ABN 22 080 933 455

Report ARU-13/015

FIRST AND FINAL REPORT FOR YEAR ENDING 26th NOVEMBER 2013
NAPPERBY CREEK PROJECT (EL29227)

By

Rodney Dean BSc(Hons)

Titleholder	Arafura Resources Limited
Operator (if different from above)	as above
Titles/tenements	EL29227
Tenement Manager	as above
Mine/Project Name	Napperby Creek
Report Title	First and final report for year ending 26th November 2013
Personal author(s)	Rodney Dean BSc(Hons)
Corporate author(s)	Arafura Resources Limited
Target commodities	Rare Earth Elements
Date of report	18th November 2013
Datum/zone	GDA94/Zone 53
250 000 K mapsheets	Napperby (SF53-9)
100 000 K mapsheets	Reynolds Range (5453)
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ABSTRACT

Exploration Licence 29227 (Napperby Creek Project) was granted to Arafura Resources Limited (Arafura) on the 27th November 2012. The tenement was acquired to test the prospectivity of the region for rare earth element (REE) mineralisation and in particular, to follow up historic work undertaken by Arafura on exploration Licence 23571 (Reynolds Range Project) of which EL29227 comprises a small part. A heavy mineral concentrate (HMC) stream sediment survey undertaken by Arafura in 2009 identified two samples of interest in the project area. The first had anomalous REE values and the second had an interesting elemental ratio of Zr to Nb which could indicate a carbonatitic or alkaline intrusive source. The region neighbouring and including the Napperby Creek Project has been historically explored for gold, uranium, base metals, tungsten, diamonds and recently REEs. The geology of the project area is dominated by the Reynolds Range Group, a Palaeoproterozoic package of metapelites, metapsammites, marbles, dolomites and calc-silicate rocks. This package forms a roughly NW-SE trending synform through the project area and is unconformably bounded by the Palaeoproterozoic Yaningidjara Orthogneiss in the north east and intruded by the Palaeoproterozoic granitic Napperby Gneiss in the southwest. First year investigations on EL29227 involved a desktop study and a short field program comprising collection of two -2mm 50kg HMC stream sediment samples and two representative carbonate rock chip samples collected for acid neutralisation test work. The HMC samples were assayed for REEs along with a suite of other important elements and one of the HMC samples was subsequently selected for QEMSCAN (Quantitative Evaluation of Minerals by Scanning Electron Microscopy) to identify the REE-bearing and indicator heavy minerals. The results of the assay and QEMSCAN indicated that the area is not prospective for economic REE mineralisation and hence Arafura has surrendered EL29227.

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INTRODUCTION

Background

Arafura Resources Limited (Arafura) acquired EL29227 (Napperby Creek Project) to explore for rare earth element (REE) mineralisation to complement its nearby Nolans Bore project [total resource of 47Mt @ 2.6% REO, 11% P_2O_5 and 0.41lb/t U_3O_8 (ASX: ARU 8th June 2012)] The rational of exploration was to identify REE mineralisation associated with carbonatites and alkaline rocks which could be processed at the future Nolans Bore mine site. Exploration was focused on identifying heavy REE-bearing minerals such as monazite [$(Ce,La,Nd,Th,Y)PO_4$], allanite [$(Ce,Ca,Y,La)_2(Al,Fe^{+3})_3$], and xenotime [$Y(PO_4)$] in the stream sediments shed of the surrounding Reynolds Range along with indicator minerals for carbonatites and alkaline rocks. The primary indicator mineral is the Nb-bearing pyrochlore ($(Ca,Na)_2(Nb,Ta)_2O_6(O,OH,F)$) which is characteristically associated with carbonatites.

Historically the region within and proximal to the Napperby Creek Project has been explored for gold, uranium, tin, base metals, tungsten, diamonds and REEs; however no mineral occurrences are recorded within the project area. Prior to the work undertaken by Arafura on EL23571, the REE potential of the area had not been investigated. Arafura acquired EL23571 (Reynolds Range Project) in 2001 to explore for Nolans Bore style mineralisation and carbonatites, which are postulated to be the source of the Nolans Bore deposit. In 2011 EL23571 was surrendered; however a small area within EL23571, EL29227, was applied for and granted on the 27th November2012.

This report outlines the exploration undertaken by Arafura on the Napperby Creek Project over the one year of tenure and the results which have led to the exploration license being relinquished.

Location and access

The Napperby Creek Project was located approximately 175kms north-west of Alice Springs in the Northern Territory (figure 1). The project comprised one granted Exploration Licence (EL29227) which covered an area of 54.0km^2 (figure 1). Access to the project area was via the Stuart Highway, north from Alice Springs to Aileron, then west of the Stuart Highway via the station tracks of Aileron, Pine Hill and Napperby Stations.

Topography and drainage

The Napperby Creek Project area is dominated by the Reynolds Range in the north and northeast where the Mount Thomas Quartzite of the Reynolds Range Group forms a steep, roughly northwest trending ridge. A more subdued parallel ridge of the same stratigraphy trends across the interior of the project area. The remainder of the project area is dominated by deeply weathered outcrop which forms gently rolling hills, and transported Cenozoic sediments.

The Project area is drained to the west by the upper tributaries of Napperby Creek. The drainage consists of small ephemeral streams which flow from both the quartzite ridgelines. Napperby Creek continues to the South Southwest for approximately 60km where it terminates in Lake Lewis.

