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EL27/2007 AND EL40/2007
FINAL EXPLORATION REPORT, 2013
BALFOUR DISTRICT
NW TASMANIA

Prepared for: Balfour Management Pty Ltd.

Tim Callaghan, October 2013



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EXECUTIVE SUMMARY

No exploration work was completed on EL27/2007 and EL40/2007 between October 2011 and October 2013. The board of King Island Scheelite (KIS) has decided to concentrate on the development of the King Island Scheelite Project and have therefore decided to relinquish the EL's.

The EL's cover a significant portion of the Balfour-Temma district which is prospective for tin tungsten, copper, copper-gold and magnetite mineralisation. KIS and the Balfour Joint Venture have completed significant exploration work including an EL wide gravity and magnetic survey, geological mapping and ground magnetics, diamond drilling programs at Specimen Hill and Roaring 42 South (R42S) and an exploration review of the project area. The area has seen significant exploration since the 1970's. Numerous copper and tin tungsten prospects have been identified and drill tested, some with significant intersections. However the size of the mineralised bodies is limited, particularly the Sn-WO₃ prospects and it is unlikely that significant economic mineralisation is located within 200m of surface.



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CONTENTS

Executive Summary	2
1 Introduction	4
2 Regional Geology	6
2.1 District Mineralisation	8
3 Work Completed	11
4 Discussion and Recommendations	12
5 Proposed Work 2013 - 2014	14
Additional Notes	15
References	16

LIST OF FIGURES

Figure 1	Balfour Tenement Location plan.
Figure 2	Regional Geology Northwest Tasmania
Figure 3	Granite Contours, Structure and Mineral deposits of the Balfour District.



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1 INTRODUCTION

A Joint Venture agreement to explore for tin and tungsten mineralisation on EL27/2007 and EL40/2007 between Pleiades Resources Pty Ltd (PRPL) and King Island Scheelite Ltd (KIS) was signed in February 2009. The EL's are located in NW Tasmania near the historic mining district of Balfour. The Balfour district covers a 35km line of intermittent copper mineralisation exploited since the early 1900's with significant tin-tungsten mineralisation located west of the copper lineament.

The EL's cover a Tertiary peneplain vegetated by open button grass plains to the west and wet sclerophyll and rainforest to the east where the topography is incised by the Frankland River drainage system. Access to the EL's is relatively easy via the Western Explorer Road and historic mining/exploration access roads (Figure 1).

A ground based gravity survey was completed in January 2009 by Haines Surveys Pty Ltd. An interpretation of the gravity survey and open file helicopter borne magnetic data acquired by MRT in 2002 identified several areas worthy of follow up.

The principal exploration target for 2009 was the known tin-tungsten mineralisation of the Specimen Hill Prospect. The geophysical interpretation (Bissett, 2009) has modeled a near surface granite cupola west of the Specimen Hill prospect and a buried magnetic body beneath the prospect. The Balfour Joint Venture drilled 4 diamond drill holes into the Specimen Hill Prospect, intersecting numerous thin tin-tungsten mineralised veins. However vein densities were low and a granitic source for the mineralisation is considered to be too deep to warrant continued exploration (Callaghan, 2009). The Specimen Hill Drill sites were rehabilitated during 2010.

A secondary target consisting of a coincident gravity-magnetic high in the NW of the tenements termed Roaring 41 South (R41S) was subject to ground geological investigation involving mapping, gridding and rock chip sampling in 2009. A ground magnetic survey and subsequent drilling program was completed in 2010. Massive magnetite-pyrite-siderite-chlorite hosted copper gold mineralisation was identified from the first drillhole R41S_01. Geophysical modeling suggests the mineralisation is of limited extent and no further work has been completed on the prospect.



