

# RESOURCING THE TERRITORY

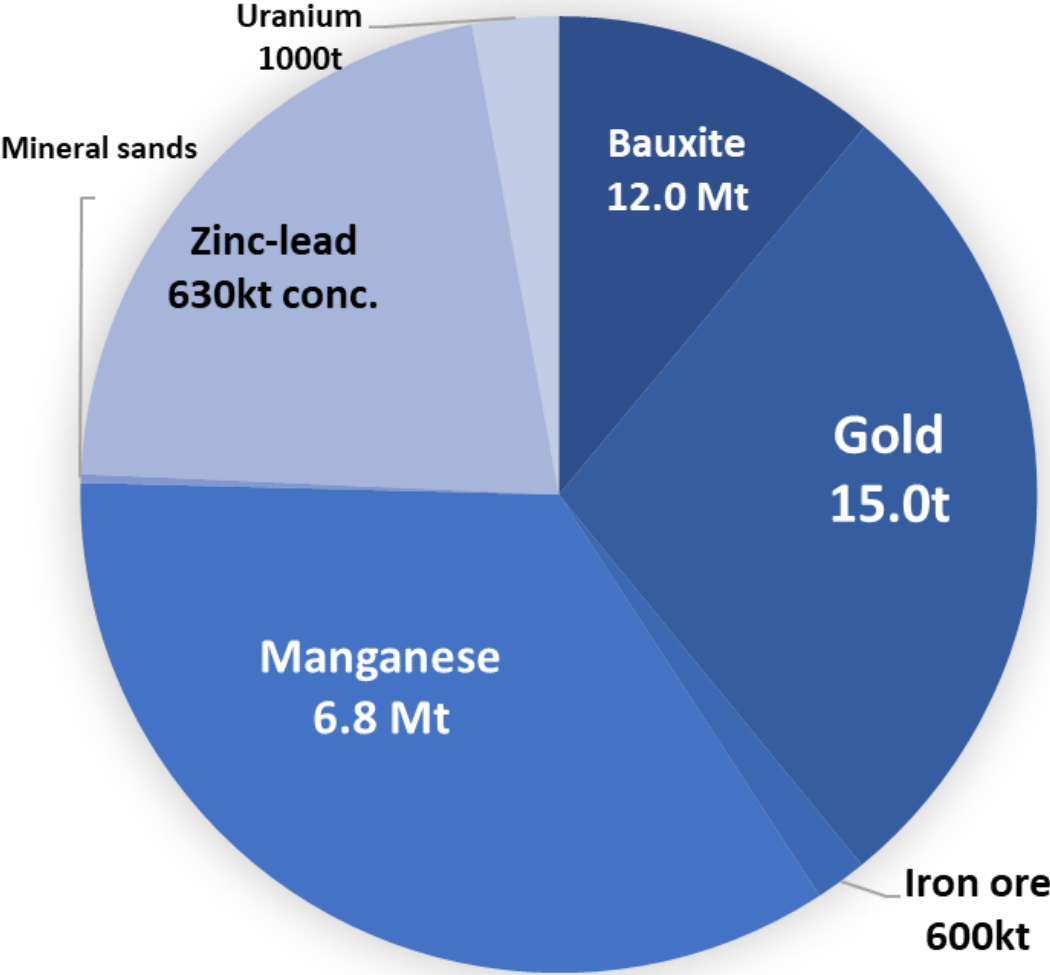
## Mineral exploration in the Territory – current state and emerging opportunities

Ian Scrimgeour  
Senior Executive Director, Northern Territory Geological Survey  
NT Dept of Industry, Tourism and Trade

