

TITLE HOLDER: XAVIER RESOURCES PTY LTD

OPERATOR: NORTHERN COBALT LTD



GR491 Combined Annual and Final Report
Arunta Project

EL 29481 & EL 29511 for the period 10/12/2017 to 08/04/2019
and
EL 29851 for the period 13/08/2018 to 08/04/2019
and
EL 31147 for the period 07/09/2018 to 08/04/2019

April 2019

Target Commodities: Li, REE
Mapsheets 100K: QUARTZ 5951
Mapsheets 250K: ILLOGWA CREEK SF5315

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Abstract

EL 29481, EL 29511, EL 29851 and EL 31147 were surrendered by Xavier Resources Pty. Ltd., a subsidiary company of Northern Cobalt Ltd in April 2019. Poor results were returned from initial surface geochemical sampling and for this reason Northern Cobalt Ltd could not justify any further work on the tenements.

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1 Introduction

EL 29481, EL 29511, EL 29851 and EL 31147 were surrendered by Xavier Resources Pty. Ltd., a subsidiary company of Northern Cobalt Ltd in April 2019, based on recommendations from a tenement consolidation review. Work completed during the reporting period included: geological desktop studies and surface geochemical sampling.

1.1 Location & Access

EL 29481, EL 29511, EL 29851 and EL 31147 fall within Northern Cobalt Limited's Arunta Project, located in the Harts Range, central Australia, approximately 150km east-north-east of Alice Springs. Access from Alice Springs is north via the Stuart Highway (70km), then east along the Plenty Highway (190km), then south along the Indiana Road (10km).

