



# Sustainable Rare Earths



**Jeremy Robinson**

**18 October 2022**  
**Las Vegas**

**ASX: REE OTCQB: REEEF**  
**rarex.com.au**



# Disclaimer & Competent Person's Statements



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60

**Nd**

**Neodymium**

59

**Pr**

**Praseodymium**



**“NdPr is a core enabler of highly efficient electric rare earth NdFeB permanent magnet synchronous motors, a core pillar for the global decarbonisation and CO<sub>2</sub> reduction roadmaps of our governments and industries.”**

**Jeremy Robinson**  
**RareX Founder and Managing Director**



**“RareX’s vision is to be one of the world’s leading rare earth material suppliers outside of China for the global NdFeB permanent magnet industry.**

**We want to provide high quality, sustainable, ethical low carbon produced materials and services through an integrated operation and corporate business model.**

**Through a continuous improvement process we want to reflect our ESG commitments to our partners, customers, shareholders, employees and to the communities in which we operate.”**

**The RareX Team**





# Our ESG Commitment

## Stakeholders and Stages



### Status Quo

RareX announced its maiden ESG framework in September 2021 and plans to publish its maiden ESG report in 2022.

RareX has aligned itself with the World Economic Forum (WEF) Principles.

RareX already contributes 3.5% of its annual exploration expenditure to the Kimberley sustainable development trust for the benefit of the Jaru People on whose land it operates.





# Corporate Snapshot



## Capital Structure

ASX Code	REE
OTCQB	REEEF
Share Price (14.10.2022)	A\$ 0.056
Shares on issue	579m
Market Capitalisation	A\$ 33.0m
Cash & Investments (Q1-22)	A\$ 6.0m
Enterprise Value	A\$ 27.0m

## Board and Management

Chairman  
Managing Director  
Non-Executive Director  
Non-Executive Director  
Exploration Manager  
GM Projects  
Head of Corporate Development  
Company Secretary

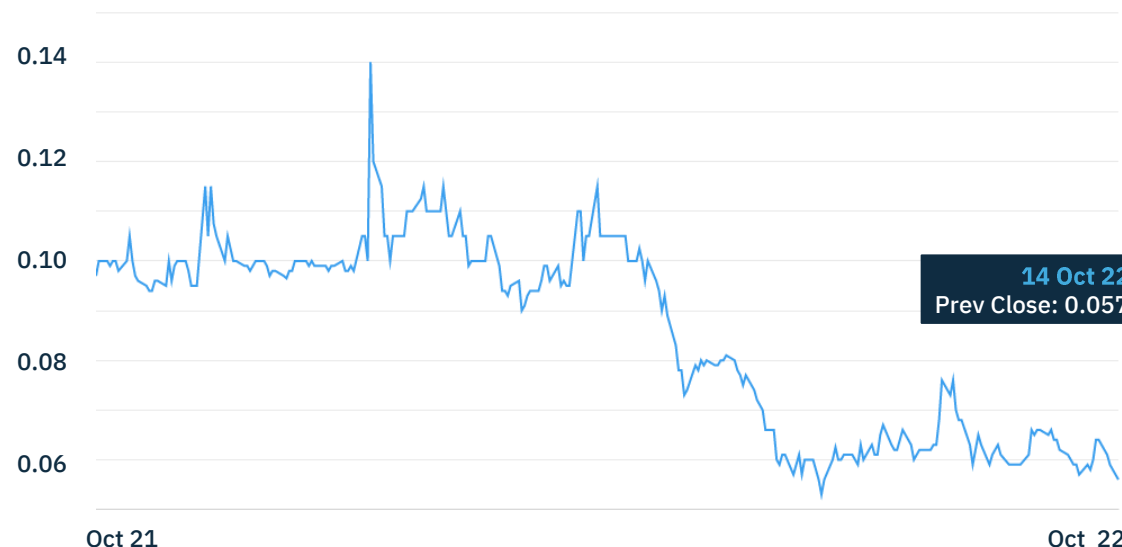
John Young  
Jeremy Robinson  
Shaun Hardcastle  
Cameron Henry  
Guy Moulang  
James Durrant  
Michael Prassas  
Oonagh Malone

## Shareholders

Top 40 Shareholders	~39 %
Number of Shareholders	~5,370
Major Shareholder	Simon Lee AO (6.3 %) Jeremy Robinson (4.0%)

## Share price Information

ASX: REE



# RareX Value Proposition

1

## Each EV & E-Mobility Solution Requires Rare Earths

Electric Trains, E-Buses, E-bikes, EVs. They all use NdPr – NdFeB permanent magnets either in the drivetrain itself or in interior applications, due to better weight-performance attributes and higher overall efficiency.



2

## Rare Earth is a Strategic Mineral

The European, Canadian, American, Korean, Japanese and Australian Governments acknowledge how import it is to diversify the global rare earth supply chain from Chinese dominance (mining to magnet). In this context, governmental resources and funds have been allocated to assess potential investment targets. The best recent Australian example is the \$1B government backing for Iluka's Eneabba rare earth refinery.



3

## Clear Path for Growth

RareX is well funded, highly leveraged to the booming global rare earths sector, with a quality asset in a Tier-1 location with Tier-1 partners and a clear growth strategy to become a sustainable low carbon rare earth producer.



4

## Becoming a Top 3 Australian Rare Earths Deposit

Substantial resource with potentially significant upside. Outstanding recent exploration results have confirmed high-grade extensions at depth and along strike. Additional drilling program commenced Q2-2022 approx. 30,000 metres.







**“The Scoping Study shows that the Cummins Range Project has the potential to be a world leader in the application of low carbon energy solutions to rare earths projects. The Project’s maximum resource utilisation and refining capacity, powered by green hydroelectric power, demonstrate RareX’s commitment to reducing its potential carbon footprint. The Study has been based on the current 2021 Resource and has good potential to grow in scale in the coming 12 months.”**

**Cameron Henry**  
**Non-Executive Director**

# Cummins Range – A Globally Significant Rare Earths Project

Scoping Study Highlights –  
Released September 2022

- Strong financials
- Tier-1 Mining Jurisdiction
- Significant production profile of sustainably, Australian produced rare earth and phosphate products with local placement opportunities
- Scoping study based only on current 2021 Indicated and Inferred Resources with 85% of the mine plan in the Indicated category
- Study considers the utilisation of grid-connected hydroelectric power for refinery operations, a potential world first for rare earth refineries
- Board approved commencement of pre-feasibility study





# RareX – Delivering Strong Financial Scoping Study Results

Capital  
expenditures

**AUD  
430M**

Life of mine

**12–13  
Years**

Return  
of investment

**2.8  
Years**

Annual  
production

**1.5 ktpa\* NdPr  
7.9 ktpa\* TREO**

Net present  
value NPV<sup>8</sup>

**AUD  
633M**

Unit cost  
per TREO

**AUD/kg 26.58  
AUD/kg 6.09\***

LOM EBITDA  
(AUD '000)

**AUD  
1,900M**

Internal  
return rate

**29 %**

\* Including Credits

# The Cummins Range Project

## Sustainable Rare Earths

### The Rare Earth Mine – Cummins Range

Located in the Kimberley region of Western Australia near the township of Halls Creek.