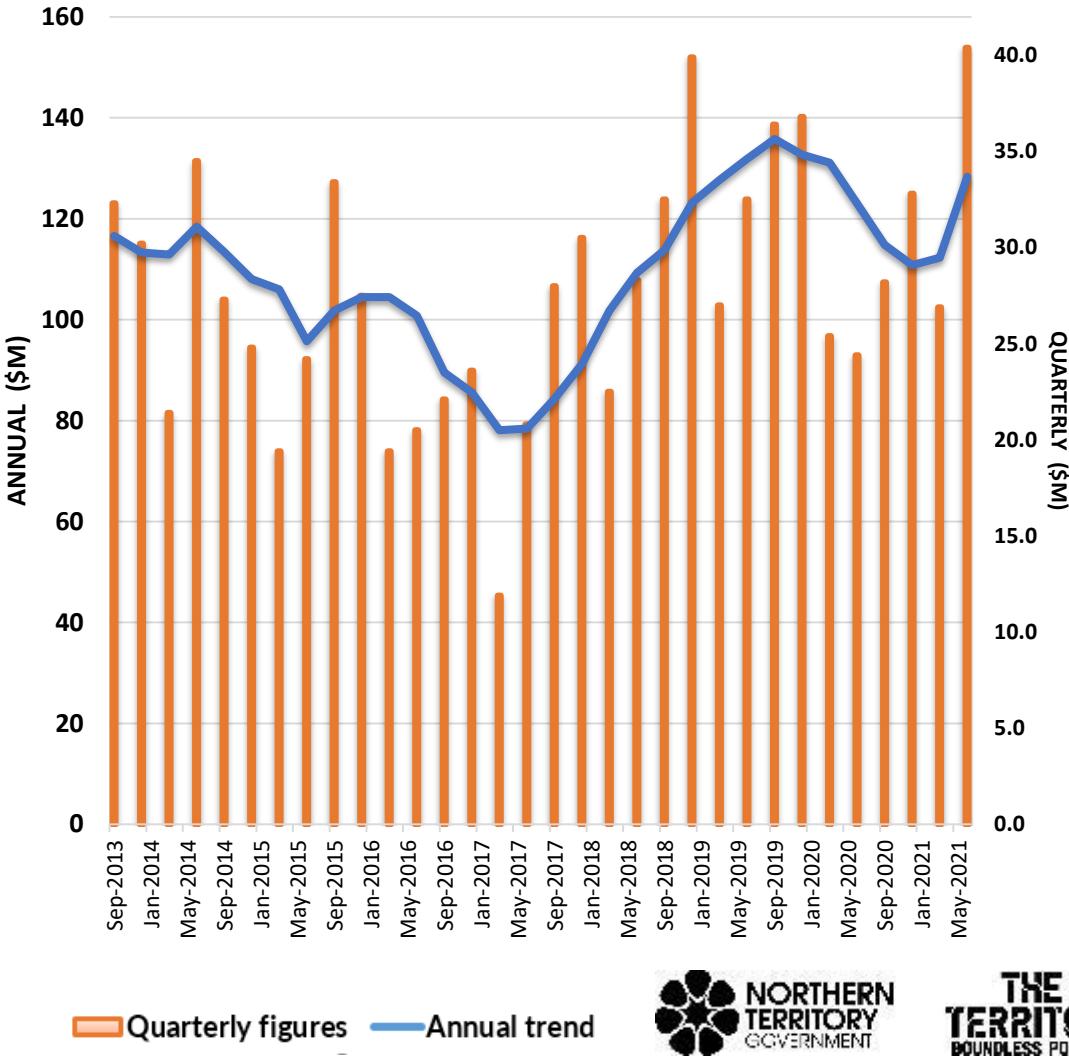


# Northern Territory's minerals sector

NT mineral production by value  
2020/21



Northern Territory mineral exploration expenditure  
2013-2021

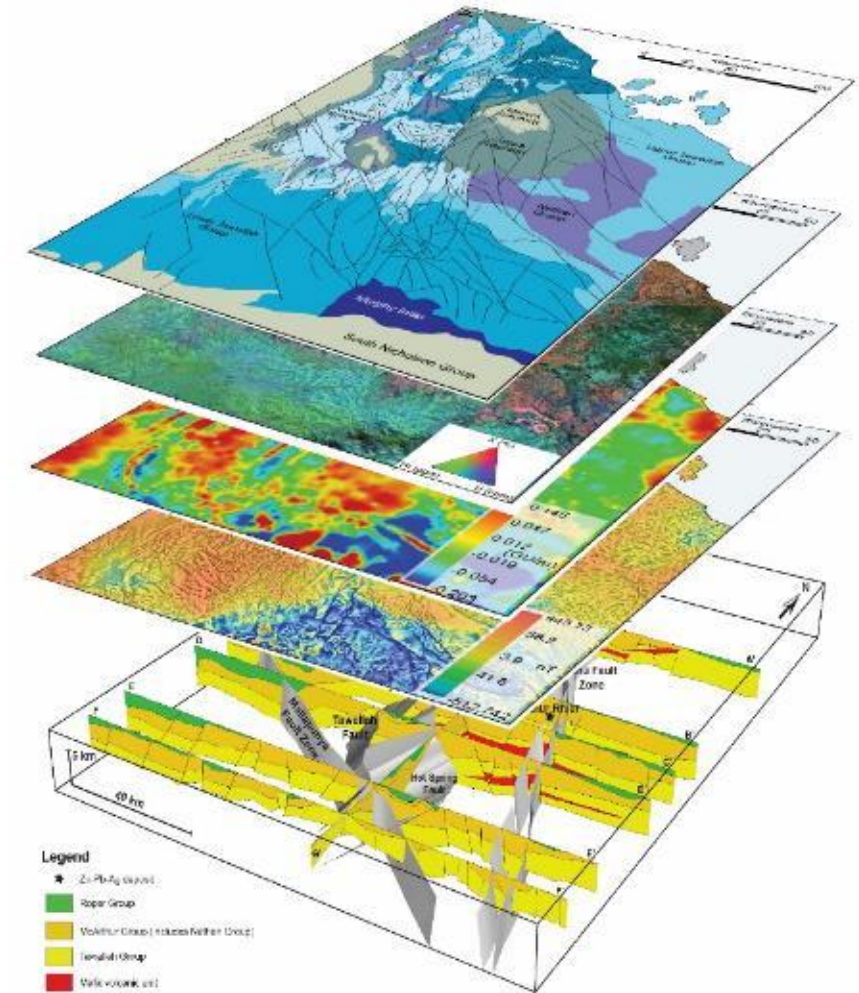


## 4 year (2018-2022), \$26 million NT Government initiative to grow the exploration sector

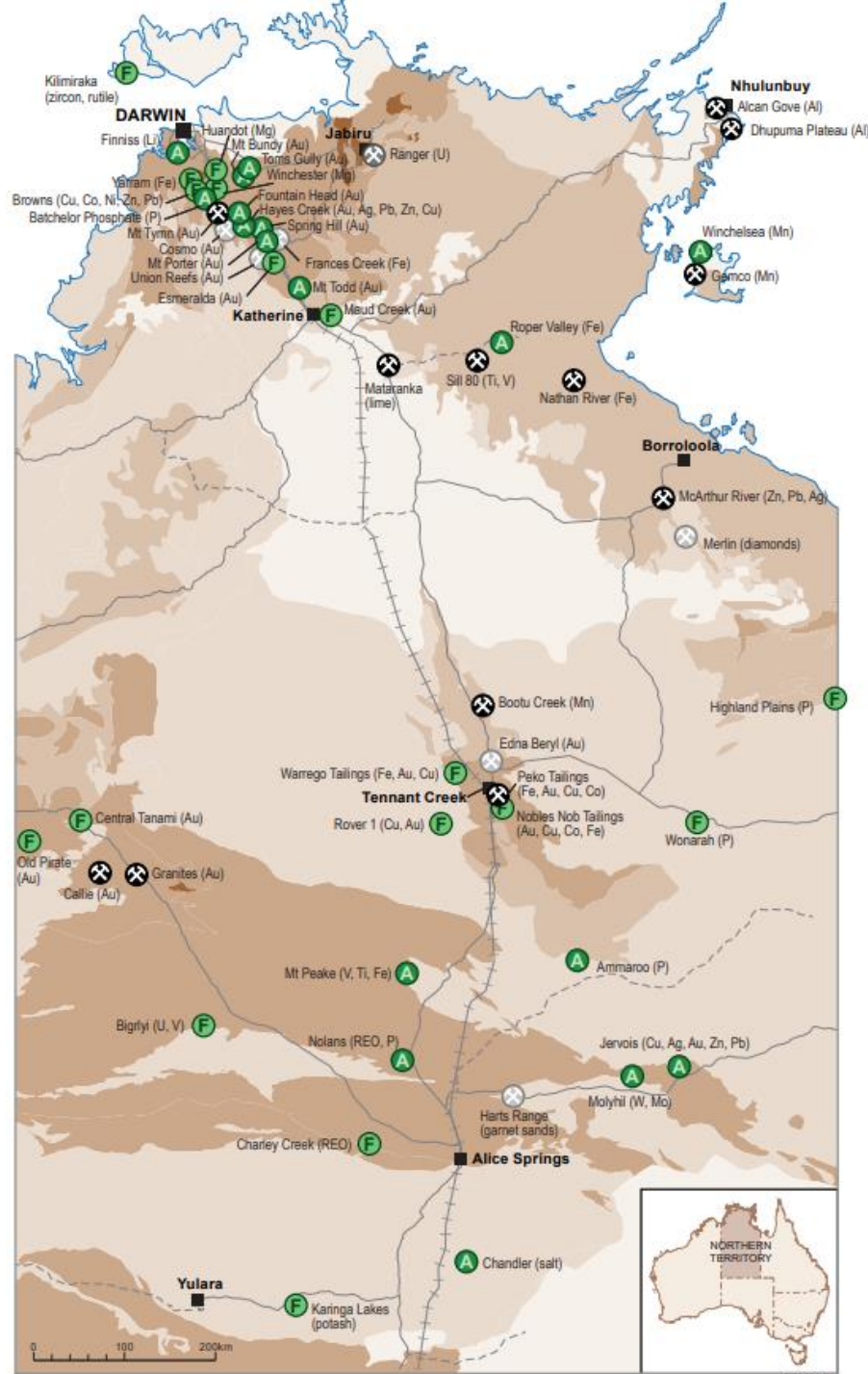
Geoscience data to de-risk and attract exploration investment, and promote the Territory's potential

- Supporting industry innovation through grants for greenfields exploration
- Upgrading the Territory's coverage of geophysical data
- Unlocking the resource potential of the Barkly and Gulf regions
- Stimulating greenfields exploration in central Australia
- Promoting the Territory's resource potential and investment opportunities; and
- Making exploration and geoscience data more accessible

**Increase in annual funding from \$6.5 to \$9.5 million per year from 1 July 2022 - ongoing**





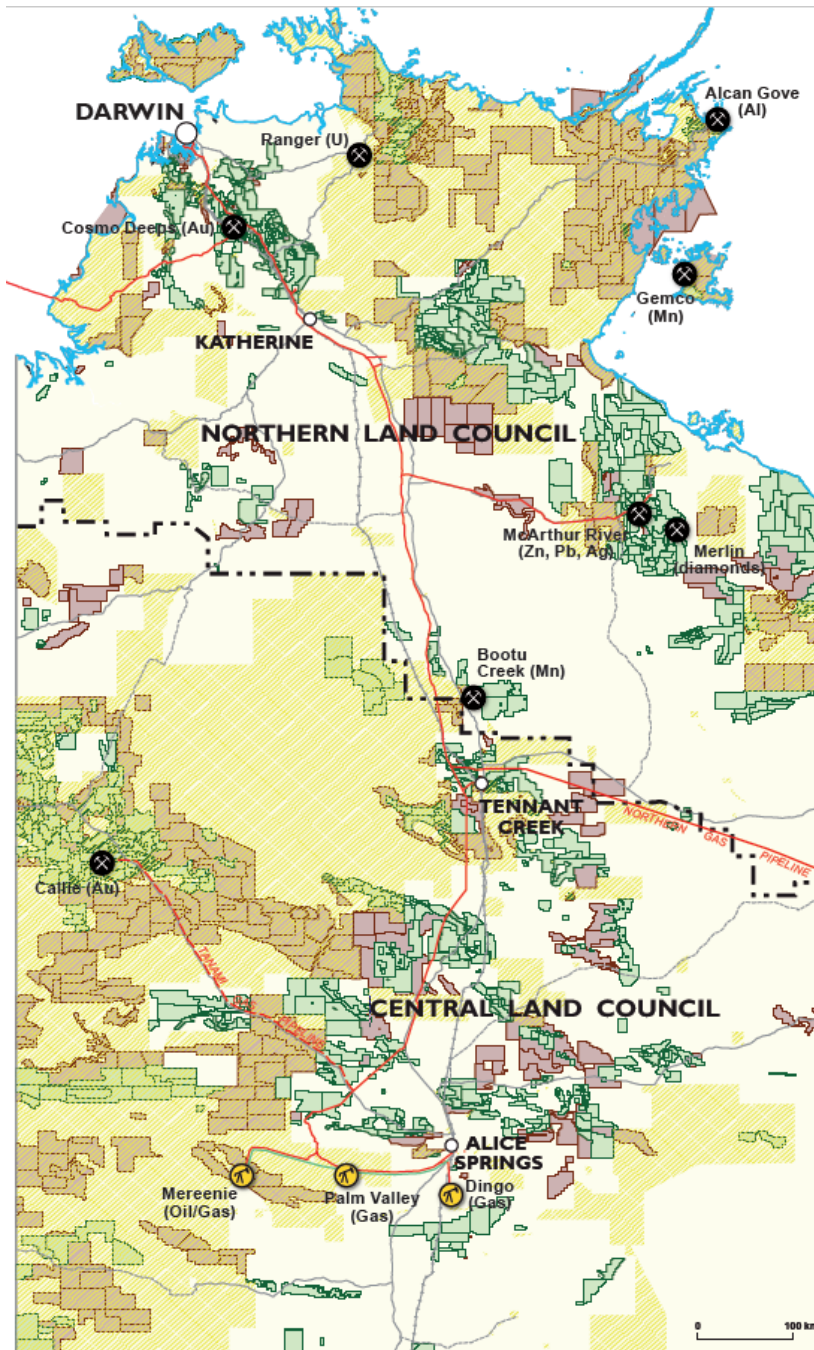


## No shortage of upside in the NT

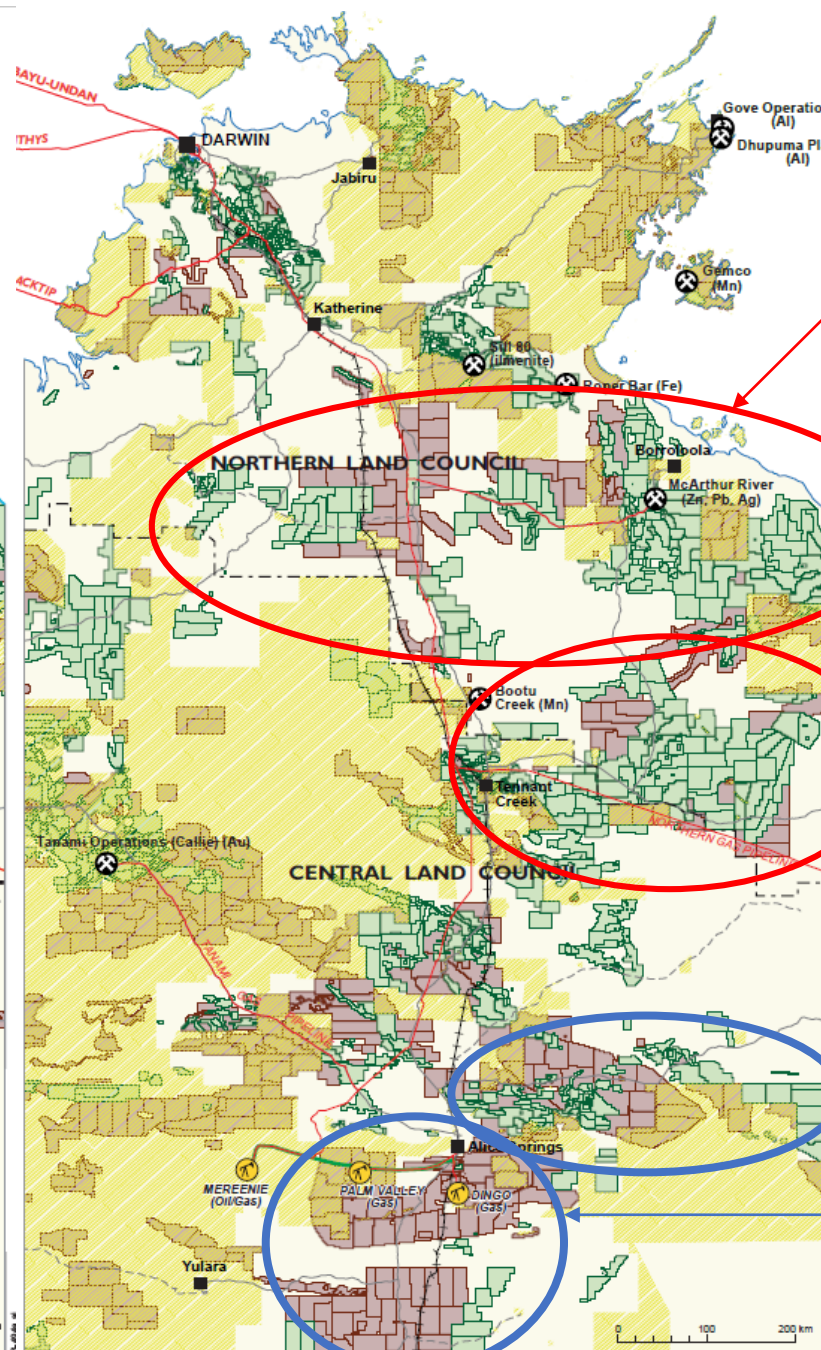
- Core Lithium's Finniss lithium mine commencing construction
- KGL Resources' Jervois copper mine nearing FID
- Large advanced rare earths and vanadium projects
- Copper exploration boom underway for both copper-gold and sediment-hosted Cu (and Zn)
- Advanced gold projects progressing in Pine Creek region; gold mill proposed for Tennant Creek
- Potential for new gold developments in the Tanami
- Exploration upturn in the Aileron and Irindina Provinces in central Australia, mainly targeting copper and/or nickel
- Iron ore mining recommenced
- Uranium is making a comeback

The Territory has awesome geology and is under-explored and under-developed compared to most other states





Oct 2018



Oct 2021

## Sediment-hosted copper/zinc

- Encounter/BHP
- Resolution/OZ Minerals
- Redbank Operations
- Teck
- DGR Global
- and many others....

