

Heavy Rare Earths Limited

ACN 648 991 039



*Supporting a cleaner and sustainable
future through critical minerals*

ASX: HRE

August 2022

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By accepting this Document, Recipient's acknowledge and agree to be bound by the above statements.

COMPETENT PERSONS STATEMENT

The Exploration Results and Mineral Resources contained in this Document have been extracted from the Independent Geologist's Report included in the Company's IPO Prospectus, a copy of which was lodged with ASIC on 5 July 2022. The Company confirms that it is not aware of any new information or data that materially affects the Exploration Results or Mineral Resources as contained in the Company's IPO Prospectus. All material assumptions and technical parameters underpinning the Mineral Resources in the Company's IPO Prospectus continue to apply and have not materially changed.

Value Proposition

Rare Earths: Ongoing supply side issues and forecast demand side strength in e-mobility and wind power supports a high rare earth price environment

Key Project: Heavy Rare Earths Limited (HRE) owns the Cowalinya clay-hosted rare earth project, located on crown land 70 km south-east of Norseman in Western Australia, amongst the world's premier mining jurisdictions

Maiden Resource¹: Shallow Inferred Resources of **28 million tonnes @ 625 ppm TREO** (Total Rare Earth Oxides) with magnet rare earths Pr, Nd, Tb and Dy comprising 25% of the mix

Expansion Potential: The Inferred Resource remains open in all lateral directions and occupies less than 1.5% of the project tenement

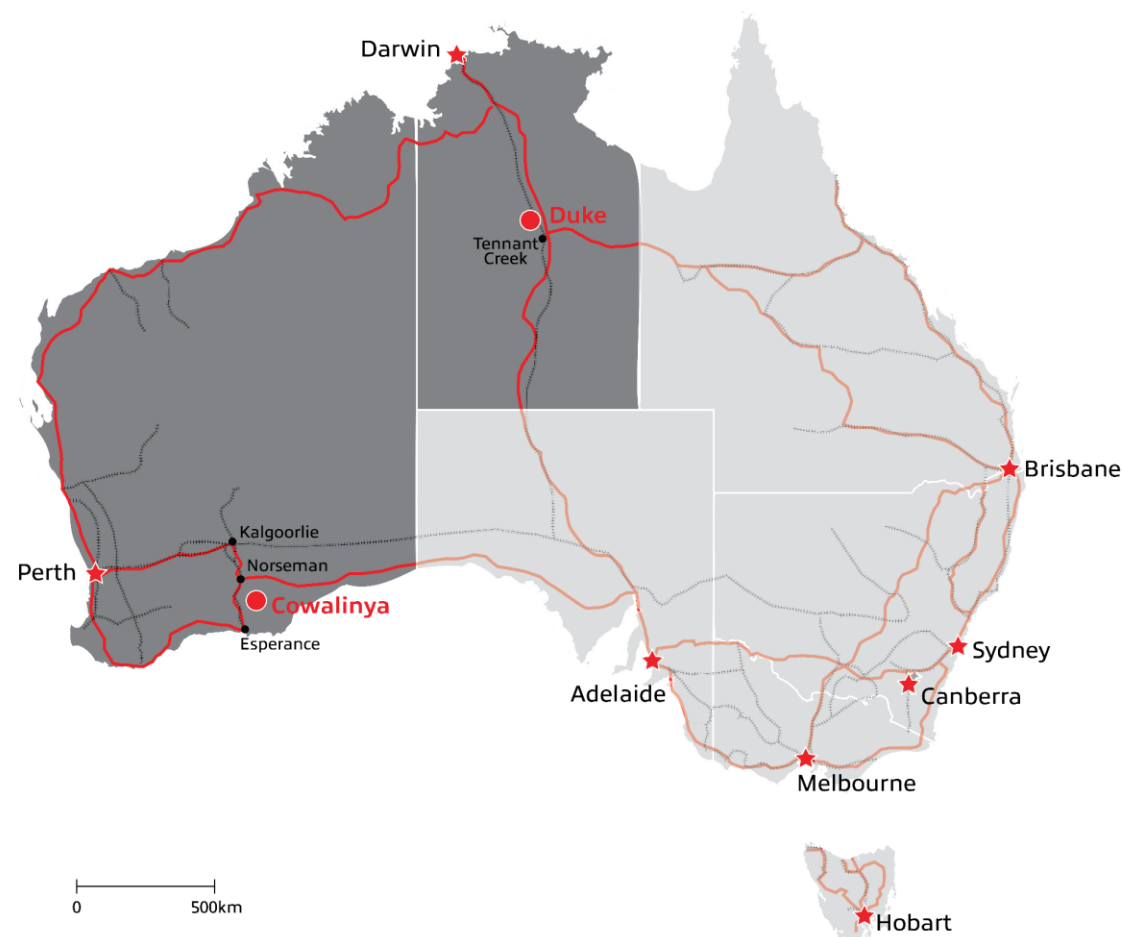
Metallurgy: Sighter test-work indicates high proportions of rare earths are brought into solution using a weak acid leach

Hard Rock Project: Targeting Browns Range-style heavy rare earths deposits at Duke, 50 km north-west of Tennant Creek in the Northern Territory (*under application*)

Strong Team: Richard Brescianini (technical, supply chain, community, 15 years' experience in rare earths); John Byrne (mining developer, 40 years' experience bringing mines into production); Ryan Skeen (financial, economic markets)

IPO Funds: Initial plan is to drill up to 10,000 m in 330 holes at Cowalinya commencing Q3 CY2022. Refer to IPO Prospectus for further details for proposed use of funds.

1. See pp 109 of the Independent Geologist's Report contained in HRE's IPO Prospectus.



Board and Management Team

Non-Executive Chairman – John Byrne

Mr Byrne has 40 years' experience in the natural resource industry as a financial analyst, investor and mine developer. John formed and mentored Cambrian Mining Plc in 2002, which started with net assets of GBP£1.4 million and before being acquired in 2008 had net assets of GBP£149 million. John has been Chairman and CEO of numerous successful resource companies, including Western Coal Corp which was capitalised at less than C\$1 million when he joined, and was sold for C\$3.3billion in 2010.