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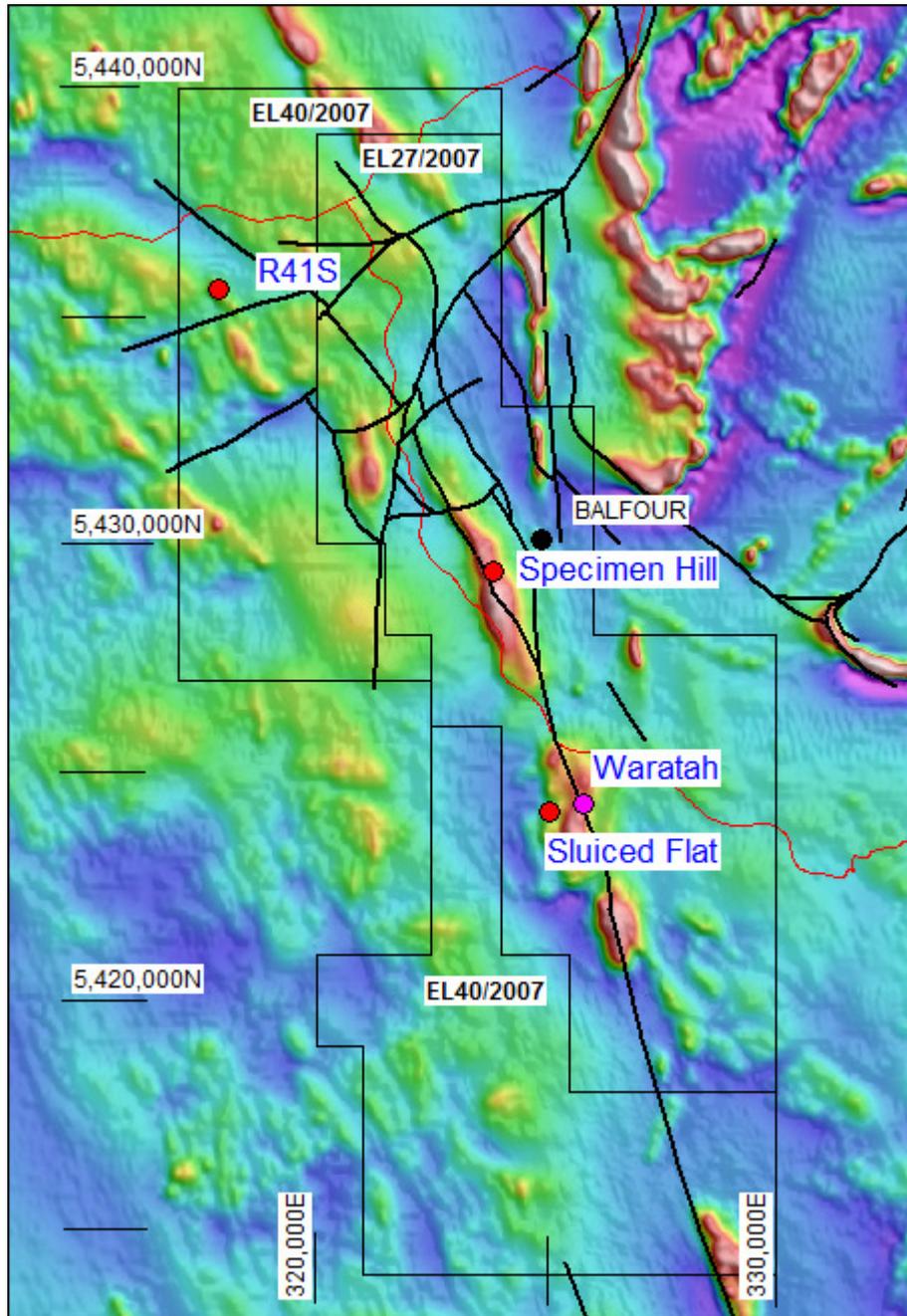


Figure 1. Balfour Tenement Location plan and Total Magnetic Intensity Image.



2 REGIONAL GEOLOGY

The Geology of NW Tasmania has been studied by many Geologists with the most recent Mineral Resources Tasmania report (Everard *et al*, 2007) summarized in this section.

The Geology of NW Tasmania is structurally dominated by the Smithton Syncline formed through Proterozoic extension and Paleozoic compression (Everard *et al*, 2007). The NW Tasmanian Geology is separated from the geology of Western Tasmania by the 510Ma Arthur Lineament, a major east dipping NNE trending thrust lineament (Figure 2). The N-NW trending Balfour thrust/shear is associated with partial inversion of the Rocky Cape and Togari Groups west of the syncline axis. The NNE trending Roger River Fault is a basin wide, long lived structure located in the east of the syncline that has controlled basin sedimentation since the Proterozoic.

