

## Critical Minerals Production Tax Incentive

Dear Sir/Madam,

### RE: Critical Minerals Production Tax Incentive (CMPTI) Consultation Paper

Please note the following submission from:

Organisation	Ardea Resources Limited		
Date	12 July 2024		
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### Background

Ardea Resources Limited (**Ardea** or the **Company**) is an Australia Securities Exchange (**ASX**) listed mineral developer and explorer with operations based in the City of Kalgoorlie Boulder (**CKB**) and with the corporate head office in West Perth, Western Australia (**WA**).

Ardea welcome the opportunity to provide a response to each of the Critical Minerals Production Tax Incentive (**CMPTI**) Consultation Paper questions. To provide further context, please note the following background information on Ardea.

Ardea listed on ASX in 2017, with the key project being the Kalgoorlie Nickel Project (**KNP**) and in particular a sub-set termed the Goongarrie Hub (**Goongarrie**). The KNP mineral projects are termed nickel-cobalt-scandium laterite and are located within a 150km arc northwest to east of the CKB, with total mineral resource of **854Mt at 0.71% Ni and 0.045% Co for 6.1Mt of contained nickel and 386kt of contained cobalt** (ASX release 30 June 2023).

The KNP is the largest nickel-cobalt mineral resource in Australia and has been awarded Federal Government Major Project Status (ASX release 21 March 2022).

Ardea has a market capitalisation of approximately AUD\$100M (199.6M shares at AUD\$0.50) with cash at bank of AUD\$14.4M (as at 30 June 2024).

Ardea is a comparatively small company advancing a globally significant Critical Minerals project.

To be able to advance the KNP – Goongarrie Hub to development, Ardea has been running a Strategic Partner process since 2018. On 26 April 2024, Ardea entered into a binding Cooperation Agreement with Sumitomo Metal Mining Co., Ltd (**SMM**) and Mitsubishi Corporation (**MC**) (Consortium) to form a 50:50 incorporated joint venture (**JV**) to develop the KNP – Goongarrie Hub. The incorporated JV vehicle will be Kalgoorlie Nickel Pty Ltd (**KNPL**), which is currently a wholly owned subsidiary of Ardea.

The Cooperation Agreement sets out the terms and conditions on which the Consortium, Ardea and KNPL will fund and conduct the Definitive Feasibility Study (**DFS**), and upon agreement by the parties and subject to a positive DFS outcome, Front-End Engineering Design (**FEED**) and Pre-Commitment Activities (**PCA**), leading to a Final Investment Decision (**FID**) on the KNP – Goongarrie Hub.

SMM is a pre-eminent Japanese nickel-cobalt laterite development and production company, operating the Coral Bay and Taganito HPAL nickel operations in the Philippines and the Niihama Nickel Refinery and Harima Refinery in Japan. MC is one of Japan's largest and premier general trading and investment companies with decades of experience in investing in the Australian resources sector and has been a significant contributor to the Australian economy.

The focus of Ardea is to become a **globally significant producer of nickel and cobalt with other Critical Minerals that are essential for new age technologies to meet the needs of modern society which demand ethical and sustainable mineral supply for a low carbon future.**

The KNP has the potential to supply the following products for a low-carbon economy:

- Nickel and cobalt precursor products (and potentially manganese) for the manufacture of Lithium Ion Batteries (**LIB**) whose dominant cathode metals are nickel, cobalt and manganese (NMC, ratio 8:1:1).
- Scandium for evolving solid-state LIB and low weight/high strength aluminium-scandium alloys.
- High Purity Alumina (**HPA**) for glass screens.
- Rare Earth Elements (**REE**) notably neodymium/praseodymium/dysprosium/terbium, for use in magnets for electric motors and for wind turbine electricity generators.
- Additionally, Critical Minerals targets identified within the KNP mineral tenure include:
  - Ba, Cr, Ga, In, Mg, Mo, Te, Ti, W, Y, Zr; and
  - PGMs - Ru, Rh, Os.

The project currently undergoing a DFS is the **Goongarrie Hub** located 70km northwest of the mining centre CKB and is the premium ore feed within the broader KNP (Figure 1). Resources from the Goongarrie Hub are planned to be the base load hydrometallurgical feed for two High Pressure Acid Leach (**HPAL**) autoclaves with one Atmospheric Leach (**AL**) circuit located at Goongarrie South. The resources at Goongarrie are dominantly the premium goethite style and extend continuously over 25km of strike and at Highway, 30km north, over a strike length of 6km (Figure 1). All Goongarrie Hub mineral resources are located on granted mining leases with tenure 100%-controlled by Ardea subsidiary company KNPL.

The project also has ready access to high-quality infrastructure with the Goldfields Highway, rail line, fibre optic cable and power infrastructure passing through the project area (Figure 1). There are two port options, these being Esperance and Kwinana, that are well serviced by the KNP road and rail network.

Significantly, the KNP is located on the rail connection to the developing battery hub at the Port of Kwinana industrial area immediately south of Perth, as well as east to Port Augusta and the developing low-carbon energy hubs on the eastern Australia seaboard.

Ardea is actively engaged with Australian Commonwealth and WA State agencies and statutory authorities, notably the Department of Foreign Affairs and Trade (**DFAT**), Critical Minerals Office (**CMO**), Major Projects Facilitation Agency (**MPFA**), Australian Trade and Investment Commission (**Austrade**), Export Finance Australia (**EFA**), Department of Mines, Energy Industry Regulation and Safety (**DEMIRS**) and Department of Jobs, Tourism, Science and Innovation (**JTSI**).

These agencies are coordinating the push for a downstream battery industry within Australia through “*Team Australia*” and the State of Western Australia through “*Team WA*”. All the LIB feedstocks, including nickel and cobalt, are available in Australia and WA at the scales required for world-significant green energy centres of excellence.

### **Metal Production Technology – Kalgoorlie Nickel Project**

Ardea’s priority is the development of the KNP Goongarrie Hub as a globally significant Battery and Critical Minerals operation focussed initially on nickel-cobalt. The project finance model seeks to optimise Ardea’s project equity and long-term offtake rights.

