

# Browns Range Heavy Rare Earths Project

*New York / Toronto Roadshow*



**ASX  
NTU**

Presented by:

**Mark Tory**

CEO

June 2022

# Disclaimer



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This document is of a summary form only and therefore contains general background information which may not be complete. It should be read in conjunction with and full review made of Northern Minerals disclosures and releases lodged with the Australian Securities Exchange ("ASX") and available at [www.asx.com.au](http://www.asx.com.au).

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## Compliance Statement

The information in this document that relates to the Mineral Resource Estimate for the Dazzler deposit is extracted from the Company's ASX Announcement dated 7 May 2020 entitled "Over 50% increase in Dazzler high-grade mineral resource" and is available to view on the Company's website ([www.northernminerals.com.au](http://www.northernminerals.com.au)) and at [www.asx.com.au](http://www.asx.com.au), and was completed in accordance with the guidelines of the JORC Code (2012). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resource Estimates in the original market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in this report relating to Exploration Results was compiled by Mr Simon Pooley who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Pooley is a full time employee of Northern Minerals Limited and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (the JORC Code). Mr Pooley consents to the inclusion of this information in the form and context in which it appears.

TREO = Total Rare Earth Oxides – La<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Pr<sub>6</sub>O<sub>11</sub>, Nd<sub>2</sub>O<sub>3</sub>, Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Dy<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>

HREO = Heavy Rare Earth Oxides – Total of Sm<sub>2</sub>O<sub>3</sub>, Eu<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Tb<sub>4</sub>O<sub>7</sub>, Dy<sub>2</sub>O<sub>3</sub>, Ho<sub>2</sub>O<sub>3</sub>, Er<sub>2</sub>O<sub>3</sub>, Tm<sub>2</sub>O<sub>3</sub>, Yb<sub>2</sub>O<sub>3</sub>, Lu<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>





# Browns Range East Kimberley, WA



## Rare earth applications

- ◆ NdFeB Permanent magnets require dysprosium (Dy) and terbium (Tb)
- ◆ Electric drivetrains in passenger cars are forecast to account for the majority of increased demand through to 2040
- ◆ Dy and Tb also have a range of military applications
- ◆ Rare earths are also used in other applications such as technology, medical and robotics

terbium 65 <b>Tb</b> 158.93	dysprosium 66 <b>Dy</b> 162.50
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# Tier 1 resources jurisdiction



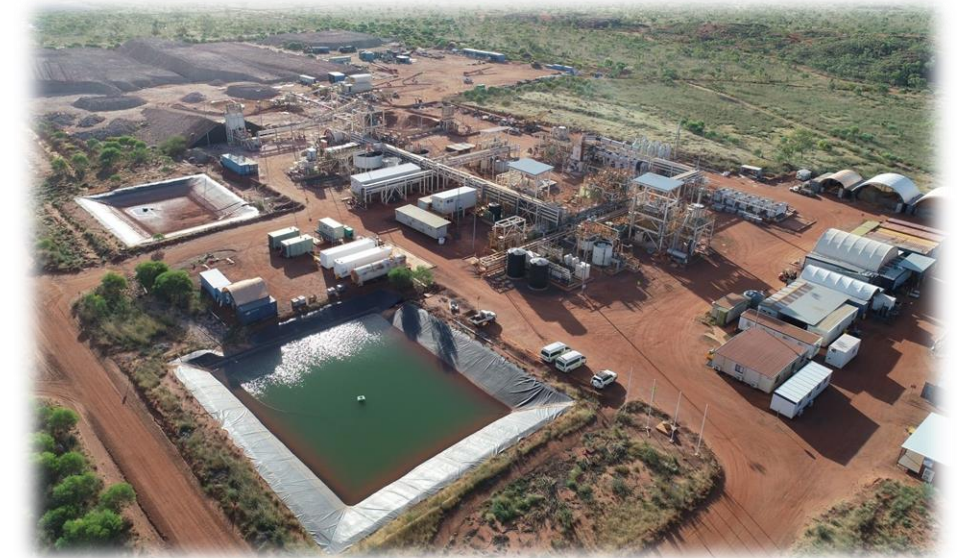
- Australia is one of the world's most proven, safe and reliable jurisdictions for mining and mineral processing
- Northern Minerals is actively engaging with Critical Minerals Facilitation Office established in Canberra in January 2020
- Secure tenement legislation and environmental approvals framework benefits local operators
- Established trade, export and logistics network and supporting economy

# Australian HREE production is ethical

- ◆ Browns Range produces HREE from hard rock xenotime ore at a grade of 600 – 800 ppm Dy
- ◆ Mining and processing methods in China, due to low grade ore, operate at just 20 – 40 ppm Dy
- ◆ 98% of world's heavy rare earths are currently produced by China
- ◆ Many are unconstrained in situ leach operations, which are environmentally harmful



Southern China in situ leach mining operation



Browns Range Pilot Plant







# Our Aspiration

*Principal supplier of ethically produced rare earth separated products with a world class heavy rare earth element inventory*

## A twelve year \$300m+ journey

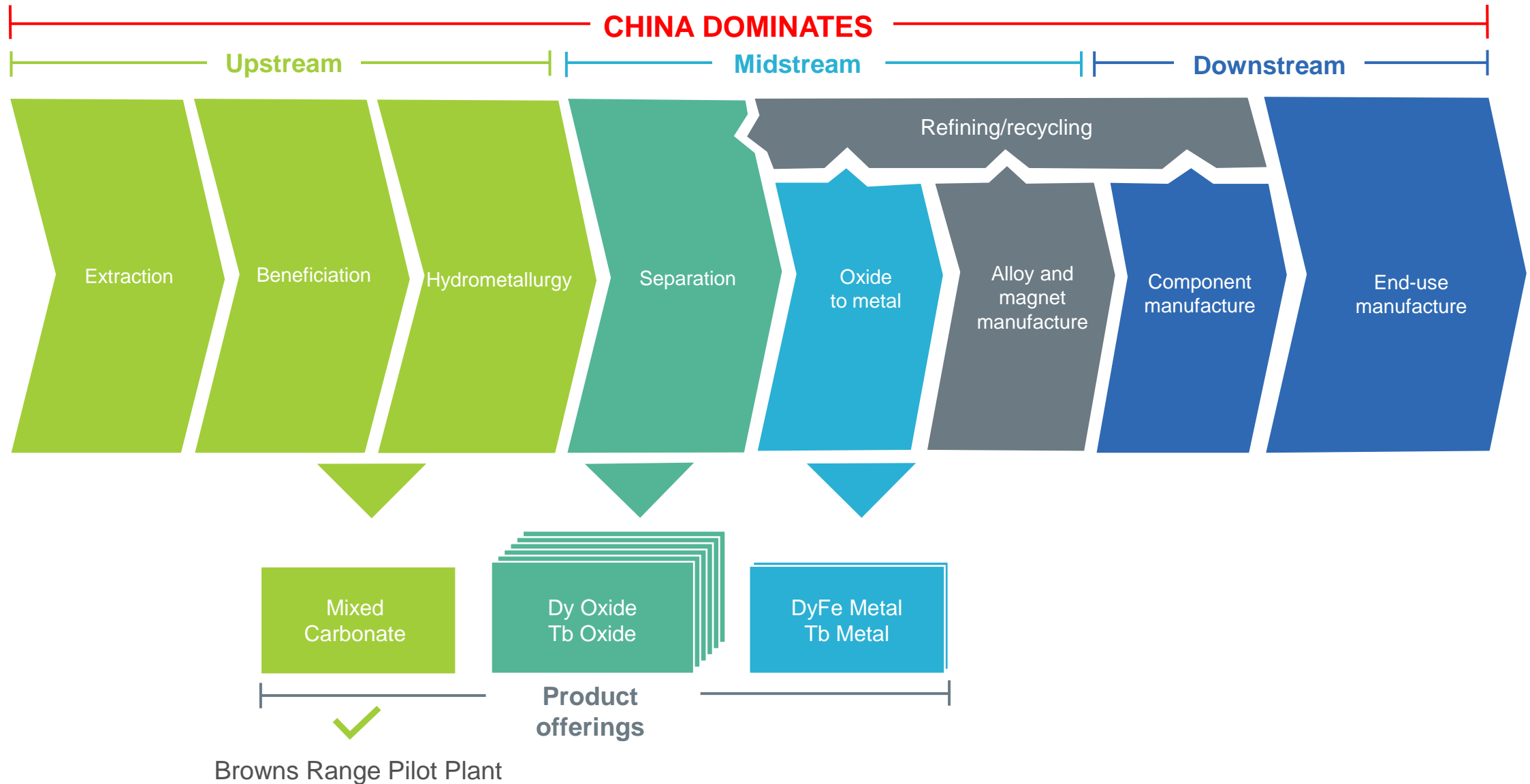
	DISCOVERY	EXPLORATION	EVALUATION AND APPROVALS			DFS	NEW PLAN	DEVELOPMENT		TESTWORK		
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021

