

Browns Range Heavy Rare Earths Project

Goldman Sachs Rare Earth Forum



**NORTHERN
MINERALS**

**ASX
NTU**

Presented by:

Mark Tory

CEO

2nd December 2020

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Compliance Statement

The information in this document that relates to the Mineral Resource Estimates of the Wolverine, Gambit, Gambit West, Area 5, Cyclops, Banshee deposits and Pilot Plant Stockpiles is extracted from the Company’s ASX Announcement dated 28 September 2018 entitled “Mineral Resource and Ore Reserve Update – Post Trial Mining Operations at June 30 2018” available to view on the Company’s website (www.northernminerals.com.au) and 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 relevant 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 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” available to view on the Company’s website (www.northernminerals.com.au) and 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 relevant 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 document that relates to Ore Reserves is extracted from the Company’s ASX Announcement dated 28 September 2018 entitled “Mineral Resource and Ore Reserve Update – Post Trial Mining Operations at June 30 2018” available to view on the Company’s website (www.northernminerals.com.au) and 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 Ore Reserves Estimates in the relevant 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 document that relates to production targets and forecast financial information derived from a production target is extracted from the Company’s ASX Announcement dated 2 March 2015 entitled “DFS positions Browns Range Project as next dysprosium supplier” available to view on the Company’s website (www.northernminerals.com.au) and www.asx.com.au. The Company confirms that all material assumptions underpinning the production targets and forecast financial information in the announcement released on 2 March 2015 continue to apply and have not materially changed.

TREO = Total Rare Earth Oxides – La2O3, CeO2, Pr6O11, Nd2O3, Sm2O3, Eu2O3, Gd2O3, Tb4O7, Dy2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3, Lu2O3, Y2O3

HREO = Heavy Rare Earth Oxides – Total of Sm2O3, Eu2O3, Gd2O3, Tb4O7, Dy2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3, Lu2O3, Y2O3

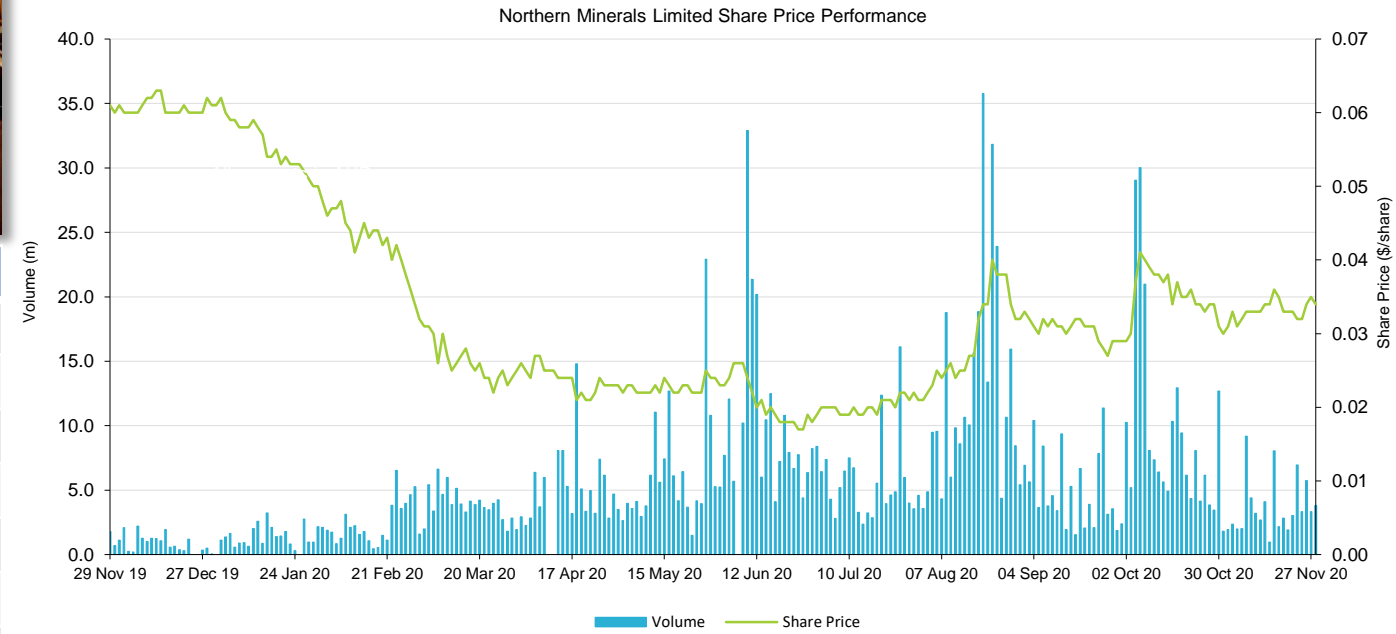


Corporate Details



Ordinary Shares as at 1 December 2020	4,436M
Options and Performance Right as at 1 Dec 2020	52.9M
Market Capitalisation as at 1 December 2020	\$159.7M
Cash (as at 1 December 2020)	\$14.0M
Debt (as at 1 December 2020):	Nil
12 month low - high	\$0.017 - \$0.063
Average daily volume (12 month avg)	5.65M

Major shareholders	30 November 2020
Citicorp Nominees	10.8%
Vastness Investment Group	8.4%
Mr Yongquan He	5.6%
Ms Yuzhen Ma	5.1%
ACiiG	4.8%
Remaining Top 20	25.2%
Other	40.1%



Rare earth applications

- ◆ Demand for Heavy Rare Earth Elements (HREE) will be underpinned by strong growth in the NdFeB permanent magnet sector
- ◆ NdFeB permanent magnets require dysprosium and terbium – the dominant payable elements contained within Browns Range’s xenotime mineralisation
- ◆ Permanent magnet demand growth is being driven by new energy applications including renewable generation and the electrification of transport
- ◆ Electric drivetrains in passenger cars are forecast to account for the majority of increased demand through to 2030, as automotive fleets transition to more hybrid and electric model alternatives
- ◆ Dysprosium and terbium also have a range of military applications, including missile guidance systems, aircraft engines, control systems, satellite communication and radars

