Report ARU-18/001

ANNUAL REPORT FOR EL 31284, YEAR ENDING 14 DECEMBER 2017.

By

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REPORTING DETAILS

Titleholder	Arafura Resources Limited
Operator (if different from above)	as above
Titles/tenements	EL 31284
Tenement Manager	as above
Mine/Project Name	Aileron-Reynolds project
Report Title	Annual report for EL 31284, year ending 14 December 2017.
Personal author(s)	Kelvin Hussey BSc(Hons) MAIG, FSG
Corporate author(s)	Arafura Resources Limited
Target commodities	Rare Earth Elements
Date of report	12 February 2018
Datum/zone	GDA94/Zone 53
250 000 K mapsheets	Napperby (SF53-9)
100 000 K mapsheets	Aileron (5552), Napperby (5452)
Contact details	Kelvin Hussey khussey@arultd.com

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SUMMARY

EL 31284 was granted to Arafura Resources on 15 December 2016 for a period of six years. The tenement covers 73 blocks or 231.23km^2 and is located on the NAPPERBY 1:250,000 geological map sheet, about 30km southwest of Aileron and 140 km northwest of Alice Springs in the Northern Territory. EL 31284 is mostly covered by unconsolidated Quaternary units overlying the Cainozoic Whitcherry Basin and Palaeoproterozoic Arunta Region rocks.

EL31284 contains low-order airborne radiometric Th targets worthy first-pass exploration. The Th radiometric signature suggests a greater concentration of REE-enriched heavy minerals (*e.g.* monazite) may occur within the palaeochannels shedding off the nearby Reynolds Ranges. HM sampling and analysis was planned in mid-2017 to test for the presence of monazite-enriched sediments. Unfortunately, no exploration fieldwork occurred on EL31284 in the reporting period because the company was focussed on the Supplemental Report for the Nolans project EIS.

Three separate groundwater baseline monitoring trips were completed within EL31284 during the reporting period. The monitoring results and detailed hydrological modelling of the area were presented in the Draft and Supplemental Report for the Nolans Project EIS.

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INTRODUCTION

LOCATION AND ACCESS

The tenement is located about 30km southwest of Aileron, and 140 km northwest of Alice Springs in the Northern Territory.

The nearest areas of occupation are Napperby, Laramba, Aileron and Alyuen (Figure 1). The Aileron Roadhouse is just off the Stuart Highway and provides limited services. Alice Springs is the major population centre of the region and provides most services.

The tenement can be reached by a well-formed gravel road which passes through the centre and links Napperby Station to the Stuart Highway. The area contains a few tracks and fence lines though access along these can be rendered impassable after periods of heavy rain.

CLIMATE AND VEGETATION

The climate for the area is arid with predominantly summer rainfall. It is characterised by long hot summers, when temperatures regularly exceed 40°C, and short mild winters. Frosts are occasionally experienced.

Official observations have been recorded at Aileron Station (Bureau of Meteorology Station 15543) from 1949-2009 but there are gaps and basically no data after April 2005. The Bureau of Meteorology reports a mean and median annual rainfall at Aileron Station of 297 and 244 mm for that period. The mean and median rainfall at Territory Grape (Bureau of Metrology Station 15643) about 70 km northeast, is about 323 and 298 mm, respectively, for 1987-present. A variety of other observations have also been recorded at the Territory Grape Farm. The mean maximum daily temperature exceeds 35°C for November to February inclusive, with January being the hottest month at 37.5°C. The lowest mean daily minimum temperature is 5.1°C in July. The highest and lowest temperatures recorded at Territory Grape are 46.2°C and -4°C, respectively. The mean monthly 9 am wind speed ranges from 13 to 20 km/hr and averages 15 km/hr. Winds are predominantly from the east and southeast with a maximum recorded wind speed of 91 km/hr. Arafura established an automated weather station at Nolans Bore in September 2008. The results of this station are generally consistent with the Ti Tree Farm measurements although the readings do vary given the distance and the scattered nature of storms in this region.

TOPOGRAPHY

The area is situated on a gently sloping sand plain on the southern side of the Reynolds Range (Figures 1 and 2). Small stabilised linear sand dunes occur near the Reaphook Range in the southwest part of the tenement but are more common further south. Isolated rocky outcrops occur in the southwestern, central-eastern, and northern parts of this tenement.

LOGISTICS

Alice Springs (pop. 27,000) is serviced daily by jet aircraft from several Australian capital cities. The town is also well serviced by road and rail transport and interstate buses. The Stuart Highway passes the Aileron Roadhouse which is about 30 kilometres northeast of the project area.

A standard gauge railway line joins Alice Springs to Port Augusta and Adelaide to the south and Darwin in the north. The railway line is about 80 km east of the project area. An existing natural gas pipeline passes through the tenement area, linking the Mereenie Field in the Amadeus Basin (west of Alice Springs) to Darwin.