### Our main focus for 2022:

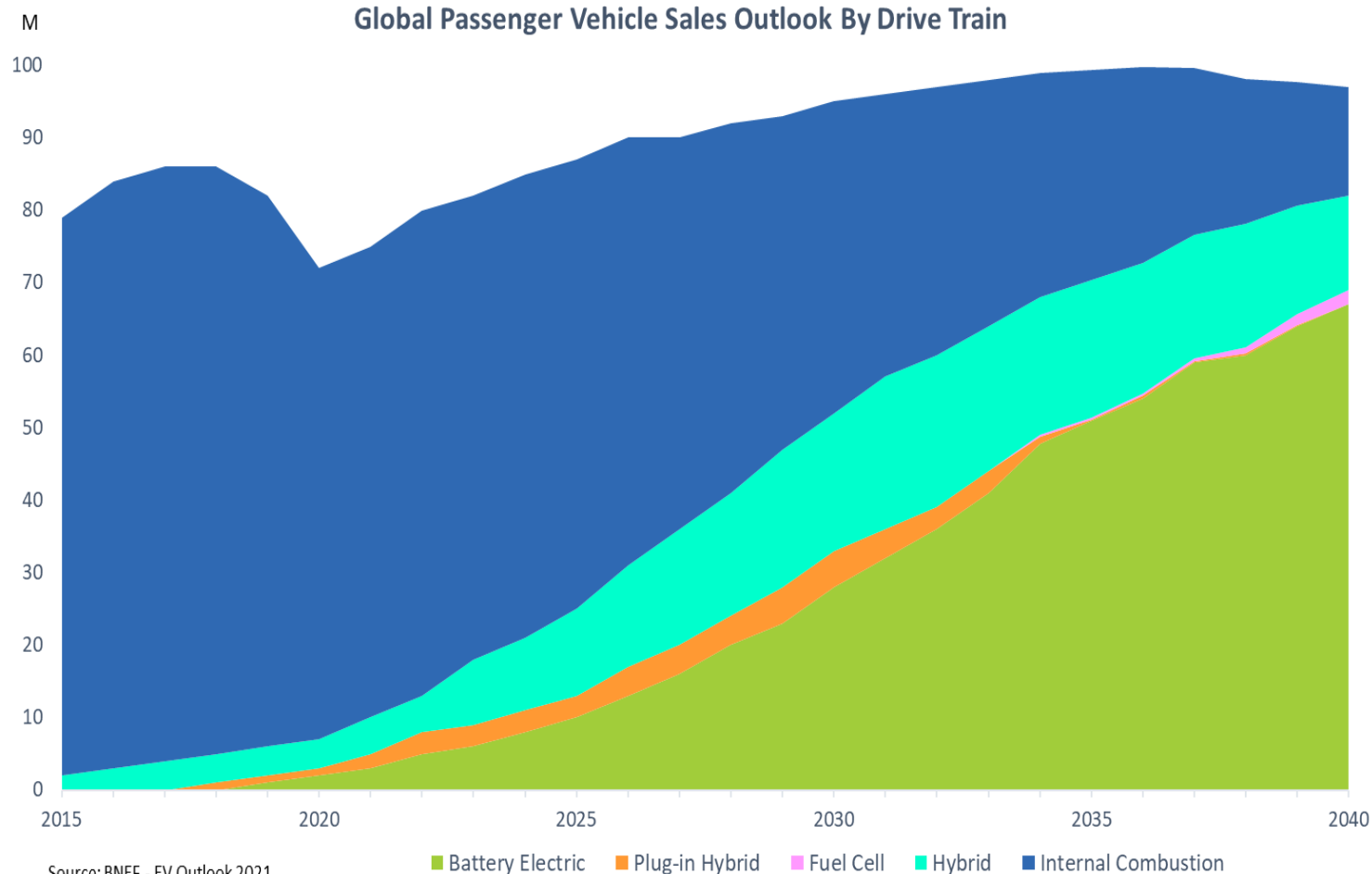
- Complete strategic review of processing potential;
- Exploration aiming to expand the resource base;
- Evaluate other corporate opportunities
- Continue with feasibility study for full scale beneficiation plant
- Long term offtake agreement for concentrate sales



