96:3954

322001

PASMINCO EXPLORATION
WHYTE RIVER EL 49/94
JOINT VENTURE
ANNUAL REPORT
PERIOD ENDING OCTOBER 1996

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- Melbourne
MPI Pty Ltd - Perth

Submitted by: NKM Gunnigle

Accepted by:

BURNIE
December 1996

LIST OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

SUMMARY

Exploration in Whyte River EL 49/94 during the period December 1995 - November 1996 included the compilation of a regional database, review of all past exploration data, reconnaissance field work and the acquisition of an aeromagnetic survey in conjunction with adjacent EL's 17/93 (Luina) and 48/94 (Waratah) and brief field visits.

The Whyte River-Waratah area contains historical discoveries of lead-silver, tin, copper and iron. A review of previous work in the Whyte River area suggests skarn style mineralisation about the contact between the Meredith Granite and the Ordovician Gordon Limestone, however, this theory remains untested.

Further exploration including detailed geology and geochemistry is recommended for the following year to follow up recent aeromagnetics.

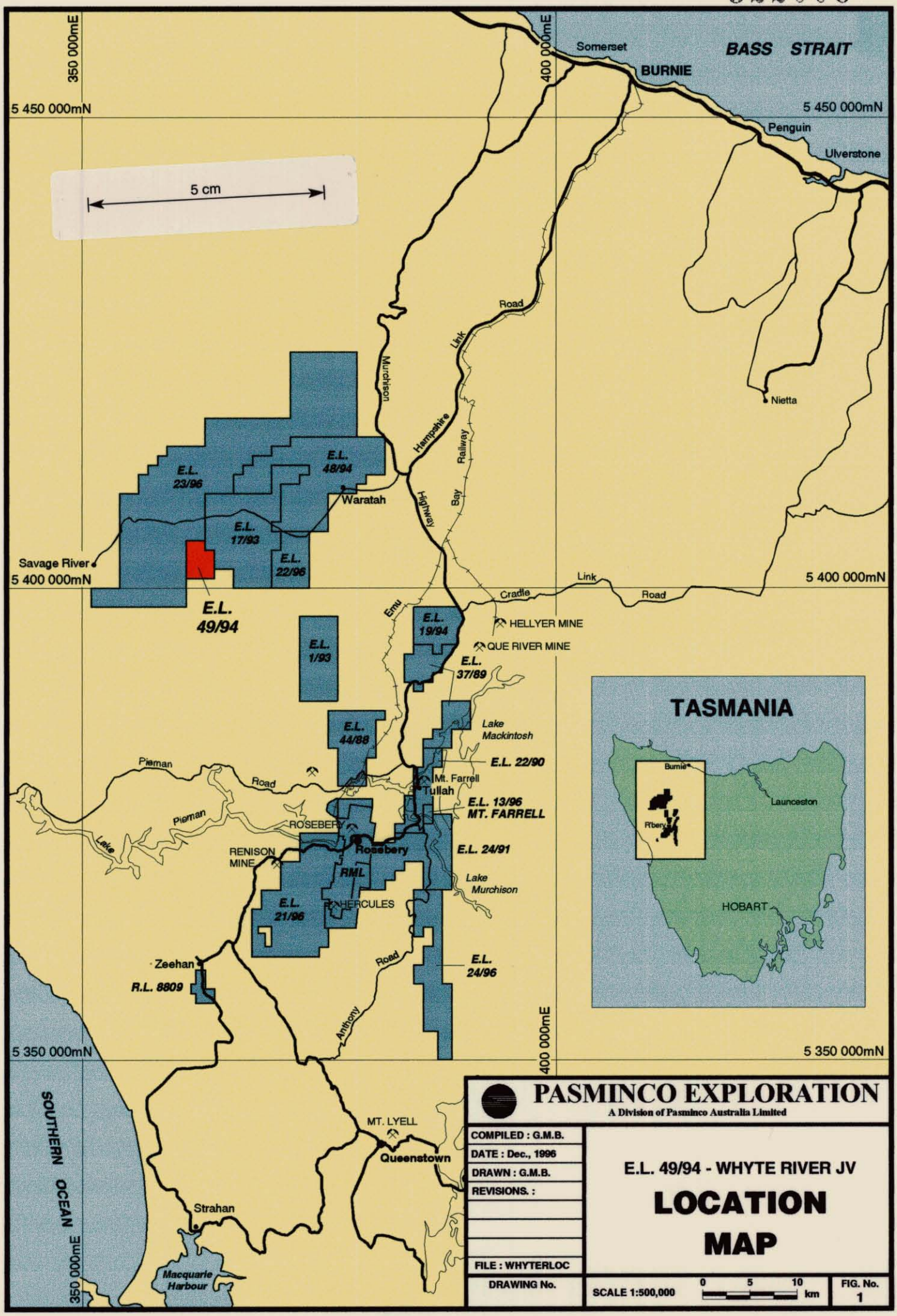
1. INTRODUCTION

Whyte River EL 49/94 covers 11km^2 of rugged and forested terrain located 4km southwest of the site of the old Luina township (Figure 1). The EL has been managed by Pasminco in conjunction with Luina EL 17/93, which lies to the immediate east of the tenement, in Joint Venture Agreement with MPI Gold Pty Ltd since April 1996. This first Annual Report for Whyte River EL 49/94 covers the period from December 1995 to November 1996. Work completed in this period includes review of past exploration data, reconnaissance field trips and acquisition of a regional aeromagnetic survey. Much of this work has been carried out concurrently with EL 17/93.

Numerous small base metal and tin shows are identified in the area. The Godkin and North Godkin Pb-Ag lodes are located just to the north of the EL boundary. Base metal mineralisation in the area appears to be hosted by Precambrian and Cambrian volcano-sedimentary sequences, with all reported occurrences being vein-style.

Most of the land in the EL area is Deferred Forest Crown Land. The Mt Ramsay RAP is located on the southeastern boundary. Whyte River EL 49/94 is accessible via the Mount Stewart track which is located to the west of the EL, south of Waratah Road. Much of the area is accessible only by foot.

