Highlights and outlook for regional resources exploration

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DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES
NT mineral production value 2017/18
Area reflects value of production

- 12.9 Mt bauxite
- 2090t $U_3O_8$
- 6.4 Mt Mn
- 17.0t Au
- 530 kt Zn-Pb concentrate

Record mineral production of $4.49B
The Territory’s pipeline of mining projects

**Final approvals/finance**
- Grants Li
- Jervois Cu-Ag
- Mount Peake V-Ti-Fe

**Notice of intent/feasibility**
- Molyhil W-Mo
- Spring Hill Au
- OB33 Li
- Bigrlyi U
- Central Tanami Au
- Oberon Au
- Karinga potash

**JORC resources**
- Tellus salt
- Mount Porter Au

**Final approvals/finance**
- Mount Bundey Au
- Nolans REE-P
- Mount Todd Au

**Notice of intent/feasibility**
- Ammaroo P
- TNG TIVAN plant
- Roper Valley Fe
- Wonarrah P
- Yarram Fe
- Roper Bar Fe

**JORC resources**
- Woolwonga Au
- Union Reefs Au
- Teena Zn
- Angularli U
- Other Finniss Li
- Maud Creek Au
- Bigrlyi U
- Karinga potash
NT mineral exploration expenditure 2000-2018
Annual expenditure calculated quarterly

- 2011 - $228.4M
- 2016 - $78.1M
- 2018 - $123.2M

Gold
Greenfields v brownfields expenditure 2004-2018

Greenfields exploration in the NT has doubled since 2014

Brownfields exploration has rebounded since mid-2017
Mineral exploration expenditure by commodity reported to DPIR in 2018

- Key commodities are copper, zinc, gold, uranium and lithium
- Large areas very underexplored
- Other main commodities for exploration and developing projects: cobalt, potash, phosphate, vanadium, rare earths, salt, tungsten, magnesium
- Many projects seeking partners for joint ventures, equity investment, project finance, construction and/or offtake

Tangible on-ground expenditure only (excludes overheads, desktop and feasibility studies)
Mineral exploration expenditure by commodity reported to DPIR in 2018

- Gold 29%
- Base metals 44%
- Other 8%
- Lithium 11%
- Uranium 4%
- Rare earths 1%
- Iron 1%
- Phosphate 1%

Tangible on-ground expenditure only (excludes overheads, desktop and feasibility studies)

Mineral exploration expenditure by region reported to DPIR in 2018

- Aileron 24%
- Tanami 10%
- McArthur 32%
- Pine Creek 19%
- Musgrave 2%
- Georgina 2%
- Tennant 3%
- Pedirka 4%
Producers with strong cash flow investing in the NT as a growth area
Primary Gold - Toms Gully
Acquisition by Hanking Australia Pty Ltd, planning redevelopment of Toms Gully underground mine

Bacchus Resources – Woolwonga
Substantial drilling during 2018

PNX Metals – Fountain Head
High grade gold discovered at Banner prospect

PC Gold – Spring Hill
Planning commencement of mining

Kirkland Lake Gold - Cosmo
- Underground development and exploration at Lantern
- High grade gold intersected at depth at Union Reefs

Vista Gold – Mount Todd
DFS well advanced, NT EPA environmental assessment process complete

www.nt.gov.au
Pine Creek – multiple commodities

Northern Territories Resources – *Browns Pb-Cu-Ni-Co*
Doe Run Mining terminated option agreement, project sale process underway

PNX Metals – *Hayes Creek Zn-Ag-Au*
EIS and Feasibility Study underway

Territory Resources – *Yarram Fe*
Notice of Intent submitted for 0.5-1.2 Mtpa iron ore mining operation
Lithium

Core Exploration – *Finniss project*

Combined resource: **9.63 Mt @ 1.3% Li$_2$O**

- Six resources now defined (Grants, BP33, Carlton, Sandras, Hang Gong, Lees)
- Discovery and resource growth continuing at multiple prospects
- DFS released April 2019
- Grants resource passing through development approvals – investment decision planned for 2019
West Arnhem Land – uranium (+ copper, gold, platinum?)