Climate

The climate is characterised by long hot summers and short mild winters. Temperatures regularly exceed 40°C in summer with rare frosts in winter. The region is relatively arid with an average annual rainfall of about 280mm, most of which falls between October and March when occasional remnant monsoonal tropical lows and cyclones can pass across the area and deposit hundreds millimetres of rain in a few days. Otherwise the area relies on intermittent summer storm rain.

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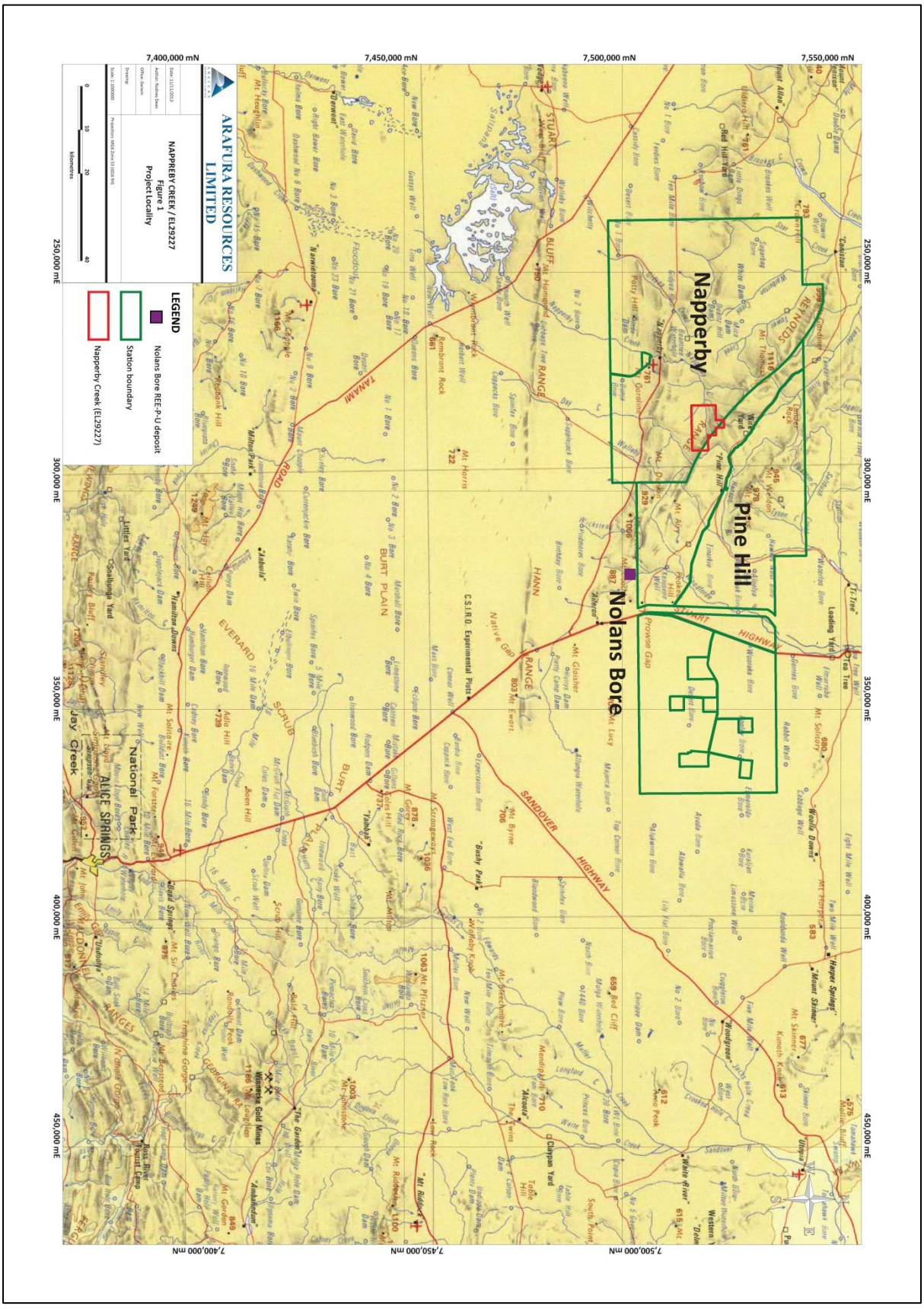

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TENURE

Mining/Mineral Rights

Exploration Licence EL29227 was 100% held by Arafura Resources Limited (ACN 080 993 455). The tenement comprised 17 sub-blocks and was granted on 27th November 2012 for a period of six years; however the exploration licence was relinquished at the end of the first year and this report covers the first and final year of tenure for EL29227.

Land Tenure

EL29227 lies predominantly within the area of Napperby Pastoral Lease (PPL 1177; Figure 1). A small area of EL29227 in the north and east lies within Pine Hill Pastoral Lease (PPL 1030).

- Napperby Station, PPL 1177/1178 – NT parcel 00748 is owned by Mr Roy Chisholm of Napperby Station (phone 08 8956 8666, fax 08 8956 8660).

- Pine Hill Station, PPL 1030 – NT parcel 00725 is owned by Mr Gil Bowman of Pine Hill Station (phone 08 8956 9590, fax 08 8956 9841).