The project scale as defined in Ardea’s 2023 Pre-Feasibility Study (**PFS**) was a 3.5Mtpa operation comprising 2 x 1.5Mtpa HPAL autoclaves combined with an up to 0.5Mtpa AL circuit. As part of the progress DFS, the project scale is being evaluated to increase to 4Mtpa, by reducing the autoclave residence time from 70 minutes to 60 minutes.

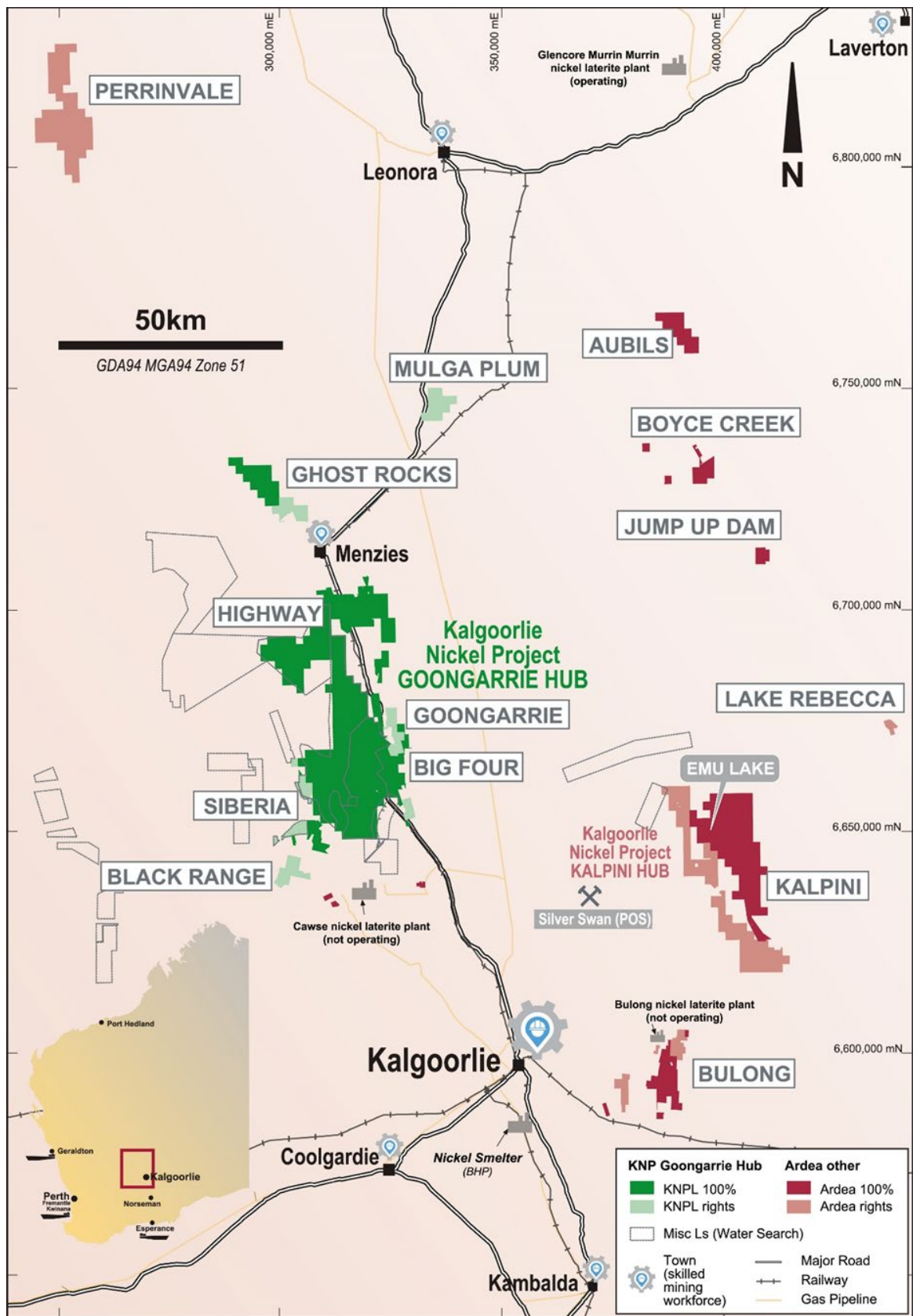


Figure 1: KNP location and infrastructure plan. Projection GDA94 MGA94 Zone 51.

The flow sheet solely uses the hydrometallurgical technology successfully deployed world-wide at existing nickel laterite operations over six decades (Figure 3), so minimising technical risk. The main neutralising agent required in ore processing is derived in-pit as Mineralised Neutraliser (**MN**), immediately underlying the nickel-cobalt laterite ore. Mineralised Neutraliser is a unique KNP attribute, being a major R&D advancement upon which Ardea now holds patents.

Ore preparation focusses on a low-risk comminution “Grind HPAL” circuit treating premium high-grade Goethite ore to facilitate an early project pay-back. With time, an increasing contribution from screened siliceous ore processed in the beneficiation “Bene HPAL” circuit facilitates an optimised resource utilisation and extended mine-life.

The AL circuit ore is sourced from high-magnesium Serpentine ore below the target Goethite ore and is gained opportunistically within pit optimisations pursuant to the Goethite mining and from MN Fines. The onsite acid plant operates by burning elemental sulphur to produce sulphuric acid as the nickel-cobalt solvent, steam for process heat as well as steam for power generation. Acid plant steady state operation is facilitated through the higher acid call of the AL circuit and is the key to the low-carbon footprint (Figure 2). The excess steam drives power generating turbines that provide the off-grid power generated independently of fossil fuels.

Initial proposed sale product to be defined as part of the DFS is possibly a Mixed Hydroxide Precipitate (**MHP**) or more likely a Mixed Sulphide Product (**MSP**) for the lithium-ion battery sector. MHP tends to contain >45% nickel and MSP >55%, so there has been considerable nickel concentration take place to produce these products. MSP appears to be a more open market, less susceptible to geopolitical manipulation.

