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**northern**minerals

# Exploring High Value Heavy Rare Earths

**Investor Presentation August 2011**

**George Bauk Managing Director**

**ASX: NTU**

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Information that relates to exploration results has been compiled by the Company and is based on information provided by Robin Wilson, a employee of Northern Minerals who is a member of the Australasian Institute of Mining and Metallurgy. All information of this type is expressed in terms of the 2004 edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Robin Wilson has sufficient experience which is 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 2004 edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”.

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# Company overview



High value, **Heavy Rare Earth Elements**

**Quality metallurgy** – >40% concentrate

Xenotime mineralisation - **simple, low cost processing**

Drilling underway – confirms HREE:

- Browns Range initial results: **12m @ 1.73% TREO including 5m @ 3.49% TREO (5m @ 0.32% Dy)**
- Exciting yttrium indications at Gambit prospect
- John Galt historical results: **9.80m @ 1.58% TREO**

**Quality people** and partners

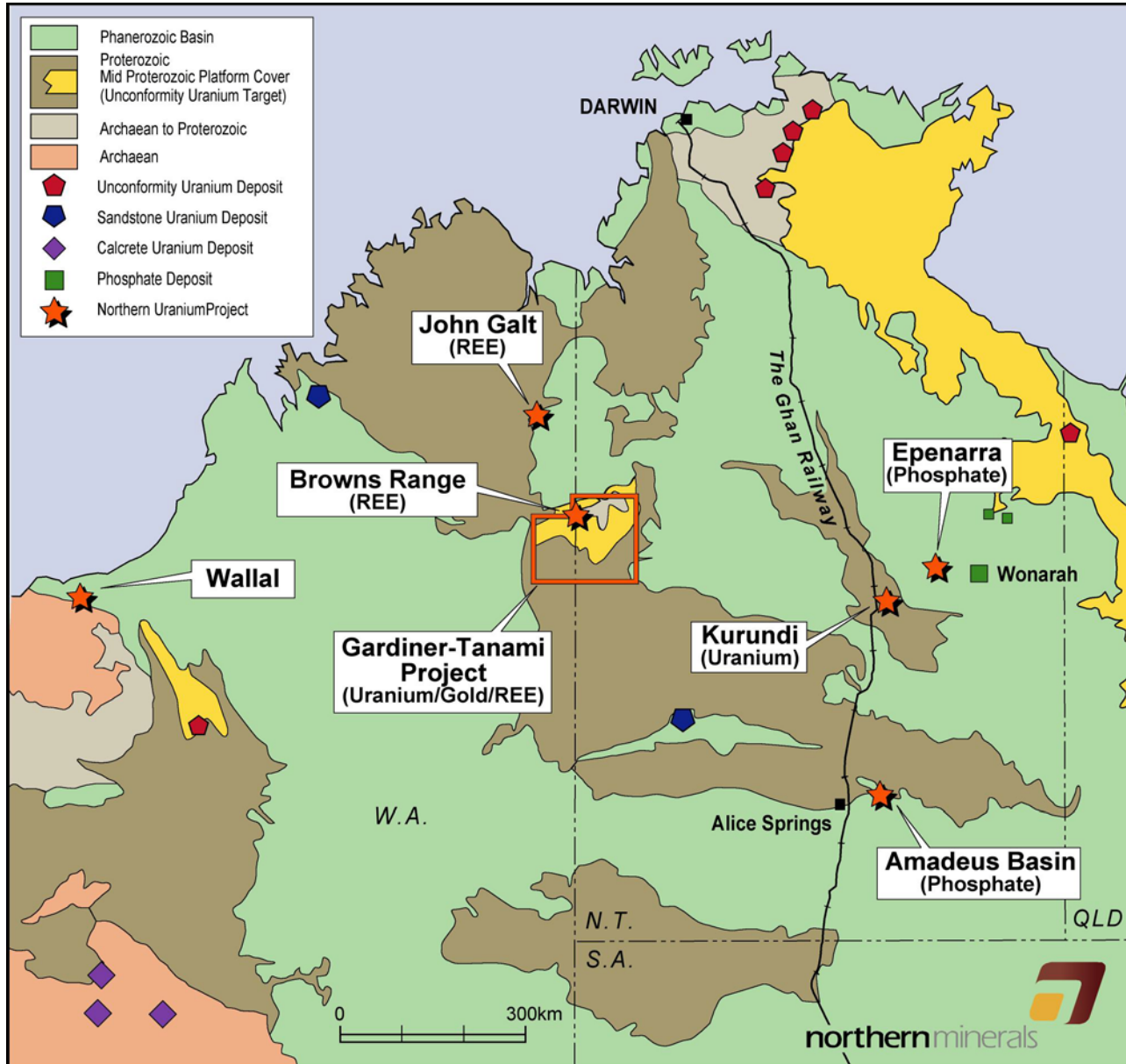
**Uranium and Gold** potential



# Focused on our HREE projects



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# Capital Structure



## ASX Codes

NTU	Ordinary Shares	174.8m*
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## Listed Options

NTUOA	\$0.20 expires 30 Sept 2012	8.7m
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NTUOB	\$0.15 expires 31 Mar 2012	12.4m
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## Unlisted Options

Various prices and expiry dates	8.3m
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## Trading Summary

Market Capitalisation (in AUD) (as at 29 July 2011 @ \$0.775)	\$135m
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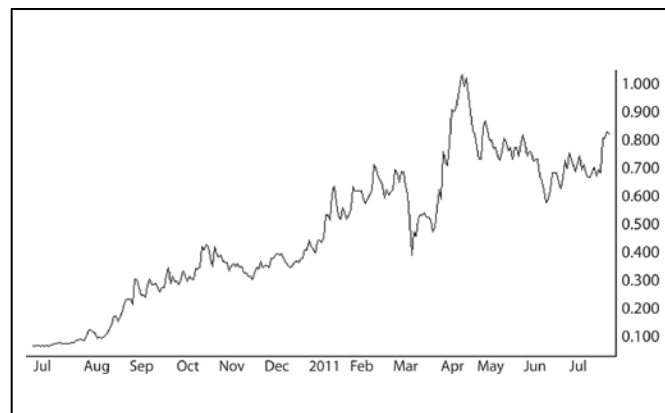
52 week trading range (in AUD)	\$0.08-\$1.07
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Daily Traded Volume (average over 3 months)	0.7m
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## Balance Sheet

Cash (30 June 2011 in AUD )	\$7.7m
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## NTU 12 Month Share Price



## Major Shareholders

Conglin Yue	18.9%
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Lynas Corporation	7.6%
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Geiger Counter	7.1%
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Board & Management	6.1%
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\*includes 3.45m restricted shares issued under the share plan

# Board & Management



**Kevin Schultz**  
***Non Executive Chairman***

- Formerly Managing Director – Polaris Metals
- Global industry experience, multi commodity
- Geologist and mining engineer



**Adrian Griffin**  
***Non Executive Director***

- Specialising in mine management and production
- Managing Director Midwinter Resources
- Chairman Potash West



**George Bauk**  
***Managing Director***

- 20 years mining operation and corporate experience
- Former MD Indago Resources, CFO Arafura, WMC



**Dudley Kingsnorth**  
***Non Executive Director***

- 20+ years experience in the Rare Earth Industry
- MD of IMCOA, Past editor of Roskill REE Report
- Chairman of Amex Resources
- Metallurgist



**Colin McCavana**  
***Non Executive Director***

- Former Managing Director Haddington Resources
- Mine production and operations management experience
- Chairman Reward Minerals



**Robin Wilson**  
***Exploration Manager***

- Geologist with 20 years exploration experience
- CRA, Woodside, Tanganyika Gold, Troy Resources

# REE - new technology, new energy



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# REE - uses



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## **Electronics - *Faster, lighter, smaller and more efficient***



## **Clean energy - *increasing efficiency, reducing emissions***





# Dysprosium and Yttrium critical



## Dysprosium

- Prized for heat and magnetic properties
- Plays a crucial role in clean energy, eg wind turbines and electric vehicles
- No known substitute
- Assessed as “critical” by US Energy Dept.