The Smithton Syncline is flanked and underlain by the Early Neoproterozoic (1000-750Ma) Rocky Cape Group. The Rocky Cape Group is considered to represent autochthonous basement (Seymour *et al* 2006) and consists of over 10km of marine shelf siliciclastic sandstone, siltstone, black shale and minor dolomite. The Lower Rocky Cape Group is comprised of the Pedder River Siltstone, conformably overlain by the Lagoon River Quartzite followed by the 3500m thick Balfour Sub Group which has been divided into four formations, Skinners Flat Siltstone, Cassiterite Creek Quartzite, Emmett's Creek Shale and the Looney's Flat Siltstone.

The Balfour Sub Group is overlain by the Cowrie Siltstone, a planar, black carbonaceous and locally pyritic siltstone and shale sequence.

The Rocky Cape Group is unconformably overlain by the late Neoproterozoic (750-520Ma) Togari Group and its correlates (Ahrberg Group, Timbs Group, Success Creek Group, Crimson Creek Formation). The Togari Group in the Smithton Basin can be subdivided into four main phases of sedimentation. The basal member is the discontinuous Forrest Conglomerate Quartzite and overlying Black River Dolomite. The Black River Dolomite consists of fossiliferous dolomite, chert, shale, siltstone and polymictic conglomerate and varies from 300m thick in the west to over 800m in the east. The overlying Kanunnah Subgroup (700 – 570Ma) is a thick sequence of mafic rift volcanics and associated volcanoclastic and siliciclastic sediments.

The Smithton Dolomite overlies the Kanunnah Subgroup and is comprised of a 1500m thick sequence of unfossiliferous dolomite and limestone. A renewal of deepwater siliciclastic sedimentation resulted in the deposition of the Salmon River Siltstone. The last two phases of the Togari Group are only found near Rocky Cape.

Early Deformation (D1) of the Rocky Cape and Togari Groups is evident as minor microstructures in the Rocky Cape Group. The next two phases of deformation (D1 and D2) are associated with the 510Ma Tyennan Orogeny. D2 is represented as open upright east west trending folds west of the Roger River Fault. The Devonian Tabberabberan Orogeny is expressed as the prominent D3 phase of deformation. D3 is represented as NW trending NE vergent folding and axial planar cleavage associated with NE directed thrusting that partially inverted the stratigraphy of the Rocky Cape and Togari Groups (Everard *et al*, 2007). One thrust hosts the copper mineralisation of the Balfour District. Late D3 transpression resulted in clockwise rotation of early D3 folding to an N-S trend adjacent to the Roger River Fault. Late



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NE trending strike slip faults in the Balfour area are associated with Sn-W mineralisation at Specimen Hill. D4, also of Devonian age is expressed as upright north trending folds in the core of the Smithton syncline and as NE trending reverse faults in the Temma area.

Devonian-Silurian post orogenic granitoids outcrop on the coast north of the Pieman River and have been interpreted to extend eastwards at approximately 2km depth below the Balfour -Temma district (Leaman, 1988).

Post Proterozoic cover rocks are generally restricted to minor, thin Tertiary to Recent, gravels, sands, and chert. Minor remnants of Tertiary basaltic flows are located at the Balfour Township, the Clump and near Temma. The basalts range from basanite, through alkali olivine basalts to tholeiite (Everard *et al*, 2007).