A 500 ktpa beneficiation facility at site is foreseen producing two products which get trucked along mainly sealed roads of the Great Northern Highway via the Tanami Road and the site access track, both currently unsealed.

The Tanami Road is anticipated to be sealed by the time the Project becomes operational financed by the Government.

Capex ~200M AU\$  
FTEs ~88

### The Mixed Rare Earth Carbonate (MREC) Refinery

Located in the east Kimberley region of Western Australia at Port Wyndham, it's envisaged to build a hydroelectric powered rare earth refinery sourcing the renewable energy from the Ord River Hydroelectric Power Station. It is envisaged to commercialize three products.

Capex ~229M AU\$  
FTEs ~70





# Lake Argyle – Hydro Plant

## Enabling A Low Carbon Operation



### Ord River Hydroelectric Power Station

Site power will be via grid supply, generated at the Ord River Hydroelectric Power Station. Since Rio Tinto's Argyle Diamond Mine has wound down to closure, significant generation capacity exists in the PacificHydro owned facility.

### Electric Logistics Fleet

Future study work will include an assessment to electrify the local fleet with charging from the hydro powered grid, eliminating fuel use for the RareX facilities at the port and mine site and the transportation of the concentrate, consumables and staff.

Representing another important step in becoming the rare earth operation with one of the lowest carbon footprints worldwide.





# Cummins Range – The Mine

## Mining And Concentrating

### Location

Kimberley region, Western Australia near Halls Creek. Good available infrastructure with power, water and sealed airstrip.

### Mine Site

Open pit; LOM strip ratio 1:2.2  
500 ktpa flotation concentrator

### Two products:

- 36 ktpa at 15% TREO of rare earth mineral concentrate
- 130 ktpa at 32%  $P_2O_5$  and 2.5% TREO of phosphate mineral concentrate

### Permits & Licences

Exploration licence obtained.  
Mining licence application started including the required surveys.

### Geology

Predominantly well understood monazite hosted rare earth mineralisation. Carbonatite & pyroxenite with occasional massive glimmerite.

### Resource

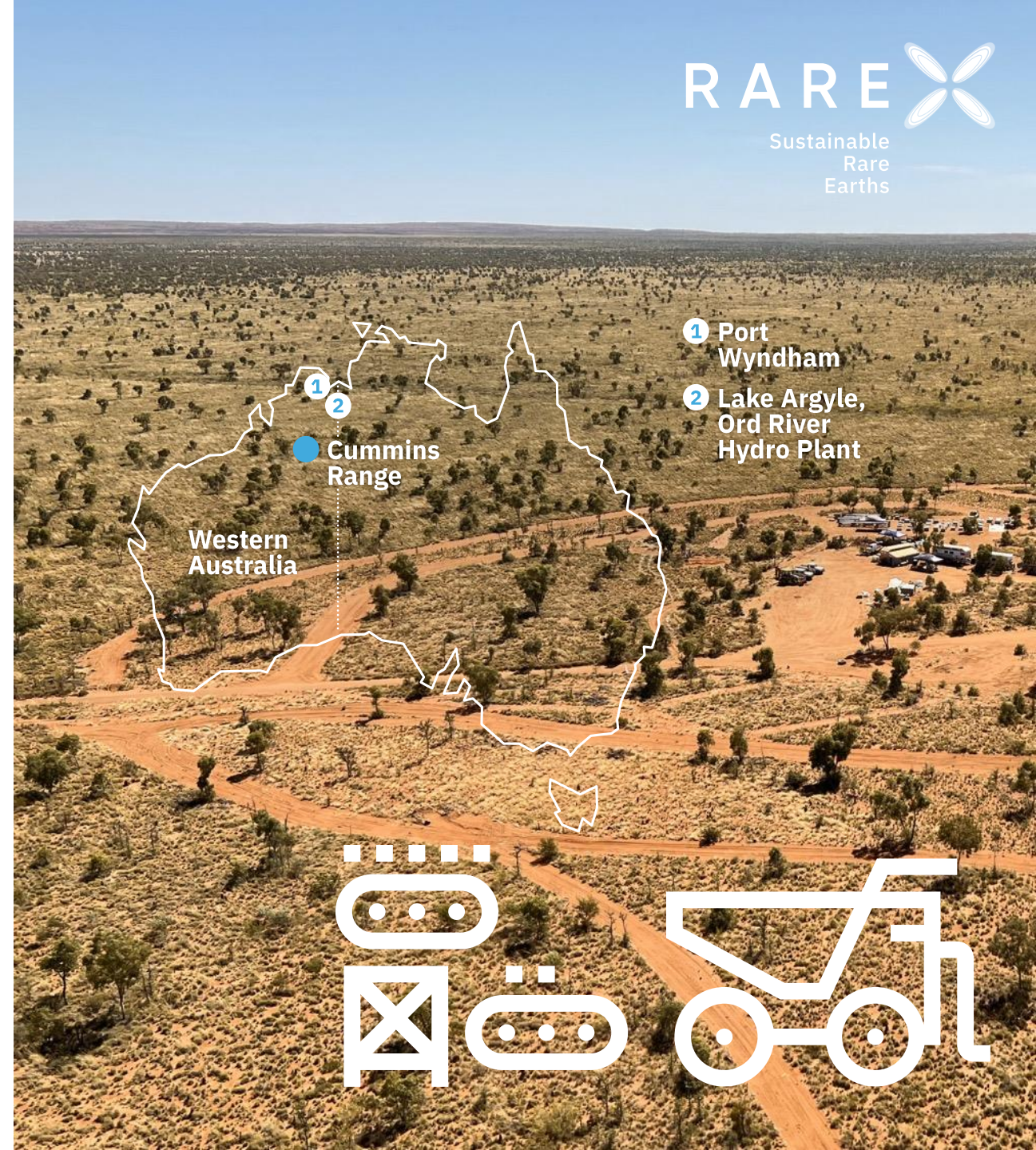
18.8 Mt at 1.15% TREO + 0.14%  $Nb_2O_5$ , incl. 6.5 Mt at 1.98% TREO + 0.21%  $Nb_2O_5$ <sup>1</sup>.