## Yttrium

- Used in phosphors for energy efficient lighting, televisions, and LEDs
- Phosphors accounted for 32% of value of HREE used in 2008
- No effective substitute
- Assessed as “critical” by US Energy Dept.

“The wide range of uses makes **Dysprosium** the **single most critical** element for **green energy technologies.**”

*New Scientist Magazine, June 2011*

# HREE – serious supply shortfalls



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China produces 95% of world's REE and 99.8% of all Heavy REE

Shortage of Dysprosium (HREE in shortest supply) could limit the production of rare earth magnets

HREE Supply confined to Southern China, where there are significant resource and environmental issues

**If China conserves HREEs for its own use; then ROW will meet only 10% of its needs in 2015 (IMCOA)**



# Demand for 'Heavies'



Rare Earths Group	Supply			
	2010		2015 <sup>1</sup>	
	China	ROW	China	ROW <sup>2</sup>
Lights (La, Ce, Pr and Nd)	94%	6%	67%	33%
Mediums (Sm, Eu and Gd)	97%	3%	89%	11%
Heavies (Tb, Dy, Er and Y) (Ho, Tm, Yb & Lu not included)	99.8%	0.2%	<b>96%</b>	<b>4%</b>

Notes:

1. In 2015 ROW demand will be approx 40% of global demand
2. Assumes ROW maximises Ce supply from ROW

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# Heavy Rare Earth Prices



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## Comparison of selected average HREE Prices

Rare Earth Product	Rare Earths Price US\$/kg FOB China <sup>1,2</sup>			
	2009	2010	June 2011	July 2011
Europium Oxide	\$465	\$626	\$1,200	\$5,870
Gadolinium Oxide	\$7	\$44	\$157	\$200
Dysprosium Oxide	\$105	\$295	\$700	\$2,840
Yttrium Oxide	\$14	\$57	\$155	\$179
Terbium	\$360	\$405	\$1,200	\$4,510

Notes:

1. Source is metal pages©
2. Prices have been rounded



# Browns Range Project



Northern Minerals 100% ownership and marketing rights

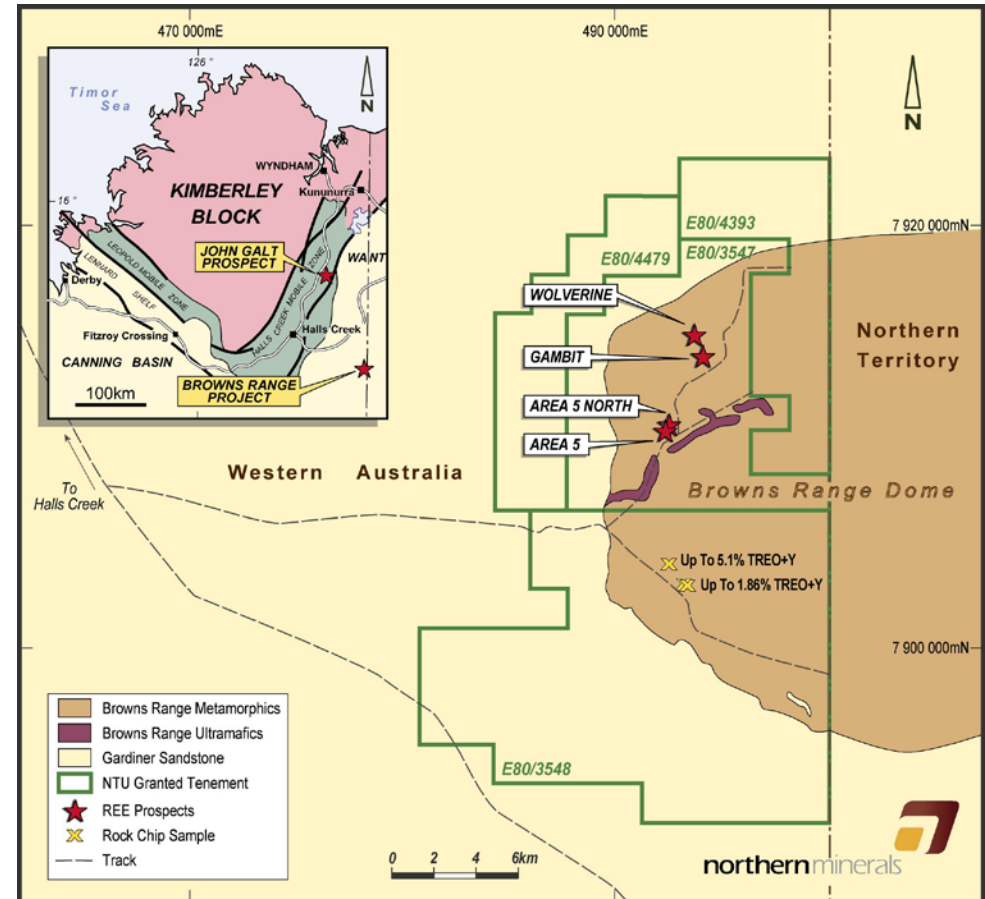
Significant HREE discoveries in the East Kimberley in 2009

Wide spaced radiometrics identified HREE mineralisation at Browns Range

Xenotime mineralisation is hosted within hydrothermal quartz veins and quartz vein breccias

