# PARTIAL RELINQUISHMENT REPORT

## **Numery South EL 32196**

## Titleholder : Gempart (NT) Pty Ltd

## **EXPLORATION LICENCE EL32196**

## FOR THE PERIOD 23/01/2020 to 22/01/2022

by

#### A. W. Mackie

&

**<u>G. J. Bubner, AsIs International</u>** 

Contact	amackie 50@hotmail.com
Datum/Zone	GDA 94 – Zone 53
1:250000	Hale River SG 53-3 and Illogwa Creek
1:100000	Todd 5949, Limbla 5950, Hale 6049 and Illogwa 6050
Target	Base metals, Nickel, Cobalt, PGE's, Ti, V and REE's
Keywords	Arunta Complex, Amadeus Basin, Casey Inlier, Pipeline prospect, Arthur Popes prospect, magnetic modelling
Copies to:	1. Gempart (NT) Pty Ltd
	2. Northern Territory Geological Survey
	3. Capricorn Mapping & Mining Title Services
	4. A.W.Mackie

# **CONTENTS**

TABLE OF FIGURES	2	
ABSTRACT	3	
1. INTRODUCTION	4	
1.1 Location, Access and Physiography	4	
2. TENURE	5	
2.1 Mineral Title	5	
2.2 Land Title	5	
3. GEOLOGY	7	
3.1 Regional geology	7	
3.2 Project Area Geology	8	
3.3 Economic Mineral Potential		
4. PREVIOUS EXPLORATION	14	
4.1 AP2459 – 1969. North Broken Hill Ltd / Exploration Divisio	ın15	
4.2 AP2698 - 1970. Fergusson, R; Underdown, L.J.R.; Kruger, A	۸ 15	
4.3 EL5363 - 1988. Quadric (acquired by Sabminco N.L.)	15	
4.4 EL6550 - 1990. Pancontinental Resources (Exploration) Pt	y. Limited15	
4.5 EL9335 - 1998. CRAE / Rio Tinto Exploration	15	
4.6 EL10270 - 2003. Gutnick Resources N.L.	16	
4.7 EL24646 - 2010. Mithril Resources Ltd	16	
4.8 EL25643 - 2013. Sammy Resources/Mithril Resources Ltd.	17	
4.9 EL27962 - 2013. Crowl Creek Exploration/Kidman Resource	es Ltd17	
4.10 EL29397 & EL28808 - 2014. Rara Terra Resources Pty Ltd.		
5. EXPLORATION COMPLETED		
5.1 Exploration completed in year one to January 2021		
5.2 Exploration completed in year two to January 2022	19	
6. CONCLUSIONS & RECOMMENDATIONS19		
7. REFERENCES	20	

# **TABLE OF FIGURES**

Figure 1.	EL32196 Numery South regional location Map.	.5
Figure 2	EL32196 Numery South Tenement blocks and location diagram.	.6
Figure 3.	EL32196 - Project area regional geology	.7
Figure 4.	EL32196 Stratigraphy	11
Figure 5.	EL 32196 1:250 000 scale geology	12
Figure 6.	EL 32196 geology compilation from 250K maps and Mithril mapping.	13
Figure 7.	EL32196 Previous exploration - surface sample sites.	18

## ABSTRACT

EL32196 was granted in January 2020. Primary commodities sought are base metals, nickel, cobalt, PGE's, Ti, V and REE's. About one half of the area has outcrop of Arunta Complex metamorphics or Amadeus Basin sediments. There are no mines or deposits within the EL area; copper and REE mineralisation has been recorded at Pipeline and Arthur Popes prospects respectively. Previous explorers, notably CRAE and Mithril, mostly targeted gold and base metals (primarily copper) in Amadeus Basin sediments, nickel/PGE's in ultramafics and REE's in carbonatitic dykes outcropping in Arunta Complex rocks.

Past explorers identified elevated and anomalous geochemistry in multiple elements from surface sampling but followed-up with limited drilling. Some programs were abandoned due to downturn in the investment cycle. Gempart believe that re-assessment of past exploration data in the light of new airborne geophysical data can vector prospect areas for more detailed investigation and drilling.

In the first two years of tenure Gempart has completed a review and re-compilation of relevant data from government geotechnical databases and previous exploration results, detailed interpretation of existing aeromagnetic data, reconnaissance field trips, detailed airborne magnetic/radiometric survey, and VTEM survey. All of this work was conducted in the central part of the tenement, where there is prominent outcrop of Arunta Complex and surrounding sediments.

The peripheral areas of the EL are largely under cover and are of little exploration interest in the current program. In consequence these areas have been relinquished.

# **1. INTRODUCTION**

## 1.1 Location, Access and Physiography

The Numery South Project area is located 250km East of Alice Springs on Numery Station; refer Figures 1 and 2. EL 32196 covers an elevated domal structure in the western central part of the tenement, bounded by steep sides with rugged low hills in the centre. The Hale River bounds the northern part of the structure and the licence area, and is passable when dry in a few places. To the south-east this leads on to a flat area with sheet wash and deflated sand dune cover. Topographic variation is 260 metres over the Hale River in the south-east of the EL to 460 metres on the prominent mesas of Heavitree Quartzite in the central west of the EL.

