Year 6
Final Surrender Report for
EL 27624 (“Mt Sainthill”)

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Date: 26th July 2016
Tenement Holders: Riding Resources Pty Ltd (50%)
Bralich Holdings Pty Ltd (50%)
Tenement: EL27624
Prospect Name: Mt Sainthill
Reporting Period: 27 May 2015 – 26 May 2016 (Year 6)
Distribution: Bralich Holdings Pty Ltd (1)
Riding Resources Pty Ltd (1)
Geoscience.Info (DME) (1)
Map Sheet: Huckitta 1:250,000 sheet (SF5311)
Jinka 1:100,000 sheet (6052)
Target Commodity: Copper, Nickel, Gold, Tungsten, Molybdenum, Zinc
Keywords: geophysical interpretation, project review

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Summary

EL27624 lies 200 km north-east of Alice Spring within the high grade metamorphic eastern Arunta region. Previous workers in the area have not been successful in drilling any economic mineralisation on EL27624. Mostly they have concentrated on Molyhil (W-Mo) skarn lookalikes with an associated magnetic anomaly. To date, no other skarns have been found, the magnetic anomaly often being the result of magnetite concentrations in the underlying gneiss or schists. Calc-silicate geology appears to be common, but has not yet returned economic grades from rock chip sampling or drilling.

A literature review and magnetic interpretation of the area suggested an unusual linear and sigmoidal zone of strong magnetics located within the Delny-Mt Sainthill Shear Zone. A portable scintillometer returned only low order throughout this area. Our earlier rock chip sampling has highlighted anomalous Zn, Cu, Ag and Pb.

Field reconnaissance during year 3 was directed at understanding the regolith geology, structure and alteration. Aster imagery data was examined, but found to be inconclusive. A field visit conducted in October 2102 failed to confirm previous assays using a niton XRF analyser. Field observation indicates that alteration is extensive over tens of km’s across the Huckitta tenements. The alteration is dominated by calc-silicate mineralogy (epidote-quartz, garnet, amphibole and hornfels). Soil samples have proven little use in this area but do provide some useful insight.

Despite the low order soil geochemistry, the scale of visible alteration and the regional structures in the area (namely the Delny Shear Zone and Entire Point Shear Zone), Bralich and Riding consider the tenement prospective albeit low order grass roots level. However due to difficult markets and funding Bralich and Riding surrendered the tenement on the 26 May 2016.

1.0 Introduction

This report covers the years 1-6 (2010-2016) exploration conducted at EL27624. EL27624 “Mt Sainthill Prospect”, along with EL28124 and EL28429 formed part of the “Huckitta Project”. It is located 200 km’s directly north-east of Alice Springs, 25km north of the Plenty Highway within the Huckitta 1:250,000 Geological Map Sheet (Fig.1.1). Access from Alice Springs is by way of the Plenty Highway for 210 km, thence north at a cattle grid track past Jinka station. Alternative access can be gained from the Molyhil road and driving towards Mt Sainthill.

Access within the tenement is by the way of a number of pastoral station and maintenance tracks that service the water bores within the property.

Historically, EL27624 has never yielded economic mineralisation, the closest mine being the Molyhil W-Mo deposit 8km east, it is currently on care and maintenance. Molyhil is a magnetite skarn. Previous explorers have unsuccessfully focussed on magnetic anomalies in the area.
2.0 Geology and Mineralisation

The Mt Sainthill tenement (EL27624) covers Early Proterozoic rocks with high magnetic relief along and flanking the Delny-Mt Sainthill Fault and Entire Point Shear Zone, a feature developed within a wide west-north-west tectonic zone (Figure 2.1). This structure was active during the 1800Ma Strangways Event, which affected the entire Arunta Orogenic Domain. Faults within this tectonic zone have been periodically reactivated with a major remobilisation during the Carboniferous Alice Springs Orogeny.

The basement rocks in the northern Huckitta sheet are unconformably overlain by Adelaidean and Palaeozoic marine and terrestrial sedimentary sequences of the intracratonic Georgina Basin to the north of EL27624.

Mineralisation is widespread within the Huckitta 1:250 000 sheet with past production from the Jervois deposits (Cu, Pg, Zn, Ag, Bi), the Molyhil “skarn” (Mo, W, Cu) and numerous other small Cu and W vein deposits in the area. Resources of barite-fluorite have also been established within quartz (carbonate-haematite) veins (“Oorabra Reefs”) cutting the Jinka Granite and other basement rocks. These veins also appear to penetrate the basal Adelaidean sedimentary sequence.