Executive Director – Richard Brescianini

Mr Brescianini is a qualified geoscientist with an Honours degree from the University of Tasmania and is a member of the Australian Institute of Geoscientists and Australian Society of Exploration Geophysicists. Richard commenced his career in mineral exploration with BHP Minerals in 1987 working in teams focused on the discovery of base and precious metal deposits across Australia and North America. Richard's experience includes working as the Director of the Northern Territory Government's Geological Survey and working for rare earths developer, Arafura Resources, in the executive management team.



Non-Executive Director – Ryan Skeen

Mr Skeen has a background in financial and economic markets, with expertise in providing investment and strategic advice to emerging companies. Ryan is largely focused on exploration in gold, rare earths and base metals. He is currently Chief Executive Officer of a junior gold and base metals explorer with projects in Victoria and Western Australia.



Company Secretary & Chief Financial Officer – Justin Mouchacca

Mr Mouchacca is a Chartered Accountant and Fellow of the Governance Institute of Australia with over 15 years' experience in public company responsibilities including statutory, corporate governance and financial reporting requirements. Since July 2019, Mr Mouchacca has been principal of JM Corporate Services and has been appointed Company Secretary and Financial Officer for a number of entities listed on the ASX and unlisted public companies.



Corporate Snapshot

Capital Structure	ASX: HRE
Shares on Issue at IPO	68.3 million
Market Capitalisation at IPO (@ \$0.20)	\$13.5 million
Cash	\$6.0 million
Debt	Nil
Enterprise Value	\$7.5 million
Options	14.2 million (exercisable @ \$0.30 and \$0.40)

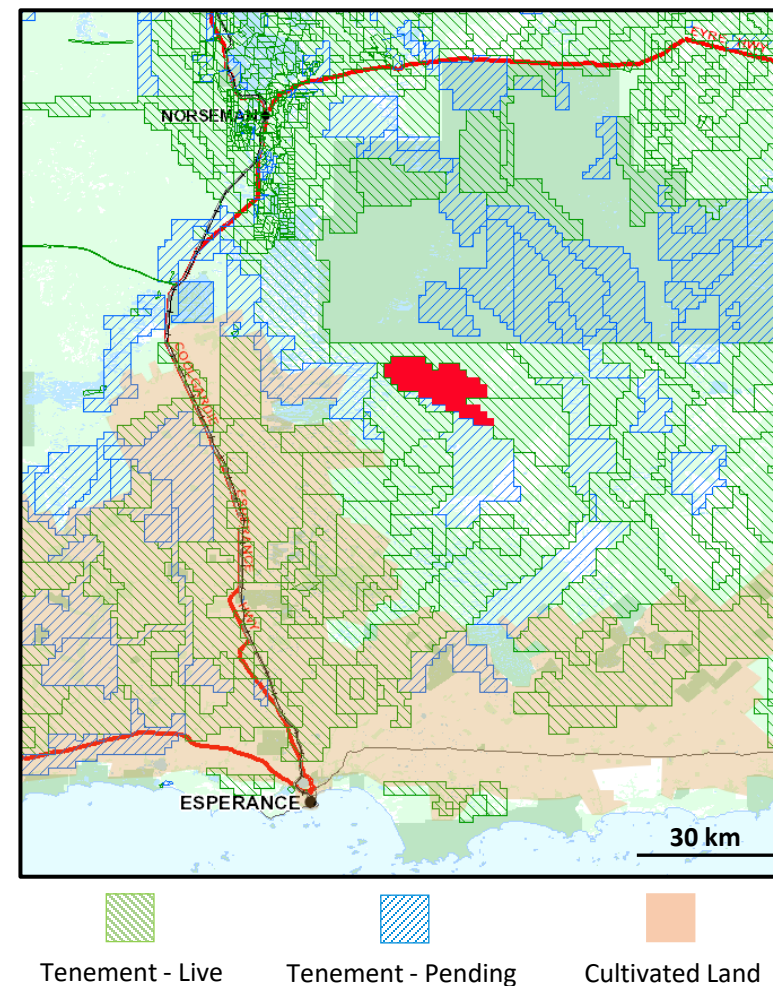


AC28 drill site at Cowalinya. Drilled by HRE in July 2021.
AC28 assayed 27 metres @ 951 ppm TREO from 12 metres.

Clay-Hosted Project – Cowalinya WA

- The **Cowalinya clay-hosted rare earth project** is located on the 230 km² granted exploration tenement E63/1972 in Western Australia
- **HRE owns 100% of the mineral rights on E63/1972**
- E63/1972 is on unallocated crown land 70 km south-east of Norseman, 45 km east of the Coolgardie-Esperance Highway and rail line, and 110 km north-east of the Port of Esperance
- The mineralisation being investigated is shallow, flat lying, supergene concentrations of rare earths in saprolite, similar in style to the southern Chinese ion adsorption clay deposits, the world's main supply source of heavy rare earths
- Drilling of Cowalinya by HRE in 2021 established the project's maiden Inferred Mineral Resource of **28 million tonnes @ 625 ppm TREO¹**
- First-pass metallurgical test-work on clay-hosted rare earths mineralisation from Cowalinya has delivered encouraging results
- The development of a metallurgical process flow sheet aimed at commercially recovering rare earths from Cowalinya will be a key focus for HRE over the coming months
- An expanded program of drilling and metallurgical test-work is planned for FY22-23