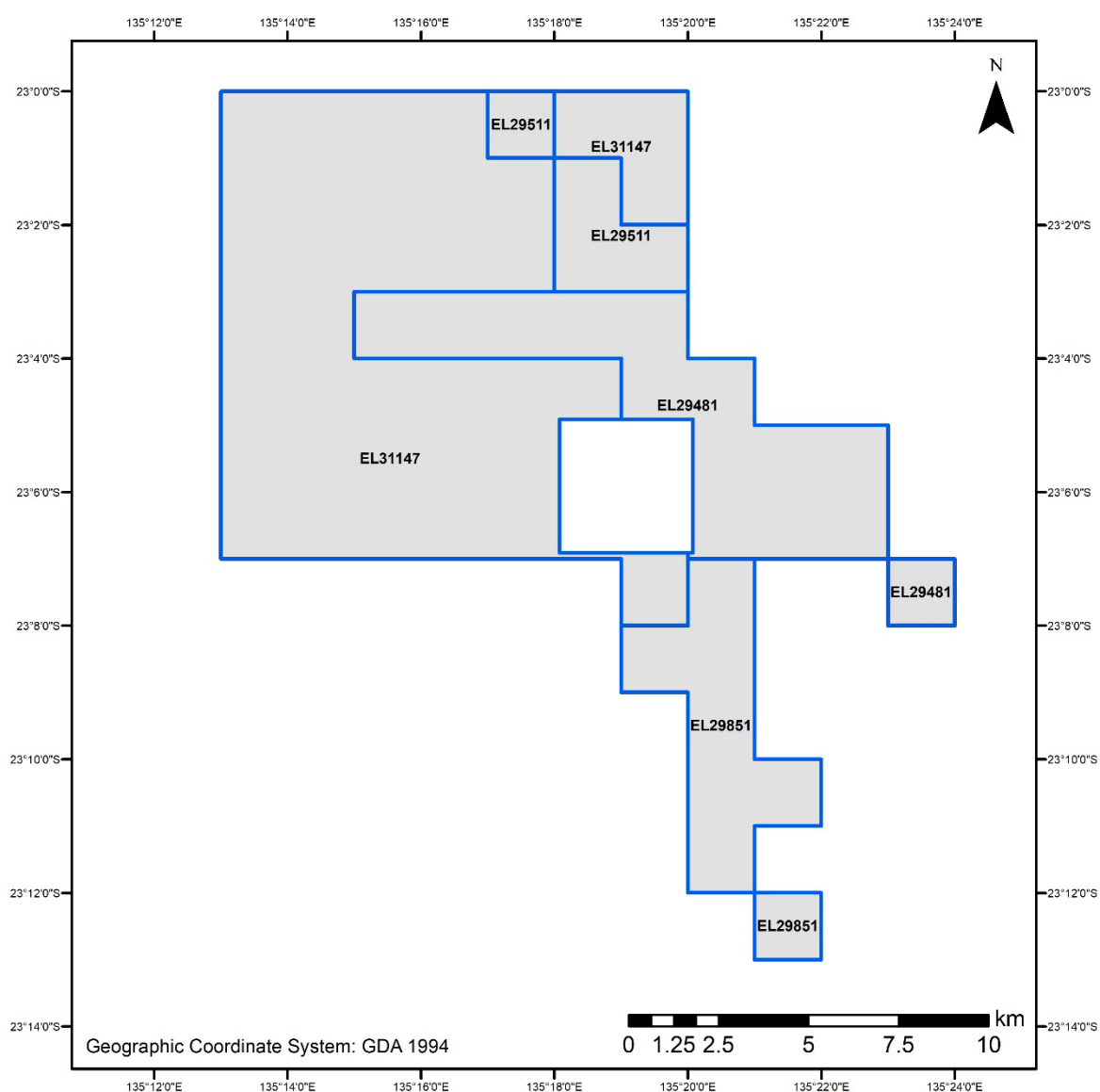


Figure 1: Location map for EL 29481, EL 29511, EL 29851 and EL 31147.

1.2 Regional Geology

The project area is located within the Arunta Region, along the faulted contact between the Palaeoproterozoic, Aileron Province and the Neoproterozoic to Palaeozoic, Irindina Province. The Arunta Region is a poly-deformed and metamorphosed basement terrain located along the southern margin of the North Australian Craton, which is unconformably overlain by the Ngalia, Amadeus, Murraba, Georgina and Eromanga Basins (Scrimgeour, 2003).

The Aileron Province is comprised of variably metamorphosed clastic sediments, meta-volcanic rocks, calc-silicate rocks, dolerite, mafic rock and granite and is prospective for metamorphosed VMS and carbonate replacement Pb-Zn-Cu, iron-oxide Cu-Au, orogenic Au, W(-Mo), Sn, mafic-hosted Ni-Cu, vermiculite, hydrothermal U, and apatite- and pegmatite-hosted REE-U(-P) (Scrimgeour, 2003).

The Irindina Province is a fault bounded metasedimentary and igneous province that formed a deep depocentre within the Centralian Super-basin and was metamorphosed to grades of granulite to amphibolite facies during the Ordovician (Scrimgeour, 2003). The dominant rock types include metasedimentary gneiss, quartzite, mafic amphibolite and felsic migmatite and the province is considered prospective for Ni-Cu sulphides, skarn Cu and pegmatite-hosted REE (U) (Scrimgeour, 2003).

1.3 Local Geology

The project area is predominantly comprised of Arunta Region, Palaeoproterozoic Aileron Province granites and gneisses in the east and Strangways Metamorphic Complex gneisses, metavolcanics and metapelites in the west. In addition, lesser Neoproterozoic, Irindina Province, Harts Range Group metasediments are present along the eastern margin of the tenement package. Surface geology is dominated by in-situ regolith, including slightly to variably weathered bedrock on erosional plains, rises, hills and plateau surfaces. A smaller component of transported alluvial regolith extends across the western portion of the project area (STRIKE, 2018).

The tenement package straddles the cropping out sheared and unconformable contact between the Entia Dome Palaeoproterozoic Ambulbinya Igneous Complex and the overlying Neoproterozoic – Cambrian Harts Range Metamorphic Complex, which is in turn overlain by the Irindina Province biotite- garnet/quartzo-feldspathic gneiss in the east (Mackie, 2017).

Ambulbinya Igneous Complex tonalitic/granitic gneisses (Entia Dome basement 1770Ma) form part of the south-east Arunta Region, Aileron Province ensialic mobile belt covering 200,000km² of central Australia. This major component of the North Australian Craton envelopes three sides (north, west and south) of the fault-bounded 1000Ma – 460Ma Harts Range Metamorphic Complex (HRMC). The HRMC is a thick metasedimentary succession including subordinate igneous component of metabasalt (Riddoch Amphibolite), mafic/ultramafic intrusives (Hammer Hill serpentinite, Baldrick/Blackadder Ni-Cu mineralised mafic/basic intrusives), granite and pegmatite (Mackie, 2017).

Until the early 2000s, the Irindina Province metasediments were deemed Palaeoproterozoic, however recent detrital zircon geochronology determined protoliths of these high-grade metamorphic rocks were deposited during Neoproterozoic – Cambrian era. The metasediments are now deemed high grade time equivalents of (1) Georgina Basin (2) Amadeus Basin sedimentary basin successions located north and south respectively. Peak metamorphism included upper amphibolite to granulite facies, which occurred during 460Ma Larapinta Event, closely followed by 450Ma-300Ma Alice Springs Orogeny (ASO). The waning stages of the ASO saw pegmatite sweats, characteristic of Harts Range, intrude (330Ma), many of which were mined last century (Mackie, 2017).