Project financing will proceed around an MHP or MSP flow sheet. The longer-term objective is to further refine at least some of the MHP or MSP on-site or at a future Australian battery hub to Precursor Cathode-Active Material (**PCAM**), and ultimately also recover scandium and Rare Earth Elements from the tailings stream. However, the PCAM technology is a specialist area, involving significant intellectual property (**IP**) and expertise that is not currently available in Australia.

With this context in mind, Ardea believes that producing nickel-cobalt products, such as MHP and MSP is the current optimum end product to be able to cost effectively transport the material, while limiting CO<sub>2</sub> emissions. If a product, such as nickel or cobalt sulphate is produced, which only grades around 22% nickel and cobalt, respectively, there are significantly increased transport costs and CO<sub>2</sub> emissions generated.

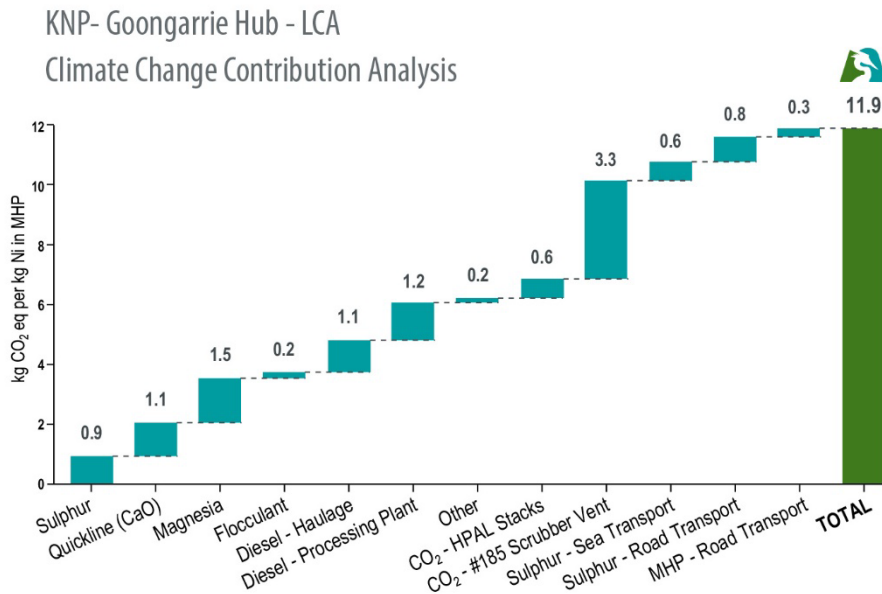
The average production rates, and capital and operating costs based on the Ardea 2023 PFS, MHP flowsheet are summarised below:

- Ore Reserve 194.1Mt at 0.70% Ni and 0.05% Co for 1.36Mt of contained nickel and 99,000t of contained cobalt<sup>1</sup>
- Mining optimisation studies have projected production of approximately 30,000t of nickel and 2,000t of cobalt per annum for more than 40 years. Year 1 to 5 (post ramp up) production >34ktpa nickel and >3ktpa cobalt<sup>2</sup>
- Conventional low-cost open pit mining methods result in mining costs comprising less than 12% of total operating cost with a very low strip ratio at an average of 1.5:1 for the first 35 years of mine life<sup>2</sup>
- The project is estimated to generate<sup>2</sup>:
  - Pre-tax NPV7 of A\$7,625M and IRR of 30%
  - Post- tax NPV7 of A\$4,980M and IRR of 23%
  - Average Annual EBITA of A\$800M

<sup>1</sup> See Section 5 of the 5 July PFS announcement for detailed Ore Reserve table and Appendix 1.

<sup>2</sup> See Section 14 of the 5 July PFS announcement for detailed notes on the financial metrics which include inputs of US\$25,000/t nickel price, US\$60,000/t cobalt price and exchange rate of 0.67 AUD:USD. Direct cash cost excludes royalties and includes third party freight charges and cobalt credit.

- Project pay back within 3.1 years
- Direct cash cost after Co by-product credit of US\$3,763/t Ni in MHP during the first five years of operation, and US\$5,763/t Ni in MHP over life of mine<sup>2</sup>
- Total capital cost of A\$3,117m, including process plant and infrastructure cost of A\$2,264M and sulphuric acid, steam, and power plant cost of \$574M<sup>3</sup>
- Life Cycle Assessment (**LCA**) is expected to be 11.9 kg CO<sub>2</sub> eq. per kg nickel in MHP based on Ardea's Scope 1, 2 and upstream Scope 3 emissions<sup>3</sup> (figure 2)
- In-pit tailings disposal minimises environmental footprint and enables mine site rehabilitation, concurrent with steady-state mine operation



Source: Minviro 2023 LCA Assessment for Ardea Resources

Figure 2: Minviro 2023 climate change contribution analysis of Ardea's Goongarrie Hub.