TENURE

Exploration Licence 31284 was granted 100% to Arafura Resources Limited (ACN 080 933 455) on 15 December 2016 for a period of six years. The tenement covers 73 blocks or 231.23km^2.

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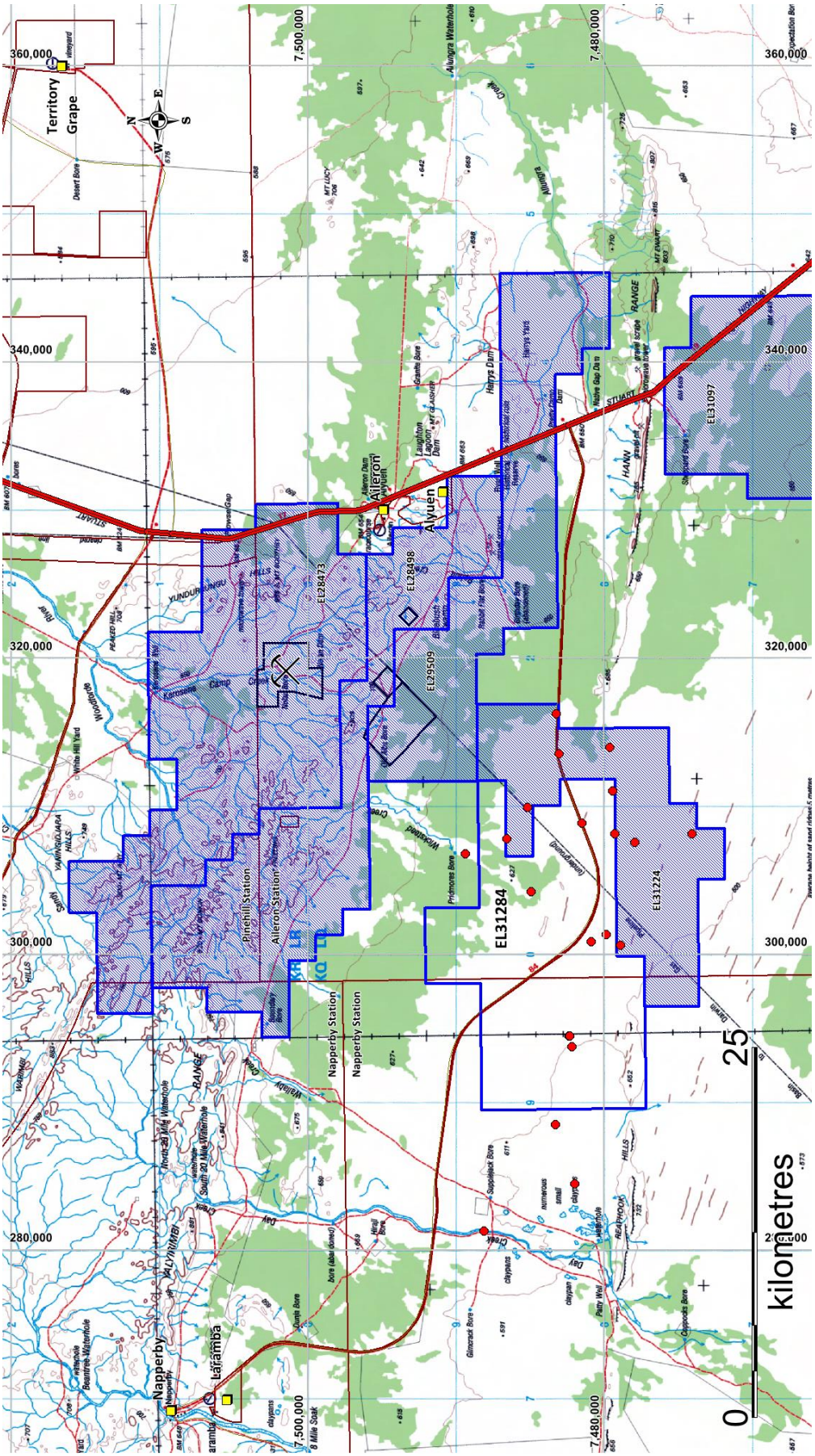

Figure 1. Regional topographic map showing EL31284 and other Arafura tenements, land boundaries and localities of note.