## Iron-oxide copper-gold; Sediment-hosted copper/zinc

- Newcrest
- Encounter
- Teck
- Inca Minerals
- Greenvale Mining
- Strategic Energy Resources
- and many others....

## Nickel-copper; copper-gold

- IGO Ltd
- Inca Minerals
- Plutonic Ltd

## Sediment-hosted Cu?; geological storage; uranium

- FMG
- Tomorrow Minerals
- Core Uranium

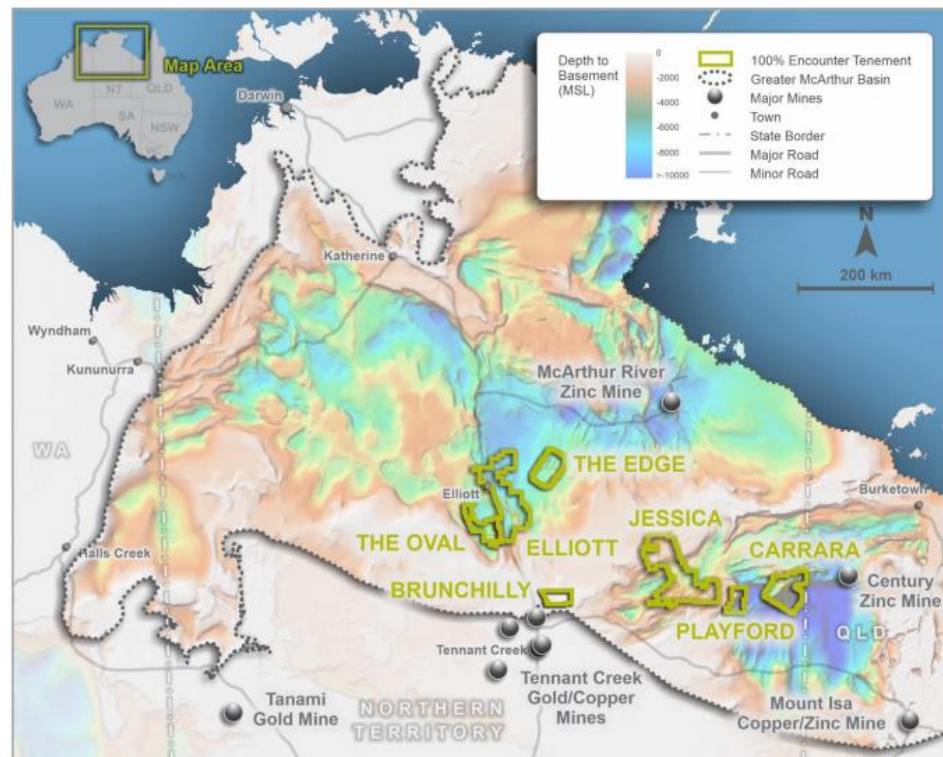


# Northern Territory: the next hot spot for copper in Australia

- Highly prospective, vastly underexplored region under shallow cover
- Located between the major copper-gold producing districts of Mt Isa and Tennant Creek
- Transformational investment in pre-competitive data by Geoscience Australia (GA) and the Northern Territory Geological Survey (NTGS)
- These new datasets are providing crucial early insights into areas prospective for sedimentary hosted deposits
- Encounter has used these datasets as a first mover to build a commanding position in this exciting new province



*Encounter Resources, Diggers and Dealers Presentation, 2 Aug 2021*



## RESOURCING THE TERRITORY

**Growing interest in sediment-hosted copper in the greater McArthur Basin**

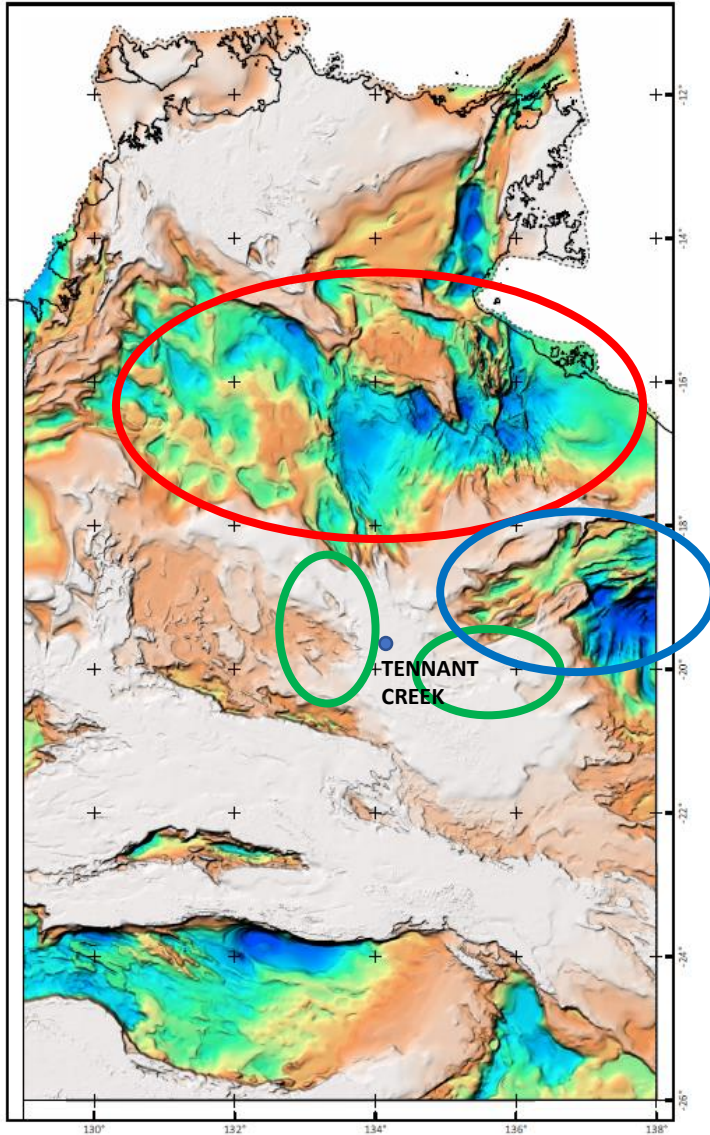
24 August 2021

## SIGNIFICANT FARM-IN AGREEMENT WITH OZ MINERALS WOLLOGORANG PROJECT, NT

- Resolution Minerals Ltd and OZ Minerals Limited (ASX: OZL) enter into a Farm-in and JV agreement on the Wollogorang Copper Project in the Northern Territory, Australia

## Unlocking the resource potential of the Barkly and Gulf regions

Collaborations with GA, MinEx CRC, University of Adelaide, CSIRO, industry



Frontier opportunities:

**Tennant Creek extensions** – undercover extensions of prospective Palaeoproterozoic basement geology east and west of Tennant Creek; regional geological framework and mineral systems

**greater McArthur Basin** – understanding the subsurface extent, structural architecture and stratigraphic correlations of the McArthur Basin undercover

**South Nicholson Basin/Lawn Hill Platform** – virtually unexplored in the NT – previously unrecognised undercover extent and sediment-hosted mineral potential



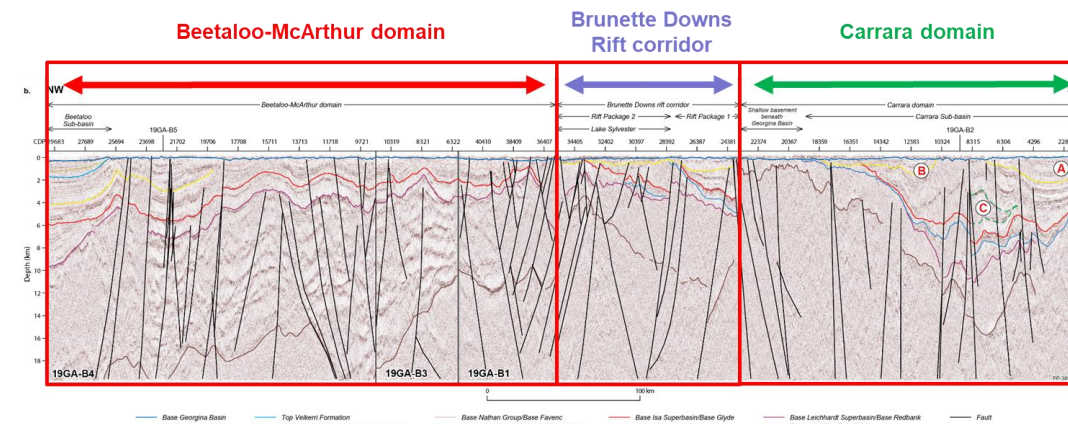
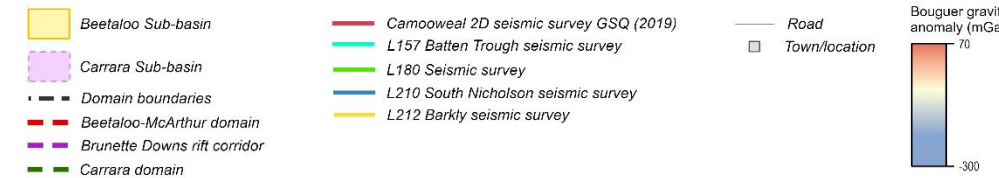
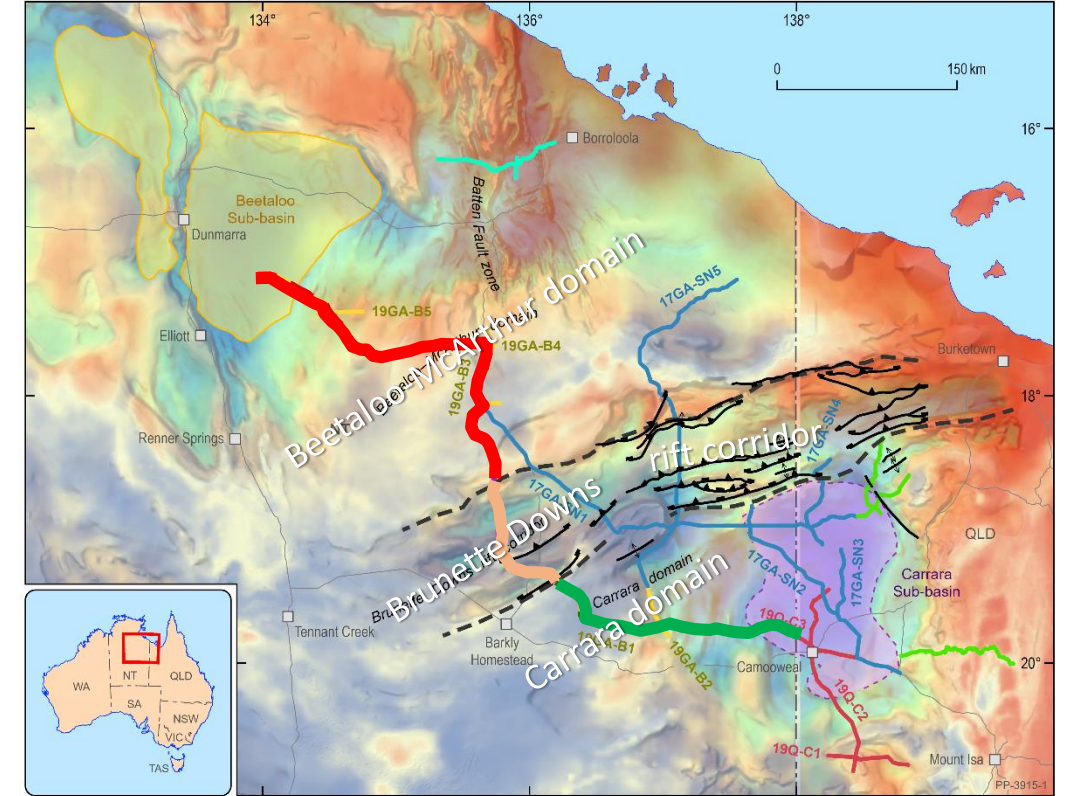
# Seismic in Barkly region highlighting new provinces for sediment-hosted copper and zinc