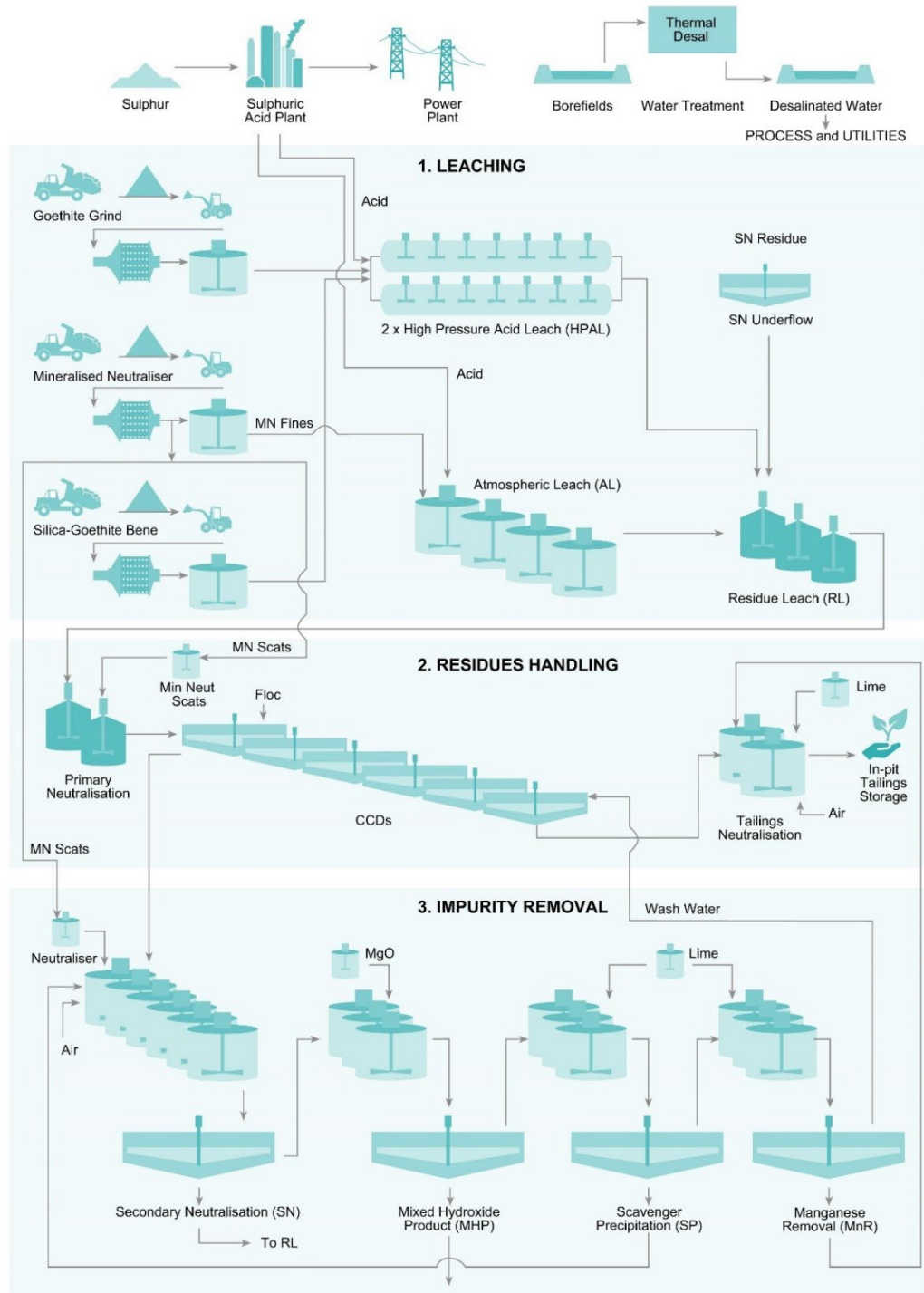
## Environmental Considerations – Kalgoorlie Nickel Project

All project development within the KNP – Goongarrie Hub is aimed at ensuring systematic and rapid rehabilitation, concurrent with operations. The KNP is located within the Great Western Woodlands, the largest and healthiest temperate to semi-arid (Mediterranean climate) woodland on Earth. The woodlands cover almost 16,000,000 hectares from the Nullarbor Plain in the east to the Wheatbelt in the west; from Esperance in the south through to the inland mulga country north of Kalgoorlie including the KNP as a comparative very small component.

Comprehensive KNP flora and fauna surveys in previous PFS work by Vale Inco in 2009 and Ardea in 2017 have confirmed environmental sustainability within the “temperate dry laterite” ecosystem.

Mine rehabilitation methodology is facilitated through four decades of WA open pit gold mine operations, and the KNP footprint is minimised using mining voids for tailings and mullock disposal. Mining voids will be progressively rehabilitated during operations and returned to their pre mining state, by dressing the back filled open pit voids with topsoil (Figure 4) and then revegetating.

<sup>3</sup> See Section 13 of the 5 July PFS announcement for detailed notes on the LCA.



**Sustainable Ni & Co Products for Battery / EV Market**



Figure 3: Goongarie Hub process flow sheet.

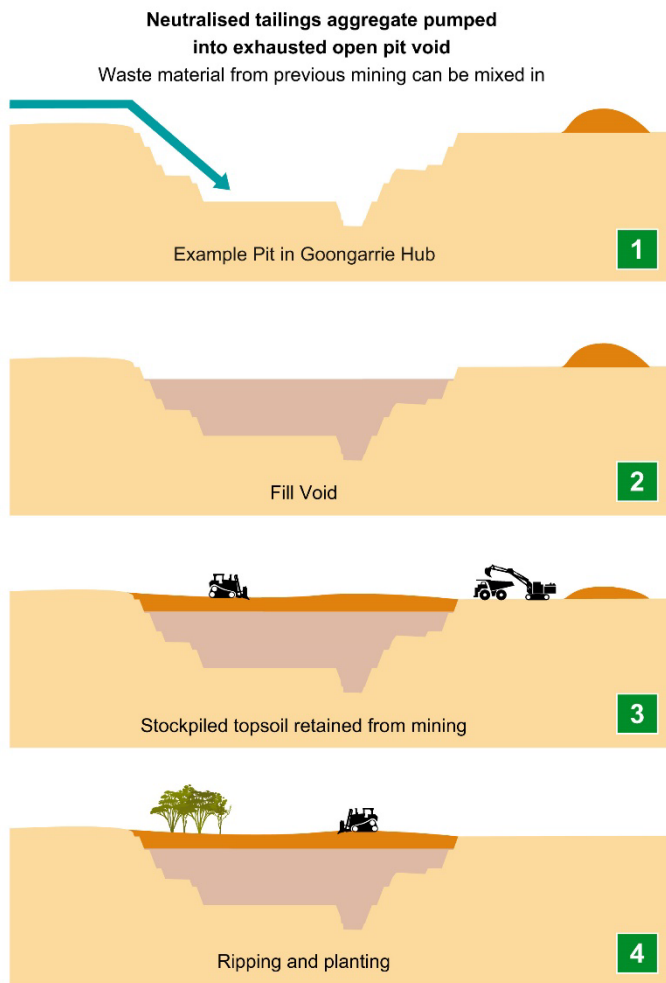


Figure 4: Planned Goongarrie Hub in-pit tails disposal and rehabilitation strategy.

