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GOLDFIELDS EXPLORATION

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Tasmanian Gold Project

Anthony

EL 19/98

EL19/98

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Part 1 – Anthony Road Area

See folio 31

Vol 1 of 1

HELD BY: Goldfields Exploration Pty Ltd

MANAGER & OPERATOR: Goldfields Exploration Pty Ltd

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27 September, 1999

PROSPECTS: Basin Lake, Bradshaws Road; Langdon Pyrite Zone; Pyrite Corner – Leech Hill Alteration Zone; Lake Selina

MAP SHEETS:	**1:250,000:**	**1:100,000:**
GEOGRAPHIC COORDS	**Min East:**	**Max East:**
	Min North:	**Max North:**

COMMODITY(s): Au, Ag and Base Metals

KEY WORDS: LowerTyndall Group, Anthony Road Andesite, Suite III Basalt, Quartz Porphyry, Central Volcanic Sequence, Western Sequence (Yolande River Sequence), Great Lyell Fault, South Henty Fault, Growth Faults, Henty Horizon, Spillway Horizon, IP anomaly, VHMS, Porphyry.

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SUMMARY

EL 19/98 - *Anthony Road* is located in western Tasmania, approximately 14 km north of Queenstown, on the western flank of the Tyndall Range adjacent to the Basin Lake and South Henty ELs. It is hosted in rocks of the Cambrian Mt. Read Volcanics along strike from known VHMS style mineralisation developed at the contact between Anthony Road Andesite and the Tyndall Group (the *Henty Horizon* e.g. Henty, Howard's Anomaly and Comstock). The EL is set in a basin between two major regional faults, the South Henty Fault and the Great Lyell Fault and is largely covered by Anthony Road Andesite units with a thin belt of overlying Tyndall Group rocks outcropping in the north east. Outcropping in the south west of the EL is a younger sequence of felsic volcaniclastics, the Yolande River Sequence (YRS) which is overlain by rhyolitic to dacitic lavas and pumice breccias of the Central Volcanic Complex (CVC). The contact between the YRS and CVC also represents a target as there is mineralisation at this stratigraphic level to the north (*Spillway Horizon*). Rocks of the CVC are structurally repeated in the west on the Basin Lake EL.

The steeply dipping, NNW trending stratigraphy of the Anthony area is cut at low angle by a series of steep N-NW trending anatomising faults which appear to be splays off the Great Lyell Fault (GLF). Relatively well behaved east dipping and facing stratigraphy in the west and laterally continuous west dipping and facing rocks alongside the GLF probably represent the limbs of a major syncline associated with GLF-related deformation. The stratigraphy in between is disrupted at low angle by a series of steep N-NW trending anastomosing splay faults which partition the stratigraphy into fault bound domains. Stratigraphic relationships and facing evidence from drillholes and outcrop indicate that rocks within these structural domains are folded, and upthrust causing stratigraphic repeats. The folding is usually in the form of a syncline with attenuation and failure along limbs and thickening at fold closures.

Sericite+pyrite and carbonate(+hematite) alteration within the Anthony EL is associated with two distinct stratigraphic contacts or horizons: the interfingering of CVC rocks with ARA intrusives in the west (Target 3) and a mixed package of upper ARA sediments, felsic intrusives and basaltic lava intersected in the central part of the EL (Target 1). This mixed package can be correlated to footwall rocks of the *Henty Horizon*. Carbonate (hematite) alteration grading to massive carbonate is also developed in basaltic andesites which bound basal Tyndall Group (LTG) rocks in the north. These three zones of alteration are characterised by IP chargeability anomalies and subdued magnetic responses and represent 3 significant targets for exploration. No significant alteration appears to be associated with the YRS–CVC contact (Spillway Horizon)

Target 1

Target 1 covers an area north and south of BL004 comprising a structurally complex corridor of altered geology associated with an IP chargeability anomaly and a patchy magnetic low. This corridor is topographically subdued with no significant outcrop and limited drill hole intersections. Based on a reinterpretation of BL004 – 008, Target 1 comprises a >1km long, N-S striking zone of structurally isolated and repeated packages of upper ARA which are stratigraphically equivalent to the highly prospective Henty horizon. The alteration pattern of proximal Sericite+pyrite and distal carbonate (hematite) alteration is analogous to that observed about the Western Tharsis deposit to the south and South Henty mineralisation along strike to the north. Sulphide mineralisation is intersected in BL004 and an ore grade (Cu-rich) massive pyrite+silica boulder sits atop glacials at the southern strike extent of the target. This glacial erratic has strong petrological similarities with the intensely altered and mineralised rocks in BL004. This zone represents a highly prospective corridor of potential VMHS mineralisation and is a priority drill target.

Target 2

An arcuate belt of Lower Tyndall Group (LTG) rocks, isolated between carbonate altered upper ARA, extends from the northern EL boundary to 5354500mN, 5kms to the south. It is associated with a strong IP conductivity response. This unit, which is now part of a shallow syncline, has been structurally dislocated from equivalent rocks to the NE by a significant N-S structure. The controlling structure is interpreted to be the southern extension of a growth fault which is associated with mineralisation as far north as the Tyndall Mine. The coincidence of this major mineralising structure with a known exhalite horizon at the base of the Tyndall Group and its proximity to a world class deposit (Henty) makes this area a compelling target for VHMS style mineralisation.

Folding of this belt of LTG sediments presents a structural repetition of the prospective Henty Horizon

over a strike length of 5kms. Given that this contact has only been tested by two widely spaced drill holes in the north, further testing of both the western and eastern limbs is recommended.

Target 3

Porphyry type alteration developed at the contact between CVC and intrusive ARA rocks in the western part of the Anthony EL is associated with a series of IP highs and a magnetic low. This zone strikes north–south and extends over 2kms from north of *Pyrite Corner* to south of Leech Hill. Within this target zone the area of most intense sericite+pyrite alteration and IP anomalism known as *Pyrite Corner* remains untested at depth. Drill testing of this area is a priority to both gauge the mineralising potential of this CVC-ARA contact and to better understand the stratigraphic relationships and possible structural controls here. A mineralised intersection at Pyrite Corner would have positive implications for the economic potential of the CVC-ARA contact which has a southern strike extent of 2kms.

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1 INTRODUCTION

EL 19/98 - Anthony Road is held and explored by Goldfields Exploration Pty Ltd. It constitutes the relinquished area of the former EL 103/87 by a joint venture between Aberfoyle Resources Limited, Acacia Minerals Pty Ltd and Resolute Limited (Figure 1). It comprises two separate blocks: Anthony Road (8 sq km) and Mount Selina (5 sq km). The Anthony Road portion is located in western Tasmania, approximately 14 km north of Queenstown, and is situated on the flank of the Tyndall Range (Figure 1). It is this portion that is the subject of this report and is referred to as the *Anthony EL.*

1.1 Location and Access

The major access to the EL is via the sealed Anthony Road, which runs alongside and dissects the tenement approximately 12 km east of the junction with the Zeehan Highway. Access from the eastern side of the tenement is provided by a gravel vehicular track which follows a HEC power line close to the eastern EL boundary. A series of grid lines and rehabilitated tracks provide access by foot within the tenement.

1.2 Topography and Vegetation

The Anthony EL lies along the peneplain between the steep, north - south trending Tyndall Ranges (1000m high) in the east and the 300m deep Henty Gorge to the west. The peneplain is between 450m and 550m ASL. The vegetation consists predominantly of button grass plains and light tea tree scrub with some patches of medium eucalypt forest and rainforest. The area has been extensively glaciated and reliable outcrop is restricted to road cuttings and topographic highs in the north and west of the EL. The EL is covered by glacial moraine and outwash.

1.3 Tenure

The EL comprises: Crown Land (Deferred Forest Land)
Crown Land
Land Vested in HEC.

The area is partly within the South West Tasmania Australian Heritage Act - Registered Entry (South West Conservation Area).

1.4 Aims

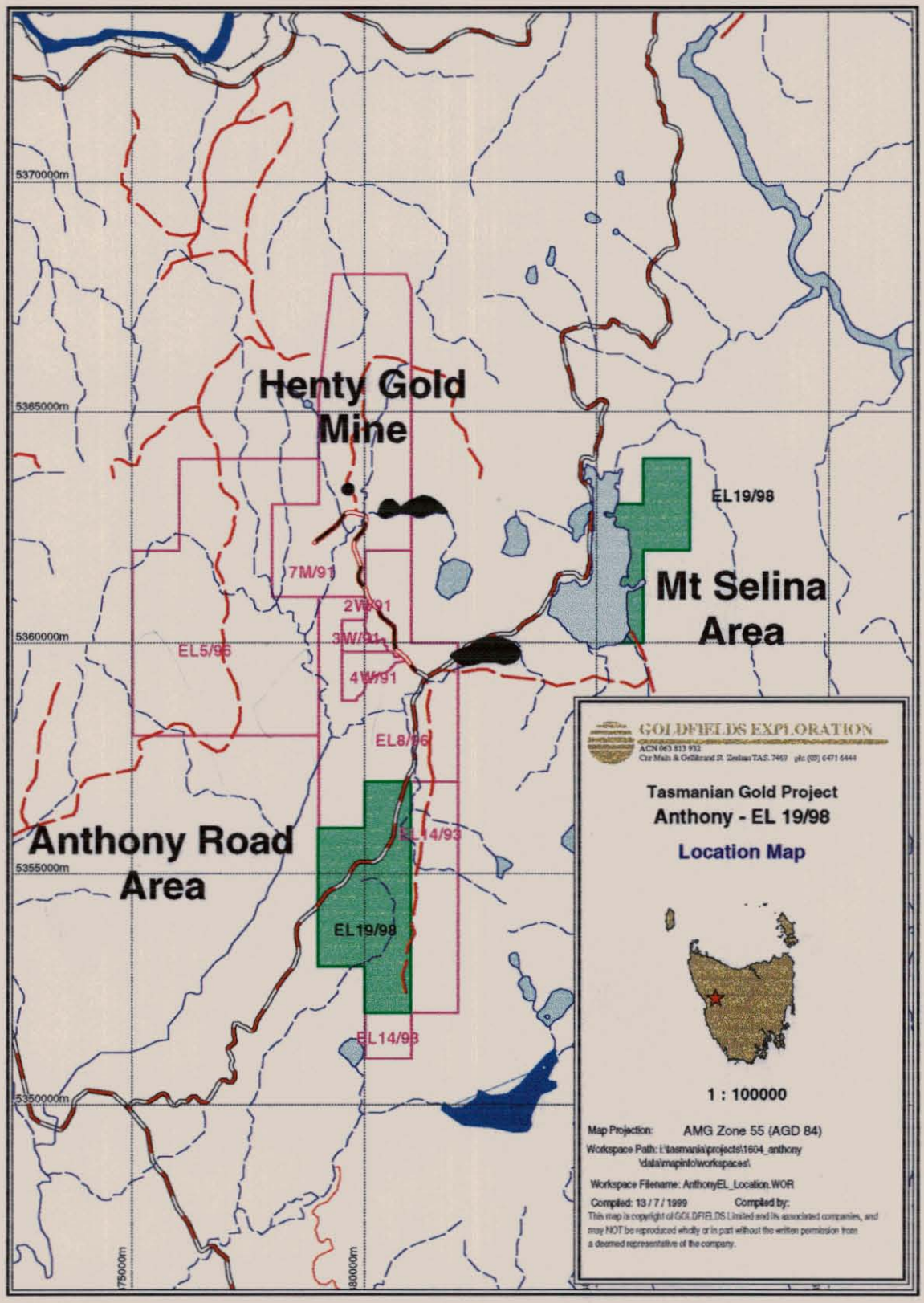
The Mount Read Volcanics are host to several world class gold rich base metal mineral deposits at Rosebery, Hellyer, Que River, Hercules, and Mount Lyell and to gold mineralisation at the *Goldfields* operated Henty Mine. Together these deposits constitute Tasmania's most productive gold province. The Henty Mine is the only gold only producer in Western Tasmania, all other deposits produce gold as a by-product of base metal treatment. In 1996 the gold reserves for Henty were 526000 tonnes @ 26.2 g/t Au.

Goldfields Exploration is actively exploring the Mount Read Volcanics in the Henty and South Henty areas immediately north of the Anthony EL. Exploration to date has focused on systematic drill testing of the Henty Horizon, which is defined as a zone of mineralisation, alteration and carbonate developed at the contact between the basal Tyndall Group and the underlying Central Volcanic Sequence. The exploration program has been highly successful and an inferred gold resource of 731000 tonnes @ 7.6g/t Au at Mount Julia in the south of the Henty Mine Lease has recently been delineated.

In early 1998 a joint venture with Resolute Limited was formed to enable testing of the southern strike extents of the Henty Horizon in the South Henty area. This highly prospective EL also includes known mineralisation at the stratigraphically lower *Spillway Horizon.* Both the *Henty* and *Spillway* Horizons are being actively explored and a recent drill hole SHD16 intersected a wide zone of moderate to strong sericite-pyrite-chalcopyrite mineralisation. The copper-gold association in SHD16 is spatially associated with a complex of Suite II andesite and quartz porphyry and is considered to be analogous to the mineralisation at Prince Lyell and Garfield.

The Anthony EL is situated adjacent to the South Henty and Basin Lake ELs and includes the southern

Figure 1


Henty Gold Mine
Mt Selina Area
Anthony Road Area
EL19/98
7M/91
2W/91
3W/91
4W/91
EL5/96
EL8/96
EL14/93
EL19/98
EL14/93
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GOLDFIELDS EXPLORATION
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Tasmanian Gold Project
Anthony - EL 19/98
Location Map
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5 cm

strike extents of the *Henty* and *Spillway* Horizons. Both these horizons are considered to be highly prospective for gold and gold-base metal mineralisation. The EL is largely covered by Suite II andesites and has considerable potential for porphyry related copper-gold mineralisation.

The distal carbonate rich and proximal sericite-pyrite rich alteration recognised in Anthony drillholes has many similarities with the zonation seen at South Henty and that surrounding the Western Tharsis ore body at Mt Lyell. The results of a recent study at Western Tharsis (Huston and Kamprad, 1998) have been re-examined by Goldfields to gain a greater insight in to the chemical zonation surrounding the ore as a possible geochemical vector. The results of this work have many implications for exploration in the South Henty EL and Anthony EL and are presented in Vicary, 1998.

Goldfield's Tasmanian exploration programme is targeted at the discovery of Henty style mineralisation and polymetallic gold rich base metal mineral deposits in the Cambrian Mount Read Volcanics. The results of previous exploration in the Anthony area suggest that this area is highly prospective. Discovery of an economic gold deposit in the Anthony Road area is important to supplement gold production at the nearby Henty mine.

1.5 Exploration Model

The current exploration model used in the Mount Read Volcanics is based on the recognition of several distinctive characteristic features of volcanic hosted massive sulphide deposits and Henty style gold deposits (Figure 2). These include:

- occurrence of mineral deposits in clusters along favourable horizons,
- spatial control of synvolcanic growth faults,
- distinctive zoned and asymmetric footwall alteration zones, and
- chemical sediments (exhalites) and sulphide clast rich mass flow units at the favourable horizon.

The initial phase of an exploration program is to define the favourable mineralised horizon. A systematic program of detailed geological mapping and logging of any existing core is performed with emphasis on delineating potential syn-volcanic growth faults and other target areas which are considered to have the greatest possibility for an economic grade mineral discovery.

The target areas identified in Phase 1 are prioritised and systematically drilled in Phase 2 of the program. A nominal drill spacing of 800m to 1000m along the favourable horizon is used to provide maximum geological information. Where significant mineralisation or alteration is intersected the spacing between adjacent drill holes is reduced. In areas that have been covered by surface geophysical surveys (e.g., IP) it is considered that the upper 200m of the bedrock have been adequately explored and drill holes generally target the favourable horizon about 300 to 350m down dip of the surface. It is hoped that any off hole conductors at depths greater than 200m will be found by routine DHEM surveying. Thus, each drill hole in this phase of the program will test a volume of rock and will provide maximum geological information.

Specific geochemical and isotopic techniques are also employed in Phase 3 of the program to determine the proximity to the mineralisation system (Table 2). Advanced exploration targets are rigorously tested by drilling in Phase 4 of the exploration program.

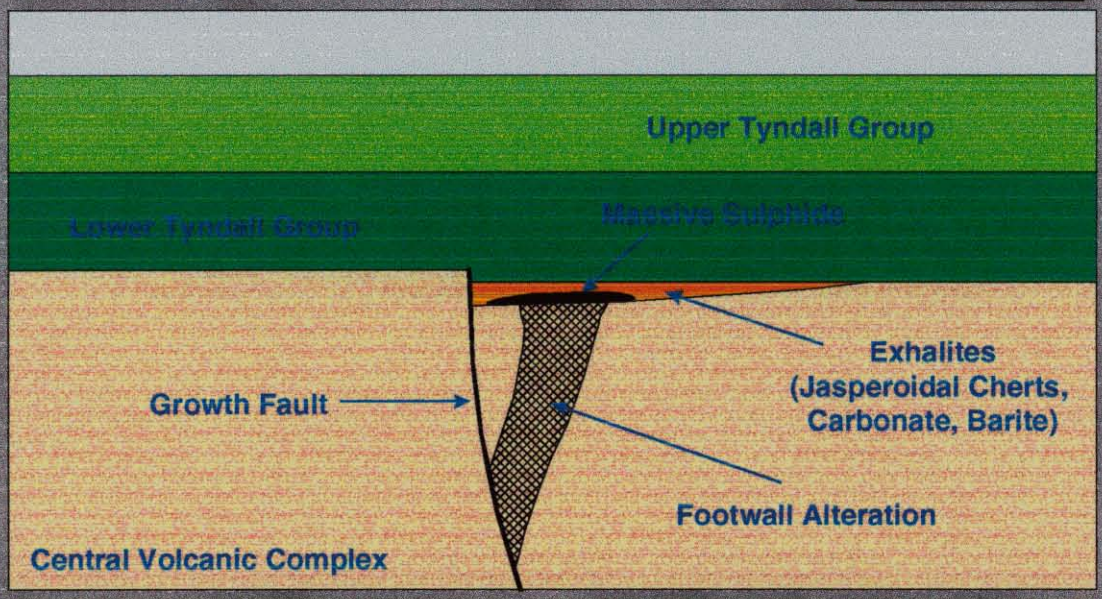
The exploration program depends entirely on the quality of the targets generated. Once a target worthy of advanced testing has been identified additional regional exploration targets are assessed. In this way a project could have several Phase 1 and Phase 4 targets that are simultaneously explored.

Figure 2

RGC Exploration

Mount Read Volcanics

Exploration Model



Exploration Strategy

1st Phase	Mapping	Define Mineralised Horizons. Locate growth faults, footwall alteration, & exhalites (chemical sediments).	
2nd Phase	Drilling	Systematically test favourable horizons	
3rd Phase	Specific Geochemistry Geophysics	Determine proximity to mineralised systems.	
4th Phase	Follow up Drilling	Orebody delineation	

2 PREVIOUS EXPLORATION

Exploration prior to 1997 is comprehensively set out in Lewis (1995) and MacDonald & Ikstrums (1998).

During 1997-1998, Resolute Samantha Ltd, who held the ground in joint venture with Acacia Metals Pty Ltd and Aberfoyle Resources Limited, completed three short (~50m each) Diamond drill holes for a total of 170.5m. These holes, LHD 1-3, were drilled to test a single anomalous Cu wacker sample (0.34% Cu) associated with a structure interpreted by Aberfoyle to be a WNW-ESE trending Cambrian growth fault - the *Pyrite Corner Fault* (see MacDonald & Ikstrums, 1998). Pyritic alteration was only intersected in LHD1 where it was most intense (~3% Pyrite) from 25.5m to 30.0m and apparently associated with shearing at 28.2 and 30.0m. Coherent to hyaloclastic Anthony Road Andesite was the only rock type intersected and assay results were disappointing throughout with all Au <0.10g/t and all Cu <946ppm. As, Ag, Pb and Zn results are all low (i.e. background).

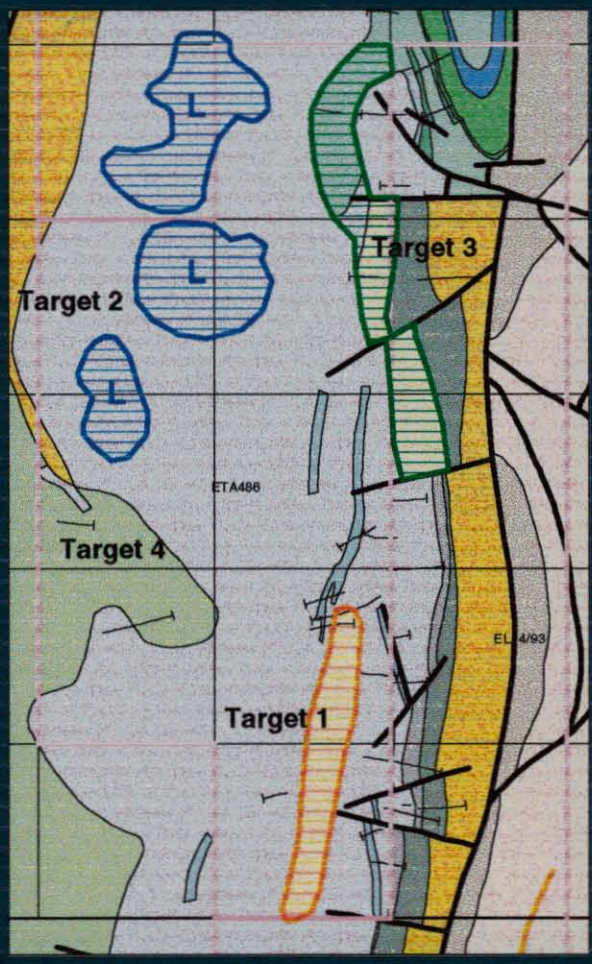
Four main target zones were recognised during a preliminary review of the Anthony EL (Vicary, 1998; Figure 3). These are:-

- **Target 1** Au - Cu mineralisation along strike from BL004. Previously referred to as *Langdon Pyrite Zone,*
- **Target 2** Au - Cu mineralisation associated with a series of magnetic lows and an IP anomaly in the north west of the EL along strike from *Pyrite Corner,*
- **Target 3** Henty style mineralisation at the base of the Tyndall Group in the north of the EL; and
- **Target 4** IP anomalies associated with the Anthony Road Andesite - Yolande River Sequence contact at Leech Hill and along strike at *Pyrite Corner*.

Figure 3

GOLDFIELDS EXPLORATION

Figure 3
Anthony ETA Targets



3 WORK COMPLETED

In the period October 1998 to September 1999 the work completed included detailed geological mapping and diamond drill hole logging (See Appendices 1 and 2) of the Licence Area with the production of outcrop and interpretation maps at 1:5000 scale (Plans 1 to 4). Thirty rockchip samples and 20 core samples were assayed for major and minor elements (Appendix 3) and compilation, reprocessing and reinterpretation of previous geochemical and geophysical surveys performed. In relation to each target area the specific work done included the following:

Target 1 Au-Cu mineralisation along strike from BL004

- Detailed geological mapping and sampling
- Logging of drill holes BL002 to BL008, BLD89-1 to BLB89-2, and LHD1 to 3
- Geochemical analysis of 15 core samples
- Data compilation and review

Target 2 Au-Cu mineralisation in the north west of the ETA

- Detailed geological mapping and sampling
- Data compilation and review

Target 3 Henty style mineralisation at the base of the Tyndall Group

- Detailed geological mapping and sampling
- Data compilation and review
- Logging of drill holes TYN001, TYN003 and TYN005
- Geochemical analysis of 1 core sample

Target 4 IP anomaly in the Leech Hill – Pyrite Corner area

- Detailed geological mapping and sampling
- Data compilation and review
- Logging of drill hole Leech Hill 1, TYN 2
- Geochemical analysis of 4 core samples

3.1 Data Compilation

A detailed data compilation project of previous exploration in the Anthony area was completed. Since all this data is available in open file reports from Mineral resources Tasmania only some of the plans generated from this study are presented in this report (see Appendix 4).

Geochemistry

- Soil sample data from previous surveys (Fitzgerald and Cartwright, 1986) was compiled and digitised and 1:5000 plans for Cu, Pb and Zn were generated. Au and Ag values were below detection for the Anthony area and were not plotted.
- Wacker sampling done by Aberfoyle Resources Pty Ltd in 1994 (Lewis, 1995) over the Anthony EL was compiled and a series of 1:5000 maps generated to show the distribution of metal and trace element values. Plans of immobile element ratios were also generated to assist in interpretation of surface geology
- Previous assays from BL006 and BL007 (Richardson,1996) were compiled and down hole (cross section) plots of metal and trace element values as well as immobile element ratios were generated to assist in interpretation of geology.

Geophysics

- IP data from surveys conducted by Goldfields Exploration Pty Ltd (Fitzgerald and Cartwright, 1986) was compiled, remodelled and adapted for *Mapinfo*.

- Magnetic data compiled from previous surveys (Sharpe, 1994) was reprocessed using Surfer and *Mapinfo* images generated at 1:5000 and 1:10000 scale in the form of *Reduced to the Pole, First Vertical Derivative* and *Second Horizontal Derivative* plans

- Mike Asten of Flagstaff Geo-Consultants (see Appendices 5, 6 and 7) reprocessed CSAMT data completed over the Anthony and Basin Lake EL's by Billiton during 1988-1990 (Creagh and Hungerford, 1990).

4. REGIONAL GEOLOGY

4.1 Stratigraphy

The Anthony Road EL is hosted in the Cambrian Mt. Read Volcanic. The Mt Read Volcanic are an arcuate belt of acid to intermediate volcanics occupying the eastern margin of the Dundas Trough. They are bounded to the east by Precambrian basement rocks of the Tyennan Region and younger Cambro-Ordovician siliciclastics and appear to interfinger with fossiliferous volcano-sedimentary rocks of the Dundas Group and Western Sedimentary Sequence to the west.

A major north south striking structure, the Henty Fault divides the Mt Read Volcanics into two parts, north and west of the Henty Fault and south and east of the Henty Fault. Within the Henty Fault are rocks of the Henty Fault Sequence to the south of Mt Murchison, and the Farrell Slates to the north near Tullah. To the north and west of the Henty Fault, the Mt. Read Volcanics host the Pb-Zn rich polymetallic volcanogenic massive sulphide (VHMS) deposits of Rosebery, Hercules, Que River and Hellyer while the volcanics south and east host the Henty Gold Mine, Mt Julia Prospect and copper gold deposits of the Mt. Lyell Field.

The Mt. Read Volcanics south and east of the Henty fault are divided into four lithological groups (Corbett 1992),

1) Central Volcanic Complex (CVC) consisting of mainly rhyolitic to andesitic volcanics with minor sediments and mafic units.

2) Eastern Quartz Phyric Sequence of quartz porphyritic lavas and volcaniclastics.

3) Tyndall Group comprising mainly quartz-phyric felsic and intermediate extrusives and volcaniclastics with interbedded epiclastics.

2) Western Sequence (Locally the Yolande River Sequence) of volcano-sedimentary siltstones, shales, quartzite and volcaniclastic turbidites and felsic porphyry intrusives.

Distinct lithogeochemical affinities have been recognised for each of these lithological groups and for certain units within each group, making classification easier (Crawford et al., 1992; *Suites I - IV*).

The oldest rocks within the Anthony EL belong to the CVC and Yolande River Sequence. The CVC is thought to be largely contemporaneous with the Yolande River Sequence to the west, and the Eastern Quartz Phyric Sequence to the east. Recent investigations on the South Henty EL (Callaghan, 1998) suggest the CVC overlies the Yolande River Sequence. The Tyndall Group overlies the CVC both conformably and unconformably.

Overlying the Mt Read Volcanics are the Cambro Ordovician siliciclastics of the Owen Conglomerate which have an unconformable to interdigitating relationship.

4.2 Regional Structure

The NNE trending, 70^{0} west dipping Henty Fault dominates the Mt Read Volcanic Belt for at least

60km. The Henty Fault divides into the North and South Henty Faults near Mt. Read. The Great Lyell Fault splays off the Henty Fault somewhere in the vicinity of Mt. Murchison and trends in a southerly direction to the south of Mt Lyell. Both of these structures bound the western margin of thick sequences of Owen Conglomerate.

The Cambrian and younger (to early Middle Devonian) rocks in western Tasmania have been effected by widespread Devonian folding of the Tabberabberan Orogeny. The Tabberrabberan Orogeny was a multiphase deformation event, with an early phase of NNW folding (D_1) and a later NW to WNW (D_2) trend recognised in the region (Williams, 1989). This has produced open upright folding in competent siliciclastic units but tight folding in phyllosilicate rich volcanics. Reverse faulting is common and the rocks have developed a pervasive regional foliation. Metamorphism was of prehnite-pumpellyite to lower greenschist facies.

4.3 Tectonic History

Basement rocks of western and central Tasmania comprise Late Proterozoic sediments multiply deformed in the Late Proterozoic Penguin Orogeny. A following rift phase deposited continental shelf sequences followed by extensive tholeiitic volcanism (Crawford & Berry 1992). Eastern Australia's passive margin collided with an oceanic arc thrusting slices of ultramafic to mafic forearc sequences over most of western Tasmania (Crawford & Berry 1992).

Middle Middle Cambrian extensional tectonism associated with the Delamerian Orogeny resulted in rapid deposition of sediments and calc-alkaline volcanics (Mt. Read Volcanics), particularly along the eastern margin of the newly formed Dundas Trough (Berry 1994). Late reactivation of extensional faults as reverse faults formed open north trending folds and the uplift and erosion of the Tyennan Block forming the Owen Conglomerate (Berry 1994).

Continued sag phase sedimentation continued to the Middle Devonian with the exception of a hiatus in deposition during the Silurian (Berry 1994).

Deposition ceased in the middle Devonian with the onset of the Tabberrabberan Orogeny. In western Tasmania north trending Cambrian folds were tightened with a NNW striking cleavage. Locally developed WNW trending folding and cleavage is associated with NNE trending compression. Late to post orogenic granitoids intruded the West Coast region with associated mineralisation (e.g. Renison Bell).

5.1 GEOLOGY

5.1.1 Introduction

The Anthony EL is situated in the Anthony Basin between two major regional faults, the South Henty Fault and the Great Lyell Fault (Figure 4 and Plans 3 and 4). The EL is largely covered by the Anthony Road Andesite with a thin belt of Tyndall Group rocks outcropping in the north east corner. An east facing sequence of volcaniclastic mass flow deposits, the Yolande River Sequence outcrops in the south west corner of the EL. To the east of the Anthony EL in EL 14/93 Basin Lake a predominantly steep dipping, west facing sequence of pumice breccias and dacitic intrusives, the Central Volcanic Sequence underlies the Anthony Road Andesite and Tyndall Creek Group.

All rocks generally strike NW-SE to N-S with dips from vertical to steeply east dipping in the western half of the tenement and steeply W dipping in the eastern half. Facing appears to be mostly to the west with possible reversal or overturning in the east (Basin Lake EL). The stratigraphy, from youngest to oldest is discussed below.

5.1.2 Stratigraphy

5.1.2.1 Yolande River Sequence (Cy)

Moderate to steeply east-dipping and east-facing rocks of the Yolande River Sequence (YRS) outcrop along the western and southwestern margin of the EL (Figure 4). Within the licence area this unit comprises a sequence of graded volcaniclastic sandstones and siltstones of felsic provenance. These graded units are characterised by thin (< 1m) medium to coarse-grained sandstone bases fining up into thick monotonous intervals (tens of metres thick) of fine grained sandstone and ashy siltstone (vitric tuff- *Cya*). Often fine-grained sandstones containing flecks of ripped up black shale represent the basal unit to overlying ashy siltstones. Less commonly, 30 to 150cm lenses of polymict breccia represent the coarse bases to graded sequences. One such unit cropping out along Anthony Road contains rare pyritic clasts (<5mm). A black shale/siltstone marks the upper contact of the YRS with the overlying central Volcanic Sequence. This marker siltstone varies in thickness from 10m in the south to less than a metre in the north where it can be seen in the Anthony Road cutting faulted against feldspar phyric lavas of the CVC. A lens of sericite - pyrite altered ashy siltstone isolated between underlying dacitic lavas (Ccvl) and overlying Anthony Road Andesite (379000mE, 5354000mN) is interpreted to be part of the YRS based on its low Ti/Zr value.

Rhyolitic to dacitic lavas and pumice breccias intrude the Sequence as 5m to 80m thick sills, probably representing shallow intrusives of the overlying Central Volcanic Complex (Ccv). In the far south west of the Exploration Licence, YRS rocks are semi-conformably intruded by a major rhyolitic to dacitic porphyry (Cyi) and discordantly intruded by a coarse grained crystal rich Hb-Fd andesite (Cyx) towards the top of the sequence.

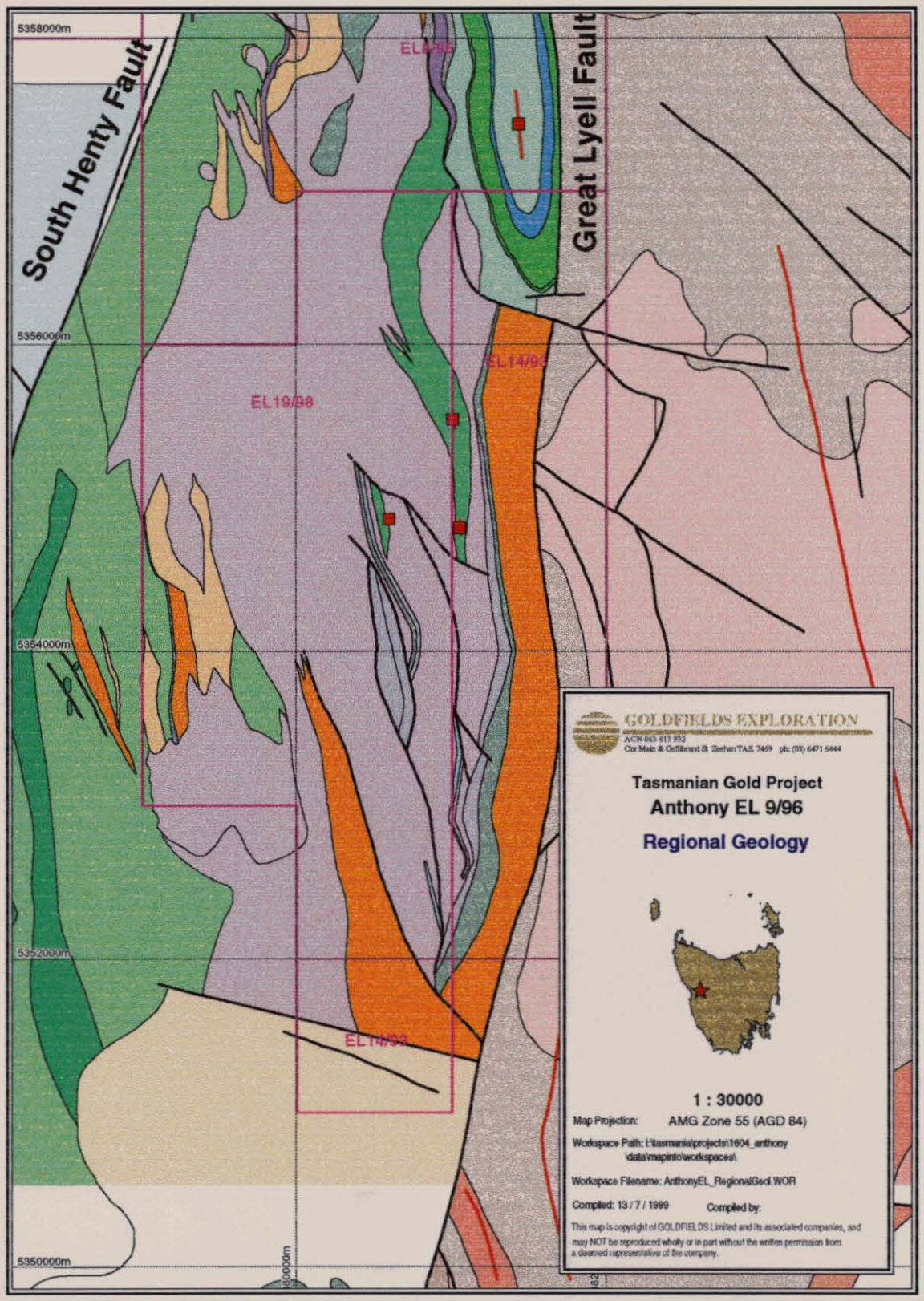
Weak (background) chloritic alteration occurs throughout with minor weak carbonate-pyrite alteration seen in black siltstones close to the contact with CVC.

5.1.2.2 Central Volcanic Complex (Ccv)

Rocks of the Central Volcanic Complex (CVC) appear in several parts of the Anthony EL (see Figure 4). In the south-west, the CVC conformably overlies and intrudes the YRS as a package of mostly dacitic feldspar phyric lavas, graded pumice breccias and rare ignimbrites. It is truncated in the south by the crystal rich andesite intrusion (Cax) and extends northwards to Anthony Road (*Pyrite Corner*) where it interfingers with and pinches out in Anthony Road Andesite (Ca). The unit re-appears as patches of mostly dacitic pumice breccia in the far north-west of the licence and is extensive further north and west on the South Henty EL. A thick interval of graded dacitic pumice breccias intersected in BLD89-1 and feldspar phyric rocks outcropping in the far south and intersected in a Basin Lake drillhole (TYN 016; Vicary, 1998), all have CVC geochemical signatures. This probably represents the southern extension of the rocks described above.

Figure 4 (See Plans 3 and 4 for Legend)

607016



5 cm

All CVC rocks mapped on the Anthony lease and to the north (South Henty) are interpreted to face and dip steeply to the east. However, to the east on the adjacent Basin Lake EL, an extensive N-S striking, steeply west dipping, 200 - 400m thick package of dacitic CVC lavas and volcaniclastics (pumice breccias) is intersected by a series of drillholes along the western margin of the Great Lyell Fault. These appear to face to the west and probably represent the reappearance of the western Anthony - CVC contact as the eastern limb of a synclinal feature close to the major fault (see Section 5.2 - *Structure*).

A precise contact between the CVC and underlying YRS is difficult to determine without better control. At surface, a laterally extensive black siltstone unit (Cyss) appears to mark the transition from felsic CYS volcaniclastics to the more coherent and intermediate units of the CVC. This contact is seen in outcrop along the Anthony Road (*Pyrite Corner* road cutting) and in a costean 50m north of the TYN 2 drillhole. Here it appears as a laminated black siltstone overlain by a 20-50m thick mixture of poorly sorted pumiceous, feldspar phyric volcaniclastics, ashy siltstone and shale clasts, interbedded with metre-scale intervals of coherent feldspar phyric lava. It is difficult from outcrop to discern whether this section represents a peperitic contact or period/s of reworking or both. Sub-surface intersection of this contact shows that the YRS marker siltstone is conformably overlain by a series of graded rhyolitic to dacitic pumice breccias. The lowermost graded bed contains rip up clasts of black shale indicating a degree of reworking of the underlying shale. Ti/Zr values from TYN 2 are consistent with those from the equivalent rocks at surface indicating downdip facies changes.

Drillhole, Leech Hill 1, is collared in *Anthony Road Andesite* (ARA) and was originally logged as having intersected 300m of intrusive crystal rich andesite (Cax) underlain by 200m of fine-grained (ashy) to medium-grained felsic volcaniclastics of the YRS (Corbett, 1985). Relogging and re-assay of this hole indicate that the overlying 'intrusive' unit, which has an unusual carbonate+silica altered amygdaloidal texture is, at least in part, CVC (Plan 7). Given that ARA (Cax) outcrops near the Leech Hill 1 collar and CVC is intersected within 80m of the surface, it is likely that the Cax is shallow in this area and begins to pinch out immediately south of Leech Hill (see Figure 4).

The overlying volcaniclastic unit, which is strongly sericite+silica+pyrite altered, has low Ti/Zr values (6.5 - 9.0) indicating that it may be a late, localised episode of felsic YRS sedimentation. The distribution of this lens-shaped unit is constrained by outcrops of ARA to the east and west and CVC to the north. The stratigraphic position of this ashy unit and its low Ti/Zr values make it a possible correlate to rocks that make up the footwall to the mineralised Spillway Horizon further north (*Footwall Pumice Breccias:* MacDonald, 1997; Vicary and Callaghan, pers. Comm.). If so, underlying dacitic lavas and graded pumice breccias would represent CVC shallow intrusives (Ccvl) and YRS mass flow units (Cymf) respectively. Alternatively, this unit may just be an ashy component of the CVC above the spillway horizon.

5.1.2.3 Anthony Road Andesite Volcanic Facies Association (Ca)

The Anthony Road Andesite facies association is a complex of mostly andesitic lavas, shallow intrusions and lesser volcaniclastics that cover a large part of the Anthony EL. They have an intrusive relationship with the underlying YRS and both a conformable and intrusive relationship with the overlying Tyndall Group. For the purpose of this report the ARA is divided into four main lithofacies (cf. Jones, *in press*). From youngest to oldest they are:

1. Hornblende Andesite;
2. *Suite II* Quartz Porphyry - *Basin Lake Porphyry;*
3. Andesitic Volcaniclastics and;
4. *Suite III* Basaltic Andesite.

Although emplacement or deposition of lithofacies 2 to 4 was probably late in the history of the ARA, eruption and intrusion by the *Hb andesite lithofacies* was ongoing and probably occurred to some degree throughout.