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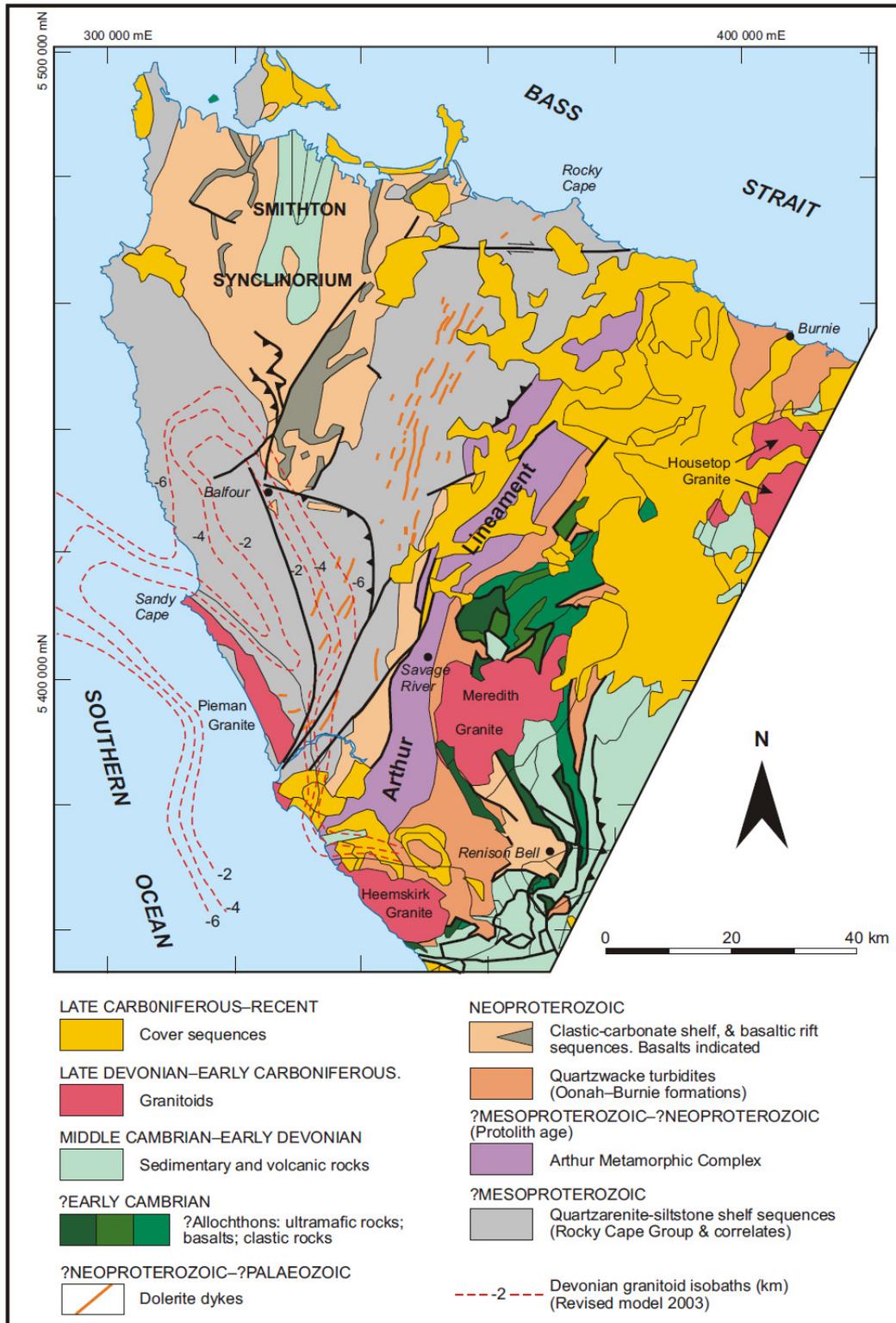


Figure 2. Regional Geology Northwest Tasmania (Everard *et al*, 2007).



2.1 District Mineralisation

Known mineralisation of the Balfour District consists of fault vein related copper deposits, Sn-WO₃ vein mineralisation and associated placers and massive magnetite bodies (Figure 3).

Copper Mineralisation.

Copper mineralisation of the Balfour District is located along a 35km long lineament from the Clump in the north to the Toner River in the south with over 60 occurrences noted (Figure 3). Most of the mineralisation is hosted in pyritic carbonaceous and/or chloritic shale of the Balfour Sub Group. The mineralisation consists of veins, disseminations, replacements, breccia infillings and semi-massive pods occupying dilational zones in a persistent NNW striking, west dipping reverse fault. Primary mineralogy consists of quartz-pyrite-chalcopyrite-carbonate and chlorite and is hosted in pyritic and chloritic shale and siltstone. Murray's Reward was the largest producer in the field and contained supergene pods of covellite and digenite. Drilling by ACI in the 1970's identified a small pre-JORC resource of 0.5Mt @ 0.8% Cu. Geochemical, isotopic and geological evidence suggest the deposits were formed by granitic or meteoric hydrothermal fluids remobilizing copper into the fault structures (Taheri and Botrill, 2003). The possible source of the copper is unknown but is likely to be the native copper contained in the Spinks Basalt of the Kanunnah Subgroup.

