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## Report ARU-15/004

# ANNUAL REPORT FOR YEAR ENDING 19th OCTOBER 2015, EL 30160 (WICKSTEAD), NORTHERN TERRITORY, AUSTRALIA

By

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## Reporting Details

<b>Titleholder</b>	Arafura Resources Limited
<b>Operator (if different from above)</b>	as above
<b>Titles/tenements</b>	EL 30160
<b>Tenement Manager</b>	as above
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## SUMMARY

Exploration Licence 30160 (Wickstead project) was granted to Arafura Resources Limited on the 20<sup>th</sup> October 2014. The tenement was acquired to test the prospectivity of the region for rare earth element (REE) mineralisation to complement Arafura Resources' nearby Nolans Bore REE-P-U deposit. The region neighbouring and including the Wickstead project has been historically explored for gold, base metals, uranium and diamonds; however no production for any commodity has been reported. Prior to Arafura's interest no company had investigated the REE potential of the region. Arafura Resources acquired the tenement to explore for REE mineralisation based on the presence of regional structure consistent with that of the Nolans Bore deposit and the apparent shallowness of basement suggested by nearby outcrop.

The Wickstead project is flanked to the north by the Reynolds Range; however the ground within the tenement is of low relief comprised primarily of Cenozoic alluvial, colluvial and sheet flood sediments. Very minor subdued outcrop of Proterozoic basement occurs in the north and east of the project area and is comprised of unassigned granitic orthogneiss and retrogressively metamorphosed rock. In the east of the project area Wickstead Creek, the projects namesake, dissects the Mulga dominated sheet flood plain and in the west an unnamed creek drains the Reynolds Range south through most of the project area.

The geology proximal to the project area is dominated by the Wickstead Creek beds; a formation originally assigned to the Palaeoproterozoic Lander Rock Beds but now believed to be part of the younger Palaeoproterozoic Reynolds Range Group. This package is comprised of calc-silicate, marble, gneiss and schist. This metasedimentary sequence was intruded by the Napperby Gneiss, a porphyritic granitoid of the Palaeoproterozoic Napperby suite.

Work undertaken on EL 30160 during the first year of tenure was restricted to a desktop study of historical reports and compilation of historical data over the exploration licence into a GIS. SPOT Maps 2.5m resolution satellite imagery was purchased while the exploration licence was under application and covers the entirety of the Wickstead project area. Work to be undertaken during the second year of tenure will include an airborne geophysical survey which will be integrated with Arafura's detailed Aileron-Reynolds merged dataset and geological reconnaissance of outcrop in the north of the project.

## INTRODUCTION

### Background

Arafura Resources Limited (Arafura) acquired EL30160 (Wickstead Project) to explore for rare earth element (REE) mineralisation to complement its nearby Nolans project [total resource of 56Mt @ 2.6% REO, 12% P<sub>2</sub>O<sub>5</sub> and 0.42lb/t U<sub>3</sub>O<sub>8</sub> (ASX: ARU 30th October 2015)]. Historically the region in and around EL 30160 has been explored for gold, base metals, uranium and diamonds; however the REE potential of the region has not been investigated. Arafura Resources acquired the tenement to explore for shallow Nolans-style REE mineralisation based on the presence of similar structure in the regional geophysics and the presence of outcrop, and hence shallow basement in the north of the project area.

### Location and access

The Wickstead project is located approximately 145km northwest of Alice Springs in the Northern Territory (figure 1). The project comprises one granted exploration licence (EL31060) which covers an area of 107.8 km. Access to the project area is via the Stuart Highway, north from Alice Springs and the Napperby Road west from the Stuart Highway. Access within the project area is via limited station tracks and fence lines which require the use of a four wheel drive vehicle.

### Topography, drainage & vegetation

The Wickstead project is dominated by the Reynolds Range to the north with the prominent 1006m Mount Freeling peak approximately 6km to the north of the tenement. The project area is dominated by low relief (approximately 650m RL), sheetflood, alluvial and colluvial sediments with very minor, subdued occurrences of basement. The area is dominated by closed Mulga (*Acacia aneura*) woodland; however in the very southwest of the tenement aeolian sediments with open spinifex grassland prevails.

The principal drainage in the project area is Wickstead Creek which drains the Reynolds Range in a general southerly direction. There is another unnamed creek in the west of the area which also drains the Reynolds Range; however does not have the extent of Wickstead Creek and terminates within the project area. Both drainages in the project area are ephemeral.

### Climate

The nearest Bureau of Meteorology weather station is located at the Territory Grape Farm approximately 50km to the northeast of the project area. Data has been collected there since 1987. The region has a semi-arid continental climate, characterised by long hot summers and short mild winters. Temperatures regularly exceed 40°C in summer with a peak mean monthly maximum of 37.3°C in January. The region experiences rare frosts in winter and has a mean monthly minimum temperature of 5.1°C in July and a corresponding lowest mean maximum of 22.2°C for the month of June.

Average annual rainfall is 314.2mm, most of which falls between December and March when occasional remnant monsoonal tropical lows and cyclones can pass across the area and deposit hundreds millimetres of rain in a few day. Otherwise the region relies on intermittent summer storm rain. Peak average monthly rainfall of 65.8mm is in February.