## Unexplored correlatives of the Carpentaria zinc province

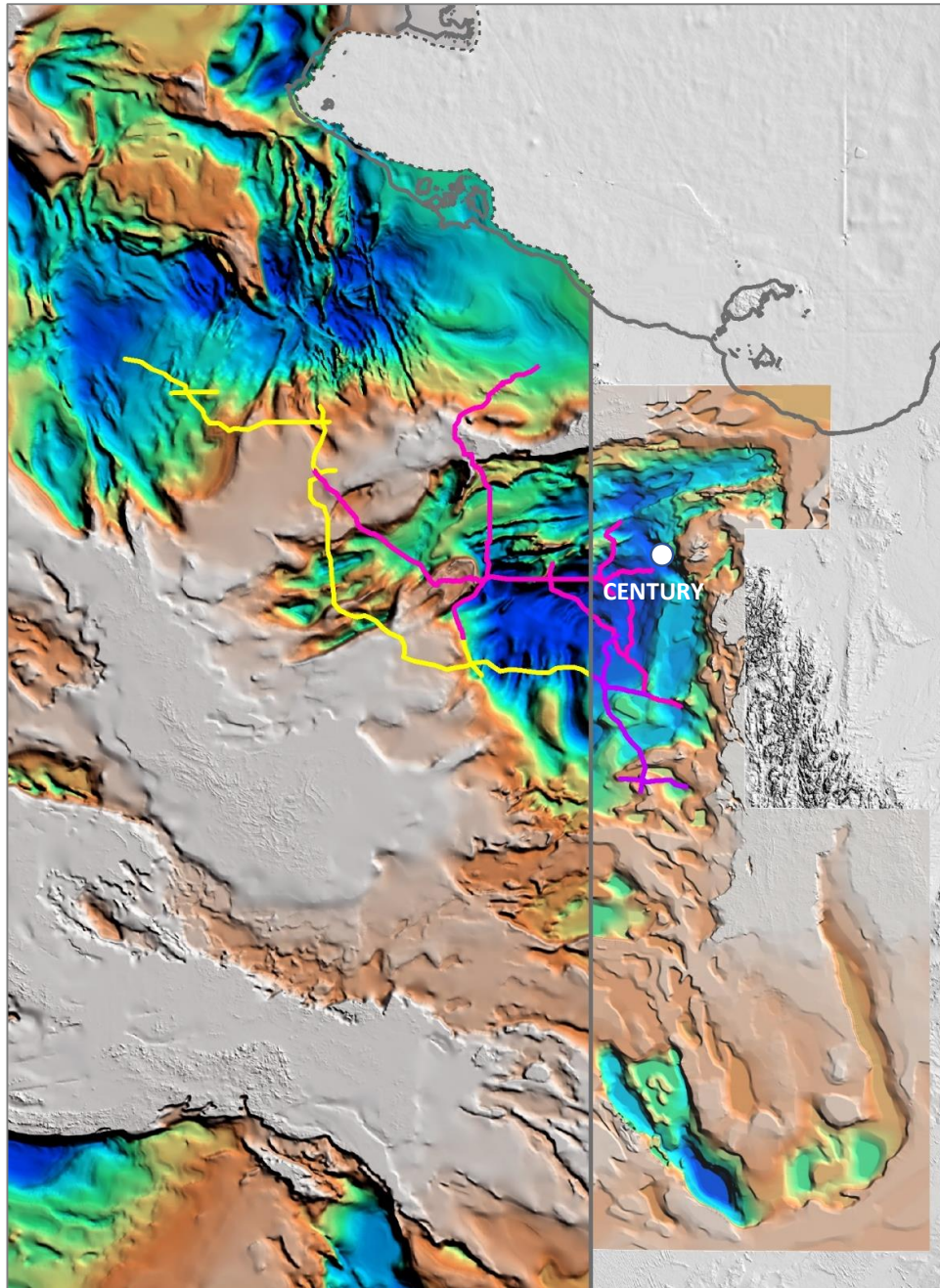
- Carrara domain
  - South-western flanks of Carrara Sub-basin
  - Shoulder of basement
- Brunette Downs rift corridor
  - Corridor of northeast trending half-grabens
  - Extends over 400 km strike length
  - Observed in South Nicholson region and Lawn Hill Platform (QLD)
- Beetaloo-McArthur domain
  - Continuous concealed sequence of Proterozoic sediments from Beetaloo Sub-basin

1.8 km drillhole by MinEx CRC (Carrara-1) intersected black shales and base metal sulphides

New sub-basins and rift corridor now covered in exploration tenements

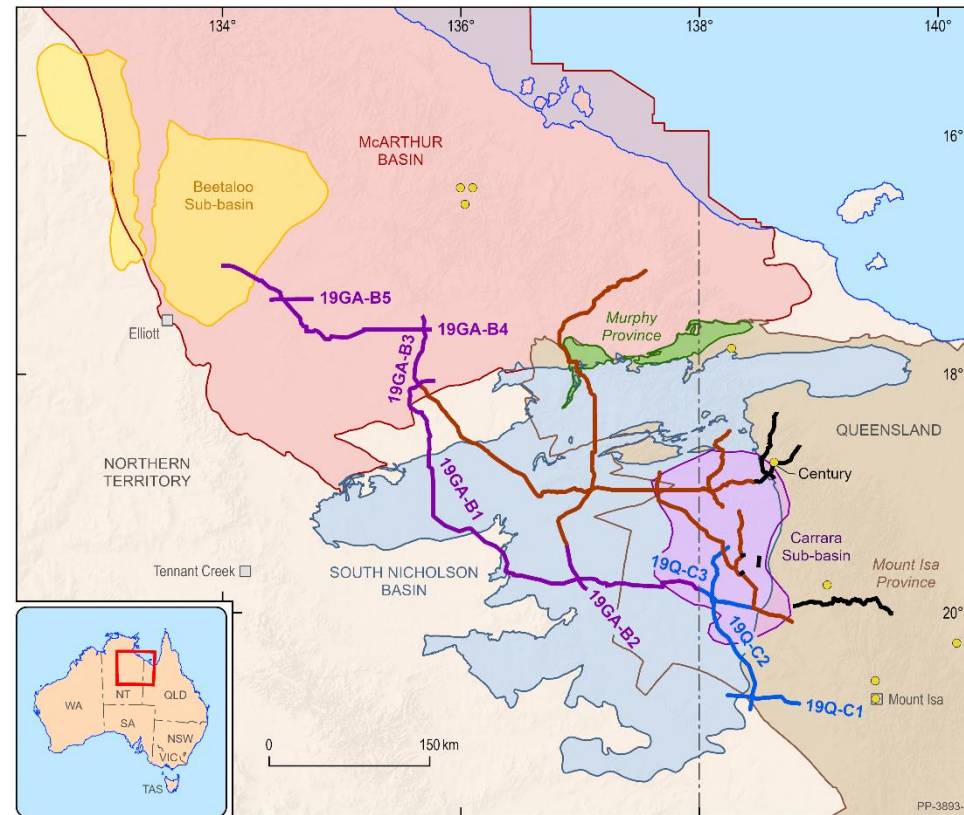




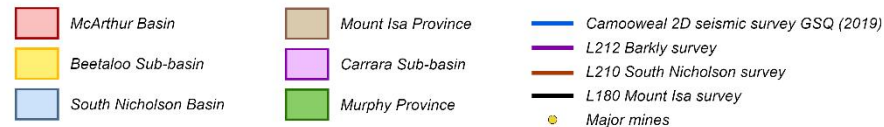


From Debacker et al, AGES 2021

South Nicholson Basin and Lawn Hill Platform have greater extent in NT than Queensland, with a northern structurally complex zone (Brunette Downs Rift Corridor) and southern depocentre (Carrara Sub-basin)