Vimy Resources Ltd
- King River and Wellington Range projects acquired from Cameco in March 2018 (JV - Rio Tinto 25%)
- Angularli maiden resource: 0.91Mt @ 1.3% U₃O₈ for 26Mlbs U₃O₈; best drill intercept of 22.9m @ 4.63% U₃O₈ from 244.6m
- Scoping study released on Angularli development
- RC drill program in 2018 at Angulari and Such Wow

DevEx Resources Ltd
- Targeting multiple commodities at U40 near Nabarlek
McArthur Basin base metals and cobalt

**McArthur River Mine** overburden management project – Environmental Assessment report received July 2018

**Northern Cobalt – *Wollogorang project***
- **Running Creek**: 55m @ 0.78% Cu incl. 13m @ 2.01% Cu
- Newly identified copper mineralisation at **GregJo**

Drilling programs in 2018 by **Pacifico Minerals** (Lorella), **Todd River Resources** (McArthur), **Marindi Metals/JOGMEC** (Carinbirini), **MMG** (incl. Cow Lagoon)

**Teck Resources**: Teena
- 58 Mt at 11.1% Zn, 1.6% Pb
Roper region: iron ore and ilmenite sand

Roper Valley iron ore
Northern Territory Iron Ore Pty Ltd
Total resource: 488 Mt @ 41.7% Fe
Includes 41.1 Mt @ 57.8% Fe
NoI in place

Roper Bar iron ore
(Britmar)
Total resource: 611 Mt @ 40.3% Fe
Includes: 47.4 Mt @ 57.3% Fe
MMP approved for restart of operation

Australian Ilmenite Resources: Sill80
Ilmenite sand
Drilling, ramping up production
Onshore oil and gas: Beetaloo Sub-basin

- Vast, geologically continuous shale gas basin
- Similar in scale and geology to US shale plays
- >500 Tcf of gas in place within B-shale of Velkerri Formation
- First horizontal hydraulically fractured well in 2016 successfully flowed gas
- Multiple dry gas and liquids-rich plays
- Drilling to restart this dry season
EMPs submitted in 2019

Origin Energy: Kyalla-117 N2

Santos: Tanumbirini-1/2H
Inacumba-1/1H
Other basins

**McArthur Basin**
- Known conventional gas reservoirs
- Substantial shale gas potential
- *Armour Energy and Imperial Oil and Gas* have extensive exploration tenure

**South Nicholson Basin**
- Largely untested basin with similarities to Beetaloo Sub-basin
Resourcing the Territory initiative

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

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
Theme 1: Supporting industry innovation through grants for greenfields exploration

NT Government co-funding of greenfields exploration since 2008

48 Drilling projects completed
130 holes: >47,000 m drilled

37 Geophysics projects completed
~55,000 ground gravity stations
~122,000 line km of airborne magnetic and radiometric surveys
~30,000 line km of airborne EM surveys
plus MT, seismic, SAM, 3D IP and passive seismic surveys

Changes to program under Resourcing the Territory
• More funding available, expanded eligibility
• Additional funding for utilising local service and supply
‘greater McArthur Basin’
Continuous distribution of prospective stratigraphy established over vast area of northern Australia

Munson et al, AGES 2019
GA Exploring for the Future in TISA area
(NTGS co-investing and collaborating)

- Unprecedented level of new geoscience data at outcrop to crustal scale
- NTGS mapping South Nicholson and Lawn Hill basins in NT
- Potential for new undercover mineral province east of Tennant Creek

Ley Cooper et al
AGES 2019

South Nicholson seismic  Carr et al AGES 2019
More information: resourcingtheterritory.nt.gov.au

Annual Geoscience Exploration Seminar (AGES)

AGES 2020
Alice Springs
March 24-25, 2020

www.ages.nt.gov.au
Thank you