Other key factors that provide the KNP with a natural advantage include:

- Large contiguous KNP land holding allows unimpeded site planning to minimise ultimate site footprint:
  - All areas disturbed in the course of mining will either be re-vegetated through agroforestry or will be utilised for solar arrays for site power generation.
- Open Mediterranean woodland is highly amenable to low-impact development and rapid rehabilitation.
  - Waste landforms in KNP regenerate easily as open woodland.
  - None of the challenges of mining in a tropical rain forest reserve.
- Arid environment, facilitates well managed tailings disposal:
  - Rehabilitation procedures are well established in the Kalgoorlie open pit gold sector.
  - No Pacific Ocean submarine tailings disposal as for Indonesia and PNG nickel laterite operations.
  - No valley-fill tailings dams.
  - No significant seismic activity.
  - No annual high rainfall to 3,000mm occurring from persistent typhoons.
- No conflicting land use demand:
  - KNP is purely a mining jurisdiction.
  - No competing food production activity (as in Eastern Australia nickel laterite districts).
  - First Nations ethnographic clearance completed, no active traditional land use conflict.
- Low carbon future:
  - KNP HPAL plant steam, heating and power generated through an onsite acid plant burning elemental sulphur for sulphuric acid feedstock.
  - KNP HPAL neutraliser includes nickel-enriched non-carbonate saprolite options.
  - Waste landform vegetation regeneration facilitates significant agroforestry throughout the KNP, with nursery planned for Menzies as a First Nations training opportunity.
- Non-carbon power generation options:
  - Solar arrays in mining degraded rehabilitated areas (avoid excessive native vegetation clearing).
  - Wind turbine (comparable climatic environment to the Merredin Collgar turbines (222MW), expect high wind activity adjoining elevated relief on western edge of Lake Goongarrie).
  - Pumped hydro is a consideration, utilising exhausted mining voids on hills some 70m above Lake Goongarrie surface voids (which may ultimately go to mined depths of >100m).

## Australian Mining Transition Opportunities

In courting potential funding partners for the KNP, Ardea notes there is a dominant and inexorable theme from the mining/battery/technology/auto giants who are our candidates:

**“Shareholders and customers demand a line of supply that is ethical and sustainable”.**

Australia, and in particular the KNP within WA and the CKB, is a text-book ethical and sustainable jurisdiction. To reiterate this point, WA is consistently one of the top-ranking jurisdictions in the Fraser Institute’s Annual Survey of Mining Companies - Investment Attractiveness Index<sup>4</sup>, which is based on a composite of policy and best practice environment with world class regulatory environment, highly competitive taxation, no political risk or uncertainty and a fully stable mining regime. The index is also weighted by mineral potential.

The clear requirement is Government policy that binds the individual projects with variously nickel, cobalt, manganese and lithium in the case of LIBs, into a single integrated downstream manufacturing operation.

The obvious opportunity is for well-resourced carbon-dependent companies of 2024 and beyond to redeploy their assets and expertise into the renewable sector, and for government policy to support the transition through existing Research and Development (**R&D**) and future training and taxation incentives.

Ardea would like to continue to engage with policy makers to ensure the best outcomes for development of the KNP for the benefit of Australia as we continue the transition to a low-carbon future. We also need to ensure that Australia continues to develop its LIB supply chain, without over reliance on overseas jurisdictions, that cannot guarantee sustainable and ethical LIB supply.

The other key asset of Australia is the abundant REE magnet metals (for neodymium magnets and samarium–cobalt magnets). The KNP has multiple REE targets hosted within ionic clays.

## The Western Australia Opportunity

Within WA, Ardea’s KNP stands out as a strategic asset that can be developed to provide essential nickel-cobalt for the LIB sector for multi decades.

## The Kalgoorlie Boulder Opportunity

CKB has a supportive community, abundant resources of nickel, cobalt, manganese (KNP) and lithium (e.g., Mt Marion and Bald Hill), plus perfect industrial land, rail infrastructure to Perth, Port of Esperance and Sydney, Curtin University for research support and a highly skilled residential mining/processing work force.

The low carbon transition is designed for Australian regional centres such as the CKB.

## The Shire of Menzies Opportunity

The Shire of Menzies has a supportive community, significant resources of nickel, cobalt, manganese (KNP – Goongarrie Hub), plus residential and industrial land, and rail infrastructure to Perth, Port of Esperance.

The low carbon transition is designed for Australian regional towns such as the Shire of Menzies.

## Questions and Answers

The following submission section is focussed on answering the Critical Minerals Production Tax Incentive (**CMPTI**) Consultation Paper questions, from the perspective of Ardea, with a Battery and Critical Mineral resource focus.

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<sup>4</sup> The Fraser Institute is a Canadian Think Tank ranked in the top 15 Worldwide - [www.fraserinstitute.org/sites/default/files/annual-survey-of-mining-companies-2021.pdf](http://www.fraserinstitute.org/sites/default/files/annual-survey-of-mining-companies-2021.pdf)



## Theme 1: Who is eligible?

### **Q1: Please provide any feedback on the proposed eligibility criteria.**

**A1:** Products, such as Mixed Hydroxide Precipitate (**MHP**) or Mixed Sulphide Product (**MSP**) for the lithium-ion battery sector must be available for the CMPTI. MHP tends to contain approximately 45% nickel and MSP >55% nickel, so there has been considerable nickel concentration take place to produce these products.

Producing nickel-cobalt products, such as MHP and MSP is the optimum end product to be able to cost effectively transport the material, while limiting CO<sub>2</sub> emissions. If a product, such as nickel or cobalt sulphate is produced, which only grades around 22% nickel and cobalt, respectively, there are significantly increased transport costs and thus CO<sub>2</sub> emissions generated.

The 11 July 2024 announced suspension of BHP Nickel West operations, Australia's largest nickel producer, reiterates the fragility of the Australian nickel sector and the requirement for mechanisms such as the CMPTI to help support the industry. Noting, that even in the current nickel price environment, the Goongarrie Hub nickel-cobalt operation can operate at current nickel prices and be cost competitive with Indonesian nickel production.

