

REDUCTION REPORT

EL 28970

HREE District

Fergusson River	SD 5212	1:250,000
Delamere	SD 5216	1:250,000
Daly River	5070	1:100,000

Titleholder: Spectrum Rare Earths
(previously TUC Resources Ltd)

Target Commodities: Rare Earth Elements and Uranium

Prepared for Spectrum Rare Earths Limited
By Laura Petrella
September 2015

CONTENTS

1.	SUMMARY	1
2.	LOCATION AND ACCESS	2
3.	TENEMENT STATUS AND OWNERSHIP	4
4.	GEOLOGY	5
5.	PREVIOUS EXPLORATION.....	8
6.	EXPLORATION DURING YEAR 1 (2012)	9
7.	EXPLORATION DURING YEAR 2 (2013)	9
8.	EXPLORATION DURING YEAR 3 (2014)	9
9.	EXPLORATION DURING YEAR 4 (2015)	9
10.	CONFIDENTIALITY STATEMENT	9
11.	REFERENCES	9

LIST OF FIGURES

Figure 1	EL28970 Location Map with underlying cadastre. Retained area in bleu and relinquished area in red.....	2
Figure 2	Location Map of EL28970 and Dropped Ground, Blue – Retained blocks, Red – Surrender blocks.....	3
Figure 3	Geological Map of EL28970 before reduction.....	7

1. SUMMARY

EL28970 is situated approximately 250 km south of Darwin, the Northern Territory. Spectrum Rare Earths Limited (Spectrum) applied for EL 28970 to determine the HREE potential of the area.

On the fourth year of EL28970 life, Spectrum Rare Earths Ltd has been issued a Partial Cancellation Notice. Consequently 7 blocks have been relinquished. This report details exploration carried out by Spectrum on relinquished grounds for the duration that it was held.

Work during year 1 and 2 of tenure consisted in data compilation from mineralogical reports and a review of available geophysical data which was critical to target prospection priority. Moreover Spectrum undertook a rock and soil sampling program however no sample were taken on the relinquished ground.

2. LOCATION AND ACCESS

EL 28970 falls in the Fergusson River SD52-12 and Delamere (SD52-16) 1:250,000 map sheets. The licence area is situated approximately 250 km south of Darwin in the Northern Territory.

Access to the tenement from Darwin is first via the Stuart Highway, then via the road to Dorisvale Station and finally tracks on Dorisvale station property. Alternatively the tenement can be access from Oolloo road and Daly River Crossing then using tracks to the tenement (Figure 1). Most of the tenement can only be accessed via four wheel drive or helicopter.

Topography for the tenement area is low relief, with some floodplains. The Flora River and the Mathison Creek are the main watercourses intersecting the tenement.