Access to the project area is via the Ross Hwy from Alice Springs, a bitumen highway for 30km and then via graded station tracks, passable when dry. Access within the project area is limited, with few station tracks accessing the main target areas.

Drainage is dominated by the Hale River, which runs through the tenement area from northwest to south-east. Numerous tributaries drain from the elevated outcrop area into the Hale River. Internal drainage comprising scattered small ephemeral creeks occur on the areas of aeolian sand and colluvium.

The climate is semi-arid and is characterized by large diurnal and annual fluctuations in temperature. Rainfall is typically 125-200 millimetres per year; most of the rain falls during sporadic storms.

## **2. TENURE**

#### 2.1 Mineral Title

EL32196 was granted for a period of six years on 23<sup>rd</sup> January 2020 to Gempart (NT) Pty Ltd.

Tenement	Name	Event	Area (Sq km)	Blocks	Date	
EL32196	Numery South	Application	744.3	240	22-Jul-19	
EL32196	Numery South	Grant	744.3	240	23-Jan-20	
EL32196	Numery South	Partial relinquishment	372.1	120	22-Jan-22	

#### 2.2 Land Title

The Numery South tenement area is located entirely within Numery PPL.

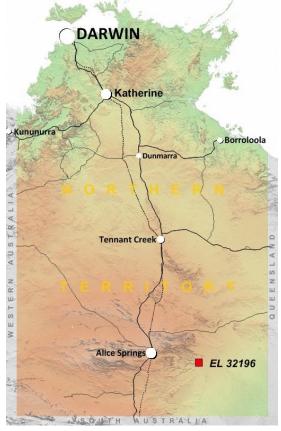


Figure 1. EL32196 Numery South regional location Map.

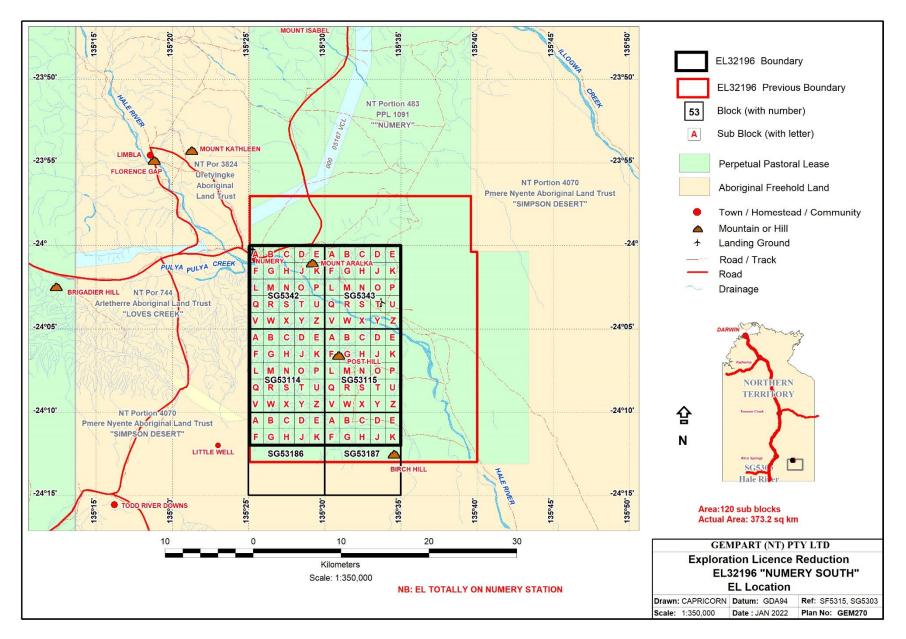


Figure 2 EL32196 Numery South Tenement blocks and location diagram.

# **3. GEOLOGY**

## 3.1 Regional geology

The project area is located on the interpreted southern edge of the North Australian Craton within Palaeo-Mesoproterozoic Arunta aged rock types between the Georgina and Eromanga Basins. It covers an eroded domal structure with prominent outcrop of Neoproterozoic Heavitree Formation and lesser outcrop of Neoproterozoic to Palaeozoic Amadeus Basin sediments which unconformably overlies and provides a window through to the Arunta metamorphic complex of gneiss, schist and quartzite. Refer Figure 3.

In 2004, the Northern Territory Geological Survey started mapping the Casey Inlier, a basement inlier within the NE Neoproterozoic to Palaeozoic Amadeus Basin. The Inlier is divided into four domains; the tenement area is located in the Eastern domain with protolith ages of  $\leq$  1845 Ma for sediments and 1817 Ma for granites. On the western margin of the EL is the Central domain comprising migmatitic metasediments plus felsic and mafic intrusives. The inlier is bounded to the south-west by the Woolangi Lineament, a structural zone trending ~303°. This direction parallels the G3 rift structure of O'Driscoll (parallel to 4A-4B corridor through Olympic Dam) [17].

An early tectonic event during the mid-proterozoic metamorphosed and dislocated the rocks into many fault-bounded blocks. The Late Proterozoic Arltunga Orogeny produced overturned strata and isoclinal folding. A later tectonic event, the Devonian-Carboniferous (~400-350 Ma) Alice Springs Orogeny, reactivated faults and generated thrust nappes.