To help Australia compete globally in the energy transition, both MHP and MSP need to be eligible for the CMPTI.

Ardea suggests clarity on the Australian Critical Minerals list and eligibility for the CMPTI be fixed on FID (so not being varied should a particular mineral be removed from the list). This will help ensure financing certainty when seeking project development capital.

### **Q2: 2. What key factors would need to be accounted for in a definition of Final Investment Decision (FID) for the purposes of the CMPTI?**

**A2:** From Ardea's perspective, to make an FID, a DFS then FEED must have been completed, approvals granted, and project development debt and equity secured, to be certain the project proceeds to construction and operation. A FID requires formal Board sign off and full ASX disclosure, with the minutes of meeting and ASX release providing proof to the CMPTI regulators.

With the majority of Australia's Critical Minerals projects held by junior exploration and development companies, who are exposed to global equity market volatility, the FID can be an uncertain and drawn-out process. This is why Ardea following an international process, has chosen to partner with Sumitomo Metal Mining Co., Ltd (**SMM**) and Mitsubishi Corporation (**MC**) (Consortium) to form a 50:50 incorporated joint venture (**JV**) to develop the KNP – Goongarrie Hub.

However, despite the best intentions of project developers, we have seen multiple Critical Minerals projects in Australia experience delays, mainly related to project development approvals and financing. This challenging track record needs to be taken into account and flexibility provided from the CMPTI regulators, that if genuine project progress is being made, but a FID is not possible by 2030, that an extension process be available up to 2032.

### **Q3: How long do you expect it will take for processing and refining facilities to reach first production following FID?**

**A3:** The timing will vary dependent on the project flowsheet, scale, location and implementation plan. In the case of the Goongarrie Hub, it is expected to take approximately two years following FID to commence ore processing and refining to produce MHP or MSP.

## Theme 2: Eligible processing expenditure

### **Q4: Please provide feedback on the proposed eligible expenditure.**

**A4:** All processing costs should be classified as eligible expenditure, including reagents and other consumables, labour, utilities, maintenance, and logistics (including reagent transport to site and end product transport).

By way of example, in Ardea's case for the KNPL managed Goongarrie Hub nickel-cobalt operation, sulphur is the key reagent for Critical Mineral Extraction. This will need to be purchased and transported to site and treated to produce sulphuric acid for processing the nickel-cobalt ore. The by-product steam produced in the acid plant exothermic reaction will drive steam turbines to generate onsite power, which contributes to Ardea's low CO<sub>2</sub> emissions per kilogram of nickel produced, compared to industry nickel laterite peers in Indonesia and nickel sulphide peers in Australia. The sulphur should be eligible CMPTI expenditure.

Process waste disposal, in Ardea's case tailings disposal, is part of the ore processing component and also needs to be eligible CMPTI expenditure. Similarly for the critical site environmental rehabilitation.

### **Q5: Please provide feedback on where you draw the line between mining and primary processing and mid-stage processing?**

**A5:** Once the ore is transported from the Run of Mine (**ROM**) pad into the comminution circuit, which represents the beginning of the ore processing stage. All processing expenditure from the ROM pad onwards, including tailings disposal, should be eligible CMPTI expenditure.

### **Q6: Are there any competitive neutrality considerations to ensure the CMPTI treats different projects fairly and does not distort commercial decision-making? For example, how should capital costs for power generation be treated for facilities that produce their own power?**

**A6:** Ardea does not expect that the CMPTI will distort commercial decision making and create competitive neutrality considerations. See answer 4 above for power generation considerations for the Goongarrie Hub.

In terms of power generation, the Goongarrie Hub has three renewable alternatives:

- Solar arrays, particularly sited on mining-disturbed ground such as ore stockpile laydown areas, following cessation of adjoining dust-generating mining.
- Wind turbines on Goongarrie Hill Waste Rock Deposits, making use of the thermal contrast between the adjoining Lake Goongarrie salina surface and the hill.
- Pumped hydro, should the DFS mining schedule allow the up to 140m deep pit Pamela Jean Deeps ore body not be used for tailings disposal. The height differential water reservoir would be a Goongarrie Hill exhausted pit (again, if the DFS mining schedule allows it to be quarantined from tailings disposal).

### **Q7: What, if any, transport costs should qualify? How could a sensible boundary between eligible and ineligible transport costs be drawn?**

**A7:** Process reagent transport costs and the costs for shipping the final product to market should be eligible.

Consideration should be given to personnel daily site bussing to be CMPTI-eligible, to encourage domiciling workers in CKB rather than FIFO Perth.

### **Q8: What reagent costs should be eligible?**

**A8:** All process reagent costs should be eligible.

Goongarrie Hub utilises on-site Neutraliser reagent, with its limiting CO<sub>2</sub> emissions.

### **Q9: What costs associated with the treatment, enrichment or disposal of waste should be included? Why?**

**A9:** All costs associated with the treatment of ore, enrichment and disposal of waste from processing should be included. Waste disposal is an inevitable process operating cost that must meet the high standards expected by society and as legislated by Goongarrie's developers geopolitical alignment.

All processing operations have to manage and safely dispose of the waste produced. Waste may be minimised but cannot be avoided as it is an outcome of separating the ore bearing minerals to specific purity and products. The waste created by undertaking processing of Critical Minerals is also a prescribed and regulated activity under both the State and Commonwealth legislative frameworks.

**Q10: What structures are likely to be adopted in critical minerals processing that could give rise to related party transactions? How should related party dealings be treated under the CMPTI?**

**A10:** Product purchases and sales need to be made on an arm length basis, at market rates (in contrast to nickel markets controlled by the industry dominant geopolitical regime).

**Q11: What intellectual property (IP) arrangements are adopted by critical minerals processors? What treatment should apply to the payment of royalties? What measures could be put in place to manage integrity risks?**

**A11:** IP considerations are particularly relevant to Critical Minerals, especially so given the rapid growth in the sector, supply chain diversity and security considerations, and the fact that most downstream processing technology is controlled by a select group of companies from several countries.

Payment of some royalties will be inevitable to guarantee technology transfer and the growth of the Critical Minerals sector within Australia.

