



PARTIAL RELINQUISHMENT REPORT FOR EXPLORATION LICENCE 30739 LAKE MACKAY PROJECT

From 13th of October 2017 to 21st of October 2021

Holder	IGO Limited
Operator	IGO Limited
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Target Commodities	Copper, Gold, Zinc, Lead, Nickel, Cobalt
Datum/Zone	GDA94/ MGA Zone 52
250,000 map sheet	Mount Doreen (SF52-12)
100,000 map sheet	Gurner (5052)
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1 Abstract

This report summarises the partial relinquishment of tenement EL30739 triggered by the fourth anniversary of the tenement being granted on the 13th of October 2017.

IGO Limited (IGO) tenement EL30739 is located approximately 330 km northwest of Alice Springs in the western Aileron Province of central Australia. EL30739 forms part of the Lake Mackay Project joint venture with Prodigy Gold NL (PRX). Ownership of the project is split 70% to IGO and 30% to PRX, with each party contributing their share of the project expenditure. All on-ground exploration since the tenement was granted has been conducted by IGO, the operator of the joint venture.

On relinquished ground in the reporting period 13/10/2017 to 21/10/2021, IGO completed airborne magnetic, radiometric and electromagnetic surveys, 1 ground electromagnetic survey, and obtained 166 soil samples and 1 rock chip sample. This work was part of a wider exploration program across the Lake Mackay project area. The tenement was also subject to a site heritage clearance by the Central Land Council.

IGO have relinquished ground for four main reasons. There were no anomalous geophysical or geochemical targets generated from the surveys conducted, targets generated were fully tested, areas were considered unexplorable because of significant depth of cover, or areas were excluded by heritage sites. No further work is recommended on the relinquished ground.

2 Location, Title History, Physiography and Access

The southeastern boundary of tenement EL30739 is located approximately 15 km south of Nyirripi in Northern Territory and is approximately 335 km northwest of Alice Springs (**Figure 1**).

The tenement was granted on 13th October 2017 for a period of six years. EL30739 forms part of the Lake Mackay Project joint venture with Prodigy Gold NL (PRX). Ownership of the project is split 70% to IGO and 30% to PRX, with each party contributing their share of the project expenditure. All on ground exploration since the tenement was granted has been conducted by IGO, the operator of the joint venture.

Tenement EL30739 is part of an amalgamated reporting arrangement (GR485) with several other Lake Mackay project tenements (ELs 24915, 25146, 30729, 30730, 30731, 30732, 30733 and 30740). EL30739 underwent a reduction in tenement area (partial relinquishment) in 2019 pursuant to the Mineral Titles Act on the second-year anniversary of the tenement being granted (McGloin 2019).

EL30739 is located on Aboriginal Freehold Land of the Yunkanjini Aboriginal Land Trust. Negotiations with the land trust are overseen and managed by the Central Land Council. The tenement has also been subject to a site heritage clearance organised by the Central Land Council.

The terrain is typically aeolian sand cover and spinifex plains, with occasional low hills and subcrop. Stands of scrubby mulga occur in areas with shallow sand cover.

The tenement can be accessed from Alice Springs north via the Stuart Highway, then west on the Tanami Road, before heading west along the well-maintained Newhaven Reserve track (dirt) towards Nyirripi. The tenement can then be reached using access tracks within Newhaven Nature Reserve, followed by temporary cross-country tracks after leaving the Nature Reserve.

