Zebs Minerals Pty Ltd
ABN 53 167 761 113

Annual Report

On

Exploration Licence 10/2014

For the period

July 2014 – June 2015

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For

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Foreword

Function of this Report

This Annual Report has been prepared as a public document for submission to Mineral Resources Tasmania (MRT). The report provides a summary of the exploration activities undertaken by Zebs Minerals Pty Ltd within Exploration Licence 10/2014 (EL 10/2014) during the reporting period July 2014 - June 2015.

Role in the Regulation Process

This document fulfils the role of an Annual Report on EL 10/2014 for the period July 2014 to June 2015, as required under Section 28 of the *Mineral Resources Development Act 1995*.

Datum

GDA 1994, MGA zone 55 has been used for this report unless stated otherwise.

Distribution: Zebs Minerals Pty Ltd x 2
Mineral Resources Tasmania x 1

Executive Summary

Zebs Minerals Pty Ltd holds the licence EL10/2014 granted in July of 2014 for a period of 5 years and has the rights to ML 1/1976, an existing mining lease which expires in 2016 with the right to extend the lease.

Contained within these leases are the Murray's Reward mine, the single largest producer of copper historically, and approximately 17kms of strike length of the Balfour copper trend. This trend has been known since the early 1900's and worked as well as explored off and on by various individuals and companies over the last 100+ years. High grade copper is known and has been mined at and near surface at numerous locations along this trend. The trend continues for some 35kms and the Company has applied for three more tenements along the strike securing the entire area of interest. We are currently awaiting approval of the licences.

Exploration in the late 1990's by Rio Tinto Exploration Pty Ltd (CRA Exploration Pty Ltd) was the last major modern exploration effort in the area. Rio geologists formed an interpretative model on the origin of the copper based on the latest geological theories and technology at the time. They completed numerous geological and geophysical surveys culminating in the delineation of several targets. Rio drilled these targets with limited success suggesting that they had effectively tested their theory and though not disproving it, satisfied themselves that a target large enough for Rio did not exist.

It should be noted that at this time Rio had made the decision to disband its exploration division and quit exploration Australia wide to focus on the acquisition of deposits of a size suitable to be profitable to Rio.

Though the data collected by Rio and their predecessors was accurate, the technology did not exist at that time which is available today to effectively model the deposits. To that end, Zebs contracted GHD to re-evaluate the geophysical data and apply new software programs and computing power to analyse the data. The resulting studies have demonstrated the concept and confirmed the ideas that Rio had postulated.

Zebs Minerals has now proven the existence of a multiple of large high density bodies at depth that can only be explained by sulphide mineralisation and which current modelling is showing connect via a system of faults to the copper bearing surface expressions of the Balfour trend. All that remains is to drill test the bodies to confirm copper, percentage and extent. A drill program has been submitted to MRT for approval which is expected by the end of the period with drilling to commence July 2015.

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PLANS

1 INTRODUCTION

1.1 Purpose of This Document

This document fulfils the role of an Annual Technical Report on the exploration activities carried out on EL 10/2014 during the reporting period July 2014 to June 2015 as required under Section 28 of the Mineral Resources Development Act 1995.

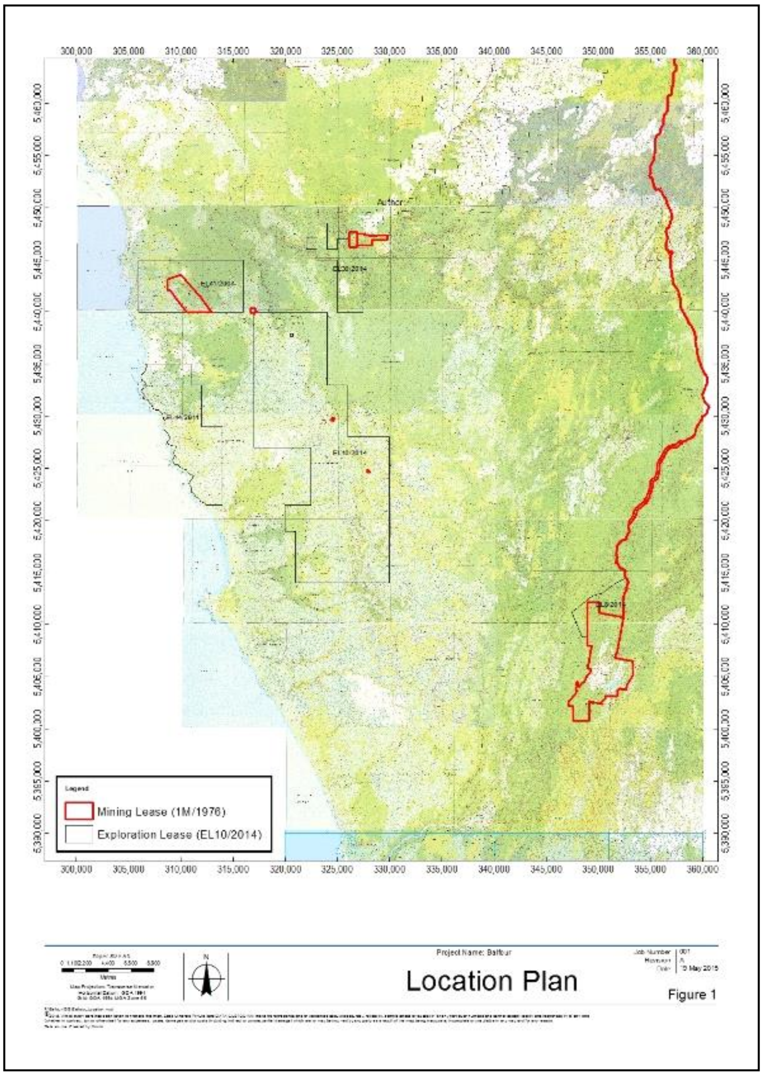
1.2 Licence Location and Operations

1.2.1 Mineral Exploration Area

The Exploration area consists of two licences as given in the table below and is located approximately 49km due south of the town of Smithton in North Western Tasmania.

Project	Licence	Location	Area sq km	Date granted	Period remaining
Balfour	ML1/1976	Balfour	.005	01 Jan 1977	6 Months
Balfour	EL10/2014	Balfour	219	01 July 2014	4 years

1.2.2 Site Location



Access to the Project is via the Bass Highway to Smithton from Burnie and then on to Balfour via the Western Explorer Highway and the Balfour track. Access to the tenements is good with historical tracks throughout the tenement still in usable condition.

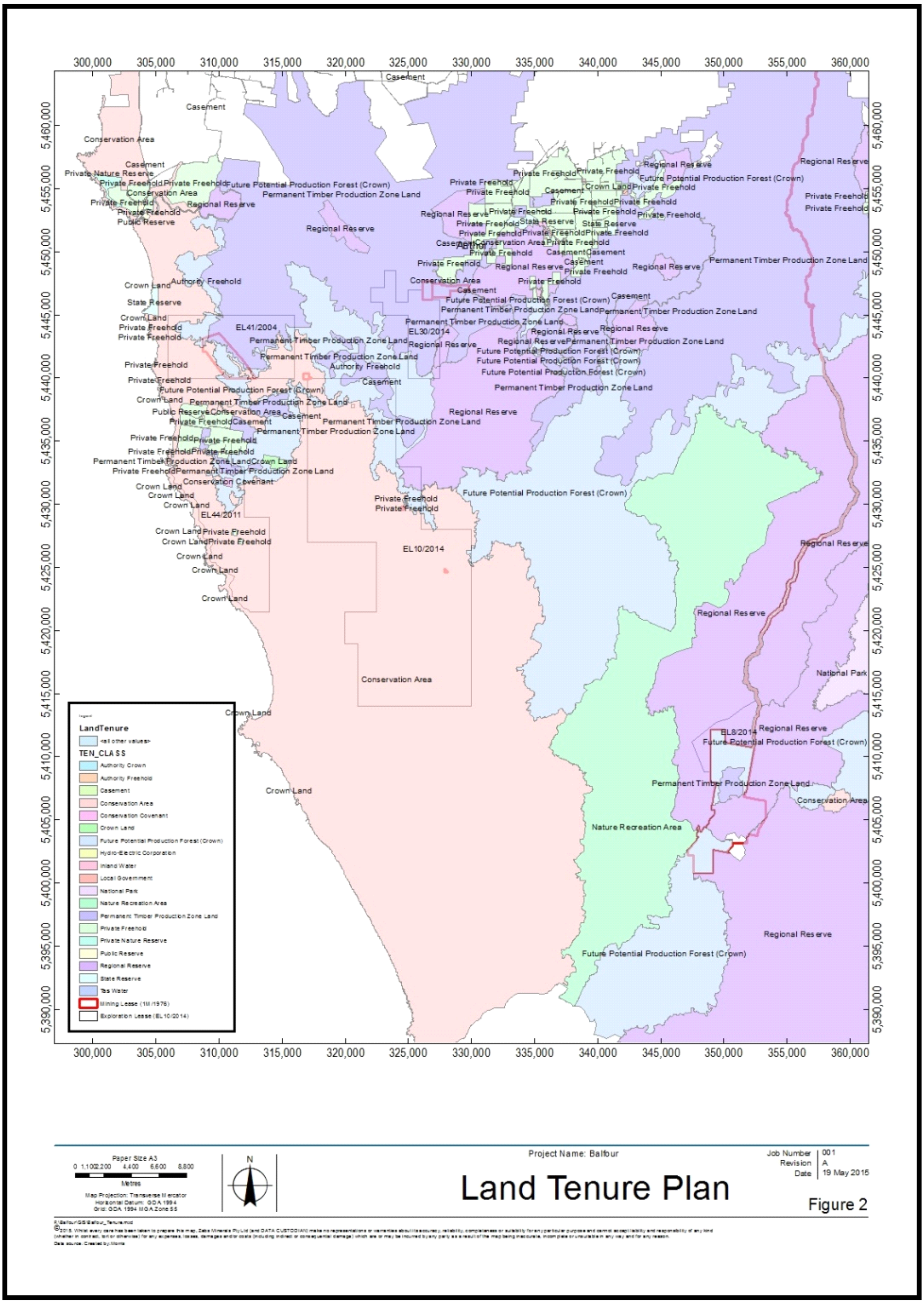
The old highway, pre-Western Explorer, supplies access through most of the tenement from the northern edge of the tenement to the middle portion ending near to the South Mine.

1.2.3 Exploration Licence Tenure

The tenement, EL 10/2014 was granted to Zebs Minerals Pty Ltd on 1 July 2014 for a period of five years and applies to all Category 1 minerals. The licence covers 219 square kilometres and excluded areas include:

- Any land owned or leased by the Commonwealth of Australia;
- Mining Leases;
- Retention Licences; and
- Crown reservations.

The current land tenure in and around EL 10/2014 is provided in figure 2 below.



1.2.4 Historical Setting

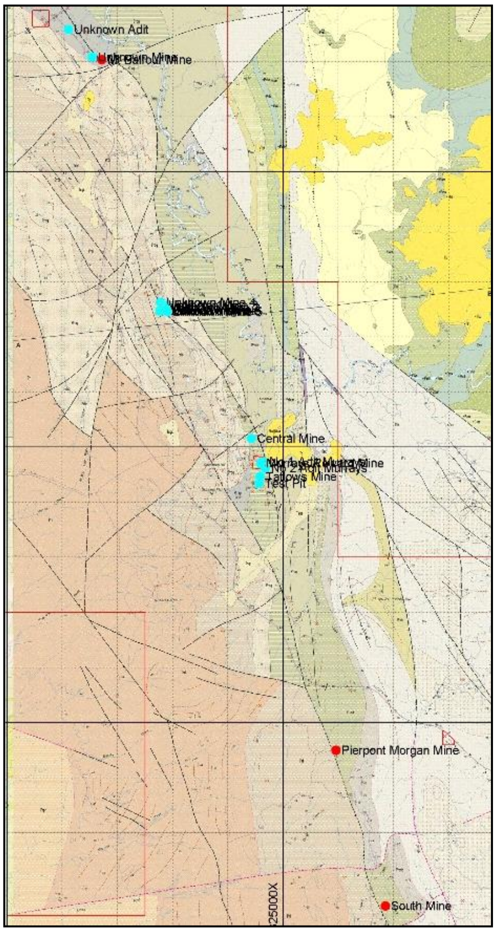


Figure 3: Historical Workings

The first mineral discovery in the Balfour region occurred in the early 1880’s with the discovery of alluvial Tin. Tin was worked on a small scale within several workings in and around the area to later be known as Specimen Hill. Alluvial tin was worked for a period of some twenty years prior to the discovery of copper in Cassiterite Creek in 1901 (Ward, 1911). Once discovery of copper was made the majority of future prospecting in the area for many years was centred on copper with only minimal tin prospecting and mining continuing over the period up until the 1980’s.

Copper was prospected in the area extensively from 1901 to the early 1920’s when the copper price dropped. Mining began in earnest in 1906 and peaked around 1917. The Murray’s Reward mine (now within ML 1/1976) did not start production until 1910. The Murray’s Reward mine is recorded as the largest producer in the Balfour field and along with the Balfour Central continued mining until around 1917, producing a recorded 6,380 tonnes of copper during its operating life. Thereafter, mining in Balfour was sporadic with only two other periods of recorded production being 1929 to 1941 with production of 3.8 tonnes of copper and most recently in 1990 where the lease holder at the time extracted 133 tonnes from a small open pit cut into the top of Murray’s Reward (Taheri, J. & Bottrill, R.). The copper recovered was sold to Copper Mines of Tasmania in Queenstown at an average grade of 25% Cu (M. Lann, pers. Comm.).

Mining was extensive over an area of approximately 17km during its peak in the Balfour field as can be seen in figure 1.

1.2.5 Geological Setting

Geologically, the area consists of thick sequences of near vertical sedimentary material of Proterozoic age with minor patches of remnant overlying Tertiary basalt and sediments. Devonian Granite intrusions occur near the coast and are inferred to underlie the sediment package to the west. The area has been subjected to numerous episodes of structural deformation over time giving place to the faults and fractures required for fluid movement. The Tin and Tungsten of the Specimen Hill area was derived from the mineralising fluids generated during the intrusion of the granites. This same episode was the catalyst for the remobilisation and concentration of the copper, seen at surface and mined historically, which is predominately confined to a series of cross cutting faults along the main structural trend. The structural feature which dominates the area is the northwest-southeast trending Balfour thrust fault which has a strike length of approximately 35kms. The Balfour copper trend can be traced along this structure from the Mt Balfour copper mine in the north to the South Mine at the south of the trend at the least, with the potential to extend through to the Toner River and Interview River areas.

2 Previous Mining and Exploration

2.1 Copper

Copper was first discovered in the Balfour region in 1901 in Cassiterite Creek whilst exploring for alluvial tin. This discovery point and the ground around eventually became the Murray's Reward Mine. Since initial discovery copper has been explored for and mined on a small scale up to the late 1940's. The first modern exploration specifically for copper in the area didn't occur until the late 1960's.

ACI Ltd carried out the first concerted effort of modern exploration for copper over a period of six years, from 1968 – 1974 exploring the Balfour copper trend from The Clump (Mt Balfour Mine) in the North to Balfour South workings in the south.

Exploration was continued by a private company, Soloriens Mining Pty Ltd between 1988 -1992.

CRA Exploration Pty Ltd returned to the area for a four year period, 1993 – 1997, this time looking for large scale sedimentary hosted base metal copper deposits where previous exploration efforts had focused on the tin potential just to the west at Specimen Hill.

ACI Ltd – 1968 -1974

ACI Ltd carried out the most comprehensive exploration program over the entire strike length of the Balfour trend between Mt. Balfour (The Clump) and Balfour South over a period of approximately four and a half years. They began their exploration program in late 1969. By early 1970 they had completed several grids, geological mapping, geochemical sampling as well as an induced polarization survey completed by McPhar Geophysics.

The IP survey indicated several strong anomalies along the strike length. Further detailed work was focused in three main areas being;

The Clump - 14 lines of IP
The Blocks - 8 lines of IP
Murray's Reward/Central Min - 14 lines of IP

At the Clump ACI recognised an anomalous area extending approximately 1,000m along strike and some 20-70m wide. They noted that graphite in the area probably influenced the results with regard to the potential strike and width but did not believe it was sufficient to discourage further work. At the Blocks prospect they found two anomalies, one classified as definite and another they thought probable, approximately 350m minimum in strike length and corresponding with existing historical copper workings.

Definite anomalies were found on all lines over the Murray's Reward/Central Mine prospect with a strike length of approximately 700m and correlating very well with existing historical copper workings, although again they estimate that graphite in the area could be exerting a minor influence (McIntyre, M.H.).

They also suggest that further work is required between the Blocks and the Clump prospects as there were several strong anomalies indicated.

ACI was fortunate enough to be able to access the old workings at the Clump, Murray's and Central and able to sample the underground workings. The results were summarised as;

The Clump Mine – Ore zone up to 20m in width with grades of Cu up to 3.53% and silver up to 22g/t.
Murray's Reward - graded 7.9% Cu over 1.5m.

Central Mine – up to .27% Cu in the mineralised zone. Geological mapping and sampling of the underground workings indicated the potential to locate mineable grades and tonnes of copper in the area of the historical mines.

Between 1970 and 1973 the company drilled a total of 37 diamond drill holes into eight separate projects along a 17km strike length. Most holes hit the targeted ore zone and intersected copper mineralisation, though sub-economic, encouraging the company to keep exploring for another twelve months. Drilling was difficult particularly in the shallower holes and near to the expected ore zones.

During the period of exploration, it was suggested that the copper was derived from a sedimentary source but this potential source was never pursued and all drilling targeted shallow supergene enriched copper lodes near to existing historical workings. It is doubtful that any drill holes were targeted in the cross-cutting fault zones where the best opportunity for this deposit type could be located or that the drill holes had a close enough spacing to properly test the prospects.

Soloriens Mining Pty Ltd – 1988-1992

During their first year of operation, Soloriens completed a data review principally of ACI Ltd data for copper and CRA Pty Ltd for tin. They also completed a gravity survey in conjunction with the Tasmanian Government over the area with results assessed by Leaman Geophysics. It was determined that the gravity densities could represent a granite spine near to surface and that known mineralisation could be associated with it. No work was completed during year two and the company was actively seeking a joint venture partner.

During year three the company collected numerous samples including water and plant samples. These were tested and it was noted that the lichens and algae specific to the area had a tendency to concentrate Cu, Ag & Au, though in small amounts. Samples were also collected from the Murray's Reward mine and sent to the CSIRO labs to have an isotope study completed. The intention was to determine the age of the mineralising fluids. The results were inconclusive, however, the CSIRO study suggested it was unlikely that the copper mineralisation was of Devonian origin and more likely Cambrian, possibly Proterozoic in age indicating the copper originated from a deep seated source and was less likely to have been influenced much by the Devonian period.

Year four continued with research by CSIRO and the data now implies a possible Devonian origin for both the tin/tungsten and the copper. The argument being the copper is older Cambrian which has been affected by the later Devonian granitic intrusion leading to the deposition of both copper and tin/tungsten at Balfour. The company proposed a 5th year of work but no report exists and it is likely the ground was relinquished.

Rio Tinto Exploration Pty Ltd – 1993-1997

Rio Tinto (then CRA Exploration Pty ltd) had explored the area of Specimen Hill for tin from 1977-1983. At that time no exploration for copper was undertaken in the Balfour region. In 1992, CRA applied for and was granted EL18/92. The sole purpose of this move back to north-western Tasmania was to explore for copper in the Balfour area. The company was targeting the potential source of the known and extensive copper mineralisation. They surmised, based on experience and studies of similar copper deposits around the world, that the source of the copper at Balfour was most likely stratiform or stratabound deep seated ore bodies potentially created by replacement of pyrrhotite, in pyrrhotite rich sediments, with copper (Menpes, S.A.). Early work by CRA indicates that copper mineralisation postdates movement on the Balfour and Roger River faults. During the latter period of exploration CRA postulated a concept with regard to the source of the copper mineralisation as being multiple large bodies down dip of the Balfour fault which was given to have a near vertical dip slightly to the south west. CRA recognised the numerous east-west cross cutting faults and their relationship with the existing higher grade workings. They came up with the model exhibited in Figure 4.

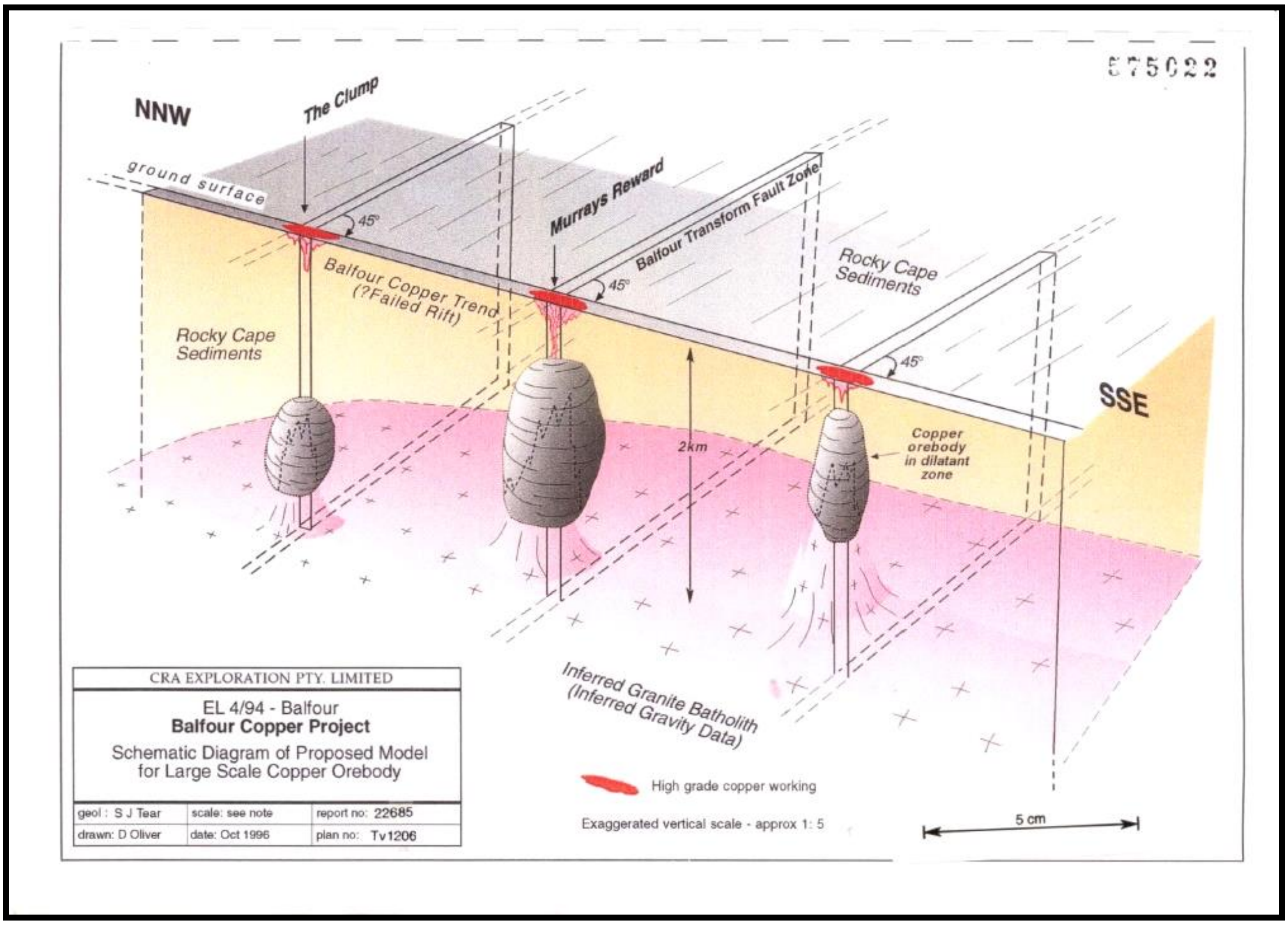


Figure 4: CRA Proposed Model of Copper ore body

CRA planned and drilled diamond drill hole DD97BC10 to test the theory of the deep seated ore bodies. The hole was planned to a depth of 500m. However, the hole was only drilled to 82.1m due to hydraulic lock of the drill rods forcing abandonment of the hole. A new drill hole, DD97BC11 was planned some 90m to the north east as a second attempt to intercept the gravity anomaly. This hole was completed at a depth of 464.5m. CRA determined that they had intersected the gravity anomaly at approximately 400m but noted the core was no different than anywhere else in the hole. They also noted that they had gone through a mineralised zone at 146.6m that was remarkably similar to the main Murray's Reward ore zone. The gravity anomaly which had been drilled, they believed to be east of the main mineralised zone on the Balfour trend. CRA failed to locate a substantial ore body and relinquished the tenements. It is worth noting that at this time CRA Exploration was disbanded and Rio Tinto discontinued exploration worldwide.

3. CURRENT EXPLORATION, 2014 – 2015

3.1 Geology

Since acquiring the tenements the company has focused on data research and acquisition. Historically numerous companies have spent time and funds in the concerted search for either tin/tungsten or copper. Data research to date indicates that ACI Ltd and CRA Exploration Pty Ltd have done the bulk of the work on the Balfour copper trend. Both companies alluded to a potential deep seated source for the copper and completed extensive work programs in the hope to locate a substantial ore body at depth that would explain the source of the copper found throughout the 35km extent of the Balfour copper trend.

The company has also spent time on the ground, re-locating old workings and making determinations on how best to progress the project. To that end and in conjunction with GHD as consultants, the company has embarked on several rounds of geophysical data research and re-interpretation which is covered in the following section on geophysics. All of the geophysical work to date, including interpretation has been completed and is incorporated in this report as Appendices 1, 2 & 3.

A 16 hole diamond drill program has been planned to test the geophysical anomalies at depth and has been submitted to MRT for approval. The company currently awaits the approval to proceed with the drilling program.

The company has applied for a further four tenements covering the entire strike length of the Balfour trend to explore for further base and precious metals discoveries as well as the graphite and quartzite potentials in the area. Graphite has been documented in areas, however, its extent and quality are yet to be assessed. Massive quartzite exists throughout the current licence and along strike in the newly applied for ground and the company expects to test the extent and quality with a view to commercialising the deposit if possible. These will take a secondary priority to the base metals but will be included within the exploration program to reduce costs and redundancies in exploration. The company is currently awaiting the approval of the pending applications.

3.2 Geophysics

The company engaged GHD to undertake a review into the available geophysical data relevant to the Balfour project which had been collected by various companies and government organizations over the years. The purpose of the review was to acquire the available data and determine if:

- The existing data was of sufficient detail and quality to be of use
- The data could be re-modelled to produce any further useful information
- Further geophysical work was required to aid in the current re-modelling
- What could be expected from re-modelling of current data with respect to the exploration potential of the Balfour project

With regard to those requirements GHD has produced three reports (Appendices 1, 2 & 3) indicating that there is sufficient information available to produce meaningful results from re-interpretation of the existing data and the re-interpretation of that data along with the results has now been completed.

The GHD re-interpretation has confirmed CRA's theory of a potential large scale source at depth for the visible mineralization as well as mapped out the surface mineralization around the Murray's Reward Mine with the geophysics as given in figure 5.

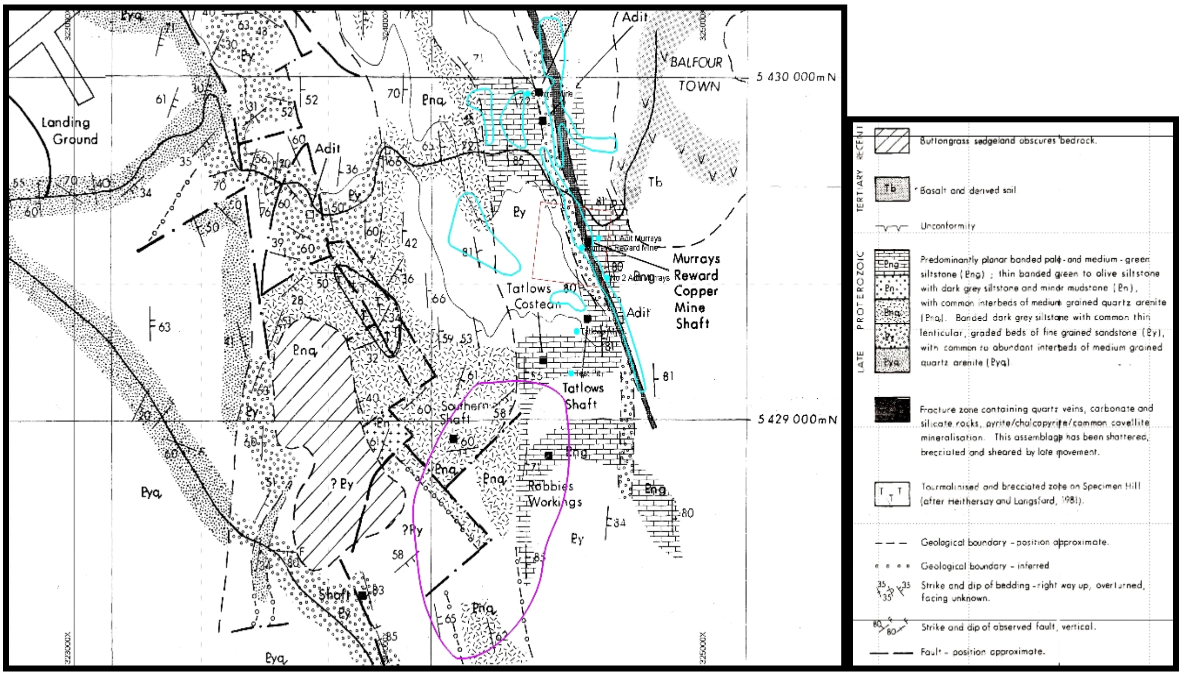


Figure 5: Geophysics trace in relation to CRA detailed geology

Blue outline = surface expression
Purple = subsurface expression

As shown in figure 5 above the geophysical trace of the near surface mineralisation parallels the main fault on the map and the surface expression of the ore. The subsurface body existing at a greater depth is interpreted to represent the potential ore source as predicted by CRA based on gravity. Figure 6 shows early modelling of the subsurface bodies produced by GHD in their second study for the company.

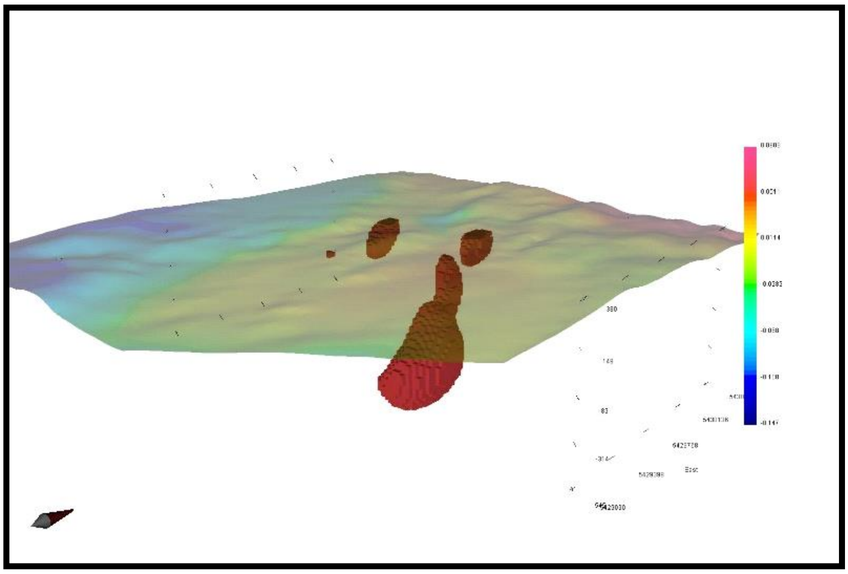


Figure 6: Density Subsurface supplied by GHD

In the model it can be clearly seen the relationship between the bodies as well as the relationship to the surface expression shown in Figure 5. Initial indications show the bodies increasing at depth to the south west from Murray's Reward. Current thinking is that the two shallower bodies probably feed into the Central Mine just north of Murray's and the larger body into Murray's itself. A structural enhancement study was recently completed by consultants GHD (Appendix 3). This study confirms continuity of the structures.

Throughout the Balfour trend it can be seen that the main structures are continuous and deep seated. The work also shows that these structures as seen on surface contact the density bodies at depth giving greater certainty to the concept that these are the potential source materials for the high grade copper at and near the s urface exposed in areas by historical copper workings.

Further geophysical work is to be carried out as downhole EM. Once the depth of existing shafts is ascertained it is proposed to attempt to obtain geophysical readings with downhole EM. This procedure will also be completed on each drill hole planned to be drilled in next year's program.

4 Discussion

Current work is ongoing, however, early understanding has advanced the concept first put forward by CRA in the late 90's. The 35km strike length of the Balfour trend exhibits copper mineralisation of varying grades throughout. Cross cutting faults have created dilation within this zone allowing for the movement of significant amounts or ore bearing fluid as evidenced in the various known historic workings along the Balfour copper trend. This fluid movement is a product of the Devonian granite intrusions remobilizing the copper in solution and creating supergene zones of high grade copper such as found at Murray's Reward, The Clump, Central and South Mines along the trend.

Although the work carried out by both ACI and later CRA was extensive and thorough, both companies tended to adopt the standard approach, when it came to drill testing, planning conservative programs targeted at known zones of mineralisation for drill testing rather than testing the theory. In the case of CRA when they finally did plan and drill a hole to test the theory of deep seated reserves, they hedged their bets and still drilled back into the suspected trend of the fluid channel. In the opinion of the author, this action, with regard to the drilling in conjunction with a misinterpretation of the data regarding placement of the gravity anomaly, was the reason they failed to define the potential resource.

With the advent of more powerful computing resources and more sophisticated software, the company has been able to refine the data and re-test the theory. CRA was on the correct track but lacked the technology and perhaps more importantly the corporate commitment at the time to see the program through to a successful conclusion. Zebs Minerals now has the opportunity to complete this program with a high degree of success in proving the source material for the copper as current modelling of the gravity leaves no doubt that large bodies of high density remain untested at depth.

The completion of the final modelling by GHD confirms early estimations, that the deep seated bodies are indeed the potential source of the copper mineralisation which has been remobilised along the structures early on and again in Devonian times leading to the known surface exposures seen today.

5 Environment

Environmental disturbance on EL 10/2014 and ML 1/1976 during the company's tenure to date has been nil as the majority of work has been office based. Field work completed has consisted of ground checking information and all travel has been either on foot or restricted to existing tracks within the tenement areas.