322005

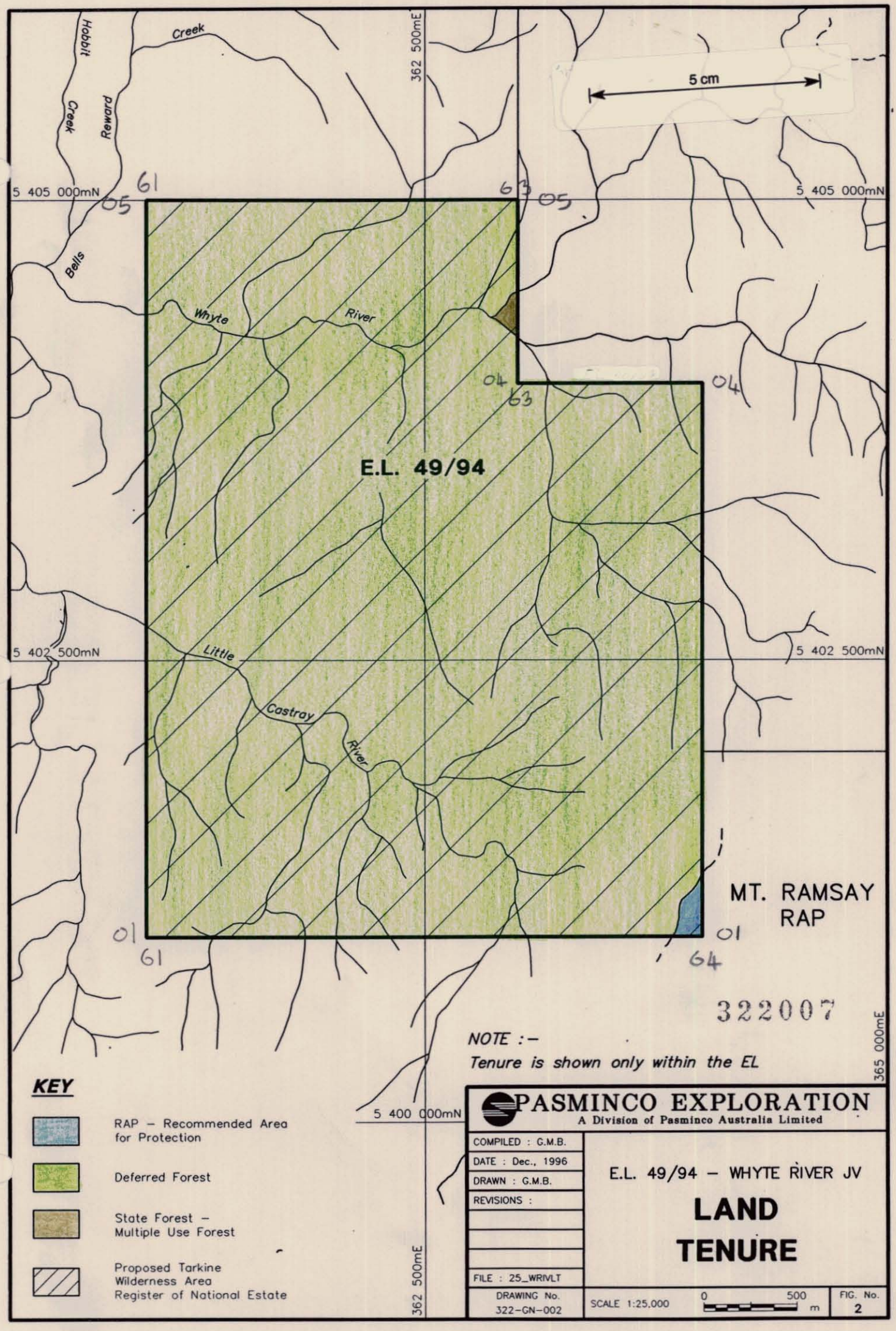

350 000mE
400 000mE
5 450 000mN
5 400 000mN
5 350 000mN
Somerset
BURNIE
BASS STRAIT
Penguin
Ulverstone
Nietta
5 cm
Murchison Highway
Hampshire Hills Link Road
Railway
Bay
Waratah
Savage River
E.L. 23/96
E.L. 48/94
E.L. 17/93
E.L. 22/96
E.L. 49/94
E.L. 1/93
E.L. 19/94
E.L. 37/89
E.L. 44/88
E.L. 22/90
E.L. 13/96 MT. FARRELL
E.L. 24/91
E.L. 21/96
E.L. 24/96
Emu
Cradle Link Road
HELLYER MINE
QUE RIVER MINE
Lake Mackintosh
Pieman Road
Mt. Farrell
Tullah
ROSEBERY
Rosebery
RENISON MINE
RML
HERCULES
Lake Murchison
Zeehan
R.L. 8809
Anthony Road
TASMANIA
Burnie
Launceston
HOBART
SOUTHERN OCEAN
MT. LYELL
Queenstown
Strahan
Macquarie Harbour
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited
COMPILED : G.M.B.
DATE : Dec., 1996
DRAWN : G.M.B.
REVISIONS. :
FILE : WHYTERLOC
DRAWING No.
E.L. 49/94 - WHYTE RIVER JV
LOCATION MAP
SCALE 1:500,000
0 5 10 km
FIG. No. 1

2. TENURE

Whyte River EL 49/94 was issued to Fodina Minerals Pty (a subsidiary of MPI Gold Pty Ltd) on December 23 1995 for a period of 12 months. A Joint Venture Agreement signed by Fodina, MPI Gold and Pasminco in April 1996 officiated active exploration by Pasminco in EL 19/94 as Tenement Managers. The schedule of the licence area which covers 11km^2 is given in AMG coordinates in Appendix 1.

The land tenure of the area comprises predominantly Crown Land, as non-allocated Deferred Forest Land. The southeastern boundary includes a small part of the Mt Ramsay RAP (Figure 2).

Pasminco has submitted an application for renewal of EL 49/94 for a further 12 month period.


Hobbit Creek
Reward Creek
Creek
362 500mE
5 cm
5 405 000mN
61
05
63
05
5 405 000mN
Bells
Whyte River
04
63
04
E.L. 49/94
5 402 500mN
Little Castroy River
5 402 500mN
MT. RAMSAY RAP
01
61
01
64
322007
365 000mE
NOTE :-
Tenure is shown only within the EL
5 400 000mN
362 500mE
KEY
RAP – Recommended Area for Protection
Deferred Forest
State Forest – Multiple Use Forest
Proposed Tarkine Wilderness Area Register of National Estate
PASMINCO EXPLORATION
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COMPILED : G.M.B.
DATE : Dec., 1996
DRAWN : G.M.B.
REVISIONS :
FILE : 25_WRIVLT
E.L. 49/94 – WHYTE RIVER JV
LAND TENURE
DRAWING No. 322-GN-002
SCALE 1:25,000
0 500 m
FIG. No. 2

3. PREVIOUS EXPLORATION AND MINING

A comprehensive bibliography of reports on previous exploration in the Waratah area is reported by Morrison (1995). Previous exploration conducted in the area is summarised in Table 1.

RGC held ground in the area from 1990-1993 primarily focusing on potential tin mineralisation, specifically carbonate replacement tin deposits such as those mined at Mt Bischoff and Luina. An interpreted skarn on the Whyte River Grid and anomalous tin geochemistry remains untested.

TABLE 1. PREVIOUS EXPLORATION IN THE WARATAH AREA

1870's- 1940 *Early prospecting.*
Discovery of tin ore in Tinstone Creek and Mt Bischoff tin deposit. 1877: Magnet Mine discovered, producing approx. 630,000t @ 6% Pb, 7% Zn and 394 g/t Ag (1895 - 1940). 1890's: small discoveries of Ag-Pb, Au, Sn, Cu and Fe lodes opened up.