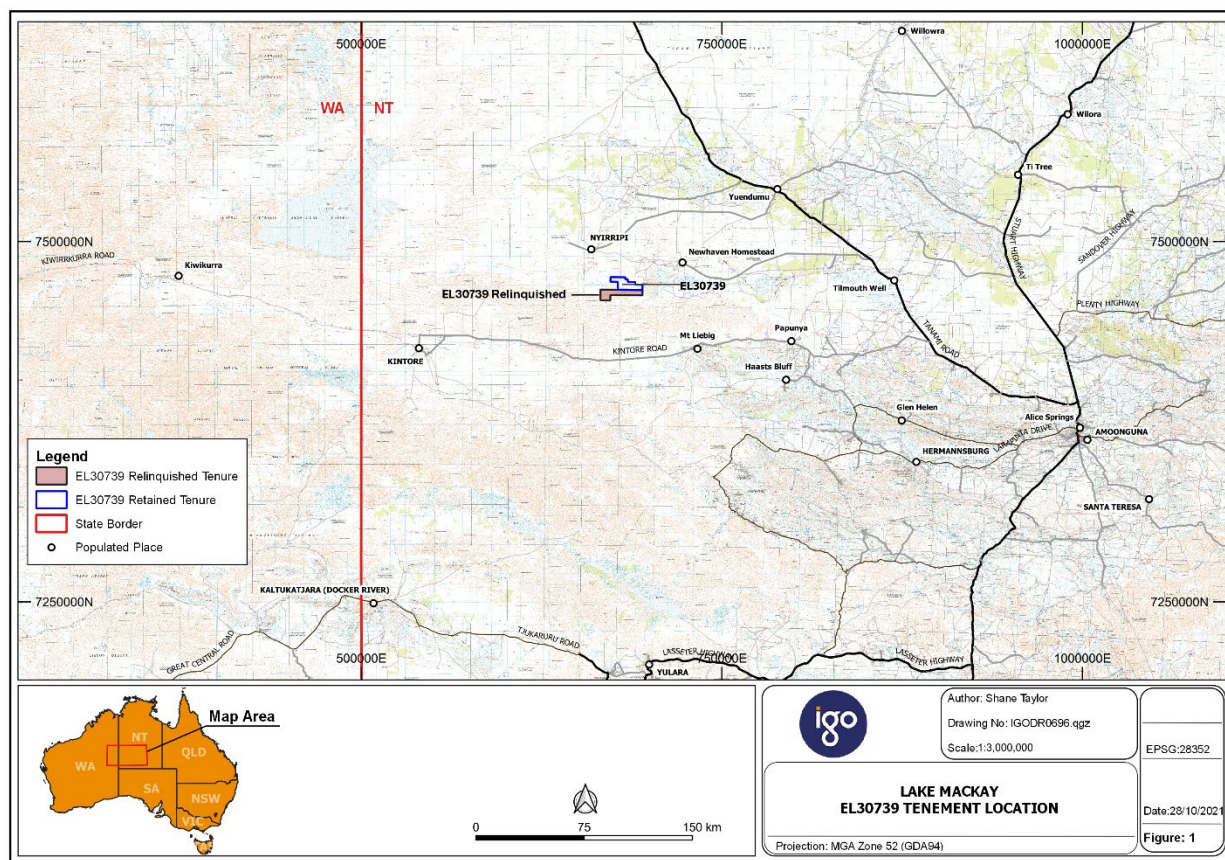


Figure 1: Location map of EL30739.

3 Geological setting, exploration history and exploration rationale

3.1 Regional and local geology and mineralisation

The Lake Mackay Project is located at the southern margin of the Paleoproterozoic North Australian Craton, straddling the Warumpi Province to the south, and the Aileron Province to the north. These provinces are separated by the Central Australian Suture, a major deep crustal-scale structure comprising a series of east-west trending major faults and shear zones (Shaw et al 1992, Scrimgeour et al 2005a, Selway et al 2009, Joly et al 2013).

Outcropping geology across the project area is typically poorly exposed. The terrain comprises low hills of poorly exposed Paleoproterozoic metasedimentary rocks and intrusions, commonly covered by aeolian sand plains and dunes (Close et al 2005). In some locations, Paleoproterozoic rocks are overlain by Neoproterozoic and Paleozoic sedimentary rocks of the Amadeus and Ngalia basins.