### Exploration Target

23 Mt to 41 Mt at 1.6% to 2.4% TREO<sup>2</sup> is in addition to current Resource.

<sup>1</sup> Indicated 11.1Mt at 1.32% TREO + 0.17%  $Nb_2O_5$ ; Inferred 7.7Mt at 0.88% TREO + 0.11%  $Nb_2O_5$

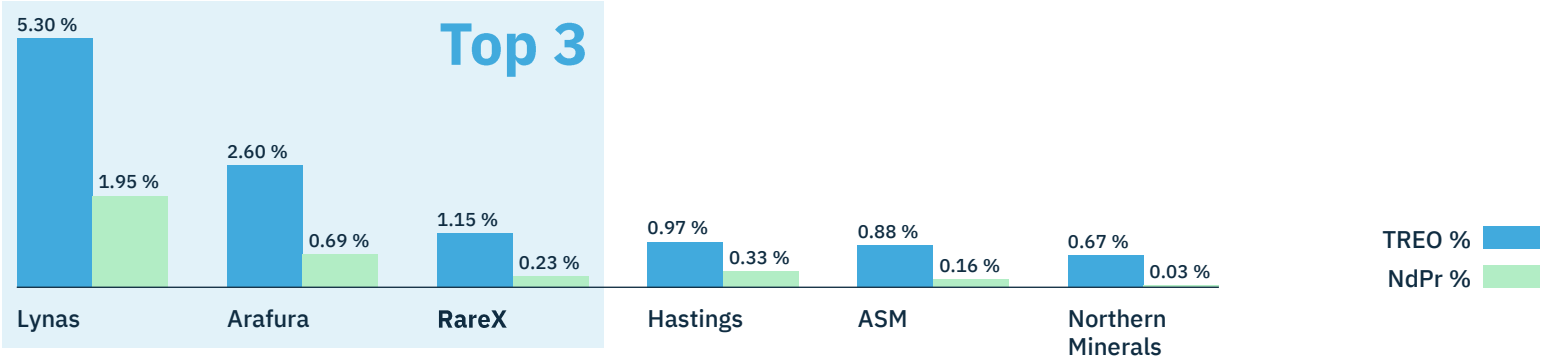
<sup>2</sup> The potential quantity and grade of the Exploration Target is conceptual in nature, and there has been insufficient exploration to estimate a Mineral Resource and it is uncertain if further exploration will result in the estimation of a Mineral Resource. The Exploration Target has been developed following a diamond drilling program completed in 2021. A 15,000m diamond drilling program designed to test the Exploration Target is on track for completion this calendar year. Drilling throughout 2022 continues to confirm this target. The average grade of the primary mineralisation below the current Resource is 2% TREO and therefore a range of 1.6% and 2.4% is provided around that figure to account for uncertainty.



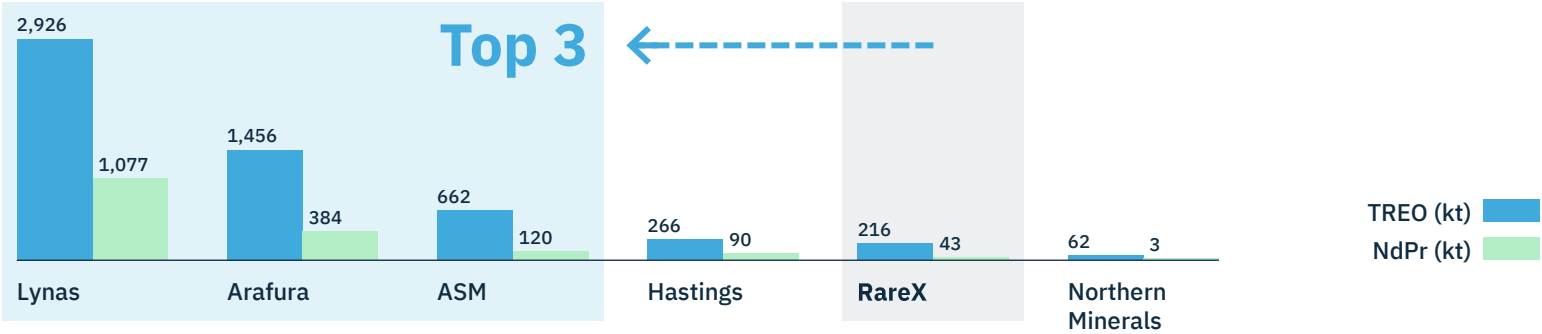


# Becoming Australia's 3rd Biggest Rare Earth Deposit

## Grade



## Scale





# Port Wyndham – Hydroelectric Powered Rare Earth Refinery

## The Mixed Rare Earth Carbonate (MREC) Refinery

Standard acid bake – water leach MREC plant.

Located in the east Kimberley region of Western Australia, it's envisaged to build a hydroelectric powered rare earth refinery sourcing the renewable energy from the Ord River Hydroelectric Power Station.

It is planned to commercialize three products:

- 8.9 ktpa 52% MREC equivalent to 4.7 ktpa TREO containing 0.9 ktpa NdPr
- With a by-product of 13.5 ktpa, 54%  $P_2O_5$  merchant grade phosphoric acid
- 128.8 ktpa @ 32%  $P_2O_5$  and 2.5% TREO of phosphate mineral concentrate equivalent to 3.2 ktpa TREO and 0.6ktpa NdPr

## Infrastructure

No significant additional non processing infrastructure is required at Port Wyndham due to the availability of existing facilities.

Trucking distance between the mine site and the Wyndham refinery is 535 km.

- 
- 1 Lake Argyle, Ord River Hydro Plant
- 2 Cummins Range

Port Wyndham

Western Australia



# Local for Local



# Fertiliser For The Local Agra-Industry

## By Product Opportunity - Tapping Into The High Value LFP Battery & Phosphate Market

The RareX product suite consists of rare earth and potentially also of phosphate products with local placement opportunities.

The phosphate market shows a strong momentum due to Covid and the recent geopolitical turmoils including the Ukraine war. Furthermore, the perspective on global supply chains has changed and onshoring and local supply chain solutions are desired.

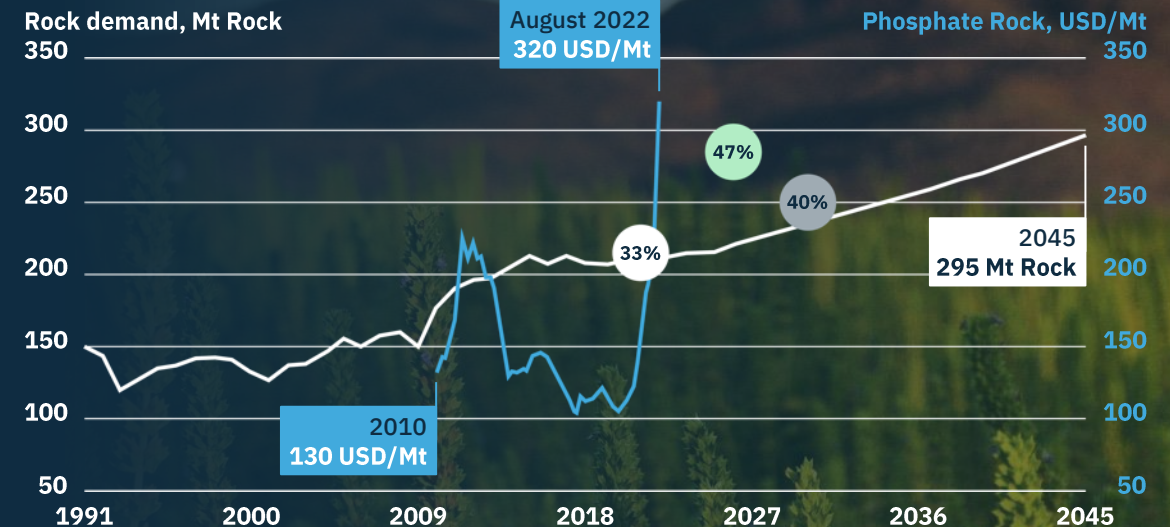
Gas prices are expected to increase further and will drive fertilizer prices.