IP arrangements are negotiated on an arms-length basis with contractual evidence available to demonstrate the details of any royalty payable.

Royalty payments need to be included as an eligible processing cost and should be included in the CMPTI. Protection of Highly Confidential Information is a critical concern of the Australian Critical Mineral sector, for limiting IP access by the dominant geopolitical regime).

### **Theme 3: Eligible outputs**

**Q12: Which critical minerals are currently processed in Australia? To what grade?**

**A12:** Ardea will focus on its main production stream, being nickel. Products currently produced in Australia vary from nickel sulphate with a relatively low nickel concentration of ~22% through to MHP containing approximately 45% nickel, MSP typically containing 55% to 60% nickel, nickel matte product containing approximately 68% nickel, and nickel powder and briquettes, containing about 99.8% nickel.

From a product transport perspective, there are transport compaction challenges with nickel sulphate and the with the relatively low nickel grade, there are increased CO<sub>2</sub> emissions associated with its transport.

All nickel products should be eligible for the CMPTI, and especially those grading ≥55% nickel, to help Australia compete globally against State-Owned Enterprises and ensure the longevity of the Australian nickel sector to contribute to the Australian economy and in particular the local communities where the operations are based.

The challenges faced by BHP's Nickel West are evidence of the fragility of the emerging Critical Minerals sector in a market under duress from the dominant geopolitical regime.

**Q13: Of Australia's 31 critical minerals, what are the current common market requirements for processed outputs?**

**A13:** The processed outputs vary widely for each Critical Mineral and Ardea feels it most appropriate in its submission to focus on nickel-cobalt, as per the answers provided to other questions in this document.

**Q14: *What is the form of the raw critical mineral when it arrives at your facility and what is its state when it leaves your facility?***

**A14:** Laterite/iron oxide ore will be delivered by the mine operations team to the ROM pad for processing. Based on the in progress KNP – Goongarrie Hub DFS, the end product is expected to be MSP, produced by exposing HPAL pregnant liquor solutions to hydrogen sulphide. The MSP is expected to contain ≥55% nickel and be packaged in approximate 1 tonne bulka bags.

**Q15: *Can you provide details on the full workflow process to convert the raw critical mineral to the end-product(s) in your facility? Does the workflow process involve beneficiation?***

**A15:** The Goongarrie Hub mine plan will focus on the premium goethite ore, which based on Ardea's 2023 PFS, comprised 69% of the mine plan. The remaining ore will include some beneficiation to remove barren coarse material, such as silica fragments. The finer size fraction material is predominantly goethite rich and contains elevated nickel-cobalt. This material will be processed.

The Goongarrie Hub DFS flowsheet is currently being updated from the 2023 PFS, to change the end product from MHP to MSP. A conceptual flowsheet from the 2023 PFS is shown in Figure 3.

**Q16: *What are the associated costs (e.g., reagents and consumables, labour, utilities, maintenance, logistics/transport, waste, etc.) for each processing stage undertaken in your facility?***

**A16:** These inputs are currently being updated as part of the recently commenced Goongarrie Hub DFS. Ardea is happy to organise a meeting with Treasury to go through the 2023 PFS financial model.

**Q17: *Does the end product undergo any further processing after it leaves your facility? Can you provide more details regarding the next steps and/or process?***

**A17:** As part of the Cooperation Agreement entered into with Sumitomo Metal Mining Co., Ltd and Mitsubishi Corporation on 26 April 2024, they will have access to 75% of the offtake from the Goongarrie Hub. This is an important consideration for securing future project development debt, as lenders tend to require at least 70% of the offtake be contracted to financially well-regarded parties.

Sumitomo Metal Mining Co., Ltd and Mitsubishi Corporation will determine if any further processing is undertaken on their share of the offtake.

KNPL will determine if any further processing is undertaken on the remaining 25% of the offtake. This will include additional consideration of further downstream processing.

However, the most important consideration is that the project is developed in a staged approach to make sure each stage is implemented successfully, to allow subsequent stages, such as further downstream processing to be evaluated.

This is also part of Ardea's rationale for partnering with Sumitomo Metal Mining Co., Ltd, as they have world leading nickel processing skills and experience throughout all nickel supply chains, including the production of Precursor Cathode Active Material and Cathode Active Material for the LIB sector.

Many companies aspire to produce downstream Critical Minerals products, but without experienced partners, willing to share their experience and IP, and access to project development capital, the majority of companies will not succeed. This trend has been evident historically throughout the Australian Critical Minerals sector.

**Q18: *To what extent are different minerals processed together e.g., from the same raw material? What considerations does this give rise to for the application of the CMPTI?***

**A18** This varies depending upon each Critical Minerals deposit. However, it is common for several minerals to occur together and to be processed together. In the case of the Goongarrie Hub, nickel-cobalt-scandium all occur together within the laterite mineral resource. The current plan is to recover nickel-cobalt within the MSP end product.

If the demand for scandium continues to grow sufficiently and if determined economically viable to develop a scandium circuit, this could be another byproduct, in addition to cobalt. Nickel is expected to continue to be the primary commodity produced.

The Kalgoorlie Nickel Project mineralisation is variously enriched in the REEs Pr-Nd-Tb-Dy, LCTs Cs-Ta-Tl and W-Mo. In due course, their recovery from tailings streams will be reviewed, but the DFS focus is solely Ni-Co.

***Q19: What is a sensible approach to apportionment of mixed-use costs?***

**A19:** In the case of the Goongarrie Hub, all expected end products are Critical Minerals, so all processing costs should be eligible for the CMPTI.

#### **Theme 4: Administrative arrangements**

***Q20: Please provide feedback on the proposed administration arrangements.***

**A20:** Australia has a highly functioning, internationally recognised, assay laboratory system that manages the specification and analysis of minerals. The performance and integrity of Laboratories is vital for the resources sector. All major Laboratories in Australia adheres to international ISO standards.

For all minerals sales, minerals are tested when they are dispatched to the customer and upon arrival. The Laboratory test results, and their underlying methodologies are internationally standardised and regulated, so that the producers and customers have an agreed framework for the quality of their minerals.