Four high priority REE prospects - drilling commenced June 2011

Under-explored region



# Browns Range 2011 - Area 5 North

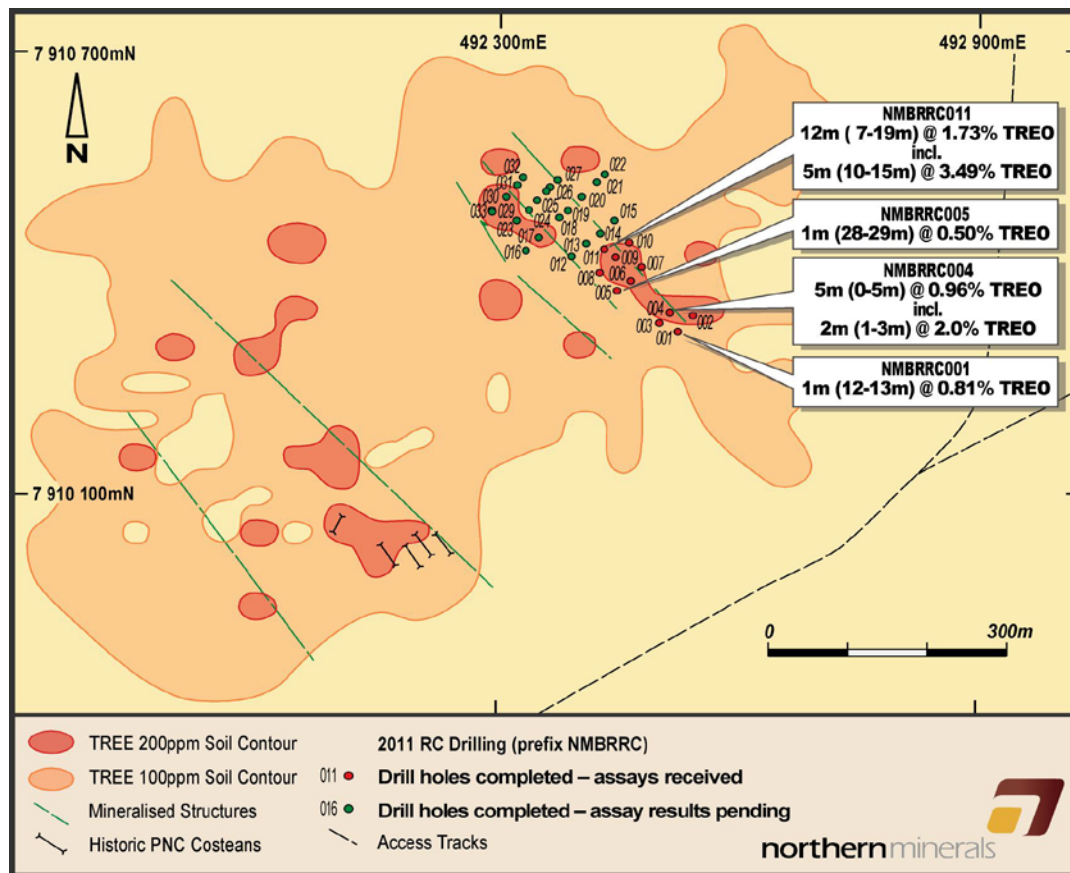


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Soil sampling highlights extensive HREE geochemical anomalies at the Wolverine, Gambit, Area 5 North and Area 5 prospects

10,000m drilling to test four priority targets - started June 2011

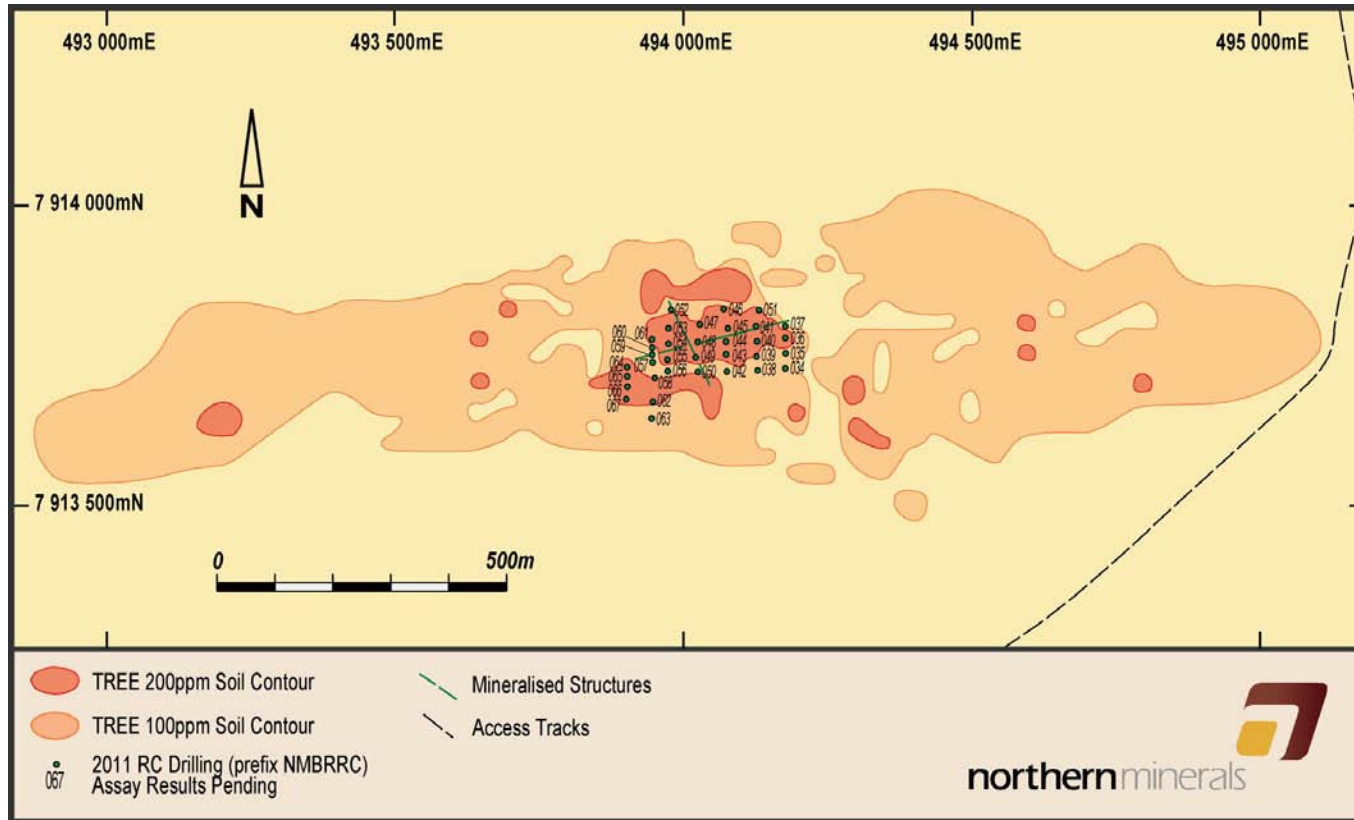
First assay results at Area 5 North include **12m @ 1.73% TREO** including **5m @ 3.49% TREO (5m @ 0.32% Dy)**



# Browns Range 2011 – Gambit



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Drilling underway – assays pending