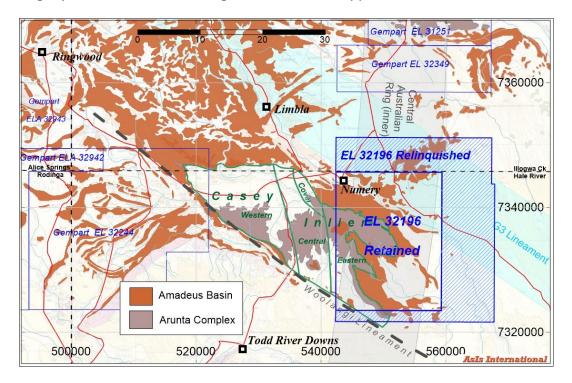


Figure 3. EL32196 - Project area regional geology

## 3.2 Project Area Geology

This description of the geology within EL32196 is derived from public domain Government and academic literature, mapping by Mithril and open file reports. A stratigraphic column relevant to the EL area is included at Figure 4, and geology maps included at Figure 5 and 6.

The Arunta Block consists of igneous and metamorphic rocks. On the Hale River 1:250,000 sheet they are undifferentiated, while to the north of the area they comprise mafic gneiss, metasediments and schist. Metamorphic grade is amphibolite facies. The presence of ultramafics has been recognised in later mapping.

In the central west of the tenement area are carbonatitic dykes known as Arthur Popes prospect. Eleven dykes up to two kilometres long and striking NE-SW have been identified. They have a silicified cap and comprise secondary epithermal fine grained granular quartz after possible coarse grained carbonate and contain, in places, elevated REO's. They crop out in Arunta age rocks but appear to pre-date Heavitree Quartzite.

The basal member of the Amadeus Basin is the Heavitree Quartzite a continental to shallow marine, red, quartz arenite to pebble conglomerate with minor siltstone. It rims the Casey Bore Uplift and occurs in a series of thrust sheets along the northern boundary of the basin in this area.

Disconformably overlying the Heavitree Quartzite is the Bitter Springs Group which is divided into three formations namely Gillen, Loves Creek, and Johnnys Creek. The Gillen Formation consists of evaporites and inter-bedded shale, sandstone and carbonates. Evaporites have acted as glide planes and formed salt domes from early in the development of the Amadeus Basin. The contact between the Gillen Member and Loves Creek Member is a disconformity.

The Loves Creek Formation disconfomably overlies the Gillen Formation and comprises predominantly dolostone, chert and limestone. The basal unit was deposited in a transgressive systems tract, with stromatolites forming as the water deepened. A gradual decline in the rate of sea-level rise and eventual sea-level still stand led to deposition of the upper unit in a prograding terrestrial and lacustrine environment.

The Johnnys Creek Formation is dominantly calcareous mudstones and dolostones deposited in shallow environments. At the top of the unit are basalts with amygdaloidal textures. These are the only observed volcanics in the Amadeus Basin sequence in the wider area. It is inferred they are likely tholeiitic and consistent with a plume-related source.

The Bitter Springs Group is in places overturned and isoclinally folded, due to the Late Proterozoic Arltunga Orogeny. This occurs within the tenement area on the north-east margin of the Arunta dome, where severely deformed Bitter Springs Formation is overlain by nearly flat lying Early Cambrian Pertaoorrta Formation sediments.

The Bitter Springs Group is terminated by an angular unconformity and overlain by the Wallara Formation. These rocks were deposited in a shallow marine environment and comprise dolostones and sandstones, and mudstones, in part carbonaceous. There is no mapped outcrop but it is intersected in drillhole CPDD003 at Pipeline prospect.

The Areyonga Formation unconformably cuts into different levels of the underlying strata including Bitter Springs Group and Wallara Formation. It consists of fluvial and glaciogene rocks, overlain by shallow marine and fluvial units. Silicified fragments of Heavitree Quartzite and Bitter Springs Formation have been noted in glaciogene sediments. There is no mapped outcrop but it is intersected in all three drillholes CPDD001-003 at Pipeline prospect.

Overlying the Areyonga Formation is the Aralka Formation, which consists of shallow marine carbonates and clastic sediments with minor shale. Within the Aralka Formation are the Ringwood Member which consists of dolostone and calcarenite, and Limbla Member comprising pebbly and sandy calcarenite, and festoon cross-bedded sandstone. There is no mapped outcrop but drillholes CPDD001 and 002 are collared in highly weathered clays interpreted to be Aralka Formation.

The Olympic Formation and Gaylad Sandstone were deposited between the Aralka and Pertatataka Formations. The Olympic Formation is a red and green mudstone and siltstone with intercalated sandstone which contains conglomerate and dolomite marker units. The Gaylad Sandstone is a coarse grained sandstone and conglomerate. Both units were deposited in fault controlled subbasins.

Subsequently, deep water deposition took place with the base of the overlying Pertatataka Formation being turbidites and deep water pelagic sediments, coarsening up to sandstones. The Julie Formation overlies the Pertatataka Formation with the boundary being transitional and represents shallow marine conditions with dolomite and limestone including thick bedded ooid grainstones.

On the Hale River 1:250,00 map sheet rare scattered outcrop was annotated, in accordance with the simpler stratigraphic succession of the time, as generic Pertatataka Formation. These outcrops may represent any of the units now assigned to the Aralka Formation, Olympic Formation or Pertatataka Formation.