Hornblende Andesite (Ca): The Hornblende Andesite association is the most abundant association in the ARA and is characterised by coherent to hyaloclastic Hb-Fd phyric andesite which is a Suite II correlate. It dominates the western and central parts of the Anthony Road EL, being almost two kilometres thick in places (see figure 4). It intrudes the underlying CVC and YRS sequences obliterating parts of the underlying stratigraphy. Drill holes to the north (South Henty) reveal that the andesite pinches out at depth. The interfingering nature of the CVC - ARA contact at *Pyrite Corner* and presence of sericite-pyrite alteration at surface in this area indicate that the ARA is not vertically extensive.

Texturally the andesite varies from fine- to coarse-grained, massive (coherent) to brecciated (hyaloclastic or peperitic), probably reflecting the different phases and depths of intrusion/extrusion. The coherent rocks generally become finer grained to the east with increased but rare volcaniclastic lenses, perhaps indicating an increase in extrusive (lava) phases and local reworking. In hand specimen the association can vary mineralogically from a dominantly Hb phyric rock through to a feldspar phyric andesite. All phases may contain up to 15% quartz phenocrysts. In thin section pyroxene has also been described (see Lewis, 1995 for petrological detail)

ARA outcrops as prominent ridges on the Anthony EL and is usually hard and relatively fresh with some limonitic and chloritic alteration. Fresh to weakly chlorite altered Hb phenocrysts up 1cm long are a diagnostic characteristic of this rock.

Crystal Rich Intrusive Andesite (Cax): A coarse grained, crystal rich Hb+Fd+(Qtz) andesite body (Cax) in the far south west of the EL, which discordantly intrudes rocks of the YRS and CVC, is recognised as a late intrusive phase of the ARA. The body is about 1km thick and extends 1km laterally, shallowing and pinching out into CVC at Leech Hill (see Plan 7). In outcrop the intrusive is generally fresh with only minor chlorite+epidote+albite alteration. It is weakly to moderately sericite+ silica+pyrite altered at its contact with CVC and YRS rocks at Leech Hill. This late crystal-rich intrusive is magnetic and curiously its southern half appears as a moderate to high IP chargeablility anomaly (see Section 5.3.1).

Quartz Feldspar Porphyry - 'Basin Lake Porphyry' (Cp): The *Basin Lake Porphyry* is a Suite II rhyolitic intrusive. It has relatively high Ti/Zr and P2O5/TiO2 values (similar to those of the Hornblende Andesite association) which distinguish it chemically from the Suite I quartz porphyries of the underlying YRS and rhyolites of the overlying Tyndall Group.

This unit does not outcrop within the Anthony EL but is intersected by several drillholes (BL 5,6,7 and 8) in the central part of the mapping area where it is spatially associated with *Lithofacies 3 and 4.* In these intersections the *Basin Lake Porphyry* occurs as 20 to 50m thick, steep to vertically dipping sills which are truncated by a steep NNW trending fault (see Plans 5 and 6). To the west of this fault two sills intrude the base of andesitic volcaniclastics of *Lithofacies 3* which, in turn, underlies Suite III basaltic andesite of *Lithofacies 4.* To the east, a single *Porphyry* unit is bounded by underlying Hb Andesite and overlying Suite III carbonate rich rocks.

In core, the *Porphyry* typically appears as a silvery grey and yellow sericitic rock with a moderate to strong foliation (schistosity) containing rounded quartz grains (phenocrysts?) up to 10mm in diameter, often as the only recognisable mineral. Rare lenses of rhyolitic sandstone are recognisable in the less schistose zones of the *Porphyry.* This clastic component is seen in BL8 as well as in drill holes from the Basin Lake EL which intersect an equivalent unit. Some zones within the unit are effectively a flakey sericite quartz schist with no preserved textural features apart from rounded, stretched quartz grains. These may represent less competent clastic components of the unit.

The sericite alteration is often combined with silica and disseminated pyrite. It is interesting to note that this alteration (schistosity) is often confined or most pronounced within the *Porphyry* unit with bounding units being relatively unaltered.

Andesitic Volcaniclastic (Cav): Intervals of dacitic to andesitic sandstone and siltstone are intersected in drill holes in the eastern part of the EL, toward the statigraphic top of the ARA. These units appear to represent lenses of locally reworked dacitic to andesitic lavas of the *Hb Andesite Lithofacies.* Lack of outcrop and sparse drill hole coverage in the area means that is hard to map out and correlate individual occurrences of this unit.

A 40 to 80m thick unit of andesitic volcaniclastics which is partly truncated by a fault is intersected by BL 4,5 and 8 (Plan 5). This unit is not intersected further north in BL 6 and 7 but it may be west of the truncating fault (Plan 6). The unit is intruded at its base by at least two sills of Suite II Porphyry and is overlain by basaltic andesite.

The *Volcaniclastic* is a 'mixed bag' of fine to coarse grained and weakly graded sandstone and siltstone with several thin Hb andesite intrusions. It is variably sericite+silica+pyrite altered and hosts an 11m interval of massive to semi-massive pyrite (including 1.7m @ 62ppm Ag) intersected close to

surface in BL 4 (50m). The same horizon 100 - 150m downdip in BL 5 is strongly sericite+pyrite altered and has elevated Cu, Pb and Zn values but only slightly elevated Ag levels and Au below detection.

The andesitic volcaniclastic lithofacies possibly represents the upper parts of The Anthony Road Andesite and marks the stratigraphic footwall to the conformably overlying Tyndall Group. It is therefore quite possible that they may be correlated with volcaniclastic units immediately underlying the Lynchford Formation in the Howards Anomaly area.

Suite III Basaltic Andesite (Cal): A 50 to 100m thick unit of chemically distinct basaltic andesites and intercalated siltstones which conformably overlies *Lithofacies 3* is intersected by BL004 and 005. These are high-P_2O_5 *Suite III-type* basalts and are compositionally distinct from the *Suite II* Hb Andesites. The lateral extent of this unit is not constrained but appears to be structurally truncated.

No analysed outcrop samples in this area registered high P_2O_5 values, however two adjacent wacker samples with Suite III signatures were recorded by Aberfoyle on line 3800N in a position steeply up dip from basalts intersected in BL004 and 005 (Lewis,1995)

In hand specimen, the basalt is a dark green, fine grained, weakly chlorite altered rock with sparse feldspar and chloritised ferromag (Hb?) phenocrysts and quartz filled amygdales.

In BL006 and 007 (300m to the north), no such coherent amygdaloidal basalt is intersected, but both holes intersect a possible Suite III carbonated dacitic to andesitic breccia, stratigraphically associated with a Suite II Quartz Porphyry. (NB: Many of the carbonate rich rocks have unusually high P2O5 contents, possibly due to the presence of a phosphate mineral and this correlation may be erroneous). The coherent amygdaloidal basalt unit is possibly to the west of the NNW trending truncating fault (Plan 3 and 4). It is interpreted however that the package of rocks intersected in BL006 and 007 is an east facing correlate of the rocks intersected in BL004 and 005 (i.e. ARA Associations 2-4) and are similar to rocks intersected by drillholes to the east on the Basin Lake EL (See Plans 3 and 4). Lewis, 1995, (p.12) notes the existence of an outcrop of Suite III basaltic andesite on line 4000N just west of the powerline access road. This may be the eastern limb to the synclinally folded Suite III rock intersected in BL006 and 007.

In summary, the package of Quartz Porphyry sills, andesitic volcaniclastics, basaltic andesite and black shales *(Lithofacies 2-4)* intersected in BL004 and 005 is effectively the stratigraphic top of the ARA Lithofacies Association which is partly intruded and overlain by late Hb Andesites (lithofacies 1). A similar lithofacies association also occurs at the base of the Anthony Road Andesite in the Basin Lake area. Lithofacies 3 probably represents a period when there was active erosion/reworking of the underlying coherent andesites and localised resedimentation. The intercalated black siltstones indicate a period quiet sedimentation (black shales) and a deepening environment of deposition. The *Quartz Porphyry* may represent episode/s of shallow intrusion into the volcaniclastics.

Jones (pers. comm.) interprets the ARA to be a submarine dome and lava complex in which abundant lava and shallow intrusions were emplaced through and onto the YRS.

5.1.2.4 Lower Tyndall Group Correlates (Cttls)

In the north eastern part of the Anthony EL, rocks of the Lower Tyndall Group (LTG) outcrop as a 300m wide arcuate belt which thins southwards and bends into the adjacent Basin Lake EL. It is laterally extensive for almost 3km and is offset 500m to the north-west at 4500N where it pinches out. From drillhole intersections (TYN 1 and 3) this unit is folded and its true thickness is more likely to be 50 - 70m. The rocks are part of a syncline trending and plunging to the NNW which means that the unit is shallowing as well as thinning to the south (see Section 5.1.2).

The unit comprises graded sequences with coarse to medium grained, crystal rich quartz feldspar sandstones grading to fine sandstone or relatively thick intervals of black siltstone. It correlates with the Lynchford Member of the Comstock Formation and is interpreted as a structurally dislocated slice of this Member. It does have a higher component of black siltstone than the equivalent rocks to the immediate east and north and is therefore classified as a distinct unit (Cttls- Plans 3 and 4).

The unit is bounded by carbonate altered coherent to brecciated Hb andesites, basaltic andesites and limestone whereas the Lynchford Member rocks, at surface and in TYN 1 and 2, are relatively unaltered with only minor sericite and pyrite alteration of the black siltstones.

5.1.2 Structure

Rocks in the western half of the Anthony EL (up to ~380500E) face and dip steeply to the east and are structurally less complex than the rocks in the eastern half. In the east (Basin Lake EL), the Great Lyell Fault (GLF) truncates the Cambrian volcanogenic rocks and juxtaposes them against the Middle to Upper Owen Formation. This is a major N-S trending structure which dips steeply to the west. Along its western margin is a laterally extensive package of CVC, Suite II Porphyry and Suite III basalt. This package has been intersected by a series of drillholes and is interpreted to dip steeply back to the west. It is truncated abruptly in the north by the E-W trending Whitham Bluff fault splay and in the south against an interpreted NW - SE trending splay of the GLF (Plan 4).

Close to the eastern boundary of the Anthony Road EL an isolated package of NNW-SSE striking, steeply dipping rocks which correlate to those along the western margin of the GLF is intersected by BL4-8. It is 150 - 250m thick and may be laterally extensive for up to 1.5 km (3400N - 4800N; see Plans 4, 5 and 6). It is faulted against *Hb Andesite* at its western margin and is interpreted to be dissected by a steep NNW trending fault. Rocks to the west of this dissecting fault, face west and are a slightly different facies to the package along the GLF. However, the rocks to the east of this fault are very similar to the Suite II porphyries and carbonated basaltic andesites intersected close to the GLF.

In the northern part of the EL, the outcropping lens of LTG volcaniclastics bounded by carbonate rich andesites (Ccarb/Ca/Cal) is interpreted to be a structurally detached correlate of the Lynchford Member rocks mapped to the north and NW (see Section 5.1.2.4). Facing evidence from LTG rocks in TYN1 and TYN3 and their relationship with outcropping equivalents suggest that this unit is relatively shallow and is part of a northerly plunging syncline (see figure 5 and plan 4). At its stratigraphically thinned southern end (5354700N) this unit is offset 500-600m to the NW (OOS costean exposure) indicating the presence of a NW - SE fault. Although there is no outcrop between the dislocated units, wacker samples described by Lewis, 1995 from this zone include sheared rocks. This dislocated portion of Lynchford Member pinches out into andesites which outcrop 300-400m to the south. It is also interpreted to be part of a syncline (see figures 5a-f).

Reprocessed magnetic (and UTEM) data of the Anthony area show predominant NW-SE to N-S trending continuity breaks with rare SW-NE and SE-NW trends apparent in the vertical derivative images. These trends do not all relate to conformable stratigraphic or alteration related changes but probably include NNW trending faults which cut stratigraphy at a low angle. Where these trends do not merely represent a conformable lithology change, alteration effect, significant lithological discontinuity or correspond to known shearing from drillhole and outcrop evidence, a fault has been inferred.

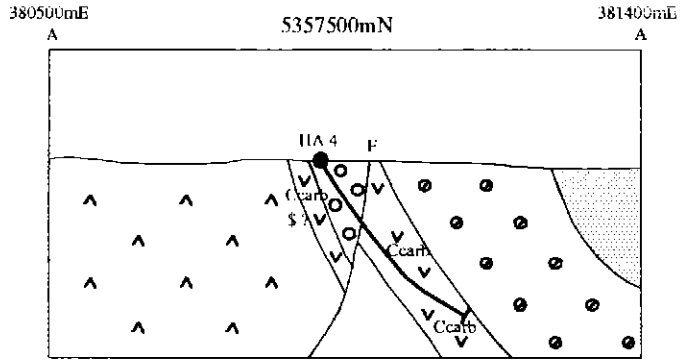
The NNW-SSE geophysical trends are most common close to the GLF and probably represent splays which are at a low angle to stratigraphy. One of these features probably represents a significant NNW-SSE trending structure which truncates the Suite II Quartz Porphyry between TYN010 and TYN016 in the south. This may represent the eastern margin to CVC rocks which outcrop to the west and are intersected in TYN016 and BLD89-1. S-type parasitic folding interpreted from facing evidence in BLD89-1 suggests a syncline to the east.

The laterally discontinuous slice of upper ARA stratigraphy intersected in BL004-008 represents a part of the stratigraphy that has been structurally isolated and probably upthrust by a series of N to NW trending, anastomosing faults (see Plans 3 and 4 and figure 5g).

Another significant NNW trending fault appears to detach LTG rocks in the north causing a repeat of equivalent Lynchford Member stratigraphy on the western side which extends southwards and is offset 400 - 500m to the NW. At its southern end this fault is interpreted to curve into an E-W trending splay of the Whitham Bluff fault. The offset of this LTG package of rocks is probably caused by an inferred NW-SE trending fault which is coincident with a geophysical discontinuity. This offset may have been accentuated by other unconstrained NNW trending faults.

Figure 5: Schematic Cross Sections of Anthony Road Geology - Looking North

a)



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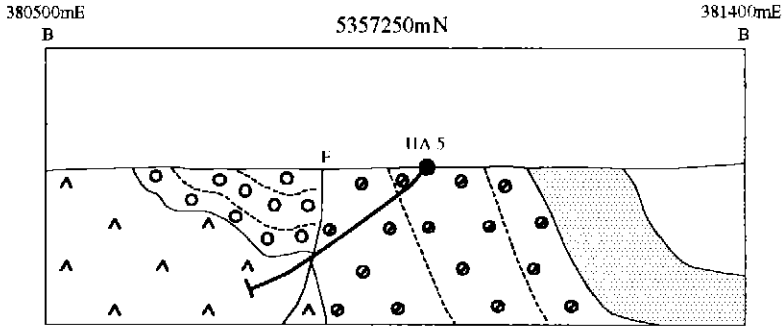

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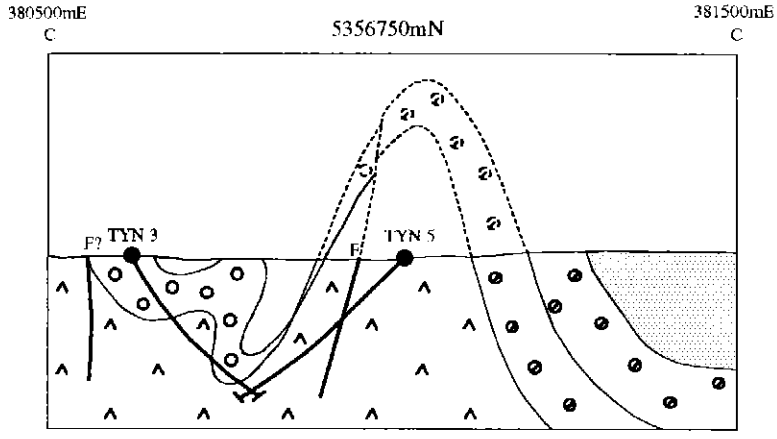
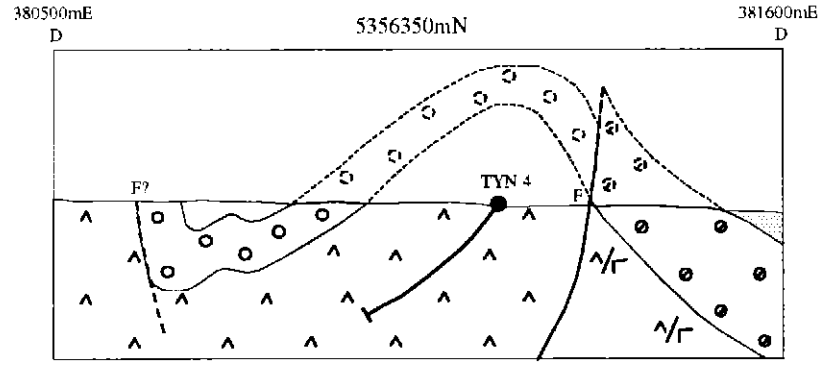
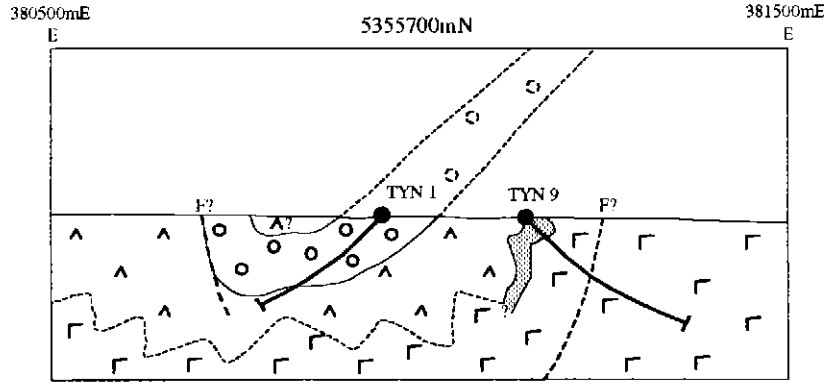


d)


380500mE
D
5356350mN
381600mE
D
F?
TYN 4
F

e)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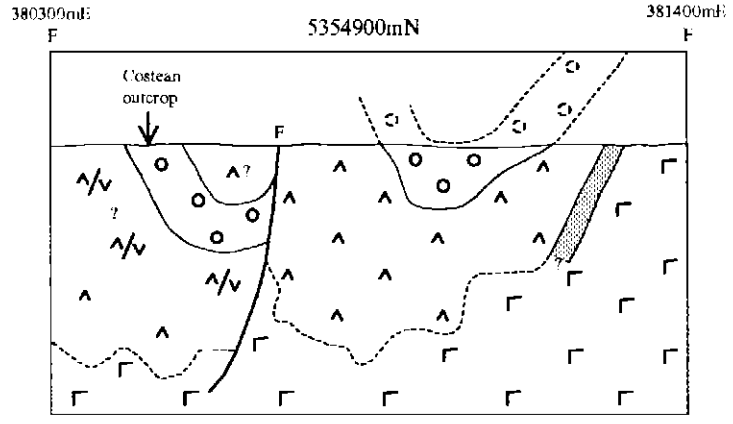
5355700mN
381500mE
E
F?
TYN 1
TYN 9
F?

f)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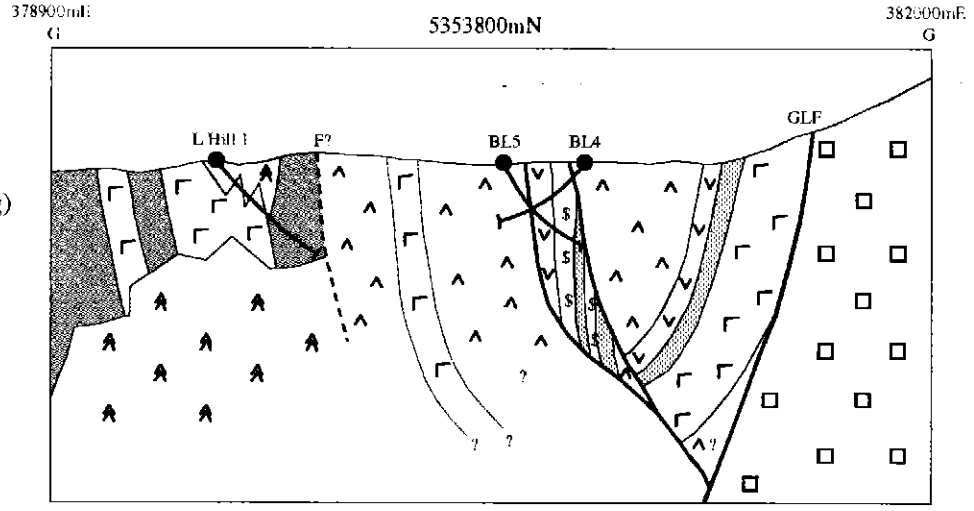
F
5354900mN
381400mE
F
Costean
outcrop
F

g)



- Upper Owen Group glacial deposits
- Middle Tyndall Group
- Lower Tyndall Group rocks on eastern side of detachment fault - Cttl
- Lower Tyndall Group Sediments - Cttls
- Suite III Basaltic Andesite (+/- Carbonate - Ccarb) - Cal
- Dacitic - Andesitic Volcaniclastic - Cav
- Quartz Porphyry - Cp
- Hb Andesite - Ca
- Xtal rich Hb Andesite - Ca
- Dacitic to Rhyolitic Cvc lavas and pumice breccias - Ccl/Ccv
- Ashy Siltstone - Cy?

The structural regime of the Anthony EL, particularly along the unconstrained eastern margin of the EL is no doubt more complex than represented on Plan 4, with a series of anastomosing faults cutting the stratigraphy at a low angle and juxtaposing different rock types or facies. These faults may have been reactivated during several separate tectonic episodes adding to this complexity.

In summary, the steeply dipping, NNW trending Anthony EL stratigraphy is cut at low angle by a series of steep N-NW trending anatomising faults which appear to be splays off the GLF. Relatively well behaved east dipping and facing stratigraphy in the west and laterally continuous west dipping and facing rocks alongside the GLF probably represent the limbs of a major syncline associated with GLF-related deformation. The stratigraphy in between is disrupted at low angle by a series of steep N-NW trending anastomosing splay faults which partition the stratigraphy into fault bound domains. Stratigraphic relationships and facing evidence from drillholes and outcrop indicate that rocks within these structural domains are folded, and upthrust causing stratigraphic repeats. The folding is usually in the form of a syncline with attenuation and failure along limbs and thickening at fold closures. This structural pattern is similar to that interpreted in equivalent rocks near Queenstown to the south (see Queenstown 1: 25 000 geological map) and may have formed during the NE-SW compressional episode of the Devonian.

5.1.3 Alteration

Outcrop mapping and drillholes to date have revealed several significant zones of alteration within the Anthony EL and neighbouring Basin Lake ground but none of these are associated with economic mineralisation. The most significant occurrence of sulphide is the 11 metres of massive pyrite intersected in BL4 in the *Langdon Pyrite Zone*.

The significant alteration zones appear to be related to two distinct stratigraphic contacts or horizons. They are the interfingering contact between the CVC and the Hb Andesites in the west and south west and the mixed package of rocks of the upper ARA which are the footwall to the Tyndall group – the *Henty Horizon*.

5.1.3.1 CVC - Hb Andesite Contact

A 2km long and 300 - 400m wide N-S trending zone of sericite+silica+pyrite+chlorite alteration extends from Leech Hill in the south west to 300m north of *Pyrite Corner* on Anthony Road. It is expressed in the south (*Leech Hill 1*) as strongly sericite+silica+pyrite altered volcaniclastics bounded by carbonate+silica altered dacitic lavas of the CVC. A 200 - 250m wide section of sericite+silica+pyrite+chlorite altered dacitic and andesitic lavas is exposed by the Anthony Road cutting and is at its most intense at about 4700N. Alteration along this section varies from sericite+pyrite schist (with coarse grained pyrite) at its most intense to zones of moderately sericite+silica+chlorite+pyrite or chlorite+silica altered rock. Rare pods of relatively unaltered (background chlorite) rock preserving volcanic textures of the dacitic and andesitic precursor are contained within this zone. The rocks grade into less foliated or massive weakly chloritised rocks to the south and north but it is difficult to discern any sensible zonation within the alteration corridor. Assays from rock chips taken along the altered Pyrite Corner road cutting returned weakly anomalous base metal, Au and Ag values. Na_2O depletion is indicative of hydrothermal alteration (see section 5.4)

Similar but less intensely altered rocks are exposed in tracks 200 - 300m to the north and north west but no good outcrop of strongly altered rocks exists between the Anthony Road exposure and Leech Hill. However, IP (conductivity) contours and subdued magnetics through this area suggest that the alteration zone is laterally continuous. Interpreted stratigraphic relationships would also seem to support this. It seems that *Pyrite Corner* and *Leech Hill Pyrite Zone* are intensely altered end members of the same alteration system.

Alteration follows the CVC - ARA contact and cross-cuts stratigraphy effecting both the Hb andesites and the dacitic lavas and pumice breccias of the CVC. This zone traces the irregular and cross-cutting contact between the intrusive ARA (Hb Andesite) and the underlying and adjacent rocks of the YRS and CVC. The intensely altered *Pyrite Corner* outcrop is probably an exposure where the contact between the CVC and shallowing, pinching ARA is close to surface. The Leech Hill alteration Zone may be the result of the interdigitating and shallowing of the southern crystal rich Hb Andesite intrusion (Cax) with rocks of the YRS and CVC. The different intrusive phase at Leech Hill may explain the unique Carbonate+quartz alteration of the contacting CVC lavas.

The alteration zone is unlikely to be reflecting the YRS - CVC contact given that TYN002 tested this *marker black siltstone* horizon without intersecting significant alteration in either the YRS sediments or overlying lavas and pumice brecicias of the CVC.

5.1.3.2 Henty Horizon

A Stratigraphically controlled alteration facies of sericite(+silica)+pyrite and overlying pinkish-purple carbonate(+hematite) is intersected in drillholes BL004 - 008. Sericite(+silica)+pyrite alteration is focused in the Suite II Quartz porphyries (Cp) and in the hosting andesitic volcaniclastics (Cav) often associated with a moderate to strong schistosity. The overlying andesitic basalts range from relatively fresh to strongly carbonate+hematite altered with some massive carbonate and moderately pyrite+sericite(+carbonate) altered interbeds of black siltstone. The enclosing coherent to brecciated Hb andesites are usually carbonate(+hematite) altered with some patches of massive carbonate. This zonation is consistent with the 800m long, 200m thick alteration intersected to west at Basin Lake between BL001 and TYN011. Here the sericite+pyrite altered Porphyry is interpreted to form the footwall to an inferred sea floor position defined by the presence of carbonate units in the overlying andesitic basalt (Cal) and Andesites - the Henty Horizon (see Vicary, 1998). This alteration pattern is also analogous to alteration zonation about the South Henty mineralisation to the north (Callaghan, 1998) and around the Western Tharsis orebody to the south (Ser+Py core and Cb halo : Huston and Kamprad, 1998).

Extensive assaying previously done on BL006 and 007 indicates that this sericite+pyrite alteration zone is generally depleted in Na2O, CaO and MgO, has an alteration index (K2O+MgO/K2O+MgO+CaO+Na2O) of above 90 and is enriched in K2O, reflecting the intensity of sericite alteration. These geochemical features are characteristic of footwall alteration to the Henty horizon. Anomalous, but not greatly elevated, base metal and Ag values as well as As and possibly Ba are also clearly associated with this pyritic alteration. Patches of anomalous base metals and Ag exist in wacker samples above BL006 and 007 and 200m to the south. The only significant massive sulphide recorded on the Anthony EL was within the Andesitic volcaniclastic sediments (Cav) intersected in BL004.

The distribution of sericite+(silica)+pyrite in the BL004-008 alteration zone is well delineated by an anomalous IP (conductivity) response and appears as a zone of subdued magnetics on Helimag images. This is consistent with magnetic susceptibility measurements for BL006-008 which give a flat response for sericite+(silica)+pyrite altered rocks and a spiky response for carbonated units (Richardson,1996).

Another extensive zone of carbonate(+hematite) altered andesitic basalts and andesites is intersected in the northern part of the EL in TYN001, 003-005 and in outcrop along Anthony Road between 5600N and 6200N. This Carbonate alteration zone encloses the unit of Lower Tyndall (Cttls) which is coincident with an extensive IP anomaly. TYN001 and 003 intersected no significant (Se+Py) alteration in the LTG sediments indicating that the IP response over these rocks is related to black siltstones within the unit rather than alteration. These sediments appear as a zone of high magnetism further indicating a lack of significant alteration (magnetite destruction). In the far north of the EL and into South Henty, elevated Pb and Zn values are recorded in wacker samples at the margins of this IP anomaly.

5.2 Geochemistry

5.2.1 Sampling

Thirty rockchip and twenty core samples taken from the Anthony EL were submitted for assay and the results are attached as Appendix 3. Samples were analysed using NAA and XRF primarily for lithogeochemical /rock identification purposes. Samples were assayed for Cu, Pb, Zn, Ag and Au but no significantly elevated base metal, Ag or Au values were detected, with only a few weakly anomalous pyrite+sericite altered samples taken from P*yrite Corner.* These *altered Pyrite Corner* samples show moderate Na_2O depletion with an average of 0.45% for 7 samples indicating hydrothemal alteration. Even though some of this depletion is due to surface leaching this value is

well below the 1.5% value considered to represent the lower limit for unaltered volcanics in this area (Large et al., 1996.)

5.2.2 Reprocessed Anthony EL Wacker Samples

Plans generated showing Cu, Pb, Zn, Ag, Au, Ba, As and Cr values for the Aberfoyle Wacker samples analysed previously by Aberfoyle (Lewis, 1995) indicate several localised zones of weakly anomalous metals. Au values were below detection (Appendix 4).

An 80-100m wide, 250m long zone of anomalous Zn and Pb (+Cu, Ag, Ba, Cr and As) occurs between 4000N and 4200N on an easing of about 380720. This zone strikes NNW-SSE and corresponds to the interpreted surface position of the Suite II Porphyry - Suite III basalt contact intersected in BL 6 and 7. A wacker sample immediately above the projected position of the massive sulphide lens in BL4 is unremarkable in base metal, Ag and Au values. A localised zone of elevated Cu values (1 sample @ 0.3%), 500m to the west (4200N, 380250E) of the laterally extensive zone was tested by Aberfoyle with three short drillholes (LHD1-3) and found to be hosted in relatively unaltered Hb andesite. The highest Cu values seen in the Anthony and South Henty wacker grid appear in the Hb andesites in the south and west rather than in areas of known alteration. This indicates that the andesite contains relatively high background levels of Cu.

In the northern part of the Anthony EL sporadic sites of weakly anomalous Pb and Zn are apparent close to the boundary between the detached unit of LTG (Cttls) and carbonate rich basaltic andesites of the ARA.

Despite these few relatively anomalous base metal zones within Anthony there are no extreme values and the samples are predominantly low or below detection. It is a comparatively quiet area when considered next to the widespread high values recorded at Howards Anomaly and South Henty immediately to the north.

The immobile ratios, Ti/Zr, P_2O_5/TiO_2 and P_2O_5/Zr for each wacker sample were also plotted to help discriminate rock types. It confirmed the interfingering nature of the *Suite I* CVC and *Suite II* Hb Andesites along the Pyrite Corner exposure. *Suite III* signatures were apparent in rocks coincident with the interpreted surface position of andesitic basalts intersected in BL4and BL5. Low Ti/Zr and P_2O_5 values in the north also confirmed the position of the LTG unit with the odd Suite III signature probably representing bounding carbonate rich andesites or black siltstones within the unit.

5.2.3 Soil Samples

Reprocessed soil sample data for Anthony (Fitzgerald and Cartwright, 1986) is not all that useful in picking up trends. Pb and to a lesser extent Zn and Cu values are elevated in the *Pyrite Corner* sericite+pyrite alteration zone but they are not significantly high values.

The ground above BL 4-8 does not produce any anomalous values apart from a single high Zn sample at the northern end of the laterally extensive wacker anomaly (5354200N, 380700E) and a high Cu sample near LHD1-3. The data is otherwise sporadic with some high Pb values at the LTG - carbonate-rich andesite contact in the north and most high Cu values appearing within the Hb andesites reflecting the wacker results. It is worth noting that Cu values are most consistently high in the area of the southern crystal-rich andesite intrusion (Cax).

5.3 Geophysics

5.3.1 IP

IP data from surveys conducted by Goldfields Exploration Pty Ltd (Fitzgerald and Cartwright, 1986) was compiled, remodelled and adapted for *Mapinfo*. Conductivity and resistivity images of this data are presented in Appendix 4.

Chargeability highs within the Anthony EL either relate to sericite-pyrite alteration or pyritic black

siltstones. All anomalies strike between N-S and NW-SE. The four main IP anomalies within the EL are:

Anomaly 1
In the far SE corner a 400m long, 100m wide anomaly (20-30m) is coincident with a NNW striking laterally extensive black siltstone within Hb andesites intersected by BLD89-2, BL001 and TYN012

Anomaly 2
A 500m wide, 1.8km long high conductivity zone (>20ms) which extends from Leech Hill in the south to beyond *Pyrite Corner* in the north is the most extensive anomaly on the EL. Cells of highest conductivity response (>35ms) are centred over Leech Hill and Pyrite Corner at either end of the anomaly. This anomaly is interpreted to be due to sericite+pyrite alteration associated with the shallow interfingering contact between rocks of the CVC and ARA (see 5.1.3.1). A thin band of high conductivity (30-40ms) along the western margin of this anomaly is caused by black siltstones (*marker siltstone*) of the YRS and probably has the effect of 'smearing' anomaly 2 westwards.

This anomaly continues south to a localised IP high (30ms) located over the south western corner of the crystal-rich Hb andesite intrusion (2800N, 379250E) surrounded by a NW trending (>20ms) halo which is 700m long and 200m wide. The location of this anomaly and the presence of chlorite+albite+epidote (+sericite) altered rocks outcropping in this area suggest conductivity associated with the altered southern margin of the intrusion, possibly in contact with YRS rocks.

Anomaly 3
The 900m long, 200m wide anomaly (20ms) which prompted the drilling of BL 004-008 is probably responding to a combination of sericite+pyrite altered quartz porphyry (*Cp*) and volcaniclastics (*Cav*) and black siltstones (within *Cal*). It is interesting that the anomaly contains several cells of higher conductivity (30-35 ms) which may reflect different lithologies. The southern high, which is coincident with a strong UTEM trend is probably responding to pyritic shales of the Suite III basalt. The central high is above the interpreted position of the massive sulphide in BL4 and the northern high corresponds to an altered Suite II Porphyry which is interpreted to reach the surface at this location. The northern high also coincides with wacker samples containing anomalous base metals

Anomaly 4
An anomaly in the north of the EL appears to be associated with the structurally detached portion of the LTG volcaniclastics (*Cttls*) and its contact with carbonate rich andesites. The anomaly boundary effectively follows this lithological contact, extending 2km from 5000N to at least the northern margin of the EL (7000N), with a width of up to 280m. This anomaly may be due to alteration at this ARA - LTG contact *(Henty horizon)* particularly as this contact appears to be shallowly folded and structurally repeated in this area. However, TYN003, which intersects this contact at its most conductive point (50ms), does not encounter any significant pyrite alteration apart from some weakly pyrite altered black siltstone It is the conductive nature of the black siltstone which is likely to be the cause of the IP response.

5.3.2 Magnetics

Lithological implications

Magnetic images of the Anthony area show Yolande River Sequence rocks as magnetically subdued with the overlying ARA producing a patchy response. The variability in magnetic response for the ARA may reflect at least two geochemically distinct episodes of lava flow or shallow intrusion as well as the localised effect of magnetite destructive hydrothermal alteration. The magnetite rich lavas may have represented impermeable units through which hydrothermal fluids could not penetrate (Sharpe,1994). The southern half of the crystal rich andesite intrusive (*Cax*) plots as a magnetic high as does CVC pumice breccias in the SE of the EL. The distribution of Lower Tyndall Group sediments is clearly delineated in the NE as strongly magnetic units.

Alteration implications

Low magnetic responses are associated with the three main zones of alteration identified on the Anthony EL: The zone of mostly Se+Py alteration extending from Leech Hill to *Pyrite Corner*; Proximal Se+Py and distal Cb style alteration along strike from BL004 and; to a lesser extent, predominantly Carbonate (+He) alteration associated with the ARA -Tyndall Group contact in the north.

The Leech Hill – Pyrite Corner alteration zone is particularly noticeable in the reduced to pole image showing magnetite destruction of the typically magnetic ARA rocks. Interestingly, ARA andesitic lavas (*Ca*) at on the western margin of the Lower Tyndall Group give a low patchy magnetic response which may be the result of carbonate alteration.

Magnetic susceptibility measurements carried out on core from BL006, 007 and 008 confirm that Se+Py(+Si) altered rocks give a flat response while Cb(+He) altered andesite gives a spikey signal.

Structural implications

First and *second vertical derivatives* and *second horizontal derivative* images confirm the magnetically flat Leech Hill – *Pyrite Corner* alteration zone seen in RTP images and highlight a series of bedding parallel lineaments. These images show a complex array of mostly NNW-SSE trending magnetic continuity breaks with a lesser component of NE – SW and WNW- ESE trends. Where these trends are consistent between the three derivative images and appear to dislocate or juxtapose lithologies a structure has been inferred. It is consistent with the interpretation that the stratigraphy is cut at low angle by a series steeply dipping, anastomosing faults which probably represent splays to the N-S trending Great Lyell Fault.

Many more structures could be inferred from the derivative images but given the lack of outcrop and drillhole evidence only a few can be constrained using a combination of magnetic and lithological criteria (Figure 4, Plans 3 and 4). A NNW striking magnetic discontinuity in the south of the Anthony EL can be explained as a significant splay fault (off the GLF) which truncates CVC and upper ARA units against an oblique unit of pumice breccia as interpreted from drillholes in the area. Other magnetically and stratigraphically interpreted splays in the southern and central western part of the EL appear to repeat slices of the stratigraphy with anastomosing faults creating structurally partitioned sequences such as the BL004 – 008 zone (see section 5.1.3). Another significant splay in the north of the EL which may be an extension of the Whitham Bluff Fault detaches a thickness of Lower Tyndall Group sediments. A NW – SE trending discontinuity is consistent with an inferred fault which dextrally offsets this unit of lower Tyndall group rocks near the middle of the EL.

A NNW trending magnetic feature which coincides with the eastern margin of the Leech Hill – *Pyrite Corner* alteration zone is apparent in both Derivative and RTP images. This significant geophysical trend is not confirmed on the ground as it is not intersected by drillhole and outcrop is rare to non-existent along this margin. It may represent a significant structure which provided a fluid pathway for hydrothermal alteration or it may just be a stratigraphic boundary (ARA). The other structures discussed above are also consistent with RTP images.

5.5.3 UTEM

Previous UTEM data reinterpreted by Chris Dauth is of limited value however several aspects are worth noting. All anomalies trend N to NNW, and although most appear to coincide with known black shales, one anomaly traces the easternmost Basin Lake porphyry unit from 5000N to 6300N where it appears to stop against the inferred cross–cutting Whitham Bluff splay extension. A strong but isolated response slightly NW of BLD 89-1 may represent a shale unit within the CVC pumice breccias or may be related to an inferred NNW trending structure immediately to the east. The extent of this anomaly is somewhat obscured by noise from the nearby powerlines and may in fact be an artefact of this powerline noise. A moderate response is also coincident with a portion of the NNW trending splay to the east of BLD 89-1 (between 5353000N and 5354300N).

A weak conductor is delineated along the eastern edge of the Leech Hill – Pyrite Corner alteration zone from 3000N to 5000N lending weight to the possibility of a controlling fault along this margin. A surficial conductor is also interpreted at the northern extent of this alteration zone (379500E, 4000N), where sericite+pyrite altered CVC pumice breccias and dacitic lavas interfinger with shalllow ARA Hb andesites.

5.5.4 CSAMT

5.5.4.1 CSAMT Technical Report

A CSAMT survey was conducted over the Anthony EL by Billiton 1989-90 (Creagh and Hungerford, 1990). Only limited parts of this survey received full evaluation. In association with concurrent exploration in the adjacent South Henty EL it was decided to reprocess and model the Billiton data using several recent techniques unavailable at the time of the Billiton survey.

A technical report by Chris Dauth is presented in Appendix 5. This report was prepared shortly before Chris's departure to serve as background information to Mike Asten, of Flagstaff Geo-Consultants who was contracted to oversee the proposed processing and modelling of the Billiton CSAMT data and the subsequent South Henty CSAMT survey.

5.5.4.2 Inversion Trials

To assess the best method of reprocessing the existing CSAMT data from the Anthony EL, Mike Asten was asked to process three trial lines using a variety of techniques. A short report of this study is presented in Appendix 6.

5.5.4.3 Review of Billiton CSAMT Data

A report on the reprocessing of the Billiton CSAMT Data is presented in Appendix 7. Several recommendations presented in this report will be evaluated in the 1999-2000 field season.

6. DISCUSSION and RECOMMENDATIONS

6.1 Introduction

Three main target areas have been delineated based on the work done. These are:-

1) Au–Cu mineralisation in the upper stratigraphic package of the ARA along strike from BL004,
2) Henty style mineralisation at the base of the Tyndall group in the north of the EL and;
3) Zone of Sericite-Pyrite alteration and IP anomalism at Pyrite Corner and along strike to Leech Hill

These targets basically correspond to Vicary's (1998) preliminary targets 1, 3 and 4 respectively. The preliminary target 2, which related to magnetic lows and minor IP anomalism in Hb andesite in the NW, forms the northern extension of Target 3

6.2 Target 1 Au-Cu mineralisation along strike from BL004

Discussion

Target 1, an area north and south of BL004 represents a structurally complex corridor of altered geology, associated with an IP chargeability anomaly and a patchy magnetic low. This corridor is topographically subdued with no significant outcrop and limited drill hole intersections. Based on a reinterpretation of BL004 – 008, Target 1 comprises a >1km long, N-S striking zone of structurally isolated and repeated packages of upper ARA (quartz porphyry, *Suite III* basalt and mineralised volcaniclastics) which are stratigraphically equivalent to the highly prospective Henty horizon.