1963-1989 *EL 5/63, 7AP/AM, Comstaff Pty Ltd (plus BHP Co Ltd).*
1969+: Stream sediment sampling, reconnaissance mapping, gridding and soil sampling around the eastern margin of Meredith Granite.
Early 1970's: Extensive stream sediment sampling and geological mapping (Shaw and Everett, 1985a, b; BHP, 1988), regional TURAM EM survey, CRONE EM and magnetic surveys over 3 grids. Drilled BAB1, MAG1 and MAG2.
1981: Investigation of Deep Gully Creek anomaly; gridding, soil geochemistry, geological mapping, ground magnetics and aeromagnetics identified anomalous tin.
1983: Regional DIGHEM survey identified anomalies in the Deep Gully Creek area (not further investigated). BHP joint-ventured into EL 5/63 in 1985 and drilled BR1.
1984: 5 holes drilled through Tertiary cover.

1963-1989 *EL 1/63, Cominco Exploration Pty Ltd.*
1974 helimag survey, 52m line spacing; 1980 - 1981 DIGHEM EM and stream sediment geochemistry.

1983-1985 *Department of Mines, Luina and Wombat Flat Exempt areas.*
Regional mapping (Brown, 1986), magnetic and DIGHEM surveys and soil geochemistry. Two holes drilled at Arthur Dam, AD1 and AD2.

1988-1990 *EL 46/88, Billiton Australia.*
Gridding of 1983 Comstaff DIGHEM anomaly; geological mapping, ground magnetics and UTEM. Drilling intersected background levels of tin and basemetals.

1989-1990 *EL 47/88 Placer Exploration Ltd.*
Regional stream sediment sampling, rock chip geochemistry (Magnet Mine) and resampling of MAG1, MAG2 and BAB1.

1990-1993 *EL 12/90, EL 15/90, RGC Exploration Ltd.*
Regional data review, magnetic and gravity interpretation of existing data, mapping and rock chip sampling and regional gravity survey led to initiation of Deep Gully Creek Grid and multi-element soil geochemistry. Geochemical anomaly identified close to the Waratah River (remains untested).

1991-1992 *EL 21/90, Geopeko.*
1: 25 000 compilation maps of Comstaff stream sediment data. Limited water and rock float sampling.

1994- *EL 17/93, EL 49/94, MPI Gold Pty Ltd.*
Regional stream sediment sampling, rock chip sampling (Magnet Mine) and resampling of AD1 and AD2.

4. GEOLOGY

4.1 Regional Geology

The regional geology of the Whyte River-Waratah area consists of Precambrian to Ordovician rocks of the Dundas Trough. Lithologies include carbonates, intermediate to mafic volcanics and ultramafics which are well described in Brown (1986). Devonian Meredith Granite outcrops in the south of EL 49/94 (Figure 3). Quaternary alluvium covers approximately one third of the EL. The outcropping lithologies in Whyte River EL 49/94 are summarised below.

4.2 Success Creek Group Correlates

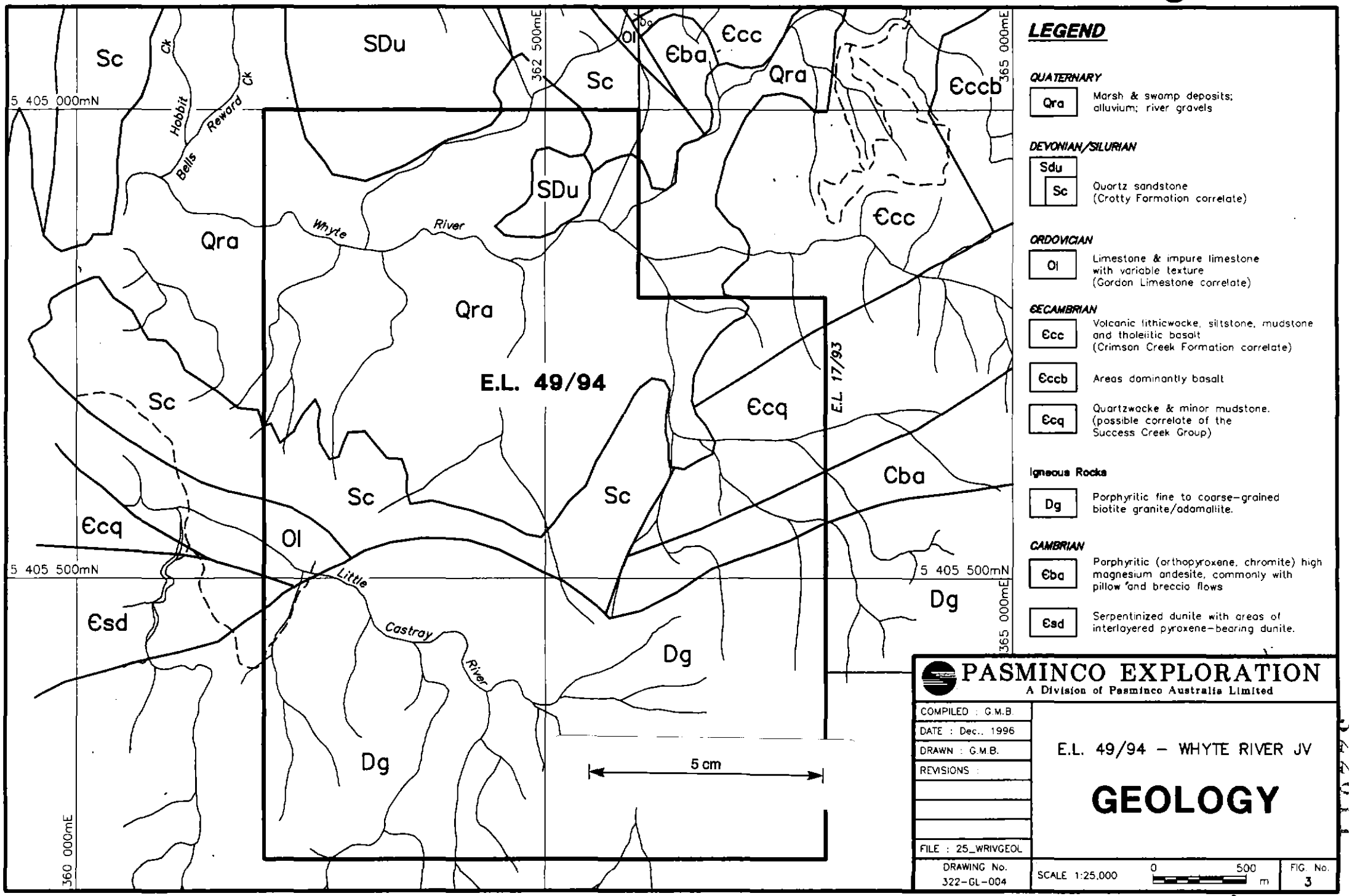
A sequence of micaeous quartzwacke-mudstone is correlated with the Success Creek Group on the basis of stratigraphic position, siliceous clastic content, low structural deformation and lack of affiliation with Crimson Creek-like composition (Brown, 1986). The dominant rock type is a quartzwacke, commonly muscovitic, and interbedded with lesser mudstone, siltstone pebble conglomerate and carbonate units.