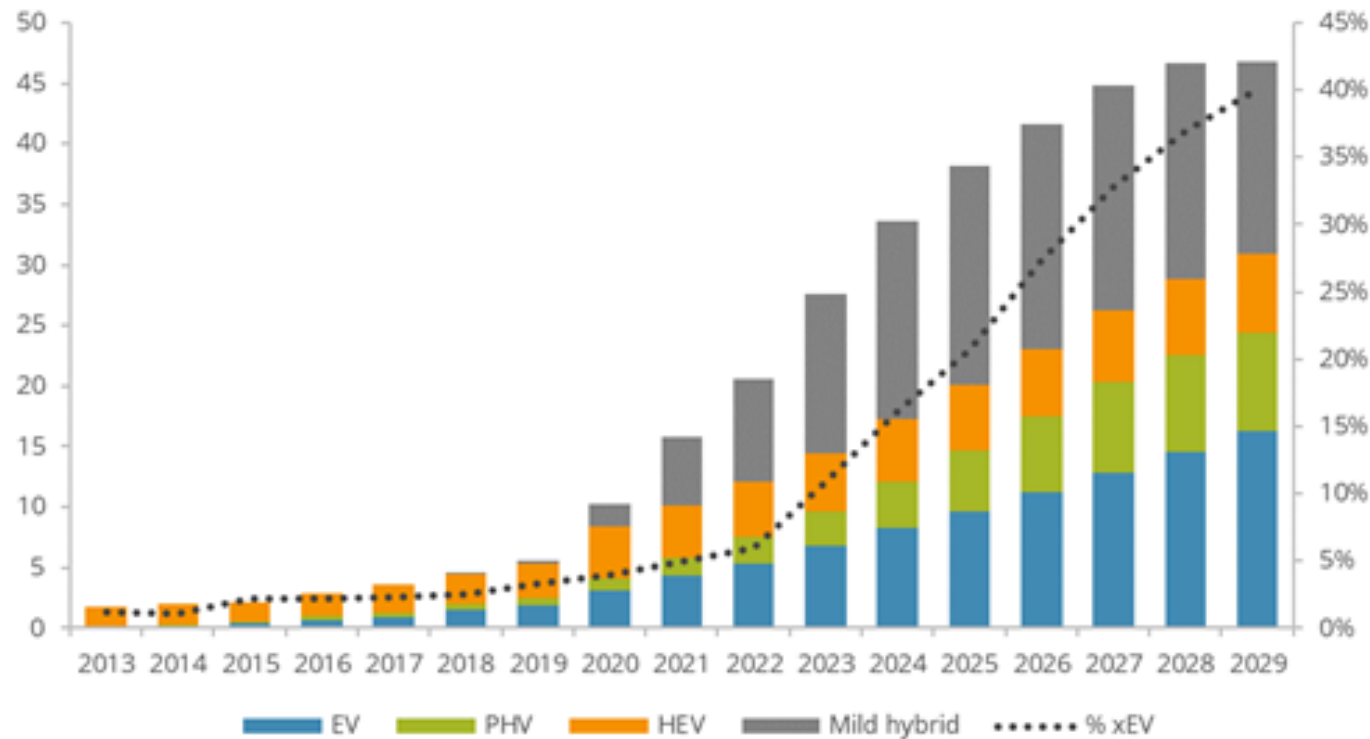


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Demand for electric vehicles continues to grow

Electric vehicle sales by type, 2013 – 2029 (M units)



- Electric vehicle (EV) and renewables demand is increasing, with significant uplift expected over the next decade (UK recently announced no sales of petrol and diesel vehicles by 2030)
- EV sales and growth will be limited by access to raw and finished commodities
- Rare earths have been classified as critical minerals as there are limited supply options and China has a monopoly position
- Northern Minerals' Browns Range Project is the most advanced heavy rare earth project that can fill the supply gap and provide surety of supply

Source: Roskill Rare Earths Outlook 2020-2029



Non-Chinese rare earths supply chain now a critical priority

- ◆ The priority of securing a rare earths supply chain outside of China has escalated for both the United States and Australian governments
- ◆ An Executive Order (EO) from US President Donald Trump has declared a critical minerals supply emergency on 30 September 2020
- ◆ The EO singled out the US's undue reliance on China for multiple critical minerals
- ◆ The US currently imports 80 per cent of its rare earth elements directly from China
- ◆ Importantly, the EO supports Policy to build resilient critical mineral supply chains in the US and with strong allies



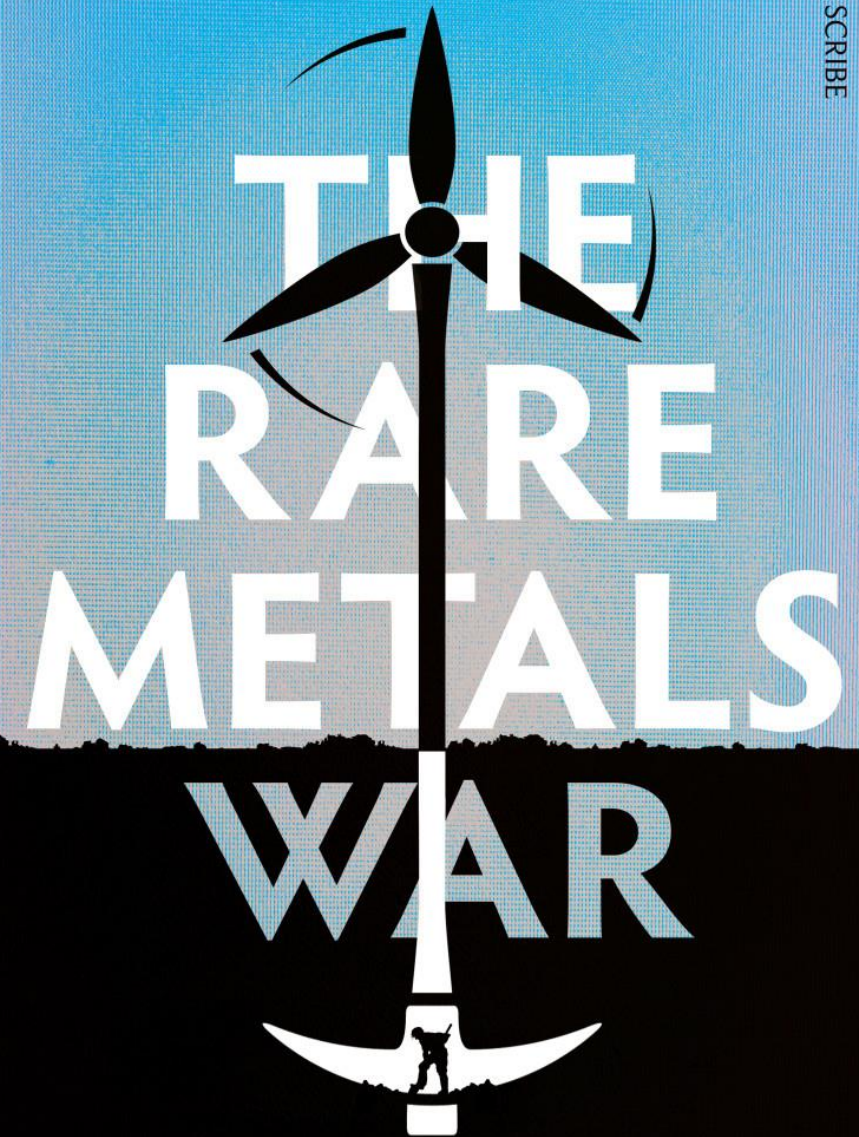
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The Rare Metals War