Native Title

Arafura Resources negotiated and executed an Exploration Agreement with the Central Land Council (on behalf of registered Native Title Claimants) of which Arafura's historic tenement, EL23571, was subject to. As Napperby Creek, EL29227, was a sub region of EL23571, it was also subject to this agreement. As a result, there were no Native Title impediments to exploration on EL29227 other than holding appropriate consultations, avoiding activity on identified sacred sites and paying agreed amounts of financial compensation.

Site Clearances

Prior to the field season in 2009 Arafura provided all relevant details of its proposed reconnaissance exploration activities over the Aileron-Reynolds project area, of which EL 23571 was a part of, to the Central Land Council (CLC). The CLC provided Sacred Site Clearance Certificate 2009-075 detailing all exclusion zones within the outlined exploration area. No exclusion zones were outlined over the Napperby Creek Project area.

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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^2 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 2).

The Aileron Province predominantly comprises Palaeoproterozoic greenschist to granulite facies metamorphosed sedimentary and igneous rocks. The oldest observed rocks within the province, the Lander Package, are a widespread sequence of clastic sediments, now at various metamorphic grades (Pietsch, 2001). This meta-sedimentary sequence is affected by numerous tectonic and thermal events. The earliest of these is the ca.1810-1800 Ma Stafford Event. During this event bimodal magmatism intruded and metamorphosed the pre-existing sedimentary sequence (Claoué-Long et al., 2008). These intrusions during the Stafford Event impose a minimum age on the Lander Package and earlier tectonism. Bimodal magmatism of the ca.1790-1770 Ma Yambah Event is believed to be responsible for pervasive low-grade fabrics across much of the province (Scrimgeour, 2003).

The observed top of the Lander Package is a regional angular unconformity. Above this unconformity lies the Reynolds Package which is a shallow marine and intertidal succession of psammites and pelites with minor calc-silicate rock (Scrimgeour, 2003). Metamorphic grade of the Reynolds Package in the Reynolds Range varies from greenschist facies in the northwest to granulite facies in the south-east. The high grade metamorphism in the southeast is related to the ca. 1600-1570Ma Chewings Orogeny. Elsewhere throughout the Aileron Province metamorphic effects from the ca.1740-1690 Ma Strangways Orogeny are observed within the Reynolds package.

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-north-west 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).

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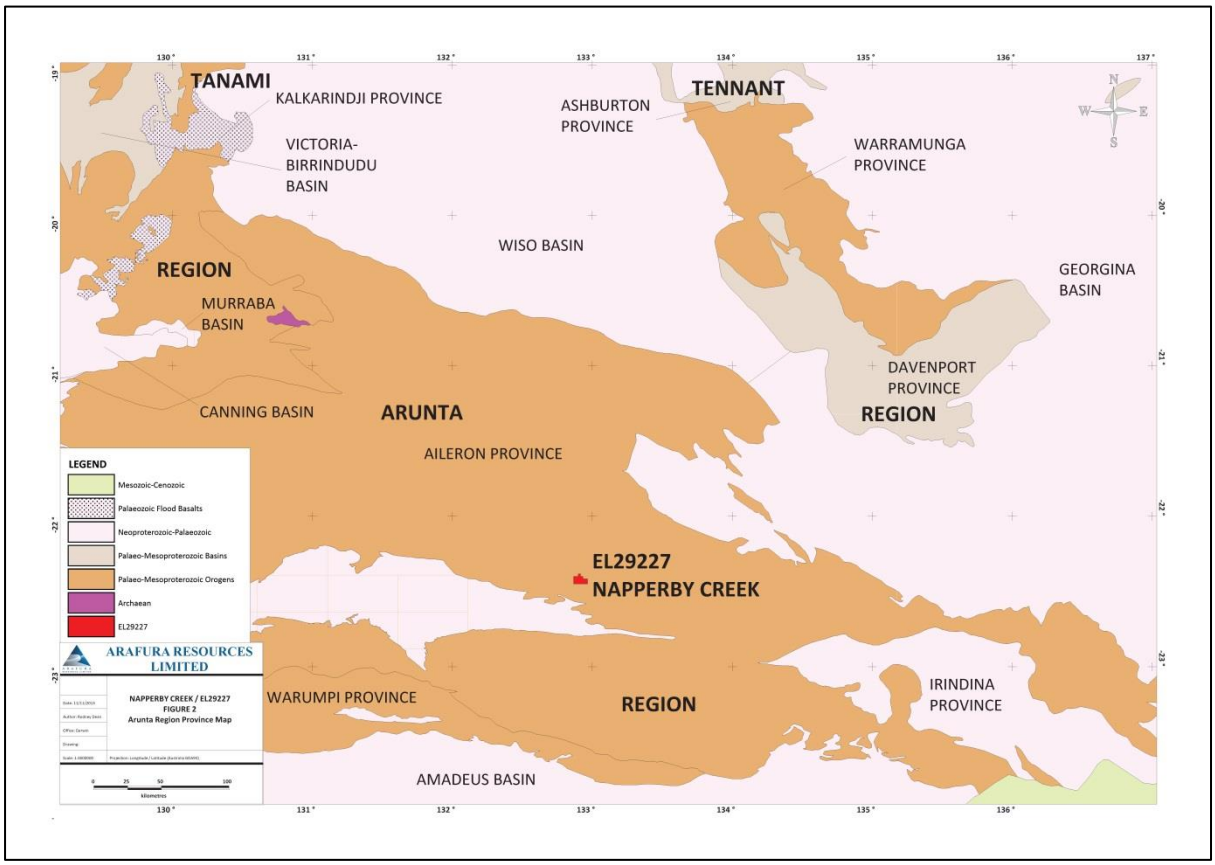

Figure 2. Map of the Arunta and surrounding regions, their provinces, and the Neoproterozoic to mid-Palaeozoic sedimentary basins. Adapted from Claoué-Long et al., (2008).