Source: Geoscience Australia and NT Geological Survey



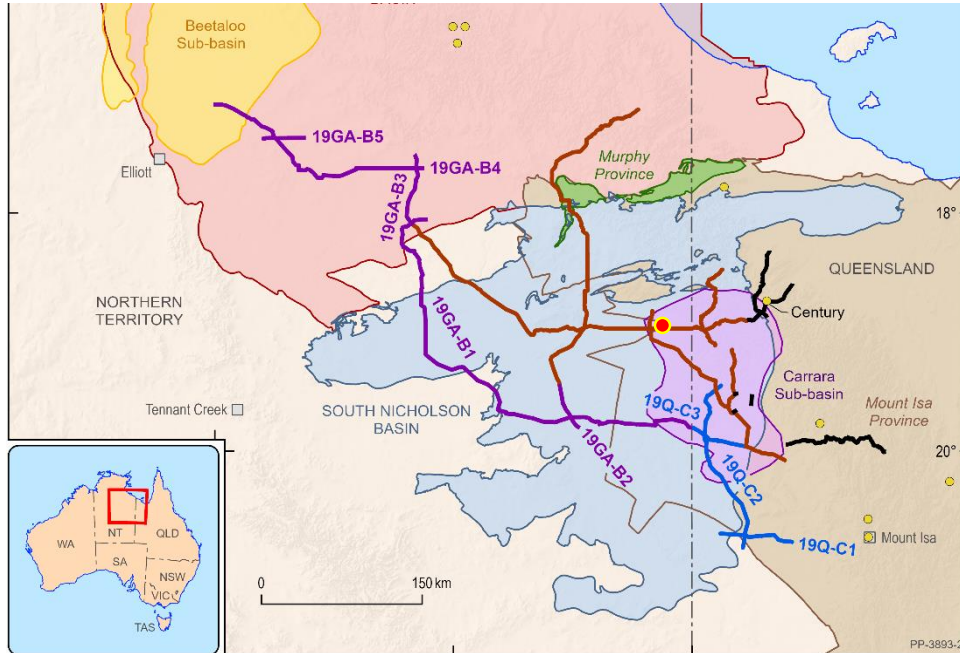
From Carson et al, AGES 2021



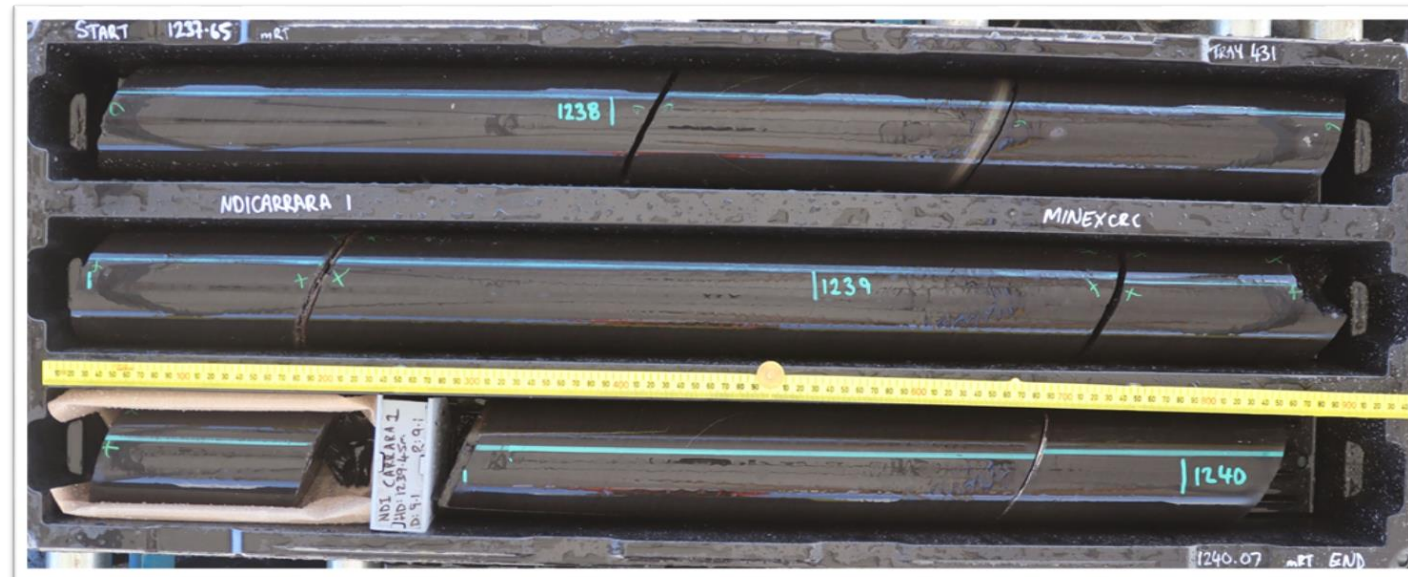
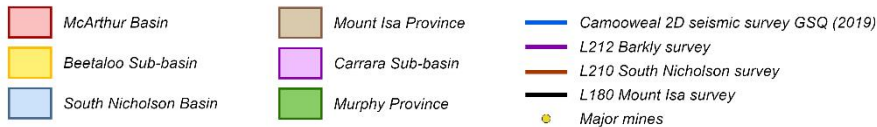
# Carrara-1 well



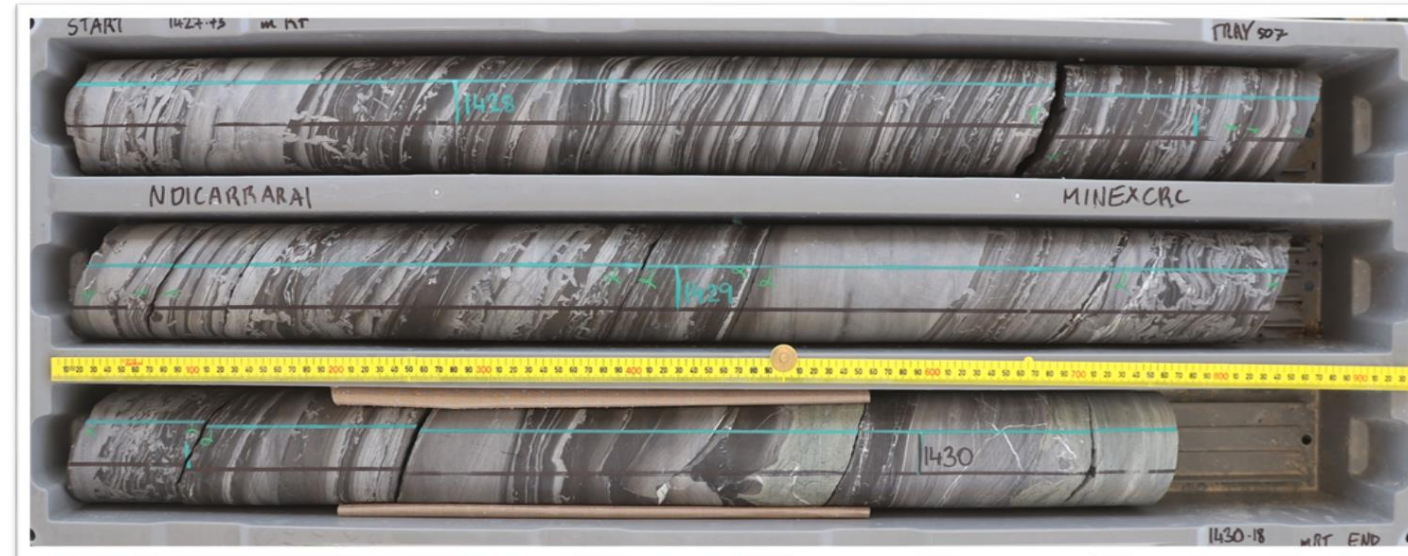
- Drilled late 2020
- Now open file at NTGS Darwin core store



Source: Geoscience Australia and NT Geological Survey



Tray 431. Depth 1237.65 m to 1240.07 m. 'Lower' black 'gassy' shales with marked gas spike



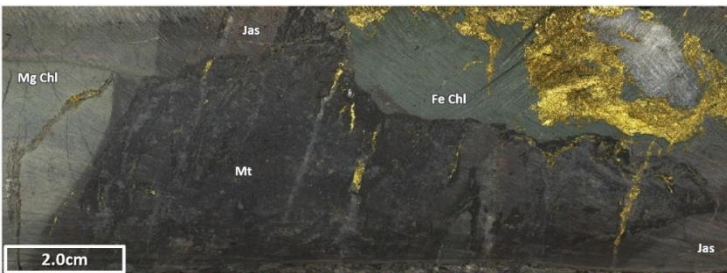
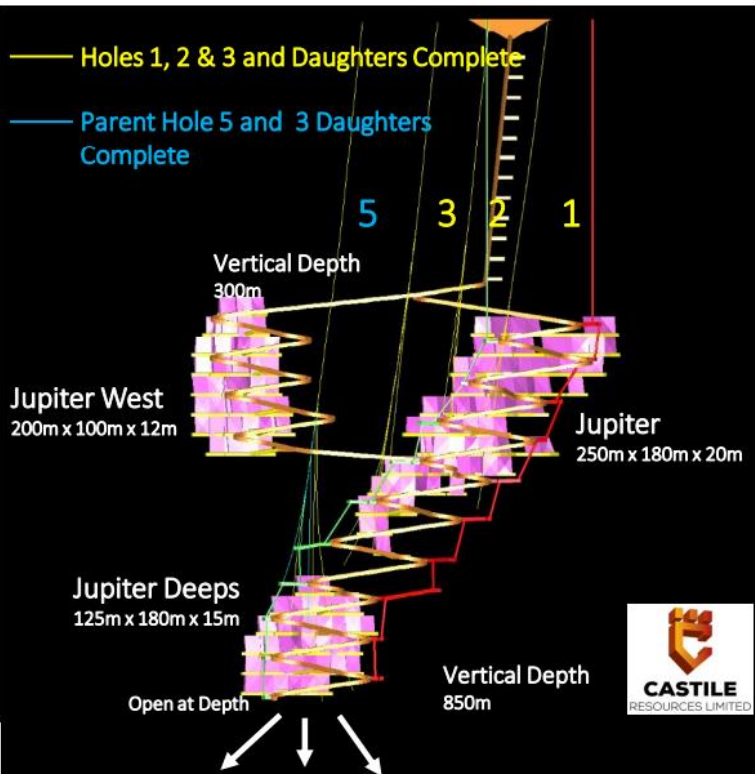
Tray 507. Depth 1427.73 m to 1430.18 m. Finely laminated 'rhythmites' with soft sediment deformation and syneresis cracks. Sphalerite, pyrite and galena reported in well log.