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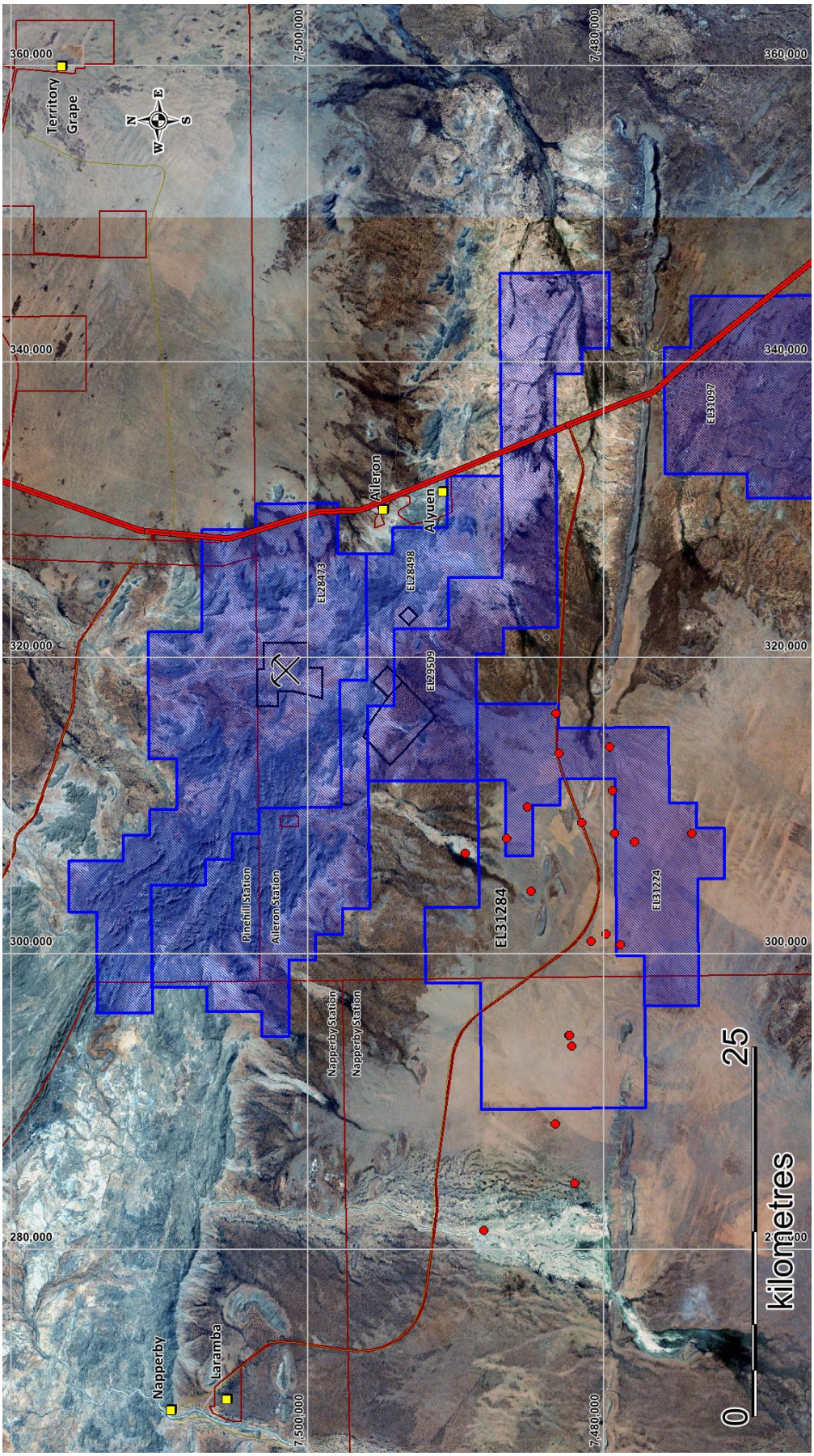

Figure 2. Landsat7TM image sowing EL31284, land boundaries and localities of note.

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GEOLOGY

REGIONAL SETTING

The Aileron-Reynolds project area is in the Aileron Province of the Arunta Region and includes part of the Ngalia Basin in the central-southern Northern Territory (Figure 3). A veneer of Cainozoic sediments covers part of the project area.