The area was subjected to deep weathering and laterisation during late Mesozoic to Miocene time. Most of this old surface has been eroded away with small remnants preserved at the top of Mt Sainthill.
The area was uplifted during the Late Tertiary and erosion continues to the present day. Extensive outwash fans have developed at the base of hills and obscure the basement rocks. A return to arid conditions during the Pleistocene produced sand plains, and loess was deposited throughout the hilly areas. The combination of the effects of deep weathering and extensive younger sedimentary deposits provide for a difficult environment for effective surface geochemical sampling.

Figure 2.1 Geology Map Extract from Huckitta 1:250,000 Geology
Figure 2.2 NTGS Total Magnetics around EL27624

Figure 2.3 Geology Summary
3.0 Tenure

EL27624 was applied for on the 10th September 2009. The tenement lies on pastoral lease PPL990 (Huckitta Station) and PPL1119 (Jinka Station). Tenure details are shown below. A waiver of reduction of 12 blocks was requested and granted in 2013. Bralich notified the DME of its intention to surrender the tenement on the 25 May 2016.

<table>
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<tr>
<th>Tenement</th>
<th>Owner</th>
<th>Date Granted</th>
<th>Tenure</th>
<th>Size</th>
<th>Rent</th>
<th>Expenditure Commitment</th>
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<td>EL 27624</td>
<td>Riding Resources Pty Ltd (50%) Bralich Holdings Pty Ltd (50%)</td>
<td>27/5/2010</td>
<td>6 Years</td>
<td>24 sq. blocks</td>
<td>$4117</td>
<td>$40,000</td>
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4.0 Previous Exploration

The discovery of the Molyhil scheelite-molybdenite deposit in 1977 stimulated an up surge in mineral exploration within the Huckitta area. Prospector Lindsay Johannsen first discovered scheelite in layered calc-silicate rock at Molyhil Pinnacle in 1973. Subsequently Fama Mines Pty Ltd selectively mined some 20 tonnes of scheelite at the site. Later, additional scheelite was discovered 800 metres east of the Pinnacle at the Yacht Club deposit which produced 20,000 tonnes of ore averaging 0.5% scheelite to yield 100 tonnes of 70% WO₃ to 1976.

In 1977 the Mines Branch Administration conducted a detailed exploration program over the mine site comprising gridding, ground magnetic surveying and diamond drilling (740 metres). This program led to the discovery of the larger Southern orebody comprising both scheelite and molybdenite.

During 1977 Otter Exploration NL flew regional radiometric survey over the southern half of the Huckitta 1:250,000 map sheet area. The initial airborne reconnaissance survey revealed several high amplitude radiometric anomalies. Traces of uraninite (up to 200ppm uranium) were discovered within mineralised skarn at the Molyhil mine. Airborne radiometric grid surveying of the licence area was completed by August 1977. Significant geochemical results from Otter rock chip and drainage-sampling programs were also noted. Ground follow-up of airborne radiometric anomalies showed they appear to cluster where Adelaidean sediments unconformably overlie Early Proterozoic Arunta Block.

In 1978 Anaconda Australia applied for 78 square kilometres near EL27324. They erected a 7 x 6 km grid centered on Yam Creek over which they conducted a 100 m line space ground magnetometer survey to see if they could repeat three AMAG anomalies from the AGSO one-mile line space survey. They also collected and analysed 539 soil samples for Cu, Pb, Zn, Ag, Ni, Co, Mn, Cr, V, Fe, Ca, Mg, Al, Ti, Ba, Sr, Mo, U. High silver values obtained from drainage sampling (12ppm) hand auger and soil sampling (5ppm) indicate several anomalous areas within the old Anaconda grid which require following up.
In 1981 Aerodata flew a 150 m line space AMAG survey over Molyhil for Petrocarb Exploration NL. Fourteen additional magnetic features were delineated by the above survey as possible Molyhil analogues. Seven anomalies were tested by fences, of shallow Air track percussion holes.

Using the Molyhil deposits magnetic signature as a model to search for additional Molyhil-type mineralised magnetite skarn deposits Geopeko commissioned Austirex International to fly the Eurobra AMAG and Radiometric survey covering 970$\text{km}^2$ centered on the Molyhil mine. The survey delineated 74 Molyhil – lookalike AMAG anomalies (Scorpion series) all of which were ground mag’d, however only 32 were drill tested for disappointing results, i.e. disseminated magnetite in quartz-feldspar-biotite gneiss or granite.

In late 1983 Petrocarb/Nicron, Geopeko consortium farmed out the uranium rights to Uranerz Australia.

Ground radiometry traverses across the Delny-Mt Sainthill shear zone 30 km west of Molyhil delineated two areas of elevated cps readings namely Crystal and Yam Dam prospects. In January 1984 the Austirex International Halfway Dam AMAG and Radiometric survey was flown.