Additionally, we believe in the significant demand growth for phosphates not only because of the agriculture demand but also because of the automotive market and the emerging application of the lithium-iron-phosphate (LFP) market.



## High Value LFP Battery & Phosphate Market

- percentage of global marketshare of LFP batteries in 2021
- projected ARK forecast for 2026
- projected UBS forecast for 2030



### Sources

Rock demand: CRU

Phosphate Rock: Arianne Phosphates corporate presentation, June 2022

Market share and forecast information: ARK & UBS

# Demand for NdPr



# NdPr Enabling Decarbonisation of our Society

NdFeB permanent magnet motors are crucial in reducing greenhouse gas emissions as they are at the heart of so many electric mobility solutions. Green, clean electric mobility solutions require ethical, sustainable, transparently produced NdPr.

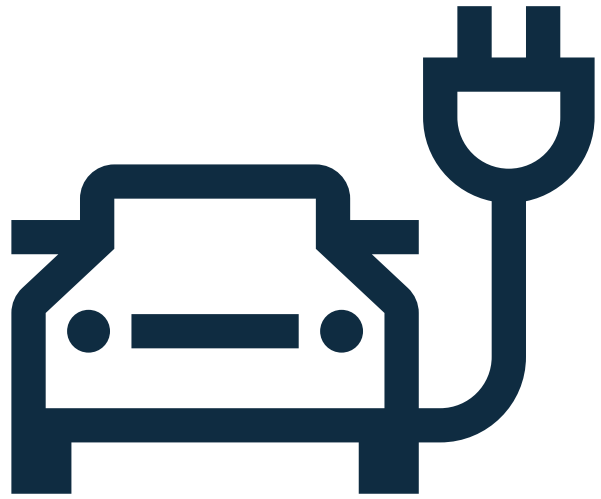
Each direct drive permanent magnet  
wind turbine requires

~200<sub>kg</sub>  
NdPr oxide  
per megawatt





# NdPr Enabling Decarbonisation of our Society



Each electric vehicle  
contains

~ **1** kg  
of NdPr oxide

**90%**



of all automotive applications,  
including hydrogen vehicles, have selected a  
rare earth NdFeB permanent magnet  
electric motor for their default driveline solution.

# Global EV Megatrend Continues to Accelerate

The global automotive  
industry surpassed  
in 2022

1  
trillion  
USD

in investments  
to transition towards EVs

“Global carmakers now  
target to spend USD  
515b\* for EVs &  
batteries. Including Tier  
1 suppliers, investments  
should have surpassed  
USD 1 trillion.”

Jeremy Robinson  
MD RareX

\* <https://www.reuters.com/business/autos-transportation/exclusive-global-carmakers-now-target-515-billion-evs-batteries-2021-11-10/>





# Supported By Global Legislation To Meet Net Zero Targets By 2050

More and more countries have a clear roadmap to phase out internal combustion engine (ICE) vehicles.  
More than 30 countries have clear electrification targets or ICE bans for cars.



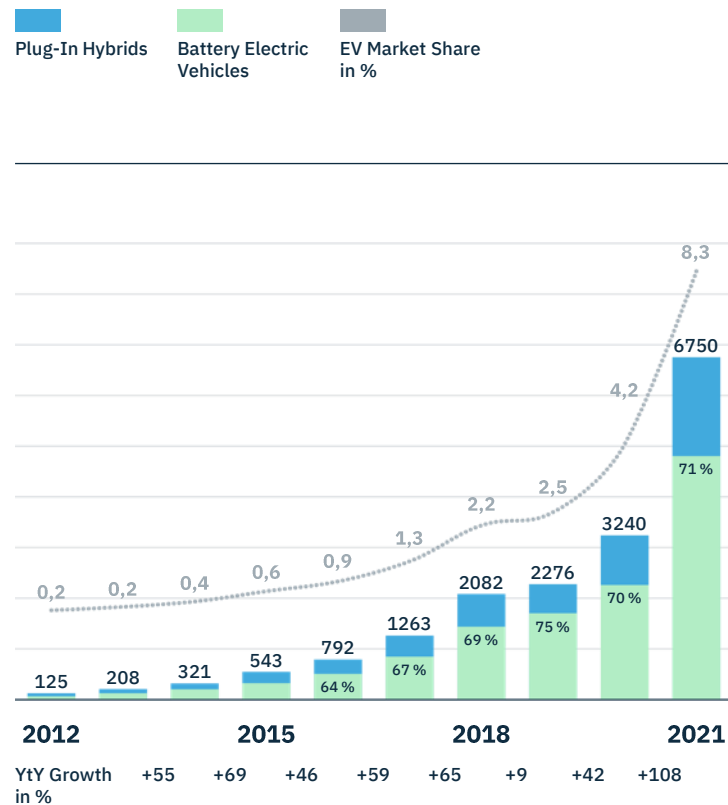
net  
zero  

Source  
<https://cleantechnica.com/2021/01/02/31-countries-states-and-cities-have-ice-bans-in-place/>

by 2050 

# Translating Into An Emerging Deficit Of NdPr Supply

Global BEV & PHEV Sales / EV volumes

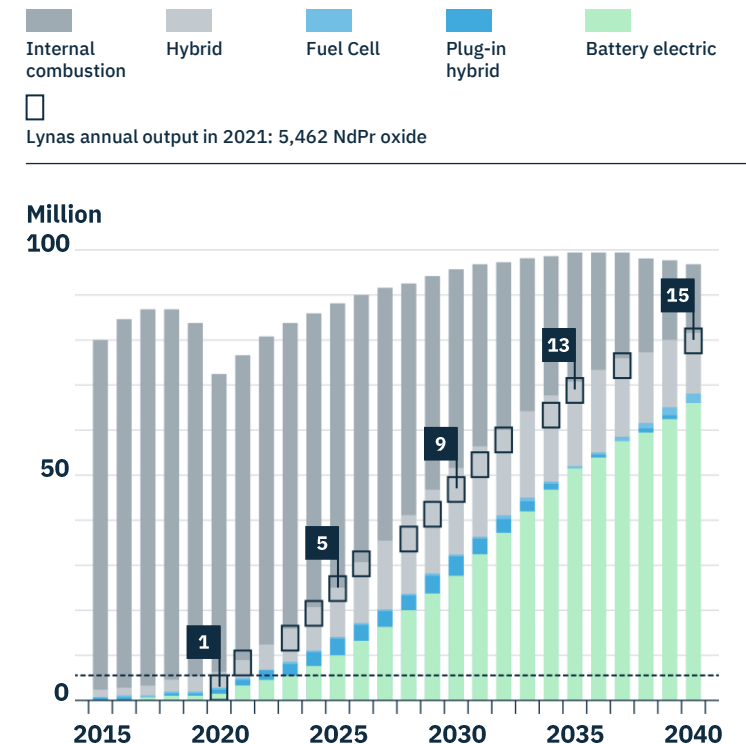


Source  
<https://www.ev-volumes.com/country/total-world-plug-in-vehicle-volumes/>

**“With every incremental, additional sale of 5.5 million EVs the world needs another rare earth producer equivalent to the annual output of Lynas.\* By 2030 the world needs ~9, by 2040 ~15 additional producers.”**

Jeremy Robinson  
MD RareX

WW passenger car outlook / BNEF



Source  
<https://bnef.turtl.co/story/evo-2021/page/4/1?teaser=yes>



# NdPr Pricing And Market Information



Sustainable  
Rare  
Earths

## The Market

Overall market sentiment is positive due to strong growth in the E-mobility sector and increasing EV sales volumes underpinned by a promising market outlook. We anticipate the continuation of the volatility of the NdPr oxide price, but with a steady continuous trend upwards.