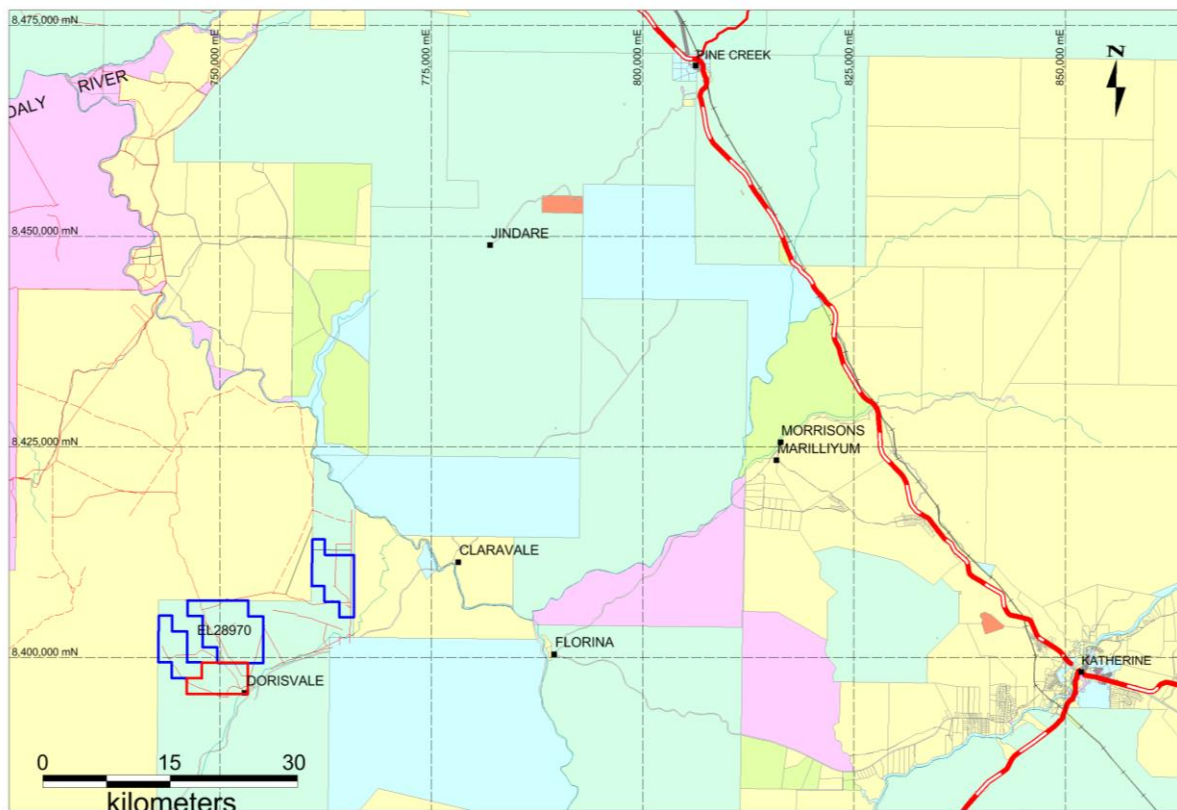


Figure 1 EL28970 Location Map with underlying cadastre. Retained area in bleu and relinquished area in red.