Initial XRF analysis returned significant yttrium readings

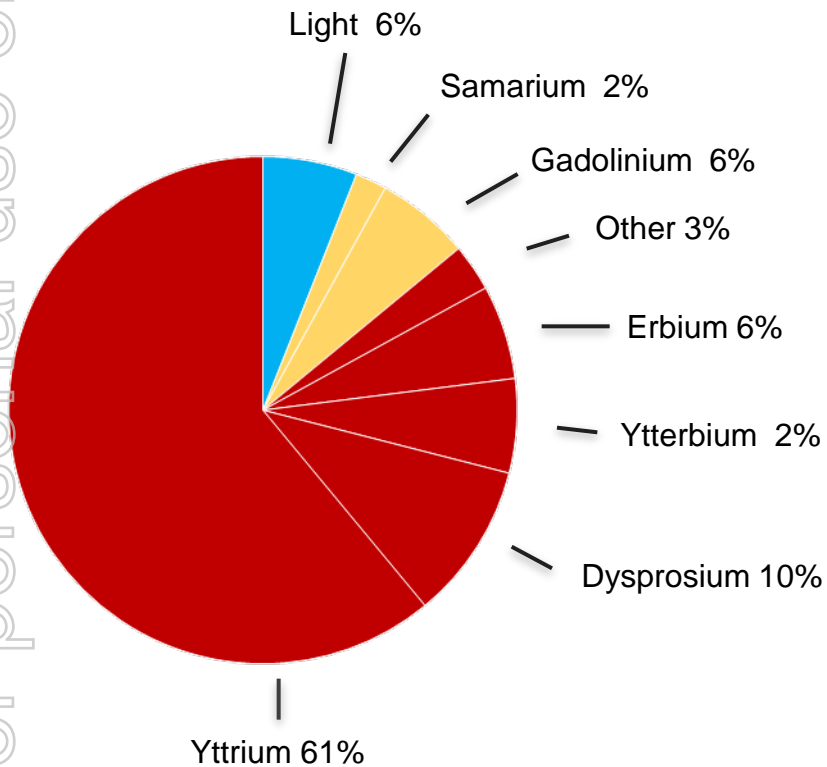
Anomalous yttrium trend over 300m strike length

# Browns Range – HREE Distribution

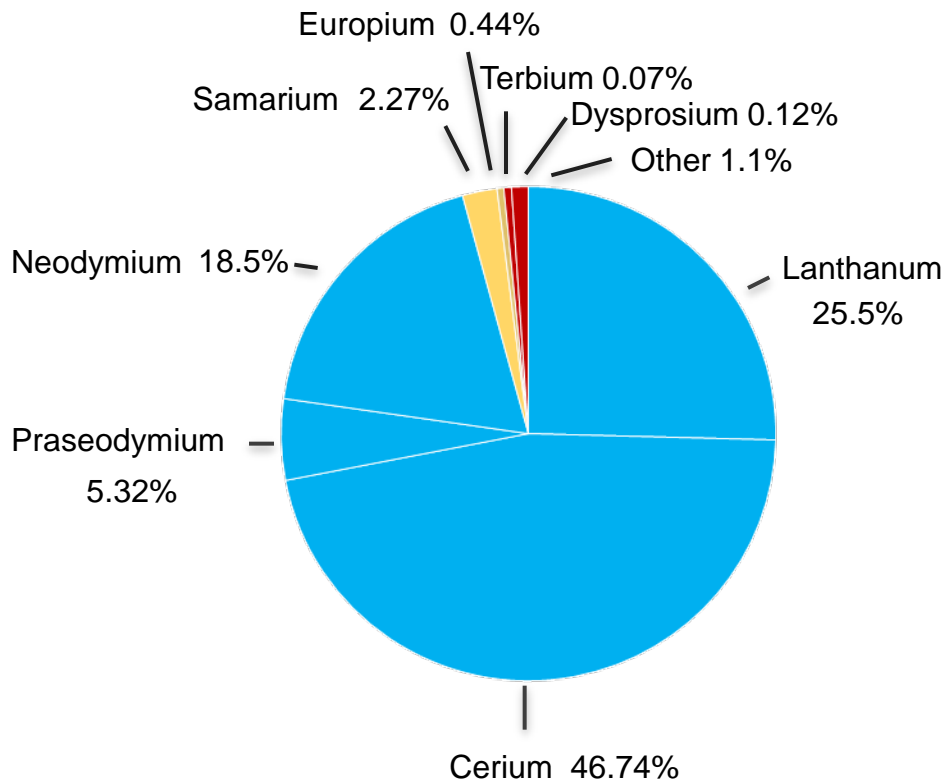


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## Browns Range\*



## Mt Weld\*\*



■ Heavy   
 ■ Medium   
 ■ Light

Low radioactivity  
 Uranium: Average  
 47ppm per 1% grade  
 Thorium: Average  
 10ppm per 1% grade

\* Based on 16 rock chip samples taken at Browns Range – Average Grade  
3.47% TREE

\*\*Mt Weld REO composition data above  
sourced from the Lynas Corporation website



# Processing Xenotime



Similar mineral to monazite but much lower radioactivity (less thorium)

Well understood; processed for >50 years (c.f. Guangdong, China)

Potential additive to standard bastnasite/monazite feed as a sweetener to yield 'heavies'

Multiple customers for a xenotime concentrate

Browns Range metallurgical results completed by NAGROM have reported a maximum Yttrium recovery of 89.5%



# Browns Range – Work Program



High resolution airborne magnetics and radiometrics survey – **completed**

RC Drilling program 10,000m at Area 5/Area 5 North and Gambit/Wolverine targets – **commenced**

On-going metallurgical studies of mineralisation from the four priority drill targets – **commenced**

Soil and rock chip sampling and mapping of regional targets to define second phase drill targets – **Q3 2011**

Follow up Diamond Drilling, including metallurgical core samples – **Q4 2011**



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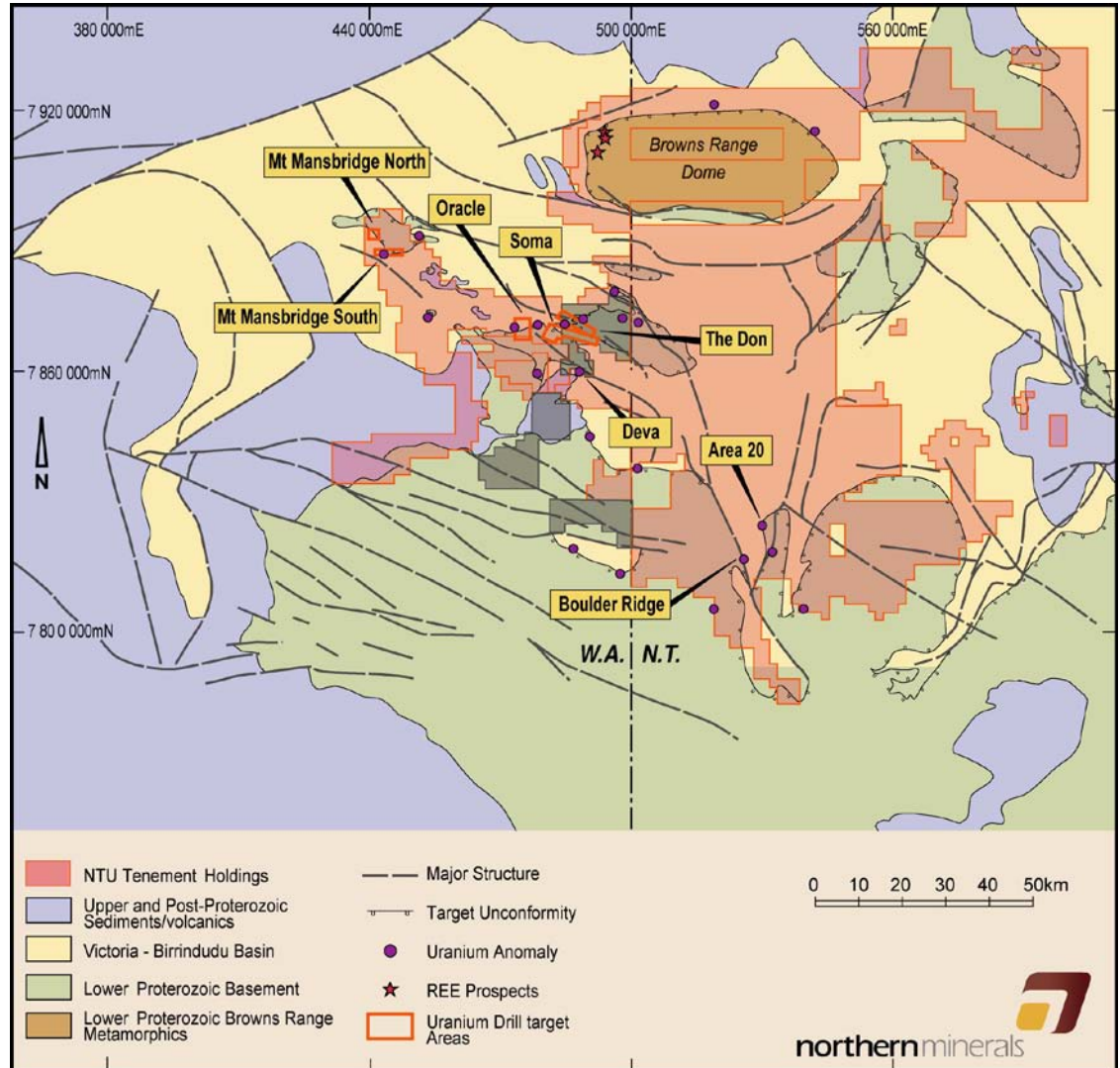
# Future HREE Exploration Potential