According to Mackie (2017), the surface geology of the project area is dominated by 1774Ma Entia Gneiss (pChe) amphibolite-biotite gneiss, biotite-garnet gneiss, kyanite-cordierite gneiss, quartzo-feldspathic gneiss and minor marble-calc-silicate. These rocks were metamorphosed to granulite facies during 1730-1690Ma Strangways Event and are unconformably overlain by, and in some cases, structurally juxtaposed with the Neoproterozoic to Cambrian Irindina Province metasediments.

Irindina units observed (Mackie, 2017) include; pChi, pChb1 & 2 cropping out north-east of regional unconformity and intruded by numerous uraniferous/micaceous/spodumene? bearing Carboniferous-age pegmatite and granitoids. Mackie (2017) observed a structural jog filled with voluminous radiogenic pegmatite 3.5km long x 1km at its widest extent, occurs within unconformity towards the eastern-most extent of the combined licence area (vectored by ENE structural trend intersecting a NNW-trending sheared unconformity).

The central southern boundary of the Arunta Project area is intruded by radiogenic 1762Ma Huckitta Granodiorite (Pgh). Similarly, a radiogenic granitic gneiss crops out over central west. Cropping out within the northern-most tenure are numerous alkaline apatite vein swarms enriched in Th-REE-U-Fe-P-carbonate. Several localities have been historically worked namely Holsteins and Jersey prospects (Mackie, 2017).

PNC believed all uraniferous pegmatites were restricted to those intruding 1770Ma Entia Gneiss (pChe) and/or Palaeoproterozoic granites namely Pg, Pgh and Pgi. The pegmatites are megacrystic and feldspar rich occurring as either concordant (similar to those seen within northeast sub block of licence area) or cross-cutting, with accessory minerals including beryl, tourmaline, apatite, monazite, high-Th allanite and oxides of Y-Nb-REEs-U-Ta-Ti (Mackie, 2017).

PNCs 'Torbernite Trend' of linear, highly elevated uranium channel readings closely correlates with (1) westerly trending pegmatoids and (2) the north-west trending unconformity surface. The northwest trending unconformity surface forms part of the north eastern margin of postulated AMAG-interpreted regional zone of intense tectonism i.e. 'Torbernite Corridor'. The interpreted Torbernite Corridor generally trends NW-SE, steepening when passing through the southern portion of the project area. This creates a 'dog leg' effect (dilatational jog), which has been infilled by voluminous pegmatoid + late-stage uranium-silica-kaolinite-Fe alteration/mineralising fluids (Mackie, 2017).

The 'Torbernite Trend' includes multiple cps uranium hotspots/secondary uranium mineral showings including PNC's Mirror Finish mica workings. According to Mackie (2017) the regional eUppm>4ppm contour image shows a possible 8km south-easterly extension to the Mirror Finish mica workings.

1.4 Previous Exploration

Historic exploration has focused on chalcedonic-barite vein hosted REE, skarn-type Sn-W-Mo, sediment-type U and Ni-Cu sulphide mineralisation within the project area.

Table 1: Previous Exploration Summary (adapted from Mackie, 2017a, b and Mackie, 2018a, b)

Year	Company	Description
1968	Capricornia	Targeting Holsteins REE prospect – 13 rock chip samples
1981	CRAE	Targeting base metals, Sn-W and U – 30 drainage samples
1982	Geopeko	Targeting scheelite/molybdenite – No on ground work completed
	UOC	Targeting scheelite – 81 heavy mineral concentrate samples
1994	PNC Exploration	Targeting uranium – Airborne Mag/Rad, ground checked and sampled anomalies. 1:1000 mapping, ground Mag/Rad, petrology
2006	Hale Energy	Targeting uranium – mapping, rock chips
2007	Mithril Resources	Targeting Ni-Cu – Airborne Mag, VTEM, ground EM, ground Mag

2 Work Completed

2.1 Geological Activities & Office Studies

A desktop review on tenure was commenced during the reporting period. This aided the design of a surface geochemical sampling program.

2.2 Geophysical Activities

Although no geophysical activities were undertaken during the current reporting period, outstanding data from the previous reporting period (2017 TEMPEST AEM) has been submitted to DPIR.

Note: This data was submitted to DPIR with the 2018 EL 29851 Annual Report and covers multiple Arunta Project tenements.

2.3 Geochemical Activities

Geochemical surface sampling included 58 soil samples, 26 stream sediment samples and 21 rock chips, which were assayed for a comprehensive element suite including: Ba, Ca, Cr, Fe, K, Li, Mg, Mn, P, S, Sc, Si, Ti and V determined by Inductively Coupled Plasma (ICP) Optical Emission Spectrometry and Ag, As, Be, Bi, Cd, Ce, Co, Cs, Cu, Dy, Er, Eu, Gd, Ge, Hf, Ho, In, La, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Re, Sb, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, W, Y, Yb, Zn and Zr determined by Inductively Coupled Plasma (ICP) Mass Spectrometry.