<https://www.ga.gov.au/eftf/projects/barkly-isa-georgetown/south-nicholson-national-drilling-initiative>



## 2021 Rover 1 Drilling Program



Rover 1 (from Savage, AGES 2021)

## Tennant Creek and Rover mineral fields

**Castile Resources - *Rover 1 Cu-Au-Co*** (70 km southwest of Tennant Ck)

- Major drilling program through 2021
- Resource growth at Rover 1; drilling at regional prospects

**Emmerson Resources – *Tennant Creek***

- Strategic Alliance with Tennant Consolidated Mining Group
- More high-grade gold drilled at Mauretania
- Drilling at Hermitage and Edna Beryl underway
- TCMG advancing plans for mill at Tennant Creek

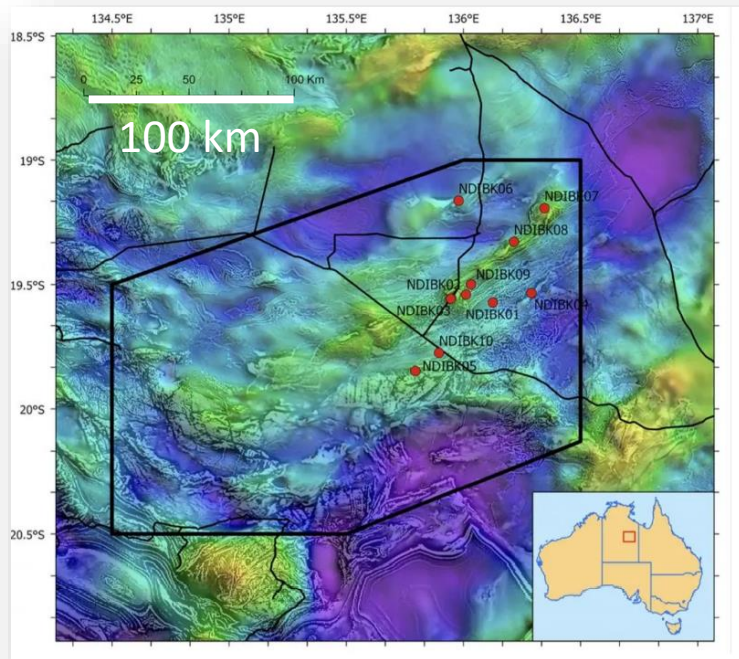
**Rio Tinto** –exploring west and north of Tennant Creek

**ICA Mining/Elmore Ltd** – planning to process Peko tailings (Fe, Au, Cu, Co)

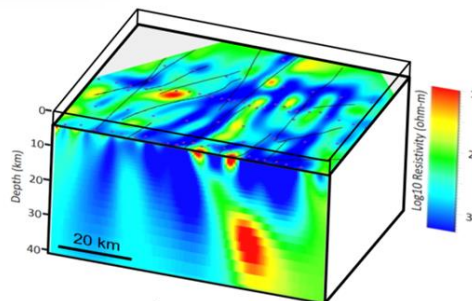
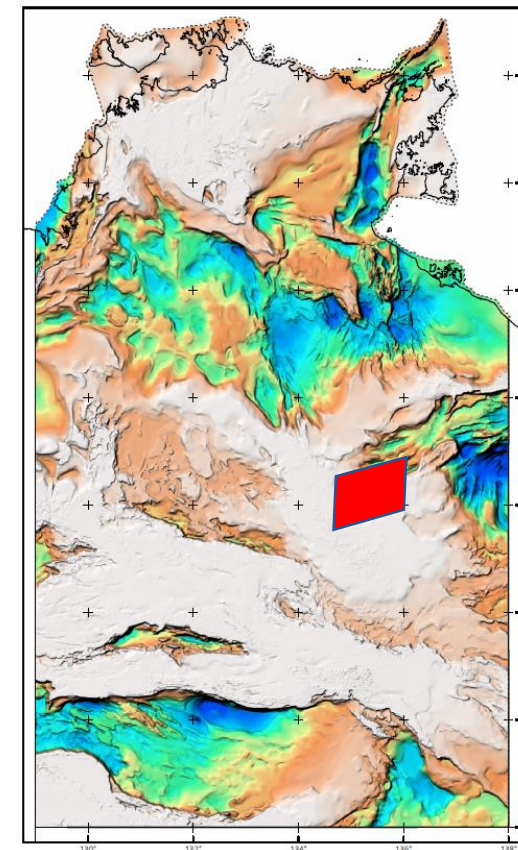
**Peak Iron** – planning processing of Warrego tailings (Fe)

# Emerging copper-gold province east of Tennant Creek

Integrated geoscience at a range of scales opening up entirely new exploration frontiers



- Collaboration between Geoscience Australia, NT Geological Survey and MinEx CRC in Barkly Tableland
- Regional studies suggested high potential of 'East Tennant' region, especially Cu-Au in basement at exploreable depths
- 10 research drillholes in late 2020 demonstrated the existence of widespread alteration systems and anomalous mineralisation; analysis ongoing



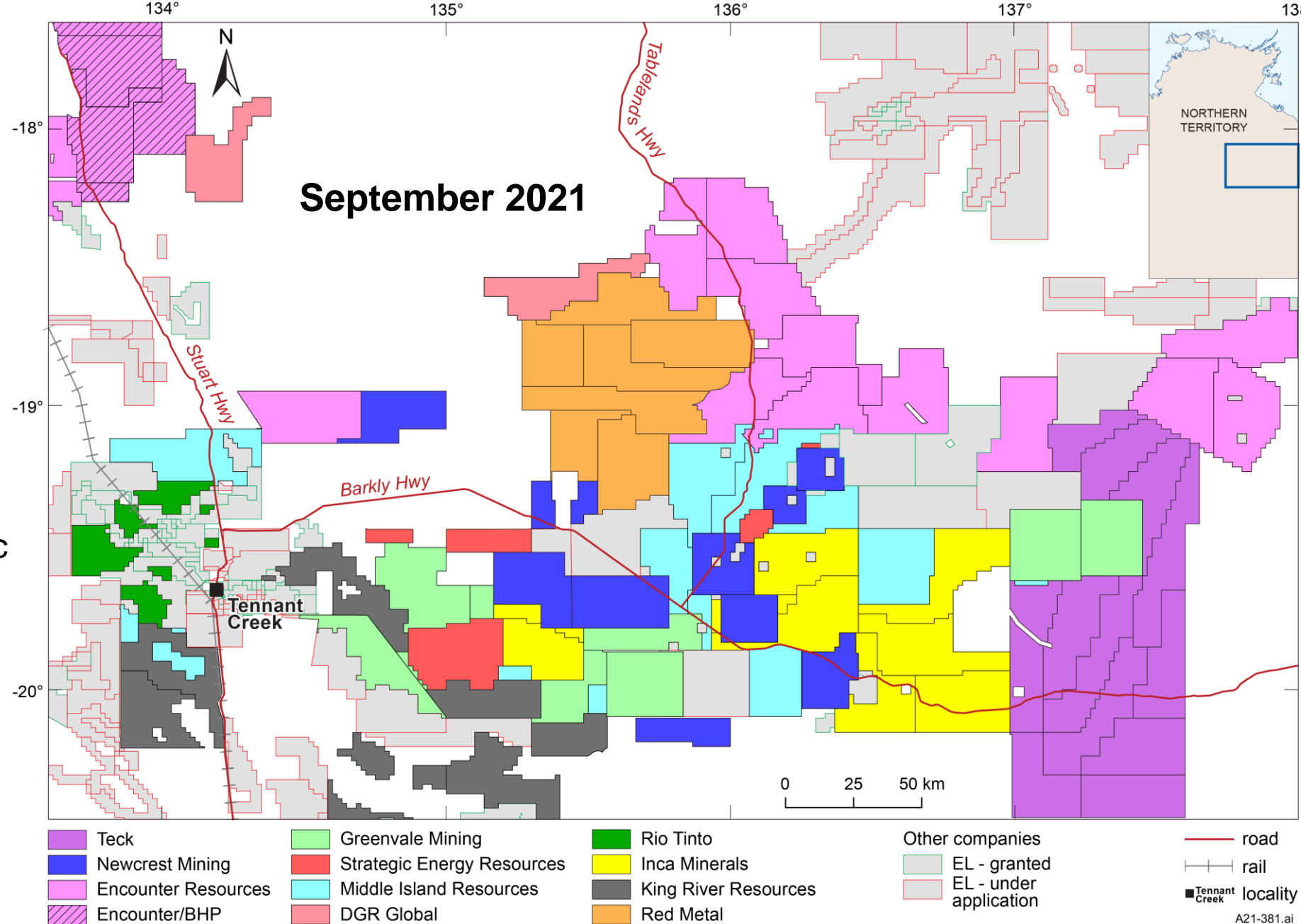
Jiang et al. 2020





Entire province now covered by mineral exploration tenure

Key targets are IOCG and sediment-hosted copper/zinc



# Exploration boom in the Barkly Tableland

**BHP** – Option to invest \$25 million in Encounter Resources' Elliott project

**Red Metal** – new applications in Brunette Downs Rift Corridor

**Encounter Resources** – large areas of titles for sediment-hosted copper

**Newcrest Mining**  
Early mover in East Tennant – exploration underway; drilling co-funded by NTGS

**Rio Tinto Exploration**  
Greenfields tenure in Tennant Creek field

**Strategic Energy Resources**  
50-100m gravity survey and diamond drilling co-funded by NTGS

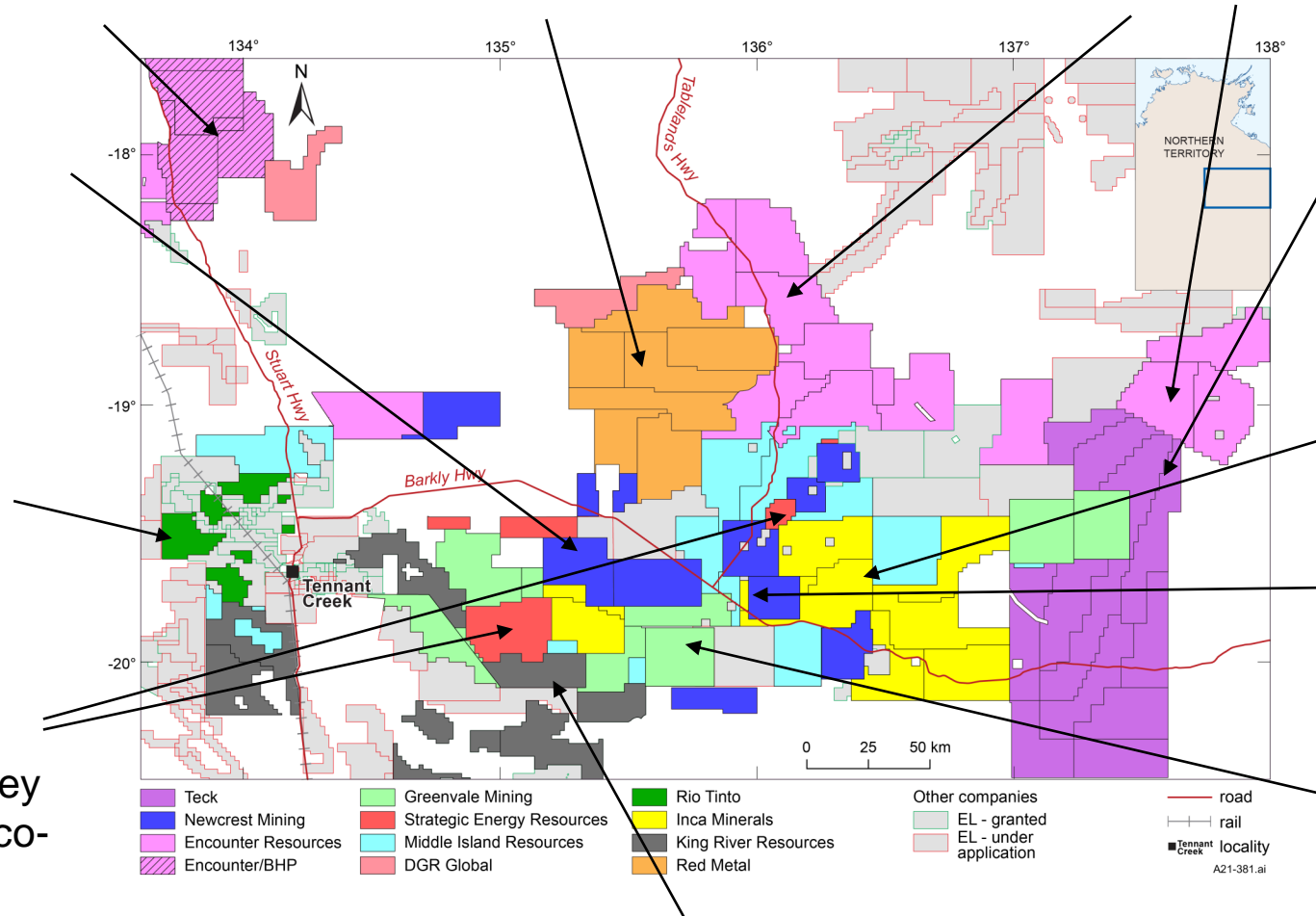
**Teck Resources**  
new applications over undercover South Nicholson/Lawn Hill basins; contributing to NTGS gravity survey