6 Recommendations

- Consider potential of downhole EM program in existing shafts to improve geophysical targets
- Assessment of size and grade of historic tailings available for re-treatment enabling possible early cash flow.
- Assessment of potential to recover copper from copper rich waters emanating from various workings in the area.
- Planning a diamond drill program to prove the gravity anomaly at Murray's Reward as the source for the copper mineralisation.
- Short drill program to below the old workings targeting dilation zones for high grade copper with the view of reopening the existing underground mine as a preliminary step to accessing the ore body at depth.
- Putting together an exploration program to extend current knowledge of ore zones and apply it to the remaining portions of the existing tenements and the new tenements currently under application.

It is likely that due to seasonal restrictions, particularly with regard to drilling, that the program to complete the above will be 9 to 12 months in duration. The estimated cost to complete the program in full over that period would be expected to be approximately $1.5 million.

Campaign	Estimated duration	Approximate cost	Priority
Geophysics (downhole EM)	One week	$20,000.00	Stage one
Recover and load all data into software	One week	$5,000.00	Stage one
Tailings assessment	Two weeks	$12,000.00	Stage two
Copper recovery from water research	Two months	$22,000.00	Stage two
Access and assessment of old workings	Three weeks	$16,000.00	Stage two
Drilling 3 deep holes to test gravity anomaly	Eleven weeks	$680,000.00	Stage three
Drill approx. 9 shallow holes in high grade	Twelve weeks	$720,000.00	Stage four
Totals	Thirty seven weeks	$1,475,000.00	

Completion of the above work programs will confirm the mineralisation and determine the economic viability. Further drilling would be required as well as geological work to progress the mining of the resource. The above work only applies to the Murray's Reward area and a similar strategy would need to be applied to the extent of the Balfour trend to identify further deep seated sources of copper mineralisation which are expected to exist.

7 References

Chesnut, W.S. (1965). Report on Balfour Tasmania Prospecting, Broken Hill Proprietary Limited.

McIntyre, M.H. (1971). Mineral Exploration in EL 16/68, Balfour Northwest Tasmania 1970 – 1971, Australian Consolidated Industries Limited, Mineral Resources Division.

Menpes, S.A. (1996). Second Annual Report for the period ending 3rd May 1996 EL4/94 Balfour Tasmania, CRA Exploration Pty Ltd.

Morrison, K.C. (1992). EL53/88 Mount Frankland Annual Report: Year 4, Soloriens Mining Pty Ltd.

Parkinson, R.G. (1993). Mount Frankland EL18/92 Report on Exploration for the First Year of Tenure 06/11/92 to 05/10/93, CRA Exploration Pty Ltd.

Russell, S.A.J. & Tear, S.J. (1997). EL 4/94 Balfour, Third Annual and Final Report for the period 3rd May 1996 – 11th November 1997, Tasmania, Australia. Rio Tinto Exploration Pty Ltd.

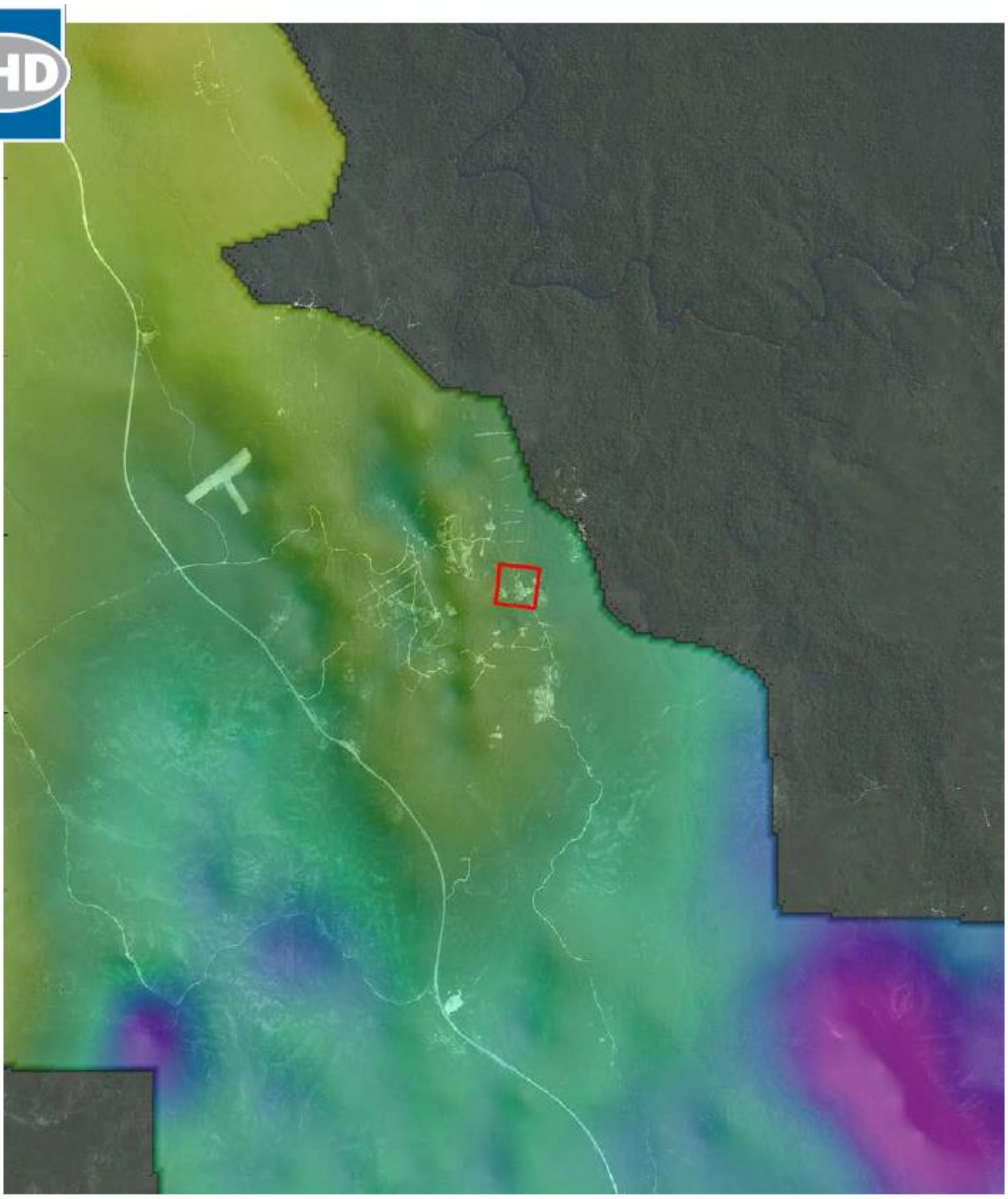
Taheri, J. & Bottrill, R. (2005). The Nature and Origin of Copper and Tin-Tungsten deposits in the Balfour-Temma area, northwest Tasmania, Tasmanian Geological Survey, Mineral Resources Tasmania.

Tear, S.J. (1996). Fourth Annual Report For The Period Ending 5 October 1996, EL 18/92 Mt Frankland, Tasmania. CRA Exploration Pty Ltd

Ward, K.L. (1911). The Mount Balfour Mining Field, Geological Survey Bulletin No. 10, Department of Mines, Tasmania.

Appendix 1

Balfour 1M/1976 Desktop Geophysical Review - Factual Report



Balfour 1M/1976
Desktop Geophysical Review - Factual Report

January 2015

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1. Introduction

1.1 Background

GHD was engaged to perform a desktop geophysical review of data and documentation pertaining to mining lease 1M/1976 in the Balfour area. The review was commissioned to assess the likelihood of an economically viable mineral deposit being hosted within, or adjacent to, the mining lease.

Aerial imagery of the mining lease and the adjacent exploration lease (EL 10/2014 Zebs Minerals Pty Ltd.) is displayed in Appendix A.

The Balfour area is located within one of the most mineralised districts of Tasmania and lies within a 35 km northwest tending line of recurrent copper workings. Elevated levels of zinc and lead are found throughout the region and anomalous levels of tin and tungsten are common to the west of the mining lease.

1.2 Objectives

The objectives of the desktop review are:

1. Locate and gather relevant data and documentation pertaining to Mining Lease 1M/1976.
2. Review relevant deposit models.
3. Review relevant geological documentation.
4. Review geological maps and geophysical data, and
5. Discuss findings and recommendations.

1.3 Scope and limitations

This report has been prepared by GHD for M. Hansen and G. Summers and may only be used and relied on by M. Hansen and G. Summers for the purpose agreed between GHD and M. Hansen and G. Summers as set out 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than M. Hansen and G. Summers arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this section 1.4 of this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Mineral Resources Tasmania and Geoscience Australia and others who provided information to GHD, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.4 Assumptions

The following assumptions have been relied upon in preparing this report:

- That geological and geophysical data collected from government agencies is accurate and representative of the geology defined in the study area.

2. Existing Works

Documentation and datasets pertaining to Mining Lease 1M/1976 and the surrounding area were collected from Mineral Resources Tasmania (MRT), Geoscience Australia (GA) and other data repositories for the purpose of this report. Documentation and datasets collected include, but are not limited to:

2.1 Geological Maps

1. Balfour 1:25,000
2. Dempster 1:25,000
3. Temma 1:25,000
4. North Western Tasmania 1:250,000

2.2 Geological Documentation

1. The Geology and Mineral Deposits of Tasmania – Bulletin 72
2. A Summary of the Economic Geology and Mineral Potential of Late Proterozoic and Palaeozoic Provinces of Tasmania.
3. Exploration Report 2011 EL/2007 and EL40/2007
4. Independent Geological Report 2004 EL 4/2002 Balfour - Jaguar Minerals Ltd.
5. Annual Report 2003 EL 4/2002 Balfour – New Challenge Resources.
6. Magnetite-Copper-Gold Mineralisation Intersected at Balfour Tasmania 2010 – King Sheelite Ltd.
7. Assorted reports for EL 16/1968 from 1969 to 1974.
8. Exploration Models of Major Australian Mineral Deposits – AGSO Journal V17, N4, 1998.
9. The Nature and Origins of Copper and Tin-tungsten Deposits in NW Tasmania – MTR 2004/5

2.3 Drill Hole Documentation

1. DDH14 – Australia Consolidated Industries Ltd.
2. DDH15 - Australia Consolidated Industries Ltd.
3. DDH23 – Australia Consolidated Industries Ltd.
4. DDH26 - Australia Consolidated Industries Ltd.

2.4 Geophysical Datasets

1. TMI – North Western Tasmania 1984.
2. Radiometrics – North Western Tasmania 1984.
3. TMI – Mt Frankland 1993.
4. Radiometrics – Mt Frankland 1993.
5. Total Magnetic Intensity (TMI) - Arthur / Pieman Survey 1996.
6. Digital Terrain Model (DTM) - Arthur / Pieman Survey 1996.
7. Radiometrics - Arthur / Pieman Survey 1996.
8. Total Magnetic Intensity (TMI) - Arthur / Pieman Survey 1996.
9. TMI – Smithton 1998.
10. EM – Smithton 1998.
11. TMI – Balfour 2002.
12. DTM – Balfour 2002.
13. Electromagnetics (EM) – Balfour 2002.
14. Conductivity Depth Imaging (CDI) – Balfour 2002.
15. Bouguer Gravity – MRT compiled.
16. Gravity – Pleiades Resources Survey 2009.

Geological maps are presented in Appendix B and selected geophysical datasets are presented in Appendix C. Documentation listed above has been referenced extensively in forming this report.

3. Review of Deposit Models

3.1 Volcanic Hosted Massive Sulphide (VHMS) Deposits

VHMS style deposits are found throughout north-west and western Tasmania and include Roseberry, Hellyer, Que River, and Mt Lyell. Mineralisation within VHMS deposits hosts economical grades of copper (Cu), lead (Pb), zinc (Zn), gold (Au) and silver (Ag) (Figure 1).

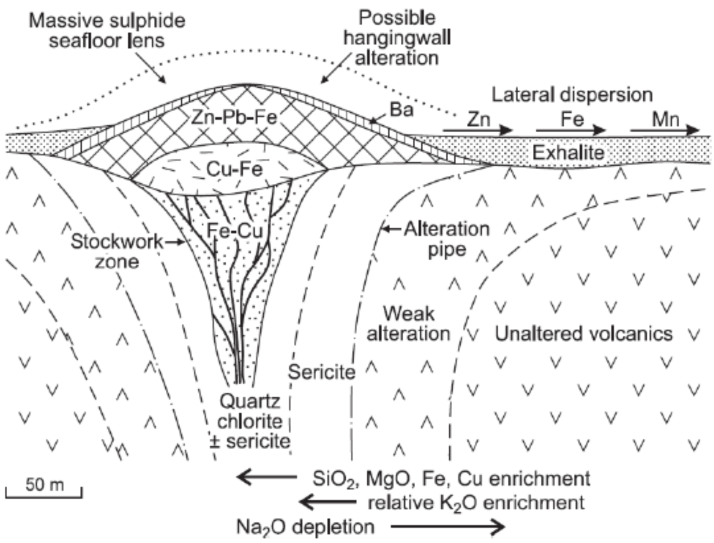


Figure 1 Idealised zonation of a VHMS deposit (after McQueen 2005).

3.1.1 Regional Criteria

- Back-arc and inter-arc rift volcanic basins.
- Preferred ages: Cambro-Ordovician and Silurian.
- Calc-alkaline submarine volcanics and sediments.
- Compositional variation: rhyolite-andesite-basalt.
- Proximity to syn-volcanic rift faults.
- Located proximal to volcanic centres (Cu- rich ores) or in distal volcanic facies (Pb- Zn-rich ores).
- Syn-volcanic magnetite-series granites may be present.
- Rhyolite is most common footwall composition.
- Sediment and/or mafic volcanics are most common hanging wall rock types.
- Regional sericite ± chlorite alteration in footwall volcanics.

3.1.2 Local geological criteria

- Ore located in favourable horizon between volcanic units.
- Favourable horizon may be iron-rich exhalite, sulphide bearing epiclastic, shale or carbonate.
- Ore same age as host volcanic- sedimentary rocks.
- Deposits vary in shape from blankets to lenses, to mounds and pipes.
- Large (1992) recognises ten different styles of VHMS deposits.

3.1.3 Mineralisation features

- Zn-Pb massive sulphide lens is stratiform.
- Massive sulphide may be banded, brecciated or massive and fractureless.
- Cu-rich footwall stringer lone is cross-cutting
- Chlorite, sericite, quartz. barite, carbonate are major gangue minerals.
- Vertical (up-stratigraphy) zonation of Cu, Au→Pb, Zn, Ag, Au→Ba.
- Pyrite is major sulphide mineral plus sphalerite, galena, chalcopyrite ± tetrahedrite, arsenopyrite.
- Magnetite and pyrrhotite are rare except for strongly metamorphosed deposits.

3.1.4 Geophysical criteria

- Regional magnetics define major volcanic units, structures and alteration.
- Regional gravity and magnetics may define position of related magnetite-series granites.
- Ores have no magnetic signature.
- EM important in discovery of Que River, Hellyer, Wilga.
- Most deposits have strong EM responses.
- Cu-rich ores have best EM response
- Zn-rich, Cu-poor ores have a very weak or non-existent EM response.
- Induced polarisation (IP) defines ore zone and pyritic alteration halo.

3.2 Sedimentary Exhalative (SEDEX) Deposits

Although no economically viable SEDEX deposits have been discovered in Tasmania documentation pertaining to the Balfour region suggests that the regional and local geology fits the criteria required for a SEDEX style deposit (Figure 2).

3.2.1 Regional geological criteria

- Intercontinental rift or rifted margin (marine) basins.
- Unmetamorphosed to greenschist-amphibolite transition.
- Continental basalts and felsic volcanics and intrusives form an important part of the underlying (older) rift fill.
- Diverse sedimentary host lithologies deposited in terrestrial, peritidal and deep marine settings; in part evaporitic; includes black, grey, brown and red rocks.
- All major deposits lie within a few kilometres of major long-lived regional-scale fault systems (e.g. Emu Fault, Mount Isa Fault, Termite Range Fault).
- Regional host sequence is often the latest sag phase fill of a series of rift-sag cycles.
- 'Carpentaria Zinc Belt' deposits are in rocks of 1660-1590 Ma.
- Evaporites may be needed for high-salinity ore fluids.

3.2.2 Local geological criteria

- Host sediments and ores are essentially coeval in most deposits, i.e. syngenetic (exhalative) or early diagenetic timing for the introduction of base-metal-bearing fluids (Century may be an exception).
- Host rocks are carbonaceous and/or pyritic black and grey (dolomitic) siltstone, mudstone and shale, often with a significant clastic carbonate (dolomite) component, i.e. the most 'reduced' parts of the local sequence.
- Turbidite and/or tempestite facies are commonly present.
- The water depths in which the sediments were deposited are different in different deposits (shallow/emergent to subphotic zone and sub-storm wave base).
- Coarse-grained debris flows (breccias) in some deposits indicate local syn-sedimentary faulting.
- Fine-grained tuffaceous component is the only indication of (distal) coeval volcanic activity.

3.2.3 Mineralisation features

- Stratiform (stacked) lenses are common.
- Individual lenses have a sheet-like aspect ratio.
- Base-metal sulphides can be finely laminated and are interbedded with or form infillings in clastic sedimentary layers.
- Pyrite is abundant in most deposits, but in detail there is no simple relationship between pyrite and base-metal sulphide abundance.
- Pyrrhotite is only common in metasomatised / metamorphosed deposits (e.g. Mount Isa).
- Wide range of Zn/(Zn+Pb), but most deposits and most parts of individual deposits Zn > Pb.
- Only minor Cu (500- 5000 ppm).
- Weak (Cu) > Pb > Zn zonation in some deposits.
- Barite is usually not present (except Lady Loretta and Grevillea).

3.2.4 Geophysical criteria

- Processed regional potential field data can be used to define basement structures, basin margins, the nature and thickness of basin fill (depocentres) and other sedimentary structures.
- Density contrast between ores and host rocks may be recognisable from detailed gravity surveys.
- Ores are generally poor electrical conductors and nonmagnetic (pyrrhotite-bearing ores are an exception).
- Airborne and ground electromagnetic surveys can locate carbonaceous and pyritic sedimentary host facies.

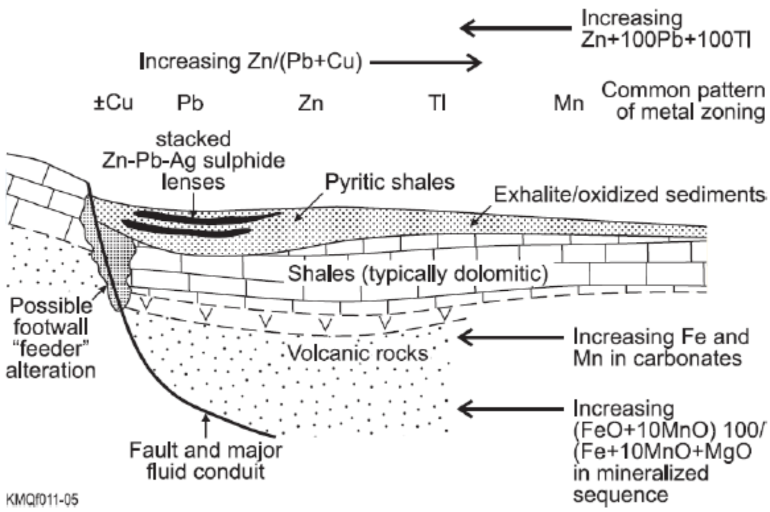


Figure 2 Idealised setting of the SEDEX style deposit (after McQueen 2005).

3.3 Renison Style Carbonate Replacement Deposits

Tasmanian Renison style carbonate replacement deposits include the Renison, Mt Bischoff, Cleveland and Queen Hill. Economic mineralisation is commonly massive to semi-massive pyrrhotite, cassiterite.

3.3.1 Regional geological criteria

- Late Precambrian- Early Cambrian dolomitic and clastic sediments deposited in Early Palaeozoic Dundas Trough; a passive rift basin in Proterozoic continental crust.
- Sn-bearing post-orogenic Devonian granitoids intruded E-W across the N- S axis of the Dundas Trough; topographic highs at the intersection of NW-trending anticlinal highs and E-W-trending Cambrian allochthonous sutures.
- Sn-bearing pyrrhotite ore bodies (distal skarns) hosted by favourably replaced carbonate within the Dundas Trough:
  - dolomites of Upper Oonah Formation (Mt Bischoff, Queen Hill);
  - dolomites of Success Creek Group (Renison, Montana);
  - limestone's of Crimson Creek Group (Cleveland, Severn).
- Non-magnetic Sn-bearing Devonian granitoids are reduced ilmenite series peraluminous intrusions.
- Thermal metamorphism of the overlying sediments assisted their brittle deformation by shallowly emplaced granitoids.
- Major fault structures and/or porphyry dykes acted as conduits for Sn-bearing magmatic hydrothermal fluids.
- Mines and prospects delineate district-scale telescoped metal zonation away from volatile-rich granite apophyses: (Proximal) Tin (Sn), tungsten (W) > arsenic (As) > Cu > Pb, Zn, Ag > antimony (Sb, Distal).
- Distal skarn deposits typically 500 1500 m from volatile rich granite apophyses.

- Key references: Largo 1989, Kitto 1994.

3.3.2 Local geological criteria

- Stratabound carbonate-replacement ore bodies (distal skarns) occur in carbonate horizons 500-1500 m from boron (B-) and fluorine (F–) rich late-stage quartz-feldspar porphyry apophyses/dykes (Figure 3).
- Residual gravity interpretation of Devonian granitoids used to detect granite apophyses and predict locations of major structural deformation features in overlying sediments.
- Depth of granitoid emplacement 1-4 km.
- Extensional fault geometry in host sediments associated with forceful granite emplacement and/or volume increases in the crystallising granite melt.
- Age of mineralisation Mid-Late Devonian

3.3.3 Mineralisation features

- Forceful granite emplacement resulted in extension of the overlying sediments, which allowed hydrothermal fluids access to reactive carbonate horizons via faults/porphyry dykes from volatile-rich granite apophyses.
- •Stratabound replacement mineralisation occurs in carbonate horizons proximal to mineralised feeder faults.
- Stratabound ore horizons are sub-divided by faulting and barren carbonate into a number of separate ore bodies, complicated by internal faulting, minor folding, and zones of barren dolomite.
- These tabular ore lenses may be up to 800 m long, 500 m wide, and 30 m thick.
- Carbonate-replacement mineralisation is the dominant ore type, but is significant in additional fault, vein stockworks, breccia and porphyry dyke mineralisation may also occur.
- A typical Sn/W vein paragenesis is intimately associated with fault reactivations:
  - stage I- oxide- silicate stage (cassiterite ore stage)
  - stage 2- main sulphide stage (cassiterite ore stage)
  - stage 3- late base-metal stage
  - stage 4- vug-fill carbonate stage
  - stage 5- supergene stage.
- Cassiterite deposition is associated with stages I and 2; stratabound carbonate replacement dominated by stage 2.
- Key references: Collins 1981, Patterson et al. 1981, Wright 1986, Halley 1987, Kitto 1994.

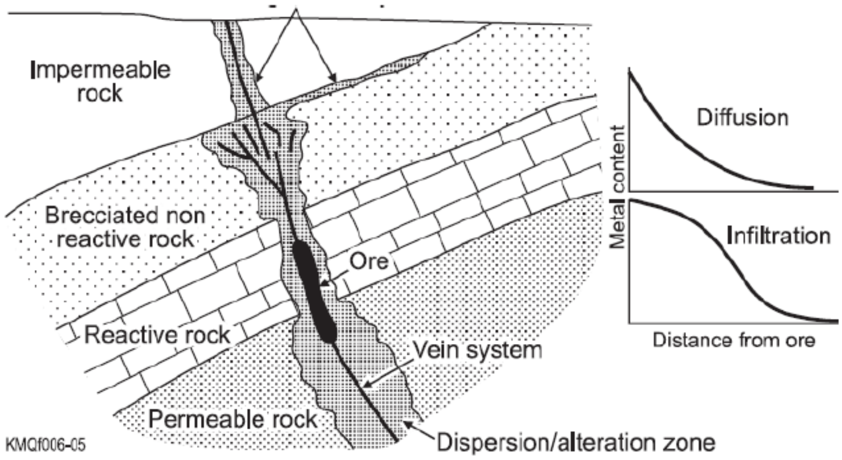


Figure 3 Metals are deposited as a result of the interaction between hydrothermal fluids and the host rock, limestone in this case (after McQueen 2005).

3.3.4 Geophysical criteria

- Magnetic pyrrhotite ore bodies detectable by aeromagnetics, but conductive black shale horizons in the Dundas Trough sediments lead to a multiplicity of false EM targets.
- Surface IP and EM, and airborne Dighem surveys failed.
- Non-magnetic Devonian granitoids are characterised by regional gravity lows.
- Residual gravity interpretations give depth to granitoids, delineate potential volatile-rich granite apophyses, and assist in interpreting the location of major fault structures.
- Key references: Anderson 1989, Leaman & Richardson 1990.

3.4 Palaeozoic Tin and Tungsten Deposits

Palaeozoic tin and tungsten deposits of Tasmania include the Mount Lindsay skarn and the Renison Bell replacement deposits (Figure 4).

3.4.1 Regional geological criteria

- Areas of known Sn mineralisation.
- Highly fractionated felsic granites with intermediate to reduced oxidation states.
- Granites of Siluro-Devonian, Carboniferous and Permo-Triassic age.
- Batholith only now being unroofed or still shallowly buried.

3.4.2 Local geological criteria

- Spatially associated with the apical portions of granites in the roof zones of batholiths.
- District-scale metal zoning.
- Contact metamorphism, alteration, structure, dykes and geophysics may assist in locating concealed granites.
- Alteration mapping to locate hydrothermal alteration zones.

3.4.3 Mineralisation features

- Greisen bodies in roof of granite or beneath internal contacts within granite; transgressive veins; stratabound replacements.
- Gangue: quartz, mica, feldspars, tourmaline, topaz.
- Metal zonation (down temperature) may be W - Sn base metals.
- Cassiterite may occur as infill or replacement.

3.4.4 Geophysical criteria

- Sn-mineralised granites have low magnetic susceptibility; alteration destroys magnetite except in chlorite-magnetite lodes and some skarns.
- Sn granites are radiogenic (high potassium (K) & uranium (U)) with high thorium (Th) in I-types, low in S-types. Feldspathic and phyllic alteration is high in K.
- Gravity lows indicate granite batholiths at depth.
- Sulphide-bearing lodes may be electrically conductive; pyrrhotite-bearing lodes may be magnetic.

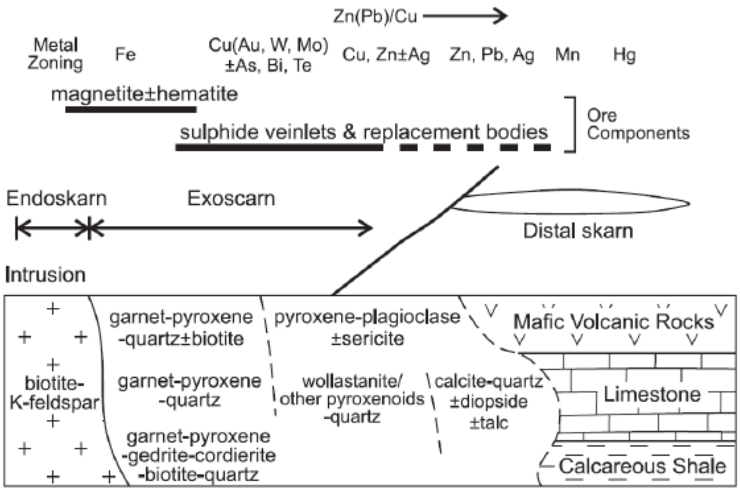


Figure 4 Typical zonation of metals relates to the proximity of the source fluids and host rock (after McQueen 2005).

4. Review of Pertinent Documentation

Mining lease 1M/1976 is located with a 35 km line of intermittent Cu workings that were sporadically mined in the 1900's (Figure A1). Anomalous zinc and lead levels are present in the immediate area and elevated tin and tungsten levels are present to the west. The Balfour area has been identified as having a potential for economic deposits relating to the following styles;

1. Proterozoic sediment hosed / stratiform Cu-Pb-Zn.
2. Cambrian VHMS (Cu-Pb-Zn), and
3. Devonian granite intrusive related Sn-W.

4.1 Geological Overview

The Balfour area is located within the Rocky Cape Element (RCE) of NW Tasmania. The RCE base rocks consist of Mesoproterozoic and Early Neoproterzoic sedimentary succession of shale, siltstone and sandstone that were deposited in a shallow marine shelf environment. To the north and south of Balfour the basement rocks are unconformably overlain by the Neoproterozoic Togari Group. The Togari group is comprised of lower clastic carbonate sediments, basalt-volcaniclastics and a shallow marine dolostones. The geology of the RCE is bounded to the SE by the highly metamorphosed NE trending Arthur Lineament.

Granitic intrusives were wide spread in Tasman from the Devonian to the Carboniferous. There are no granitic outcrops in the Balfour area, the nearest outcrop is the Pieman granite 22 km to the SW. A NNW trending granite spline is interpreted from gravity data to underlie the central and south regions of the Balfour copper belt. Many of the surrounding anomalous Sn-W prospects show a spatial correlation with interpreted granite intrusives at shallow levels of 2 to 4 km.

Tertiary basalt is present as thin hill cappings in the area. The remaining covers rocks consist of Tertiary siliceous gravels with interbedded quartz sands and Quaternary talus, alluvium and swamp deposits.

4.2 Structural Overview

The RCE group in the vicinity of the Balfour area forms the eastern limb of the southern extension of a large anticline. To the east, is a large NE trending geanticline, and to the NE, the Smithton Trough contains a broad syncline. Basement in the area has a general NNW strike dips to the east. Faults in the area include:

1. Roger River Fault; a NE trending , steeply dipping district scale fault that separates the The Clump and the Balfour areas.
2. Balfour Shear Fault; a complex NNW trending thrust fault with splays that host copper mineralisation.
3. The Balfour Transform; a WNW trending fault that cuts the Balfour area.
4. NNW trending faults around Mount Frankland in the east region of the Balfour area, and
5. An E to W trending fault that separates the Balfour block from the Balfour South prospect area.

North-easterly directed thrusting in the Balfour area has resulted in the RCE overriding the Togari group by some 2.5 km laterally and 3 km vertically.

Two stages of syn-depositional extension are interpreted in the area followed by four or more phases of deformation (

Table 1). Deformation events D1 and D2 are considered Cambrian in age and D3 and D4 Devonian in age. D4 is considered the dominate deformational event and is considered to temporally relate to Cu mineralisation at Murrays reward and Sn-W mineralisation at Specimen Hill.

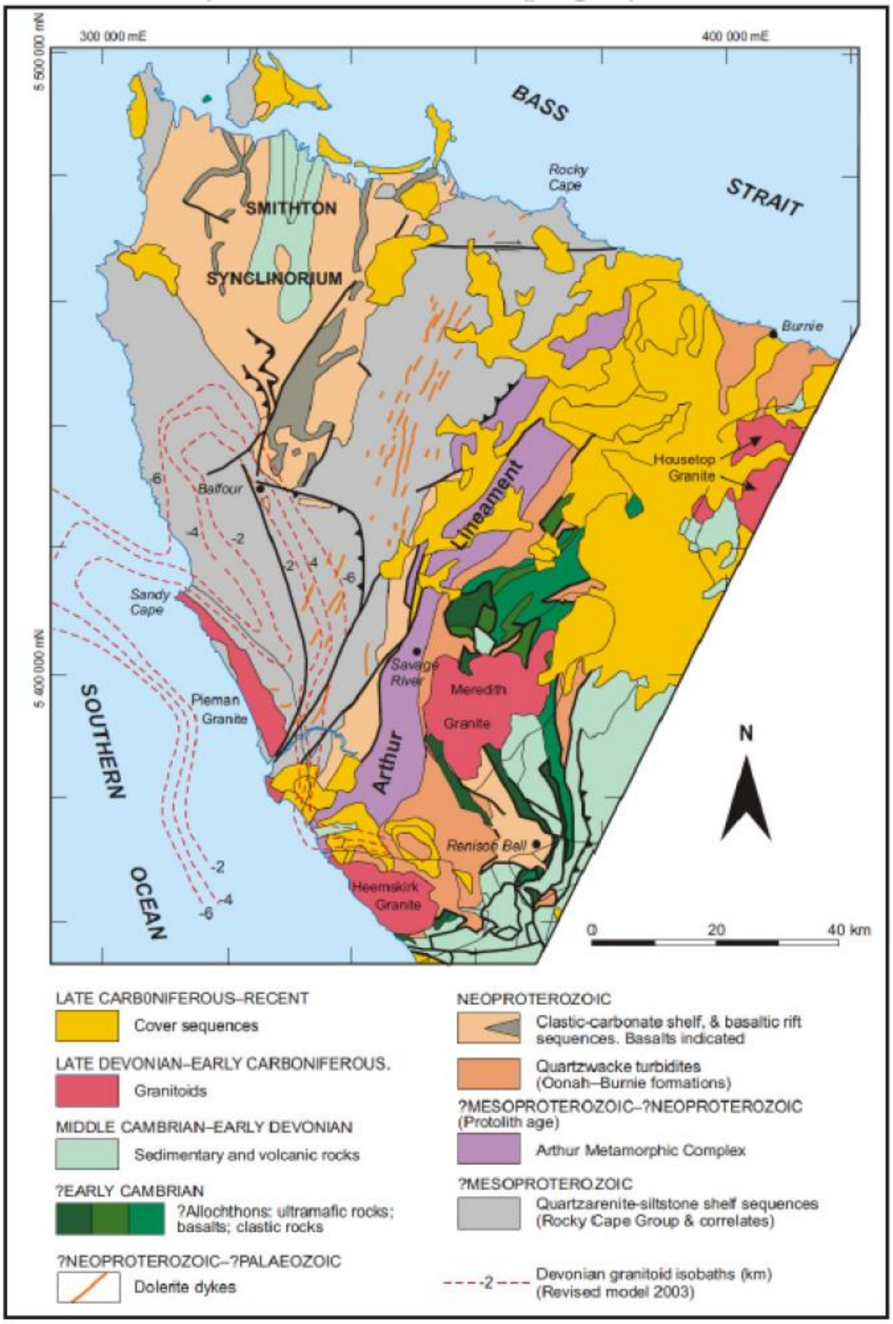


Figure 5 Regional Geology of NW Tasmania (after Everard et al 2007)

Table 1 Summary of deformation events of NW Tasmania (after Legge 2003)

Deformation Event	Deformation Name	Deformation / description
Extension 1	Growth faulting associated with the deposition of the RCE	Outcrop scale growth faulting near the Temma coast
Extension 2	Growth faulting associated with the deposition of the Tongari Group	Block rotation during extension may account for unconformity between the RCE and Tongari Groups
Deformation 1	Tyennan Orogeny	Mostly focused east of the Arthur Lineament
Deformation 2	Tyennan / Tabberabberan Orogeny	E-W trending folds and cleavage in the RCE and Tongari groups
Deformation 3	Tyennan / Tabberabberan Orogeny	NW trending folds and thrusts, reactivation of the Roger River Fault
Deformation 4	Tabberabberan Orogeny	Open upward north trending folds

4.3 Mineralisation Overview

Legge (2003) classifies mineralisation in the Balfour area into four categories:

1. **Copper lodes**; in quartz-dolomite along the 35 km NNW trending Balfour Copper Belt. The lodes are interpreted as being structurally controlled. They run parallel, or adjacent to, a highly magnetic pyrrhotite siltstone marker bed. Mineralisation styles include;

   i) Massive sulphide, covellite-chalcopyrite-pyrite and quartz lodes are tectonically brecciated and re-brecciated.

   ii) Brecciated quartz veins, with intermixed coarse dolomite and sulphide masses and fragments of country rock, and

   iii) Massive sulphide quartz lodes, with pyrite-marcasite, pyrrhotite, chalcopyrite, sphalerite, arsenopyrite and cassiterite.