Historical reports of xenotime occurrences at Mt. Mansbridge and east of The Don, on-ground follow-up required

Assessment of Tanami region proximal to Birrindudu Basin for HREE potential – never systematically explored for HREE

NTU dominant landholder in a potential HREE province with over 11,000km<sup>2</sup>





# John Galt Project



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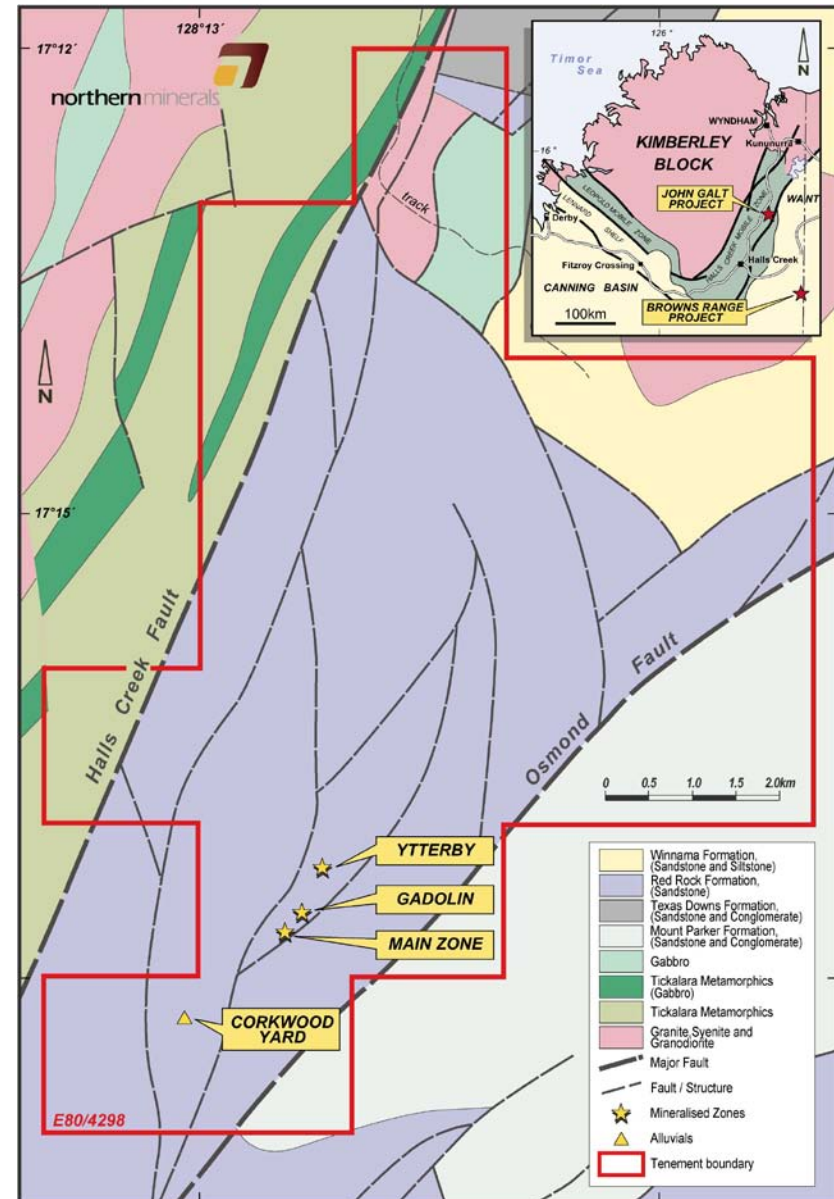
Northern Minerals has option to acquire 100% of the project