The Dark Side of Clean Energy and Digital Technologies
Guillaume Pitron

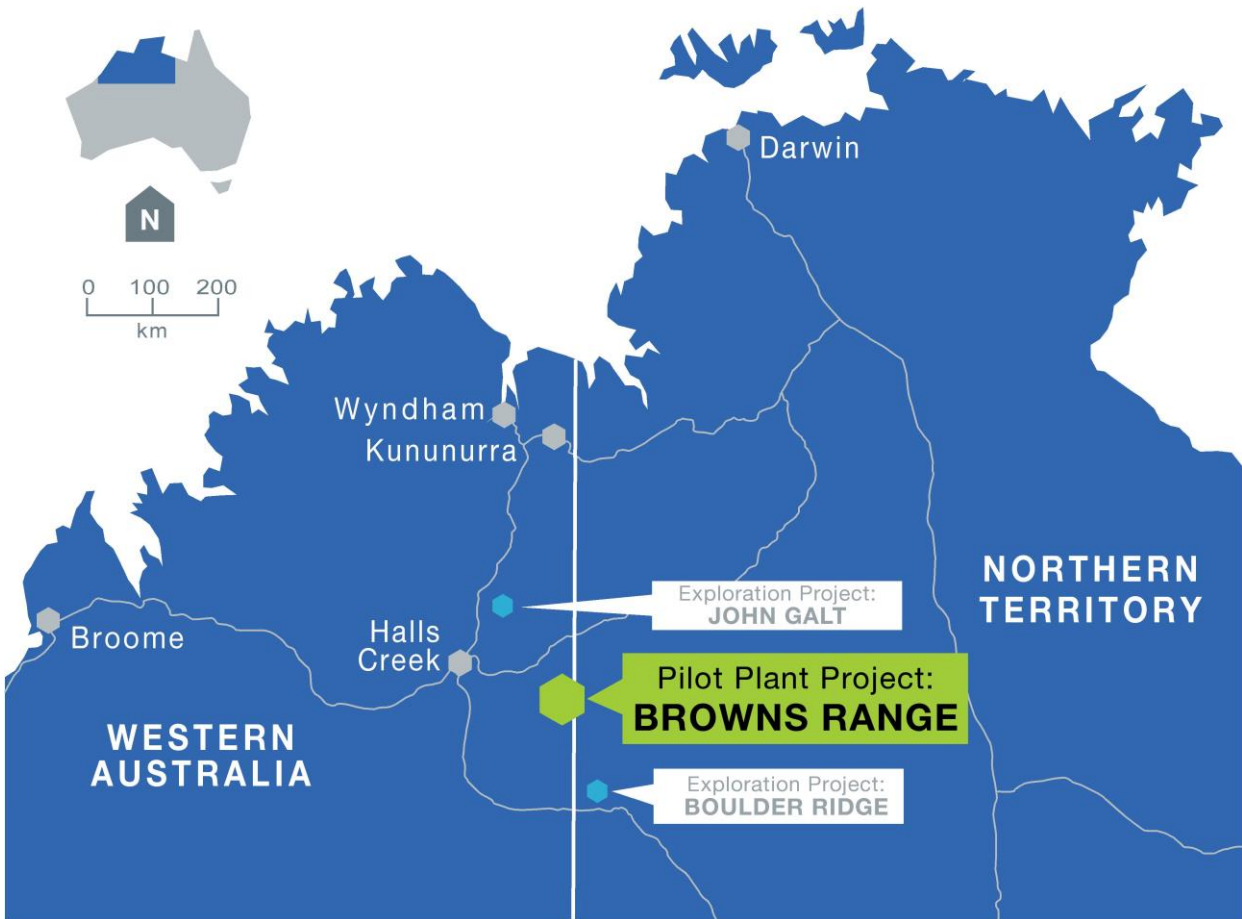
- ◆ French investigative journalist
- ◆ Documents issues with RE production in China
- ◆ Discusses how the gap is closing of internal China supply v demand



the dark side of clean energy and digital technologies

GUILLAUME PITRON

Tier 1 resources jurisdiction



- ◆ Australia is one of the world's most proven, safe and reliable jurisdictions for mining and mineral processing
- ◆ Western Australia ranked first in Fraser Institute Investment Attractiveness Index ratings
- ◆ 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 operations are in situ leach operations, which are dirty and environmentally dangerous



Southern China in situ leach mining operation



Browns Range Pilot Plant



Our Aspiration

Principal supplier of ethically produced rare earth separated products from the world's largest heavy rare earth element inventory

An eleven year \$269m journey

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

Over the next 12 months our main focus:

- ◆ Accelerated exploration aiming to expand the resource base;
- ◆ Ore sorting implemented;
- ◆ Complete separation scoping study;
- ◆ Continue testing the economic and technical viability of the pilot plant; and
- ◆ Begin update of feasibility study.