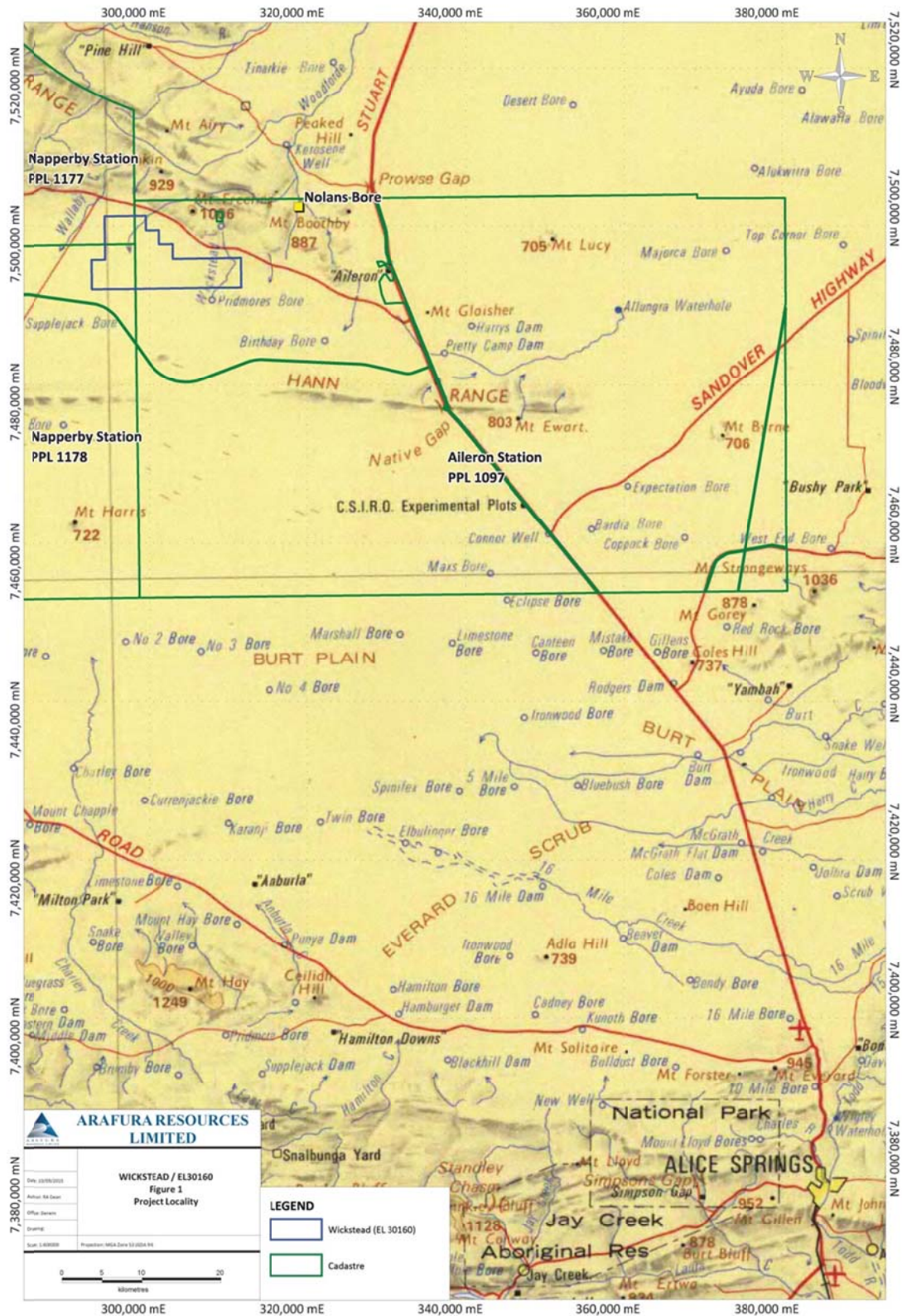


Figure 2 Project location map and cadastre information.

## TENURE

### Mining/Mineral Rights

Exploration Licence EL 30160 (Wickstead) is 100% held by Arafura Resources Limited (ACN 080 993 455). The tenement comprises 34 sub-blocks (107.8 km<sup>2</sup>) and was granted on the 20<sup>th</sup> October 2014 for a period of six years. The exploration licence will expire on the 19<sup>th</sup> October 2020. This report covers the first year of tenure for EL 30160.