2. **Tin and tungsten veins and stockworks**; occur in close proximity of coppers lodes and are more heavily mineralised in the central region of the copper belt.

3. **Zinc and lead anomalous geochemistry**; reported at the Nelson Prospect and in trial workings SW of Balfour where 7% Zn was reported at Mullock.

4. **Cupriferous transgressive magnetite-dominated lodes**; occur in the Temma area ~18 km west of Balfour. Lodes are up to 15 m thick and consist if hematite, chalcopyrite, tetrahedrite, galena, sphalerite, pyrite, Fe-Mn carbonates and silicates.

4.4 The Balfour Copper Belt

The Balfour Copper Belt (BCB) is a 2 km wide corridor that runs for 35 km in a NNW trending direction. The BCB is interpreted as a complex shear zone in the RCE that is Devonian of age, and likely formed as a result of the Tabberabberan Orogeny. Blebs and stringers of chalcopyrite with secondary sulphides of covellite and chalcocite occur in pyrite-quartz-dolomite gangue that fills NNW trending fractures and splay faults.

The BCB can be divided into western and eastern districts. The western side is comprised of dark carbonaceous siltstone with anomalous Cu pyritic beds, the eastern successions consists of pale carbon poor siltstone beds. A complex deformational history is apparent from small scale folds, faults, vein formations, extensive fracturing and multiple brecciation phases.

The nature of mineralisation in the BCB was investigated by MRT on drill core from 3 drill cores from Murray's Reward prospect and 37 core logs from 8 other prospects in the area. Mineralised core was commonly broken, sheared, brecciated and puggy zones were common. The contact between mineralisation and country rock was sharp and likely faulted. The majority of mineralisation in the area is confined to the dark grey, carbonaceous siltstone, however in the Balfour Blocks area mineralisation is hosted by deformed chloritic siltstone. The mineralised zones (dolomite ± quartz ± chalcopyrite ± pyrite ± chlorite) are repeated over a 40 m width, with individual mineralised zones varying in width from less than one to a few metres.

Passive alteration in the BCB is dominantly chloritic or silicic:

1. Chloritisation; is the dominate early alteration phase, replacing the original country rocks. Chloritic mineralisation is commonly cut and replaced by secondary quartz and carbonate veins. Late stage chlorite likely occurs in late hydrothermal associated quartz and carbonate veins.
2. Silicification; replaces mainly siltstone and slate and is common on the edges of mineralised zones. Early silification is barren and commonly cut by quartz and carbonate veins. Late silification is found replacing brecciated chloritised slates and dolomite.

The most common veins present in the area are quartz veins. Quartz veins are mostly barren, show evidence of multiple generations and are commonly 20 cm or less in width. Pyrite ± quartz, quartz-chalcopyrite ± pyrite, and quartz-chlorite veins are also common. These veins display widths of 1 to 15 cm in width.

Pyrite is dominantly disseminated in sedimentary successions or appears as fine grained sulphide in carbonaceous and chloritic siltstones or slate. Late pyrite is found in mineralised sections as veins, veinlets and fracture infill.

Chalcopyrite in a late forming mineral occurring as fracture infill, within stringers along fractures, disseminated and as clots filling brecciated dolomite. Evidence suggests that chalcopyrite formed after pyrite and that remobilisation from dolomite to breccias may have occurred. Trace elements of galena and sphalerite were also found with minor traces of bornite and covellite.

4.5 Copper Prospects

4.5.1 Balfour Blocks Prospect

The Balfour Blocks Prospect is located 3 km NNW of Balfour. The site is located on a mineralised shear fault / thrust system that runs NNW to the Clump. Drilling documentation indicates an intersection of magnesium at greater than 20%.

4.5.2 Central Balfour Prospect

The central Mount Balfour Prospect is located 300 m north of Mining Lease 1M/1976. Approximately 200 t of high grade ore was mined at the site. Anomalies in the area were detected by an IP survey and were coincident with a cross fault intersection.

4.5.3 Clump Prospect

The Clump Prospect is situated 9 km NNW of Balfour . Copper mineralisation is found as chalcopyrite in dolomitic quartzite that is 2 to 15 m thick. Eight diamond drill holes, an IP survey and a gravity survey have been conducted at the Clump. IP data showed a 900 m long and 60 m wide anomaly but drilling failed to locate sufficient economical grade Cu mineralisation.

4.5.4 Development Prospect

A single drill hole at the site intersected traces of copper with chloritic sediments just south of the Roger's River Fault. High magnesium levels (>20%) have also been reported.

4.5.5 Emmetts Copper Prospect

The Emmetts Copper Prospect is located 700 m NNW of Balfour. A NW trending zone of quartz and ironstone cap a ridge of deformed north trending sediments. The deposit is hosted by the boundary between slaty chloritic siltstone and finer carbonaceous sediments. Channel samples returned Cu value of less than 500 ppm.

4.5.6 Murray's Reward Mine

Murray's Reward Mine is located within Mining Lease 1M/1976 and was the main copper producer of the district. Four adits, an open cut area, shafts and trenches produced >6,000 t of ore. Mineralisation was found within sulphides and quartz sulphides in a 15 to 20 m wide zone that dipped 80º to the west near the surface and at 70º to the east at depth. NNW dipping faults were identified as controlling Cu mineralisation. The copper mineralisation in the open cut comprises numerous quartz-pyrite ± chalcopyrite veins associated with a shear zone that hosts some small, high grade lenses of supergene-enriched copper (mainly covellite and digenite) ore.

Hydrothermal alteration of the mineralised and surround zone was silicic, chloritic and sericitic. Mineralisation is interpreted as being introduced during a tensional phase and is characterised by quartz ± sulphides ± dolomite veining, extensive shearing, fracturing, and brecciation and occurring along hinges of small folds.

IP data displayed a high response over the site and up to 19 holes have been drilled (Table 2). Drill data defined a body with dimensions of 220x 220x 7m, with a strike of 320º and a dip of 55º to the SW. The inferred resource of the body was approximately 0.5 Mt @ 0.8 % Cu.

Table 2 Selected drill core information from holes within and surrounding Murray's Reward Mine

Hole ID	From (m)	Intersection (m)	Copper %
DDH13 (workings)	-	11.6	0.7
DDH14 (main shaft)	84.4	21.1	0.9 4 * >1.7
DDH16	62.5	21.7	1.4 2.5
DDH19	-	12.8	0.5
DDH21	42.5	13.2	0.6
DDH23	57	3.1	2.1
DDH33	118	5.4	1.3
DDH36	195	25.5	0.8

A total of 12 geological cross sections were constructed by CRA Exploration Pty.Ltd. in the Balfour area surrounding Murrray's Reward, these are provided in digital format as .PDF files (Drill_data_and_X_sections.pdf) with cross section plan map presented in Figure B4. CRA interpreted sub-vertical lodes of Cu mineralisation. It should be noted that the maximum length of drill holes in the area is ~200 m and that cross sections only represent the very near surface.

4.5.7 Pier Morgan Prospect

The Pier Morgan Prospect is located on a quartz cored ridge approximately 2.5 km SSE of the Murray's Reward Prospect. Eastward dipping sequences with a NNW trend host quartz and quartz-dolomite lodes that contain slightly elevated Cu levels. Host rocks are dominantly carbonaceous siltstones, the highest Cu level reported was 280 ppm.

4.5.8 South Balfour

The South Balfour Prospect is located approximately 8 km SSE of Murray's Reward. Copper is present in high grade chalcopyrite veins with widths of up to 20 m. The mineralised zone is structurally complex, hosts anomalous As / Au and is coincident with a magnetic high along the Balfour shear.

4.5.9 Waratah Copper Prospect

The Waratah Copper Prospect is located on a 300 m long quartz load ridge 7 km south of Balfour. The prospect coincides with a magnetic anomaly. Two diamond drill holes (DDH29 and DDH30) identified low levels of Cu mineralisation.

5. Review of Geological Maps and Geophysical Data

5.1 Geological Maps

Figures B1 and B2 of Appendix B display a 1 to 25,000 scale geological map (MRT), the red box indicates the extent of mining lease 1M/1976. The geology within the subject lease is interpreted to trend to the NNW and beds dip steeply to the WNW. These beds may be overturned to the north and south of the mining lease. The geology is characterised as 'dominately plane-laminated chloritic mudstone to siltstone, containing variably disseminated porphyroblastic chlorite' (MRT 1:25,000 Balfour Map Sheet).

The mining lease is flanked on all sides by sedimentary successions of the Balfour Sub-Group, which forms part of the RCE. The Balfour township is located to the NE of 1M/1976 and is situated on of the remnants of a Tertiary Basalt sheet. The structure of the areas is complex with a multitude of local scale faults obscuring the main fault complexes.

Figure B3 displays a geological map constructed by CRA Exploration Pty. Ltd. in 1996. Mining Lease 1M/1976 is positioned on an interpreted NNW trending fracture zone. The fracture zone contains silicate and carbonate rocks with quartz veins and Cu mineralisation. The fracture zone displays evidence of multiple deformation events and is largely brecciated

5.2 Geophysical Datasets

Selected geophysical imagery is presented in Appendix C and is also provided in digital format. The selected images contain the highest resolution data that could be located from existing data repositories.

5.2.1 Gravity

A Bouguer Anomaly gravity image constructed from gravity data collected by Solorien Mining Pty. Ltd. in 1992 is presented in Figure C1. Mining Lease 1M/1976 is situated on the eastern fringe of a large gravity anomaly (green-yellow) that extends to the south from a main body in the north and western sections of the image. Low gravity values (blue to pink) are identified in the southern and eastern section of the image, these low gravity values are interpreted to result from underlying granite bodies of low density. An anomalous high density body to the west of the mining lease displays NNW trending internal structure. This feature may represent faults with associated mineralisation for metalliferous hydrothermal fluids.

5.2.2 Magnetics

A TMI image of the mining lease and the surrounding area is presented in Figure C2 (Mt Frankland Survey 2003). The lease is situated in an area containing no obvious magnetic anomalies. To the west of the lease high magnetic values are observed trending in a NNW direction. This zone spatially coincides with Sn and Sn-W deposits in the area and is likely a result of documented magnetite and pyrrhotite mineralisation.

The magnetic high in the NE corner the image spatially correlates with alluvial and swamp deposits of the Quaternary (Figure B1) and likely represent alluvial magnetite. To the west of the Quaternary deposit a north trending magnetic high correlates with a basalt sequence that forms part of the Spinks Creek Volcanics. The area directly to the east of the mining lease, with a slightly elevated magnetic response, is interpreted as a thin basalt cap.

5.2.3 Radiometrics

Figure C3 displays a red-green-blue (RGB) radiometrics image constructed from data collected as part of the Mt Frankland Survey 2003. Red represents potassium (k), blue represents uranium (U) and green represents thorium (Th). Areas of the image containing mixed responses from the above elements are colour coded according to the inset pyramid.

A low response is observed in the western section of the image. This area correlates with sandstones, with minor shales, of the RCE (Figure B1). Mining Lease 1M/1976 is positioned over a north to NNW trending white / pale pink region, this indicated a strong response from all elements, particularly K. A distinct increase in the response from Th, relative to the other elements, is observed to the east of Murray's Reward.

5.2.4 Electromagnetics (EM)

Electromagnetic imagery of the Balfour area, collected by MRT in 2002, is displayed in Figures C4 and C5. Both images display apparent conductivity. Figure C4 displays data collected using a source frequency of 880 Hz, this allows for the greatest depth of investigation (~150 m). The subject mining lease is situated in an area of no significant EM response. Linear features trending NW to NNW are clearly visible throughout the region and correlate strongly with geological units and faults from geological mapping (Figure A1).

Figure C5 displays EM data collected utilising a 7000 Hz source, this images the near surface (~50 m) apparent conductivity. At this depth of investigation the subject mining lease appears to be positioned on a weak boundary between low values to the south and higher values to the north. In general, linear features from NE through to NW can be clearly observed throughout the image and should aid in structural interpretation of the area.

5.2.5 Induced Polarisation (IP)

Figure C6 displays IP imagery of the Balfour area. The IP data was collected during surveys from 1968 to 1970 and has undergone reanalysis by CRA Pty. Ltd. in 1996. A strong IP response is observed at Murray's Rewards within an anomalous zone that trends NNW. This anomalous zone extends considerably outside the mining lease to the north.

Strong IP responses to the west and south of the image correlate with observed potential field gravity and magnetic anomalies. The moderately sized high IP response directly to the west of Mining Lease 1M/1976 is coincident with a gravity anomaly but has no accompanying magnetic anomaly; this characteristic is shared by high IP responses in the Murry's Reward area and could warrant further investigation.

6. Discuss and Recommendations

6.1 Discussion

Mining Lease 1M/1979 and the surrounding area is positioned in a highly complex geological zone dominated by WNW to NNW trending structures in the form of faults and thrusts faults. Meso and Neoproterozoic basement sequences of the RCE and Tongari group have undergone multiple stages of deformation during the Tyennan and Tabberraberran Orogeny's with faulted and folded geology in the area generally dipping steeply to the NE. The Tabberraberran Orogeny and granitic intrusives of the Devonian are generally accepted as the cause of the majority of mineralisation in the area, particularly that of Sn-W mineralisation.

The NNW trending Sn-W belt to the west of 1M/1976 spatially correlates with anomalies in magnetic, gravity and EM datasets. The Sn-W prospects in this area lie on NNW trending fault structures that overly shallowly emplaced granitic intrusives.

6.1.1 Palaeozoic Copper Lode Deposit – Murray's Reward

Murrays Reward is positioned within the NNW trending copper belt termed the Balfour Copper Belt. Murray's Reward is characterised by a reasonably large positive gravity anomaly and a strong IP response but is devoid of any anomalous magnetic or EM signature.

These geophysical characteristics do not fit the general deposit model pre-requisites for a Cu bearing VHMS or SEDEX deposit immediately within or beneath mining lease 1M/1976. This is supported by geochemical analyses that indicate cupriferous mineralisation of Murray's Reward is predominantly a secondary product that replaced original mineralogy as a result of fault reactivation and renewed hydrothermal fluid movement associated with granitic intrusions of the Devonian Tabberraberran Orogeny.

CRA cross sections derived from drilling present a series of sub-vertical lodes of Cu mineralisation found within sulphides and quartz sulphides in a 15 to 20 m wide zone with a strike of 320º which dips 80º to the west near the surface and at 70º to the east at depth.

Induced polarisation data is consistent with the findings of the CRA drilling program and indicates that sulphide mineralisation is continuous along an approximate 320º strike through mining lease 1M/1976 (as presented in Appendix C6).

Drill data indicates that sulphide mineralisation is extensive down dip (to at least the maximum depth of drilling at approximately 200m), with copper mineralisation controlled by NNW dipping faults. Both airborne magnetic and EM data indicate the presence of a number of such structures situated within mining lease 1M/1976.

The above findings lead to the conclusion that a considerable quantity of the inferred resource of approximately 0.5 Mt @ 0.8 % Cu may remain and warrants further investigation.

6.1.2 Deep Proterozoic Copper VHMS / SEDEX Deposit

As previously discussed, Murray's Reward (and ML 1M/1976) is geophysically characterised by a moderate positive density anomaly and a strong IP response but is devoid of any anomalous magnetic or EM signature typical of cupriferous VHMS or SEDEX deposits.

That said however, the geological and structural pre-requisites for such a deposit in the nearby vicinity (within the surrounding EL 10/2014) are broadly met, making the area highly prospective for such deposits.

Of particular note is the large positive density anomaly striking NNW-SSE situated immediately to the west of 1M/1976. This anomaly indicates that significant additional mass, not accounted for by the Proterozoic sedimentary units or Devonian granitoids, exists at depth at this location. Given that this density anomaly appears to bear the same structural control as copper mineralisation at Murray's Reward, it is possible that this it may depict mineralised fluid pathways and/or the presence of volcanic intrusives down-dip to the southwest at significant depth. On this basis, further investigation of this gravity anomaly is warranted.

6.2 Recommendations

GHD recommend the following actions be taken to further investigate copper mineralisation at 1M/1976 and the surrounding vicinity:

6.2.1 Palaeozoic Copper Lode Deposit – Murray's Reward

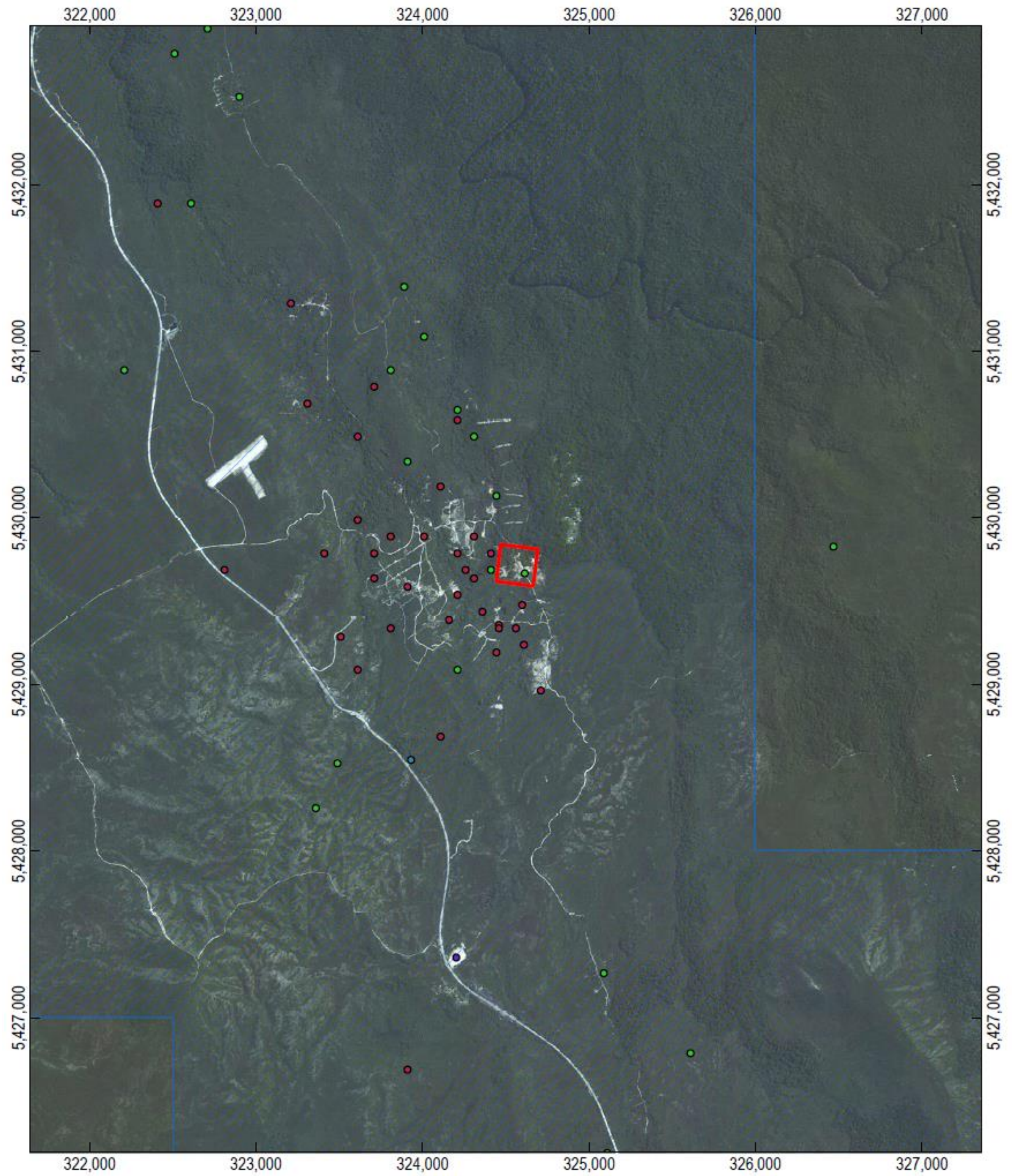
1. Perform detailed structural mapping – in particular of any local NNW dipping structures which may be associated with copper mineralisation.
2. Develop a drilling program to further define the along strike extent of cupriferous sulphide mineralisation of Murray's reward.

6.2.2 Deep Proterozoic Copper VHMS / SEDEX

1. Given the spatial extent of the gravity anomaly and the strong IP response GHD recommends that the boundaries of Mining Lease 1M/1976 be increased in order to any areas of possible mineralisation that maybe uncovered from further exploration efforts. GHD proposes that the lease area be increased by;
   i) 1 km in a northerly direction.
   ii) 2 km in a southerly direction.
   iii) 1.5 km in an westerly direction, and
   iv) 1 km in an easterly direction.
2. Potential field gravity and magnetic data collected for the mining lease and the surrounding area is of relatively high quality and resolution. With the addition of petrophysical data (density and magnetic susceptibility), that is likely freely available from MRT, the area could be forward modelled utilising petrophysical properties as constraints. 2D forward modelling produces cross sections of the subsurface that aid in identifying the presence, size and geometry of mineral deposits. Forward modelling will prove cost effective given that no additional potential field data need be collected.
3. At present, all drills holes in the area are less that ~200 m in extent. Given good outcomes from recommendations 1 and 2 above, GHD propose a deep diamond drill hole in the vicinity of previous working at Murray's Reward. The drilling of a WSW trending drill hole would provide important geological and structural information, and may identify mineralisation at greater depths than previously investigated.

Appendices

Appendix A – Aerial Imagery of Mining Lease 1M/1976



Copper
Gravel/aggregate
Iron
Silica
Tin
Titanium
Zinc
Mining Lease 1M/1976
Exploration Licence 10/2014

Paper Size A4
0 110 220 440 660 880
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number	32-1726250
Revision	A
Date	17 Dec 2014

Aerial imagery of mining lease 1M/1976.

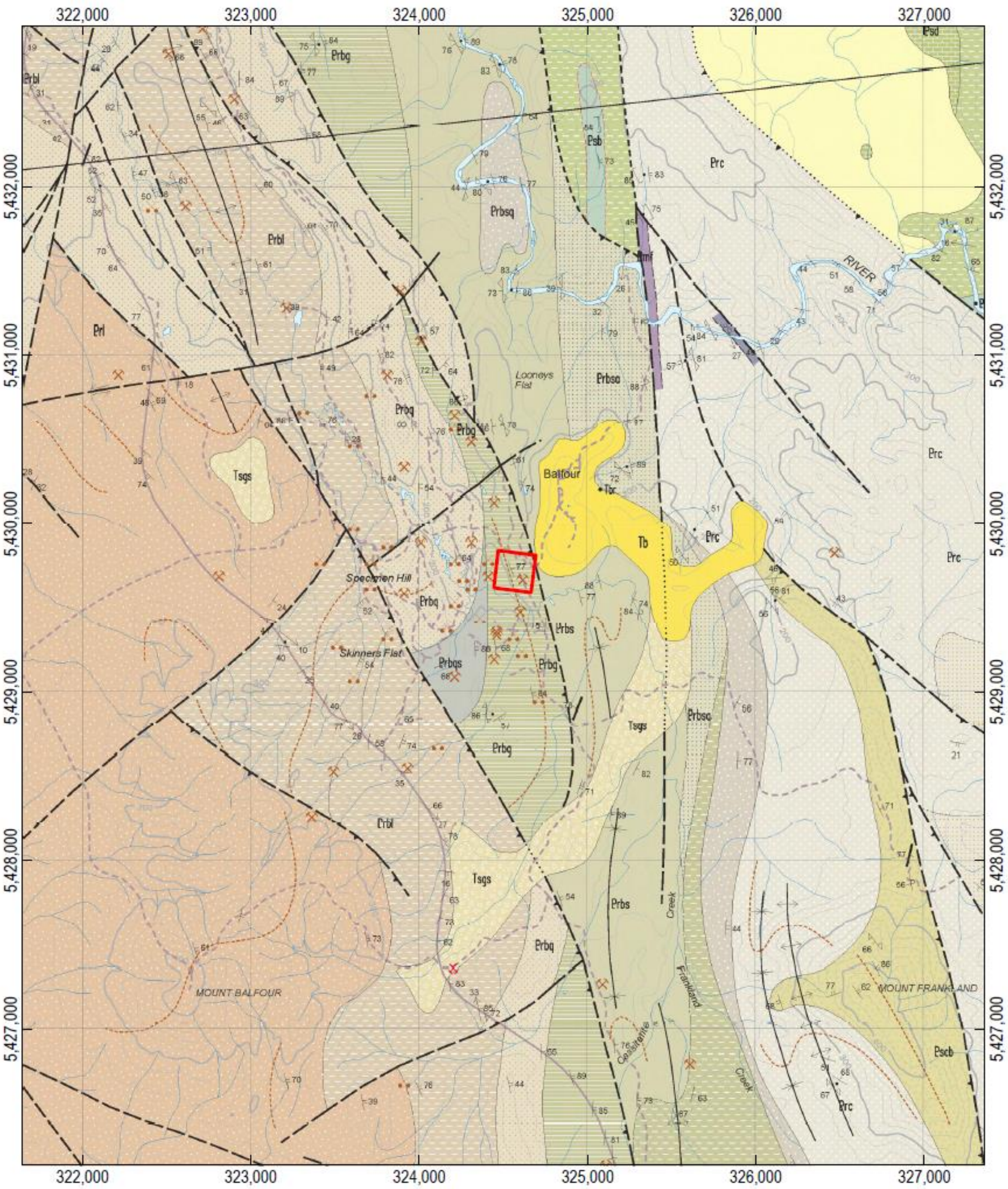
Figure A1

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\A1.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson

Appendix B – Geological Maps



Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number	32-1726250
Revision	A
Date	18 Dec 2014

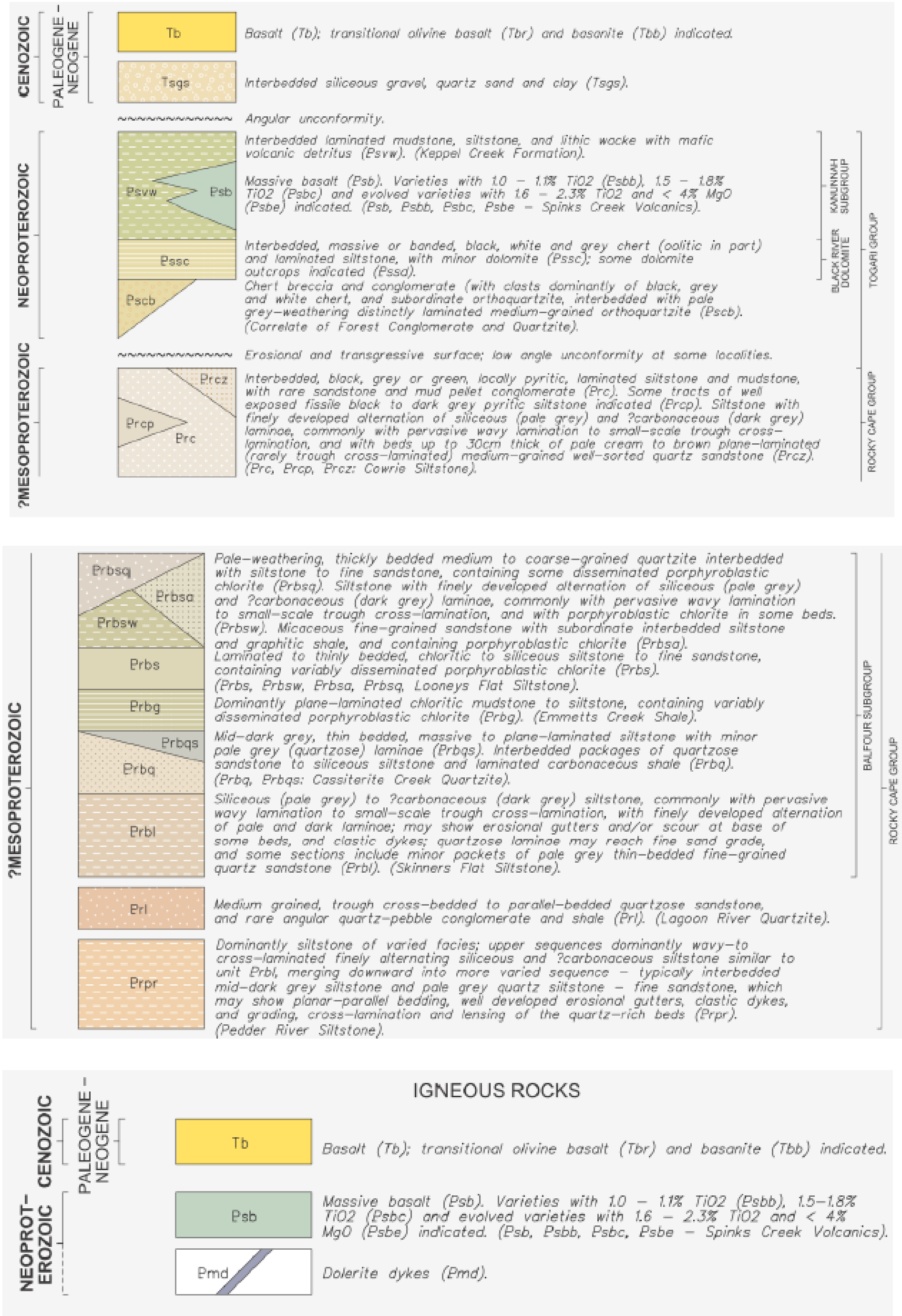
Geological Map

Figure B1

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\B1.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson



N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number | 32-1726250
Revision | A
Date | 18 Dec 2014

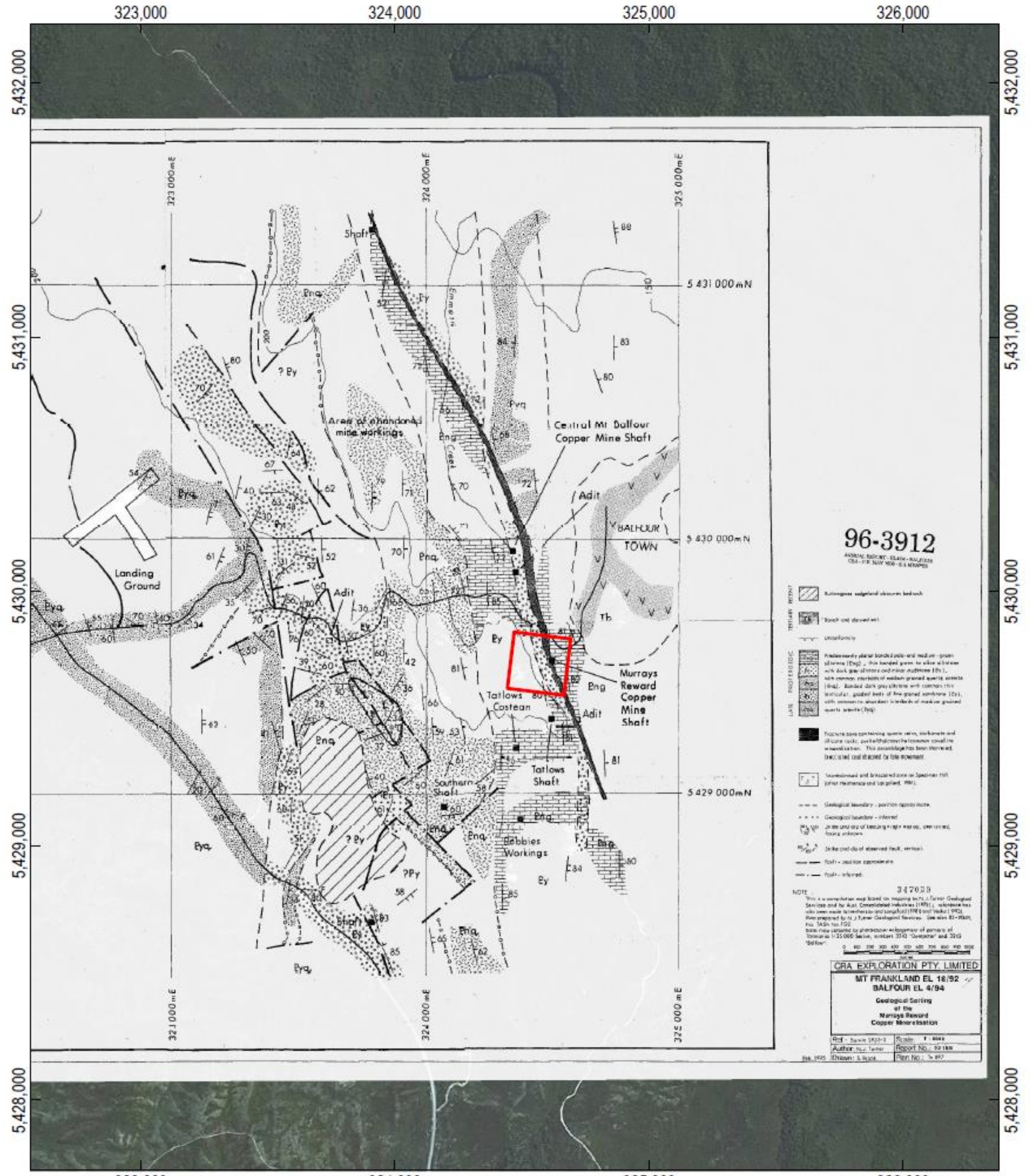
Geological Map Legend

Figure B2

180 Lonsdale Street Melbourne VIC 3000 Australia **T** 61 3 8687 8000 **F** 61 3 8687 8111 **E** melmail@ghd.com **W** www.ghd.com