Operations update post COVID-19 restrictions

- ◆ R&D testwork recommenced in August 2020, with the partial restart of operations
- ◆ Beneficiation and Hydrometallurgy testwork on Browns Range ore is continuing
- ◆ Ore sorter construction commenced
- ◆ Final stages of three-year pilot assessment of economic and technical feasibility
- ◆ Infectious Diseases Management Plan remains in place at Browns Range



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Exploration – \$5 million commitment

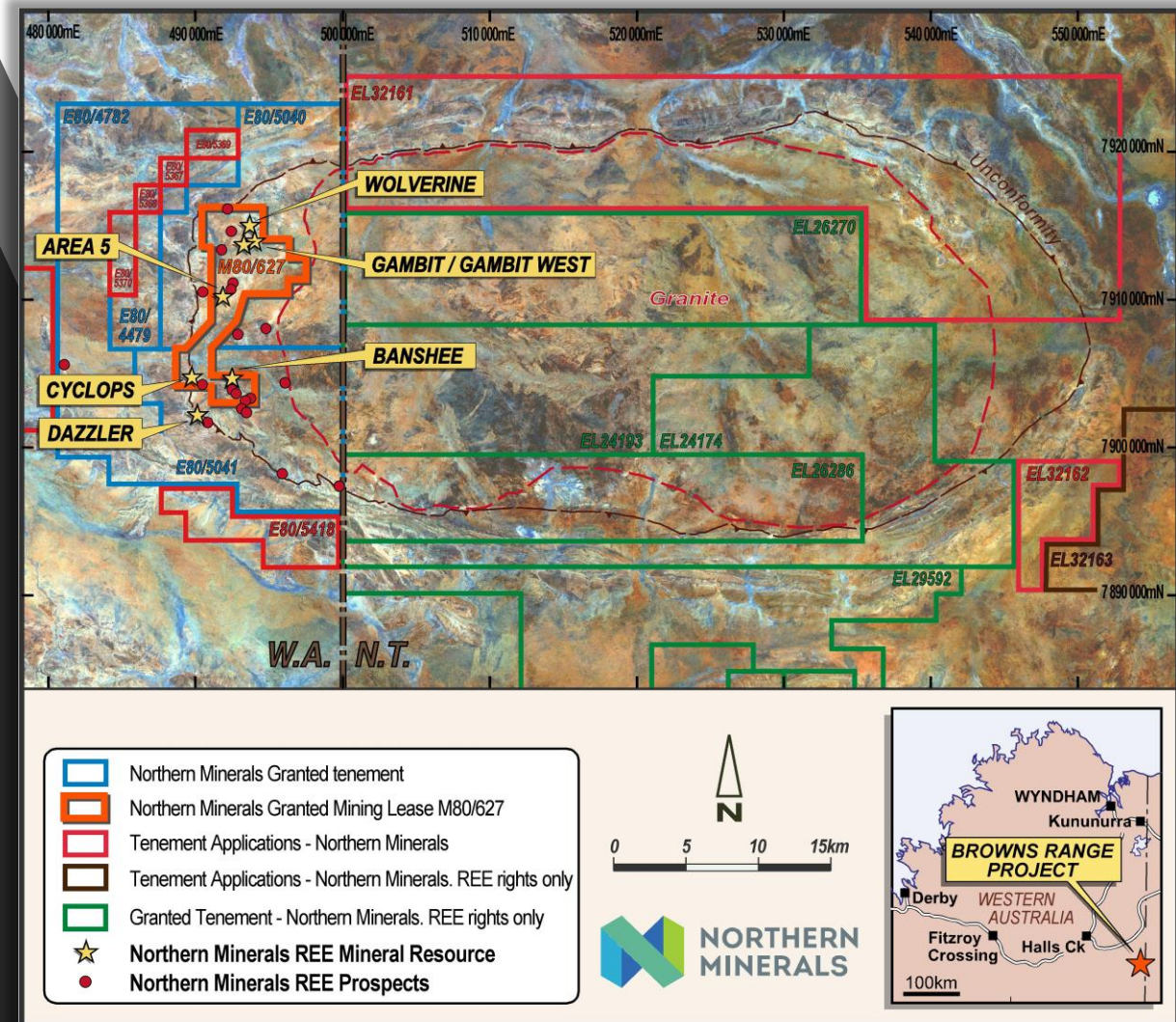


- ◆ Ramp-up of exploration across Browns Range commenced, with drill rigs due on site in mid October