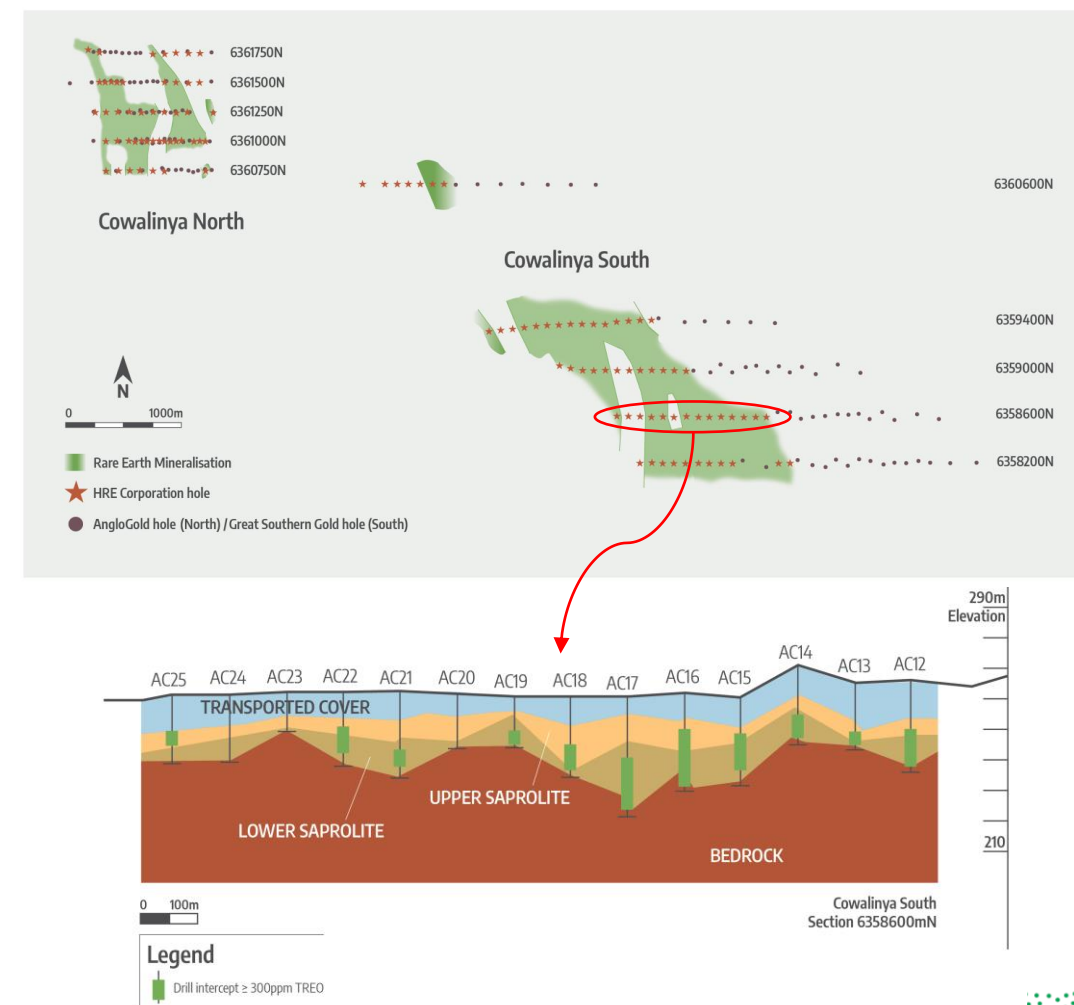
1. See pp 109 of the Independent Geologist's Report contained in HRE's IPO Prospectus.



Cowalinya Drilling Results¹ – 2021

- HRE drilled 3,098 metres in 109 air core holes at Cowalinya in July 2021, targeting two areas covering 6.2 kilometres of potential strike
- The area of the Cowalinya tenement covered by HRE's drilling represents **less than 1.5% of the total area of the tenement**
- Drilling confirmed the exploration model by intersecting supergene enrichment of rare earths in saprolite in 82 of the 109 holes
- Mineralisation (≥ 300 ppm TREO) is flat-lying, extensive, **averages 8-9 metres thick** and is overlain by an average of 17-18 metres of overburden
- Significant mineralised drill intercepts included:
 - AC02: 24 metres @ 892 ppm TREO from 8 metres
 - AC04: 18 metres @ 719 ppm TREO from 17 metres
 - AC28: 27 metres @ 951 ppm TREO from 12 metres
 - AC29: 19 metres @ 1445 ppm TREO from 20 metres**
 - AC89: 17 metres @ 1205 ppm TREO from 26 metres
- The Cowalinya discovery enabled Mineral Resources to be estimated in December 2021

1. See pp 89-98 of the Independent Geologist's Report contained in HRE's IPO Prospectus.



Cowalinya Mineral Resources¹

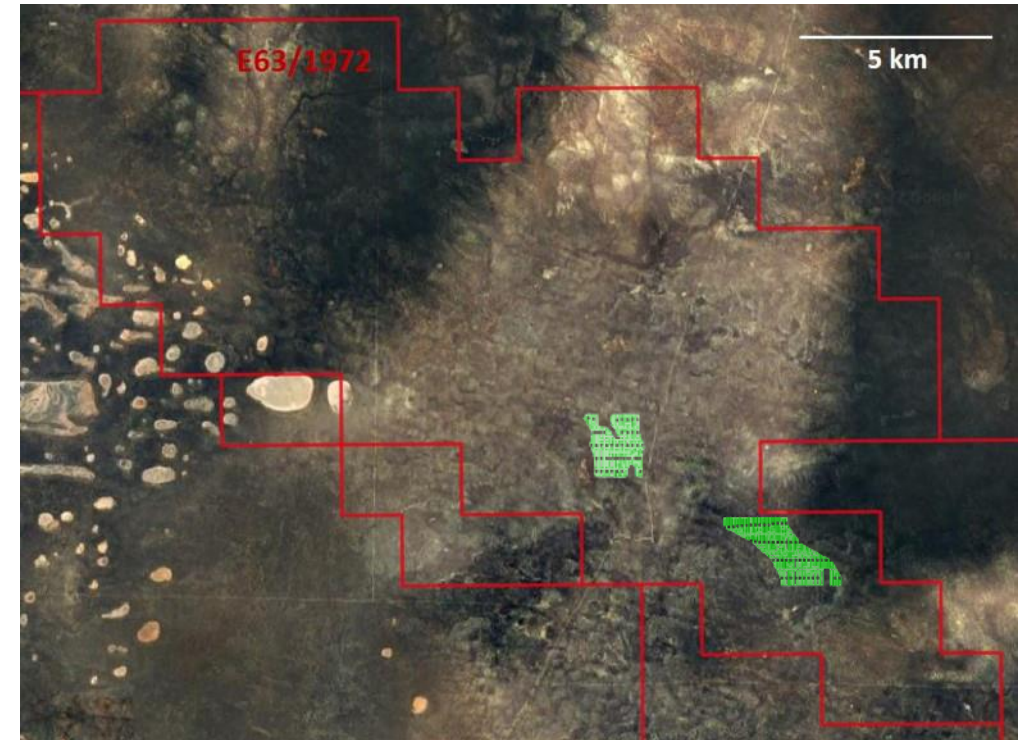
- Mineral Resources were estimated for Cowalinya rare earths mineralisation in December 2021 by independently commissioned JMCT Consulting