In the north and central Amadeus Basin, deposition recommenced with the Pertaoorrta Group. Initially, red bed sandstone, siltstone and conglomerate of the Arumbera Formation was deposited, followed by carbonates of the Todd River Dolomite, Chandler Formation, Giles Creek Dolomite, Jay Creek Limestone and Shannon Formation. In the tenement area the Pertaoorrta Group is represented by the Arumbera Sandstone where it crops out as a flat lying sandstone to the northeast of Numery homestead. Deposition in the Amadeus Basin was brought to an end by the 450-300 Ma Alice Springs Orogeny, whereby north-south compression caused significant shortening and thrust disentombed Arunta Block to the south over Amadeus Basin sediments.

In the north-eastern quadrant of the tenement area are minor outcrops of sandstone assigned to the Cretaceous Hooray Sandstone and Jurassic De Souza Sandstone.

Outcrop over half of the tenement area is concealed beneath aeolian sand, and alluvium and river gravel along the Hale River.

# 3.3 Economic Mineral Potential

Within the tenement area there are no operating or historical mines, or mineral deposits. A small number of base metal prospects are located in Amadeus Basin rocks namely Pipeline and Pipeline North prospects. Carbonatitic dykes with elevated REO's occur in Arunta age rocks and may predate Heavitree Quartzite. Drainage and rock chip sampling, plus limited drilling, has revealed anomalous assays of copper and zinc, and elevated assays of Au, Pb, Ni, Cr, Ti, V, REO's and Y.

In the broader context the area has potential for many commodities. Mineralisation styles targeted by previous explorers include:

- Sedimentary copper mineralisation of Zambian Copperbelt style in the Amadeus Basin sediments, especially Bitter Springs Group.
- Unconformity uranium mineralisation at the contact between the Arunta Block and Amadeus Basin.
- Magmatic nickel and PGE in ultramafics mapped in Arunta Block.
- REE's in carbonatitic dykes intruding Arunta Complex rocks.
- Diamondiferous kimberlites associated with major structures such as the Woolangi Lineament.

On a regional scale mineral deposits in the Arunta Block and Amadeus Basin lithologies include:

- Vanadium-titanium-iron in Arunta Complex rocks at Mount Peake.
- Copper-silver-gold in Arunta Complex at Jervois.
- Mo-W in magnetite skarns in Arunta Complex at Molyhil.
- REE's in gneissic granite within Arunta Complex at Nolans Bore, and in pegmatites at Bluey's Folly.
- Cu-Pb-Zn-Au in magnetite skarns in Arunta Complex at Johnnies Reward.
- Gold in Heavitree Quartzite at White Range.
- Sandstone-hosted uranium in the Brewer Conglomerate at Angela and Pamela.
- Gold in Amadeus Basin sediments-volcanics at Golden Goose (Winnecke goldfields).

 Base metal mineralisation, particularly copper, is known to occur near the contact of Heavitree Quartzite and Bitter Springs Group at many places along the Arltunga Nappe Complex from Undoolya Gap, 100 km to the west near Alice Springs, through to Illogwa Creek 200 km to the east.

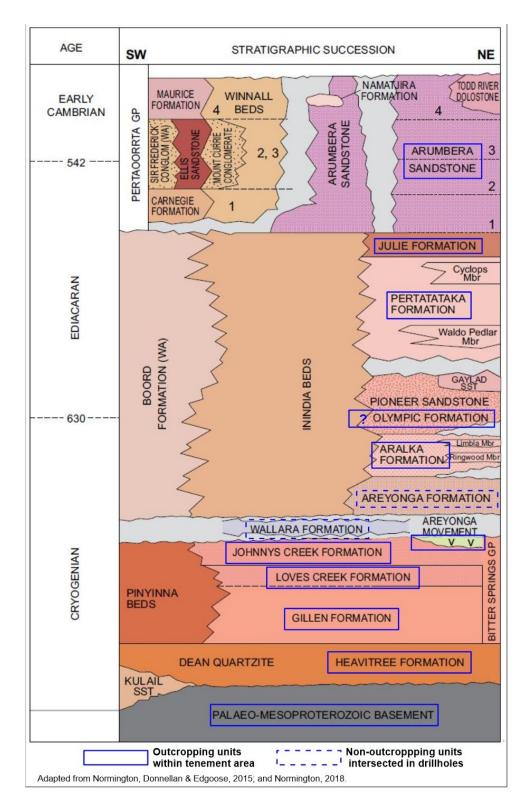


Figure 4. EL32196 Stratigraphy.