- ◆ 16,500 metres to be drilled on Browns Range tenements before the end of June 2021. (8,500 metres drilled to date)
- ◆ \$5 million budget allocated for the program in Financial Year 2021
- ◆ Drilling on greenfields targets
- ◆ Follow-up also planned on previous drilling at the Dazzler and Banshee deposits



Exploration - “Own the Dome” strategy

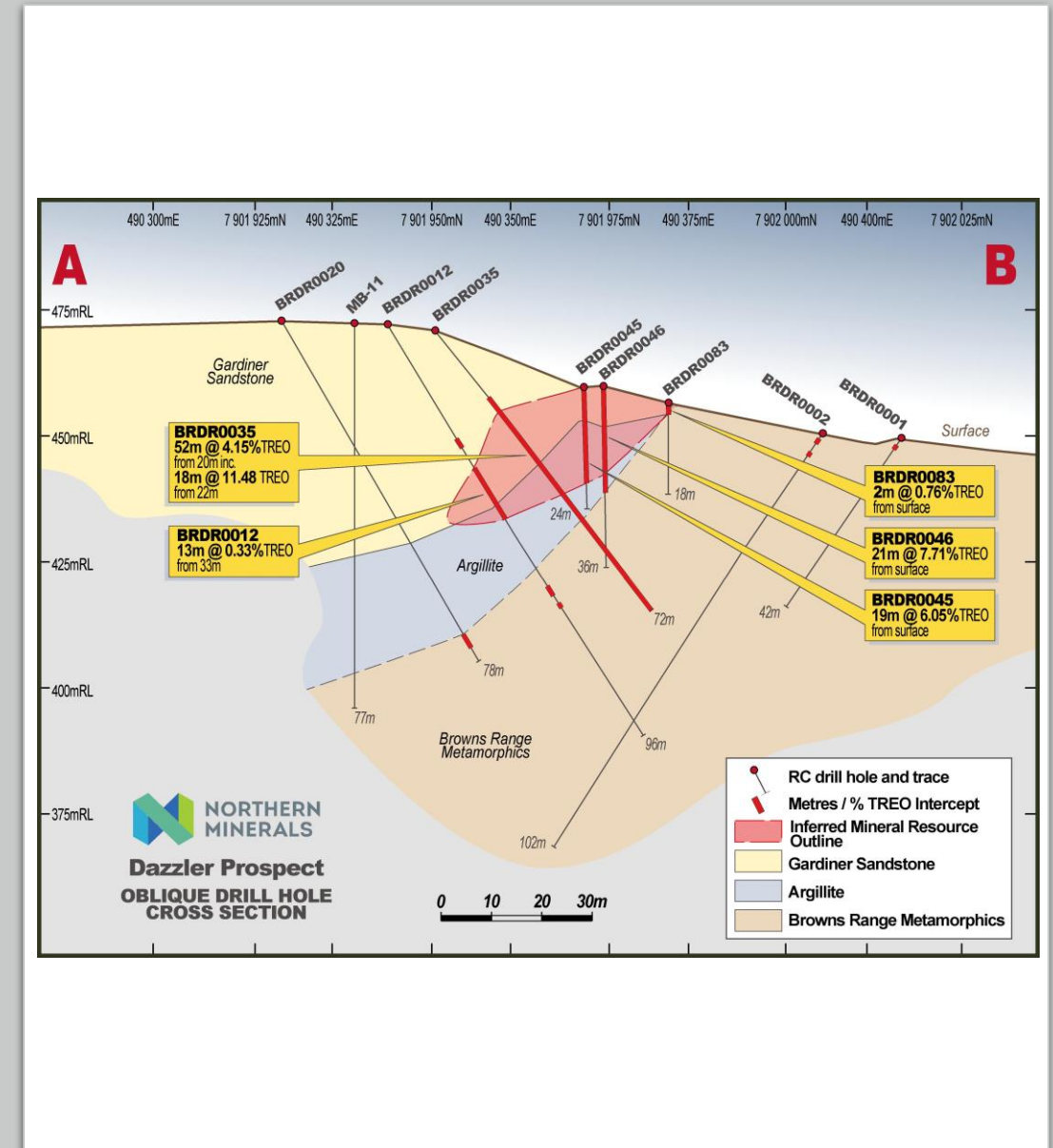
- 100% owned tenure and/or 100% rare earth rights over the Browns Range Dome
- More than 2,300 square kilometres of tenure to evaluate
- Strategy to increase Mineral Resource and the life of mine potential at Browns Range to 20+ years
- Results, along with Pilot Plant testwork, will feed into a new feasibility study for a potential commercial scale plant