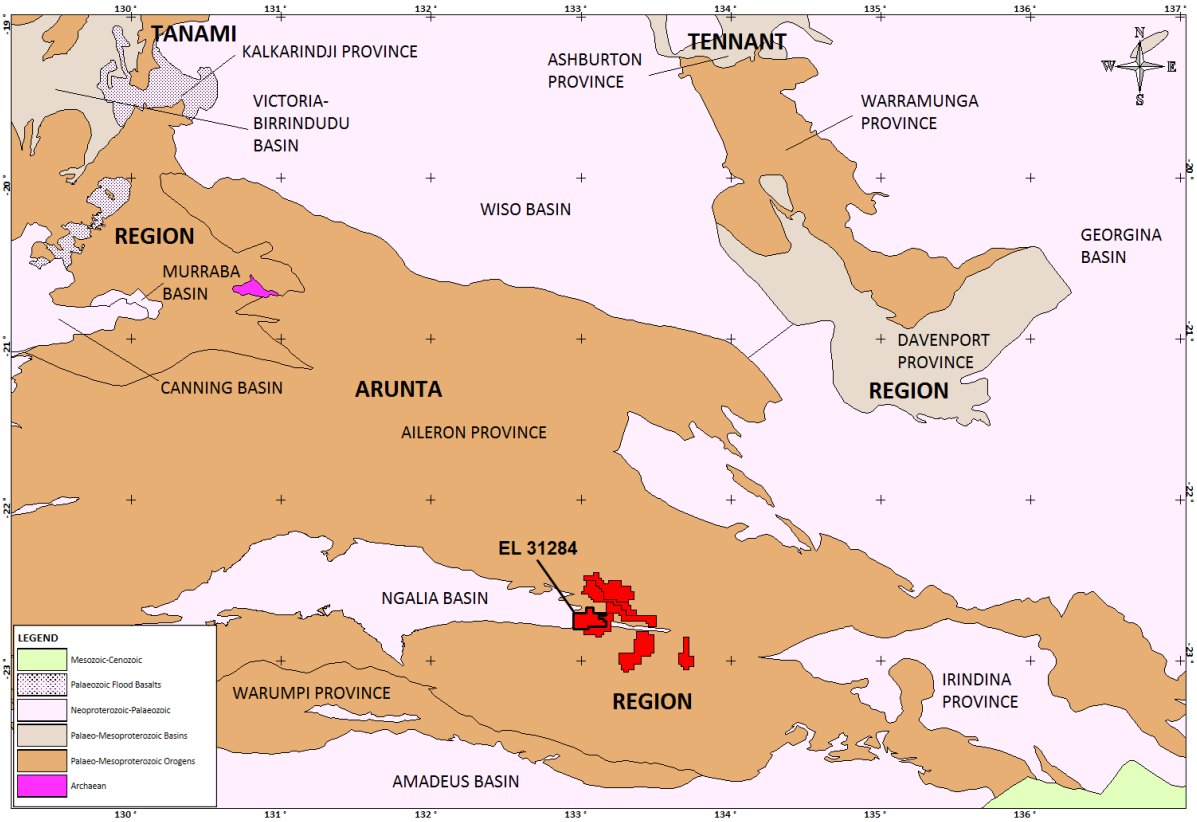

Figure 3. Gelogical provinces of the central-southern Northern Territory showing the location of Arafura's tenements in the Aileron-Reynolds project region.

The Proterozoic rocks of the Aileron Province host the world-class Nolans Bore REE-P-U deposit and are considered prospective for additional REE resources. This region consists of variably exposed, greenschist to granulite facies metamorphosed sedimentary and igneous rocks. Cainozoic sedimentary units are deposited in localised depocentres across the region (palaeovalleys). These are of geological interest, as a long-term sustainable water supply is required to support the development of the Nolans Bore REE mine and processing plant. Some of the Arunta basement rocks in this region have elevated Th and U contents, meaning there is a potential to accumulate REE-enriched heavy minerals in alluvial deposits derived from these rocks.

The regional geology for the project area is illustrated in Figure 3. Figure 4 is derived from digital copies of the Napperby (Stewart 1982), Alcoota (Shaw and Warren 1975), Hermannsburg (Warren and Shaw 1995) and Alice Springs (Shaw and Wells 1983) 1:250,000 Geological Map Series. Most of Arafura's tenements in the general project area are located on Napperby and the reader is referred to the various published geological maps, legends and explanatory notes for the map sheets noted above. The Reynolds Range Region 1:100,000 Geology Map is also available (Stewart and Pillinger 1981) and provides more detailed geology for the north western parts of the general project area. Stewart *et al* (1980) provides detailed geological descriptions and definitions for all mapped units in the project area. Shaw *et al* (1975, 1979) provides a similar level of detail for all mapped units in the areas surrounding the tenements in Figure 4. Images of the airborne radiometric, magnetic and electromagnetic surveys covering the same area are presented in Figures 5-7, respectively. These geophysical images were derived by reprocessing and merging all available open-file and NTGS datasets together with Arafura's dataset.