# Rare earth magnet supply chain



# Demand for EV's continues to grow which means increase in Dy and Tb

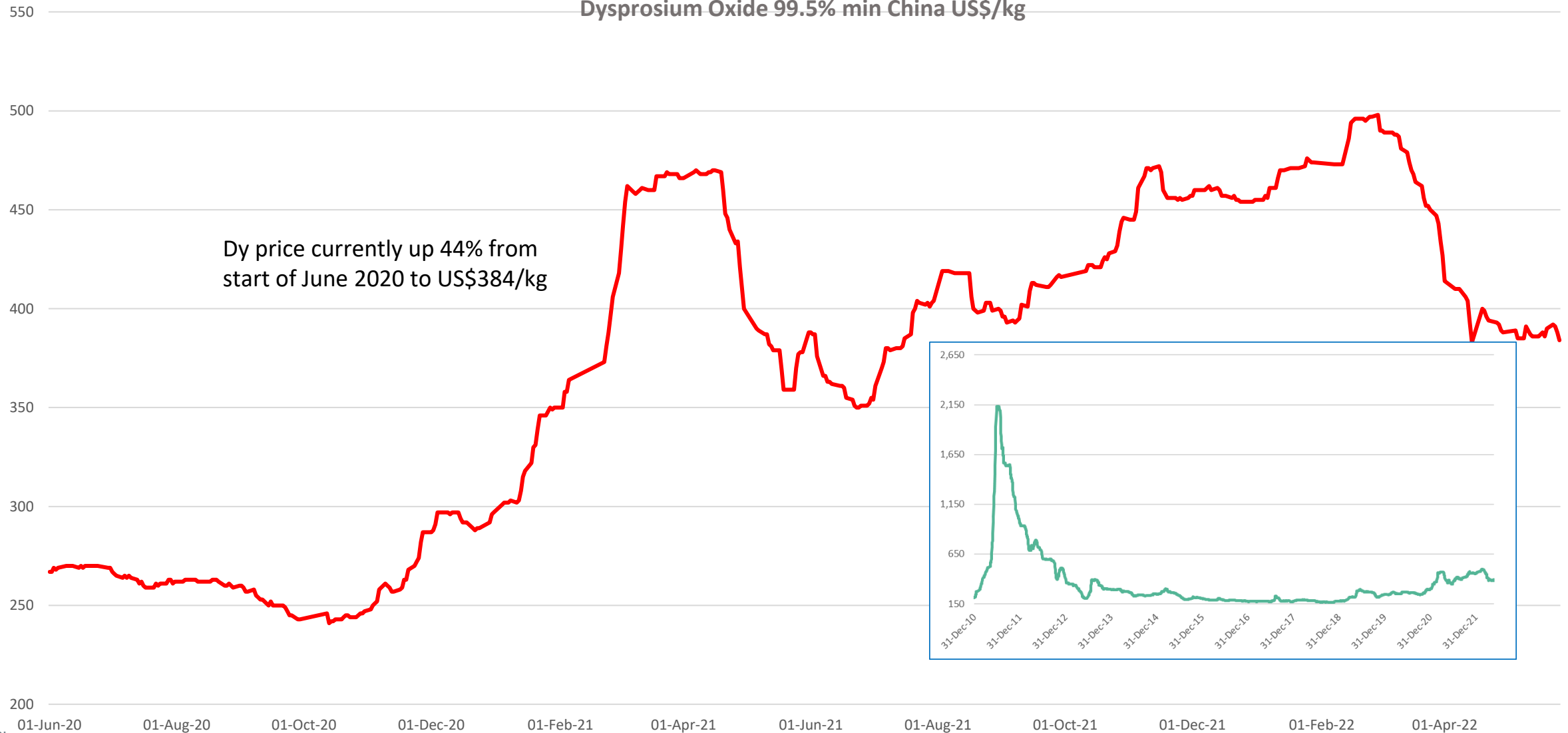


- Electric vehicle (EV) and renewables demand is increasing, (UK announced no sales of petrol and diesel vehicles by 2030)
- EV sales and growth will be limited by access to raw and finished commodities – particularly Heavy Rare Earths (HRE)
- Rare earths have been classified as critical minerals as there are limited supply options for HRE - China has a monopoly position
- Northern Minerals' Browns Range Project is an advanced heavy rare earth project that has the potential to fill some of the market gap and provide surety of supply



# Dysprosium Pricing

Dysprosium Oxide 99.5% min China US\$/kg

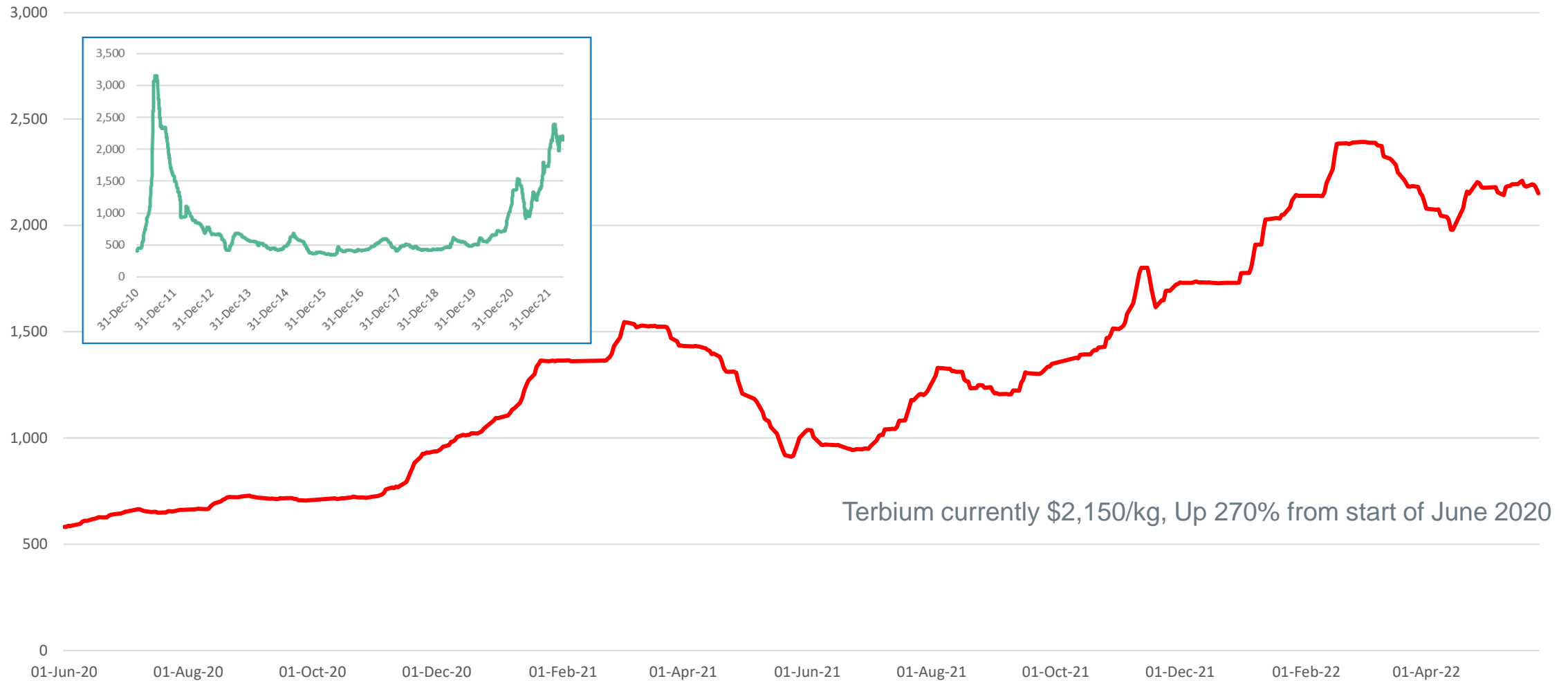


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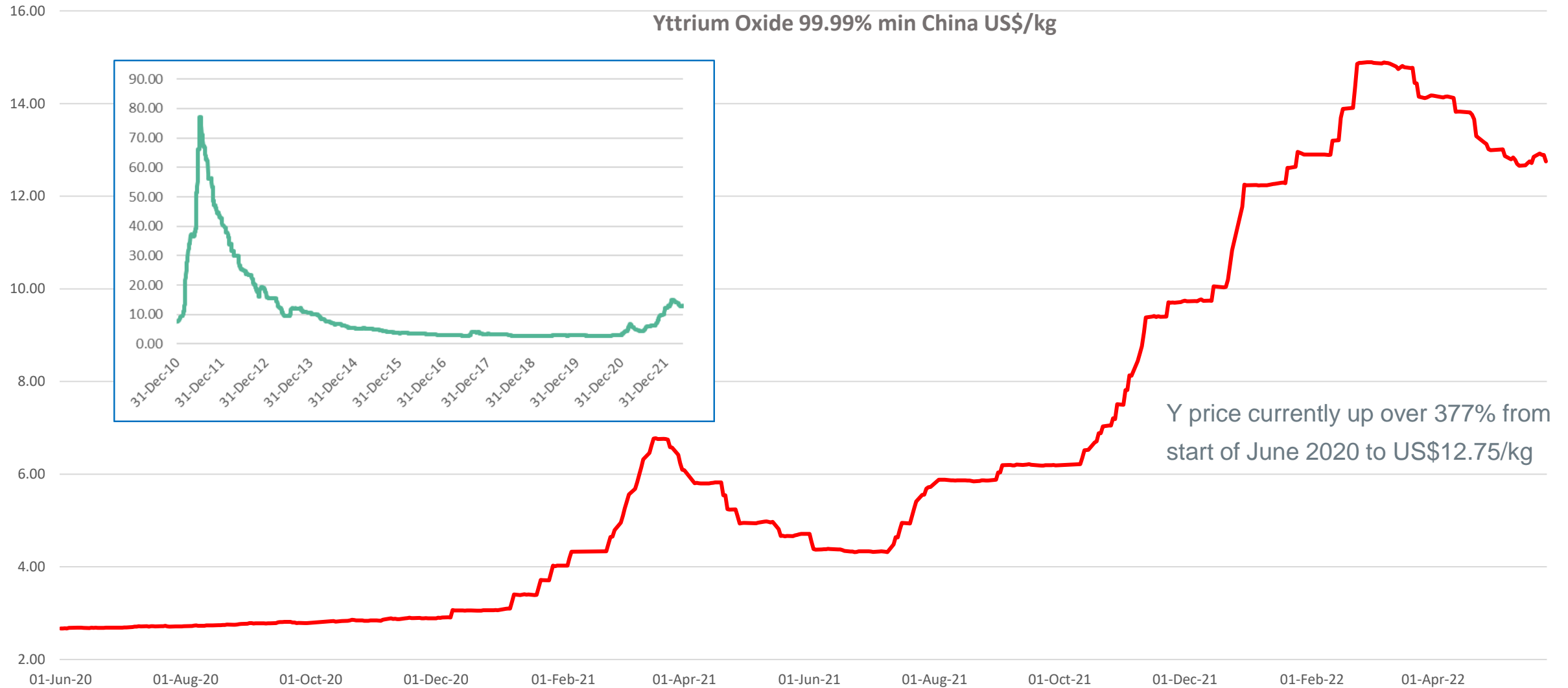