Li results were disappointing with a maximum value of only 30ppm (Figure 2).

Best Total REE (i.e. combined La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu) of value of 471ppm was in stream sediment HR0418.

Note: Previously reported outstanding geochemical analytical results were never received from Gempart, hence Northern Cobalt re-sampled the area.

3 Conclusion & Recommendations

Poor results were returned from initial surface geochemical sampling and consequently no drill targets were defined. After completing a tenement consolidation review on all the Arunta Project tenements, Northern Cobalt opted to relinquish EL 29481, EL 29511, EL 29851 and EL 31147.

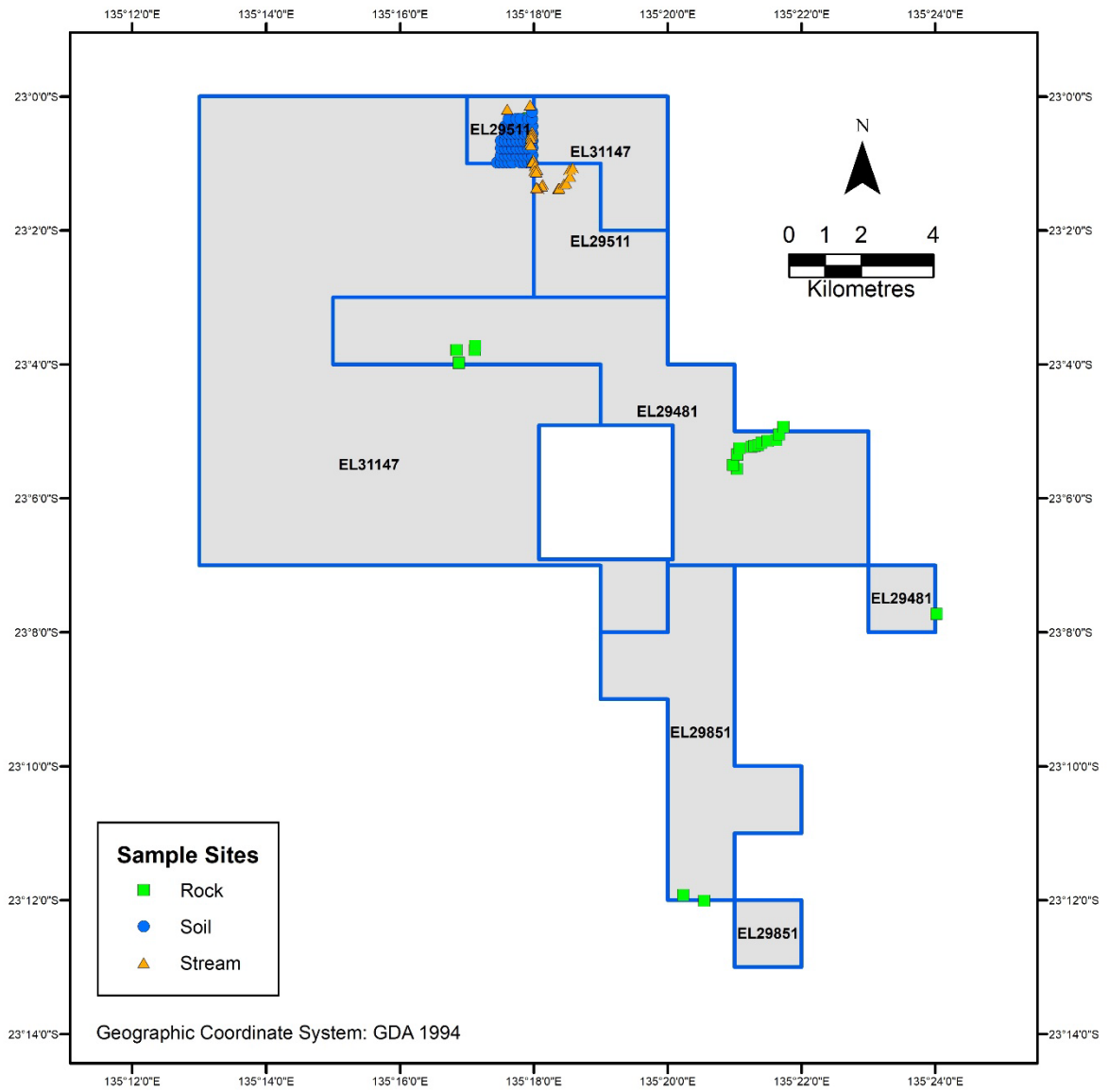


Figure 2: Location map for soil, stream sediment and rock chip samples (Exploration Index Map)

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