Area	Classification	Tonnes (Mt)	TREO (ppm)	TREO-CeO ₂ (ppm)	Sc ₂ O ₃	Magnet REOs/TREO (%)
Cowalinya North	Inferred	7	635	450	26	25
Cowalinya South	Inferred	22	620	430	32	25
Total	Inferred	28	625	435	31	25

Mr John Tyrrell of JMCT Consulting is the Competent Person for the Cowalinya Mineral Resource estimate (in accordance with 2012 JORC Code).
 TREO = La₂O₃+CeO₂+Pr₆O₁₁+Nd₂O₃+Sm₂O₃+Eu₂O₃+Gd₂O₃+Tb₄O₇+Dy₂O₃+Ho₂O₃+Er₂O₃+Tm₂O₃+Yb₂O₃+Lu₂O₃+Y₂O₃.
 Magnet REOs = Pr₆O₁₁+Nd₂O₃+Tb₄O₇+Dy₂O₃; Totals may not add due to rounding; Reported above a TREO-CeO₂ cut-off grade of 300 ppm.

- Resource is open in all lateral directions**
- TREO grade is conservative as re-assay of 46 samples from 2 holes using lithium borate laser ablation delivered a 12% higher average grade
- Magnet rare earths Pr-Nd-Tb-Dy comprise **25% of the mix**
- Heavy rare earths Tb-Dy-Ho-Er-Tm-Yb-Lu-Y comprise **23% of the mix**
- Very low concentration of radioelements**, averaging 15 ppm ThO₂ and 5 ppm U₃O₈

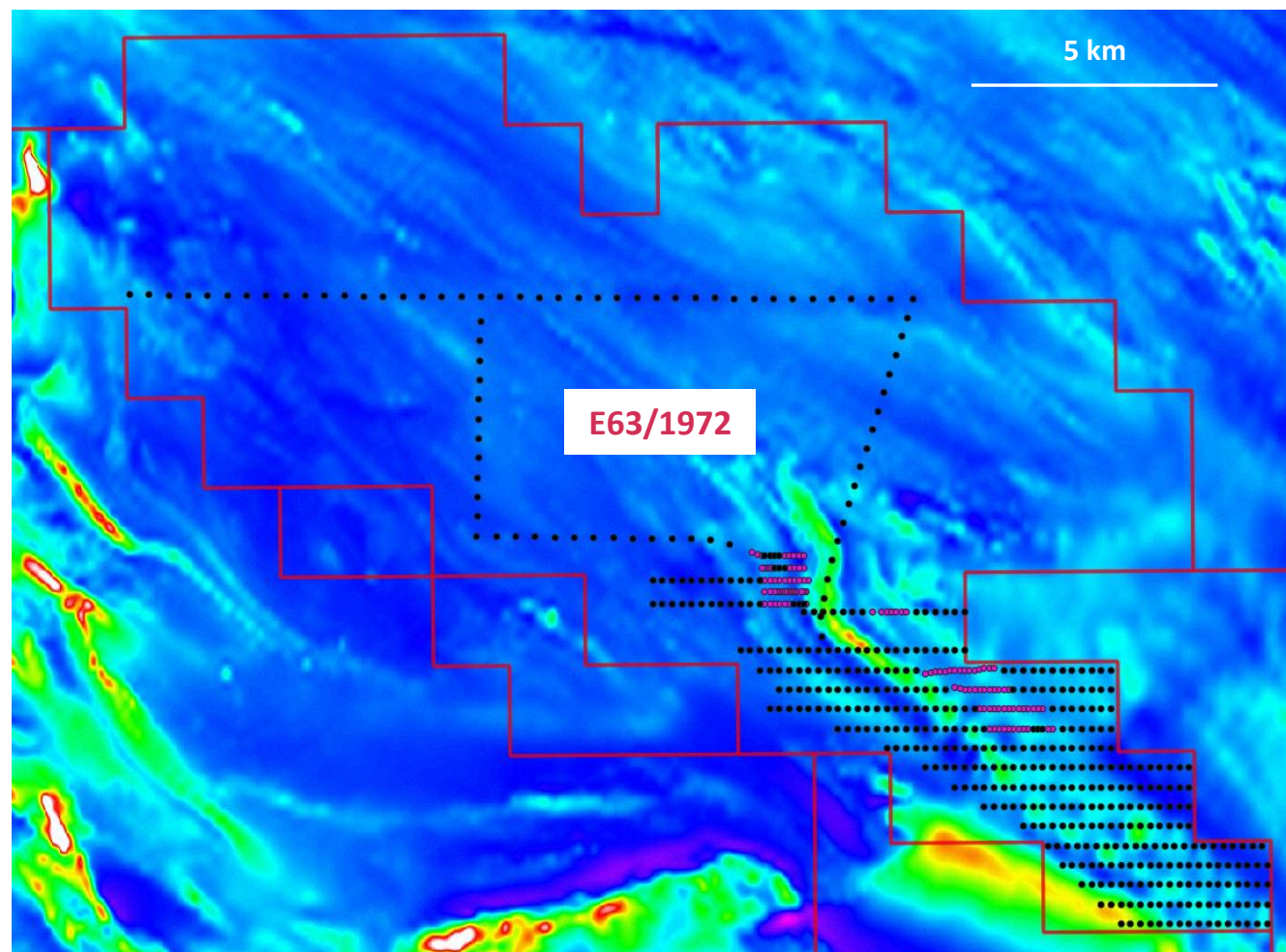
1. See pp 101-110 of the Independent Geologist's Report contained in HRE's IPO Prospectus.



Inferred Mineral Resources shown in green.
Background image from Google Earth.