The most intense IP anomaly in this area was initially tested to a depth of about 200m by BL004 and 005 which were drilled at the anomaly from the east and west respectively. BL004 intersected a highly sericite – pyrite altered package of interbedded quartz porphyry and volcaniclastic sediments close to surface, including two thin massive sulphide lenses between 65 and 70m. The larger of the lenses returned an assay of 2m@ 57 g/t Ag, 1.7% Ba, 2315 ppm Zn and 655 ppm As from 68 to 70m. The alteration zone is spatially associated with a chemically distinctive amygdaloidal basalt which is considered to be a correlate of the Light Rare Earth Element enriched (*suite III*) basaltic andesite in the "Target Horizon" at Basin Lake (See Vicary, 1998) BL005, which is located about 200m south of BL004 also intersected the alteration zone and amygdaloidal basalt down dip at a depth of 170m, but

failed to intersect the massive sulphide. The strongly sericite – pyrite altered volcaniclastics were anomalous in base metals and Ag (+/- Au).

BL008, which was drilled to a depth of 700m and collared 200m to the east of BL004, intersects sericite–pyrite altered quartz porphyry and possible volcaniclastics representing the projected eastern margin of the BL004 alteration zone at a depth of about 400m (see Plan 5). No mineralisation was reached by BL008 but it was probably collared too far east and drilled too steeply to truly test at depth the strongly altered and mineralised volcaniclastic unit identified in BL 004 and 005

BL006 and 007, located 400m to the north of BL004, were drilled to test the along strike potential of the BL004 alteration. BL006, which was drilled under a zone of anomalous wacker samples, intersected a separate sequence of carbonated Suite III andesitic basalts (Cal, Ccarb) and altered quartz porphyry (Cp) bounded by Hb andesite, but failed to fully test the BL004 alteration package. The hole was abandoned within intensely sericite–pyrite altered quartz porphyry (Cp), short of the target volcaniclastic (Cav) unit. Downhole EM detected a conductive source 150m below this alteration. BL007 targeted the source of this EM anomaly but was drilled too steeply reaching only the initial sequence of unmineralised carbonated basalt and quartz porphyry (see Plan 6). Downhole EM done in BL007 was ambiguous. Therefore the along strike potential of the BL004 alteration package, which is coincident with anomalous surface geochemistry (Wacker samples) and IP anomalism, remains untested.

Pyrite Corner Fault Zone

Previous work by Aberfoyle suggested that a WNW trending transfer fault between the BL004 alteration zone and *Pyrite Corner* represented a dominant control on alteration/mineralisation in the central part of the Anthony EL *(Pyrite Corner Fault Zone)*. They also believed that this structure would represent the faulted boundary between the ARA and overlying Tyndall Group rocks. Apart from an unmineralised fault intersected in BL008, no mineralised structures are apparent in holes drilled to test this fault (BL006, BL007 and LHD 1-3) and although *Pyrite* Corner is strongly altered there is no definite evidence of a significant structure cutting through the outcrop. This cross cutting WNW trend is also inconsistent with lower angle northerly trends interpreted from magnetic and IP data. Furthermore, no holes drilled within this *fault zone* intersect Tyndall Group rocks.

Glacial Erratic

Further physical evidence for significant economic mineralisation within the upper ARA units of Target 1 comes in the form of a 2m boulder of massive sulphide - silica located in Quaternary glacials 1 km to the south of the BL004 alteration zone.

The mineralised erratic contains anomalous Cu, As, Sb, Au, Ag and Te and thinly laminated pyrite and enargite (see Vicary,1998 for details). The presence of enargite is intriguing as it is typically associated with high suphidation acid sulphate alteration. Its occurrence in Tasmania is restricted to rare observation at Mt Lyell (Huston et al, 1992). The recent study at Western Tharsis by Huston and Kamprad, 1998 has confirmed the presence of acid sulphate alteration assemblages consisting of pyrophyllite, topaz, fluorite, zunyite and woodhouseite.

The sulphide consists mainly of massive pyrite that is replacing a peperitic mixture of quartz phyric lava (rhyolite?) and silicified siltstone and sandstone. A feature of the ore is the presence of very distinct rounded quartz phenocryts. This is consistent with the porphyritic rhyolite (Cp) and rhyolitic to dacitic sediments (Cav) associated with sericite - pyrite alteration and minor massive pyrite mineralisation in BL004 and BL005. It is significant that the Cu-rich glacial erratic is to the south of the BL004 mineralised zone which is consistent with southerly movement of glacial deposits interpreted for the Anthony region.

Given the thinness of glacial cover in this area and the density of the erratic it is unlikely that it has travelled far from its source (Kalliokoski, 1998) and has probably been dislocated from an outcropping topographic high (Laittakari,1989; Ramaekers et al., 1982). This means that the source may well be sub-cropping beneath shallow glacial cover to the north, in close proximity to its present position. A detailed search within a 500m radius of the glacial erratic (particularly to the north) was carried out but only small cobble-size pieces less than 100m from the boulder were located.

Recommendations

Target 1 is a stratigraphically and structurally favourable zone of high conductivity and subdued magnetism which remains poorly tested. BL004 and 005 were the only drill holes to directly test the mineralised package but only to a depth of 200m. BL006 and 007 both fell short of the target and failed to test its northern strike potential. Therefore this highly prospective stratigraphy remains effectively untested down dip and along strike to the north of BL004 and to the south as far as the mineralised erratic. The presence of this chunk of economic ore along strike to the south raises the possibility of a Que River-type deposit hiding under glacial cover somewhere along this Target horizon. Given the poorly constrained geology, a three step approach should be adopted in the exploration of this target:

1. Wacker Sampling Programme

A close spaced Wacker sampling programme over the prospective zone of Target 1 is recommended before directly testing the stratigraphy with drill holes. These samples should be assayed for base and precious metals as well as the relevant trace elements including Ti, Zr and P_2O_5. A sample grid with the boundaries 5353000mN, 5355250mN, 380400mE and 381000mE using 100m spaced E – W lines and <25m sample spacing, would be effective in delineating alteration/mineralisation and *suite III* horizon(s). This will help define drill hole locations and possibly generate new targets, particularly in the northern half of the grid where glacial cover is not as thick. Some areas may not be amenable to this form of sampling due to the thickness of the glacials.

Depending on budgetary allowances and as a lower priority the sampling could be extended to the south west to test the projected faulted margin of the pumice breccia (CVC) intersected by BLD 89-1.

2. IP and CSAMT Survey

A fresh IP survey would be another effective but expensive method of delineating drill targets within the BL004 alteration zone as well as determining its strike extent. This was proposed as a preliminary tool in the Exploration Application (Vicary, 1998), however this may not be necessary given the work being done by Mike Asten to remodel CSAMT lines across this area. These results combined with wacker sampling should be sufficient to define preliminary targets. If this target area is afforded the luxury of an IP survey then the best IP responses will be tested by a series of shallow diamond drill holes.

3. Drill Holes

Based on current knowledge of the geology **at least** four shallow (150 – 250m) drill holes, two to the north and two to the south and along strike from BL004 should be drilled to initially test the continuity of the alteration zone. These could be spaced at 100-150m intervals away from BL004 and preferably to the east of the steeply dipping target horizon on a bearing of about 260. Possible collar locations would be 380775mE-5353550mN; 380775mE-5353725mN; 380800mE- 5354000mN; and 380800mE-5354100mN. Anomalous wacker results or encouraging intersections may lead to a tightening and/or a stepping out of this pattern, particularly to the north.

If positive results are returned from the initial shallow drilling, a deeper phase of drilling would be completed to test mineralisation potential down dip. One location where this should be done initially is at BL006. If re-entry of this hole is not feasible, a new 400-600m hole, collared adjacent to BL006, should be drilled on a similar bearing (260) but dipping at 40-45 degrees to conclusively test the target horizon (see plan 6). Using BL007 to wedge off is probably not an option given its steepness and distance from the target horizon.

Target 2 Henty style mineralisation at the base of the Tyndall Group to the north of the EL.

Discussion

Previous testing of the base of the Tyndall Group (*Henty Horizon*) in the north of the Anthony ETA is limited to two diamond drill holes, TYN001 and TYN003 which are almost a kilometre apart. Both holes targeted a zone of IP anomalism and intersected black siltstone and minor carbonate (Ccarb/ Ca, Cal) development at the base of the Tyndall Group. In both cases no mineralisation or significant pyrite alteration was intersected and the black siltstone was considered the source of the IP anomaly.

From reinterpretation of the geology in this area it appears as if the rocks intersected in TYN001 and TYN003 are part of an arcuate belt of basal LTG stratigraphy that has been dislocated from equivalent rocks outcropping to the NE by a significant N – S structure. This belt of rocks which is defined by an extensive IP anomaly, extends from the northern EL boundary to the OOS Costean in the south (5354500mN). This represents a strike length of over 5km. Logging of the relevant drill holes suggests that this belt of rocks is part of a shallow syncline (see figure 5a-f; section 5.1.3) with the potential for Henty Horizon-type contacts on both its eastern and western margins (limbs).

The controlling structure possibly emanates from the Whitham Bluff splay fault and extends along Tyndall Creek where it can be traced through barite and base metal mineralisation at Tyndall Creek bridge. This structure appears to be a southern extension of a significant zone of strike parallel faulting recently recognised to the north at Howard's Anomaly and South Henty (as far north as the Tyndall Mine). It is thought that this fault zone was a major syn-volcanic growth fault and conduit for mineralisation (Vicary, 1998; Callaghan, pers com.). Mineralisation at Tyndall Creek bridge, anomalous wacker samples and coincident IP anomalism attest to the mineralising potential of this structure.

Recommendations

Controlling Growth Fault

Recognition in the northern end of the Anthony ETA of an extensive structure that significantly dislocates LTG stratigraphy, repeats basal Tyndall Group stratigraphy and is associated with mineralisation to the north greatly increases the prospectivity of this area. Drill testing of this fault position, particularly north of the Anthony tenement between 5357000mN5357750mN, should be a high priority whether as part of the Anthony programme or South Henty programme. Tentatively based on steeply east dipping stratigraphy and a steeply west dipping fault, a series of relatively shallow holes, collared to the east of the fault and drilled towards 270 at a dip angle of 40-50 degrees, would test this target.

Margins of dislocated LTG – Henty Horizon

Although BL001 and BL003 have down graded the potential of the IP anomalous belt of LTG rocks, the drill holes are almost 1 km apart and have probably only tested the LTG – ARA contact on the eastern limb of the syncline (see figures 5c and 5e). As a low priority, a series of shallow holes could be drilled along the western and eastern margins/limbs of this dislocated package to test the mineralisation potential of the *Henty Horizon* positions.

A preliminary wacker sampling programme across this belt of Tyndall Group rocks may help define the ARA – LTG contact and target potential drill hole locations.

Target 3 Zone of Alteration and IP anomaly between *Pyrite Corner* and Leech Hill

Discussion

A series of IP anomalies are developed at the contact between CVC rocks and ARA andesites in the western part of the EL from about 5353500mN to 5355500mN. Intense anomalism is focused at the northern and southern ends of the zone at *Pyrite corner* and Leech Hill respectively.

The Leech Hill area has been previously tested by a single 500m drill hole which intersected weak to moderate carbonate–silica altered CVC lavas and sericite–pyrite altered ashy sediments but no significant gold or base metal abundances. TYN002 tested an IP high 250m south of Pyrite Corner which corresponds with a black siltstone unit at the contact between the YRS sandstones and dacitic rocks of the CVC. No significant alteration was encountered in this drill hole. This YRS – CVC contact is also exposed in a costean above TYN002 and in a road cutting to the north with little evidence of alteration or mineralisation. BL002, only extended a few metres into the CVC and did not test the CVC-ARA contact intersected in Leech Hill. The area of most intense sericite-pyrite alteration, outcropping at *Pyrite Corner*, remains untested at depth by drill hole.

Mapping of the Target 3 area indicates that where the IP anomalism isn't picking up the barren black siltstone of the YRS – CVC contact it is responding to alteration associated with the interfingering of CVC rocks with andesites of the ARA. A crystal rich intrusive andesite (Cax) in the south and a Hb andesite (Ca) in the north. This target zone also translates as a distinct magnetic low, indicating magnetite destructive hydrothermal alteration. This alteration-associated magnetic low extends north into Hb andesite recognised previously as part of the preliminary Zone 2 (Vicary, 1998)

Although the rocks of Target 1 occur at the same stratigraphic level as the mineralised *Spillway Horizon* to the north there is no evidence of a mineralised polymictic mass flow deposit at the interpreted YRS – CVC contact at Anthony Road. In fact the interpreted boundary is marked by a weakly pyritic black siltstone. It is arguable however that the sericite+pyrite altered ashy unit intersected in Leech Hill 1 is the same as the *Spillway Horizon* footwall rocks observed to the north rather than an ashy deposit within the CVC. If this is the case then the Spillway horizon (YRS – CVC contact) lies somewhere to the east of Leech Hill, possibly obscured by intrusive ARA rocks. Regardless of this contention there is little doubt that alteration and IP anomalism associated with target 1 relates to the contact between CVC and ARA rocks.

Recommendations

The strongly altered rocks of *Pyrite Corner* represent an area of high chargeability, low magnetism, they are coincident with the CVC–ARA contact and are possibly controlled by a NNW trending structure along their eastern margin. Given this criteria and the fact that this area has not been tested at depth it is a high priority diamond drill hole target. This target could be tested by a single drill hole preferably collared at 379500mE, 5354650mN (– *PC1*) to the east of the most altered section and drilled towards 263) at a dip angle of 40- 50 degrees. (If the budget allows or if initial results are encouraging, a 'fence' drilled from the same collar using two dip angles eg. 35 and 60 may be employed to test down dip variations of the zone). If access to the location recommended above (or adjacent) is not feasible then an option may be to drill the zone from the west at a lower angle given that the rocks dip steeply (70 –80 degrees) to the ENE. Old Bradshaws Road adjacent to Anthony Road should allow access to collar a hole at approximately 379075mE and 5354520mN to be drilled towards 072 at an angle of about 30 degrees.

The mineralisation potential of the southern end of the altered CVC – ARA contact has been tested in a preliminary sense by the *Leech Hill 1* stratigraphic hole. The lateral extent and intensity of this alteration and possible mineralisation could be further constrained by drilling to the north and south of Leech Hill 1. Its down dip potential could also be tested with strategically position and angled holes. At this stage however, given the barren nature of the Leech Hill intersection this is a low priority proposition.

The 2 kilometres of highly prospective CVC – ARA contact between Leech Hill and Pyrite Corner remains untested. This zone is topographically subdued with virtually no outcrop and represents a horizon of significant exploration potential for possible blind deposits. This is an area that should be looked at in greater detail if results from the Pyrite Corner drilling are positive.

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APPENDIX 1

Symbols and Codes used in drill logs

GOLDFIELDS EXPLORATION (ZEEHAN) - ROCK CODES

TYPE

U - Volcanic (general)
V - Volcaniclastic
E - Epiclastic
L - Lava
I - Intrusive

COMPOSITION

R - Rhyolite
Y - Rhyodacite
D - Dacite
A - Andesite
B - Basaltic
F - Felsic
M - Mafic
U - Ultramafic

CRYSTAL TYPE

X - Crystal rich
A - Aphyric
F - Feldspar phyric
< - Feldspar - quartz phyric
> - Quartz - feldspar phyric
Q - Quartz phyric
H - Hornblende phyric
P - Pyroxene phyric
B - Biotite phyric
V - Vitric / glassy
L - Lithic rich
R - Reworked, commonly with Carbonate matrix

OTHERS

TILL - Glacial moraine
CLAY - Glacial clays
SILT - Black pyritic siltstone
FALT - Fault
CARB - Massive Carbonate
CBBX - Carbonate breccia
VEIN - Vein
GWAC - Greywacke
CONG - Siliciclastic Conglomerate
SAND - Siliciclastic Sandstone
XXXX/YYYY - Interbedded units

GRAINSIZE

B - Breccia
C - Coarse
M - Medium (Sandy)
F - Fine (Silty)
V - Very fine (Shaley)
A - Ashy
/ - Undifferentiated
X - Crystal Rich
P - Pumiceous

ALTERATION

P - Pyrite
$ - Mineralised
Q - Quartz
O - Chlorite
C - Carbonate
H - Hematite
S - Sericite
K - K feldspar
A - Albite
E - Epidote
F - Fuchsite
M - Magnetite
L - Limonite

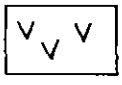
N - Scale

1 - Very Weak
3 - Weak
5 - Moderate
7 - Strong
9 - Intense

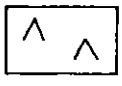
eg. AOC7
Strong albite-chlorite-carbonate alteration
(albite>chlorite>carbonate, albite = 7)

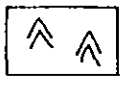
SYMBOLS FOR COHERENT TEXTURES

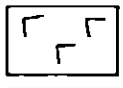
- single line symbols for low to moderate phenocryst abundance
- double line symbols for abundant phenocrysts
- smaller symbols for fine grained phenocrysts
- larger symbols for coarse grained phenocrysts
- additional "+" symbol for coarse, phenocryst-rich granitoid texture

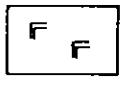

basalt, poorly to moderately porphyritic basalt

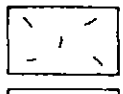
phenocryst-rich basalt

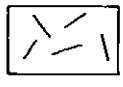

andesite, poorly to moderately porphyritic andesite

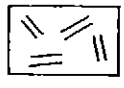

phenocryst-rich andesite

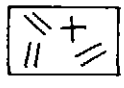

dacite, poorly to moderately porphyritic dacite

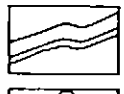

phenocryst-rich dacite

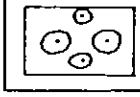

fine, poorly to moderately porphyritic rhyolite


coarse, poorly to moderately porphyritic rhyolite


coarse, phenocryst-rich rhyolite


coarse rhyolitic porphyry


flow foliation

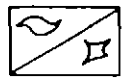

spherulites, lithophysae, alteration spots, nodular devitrification texture

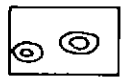
SYMBOLS FOR VOLCANICLASTIC TEXTURES

- closer spaced symbols for dominant grain size and grain type

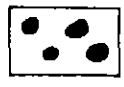
pumice or relict pumice

angular, juvenile lava clasts

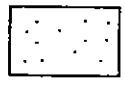

fiamme/ vitriclast or relict vitriclast


accretionary lapilli

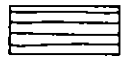
angular, polymict lithic clasts

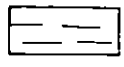

rounded, polymict lithic clasts

mudstone intraclast

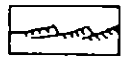

sand-size particles, granular texture

mud-size particles


distinct planar stratification


diffuse planar stratification

cross bedding


micro-cross lamination

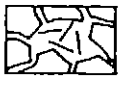
e.g.

pumice clasts in sand matrix

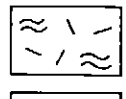
angular polymict lithic clasts and mudstone intraclasts in sand matrix

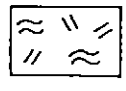
SYMBOLS FOR JUVENILE-CLAST-RICH DEPOSITS

jigsaw-fit texture of fine, moderately porphyritic rhyolite


jigsaw-fit texture of coarse, moderately porphyritic rhyolite

jigsaw-fit texture of coarse phenocryst-rich andesite


pumice-clast-rich deposit, coarse, moderately porphyritic rhyolitic composition


pumice-clast-rich deposit, coarse, phenocryst-rich rhyolitic composition

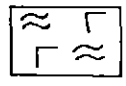

pumice-clast-rich deposit, coarse, moderately porphyritic dacitic composition

Fig. 9—Recommended composition and texture symbols for graphic logging of volcanic deposits.
(From:- McPhie, Doyle and Allen. CODES 1993)

607039

1:5000 ANTHONY EL FACT MAP ROCK DESCRIPTION LEGEND

MINERALS (phenocrysts)
Fd – Feldspar
Q – Quartz
Hb – Hornblende

ROCK CLASSIFICATION
A – Andesite
D – Dacite
R – Rhyolitic

GENESIS
I – Instrusive
L – Lava (extrusive)
Vc – Volcaniclastic
sst – Sandstone
sh - Shale

PREFIXES

Textures
fg – fine grained (vfg = very fine grained)
mg – medium grained
cg – coarse grained
x – crystal rich
mas – massive
fol – foliated
pep – peperitic
bd – banded
sh – sheared
bx – brecciated
lam – laminated

Colours
bl or bk – black
gy – grey
gn – green
rd – red
yw – yellow

Alteration
wth – weathered

POSTSCRIPTS

Alteration
Alb – Albite
Ep – Epidote
Cl or Chl – Chlorite
Si – Silica
Ser - Sericite
Py – pyrite
Lim – Limonite
Cb – Carbonate

APPENDIX 2

Diamond Drill Hole Logs

M1

RGC EXPLORATION PTY LTD

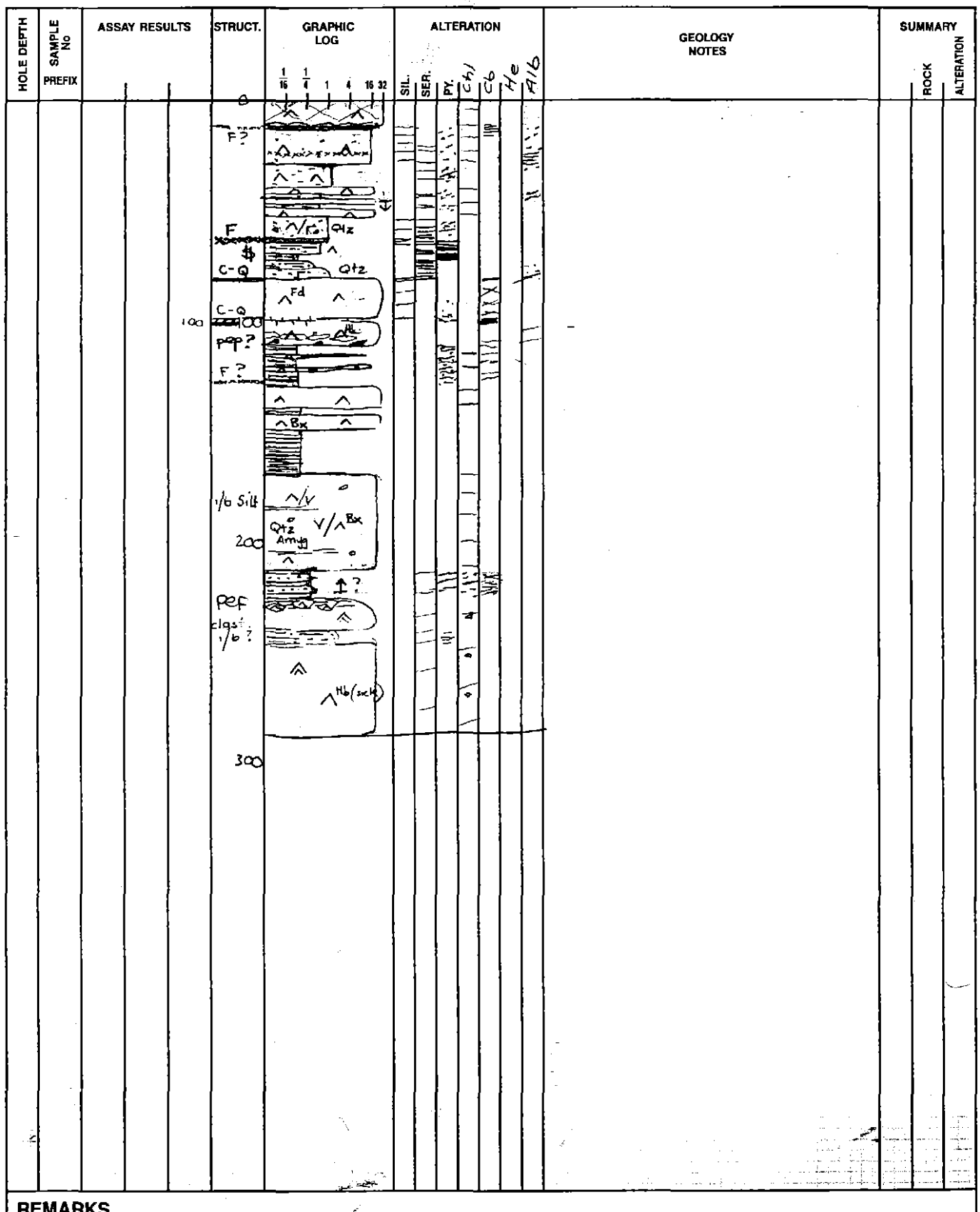
DRILL HOLE No BL004

SHEET 1 OF 1

Summary

PROJECT	:	ANTHONY
PROSPECT	:	
DATE	:	1999
LOGGED BY	:	RHill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

607041

RGC EXPLORATION PTY LTD

DRILL HOLE No BL004

SHEET 1 OF 7

PROJECT	: ANTHONY
PROSPECT	:
DATE	: NOVEMBER 98
LOGGED BY	: RH

— Bedding
⌐ Cleavage
— Foliation
~ Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY CHL CARB ALB Limonite) | GEOLOGY NOTES | SUMMARY ROCK | SUMMARY ALTERATION

0 – 7.0 Glacials

Qps | TILL

7.0 – 14.0 Feldspar phyric Andesite:
7.0 – 10.0 weathered and fractured
10.0 – 14.0 Foliated hyaloclastic to coherent with chloritic wisps, ser ± py matrix

Ca | LAF | LO3

14.0 – 64.40
Mixed package of Feldspar phyric dacitic to andesitic sandstones and rare lavas and bx

15.0 – 81.4
Volcaniclastics - Ser + Py ±Q altered with a yellow-cream-green foliated to schistosed fabric. Sericite wisps = pumice? (py as stringers, dissem and altered clasts?)

Fd phenos as stretched, rounded 'eyes' in fabric
@ 28.0 – 30.1
34.2 – 38.1
40.0 – 42.2
44.0 – 46.1
50.0 – 63.5

Cav | VAF - VDF | PSOCSA 5-7

1/b Andesitic - dacitic lavas or shallow int^s relatively unaltered

Increasingly broken

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL004

SHEET 2 OF 7

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

— Bedding
⌐ Cleavage
— Foliation
~ Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY Chl Carb Alb) | GEOLOGY NOTES | SUMMARY ROCK | SUMMARY ALTERATION

40.0 – 42.4 Mod to strongly foliated and broken Fd phyric sst/bx - undifferentiated (creamy-yellow cb/ser bands)

Cav | VDFM | SPC 4-6

44.1 – 46.0 – Foliated qtz xl'n coarse sst-bx grading into py-ser-cb altered silt^s

46.1 – 48.0 - Dark Fd phyric lava containing siltstone clasts and Albitised Felsic lava clasts = bx? or pseudo bx

Ca | LAF

48.4 – 50.0
Dk gn Fd phyric dacitic lava.

Cav | LDF - VDFM | SPC 4-5

50.0 – 50.2 – broken core = TALT?

50.2 – 65.0 m
Med-coarse grained gy gn pumiceous, Fd V^clastic with pale (cm-white) pumice stretched into foliation which increases down hole

Increased Sericite (±Qtz and Py) alteration down hole with increasing qtz 'grains' (eyes).

Cav | VDFM | SPQ 5-9

63.9 – 65.0 broken core
65.0 – 65.15 Massive Sulphide
65.15 – 66.4 broken core containing Qtz vein
66.4 – 68.4 Strongly foliated Ser-py-Qtz altered rock (Vc?) containing rounded Qtz/chert clasts? or grains

MS | Py | SPQ

Cav | VDFm | SPQ 6

68.4 – 70.1. Strongly fol'd MS containing stretched chert (? silicified silt) 'clasts'

Cav | Mix | Py | SCHIST | SPQ

70.1 – 72.1 - Pyritic mg-cg V^clastic (undifferentiated) sst. Sericitized and soft. Similar to 66.4 – 68.4.

72.1 – Yellowy-cm-gn pumiceous V^clastic sst grading into a highly sericitized broken rock = porphyroblastic

REMARKS

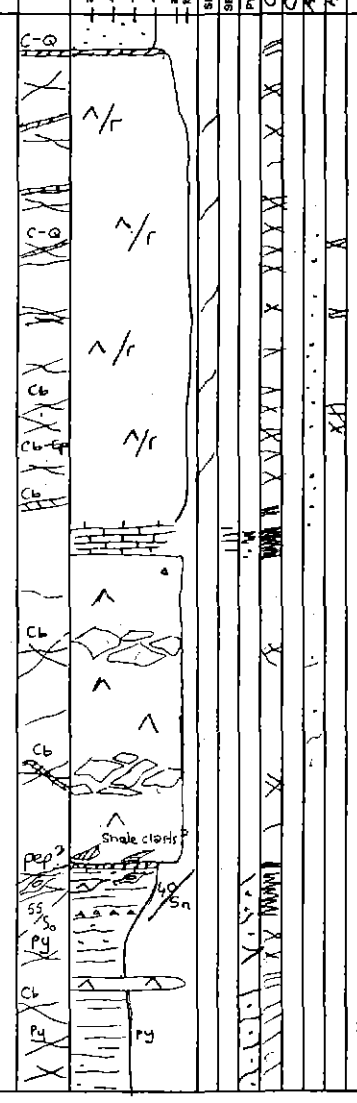
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 4

SHEET 3 OF 7

PROJECT	: ANTHONY
PROSPECT	:
DATE	: November 98
LOGGED BY	: RH

Legend: Bedding, Cleavage, Foliation, Fault, Shear, Breccia, Broken core, Disseminated, Massive, Pervasive, Narrow vein, * Visible gold



Depth	Geology Notes	Summary	Rock	Alteration
80–100	81.2 – 99.0 m Fg-mg Fd phyric Andesitic to dacitic lava cut by Cb(±Qtz) veins increasing to massive Cb downhole (some He)	Ca? or Cal	LAF	CHQ 3-4
	Ccarb?		CARB	
100–110	100.2 – 111.6 m Relatively unaltered dk gn-gy Fd Andesitic lava – mostly coherent but with bx zones. Minor fg Hb. Possible peperitic contact at 111.5 – 111.7	Ca/Cal	LAF - LAFB	C-3
110–120	Contact obscured by Cb alteration 111.7 – mg Vc sandstone and polymict bx grades into pyritic black shale Shale contains clasts of Cb(±Q,± Ser) altered Andesite and 1/b bx.	Cal	SILT	CP 5

REMARKS

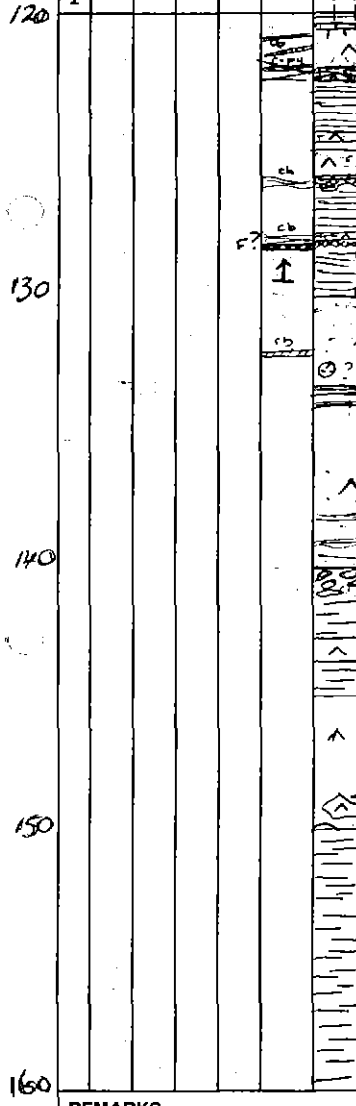
RGC EXPLORATION PTY LTD

DRILL HOLE No BL4

SHEET 4 OF 7

PROJECT	: ANTHONY
PROSPECT	: Anthony Rd
DATE	: Nov 1998
LOGGED BY	: RH

Legend: Bedding, Cleavage, Foliation, Fault, Shear, Breccia, Broken core, Disseminated, Massive, Pervasive, Narrow vein, * Visible gold



Depth	Geology Notes	Summary	Rock	Alteration
120–130	122.0 – 130.3 Black shale with 1/b mg-cg Andesitic Volcaniclastic sandstone and lava (bx?)	Cal	SILT/VBM/LB-LA	CP 3-6
130–140	130.4 – 150.2 Fd phyric Andesitic-Basaltic lava – amyddaloidal (Qtz filled) – 1/beds of black siltstone 141.8 – 143.1 144.0 – 145.2		LA-LB/SILT	
140–150	Zone of rounded lithic (volcanic) clasts		SILT/LB	
			LBB-LAB	
150–160	150.2 – 171.0 Black siltstone (±py)		SILT	

REMARKS

607043

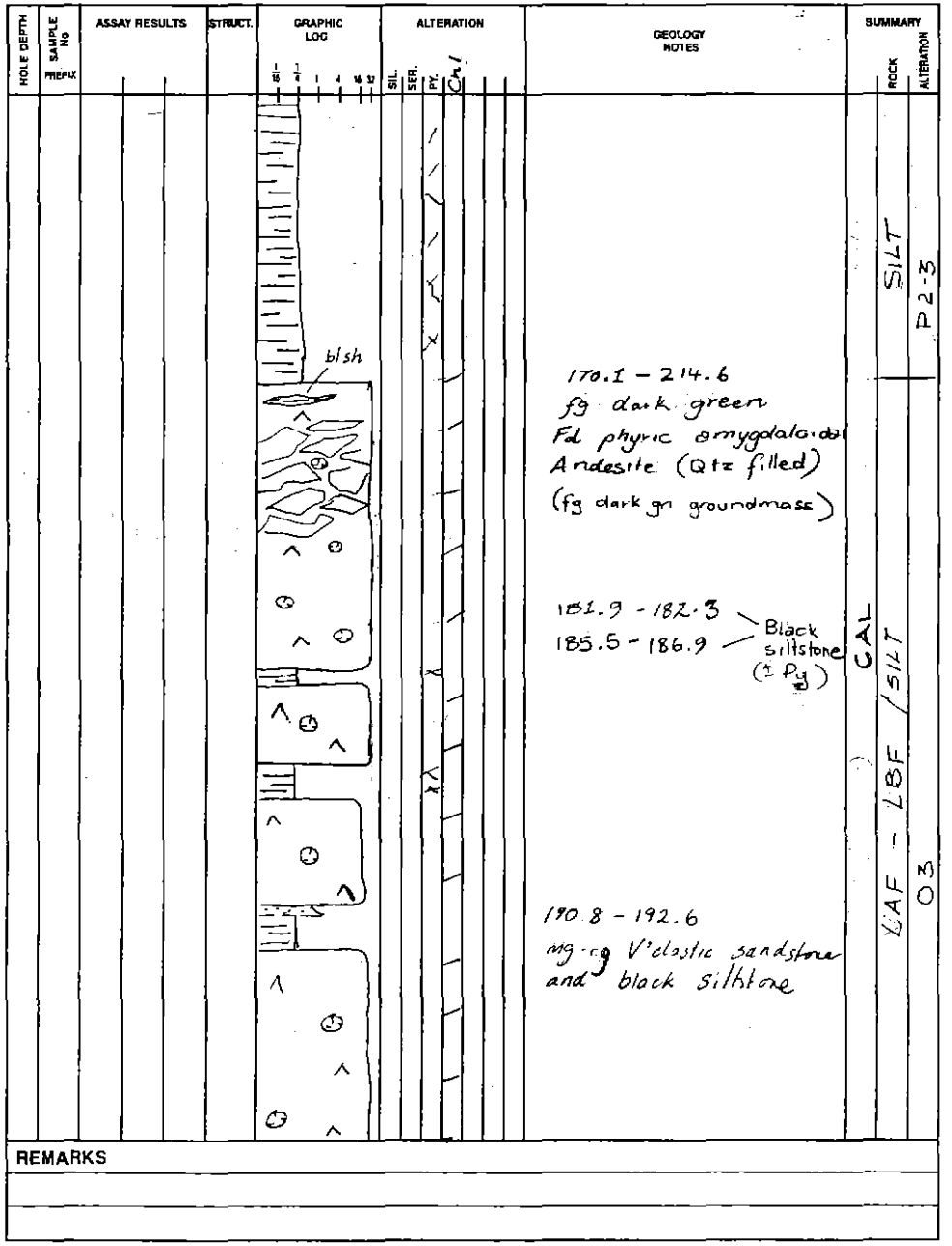
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 4

SHEET 5 OF 7

PROJECT :	ANTHONY
PROSPECT :	
DATE :	
LOGGED BY :	RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core
Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



REMARKS

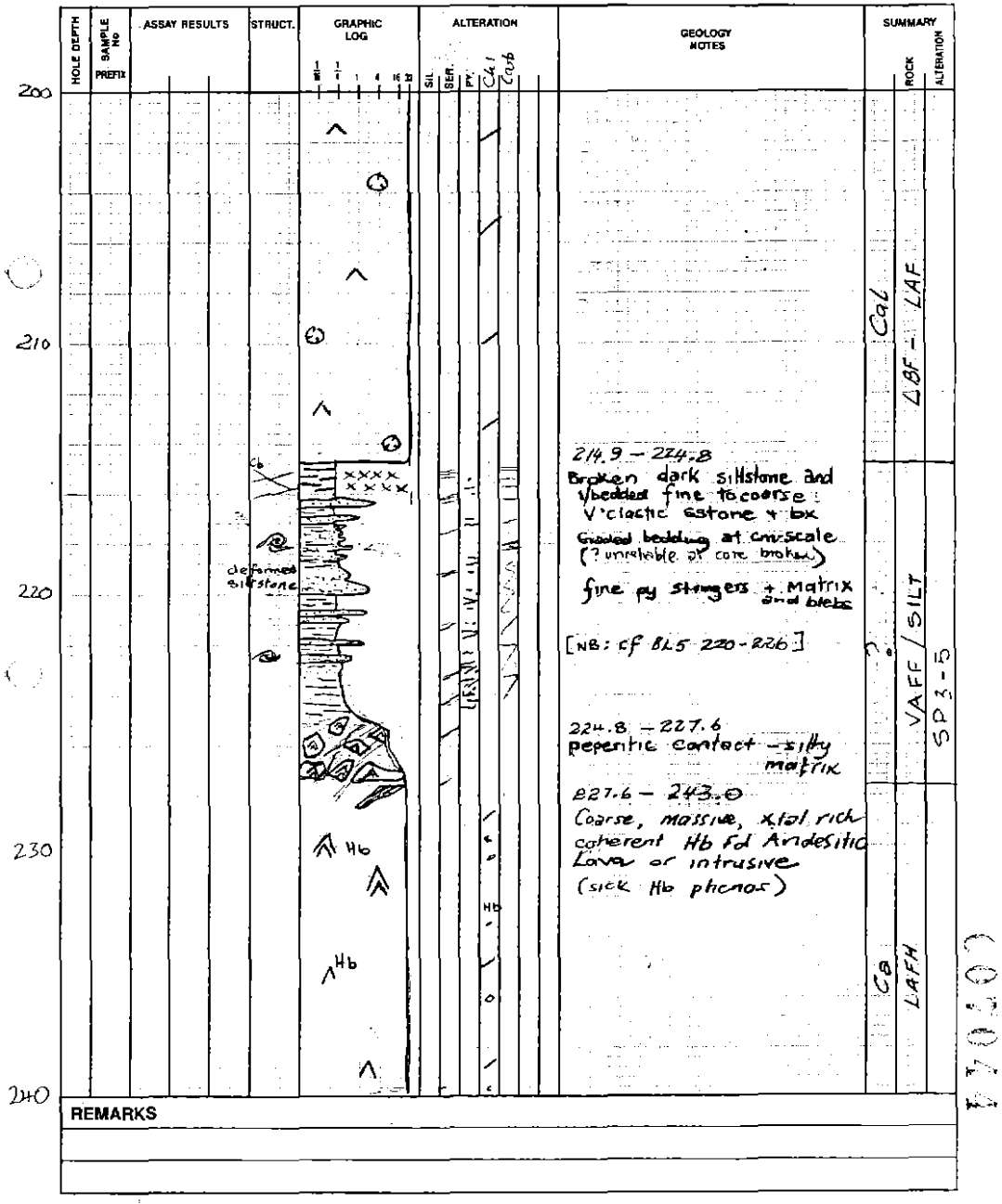
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 4

SHEET 6 OF 7

PROJECT :	
PROSPECT :	
DATE :	
LOGGED BY :	RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core
Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