**Inca Minerals**  
50m-spaced mag-rad surveys co-funded by NTGS; new gravity data

**Middle Island Resources**  
100m mag-rad survey co-funded by NTGS

**Greenvale Mining**  
100m spaced mag-rad co-funded by NTGS

**King River Resources** – 100m mag-rad co-funded by NTGS





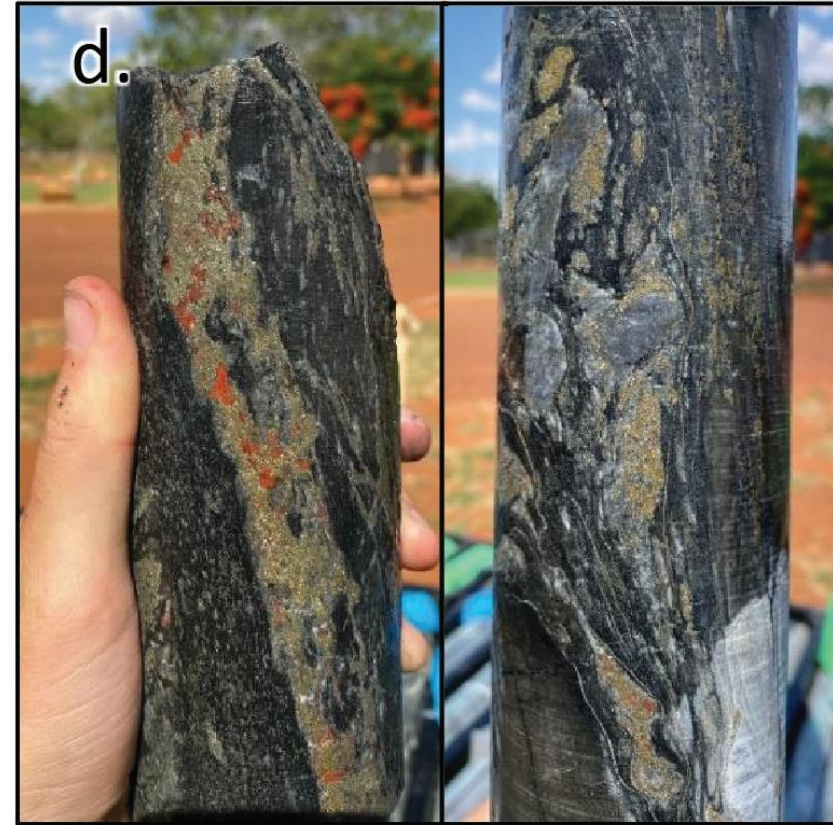
There is copper out there...



Surface copper at Crosswinds (Middle Island Resources)



Copper in water bore at Jessica project (Encounter Resources)

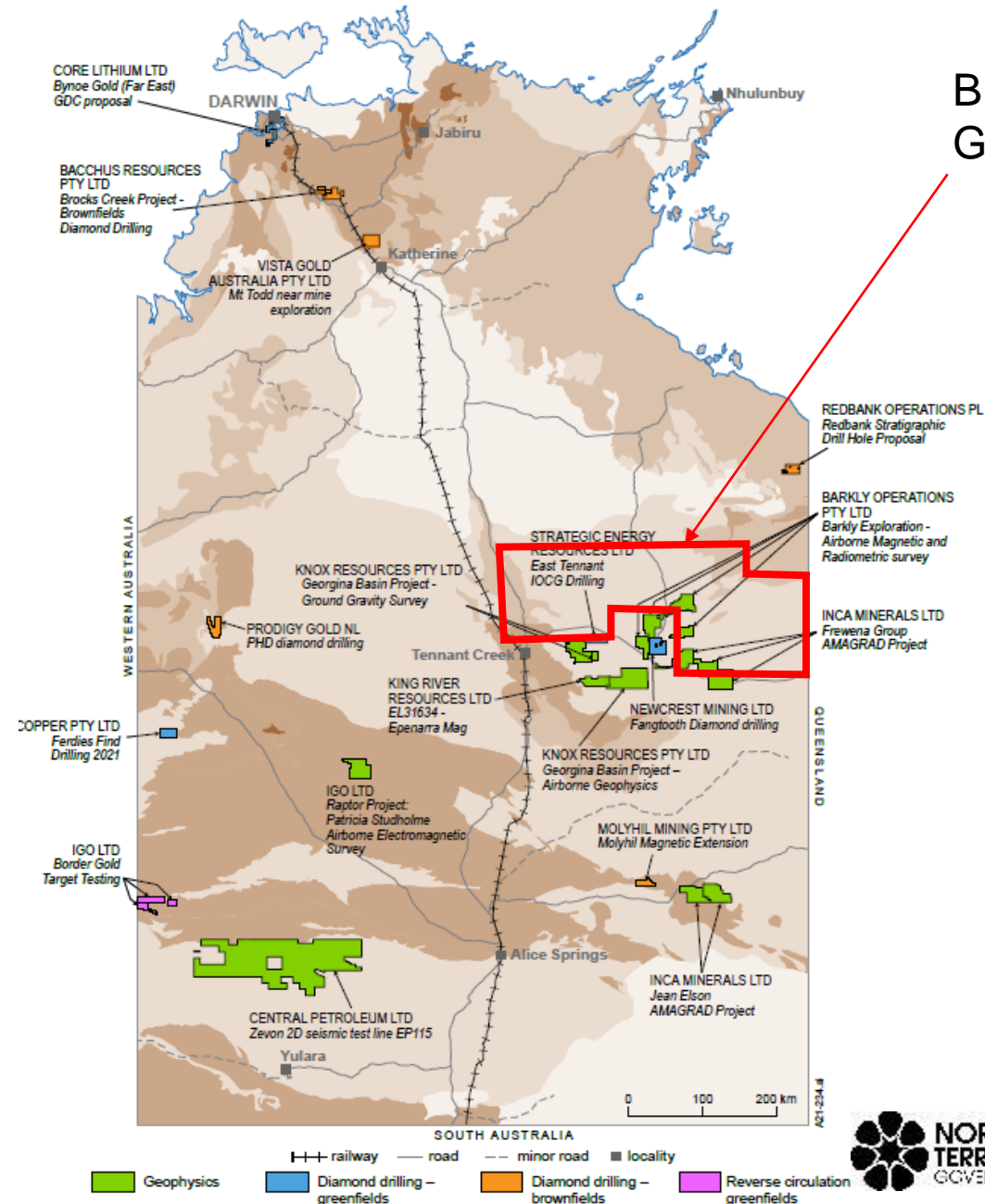


Copper in MinEx CRC drillhole NDIBK04 (from Clark et al, AGES 2021)



## Ongoing NT Geological Survey support for exploration in the Barkly

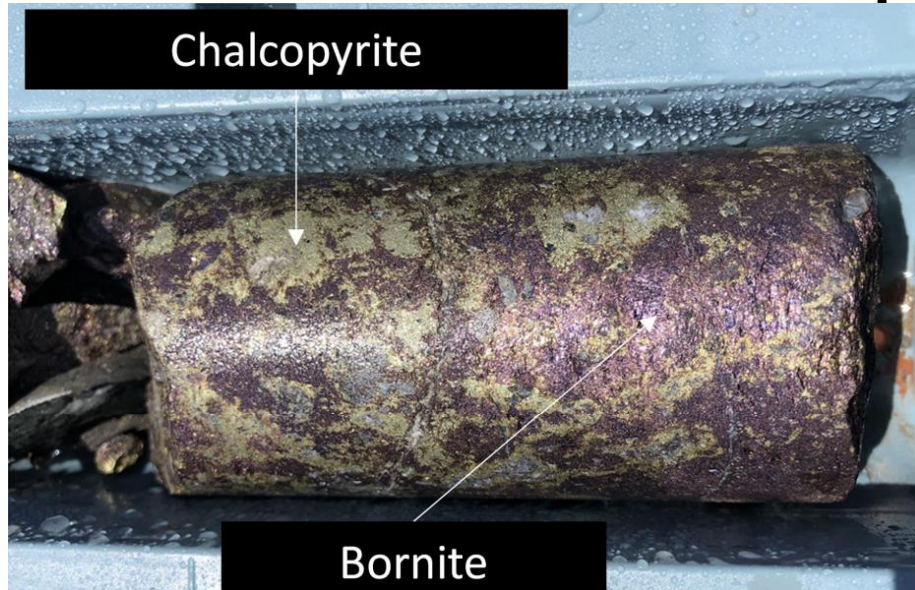
- All exploration drilling and geochemistry for entire Tennant Creek, Barkly and Gulf region digitally captured and made available
- Seven exploration projects in east Tennant area awarded co-funding grants (5 regional geophysical surveys, 2 deep drilling programs)
- A 57,000km<sup>2</sup> ground gravity survey about to commence across region – 2 x 2 km spacing with 5 companies contributing to infill to 1 x 1 km
- Ongoing data releases by both Geoscience Australia and NTGS