Polymetallic base metal and gold mineralisation at Grapple and Bumblebee (Winzar 2016, Reno et al 2018, McGloin et al 2019), and more recently at the Phreaker, Scuba and Raw prospects (Prodigy Gold, ASX Releases, 17 July 2019 and 18 January and 26 May 2021), is located in the western Aileron Province. The ore-forming processes for these prospects remain poorly understood (Reno et al 2018, McGloin et al 2019). Nonetheless the observation of weakly magnetic pyrrhotite directly associated with base metal sulfides and gold (Cu-Au-Ag-Co-Zn-Pb), and anomalous enrichment in several trace elements (As, Bi, Te, Sn, Cd, Se, Sb) provides empirical geophysical and geochemical pathfinders that can be used to explore for similar

mineralisation regionally.

The host rocks to the sulfide and gold mineralisation are ca 1.84–1.81 Ga metamudstone and metasediment of the Lander Rock Formation, interpreted as a turbidite sequence (Close et al 2004, Close et al 2005a, Hollis et al 2013, McGloin et al 2019, Kositcin et al 2019). These siliciclastic metasedimentary rocks are strongly deformed and variably metamorphosed and interpreted to be lateral equivalents of similar metasedimentary rocks in the Tanami, Warramunga and Davenport Provinces (e.g., Claoué-Long et al 2008). A regional lithostratigraphy is not established between these provinces however because of a lack of continuous outcrop, few marker horizons, and the high metamorphic grade and deformation of these rocks in many locations.

Between ca 1.84–1.70 Ga, metasedimentary rocks of the Lander Rock Formation were intruded and metamorphosed by several phases of magmatism (Scrimgeour 2013, Hollis et al 2013, Kositcin et al 2019). Such intrusions include phases of the loosely defined ca 1.81–1.77 Ga felsic Carrington Suite and the ca 1.8 Ga Du Faur mafic Suite (Close et al 2005, Edgoose et al 2008, Kirkland et al 2009, Scrimgeour 2013, Hollis et al 2013).

The Du Faur Suite encompasses metadolerite and metapyroxenite sills (typically recrystallised to hornblende amphibolite; Close et al 2005). The Du Faur Suite are low-K tholeiites; this chemistry is interpreted as evidence for their emplacement in an extensional tectonic setting (Close et al 2005, Scrimgeour 2013). The precise timing of emplacement remains unknown due to difficulties sampling mafic rocks for chronology (Beyer et al in prep); nonetheless these sills preserve the same folded regional fabric as the enclosing metasedimentary succession, dated at ca 1.67 Ga at the Grapple prospect (Reno et al 2018), providing a minimum crystallisation age.

The Warumpi Province records a ca 1.69–1.60 Ga history of voluminous, dominantly granitic felsic magmatism, crustal thickening, and high-thermal-gradient metamorphism along the southern margin of the Aileron Province (Scrimgeour et al 2005a,b). Felsic and lesser mafic rocks of the Argilke Igneous Event were emplaced between ca 1.69–1.66 Ga (Close et al 2005, Scrimgeour et al 2005a, Kirkland et al 2009, Hollis et al 2013). Interpreted metasedimentary rocks with minimum ages of ca 1.66–1.64 Ga and 1.64–1.60 Ga (e.g., Yaya Metamorphic Complex) occur adjacent to these older igneous rocks (Scrimgeour 2005a-b, Close et al 2003, Scrimgeour et al 2005b, Hollis et al 2013).

Further felsic and mafic magmatism occurred in the Warumpi Province, and locally in the Aileron Province on Mount Rennie and Mount Doreen map sheets (e.g., Andrew Young Igneous Complex, Walungurru Volcanics, Waluwiya Suite) at ca 1.64–1.63 Ga contemporaneous with high-thermal gradient metamorphism (Wyborn et al 1998, Cross et al 2005, Scrimgeour et al 2005a, Hollis et al 2013, Kositcin et al 2019). The Andrew Young Igneous Complex in particular, is dominated by ultramafic and mafic intrusions, but also contains subordinate biotite-granite and pegmatites (Close et al 2005, Scrimgeour 2013). The mafic and intermediate intrusions include coarse augite-bearing norite, porphyritic micro-crystalline norite, olivine and K-feldspar-bearing norite, biotite-bearing olivine gabbro-norite, quartz-bearing microdiorite, anorthosite, and plagioclase-andradite-clinopyroxene rock.