Local Geology

Palaeoproterozoic

The Lander Rock Formation is the oldest package of outcropping rocks in the area. It comprises a suite of interbedded pelitic and psammitic rocks interpreted to represent dominantly turbiditic sedimentation (Claoué-Long et al., 2008). The thickness of the sedimentary pile is unknown as the basement to it has not been identified. The Lander Rock Formation is intruded by plutons with an age range of ca. 1770-1795 Ma and older bodies belonging to Stafford Event (Claoué-Long et al., 2008). These intrusions constrain a minimum age for the sedimentary sequence. U-Pb SHRIMP detrital zircon ages provide a rough maximum estimate of 1806-1840 Ma (Vry et al., 1996, Claoué-Long 2003, Claoué-Long et al., 2005, Claoué-Long et al., 2008.)

Minor outcrop of the Lander Rock Formation occurs in the northeast of the project area (figure 3). It is mapped as Pll_3 on the Reynolds Range 100K sheet which comprises schist, phyllite, andalusite hornfels and tourmaline-quartz pods. The Lander Rock Formation is intruded in the northeast of the project area by the Yaningidjara Orthogneiss which has an age of ca. 1806 Ma (Vry et al., 1996).

The Reynolds Range Group unconformably overlies the Lander Rock Formation and the Harverson Suite. It is a sequence of quartzite, pelitic and psammitic schist, minor calc-silicate rock and rare mafic rocks which have been interpreted to have been deposited in a shallow marine environment (Claoué-Long et al., 2008). Metamorphic grade of the group ranges from greenschist in the northwest to granulite facies in the southeast where there is a ca. 1600-1570 Ma Chewings Event overprint (Williams et al., 1996). The Reynolds Range Group has a minimum age of ca. 1773 Ma based on an

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intrusive relationship and a maximum age of 1805 Ma based on detrital zircon ages in newly identified sandstone unit which unconformably underlies the Reynolds Range Group (Claoué-Long et al., 2008).

In the project are the Reynolds Range Group is preserved as the eroded remnant keel of a major northwest-southeast trending syncline. The basal unit, the Mount Thomas Quartzite, is a coarse metaquartzite with metasandstone, muscovite schist, shale and conglomeritic zones on the north-eastern limb and a very coarse rutile-biotite metaquartzite on the south-western limb of the fold (Stewart, 1982). The unit varies in thickness from ~200 metres to 550 metres cropping out along the length of the range. Relict sedimentary structures indicate a high-energy, intertidal depositional environment (Buick *et al.,* 1999).

Conformably overlying the Mount Thomas Quartzite is the Pine Hill Formation which in the project area comprises muscovite schist, metasandstone and metaquartzite and achieves a maximum thickness of ~500 metres. This unit is overlain, but is also contemporaneous with the Algamba Dolostone. This unit comprises fine to medium-grained recrystallised dolomite and limestone with minor interbedded calc-silicate rock. Much of the Algamba Dolostone is deeply weathered.

Intruding this sedimentary package to the southwest is the orthogneisses of the Napperby Suite which have an age range of ca. 1770-1780 Ma and in the northwest of the project area the sequence is intruded by the ca. 1785 Warimbi Schist (Budd, 2001) which is a biotite-sericite-quartz orthoschist with quartz and rare feldspar augen (Stewart et al., 1980).

Neoproterozoic

Ngalia Basin rocks were deposited between the Neoproterozoic to the Late Carboniferous (Wells & Moss, 1983). The rocks are an important component of the nearby EL 24548, but do not occur in EL 29227

Cenozoic

A large proportion of the project area in covered with Cenozoic sediments. These include alluvium, colluvium, lag gravels, and minor fanglomerate. Significant ferricrete is developed over the Algamba Dolostone along strike throughout the project area.