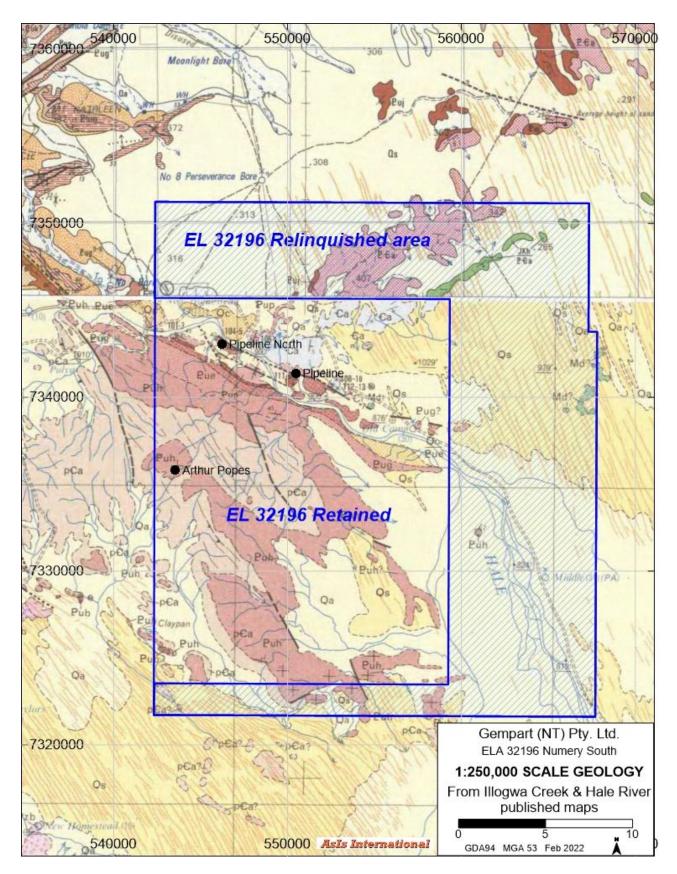


Figure 5. EL 32196 1:250 000 scale geology.

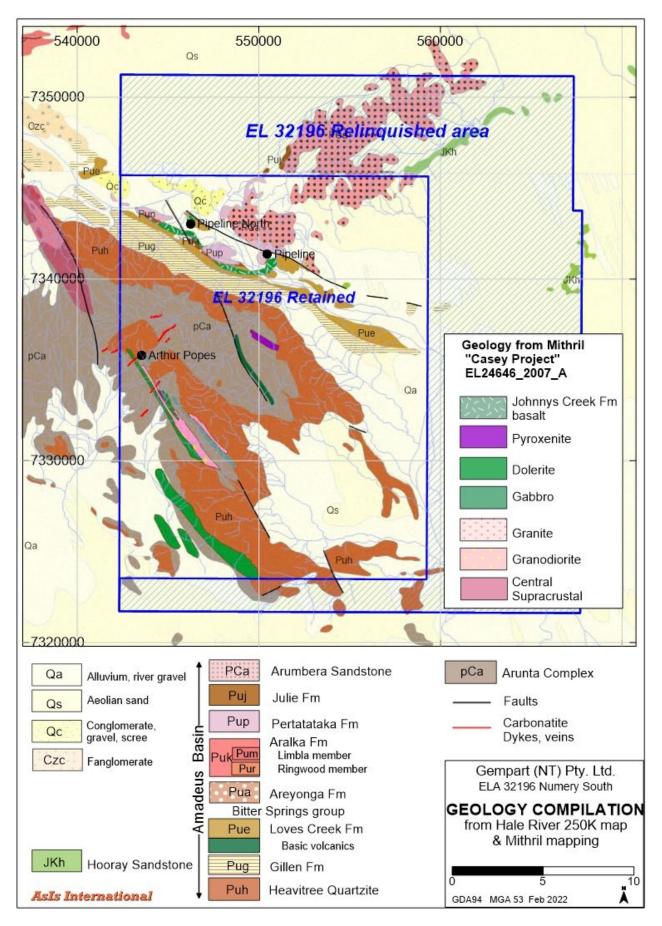


Figure 6. EL 32196 geology compilation from 250K maps and Mithril mapping.

# 4. PREVIOUS EXPLORATION

Numerous historical tenements have encompassed the area of EL32196. NTGS databases "Historical Mineral Titles" and "GEMIS" were interrogated to capture past exploration titles, and all relevant reports were reviewed. Very little work has been carried out on the relinquished part; a few surface samples but no drilling. Table 2 is a summary of historical titles and results reported. Previous exploration title relevant to the relinquished area of EL32196 and/or involving collection of new data are summarised thereafter. A plan showing previous exploration surface sampling is included at Figure 7.

Table 2. Historical mineral titles overlapping relinquished part of EL32196 & exploration work
summary

Title & Final Year	Titleholder, (Report reference) & exploration work
AP1923	McIntyre Mines (Australia) (CR1968-0062)
1968	Proposals for work but no data collected or exploration reported.
AP2459	North Broken Hill; Mines Exploration (CR1970-0058)
1969	Rock-chip sampling; no work on relinquished part.
AP2698	Fergusson, R; Underdown, LJR; Kruger, A (CR1971-0066)
1970	Geological discussions; a few assays from unlocated rock samples.
EL5363	Quadric - subsequently acquired by Sabminco N.L. (CR1989-0017)
1988	Stream sediment samples; no work on relinquished part.
EL5576	Pacific Arc Exploration N.L. (CR1989-0178)
1989	Reconnaissance only for gold and diamonds. No data reported.
EL6550	Central Rare Earths Corporation NL. (CR1990-0180)
1996	Sampling and shallow RC drilling for mineral sands. Four samples on
	relinquished part.
EL9335	Rio Tinto Exploration Pty. Ltd. (CR1998-0565)
1997	Mag-rad survey; rockchip, loam and drainage sampling; RC drilling.
	Two magnetic anomalies on relinquished part.
EL10270	Gutnick Resources N.L. (CR2004-0166)
2003	Stream sediment & rock chip sampling; no work on area of EL32196
EL24646	Mithril Resources Ltd. (CR2007-0754)
2010	Mapping, drainage & rockchip sampling, drilling, ground geophysics.
	No work on relinquished part.
EL25162	Maximus Resources Ltd. (CR2009-0723)
2009	Proposed uranium exploration; access issues; no work done.
EL25643	Sammy Resources/Mithril Resources Ltd. (CR2015-0414)
2015	Extensive soil sampling, geophysics, drilling but no work on EL32196.
EL27962	Crowl Creek Exploration Ltd. (CR2011-0758)
2013	Sampling of carbonatitic dykes at Arthur Pope's prospect. NO work
	on relinquished part.
EL28808 & 29397	Rara Terra Resources (CR2014-0213 & CR2014-0216)
2014	Data review for thermal coal. No data collected.