The origin of the Warumpi Province remains a focus of study; one model based on U–Pb zircon chronology interprets the province as an exotic terrain that collided obliquely with the Aileron Province at ca 1.64 Ga (Close et al 2005b, Scrimgeour et al 2005b). An alternative model based on isotopic and chronological evidence for mantle-derived magmas and crustal inheritance proposes that the Warumpi Province represents a rifted piece of the Aileron Province that was re-attached at some point (Hollis et al 2013, Wong et al 2015). Morrissey et al (2011) and Wong et al (2015) propose that the Warumpi Province was the upper plate to the Aileron Province during the Paleoproterozoic, and that the province was emplaced along the Central Australian Suture at ca 1.1 Ga during the Grenvillian orogeny. The timing of development for the Suture remains uncertain (Scrimgeour et al 2005) however it must have formed during or after the so-called Liebig Orogeny (ca 1.64–1.63 Ma) and may have been re-activated several times.



Along with the hydrothermal polymetallic sulfide mineralisation, the project area is also considered prospective for both nickel-cobalt-manganese and gold mineralisation.

Ultramafic intrusions of the ca 1.64 Ga Andrew Young Igneous Complex represent a potential economic target for orthomagmatic and lateritic nickel and cobalt mineralisation (Gregory et al 2004, Hoatson et al 2005, Prodigy Gold ASX Releases 26 July 2018, 30 May and 17 July 2019, 18 January 2021). Shallow zones of nickel-cobalt-manganese mineralisation have been confirmed in duricrust at the Grimlock and Swoop prospects through reverse circulation (RC) and aircore drilling. Further outcrops of weathered ultramafic remain untested in the Warumpi Province, providing additional viable exploration targets.

Orogenic gold has also actively become a valid exploration target across the project area, following the successful greenfields gold discoveries at the Arcee and Goldbug gold prospects in EL31234 and EL31794, respectively. The Arcee gold prospect was discovered in September 2019 (Cornwell 2019). RC drill hole 19LMRC072 tested a coherent gold anomaly (>50 ppb Au) from regional soil sampling. The drill hole intersected a broad zone of gold mineralisation (12 m at 3.6 g/t Au from 112 m) in the centre of an orthoamphibolite sill of the Du Faur Suite, that intrudes metasedimentary rocks of the Lander Rock Formation. The Goldbug prospect was discovered in October 2020. The best intercepts from the discovery hole 20LMRC039 were 16 m at 1.15 g/t Au, 4 m at 0.78 g/t Au and 4 m at 1.54 g/t Au, from 48 m depth, hosted within orthoamphibolite of the Du Faur Suite (Prodigy Gold ASX Release 18 January 2021).

3.2 Historical regional exploration and exploration rationale

The exploration rationale for the Lake Mackay Project is now largely based on empirical observations from systematic fieldwork and the recent discovery of base metal and gold mineralisation in the area. However, before the discovery of mineralisation at the Bumblebee prospect in 2015, the project area was largely untested for mineral potential using modern exploration methods.

Previous theoretical studies considered the general Lake Mackay area prospective for nickel mineralisation (Hoatson et al 2005), orogenic and intrusion-related gold, sediment-hosted base metal deposits and uranium mineralisation (Joly et al 2013), and hydrothermal copper-gold mineralisation including IOCG deposits (Skirrow et al 2019).

IGO initially targeted the project for orogenic gold. The area was considered to have the key constituents identified by Joly et al (2013) in the Western Australian part of the Aileron Province. These included ca 1.80–1.70 Ga and 1.64 Ga intrusions that show evidence for local gold enrichment (potential sources), major deep crustal structures (fluid conduits) and potential physico-chemical boundaries (depositional traps). The trends of west-northwest gold anomalism from regional sampling in Western Australia occurs parallel to D₁ structures, and the Central Australian Suture, and continue into IGO's Lake Mackay tenements in the Northern Territory.