Exploration

Dazzler: grade is king

- Exploration results from Dazzler show grades up to 10x the average Browns Range resource grade
- Mineralisation associated with unconformity and concentrated in Gardiner Sandstone and argillite unit
- Dazzler 'lookalikes' to be a focus of new exploration program now under way
- 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

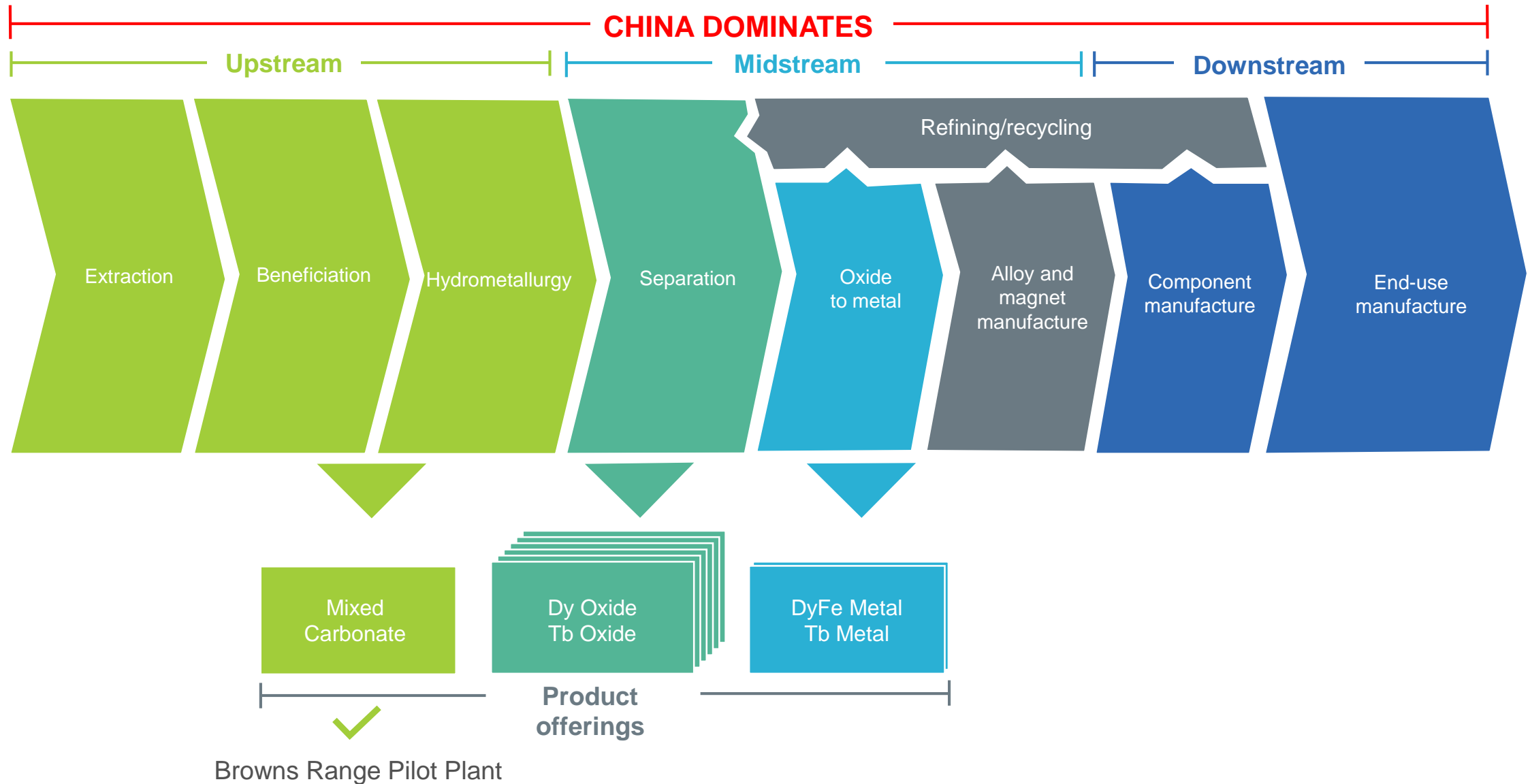


Continuous improvement – ore sorting

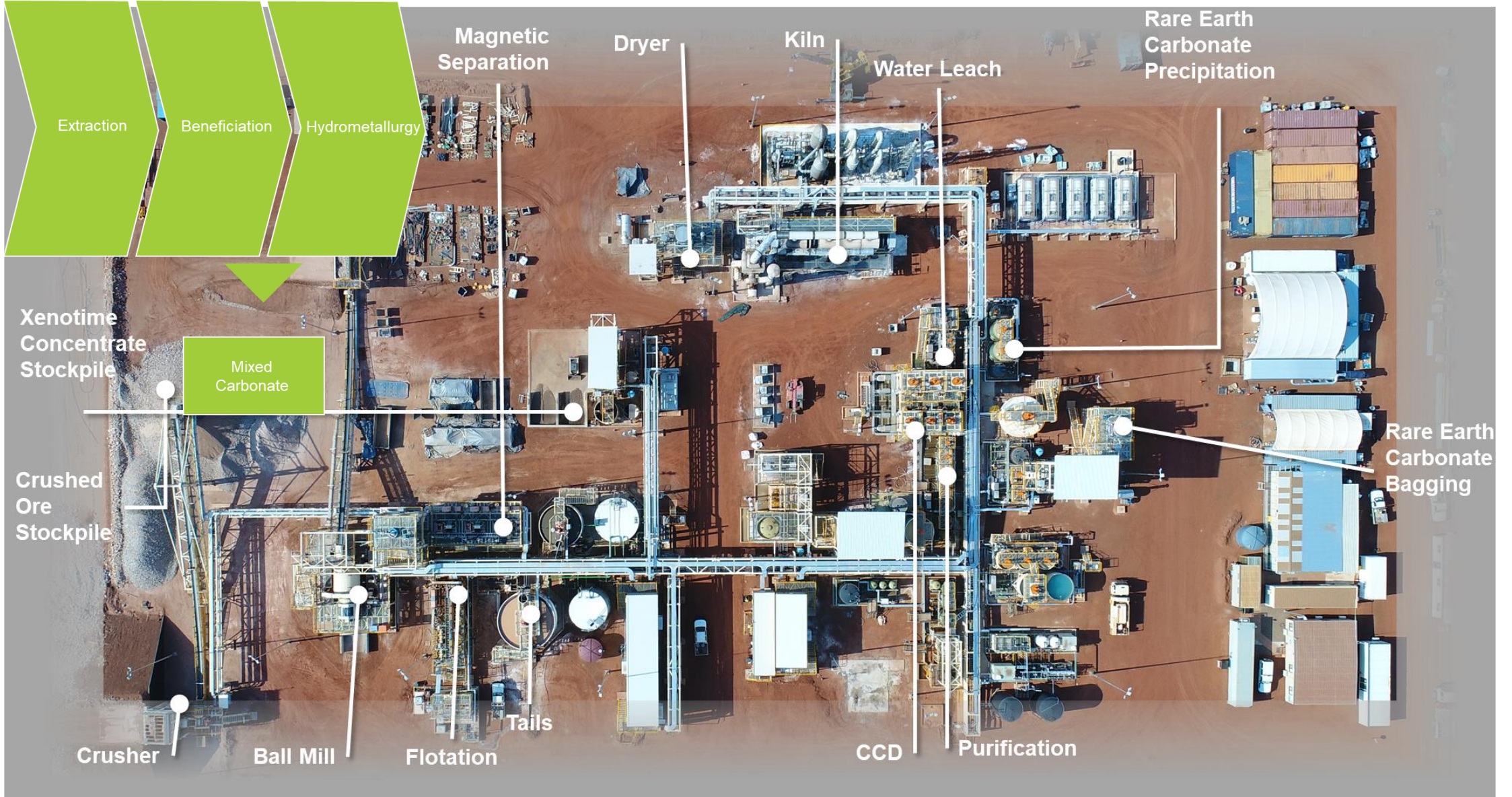


- ◆ Construction has commenced on the selected ore sorter system
- ◆ Ore sorter system concentrates ore in the beneficiation circuit based on x-ray transmission
- ◆ Previous trials of ore sorting at Browns Range identified the potential to more than double the feed grade to the mill at bench test scale
- ◆ Approvals for installation of the ore sorter system has been received
- ◆ Commissioning of the ore sorter system is planned to occur at the end of Q1 2021