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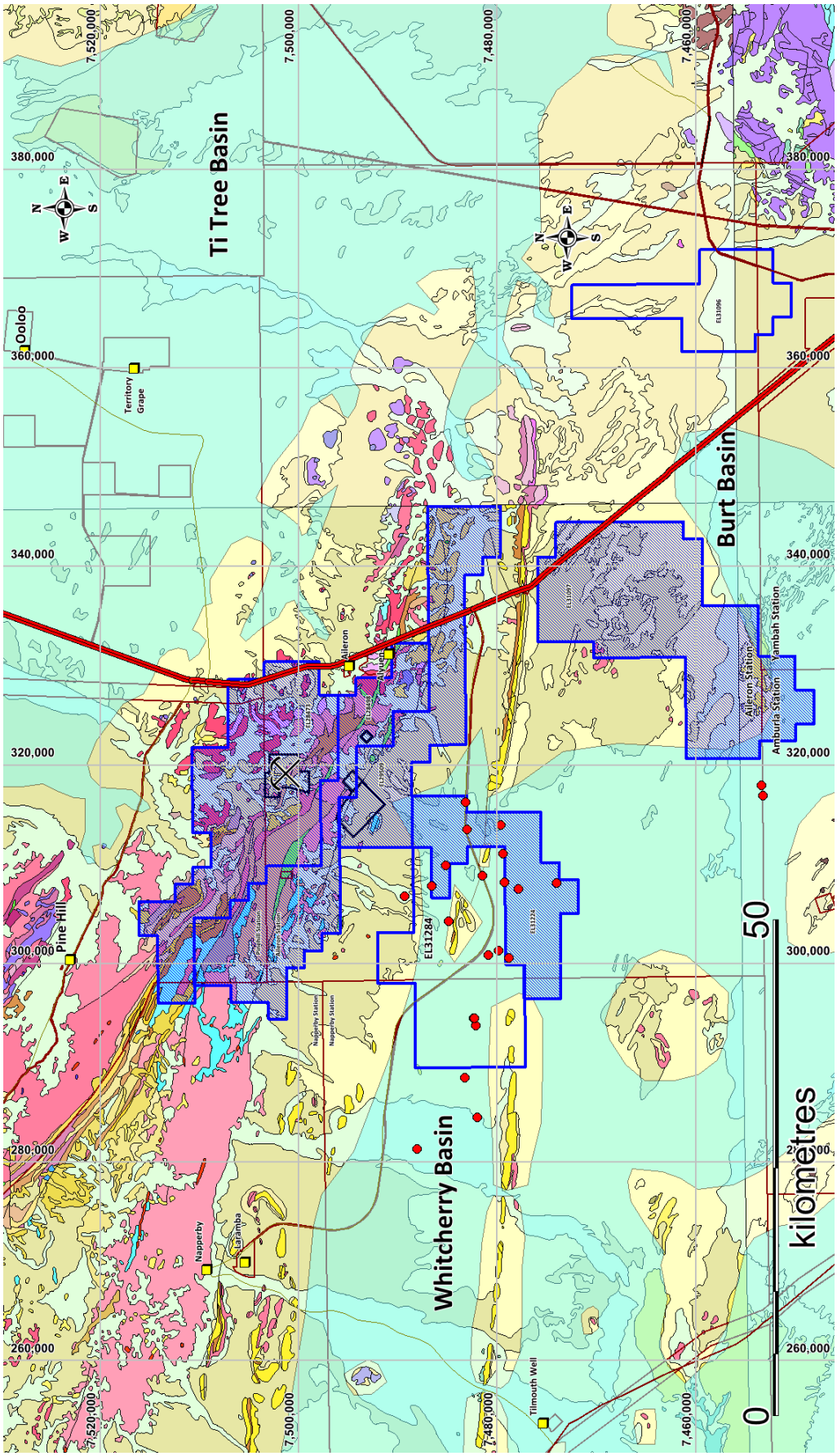

Figure 4. Regional geology of project area based on digital copies of published maps. The geology has been modified to show the approximate distribution of the concealed Cainozoic basins (pale blue overlay).

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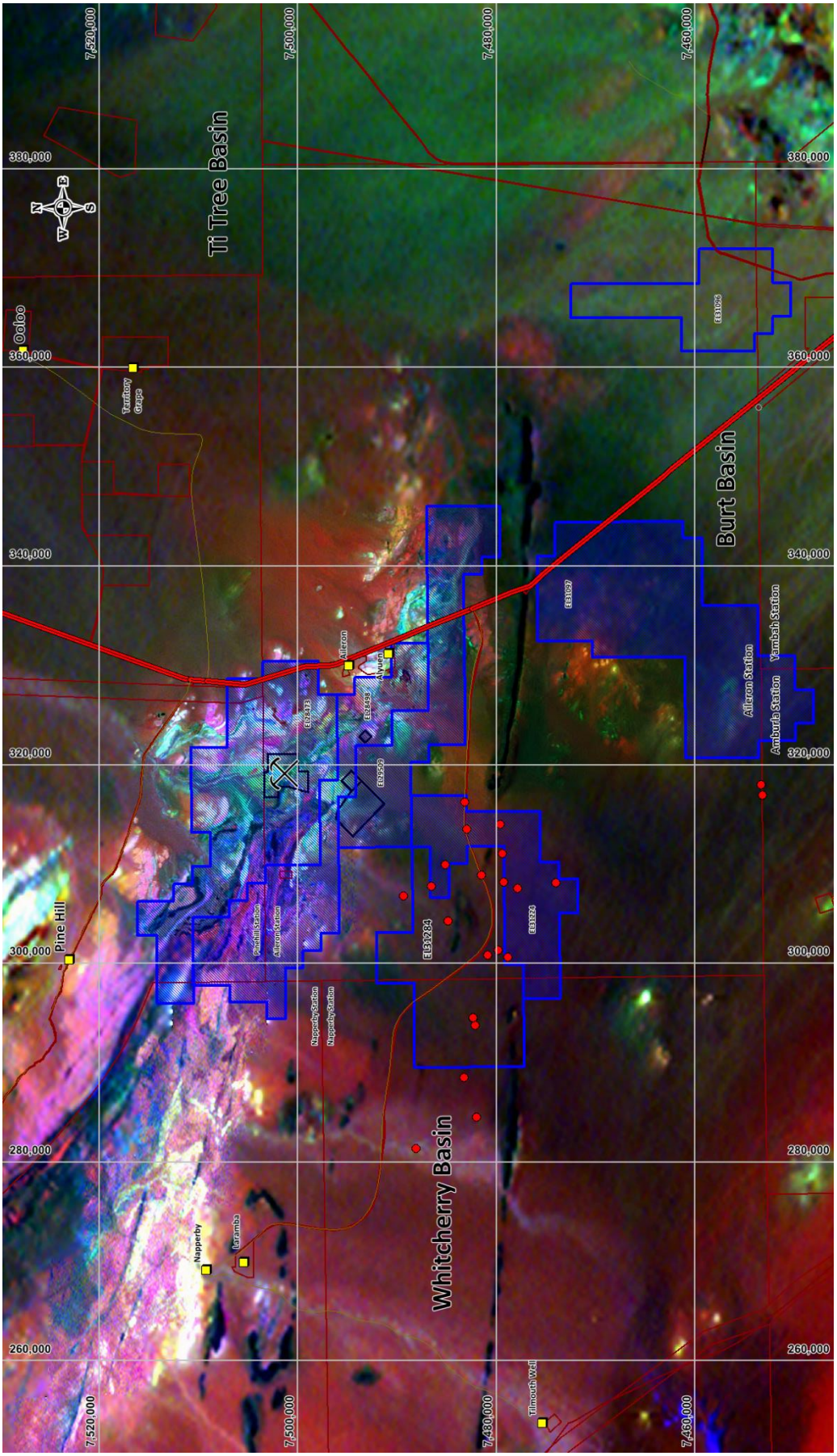