Limited historical exploration in the 2000s by BHP Billiton on the nearby tenement EL24915 targeted orthomagmatic nickel mineralisation associated with ultramafic and mafic rocks of the Andrew Young Igneous Complex (Gregory et al 2004). In 2003, two RC drill holes testing electromagnetic anomalies intercepted minor sulfide mineralisation (one of these drill holes was located 3.6 km west of IGO's subsequent Bumblebee discovery). The BHP drilling was never followed-up despite intercepting minor pyrite, pyrrhotite and trace chalcopyrite in tourmaline-bearing quartz veins within a shear zone that cut metasedimentary rocks and hydrothermally altered mafic intrusions.

Between 2002 and 2012, a joint-venture between Teck Australia Pty and Kajeena Mining Company carried out preliminary exploration work, including on historical tenement EL10383 (now part of EL29748), about 300 metres north of the Grapple and Bumblebee prospects (Kalma and Cawood 2009, Lee 2012). This work

included field visits to collect sporadic rock chip, portable XRF, spinifex and soil samples where weakly anomalous gold, copper and zinc results were obtained. The Leg Gully anomaly, an east-west trending ironstone within mica schist, returned XRF readings of ≤ 1404 ppm Cu and rock chip assays of 323 ppm Cu. These results were never followed up. With hindsight, these reports from BHP, Kajeena Mining Company and Teck match the setting and observed mineralisation now discovered at Phreaker, Bumblebee and Grapple.

The Bumblebee prospect was discovered by IGO in 2015 after drilling of soil geochemical anomalies (Winzar 2016). The soil sampling program was designed to test for both gold and base metal anomalism using a -50 μm soil sampling method developed specifically for the project. This involved a 10 g cyanide leach for gold and silver and a 0.5 g Aqua Regia digestion for other base metal and pathfinder elements.

Additional soil sampling, along with airborne and ground electromagnetic surveys and geological mapping between 2016 and 2021 discovered several further polymetallic sulfide and gold prospects (e.g., Grapple, Phreaker, Raw, Scuba, Arcee, Goldbug). Additionally, rock chip sampling and drilling of ultramafic duricrust from the Andrew Young Igneous Complex at the Grimlock and Swoop prospects led to discovery of lateritic Co-Ni-Mn mineralisation (Prodigy Gold ASX Releases 26 July 2018, 30 May and 17 July 2019, 18 January 2021).

The exploration concept for the Lake Mackay project is to target geochemical anomalies and/or electromagnetic conductors that likely relate to:

- 1 “Bumblebee-Grapple-Phreaker-style” pyrrhotite and associated base and precious metal mineralisation hosted in the Lander Rock Formation; and
- 2 Orthomagmatic or lateritic Ni-Co-Cu mineralisation hosted within ultramafic intrusions of the Andrew Young Igneous Complex.
- 3 Orogenic gold mineralisation hosted within structures associated with metamafic sills of the Du Faur Suite that intrude metasedimentary rocks of the Lander Rock Formation.

All three mineralisation styles are of interest to IGO because deposits of this nature should be readily detectable using both modern airborne and follow-up ground electromagnetic surveys, and geochemical methods, even under shallow cover, and thus could provide economically viable deposits despite the remote location. The Bumblebee and Grapple prospects produced strong geochemical anomalies using soil sampling, and along with the Phreaker prospect, strong electromagnetic conductors using airborne and ground surveys, providing empirical methods to target further mineralisation. Consequently, IGO have applied both soil geochemistry and airborne (AEM) and ground (MLEM) geophysical surveys as a way to delineate additional mineralisation across the project (Winzar 2016, Whitford 2019).

These methods successfully generated multiple drilling targets and led to the discovery of the Phreaker, Scuba, Raw, Arcee and Goldbug prospects (Prodigy Gold ASX Releases 26 July 2018, 30 May 2019, 18 January and 26 May 2021). The discovery of these mineralised bodies confirms the mineral potential, and the applicability of these exploration methods, across the project area.

4 Relinquishment details

Pursuant to the Northern Territory Mineral Titles Act, a partial relinquishment on EL30739 was required on the fourth-year anniversary of the tenement being granted. Consequently, EL30739 has been reduced from 82 blocks (254 km²) down to 40 blocks (121 km²; **Figure 2**).