Rare earth magnet supply chain

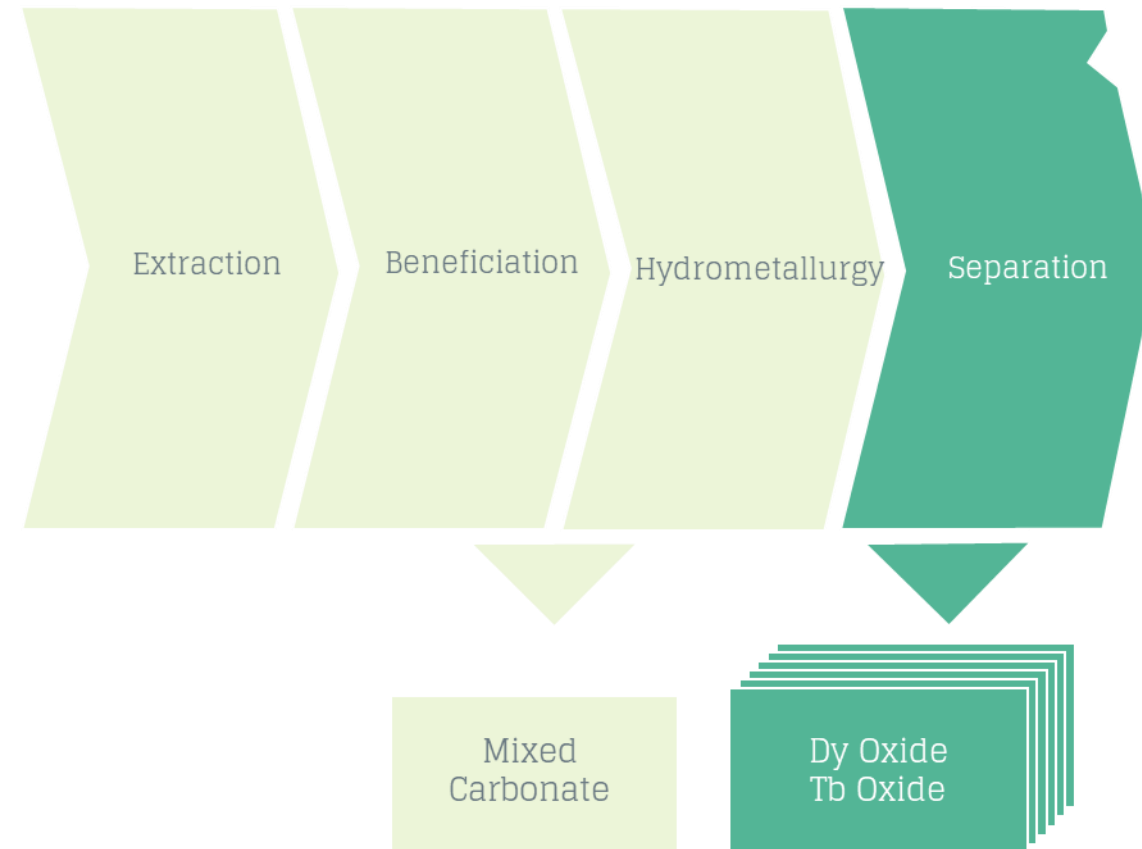


Browns Range Pilot Plant flowsheet



Downstream addition – product separation

- ◆ To date, Browns Range has produced a mixed rare earth carbonate (REC)
- ◆ The next stage is to separate the REC into individual rare earth oxide (REO) products
- ◆ In 2019, NTU commenced a scoping study into separation technology on intermediate mixed rare earths materials with United States based K-Technologies, Inc. (K-Tech)
- ◆ K-Tech's technology is focused on continuous ion exchange (CIX), continuous ion-chromatography (CIC) and related advanced separation methodologies
- ◆ Multiple studies progressing into traditional solvent extraction separation
- ◆ Separation will unlock an alternative supply chain for REO's and increase the value of the product as well as the number of potential end-customers for NTU

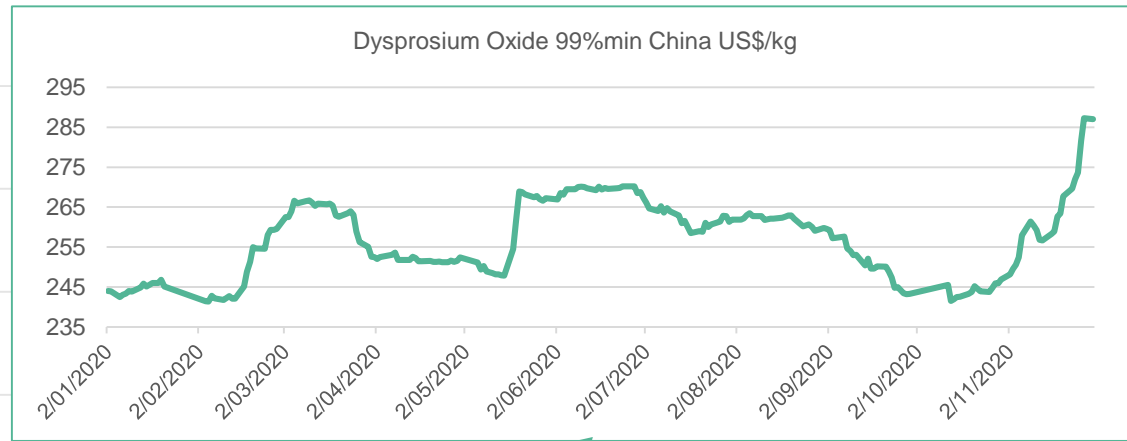


China currently controls HREE supply and pricing

Dysprosium Oxide 99%min China US\$/kg



- ◆ In 2010/11, China restricted rare earth exports as part of a dispute with Japan in the South China Sea. The Dy price spiked at nearly US\$2,000/kg
- ◆ In 2020, Dy price up over 17% from start of year
- ◆ Terbium currently \$936/kg which is the highest price since 2012. Up 78% from start of 2020 year.



Source: Asian Metal



Australian Government prioritising financial support

- ◆ The 2020/21 Australian Federal Budget announced a \$1.5 billion strategy to support Australian industry
- ◆ The Modern Manufacturing Initiative (MMI) prioritises critical minerals processing and resources technology
- ◆ The Manufacturing Integration Stream (MIS) of funding could advance integration of local rare earth producers into domestic and international supply chains
- ◆ MIS will fund up to 50% of an eligible project's cost, with the first round to begin in the first half of 2021
- ◆ This timing is compatible with NTU's ambition to develop further downstream processing of rare earths
- ◆ The Federal Government has also renewed its support for funding R&D tax offsets, which has underpinned NTU's significant capital investment on HREE manufacturing to date



Why invest in Northern Minerals?

- ◆ The only significant producer of HREE outside of China over the last 2 years
- ◆ The Company's IP on production of REC
- ◆ Studies commenced on commercial viability of producing separated HREE oxides in Australia
- ◆ \$5 million committed to exploration and building Resource inventory
- ◆ Feasibility for a full-scale, commercial mining and processing operation to commence in 2021
- ◆ Strong balance sheet
- ◆ Browns Range is in a stable, tier one mining and mineral processing jurisdiction in Western Australia
- ◆ United States and Australian governments are acting on Chinese supply chain threat for HREE's