### Land Tenure

EL 30160 is coincident with two pastoral stations Napperby and Aileron Stations, and three pastoral leases:

- Napperby Station, PPL 1177, NT Portion 748 and PPL 1178, NT Portion 747 are owned by Mr Roy Chisolm of Napperby Station (phone 08 8956 8666, fax 08 8956 8660)
- Aileron Station, PPL 1097, NT Portion 703 is owned by Casson Group (phone 03 9211 6000)

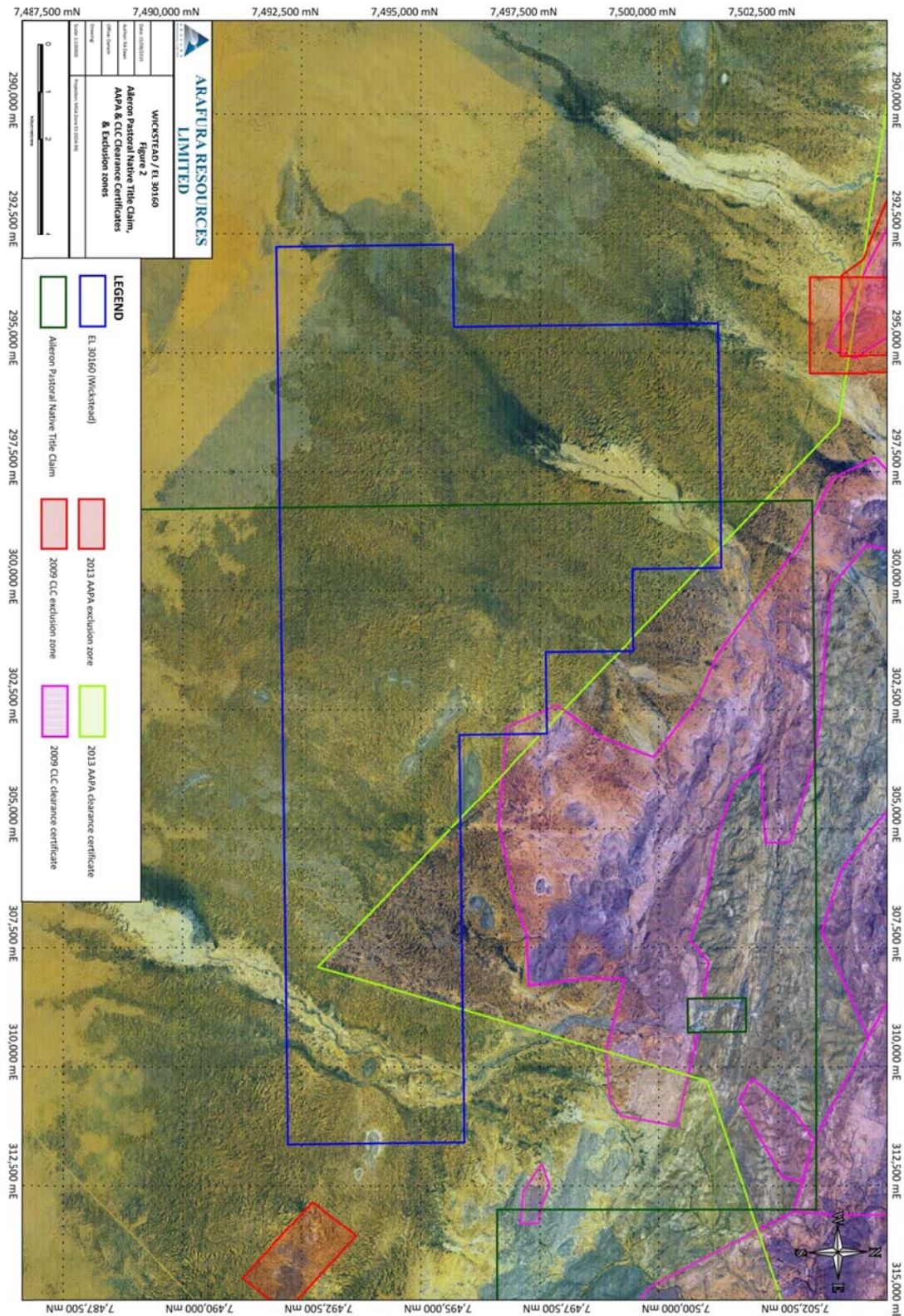
### Native Title

An application for a determination on a Native Title Claim which covers most of Aileron Station coincides with the eastern portion of the tenement constrained by the Aileron-Napperby Boundary (figure 2). The application tribunal file No is DC2014/002 and it was lodged on the 21<sup>st</sup> March 2104.

### Site Clearances

Arafura Resources Limited obtained a clearance certificate within the Southern Basins water exploration area from the Aboriginal Areas Protection Authority (AAPA) in 2103. This area covers all but a small portion of EL 30160 as can be seen in figure 2. Arafura also acquired a clearance from the CLC for its reconnaissance exploration program in 2009. A very small portion of this clearance intersects the project area and no exclusion zones from either clearance are located within EL 30160.





**Figure 2** Wickstead project (EL30160), Native Title claims, AAPA and CLC clearance certificates and exclusion zones.

## GEOLOGICAL SETTING

### Regional Geology

The project area is located in the Arunta Region, a complex basement inlier which has undergone a prolonged history of sedimentation, magmatism and tectonism extending from the Palaeoproterozoic to the Palaeozoic (Shaw et al., 1984). The Arunta Region covers more than 200 000 km<sup>2</sup> of the southern Northern Territory and can be subdivided into three, largely fault bounded geological provinces; the Aileron, Warumpi and Irindina Provinces. The Arunta Region is unconformably overlain by unmetamorphosed sedimentary rocks of the Neoproterozoic to mid-Palaeozoic Amadeus, Georgina, Ngalia and Wiso Basins (Walter et al., 1995). The project area is located within the Aileron Province of the Arunta Region (figure 3).