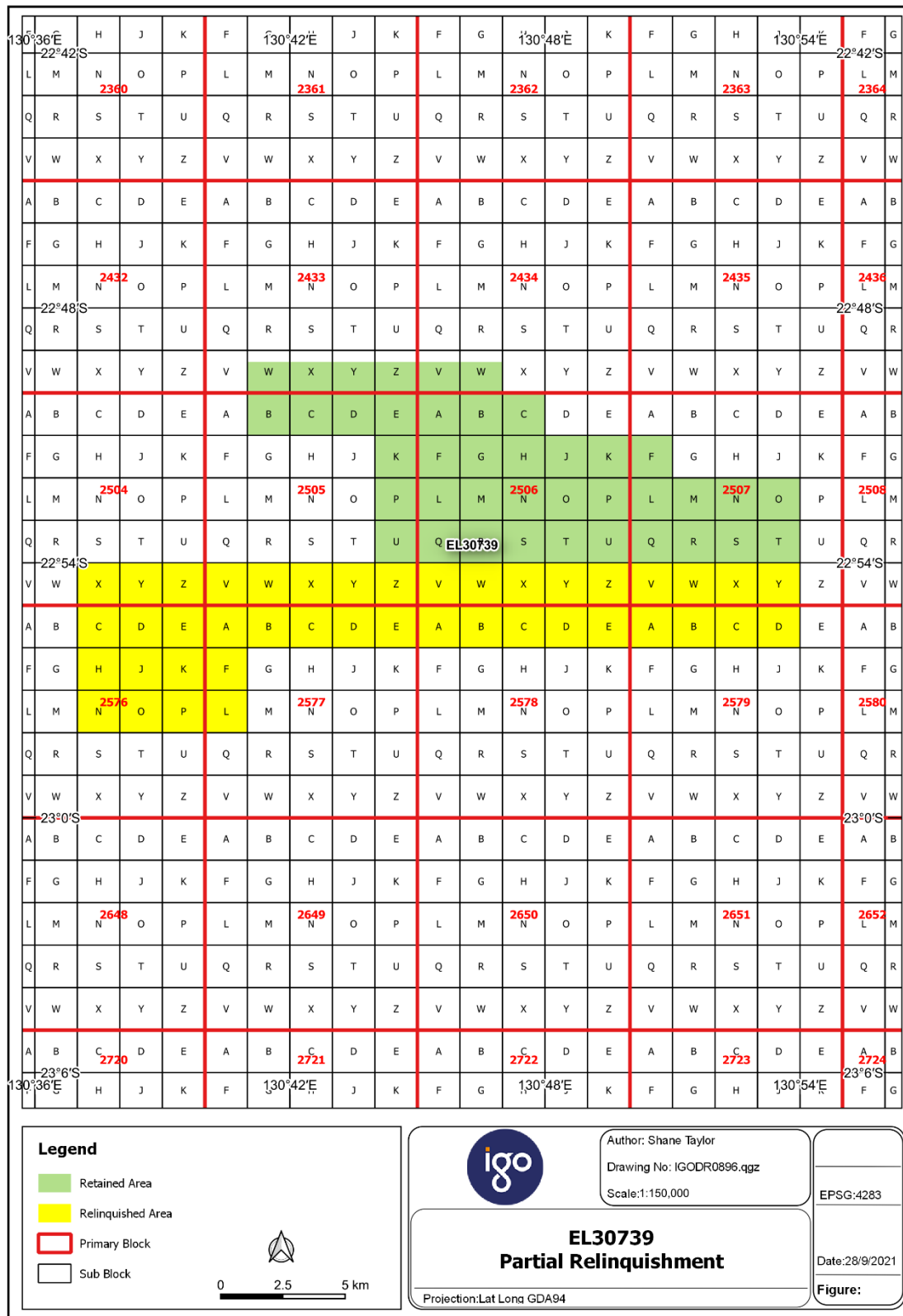


Figure 2. Map showing aerial extent of EL30739 with areas retained (green polygons) and surrendered (yellow polygons) during the partial relinquishment. 1-minute graticules (black grid). 5-minute graticules (red grid). Coordinates given in GDA94 MGA zone 52.