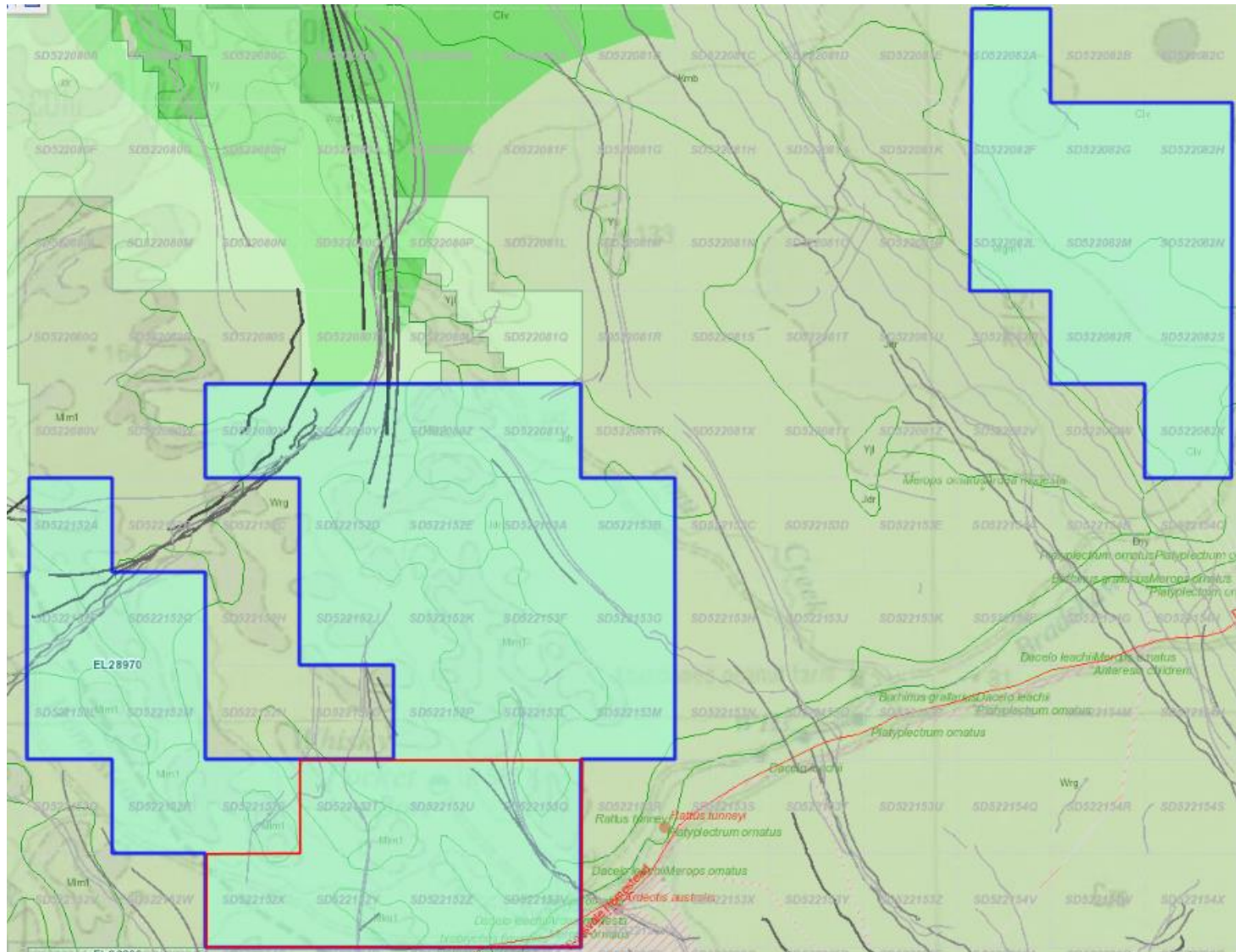


Figure 2 Location Map of EL28970 and Dropped Ground, Blue – Retained blocks, Red – Surrender blocks.

3. TENEMENT STATUS AND OWNERSHIP

EL 28970 was granted on 5 March 2012 and expires on 4 March 2018. It originally comprised of 93 graticular blocks (292.06 sq km). EL 28970 is currently in its fourth year and was issue a Partial Cancellation Notice, therefore 7 blocks are relinquished as illustrated in *Figure 2*.

There are no other mining leases or mineral claims shown within the Licence boundaries.

Underlying cadastre (Figure 1) is perpetual pastoral lease (PPL) stations owned by:

- PPL 1066, (NT Portion 01167) Dorisvale Station, covering the northern part of the Licence, owned by Anthony Harrower.

Tenement Reductions:

	Blocks retained	Blocks relinquished
Partial relinquishment Year 4	32	7

This report details exploration carried out by Spectrum on the relinquished ground for the duration that it was held. The relinquished blocks versus the retained blocks are displayed in *Figure 2*.

4. GEOLOGY

Regional Geology

EL28970 is situated within the Fergusson River (SD52-12) and Delamere (SD52-16) 1:250,000 map sheets. The description of regional geology has been adapted from Pontifex, I.R and Mendum, J.R. (1972) and Beier *et al.* (2002).

The regional stratigraphy is represented by rocks ranging in age from mid Proterozoic to Cretaceous. The main structural feature of the region is the northwest striking Dorisvale Fault. The Dorisvale Fault marks the boundary between the Victoria Platform to the west (comprising gently folded Lower Cambrian Antrim Plateau Volcanics overlying Proterozoic units of the Banyan and Bynoe Formations) and the Daly River Basin to the east (comprising Middle Cambrian to Ordovician carbonates of the Tindall Limestone and the Jinduckin Formation).