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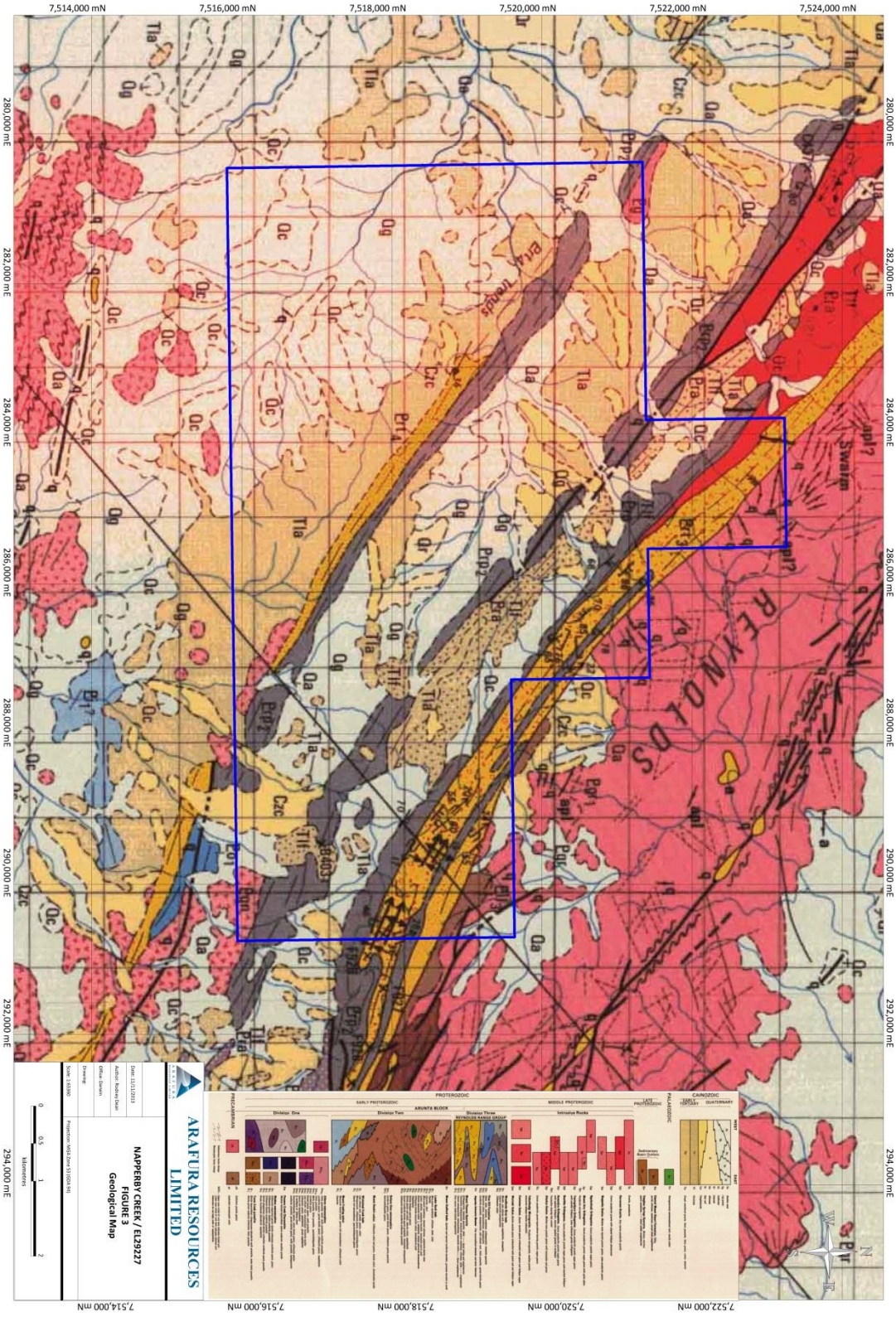

Figure 3 Napperby Creek Project geological map, adapted from Stewart, (1982).

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PREVIOUS INVESTIGATIONS

Other Parties

Significant exploration has been conducted over the Napperby Creek Project area with the focus being primarily on the prospectivity of the region for gold, uranium, base metals, diamonds, and 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, 1982). 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 Napperby Creek Project area (EL29227) and the following section briefly describes the work that was undertaken in each case.

Table 1: Summary of historic exploration

Years	Tenement(s)	Exploration Company	Exploration Targets/Commodities	NT Department of Mines & Energy Open File Company Report(s)
1966-1967	AP1378	Trans Pacific Petroleum NL	Gold, Base Metals & Iron	CR1966-0036 CR1967-0046 CR1967-0053
1968	AP1378	Central Pacific Minerals NL	Gold, Base Metals & Iron	CR1968-0013
1971	AP2617	CRA Exploration Pty Ltd	Base Metals & Uranium	CR1973-0123
1973	EL23	Central Pacific Minerals NL	Uranium	CR1973-0029
1978	EL1294	Pacminex Pty Ltd	Uranium, Base Metals & Tungsten	CR1978-0146
1979	EL1294	CSR Minerals & Chemicals Ltd	Uranium, Base Metals & Tungsten	CR1979-0198

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1983	EL2942	BHP Ltd	Diamonds	CR1983-0015 CR1983-0289
1989-1990	EL5511	Colchis Mining Corporation Pty Ltd	Gold & Base Metals	CR1989-0020 CR1990-0366
1992-1993	EL7344	Poseidon Gold Ltd	Base Metals & Gold	CR1992-0238 CR1993-0410
1995-1996	EL8411	PNC Exploration Pty Ltd	Uranium	CR1995-0266 CR1996-0187
1998-2002	EL9672	Homestake Gold of Australia Pty Ltd	Gold	CR1997-0791 CR1998-0817 CR1999-0031 CR2002-0350
2004-2011	EL23571	Arafura Resources Ltd	REEs	CR2009-1113

Trans Pacific Petroleum NL

AP1378 of Trans Pacific Petroleum intersected the lower half of the Napperby Creek Project area. Trans Pacific Minerals was exploring the region for gold, base metals and iron. Their exploration was focused on identifying Tennant Creek style ironstone hosted gold and base metal mineralisation in the Stuart Bluff Range, Reaphook Hills and Hann Range (Williams & Layton, 1966; Layton, 1967; Ingall, 1977). Exploration included a pilot soil and rock chip geochemical survey, ground magnetic radiometric and IP survey. Their area of interest within AP1378 did not intersect EL29227.