However because Geopeko were about to withdraw from the Petrocarb/Nicron joint venture and Uranerz were losing interest in the area because most radiometric anomalies appeared to be over Thorium-rich granites only the AMAG data was processed. No ground checking of any AMAG anomalies was carried out by Geopeko nor was any yet to be identified radiometric anomalies by Uranerz!

Geopeko withdrew from the Petrocarb/Nicron joint venture in early 1983. Petrocarb resumed control of the Molyhil tenements until final relinquishment in 1989; however the only exploration activity undertaken during this period of low tungsten and molybdenum prices was a drainage sampling program centred on Molyhil. Three drainage anomalies were delineated namely 11182 (Pb), 11096 (Zn, Cu) and 11212 (W-Mo) none of which have been followed up.

Roebuck Resources NL applied for nearby EL’s 8127 and 8144 in 1989. Roebuck made the following observations with regard to the prospectivity of the area;

1) Molyhil licences are over fundamental intersecting east northeast and west northwest-trending regional fracture zones. The zone of intersection is the site of two or more phases of Proterozoic granite intrusion namely Marshall and Jinka.

2) A long standing thermal source is evidenced by the Oorabra Reefs intruding Jinka Granite during pre-Adelaidean times followed by a later quartz-fluorite-barite-base metal sulfide veining event which again intruded basement as well as all levels of Adelaidean sediments over a strike length of 75 km of the Delny-Mt Sainthill Fault zone.

3) The Molyhil skarn deposit occupies a northeast fracture where it intersects the Delny-Mt Sainthill Fault Zone as indicated by a northeast-trending break in the magnetic contour pattern, which is clearly apparent as a photo linear feature.
4) In the Elyuah Range near Gap Bore a Cambrian dolostone contains megacrysts of barite replacing hyoliths along bedding plans for 300 m over a stratigraphic interval of 2-3 metres thus implying a similar replacement mechanism with the gangue of the Pb-Ba Boxhole Bore mineralisation located 55km north of Gap Bore.

5) Black Ridge prospect is a low temperature epithermal vein system enriched in Au, As, Mo, Cu and Pb occurring at the intersection of a large Oorabra Reef and the east northeast-trending Oomoomilla Fault. There is an underlying small magnetic anomaly at Black Ridge similar to the magnetic highs along the Oomoomilla Fault perhaps indicating more iron-rich vein developments or local concentrations of magnetite within the Oorabra Arkose adjacent to the fault?

6) Several geochemical anomalies are defined north of Mt Sainthill towards Deep Bore and Oorabra Rock Hole. Although underlain by Jinka Granite the area hosts four discrete AMAG anomalies including one, which appears to underlie a quartz-chalcopyrite-barite veined altered granite south of Moppata Water Hole. Note: this area coincides with Anaconda’s 1979 soil grid.

7) An iron formation cropping out near Mt Sainthill requires following up similarly a Cu-Au mineralised ironstone cropping out on the Huckitta track.

In May 1997 Roebuck farmed out EL 8127 to BHP Minerals who identified the Molyhil region as prospective for world-class examples of Iron oxide, copper gold (IOCG) deposits following the completion of AGSO’s "The Metallogenic Potential of Australian Proterozoic Granites" study in 1996 which identified the Alaringela Suite of (1713Ma) granites as being highly prospective for Cu, Pb, Zn and moderately prospective for gold.

The Alaringela Suite includes:

   i) Alaringela Igneous Complex on Dneiper 100k sheet
   ii) Unca Granite on Jervois Range 100k sheet
   iii) Marshall Granite on Jinka 100k sheet.

All these granites are fractionated, oxidised (with red to pink coloration and hematite to magnetite-stable mineralogy) show evidence for a fluid phase, intrude suitable host rocks and appear to be associated with known Cu, Pb, Zn, Ag, Mo & W mineralisation (including the Jervois deposits?).

BHP also believed the Molyhil region to be prospective for world-class examples of Broken Hill Type (BHT) Ag-Pb-Zn (Cu) deposits.

BHP firstly assessed the scope and effectiveness of previous surface geochemical work. Drainage geochemistry is the only technique used extensively on Jinka (the effectiveness of which BHP questioned given the regolith of the area) resulting in a series of minor Cu (Pb-Zn-Ni) drainage anomalies evident in the Mt Sainthill area where Kanandra Granulite gneisses dominate the geology.