Tin-Tungsten Mineralisation

Sn-WO₃ mineralisation of the Balfour District is constrained mainly to within 2km of the Specimen Hill Prospect just west of Balfour. The association of tin-tungsten mineralisation with Devonian granites is well established in Tasmania, although the nearest outcropping granite is the Interview Granite located 30km SW. Interpretation of the regional gravity data has identified a potential granite ridge within 2km of the surface immediately west of Balfour. The Haines survey suggests the granite may be within 200m of the surface although the lack of thermal metamorphism suggests it may be further away.

There are at least ten Sn-WO₃ occurrences in the Balfour Field, all but one are located within a 2km radius of the main Specimen Hill Prospect. The southern outlier is an unnamed prospect at 324,900mE, 5,429,300mN. The Sn mineralisation is restricted in comparison to the extensive Cu mineralisation along the Balfour Lineament.

The Balfour Field produced at least 125t of Sn metal from the early 1880's until 1942 with minor production continuing until the 1980's. The majority of the production was from alluvial workings in Cassiterite Creek and its tributaries and from Emmett's Creek.

There are some reports of alluvial tin from the sluiced flat prospect but a hard rock source has not been identified.

Massive Magnetite-Sulphide

Several massive magnetite-sulphide bodies are located 18km west and northwest of Balfour near Temma. The mineralisation occurs as magnetite dominated lodes with lesser hematite-chalcopyrite-tetrahedrite-sphalerite-galena-pyrite-Fe rich amphibole and Fe-Mn carbonates. The deposits appear to be fault related and are hosted



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within the Rocky Cape Group sediments. The primary lode assemblage is recognized as being pyrometamorphic skarn (Weber, 1983).

The only significant modern exploration of the lodes near Temma was completed by Geopeko (Herrmann and Sumpton, 1982, Weber, 1983). Metals appear to be erratically distributed and include maximum values of 2.2g/t Au, 22g/t Ag, 0.4% Cu and 1.8% Pb.