## Cummins Range basket price distribution

SEG 2 %

CeLa 3 %

Tb 9 %

Dy 11 %

NdPr 75 %



## Rare Earth Material Pricing from Asian Metals (USD per kg)

Price (USD/kg)

200

175

150

125

100

75

50

Sep 21

Mar 22

Oct 22

NdPr Oxide domestic China  
— RMB converted to USD

Oct 22  
96 USD/kg



# The RareX Team



Sustainable  
Rare  
Earths



**Jeremy Robinson**  
Managing Director

is the founder of RareX that was acquired by Sagon Resources Ltd. Jeremy has worked in both the capital markets and in-house for junior and mid-cap mining companies for the past 15 years. Jeremy is an experienced mining executive having held senior roles at Mungana Goldmines Limited and Apex Minerals Limited. Jeremy holds a Bachelor of Commerce from the University of Western Australia majoring in Corporate Finance, Investment Finance and Marketing.

**James Durrant**  
General Manager  
Projects

James is a Mining and Mechanical Engineer with a background in tier 1 and junior mining company operational leadership and project development, across Africa and Australia, having started his career with BHP Billiton. James is experienced in greenfield project development from exploration through to development. His experience includes leading the engineering, socio-environmental and infield investigation programs.



**Michael Prassas**  
Head of Corporate  
Development

Michael is a highly-experienced sales, marketing, and business development manager with a deep interest in the transition to a zero-carbon economy and the advancement of the e-mobility industry – drawing on more than 25 years' experience in the automotive & rare earth sectors. He has held management roles at AW Europe in Germany, TomTom, BP in Netherlands, Solvay/Rhodia in France and Peak Resources & Hastings in Australia.

**Guy Moulang**  
Head of Exploration

Guy has more than 15 years' experience in technology metals, base metals and gold exploration. Guy has a Bachelor of Science from James Cook University and is a Member of the Australian Institute of Geoscientists (AIG). Guy spent 10 years at Kagara Ltd where he played an integral role in taking Kagara from an ASX-listed junior to an ASX 200 company with a market capitalisation of A\$1.5B.



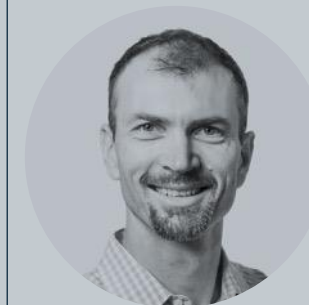
**Gavin Beer**  
Lead Consultant  
Metallurgist

Gavin has more than 30 years' experience in technical and operational roles in the mining industry with the last 12 being exclusively within the rare earth and technology metals sector. Gavin is a Chartered Professional and a Member of the Australian Institute of Mining and Metallurgy and is qualified as a Competent Person for both JORC and NI 43-101 reporting with respect to his metallurgical expertise.



**Damien Krebs**  
Consultant  
Metallurgist

Damien is a Metallurgical Engineer with a Masters in Mineral Economics from the Western Australian School of Mines. He has 25+ years of experience in development of complex metallurgical projects across nickel, cobalt, uranium and rare earth elements. In particular, he led a team which developed novel and simple processing methods for the unique Kvanefjeld rare earth project of Greenland Minerals. He has an excellent knowledge of the rare earth industry as he has worked almost exclusively on rare earth project development since 2010.





# Board Of Directors

## John Young Chairman

Mr Young is a highly experienced geologist and was co-founder and executive director of successful ASX200 lithium producer Pilbara Minerals Limited (ASX: PLS). Mr Young played a critical role in growing Pilbara from a junior ASX-listed company to a globally significant \$2 billion lithium producer in the Pilbara region of Western Australia. Mr Young currently serves as a non-executive director of a number of ASX-listed companies.



## Jeremy Robinson Managing Director

Jeremy Robinson is the founder of RareX. Mr Robinson has worked in both the capital markets and in-house for junior and mid-cap mining companies for the past 15 years. Mr Robinson is an experienced mining executive having held senior roles at Mungana Goldmines Limited and Apex Minerals Limited. Mr Robinson holds a Bachelor of Commerce from the University of Western Australia majoring in Corporate Finance, Investment Finance and Marketing.



## Shaun Hardcastle Non-Executive Director

Mr Hardcastle has over 10 years' experience as a corporate and finance lawyer and extensive experience in corporate governance, risk management and compliance. He has been involved in a broad range of cross-border and domestic transactions including joint ventures, corporate restructuring, project finance, resources and asset/equity sales and acquisitions. Mr Hardcastle has practiced law both in Australia and overseas and is a partner at Hamilton Locke Lawyers. Shaun is currently a non-executive director of a number of ASX listed companies.



## Cameron Henry Non-Executive Director

Mr Henry is the founding Managing Director of ASX-listed engineering firm, Primero Group Limited (ASX: PGX), where he has led the Company's strategic and operational direction resulting in its successful listing on the ASX in 2018 and rapid growth globally.

He has been instrumental in positioning the Group to grow within the resources sector as a leader in sub-\$150 million CAPEX EPC projects, ensuring it can differentiate its services offering across design, construction and operation. Primero now operates in several regions globally with annual revenues of approximately A\$200 million.

Mr Henry has over 20 years of industry experience in the development and delivery of minerals processing, energy and infrastructure projects across Australia, Indonesia, North and South America. He has been a member of the Australian Institute of Company Directors since 2013 and has previously held non-executive roles with ASX-listed resource company Titan Minerals Limited.



# Great Track Record



## 2018

Rare earths  
identified for strategic focus.

## 2019

Cummins Range acquired.



Cummins Range  
Western Australia

## 2020

Company re-brands to RareX,  
divests non-core portfolio.

## 2022

Exploration target drilling.  
Scoping study released.  
Environmental baselines begin.  
Mining licence application initiated.

## 2021

Exploration drilling  
and Resource upgrade.  
Metallurgy begins.  
ESG commitments established.



# What's Next?



# What's Next?

2023

Pre-feasibility study.  
Advanced metallurgy.  
Orebody geochemistry definition.  
Resource expansion.  
Mining licence.  
Environmental referral complete.  
Offtake.

2024

Definitive feasibility study.  
Finalised metallurgy.  
Orebody geometallurgy.  
Construction readiness.

2025

Construction.  
Operational readiness.

2026

Operations.