Geological History: Proterozoic sedimentary rocks (Bullita, Auvergne and Tolmer Groups) were laid down in shallow seas. Uplift and erosion preceded the regional extrusion of Early Cambrian flood basalts of the Antrim Plateau Volcanics. An extensive marine transgression in the Middle Cambrian occurred and resulted in the deposition of the Daly River Group. Brief periods of peritidal carbonate deposition resulted in the deposition of Tindall Limestone. A subsequent regression led to the deposition of the Early Ordovician Jinduckin Formation (mixed carbonate-siliciclastic succession). Between the Ordovician and Early Cretaceous, regional sedimentation ceased and large areas were eroded. Mesozoic sandstones, conglomerates, silt and mud of continental and shallow marine origin were subsequently deposited in a thin succession. Cenozoic deposits resulted from a period of erosion, deep weathering and lateritisation.

Local Geology

The description of local geology has been adapted from Pontifex, I.R and Mendum, J.R. (1972). *1:250,000 Geological Series Explanatory Notes, Fergusson River, NT.*

The oldest rocks that crop out in the licence area are rocks of the Bullita Group. The Bullita Group is a sequence of Neoproterozoic (Adelaidean or Carpentarian) dolomite and siltstones and only crop out in the central and northern portions of the tenement. The basal unit, the Skull Creek Formation, is not exposed in the tenement. It is conformably overlain by the Bynoe Formation. The Bynoe Formation consists of purple and green siltstone and dolomitic siltstone, which is commonly friable and blocky, and contains minor intercalated dolomite or silty dolomite bands. These bands are flaggy to blocky, and contain halite casts and mud cracks. The Banyan Formation overlies the Bynoe Formation generally conformably but in a few places with a slight unconformity. It consists of a basal calcareous sandstone-dolomite sequence, a middle thick dolomite sequence and an upper siltstone-shale sequence. The middle dolomite sequence contains pink and grey, flaggy to massive, oolitic and stromatolitic dolomite. No other Proterozoic rocks are known to be exposed in the area.

The Lower Cambrian Antrim Plateau Volcanics unconformably overlie the Proterozoic rocks. They consist of massive and vesicular tholeiitic basalt. Prehnite, calcite, zeolites and rarely quartz have filled some vesicles in the basalt. They are known to contain barite and traces of copper and gypsum. In places, grey to reddish brown, blocky, medium grained feldspathic sandstone is interbedded with the basalt.

Unconformable to the Plateau Volcanics is the Daly River Group which consists of a sequence of limestone, sandstone, and siltstone. These sediments are confined to the Daly Basin, the western margin of which is defined by the Dorisvale Fault. The lowest stratigraphic unit, the Tindall Limestone, has limited exposure in the southern portion of the licence area. The Tindall Limestone outcrops in a narrow, discontinuous belt along the margins of the Daly Basin and comprises calcilutite, coarsely crystalline limestone and minor sandstone. Middle Cambrian fossils are present in this unit. The Jinduckin Formation conformably overlies the Tindall Limestone and consists of flaggy, friable, ferruginous sandstone and siltstone with minor limestone and dolomite. Halite pseudomorphs are also common. Lower Ordovician conodonts have been identified within the formation.

The Mullaman Beds consist of freshwater and shallow water marine sandstone, siltstone and porcellanite and unconformably overlie all older units. The Mullaman Beds have been extensively laterised; in places the pallid zone of the laterite profile has been silicified and forms a tough cap rock.

Superficial deposits overlying the above strata are the Cainozoic sediments, which are widespread across the licence area consisting of pisolitic laterite and ferruginous rubble and alluvium. The lateritic profile, associated with the claystones of the Mullaman Beds, have a maximum thickness of thirty metres.

Exploration Licence 28970 contains two major structural units, the Victoria Platform and the Daly Basin. The Carpentarian and Adelaidean sediments and the Antrim Plateau Volcanics belong to the Victoria Platform and are gently folded. The platform is bounded to the east by the Dorisvale Fault and contains small-scale normal faults. The Daly Basin consists of a sequence of gently dipping sediments and shows little faulting or folding.