Exciting REE prospect, acquired in June 2010 – granted December 2010

Regional proximity to the Browns Range HREE Project

Similar geology – high value HREE in xenotime mineralisation

Detailed data study confirms dominance of HREE at John Galt





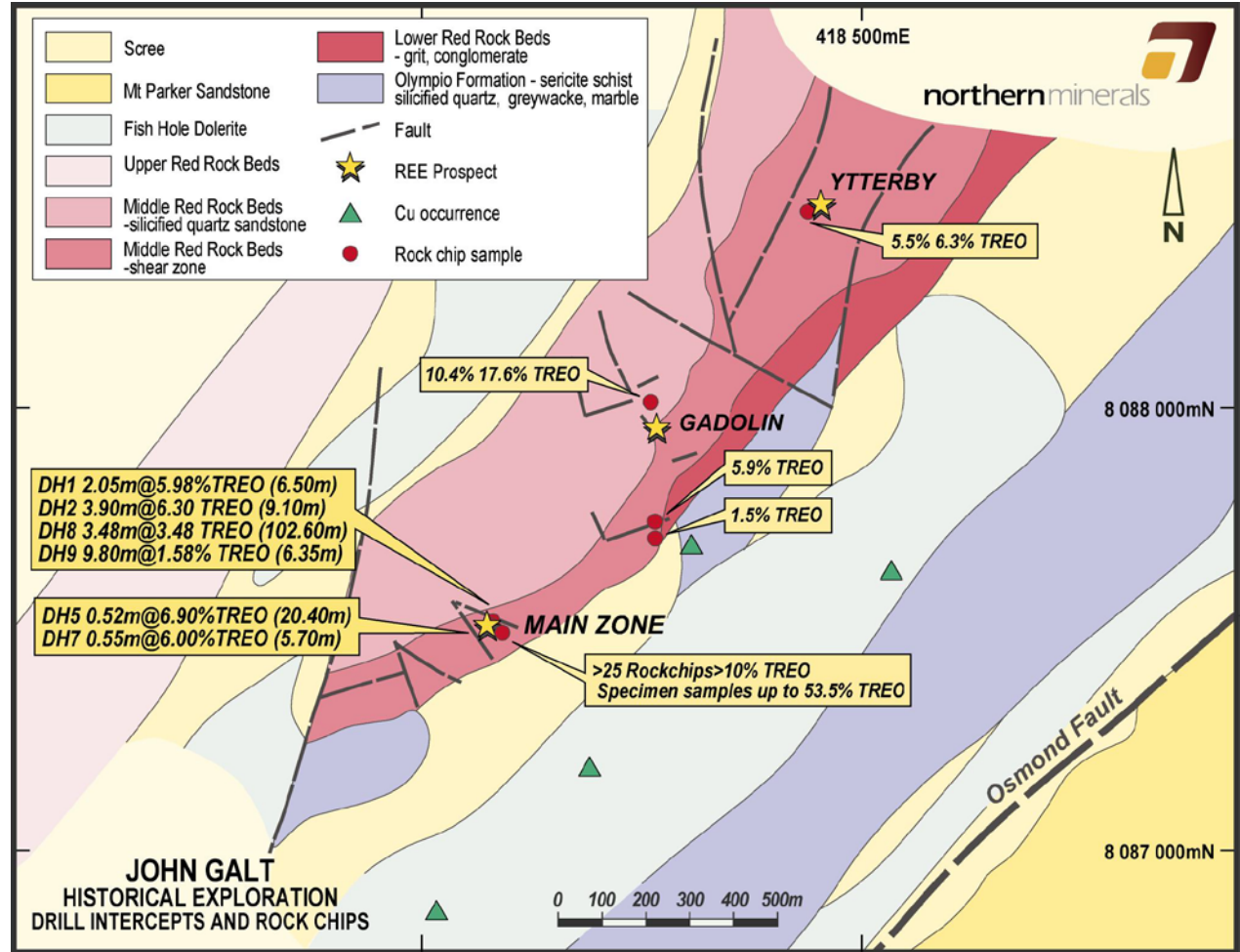
# John Galt – Historical Exploration



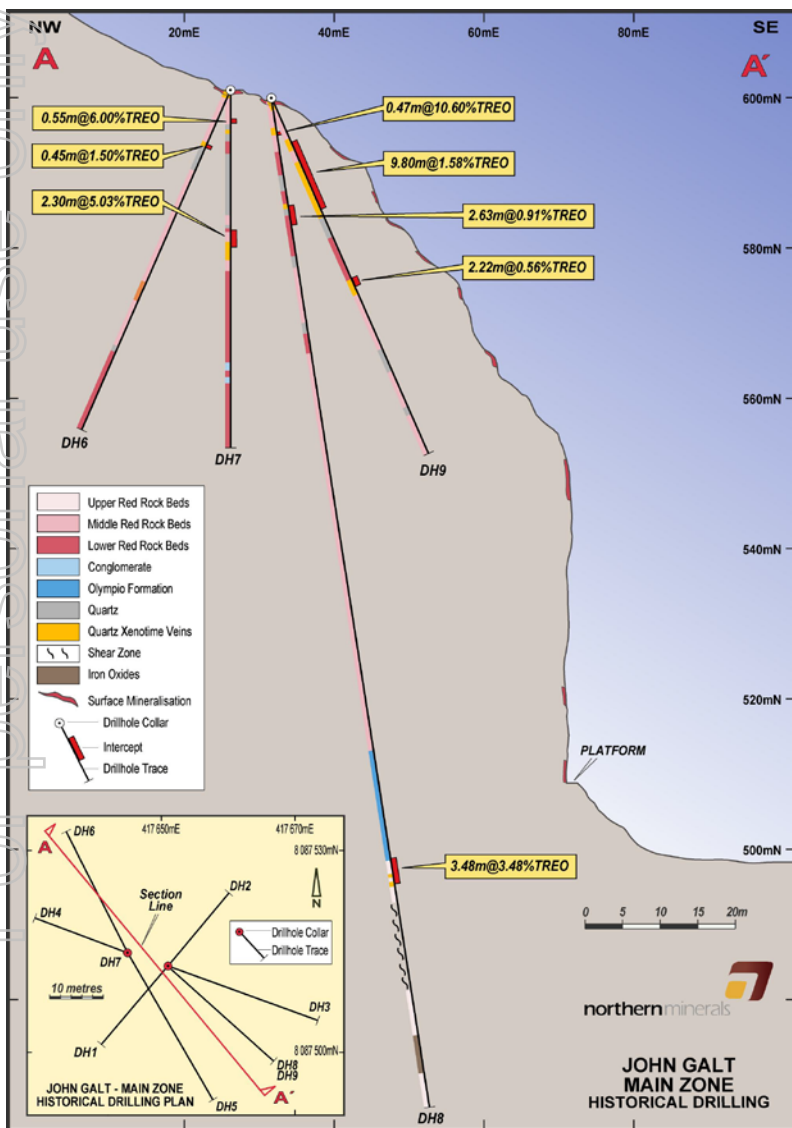
Xenotime-hosted mineralisation at three different zones

Rock chip assays up to **53.5% TREO**

At Gadolin prospect three radiometrically anomalous zones extend over 360m along a N-S trending fault, with rock chip assays up to **17.6% TREO**



# John Galt – Historical Drilling



Fan of nine diamond drill holes for 503m from two drill sites

Detailed analysis of structural controls using 3D software

Every drill hole intercepted at least one mineralised zone

Excellent correlation between downhole radiometrics and assayed samples

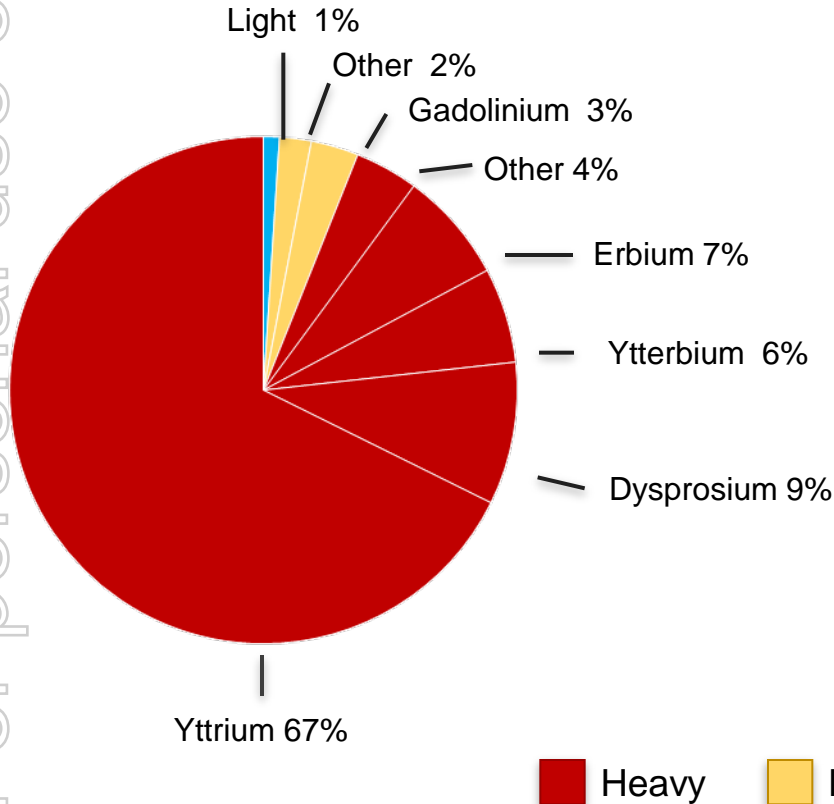
Not all downhole radiometric anomalous zones submitted for assay