## Investment Proposition

### The Right Market & Timing

- Strong connection to the decarbonisation and CO<sub>2</sub> reduction roadmaps and rising regulatory requirements and targets across the globe
- Asian Metals NdPr price Dom. China per kg US\$ 88 (5 September 2022); US\$ 48 (12 October 2020); 2022 max price US\$ 175 (1 March 2022 )
- Strong governmental financing support for critical materials and in particular for rare earths projects

### The Right Project & Jurisdiction

- Significant Exploration Target of 23–41 Mt at 1.6–2.4 % TREO
- Confirmation of high-grade primary mineralisation
- Massive resource growth expected in 2022

### The Right Company

- Well-funded with cash and investments
- RareX EPV compared to its peers is significantly undervalued

### The Right Team

- Recent addition of Michael Prassas to the team  
+ further continuous team expansion planned

**“Rare earths and NdPr (Neodymium and Praseodymium) are an integral part of the electric mobility and renewable energy thematic.**

**NdPr is a core enabler of highly efficient electric rare-earth NdFeB permanent magnet synchronous motors, a core pillar for the global decarbonisation and CO<sub>2</sub> reduction roadmaps of our governments and industries.**

**As the global green transformation continues to accelerate and governments clearly have expressed their desire to support diversification of the global rare earth supply chain, RareX is confident to play a vital role in this market to mitigate the upcoming emerging NdPr supply shortage.”**

**Jeremy Robinson**

RareX Founder and Managing Director

**Directors**

Non-Executive Chairman  
Managing Director  
Non-Executive Director  
Non-Executive Director

**John Young**  
**Jeremy Robinson**  
**Shaun Hardcastle**  
**Cameron Henry**

**Company Secretary**

Oonagh Malone

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[rarex.com.au](http://rarex.com.au)

**ASX: REE OTCQB: REEF**

**Thank  
you**



# Facts & Figures

# Upcoming Milestones And Key Catalysts

## 2022

A	B	C
Initiation of PFS	Initiation of advanced metallurgical program	Initiation of renewable hydro power purchase agreement
D	E	F
Initiation of land purchase agreement for the rare earth refinery at the port	Initiation of business development activities for offtakes discussions for phosphate and rare earth	Orebody geochemistry definition
G	H	
Mining licence negotiation protocol agreement with Jaru PBC	Completion of 2022 drilling season	

## 2023

A	B	C
Metallurgical, geotechnical and resource drilling program	Environmental and socio-economic baseline assessments	Oxide separation facility scoping study
D	E	F
Fertiliser plant scoping study	Mineral resource estimate expansion including rare earths and phosphates	Mining licence agreement with Jaru complete
G	H	I
Initiation of pilot plant	Completion of advanced metallurgical program	Completion of renewable hydro power purchase agreement
J	K	L
Completion of rare earth refinery land purchase agreement	Pre-feasibility study complete	Environmental referral complete
M	N	
Maiden ore reserve	Business development activities materially advanced on phosphate and rare earth	



# The Asset – Current JORC Resource

A large rare earth – niobium – phosphate rich carbonatite deposit located in the Kimberley region of Western Australia

Significant global Indicated and Inferred JORC Resource  
**18.8 Mt at 1.15 % TREO + 0.14 % Nb<sub>2</sub>O<sub>5</sub>**

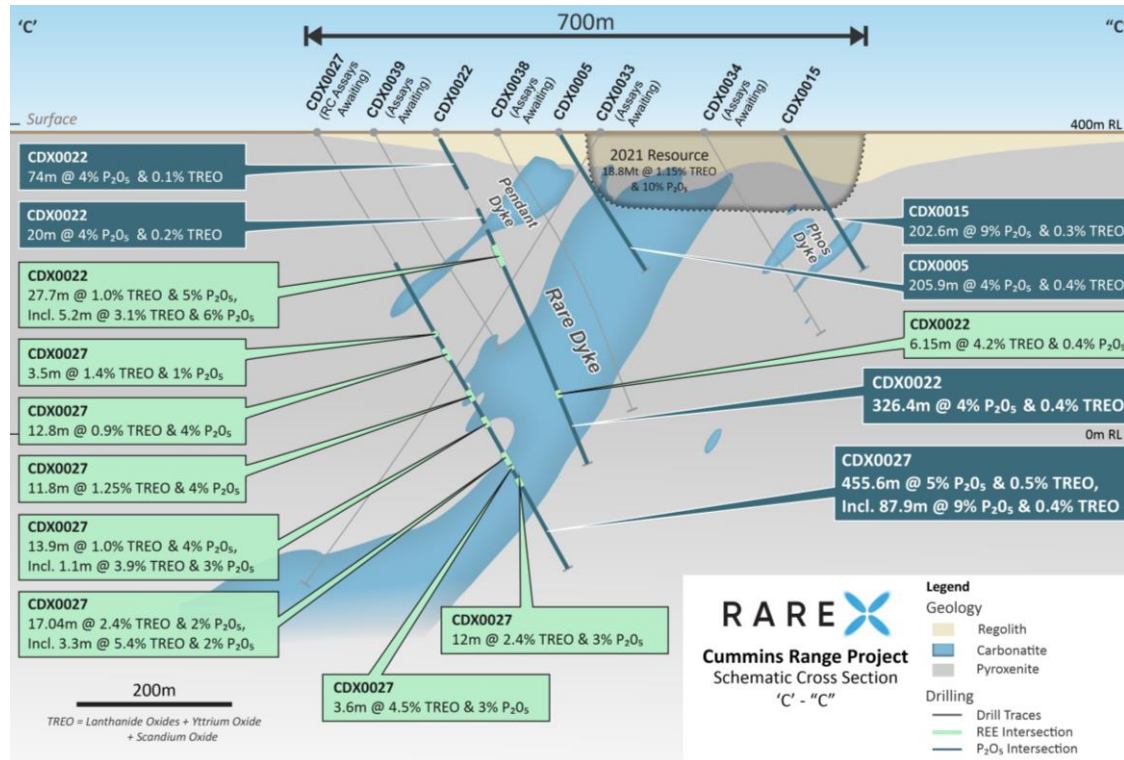
High-grade tonnes to **6.5 Mt at 1.98 % TREO (inc. 0.38 % NdPr) + 0.21 % Nb<sub>2</sub>O<sub>5</sub>**

Indicated Resource of 11.1 Mt at 1.3 % TREO + 0.17 % Nb<sub>2</sub>O<sub>5</sub>

0.5 % Cut Off	Tonnes Mt	TREO %	NdPr %	Nb <sub>2</sub> O <sub>5</sub> %	HREO ppm
Indicated	11.1	1.34	0.27	0.17	830
Inferred	7.7	0.88	0.18	0.11	540
<b>Total</b>	<b>18.8</b>	<b>1.15</b>	<b>0.23</b>	<b>0.14</b>	<b>711</b>

1.0 % Cut Off	Tonnes Mt	TREO %	NdPr %	Nb <sub>2</sub> O <sub>5</sub> %	HREO ppm
Indicated	4.9	2.11	0.41	0.23	1,150
Inferred	1.6	1.60	0.31	0.16	800
<b>Total</b>	<b>6.5</b>	<b>1.98</b>	<b>0.38</b>	<b>0.21</b>	<b>1,060</b>