Brunette Downs Gravity Survey



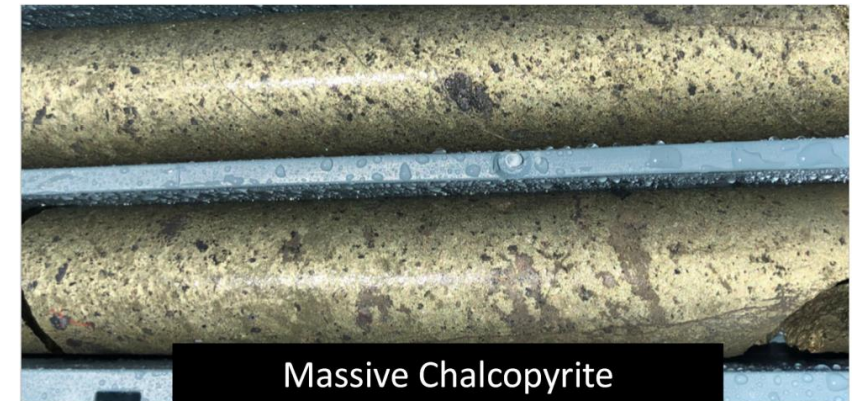
# Aileron Province – polymetallic copper province



## KGL Resources – *Jervois Cu-Ag*

**21.0 Mt @ 2.03% Cu, 31.9 g/t Ag**

- Higher-grade resource through improved geological model; ongoing drilling and resource growth
- All environmental approvals and mining approvals in place
- > 12 year mine life with scope to substantially grow resources
- FID planned Q1 2022



## IGO Ltd/Prodigy Gold – Phreaker

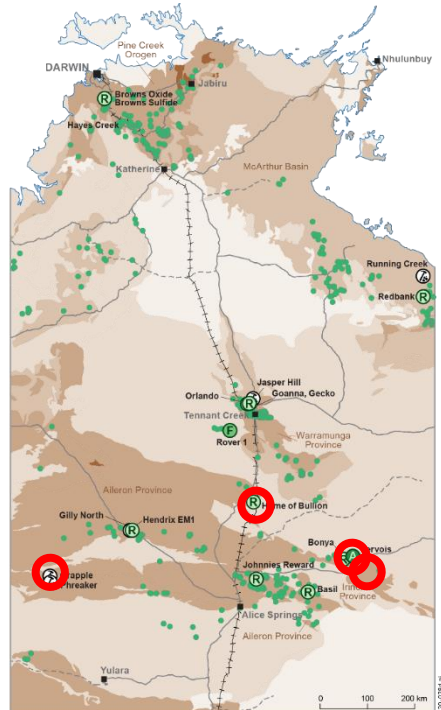
- High-grade copper intersected in 2021 drilling
- 4.5m @ 3.03% Cu, 1.78g/t Au and 14g/t Ag;  
17.47m @ 2.13% Cu, 0.21g/t Au and 9g/t Ag

## Inca Minerals – *Lorna May and Jean Elson Cu-Au projects*

- Multiple greenfields copper-gold targets

## Eastern Metals – *Home of Bullion Cu*

- New IPO on October 22, with projects at Barrow Creek





Drilling at Mount Todd, April 2021



## Gold in the Pine Creek Orogen

### Vista Gold – Mount Todd

- Major drilling campaign in 2021; verified continuity of gold mineralisation extending 1.4 km NE from the Batman deposit
- 29 m @ 2.65 g/t, incl. 0.31 m @ 161.80 g/t Au

### PNX Metals – *Fountain Head*

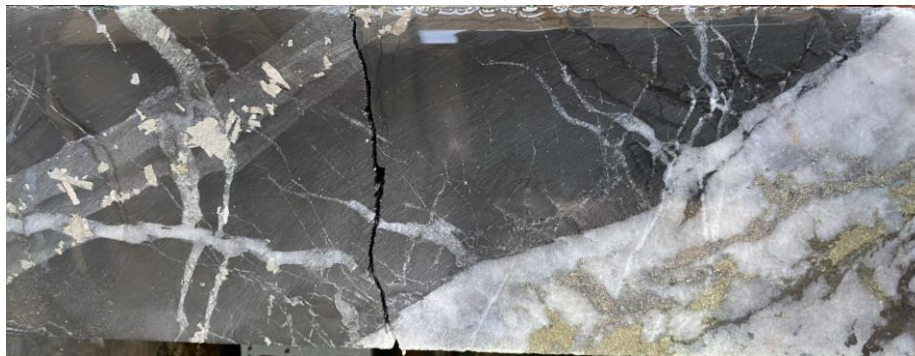
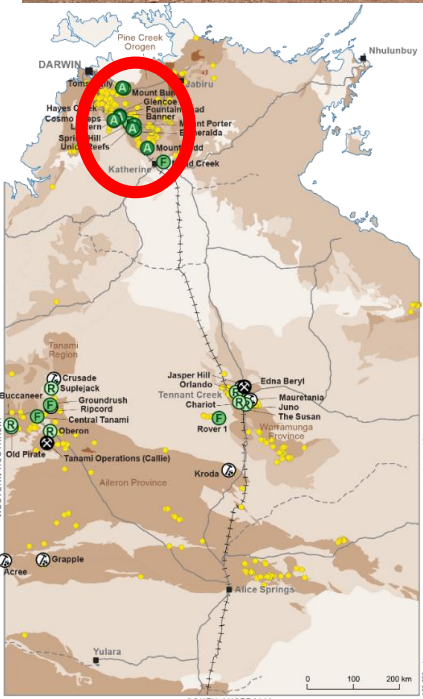
- Drilling campaigns at Fountain Head and Glencoe

### Bacchus Resources – *Woolwonga and Brocks Creek*

Resource and metallurgical drilling at Brocks Creek

### China Hanking Pty Ltd – *Mount Bundy*

- Substantial increase in resource at open cut Reserve at Rustlers Roost and Quest 29 (Reserve: 44.9 Mt @ 0.85 g/t Au)
- Environmental approvals for Toms Gully completed



Mineralised quartz veins in drillcore, Brocks Creek



# The expanded Resourcing the Territory initiative

**RESOURCING  
THE TERRITORY**

## Funding of \$9.5 million per year - ONGOING

*Tanami airborne survey: Photo courtesy of Prodigy Gold*

Quote from Ministerial release, April 2021:

“The funding will allow:

- Near-term resource development through an increased focus on exploration of ‘brownfields’ sites
- Identification and promotion of new areas of the Territory for resource exploration
- Acceleration of geoscience programs to attract and de-risk mineral exploration
- Expansion of the Geophysics and Drilling Collaborations grants program
- Studies of the Territory’s geological potential for critical commodities to support a low-emissions future
- Further collaboration with the Federal Government’s Exploring the Future program”



## Areas of focus

- **Substantially expanded grants program**; increase in funding amounts per program and total funding. Supporting greenfields drilling, regional geophysics, brownfields drilling and innovative targeting – likely call for applications in Feb 2022, closing April-May 2022
- **Data modernisation** to make large datasets more findable, accessible and useable
- New focus on the **Pine Creek Orogen** – rolling out a range of programs to reinvigorate a major mineral province
- Strong focus on **energy systems in basins** – gas, hydrogen, geological storage
- Ongoing programs across **greenfields provinces** – eg Birrindudu Basin?
- Studies of the NT's **critical mineral potential** in areas such as the Aileron Province and Pine Creek

***All underpinned by an ongoing commitment to provide industry with the quality baseline data and geological framework they need to support and de-risk their exploration***



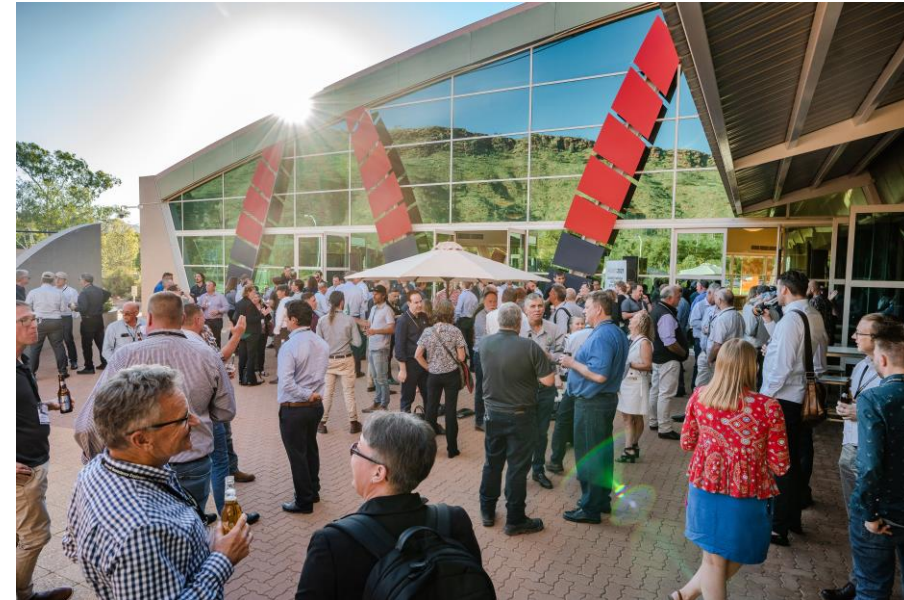


# Annual Geoscience Exploration Seminar (AGES)

## AGES 2022 – April 5-6, 2022

Alice Springs Convention Centre

**RESOURCING  
THE TERRITORY**





## Data and publications released under Resourcing the Territory

For the latest data, products and publications from NTGS and its collaborative partners, visit the Data and Publications page.

[Find out more](#)

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## Latest news



### NTGS to present at NT Resources week

20 Sep 2021

NT Resources Week will be held on 27-28 October at the Darwin Convention Centre.



### AGES 2022 dates announced

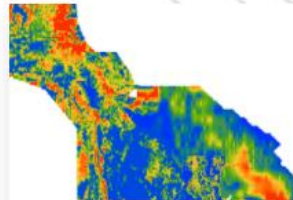
20 Sep 2021

Annual Geoscience Exploration Seminar (AGES) will be held in Darwin on 27-28 October.



### Newly compiled petroleum geoscience data from onshore basins in southeast NT

08 Sep 2021



### New conductivity data from reprocessed historical AEM: CSIRO NTGS McArthur Basin Project

# For more information:

Resourcing the Territory website  
[www.resourcingtheterritory.nt.gov.au](http://www.resourcingtheterritory.nt.gov.au)

Geoscience data and products  
[gemis.nt.gov.au](http://gemis.nt.gov.au)  
or email: [geoscience.info@nt.gov.au](mailto:geoscience.info@nt.gov.au)

Geoscience and titles web mapping  
[strike.nt.gov.au](http://strike.nt.gov.au)

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