The Aileron Province predominantly comprises Palaeoproterozoic greenschist to granulite facies metamorphosed sedimentary and igneous rocks. The oldest observed rocks within the province, the Lander Rock Formation, are a widespread sequence of clastic sediments interpreted to represent dominantly turbiditic succession (Claoué-Long et al., 2008). U-Pb detrital zircon ages provide an imprecise maximum deposition age of 1806 -1840 Ma (Vry et al., 1996; Claoué-Long, 2003; Claoué-Long et al., 2008).

The Lander Rock Formation has been affected by numerous tectonic and thermal events. The earliest of these is the ca.1810-1800 Ma Stafford Event where bimodal magmatism intruded and metamorphosed the pre-existing sedimentary sequence (Claoué-Long et al., 2008). In the Reynolds Range this magmatism is manifest by the intrusion of the Harverson Suite granitic gneisses into the Lander Rock Formation. These intrusions impose a minimum age on the Lander Rock Formation and earlier tectonism.



**Figure 3** Map of the Arunta and surrounding regions, their provinces, and the Neoproterozoic to mid-Palaeozoic sedimentary basins. Adapted from Claoué-Long et al., (2008).

The Reynolds Range Group unconformably overlies the Lander Rock Formation and the Harverson Suite. The Reynolds Range Group is a shallow marine and intertidal succession of psammites and pelites with minor calc-silicate rock (Dirks, 1990). Metamorphic grade of the Reynolds Range Group in the Reynolds Range varies from greenschist facies in the northwest to granulite facies in the southeast. The high grade metamorphism in the southeast is related to the ca. 1600-1570Ma Chewings Orogeny (Williams, 1996). Elsewhere throughout the Reynolds Range metamorphic effects from the ca.1740-1690 Ma Strangways Orogeny are observed within the Reynolds Range Group. The Reynolds Range Group has a minimum age of ca. 1773 Ma based on an intrusive relationship and a maximum age of 1805 Ma based on detrital zircon ages in a newly identified sandstone unit which unconformably underlies the Reynolds Range Group (Claoué-Long et al., 2008).

The Arunta region was subjected to a long-lived event from 450-300 Ma. The Alice Springs Orogeny is expressed in the Aileron Province as west-northwest trending greenschist to upper-amphibolite shear zones. Large scale fluid flow during the Alice Springs Orogeny was responsible for Winnecke-style gold mineralisation and pegmatite associated REE mineralisation (Scrimgeour, 2003).

## Local Geology

### Palaeoproterozoic

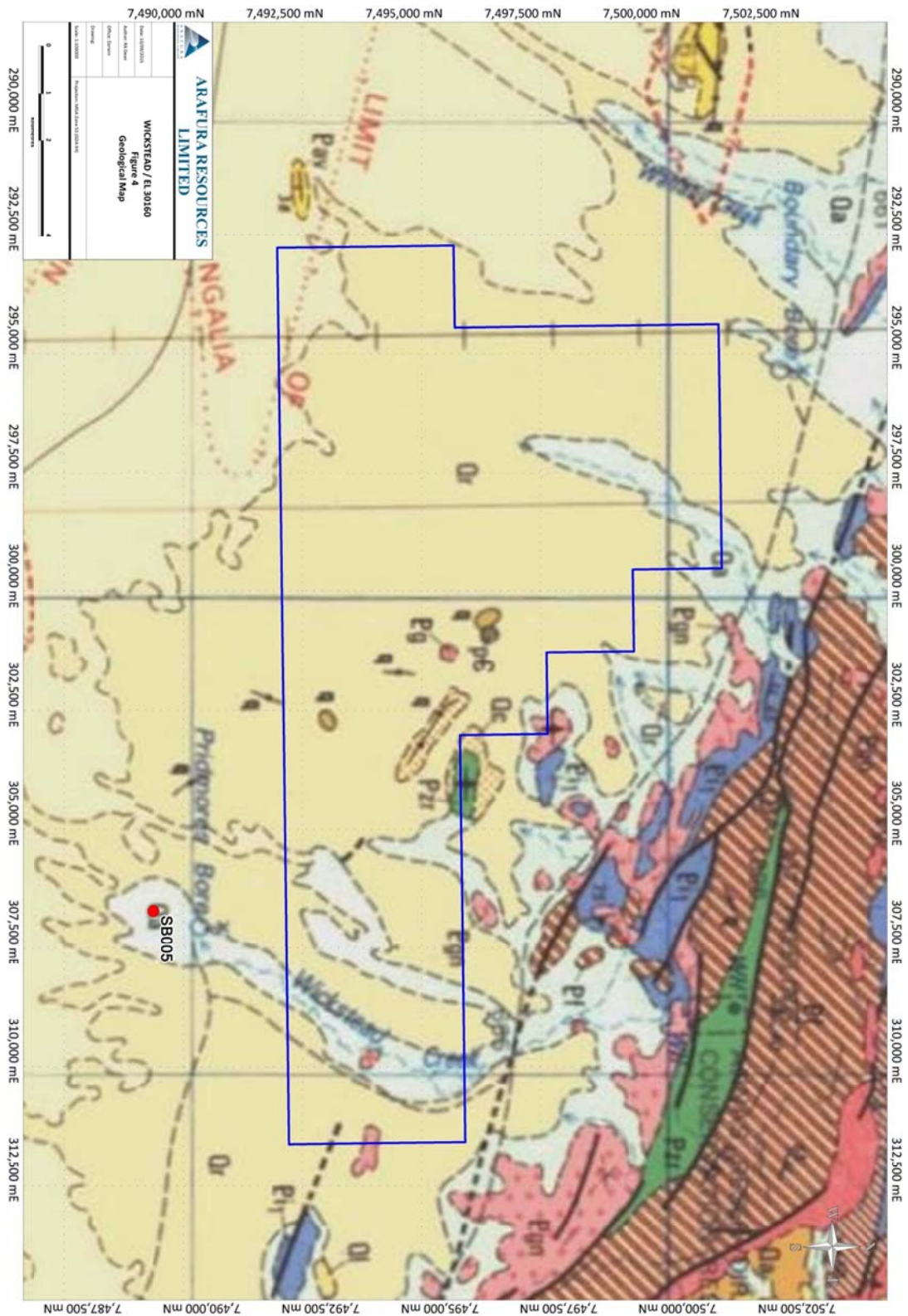
The Reynolds Range was mapped by BMR during the 1970's and the first edition Napperby 1:250,000 Geological Sheet was released in 1971. The second edition, on which the following geological summary is based, was released in 1982 (Stewart, 1982a). Subsequent mapping of the Reynolds Range by Dirks (1990) has led to a reinterpreted stratigraphy for the region with particular interest to the Palaeoproterozoic rocks within or proximal to the Wickstead project as these units have been reassigned to the younger Reynolds Range Group. The following section will summarise the stratigraphy outlined by Stewart (1982a) and the reinterpretation proposed by Dirks (1990).