Figure 5. Regional airborne ternary radiometric image with K, U and Th shown in RGB.

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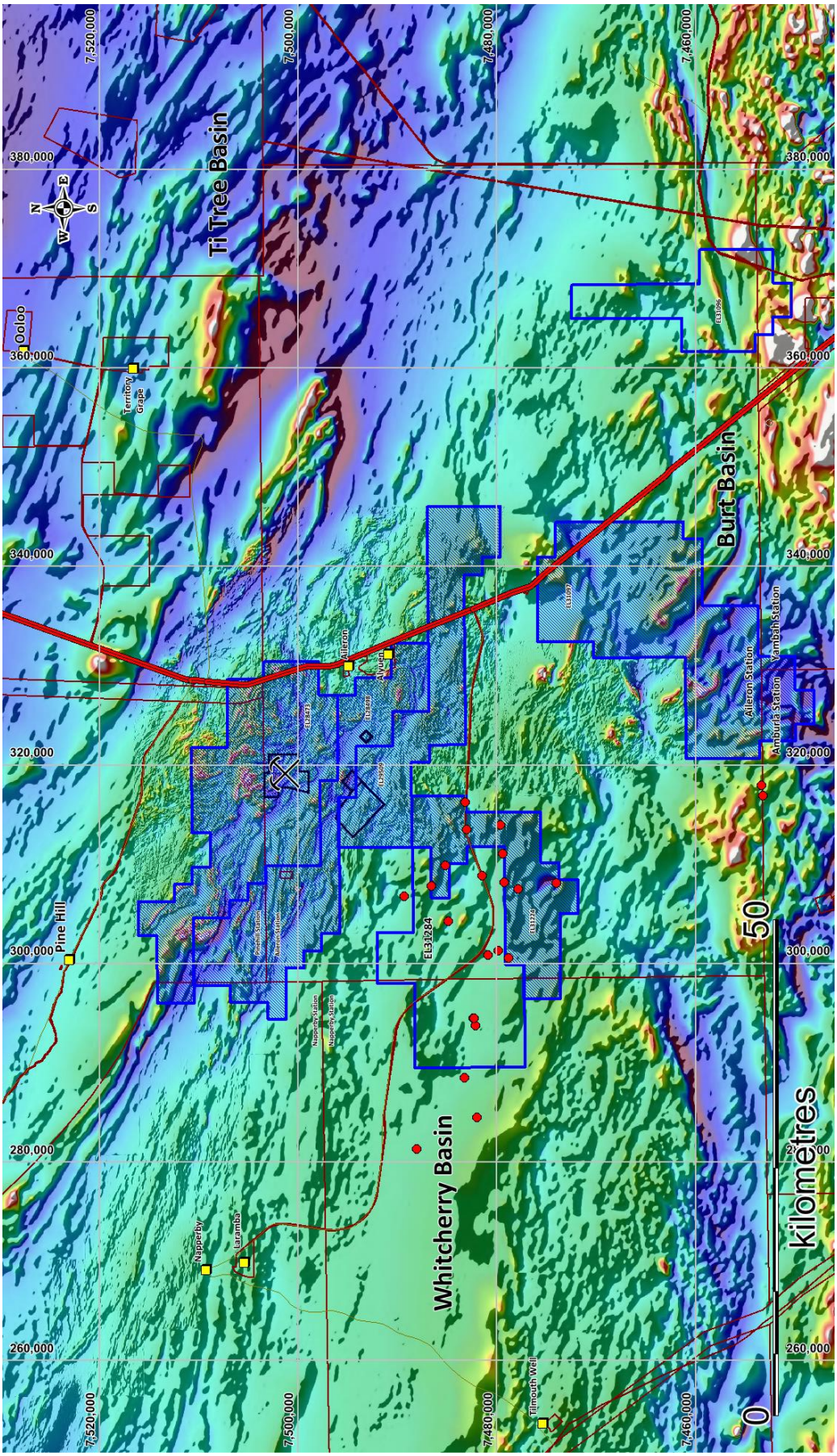

Figure 6: Regional airborne magnetics showing TMI enhanced using a NE shade angle.