Central Pacific Minerals NL

Central Pacific Minerals acquired AP1378 in 1968 and continued the exploration of Stuart Bluff Range and Reaphook Hills for ironstone hosted gold and base metal mineralisation (Clarke, 1968). Exploration was focussed on the drilling of six rotary airblast holes to test magnetic and IP targets identified by Trans Pacific Petroleum. Economic concentrations of gold and base metals were not identified and the ground was surrendered.

CRA Exploration Pty Ltd

AP2617 of CRA Exploration intersected all but the southwest corner of the project area and ran the entire length of the Reynolds Range. CRA Exploration was exploring the region for base metals and uranium. 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 (Tham, 1971). No Mineralisation of economic significance was located and the ground was surrendered.

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Central Pacific Minerals NL

EL 23 of Central Pacific Minerals intersected a very small portion (0.064km^2) of the southwestern corner of the project area. Central Pacific Minerals were exploring the region for uranium (Schindlmayr, 1973). Work involved an airborne and carborne radiometric survey and follow up reconnaissance of 9 anomalies none of which were located within the project area. No potential host rocks for mineralisation were found and the ground was surrendered.

Pacminex Pty Ltd

EL 1294 of Pacminex intersected the whole of the project area. Pacminex was exploring primarily for uranium with a secondary interest in base metals and tungsten (Allen, 1978). Exploration work included an airborne geophysical survey and interpretation of anomalies, a stream sediment and rock chip geochemical sampling survey, ground radiometric survey and follow-up of 14 of the highest priority airborne radiometric anomalies of a total of 49 interpreted anomalies. No significant uranium or base metal mineralisation was found in the stream sediment survey or ground follow-up of geophysical anomalies.

CSR Minerals & Chemicals Ltd

CSR Minerals & Chemical Ltd acquired EL1294 and continued exploration for uranium, base metals and tungsten (Vicary, 1979). Work included a heavy mineral concentrate stream sediment survey, semi-quantitative mineral identification and ground checking of a further 23 airborne radiometric anomalies outlined by Pacminex in 1978. No significant mineralisation was found and the ground was surrendered.

BHP Ltd

EL 2942 of BHP intersected the whole of the project area. 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). Three of these samples were collected in drainages which originate or have upstream components in the Napperby Creek Project area with being located within the project area and the other two are collected just outside the project area.Table 2 outlines the assay results for these three samples. The elevated cerium and lanthanum values of RTO856 were of interest to Arafura.

Table 2 Assays of BHP HMC samples from EL2942 which drain the project area

Sample ID	As ppm (1)	Ce ppm (20)	La ppm (20)	Ba ppm (20)	Nb ppm (4)	Zr ppm (4)	Cu ppm (2)	Pb ppm (5)	Zn ppm (2)	Co ppm (5)	Ni ppm (5)	Cr ppm (10)
RTO856	<1	540	290	340	26	2600	6	20	18	<5	<5	10
RTO857	1	110	50	360	18	420	10	5	36	5	10	10
RTO860	2	70	40	370	16	370	10	5	50	15	20	10

As no kimberlitic indicator minerals were identified in any of the samples the ground was surrendered.

Colchis Mining Corporation Pty Ltd

EL 5511 intersected the whole of the project area. Colchis Mining was exploring the region for gold and base metal mineralisation based on similarities of the geological setting of the region to the Granites-Tanami and Tennant Creek regions (Jockel, 1989; Wilkinson, 1990). Exploration comprised ground reconnaissance and

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mapping, a rock-chip and stream sediment survey and structural interpretation of Landsat imagery. No significant mineralisation was found and the ground was surrendered.

Poseidon Gold Ltd

EL 7344 intersects the whole of the project area. Poseidon Gold was targeting structurally controlled base metals and gold mineralisation (Price, 1992 & 1993). On ground work included soil sampling over the Reward Cu/Pb/Zn workings to the northwest of the project area, regional stream sediment and rock chip sampling; however none of it was 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 whole of the project area. PNC Exploration was targeting various styles of uranium mineralisation (Thevissen, 1994 & 1995). On ground work included reconnaissance, semi-detailed grid based geological mapping and 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-spectroscopic 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 which were discovered with helicopter based radiometric anomaly follow-up. None of the identified anomalies or prospects are 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.

Homestake Gold of Australia Pty Ltd

EL 9672 of M^{c}Cleary Investments Pty Ltd intersected the whole of the project area. Homestake Gold, the partner in the joint venture with M^{c}Cleary Investments, was exploring the region for gold with a secondary interest in base metals (Stewart, 1997; Lindsay Park, 1998; Anon, 1999). On ground work included an extensive regional BLEG stream sediment sample survey with an approximate density of one sample per 10 km^{2}. Only one sample returned an anomalous value for gold. A follow-up and infill BLEG stream sediment sampling survey was undertaken the following year and no anomalous gold was detected. Minor rock chip sampling was also undertaken with very slightly elevated base metals detected in three samples. These results were very disappointing to Homestake Gold and the company ended its interest in EL9672.