The oldest mapped units in the vicinity of EL 30160 are the Palaeoproterozoic Wickstead Creek beds and the Mount Freeling Schist which outcrop just to the north of the tenement. These units are interpreted by Stewart (1982a) to be sedimentary facies equivalents (figure 4). To the north of Mount Freeling the Lander Rock Formation outcrops and was observed by Stewart et al., (1980) to have a gradual transition from the Mount Freeling Schist to the south. This sedimentary sequence was intruded by the orthogneisses of the Napperby Suite which have an age range of ca. 1770-1780 Ma. The rocks within the region are upper-amphibolite to granulite facies associated with the 1600-1570 Ma Chewings Event with discrete zones of greenschist facies retrogressively metamorphosed rocks associated with the 450-300 Ma Alice Springs Event.

The Wickstead Creek beds, within the vicinity of the project area, are mapped as unit Pi<sub>1</sub>. The unit is comprised of calc-silicate rock, marble, gneiss and schist (Stewart, 1981) and occurs as a WNW striking zone which flanks the northern boundary of the project area. The unit is coloured blue on the geological map seen in figure 4. The unit is dominated by diopside or tremolite-bearing calc-silicate or epidote-rich quartzite and is strongly deformed and faulted (Stewart et al, 1980). The Wickstead Creek beds are interpreted by Stewart et al., (1980) to be an interbedded sequence of metamorphosed shallow marine sediments.

The Mount Freeling Schist outcrops to the north of the project area and is mapped as Pf<sub>1</sub>. This unit is comprised of muscovite-biotite schist with minor quartzite and sillimanite schist (Stewart, 1981). The Mount Freeling Schist can be observed in figure 4 as the large brown body with thick NE-SW hatching. The unit is conformable with the Wickstead Creek beds and is suggested by Stewart (1980) to probably represent an interbedded assemblage of shale and sandstone. Widespread retrogressive metamorphism is observed in the unit.

The Lander Rock Formation occurs in the very northeast of figure 4 and is represented by a small zone coloured brown with small NE-SW hatching. The unit was mapped by Stewart (1982) as Pll<sub>3</sub> and is comprised of biotite-muscovite schist with sparse interbeds about 10cm thick cross-bedded micaceous quartzite, some with ubiquitous tourmaline (Stewart et al, 1980). The unit is strongly deformed and is interpreted to represent a turbidite sequence.



**Figure 4** Geological map of the Wickstead project area (Stewart, 1982) with location of nearby Arafura Southern Basins water exploration drillhole SB005.

The Napperby Gneiss outcrops to the north of, and within the Wickstead project area and is interpreted to be basement to much of the tenement (Stewart, 1981). The Napperby Gneiss is a strongly-foliated granitic gneiss and is observed to intrude the Wickstead Creek beds and the Mount Freeling Schist, with the latter contact being a major shear zone. The orthogneiss locally contains large clasts (roof pendants) of Wickstead Creek beds and elsewhere is observed to have an intrusive relationship with the overlying Pine Hill Formation of the Reynolds Range Group. The unit has a minimum U/Pb-Pb/Pb ion probe age of  $1775 \pm 12$  Ma. This age, given the intrusive nature of the Napperby gneiss, also gives a minimum age to the Wickstead Creek beds and Mount Freeling Schist.