G:\32\1726250\Technical\Geophysics\B2.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson



Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number 32-1726250
Revision A
Date 06 Jan 2015

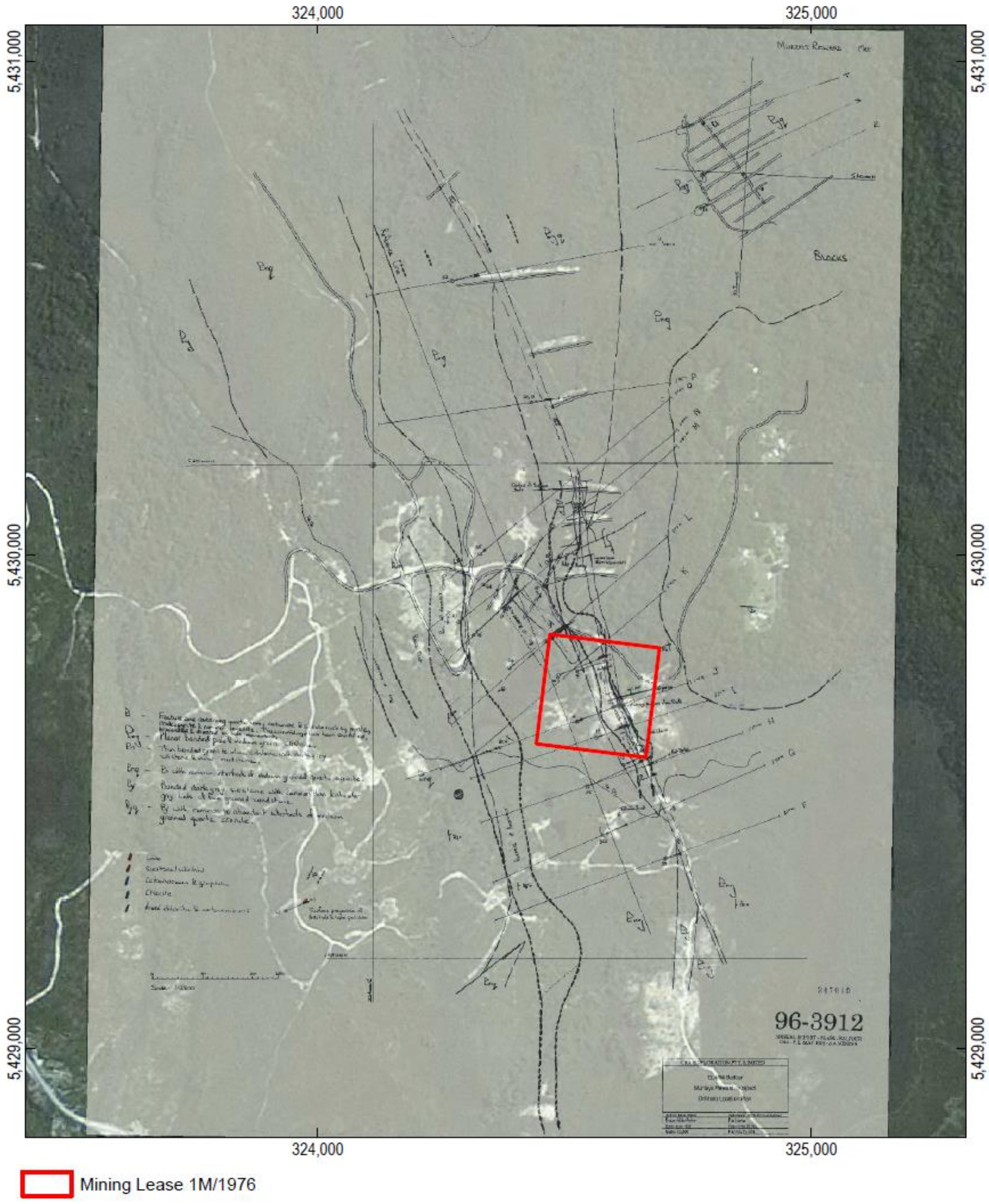
Geological Map

Figure B3

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\B3.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson



Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number	32-1726250
Revision	A
Date	12 Jan 2015

CRA Geological Cross-section Plan

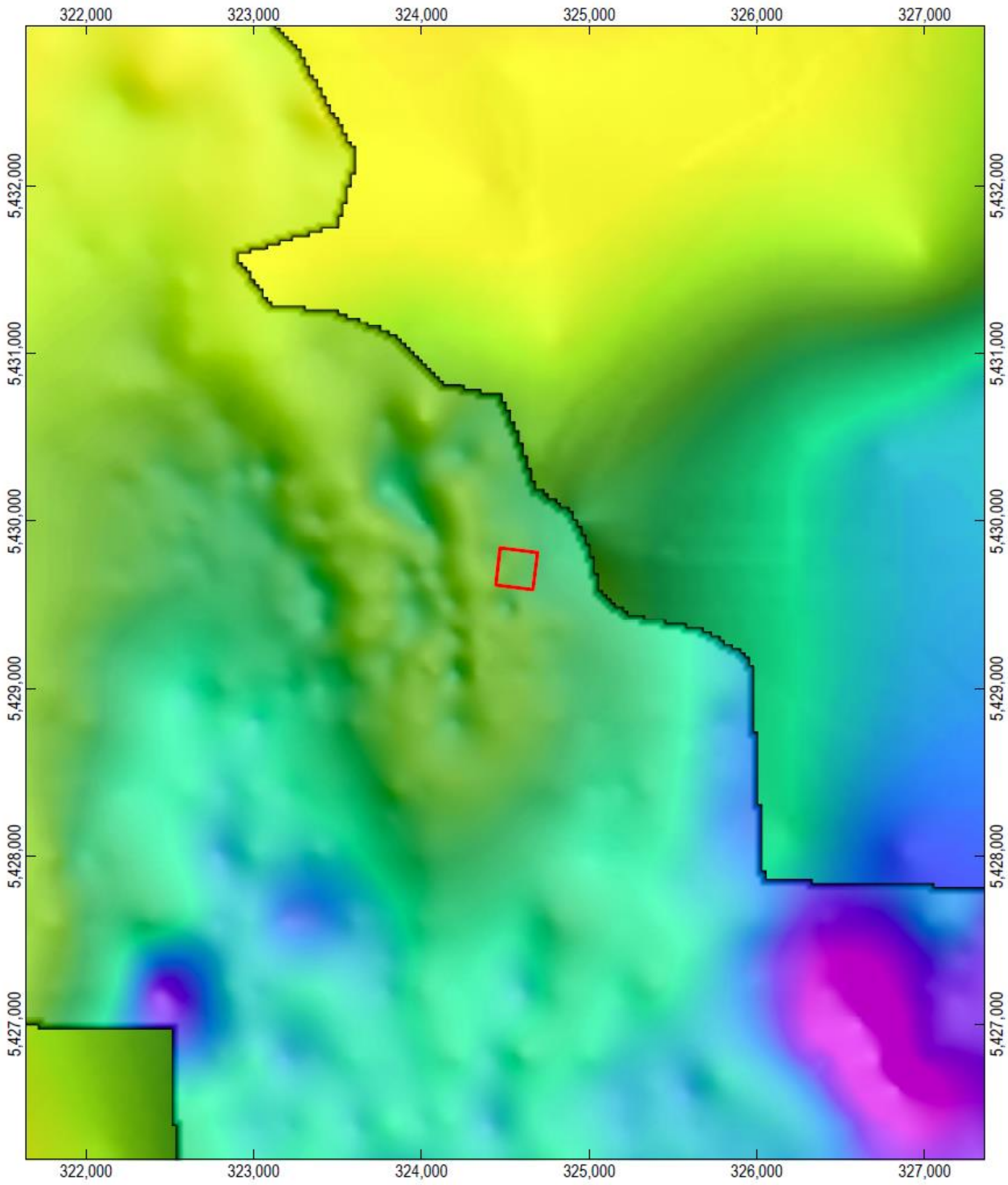
Figure B4

G:\32\1726250\Technical\Geophysics\B4.mxd

2 Salamanca Square Hobart TAS 7000 Australia T 61 3 6210 0600 F 61 3 6210 0601 E hbamail@ghd.com.au W www.ghd.com.au

Data source: DPIPWE, Aerial Image, 2009; CRA, Geology, 1996. Created by: jtoregan

Appendix C – Geophysical Datasets



Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number | 32-1726250
Revision | A
Date | 22 Dec 2014

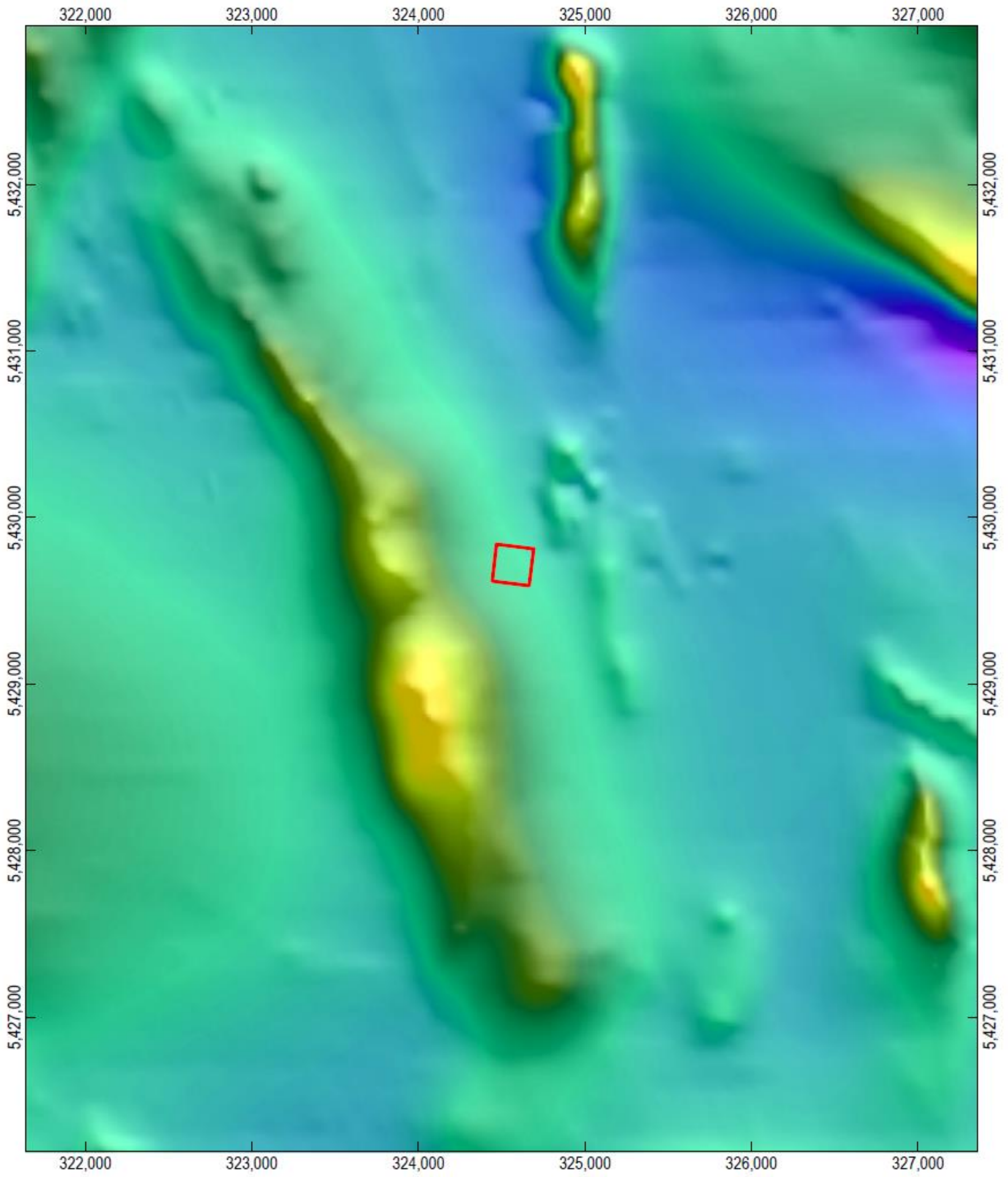
Gravity image - Bouguer anomaly

Figure C1

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\C1.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson



Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number	32-1726250
Revision	A
Date	17 Dec 2014

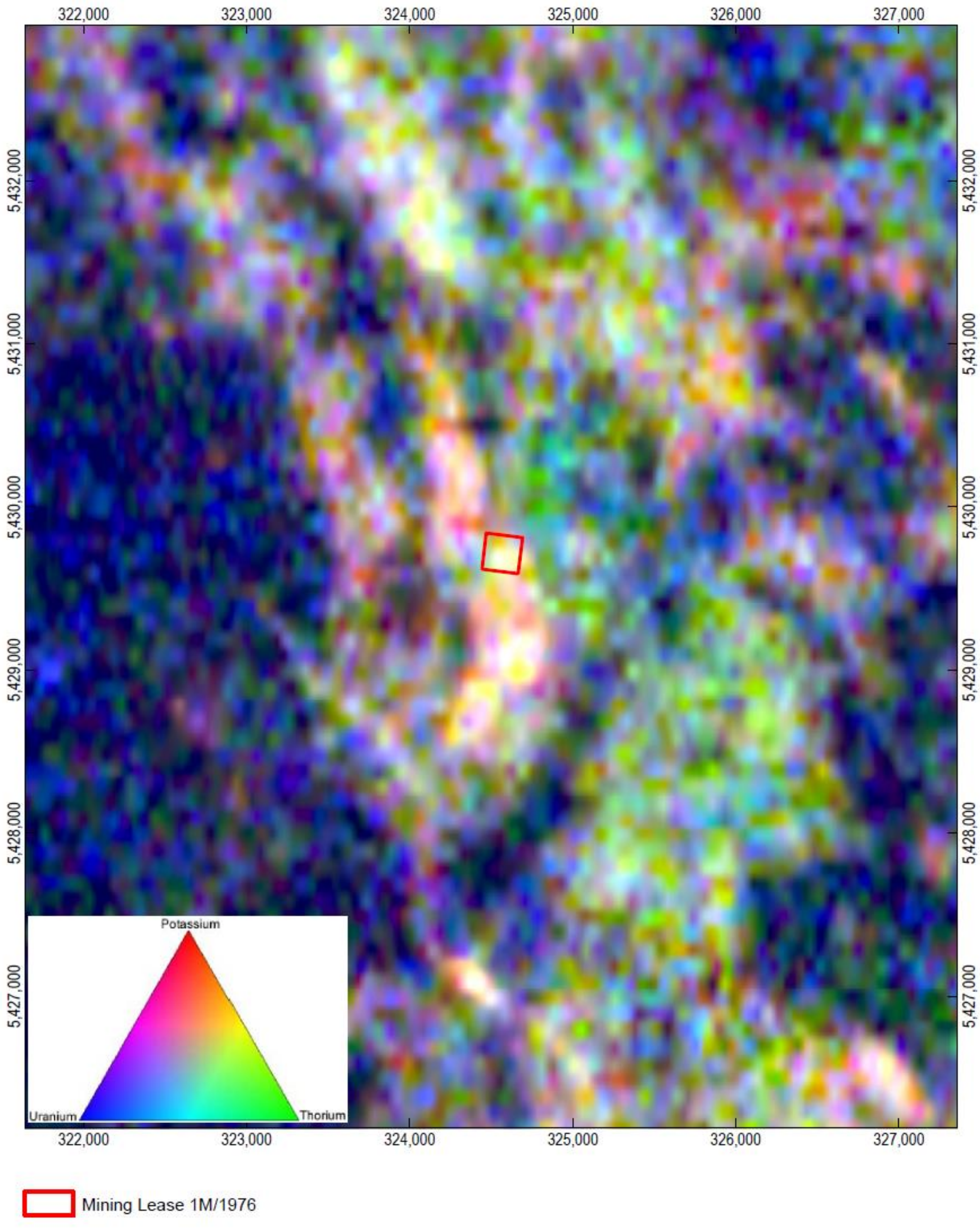
Magnetic image - total magnetic intensity

Figure C2

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\C2.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson



Paper Size A4

0 110 220 440 660 880

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number 32-1726250
Revision A
Date 17 Dec 2014

Radiometrics image - RGB

Figure C3

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\C3.mxd

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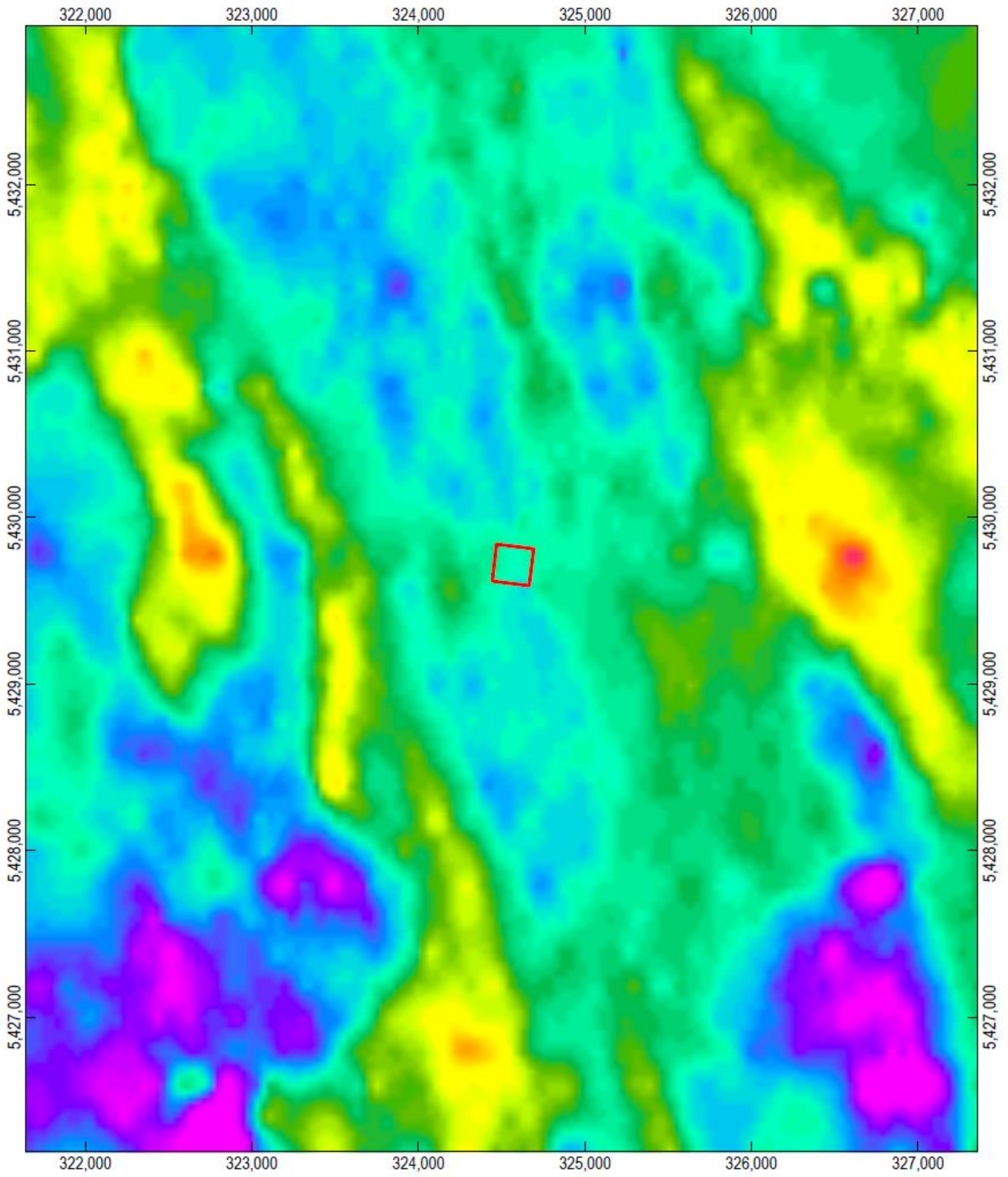

Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number	32-1726250
Revision	A
Date	18 Dec 2014

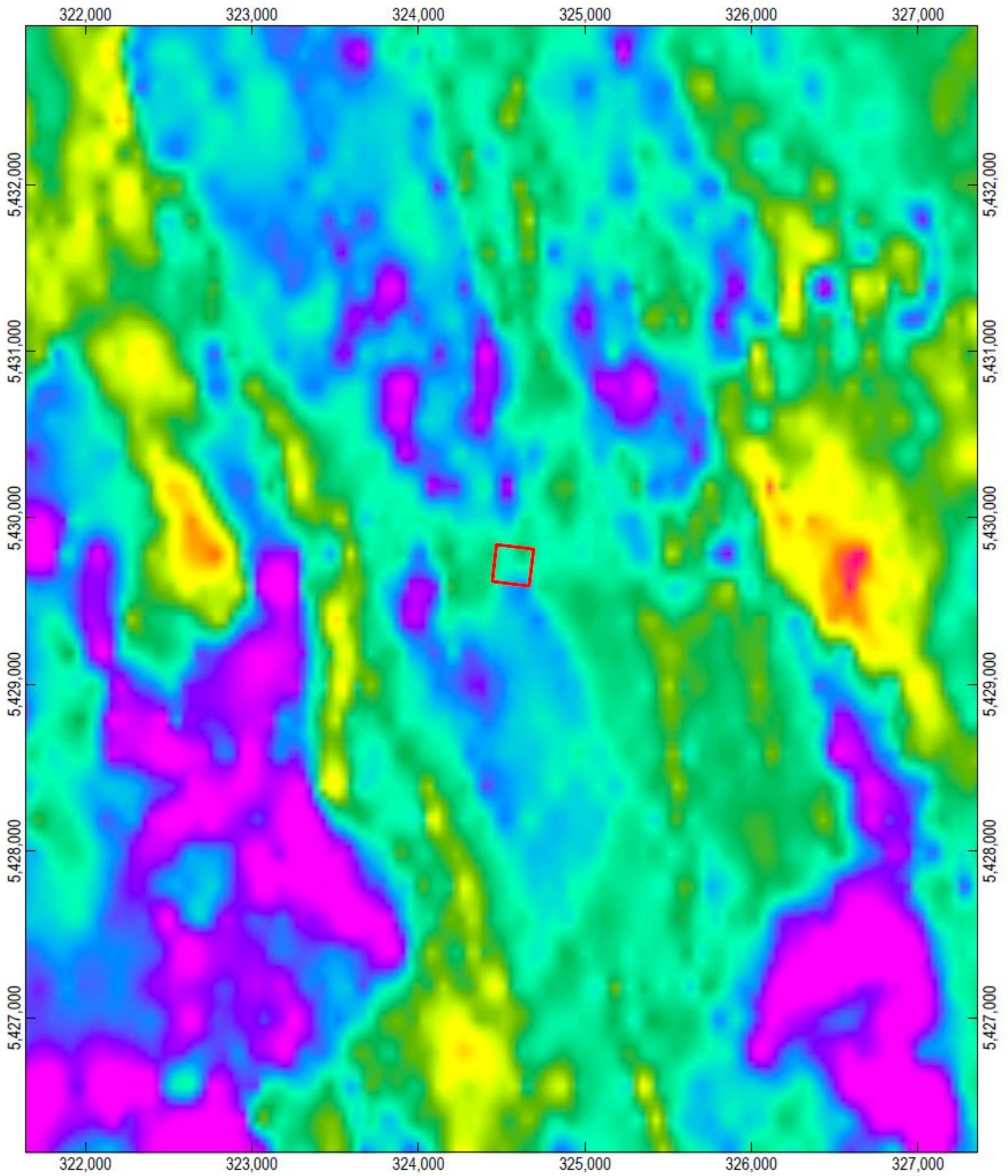
Electromagnetics image - Apparent conductivity - 880 Hz

Figure C4

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\C4.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson



Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number	32-1726250
Revision	A
Date	18 Dec 2014

Electromagnetics image - Apparent conductivity - 7000 Hz

Figure C5

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\C5.mxd

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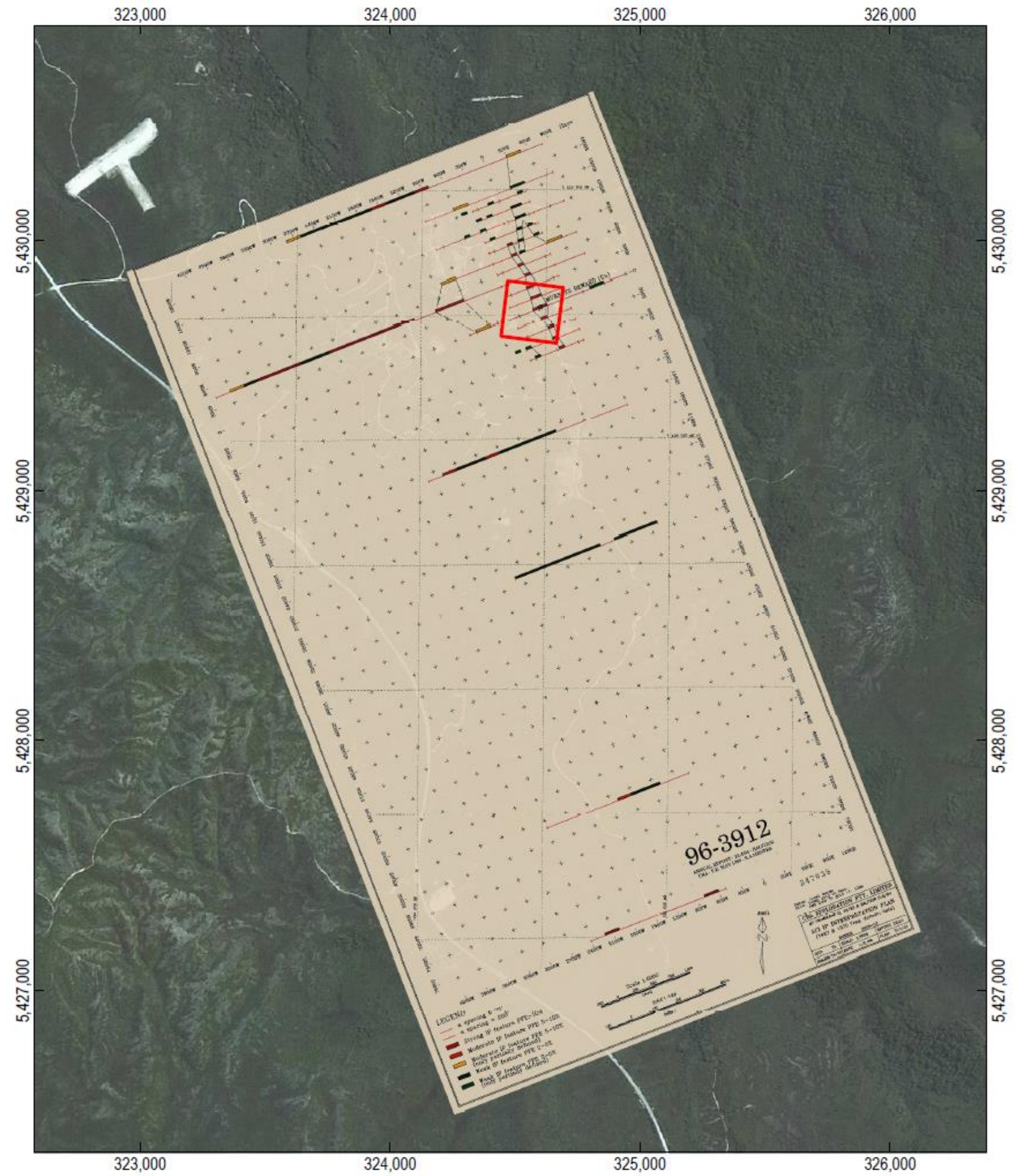

Mining Lease 1M/1976

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number 32-1726250
Revision A
Date 06 Jan 2015

Induced Polaristion Image

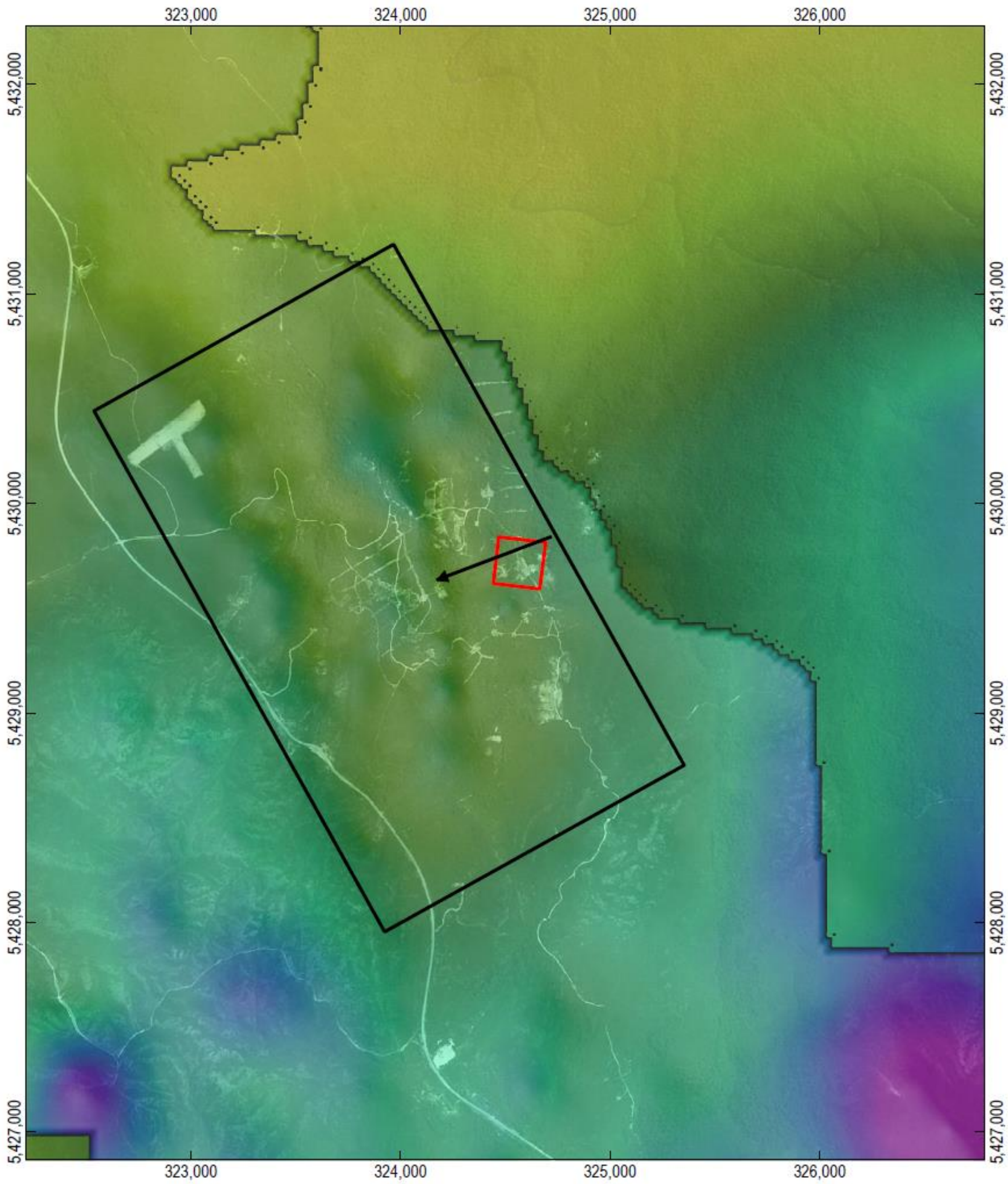
Figure C6

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\C6.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson

Appendix D – Recommendations Imagery



Current Mining Lease 1M/1976

Proposed Lease Extents

Proposed Drill Hole

Paper Size A4
0 87.5175 350 525 700
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Client Name: M. Hansen and G. Summers
Project Name: Balfour Desktop Review

Job Number 32-1726250
Revision A
Date 07 Jan 2015

Recommendations Image

Figure D1

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

G:\32\1726250\Technical\Geophysics\D1.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:mranderson

347019

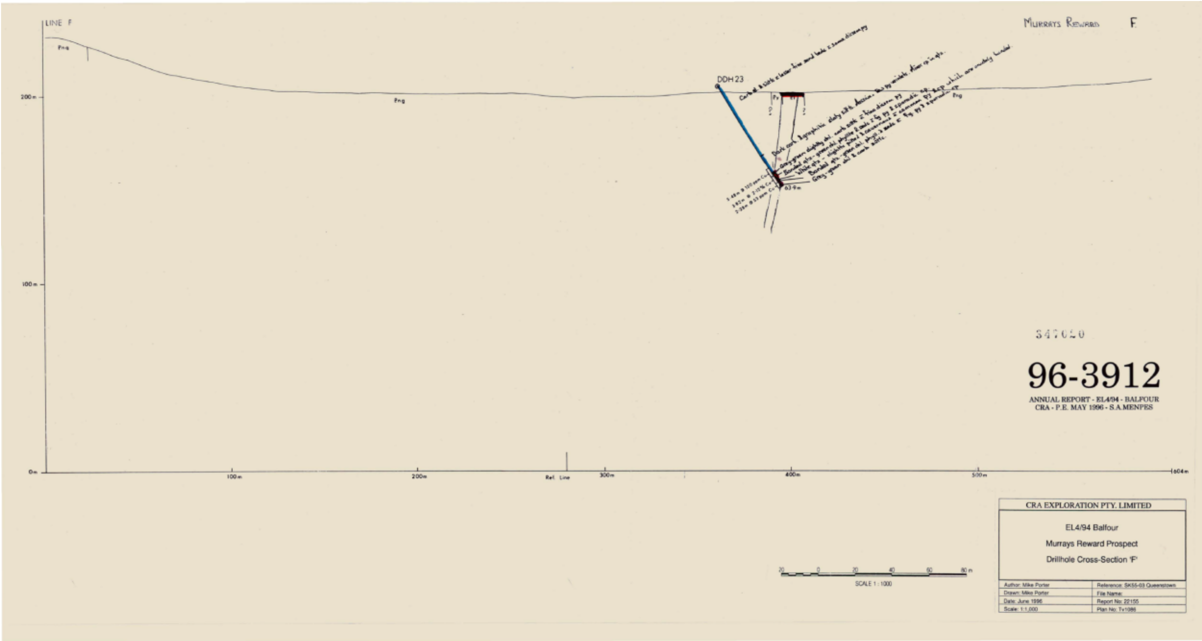
96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED

EL4/94 Balfour
Murrays Reward Prospect
Drillhole Location Plan

Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:2,500	Plan No: Tv1074


LINE F
Murrays Reward F
DDH 23
Png
200m
100m
0m
100m
200m
Ref. Line
300m
400m
500m
604m
347020
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
CRA EXPLORATION PTY. LIMITED
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'F'
Author: Mike Porter
Reference: SK55-03 Queenstown
Drawn: Mike Porter
File Name:
Date: June 1996
Report No: 22155
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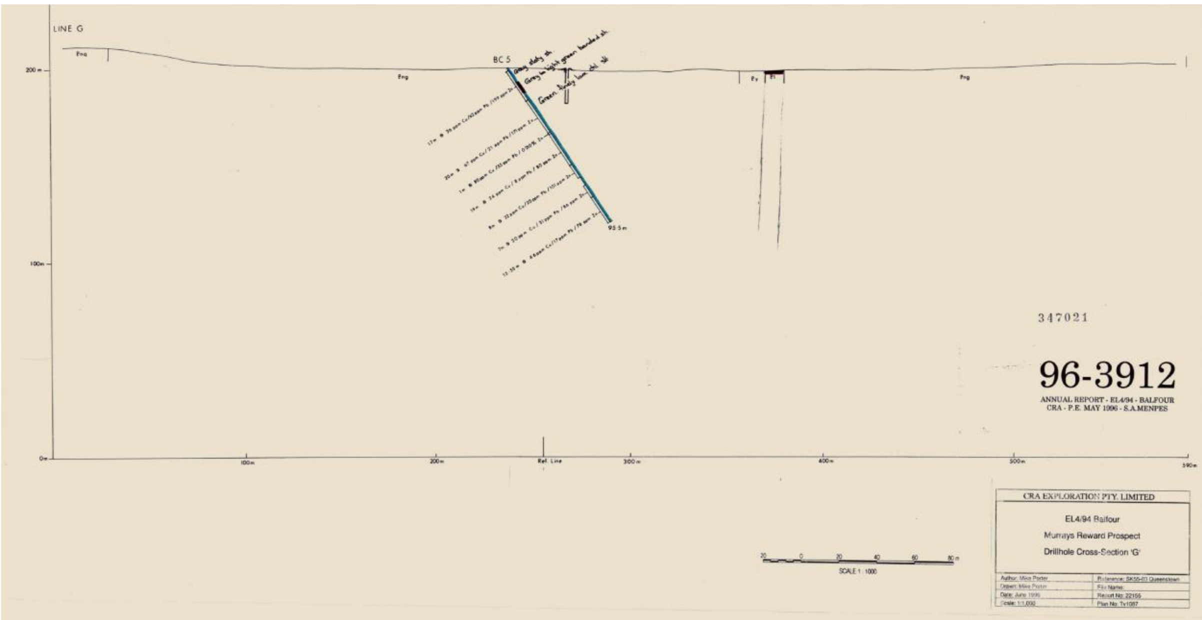
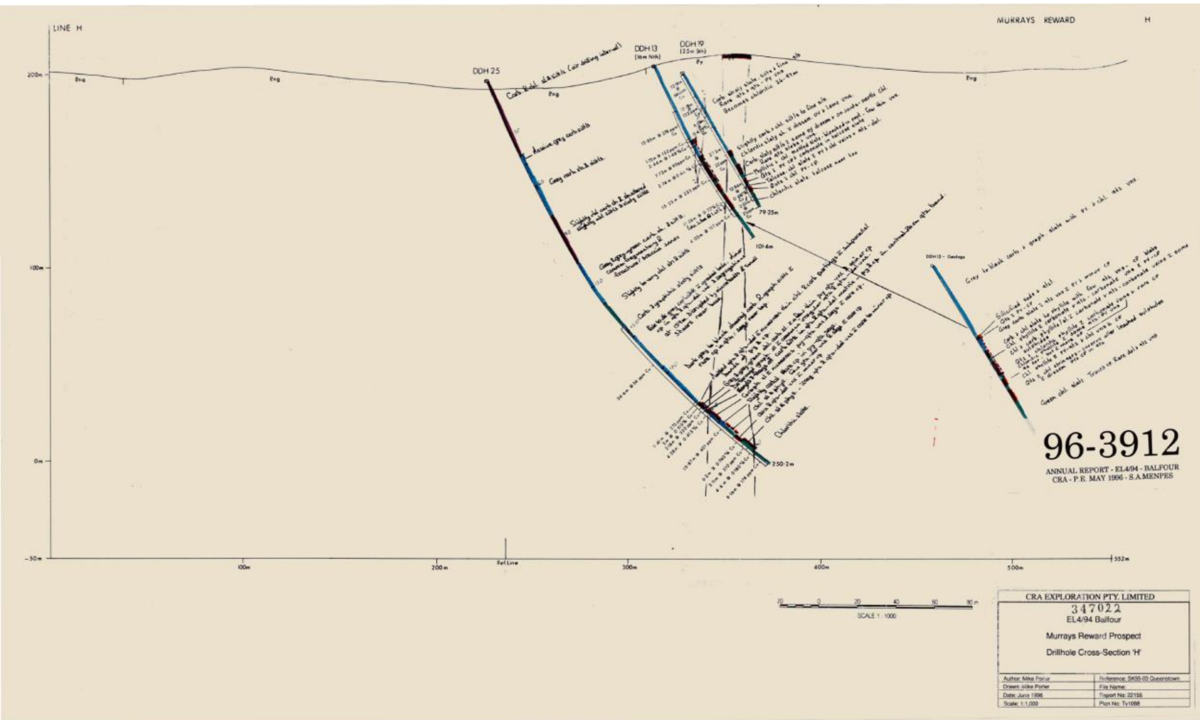
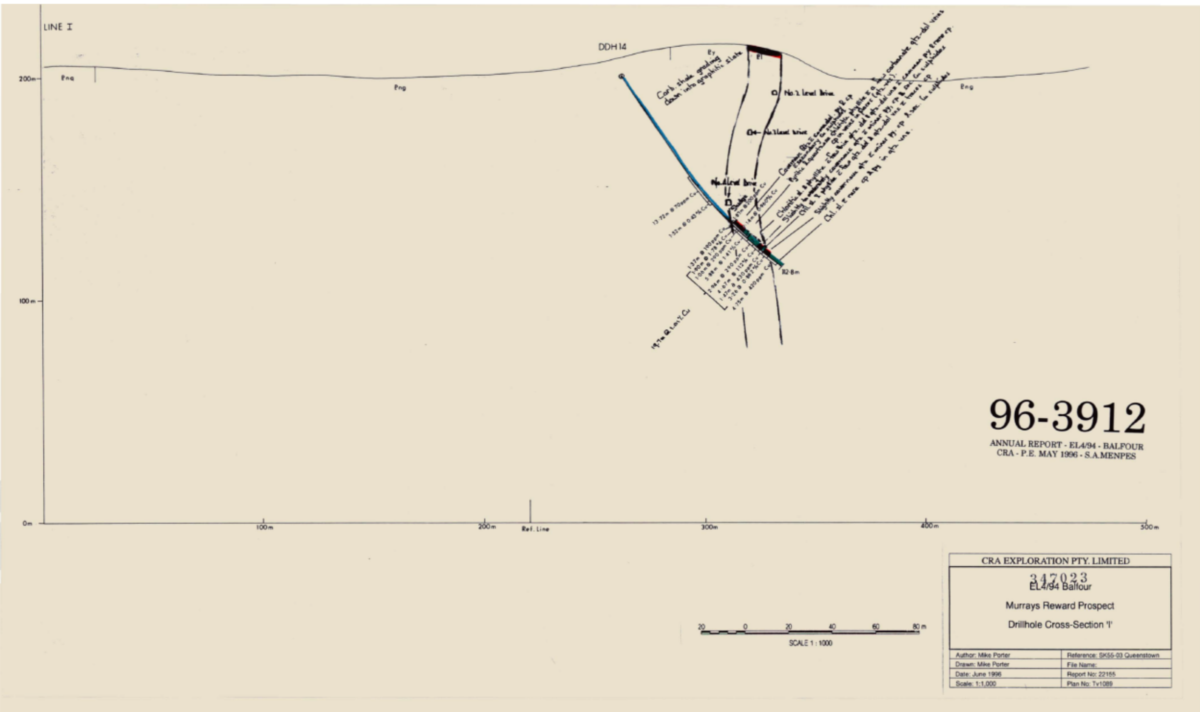
Plan No: Tv1086
SCALE 1 : 1000


LINE G
BC 5
Png
200m
100m
0m
93.5m
100m
200m
Ref. Line
300m
400m
500m
590m
347021
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
CRA EXPLORATION PTY. LIMITED
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'G'
Author: Mike Porter
Reference: SK55-03 Queenstown
Drawn: Mike Porter
File Name:
Date: June 1996
Report No: 22155
Scale: 1:1,000
Plan No: Tv1087
SCALE 1 : 1000


LINE H
MURRAYS REWARD
DDH 25
DDH 13
DDH 19
Ref. Line
SCALE 1 : 1000
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
CRA EXPLORATION PTY. LIMITED
347022
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'H'
Author: Mike Porter
Reference: SK55-03 Queenstown
Drawn: Mike Porter
File Name:
Date: June 1996
Report No: 22155
Scale: 1:1,000
Plan No: Tv1088


LINE I
DDH14
Ref. Line
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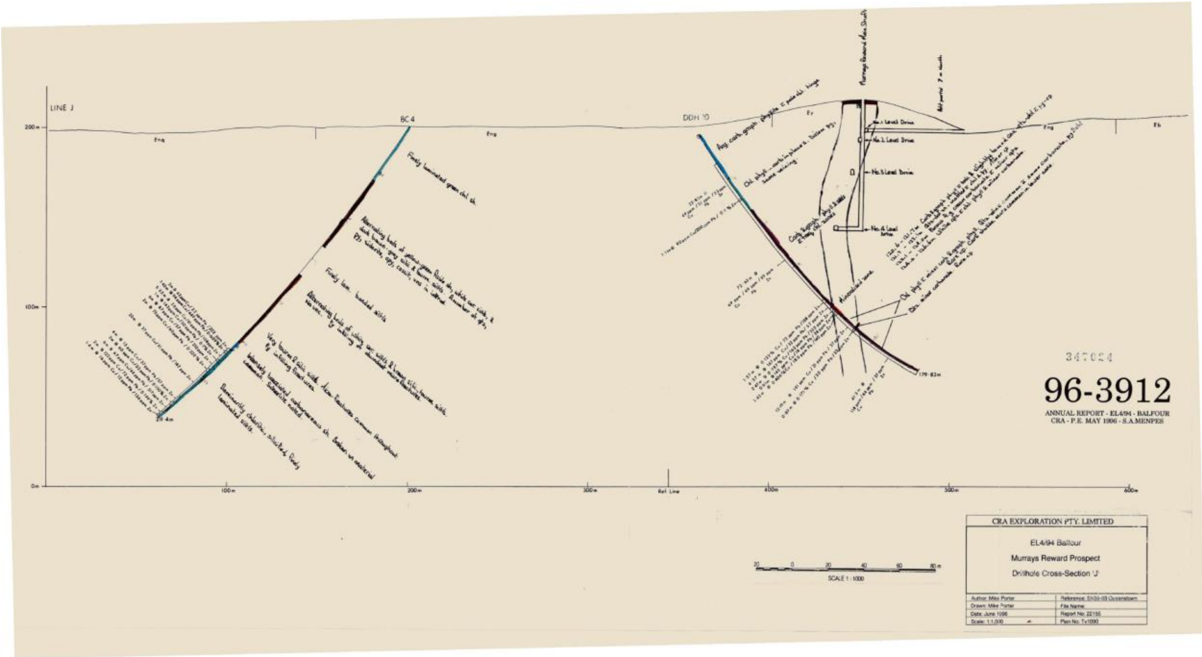
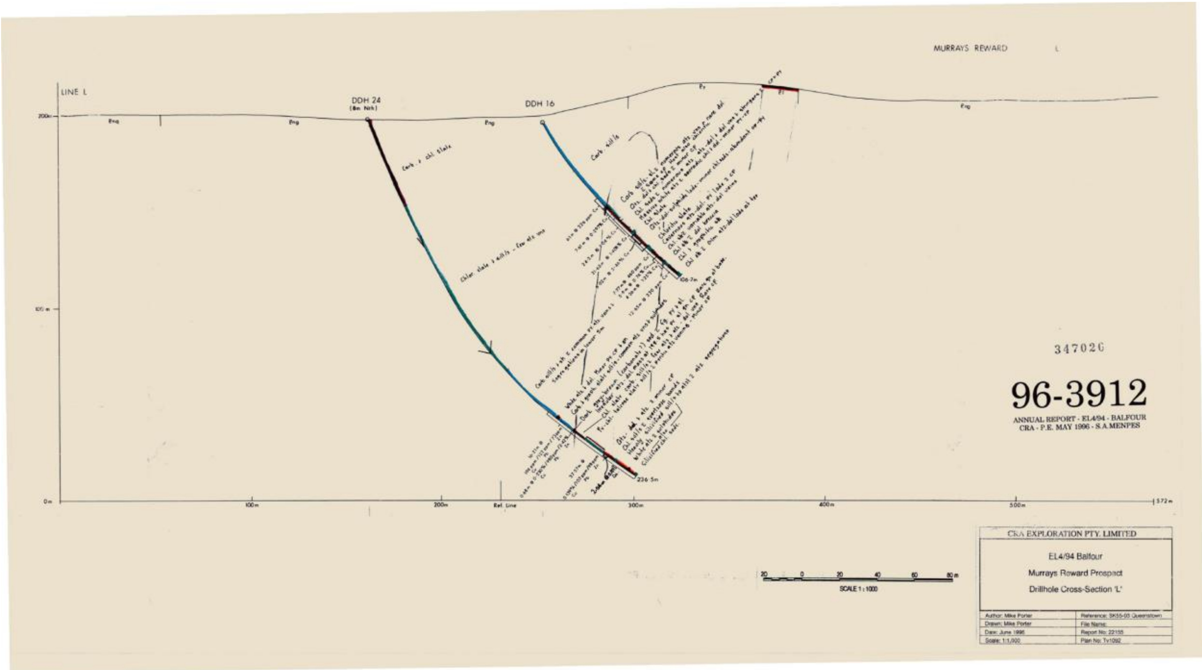
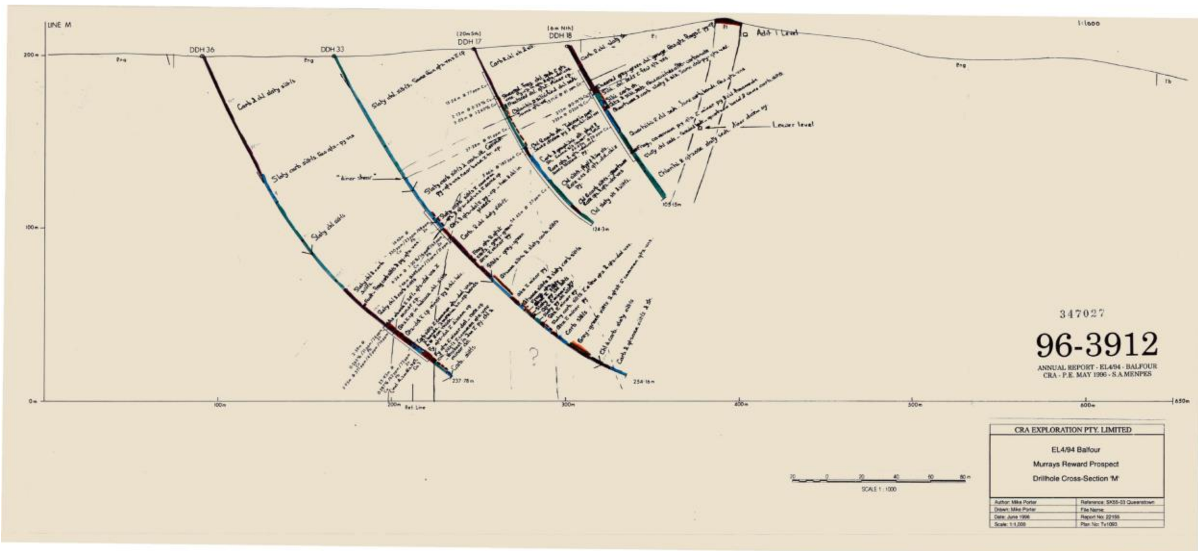
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
CRA EXPLORATION PTY. LIMITED
347023
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'I'
Author: Mike Porter
Reference: SK55-03 Queenstown
Drawn: Mike Porter
File Name:
Date: June 1996
Report No: 22155
Scale: 1:1,000
Plan No: Tv1089



LINE J
BC 4
DDH 10
Murrays Reward Main Shaft
No.1 Level Drive
No.2 Level Drive
No.3 Level Drive
No.4 Level
179·83m
347024
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
200m
100m
0m
100m
200m
300m
Rel Line
400m
500m
600m
SCALE 1 : 1000
CRA EXPLORATION PTY. LIMITED
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'J'
Author: Mike Porter
Drawn: Mike Porter
Date: June 1996
Scale: 1:1,000
Reference: SK55-03 Queenstown
File Name:
Report No: 22155
Plan No: Tv1090

LINE K
(10m Nth)
DDH 26
(8m Nth)
DDH 15
169·10m
347025
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
200m
100m
0m
100m
200m
Rel Line
300m
400m
500m
540m
SCALE 1 : 1000
CRA EXPLORATION PTY. LIMITED
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'K'
Author: Mike Porter
Drawn: Mike Porter
Date: June 1996
Scale: 1:1,000
Reference: SK55-03 Queenstown
File Name:
Report No: 22155
Plan No: Tv1091


MURRAYS REWARD
LINE L
DDH 24
DDH 16
200m
100m
0m
100m
200m
Ref. Line
300m
400m
500m
572m
347026
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
SCALE 1 : 1000
CRA EXPLORATION PTY. LIMITED
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'L'
Author: Mike Porter
Reference: SK55-03 Queenstown
Drawn: Mike Porter
File Name:
Date: June 1996
Report No: 22155
Scale: 1/1,000
Plan No: Tv1092


LINE M
DDH 36
DDH 33
DDH 17
DDH 18
200m
100m
0m
100m
200m
Ref. Line
300m
400m
500m
600m
650m
347027
96-3912
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES
SCALE 1 : 1000
CRA EXPLORATION PTY. LIMITED
EL4/94 Balfour
Murrays Reward Prospect
Drillhole Cross-Section 'M'
Author: Mike Porter
Reference: SK55-03 Queenstown
Drawn: Mike Porter
File Name:
Date: June 1996
Report No: 22155
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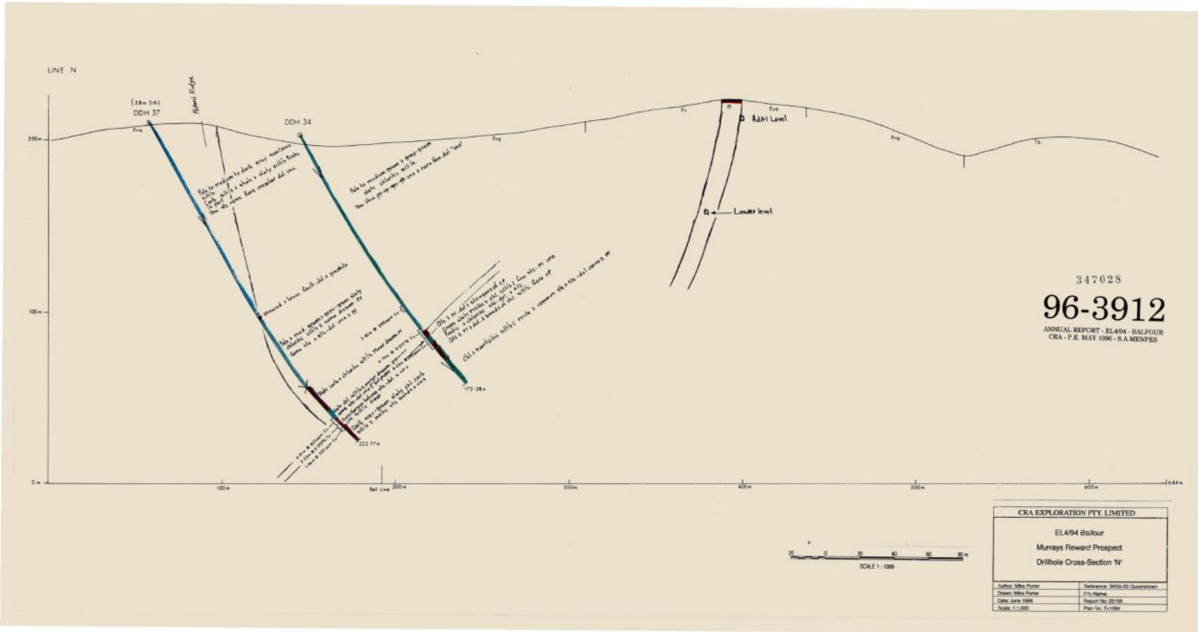
Plan No: Tv1093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Drawn: Mike Porter
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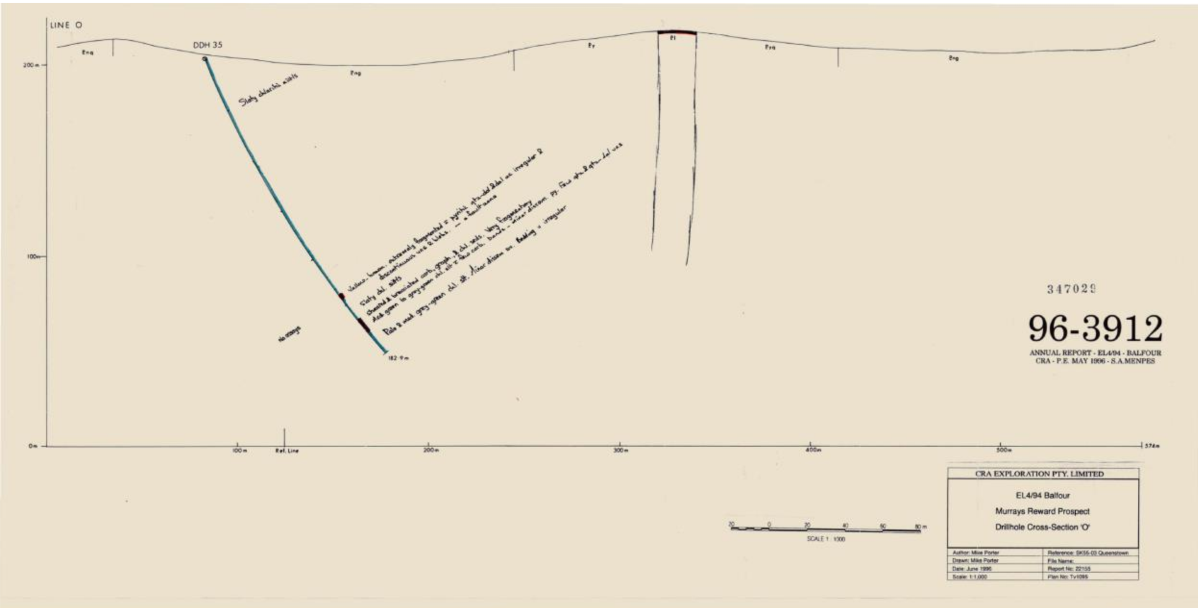
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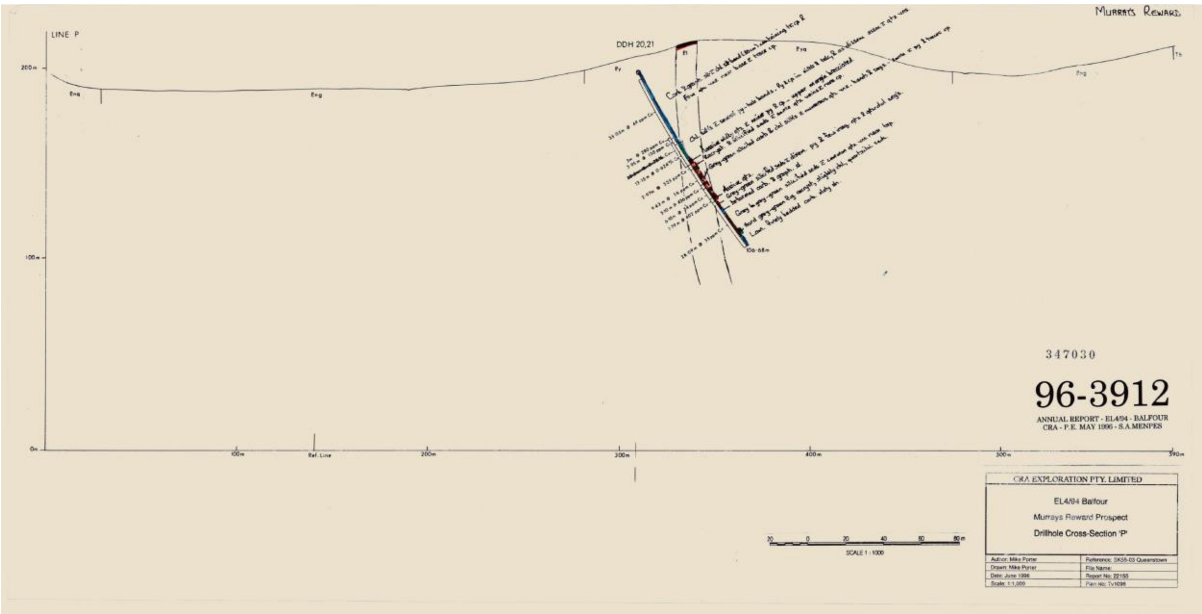
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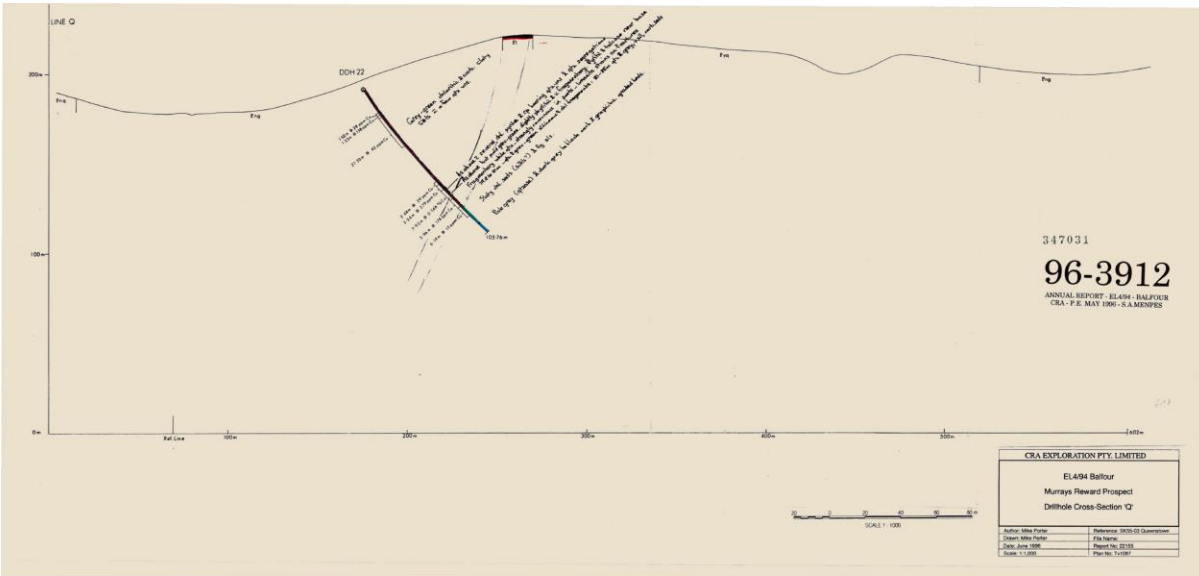
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Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	M. Anderson	H. Tassell		N. Gunadasa		12/1/2015

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Appendix 2

Balfour Area Prospectivity Review Potential Field Unconstrained Modelling - Factual Report

Geoff Summers and Morris Hansen

Balfour Area Prospectivity Review

Potential Field Unconstrained Modelling - Factual Report

March 2015

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Appendices

1. Introduction

1.1 Background

Following on from the recently completed desktop review (GHD document 62439) that examined the prospectively of the Balfour Area GHD were engaged to perform unconstrained modelling of the study area. Unconstrained modelling of gravity and magnetic potential field data over Mining Lease 1M/1976 and the neighbouring Exploration Lease 10/2014 was commissioned.

1.2 Purpose of this report

The purpose of this report is to provide details and results of processing and modelling conducted by GHD. Magnetic susceptibility and density contrast models are produced for the Balfour study area. Deliverables from potential field modelling are:

- Digital ERMapper grids of elevation, magnetic and gravity data used for modelling.
- Isometric view maps of the geological models derived from geophysical modelling.
- Digital version of geological models derived from geophysical modelling suitable for import into Micromine.
- Report detailing methodology, a discussion of results obtained and any recommendations for additional work.

Subsurface models of the subject areas produced will provide a mesh of magnetic susceptibility and density contrast values that can aid in future exploration targeting.

1.3 Scope and limitations

This report: has been prepared by GHD for Geoff Summers and Morris Hansen (GM&MH) and may only be used and relied on by GM&MH for the purpose agreed between GHD and the GM&MH as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than GM&MH arising in connection with this report. The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (Section 1.4). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by GM&MH and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.4 Assumptions

The following assumptions have been relied upon in preparing this report;

- That potential field magnetic and gravity data provided by GM&MH is accurate in value and is correctly geo-referenced.

- That the potential field and elevation data provided by Department of State Growth, Mineral Resources Tasmania (MRT) and Geoscience Australia (GA) is accurate in value and correctly geo-referenced.
- That petrophysical measurements of drill core and chip samples provided by GM&MH have been accurately logged and are reflective of the indicated lithologies.
- That petrophysical data of drill core obtained from MRT and GA has been accurately logged and is reflective of the indicated lithologies.

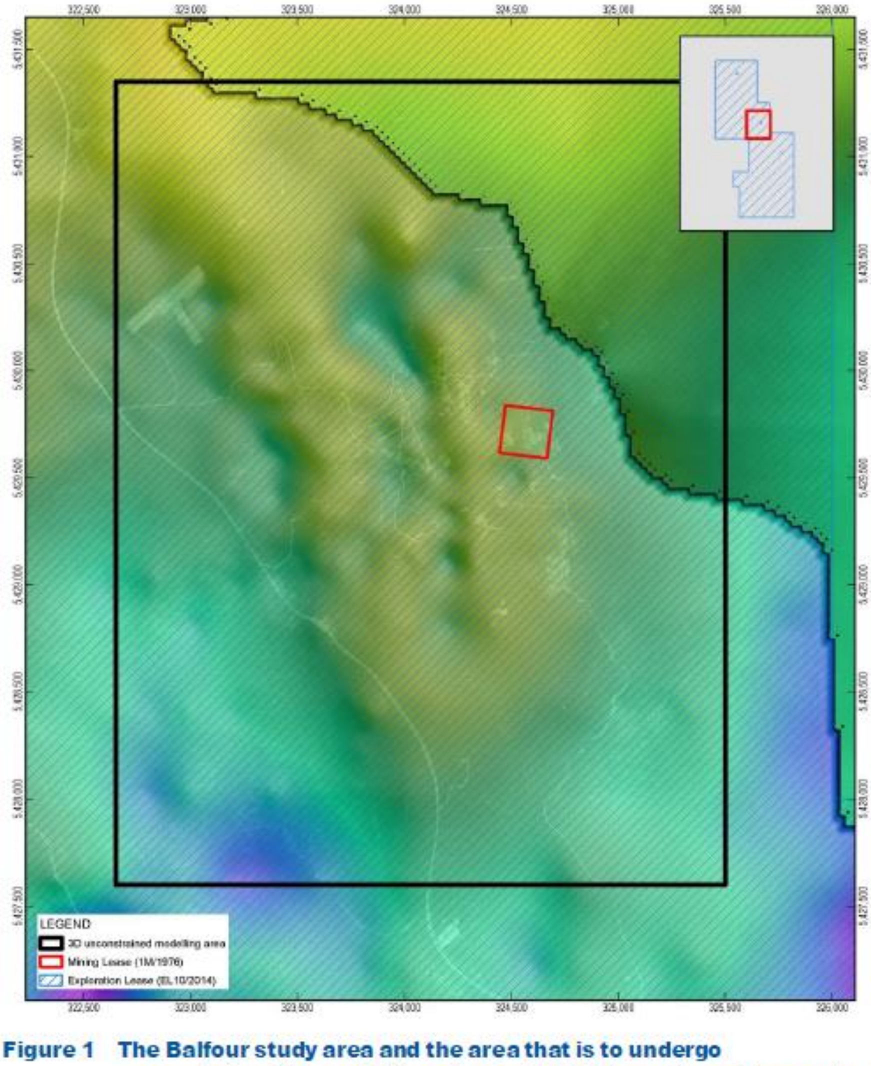


Figure 1 The Balfour study area and the area that is to undergo unconstrained 3D modelling of potential field gravity and magnetic data.

2. Data Preparation

2.1 Data Sources

All freely accessible data repositories were searched and the highest resolution datasets for the Balfour study area were extracted for use in the modelling process. Datasets utilised in the modelling process include:

2.1.1 Elevation Data

- DTM.ers (regional dataset, 2002 Balfour Area (MRT))

2.1.2 Magnetic Data

- TMI_GDA.ers (1993 Mt Frankland (MRT))

2.1.3 Gravity Data

- Bouguer_anom_2009.ers (2009 Balfour Gravity (MRT))
- Gravity_Bouguer.ers (regional dataset, MRT)

2.2 Data Processing and Grid Creation

Data preparation included the processing of the collected elevation and magnetic data into a form suitable for standalone interpretation and modelling. The Geocentric Datum of Australia 94 (GDA94) and the Map Grid of Australia (MGA) projection for Zone 55 are used throughout this report. Heights are all specified to Australian Height Datum (AHD). All datasets using alternate datums and/or projections were transformed prior to further processing.