# Terbium Pricing

Terbium Oxide 99.9% min China US\$/kg



# Yttrium Pricing





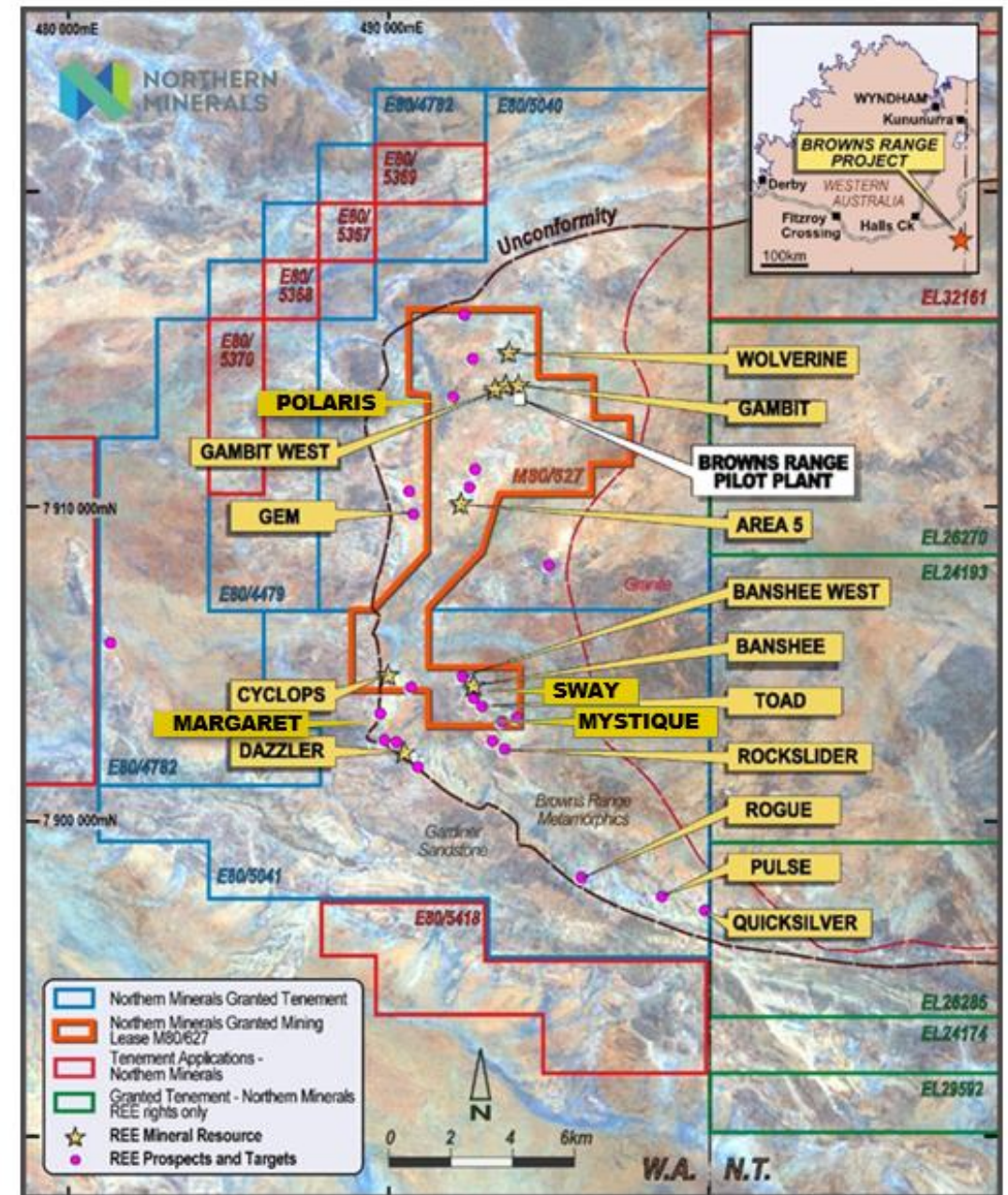
# Strategy for Downstream Processing

- ◆ Review completed in relation to strategy for downstream processing
- ◆ Only full-scale beneficiation plant would be built at site
- ◆ Selling concentrate from beneficiation plant to be reviewed with view of long term contract
- ◆ Long term strategy of potential metal making / magnet production
- ◆ Corporate transactions and joint ventures to be investigated