Cowalinya Resource Expansion and Exploration Drilling – 2022

- HRE plans to drill up to 10,000 air core metres in 330 holes commencing in September 2022
- The purpose of the program is to explore for rare earth resources primarily to the west and south-east of the Cowalinya South resource, initially on a 400 x 200 metre grid
- Results will guide the extent of closer-spaced drilling to increase resource confidence
- Regional traverses of 400 metre-spaced air core holes will also be drilled to generate new target areas
- Cultural heritage surveys and drill line clearing have been completed

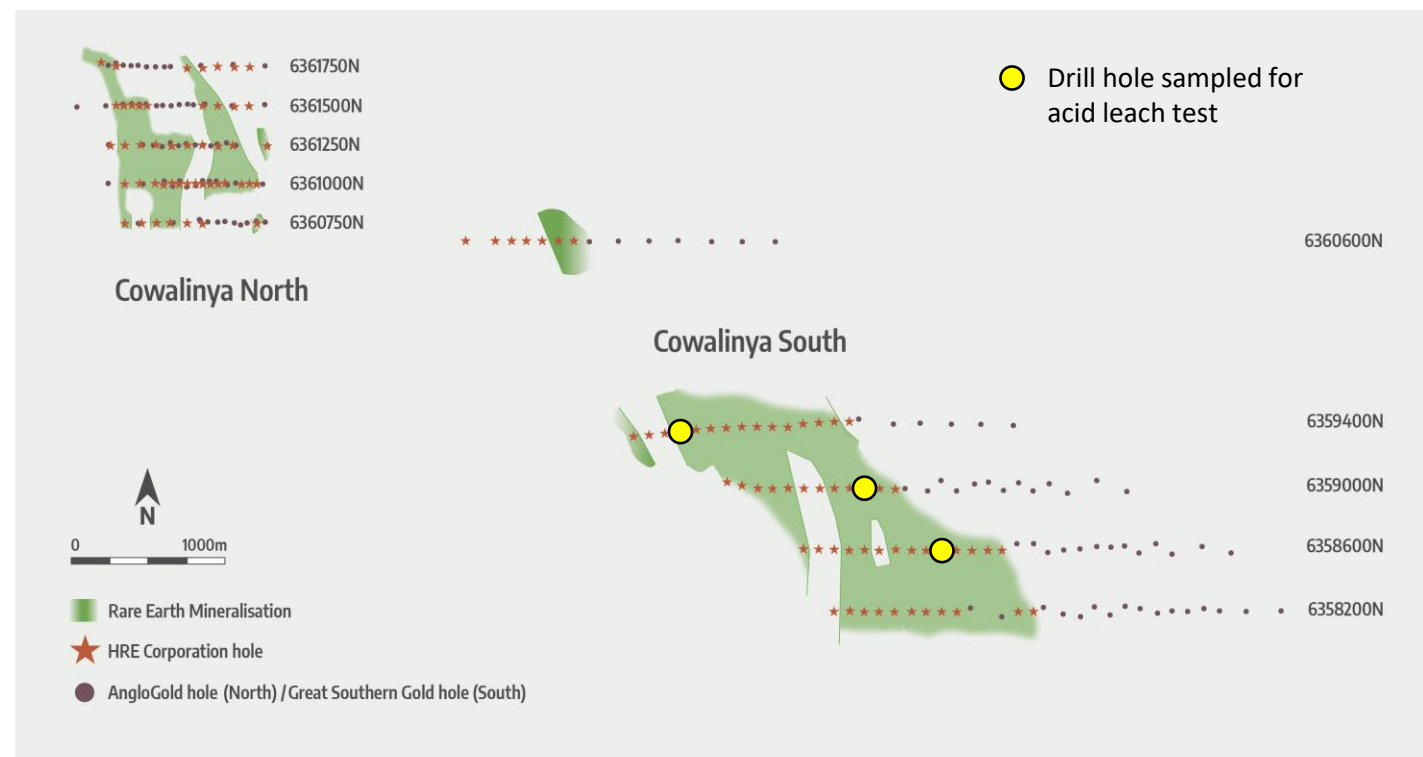


- Existing 2021 Drill Holes
- Proposed 2022 Drill Holes
- Tenement Boundary

Background image is reduced-to-pole total magnetic intensity (RTP-TMI)

Metallurgical Test Work¹

- HRE conducted preliminary hydrochloric acid (HCl) leach tests at LabWest Minerals Analysis on 40 mineralised saprolite samples from 3 holes drilled at Cowalinya in 2021
- This work indicated that high proportions (89% weighted average) of the magnet rare earths were brought into solution using weak (5%) HCl consistent with earlier work by Salazar Gold on saprolite drilled elsewhere in the region
- Additional mineralised saprolite samples from the 2021 program have been collected from the Cowalinya site for an expanded metallurgical program of acid leach and other sighter test work
- HRE is engaging an independent metallurgical consulting company to design and complete this work
- The development of a metallurgical process flow sheet aimed at commercially recovering rare earths from Cowalinya will be a key focus for HRE over the coming months



1. See pp 99 of the Independent Geologist's Report contained in HRE's IPO Prospectus.

Rare Earth Composition

Rare Earth Group		Rare Earth Oxide (REO)	Primary Application	Cowalinya In-Situ Rare Earth Composition ¹ (% of TREO)
Magnet Rare Earths	Light	Praseodymium	Rare earth permanent magnets in electric motors, micromotors and generators (conventional and EV automotive, wind turbines, power tools, elevators, robotics), speakers, smart phones, medical devices, military hardware, etc.	4.6%
		Neodymium		17.4%
	Heavy	Terbium		0.5%
		Dysprosium		2.7%
Other Rare Earths		Heavy	Specialty alloys, lasers, health treatment, nuclear industry	19.8%
		Light	Fluid (oil) cracking catalysts, automotive catalytic converters	54.9%
				100%

Magnet Rare Earths are Praseodymium, Neodymium, Terbium & Dysprosium.
 Other Heavy Rare Earths are Holmium, Erbium, Thulium, Ytterbium, Lutetium & Yttrium.
 Other Light Rare Earths are Lanthanum, Cerium, Samarium, Europium & Gadolinium.
 Refer to the Important Notice and Disclaimer on slide 2.