## 4.1 AP2459 – 1969. North Broken Hill Ltd / Exploration Division.

Mapping and rock chip sampling for base metals, particularly sedimentary-hosted copper [16]. Initial regional sampling subsequently focussed on Gillen Member and the Bitter Springs Formation, including in vicinity of Pipeline and Pipeline North prospects. The values obtained and the style of gossan observed could not justify a drilling campaign.

#### 4.2 AP2698 - 1970. Fergusson, R; Underdown, L.J.R.; Kruger, A.

This is one of four AP's inspected by Geopeko on behalf of the titleholders [9]. They concluded "There is insufficient data available on these tenements areas to determine whether or not these licences are likely to host economic mineralisation. Copper mineralisation is known to occur within the permits".

## 4.3 EL5363 - 1988. Quadric (acquired by Sabminco N.L.)

The primary target was gold mineralisation associated with a NNW-SSE trending fault zone cutting both the gneiss of the Arunta Complex and Heavitree Quartzite [2]. Gold in thrust faults and gold-nickel and PGEs in carbonate-veined ultramafic plugs were secondary targets. 45 stream sediment samples were initially collected and assayed for Au, Cu, Pb, Zn, Ag and As. Eight plot within EL32196; none within the relinquished part. A further 20 follow-up samples were collected. Six BLEG samples were anomalous in gold, including one in EL32196. The final report stated "These justify further work in the area."

## 4.4 EL6550 - 1990. Pancontinental Resources (Exploration) Pty. Limited

Mineral sands exploration conducted on EL6550 under a JV between Mules and Bruce (Central Rare Earths Corporation NL) and Pancon, comprising reconnaissance mapping and alluvial sediment sampling. Seven samples were collected on EL32196, of which four are on the relinquished part. [10]. Drill hole and ground magnetic traverses were also undertaken, including 9 RC holes on EL32196 (retained) and three RC holes on the relinquished part. Heavy mineral concentrations were found to be too low to be of economic interest.

#### 4.5 EL9335 - 1998. CRAE / Rio Tinto Exploration

Rio Tinto explored for base metals, uranium, and diamondiferous intrusions within a series of ELs of which EL9335 encompasses most of EL32196 [6]. Targets included the Amadeus Basin sediments, particularly the contact between the Heavitree Quartzite and Gillen Member (Bitter Springs

Formation) looking for stratabound, sediment-hosted copper (African Copper Belt, Kupferschiefer) and unconformity-related uranium mineralisation.

An airborne high resolution magnetic and radiometric was flown; data quality is average and uranium channel unusable. This identified a 2,500 nT magnetic anomaly over Heavitree Quartzite, located within the retained part of the tenement. Ground magnetics and gravel or loam sampling was completed over 33 aeromagnetic anomalies; two of these occur within the relinquished part. No diamonds or indicator minerals were recovered.

Within the relinquished area no further work was carried out.

## 4.6 EL10270 - 2003. Gutnick Resources N.L.

The Rand Project comprised 22 EL's and was a joint venture between Gutnick Resources N.L. (manager) and Johnson's Well Mining N.L. [23]. Exploration for gold was conducted using a new genetic interpretation for the Witwatersrand mineralisation in South Africa. Stream sediment and rock chip sampling returned several anomalous gold and silver values to maximum values of 25 ppb and 5 ppm respectively. No samples were collected within the area of EL32196.

## 4.7 EL24646 - 2010. Mithril Resources Ltd.

The Casey Project area was selected following mapping by the Northern Territory Geological Survey, who identified previously unknown ultramafic rocks that were considered prospective for Ni-Cu-PGE sulphide mineralisation [3], [13]. Reconnaissance sampling delineated Cu gossans (Pipeline Prospect) within Amadeus Basin sediments and the NTGS rediscovered the Arthur Pope's Cu Prospect. Work completed included:

- · Ground magnetic surveys (69.6 line km) at Pipeline and Arthur Popes,
- · Fixed loop ground EM survey (10 line) at Pipeline,
- · Dipole-dipole IP surveys (6 lines) at Pipeline and Arthur Popes,
- · Diamond drilling (3 holes for 590 m) at Pipeline,
- Prospect mapping, stream sediment and rock chip sampling at Arthur Popes, Pipeline, Pipeline North, western ultramafic and central ultramafic
- · Regional mapping, and stream sediment and rock chip sampling,
- · A regional gravity survey at 1 x 1 km spacing as part of "bringing forward discovery"

Multi-element assays were completed on the 385 rock chip samples, and 72 -80# and +80 mesh fractions of the stream sediment samples.