Magnetic, gravity and elevation data were gridded with the Surfer software package utilising a Kriging interpolation algorithm and a cell spacing of 10 m. Areas of the created grids that lay outside the range of observations were blanked or removed. The following grids were created by this process;

1. Digital elevation model (DEM, m)
2. Total Magnetic Intensity (TMI, nT), and
3. Bouguer anomaly (mgal)

The magnetic grid was further processed to create a residual dataset suitable for incorporating into the University of British Columbia (UBC) geophysical inversion software packages. The residual grid was produced by subtracting the magnetic field intensity. This value is the calculated magnetic field intensity using the International Geomagnetic Reference Field (IGRF) at the time of the recently flown magnetic survey. The following grid was created by this process:

1. Residual magnetics (nT)

3. Inverse Modelling

3.1 Introduction to Inverse Modelling

In geophysics, inversion modelling is the process of predicting properties of the subsurface utilising observations made from a geophysical survey. The subsurface is discretised into mesh cells and each cell is given a physical property relating to the survey technique. By an iterative process the physical properties of the cells are altered until the calculated response from the modelled subsurface is acceptably consistent with the observed survey values, the difference between the calculated and observed values is termed 'misfit' or 'error'. Figure 2 display a flow diagram depicting the general processing flow of the inversion process.

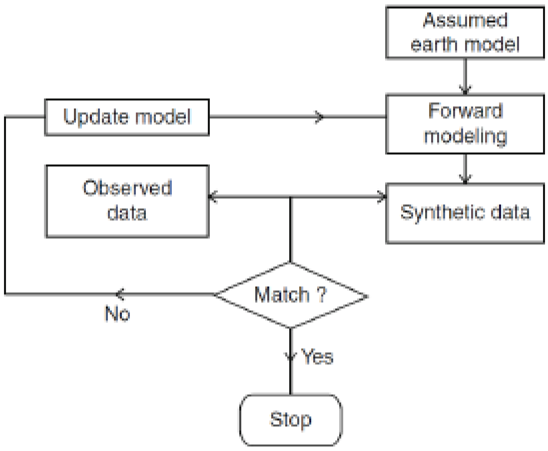


Figure 2 Flow diagram depicting the processing flow of the inversion process

3.1.1 Non-Uniqueness and Equivalent Sources

Key issues that must be taken into account when performing geophysical inverse modelling is non-uniqueness and the concept of equivalent sources. In summary, these issues describe how it is possible for the same calculated response to result from a variety of subsurface models, with differing distributions of the physical property in question.

This problem is known as non-uniqueness, and when assessing models produced from an inversion process it is important that the interpreter acknowledges and takes into account that the subsurface model produced is one of many models that could produce the calculated response. It is therefore a process of geological inference based upon other available information to assess the probability that the geophysical model produced is a valid representation of the subsurface geology and target.

Figure 3 displays an example of this effect of "equivalent sources". Three subsurface bodies are shown of differing volumes and geometries. If the physical property (such as density) of these bodies increases with depth it is possible for all three of these bodies to produce an identical response at the surface from a geophysical survey (response indicated by the red line).

It is critical that this uncertainty is taken into consideration when assessing and interpreting results of geophysical inversion.

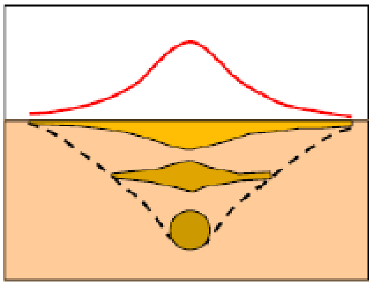


Figure 3 Example of equivalent sources. The same observed anomaly may result from a number of different subsurface bodies.

3.2 Data Extraction

Elevation and potential field data utilised for inverse modelling was extracted from the digital elevation model and residual magnetic grids detailed in section 2.2. Table 1 details the modelling extents of the Rogetta, Cuprona, Camena and Riana modelling areas and the limits of the XYZ Ascii data extracted from the gridded datasets.

Table 1 3D inversion modelling area extents

Area	Min. Easting (m)	Max. Easting (m)	Min. Northing (m)	Max. Northing (m)
Balfour	322650	325500	5427600	5431350

3.3 Data Reformatting and Error Assignment

The XYZ ASCII data extracted in section 3.2 was imported into Microsoft Excel and reformatted in order to match UBC data formats. Standard deviation error was assigned to observation as constant value and as a percentage of the observed value, as per Table 2. The assignment of standard deviation error to observations ensures errors in observed values and/or spatial location of the observation do not halt or negatively impact the inversion process.

Table 2 Parameters utilised to assign standard deviation error

Data Type	Constant	Percentage (%) of observed value
Magnetics	5 nT	2.5
Gravity	0.05 mgal	2.5

3.4 Model Discretisation

The subsurface beneath each of the modelling areas was discretised into a network of cells (Figure 4). Larger cells (padding) were added to the extremities of the subsurface models to mitigate edge effects. Table 3 details the number of potential field observations and the number of model cells that are utilised in the inversion process for each of the modelling areas.

Observations are spaced at 10 m intervals and the smallest model cells of the mesh are 25 m long in the horizontal and vertical directions. The time needed to complete an inversion is directly proportional to the number of observations and the numbers of cells in the model mesh.

For gravity inversions, each cell of the mesh is assigned a density contrast (DC). Negative DC values are indicative of geologies with low density values and positive DC values indicate geologies with high density values. For magnetic inversions, each cell of the mesh is assigned a magnetic susceptibility value, in SI units. Magnetic susceptibility is directly proportional to the concentration of magnetite. Areas with high magnetic susceptibility values are composed of elevated levels of magnetite.

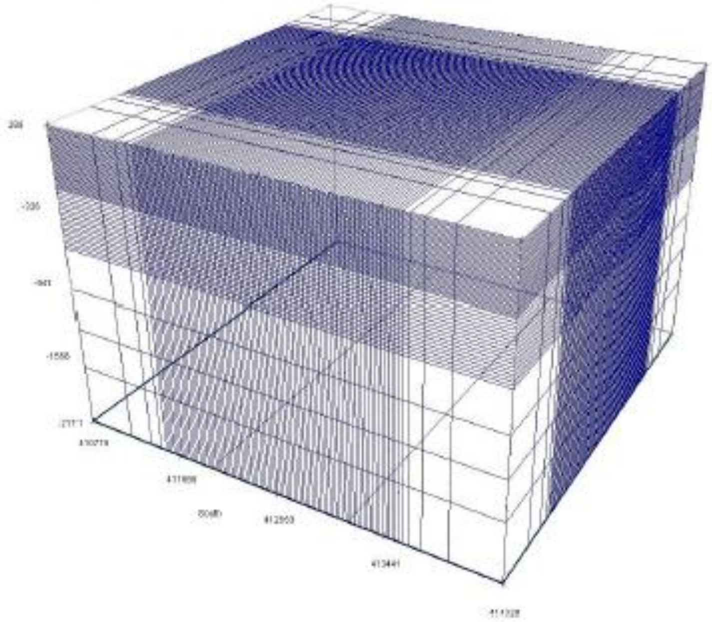


Figure 4 Example of a discretised 3D subsurface model

Table 3 Number of observations and number of model cells utilised in the inversion process

Area	No. Observations	Min. Obs. Interval	No. Model Cells	Min. Cell Size
Balfour	213750	10 m	2326968	25 m

3.5 Inversion Parameters

There are a number of inversion parameters that can be adjusted prior to conducting a modelling inversion. These parameters apply constraints to the resulting subsurface mode. The following parameters were systematically altered in a sensitivity analysis program prior to inversions being run to ensure the resulting subsurface model was geologically plausible. Sensitivity analysis runs included the following:

1. Depth weighing; controls the depth at which causative bodies are formed by allowing for the natural decay of potential fields.
2. Chifact; loosen or tightens the allowable misfit (error) between the observed survey values and the calculated values of the inversion process.
3. Smallness and smoothness; adjusts the allowable transition between the values of adjacent cell, and
4. Bounds; specifies the minimum and maximum value that a mesh cell may be assigned.

The inversion parameters ultimately selected to produce the final magnetic subsurface and density contrast models are detailed in Table 4.

Table 4 Magnetic and gravity modelling parameters utilised in the inversion process

Model	Depth weighting factors (exp,z0)	Chifact	Smallness and Smoothness (As, Ae, An, Az)	Bounds (lower SI, upper SI)
Magnetic	1.5, 0.5	1	0.0001, 24, 24, 12	-0.05, 1
Gravity	1.5, 0.5	0.75	0.0001, 25, 25, 12	-1.5, 2

4. Results

Gravity and magnetic subsurface models produced from inverse modelling are supplied in the accompanying digital media in UBC (.model), Mircomine (.dxf) and ER-Mapper (.ers) formats. The following figures display iso-surfaces of the subsurface models produced. Iso-surface are constructed by assigning upper and/or lower cut off limits that dictate which cells within a model will be displayed. The iso-surfaces displayed are intended to highlight zones of elevated density (possible mineralisation) or elevated magnetic susceptibility (high magnetite content).

4.1 Gravity

The density contrast subsurface model in Figure 5 displays iso-surfaces constructed with a lower cut off of 0.0625 DC. Two large high density bodies are observed, with two smaller satellite bodies positioned to the north. These high density bodies correlate with elevated observations in gravity data.

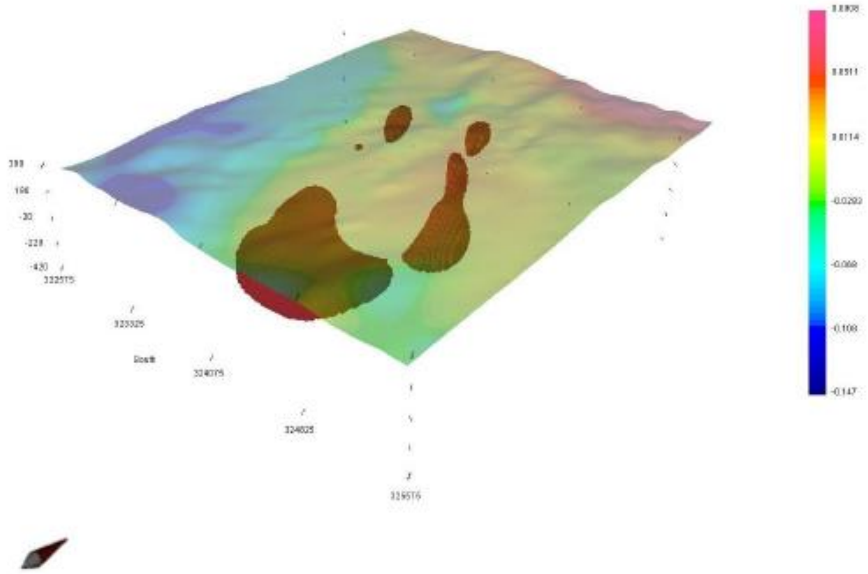


Figure 5 Subsurface model produced from gravity data for the Balfour Area, lower cut off 0.0625 density contrast (south-eastern aspect)

4.2 Magnetics

No isolated high magnetic susceptibility bodies were imaged through the inversion of magnetic data. A general increase in magnetic susceptibility values with depth was exhibited; this trend is portrayed in Figure 6. It is noted that the anomaly in the observed magnetic data is of a relatively low intensity, and that magnetic susceptibility is generally indicative of magnetite content only.

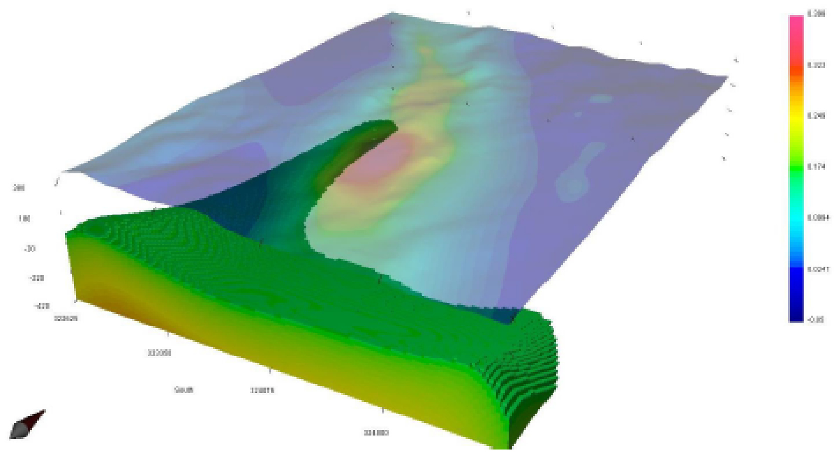


Figure 6 Subsurface model produced from magnetic data for the Balfour Area, lower cut off 0.175 SI (south-eastern aspect)

4.3 Anomaly Volume

To assist in geological modelling and exploration program development, the relative size (in volume) of the causative gravity anomalies are provided in Table 5. Volumes are based upon the density contrast thresholds specified in Section 4.1. Note that these volumes are provided only to assist in illustrating the overall geometry of the gravity anomalies and should not be used to directly infer tonnage estimates. Volume calculations are based on gravity data only as no isolated high magnetic susceptibility bodies were imaged through the inversion process.

Constraint (and hence reliability) on the southernmost density anomaly is considered to be low due to the strong background density gradient on it southwest margin. The result of this is that the modelling results depict a substantially larger density anomaly than is likely to exist. Accordingly, the volume of this anomaly has not been included in Table 5.

Table 5 Approximate volume of causative magnetic anomalies

Area	Volume
Balfour	65 million cubic metres

5. Discussion and Recommendations

5.1 Discussion

Four high density bodies were resolved through the inversion of gravity data. The position of these bodies relative to their associated density anomalies in gravity data and ML 1M/1976 are presented in Figure A1.

The body directly to the south-east of ML 1M/1976 is well constrained in geometry (Figure 5). The bulbous and most voluminous southern section of this body is located at a depth of approximately 150 m from the surface. The less voluminous elongated northern section of this body extends to the very near surface and correlates with an IP anomaly measured by CRA in 1996. The overall geometry of this body follows the regional NNW-SSE trend of the thrust fault, steeply dipping to the southwest with the density anomaly situated down dip from the surface expression of the fault and the mineralisation associated with Murray's Reward.

This is consistent with the posited source model for the copper vein/lode mineralisation at Murray's Reward of Proterozoic host sequences containing a cupiferous VMS-style body situated down dip on the major regional thrust fault and Devonian reactivation mobilising cupiferous fluids up dip to their present location near the surface expression of the fault.

The larger high density body to the south-east of the Murray's Reward associated body is less well defined from the inversion process. The south-eastern section of this body correlates with a steep gravity gradient, with low gravity values to the west and high values to the east. It is possible that the volume of western section of the body maybe exaggerated as a result of artefacts introduced from this steep gravity gradient. The north-eastern section of this body correlates spatially with anomalous gravity values in observed data.

The two smaller bodies situated to the north appear to be very close to the surface. The position of the high density bodies relative to the local geology is presented in Figure A2. The smaller body to the west is situated in close proximity to the Specimen Hill deposit, a fault intersection and a high intensity magnetic anomaly and a mapped IP anomaly from a 1996 CRA survey. MRT documentation details the presence of high tin levels in this area.

The small eastern body is also located on a mapped fault and located to the north of Peter's Ridge (Tin) and to the west of Central Mount Balfour (Copper). As with the western body, this body also appears to have an IP response associated with it.

Association of a positive IP response with a density correlates with the expected response of sulphide mineralisation. The near-surface location of these density anomalies indicates that they are likely zones of alteration caused as a result of up-dip migration of fluids containing copper from some deeper source rather than primary VMS-style mineralisation. Nonetheless, these two bodies represent areas of high priority with regards to follow up geological mapping to better understand their prospectivity for copper lode/vein mineralisation.

The larger body to the south west of 1M/1976 is situated within Proterozoic successions of siltstones and shales. The geology in this area is complex. Boundaries between sedimentary successions trend to the north and north-east with dips are predominately orientated to the south-east. MRT documentation details multiple tin and copper occurrences within and surrounding this area.

The largest body to the south-west is positioned within siliceous to carbonaceous siltstones of the Proterozoic. The north-eastern section of the body intersects a large north-north-west trending thrust fault that dips the south-west. MRT details the occurrence of tin and zinc within this area.

Modelling results indicate that the south-western body is situated deeper, and further down dip of the major regional thrust fault that the other bodies. Much of this area has been subject to little exploration geologically or geophysically. The deeper nature of the anomaly may be in part responsible for this. Nonetheless, it is considered that this anomaly warrants further geological investigation.

5.2 Summary

No isolated high magnetic susceptibility subsurface bodies were identified from the inversion of magnetic data. The north-north-west trending low intensity anomaly observed in magnetic data is likely the result of minor magnetite mineralisation associated with the emplacement of Devonian granitoids. The position of the magnetic anomaly is coincident with north-north-west trending faults in the area and may indicate the presence of fluid pathways.

The two most voluminous high density bodies imaged from the inversion of gravity data are identified as the most prospective in term of possible economic mineralisation, in particular the smaller body immediately to the south-west of ML 1M/1976. This body is situated within Proterozoic sediments that host mineralisation within the area. The complex geology and thrust faulting to the west and east may act at conduits for mineralising fluids.

The smaller bodies to the north may also be prospective for copper lode and vein-hosted style deposits, but their shallow nature indicates that they likely represent secondary alteration as a result of upwards migrating fluids on fault structures rather than primary mineralisation.

5.3 Recommendations

Results of geological review and geophysical modelling to date indicate that ML 1M/1979 and EL 10/2014 are highly prospective for copper mineralisation. Tin and tungsten mineralisation is also likely present, particularly in the western Balfour succession but is not the focus of this investigation.

Potential field modelling indicates the presence of two deep, high density bodies with characteristics favourable of potential VMS style mineralisation. In addition, modelling has also indicated that two moderate size density anomalies exist at or near the surface with coincident IP anomalies.

Accordingly, the following recommendations are focussed around evaluation of both the deeper density anomalies for VMS style mineralisation and the shallower zones associated with copper lode/vein mineralisation.

5.3.1 Field Mapping

GHD recommends a geological mapping program, particularly aimed at understanding the structural controls on mineralisation in the area. In order to be beneficial sufficient outcrop would have to be present so that mapping could take place and samples could be collected. This is a low cost measure that could be conducted in-house by GS&MH. Mapping and sample collection could provide considerable insight in the location of host sequences and the presence of structures, samples would assist in estimating tonnage from gravity.

More extensive investigation of the two shallow density anomalies identified during geophysical modelling is also recommended.

5.3.2 Perform structural analysis of geophysical data

Due to the restricted quantity of visible outcrop, GHD also recommend that structural lineament analysis of gravity and magnetic data be performed (jointly as a workshop between GHD geophysicists and GS&MH to provide better regional definition of major structural features. Structural analysis should be carried out to assist in identifying:

- Location of host sequences, and
- Fluid migration pathways.

5.3.3 Perform detailed 2D forward modelling and geologically constrained modelling

On the basis of unconstrained 3D potential field modelling sufficient constraint has been achieved to warrant detailed 2D geological cross section modelling to further refine geometry with the view to developing a targeted drilling program.

GHD recommend that 2D forward modelling using petrophysical constraints on profiles through the Balfour gravity anomaly. Petrophysical properties will need to be obtained from hand samples or core where available. This modelling will facilitate improved definition of possible mineralisation and assist in guiding the future exploration efforts.

Central to this modelling will be incorporation of drill hole data collected by CRA during the 1990's.

5.3.4 Investigate ground and airborne IP as a pre-cursor to drilling

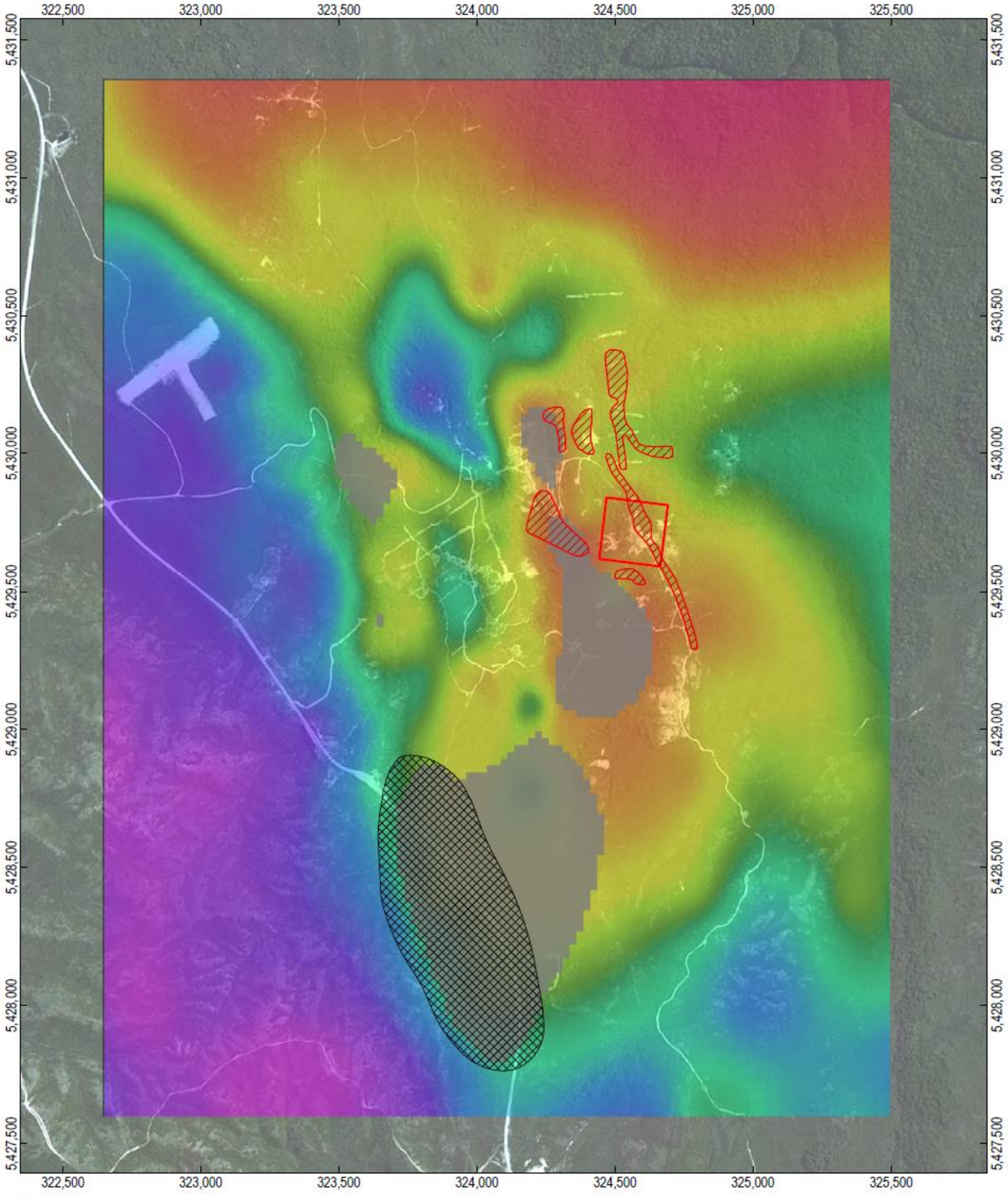
At present multiple geophysical a geological data indicate favourably towards some form of massive sulphide mineralisation at depth in proximity to ML 1M/1979. However, given the costs associated with mobilising and drilling at Balfour, GHD consider that it is worthwhile investigating the feasibility of carrying out a ground or airborne induced polarisation survey.

The shallow density anomalies situated to the north of the 3D modelling area show a positive IP response in the 1996 CRA data. This is consistent with that expected of sulphide mineralisation.

The larger and deeper density anomalies to the south do not appear to have any IP response associated with them. However, due to their deeper nature, this may be as a result of the limited ability of the IP system used by CRA to acquire the survey.

Acquisition of a new ground or airborne IP survey would have the potential to significantly reduce the uncertainty associated with the nature of the two density anomalies prior to the commitment of drilling.

Appendix A – Subsurface body 2D locations



Questionable inversion results

Mining Lease (1M/1976)

Mapped copper mineralisation

Paper Size A3

0 60 120 240 360 480

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: Geoff Summers and Morris Hansen
Project Name: Balfour Area Prospectivity

Job Number	32-17626250
Revision	A
Date	26 Feb 2015

High desity subsurface bodies displayed over a gravity image layer

Figure A1

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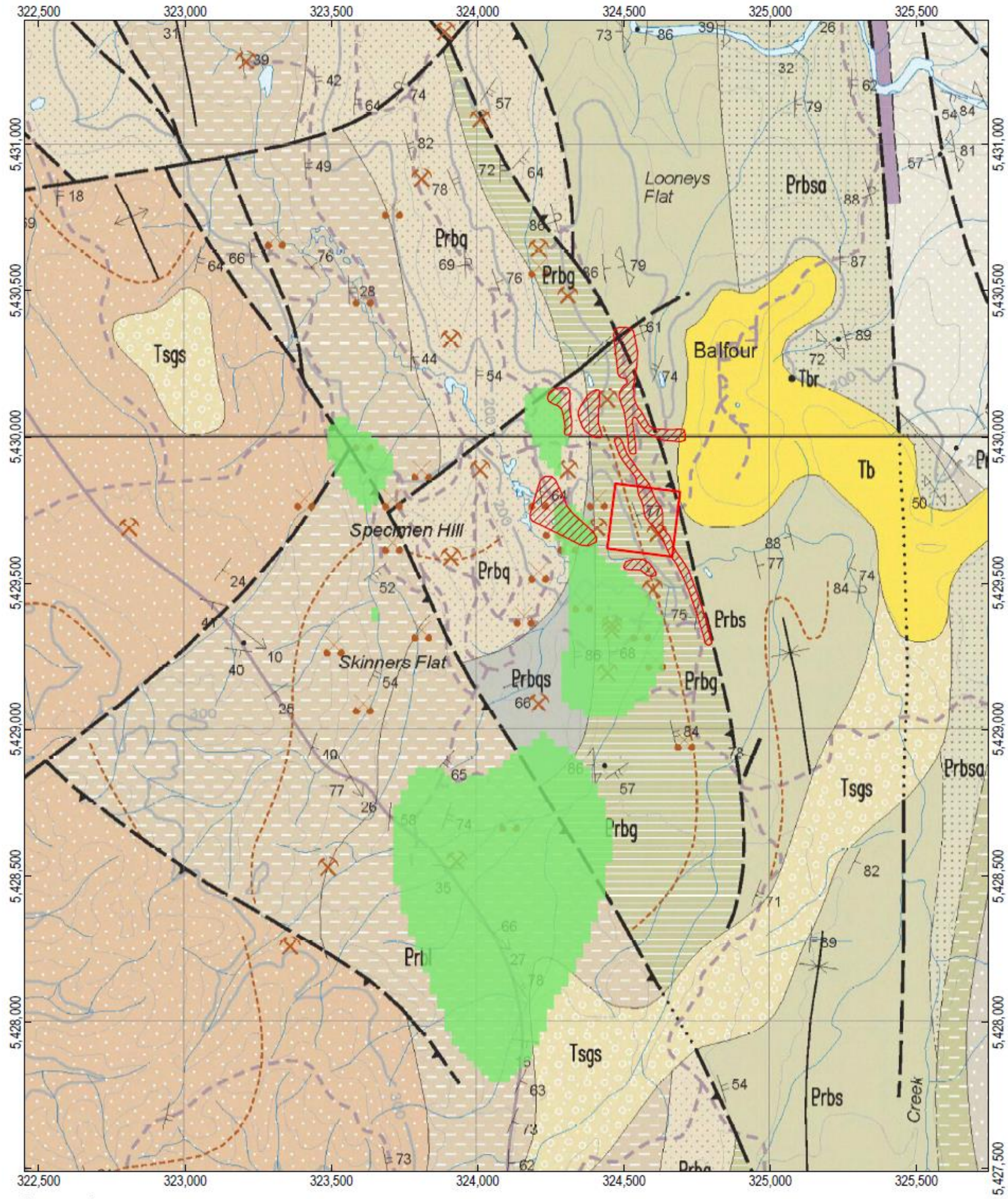

Legend

Mining Lease (1M/1976)

Mapped copper mineralisation

Paper Size A3
0 55 110 220 330 440
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Client Name: Geoff Summers and Morris Hansen
Project Name: Balfour Area Prospectivity

Job Number 32-17626250
Revision A
Date 26 Feb 2015

High desity subsurface bodies displayed over a geological mapping

Figure A2

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Data source: Created by:mrenderson

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	M. Anderson	H. Tassell	[signature]	N. Gunadasa	On File	26/02/2015

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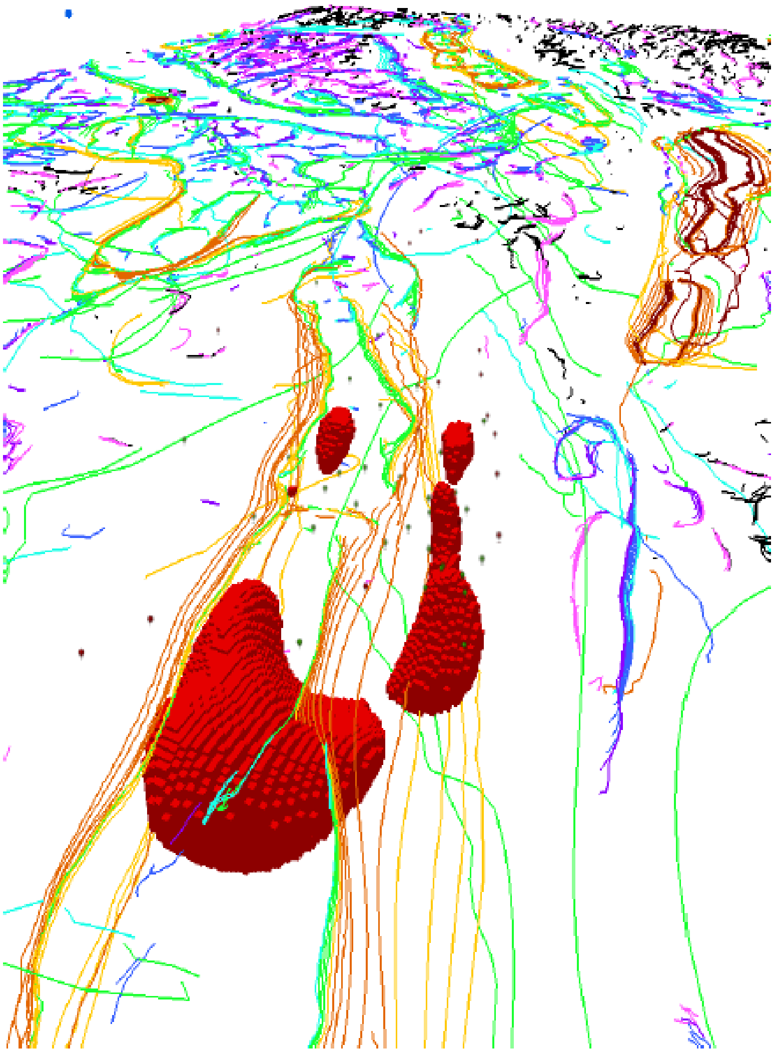
Appendix 3

Balfour Area Prospectivity Review Structural Enhancement Processing - Factual Report



Geoff Summers and Morris Hansen

Balfour Area Prospectivity Review

Structural Enhancement Processing - Factual Report

March 2015

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Appendices

1. Introduction

1.1 Background

Following on from the recently completed inverse modelling of magnetic and gravity data for the Balfour area (GHD document 62721) GHD were commissioned by Geoff Summers and Morris Hansen (GM&MH) to conduct structural enhancement processing. The structural enhancement processing area includes Mining Lease 1M/1976 and the recently acquired Exploration Lease 10/2014 (Figure 1). The aim of processing is to identify structures throughout the region that are precursors to the formation of copper mineralisation and to aid in the development of a drilling program.

1.2 Purpose of this report

The purpose of this report is to provide details of the processing conducted by GHD and present results in the form of maps and digital media. Deliverables from potential field modelling are:

- Digital ERMapper grids of elevation, magnetic and gravity data used for MSED processing
- Digital ERMapper grids displaying worms that result from MSED processing
- Digital ERMapper continuation and derivative grids utilised in the MSED processing sequence
- Digital 3D volumes displaying magnetic and gravity worms
- Report detailing methodology, a discussion of results obtained and any recommendations for additional work.

1.3 Scope and limitations

This report: has been prepared by GHD for Geoff Summers and Morris Hansen (GM&MH) and may only be used and relied on by GM&MH for the purpose agreed between GHD and the GM&MH as set out in section 1.2 of this report.

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1.4 Assumptions

The following assumptions have been relied upon in preparing this report;

- That potential field magnetic and gravity data provided by GM&MH is accurate in value and is correctly geo-referenced.

- That the potential field and elevation data provided by Department of State Growth, Mineral Resources Tasmania (MRT) and Geoscience Australia (GA) is accurate in value and correctly geo-referenced.
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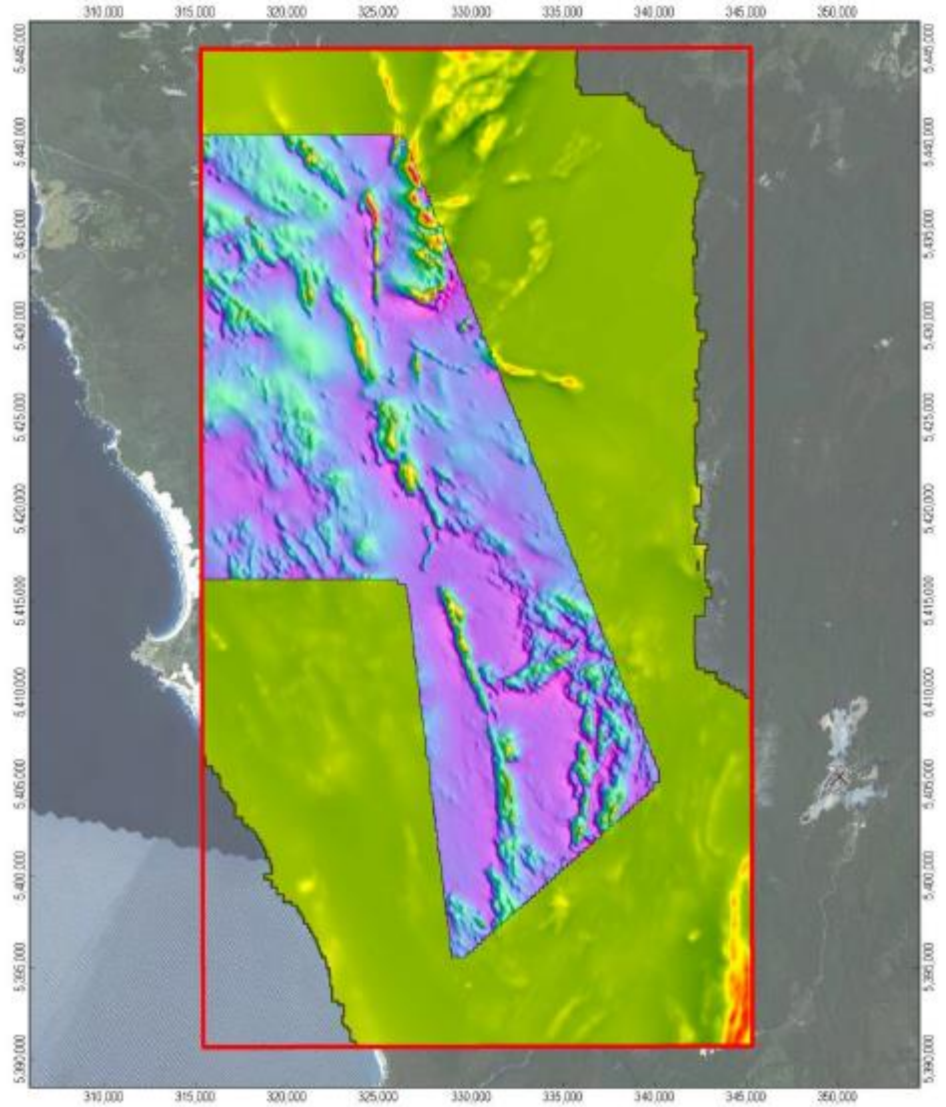


Figure 1 The Balfour study area to undergo structural enhancement processing.