1. See pp 85 of Appendix 7 of the Independent Geologist's Report contained in HRE's IPO Prospectus.

Peer Comparison

		Heavy Rare Earths	Australian Rare Earths	Meeka Metals	Mount Ridley Mines	OD6 Metals
ASX Code		HRE	AR3	MEK	MRD	OD6
Project		Cowalinya (WA)	Koppamurra (SA & VIC)	Cascade & Circle Valley (WA)	Mount Ridley (WA)	Grass Patch & Splinter Rock (WA)
Tenement Holdings (km ²)		230	4,030	2,290	~3,400	4,828
Underlying Land Use		Unallocated Crown Land	Agricultural	Agricultural	Unallocated Crown Land & Agricultural	Unallocated Crown Land & Agricultural
Mineralisation Type		Clay hosted	Clay hosted	Clay hosted	Clay hosted	Clay hosted
Resources	Classification	Inferred	Indicated & Inferred	Nil	Nil	Nil
	Million Tonnes	28	81			
	Grade (ppm TREO)	625	785			
	Average Thickness (metres)	8-9	3			
	In-Situ TREO (tonnes)	17,500	63,590			
	Area Drilled (km ²)	2.2	28.9			
	Resource Intensity (tonnes TREO/km ²)	7,950	2,200			
	Magnet REOs/TREO	25.3%	24.5%			
Market Capitalisation (A\$)		\$13.5 million	\$56.3 million	\$80.4 million	\$32.2 million	\$19.0 million

Tenement Holdings limited to Project & include applications.

Magnet REOs = Pr₆O₁₁ + Nd₂O₃ + Tb₄O₇ + Dy₂O₃.

Cowalinya (HRE) Resources quoted at COG of 300ppm TREO-CeO₂. See pp 109 of the Independent Geologist's Report contained in HRE's IPO Prospectus.

Koppamurra (AR3) Resources quoted at COG of 325ppm TREO-CeO₂.

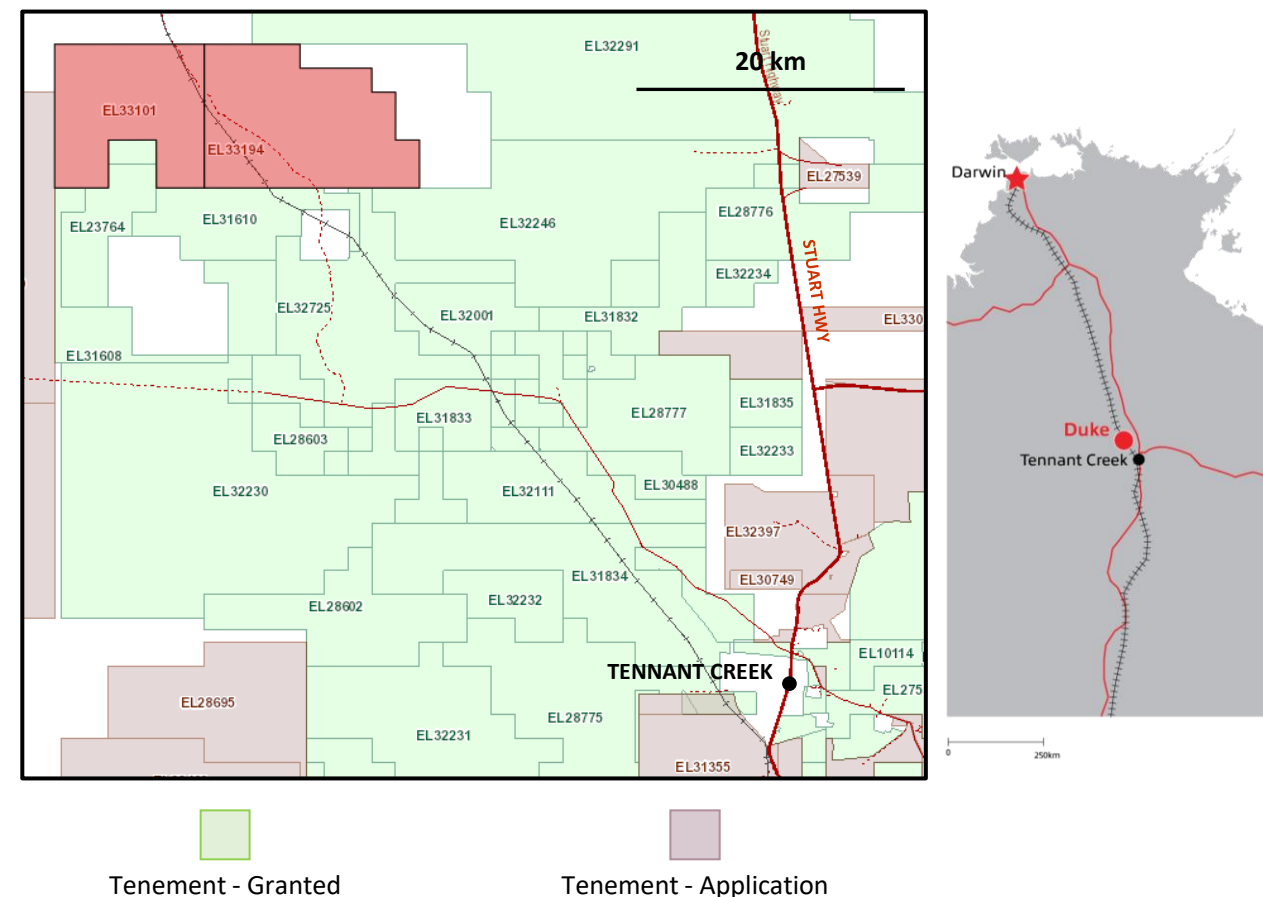
In-Situ TREO, Area Drilled & Resource Intensity for Cowalinya (HRE) & Koppamurra (AR3) calculated by HRE.

Information on peer companies sourced from public disclosures.

Market Capitalisation: HRE on listing; AR3, MEK, MRD & OD6 as at 19/8/22.