If the tests differ between dispatch and arrival, a third laboratory adjudicates and undertakes tests. This is called Umpiring and is a common practice throughout the resources sector. In many cases the results of the analyses from two separate laboratories will either be the same, or sufficiently close, to allow the parties to agree on composition and therefore the value of a cargo.

Prequalifying to meeting these requirements to be considered for offtake is, in itself, an exhaustive process. Companies must produce commercial scale processed samples of their product during the offtake process so that customers may discern whether they are able to meet the required product specifications.

The resources sector has an established and well-functioning assay Laboratory system which can be checked and audited to ensure full transparency. There is no need to duplicate this system. However, if the Commonwealth Government and agencies such as Geoscience Australia, would like to check and audit this system, they are welcome to.

***Q21: What testing certifications of processed minerals are common in industry?***

**A21:** The following testing certifications are common umbrella ISO certifications that most major labs operate under:

ISO17025 is a National Association of Testing Authorities (NATA) accreditation, which covers all analysis related to ores and minerals, environmental, and materials (including oils and lubricants etc).

ISO45001 is a National Association of Testing Authorities accreditation for Health and Safety.

The National Association of Testing Authorities (NATA) is the overseeing agency for the quality control of private laboratories. On the 25 June 2024 in Sydney, the NATA signed a new Memorandum of Understanding (MoU) with the Commonwealth of Australia.

Under the MoU, the Commonwealth Government recognises NATA as Australia's national authority for the accreditation of laboratories, reference materials producers, proficiency testing providers and biobanks, and a peak authority for the accreditation of inspection bodies. The Government also recognised NATA as Australia's compliance monitoring authority of the OECD Principles of Good Laboratory Practice.

**Q22: Do businesses regularly rely on commodity contracts to evidence the purity of the commodities being exchanged?**

**A22:** Every company that provides mineral products to a customer have arrangements in place to evidence the composition of the mineral products at the point of dispatch and receipt. Specifications on the quality of the mineral to be produced are identified in the offtake contracts. The majority of offtake agreements include agreed upon processes for evidencing the quality and quantity of minerals, what to do if that is disputed, and penalties if it is found not to meet specification.

**Q23: Do current facilities fail processed mineral purity tests? If so, how often?**

**A23:** Purity for Critical Minerals tends to be more precise, than other commodities.

Each Critical Mineral project and contract can have varying specifications, based on the customer requirement.

From general industry experience, there tends to be a low rate of failure for mineral purity tests, with most projects having to go through a prequalification process, to make sure customer specifications can consistently be met.

## Theme 5: Community benefit principles

**Q24: What obligations should be imposed on potential recipients of the CMPTI to ensure the community benefit principles are met?**

**A24:** To be able to develop a mineral processing facility in Australia the level of local stakeholder, State and Federal engagement is sufficiently high to ensure that the communities within which the project is developed benefit.

With the Goongarrie Hub located only 70km northwest of the CKB, KNPL will be able to offer both residential (preferred option) and fly in fly out roles to be able to attract and retain the best possible work force.

Community engagement, providing opportunities for increased employment, training and earning capacity are compulsory requirements and guiding business principles. As are supporting local causes through mechanisms such as Ardea's Eastern Goldfields Education Grant Program, and joint Curtin University and CSIRO minerals research programs.

Additional obligations do not need to be imposed.

**Q25: What obligations are potential recipients of the CMPTI currently subject to that might support the community benefit objectives (noting these will be finalised under the Future Made in Australia Act)?**

**A25:** In the example of the Goongarrie Hub, the in progress DFS is incorporating the Future Made in Australia Act, community benefit principles.

As mentioned in A24, above, these guidelines are compulsory requirements and guiding business principles.

**Q26: Are there any additional objectives that you consider important? What obligations might support these?**

**A26:** The Future Made in Australia Act list is extensive and does not need to be extended.

The key objective of the CMPTI is to promote additional Critical Minerals processing within Australia, so the barrier to do so should not be raised higher by further administrative burden for outcomes already being achieved via other regulatory provisions.

**Q27: Recipients of the CMPTI may be subject to additional transparency and disclosure requirements in order to be eligible. What kind of requirements are appropriate? What are the key practical considerations to take into account when setting the requirements?**

**A27:** ASX listed companies are already required to provide detailed transparency and full disclosure. Any CMPTI requirement should be tailored to be consistent with existing ASX listing obligations to limit the unintended consequence of additional compliance and cost.

It is axiomatic that Ardea's considerable IP be safe guarded.

**Q28: How should entities proposing to claim the CMPTI be required to demonstrate compliance with tax obligations?**

**A28:** Compliance with the CMPTI guidelines can be specifically included as a line item in recipient companies annual and half yearly financial reporting.

The quality and quantity of the Critical Minerals produced could be evidenced through the provision of paperwork from an independent laboratory to the ATO to satisfy product specifications and detailed quantities based on weigh bridge or other auditable mechanism. This data can be quantified and audited by the Government as required.

**Q29: What information do you think should be reported publicly on the recipients of the CMPTI and the amount of credit received?**

**A29:** Disclosure on the recipients of the CMPTI and the amount of credit received could be provided on an annual basis.

Another option is to be consistent with the model used by the Research and Development (R&D) Tax incentive. In this example, to be eligible for the R&D Tax incentive a company completes the required form, and then two years afterwards, the Australian Tax Office will publish the information.

Consideration needs to be given to protecting confidential company information, whilst providing sufficient disclosure to demonstrate the benefit of the CMPTI to the Australian economy, by helping support and expand the Critical Minerals sector.

**Q30: Who should the reporting requirements be imposed on? For example, on the recipient entity, or central reporting through a regulator?**

**A30:** Reporting requirements should be placed on the recipients of the CMPTI and can be included in their annual accounts. Central reporting through a regulator can also be implemented to monitor and administer, with this model successfully applied for the R&D tax incentive.

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Ardea welcomes any additional feedback and being able to work with all stakeholders to see a CMPTI successfully implemented, that applies to nickel products, such as MHP and MSP.

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