In the Whyte River EL, the Success Creek sediments are in a faulted contact with Crimson Creek Formation to the north and pyroxenite to the south.

4.3 Crimson Creek Formation

The Crimson Creek Formation is comprised largely of basalt lavas, basaltic volcaniclastics, and finely bedded siltstone and mudstone. Brown (1986) notes that the Crimson Creek Formation becomes basaltic to the north of the Meredith Granite. Thin carbonate horizons occur in the Crimson Creek Formation but rarely outcrop.

Ultramafic and mafic rocks have been locally overthrust onto the Crimson Creek Formation.



LEGEND

QUATERNARY

- Qra — Marsh & swamp deposits; alluvium; river gravels

DEVONIAN/SILURIAN

- Sdu / Sc — Quartz sandstone (Crotty Formation correlate)

ORDOVICIAN

- Ol — Limestone & impure limestone with variable texture (Gordon Limestone correlate)

CAMBRIAN

- Ccc — Volcanic lithicwacke, siltstone, mudstone and tholeiitic basalt (Crimson Creek Formation correlate)
- Cccb — Areas dominantly basalt
- Ccq — Quartzwacke & minor mudstone. (possible correlate of the Success Creek Group)

Igneous Rocks

- Dg — Porphyritic fine to coarse-grained biotite granite/adamellite.

CAMBRIAN

- Cba — Porphyritic (orthopyroxene, chromite) high magnesium andesite, commonly with pillow and breccia flows
- Csd — Serpentinized dunite with areas of interlayered pyroxene-bearing dunite.

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COMPILED : G.M.B.	E.L. 49/94 – WHYTE RIVER JV
DATE : Dec., 1996	**GEOLOGY**
DRAWN : G.M.B.	
REVISIONS :	
FILE : 25_WRIVGEOL	
DRAWING No. 322-GL-004	SCALE 1:25,000 (0 – 500 m)
	FIG. No. 3

4.4 Pyroxenite

A series of mixed intermediate to mafic volcanics dominate the area west of Arthur Dam, and are referred to as high magnesian andesites and low-titanium tholeiite basalts by Brown (1986). Pyroxenite is in faulted contact with Success Creek Correlates, in EL 49/94.

The volcanics range in texture, and occur most commonly as interstratified volcaniclastics, lava and lava breccias, many of which have been subaqueously emplaced. The andesite is feldspar-pyroxene phyric and commonly amygdaloidal.

4.5 Ordovician to Devonian sediments

A sequence of Ordovician to Devonian sediments overlie the Crimson Creek Formation and associated ultramafic rocks within a small syncline to the north of the Meredith Granite in the Mt Stewart-Heazlewood area in EL 49/94. These sediments belong to the conformable Gordon Limestone-Eldon Group sequence, and the Gordon Limestone at the base of the sequence may have a stratigraphic thickness of up to 500m. It is overlain by the Crotty Sandstone, a white, friable, quartz rich unit up to 400m in thickness, which forms a prominent ridge around the edge of the syncline. Much of the sequence is poorly exposed and covered by alluvium.

4.6 Meredith Granite

The Meredith Granite has been radiometrically dated at 356 Ma. Around the north-eastern tip and eastern margin the granite is porphyritic close to the contact and contains feldspar (up to 25mm) and quartz phenocrysts (up to 8mm). The granite becomes increasingly equigranular towards the core, and contains biotite throughout. Zones of greisenisation and concentrations of tourmaline veining are common and conspicuous close to the granite margins.

4.7 Known Mineralization

The Waratah area is well known for large skarn-style Sn deposits (Mt Bischoff and Cleveland), but lesser known for Pb-Zn mineralization.

The largest base metal orebody discovered and mined to date is Magnet, which lies to the northeast of EL 49/94. Approximately 630,000t grading 6% Pb, 7% Zn and 394 g/t Ag were extracted from the orebody which is described as occupying a steep west-northwest dipping fracture system within an early Cambrian mafic/ultramafic body known as the Magnet dyke, close to its discordant footwall contact with early Cambrian sedimentary rocks.

Other base metal mineralisation sites are discussed in Nye (1923), however each are small vein style galena dominated accumulations which were worked to a shallow depth only.

The Cleveland Sn-Cu deposit located immediately northeast of EL 49/94 comprises several stratabound lenses of pyrrhotite-cassiterite-stannate-chalcopyrite mineralisation formed by metasomatic replacement of limestone beds. The limestone is a small part of the Crimson Creek Formation in the area, forming the transitional sequence between mafic volcanics and the overlying turbidite sequence. The tabular lenses are up to 30m in thickness, and are disrupted by a series of sub-parallel reverse faults that were mineralisation conduits.

At Mt Bischoff, massive pyrrhotite has partially replaced a 40-60m thick dolomite bed within a sequence of turbiditic sandstone, siltstone and shale of the Oonah Formation. Quartz-feldspar porphyry dykes intrude this sequence. Other mineralisation styles include topazised porphyry dykes and late stage quartz-carbonate-fluorite veins.

5. WORK COMPLETED

During the initial year's exploration of Whyte River EL 49/94 work has included compilation of all past exploration data and establishing a GIS database, reconnaissance field visits and a regional aeromagnetic survey which was completed in conjunction with neighbouring EL's 17/93 and 48/94 to the east. Follow up work is planned to commence upon interpretation of the survey.