# 2021 / 22 Exploration Results

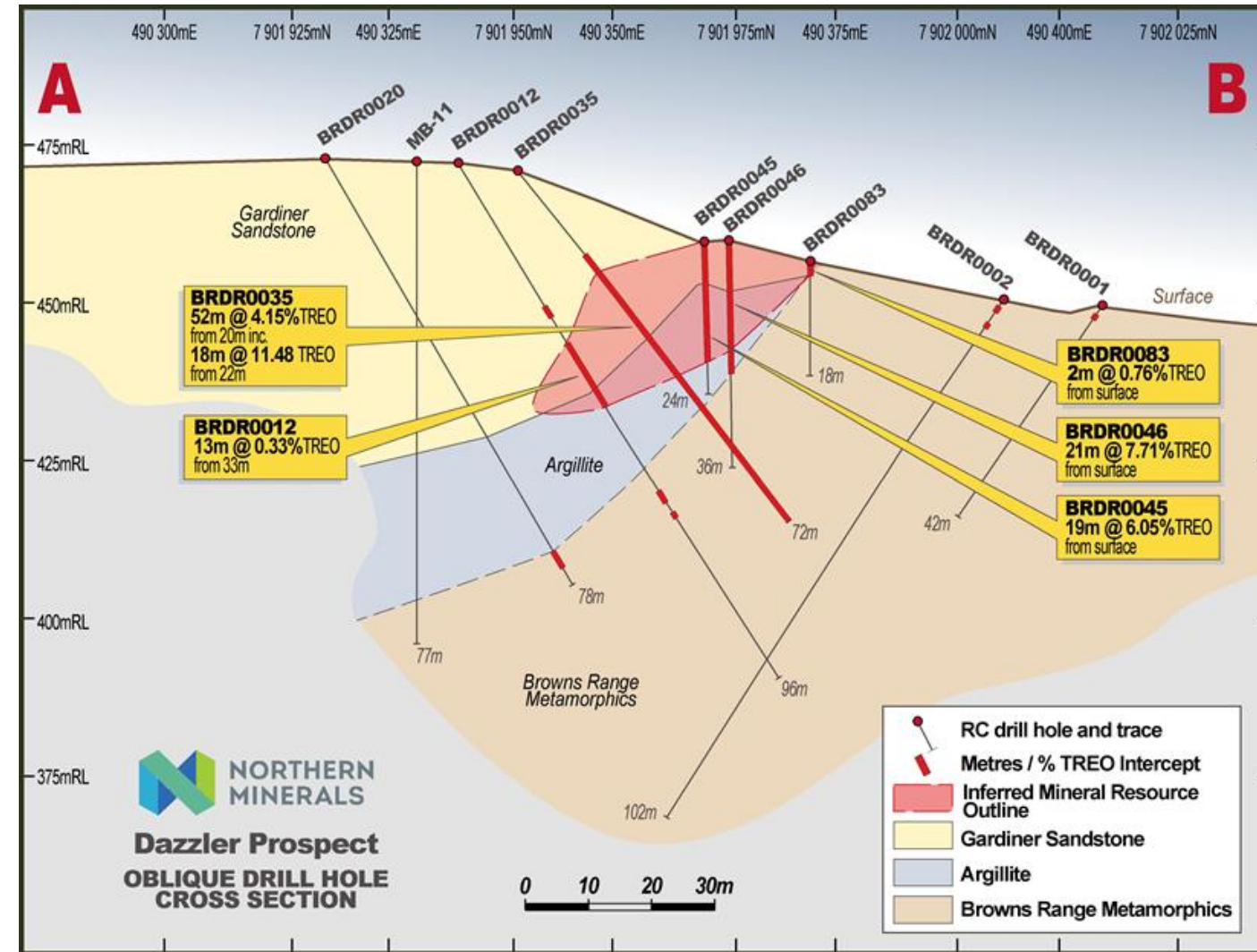
- ◆ Since 30 June 2021 spent nearly A\$7m on exploration
- ◆ Total of 17,500 metres RC drilling and over 2,000 metres of diamond drilling since end of June 2021
- ◆ Continued to get good results from Dazzler resource
- ◆ Encouraging results Banshee drilling to increase the Inferred Resource
- ◆ Prospectivity demonstrated at Cyclops and Rockslider
- ◆ Encouraging assay results from Toad, Polaris and Mystique
- ◆ High value rock chip results to follow up at Margaret and Sway





# Dazzler – Grade is King

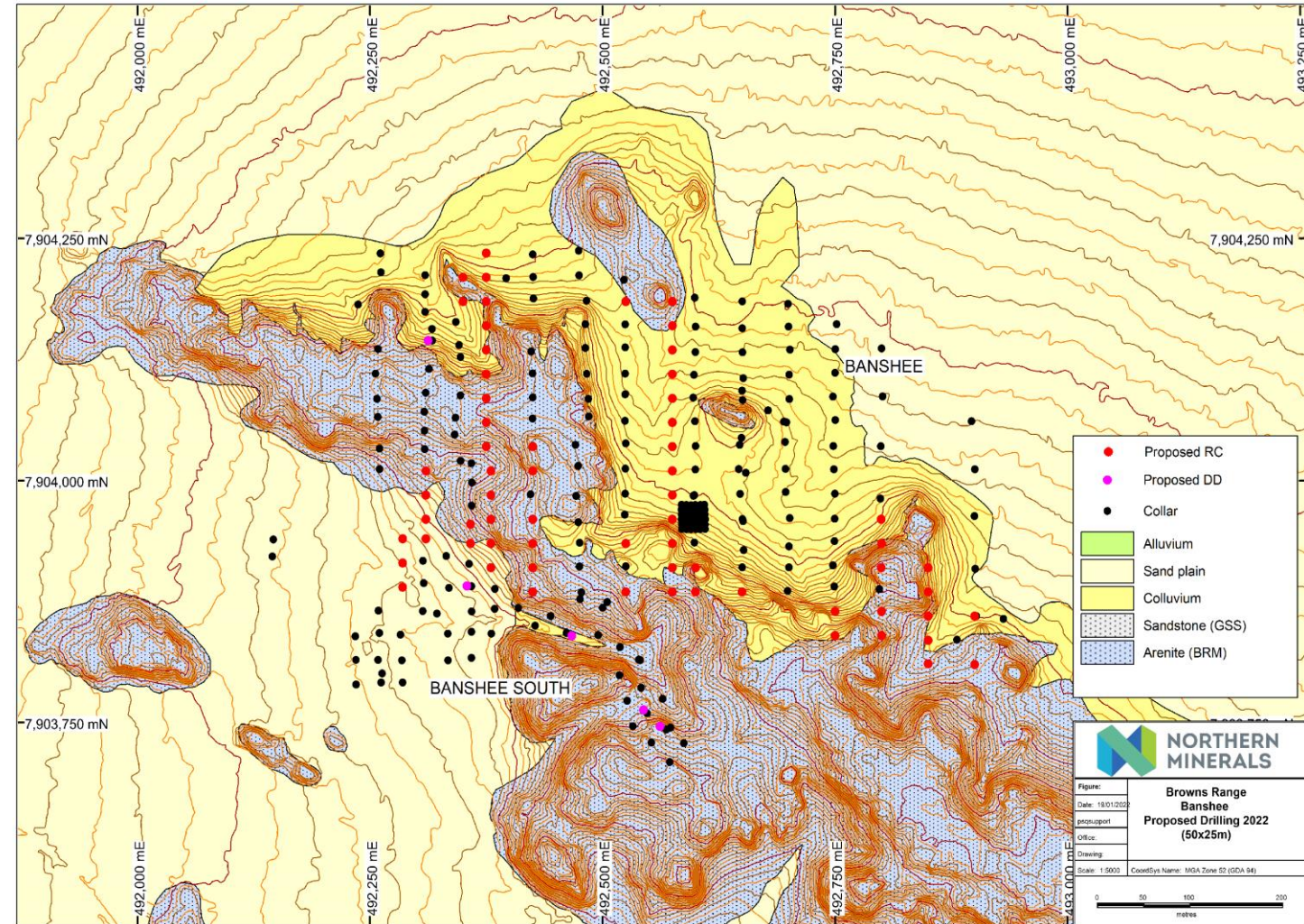
- Exploration results from Dazzler show grades up to 10x the average Browns Range resource grade
- Dazzler 'lookalikes' to be a focus of the exploration program
- Dazzler Inferred Mineral Resource of 0.21Mt @ 2.33% TREO
- Dazzler intercepts to date include:
  - 19m @ 6.05% TREO
  - 21m @ 7.71% TREO
  - 52m @ 4.15% TREO