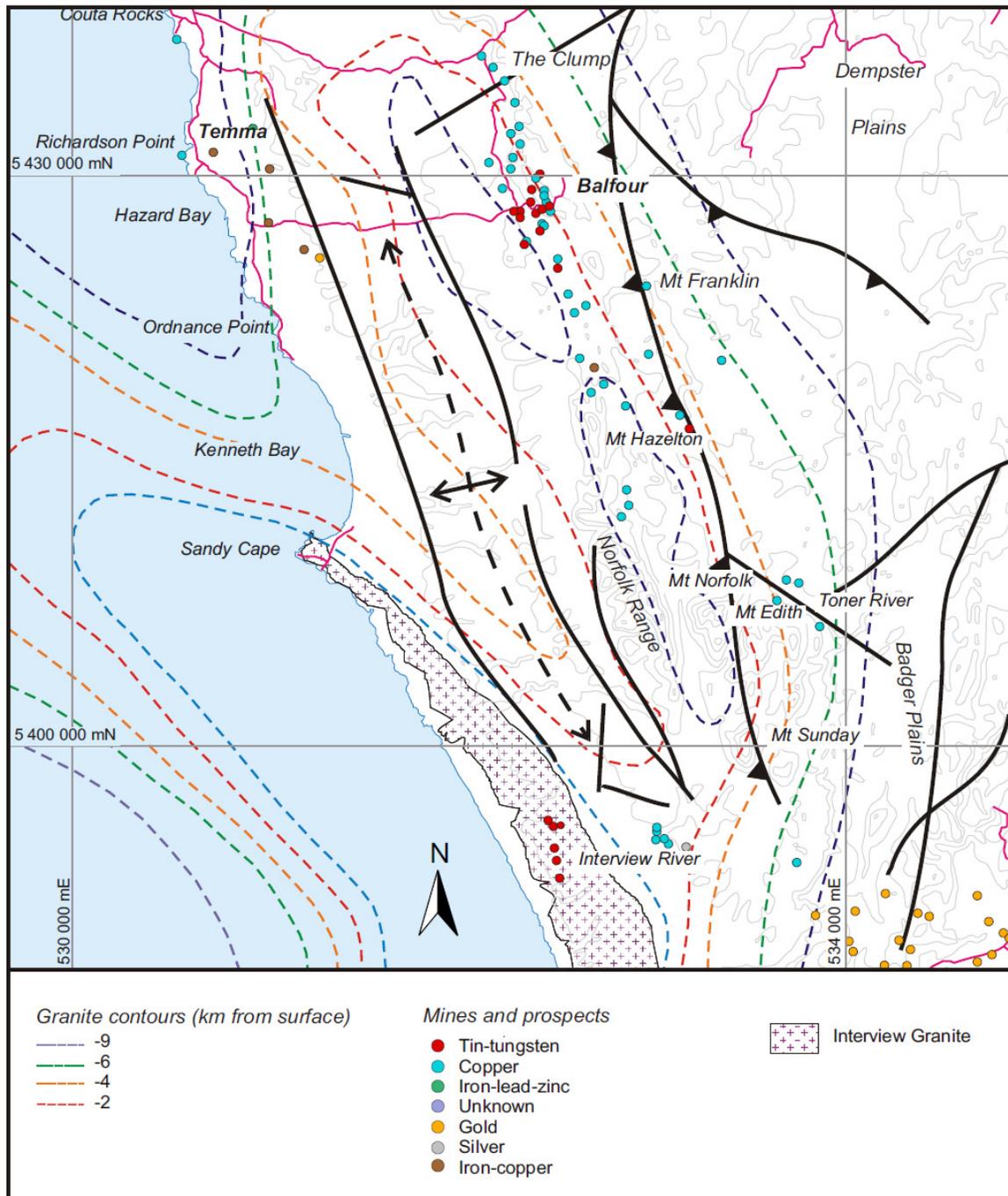


Figure 3. Granite Contours, Structure and Mineral deposits of the Balfour District, (Bottrill and Taheri, 2003).



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3 WORK COMPLETED, 2012 - 2013

No work was completed on either EL27/2007 or EL40/2007 during 2012 or 2013.

Previous work completed by the Balfour Joint Venture consisted of an EL wide gravity and magnetic survey, diamond drilling of the Specimen Hill tin-tungsten deposit, ground magnetics and mapping of the Roaring 41 South deposit followed by a diamond drilling program and downhole geophysics and an EL wide review of the exploration potential.

Details of exploration work completed under the BJV is documented in the 2009, 2010 and 2011 Annual Reports (Callaghan, 2009, Callaghan, 2010, Callaghan, 2011).



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4 DISCUSSION AND RECOMMENDATIONS

The Balfour and Temma districts are prospective for tin-tungsten, copper, copper-gold and magnetite mineralisation. The ground covered by EL27/2007 and EL40/2007 has seen extensive mining and exploration activity, particularly in the 1970's to 1980's by BHP, CRA and Geopeko and again in the last few years by the Balfour Joint Venture.

A review of exploration (Callaghan, 2011) concludes that the regional setting and intensity of mineralisation strongly implies the presence of mineralised granite located at depth below the Specimen Hill-Balfour area. Systematic historic and recent exploration drilling has tested the tin-tungsten and the copper mineralisation to a depth of 200m, identifying significant, but uneconomic mineralisation. The best target is considered to be the depth extension of the Balfour and Specimen Hill structures/mineralisation. Both MRT regional gravity and the Haines EL wide gravity surveys suggest the granite is shallower than 1km in depth and located just west of Specimen Hill. Several 1000m plus drill holes could be drilled to test the down plunge extent of the Balfour shear attempting to test the shear/granite contact. The exploration program would be expensive and high risk. However given the world class nature of the Tasmanian tin-tungsten deposits the potential return can be considered as high.

The Specimen Hill Prospect contains significant intercepts of mineralisation. However the size of mineralised bodies is limited and is considered to be uneconomic under prevailing conditions. Results of the 2009 drilling program were similar to those obtained in the earlier programs. Mineralisation consists of coarse cassiterite, wolframite and scheelite associated with sparse quartz-carbonate-pyrite-arsenopyrite veining hosted in silica-tourmaline-carbonate altered siltstones and sandstones.