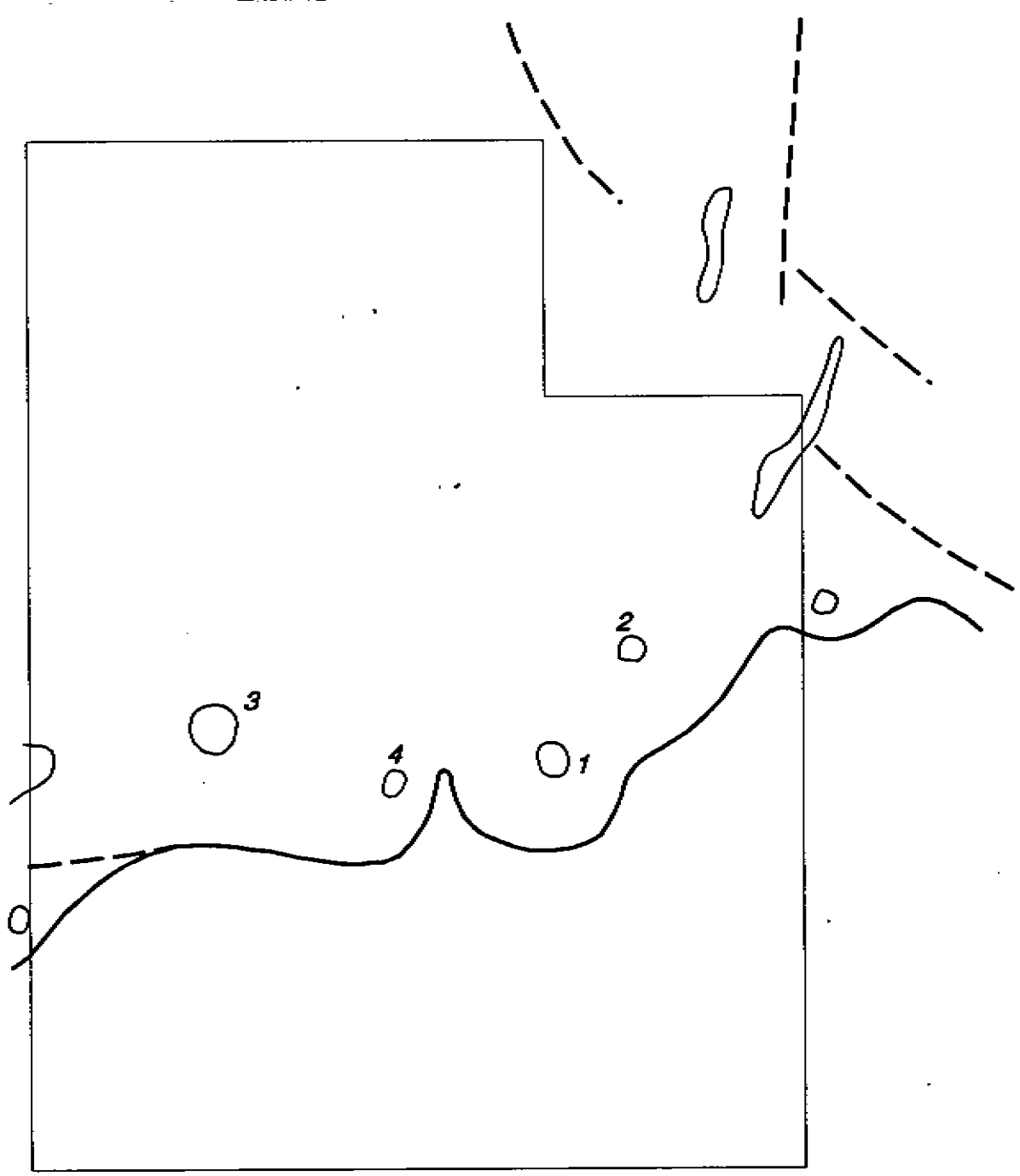
5.1 Aeromagnetic Survey

A detailed aeromagnetic survey was flown over the Whyte River tenement (figure 4) in conjunction with a survey over the Luina and Waratah tenements. UTS Geophysics were contracted to conduct the survey, with specifications of 100m line spacing, flight lines East-West and flight height to average 50m. Navigation was through the use of Real-time GPS and height above ground level was monitored using a radar altimeter.

Structures and contacts interpreted in the regional mapping of the area (Brown, 1986) are not evident in the aeromagnetic data, with the exception of the Meredith Granite contact. The granite is indicated by a large magnetic low at the bottom of the EL, and the contact position is best observed using a greyscale sun angle image (figure 5).

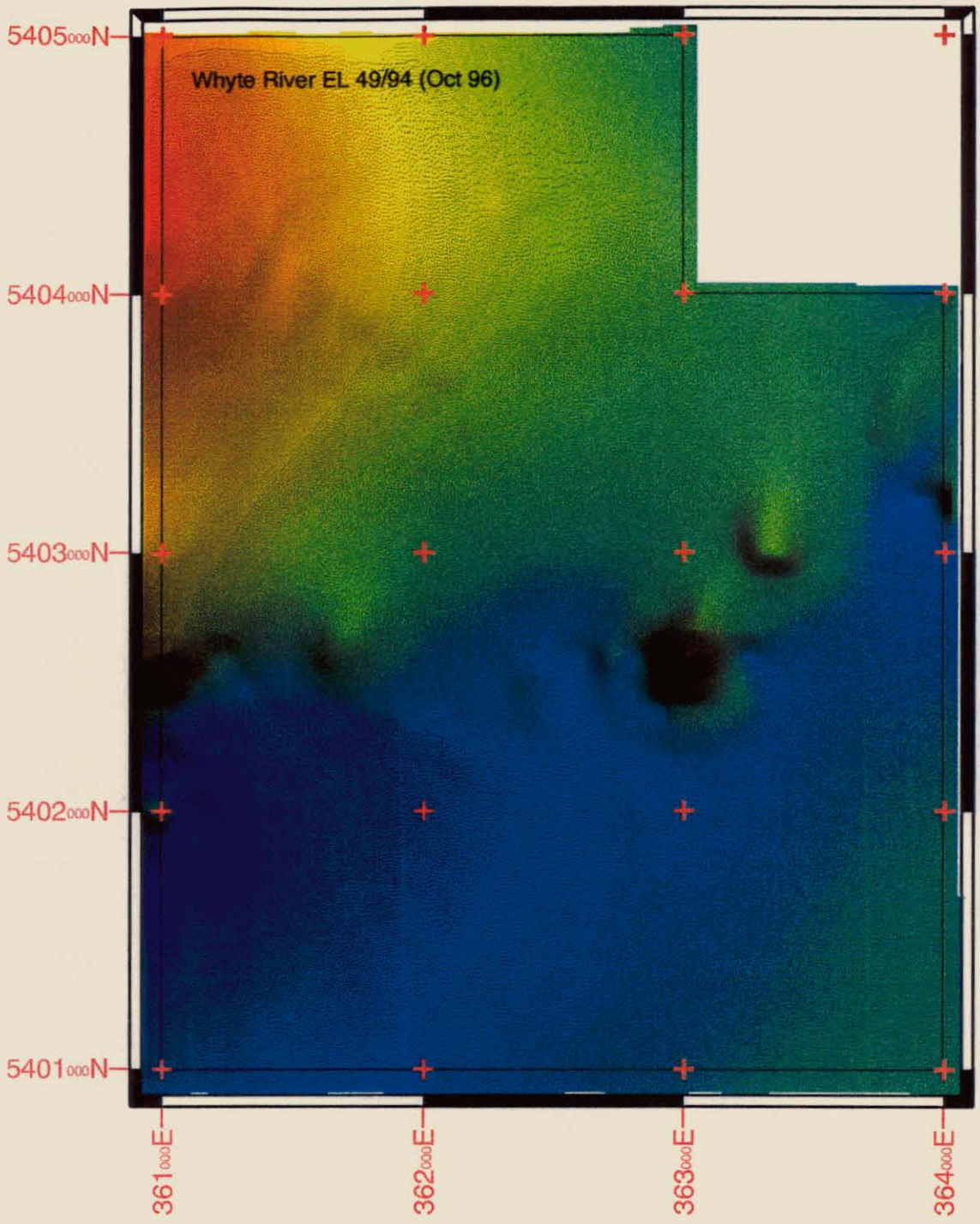
There is a major magnetic gradient on the west side of the EL, thought to be caused by a large magnetic source to the west. This may be related to an ultramafic unit associated with the Heazlewood complex. Possible sources include the tholeiitic basalts to the northwest and a high-magnesium andesite located west of the EL. The regional aeromagnetic data (500m line spacing) indicates a semi-continuos magnetic rim at the south end of the Heazlewood ultramafic complex. Part of this unit appears to be producing the gradient observed in the detailed survey.