# Banshee Prospect

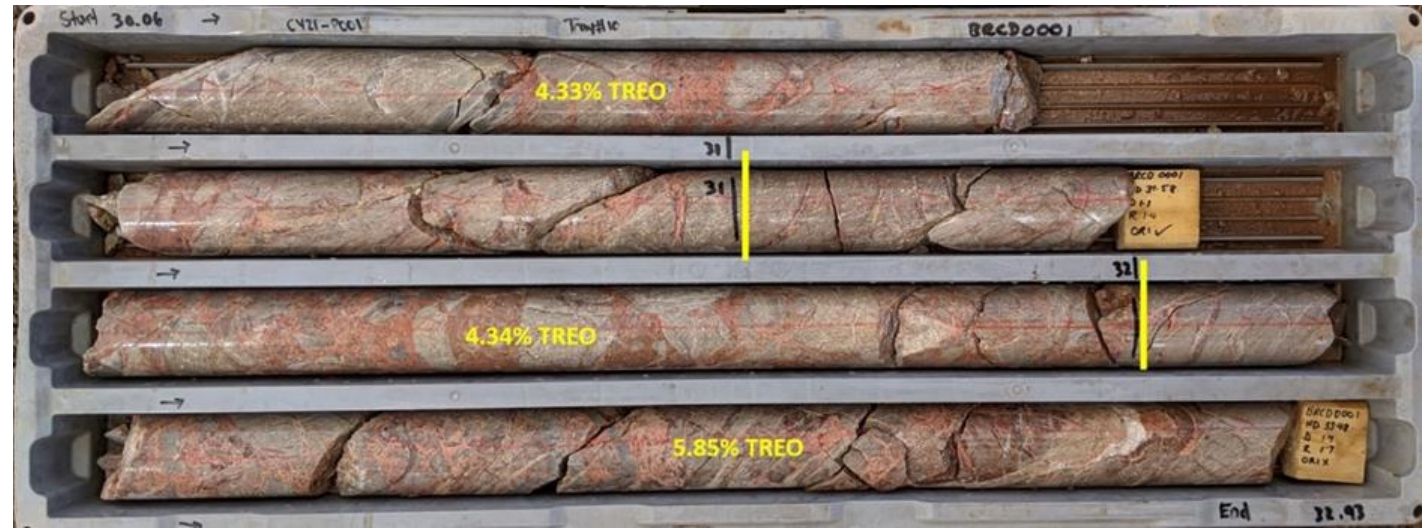
- Combining Banshee, Banshee West and Banshee South
- 2021 / 22 drilling indicates mineralization continuous over a 400m by 400m area (compared to existing resource 175m by 150m)
- Bulk samples tested through ore sorter at pilot plant





# Cyclops Prospect

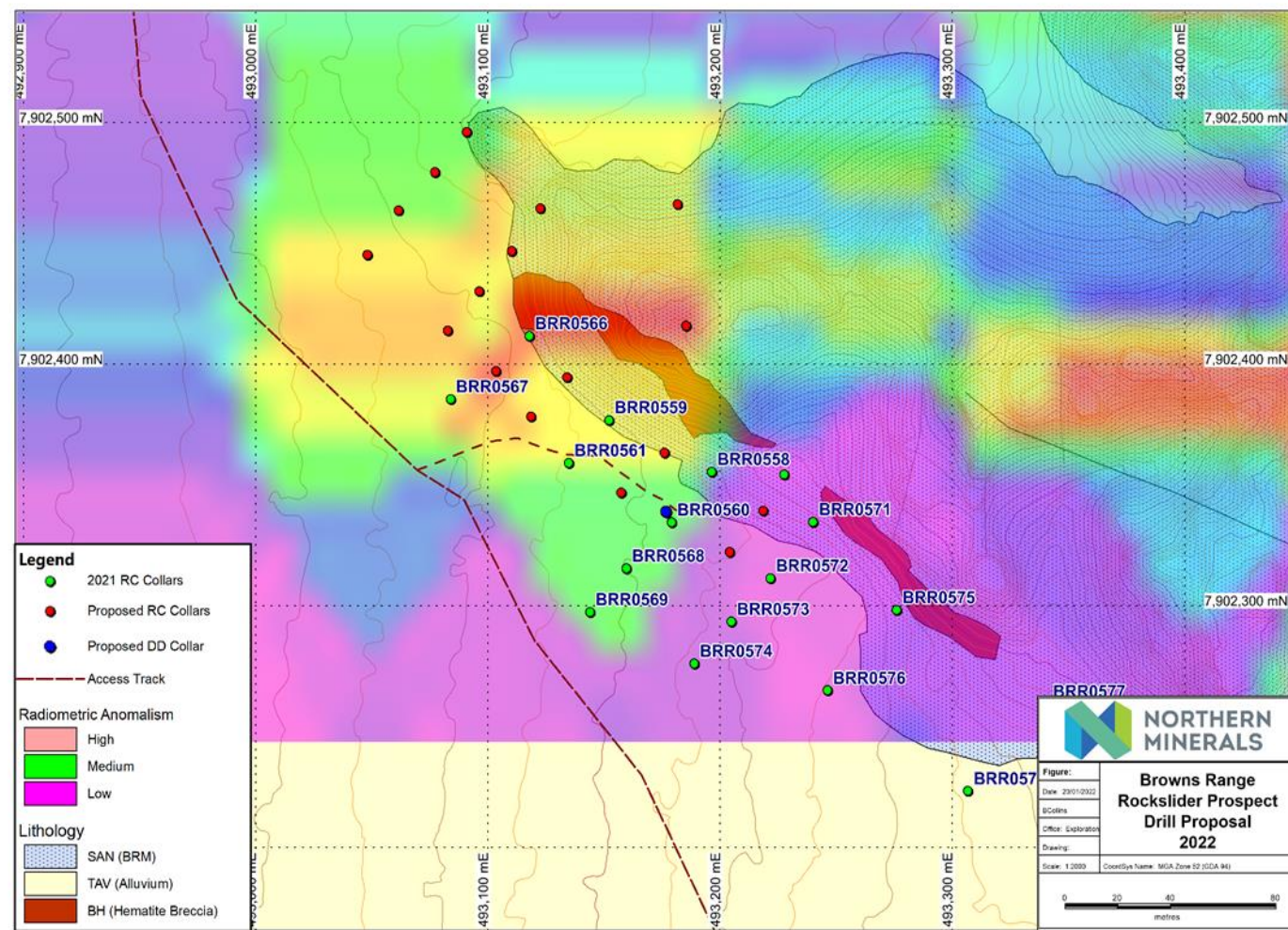
- Wolverine style hematite-xenotime breccia
- Diamond drilling grades have seen 15.65m @1.83% TREO from 24m
- Strong potential to extend high grade intercepts at depth
- Shallow intercepts improve economic viability
- Follow up drilling in 2022 / 23





# Rockslider Prospect

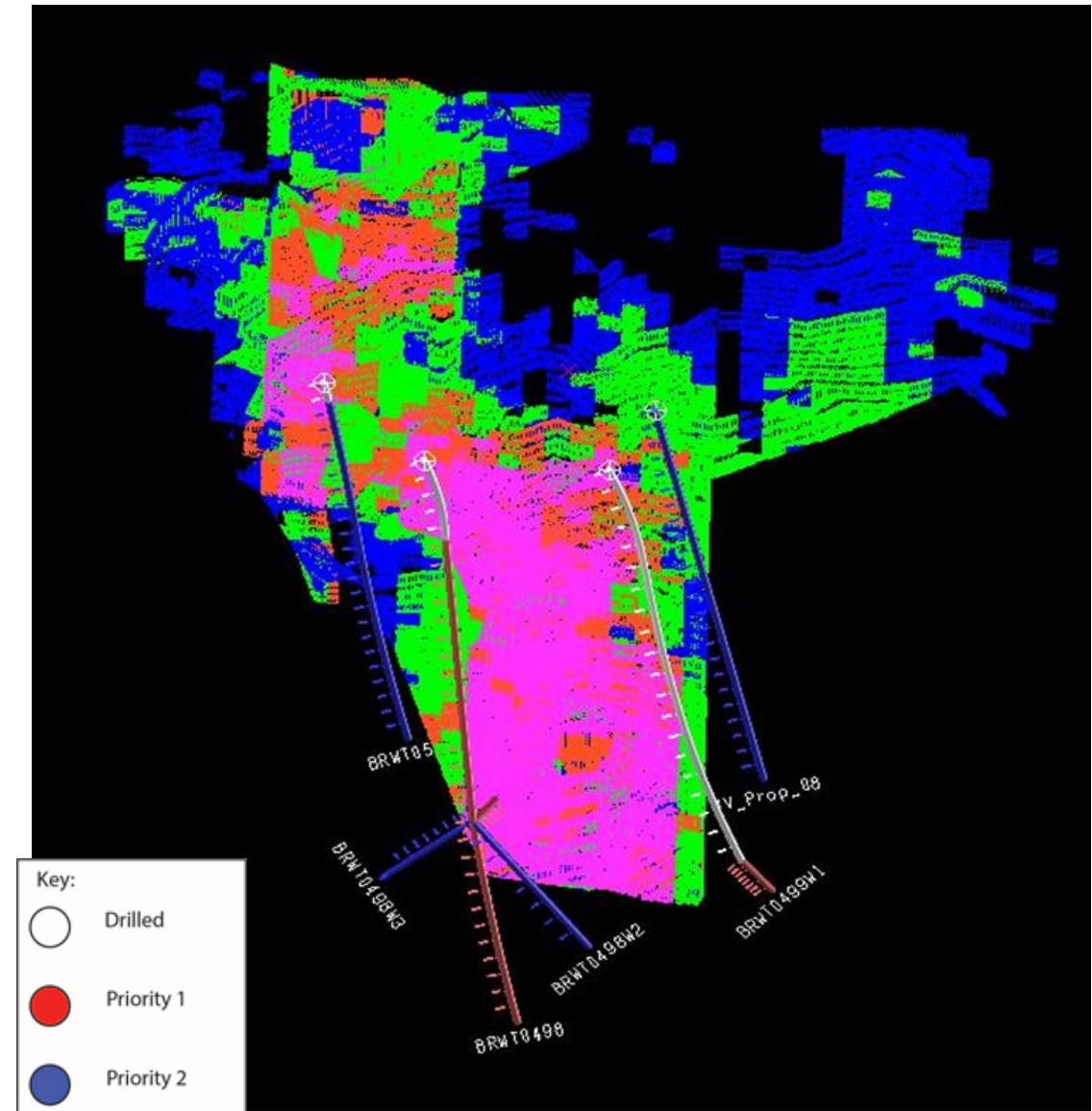
- Strong pXRF and radiometric anomalism with hematite breccia
- RC drilling results returned 103m @ 0.32% TREO from 15 metres
- 100 metre + strike in length and open to the N-NW
- Follow up in 2022 / 23