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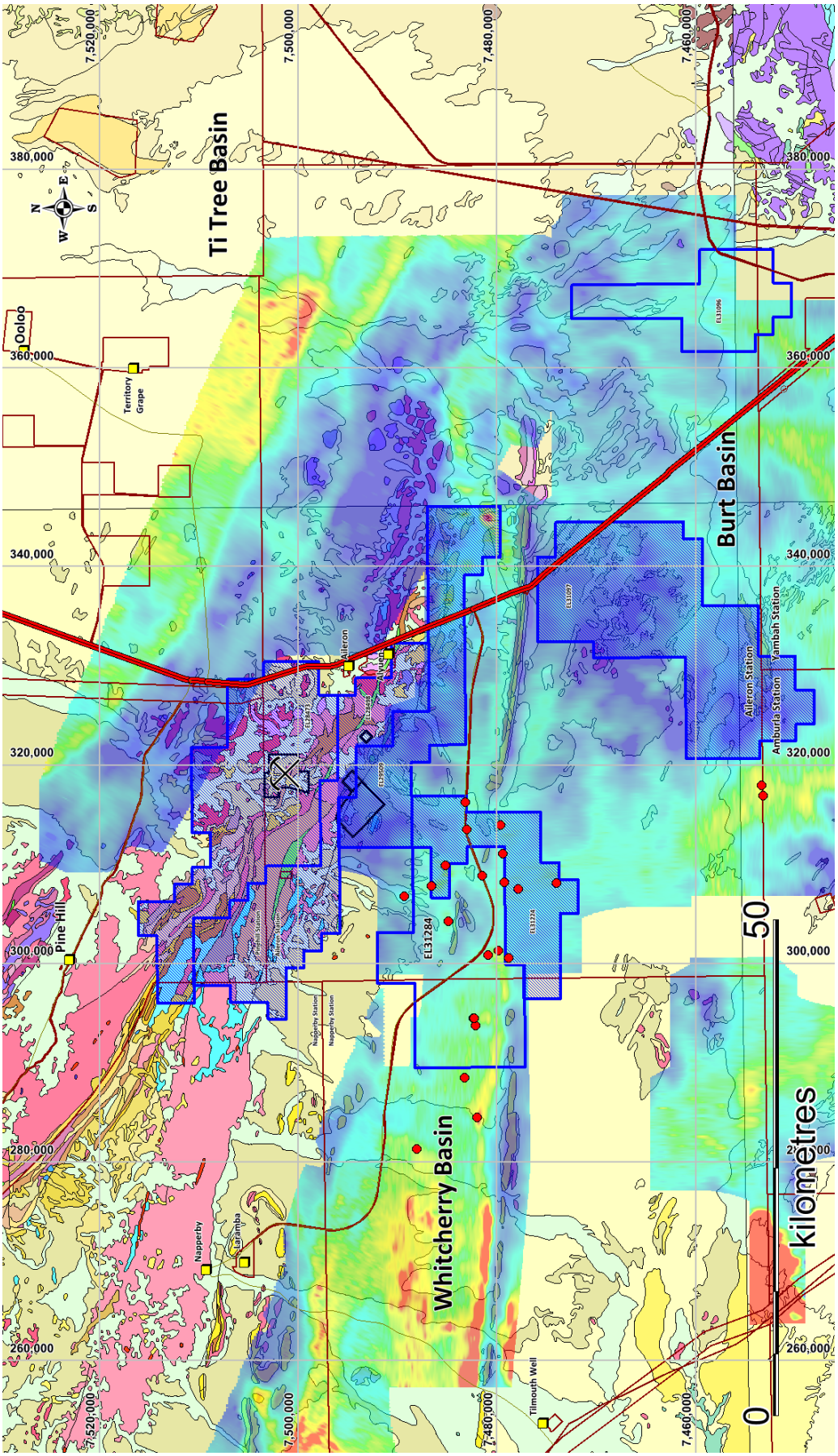

Figure 7: Reprocessed regional AEM conductance image draped on the regional geology.