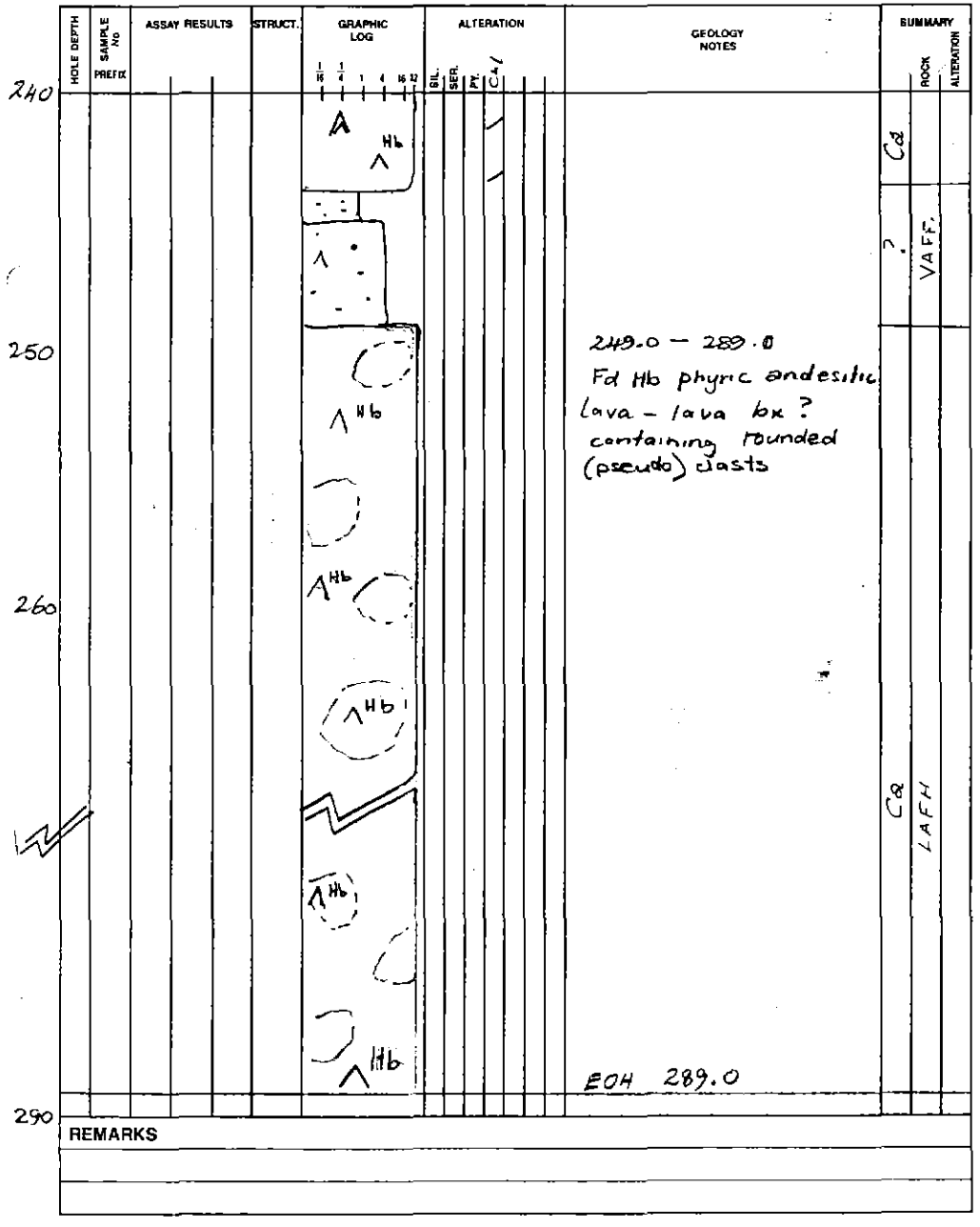
REMARKS

[redacted] EX[redacted]ORA[redacted]N [redacted] LTD [redacted] D[redacted] HOL[redacted] 314 [redacted]

SHEET 7 OF 7

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	: Anthony Rd.
PROSPECT	:
DATE	:
LOGGED BY	: RH



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. CAL)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
240				Hb			Ca	
							?	VAFF.
250				Hb		249.0 – 289.0 Fd Hb phyric andesitic lava – lava bx ? containing rounded (pseudo) clasts		
260				Hb				
				Hb			Ca	LAFH
				Hb				
				Hb		EOH 289.0		
290								

REMARKS

607045

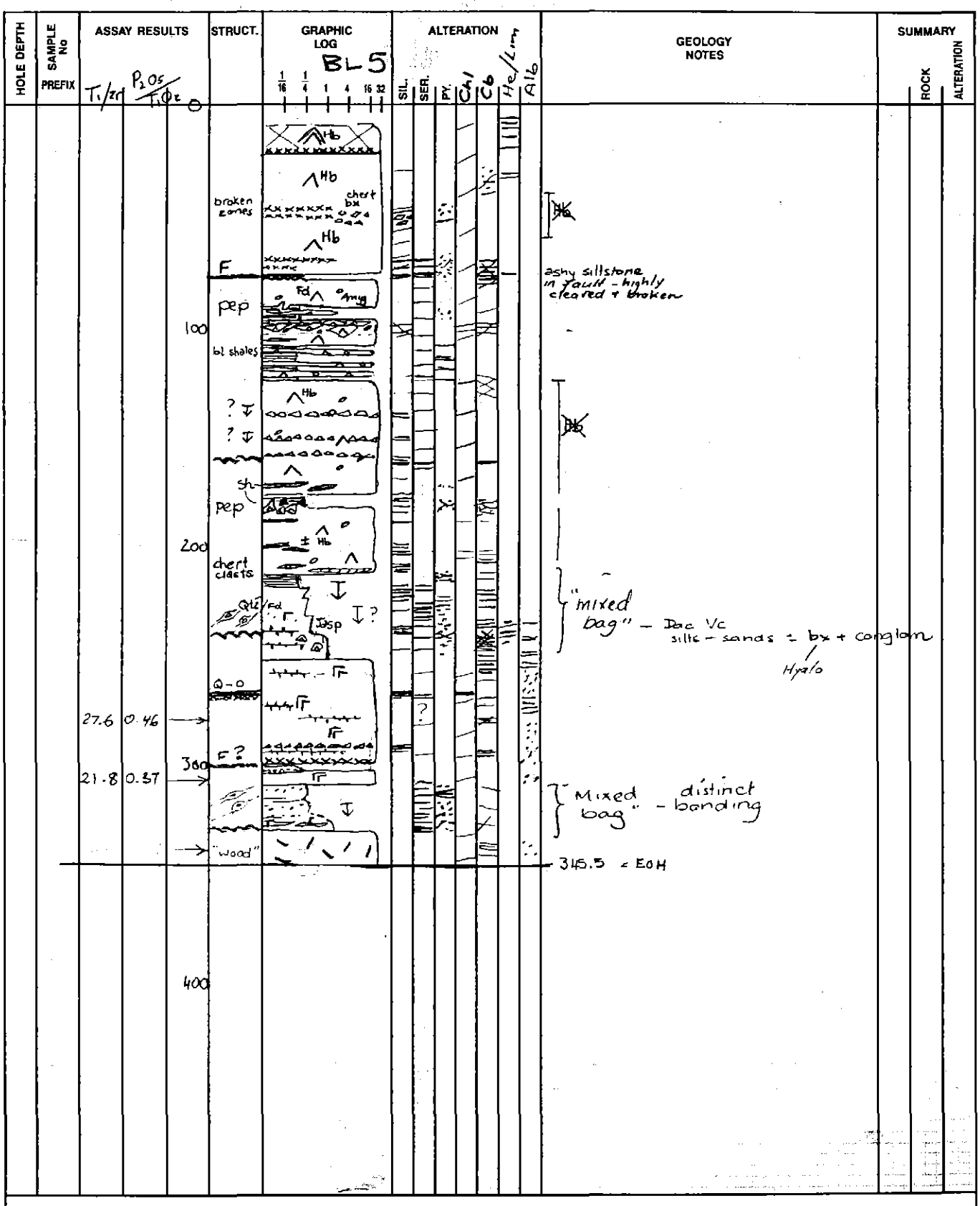
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 005

SHEET 1 OF 1

PROJECT	:
PROSPECT	:
DATE	: 1999
LOGGED BY	: R. Hill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

607046

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 5

SHEET 1 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Alteration Styles
∴ disseminated grains
⁂ phenos
× vein
≡ pervasive
▩ massive
▩ patchy
☆ clasts

Bedding | Cleavage | Foliation | Fault, Shear | Breccia | Broken core
Disseminated | Massive | Pervasive | Narrow vein | * Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION: SIL. SER. PY. Chl Cb Lim Ep | GEOLOGY NOTES | SUMMARY: ROCK ALTERATION

0.0 – 9.0m :
Glacials 70 : 30
Owen : Ca clasts
(rare qtz phyric Volcanic clastic)

9.0 – 19.4 Limonitised Hb Fs phyric xtal rich Andesite Lava – intrusive to Lava bx

14.0 – 14.9 Interval of very broken core containing owen clasts

↓ Relatively fresh Andesite

TILL | LAXHF LOQ5 | Ca LAXHF LOQ4 LO SCLQ5 | LAFB

Hb | Chl-Cb

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL5

SHEET 2 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding | Cleavage | Foliation | Fault, Shear | Breccia | Broken core
Disseminated | Massive | Pervasive | Narrow vein | * Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION: Bil. Ser. Py, Hm Chl Carb Zm Ep | GEOLOGY NOTES | SUMMARY: ROCK ALTERATION

Variably coherent and variably altered Fd Hb Xtal rich Andesitic Lava, Lava bx (± pseudo bx) and Volcaniclastic (pheno rich) rock

~ 54.0 – 62.0m
Xtal, lithic Volcaniclastic bx (Andesitic) containing cherty clasts + py + pyrrhotite fragments.

77.4 – 78.7
Shear zone – pulverised rock with coherent clasts of silicified siltstone(?)

Cb-Q | Qtz | Ser | Cb-Q | Cb-Q | Ser-py-cb | Q | Ser-Cb-Qtz | Q-cb | Qtz | Q-C | Ser-cb | cb veins

cherty | Silicified siltstone?

FAULT

Ca LAXHF – VAFB | OQCP4 | OQP4 | SOCQ5 | FALT | CSPE 6

REMARKS

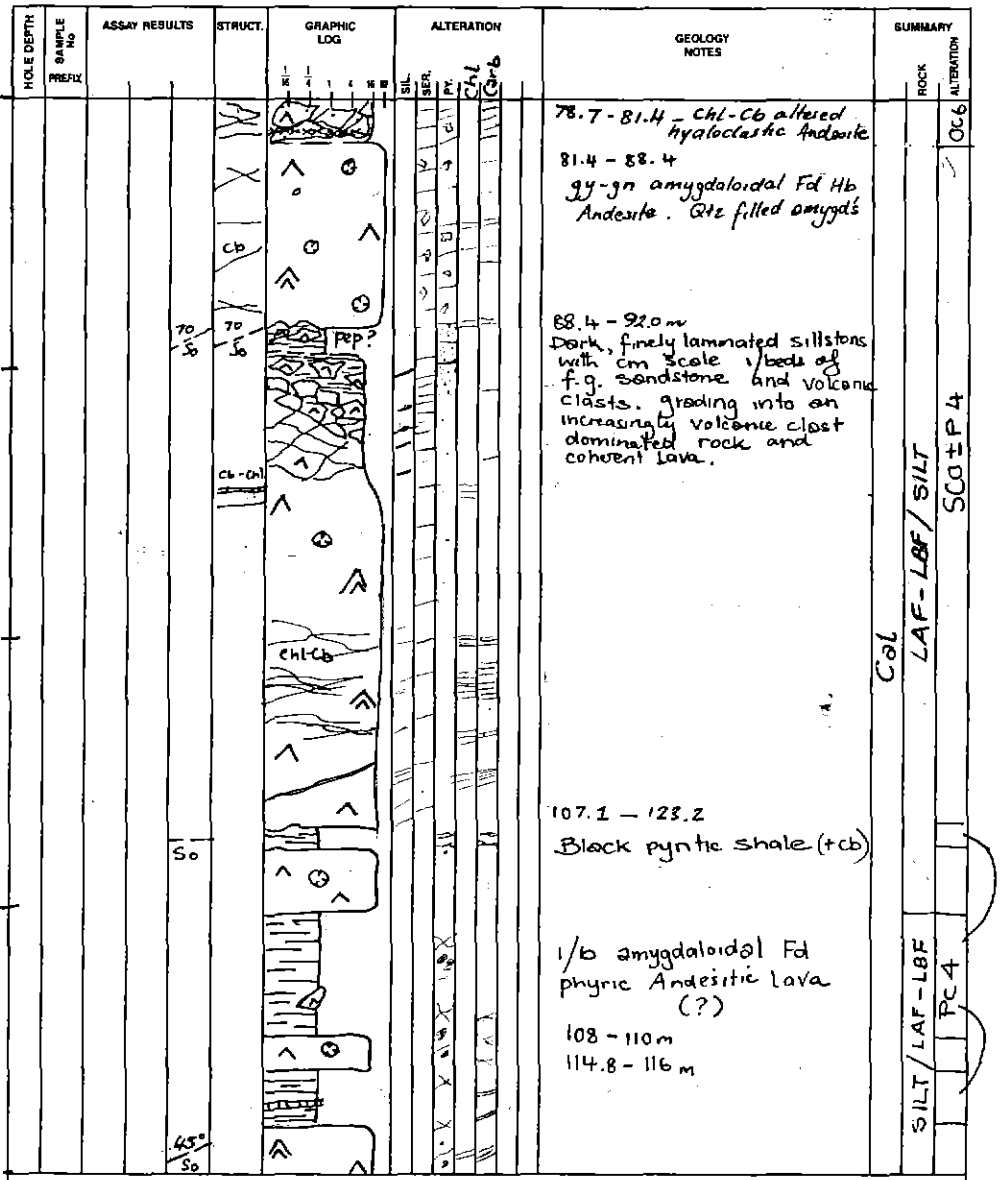
RGC EXPLORATION PTY LTD

DRILL HOLE No BL5

SHEET 3 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



GEOLOGY NOTES

78.7 - 81.4 – Chl-Cb altered hyaloclastic Andesite

81.4 - 88.4
gy-gn amygdaloidal Fd Hb Andesite. Qtz filled amygds

88.4 - 92.0 m
Dark, finely laminated siltstone with cm scale l/beds of f.g. sandstone and volcanic clasts. grading into an increasingly volcanic clast dominated rock and coherent lava.

107.1 – 128.2
Black pyritic shale (+cb)

l/b amygdaloidal Fd phyric Andesitic lava (?)
108 - 110 m
114.8 - 116 m

SUMMARY

ROCK	ALTERATION
	QC6
Col	LAF-LBF/SILT
	SCa+P4
SILT/LAF-LBF	PC4

REMARKS

8702109

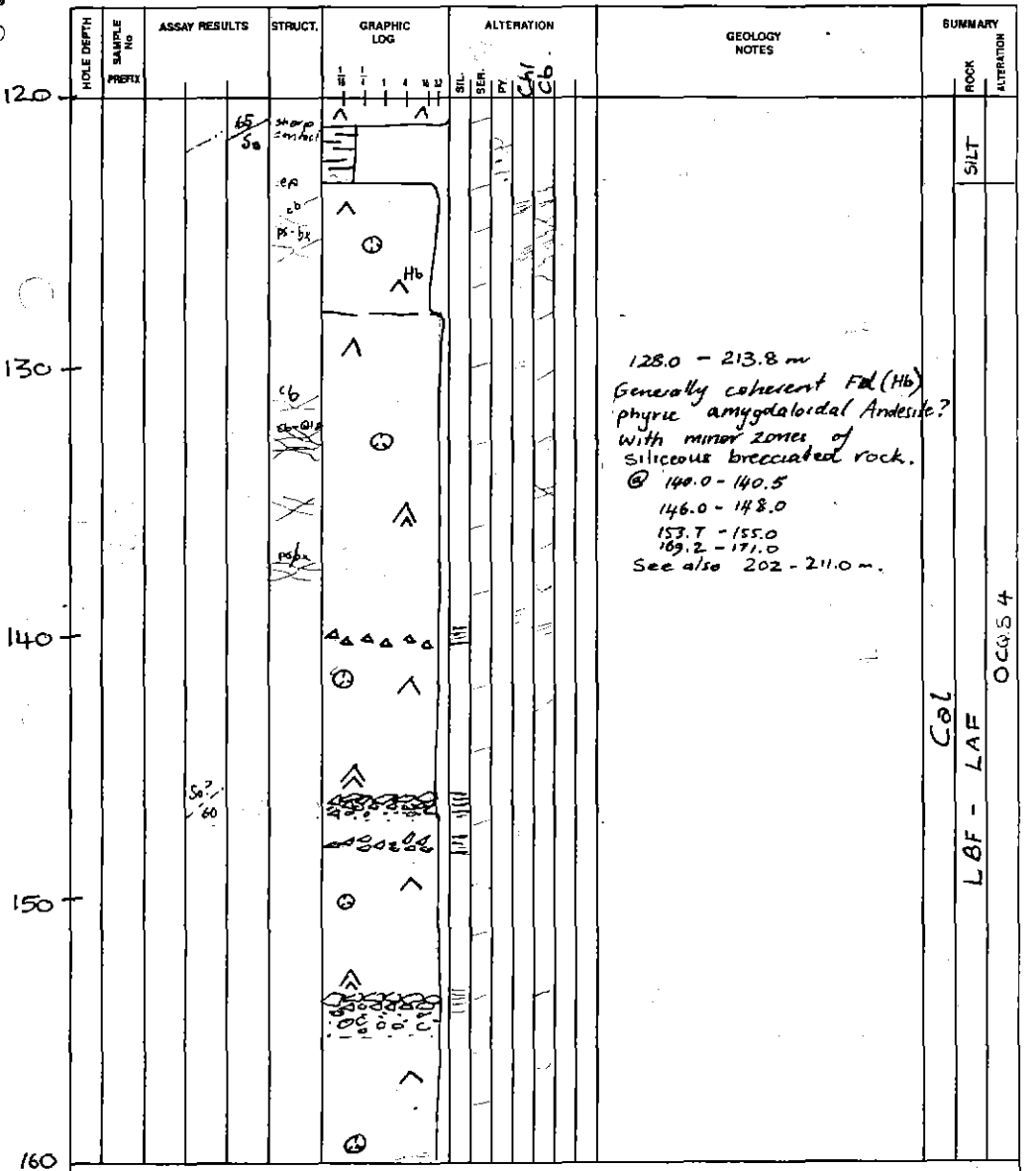
RGC EXPLORATION PTY LTD

DRILL HOLE No BL5

SHEET 4 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



GEOLOGY NOTES

128.0 - 213.8 m
Generally coherent Fd (Hb) phyric amygdaloidal Andesite? with minor zones of siliceous brecciated rock.
@ 140.0 - 140.5
146.0 - 148.0
153.7 - 155.0
169.2 - 171.0
See also 202 - 211.0 m.

SUMMARY

ROCK	ALTERATION
SILT	
Col	
LBF - LAF	QCQS4

REMARKS

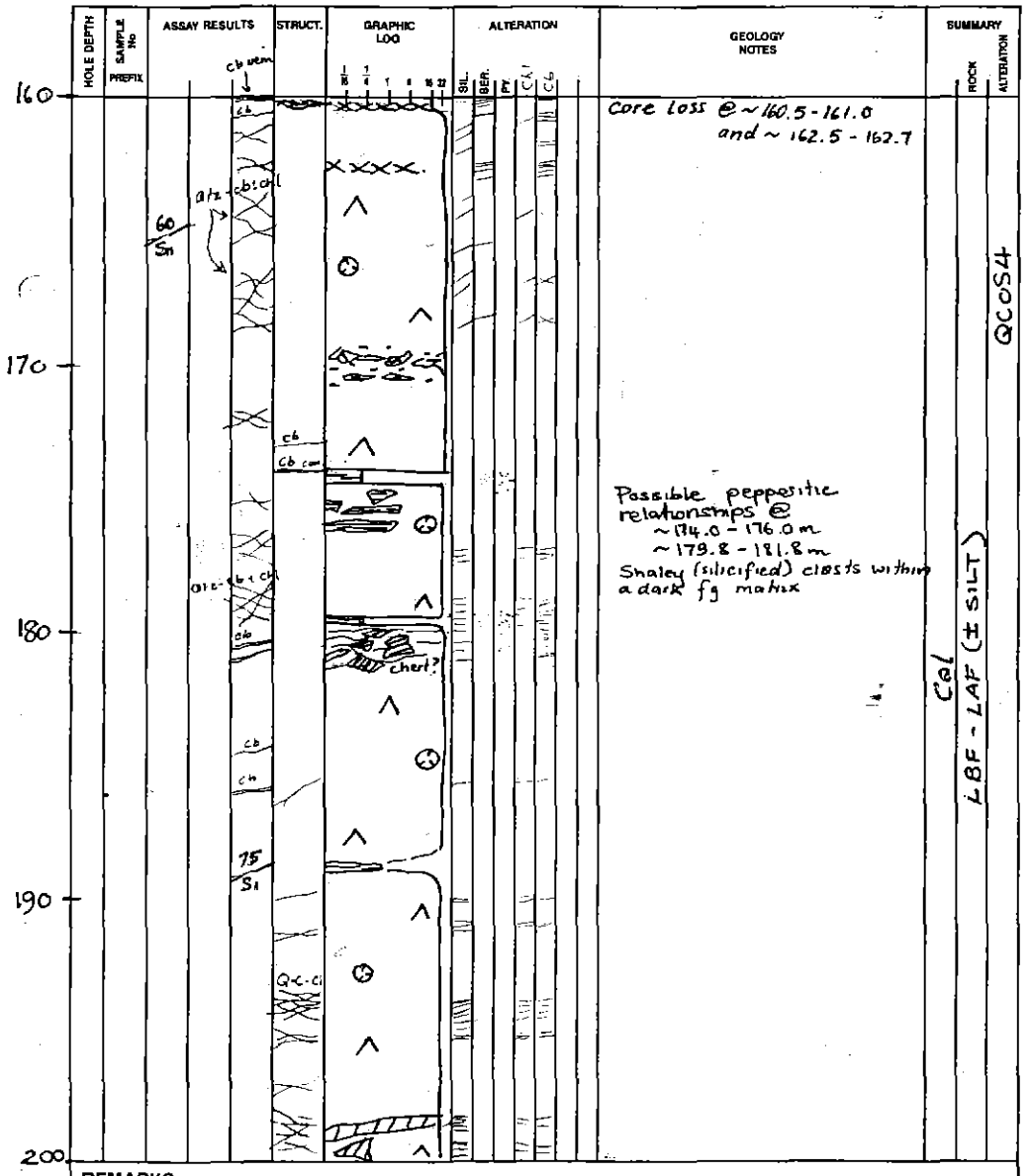
RGC EXPLORATION PTY LTD

DRILL HOLE No BL5

SHEET 5 OF 9

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core
Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



REMARKS

RGC EXPLORATION PTY LTD

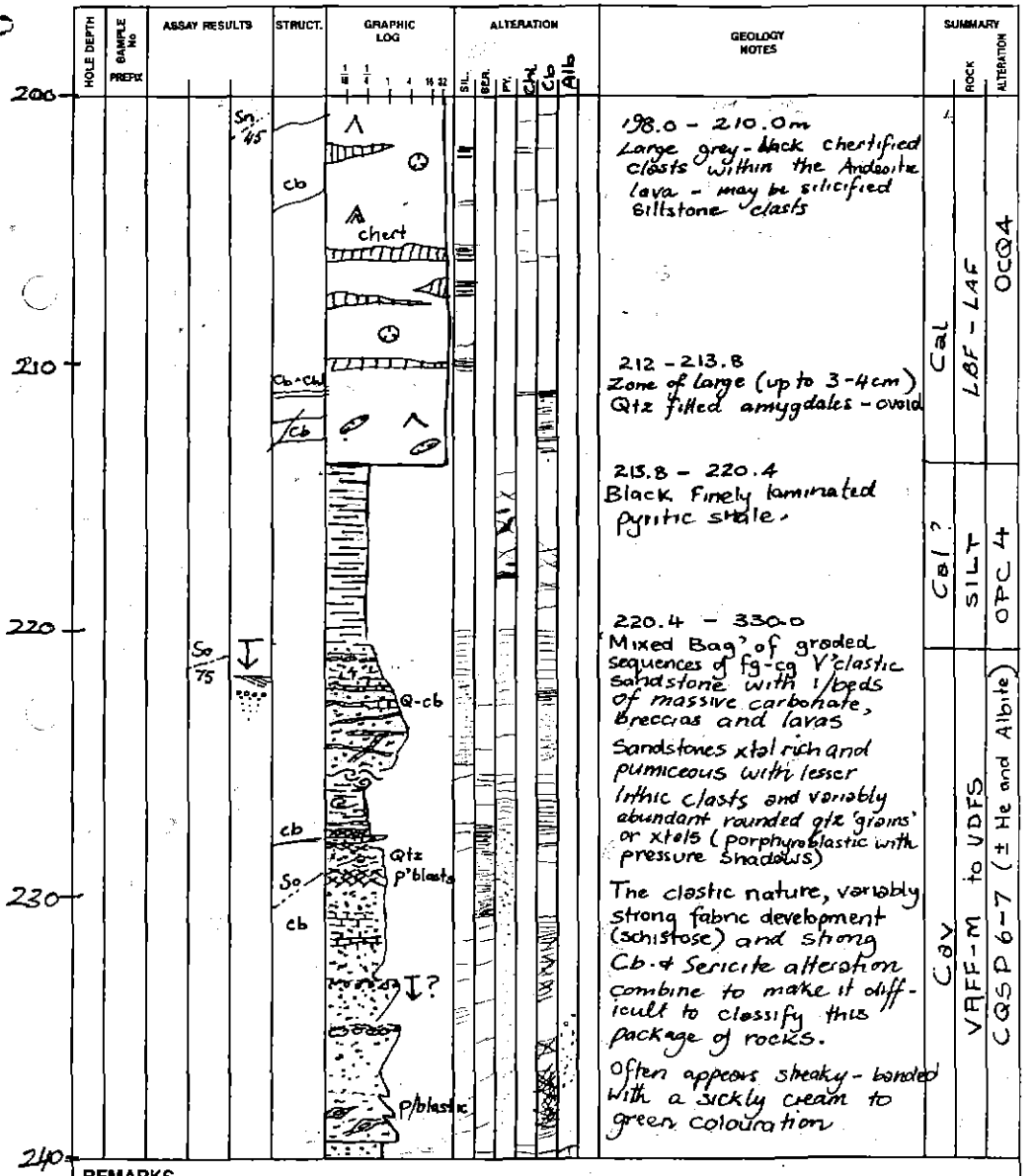
DRILL HOLE No BL5

SHEET 6 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core
Disseminated · Massive · Pervasive · Narrow vein · * Visible gold

670209



REMARKS

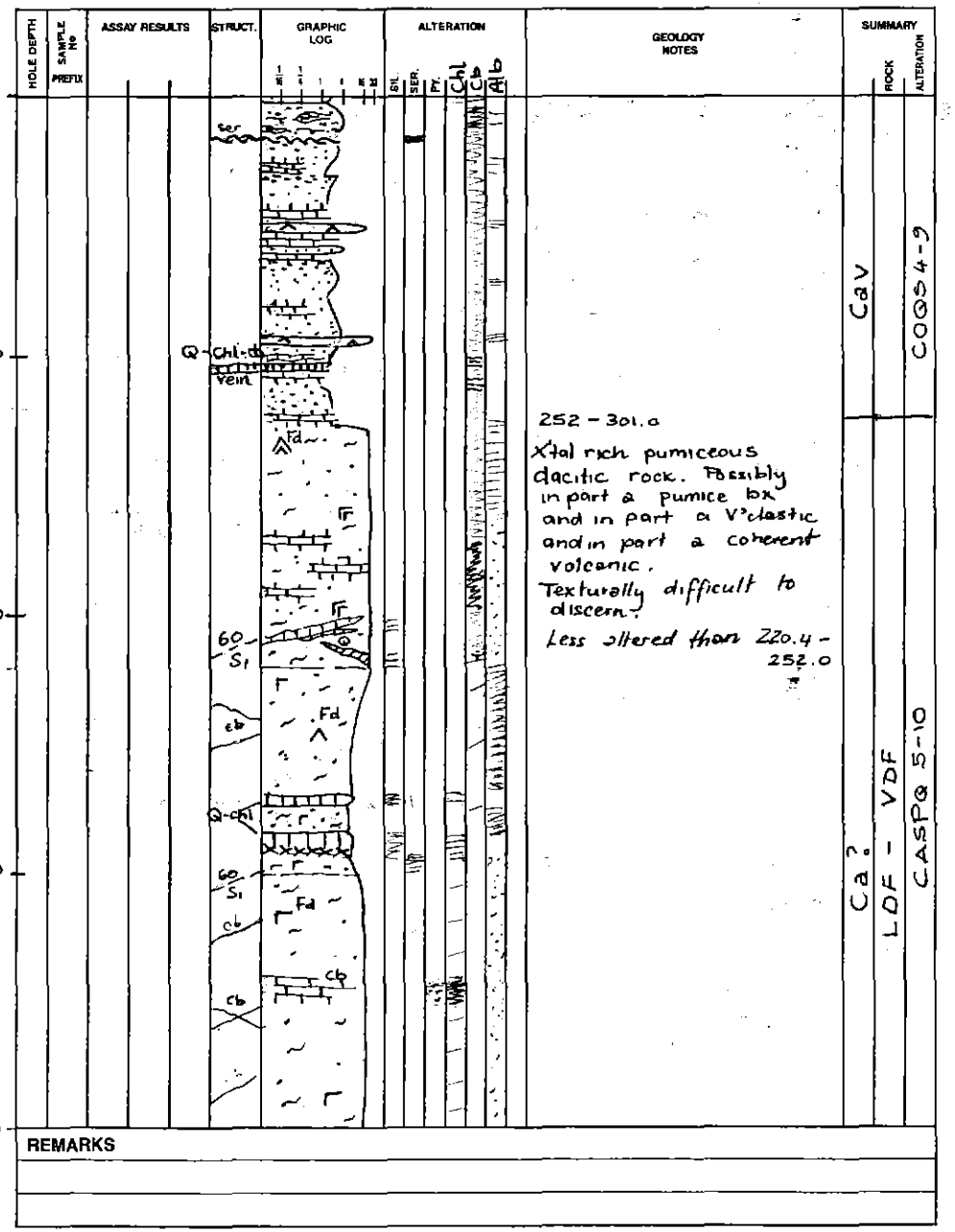
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 5

SHEET 7 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



252 – 301.0
Xtal rich pumiceous dacitic rock. Possibly in part a pumice bx and in part a V'clastic and in part a coherent volcanic.
Texturally difficult to discern.
Less altered than 220.4 – 252.0

REMARKS

0030709

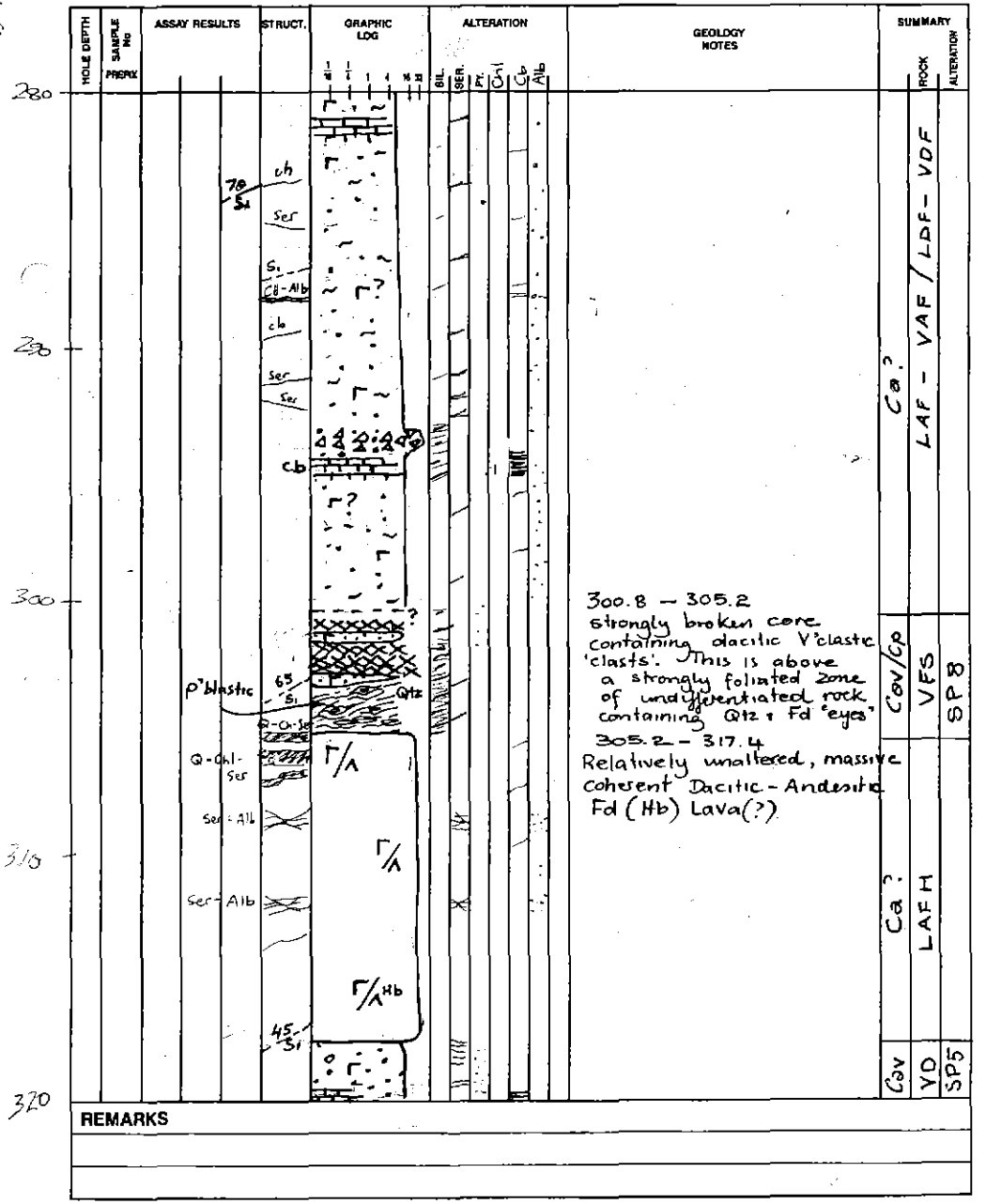
RGC EXPLORATION PTY LTD

DRILL HOLE No BL5

SHEET 8 OF 9

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



300.8 – 305.2
Strongly broken core containing dacitic V'clastic 'clasts'. This is above a strongly foliated zone of undifferentiated rock containing Qtz + Fd 'eyes'
305.2 – 317.4
Relatively unaltered, massive coherent Dacitic - Andesitic Fd (Hb) Lava(?)

REMARKS

RGC EXPLORATION PTY LTD

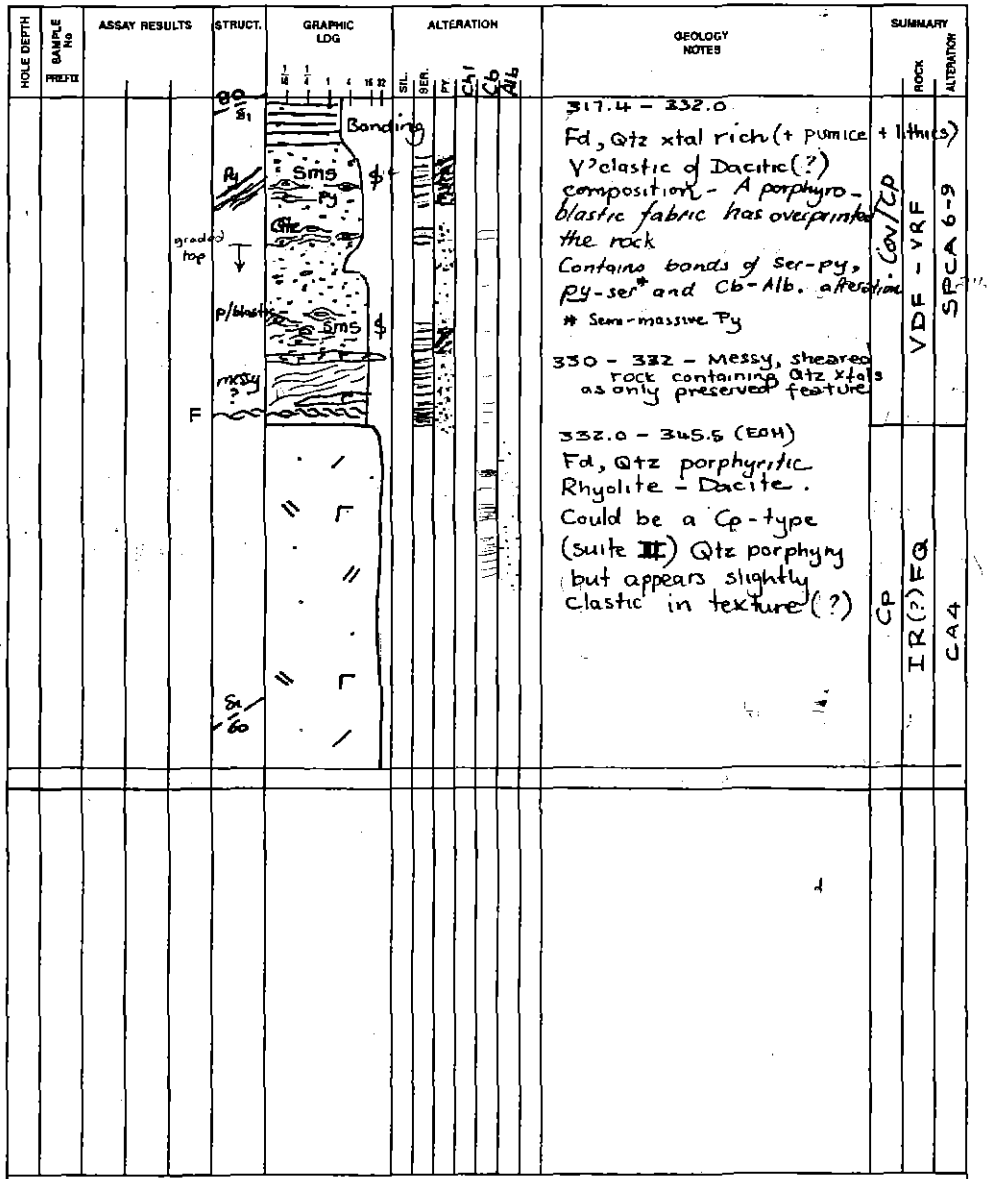
DRILL HOLE No BL5

SHEET 9 OF 9

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	ANTHONY
PROSPECT :	
DATE :	
LOGGED BY :	RH

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb Alb)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
320			80 / 81	Banding; Py; Sms; Py; Qtz; graded top; p/blastic; Sms; messy ?; F		317.4 – 332.0 Fd, Qtz xtal rich (+ pumice + lithics) V? clastic of Dacitic (?) composition – A porphyro-blastic fabric has overprinted the rock Contains bands of Ser-py, py-ser* and Cb-Alb. alteration * Semi-massive Py 330 – 332 – Messy, sheared rock containing Qtz xtals as only preserved feature	Cov/Cp	VDF – VRF	SPCA 6-9
330						332.0 – 345.5 (EOH) Fd, Qtz porphyritic Rhyolite – Dacite. Could be a Cp-type (suite II) Qtz porphyry but appears slightly clastic in texture (?)	Cp	IR(?)FQ	CA4
340			81 / 60					
EOH 345.5								
350								
360								



REMARKS

607051

RGC EXPLORATION PTY LTD

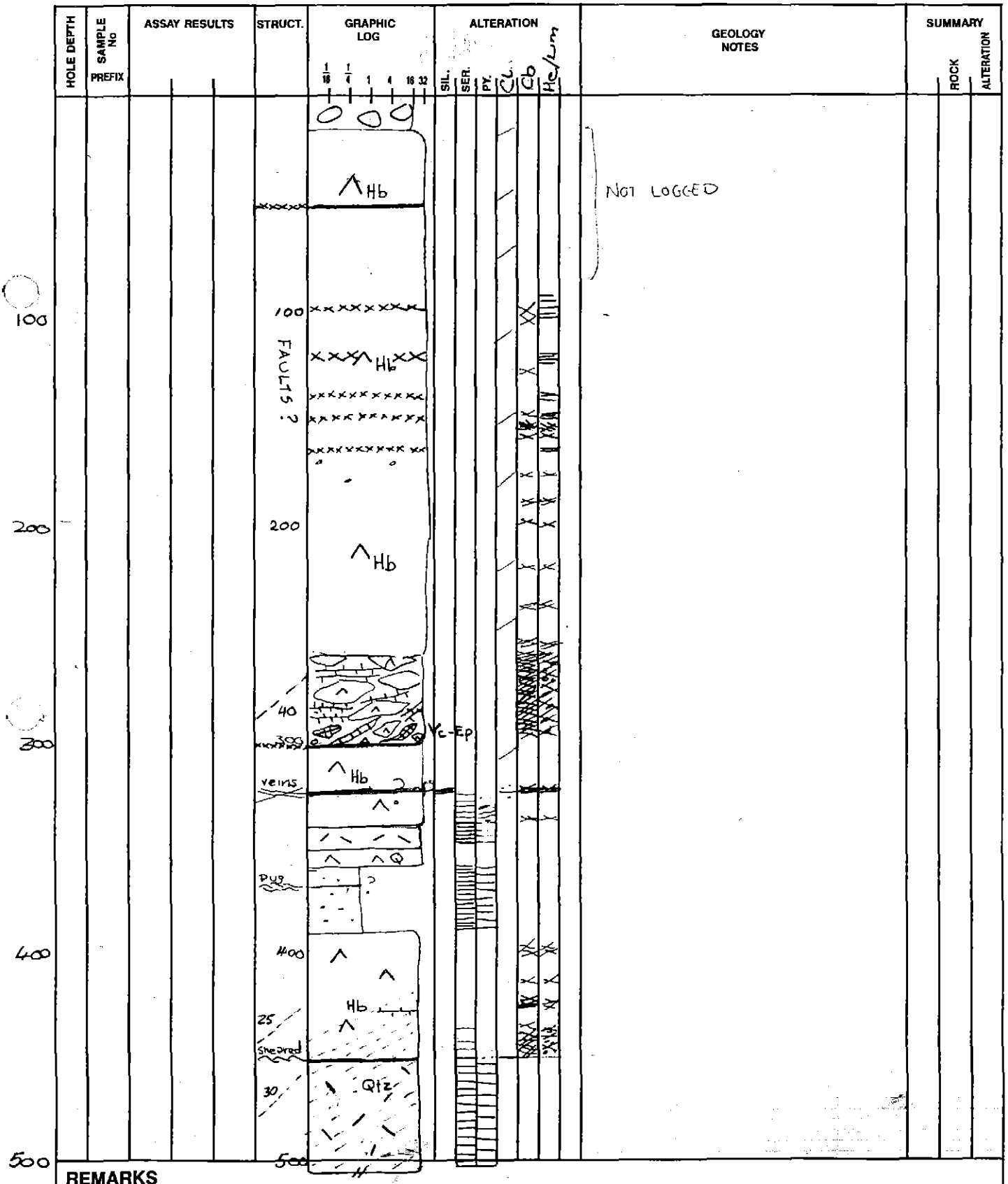
DRILL HOLE No BL006

SHEET 1 OF 1

SUMMARY LOG

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	:
DATE	: 1999
LOGGED BY	: R H.11