No work was carried out on the relinquished part of EL32196.

The regional gravity data acquired by Mithril is too coarse to define prospect-scale anomalies. It better defines structures in a broad 20 milliGal high generally corresponding to the Eastern Domain of the Casey Inlier. The source of the gravity high is unknown; it presumably represents a significant thickness of upwardly thrust Arunta Block.

## 4.8 EL25643 - 2013. Sammy Resources/Mithril Resources Ltd.

Extensive exploration program including mapping, soil sampling, airborne and ground geophysics and drilling [12]. All activities located on that part of the tenement to the north of EL32196.

## 4.9 EL27962 - 2013. Crowl Creek Exploration/Kidman Resources Ltd.

Primary exploration target was rare earth elements in carbonatitic dykes [5]. These were discovered by the Northern Territory Geological Survey in 2006, with a chert sample returning 1.66% REO +  $Y_2O_3$  Extensive multi-element assays on 98 rock chip samples confirmed elevated and variable REO content. It was concluded that, based on the study of a kimberlite with a siliceous cap probably similar to the Arthur Pope's dykes, the REE content is likely to increase with depth below the silicified cap.

No work was carried out on the relinquished part of EL32196.

## 4.10 EL29397 & EL28808 - 2014. Rara Terra Resources Pty Ltd.

A subsidiary of Ebony Coal Ltd, these tenements were secured to assess the potential for thermal coal in the Purni Formation in Permian Pedirka Basin sediments [18], [19]. Data reviews failed to justify further exploration expenditure, no new data were acquired, and the tenements were surrendered.

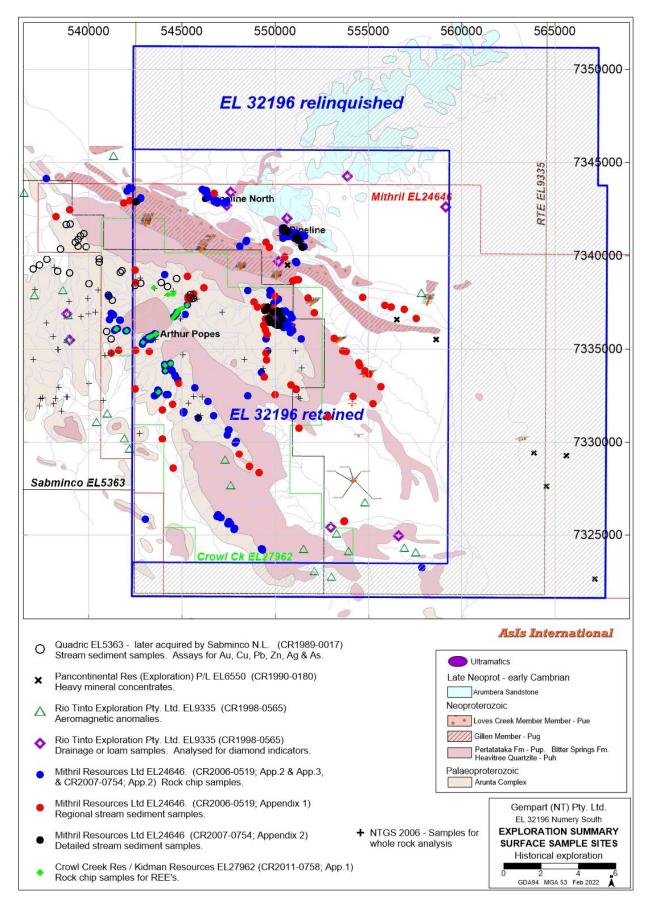


Figure 7. EL32196 Previous exploration - surface sample sites.

# **5. EXPLORATION COMPLETED**

## 5.1 Exploration completed in year one to January 2021

The following work was completed in the first year of tenure of EL32196. No work was carried out on the relinquished part of the tenement.

- 1. Review and assessment of previous exploration results and currently available geophysics.
- 2. Detailed interpretation of large magnetic anomaly evident in public domain data.
- 3. Field trip to Arthur Popes and Pipeline prospects including geological descriptions and pXRF readings on nine samples from each prospect.
- 4. Successful application for co-funding of a detailed airborne magnetic/radiometric survey under Round 13 of the NTGS Geophysics and Drilling Collaborations program.

# 5.2 Exploration completed in year two to January 2022

The following work was completed in the second year of tenure of EL32196. No work was carried out on the relinquished part of the tenement.

- 1. Detailed magnetic/radiometric survey co-funded under Round 13 of the NTGS Geophysics and Drilling Collaborations program.
- 2. Airborne EM (VTEM) survey.
- 3. Field trip to inspect VTEM anomaly areas.

# 6. CONCLUSIONS & RECOMMENDATIONS

Results of previous exploration, especially that by CRAE and Mithril, confirms the Arunta Complex and Amadeus Basin lithologies in EL32196 are prospective for a range of commodities including copper, lead, zinc, nickel, cobalt, vanadium, PGE's and REE's. Historically, substantial surface sampling has been followed up by limited drilling, with much of the geochemical anomalism unexplained. The areas of interest, and focus of work by Gempart, occur in the central part of the tenement where a dome of Arunta Complex rocks form the Eastern Domain of the Casey Inlier.