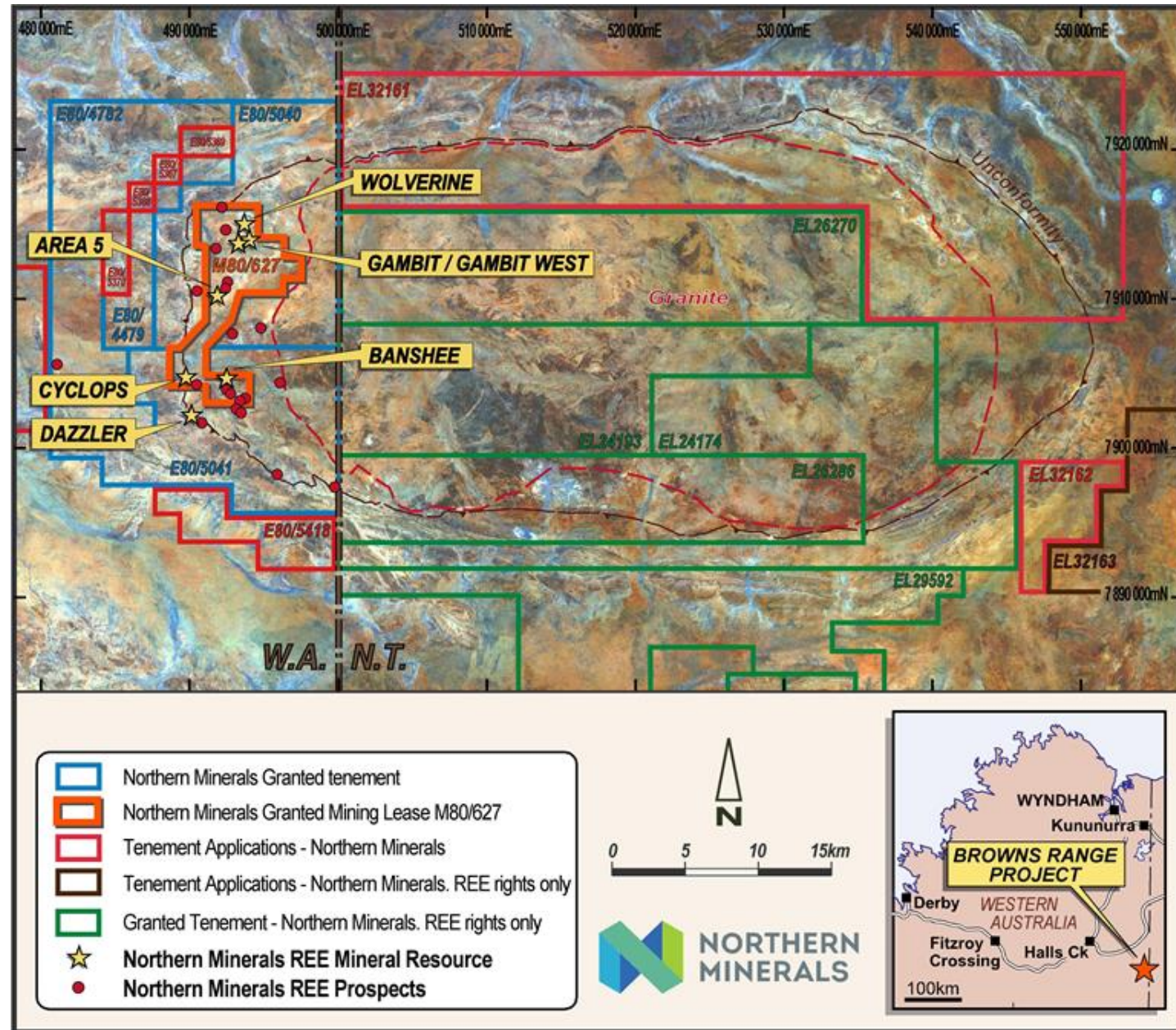
# Wolverine Resource

- High grade intercepts trending NW have not been closed off at depth
- Strong potential for continuation along primary mineralized structure
- Last hole hit 28.6m @ 4.06% TREO from 480 metres and open to the West
- Priority holes for follow up in 2022 / 23



# Exploration – “Own the Dome” strategy

- 100% owned tenure and/or 100% rare earth rights over the Browns Range Dome
- More than 2,300 square kilometres of tenure to evaluate
- Strategy to increase Mineral Resource and the life of mine potential at Browns Range to 20+ years