REMARKS

607052

RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 1 OF 12

PROJECT	ANTHONY
PROSPECT	
DATE	
LOGGED BY	RH

Bedding, Cleavage, Foliation, Fault, Shear, Breccia, Broken core, Disseminated, Massive, Pervasive, Narrow vein, * Visible gold

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
60						0.0 – 15.0 No core 15-0 – 60.0 Not logged (see M. Vicary)		
70			Qtz	Hb				
80			Qtz +chl				Ca	LAFH
90				Hb				
100								

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 2 OF 12

PROJECT	ANTHONY
PROSPECT	
DATE	JAN 1999
LOGGED BY	RH

Bedding, Cleavage, Foliation, Fault, Shear, Breccia, Broken core, Disseminated, Massive, Pervasive, Narrow vein, * Visible gold

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb He/Lim Ep)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
100				Hb		Broken, weathered (Limonitic) Fd-Hb-(Qtz) Phyric Andesite		
110			Cb-Q			↓ Fresh dk gn Andesite 109.2 – Generally fresh dk gn Fd (Hb) Andesite lava – Lava bx		
120			Cb-Q-Chl			122 – 131.0 – broken Limonitised core (Andesite) with some core loss also 133.2 – 134.2 137.0 – 137.9 139.2 – 141.9	Ca	LAFH – LAFHB
130			Cb-He-Q-Chl					
140				Hb				

REMARKS

607053

RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 3 OF 12

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

— Bedding
⌴ Cleavage
—▲— Foliation
~~~ Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. Chl Cb He Epi) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)

140
Hb
Cb-He-Qtz
150
Cb-Qtz
Hb
150.0 - 153.8
Broken Limonitic core
160
Cb
Cb-He
Qtz-Chl
170
5-10°
Sh?
Cb+He
Qtz
fg
Hb
~170.0m - 240.0m
Zone of
Qtz phenos & amygdales
180
Ca
LAFH - LAFHB

REMARKS

9020541

RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 4 OF 12

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH

— Bedding
⌴ Cleavage
—▲— Foliation
~~~ Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. Chl Cb He Ep) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)

180
Hb
Qtz
Cb-Ep
Cb-Qtz-He
190
Qtz-Chl-Cb
Hb
200
Qtz
Cb-Qtz-Chl
210
Qtz-Cb
209.2 - 209.3
broken core
He-Cb (Jasper)
Cb-He
Hb
Cb-Qtz-Cb-Ep
220
Ca
LAFH - LAFHB

REMARKS

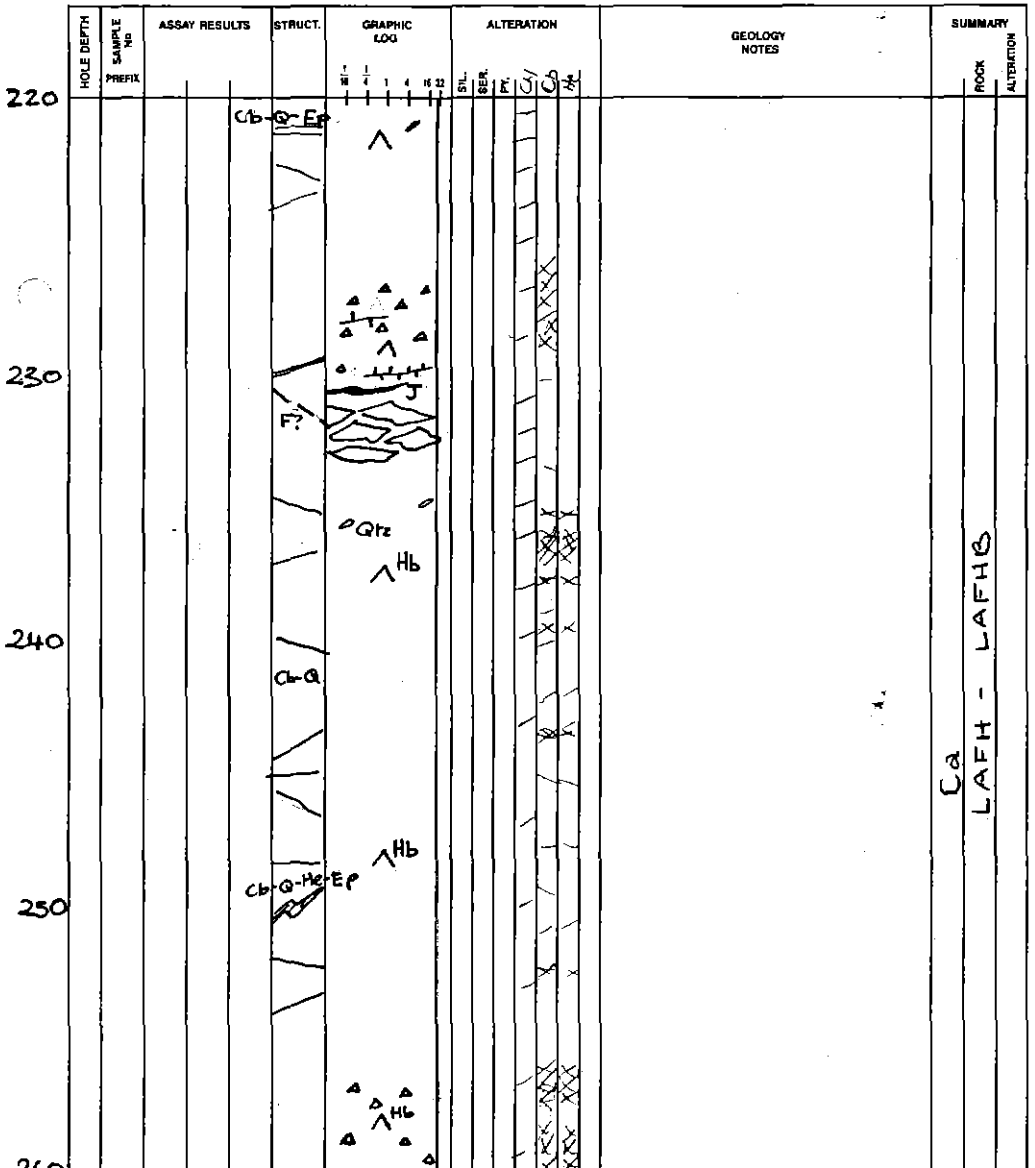
RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 5 OF 12

Bedding | Cleavage | Foliation | Fault, Shear | Breccia | Broken core
Disseminated | Massive | Pervasive | Narrow vein | * Visible gold

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH



REMARKS

CS0209

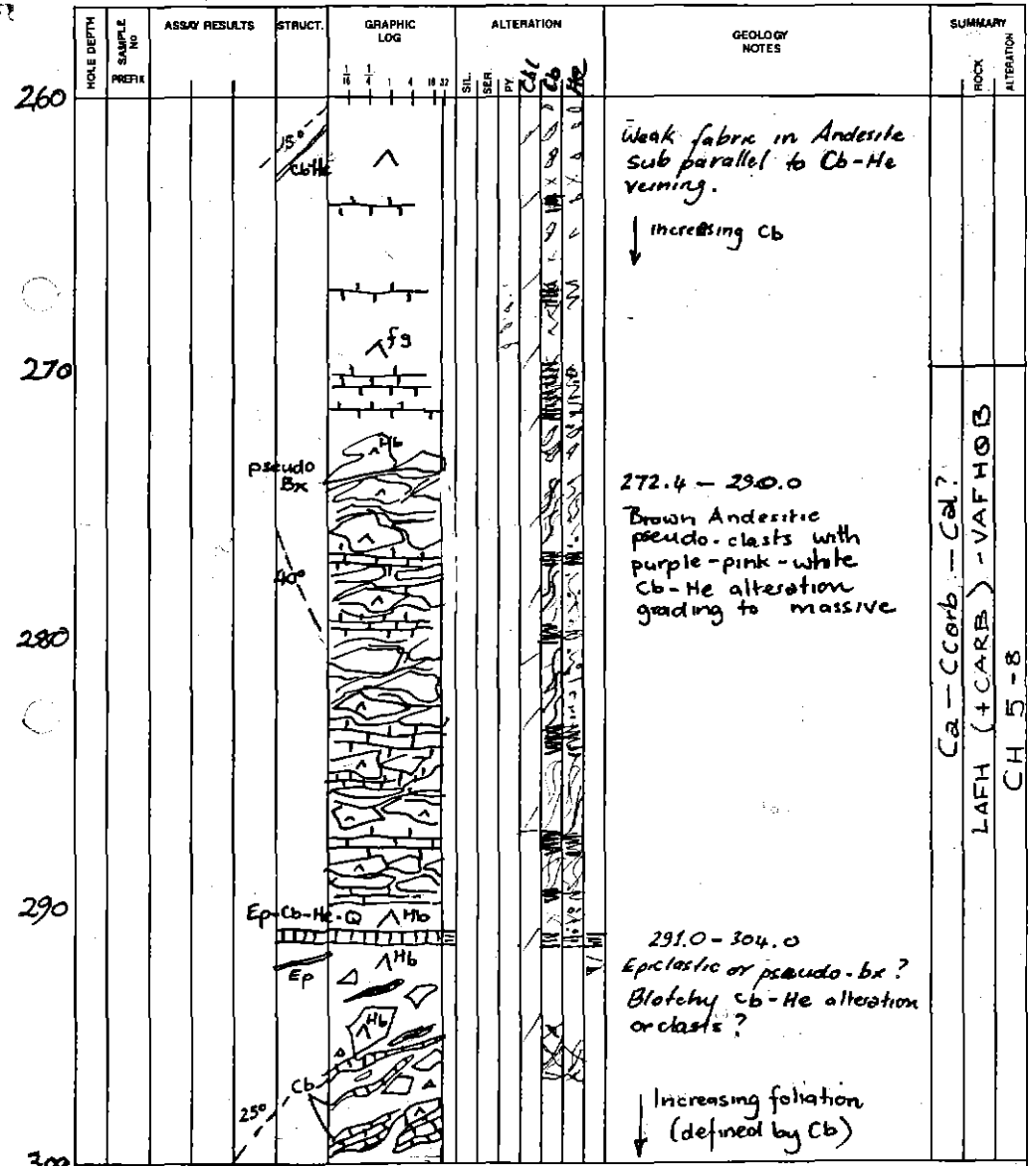
RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 6 OF 12

Bedding | Cleavage | Foliation | Fault, Shear | Breccia | Broken core
Disseminated | Massive | Pervasive | Narrow vein | * Visible gold

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:



Weak fabric in Andesite sub parallel to Cb-He veining.

↓ Increasing Cb

272.4 – 290.0
Brown Andesitic pseudo-clasts with purple-pink-white Cb-He alteration grading to massive

291.0 – 304.0
Epiclastic or pseudo-bx?
Blotchy Cb-He alteration or clasts?

↓ Increasing foliation (defined by Cb)

REMARKS

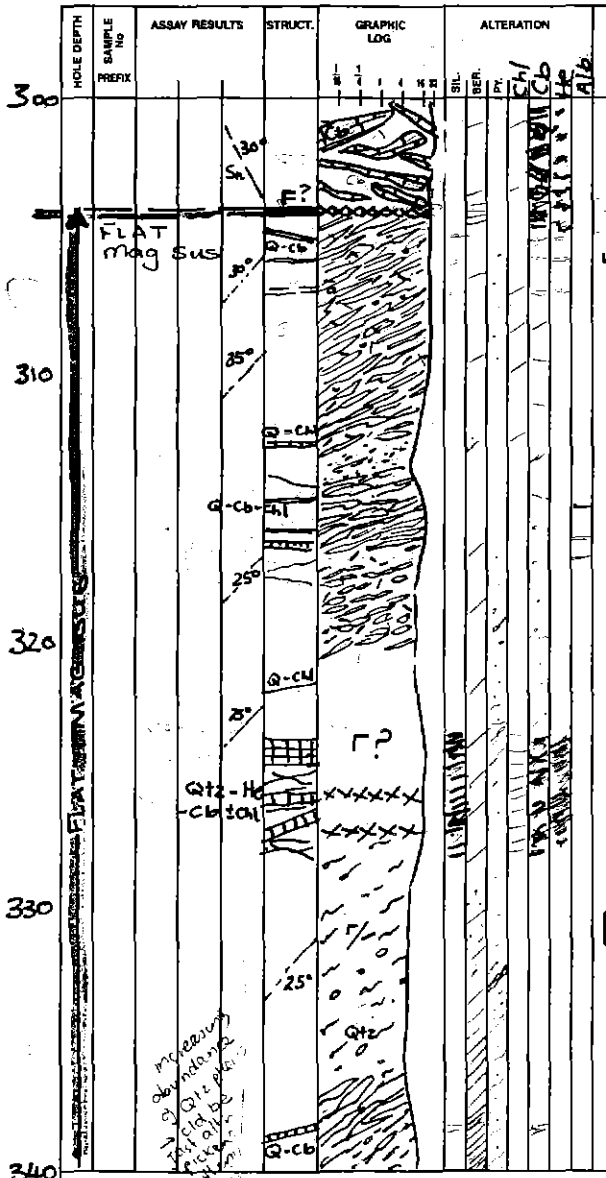
RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 7 OF 12

PROJECT	ANTHONY
PROSPECT	
DATE	
LOGGED BY	RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



GEOLOGY NOTES

103.9-104.2 - bleached cm-gn zone

104. -
Rhyolitic - Dacitic?
Qtz, Fd phyric pumiceous
Volcaniclastic (?)
Streaky gy gn and increasingly foliated down hole.

323.6 - 328.0
FAULT ZONE? - Qtz-Cb-He ± Chl Veining and alteration. Broken zones

[Felsic - Intermediate Pumice bx]

SUMMARY: CCarb | CARB Bx | CH 8

REMARKS

607056

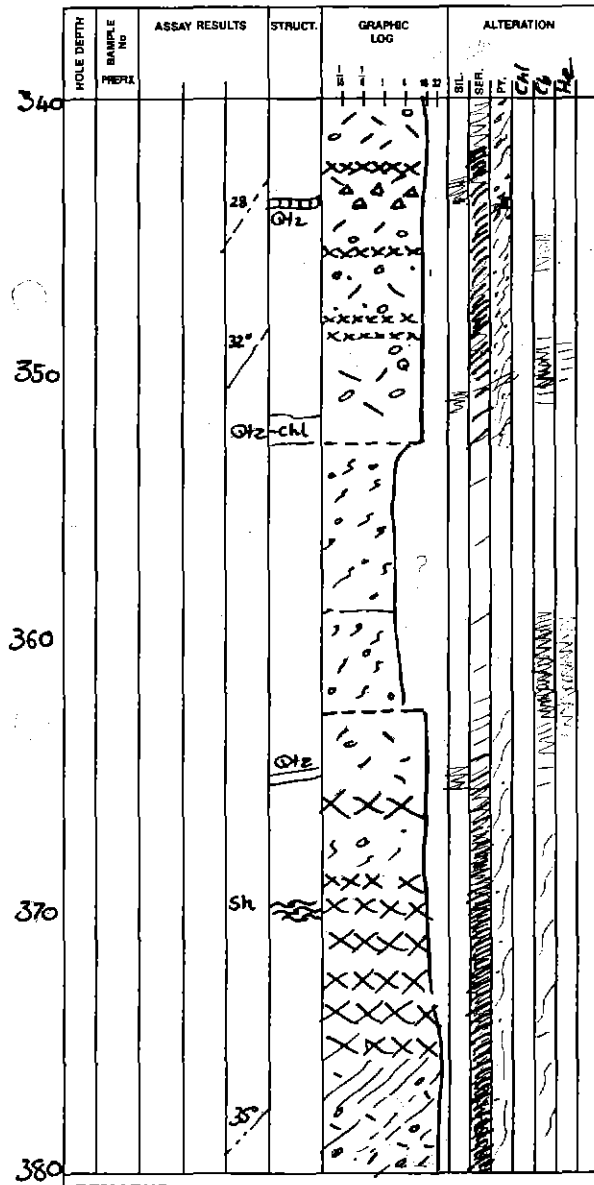
RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 8 OF 12

PROJECT	ANTHONY
PROSPECT	
DATE	
LOGGED BY	RH

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



GEOLOGY NOTES

Silver-grey to cream
Streaky schistosed
rock containing distinct
Qtz xtals (phenos?)
up to 0.75cm

368.9 - 375.8 - broken core
369.7 - 370.3 - Pug
increasingly broken and schistosed

376.0 -
Felsic, sericitic schist

SUMMARY: ROCK | ALTERATION

REMARKS

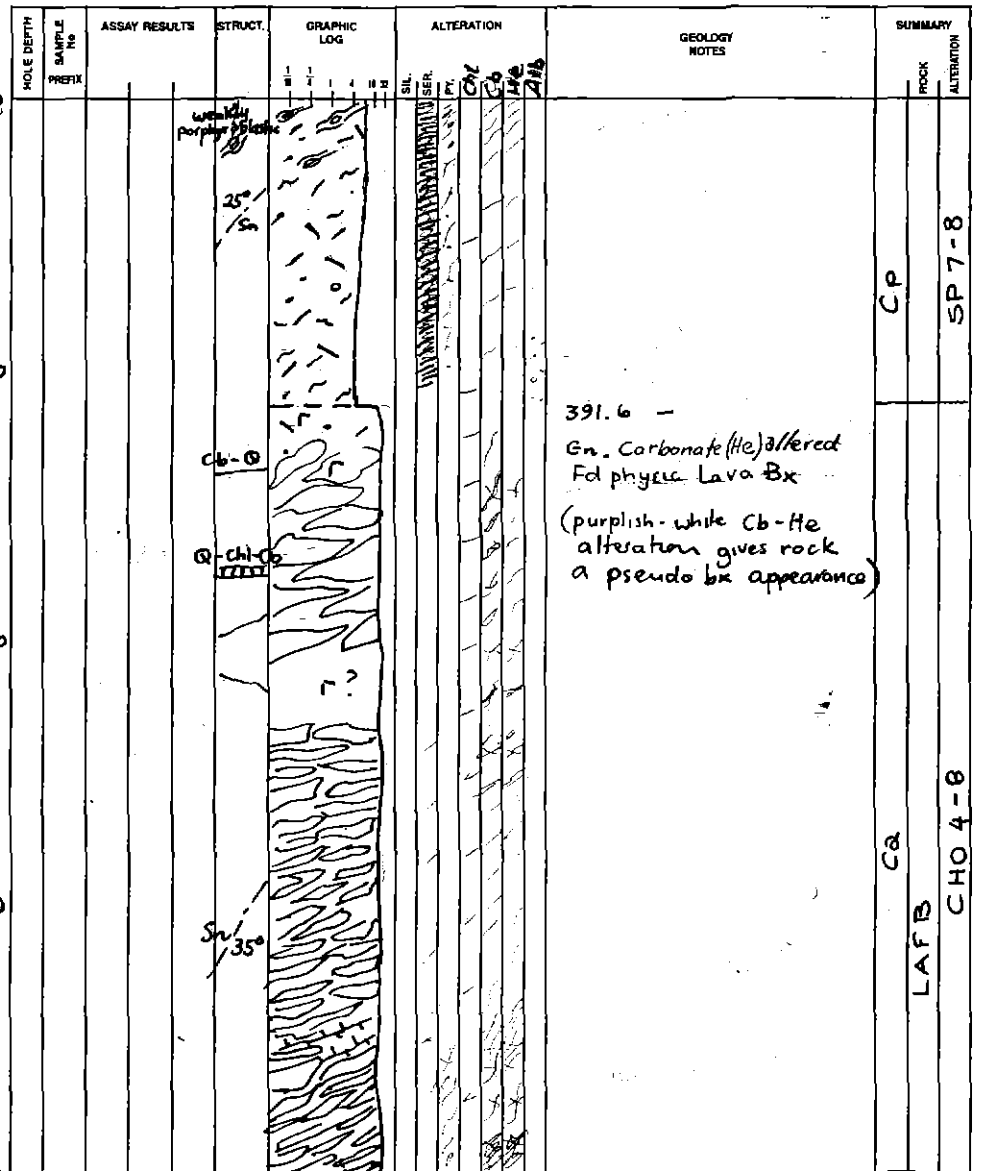
RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 9 OF 12

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH



391.6 –
Gn. Carbonate (He) altered
Fd phyric Lava Bx
(purplish-white Cb-He alteration gives rock a pseudo bx appearance)

REMARKS

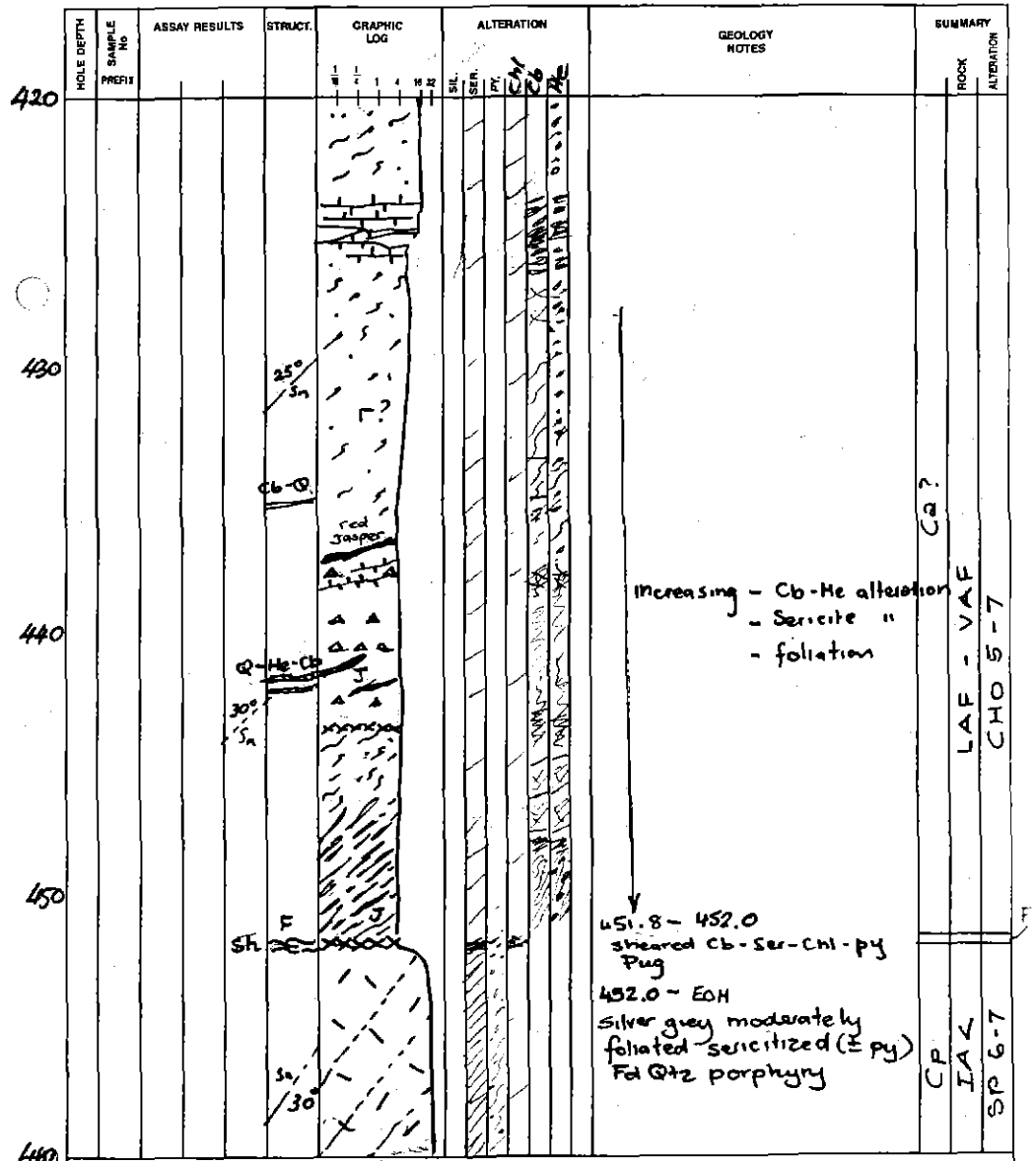
RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 10 OF 12

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	: ANTHONY
PROSPECT	:
DATE	:
LOGGED BY	: RH



Increasing – Cb-He alteration
– Sericite "
– foliation

451.8 – 452.0
sheared Cb-Ser-Chl-py
Pug

452.0 – EOH
Silver grey moderately foliated sericitized (± py) Fd Qtz porphyry

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 11 OF 12

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. BER. PY. Chl Cb Hc Alb)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
460						462.0 – 501.0 Fd-Qtz porphyry appears more clastic possibly due to its hyaloclastic (= pseudo ba) zones.		
470			Sh/40					
480							Cp	IA<
			Qtz Cb					SPO 5-7
490			Hc					
500								

REMARKS

607058

RGC EXPLORATION PTY LTD

DRILL HOLE No BL6

SHEET 12 OF 12

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
500								
510							Cp	IA<
510.60						EOH 510.60m		SPO 5

REMARKS

RGC EXPLORATION PTY LTD

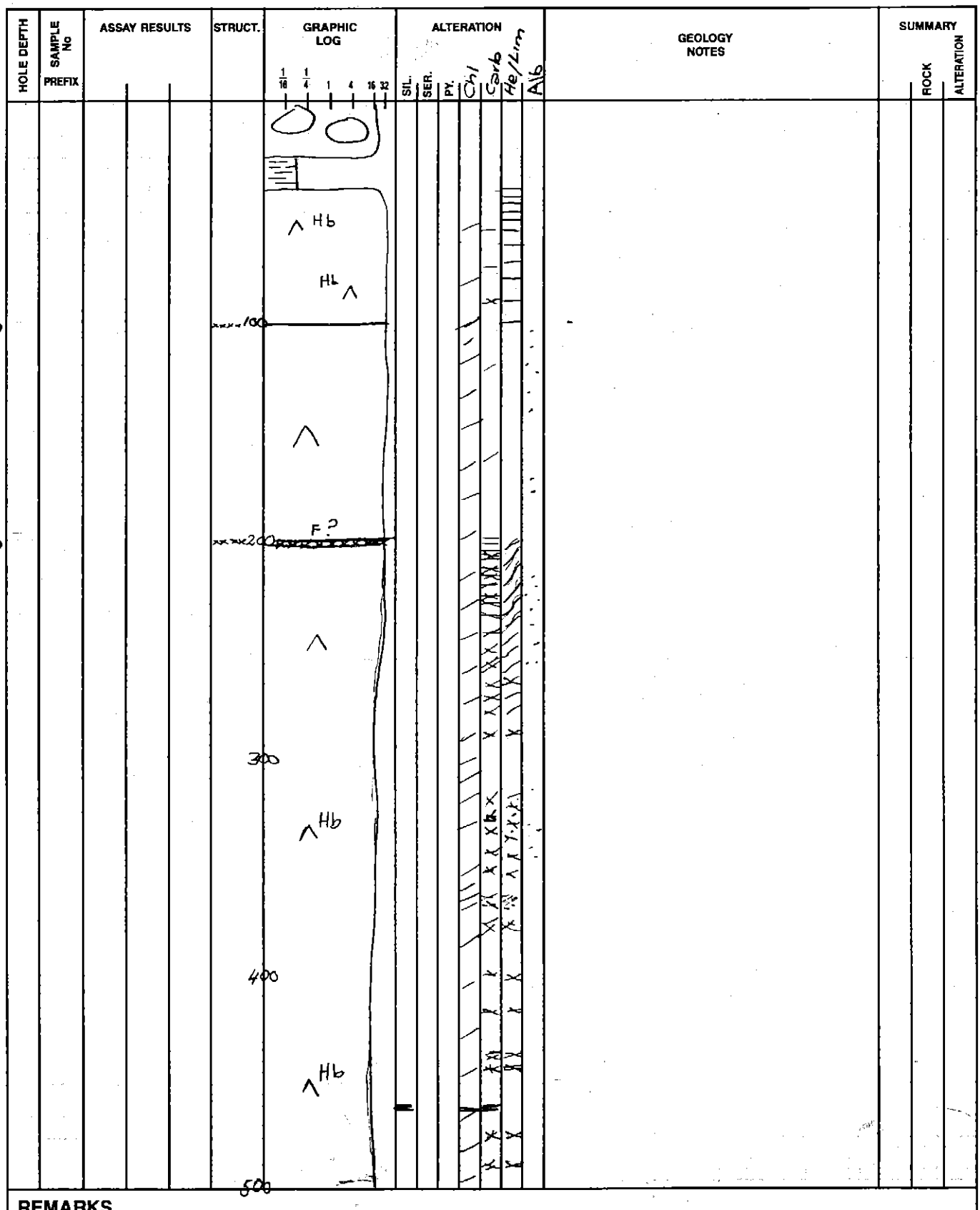
DRILL HOLE No BL 7

SHEET 1 OF 2

SUMMARY

PROJECT	: Anthony EL
PROSPECT	: Anthony
DATE	: 1999
LOGGED BY	: R. Hill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

607059

RGC EXPLORATION PTY LTD

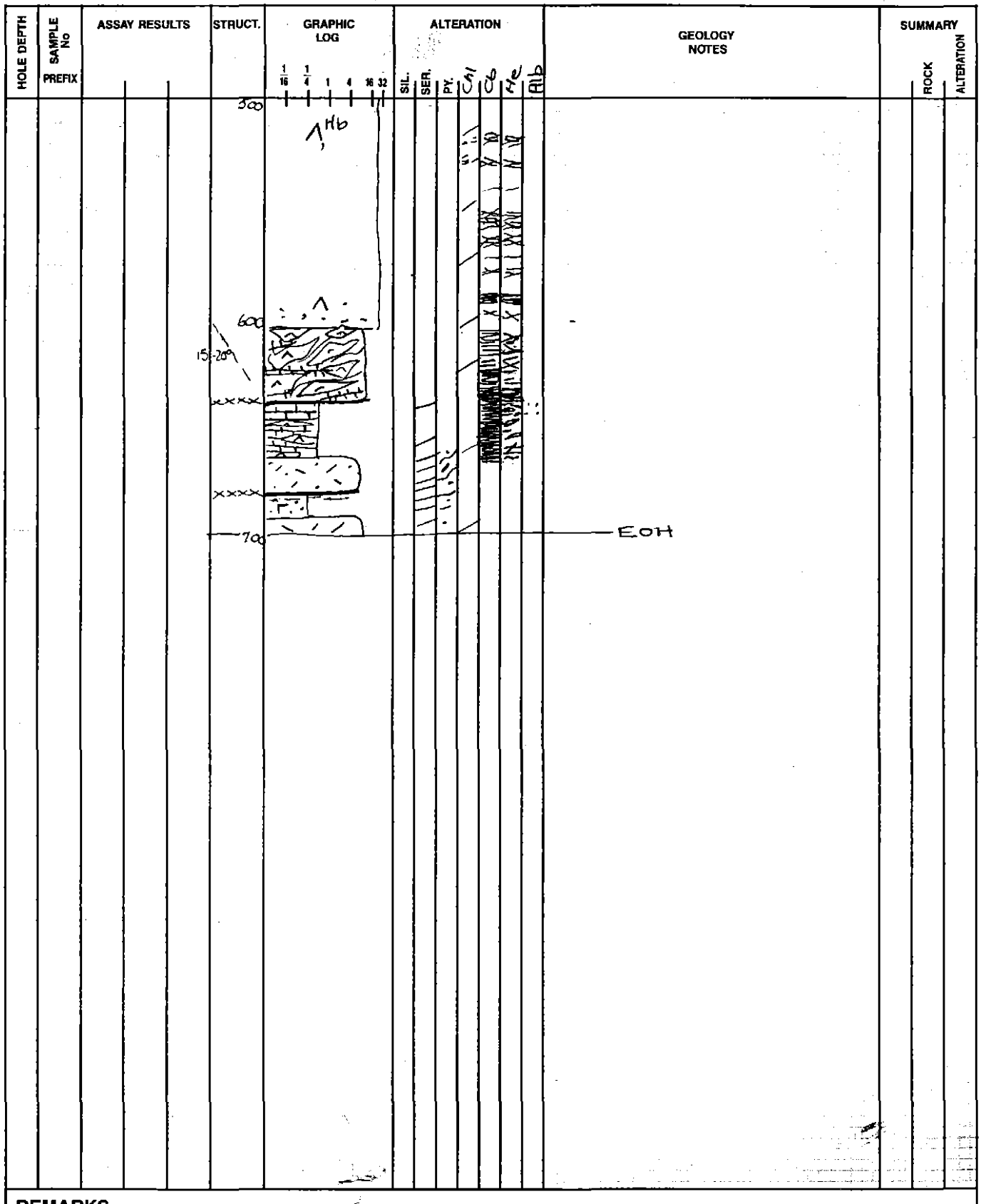
DRILL HOLE No BL7

SHEET 2 OF 2

Summary

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold



REMARKS

607060

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 7

SHEET 1 OF 18

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

T 90/09

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY.) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)

0 - 23.5 Glacials

23.5 - 40.0
Fine pale yellow - cream clay

SUMMARY: TILL / QPg / CLAY

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 7

SHEET 2 OF 18

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: RH

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY.) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)

40.0 - 78.0
Limonitic (weathered) Andesite
Broken in places
MnO_2 joint surfaces common

SUMMARY: Ca / LAFH / L 7-8 / OL6

REMARKS

[redacted] EXPLORATION [redacted] LTD [redacted] DRILL HOLE [redacted] BL-7 [redacted]

SHEET 3 OF 18

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

290209

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT	GRAPHIC LOG	ALTERATION: SIL.	SER.	PY.	GEOLOGY NOTES	SUMMARY: ROCK	ALTERATION
80								Cont'd Fd Hb Andesite ± hyalo-clastite		
90				Hb						
100								broken zones: 104.5 – 105.5 106.5 – 107.0	Cg LAFH	9 70
110										
120										

REMARKS

[redacted] EXPLORATION [redacted] LTD [redacted] DRILL HOLE [redacted] BL-7 [redacted]

SHEET 4 OF 18

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT	GRAPHIC LOG	ALTERATION: SIL.	SER.	PY.	Chl	Cb	Alb	Ep	He	GEOLOGY NOTES	SUMMARY: ROCK	ALTERATION
120				Hb									cg HbFd(±Qtz) phyric Andesite (±qtz amygdales up to 1cm)		
130													Jasper		
140			Cl-Cb-Si Lim										Broken Core 136.5 – 136.65 Lessening Hb	Cg LAFH	CHA03
150			Cb Ep Cb Qtz Chl Cb Qtz										Broken zone 152.7 – 153.8		
160															

REMARKS

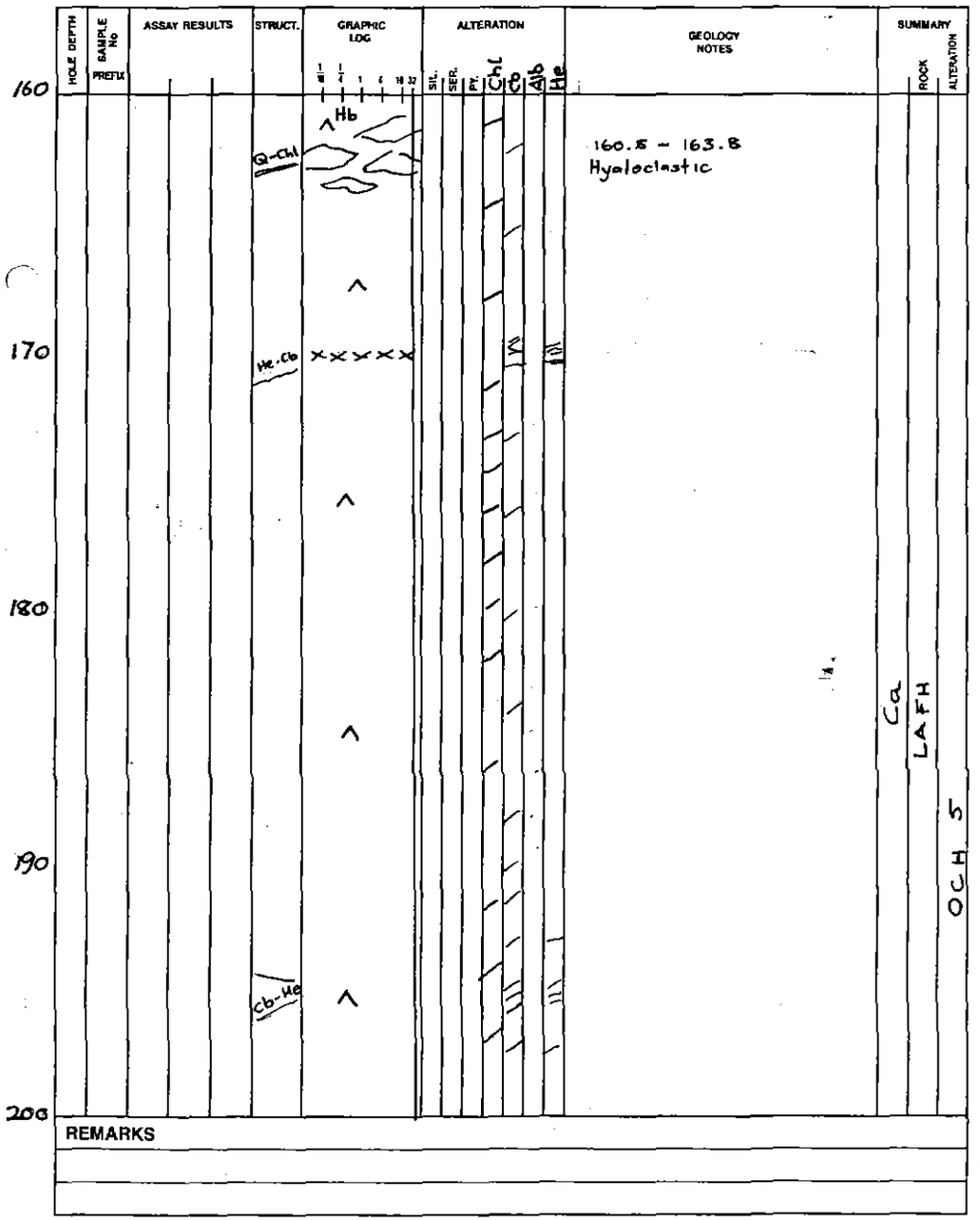
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 7

SHEET 5 OF 18

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

60709

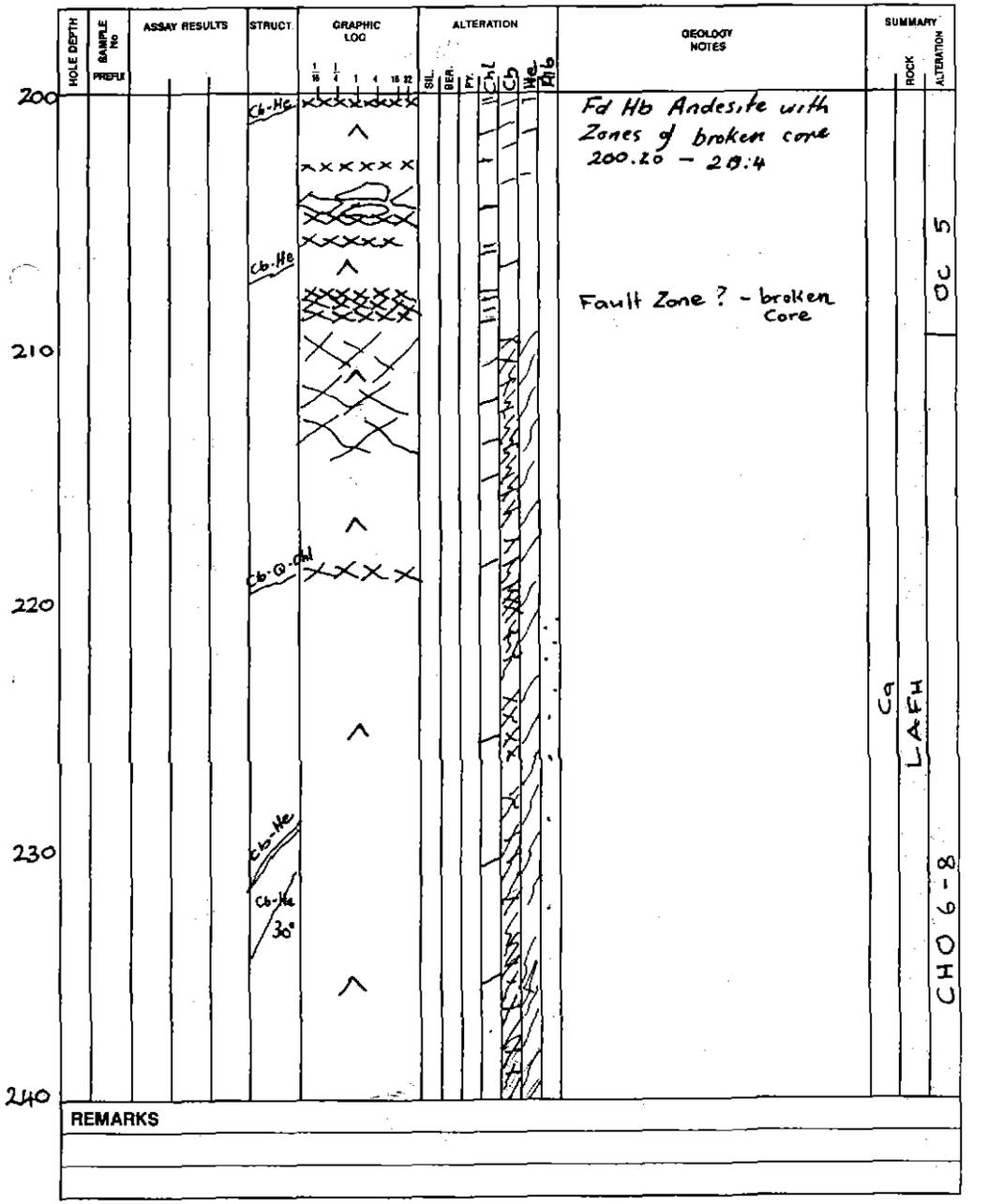
RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 6 OF 18