BHP decided to complete a regolith interpretation of the area prior to commencing any geochemical sampling program. The regolith is dominated by transported alluvial and fluvial material primarily related to the Plenty and Marshall River systems. These deposits comprise a polymictic lag of numerous types of lithic fragments dominated by vein quartz,
quartzite, granitoid, mafics and felsic gneiss set within a silt-sand matrix. BHP decided that systematic 1 km x 1 km regional lag sampling would be the best technique to apply across the entire area given the diversity of regolith environments. The emphasis of the lag sampling was on:

i) areas of residual Tertiary laterite
ii) areas of eroding Arunta outcrop/subcrop and
iii) intervening areas where abundant lag deposits occur.

Spatial analysis of comprehensive regional lag data sets identified two priority anomalies;

i) a cluster of Cu-Pb-Zn-Ag anomalies occurring near Mt Sainthill.
ii) One coherent Ag anomaly east of Mt Sainthill.

A 45 sample infill lag sampling follow up program failed to upgrade the anomalies resulting in BHP withdrawing from the joint venture in 1998.

More recent work from 2004 till 2010 by TNG Ltd and Thor Mining PLC has concentrated on the Molyhil deposit. This has included resource drilling, underground bulk sampling, detailed metallurgy and scoping studies.

5.0 Year 1-6 Work Summary

Previous sampling by Bralich and Riding had confirmed the difficult correlation of low tenure soil and rock chip assays, to visually impressive alteration and gossan formation. This was in part attributed to juvenile sand cover. Key outcrops (see figs 5.2-5.4) were once again visited during 2012. GPS locations were supplied in the previous report. We were joined by several geologists with an XRF Niton gun. Results were low and generally below detection levels. However it was agreed that alteration in the area held promise of significant hydrothermal fluids having been active in the area. This lack of responsive surface geochemistry indicates that subsurface methods, starting with acquiring new and better magnetic/radiometric data would be useful.

Recent Aster imaging by the NTGS has modelled a suite of geochemical elements such as quartz, silica, Mg, Fe, carbonates in soil. Several areas that were highlighted by elevated carbonates and iron were visited, but as mentioned the XRF readings were disappointing. Acid tests of selected outcrop failed to indicate that it was a source of carbonate alteration. The Aster imagery remains inconclusive.

An anomalous rock chip assay of 130ppm tungsten taken during the previous year was visited again and reassessed. This was previously called the Yam Prospect and was considered to small and poorly mineralised by Peko. Three air track holes to 3m depth failed to upgrade the area. The highest value from the shallow drilling was 74 ppm W. An XRF reading failed to register an assay, and remained below the level of detection. It appears that rock chips and tradition lab methods return more useful data, especially when searching for low level detections.

Magnetite alteration is often seen in chloritised chips along graded rocky tracks (and has been logged in the old scorpion series holes). Mylonitic quartz-feldspar schist from soil
location 411032 has sericite. It was originally thought this was an altered rhyolite or mylonite. The observed alteration patterns indicate that something more complex, than just calc-silicate alteration has occurred. Unfortunately, no alteration sampled to date has consistently returned encouraging assays. One of the focus points has to be on finding the surface expression of a deeper, mineralised structure.

Previous worker have highlighted Molyhil as sitting in a NE fracture (visible on the aeromagnetic image) along with, and lying parallel, to the main structure (the Delny Shear Zone). This structural pairing was examined in detail using magnetics, google lineaments and false colour satellite imagery (Fig 5.2). A few targets have been outlined, but more sophisticated exploration techniques (e.g. airborne magnetics/radiometrics and/or EM) are required.

In 2014, the JV partners (MMG from China) commissioned an airborne magnetic-radiometric survey over the Huckitta tenements, including EL27624. The data has since been supplied and reported to the DME. The results were encouraging, revealing previously undocumented structures and mafic intrusives. A summary image is shown below.

![Airborne magnetic TMI image overlay on google earth. EL27624 located in the NW tenement.](image)

Activities during the 2014-2016 period were hampered by the JV partners lack of funding, the proposed airborne EM survey was put on hold, with the only activities being further geophysical re-interpretation and reviews. Attention was also given to how other projects in the eastern Arunta area were developing. GIS databases were updated. A new JV partner was introduced in 2015 but failed to deliver any field work or new sampling. In light of funding difficulties, poor commodity markets and lack of overall interest, the tenement owners relinquished EL27624 in its final sixth year.
Figure 5.2 Interpreted structures on EL27624
Figure 5.3 Previous Rock Chip and Soil Locations
Figure 5.4 Anaconda soil samples showing Ag > 2.5 ppm contour and location of Oorabra veins

Figure 5.5 Footwall exposure near Yam prospect at sample location 411507
6.0 Rehabilitation

There were no earth disturbing activities on the tenement. No rehabilitation was required.