# Exploration Update



## Major Extension of Mineralisation

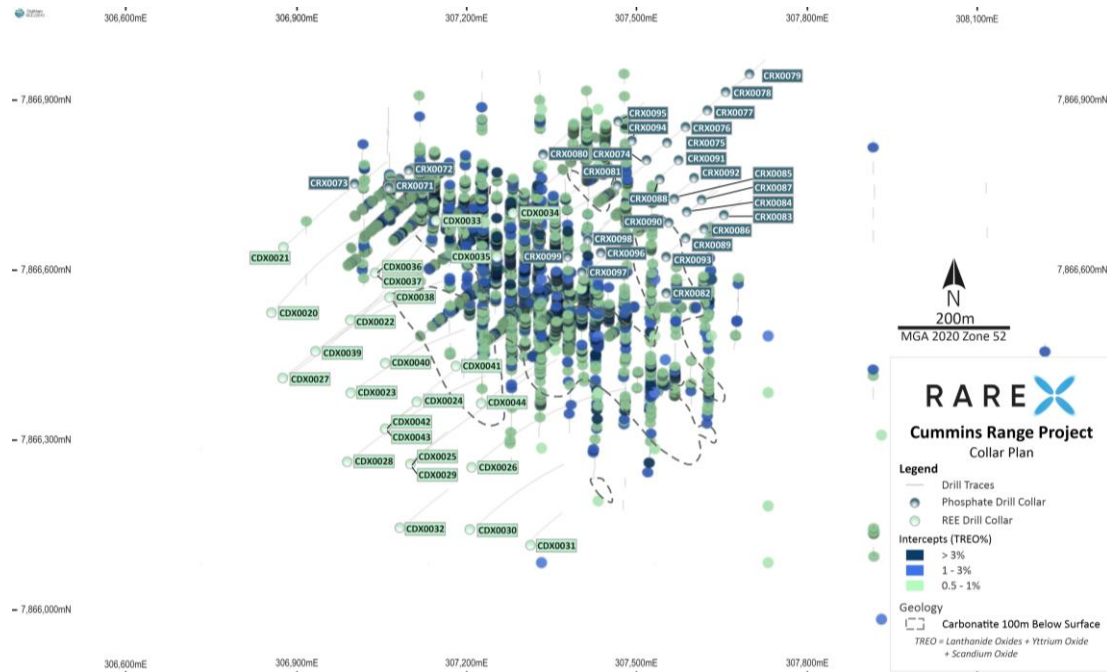
- Drilling since April and completed over 15,000m
- Drilling has confirmed the presence of 3 mineralised carbonatite dykes with associated large alteration systems
- Within the dykes and in the surrounding altered wall rocks are coarse monazite, bastnasite and apatite producing intersections up to 455.6m at 0.5% TREO and 5% P<sub>2</sub>O<sub>5</sub>
- Fresh rock mineralisation has unusually low uranium thorium levels with an average of <40ppm from this year's drilling
- Exploration this year has more than doubled the width of the mineralised system to over 700m wide
- Assay turnaround remains an issue in the west and assays are trickling in

**Exploration Target of 23Mt to 41Mt at 1.6% to 2.4% TREO is in addition to current Resource of 18.8Mt at 1.15% TREO**



# Exploration Update

## What Next?



## Major Extension of Mineralisation

- Assay results will continue to flow to the end of the year
- Updated resource in the first quarter of 2023
- 2023 exploration program will grow the resource and convert further tonnes into the indicated category
- Large portions of the 2km pipe have not been explored with multiple rare earths intersections that have not been followed up
- Several geochemical and geophysical exploration targets proximal to the Cummins Range pipe to be tested

# Phos Dyke Phosphate Zone

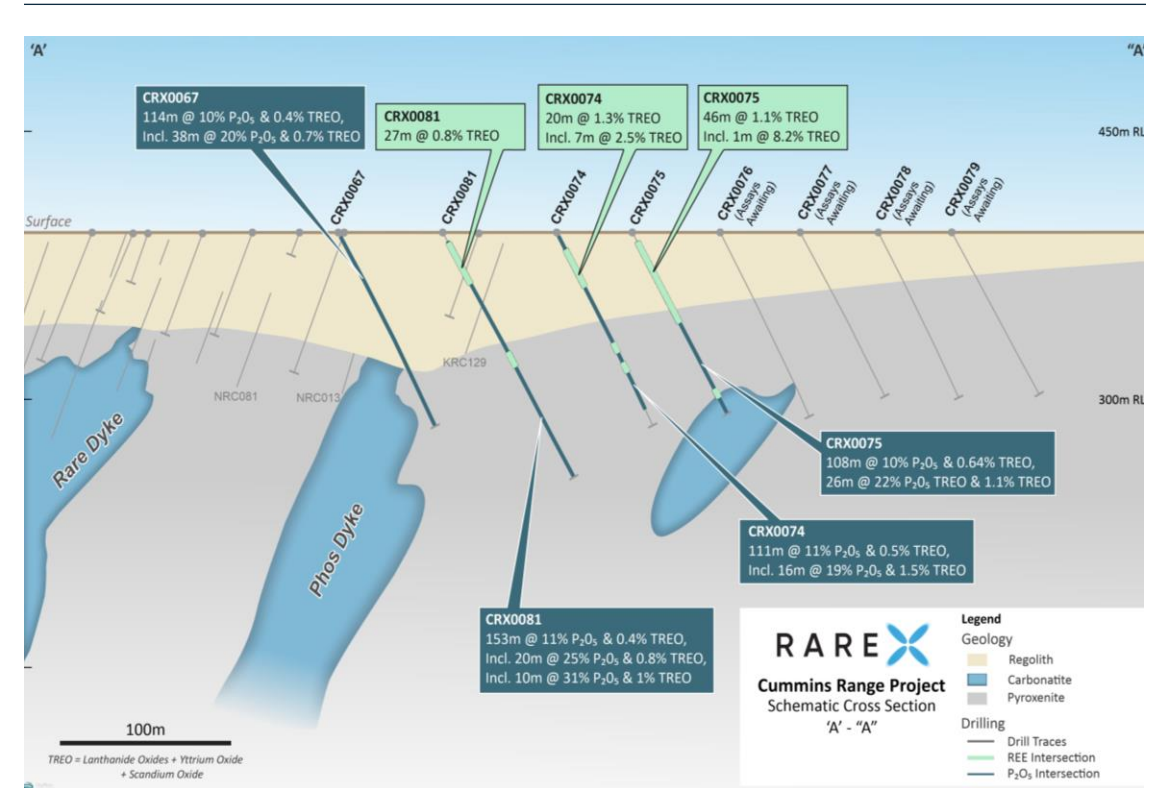
## Drilling Expands Phos Dyke Phosphate Zone at Cummins Range

Phoscorite rocks identified over 600m of strike and outcropping. Recent drilling has extended the width of the zone to over 200m, highlighting opportunity for future.

Valuable by-product stream alongside a rare earths operation.