Hard Rock Project – Duke NT

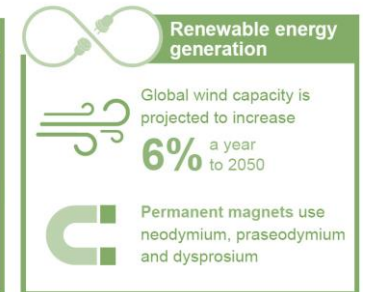
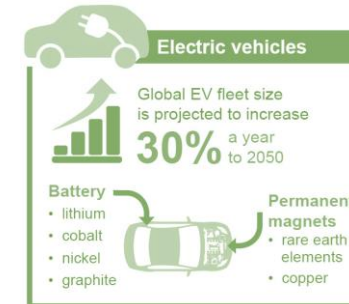
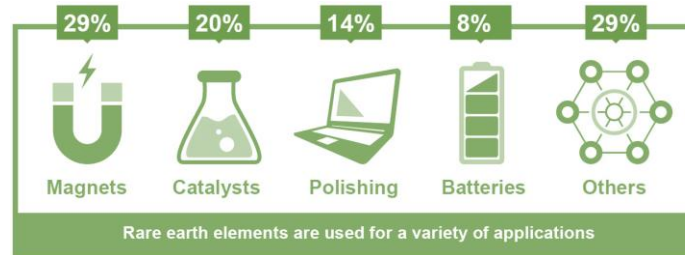
- The **Duke rare earth project**¹ applications were lodged by HRE (100%) in December 2021 and February 2022
- Duke is located 50 km north-west of Tennant Creek, 25 km west of the Stuart Highway, and on the Darwin-Adelaide rail line in the Northern Territory
- It comprises two applications for exploration tenements EL33101 and EL33194 (255 km² awaiting grant) on a pastoral lease
- Outcrop on the tenements comprises faulted metasedimentary rocks of the Tomkinson and Warramunga provinces of the Tennant Region, separated by an unconformity, and the Warrego Granite
- The Duke area has been explored for Tennant Creek-style ironstone-hosted gold-copper-bismuth, IOCG and unconformity-related uranium, **but not for rare earths**
- Following grant of the applications, the project is proposed to be explored by HRE for heavy rare earths in unconformity-related hydrothermally-altered breccias and quartz veins similar to Browns Range in Western Australia (Browns Range mineral resources: 9.24 Mt @ 0.67% TREO)²
- A program of prospecting and surface geochemistry is planned for FY22-23 to initially verify the exploration model



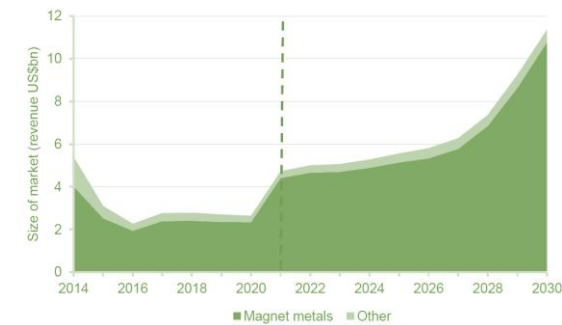
1. See pp 113-152 of the Independent Geologist's Report contained in HRE's IPO Prospectus.
 2. See pp 51-54 of the Independent Geologist's Report contained in HRE's IPO Prospectus.

Rare Earth Market Overview

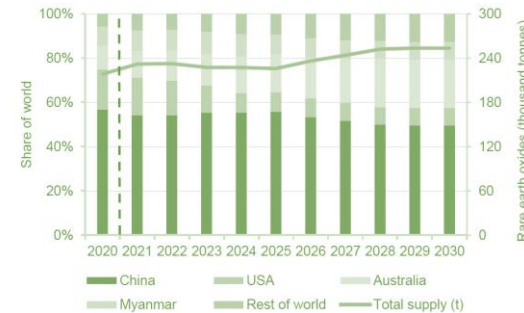
- Rare earths are featured in the official Australian, U.S., European Union and Canadian critical minerals lists
- According to Roskill and the Department of Industry, Science, Energy and Resources in 2021:
 - The global rare earths market was valued at US\$2bn in 2020 and is forecast to grow to \$12bn by 2030
 - Global mine supply is projected to grow by 1.5% p.a. over 10 years to 2030, and refined production of rare earths is projected to grow by 4.6% p.a. to 2030
 - Global consumption of rare earths is projected to grow at 4.0% p.a. to 2030, with rare earth permanent magnet consumption to grow by 6.2% p.a. driven by the strong take-up of low carbon emissions technologies
- In 2022 Adamas Intelligence forecast that:
 - Global production of the magnet rare earths Pr, Nd, Tb and Dy will collectively grow at 5.4% p.a. during 2022 to 2035
 - Global demand for rare earth permanent magnets will increase at a compound annual growth rate of 8.6% over the same period, following an 18.1% jump in consumption in 2021
- The Australian Government actively encourages the development of Australia's rare earths and has provided \$1.74bn in grants and loans to domestic rare earth projects via critical minerals initiatives



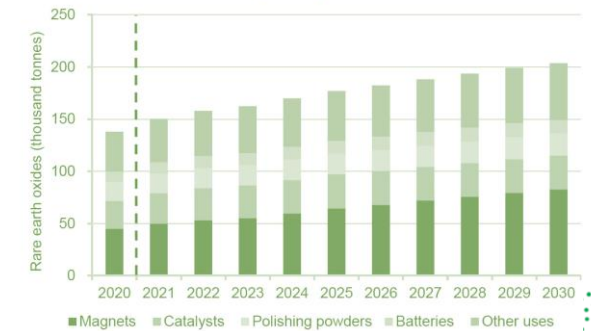
Rare earths market size outlook



Projected rare earths refined production by country



Projected rare earths consumption by end use

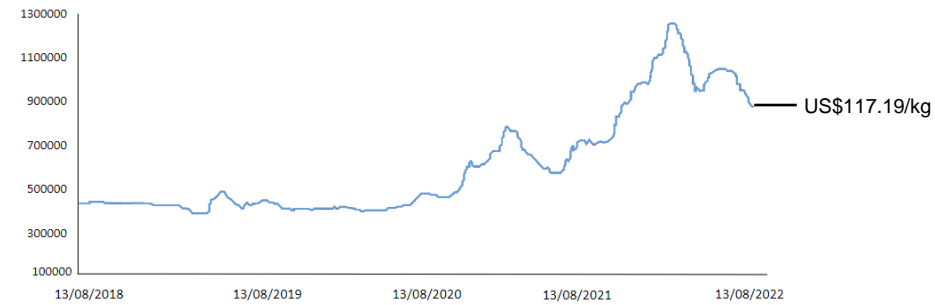


All graphics from Australian Government Department of Industry, Science, Energy and Resources, Office of the Chief Economist (2021): Outlook for Selected Critical Minerals.