Individual one metre samples assayed up to 2.2% WO₃ and 1%Sn. However, vein densities are low and most analyses from the host sediments are well below 0.1% for both elements. It is unlikely that significant quantities of mineralisation exist near surface to operate a viable open pit mine.

Apart from tin-tungsten mineralisation, there is the added potential to discover significant copper mineralisation, again at depth. The copper source is most likely to be the native copper contained in the Spinks Basalt but there remains a possibility for it to have been remobilized from a sediment hosted copper body, or for the shear hosted and replacement mineralisation to be more extensive and higher grade.

The extensive exploration completed to date suggests there is limited potential for economic mineralisation within 200m of surface. All exploration work required to look deeper in the field is considered to be expensive and high risk.

A summary of recommendations from the 2011 annual report (Callaghan, 2011) is listed below:

Compile Balfour drilling data and target 2-3 plus 1000m DDH on the Balfour shear below Specimen Hill, adjacent to the interpreted Granite contact.

Estimated cost \$800 000.



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*Risk = High.
Potential Return = High*

*Test down plunge potential of R41S with 3 DDH for 450m.
Estimated cost \$130 000.
Risk = High.
Potential Return = Moderate to Low*

*Acquire ground west of current projects to explore for Tennant Creek style Cu-Au and for Magnetite-Scheelite skarn mineralisation.
Estimated cost \$50 000 (dependant on ERA process)
Risk = High.
Potential Return = Moderate*

*Map and sample Waratah, Balfour South and Pierpont Morgan Prospects at 1:1000 scale and model Balfour South Magnetic anomaly.
Estimated cost \$15 000.
Risk = Low
Potential Return = Moderate to Low*

*If warranted design a diamond drilling program to test the Waratah and South Balfour deposits (2 x 300m DDH)
Estimated cost \$180 000.
Risk = High
Potential Return = Moderate to Low*

The BJV reviewed the recommendations from the 2011 annual report and proposed a work program for 2011-2012 to include:

- 2 x 100m DDH into the R41S prospect
- Review and model the geophysics from the Waratah-Sluiced Flat-South Balfour area (Furious 50's).
- Drill 2 x 150m DDH testing generated targets
- Relinquish 30 km² from EL27/2007 from 109 km² to 79 km²
- Relinquish 50 km² from EL40/2007 from 108 km² to km²

None of the above work was completed with the board of KIS deciding to concentrate on the development of the King Island Scheelite project.

Consequently the board of KIS has decided to discontinue exploration on the EL's. It is recommended that be relinquished.



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5 PROPOSED WORK 2013 - 2014

No work is proposed for EL27/2007 or EL40/2007.

The EL's are to be relinquished to allow King Island Scheelite to concentrate on the development of the King Island Scheelite Project.



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ADDITIONAL NOTES

STATEMENT OF INDEPENDENCE

Tim Callaghan has no material interest or entitlement in the securities or assets of Balfour Management Joint Venture or any associated companies.

LIMITATIONS AND CONSENT

The report has been prepared for the Balfour Management Joint Venture using information collected by and historic information available to the Author at the time of writing. The opinions stated herein are given in good faith and with the belief that the basic assumptions are factual and correct and the interpretations reasonable.

This report is not intended for the use as a public document nor, in whole or in part, in a public document without written consent to the form and context in which it appears.