# John Galt – HREE Distribution

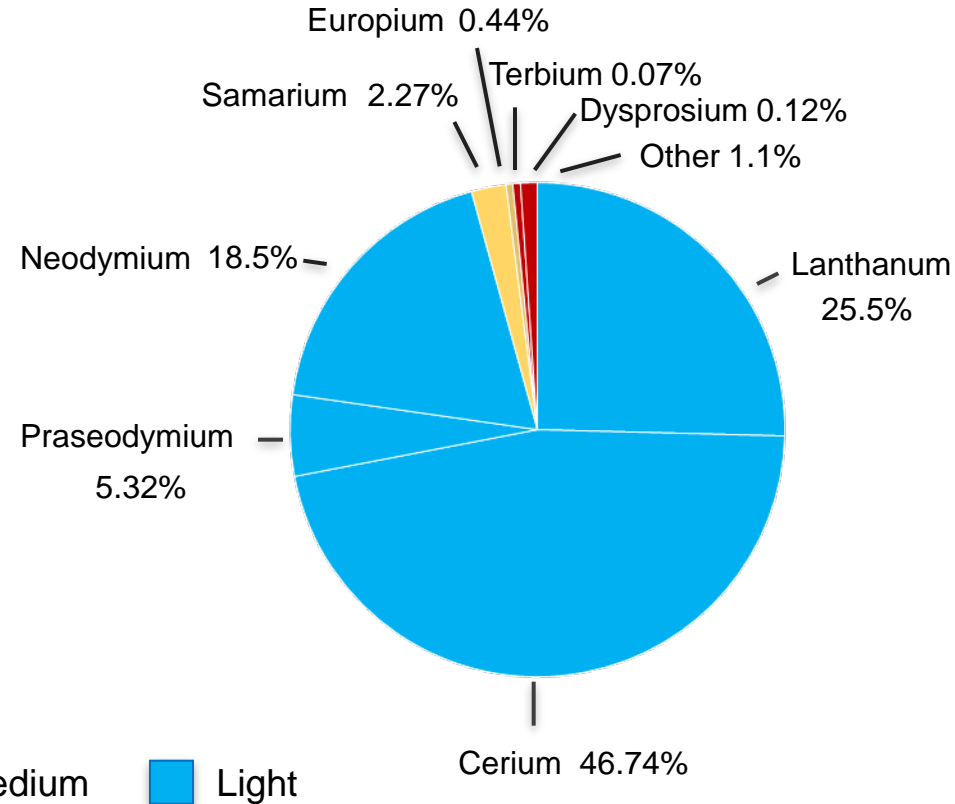


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## John Galt\*



## Mt Weld\*\*



■ Heavy   
 ■ Medium   
 ■ Light

\*\*Mt Weld REO composition data above sourced from the Lynas Corporation website

\*TREO – Total Rare Earth Oxide as calculated by the previous explorer using what was termed the “Yttrium Ratio Method”. In the original work on samples of John Galt Main Zone mineralisation it was found that after assaying for a suite of REE a consistent ratio existed between the total rare earth content and the yttrium content. By assaying the yttrium (Y) content of each sample using XRF techniques it is possible to estimate the total rare earth content, based upon that consistent ratio between Y and TREO. It should be noted that it was estimated that the accuracies range from +/- 15% for high concentrations and +/- 20% for low concentrations.

# John Galt - Work Program



High resolution airborne magnetics and radiometric survey – **completed**

Reconnaissance geological investigations – **completed**

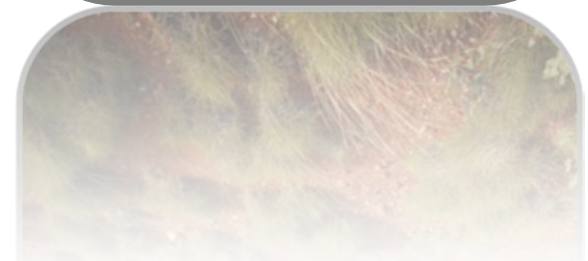
Aboriginal Heritage Survey – **Q3 2011**

Detailed structural mapping and systematic program of rock chip and soil sampling – **Q3 2011**

Ground radiometric surveys – **Q3/4 2011**

Determine and rank drill targets – **Q3/4 2011**

First phase drilling program – **Q1/2 2012** *(delayed from Q4 2010 due to impact of wet weather)*