2. Data Preparation

2.1 Data Sources

All freely accessible data repositories were searched and the highest resolution datasets for the Balfour study area were extracted for use in the modelling process (MRT and GA). MRT were consulted to identify if any confidential data for Exploration Lease 10/2014 existed (previously owned by Zebs Mineral Pty. Ltd.), unfortunately no such data exists. The following datasets were utilised in the structural enhancement processing:

2.1.1 Magnetic Datasets

- North-west Tasmania 2001 (MRT)
- Western Tasmania 2001 (MRT)
- Arthur / Pieman 1996 (MRT)
- Mt Frankland 1993 (MRT)
- Balfour 2002 (MRT)

2.1.2 Gravity Data

- Consolidated gravity of Tasmania (MRT)
- Balfour 2009 (MRT)

2.2 Data Processing and Grid Creation

Data preparation included the processing of magnetic and gravity datasets into a form suitable for the multi-scale edge detection (MSED) to be applied. The Geocentric Datum of Australia 94 (GDA94) and the Map Grid of Australia (MGA) projection for Zone 55 are used throughout this report. All datasets using alternate datums and / or projections were reprojected prior to further processing.

Datasets were gridded with the Surfer software package utilising a Kriging interpolation algorithm and a cell spacing of 50 m. The gridded areas were restricted spatially to the confines of a box designated by the co-ordinates in Table 1. Magnetic and gravity dataset were then consolidated into single magnetic and gravity datasets with the Intrepid software package. This processing involves the DC shift and feather merging of datasets into a seamless master dataset. The following ER-Mapper format images were generated by this process, and are supplied with the digital data that accompanies this report:

1. Total Magnetic Intensity (TMI, nT), and
2. Bouguer anomaly (mgal), and
3. Digital elevation model

Table 1 Location of the Balfour study area

Location	Easting	Northing
South-west corner	315300	5390700
North-east corner	345250	5445000

The magnetic image was further processed to produce a TMI reduced to the pole (RTP) grid. This processing corrects the location of features in the dataset that are spatially shifted due to the form of the causative body and the direction and amplitude of the inducing magnetic field.

3. Multi-scale Edge Detection Processing

3.1 Introduction to Multi-scale Edge Detection

Multi-scale edge detection (MSED) is a technique utilised to analyse and highlight structures within potential filed datasets that may not be clearly visible to the naked eye. This method locates local maxima points (edge points) in horizontal derivative images for a pre-defined set of upward continued images (Figure 2 left). Correlations are made between these points to form linear strings which are further correlated to form worms (Figure 2 right). These worms identify strike distributions, structural units at depth and provide critical information pertaining to fluid pathways.

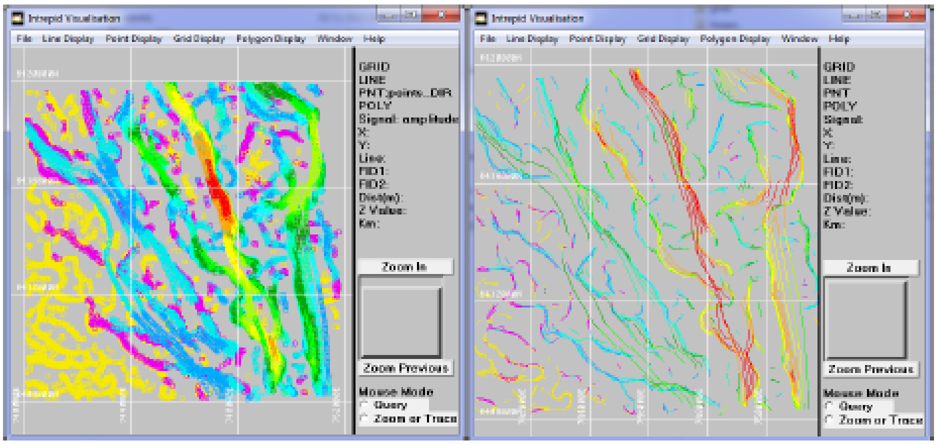


Figure 2 Example of edge points (left) and worms (right) formed using the MSED technique

3.2 MSED Processing Parameters

MSED was applied to gravity and magnetic datasets constructed in Section 2 of this report (Appendix A). Multiple processing runs were conducted, with each run having differing processing parameter that influence the creation of points, linears and worms. The processing parameters utilised to produce the final MSED imagery presented in this report are displayed in Table 1. The derivative and continuation grids utilised in calculating MSED points, linears and worms are provided in the accompanying digital media.

Table 2 MSED processing parameters

Dataset	Number of continuation levels	Maximum continuation height	Max distance between points	Min points to form worms
Magnetic	20	5000 m	50 m	3
Gravity	20	3700 m	100 m	3

Imagery produced from the points and worms processing sequences of MSED are displayed in Figure 3. Points and worms have been colour coded according to the amplitude of the calculated points or worms.

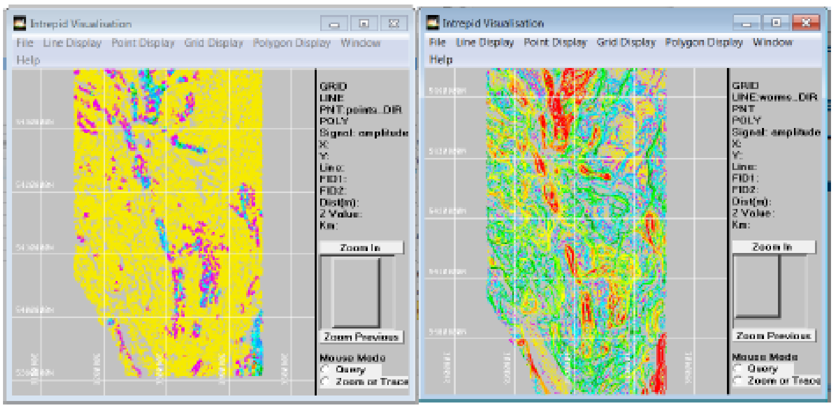


Figure 3 Edge points (left) and worms (right) formed using the MSED technique on magnetic potential field data

4. Results

Results of MSED processing are provided in Appendix B as 2D maps and in the accompanying digital media as ERMapper grids. 3D model are provided in digital format suitable for viewing in ArcScene. It was noted that the higher resolution magnetic data resulted in the imaging of a greater number of worms at depth when compared to processing of gravity data.

4.1 Magnetic Worms

Worms produce from MSED processing and the high density subsurface bodies imaged from unconstrained modelling are displayed in Figure 4.

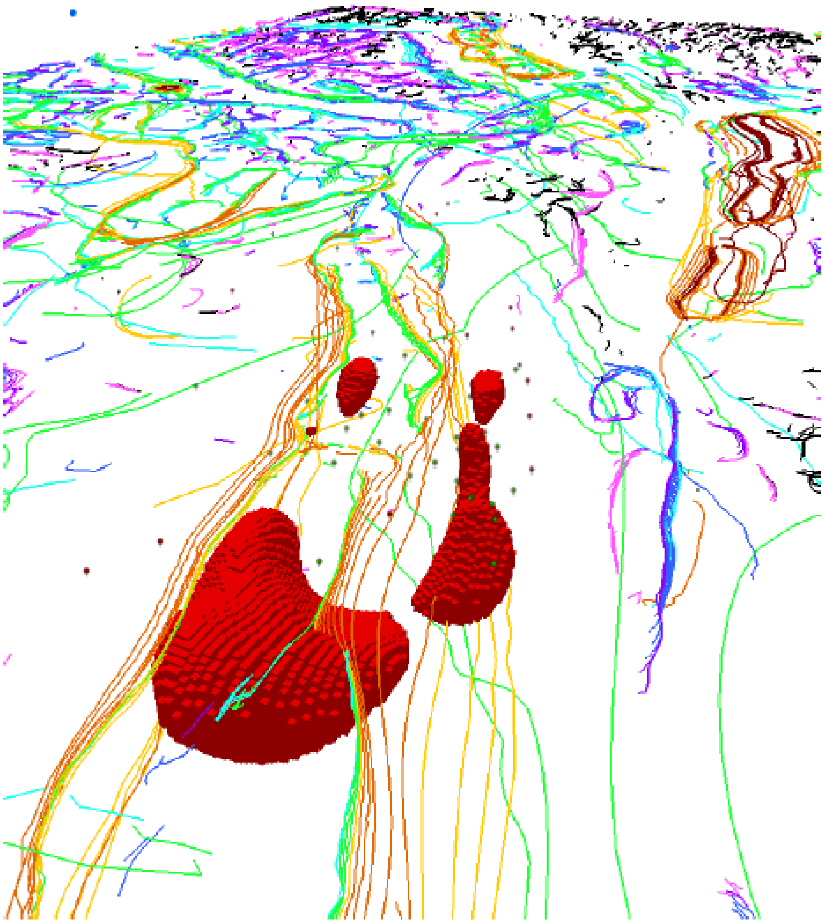


Figure 4 Imagery displaying high density subsurface bodies produced from unconstrained modelling and works from MSED processing

High amplitude magnetic worms in the study area trend from the north to northwest (Figure 4). These dominant structures are cut by lower amplitude structures trending to the west. The largest of the high density subsurface bodies is spatially located within two north-northwest trending sub vertical structures that extend to a significant depth (> 5km). These structures spatially correlates with thrust faulting identified in 25K geological mapping, although mapping identifies only one fault structure through the area.

The large eastern high density body that is situated in close proximity to Murray's Reward is cut by the sub-vertical eastern fault structure interpreted from magnetic worms (Figure 5). This structure bi-sects the body at a depth of approximately 300 m. A small scale surficial fault is identified a short distance to the east of the body that trend north-northwest.

The smaller north-eastern high density body is located to the east of this main fault structure and is located within the Balfour Copper Belt (BCB) that extends to the north-northwest. The BCB displays a strong spatial correlation with the dominant structures identified from magnetic MSED processing. The small north-western body is located within the main fault structures that encompass the largest high density body.

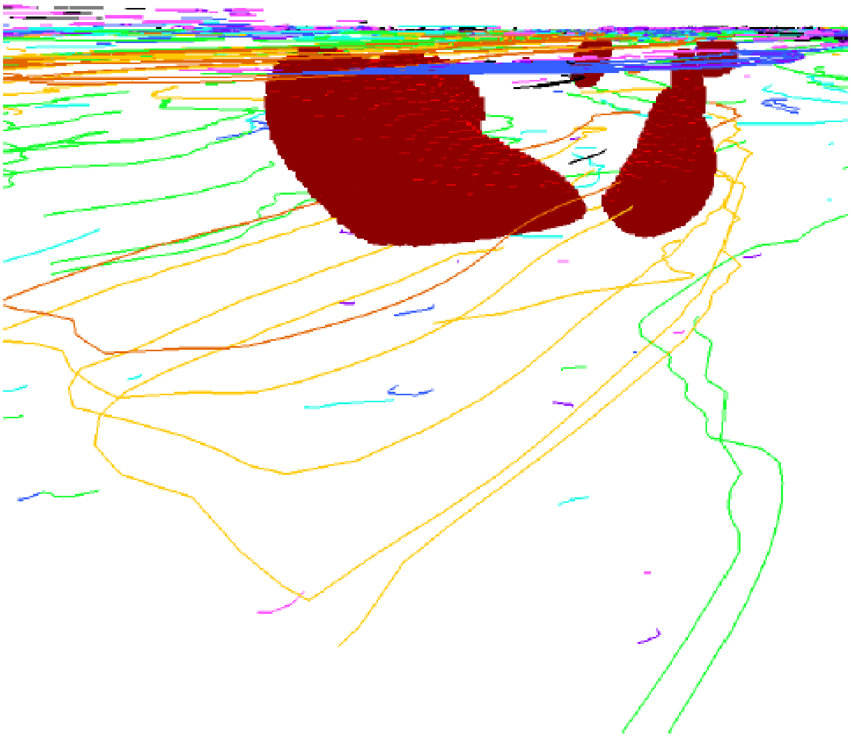


Figure 5 Subsurface view high density bodies and magnetic worms

4.2 Gravity Worms

Although gravity data over the Balfour areas was of high resolution the remainder of the study area contained low resolution gravity data only. As such, the number of worms resulting from MSED of gravity data was significantly less and that resulting from the processing of magnetic data. Secondly, the gravity worms identified were restricted to the near surface.

The large north trending structure to the west of the largest high density body spatially correlates with the major western structure identified from magnetic MSED processing. This structure extends the entire length of Exploration Lease 14/2010. A smaller scale north-northwest trending structure bisects the two eastern high density bodies. A number of small fault structures are located in close proximity to these bodies, their form and number indicates that the geology in this area is highly complex (Murray's Reward and Central).

Gravity derived worms display a high proportion that are trending to the west or west-northwest. As deposits in the area are structurally controlled and are often located on fault intersections, these worms provide valuable information when compared with magnetic data to identify these fault intersections that are often proximal to mineralisation.

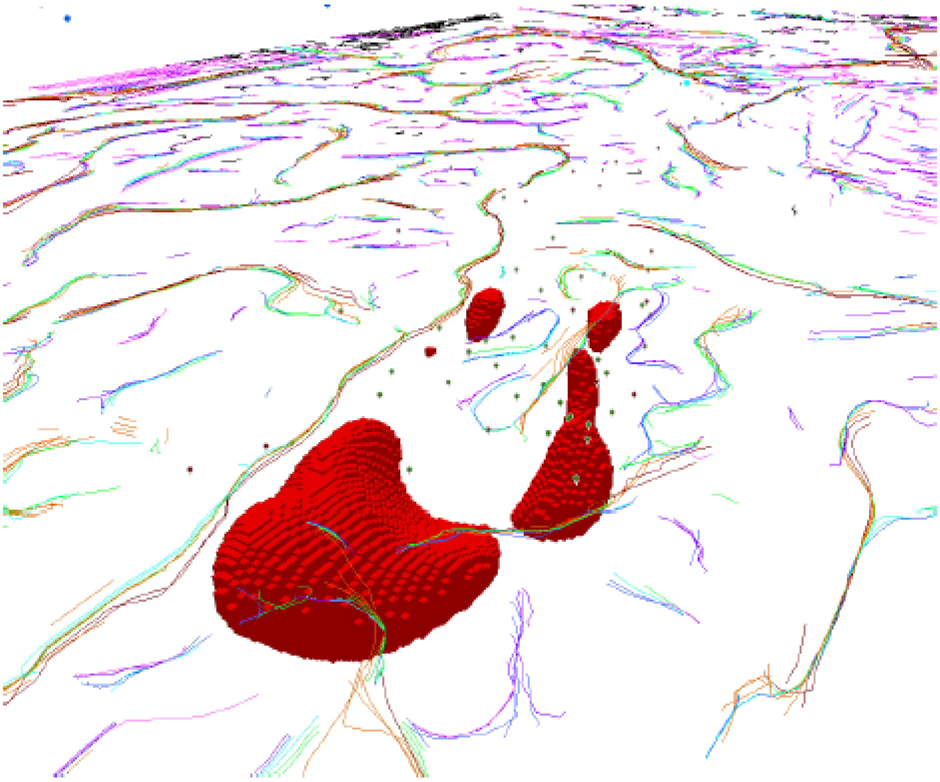


Figure 6 High density subsurface bodies and worms constructed from gravity data

5. Discussion and Recommendations

5.1 Geological Overview

The Balfour Copper Belt (BCB) is a 2 km wide corridor that runs for 35 km in a NNW trending direction. The BCB is interpreted as a complex shear zone in the RCE that is Devonian of age, and likely formed as a result of the Tabberabberan Orogeny. Blebs and stringers of chalcopyrite with secondary sulphides of covellite and chalcocite occur in pyrite-quartz-dolomite gangue that fills NNW trending fractures and splay faults.

The BCB can be divided into western and eastern districts. The western side is comprised of dark carbonaceous siltstone with anomalous Cu pyritic beds, the eastern successions consists of pale carbon poor siltstone beds. A complex deformational history is apparent from small scale folds, faults, vein formations, extensive fracturing and multiple brecciation phases.

5.2 Discussion

Multiscale edge detection analysis has been highly effective at highlighting the major and secondary structural controls on mineralisation in the Balfour region. This structural control will provide significant additional constraint to subsequent phases of geophysical modelling of density anomalies identified at the Balfour Prospect.

Magnetic MSED worms indicate that an alternative geometry for the Balfour Shear Zone is likely. Two major sub vertical to slightly overturned faults striking approximately north-south and extending to a depth of several kilometres appear to define the western and eastern boundaries of the modelled density anomalies.

Gravity MSED worms indicate a series of smaller more shallowly westward dipping thrust faults trending approximately north-south run parallel to and terminate against the eastern fault of Balfour Shear Zone. These faults appear to constrain the strike location of copper lode and supergene mineralisation between the Clump in the north and Murray's Reward to the south.

Gravity MSED worms also indicate that a series of east-west oriented, NNE dipping faults (possibly syntectonic to the Balfour Transform) transect the eastern most fault splays of the Balfour Shear Zone. Copper mineralisation at Murray's Reward, Emmet's, Central, Development, Blocks and Clump all appear to be coincident with transform faults that intersect the major eastern fault of the Balfour Shear Zone.

The consistent association of cupiferous and tin-tungsten mineralisation at the intersection of transform faults with the Balfour Shear Zone and associated fault splays is anticipated to represent a valuable targeting tool to identify additional zones of mineralisation along the strike extent of the Balfour Shear Zone.

5.3 Recommendations

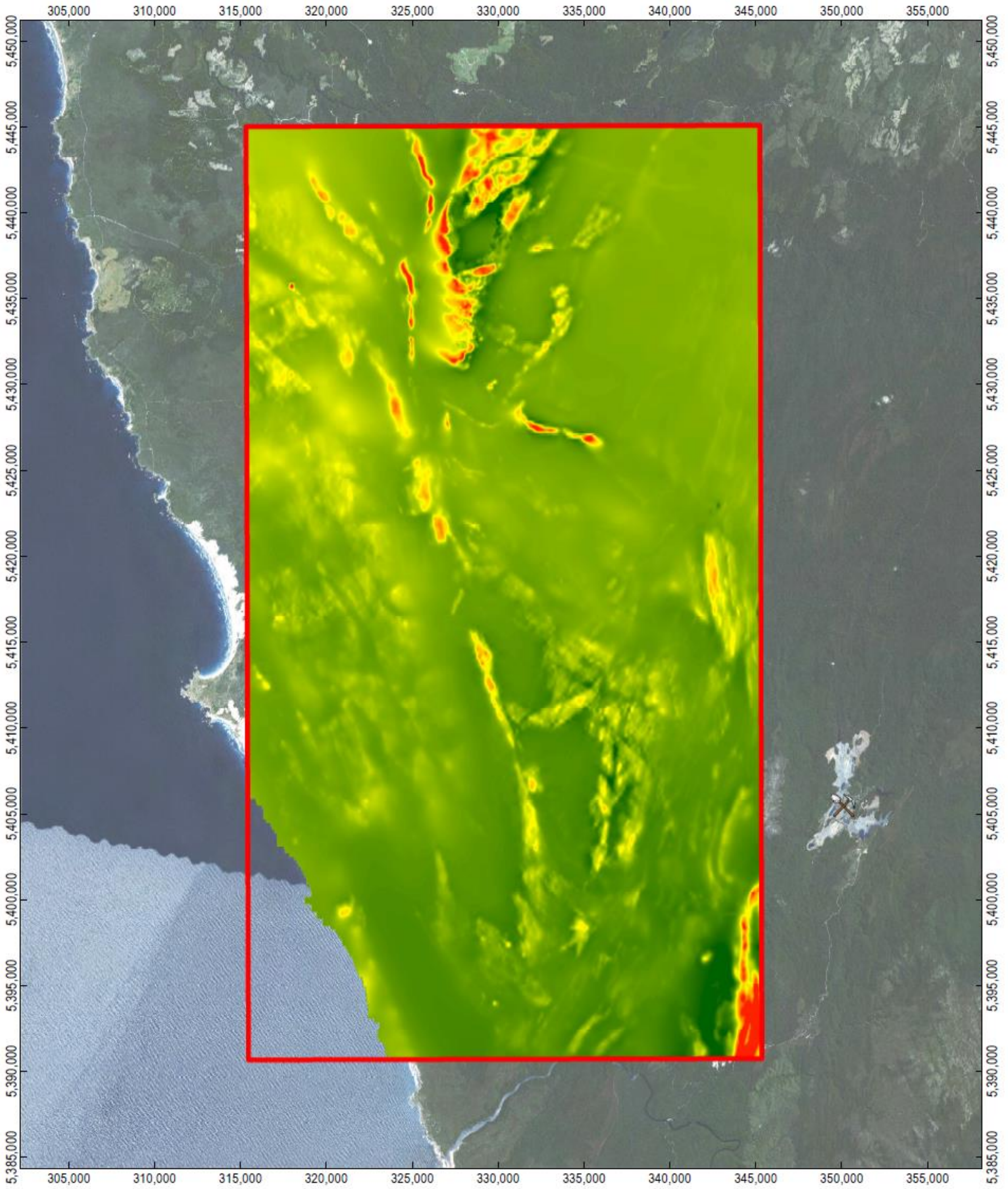
MSED worms have provided significant additional insight into the geometry and structural/genetic controls on mineralisation, both for remobilised copper lode/vein deposits and also for the deeper density anomalies that may represent VMS targets.

This MSED data is currently being incorporated into the 2D gravity and magnetic forward modelling works being performed by GHD.

While it is anticipated that detailed 2D gravity and magnetic forward modelling will largely inform the direction of ongoing exploration activities at the Balfour Prospect, the following recommendations are likely to be recommended:

- Detailed surface and underground structural and geological mapping to further constrain fault splay geometry responsible for copper lode and vein-hosted mineralisation, and to better constrain host unit distribution in area.
- Development of a revised geological map incorporating the above along with a revised structural interpretation of the MSED data.
- Investigate the technical and financial feasibility of IP and or Electromagnetic surveys to image the deep density anomalies identified during gravity and magnetic modelling.
- Development of a drill plan to examine the identified anomalies.
- Analysis and interpretation of MSED and potential field data along the full strike extent of the Balfour Shear Zone to identify other zones prospective for similar styles of mineralisation, and where applicable, perform additional unconstrained gravity and magnetic inversions in these areas.

Appendix A – Potential Field Imagery



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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Client Name: Geoff Summers and Morris Hansen
Project Name: Balfour Area Prospectivity

Job Number | 32-17626250
Revision | A
Date | 26 Mar 2015

Figure A1 Magnetic potential field imagery

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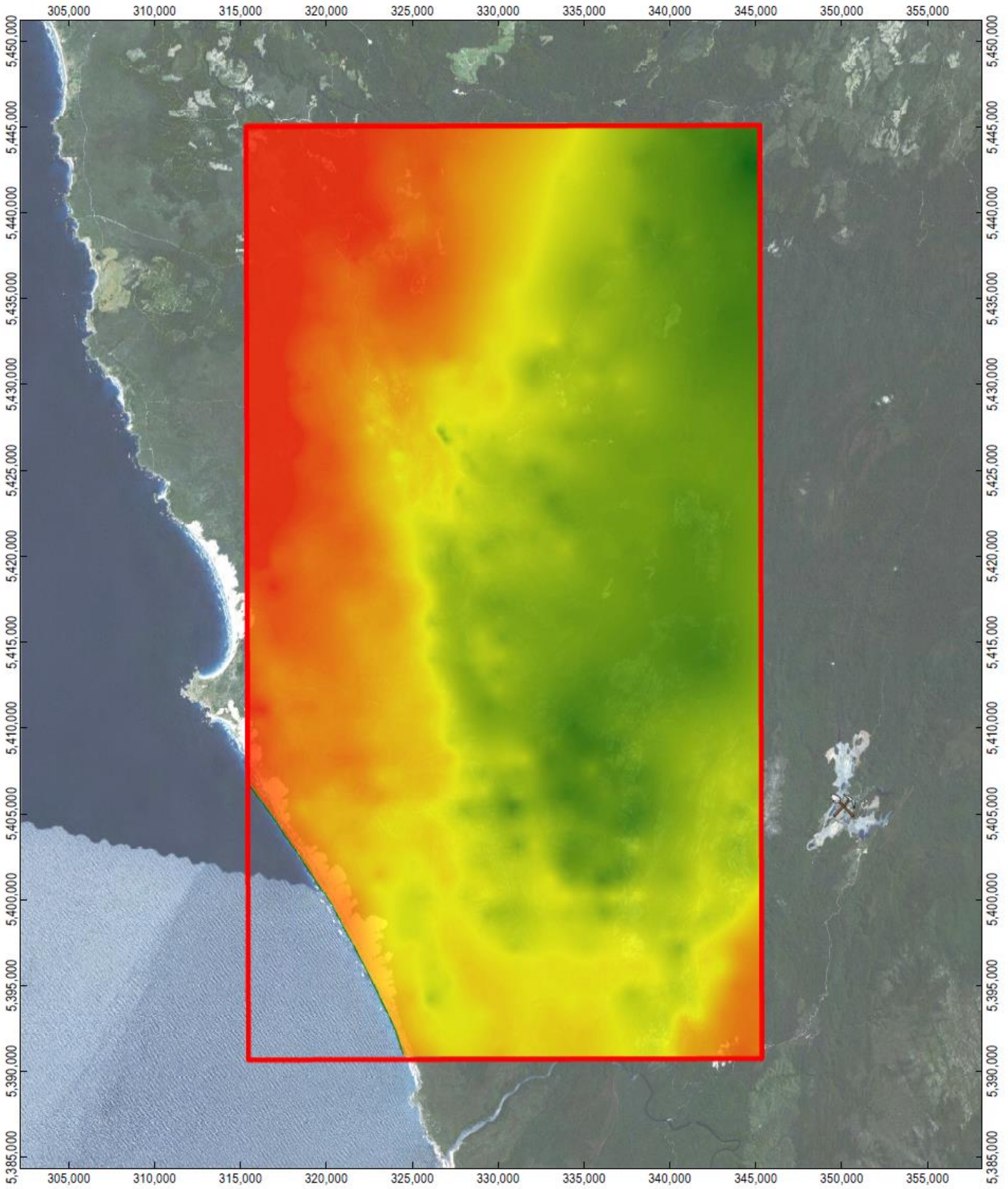

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Figure A2 Gravity potential field imagery

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Data source: Created by:au

Appendix B – Worms Derived from MSED

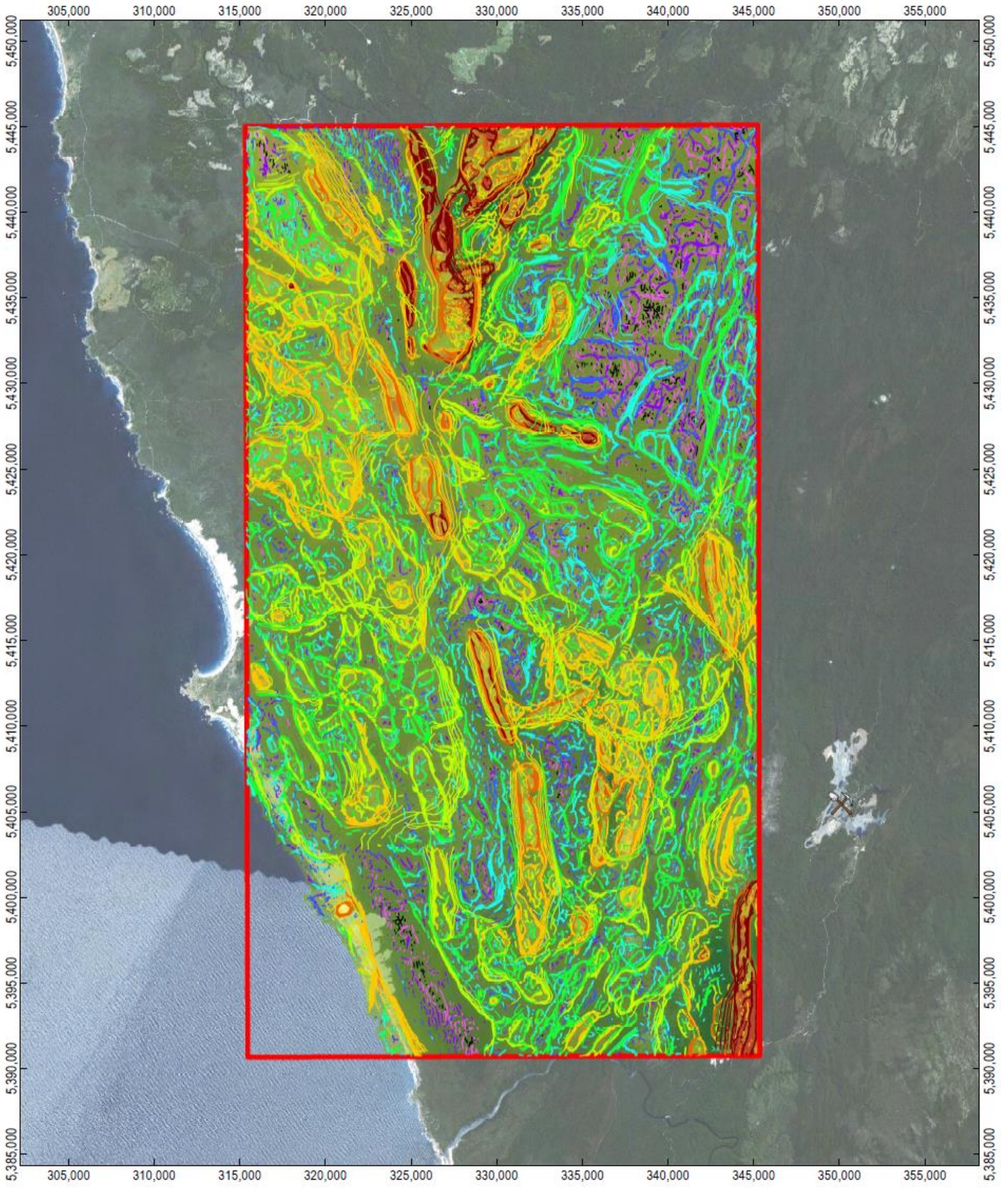

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Figure B1 Magnetic worms over magnetic imagery

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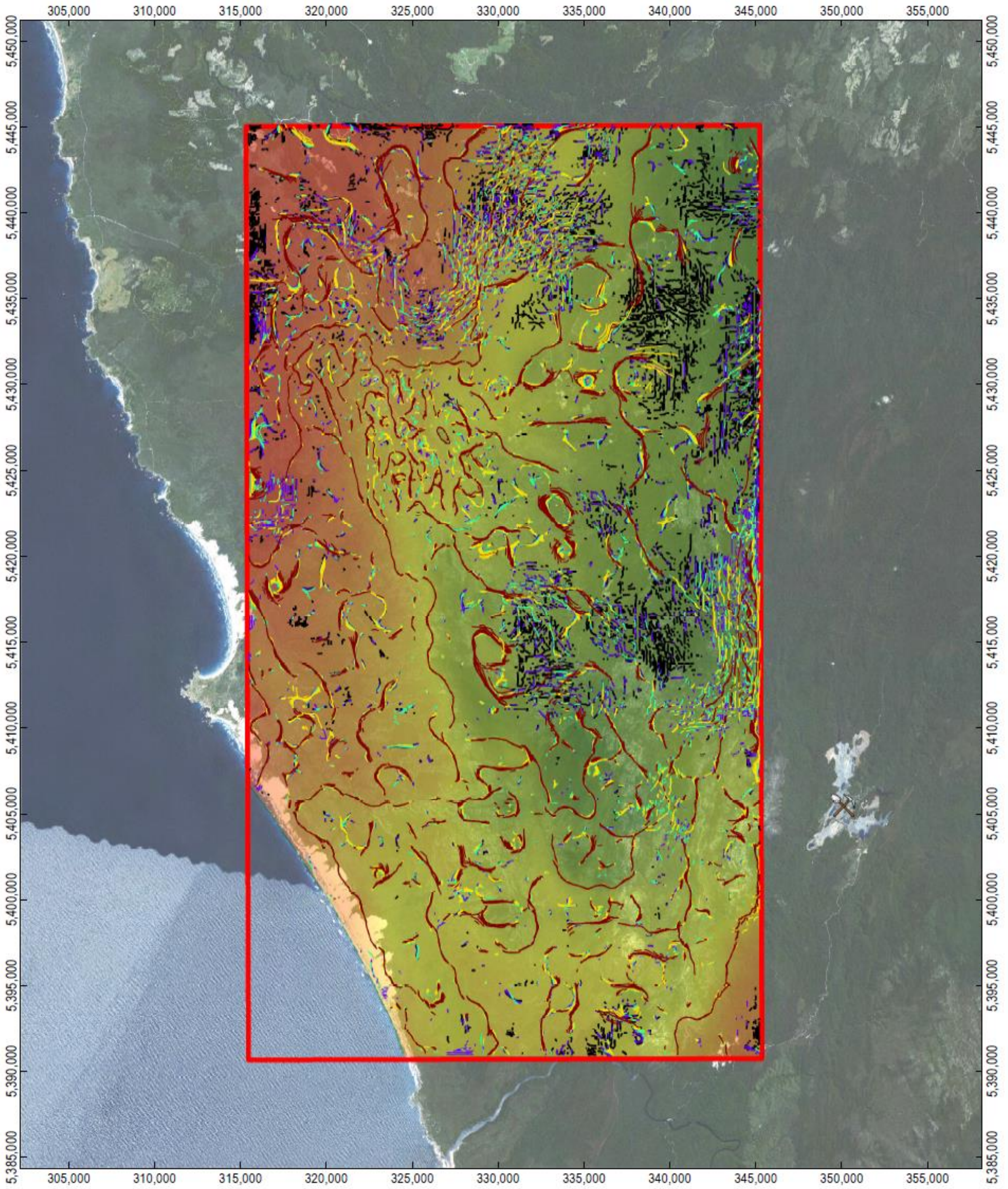