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 7 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :

PROSPECT : Anthony

DATE :

LOGGED BY : R. Hill

607064

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb He Alb)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
240								
250				Fd				
260							Ca	LAF
270				Fg				CDH 5-7
280								

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 8 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :

PROSPECT : Anthony

DATE :

LOGGED BY : R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb He)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
280				Hb				
290				Cb-He				
300								
310				Fg				
320				Cb-Q-chl				

REMARKS

RGC EXPLORATION PTY LTD

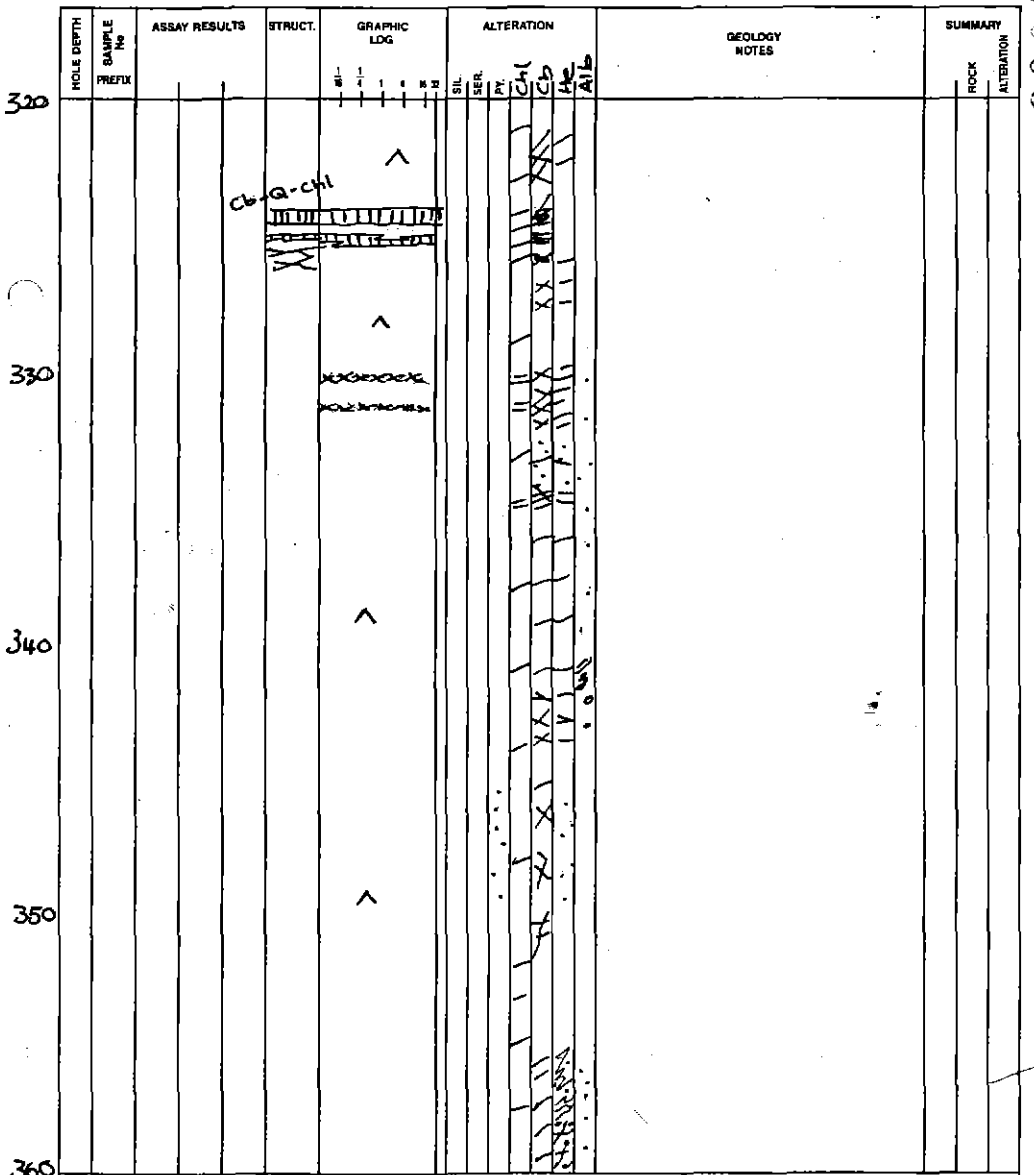
DRILL HOLE No BL7

SHEET 9 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

607065



REMARKS

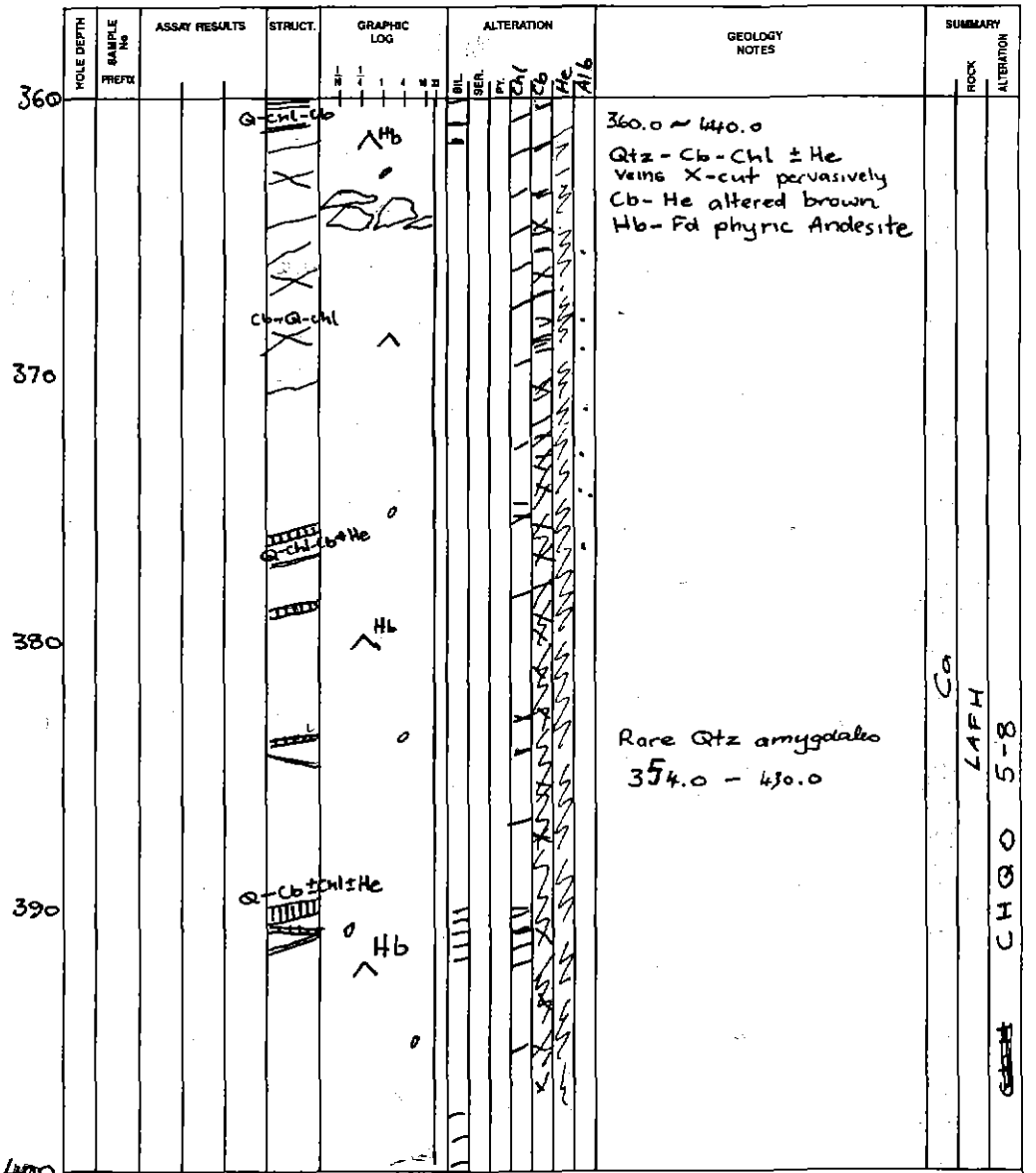
RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 10 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill



REMARKS

RGC EXPLORATION PTY LTD

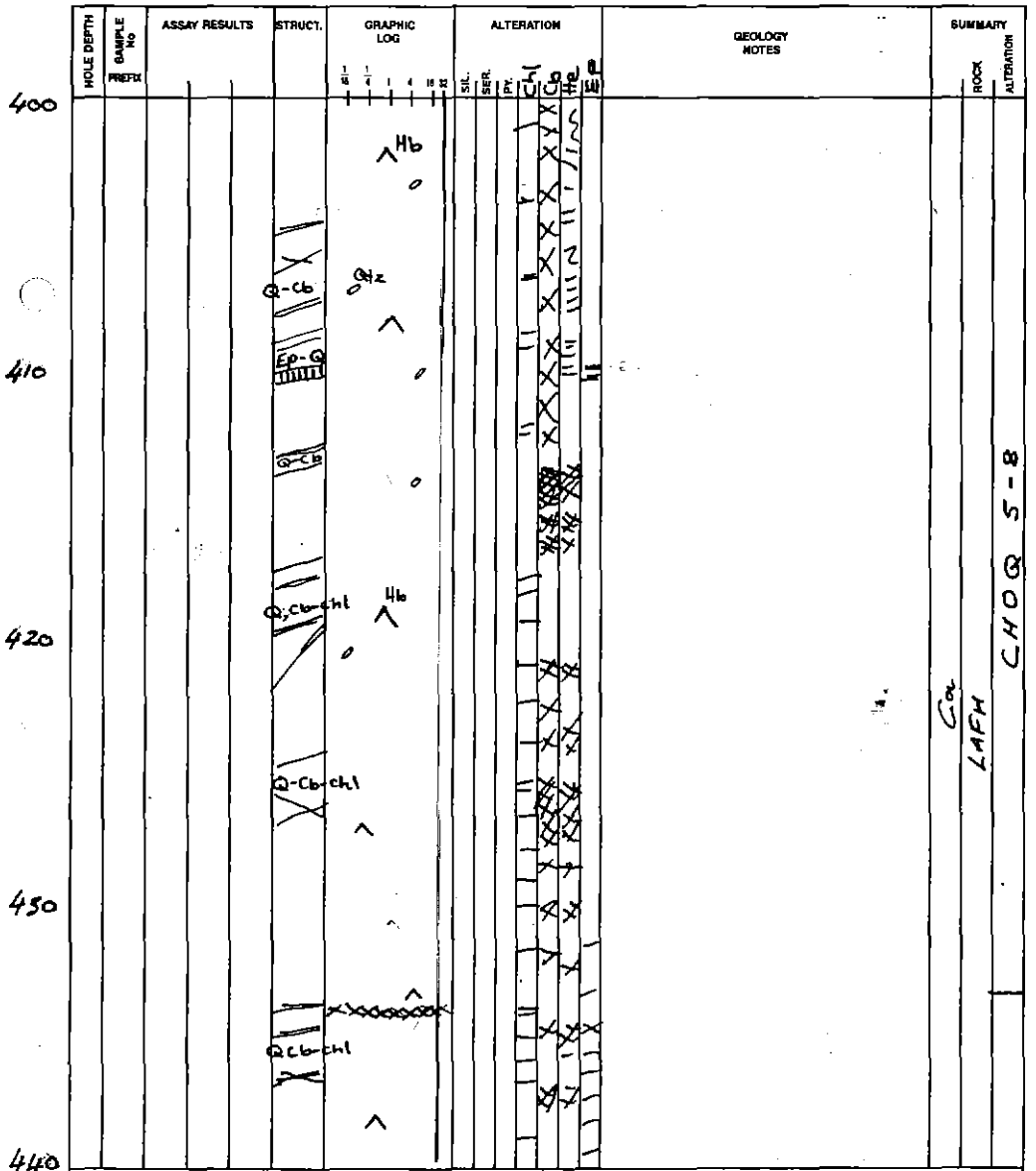
DRILL HOLE No BL7

SHEET 11 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

607066



REMARKS

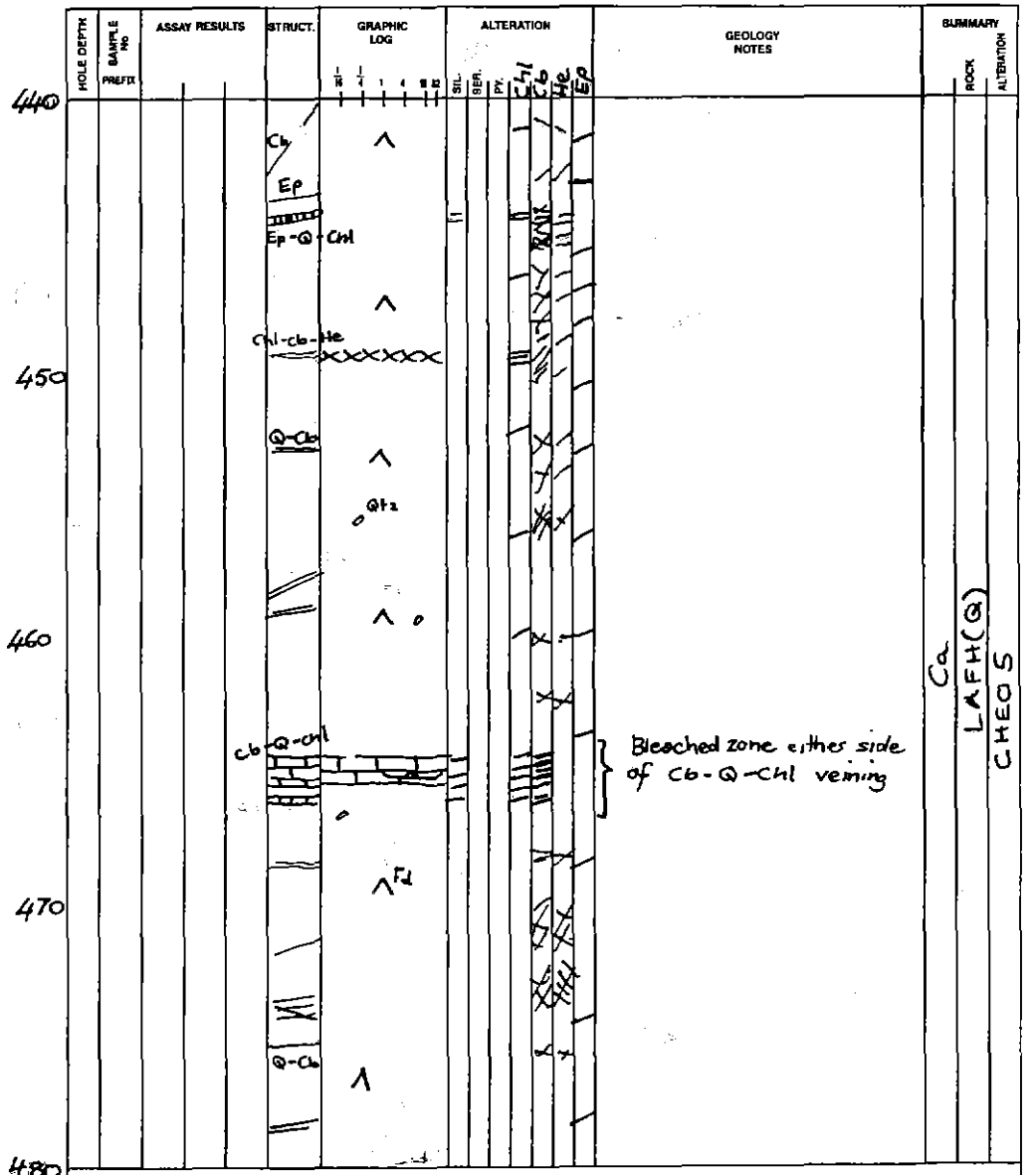
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 7

SHEET 12 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:



REMARKS

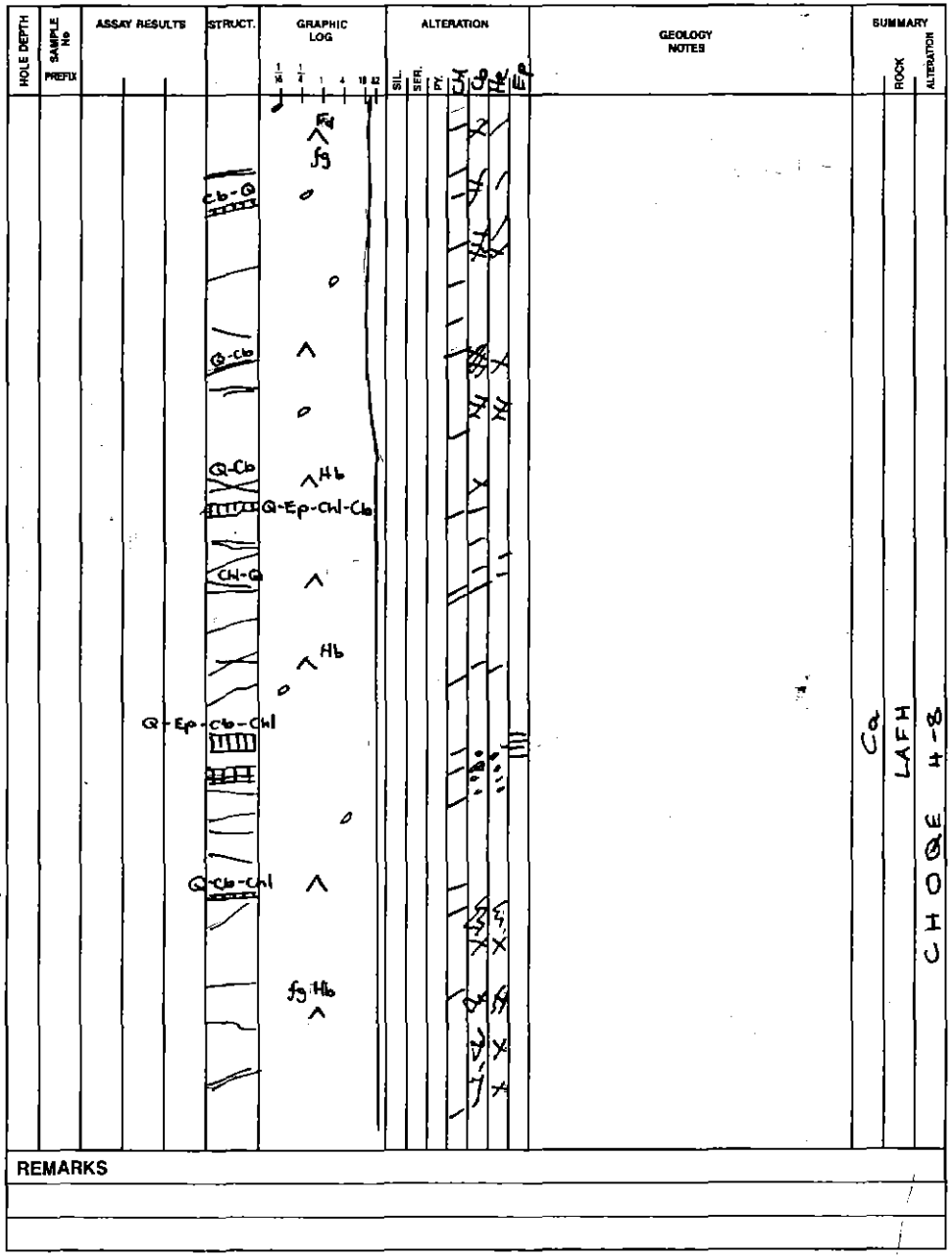
[redacted] EXPLORATION [redacted] LTD [redacted] HOLE [redacted] 7 [redacted]

SHEET 13 OF 18

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding | Cleavage | Foliation | Fault, Shear | Breccia | Broken core

Disseminated | Massive | Pervasive | Narrow vein | * Visible gold



REMARKS

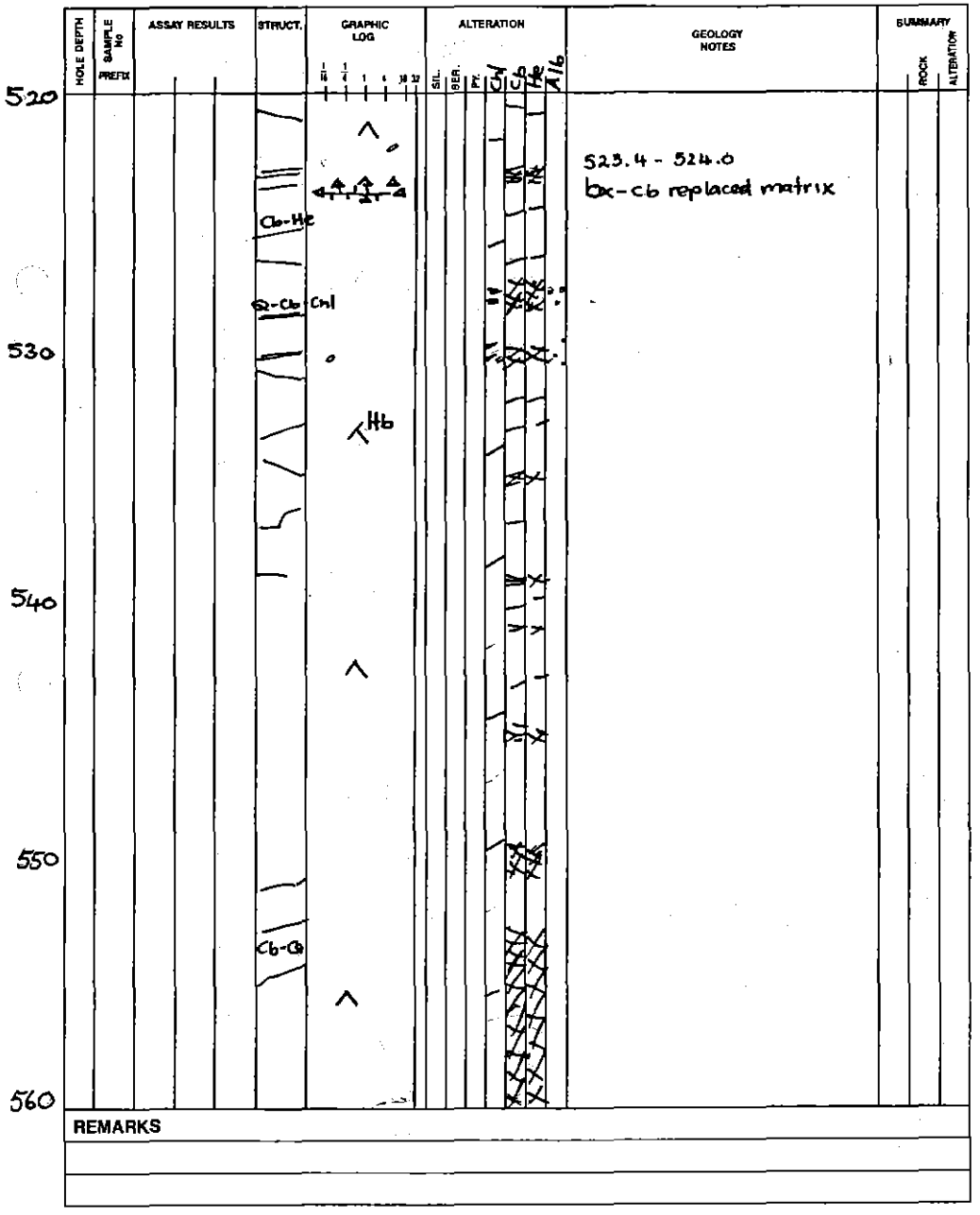
[redacted] GC EXPLORATION [redacted] LTD [redacted] HOLE No [redacted] 17 [redacted]

SHEET 14 OF 18

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding | Cleavage | Foliation | Fault, Shear | Breccia | Broken core

Disseminated | Massive | Pervasive | Narrow vein | * Visible gold



REMARKS

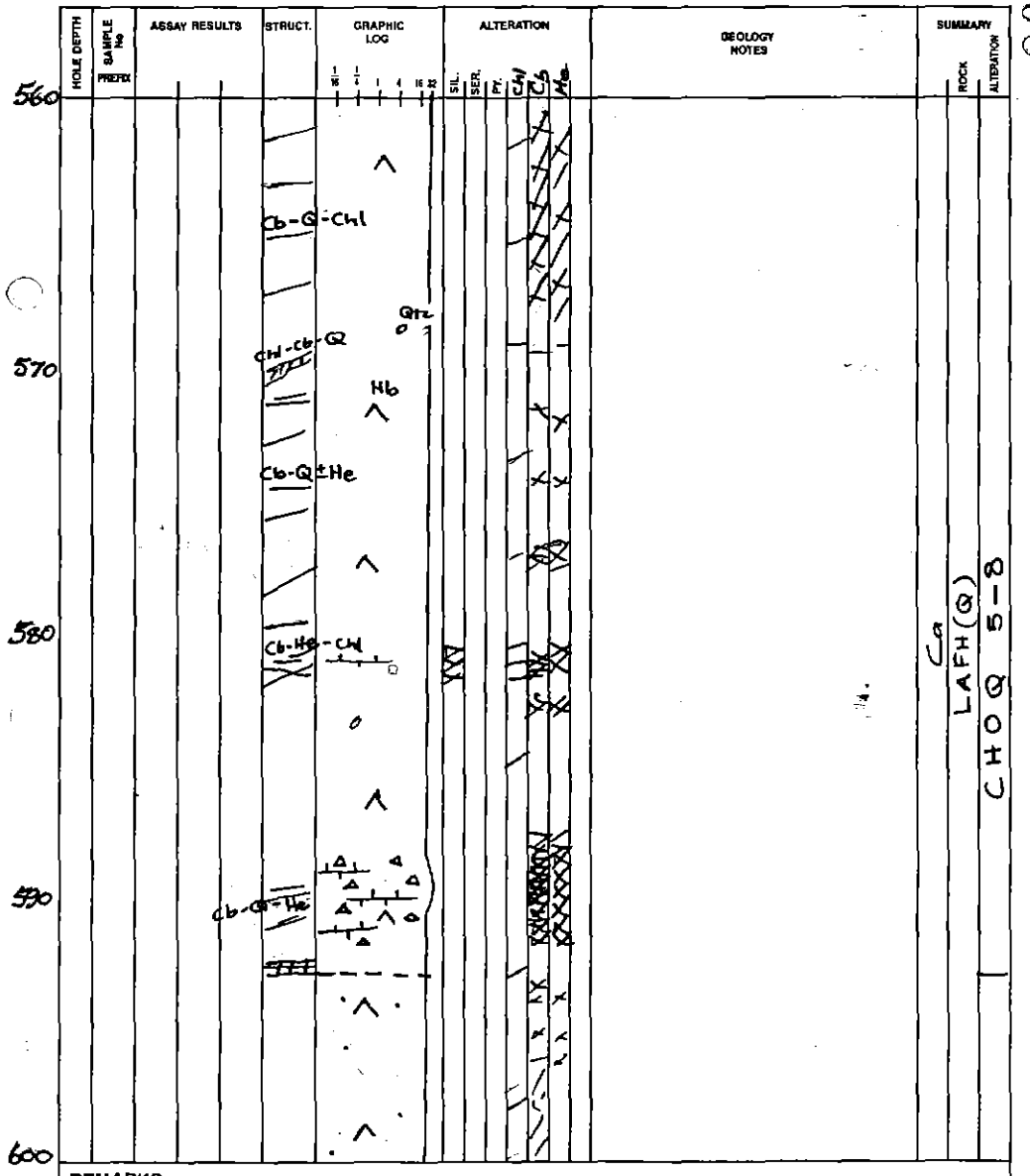
RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 15 OF 18

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



REMARKS

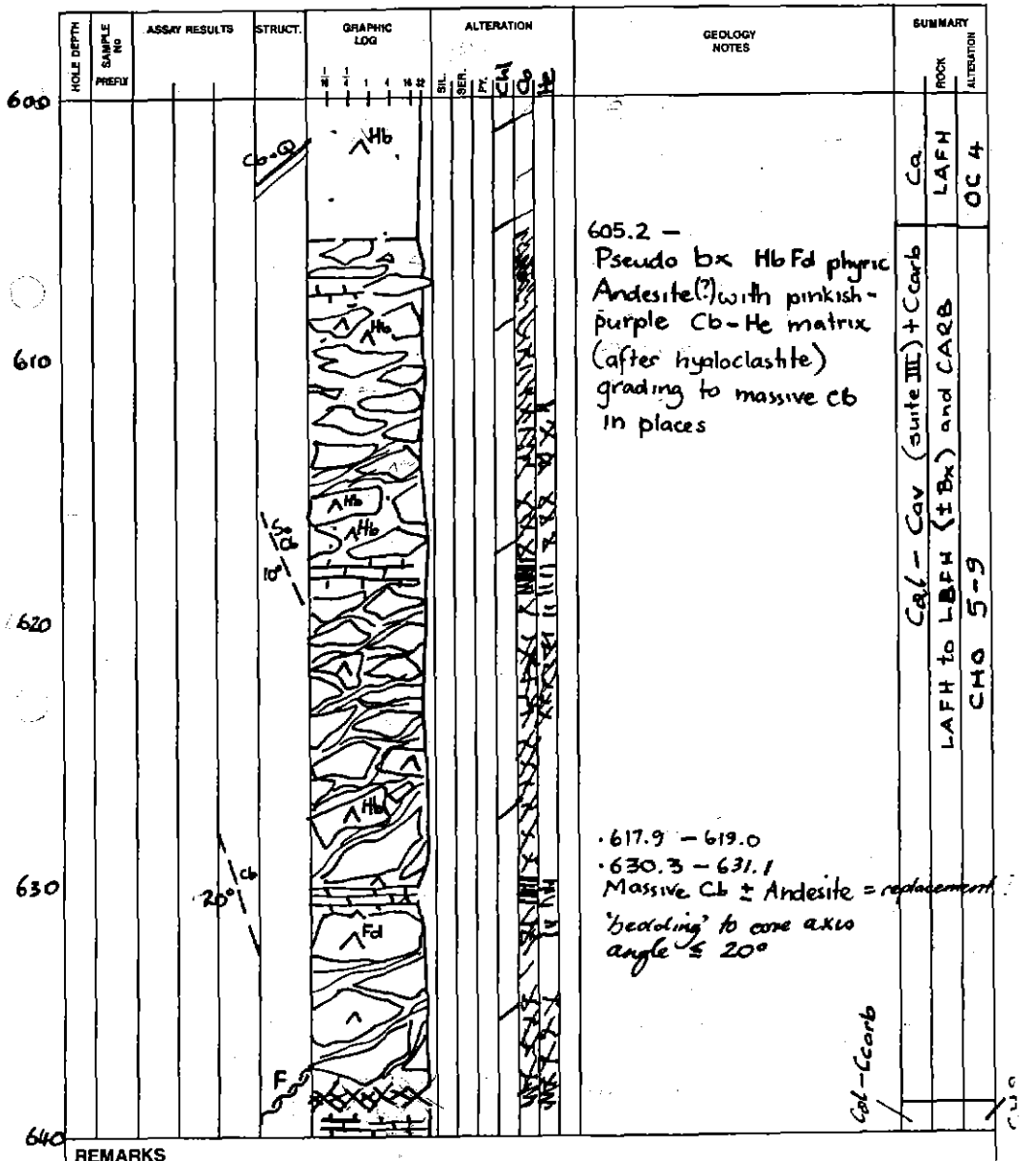
RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 16 OF 18

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



REMARKS

RGC EXPLORATION PTY LTD

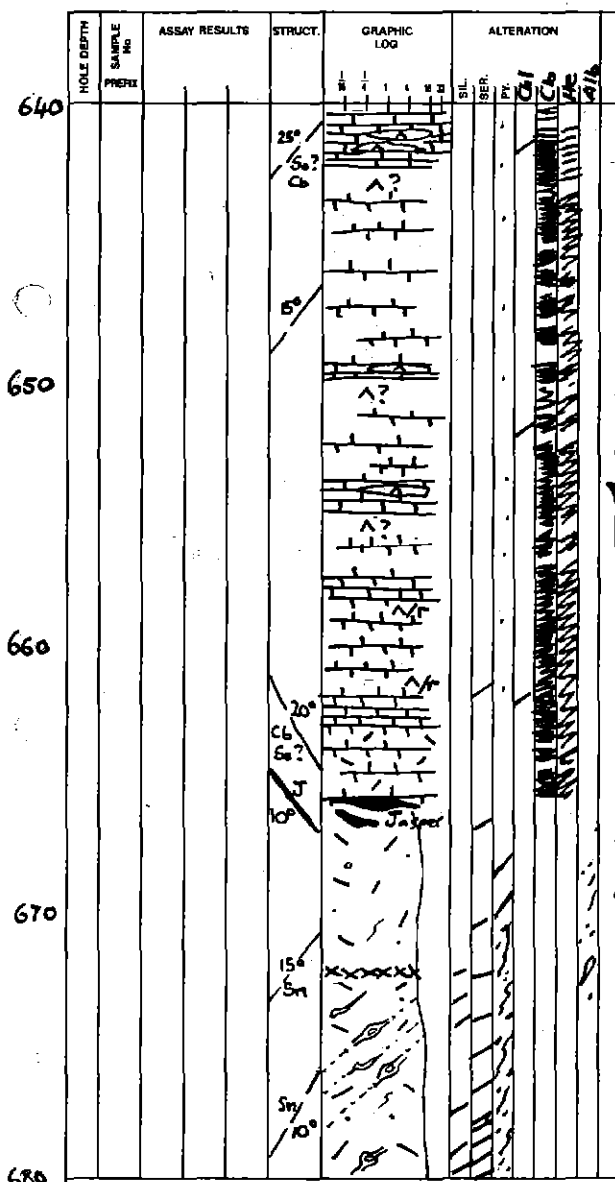
DRILL HOLE No BL7

SHEET 17 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

690209



GEOLOGY NOTES

Increasingly - foliated
- 'porphyroblastic' (Fd phenos)
- Felsic

665.9 –
gy gn foliated Rhyolitic rock containing rounded qtz xtals (porphyroblasts) and a fabric defined increasingly by Py and Sericite.
Possibly clastic ?

SUMMARY

	ROCK	ALTERATION
Cal Ccarb	CARB ± LAF ?	CHO 9
CP	IR>	PSQ 4-6

REMARKS

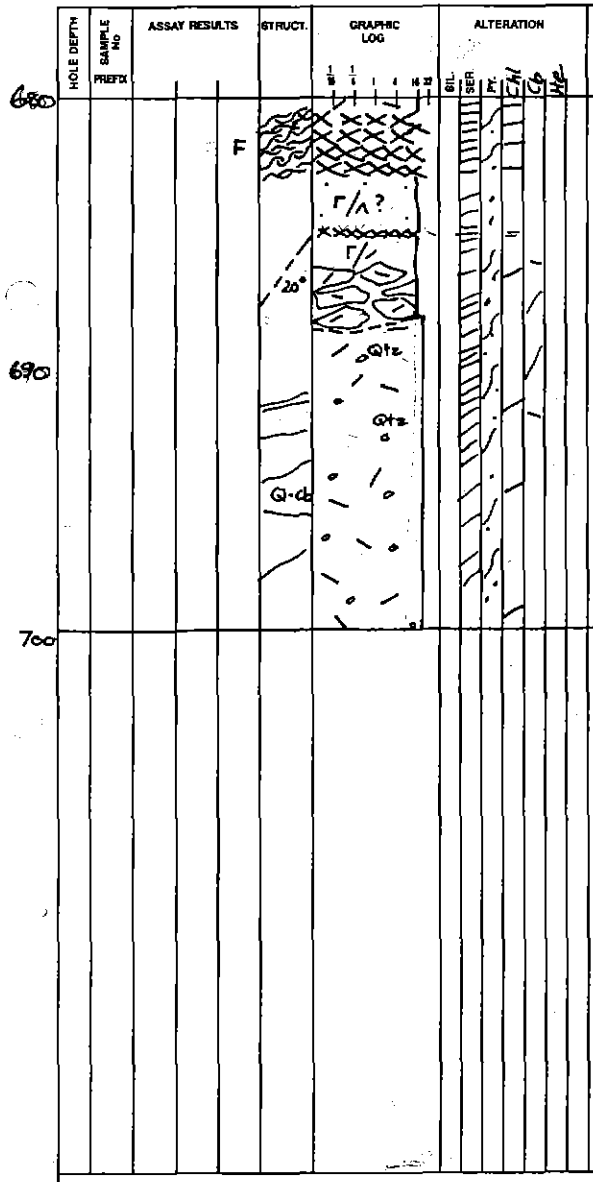
RGC EXPLORATION PTY LTD

DRILL HOLE No BL7

SHEET 18 OF 18

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill



GEOLOGY NOTES

680.8 m - 683.7m
Crush zone = puggy Fault

686.0 - 688.2 Hyaloclastic Rhyolite/Dacite?