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Figure 4 shows that unconsolidated Quaternary sand, soil, alluvium and colluvium which is mapped Qs, Qr, Qa (yellow, pale green and light blue, respectively) blankets much of the area surrounding the Reynolds Range and covers most of the tenement area. The geophysical data indicates areas of shallowly buried “explorable” basement occurs throughout the region in places. The unconsolidated transported cover conceals underlying Tertiary Basins with their historically interpreted distribution shown in Figure 4. A more refined distribution of these Tertiary units can be interpreted using regional AEM (Figure 7). Arafura used this AEM survey data to devise a groundwater investigation program with the drill holes, shown as red dots on Figure 2 and Figures 4-7, intersecting significant thicknesses of Tertiary sedimentary units. The results of these investigations and ongoing monitoring are reported in Arafura’s Draft EIS and Supplementary Report for the Nolans Project.

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PREVIOUS INVESTIGATIONS

REGIONAL

Records of systematic exploration in the Reynolds Range region date back as early as 1948 (Thevissen 1995) but most investigations date from about 1965 (Stewart 1982). Exploration beneath the surrounding sand plains has been limited. The historic exploration activities overlapping EL31284 have been researched using NTGS's STRIKE and is summarised in Table 1 below.

Table 1: Summary of historic exploration

Term of Grant	Tenement	Exploration Company	Exploration Targets/Commodities	NTGS Open File Company Report(s)
14/05/1972-13/05/1974	EL256	CENTRAL PACIFIC MINERALS	U	CR1974-0080, CR1974-0035, CR1973-0137
31/10/1977-30/10/1978	EL1658	CENTRAL PACIFIC MINERALS	U	CR1978-0097
24/01/1981-23/01/1982	EL2066	AGIP AUSTRALIA PTY LTD	U	CR1982-0007
25/03/1983-24/03/1989	EL3003	YUENDUMU MINING COMPANY	Cu, Pb, Zn, Co, Ni, Sn, Ag, Cr, W	CR1984-0258
19/11/1987-19/02/1990	EL5511	COLCHIS MINING CORPORATION	Au, Cu, Pb, Zn, Ag	CR1990-0366, CR1989-0020
15/03/1994-14/03/2000	EL8411	PNC EXPLORATION (AUSTRALIA) PTY LTD	U	CR1996-0187, CR1995-0266
28/03/2001-23/07/2003	EL10251	HAWTHORN RESOURCES LIMITED (GUTNIK RESOURCES)	Au	CR2004-0166, CR2003-0351
19/12/2005-27/02/2013	EL24625	CAULDRON ENERGY LIMITED	U, Fe	CR2013-0350, CR2012-1144, CR2012-0063, CR2011-1072, CR2010-0950, CR2009-1106, CR2009-0984, CR2008-0926, CR2007-0625, CR2006-0645
13/04/2006-3/07/2013	EL24746	NORTHERN MINING LIMITED	U, Cu, Ni, Co, and PGE	CR2013-0833, CR2013-0412, CR2012-0394, CR2012-0393, CR2011-0431, CR2011-0265, CR2010-0306, CR2009-0694, CR2009-0693, CR2008-0165, CR2007-0149
2/01/2013-16/01/2014	EL29503	ARAFURA RESOURCES LIMITED	REE	CR2014-0091

All historic mineral exploration work has largely focussed elsewhere within the overlapping historic tenements.

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Searches of the historic exploration activity in this area indicate there have been airborne geophysical surveys covering the tenement area (*e.g*. AEM shown in Figure 7). However there has been no on-ground mineral exploration sampling activity or drilling within the tenement area.

Arafura reprocessed the historic open-file AEM datasets covering this region and then used them to devise and complete two drilling programs in 2012-14 as part of groundwater investigations to support the development of the Nolans Project. These groundwater investigations have been reported in Arafura's Draft EIS and Supplemental Reports. The work by Arafura demonstrates considerable groundwater is present within the Tertiary units. Groundwater investigations demonstrate the Tertiary units are up to about 200m thick in the western parts of the tenement area but clearly there are areas of shallow cover with near-surface Arunta basement rocks in the north. Arafura's studies and modelling of the groundwater within these Tertiary units indicates there is an adequate brackish water supply to support the development of the Nolans Project.

INVESTIGATIONS BY ARAFURA

EL31284 contains a palaeochannel system with some anomalous airborne Th signatures. The more significant Th targets mostly occur north of the Napperby access road and are considered worthy first-pass exploration targets given the geological setting and the surrounding metamorphic rocks in the drainage catchment.

A higher Th radiometric signature suggests a greater concentration of REE-enriched heavy minerals (*e.g.* monazite) within the palaeochannels shedding off the nearby Reynolds Ranges. HM sampling and analysis was planned in mid-2017 to test for the presence of monazite-enriched sediments. Unfortunately, no exploration fieldwork occurred on EL31284 in the reporting period because the company was focussed on the Supplemental Report for the Nolans project EIS.

Three separate baseline monitoring trips were completed within EL31284 during the reporting period. The monitoring results and detailed hydrological modelling of the region was presented in the Nolans Project EIS. The Draft Report for the EIS is publicly available and the Supplementary Report will be provided once it is publicly available.

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