An alternative interpretation of the stratigraphy of the region was published by Dirks (1990). This interpretation places the Wickstead Creek beds, Mount Freeling Schist and the portion of Lander Rock Formation, PII<sub>3</sub>, within the younger Reynolds Range Group. In this interpretation the Wickstead Creek beds along with quartzite units to the north of the project area form the base of the Reynolds Range Group. Dirks (1990) interpreted the Mount Freeling Schist and PII<sub>3</sub> of the Lander Rock Formation to be part of an extensive pelitic facies which represents muddy sediment deposited in the more distal regions of an epicontinental sea.

### Neoproterozoic

The Ngalia Basin, which unconformably overlies the Palaeoproterozoic rocks of the Aileron Province has limited outcrop to the west and south of the project area. No outcrop of Ngalia sediments was mapped by Stewart (1982a) within EL 30160; however these basin sediments are interpreted to extend under the Cenozoic cover just into the southwestern corner of the Wickstead project area (figure 4).

The basal unit of the Ngalia Basin is the Vaughan Springs Quartzite. This unit, which outcrops only a few hundred metres from tenement in the southwest, is tough, massive to thickly bedded orthoquartzite and sandstone (Stewart et al., 1980) and in places a basal conglomerate is observed. The deposition environment is interpreted to be near shore to shallow marine. Within the Vaughan Springs Quartzite a white micaceous siltstone and fine-grained clayey sandstone with minor evaporates is observed. The Treuer Member (Pat) crops out near the middle of the Vaughan Springs Quartzite and is interpreted to have been deposited in a shallow partly evaporitic marine environment. Other units within the Ngalia Basin are distal to the Wickstead Project area and not outlined within this report.

### Palaeozoic

Retrogressively metamorphosed igneous and metamorphic rocks outcrop on the northern border of the Wickstead Project and further to the north within the Reynolds Range. These units can be seen in figure 4 mapped in green and labelled Pzr. These steeply dipping shear zones were activated during Alice Springs Orogeny and have been retrogressively metamorphosed to greenschist facies. The shear zones are comprised of muscovite-quartz orthoschist with vein quartz lenses and epidosite (Stewart, 1982b).

### Cenozoic

The Wickstead Project is almost entirely underlain by Cenozoic sediments of unknown thickness. The surface of the project is dominated by quaternary sheet flood deposits mapped by Stewart (1982) as red soil (Qr). Minor, colluvial (Qc), and alluvial sediments (Qa) associated with the two principal drainages are also found within the project area along with a small zone of aeolian sand (Qs) in the very southwest of the tenement. Underlying this thin veneer of Quaternary sediments is a sequence of Palaeogene to Neogene sediments only known from drilling and yet to be formally named. Water bore drilling by Arafura Resources to the south of the tenement has identified two primary units within the sequence. The basal unit is white-grey and comprised of kaolinitic sandstone, sands and gravels and the upper unit, colloquially known as the 'Napperby Formation', is comprised of red-brown weakly consolidated and poorly sorted sands, silts and gravels.

Arafura Resources water bore SB05 (RN18873) is approximately 3km south of the tenement's boundary (figure, 4). The drill hole intersected 99m of Cenozoic sediments: 3m of Quaternary sands and gravels, 48m of red-brown oxidised and poorly-sorted, clayey sands and gravels (upper unit), 42m of kaolinic gravel and sand (basal unit). Granitic crystalline basement was intersected at a depth of 99m.

## PREVIOUS INVESTIGATIONS

### Other Parties

Significant exploration has been conducted over the region to the north of the Wickstead tenement in the Reynolds Range; however little work has been undertaken over the actual tenements as most of the ground is covered by Cenozoic sediments. The Wickstead project area has been historically explored with a focus on gold, base metals, uranium, diamonds and more recently REEs. No production for any commodity however has been reported.

The region was geologically mapped by the Bureau of Mineral Resources in 1968 for the production of the Napperby 1:250 000 Sheet. The area was re-mapped in the mid 1970's which resulted in the second (and current) edition Napperby Sheet (Stewart, 1982a). The Napperby sheet was covered by a reconnaissance airborne radiometric survey in 1958 and later in 1976 on behalf of the Bureau of Mineral Resources.

Table 1 outlines the exploration undertaken on historic tenements that intersect the Wickstead project area and the following section briefly describes the work that was undertaken in each case.