688.2 - 699.7 (EOH)
Ser - Py altered Qtz Feldspar porphyry

EOH 699.70

SUMMARY

	ROCK	ALTERATION
	FALT	SOP7
Cav/CP	VRB-VDB	SPO 6
CP	IR<	SPO 5-6

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

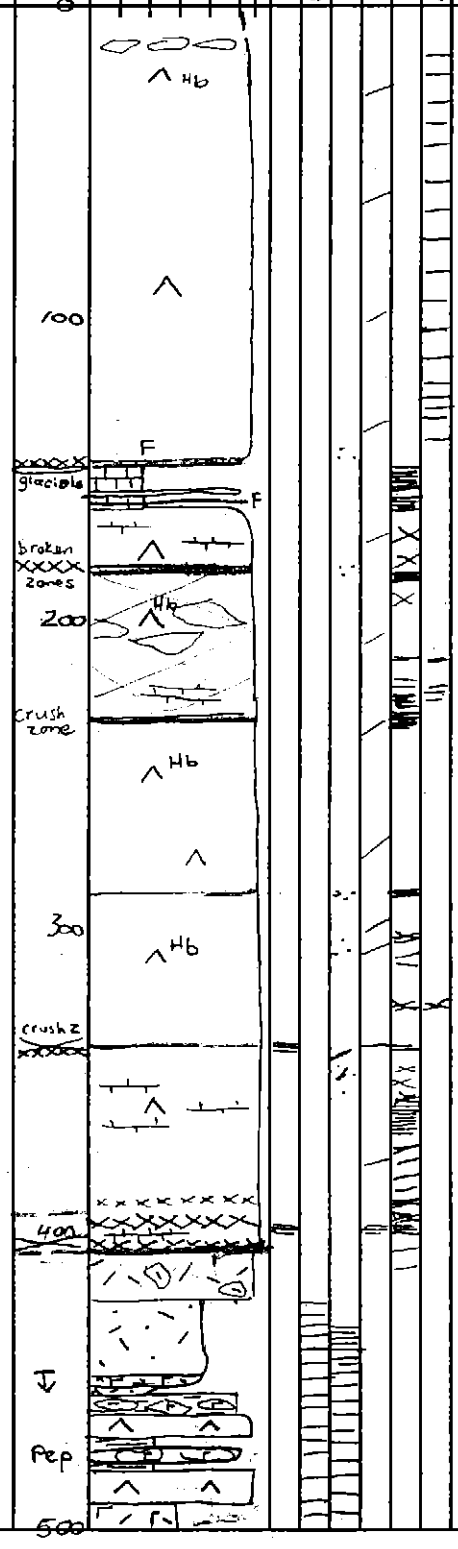
SHEET 1 **OF** 2

Summary

PROJECT	:
PROSPECT	: Anthony
DATE	: 1999
LOGGED BY	: R. Hill

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG (1/16, 1/4, 1, 4, 16, 32)	ALTERATION: SIL.	SER.	PY.	Chl	Cb	He/Lim	GEOLOGY NOTES	SUMMARY: ROCK	ALTERATION



REMARKS

607070

RGC EXPLORATION PTY LTD

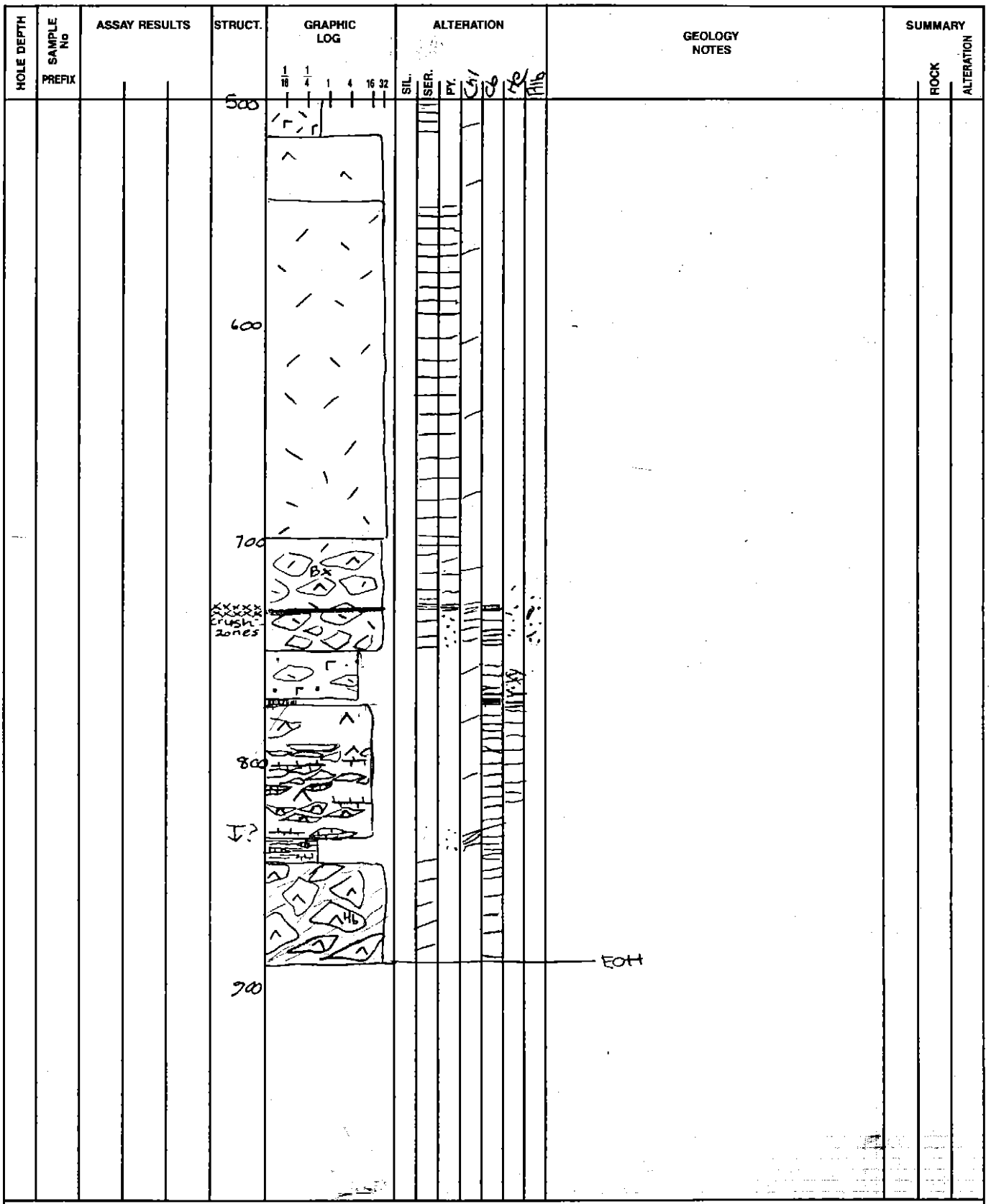
DRILL HOLE No BL008

SHEET 2 OF 2

Summary

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold



REMARKS

607071

RGC EXPLORATION PTY LTD

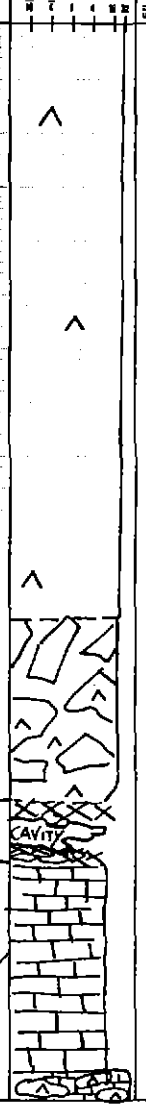
DRILL HOLE No BL8

SHEET 1 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY.) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)



0 – 13m Glacials
13 – 142.0m
Moderately weathered (Limonitic) Fd Hb phyric Andesite Lava and Lava bx (hyaloclastite)

142.0 – 148.9
Chloritic Hb-Fd phyric Lava and bx

148.7 – 149.5 Highly broken core
149.5 – 150.9 Open Cavity
150.9 – 151.2 Broken core
151.2 – 158.9
White massive Carbonate (foliated)

158.9 – 162
Fd Phyric Andesite Bx + Cb

Ca | LAFH | L 1-6
Ca
LAFH/LAFB
FALT
Ccorb | CARB
Ccorb | LAHB

REMARKS

RGC EXPLORATION PTY LTD

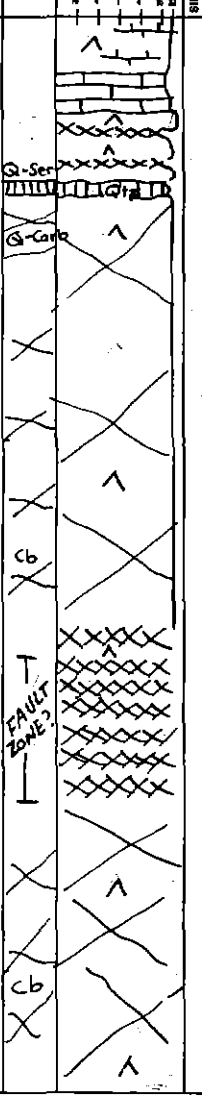
DRILL HOLE No BL8

SHEET 2 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. Chl Cb Alb) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)



puggy crush zone

163.7 – 232.0
Zone of broken to coherent Andesite with broken to crushed intervals (xxxxx) grading into less broken core.
Andesite is Fd ± Hb phyric (± sick Hb)
X-cut by white Cb veins with patches of pervasive to massive white Cb

Ccorb | LAHB | CARB
Ca | LAFH | COP 3-8

REMARKS

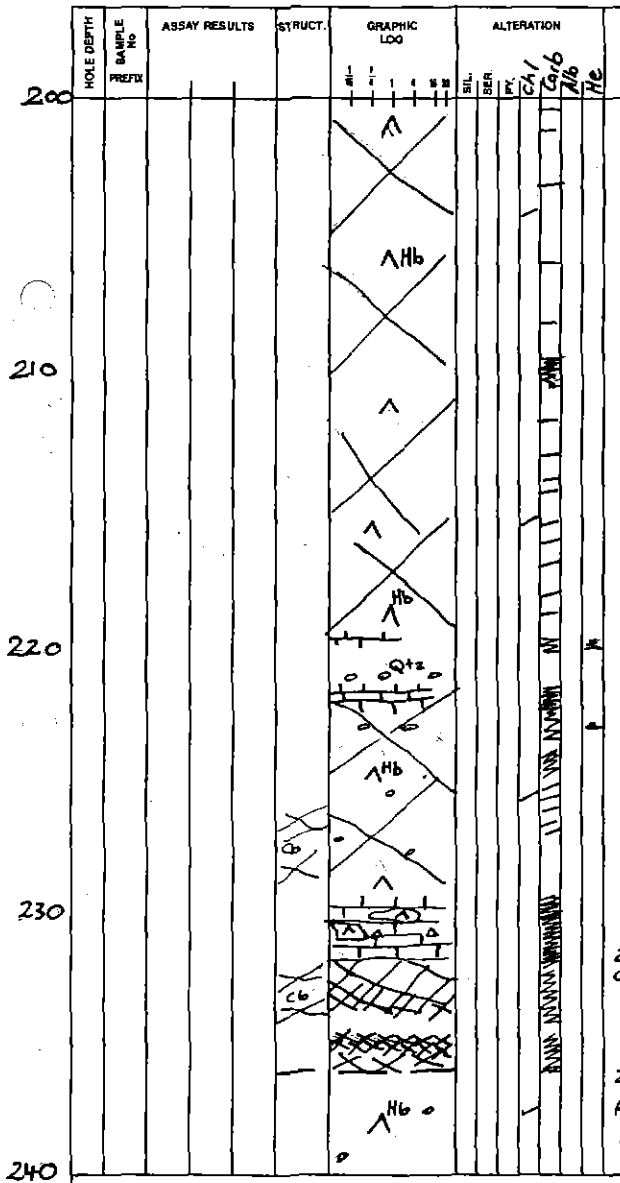
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 8

SHEET 3 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill



GEOLOGY NOTES

Qtz amygdales below 220m

232.0 - 236.0 crush zone

236.0 - Relatively Fresh unbroken Hb Fd phyric Andesite (± qtz amygdales)

SUMMARY

	ROCK	ALTERATION
Ca (+ Ccarb)	LAFH (+ CARB)	CO 3-9
Ccarb	CARB	
FALT	FALT	CQ8
Ca	LAFH	

REMARKS

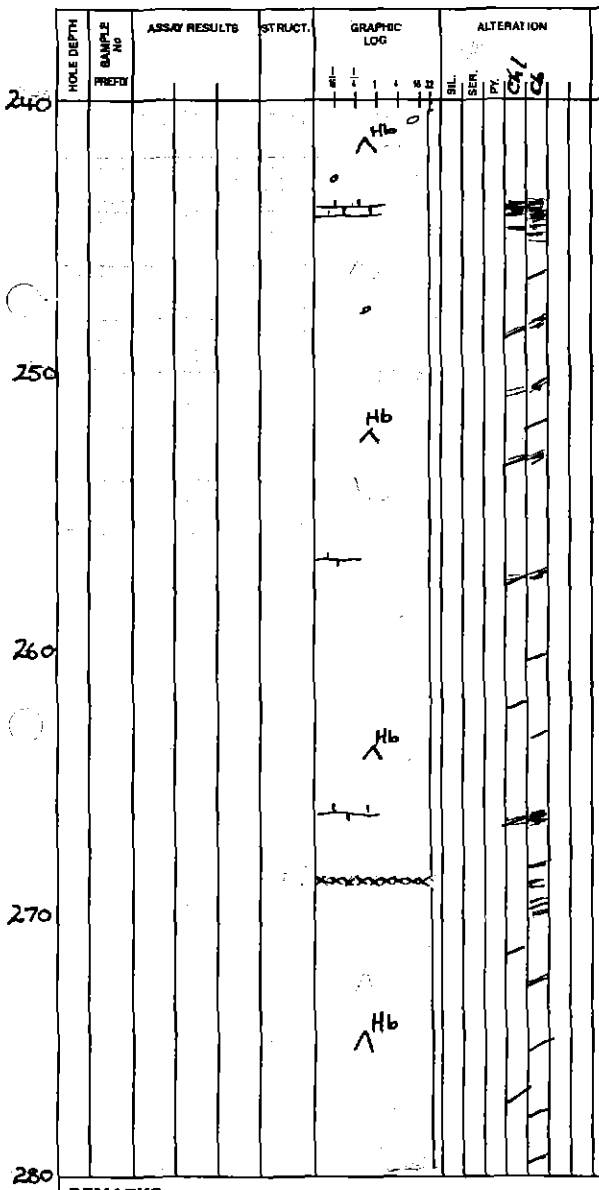
RGC EXPLORATION PTY LTD

DRILL HOLE No BL 8

SHEET 4 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill



GEOLOGY NOTES

SUMMARY

	ROCK	ALTERATION
Ca	LAFH	CO 4

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 5 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Carb)	GEOLOGY NOTES	SUMMARY (ROCK / ALTERATION)
280				Hb			
290			F?			291.8 - 292.3 Cb-py altered crush zone	
300				Hb			
310							
320							

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 6 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Carb Hb)	GEOLOGY NOTES	SUMMARY (ROCK / ALTERATION)
320				Hb		320.0 - 320.8 Andesitic Bx with white Cb matrix	
330				Hb Qtz			
340				Hb Q-Cb-Chl F? Hb Q-Cb-Chl Q-Py Q-Py		Crush zone	Ca LAFH COPQ 3-8
350				Hb			
360				Hb			

REMARKS

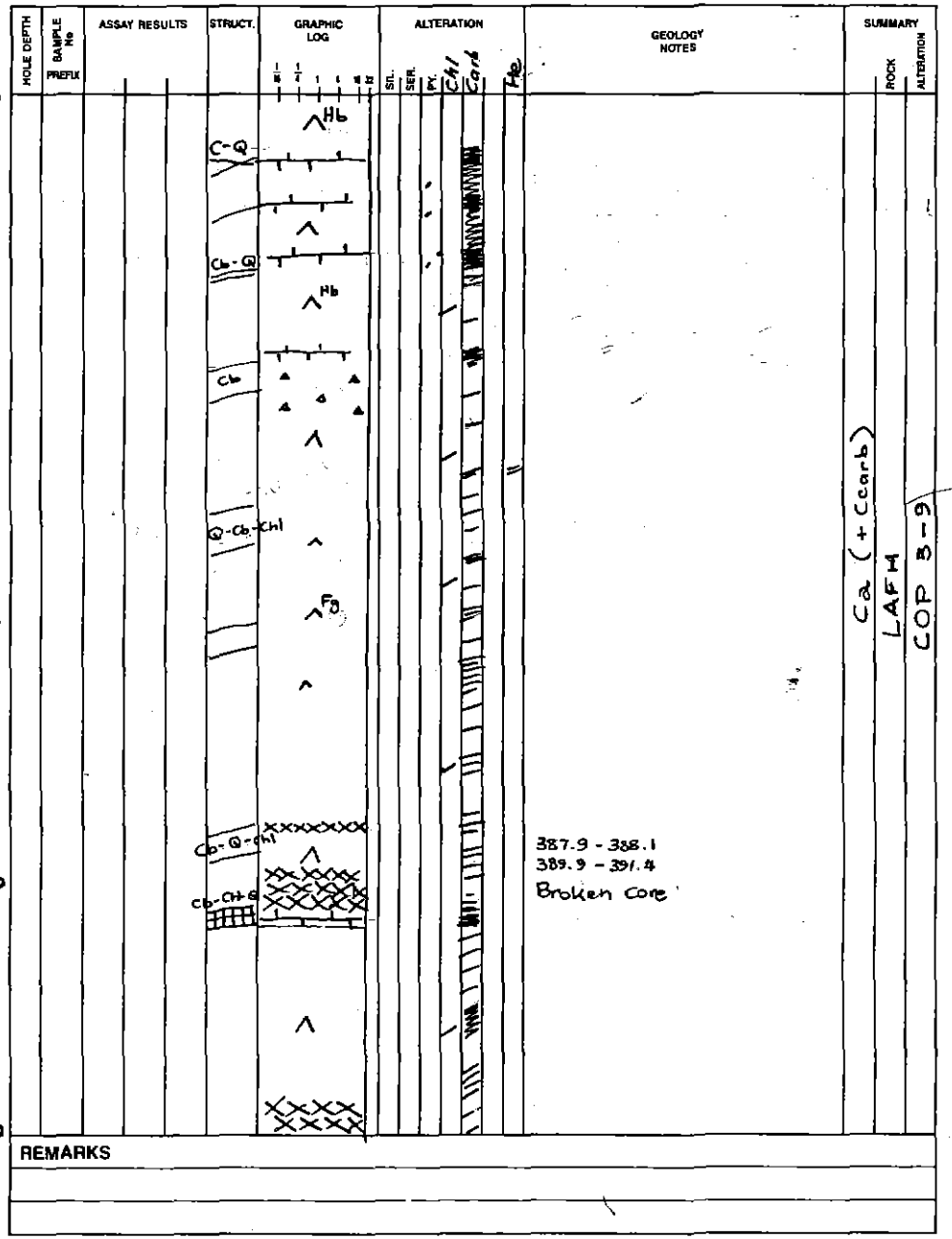
RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 7 OF 19

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

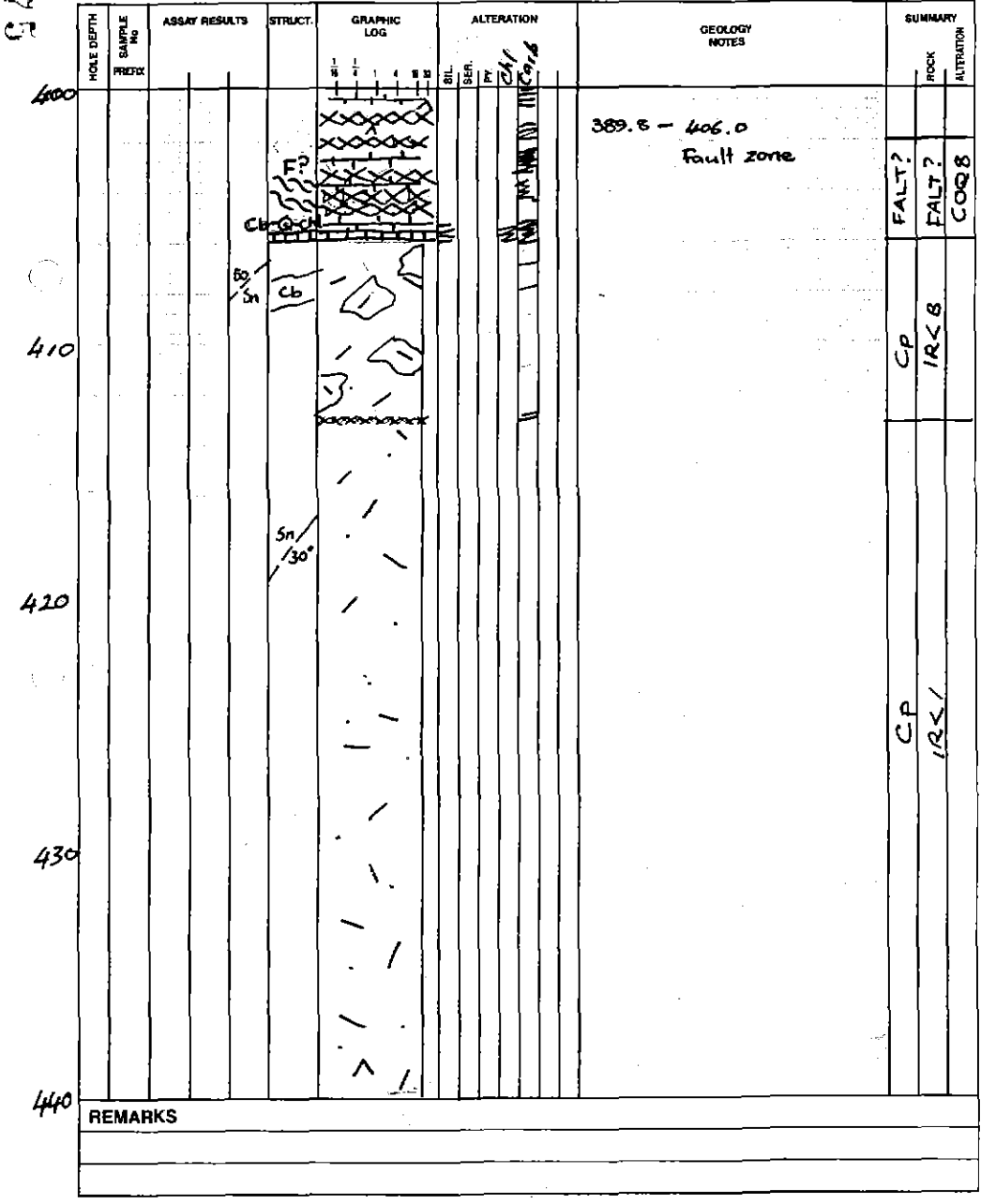
RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 8 OF 19

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 8

SHEET 9 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. Chl Cb He) | GEOLOGY NOTES | SUMMARY (ROCK / ALTERATION)

440
450
460
470
480

454.4 - 457.0
Fd phyric dacitic Vc

457.0 - 458 Qtz Fd phyric rhyolite

458.0 - 466.5
Peperitic Dacite / Rhyolite containing dacitic and rhyolitic clasts in a fg gy cherty matrix

464.5 - 472.0
Fd Phyric Andesite Lava

472.0 - 478.0
dk gy cherty (peperitic?) unit with dacitic clasts in avfg cherty matrix and bounded by intervals of this chert

Geology Notes	Summary	Rock	Alteration
	Cp	VR< - IR<?	SP6-8
454.4 - 457.0 Fd phyric dacitic Vc	Cav	LDFB - VR<B	SP5-8
457.0 - 458 Qtz Fd phyric rhyolite			
458.0 - 466.5 Peperitic Dacite / Rhyolite containing dacitic and rhyolitic clasts in a fg gy cherty matrix		LDFB/LR>B	
464.5 - 472.0 Fd Phyric Andesite Lava		LAF	
472.0 - 478.0 dk gy cherty (peperitic?) unit with dacitic clasts in avfg cherty matrix and bounded by intervals of this chert		LDFB/SILT?	
	Ca	LAF	SP4

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 8

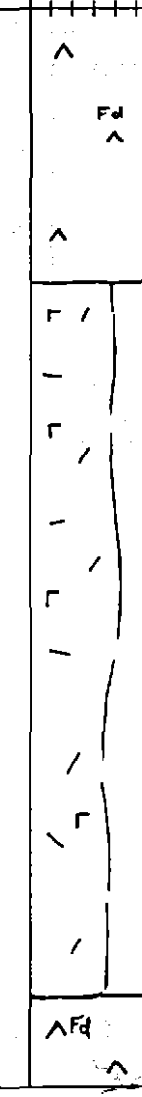
SHEET 10 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. Chl) | GEOLOGY NOTES | SUMMARY (ROCK / ALTERATION)

480
490
500
510
520



478.0 - 490.1
Fd phyric Andesitic Lava

490.1 - 516.4
Rhyolitic to dacitic Vc Sediments ± Lava

516.7 - 544.7
Fd phyric andesite (± chlorite altered Hb)

Geology Notes	Summary	Rock	Alteration
478.0 - 490.1 Fd phyric Andesitic Lava	Ca	LAF	SP5
490.1 - 516.4 Rhyolitic to dacitic Vc Sediments ± Lava	Cav	VR< - VDF	SP4-7
516.7 - 544.7 Fd phyric andesite (± chlorite altered Hb)	Ca	LAF±H	

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 11 OF 19

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R.Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. CA) | GEOLOGY NOTES | SUMMARY ROCK / ALTERATION

520 · 530 · 540 · 550 · 560

Fd

tHb

544.7 – 697.8
Ser-Py altered qtz phyric rhyolitic lava(?) or intrusive with zones of insitu hyaloclastic bx.

CA LAF 03

CP IRV / IRVB SP5-7

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 12 OF 19

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R.Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY.) | GEOLOGY NOTES | SUMMARY ROCK / ALTERATION

560 · 570 · 580 · 590 · 600

CP IRV ± IRVB SP5-7

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 8

SHEET 13 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY.)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
600								
610								
620							CP	IR< SP 4-7
630								
640								

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL 8

SHEET 14 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Sh Cb He)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
650						649.5 – 651.3 Crumbly Cb-He ± Py rhyolite (Fd>Qtz) also 653.0 – 653.8 658.0 – 658.2 otherwise Relatively unaltered to weakly altered Ser-Py gy Fd Q phyric Rhyolite Fd>Q; Qtz phenos up to 0.75 cm often rounded		
660								
670							CP	IR> SP 4-6
680				Q-CH		←hyaloclastic		
690								

REMARKS

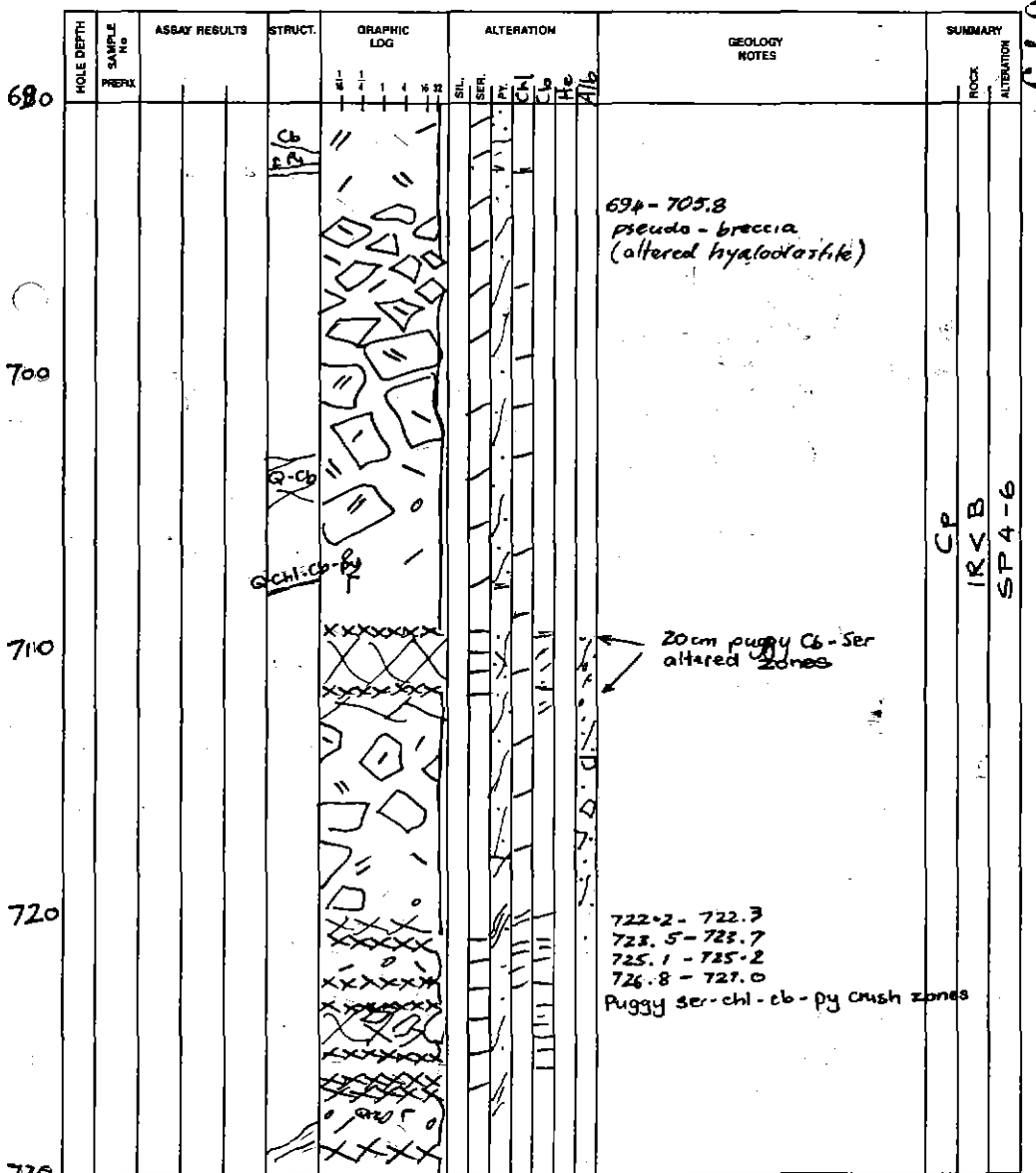
RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 15 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill



REMARKS

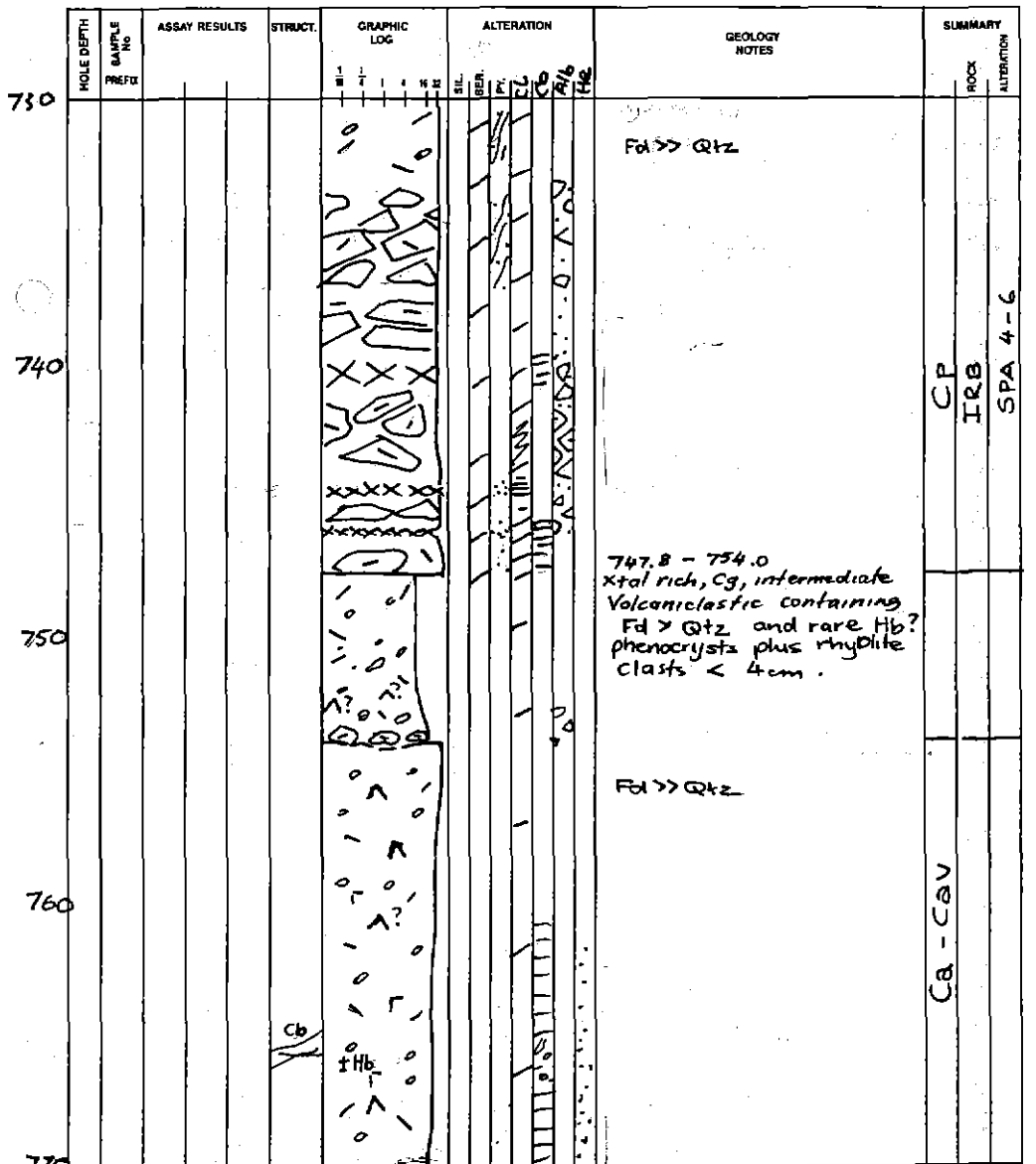
RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 16 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill



REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No BL8

SHEET 17 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

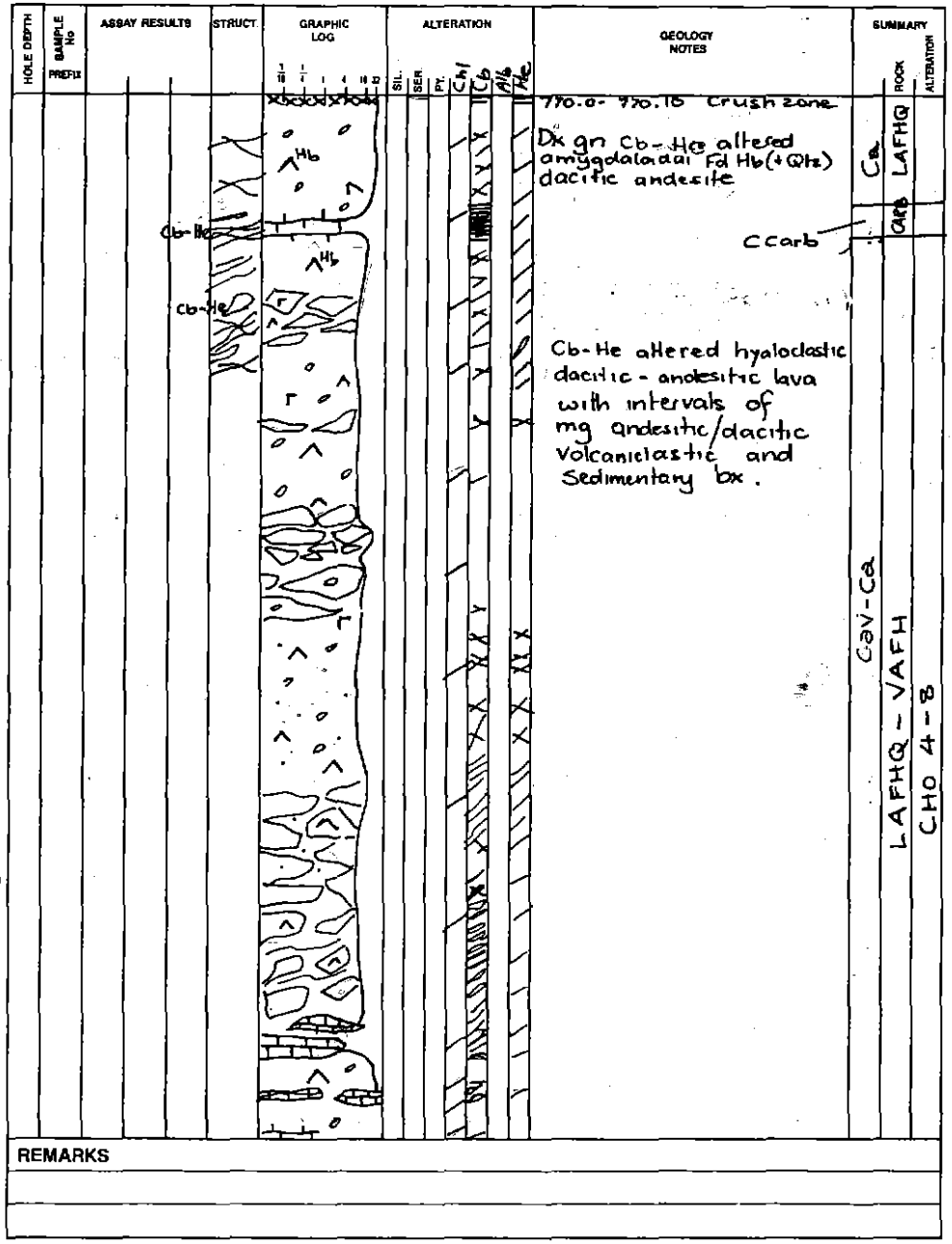
PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

080409

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb Alb He)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
770						770.0 - 770.15 Crush zone		
						Dk gn Cb-He altered amygdaloidal Fd Hb (+Qtz) dacitic andesite	Ca	LAFHQ
						CCarb	CARB	
780						Cb-He altered hyaloclastic dacitic - andesitic lava with intervals of mg andesitic/dacitic volcaniclastic and sedimentary bx.		
790							Cav-Ca	LAFHQ - VAFH
800								CHO 4-8
810								

Cb-He

Hb



REMARKS

RGC EXPLORATION PTY LTD

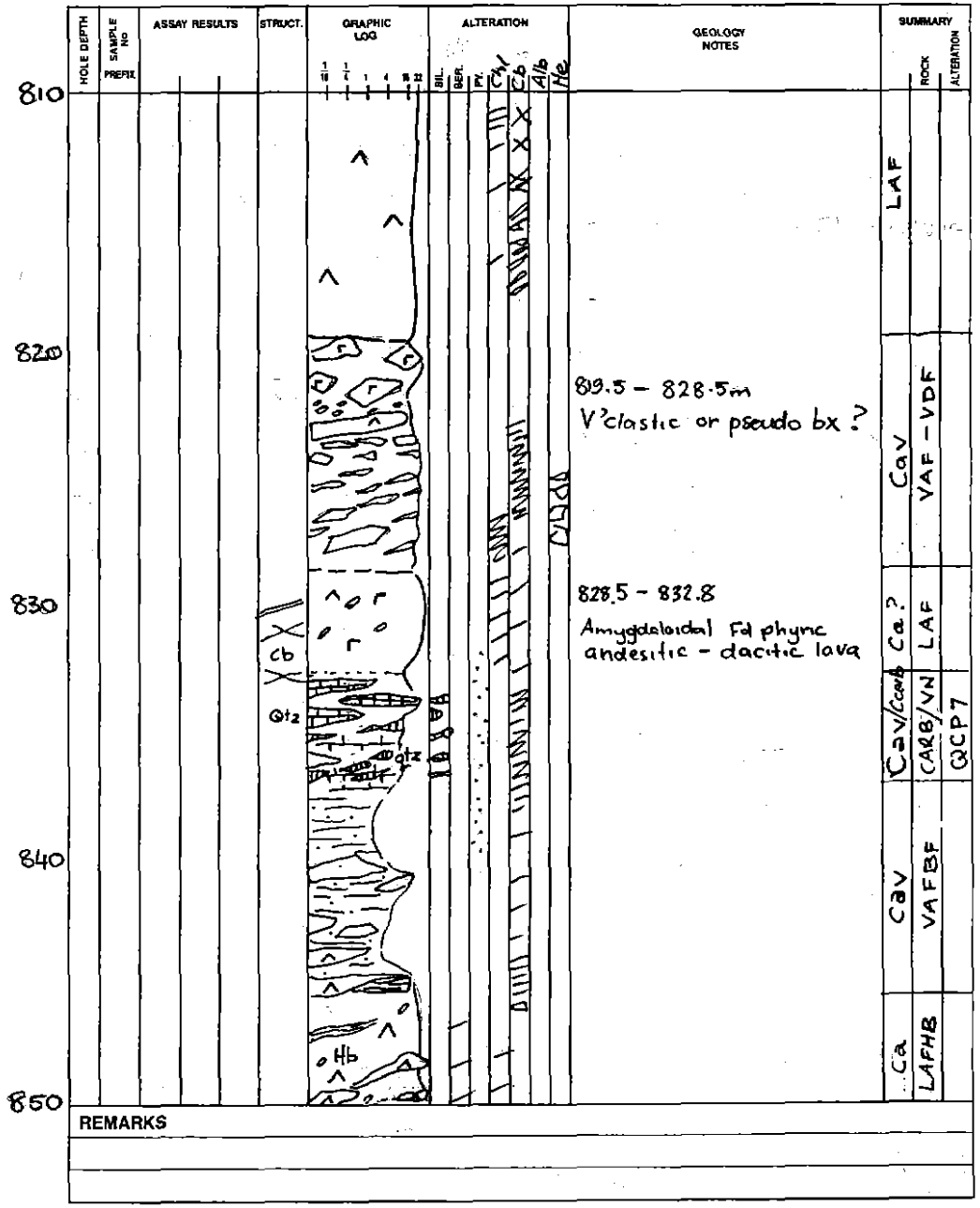
DRILL HOLE No BL8

SHEET 18 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb Alb He)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
810							LAF	
820						819.5 - 828.5m V'clastic or pseudo bx ?	Cav	VAF - VDF
830						828.5 - 832.8 Amygdaloidal Fd phyric andesitic - dacitic lava	Ca?	LAF
							Cav/Ccarb	CARB/VN
840							Cav	VAFBF
850							Ca	LAFHB



Cb

Qtz

Hb

REMARKS

RGC EXPLORATION PTY LTD

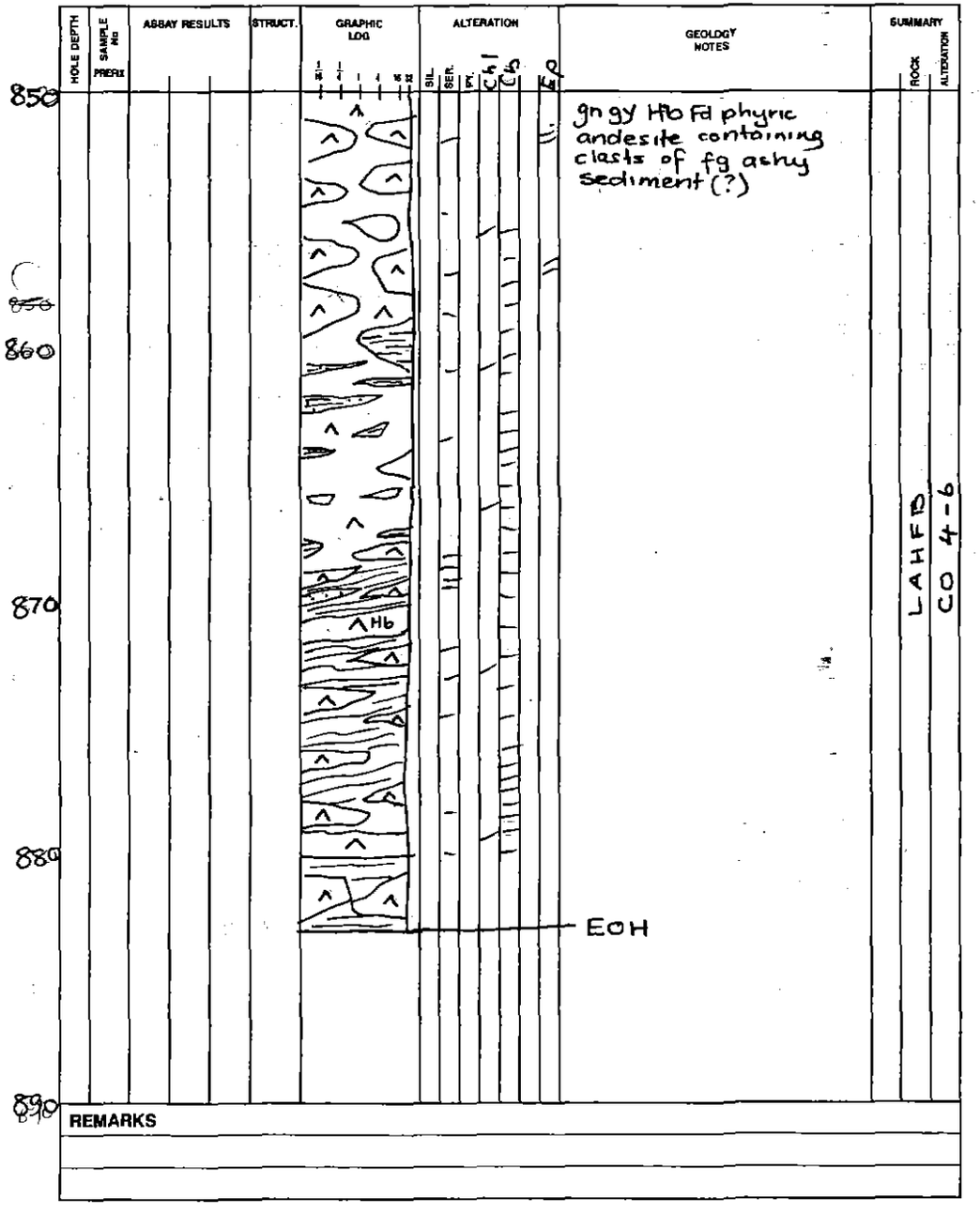
DRILL HOLE No BL8

SHEET 19 OF 19

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb Ep)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
850						gn gy Hb Fd phyric andesite containing clasts of fg ashy sediment (?)	LAHFB	CO 4-6
~~850~~ 860								
870				Hb				
880						EOH		
890								