The remainder of the area is magnetically low, inferring that the lithological units do not contain magnetic minerals. This area equates to the overlying geology dominated by Quaternary alluvials and the Crotty Formation quartzite's and mudstone equivalents.



322015

322016



Pasminco Australia Ltd

Melbourne - Exploration

REVISIONS				TASMANIA	Compiled: AMR
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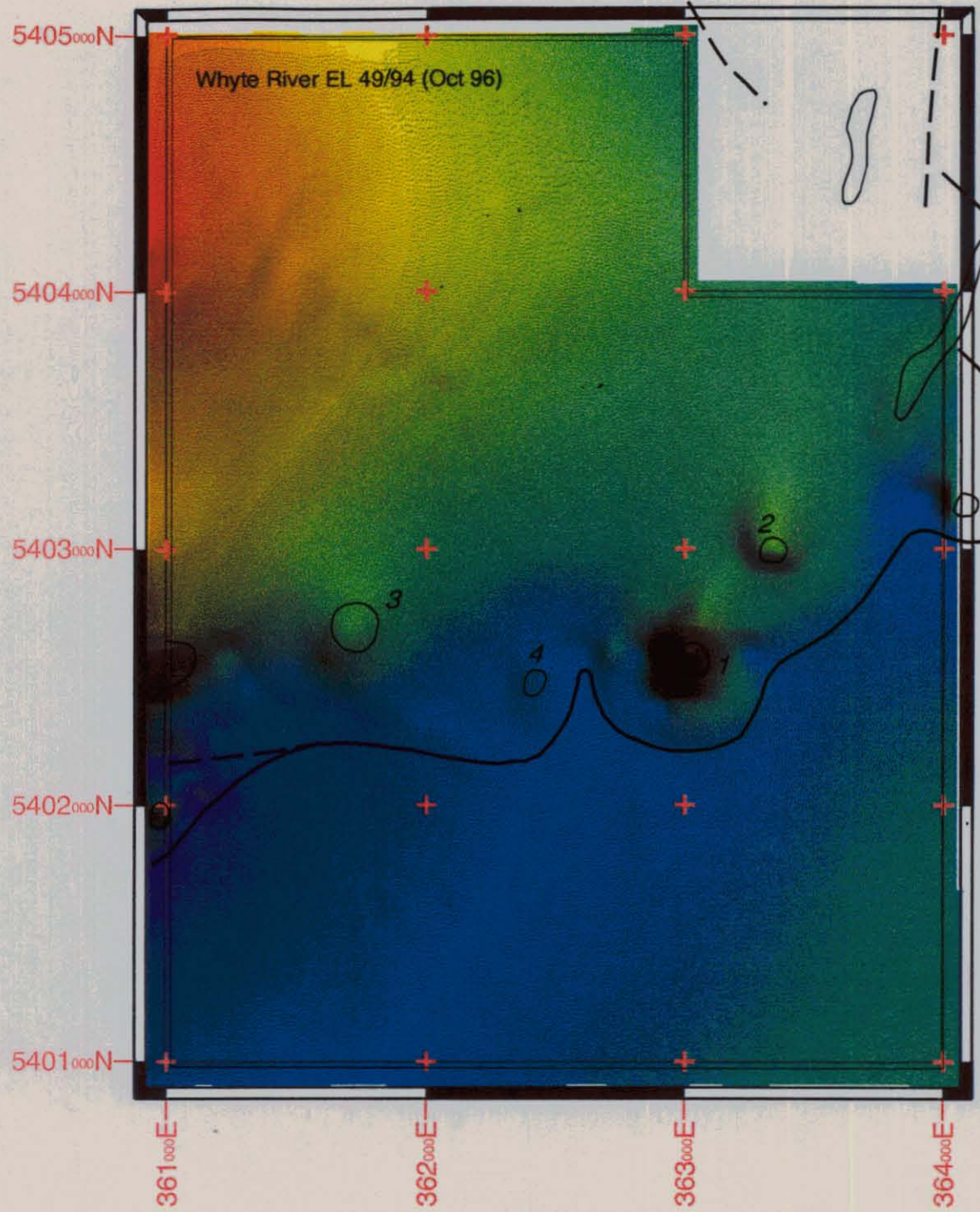
Map Projection:TMAMG55				whyte_river_mag_cd_ne_25.alg	Checked:
Geodetic Datum:AGD66					
Location Code:		Scale: 1:25 000		Date: 16 December 1996	**Figure 4**