The peripheral areas are largely under cover and are of little exploration interest in the current program. In consequence these areas have been relinquished.

## 7. REFERENCES

- 1. Agip Australia, 1979. Final Report on Exploration. Northern Territory Geological Survey, Open File Company Report CR1979-0071.
- 2. Barraclough, D. and Glasson, M., 1988. Annual Report on EL 5363 Casey Bore. Northern Territory Geological Survey, Open File Company Report CR1989-0017.
- Burton, P.E., 2006. First annual technical report for the period 16 December 2005 to 15 December 2006. Northern Territory Geological Survey, Open File Company Report CR2006-0519.
- 4. Close, D., Scrimgeour, I., Carson, C. and Claoué-Long, J., 2007, Diverse terranes and mineral potential of the Casey Inlier, Arunta Region. In Annual Geoscience Exploration Seminar (AGES) 2007. Record of Abstracts. Northern Territory Geological Survey *Record 2011-003*.
- Cooper, S.A., 2011. Hale River EL 27962 First annual technical report for period ending 29 September 2011. Northern Territory Geological Survey, Open File Company Report CR2011-0758.
- Davies, A., 1998. EL 9330 Cleary Creek, EL 9332 Loves Creek, EL 9335 Moonlight Bore, EL 9337 Salt Hole and EL 9340 Albarta Dam, Second and Final Report for the period ending 30 May 1998. Northern Territory Geological Survey, Open File Company Report CR1998-0565.
- 7. Ding, P., James, P.R. and Sandiford, M., 1992. Late proterozoic deformation in the Amadeus Basin, Central Australia. Australian Journal of Earth Sciences. Vol. 39,1992 Issue 4.
- Dodge, R. A. & Associates, 1968. Report on the Numery Prospect. Northern Territory. for McIntyre Mines (Australia) Pty. Ltd. Northern Territory Geological Survey, Open File Company Report CR1968-0062.
- 9. Faulkner, J. W., 1971. Inspection of Authorities to Prospect Harts Range Area. Northern Territory Geological Survey, Open File Company Report CR1971-0066.
- Graham, J.M., 1990. Combined Annual Report for Period 11 February 1989 to 10 February 1990 Hale River Project, Northern Territory for Exploration Licences 6382 & 6550. Northern Territory Geological Survey, Open File Company Report CR1990-0180.
- Green, M., 2007. Second Annual Technical report on EL24646 Casey Project for the period 16 December 2006 to 15 December 2007. Northern Territory Geological Survey, Open File Company Report CR2007-0754.
- Lockheed, A. And McKinnon-Matthews, J., 2015. EL25643 Mount Isabel and EL 25653 Acacia Bore Sammy JV Project Annual and final technical report for the period 20 August 2014 to 9 June 2015. Northern Territory Geological Survey, Open File Company Report CR2015-0414.
- 13. McKinnon-Matthews, J., 2010. Fifth and final technical report on EL 24646 Casey Project for the period 16 December 2005 to 15 December 2010. Northern Territory Geological Survey, Open File Company Report CR2010-0880.

- 14. Normington, V.J., Donnellan, N. and Edgoose, C., 2015, Neoproterozoic evolution of the Amadeus Basin: evidence from sediment provenance and mafic magmatism. In Annual Geoscience Exploration Seminar (AGES) 2015. Record of Abstracts. Northern Territory Geological Survey *Record 2015-002*.
- 15. Normington VJ, 2018. Revised stratigraphy of drillholes CPDD001, CPDD002 and CPDD003, Pipeline Prospect, northeast Amadeus Basin. *Northern Territory Geological Survey, Record* 2017-015.
- North Broken Hill Ltd. / Exploration Division, 1969. Final Report on AP 2459 copper search and Hale Ironstones. Northern Territory Geological Survey, Open File Company Report CR1970-0058.
- 17. O'Driscoll, E.S.T., 1997. "Mineral deposits related to Australian continental ring and rift structures with some terrestrial and planetary analogies". Global Tectonics and Metallogeny, Vol. 6, No. 2.
- Raffan, N., 2014. EL 28808 Hale River Project Final and annual report for the year 13 March 2012 to 17 March 2014. Northern Territory Geological Survey, Open File Company Report CR2014-0213.
- 19. Raffan, N., 2014. EL 29397 Hale River Project Final and annual report for the year 13 March 2012 to 17 March 2014. Northern Territory Geological Survey, Open File Company Report CR2014-0216.
- 20. Shaw, R.D., 1968. Hale River, N.T. 1:250,000 Geological series Explanatory Notes SG/53-3. Bureau of Mineral Resources, Geology and Geophysics.
- 21. Shaw, R.D. and Freeman, M.J., 1985. Illogwa Creek, N.T. (Second Edition). 1:250,000 Geological series Explanatory Notes SF/53-15. Bureau of Mineral Resources, Geology and Geophysics.
- 22. Szabo, L., 1989. Final Report Hale River period 16-03-1988 to 08-02-1989. Northern Territory Geological Survey, Open File Company Report CR1989-0178.
- 23. Washburn, C., 2004. Joint surrender report for the period 28th March 2001 to 23rd July 2003. Northern Territory Geological Survey, Open File Company Report CR2004-0166.