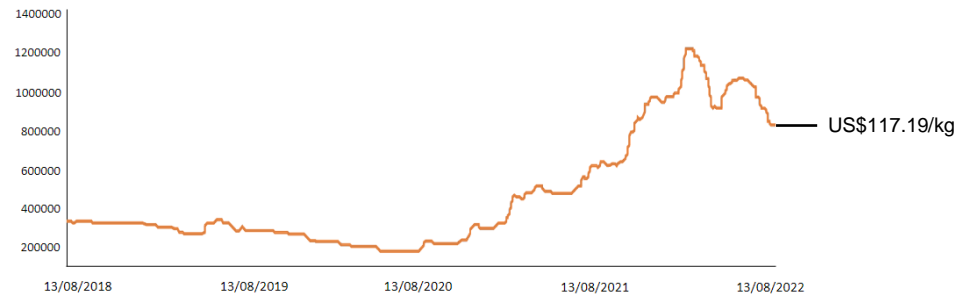
Magnet Rare Earths Pricing

Historical Pricing

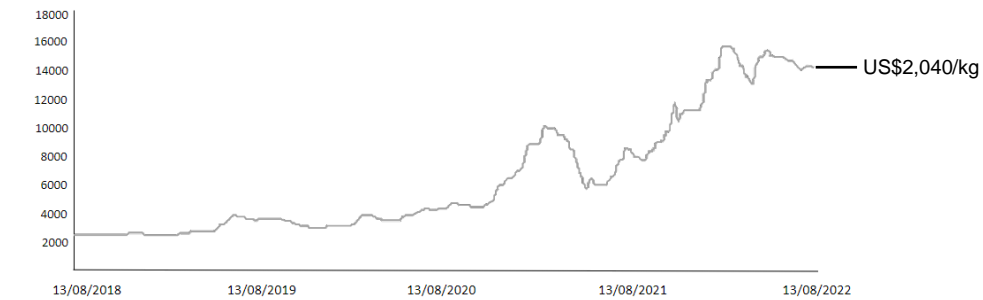
Praseodymium Oxide 99.5%min EXW China RMB/mt



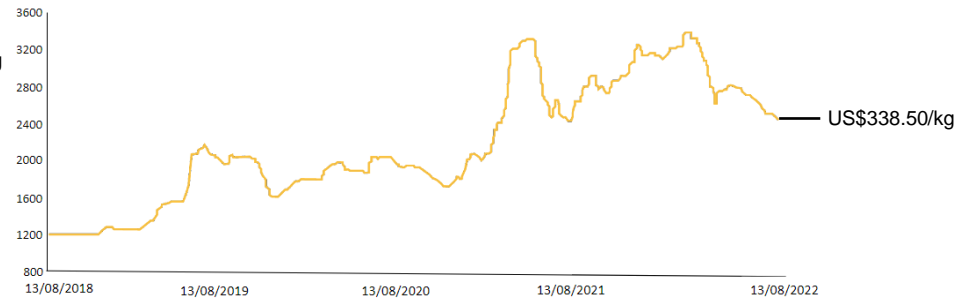
Neodymium Oxide 99.5%min EXW China RMB/mt



Terbium Oxide 99.99%min EXW China RMB/kg

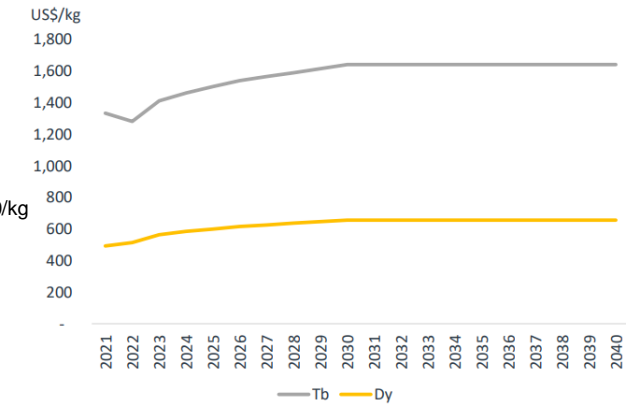
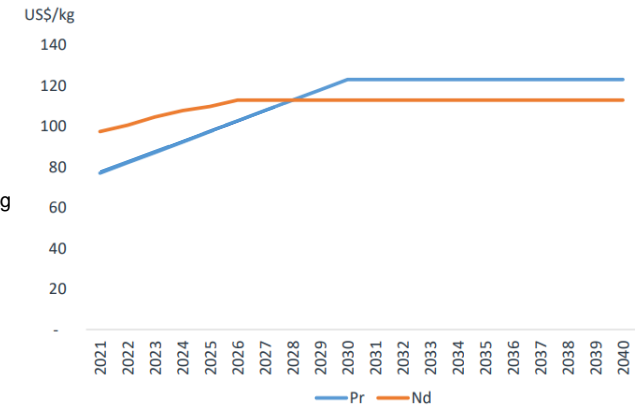


Dysprosium Oxide 99.5%min EXW China RMB/kg



Prices from Asian Metal 12/8/22
VAT inclusive

Forecast Pricing



From ILU ASX Announcement 4/4/22
VAT inclusive pricing forecasts from Adamas Intelligence
September 2021

Project Development Indicative Timeline

		2022		2023				2024	
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Cowalinya WA	Drilling								
	Assay								
	Resource Update								
	Metallurgical Development								
	Project Studies								
Duke NT	Field Reconnaissance								
	Geochemical Surveys								
	Drilling								

All dates are subject to change without notice



Cultural heritage
survey at Cowalinya,
February-March 2022.

Photo courtesy of
JCHMC Pty Ltd.



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