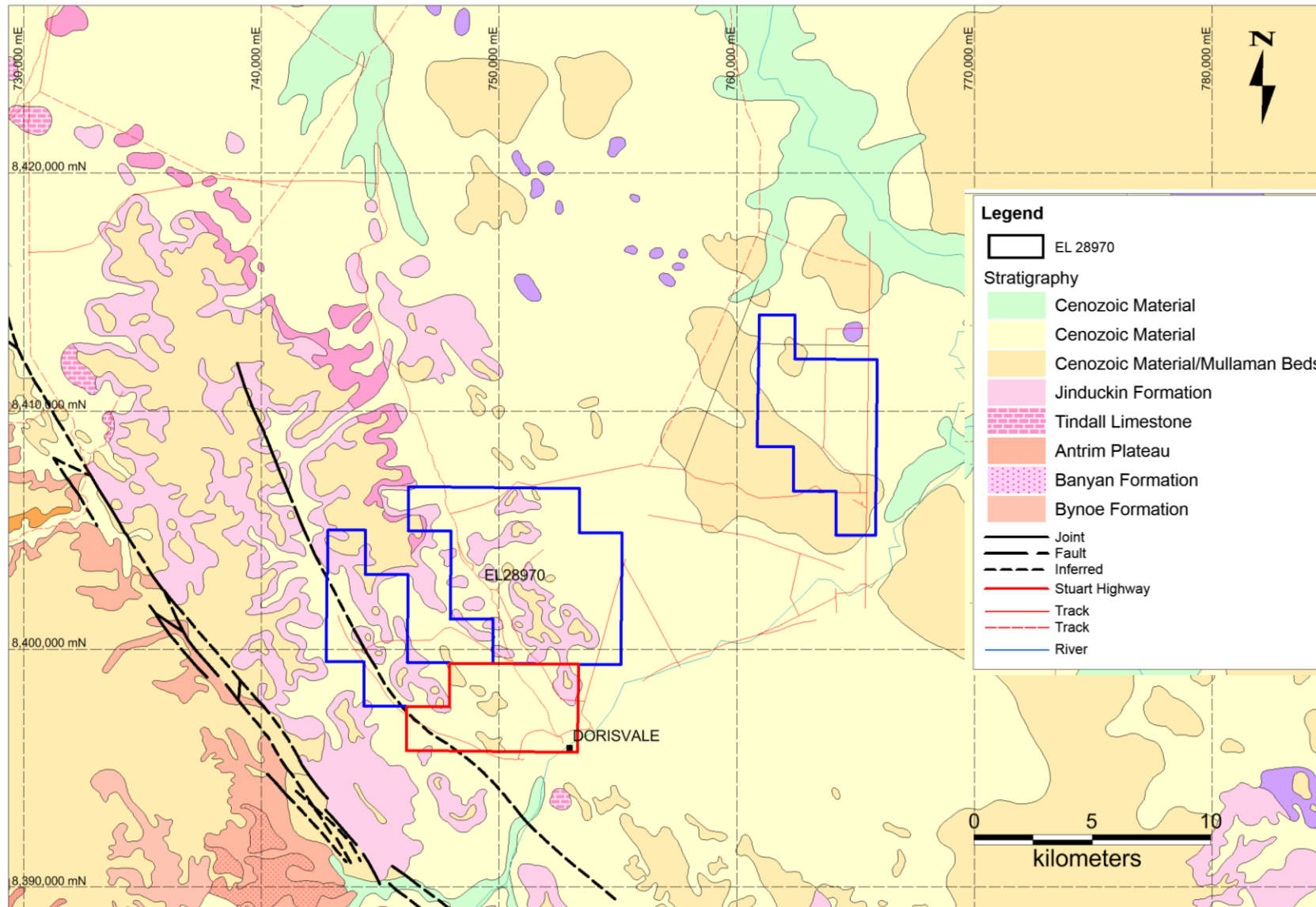


Figure 3 Geological Map of EL28970 before reduction

5. PREVIOUS EXPLORATION

Work completed on EL 28970 by Spectrum during Year 2 included a literature review and GIS data compilation.