322016



GN MN

Scale 1:25 000

0 0.500 1.000 1.500 2.000 2.500

Kilometers

5 cm

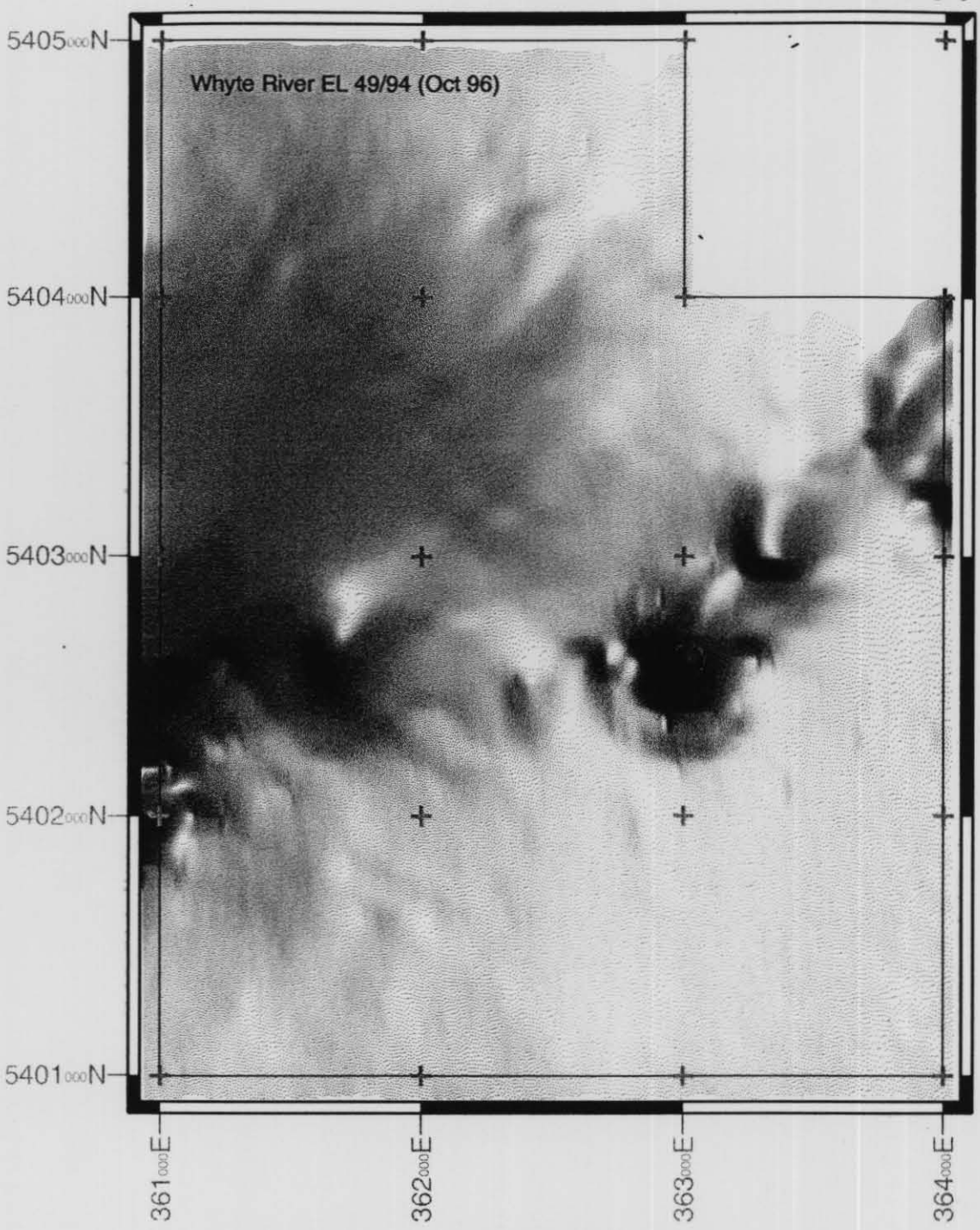
Pasminco Australia Ltd

Melbourne - Exploration

REVISIONS				TASMANIA	Compiled: AMR
Init.	Date	Init.	Date	NORTH WEST TASMANIA - MAGNETICS	
				Whyte River EL 49/94 Area	Printed: Novajet111
				Colour Drape, TMI as Pseudo, Sun NE 45 73	Traced:
Map Projection:TMAMG55				whyte_river_mag_cd_ne_25.alg	Checked:
Geodetic Datum:AGD66					
Location Code:		Scale: 1:25 000		Date: 16 December 1996	**Figure 4**

322015

322017



Scale 1:25 000

0 0.500 1.000 1.500 2.000 2.500

Kilometers

GN MN

5 cm

Pasminco Australia Ltd

Melbourne - Exploration

REVISIONS				TASMANIA NORTH WEST TASMANIA - MAGNETICS **Whyte River EL 49/94 Area** Greyscale Sun NE 45 73 whyte_river_mag_sun_ne_25.alg		Compiled: AMR
Init.	Date	Init.	Date			Printed: Novajet111
						Traced:
Map Projection:TMAMG55						Checked:
Geodetic Datum:AGD66						
Location Code:				Scale: 1:25 000	Date: 16 December 1996	Figure 5

322018

362 500mE

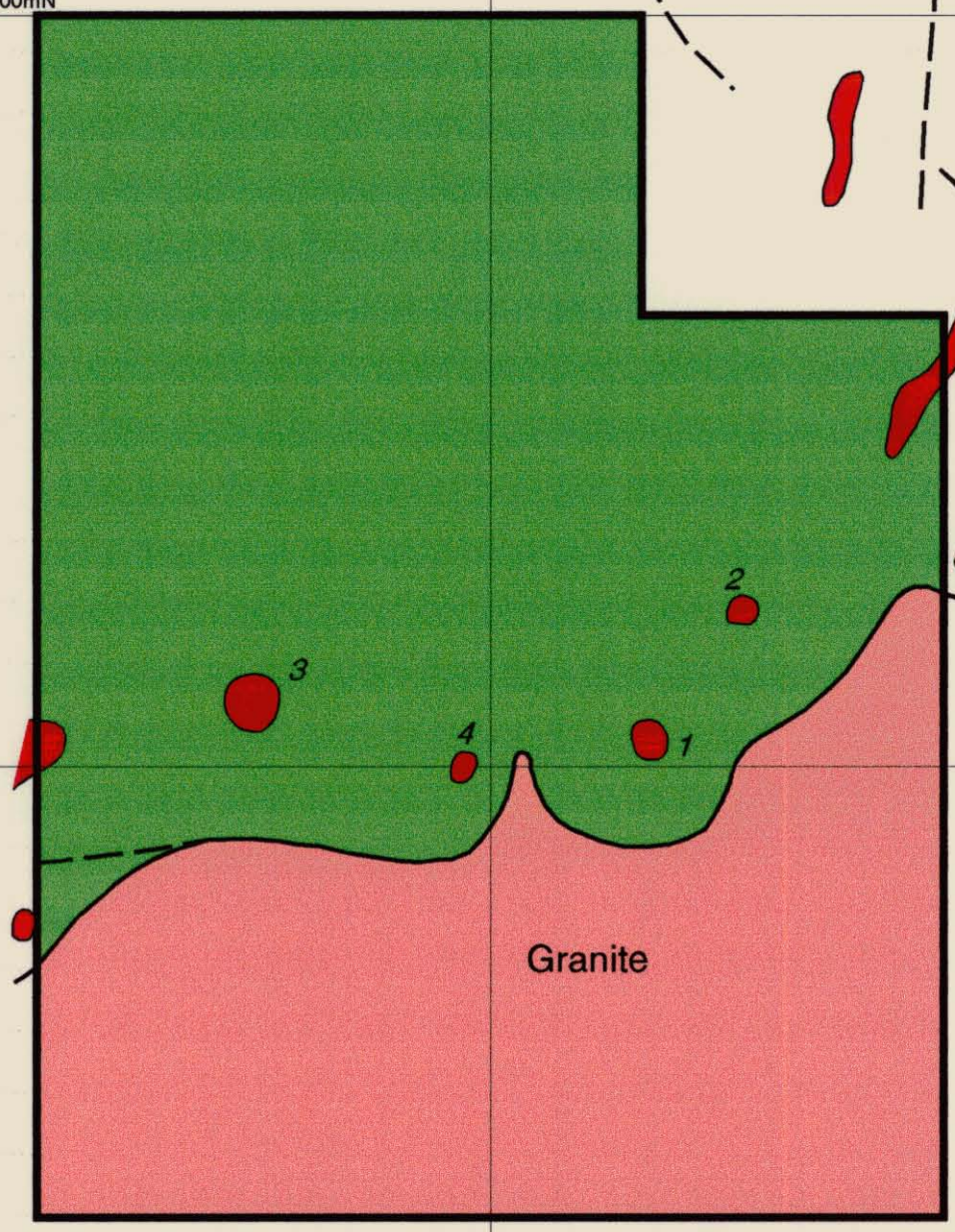
365 000mE

5 405 000mN

5 405 000mN

5 402 500mN

5 400 000mN



5 cm

KEY

Inferred structure

Magnetic high

Granite contact (interpreted)