Investigations by Arafura Resources

Arafura Resources became a partner with M^{c}Cleary Investments in a joint venture on EL9672, Dragons Lair, in 1999. Arafura's interest was to further explore Nolans Bore fluorapatite-hosted REE-P-U prospect and in 2001 the exploration licence was transferred to Arafura (Goulevitch, 2002). All on ground work within EL9672 for the remainder of its tenure was focused on the Nolans Bore prospect.

EL23571

EL23571 of Arafura Resources intersected the whole of the project area. 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, and acquisition of a Hymap hyperspectral survey data which covered all of the project area. A ground reconnaissance and rock chip survey was undertaken in 2009 to follow-up targets generated by the hyperspectral survey

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and regional radiometric data. The primary targets were mineral signatures which could be of Nolans Bore style mineralisation affinity, such as epidote/allanite, 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, of these 118 were collected over the Napperby Creek project area. No elevated REEs were reported however a group of rock chip samples from an identified argillic alteration target yielded anomalous silver values of up to 3.9 ppm and elevated bismuth and antimony. The highest uranium assay of 44.5ppm was obtained from an identified airborne radiometric target. A small number of ironstone bodies were tested during the program, however the assays were disappointing. Table 3 below outlines these anomalous assay results.

Table 3 **Assays of interest from rock chip sampling program within the project area EL29227. Green is elevated, orange is probably anomalous and red is definitely anomalous.**

Sample ID	Lithology	Easting m	Northing m	Ag ppm	Be ppm	Bi ppm	Fe ppm	Mn ppm	Sb ppm
ARA0006	Ironstone	287243	7517951	0.1	4.1	2.2	398000	103	2.3
ARA0007	Ferricrete	287357	7517901	0.2	3.0	2.4	345000	75	2.8
ARA0008	Ironstone	287556	7518459	0.5	15.1	0.4	294000	195000	2.6
ARA0009	Calcareous sediment	287658	7518576	1.6	25.9	1.0	8420	640	2.6
ARA0010	Quartz vein	287658	7518565	2.4	0.7	0.4	11700	5980	0.4
ARA0011	Calcareous sediment	287659	7518602	3.9	3.0	0.5	4700	134	5.15
ARA0012	Calcareous sediment	287676	7518605	1.4	7.0	3.4	3840	113	6.9
ARA0013	White clay	287724	7518576	1.2	5.3	12.6	2220	111	7.7

Arafura also conducted a reconnaissance level HMC stream sediment survey to explore for possible carbonatite or alkaline rocks in the project area, two of which were located within the project area. One of these samples SSC35 yielded significant total REE, Th, U and Y levels and is consistent with significant amounts of monazite and possibly xenotime in the concentrate. The other sample SSC36 had a low Zr to Nb ration which could indicate a mantle derived source such as a carbonatite. The abridged assays for these two samples are outlined in table 4.

Table 4 **Assays from HMC stream sediment sampling within the project area EL29227 normalised to 100g of HMC sample.**

Sample ID	Ce ppm	La ppm	Nb ppm	Nd ppm	P ppm	Th ppm	U ppm	Y ppm	Zr ppm
ARA0877	58824	32647	95	27941	5588	18059	1403	9824	1903
ARA0876	800	381	100	321	725	218	23	132	121

First Year Investigations

First year investigations on the Napperby Creek project involved the collection of two follow-up HMC samples as a systematic check for the 2 samples collected by Arafura in 2009. Appendix 1 contains the sample location and assay data This field work was conducted over 3 days from the 8th to the 9th

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of October 2012, camping overnight at Napperby Creek and a single day on the 12th of October 2012 panning the two stream sediment samples to HMCs at the Arafura office at Aileron. The two staff members involved in this work was Principal Geologist Kelvin Hussey and Geologist Rodney Dean.

The stream sediment survey involved resampling at proximal to the historic samples SS35 and SS36. The procedure for sampling involved locating a trap site for the heavy minerals. This was the up-stream part of the trunk of a large gum tree in both instances. The top 20cm of stream sediment was scrapped away and the sediment was sampled in a profile downwards. A sample of around 50kg of -2mm fraction was obtained and this material was later weighed and panned down to heavy mineral concentrates of between 1 and 1.5kg. The panned concentrates were sent to ALS metallurgy laboratory, Perth for heavy liquid separation (HLS) at specific gravity of 2.96 using tetrabromoethane (TBE) and subsequent assay by ICPMS/ICPAES and XRF (assay data in from ALS Minerals is located in appendix 2) in from. On receipt of the assay results one of the six samples, ARA5328, was identified as having elevated REE concentrations relative to the other sample and was selected for QEMSCAN® (Quantitative Evaluation of Minerals by Scanning Electron Microscopy), also at ALS metallurgy laboratory as part of a broader QEMSCAN® investigation.

The QEMSCAN® results indicated REE-bearing minerals, predominantly monazite and xenotime, to be present in the heavy mineral fraction of the sample. It also indicated that the niobium content was primarily found in rutile and ilmenorutile and no pyrochlore was detected. This indicates that the niobium in the sample was sourced from the surrounding crustal rocks and not from a carbonatite or associated alkaline intrusive of mantle affinity. ALS Metallurgy report MIN1536 outlines the QEMSCAN® procedure and results and is contained in Appendix 3. Chemical assay indicated that ARA5328 was REE enriched relative to ARA5327 and that it had a significant HREE component. It had a TREE grade of 7.28% and a HREE+Y grade of 2.81%; however this represents a calculated alluvial grade of 98.7ppm TREE and 38.1ppm HREE+Y. These grades are deemed too low to be economically viable for alluvial extraction.