All coordinates in this report are recorded in AMG66 Zone 55



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REFERENCES

- Bissett A, 2009a. Balfour Project Tasmania, Ground Gravity Survey Interpretation, April 2009. *Unpublished Report for Pleiades Resources NL.*
- Bissett A 2009b. Balfour Project Tasmania, Specimen Hill Magnetic Data Modeling June 2009. *Unpublished Report for Pleiades Resources NL.*
- Bissett A, 2009c. Balfour Project Tasmania, Roaring 41 South Magnetic Data Modeling June 2009. *Unpublished Report for Pleiades Resources NL.*
- Bissett A, 2009d. Balfour Project Tasmania, Furious 50's Magnetic Data Modeling June 2009. *Unpublished Report for Pleiades Resources NL.*
- Bottrill R S and Taheri J, 2003. Ground Truthing of Western Tasmanian Regional Minerals Program geophysical data in the Balfour – Temma Area. *Tasmanian Geological Survey Record 2003/18.*
- Callaghan TJ, 2009 EL27/2007 and EL40/2007, Exploration Report 2009, Balfour District NW Tasmania. *Unpublished Annual Report for Balfour Management Joint Venture.*
- Callaghan TJ, 2010 EL27/2007 and EL40/2007, Exploration Report 2009, Balfour District NW Tasmania. *Unpublished Annual Report for Balfour Management Joint Venture.*
- Callaghan TJ, 2011 EL27/2007 and EL40/2007, Exploration Report 2009, Balfour District NW Tasmania. *Unpublished Annual Report for Balfour Management Joint Venture.*
- Chesnut, W R, 1964. Report on Balfour Area Tasmania – Prospecting 1963-64. *Unpublished Report for Broken Hill Pty Ltd. Kingston G C. TCR 64 – 0373.*
- Chesnut, W R, 1965. Report on Balfour Area Tasmania – Prospecting 1964-65. *Unpublished Report for Broken Hill Pty Ltd. Kingston G C. TCR 64 – 0394.*
- Dickson T W, 1983. Final report for Mineral Leases 20M/76, 72M/77, 103M/77, 104M/77, 8M/78, 57M/78 and SPL's 774 and 781. *Unpublished Company report for CRA Exploration Pty Ltd. TCR 83-1934, TCR 83-1935.*
- Everard J L, Seymour D B, Reed A R, McClenaghan M P, Green D C, Calver C R, 2007. Regional Geology of the Southern Smithton Synclinorium, Explanatory Report for the Roger, Sumac and Dempster 1:25000 Scale map Sheets for North Western Tasmania. *Mineral Resources Tasmania. ER_25_2.*
- Herrmann W and Sumpton J, 1982. Progress report on EL1/77 Temma Area 1981. *Unpublished Company report for CRA Exploration Pty Ltd.*
- Hiethersay P, 1982. CRA Exploration Pty Ltd. Balfour Tasmania Report for the year Ended 31st December 1981. *Unpublished Company report for CRA Exploration Pty Ltd. TCR 82-1730, TCR 82-1740, TCR 82-1741, TCr-1743.*



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- Langford NR 1983. Geology and Mineralisation at Specimen Hill Area, Balfour. *Unpublished Company report for CRA Exploration Pty Ltd.*
- Legge, PJ, 2003. EL4/2002 Balfour. Annual report August 2003. Review of Exploration opportunities. *Unpublished report for New Challenge Resources Pty Ltd.*
- Menpes PA 1996. Second Annual report for the period Ending 2nd may 1996, EL4/1994, Balfour Tasmania. *Unpublished Company report for CRA Exploration Pty Ltd.* TCR96-3912
- Patterson G W. 1996. A review of Exploration at Specimen hill, Balfour, Tasmania. *Unpublished Company report for CRA Exploration Pty Ltd.* In TCR96-3912.
- Porter, T M, 1980. The Balfour-Specimen Hill Program, Six monthly Report to December 26 1979. *Unpublished Company report for CRA Exploration Pty Ltd.* TCR-80-1475
- Seymour D B, Reed A R, 2003. Geological Atlas 1:25000 Scale digital series, Sheet 3043, Temma. Mineral resources Tasmania.
- Turner N J, 1994. Report on Stratigraphic and Structural Setting of rocks in EL80/1992 Balfour Tasmania. *Unpublished Company report for CRA Exploration Pty Ltd.* TCR94-3644
- Turner N, Reed A and Morrison K, 2003. Devonian Granitoids and Prospective Copper Tin and Gold Northwestern Tasmania. Tasmanian Geological Survey Record 2003/15.
- Weber G B, 1983. Rocky cape EL1/77, Progress report on the Temma Area, January 1983. *Unpublished Company report for CRA Exploration Pty Ltd.* TCR83-1958
- Wedekind, MR, Large RR, and Williams, BT, 1989. Controls on high grade gold mineralisation at tenant Creek, Northern Territory, Australia. *Econ Geol, Monograph 6 pp 168 – 179.*