3 Anomalies

PASMINCO EXPLORATION
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COMPILED : P.W.B.	E.L. 49/94 - WHYTE RIVER JV
DATE : Nov., 1996	**AEROMAGNETIC INTERPRETATION**
DRAWN : G.M.B.	
REVISIONS :	
FILE : WRIVMAGINT	
DRAWING No. 322-GP-003	SCALE 1:25,000 (0 – 500 m)
	FIG. No. 6

There are several small isolated magnetic highs evident in the data set proximal to the top the interpreted contact of the granite and overlying lithology's. It is unknown if these are related to skarn mineral assemblages or are primary magnetic features. Some anomalies may be cultural responses.

There are four isolated features located within the EL which require further exploration. The first and most prominent is the anomaly at 363000E, 5402600N (anomaly 1) which is located at the contact of the Crotty Formation, Success Creek sediments and a porphyritic andesite, close to the contact of the granite. Anomaly 2 is located north-east of anomaly 1 at 363300E, 5403000N. It is thought to be under Success Creek sediments close to the Crotty quartzite. The granite is interpreted to be less than 500m from this position. The third anomaly is a low amplitude deeper source, located close to the contact of the granite and underlying Crotty Formation equivalents at 361700E, 5402700N. The Gordon Limestone equivalents are interpreted to dip underneath this unit and therefore there is a possibility that the anomaly is actually within the limestone unit. Anomaly 4 (362400E, 5402500N) is a moderate amplitude short wavelength feature close to a complex contact in the granite.

5.2 Past Exploration Data Compilation and Regional GIS Database

A GIS database has been established for Whyte River EL 49/9, which along with Waratah and Luina EL's 48/94 and 17/93 forms a regional database with for the area. Information available includes previous stream sediment and soil geochemistry, water and drainage maps, roads, tracks and access in the area, known mineralisation and possible sources of contamination.

A small stream sediment survey comprising 8 samples in the current Whyte River EL was undertaken by Aberfoyle, EL 16/78 (Sise, 1983). The sample area was primarily over Success Creek Group sediments. Anomalous Sn was reported downstream of the Meredith Granite (203ppm), however there were no significant Pb or Zn anomalies.

A small grid in the Whyte River area established by Aberfoyle and reviewed by RGC (Halley, 1981) lies just outside the Whyte River EL boundary. The Whyte River Grid was not reported by Aberfoyle, but is thought to be following up a Sn geochemical anomaly which coincides with a magnetic anomaly. The magnetic anomaly apparently occurs on the contact between the Meredith Granite and the Gordon Limestone where tremolite calc-silicate rocks are reported to be possible skarn material.

5.3 Reconnaissance Field Work

Brief field visits have been made during the year to familiarise with surface geology.

6. ENVIRONMENTAL DISTURBANCE AND REHABILITATION

Brief field visits within EL 49/94 during the 1995-1996 period have been restricted to traverses on foot. No environmental disturbance was associated with this activity and no rehabilitation was required.

7. EXPENDITURE

Expenditure for the 1995-96 year outlined below is $14 265.

Personnel & Oncosts	5 254
Travel & Accommodation	144
Drilling (including access & core processing/storage)	108
Geophysical Surveys/Consultants	3 764
Other contractors	639
Stores & Supplies	353
Vehicles & Equipment	504
Computing	393
Office Running Costs	1 809
Management Fee	1 297
TOTAL EXPENDITURE	**14 265**

8. CONCLUSIONS AND RECOMMENDATIONS

Exploration undertaken to date within Whyte River EL 49/94 has focused on the evaluation of past exploration data and on the regional scale interpretation of recently flown aeromagnetic data. The aeromagnetic data shows several isolated magnetic anomalies proximal to the contact of the Meredith Granite and overlying lithologies. It is thought that these anomalies could be associated with skarn assemblages and warrant further investigation. Evaluation of previous works reported so far suggests skarn style mineralisation south of the Whyte River Grid, about the contact between the Meredith Granite and the Gordon Limestone.

Much of the Licence remains underexplored. Activity in the following year should include follow up of isolated magnetic targets identified on the recent aeromagnetic data with regional scale compilation of geology, reconnaissance ground magnetic surveys and geochemistry.

9. REFERENCES

BHP, 1988 EL 5/63 Final Report in the Relinquished Area: Results of exploration for 1987-1988 and a summary of activities for the period 1963-1988. BHP Ltd.

Brown, A.V., 1986 Geology of the Dundas-Mt Lindsay-Mt Youngbuck Region. Tasmanian Department of Mines Geological Survey Bulletin 62.

Halley, S.W., 1991 EL 12/90 and EL 15/90 Waratah Annual Report 1990/91. RGC Exploration Pty Ltd.

Morrison, K.C., 1995 Waratah Project - Open File Literature Review. Unpub. Report to Pasminco Exploration, Burnie.

Nye, P.B., 1923 The Silver-Lead Deposits of the Waratah District, Tasmanian Department of Mines Geological Survey Bulletin 33.

Shaw, R.W.L. & Everett, M.P., 1985a Final Report on areas surrendered to the Department of Mines Tasmania, June 1985. EL 5/63 Area 1 Arthur River. Unpub. Report. Comstaff Pty. Ltd.

Shaw, R.W.L. & Everett, M.P., 1985b Final Report on areas surrendered to the Department of Mines Tasmania, June 1985. EL 5/63 Area 5. Unpub. Report. Comstaff Pty. Ltd.

Sise, J.R., 1983 Annual Report EL 16/78, Meredith, Tasmania. Year Ended October 20 1983. Aberfoyle Exploration Ltd

KEYWORDS AND LOCALITY

BASIC VOLCANICS, GRANITE, CARBONATE, BASE METALS, TIN, GOLD, REPLACEMENT, VEINS, PRECAMBRIAN, CAMBRIAN, DEVONIAN, ORDOVICIAN, DATA REVIEW, GEOLOGY, GEOCHEMISTRY, GEOPHYSICS, AEROMAGNETICS

BURNIE SK5503, WARATAH, RUSSELL, DUNDAS