### Highlights

- Unique geology with coarse apatite rich phoscorite and later rare earths mineralised carbonatite veins.
- Results from all drill holes this year have returned assays of 100m plus at  $>10\% \text{P}_2\text{O}_5$ , higher grade intervals up to 10m at  $31\% \text{P}_2\text{O}_5$
- Rare earths results of 46m at 1.1% TREO and 7m at 2.5% TREO
- Low uranium thorium content of  $<120\text{ppm}$
- Apatite is coarse and will be liberated easily
- Assays awaited for over 2,000m of drilling on the Phos Dyke



Example of phoscorite in core:  
Apatite= light brown  
Diopside=green  
Magnetite=dark grey  
Phlogopite=black



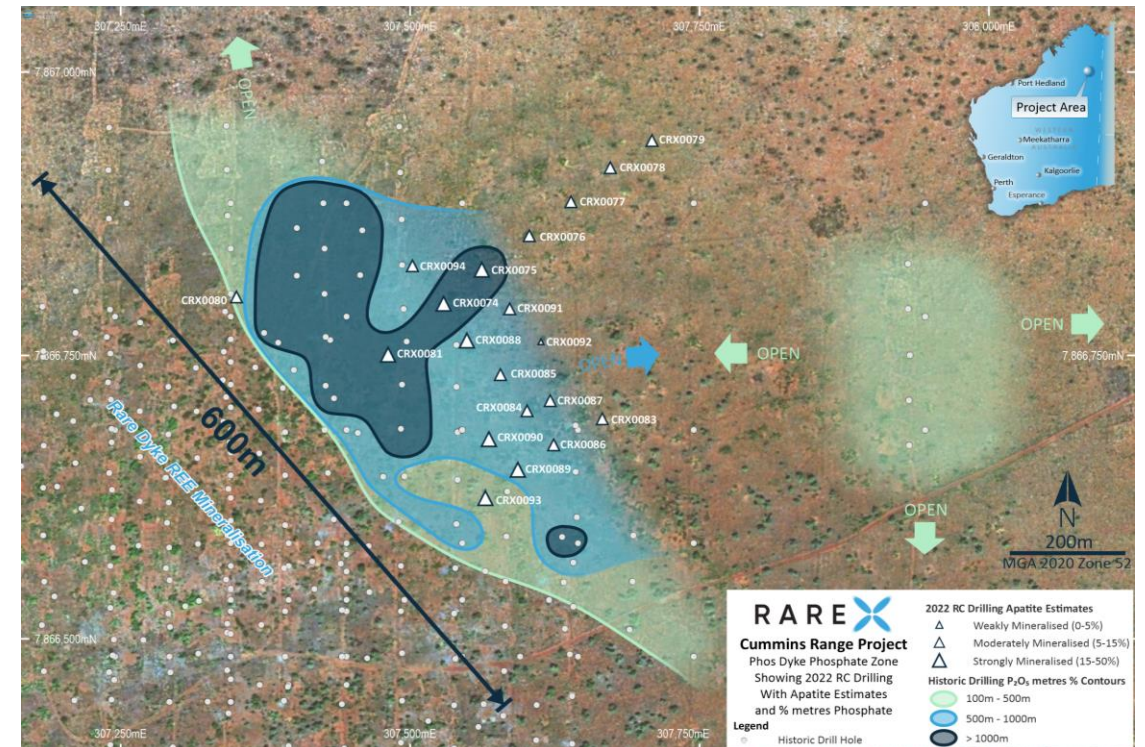
Strong Apatite (light brown) mineralisation (>15% apatite) in phoscorite. Hole CDX0093 at 107m - 114m



# Phos Dyke Phosphate Zone What Next?

## Drilling Expands Phos Dyke Phosphate Zone at Cummins Range

- Great metallurgy results supports phosphate growth drilling
- Phoscorite and rare earths mineralisation open in all directions and at depth
- Large portions of the 2km pipe have not been explored with multiple phosphate intersections that have not been followed up
- Several geochemical and geophysical exploration targets proximal to the Cummins Range pipe to be tested



# List Of Sources For Grade And Resource Graphs

Resource	Lynas	Source of data	Hastings	Source of data	ASM	Source of data
Resource Million Tonnage	55.2	<a href="https://wcsecure.weblink.com.au/pdf/LYC/02434182.pdf">https://wcsecure.weblink.com.au/pdf/LYC/02434182.pdf</a>	27.42	<a href="https://www.investi.com.au/api/announcements/has/01aac881-001.pdf">https://www.investi.com.au/api/announcements/has/01aac881-001.pdf</a>	75.18	<a href="https://asmd.irmau.com/site/PDF/9d1c747a-65d0-4b1a-9ff0-9a931ee9b649/InvestorPresentation">https://asmd.irmau.com/site/PDF/9d1c747a-65d0-4b1a-9ff0-9a931ee9b649/InvestorPresentation</a>
Total REO Grade	5.30%	<a href="https://wcsecure.weblink.com.au/pdf/LYC/02434182.pdf">https://wcsecure.weblink.com.au/pdf/LYC/02434182.pdf</a>	0.97%	<a href="https://www.investi.com.au/api/announcements/has/01aac881-001.pdf">https://www.investi.com.au/api/announcements/has/01aac881-001.pdf</a>	0.88%	<a href="https://asmd.irmau.com/site/PDF/9d1c747a-65d0-4b1a-9ff0-9a931ee9b649/InvestorPresentation">https://asmd.irmau.com/site/PDF/9d1c747a-65d0-4b1a-9ff0-9a931ee9b649/InvestorPresentation</a>
NdPr Enrichment wrt Resource	1.95%	Calculation	0.33%	Calculation	0.16%	Calculation
NdPr Enrichment wrt TREO	36.82%	Cover full page image (weblink.com.au)	34.02%	<a href="https://www.investi.com.au/api/announcements/has/01aac881-001.pdf">https://www.investi.com.au/api/announcements/has/01aac881-001.pdf</a>	18.20%	<a href="http://www.techmetalsresearch.com/metrics-indices/tmr-advanced-rare-earth-projects-index/">http://www.techmetalsresearch.com/metrics-indices/tmr-advanced-rare-earth-projects-index/</a>
Contained NdPr	1,077	Calculation	90	Calculation	120	Calculation
Contained TREO	2,926	Calculation	266	Calculation	662	Calculation

Resource	Arafura	Source of data	RareX	Source of data	Northern Minerals	Source of data
Resource Million Tonnage	56	<a href="https://wcsecure.weblink.com.au/pdf/ARU/02524918.pdf">https://wcsecure.weblink.com.au/pdf/ARU/02524918.pdf</a>	18.8	02396566.pdf (weblink.com.au)	9.24	Resource and Exploration – Northern Minerals
Total REO Grade	2.60%	<a href="https://wcsecure.weblink.com.au/pdf/ARU/02524918.pdf">https://wcsecure.weblink.com.au/pdf/ARU/02524918.pdf</a>	1.15%	02396566.pdf (weblink.com.au)	0.67%	Resource and Exploration – Northern Minerals
NdPr Enrichment wrt Resource	0.69%	Calculation	0.23%	02396566.pdf (weblink.com.au)	0.03%	Calculation
NdPr Enrichment wrt TREO	26.40%	<a href="https://wcsecure.weblink.com.au/pdf/ARU/02524918.pdf">https://wcsecure.weblink.com.au/pdf/ARU/02524918.pdf</a>	20.00%	Calculation	4.50%	02028753.pdf (weblink.com.au)
Contained NdPr	384	Calculation	43	Calculation	3	Calculation
Contained TREO	1,456	Calculation	216	Calculation	62	Calculation