The region has previously been explored for a variety of commodities including diamonds, base metals, barite, phosphate, bauxite and limestone. Exploration details of the historic tenements intersecting and contained with EL 28970 are summarised below:

AP1682 CR1967-0020

IMC development corp. undertook a rock chip sampling program however the geochemical results are missing in the report.

AP2545 CR1970-0024, CR1971-0093

Euralba Mining undertook a mapping rock chip sampling program over EL18970. They found Pb, Zn and Fe anomaly however no map was attached to the report and the samples location were missing too.

EL1768 CR1981-0089

Ashton Mining undertook a mapping and a rock, stream-sediment, and gravel sampling program partly over EL28970. They identified large number of U anomalies in The Bamboo Creek area, near Dorisvale associated to significant Pb-Zn values. The area is considered to hold potential for a McArthur River or Rammelsberg type deposit and possibility exists for a sandstone/siltstone U mineralization. They have done detailed mapping, rock chip sampling and ground radiometric survey. There is a correlation in their data between U and P_2O_5 for most samples.

EL2327 CR1984-0051

CRA Exploration identified radiometric anomalies after flying eighteen airborne radiometric lines. Follow up rock chip geochemistry indicated low U enrichment (max. 32ppm U) associated with laterite horizons developed over thin sediments of Cretaceous age (Mullaman Beds). No further work was recommended.

EL7672 CR1994-0609

Stockdale Prospecting explored for diamond over EL29870 but they haven't found any.

EL9628 CR1998-0034, CR1998-0744

Stockdale Prospecting Ltd undertook aeromagnetic and reconnaissance sampling survey in their exploration for diamonds. 52 heavy mineral samples were collected but no diamonds or kimberlitic indicator minerals were recovered. No features of interest were observed from the aeromagnetic survey. The area was relinquished.

From thin work Spectrum discovered that base metal mineralisation has been found locally carbonate rocks in close proximity to the Dorisvale fault. Moreover Spectrum compiled rock chips, stream sediments and soil samples base metals and U results, however none of these data fall into the drop ground.

6. EXPLORATION DURING YEAR 1 (2012)

Spectrum undertook a soil and rock sampling reconnaissance program however none were taken on the relinquished ground.

7. EXPLORATION DURING YEAR 2 (2013)

Spectrum work was focused on compiling historical data from mineral exploration reports which was followed by a desktop study involving the data compiled.

8. EXPLORATION DURING YEAR 3 (2014)

No work was undertaken on the relinquished ground.

9. EXPLORATION DURING YEAR 4 (2015)

No work was undertaken on the relinquished ground.

10. CONFIDENTIALITY STATEMENT

This document and its content are the copyright of Spectrum Rare Earths Limited. The document has been written for submission to the Northern Territory Department of Mines and Energy as part of the tenement reporting requirements as per the Mineral Titles Act (NT). Any information included in the report that originates from historical reports or other sources is listed in the "References" section at the end of the document. All relevant authorisations and consents have been obtained. Spectrum Rare Earths Limited authorises the department to copy and distribute the report and associated data.

11. REFERENCES

Pontifex I.R. and Sweet, I.P., 1972: *1:250 000 geological map series explanatory notes. Fergusson River, Northern Territory. Sheet SD/52-12 International Index.* Bureau of Mineral Resources, Geology and Geophysics.

Beier P.R., Dunster J.N, Cutovinos A. and Pietsch B.A, 2002. *1:250,000 geological map series explanatory notes, SD52-16. Delamere, Northern Territory (Second Edition).* Northern Territory Geological Survey, Darwin.