**Table 1:** Summary of historical exploration

Years	Tenement	Exploration Company	Exploration Targets/Commodities	NT Department of Mines & Energy Open File Company Report(s)
1971	AP 2617	CRA Exploration Pty Ltd	Base Metals & Uranium	CR1971-0134
1973	EL 753	CRA Exploration Pty Ltd	Uranium	CR1973-0121
1973-1974	EL 256	Central Pacific Minerals NL	Uranium	CR1973-0137 CR1974-0035 CR1974-0080
1977-1978	EL 1384	Central Pacific Minerals NL	Base Metals, Tin-Tungsten & Uranium	CR1978-0009 CR1978-0099
1978	EL1658	Central Pacific Minerals NL	Uranium	CR1978-0097

1982-1983	EL 2942	BHP Ltd	Diamonds	CR1983-0015 CR1983-0289
1988-1990	EL 5511	Colchis Mining Pty Ltd	Gold & Base Metals	CR1989-0020 CR1990-0366
1992-1993	EL 7344	Poseidon Gold Ltd	Gold & Base Metals	CR1992-0238 CR1993-0410
1995-1996	EL 8411	PNC Exploration Pty Ltd	Uranium	CR1995-0266 CR1996-0187
2003-2004	EL 10251	Gutnick Resources NL	Gold & Base Metals	CR2003-0351 CR2004-0166
2011-2013	EL 28111	Greywolf Resources Ltd	Gold	CR2011-1043 CR2013-0373
2004-2011	EL 23571	Arafura Resources Ltd	REEs	CR2009-1113

### CRA Exploration Pty Ltd

AP 2617 of CRA Exploration intersects only the north-eastern tip of the Wickstead tenement. AP2617 ran the entire length of the Reynolds Range and CRA Exploration was exploring the region for base metals and uranium (Tham, 1971). Operations included field reconnaissance and investigation of geophysical anomalies, a helicopter-borne drainage geochemistry survey for base metal mineralisation, bore water investigation for uranium and the drilling of 10 shallow auger holes to test for uranium mineralisation in areas covered by consolidated sand. Two stream sediment samples were collected in the northwest of the adjacent Ryan tenement (EL 29509) which drained the Reynolds Range to the north. No mineralisation of economic significance was identified in these or any samples and AP 2617 was surrendered.

### Central Pacific Minerals NL

EL 256 of Central Pacific Minerals intersects approximately half of the southwestern portion of the Wickstead tenement. It was acquired in 1972 to explore the region for sedimentary uranium mineralisation in the Ngalia Basin (Anon, 1973, 1974a & 1974b). Exploration work included geological reconnaissance, an airborne radiometric survey and a carborne radiometric survey. Investigations failed to identify significant exploration targets and the ground was surrendered.

EL 1384 intersects all but the very western tip of the Wickstead tenement. The exploration licence was acquired to explore the region for carbonate hosted base metal mineralisation, tin-tungsten skarns, and uranium vein and skarn mineralisation in the Reynolds Range Group (Green, 1977 & 1978b). Field work included a stream sediment survey, rock chip sampling and minor ground radiometrics; however no sampling occurred on the Wickstead project area. The results were

disappointing and the ground was surrendered.

EL 1658 intersects only the three western most sub blocks of the Wickstead tenement. The tenement was acquired to explore the Cenozoic basin sediments of the Ngalia Basin for secondary uranium mineralisation (Green, 1978a). Exploration activities included an airborne and carborne radiometric survey and geological mapping. No anomalous radioactivity or favourable geological units, principally the Mount Eclipse Sandstone, were identified within the tenement and the ground was relinquished.

#### **BHP Ltd**

EL 2942 of BHP intersects the eastern part of the Wickstead tenement and the northern most tip of the Ryan tenement. BHP was exploring the region for diamonds and work included a helicopter-borne heavy mineral concentrate stream sediment survey for assay and kimberlitic indicator mineral assessment (Anon, 1982 & 1983). One of these samples RTO830 was collected within the project area. It was assayed for Ce and La along with a suite of other elements. No anomalous vales were returned. BHP surrendered the tenement after no kimberlitic indicator minerals or anomalous assays were identified.

#### **Colchis Mining Corporation Pty Ltd**

EL 5511 intersects the whole of the Wickstead tenement. Colchis Mining was exploring the region for gold and base metal mineralisation based on similarities of the geological setting of the Arunta Region to the Granites-Tanami and Tennant Creek regions (Jockel, 1988 & Wilkinson, 1990). Exploration comprised ground reconnaissance and mapping, a rock-chip and stream sediment survey and structural interpretation of Landsat imagery. No samples were collected over the Wickstead tenement and no elevated gold or base metal values were returned from within EL 5511. The tenement was

#### **Poseidon Gold Ltd**

EL 7345 of Poseidon Gold intersects all but the very western tip of the Wickstead tenement. Poseidon Gold was targeting structurally controlled base metals and gold mineralisation (Price, 1992 & 1993). On ground work included a regional stream sediment and rock chip sampling survey; however none were collected within the project area. No samples highlighted targets which required follow-up and hence the ground was surrendered.