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# Uranium and Gold projects



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# Gardiner-Tanami Project



## Gardiner-Tanami

Large project, multiple uranium targets

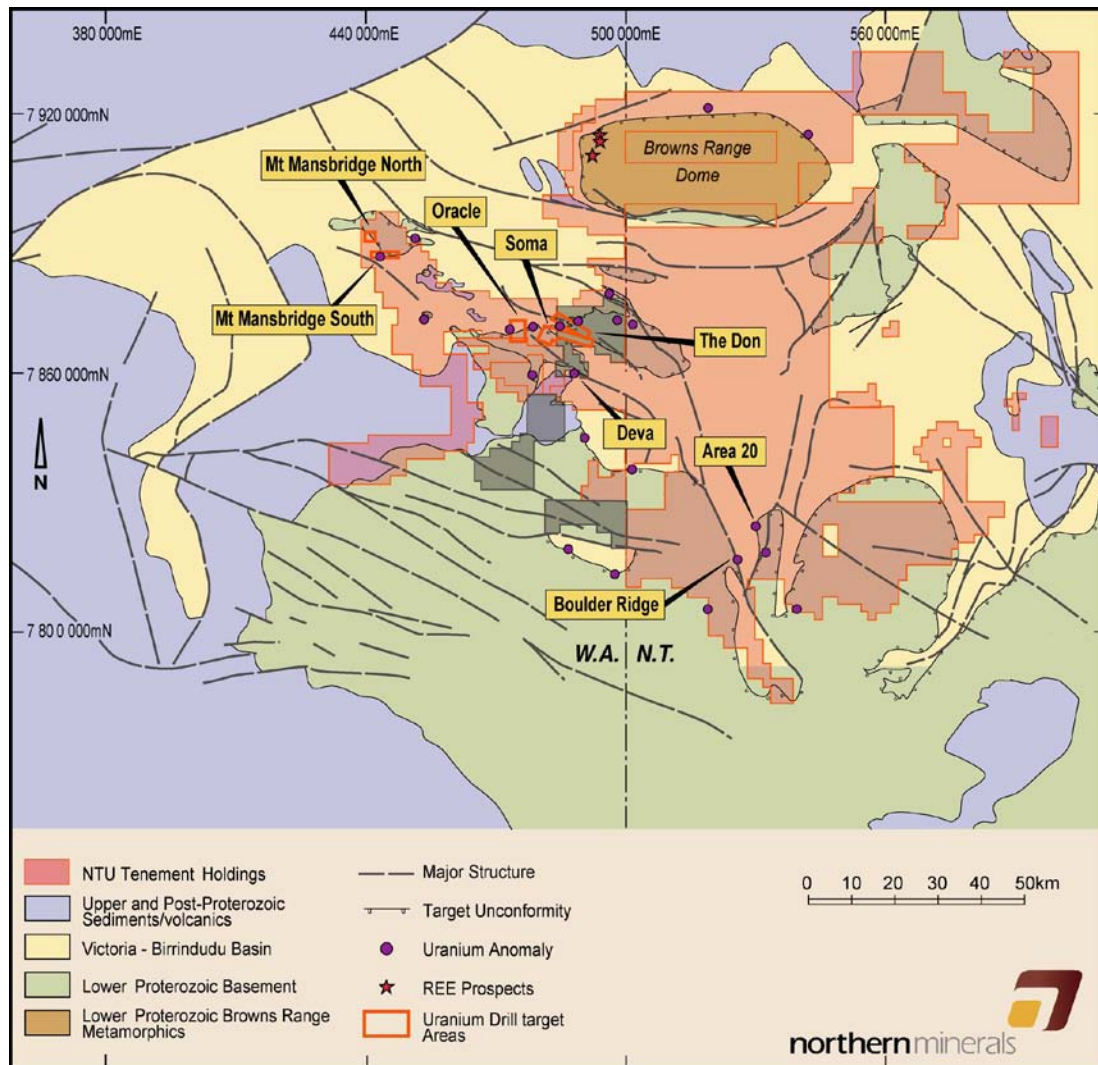
100% ownership

NTU now holds rights for all minerals

## Gardner Range JV

60% ownership

JV with Manhattan (ASX:MHC)



# Gardiner-Tanami Drilling



## Soma

Intersected Gardiner Sandstone / Killi Killi formation

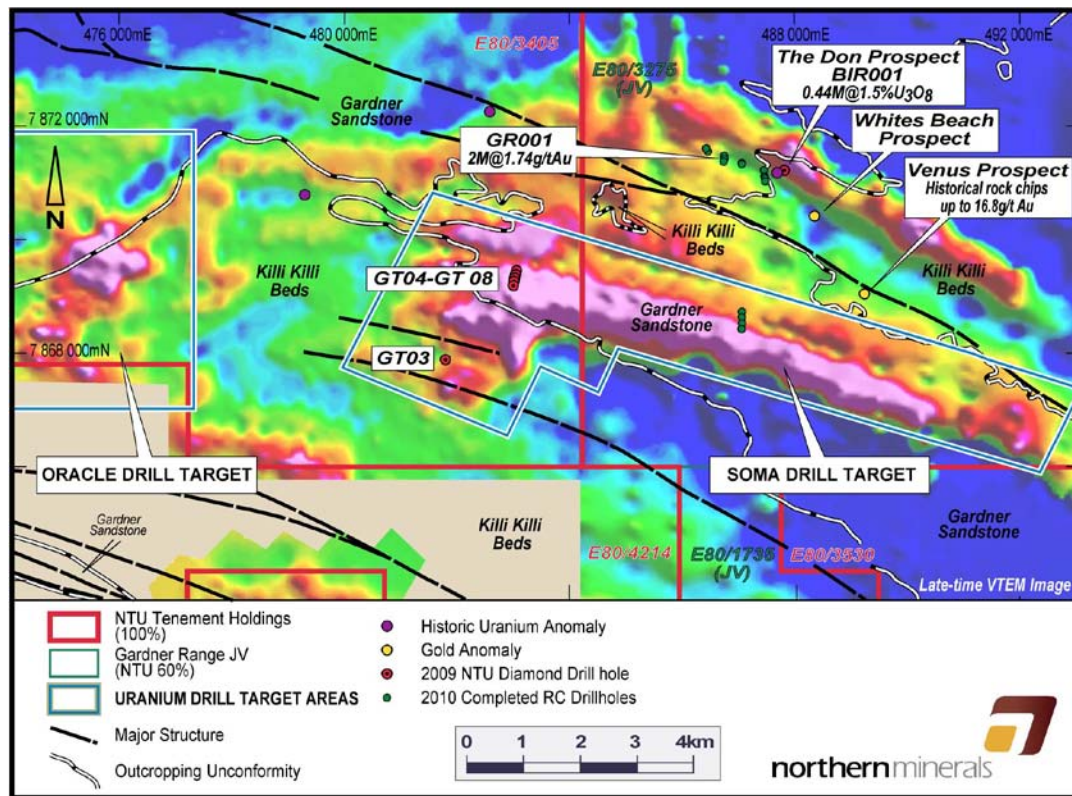
Confirms large (8km) target for high grade unconformity mineralisation

Follow-up drilling in 2011, plus drilling at Mt.Mansbridge North, Mt.Mansbridge South, Oracle and Deva targets (Total 5000m)

## The Don

Encouraging gold intersections - 2m @ 1.74ppm Au

Follow-up drilling at The Don, Whites Beach and Venus gold targets in 2011



ORACLE AND SOMA DRILL TARGETS.  
GEOLOGY AND TENEMENTS OVER VTEM IMAGE

# 2011 – The Year Ahead



## Schedule of Exploration Program

QTR 1

QTR 2

QTR 3

QTR 4

Rebranded to Northern Minerals



Browns Range geophysics



John Galt geophysics



REE drilling at Browns Range



Finalise NT tenements with T/Os



Regional Browns Range HREE exploration



Gardiner Tanami Uranium and Gold drilling



John Galt soils/rock chip sampling



Diamond drilling at Browns Range



John Galt petrology / metallurgical test work



Ongoing exploration at Browns Range and John Galt



REE exploration at Gardiner Tanami Project





# Value Proposition



## High value, Heavy Rare Earth Elements

Drilling underway - first results of 12m @ 1.73% TREO including 5m @ 3.49% TREO (0.32% Dy)

Xenotime mineralisation – amenable to processing

Metallurgy >40% concentrate grade

John Galt Historical Drilling incl. 9.8m @ 1.58% TREO

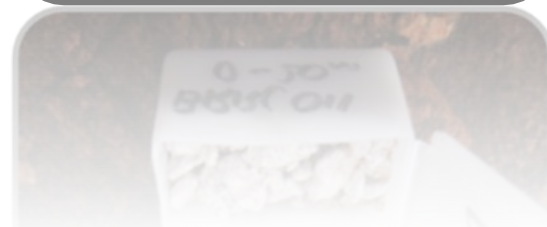
## Quality people and partners

Expanded management and geological team – specific experience with rare earths and uranium

Highly experienced Rare Earth experts, Dudley Kingsnorth and John Goulevitch

## Uranium and gold potential

Highly prospective high grade unconformity-related targets and gold targets



# For more information

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