5 Exploration Index Map

The Exploration Index Map (**Appendix 1**) shows the exploration activities completed on the relinquished ground. Airborne geophysical data were previously reported in Winzar (2018) and Cornwell (2019) are not included.

6 Work Completed on Relinquished Ground

Exploration during the tenure period for the relinquished ground consisted of collection of surface geochemistry, collection of airborne magnetic, radiometric, and electromagnetic (AEM) data as part of regional surveys, and a follow-up ground-based moving loop electromagnetic survey (MLEM). Details have previously been outlined in Annual Reporting (see Winzar (2018), Winzar and Whitford (2019), Cornwell (2019), and McGloin (2020)).

Prior to undertaking on-ground activities, a sacred site clearance survey was conducted by the Central Land Council.

6.1 Surface Geochemistry

Between 2017 and 2021, regional reconnaissance soil and rock sampling was undertaken over poorly explored areas of the Lake Mackay Project (Winzar 2018, Cornwell 2019). For the relinquished ground in EL30739, 166 soil samples and one rock chip sample were collected in September and October 2018 (**Appendices 1-2**).

6.1.1 Soil sampling

Areas suitable for soil sampling were selected from radiometric imagery that identified a bedrock response. The sampled areas were commonly limited due to a lack of outcrop. Reconnaissance soil sampling was completed on a 400 m (north-south) x 800 m (east-west) grid over areas with bedrock or shallow cover (Winzar 2018). The details of the method for this Bulk Leach Extractable Gold (BLEG) soil sampling survey were outlined in Winzar (2018) and in the previous open file relinquishment report for EL31234 (McGloin 2019).

Sampling was conducted by teams of two people, using all-terrain vehicles, from mobile camps that were established at several locations throughout the project area along temporary access tracks. The samples were collected from a depth of 0 to 20 cm after scraping the surface to remove any organic matter. Duplicate samples were collected every 50 samples. Samples were screened on site to -0.4 mm for an approximate 2 kg of fine material. The samples were then submitted to Intertek in Alice Springs for additional screening to -50 µm. Company standards were also added every 50 samples. All samples were then dispatched to Perth for analysis.

The BLEG technique was used for Au and Ag with a 10 g aliquot of -50 µm material. A 0.5 g aqua regia digest was used for Al, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Pd, Pt, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn and Zr. Additional duplicates, standards and blanks were also undertaken by the laboratory as part of their standard in house quality control procedures.

The results of this soil sampling (and associated standards and duplicates) are reported in **Appendix 2**. These data were previously reported in the closed file reports of Winzar (2018) and Cornwell (2019). The reconnaissance soil sampling led to one follow-up grid with 200 x 100 m spacing. The infill soil sampling failed to generate a coherent geochemical anomaly, with a highest individual sample yielding 3.2 ppb Au (see **Table 1** and **Appendix 2**).

6.1.2 Rock chip sampling

One iron-bearing rock sample (LM06800) was collected during the soil sampling program and was assayed using a 4-acid digest (Cornwell 2019). Table 2 outlines the analytical method. The rock did not contain any significant metal anomalism (**Appendix 2**).

6.2 Geophysics

6.2.1 Aeromagnetic and radiometric survey

An aeromagnetic and radiometric survey was flown over parts of EL30739 prior to granting as part of a co-funded project-wide survey. The details of the survey were outlined in Winzar (2018) and Cornwell (2019). The survey was flown as 200 m spaced flight lines oriented north-south. The mean terrain clearance was 35m.

6.2.2 Airborne electromagnetic survey

Between 2018 to 2019, 990.6-line kms of SPECTREM airborne electromagnetic surveying were completed over EL30739, including parts of the relinquished ground in this report (Cornwell 2019 and Winzar and Whitford 2019). This survey was flown on a 300 m line spacing with north-south lines and 90 m mean terrain clearance.

Table 1: Peak -50 μ m BLEG soil sampling results for relinquished ground in EL31234 (GDA94 MGA Zone 52).