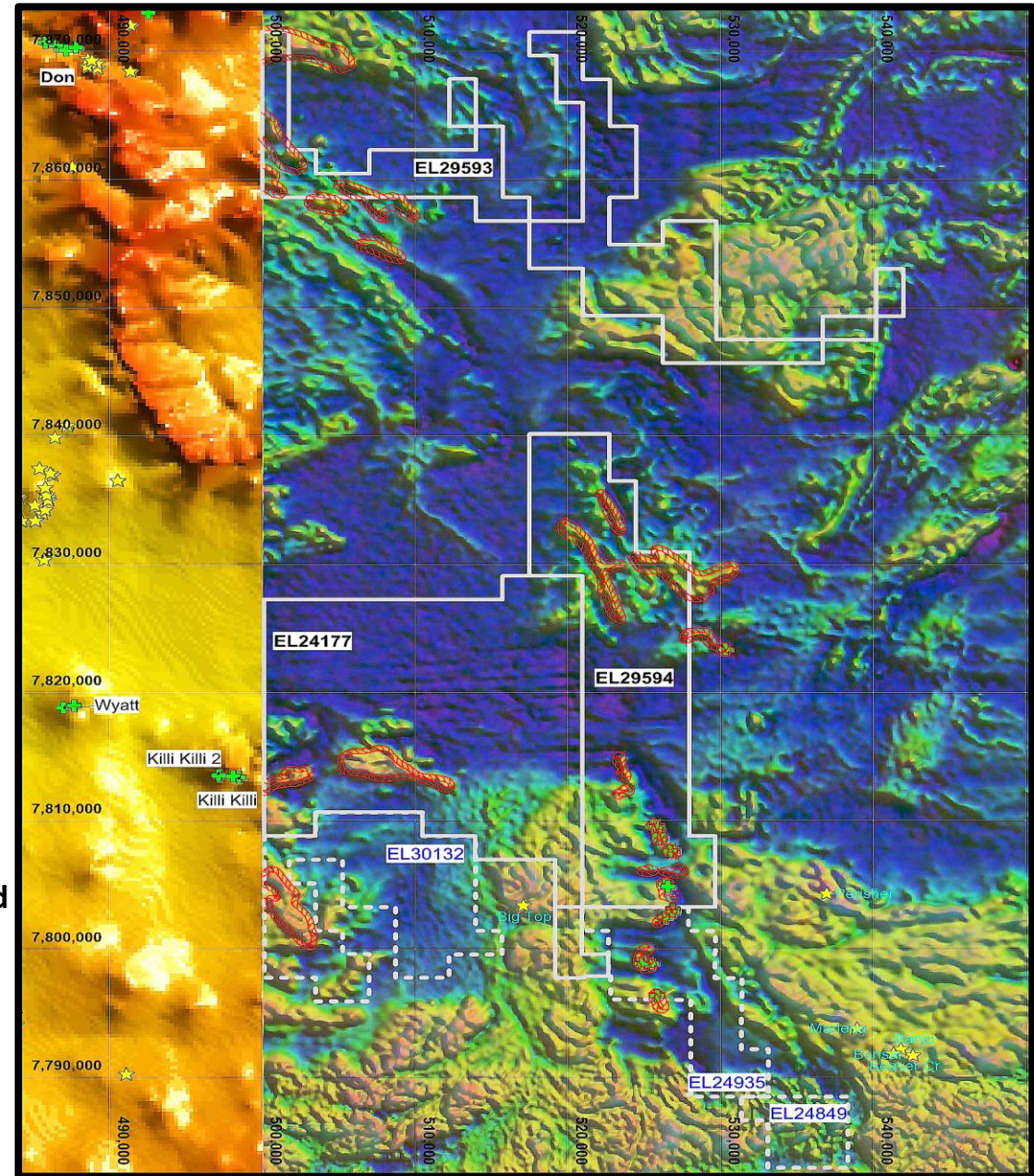


# Boulder Ridge NT Project

- ◆ Boulder Ridge previous rock chip results exceeding 12% TREO including up to 1.15% Dy
- ◆ Work plan completed of mapping and collecting rock chips
- ◆ Future RC scout drilling in 2022 / 23



**HREE targets plotted  
onto Radiometrics  
anomaly and DEM.**





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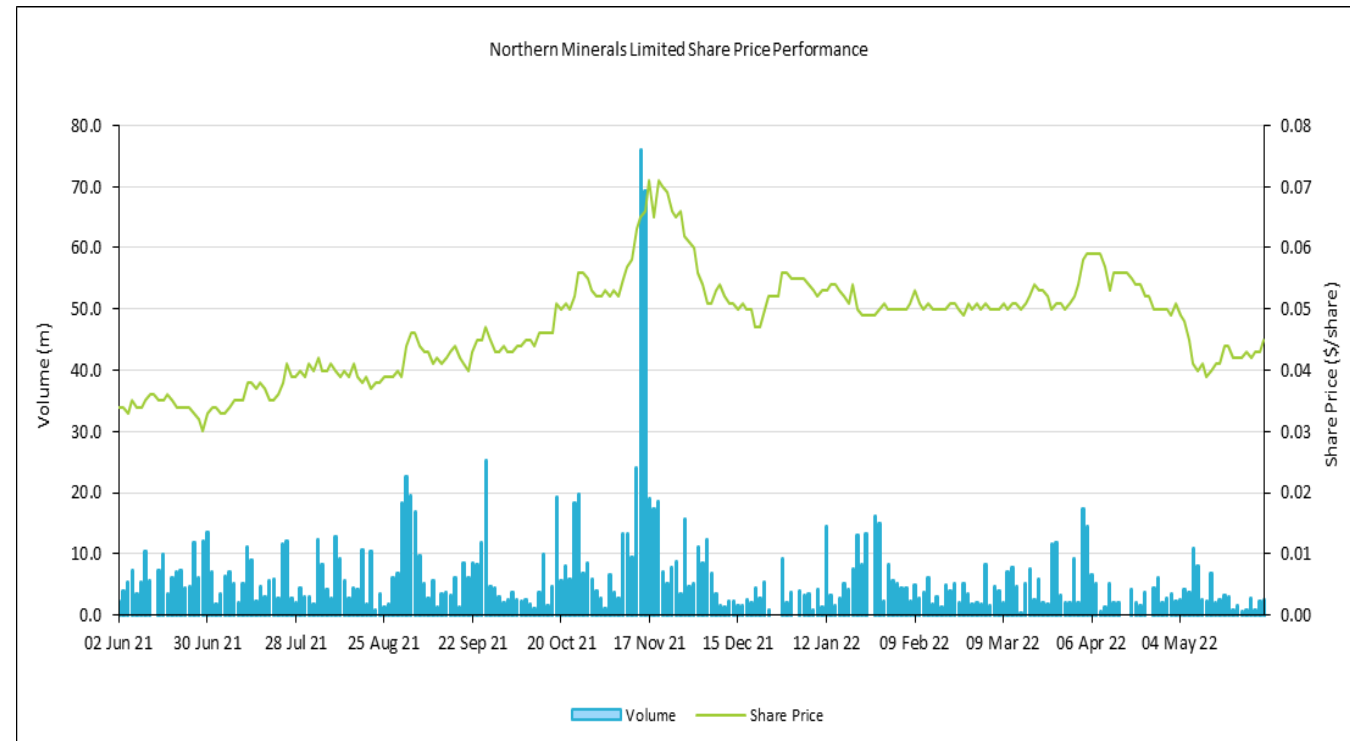


# Corporate Details



Major shareholders	31 May 2022
Citicorp Nominees Pty Ltd	16.57%
Vastness Investment Group	7.71%
Mr Yongquan He	5.14%
Ms Yunzen Ma	4.63%
Mr Conglin Yue	4.33%
Remaining Top 20	24.81%
Other	36.81%

Ordinary Shares as at 31 May 2022	4,864M
Options and Performance Rights as at 31 May 2022	258.8M
Market Capitalisation as at 31 May 2022	\$218.9M
Cash (as at 31 March 2022)	\$4.2M
Debt (as at 31 March 2021):	Nil
12 month low – high	\$0.03 - \$0.071
Average daily volume (12 month avg)	6.40M



# Why Northern Minerals has potential

- Has been only significant producer of HREE outside of China over the last 4 years
- Working on feasibility study for full scale beneficiation plant at site with view to enter into long term concentrate sale contract
- The Company's IP on production of Heavy Rare Earth Carbonate
- Strong balance sheet, with no debt
- Browns Range is in leading tier one mining and mineral processing jurisdiction in WA





# Contact details

A man in a high-visibility yellow and blue work shirt, dark blue trousers, and a white hard hat stands with his hands in his pockets in front of a large industrial facility. The facility features multiple levels of metal scaffolding, pipes, and large cylindrical tanks. The ground is reddish-brown dirt. In the background, there are some storage containers and a large arched structure. The sky is clear and blue.

**Mark Tory**

**Chief Executive Officer**

[mtory@northernminerals.com.au](mailto:mtory@northernminerals.com.au)

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



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