Other work included the desktop study, target generation and collection of carbonate samples for acid neutralisation test work for the Nolans project. The Algamba Dolostone was identified as a possible carbonate source and a single sample traverse across strike was designed over a HyMap hyperspectral anomaly for carbonate using the carbonate-amphibole-chlorite mineral map produced by HyVista for Arafura. Sampling was undertaken by Arafura staff, Senior Field Supervisor Jeremy Grose and Geologist Rodney Dean on the 14th July 2012. A single Land Cruiser was used to drive out to site from the Aileron office. Four sub samples were collected along the traverse. At each sub sample location 4-6 fist size pieces of rock were collected to represent the lithology. These sub samples were numbered NBCP01-1 to NBCP01-2 and a representative sample NBCP01 was created to be sent for test work at SGS Ore Test in Perth.

Table 5: Sample locations

Sample Id	MGA94_53E	MGA94_53N	Sample Type	QEMSCAN
ARA3339	286062	7519870	Carbonate Grab Sample	No
ARA3340	285945	7520126	Carbonate Grab Sample	No
ARA3341	285776	7520141	Carbonate Grab Sample	No
ARA3342	285621	7520200	Carbonate Grab Sample	No
ARA3343	286356	7519463	Carbonate Grab Sample	No
ARA3344	286361	7519584	Carbonate Grab Sample	No
ARA5327	280398	7519572	Heavy Mineral Conc. -2mm	No
ARA5328	280521	7518540	Heavy Mineral Conc. -2mm	Yes

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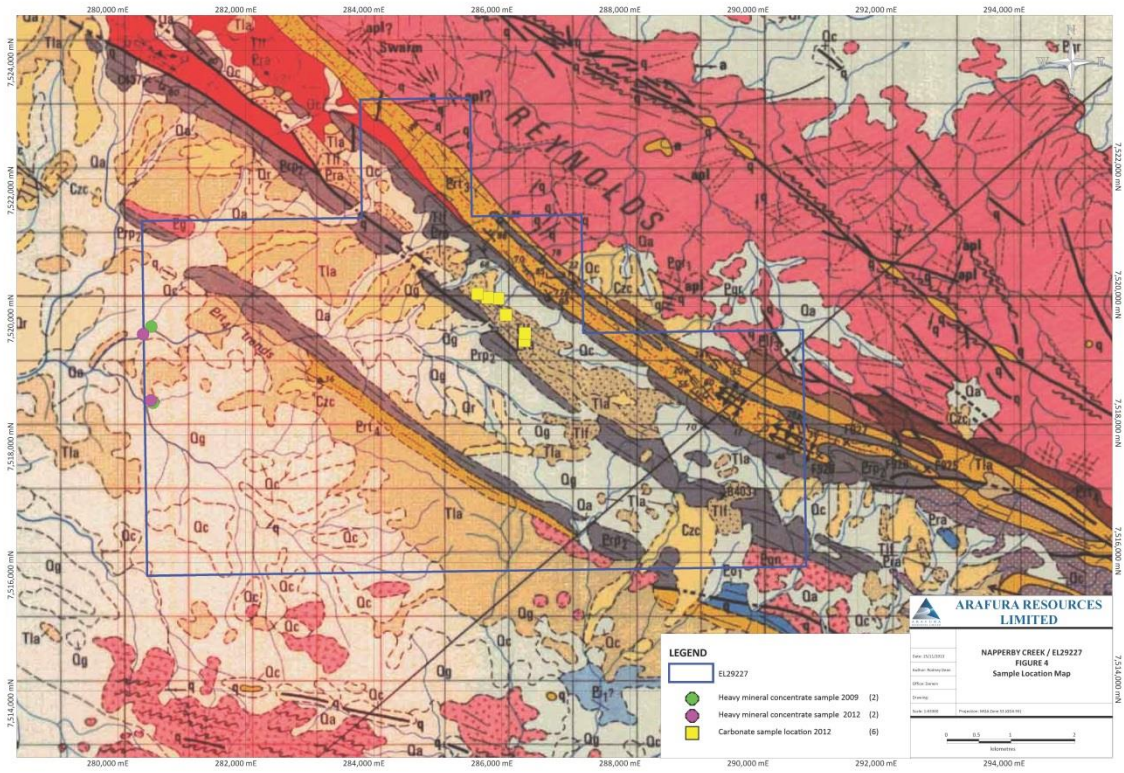

Figure 4. Location of HMC stream sediment and carbonate grab samples

CONCLUSIONS AND RECOMMENDATIONS

The follow-up HMC samples collected from the Napperby Creek project area indicated that although there is some REE bearing heavy mineral accumulation in the drainages within the project area, it's provenance is unlikely to be a carbonatite or associated alkaline intrusive. The monazite and xenotime present in the HMCs is most likely to have been sourced from the surrounding granitoids and metasedimentary sequence. Furthermore, the low bulk REE grades make alluvial extraction unviable. The project area is therefore deemed to non-prospective for significant REE mineralisation and the exploration licence, EL29227, was surrendered.

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