Contact details

Mark Tory

Chief Executive Officer

mtory@northernminerals.com.au

www.northernminerals.com.au



Appendices





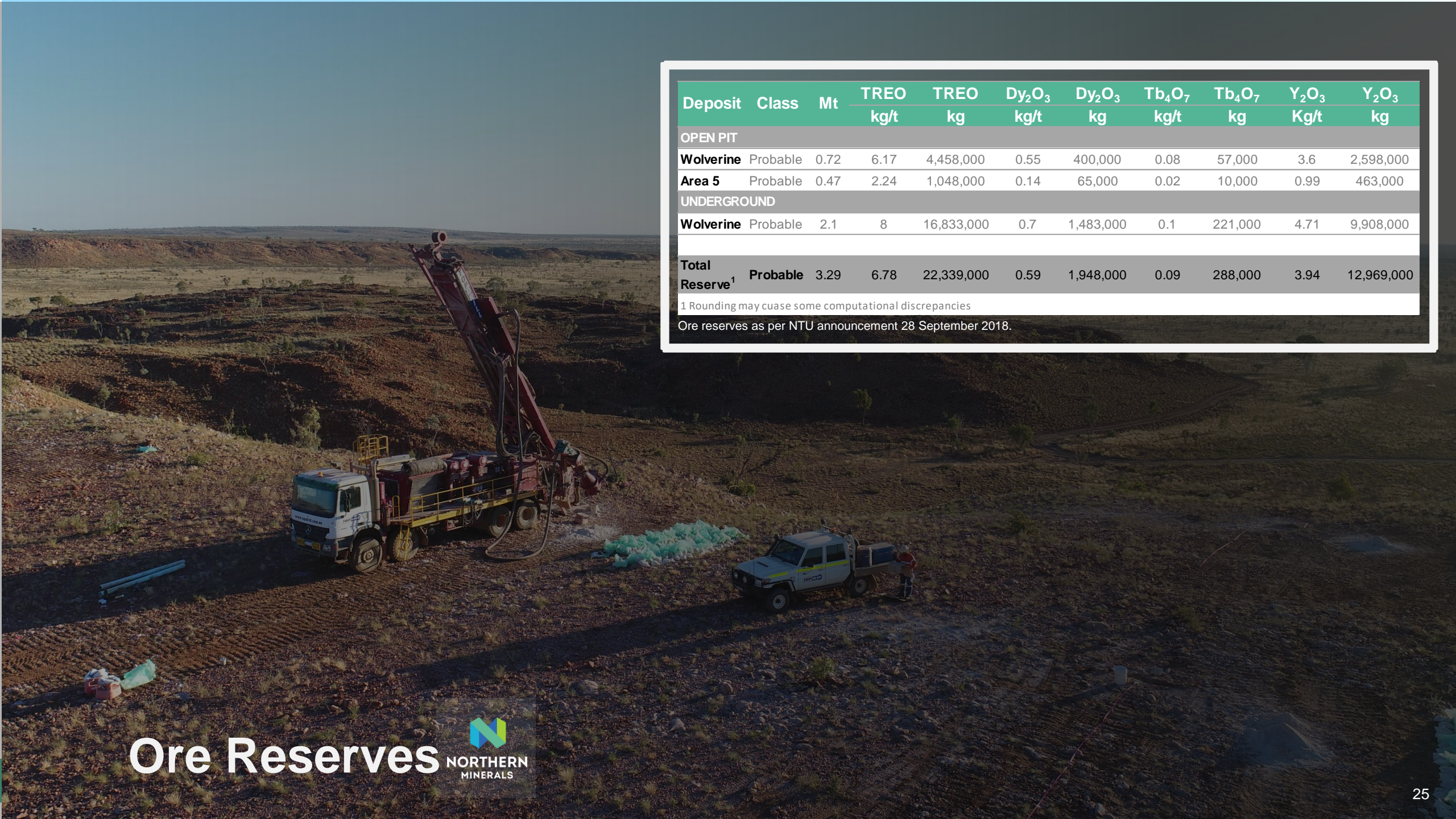
Deposit	Classification	Mt	TREO %	Dy ₂ O ₃ kg/t	Y ₂ O ₃ kg/t	Tb ₄ O ₇ kg/t	HREO %	TREO kg
Wolverine	Indicated	2.88	0.84	0.74	4.89	0.11	89	24,195,000
	Inferred	1.97	0.89	0.76	5.15	0.11	88	17,588,000
	Total ¹	4.85	0.86	0.75	4.99	0.11	89	41,786,000
Gambit West	Indicated	0.12	1.8	1.62	10.98	0.22	94	2,107,000
	Inferred	0.13	0.51	0.4	2.67	0.05	81	674,000
	Total ¹	0.25	1.11	0.97	6.56	0.13	91	2,781,000
Pilot Plant Stockpiles	Indicated	0.2	0.99	0.86	5.73	0.12	89	1,934,000
	Inferred	0.03	0.26	0.2	1.35	0.03	79	89,000
	Total	0.23	0.88	0.76	5.08	0.11	89	2,022,000
Gambit	Indicated							
	Inferred	0.21	0.89	0.83	5.62	0.11	96	1,878,000
	Total ¹	0.21	0.89	0.83	5.62	0.11	96	1,878,000
Area 5	Indicated	1.38	0.29	0.18	1.27	0.03	69	3,953,000
	Inferred	0.14	0.27	0.17	1.17	0.03	70	394,000
	Total ¹	1.52	0.29	0.18	1.26	0.03	69	4,347,000
Cyclops	Indicated							
	Inferred	0.33	0.27	0.18	1.24	0.03	70	891,000
	Total ¹	0.33	0.27	0.18	1.24	0.03	70	891,000
Banshee	Indicated							
	Inferred	1.66	0.21	0.16	1.17	0.02	87	3,484,000
	Total ¹	1.66	0.21	0.16	1.17	0.02	87	3,484,000
Dazzler	Indicated							
	Inferred	0.21	2.33	2.17	13.93	0.29	95	5,000,000
	Total ²	0.21	2.33	2.17	13.93	0.29	95	5,000,000
Total ¹	Indicated	4.58	0.71	0.60	4.00	0.09	86	32,189,000
	Inferred	4.68	0.64	0.54	3.67	0.08	87	29,998,000
	Total ^{1,2}	9.264	0.67	0.57	3.83	0.08	87	62,189,000



Mineral Resources

¹ – Rounding may cause some computational discrepancies (TREO (metal) tonnes estimated from Mt x TREO%). Mineral Resources as per NTU 2019 Annual Report Statement of Ore Reserve and Mineral Resources dated 11 October 2019

² - Dazzler Mineral Resource as per ASX announcement dated 7th May 2020 entitled "NTU – Over 50% increase in Dazzler high-grade mineral resource".



Deposit	Class	Mt	TREO kg/t	TREO kg	Dy ₂ O ₃ kg/t	Dy ₂ O ₃ kg	Tb ₄ O ₇ kg/t	Tb ₄ O ₇ kg	Y ₂ O ₃ Kg/t	Y ₂ O ₃ kg
OPEN PIT										
Wolverine	Probable	0.72	6.17	4,458,000	0.55	400,000	0.08	57,000	3.6	2,598,000
Area 5	Probable	0.47	2.24	1,048,000	0.14	65,000	0.02	10,000	0.99	463,000
UNDERGROUND										
Wolverine	Probable	2.1	8	16,833,000	0.7	1,483,000	0.1	221,000	4.71	9,908,000
Total Reserve¹	Probable	3.29	6.78	22,339,000	0.59	1,948,000	0.09	288,000	3.94	12,969,000

¹ Rounding may cause some computational discrepancies
 Ore reserves as per NTU announcement 28 September 2018.