#### **PNC Exploration Pty Ltd**

EL 8411 of PNC Exploration intersects the north-eastern tip and eastern third of the Wickstead tenement. PNC Exploration was targeting various styles of uranium mineralisation (Thevissen, 1995 & 1996). Exploration activities included reconnaissance, semi-detailed grid based geological mapping along with ground magnetic and radiometric surveys over two prospects identified from previous airborne geophysics; the Mount Freeling Uranium and Mount Dunkin Uranium Prospects. An airborne magnetic and radiometric survey was later flown over the main outcrop within EL 8411. This identified several new targets including many calcrete hosted secondary uranium occurrences as well as several secondary uranium occurrences in the Napperby Gneiss. These targets were investigated further during helicopter based reconnaissance. None of the identified anomalies or prospects was within the project area.

Of monumental importance to Arafura Resources was the discovery of the Nolans Bore fluorapatite-hosted REE-P-U prospect which was deemed by PNC to be too low grade with respect to uranium to be viable. Although uranium occurrences were observed and prospects discovered none of them had the grade or size deemed necessary for PNC Exploration and the ground was relinquished.



## Gutnick Resources NL

EL 10251 intersects all but a small section of the Wickstead tenement in the north of the tenement. The tenement comprised part of Gutnick Resources Rand project which was targeting gold and base metals mineralisation (Washburn, 2003 & 2004). Their exploration rationale was based on a new hydrothermal model for mineralisation in the Witwatersrand, and exploring sedimentary basins with similar structural and stratigraphic styles such as the Amadeus and Ngalia Basins. On ground work included a BLEG stream sediment survey and a rock chip survey. Over both the Gutnick tenements described, only one sample (a rock chip sample on EL 10251 just to the north of the Wickstead tenement) was collected during the field work. It returned background assay results and EL 10251 and was subsequently surrendered.

## Greywolf Resources NL

EL 28111 of Greywolf Resources intersects 3 sub blocks in the north of the Wickstead tenement. Greywolf Resources was intending to explore the region for gold; however they did not undertake any field work (Hall, 2011 & Qian, 2013).

## Investigations by Arafura Resources

Arafura Resources became a partner with M<sup>c</sup>Cleary Investments in a joint venture on the nearby EL 9672, Dragons Lair, in 1999. Arafura's interest was to further explore the Nolans Bores fluorapatite-hosted REE-P-U prospect and in 2001 the exploration licence was transferred to Arafura Resources (Goulevitch, 2003a & 2003b). All further exploration activities within EL 9672 for the remainder of its tenure was focused on the Nolans Bore prospect.

## EL23571

EL 23571 of Arafura Resources intersects 3 sub blocks in the north of the Wickstead tenement. Arafura acquired the licence in 2004 to explore the region for REEs with a secondary interest in uranium (Hussey, 2009). The proximity to Arafura's Nolans Bore REE-P-U deposit made the region highly prospective for Nolans Bore style mineralisation. On ground work included a helicopter-borne reconnaissance of uranium and iron targets in 2005, collection of gravity data on 2 x 2 km spacing in 2008 as part of the Geoscience Australia - NTGS Central Arunta Gravity Survey, and acquisition of a Hymap hyperspectral survey data which covered only a very minor area in the north the Wickstead tenement. A ground reconnaissance and rock chip survey was undertaken in 2009 to follow-up targets generated by the hyperspectral survey and regional radiometric data. The primary targets were mineral signatures which could be of Nolans Bore style mineralisation affinity, such as epidote/allanite and kaolinite/carbonate; however other targets such iron occurrences near the Woodforde River were also investigated. 266 Rock chip samples were collected over the entire tenement; however no elevated REEs were reported and none of these were collected over the Wickstead project area.

## INVESTIGATIONS ON EL 30160

### Arafura Resources Exploration Activities Completed, Year 1, (20/10/14 – 19/10/15)

During the first year of tenure exploration activities comprised desktop studies of open file historical reports, the compilation of a GIS of historical company data and region geophysical datasets, and the writing of this report. During the application period for the exploration licence Arafura purchased SPOTMaps 2.5m resolution satellite imagery over the greater Aileron-Reynolds and Southern Basins water exploration project areas. This purchase extended Arafura's SPOTMaps coverage from 6752 km<sup>2</sup> to 10017 km<sup>2</sup> and all 108 km<sup>2</sup> of the exploration licence is covered by the extended dataset.

Exploration activities in the second year of tenure will involve an airborne geophysical survey over the entire Wickstead project area. This survey will be integrated with Arafura's detailed Aileron-Reynolds merged geophysical dataset. Other on-ground work will comprise geological reconnaissance and mapping of the limited outcrop in the north of the project area.

## CONCLUSIONS AND RECOMMENDATIONS

Arafura Resources Limited acquired EL 30160 (Wickstead) to explore for Nolans Bore-style REE mineralisation under shallow Cenozoic cover. Work completed during the first year of tenure was limited to a desktop study and GIS compilation, purchase of SPOTMaps satellite imagery and the writing of this report. As no on-ground exploration has yet been completed it is recommended that Arafura Resources completes a reconnaissance trip to the project area to lithologically and structurally map the outcrop in the north of the tenement. This work will be complemented by the acquisition of an airborne geophysical survey over the project area, which will be merged with Arafura Resources' extensive Aileron-Reynolds geophysical data set. Targets generated from the geophysical survey will be investigated in the third year of tenure.

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