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Job Number	32-17626250
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Figure B2 Gravity worms over gravity imagery

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Data source: Created by:au

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Figure B3 Magnetic worms and high density bodies derived from modelling

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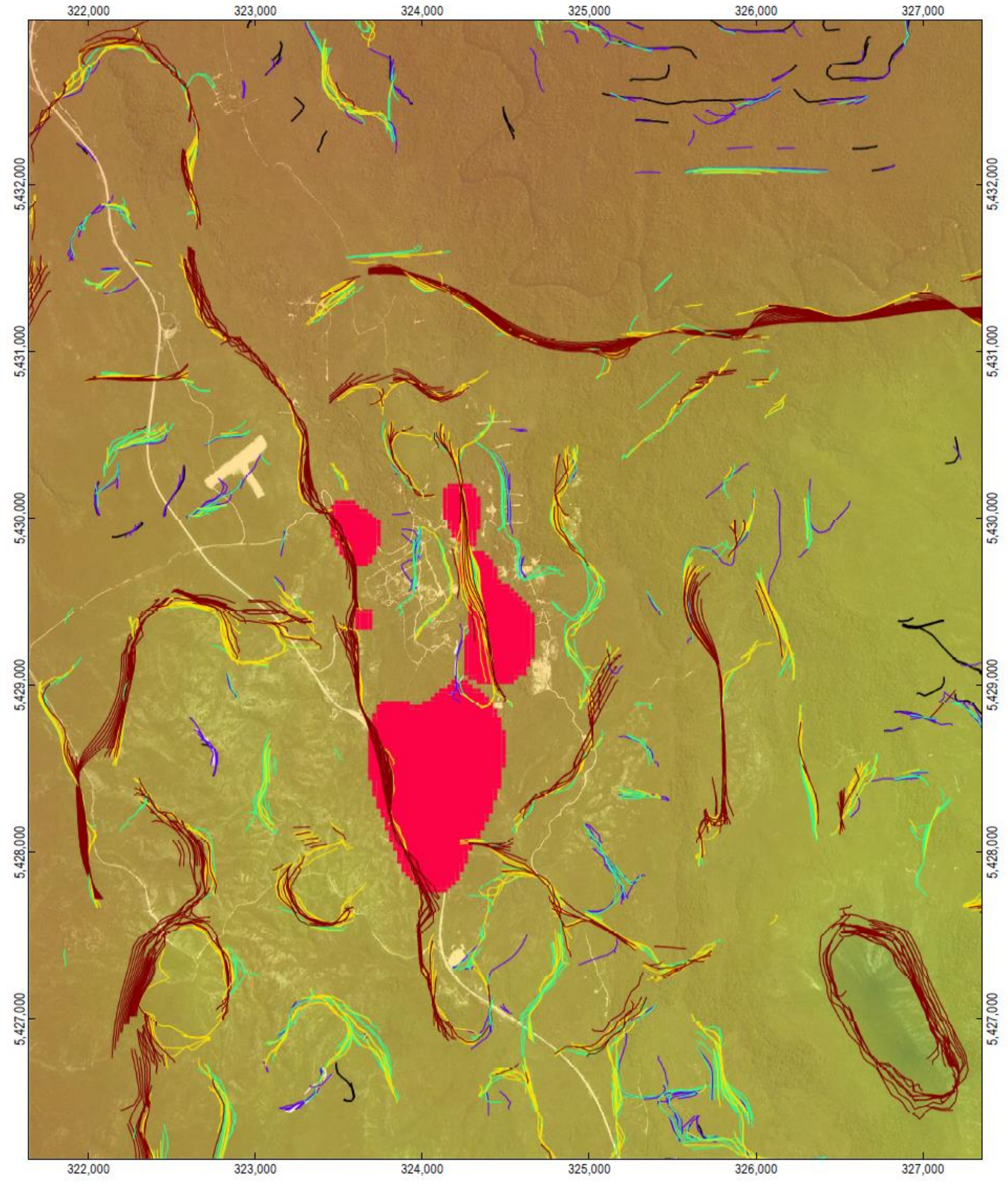
Data source: Created by:au



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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Client Name: Geoff Summers and Morris Hansen
Project Name: Balfour Area Prospectivity

Job Number	32-17626250
Revision	A
Date	27 Mar 2015

Figure B4 Gravity worms and high density bodies derived from modelling

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Data source: Created by:au

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	M. Anderson	H. Tassell		N. Gunadasa	On File	26/02/2015

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Appendix 4

Balfour Area Prospectivity Review 2D Forward Modelling - Factual Report

Geoff Summers and Morris Hansen

Balfour Area Prospectivity Review

2D Forward Modelling - Factual Report

April 2015

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Figure index

Appendices

1. Introduction

1.1 Background

GHD were commissioned by Geoff Summers and Morris Hansen (GM&MH) to conduct Structural Enhancement Processing and 2D Forward Modelling of Mining Lease 1M/1976 and the recently acquired Exploration Lease 10/2014. Results from Structural Enhancement Processing have been delivered to GM&MH in GHD report document 62518 and accompanying digital files. This document details the finding from the second stage of works, 2D Forward Modelling. It is envisaged that these reports will be utilised in conjunction with existing documentation to assess the prospectivity of the Balfour Area and develop a drilling program.

1.2 Purpose of this report

The purpose of this report is to provide details of the forward modelling processing conducted by GHD and present results in the form of cross sections and digital media. Deliverables from potential field modelling are:

- Digital ERMapper grids of elevation, magnetic and gravity data used for MSED processing
- 2D cross sections depicting observed and calculated potential fields and the interpreted distribution of subsurface lithologies and mineralisation.
- Digital files of the constructed cross section suitable for import into Micromine
- Report detailing methodology, a discussion of results obtained and any recommendations for additional work.

1.3 Scope and limitations

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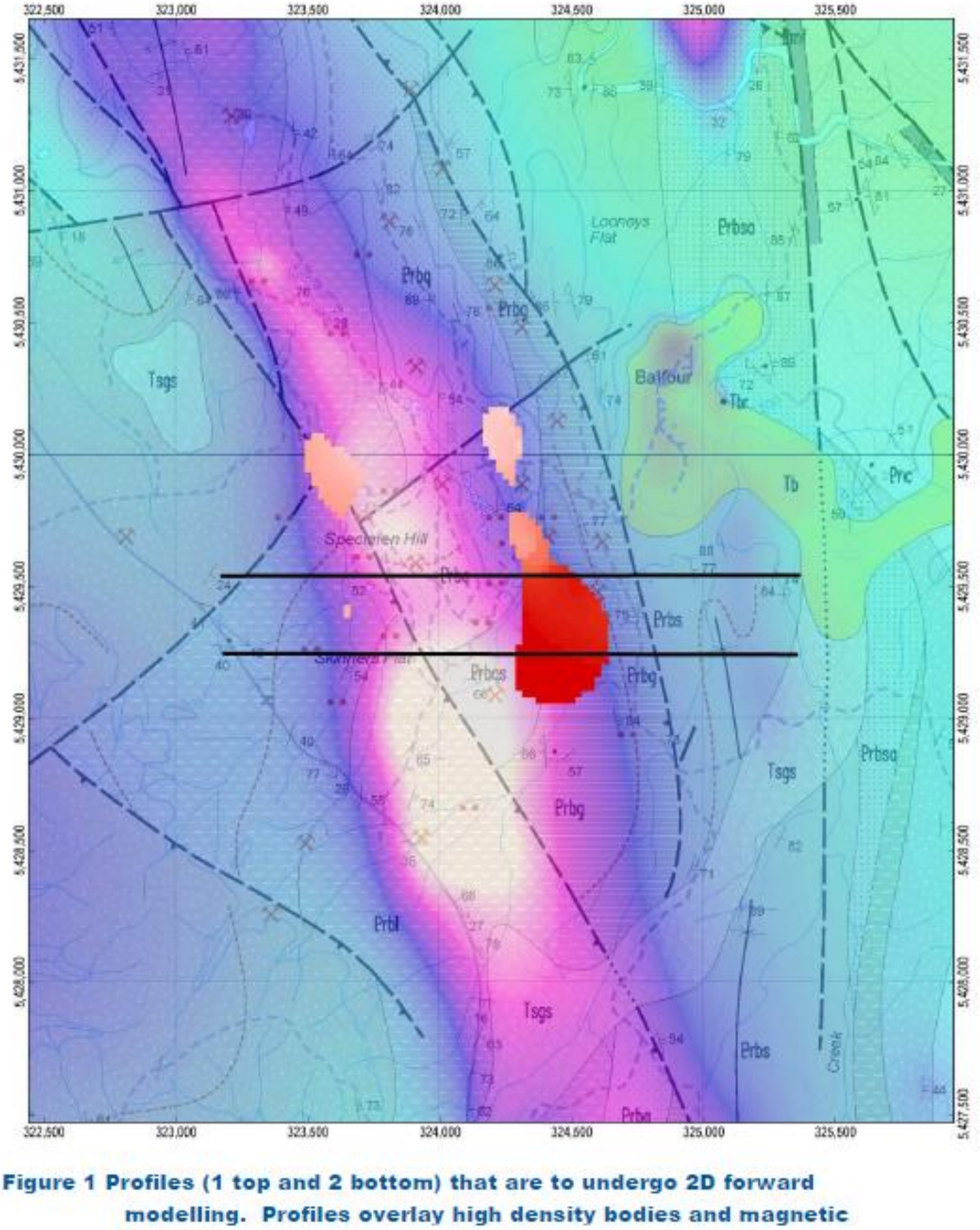

Figure 1 Profiles (1 top and 2 bottom) that are to undergo 2D forward modelling. Profiles overlay high density bodies and magnetic imagery.

2. Data Preparation

2.1 Data Sources

Potential field data collected as part of the Structural Enhancement Processing that preceded this stage of modelling was utilised to conduct 2D forward modelling. This data was collected from all freely accessible data repositories and the highest resolution datasets for the Balfour study area were extracted (MRT and GA). MRT were consulted to identify if any confidential data for Exploration Lease 10/2014 existed (previously owned by Zebs Mineral Pty. Ltd.), unfortunately no such data exists. The following datasets were utilised in the structural enhancement processing:

2.1.1 Magnetic Datasets

- North-west Tasmania 2001 (MRT)
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2.2 Data Processing and Grid Creation

Data preparation included the processing of magnetic and gravity datasets into a form suitable for extraction of a subset for 2D forward modelling. The Geocentric Datum of Australia 94 (GDA94) and the Map Grid of Australia (MGA) projection for Zone 55 are used throughout this report. All datasets using alternate datums and / or projections were reprojected prior to further processing.

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1. Total Magnetic Intensity (TMI, nT), and
2. Bouguer anomaly (mgal), and
3. Digital elevation model

Table 1 Location of the Balfour study area

Location	Easting	Northing
South-west corner	315300	5390700
North-east corner	345250	5445000

Data was extracted from the magnetic, gravity and elevation grids at 25 m intervals along the two pre-defined profiles to be modelled (Figure 1). This data was consolidated into files for each respective profile and formatted for import into the modelling software. Magnetic and gravity data utilised for modelling each profile are displayed in Figure 2 and Figure 3.

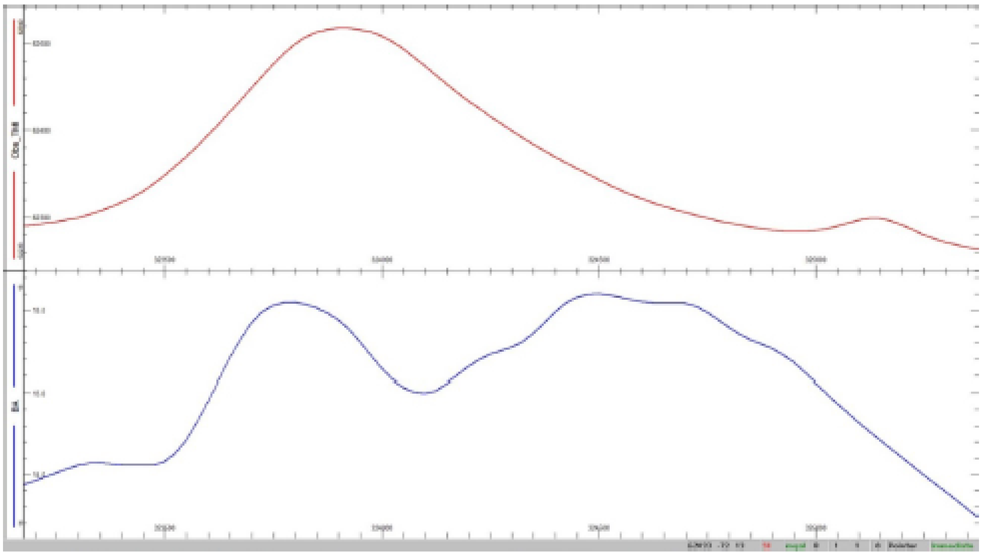

Figure 2 Observed magnetic and gravity data for profile 1

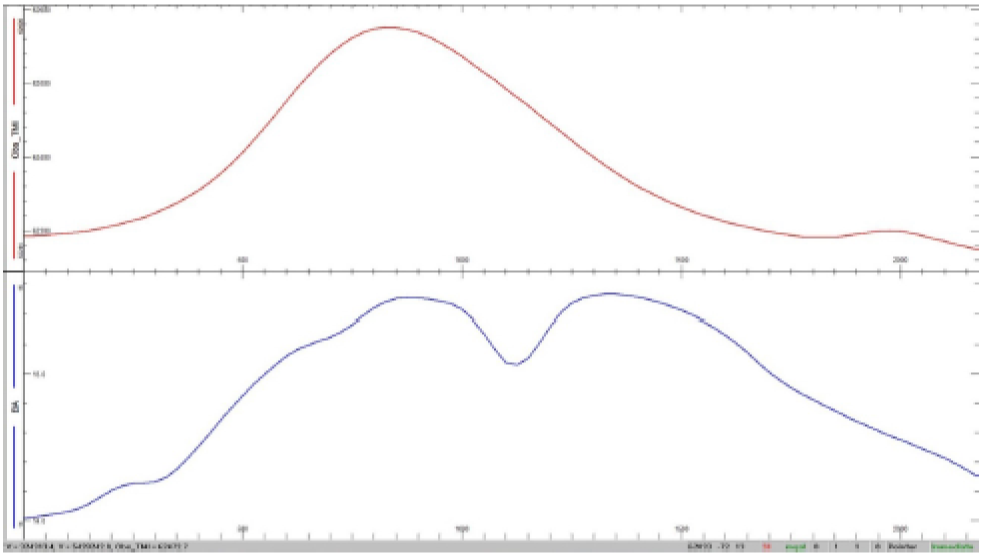

Figure 3 Observed magnetic and gravity data for profile 2

3. 2D Forward Modelling

3.1 Introduction to 2D Forward Modelling

2D forward modelling of potential field data involves the creation of a subsurface cross section where the designated lithologies are assigned density and magnetic susceptibility values that are derived from real world measurements on drill core. Magnetic and gravity potential fields are then calculated and compared to observed values. Modifications are made to the model to minimise the difference between observed and calculated values.

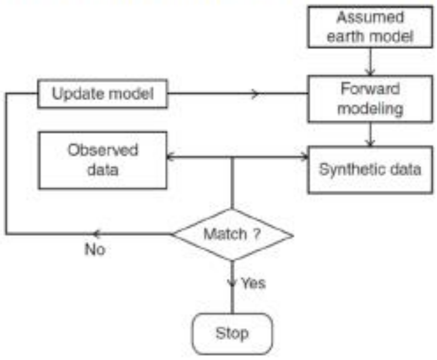

Figure 4 Flow diagram depicting the processing work flow of forward modelling

The ModelVision software package is an interactive geophysical modelling package for the display, analysis and simulation of magnetic and gravity data. The software package supports inversion and forward modelling, with the ability to calculate potential fields in real time. Figure 5 displays screen shots of the forward modelling process with the ModelVision software package.

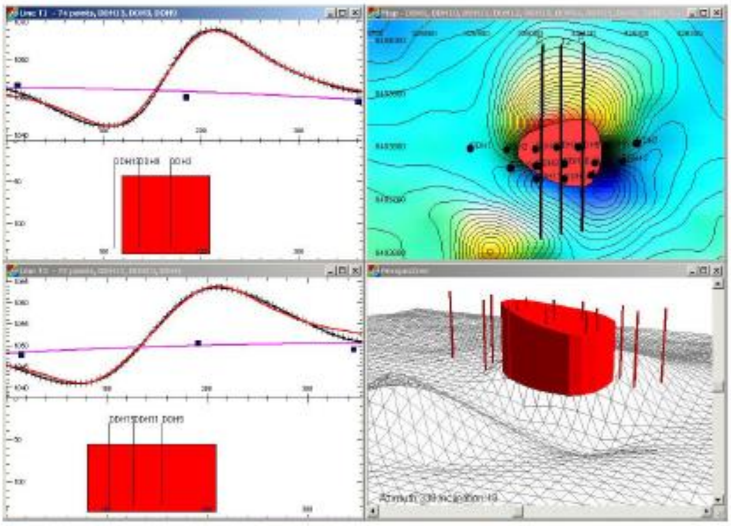

Figure 5 Screen shots of the forward modelling process

3.2 Non-Uniqueness and Equivalent Sources

Key issues that must be taken into account when performing geophysical forward modelling is non-uniqueness and the concept of equivalent sources. In summary, these issues describe how it is possible for the same calculated response to result from a variety of subsurface models, with differing distributions of the physical property in question.

This problem is known as non-uniqueness, and when assessing models produced from an inversion process it is important that the interpreter acknowledges and takes into account that the subsurface model produced is one of many models that could produce the calculated response. It is therefore a process of geological inference based upon other available information to assess the probability that the geophysical model produced is a valid representation of the subsurface geology and target.

Figure 6 displays an example of this effect of "equivalent sources". Three subsurface bodies are shown of differing volumes and geometries. If the physical property (such as density) of these bodies increases with depth it is possible for all three of these bodies to produce an identical response at the surface from a geophysical survey (response indicated by the red line).

It is critical that this uncertainty is taken into consideration when assessing and interpreting results of geophysical inversion.

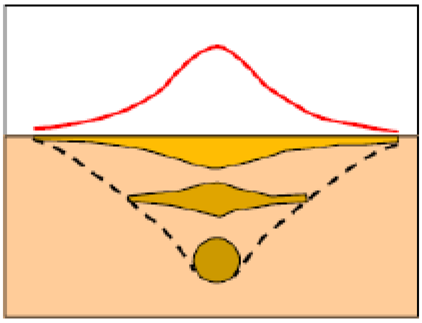

Figure 6 Example of equivalent sources. The same observed anomaly may result from a number of different subsurface bodies.

3.3 Modelling Parameters

2D forward modelling was conducted with a background density of 2.67 g/cm^3 and a background magnetic susceptibility of 0.0 SI. The inducing magnetic field was set at 62033 nT with an inclination and declination of -71.888° and 12.564° respectively derived from the IGRF model (British Geological Survey 2010). 2D forward modelling of potential field datasets was conducted on the two profiles defined in Figure 1. A strike length of 500 m extended perpendicular to the line was set for polygonal bodies in all subsurface models.

Regional fields were not removed from the observed line datasets prior to modelling. Fixed shifts were applied to the regional fields in order to approximately match calculated and observed potential field values. Long wavelength regional trends in the observed gravity values were modelled by increasing / decreasing the depth of basal sequences.

The subsurface was categorised into lithologies as defined in Table 2. Each lithology was assigned magnetic susceptibility and specific gravity values based on drill core measurements and available documentation. Table 2 also displays the colours that have been used to construct lithological bodies in the forward modelling process.

Table 2 Magnetic susceptibility and specific gravity values utilised for each lithology during the modelling process

Lithology	Magnetic susceptibility (SI x10^{-3})	Specific Gravity	Model Colour
Chloritic siliceous siltstone (CSS)	0.001	2.650	
Chloritic mudstone (CM)	0.2537	2.745	
Quartz (Qtz, variably metamorphosed)	0.287	2.700	
Mineralisation	0.185	2.846	
Siliceous to carbonaceous wavy siltstone (SCWS)	0.363	2.842	
Medium grained siltstone (MGSS)	0.275	2.600	
Siliceous laminated graphitic siltstone (SLGS)	0.272	2.550	
Siliceous laminated graphitic siltstone (SLGS)	0.272	2.694	
Deep seated magnetic unit	300	2.770	

3.4 Model Sensitivity

Model sensitivity was explored by systematically altering the shape, magnetic susceptibility and specific gravity of each lithological body in the constructed models. It was noted that the observed magnetics could not be explained by the magnetic susceptibility values of sampled drill core. It was found that a similar magnetic response could be explained by a deep west dipping structure with high magnetic susceptibility values, this is consistent with the large wavelength magnetic variation in observed magnetic data.

In terms of gravity, the model is relatively sensitive to the size and geometry of the mineralised and SCWS bodies due to their high specific gravity values. The western gravity anomaly is largely interpreted as a response from the SCWS unit and the eastern gravity anomaly a result of the mineralised and CM units.

4. Results

Results from the 2D Forward Modelling process are presented in Appendix A and are provided in digital format in the digital media accompanying this report. ModelVision channels are displayed in the lower right corner of the constructed cross sections. Black lines represent the observed magnetic (TMI) and gravity (Bouguer BA) values along the each profile. The blue and red lines represent the calculated gravity and magnetics respectively. These calculated values are based on the bodies present in the constructed cross sections.

Two gravity highs are observed along profile 1 (Appendix A1). The western gravity anomaly (left side) is at its maximum value at ~600 m along the profile and is relatively narrow in extent. This anomaly was successfully modelled by the dense SCWS unit and the deep seated magnetic unit. The magnetic unit is the dominant unit affecting the calculated curve of the magnetic data.

The eastern gravity anomaly (right side at ~1400 m) displays a longer wavelength form and appears bi-modal in nature. This anomaly spatially correlates with the most prospective subsurface body identified from inverse modelling of gravity data in stage 1 of the Balfour Prospectivity works. The bimodal nature of this anomaly is modelled by the mineralised unit and the CM unit, which both share elevated specific gravity relative to other lithologies. It should be noted that the extent and geometry of these units is very subjective due to them sharing similar petrophysical properties.

Unit boundaries are generally sub-vertical although shallower dipping boundaries in the east of the section are observed dipping to the west at depth. The mineralised body is interpreted to be positioned within one of these dipping structures adjacent to the variably metamorphose quartz sequence.

Profile 2 (Appendix A2) displays very similar observed magnetics to profile 1, although the maximum amplitude of the anomaly has shifted in an easterly direction. The observed magnetic anomaly is closely matched by the calculated magnet response from the deep seated magnetic unit that dips steeply to the west. The observed western gravity anomaly has also shifted towards the east, this is consistent with the deep seated magnetic unit providing an excess of mass that together with the dense SCWS unit produces this gravity anomaly. The eastern gravity anomaly does not appear bimodal in profile 2 but overlaps with the western anomaly.

The mineralised unit in both profiles is imaged as dipping steeply to the west along unit boundaries. An increase in volume of the mineralised unit at a depth of ~100 m is supported by the calculated data relative to the observed gravity data. Short to medium wavelength variations in the gravity anomaly suggest that increases in density are not surficial or at great depth.

5. Discussion and Recommendations

5.1 Discussion

The forward modelled sections display close fitting calculated potential field data when compared to observed data. Petrophysical measurements from drill core data used to assign values to lithologies was sufficient to model gravity trends but was unable to account for large scale long wavelength magnetic variations. As such, a deep seated magnetic body was added to the section based on magnetic observations.

No magnetic contrast between the mineralised unit and remaining units was observed. This resulted in the geometry of the mineralised bodies being derived solely from observed gravity data. The high density and close spatial positioning of the CM unit further complicated the assigning of geometry for the mineralised and CM units, and increases the possibility of effects from non-uniqueness.

2D forward modelling suggest that a high density body lies in the near subsurface in the region of the gravity anomaly, this region spatially correlates with subsurface bodies identified from inverse modelling in earlier works conducted by GHD.

5.2 Recommendations

2D forward modelling supports the presence of a high density body (ore bodies) in the near subsurface. The shape and form of the interpreted mineralisation (i.e. lode / vein / brecciated) is now of critical importance. GHD recommends a discussion of the following options as the next course of action:

- Development of a drill plan to examine the identified anomalies.
- Detailed surface and underground structural and geological mapping to further constrain fault splay geometry responsible for copper lode and vein-hosted mineralisation, and to better constrain host unit distribution in area.
- Development of a revised geological map incorporating the above along with a revised structural interpretation of the MSED data.
- Investigate the technical and financial feasibility of IP and or Electromagnetic surveys to image the deep density anomalies identified during gravity and magnetic modelling.
- Analysis and interpretation of MSED and potential field data along the full strike extent of the Balfour Shear Zone to identify other zones prospective for similar styles of mineralisation, and where applicable, perform additional unconstrained gravity and magnetic inversions in these areas.

Appendix A – 2D Models

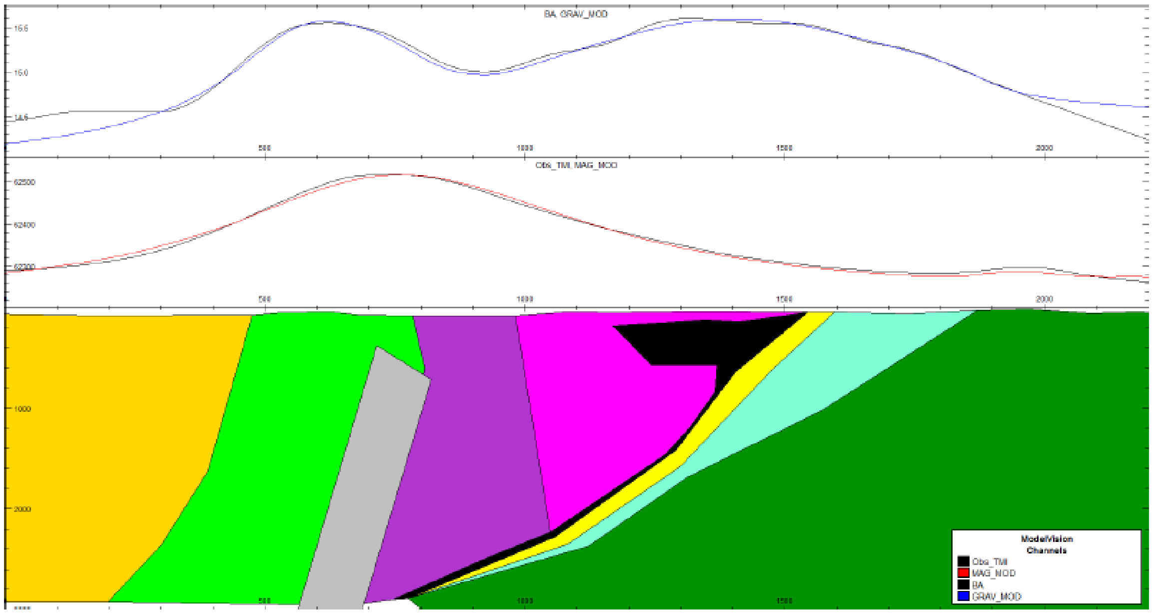

Figure A1 Calculated and observed potential field data (top) and the constructed subsurface model (bottom) for profile 1

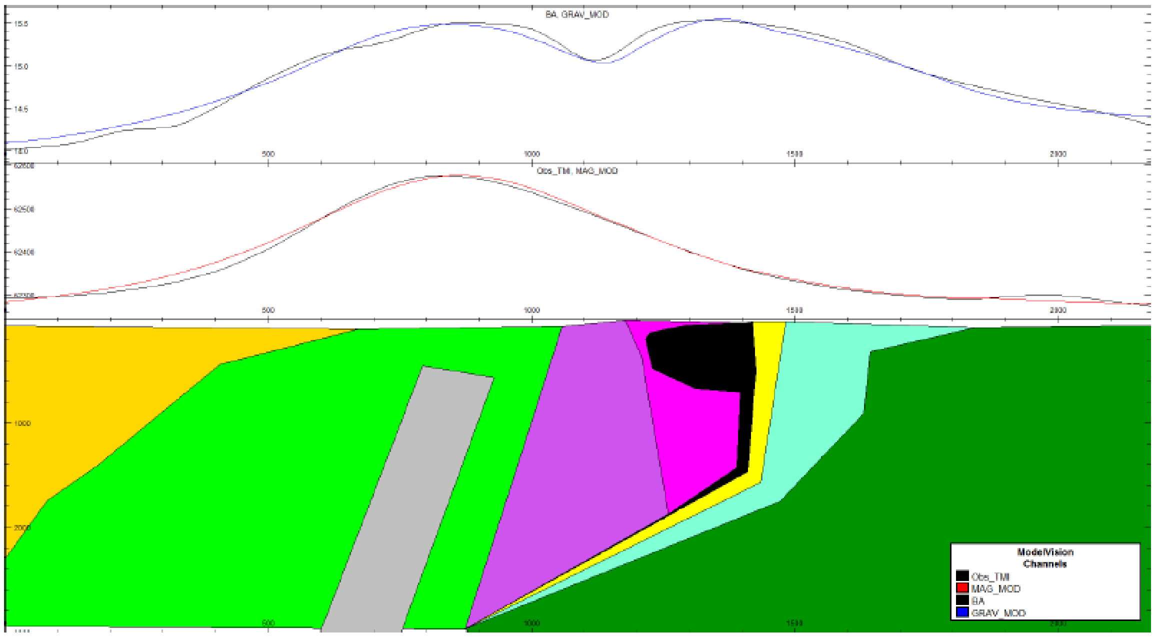

Figure A2 Calculated and observed potential field data (top) and the constructed subsurface model (bottom) for profile 2

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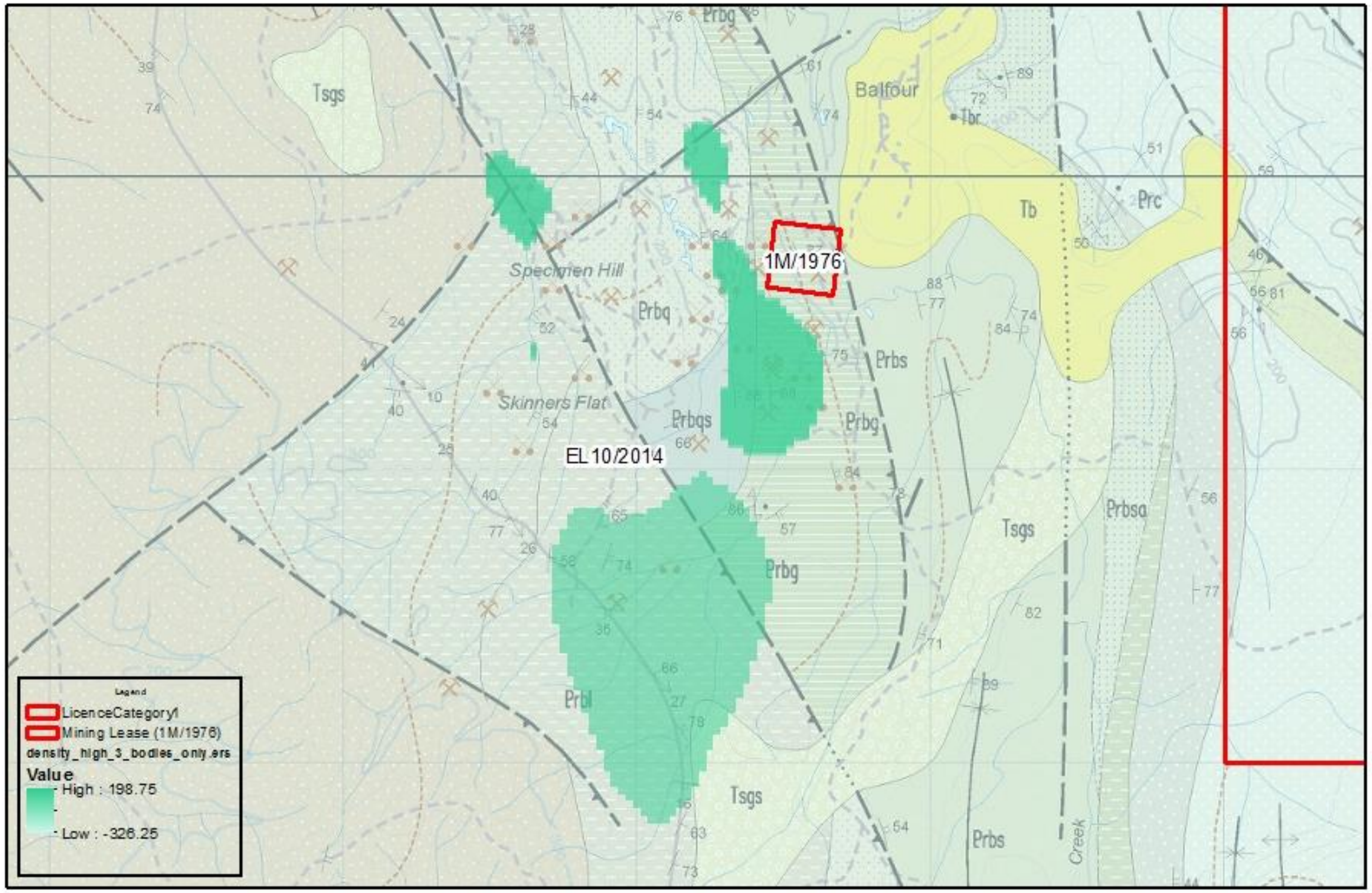
Plan A

General Geology and Geophysical Anomalies

Balfour Region – Western Tasmania



General Geology and Geophysical Anomalies

Balfour Region - Western Tasmania

N

0 125 250 500 750 1,000
Meters

Coordinate System: GDA 1994 MGA Zone 55
Central Meridian: 147°0'0"E