Element	Sample Number	MGA East (m)	MGA North (m)	Value	Peak	Mean	Median	Standard Deviation
Ag	LM06312	683501	7462750	ppm	0.04	0.01	0.01	0.01
As	LM05010	685608	7462800	ppm	13.16	2.49	2.39	1.0
Au	LM06327	683288	7462849	ppb	3.23	0.87	0.74	0.47
Bi	LM05010	685608	7462800	ppm	0.63	0.33	0.32	0.07
Co	LM06312	683501	7462750	ppm	17.7	6.3	5.8	2.5
Cu	LM06312	683501	7462750	ppm	54.1	17.5	17.3	4.0
Mn	LM06581	675200	7464011	ppm	680.3	293.3	259.7	140.6
Ni	LM06312	683501	7462750	ppm	28.8	9.4	9.3	2.3
Pb	LM05002	681601	7463204	ppm	18.5	11.8	11.7	2.0
Zn	LM05268	680799	7466402	ppm	41.5	22.2	21.6	6.4

Table 2: Analytical method used for rock chip sample LM06800

Sample Type	Digest (Lab Code)	Finish (Lab Code)	Element (Detection Limit)
Rock chip	Four Acid (4A)	Inductively coupled plasma optical emission spectrometry (OE33)	Ag (0.5 ppm), Al (50 ppm), As (10 ppm), Ba (2 ppm), Bi (5 ppm), Ca (50 ppm), Cd (0.5 ppm), Ce (20 ppm), Co (1 ppm), Cr (5 ppm), Cu (1 ppm), Fe (100 ppm), K (20 ppm), La (20 ppm), Li (1 ppm), Mg (20 ppm), Mn (1 ppm), Mo (2 ppm), Na (20 ppm), Ni (1 ppm), P (50 ppm), Pb (5 ppm), S (50 ppm), Sb (5 ppm), Sc (1 ppm), Sn (5 ppm), Sr (1 ppm), Te (5 ppm), Ti (5 ppm), Tl (5 ppm), V (1 ppm), W (5 ppm), Zn (1 ppm)
	25g lead collection fire assay (FA25)	Inductively coupled plasma optical emission spectrometry (OE04)	Au (1 ppb)

Further details can be found in Winzar (2019), Winzar and Whitford (2019), McGloin (2019) and Cornwell (2019). The aerial survey highlighted one large conductive anomaly, the Stacked target, which required a follow-up ground electromagnetic survey (Cornwell 2019).

6.2.3 Ground electromagnetic survey

For the relinquished ground, a total of 140 moving-loop stations were positioned in June 2019 using a 200 x 100 m grid spacing in a total of 9 north-south oriented lines (see Cornwell 2019). The grid was designed to test the anomalous Stacked AEM target using 200 m x 200 m loops in a Slingram configuration (**Appendix 1**).

The AEM survey had identified this target as a ring of anomalies around a central highly resistive core. These anomalies were present in both the Z and X component and showed exponential character. The nine lines of MLEM all confirmed and replicated the AEM response, however in early time responses with no significant late time responses indicated in the data. To the northwest of the MLEM grid, a number of lines showed a persistent anomaly into the mid-time responses. Interpretation of the data indicated however that the source of the EM response had low conductance (<80 siemens). No further work was recommended.

The MLEM data for the Stacked target were previously reported in Cornwell (2019). Further details on MLEM surveys were provided in Winzar (2018), McGloin (2019) and Cornwell (2019).

7 Reason for Relinquishment

IGO have relinquished ground in EL30739 for 4 main reasons. These were:

- No conductive anomalies generated that warranted further exploration after completion of appropriate airborne and/or ground EM surveys.
- No coherent geochemical anomalies generated to warrant further exploration after the completion of appropriate reconnaissance and infill BLEG soil surveys and rock chip sampling.
- Areas considered relatively unexplorable because of significant depth of cover to targeted basement rocks.
- Areas unexplorable based on exclusion or restricted zones defined by the Central Land Council.

No further work is recommended on the relinquished ground.

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