REMARKS

607081

RGC EXPLORATION PTY LTD

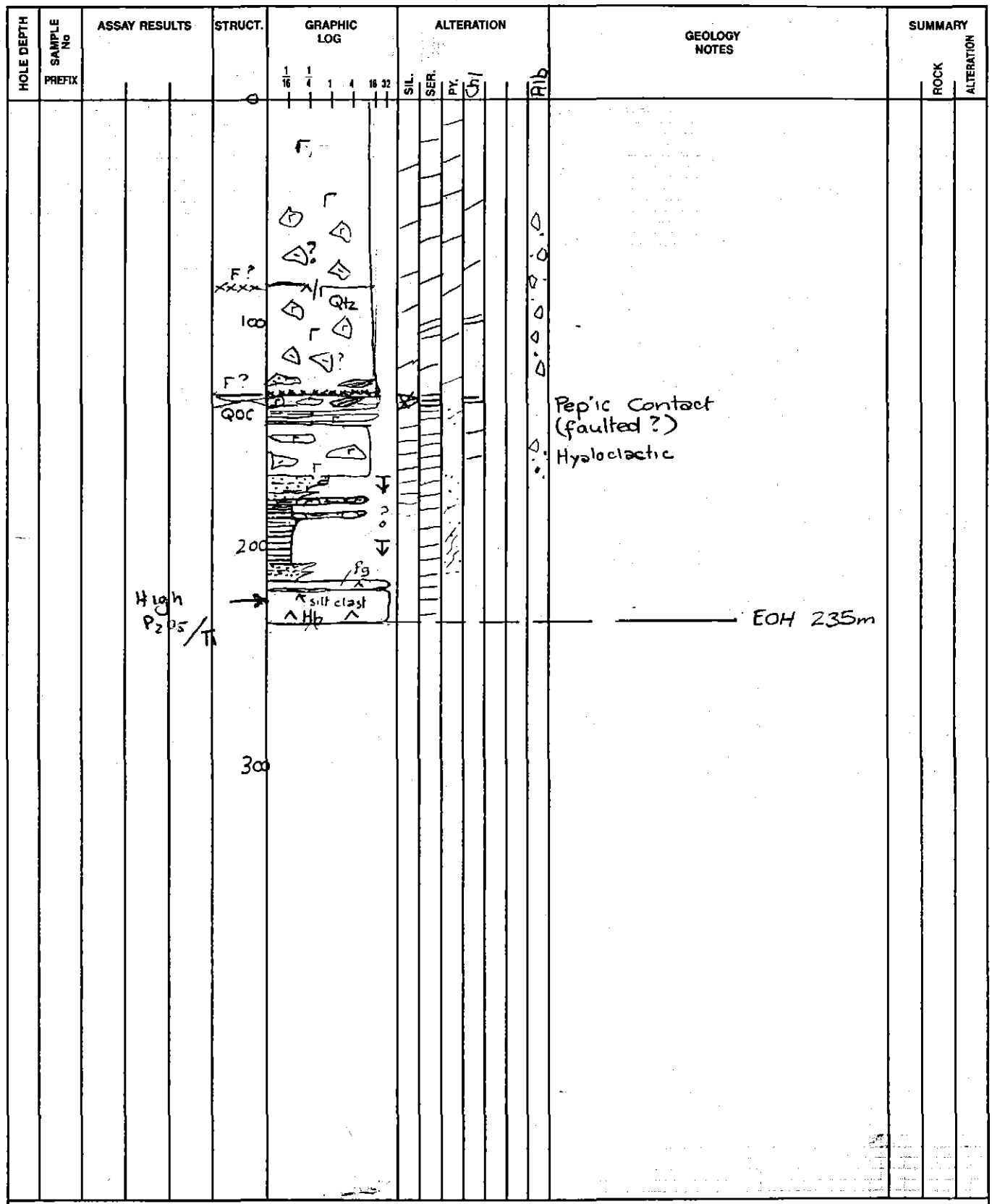
DRILL HOLE No BLD 89-1

SHEET 1 OF 1

Summary

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	: R Hill 1999

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

607082

[redacted] EX[redacted]ORA[redacted]N [redacted] LTD[redacted]

D[redacted] HOLE [redacted] 89 [redacted]

SHEET 1A OF 5

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Lim)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
20								
30								
40								
50								
60								

Ccl

LDF - LDFB

REMARKS

60708

[redacted] RGC [redacted]LORA[redacted]TY [redacted]

[redacted] HOLE No [redacted] D [redacted]-1 [redacted]

SHEET 1 OF 5

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Cb He/Lim Albite)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
60						0m - 71.0m Weakly to moderately Sericite altered grngy Dacitic - Rhyolitic Lava and Lava Bx (Hyaloclastic)		
70						71.0 - 135.0. Foliated Ser-Chl-Py-Alb altered Ignimbrite or Lava bx - Pumic bx		
80						Foliation defined by Sericite whisps Rhyolitic - Dacitic clasts are albite altered (orange - pink)		
90								
100								

Cb-Lim

Cb-Lim

Cb-Q

Ccl - Ccv

LDF - VDB

SPOA 4

REMARKS

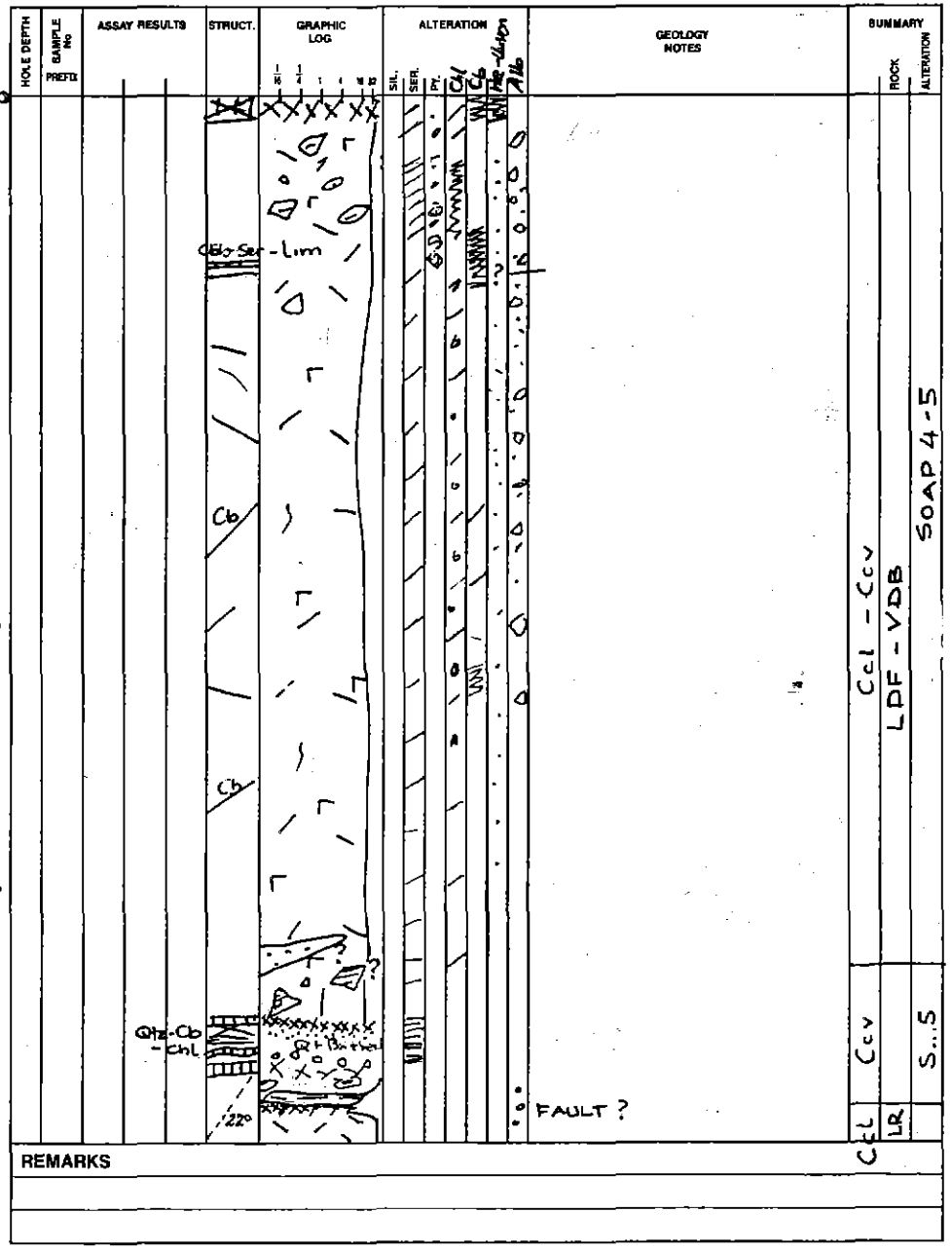
RGC EXPLORATION PTY LTD

DRILL HOLE No BLD 89-1

SHEET 2 OF 5

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core
Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



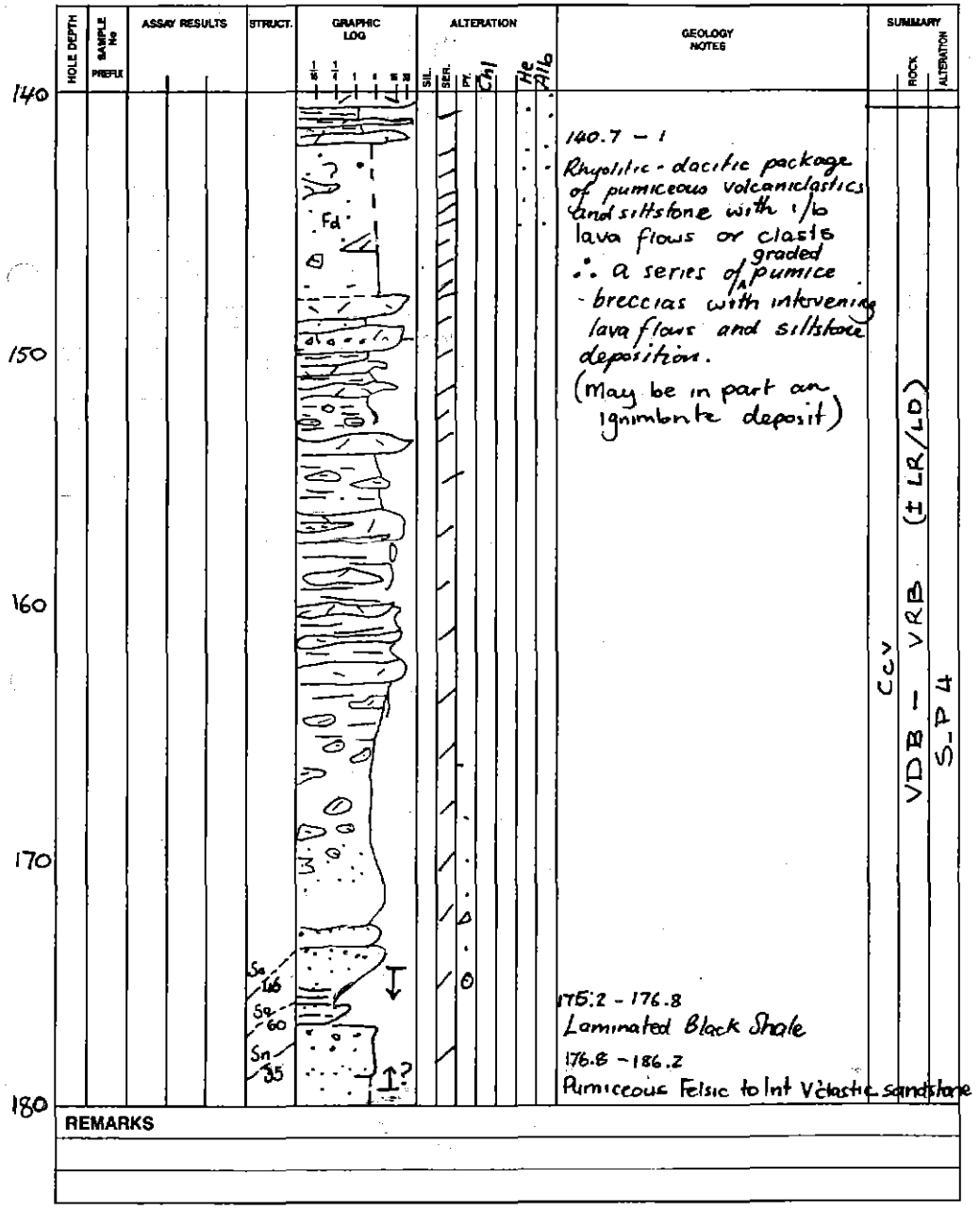
RGC EXPLORATION PTY LTD

DRILL HOLE No BLD 89-1

SHEET 3 OF 5

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core
Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



RGC EXPLORATION PTY LTD

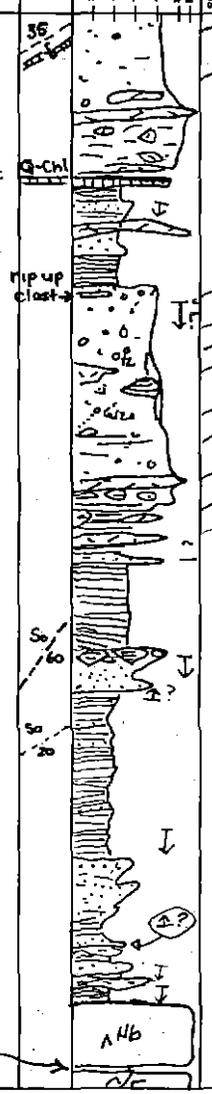
DRILL HOLE No BLD 89-1

SHEET 4 OF 5

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. Chl Cb) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)



186.2 - 190.0 m
Package of laminated black siltstone/shale with thin interbeds of f.g. sandstone showing a local grading down hole. Plus rhyolitic dacitic clasts up to 15cm

190.10 - 198.0
Dacitic lava/volcaniclastic containing rhyolite clasts and possible shale rip ups

pepeitic
198 - 216.8 :
Black shaley siltstone with l/beds of coarse bx containing rhyolite clasts.

Local variations in facing and bedding to core axis angle.

Summary: Ccv VRB - VDB; Ccv; Ccv SILT / VDF-M; Ca LAFH

REMARKS

RGC EXPLORATION PTY LTD

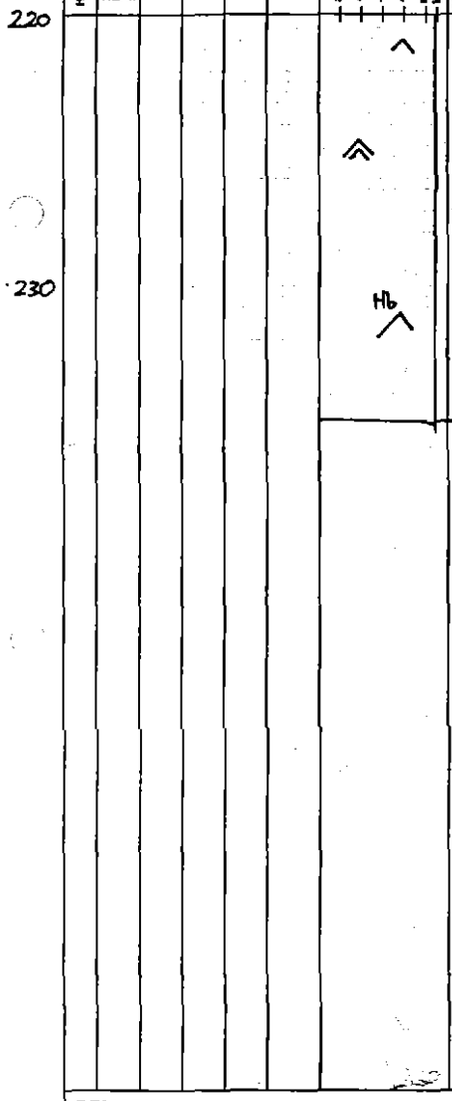
DRILL HOLE No BLD 89-1

SHEET 5 OF 5

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :
PROSPECT : Anthony
DATE :
LOGGED BY : R. Hill

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY.) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)



EOH = 235m

Summary: Ca LAFH

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LHD 1

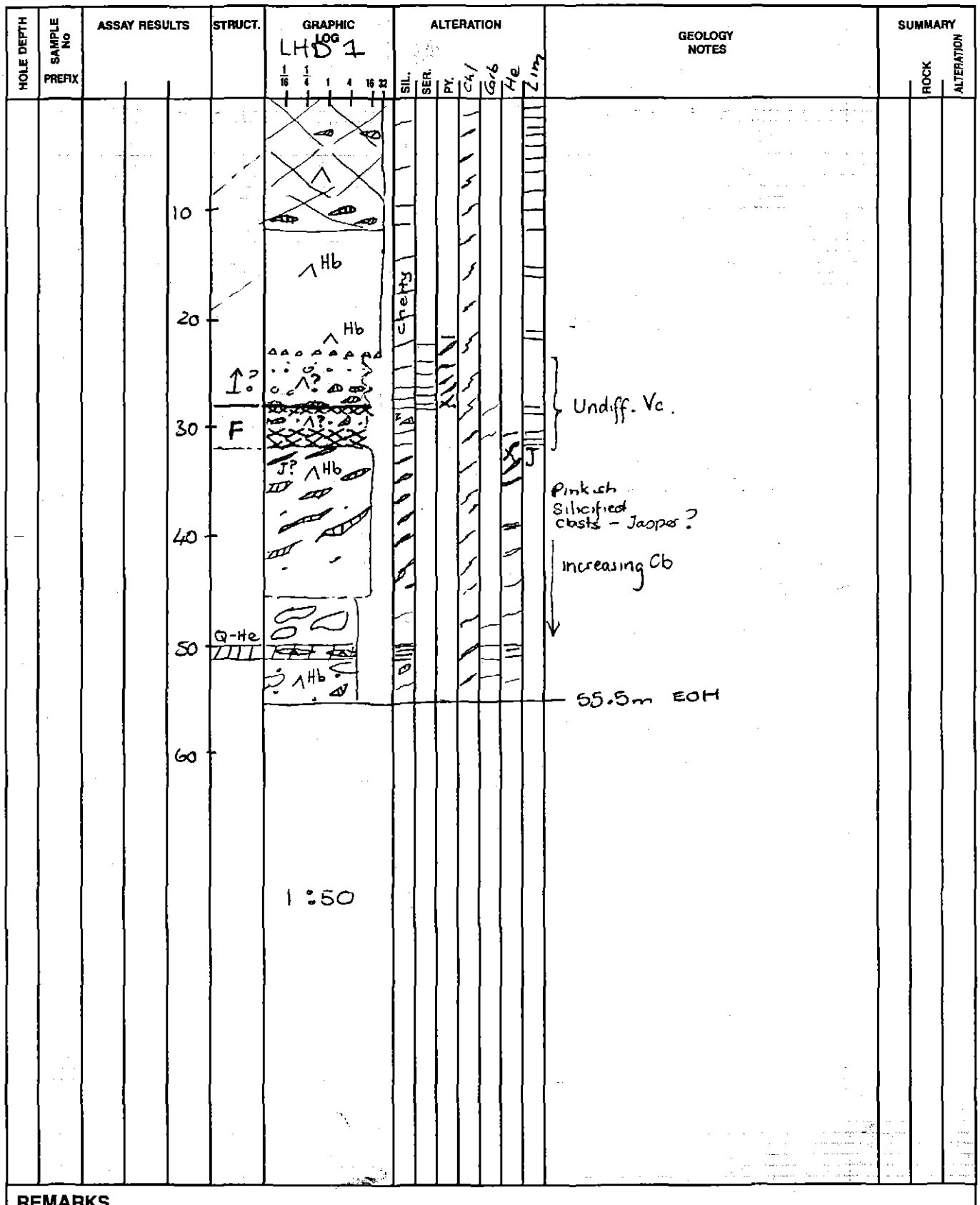
SHEET 1 **OF** 1

Summary

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	: R. Hill 1999

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION



REMARKS

607086

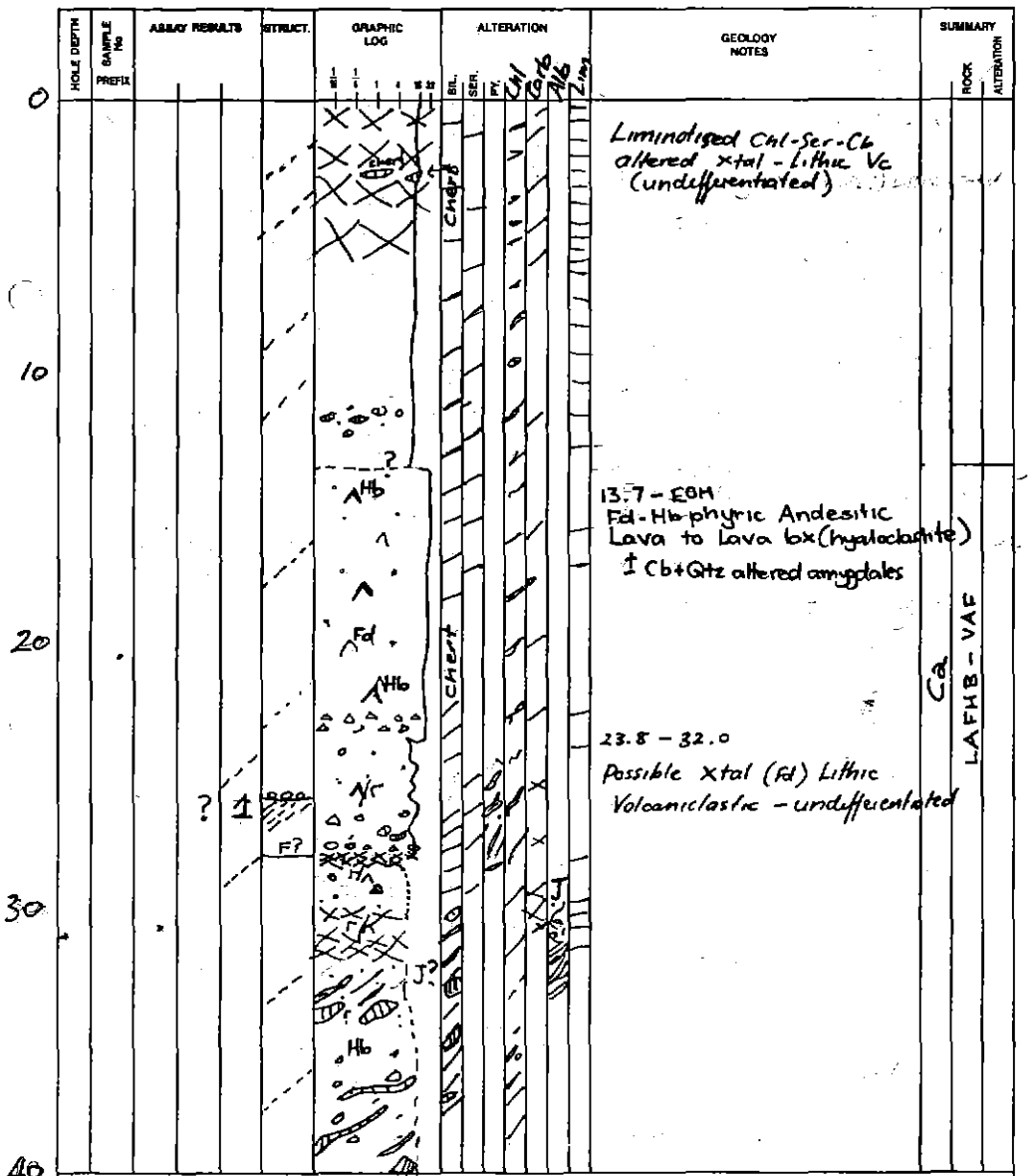
RGC EXPLORATION PTY LTD

DRILL HOLE No LHD 1

SHEET 1 OF 2

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



Liminolised Chl-Ser-Cb altered xtal - Lithic Vc (undifferentiated)

13.7 - EOH
Fd-Hb-phyric Andesitic Lava to Lava bx (hyaloclastite)
± Cb+Qtz altered amygdales

23.8 - 32.0
Possible xtal (Fd) Lithic Volcaniclastic - undifferentiated

REMARKS

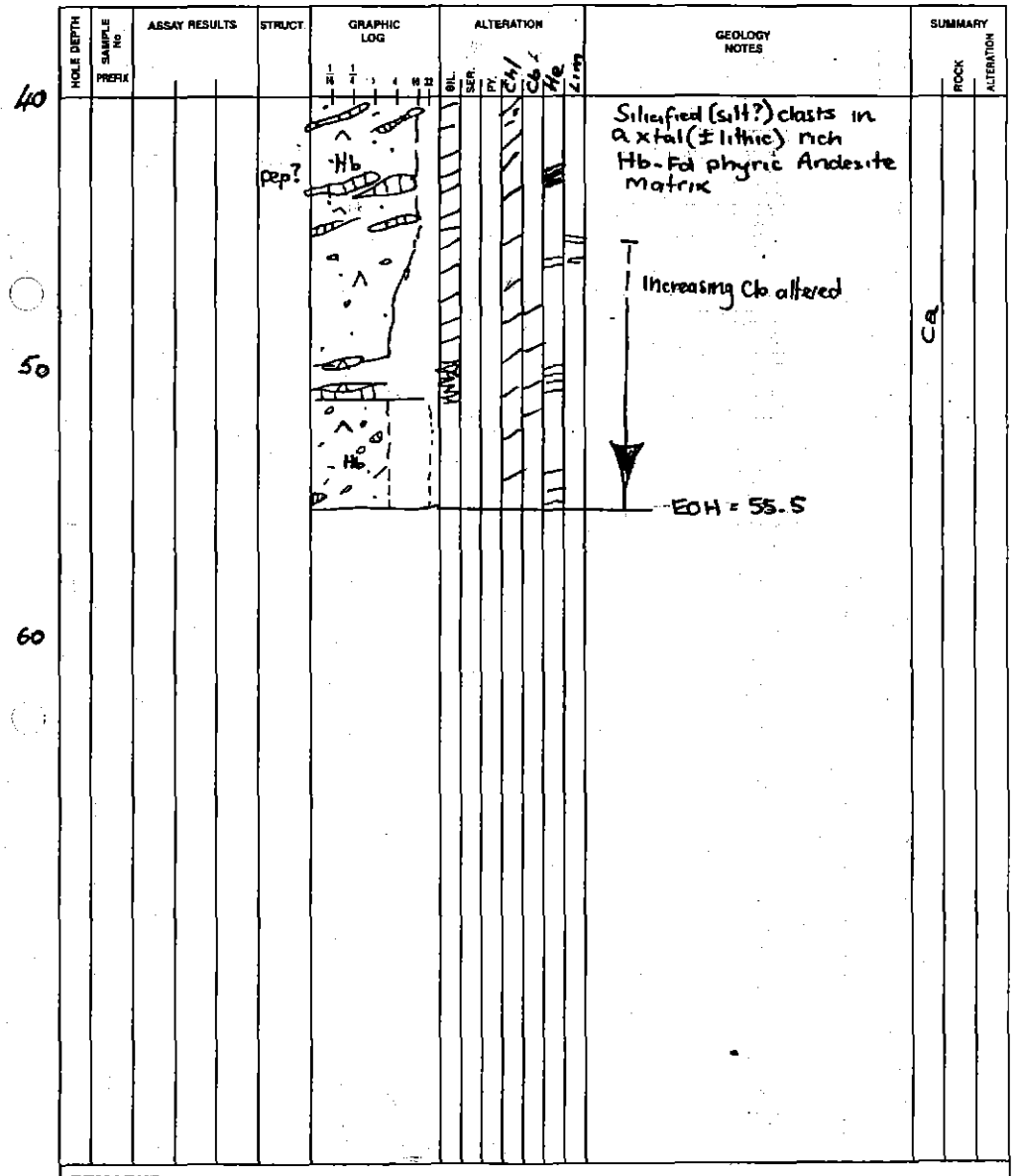
RGC EXPLORATION PTY LTD

DRILL HOLE No LHD 1

SHEET 2 OF 2

PROJECT :	
PROSPECT :	Anthony
DATE :	
LOGGED BY :	R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



Silicified (silt?) clasts in a xtal (± lithic) rich Hb-Fd phyric Andesite Matrix

Increasing Cb altered

EOH = 55.5

REMARKS

RGC EXPLORATION PTY LTD

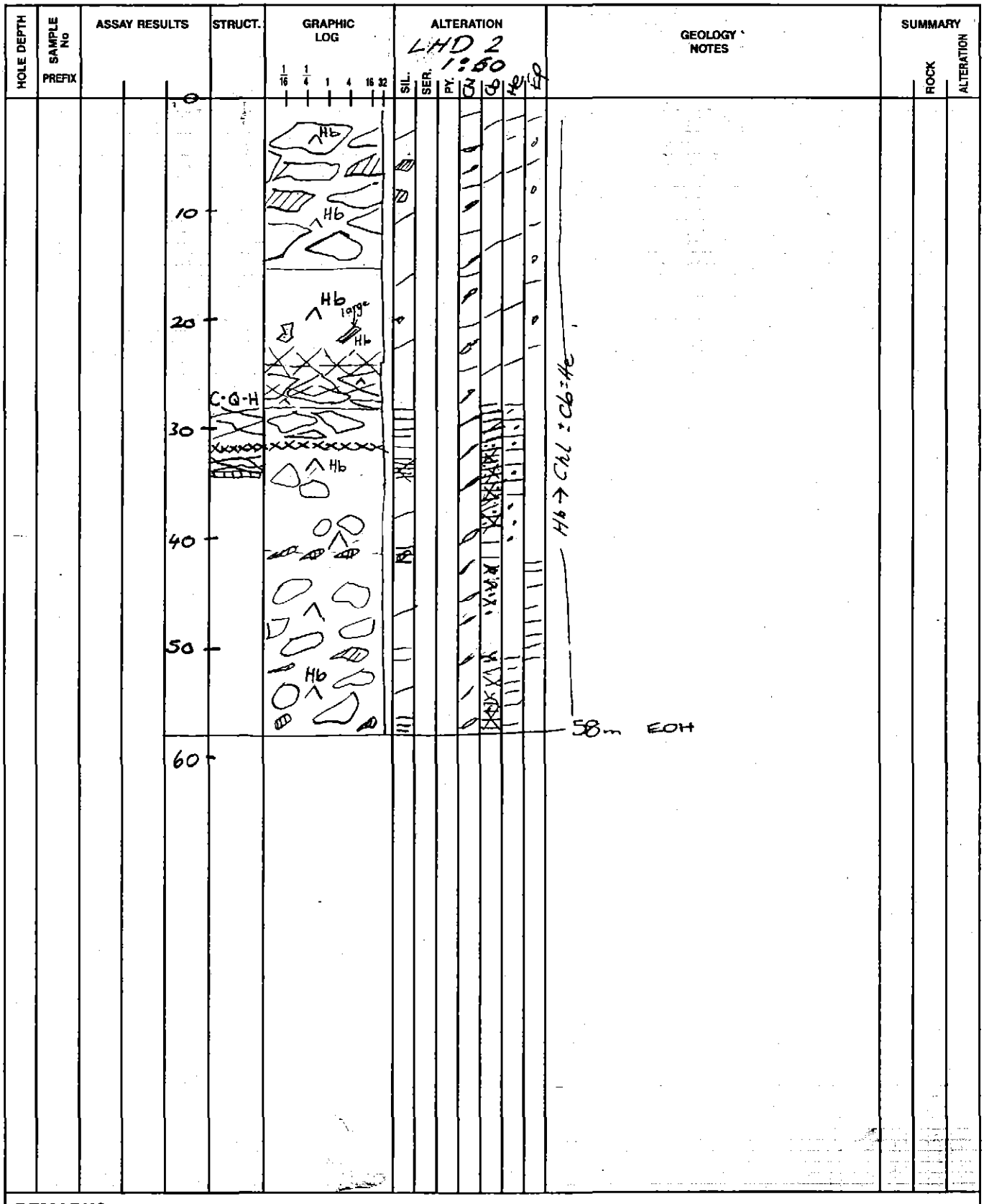
DRILL HOLE No LHD 2

SHEET 1 OF 1

Summary

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	: R. Hill 1999

Bedding
Cleavage
Foliation
Fault, Shear
Breccia
Broken core
Disseminated
Massive
Pervasive
Narrow vein
* Visible gold



REMARKS

607088

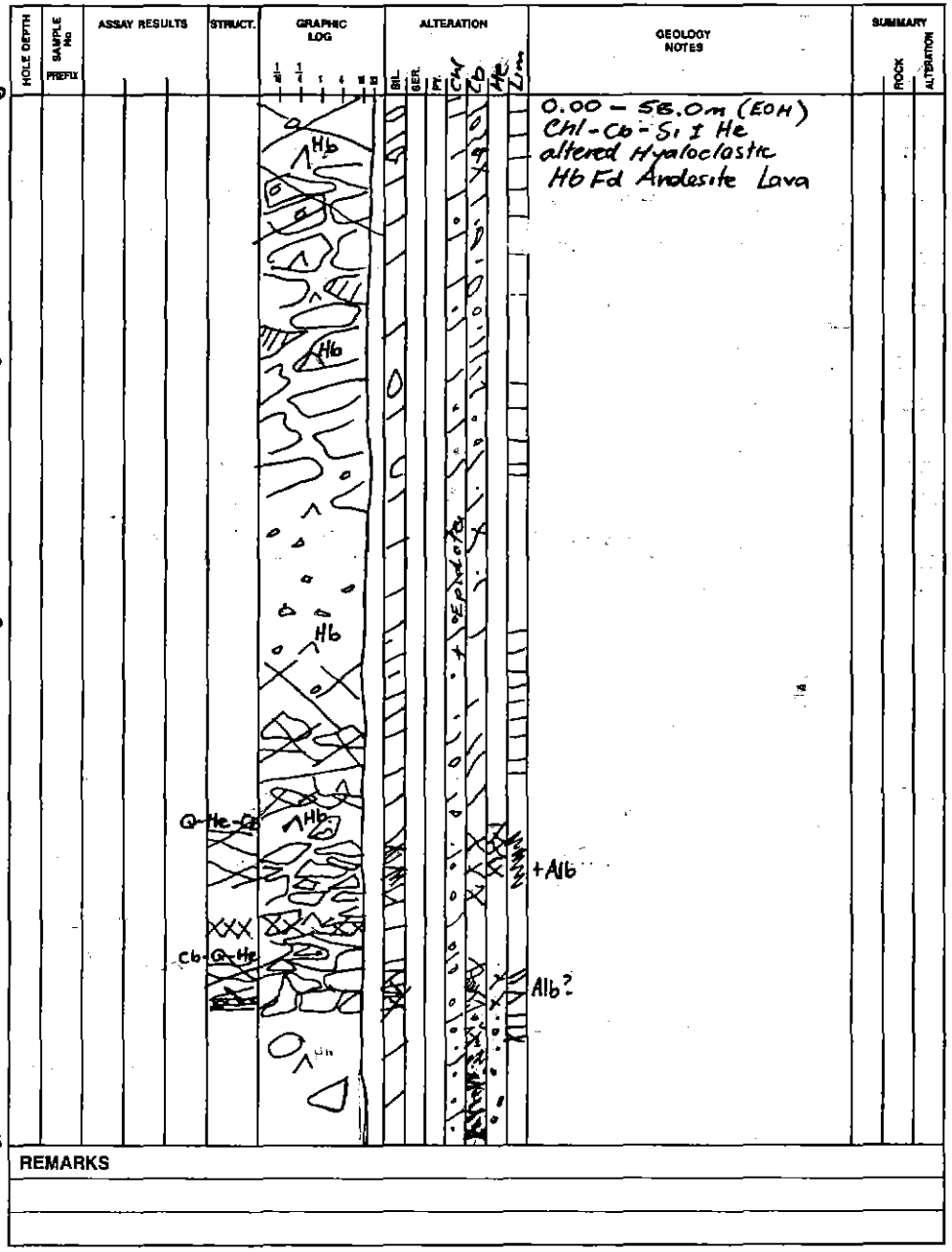
RGC EXPLORATION PTY LTD

DRILL HOLE No LHD2

SHEET 1 OF 2

PROJECT	:
PROSPECT	: Anthony
DATE	:
LOGGED BY	: R. Hill

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



REMARKS

680209

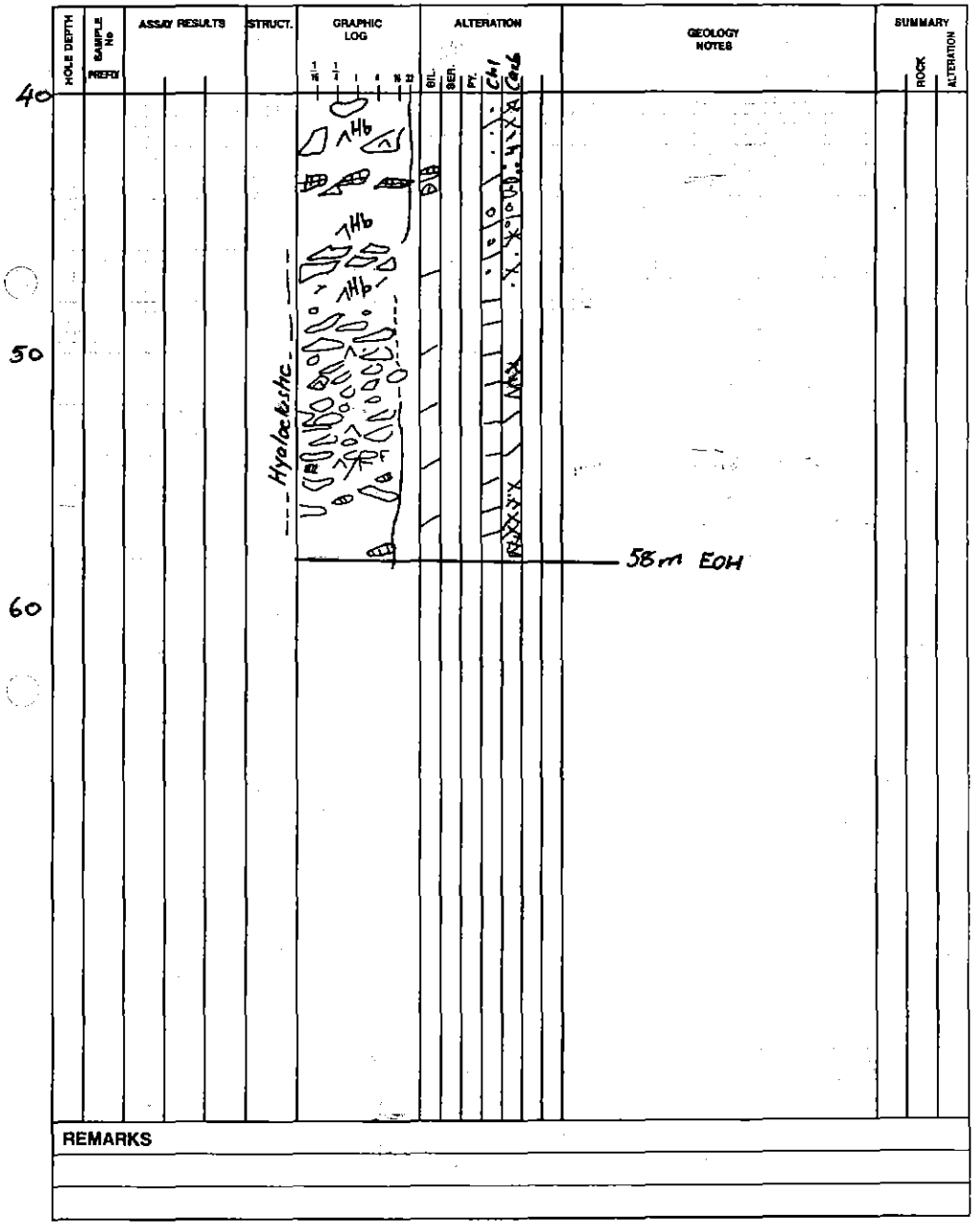
RGC EXPLORATION PTY LTD

DRILL HOLE No LHD2

SHEET 2 OF 2

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:

Bedding · Cleavage · Foliation · Fault, Shear · Breccia · Broken core · Disseminated · Massive · Pervasive · Narrow vein · * Visible gold



REMARKS

RGC EXPLORATION PTY LTD

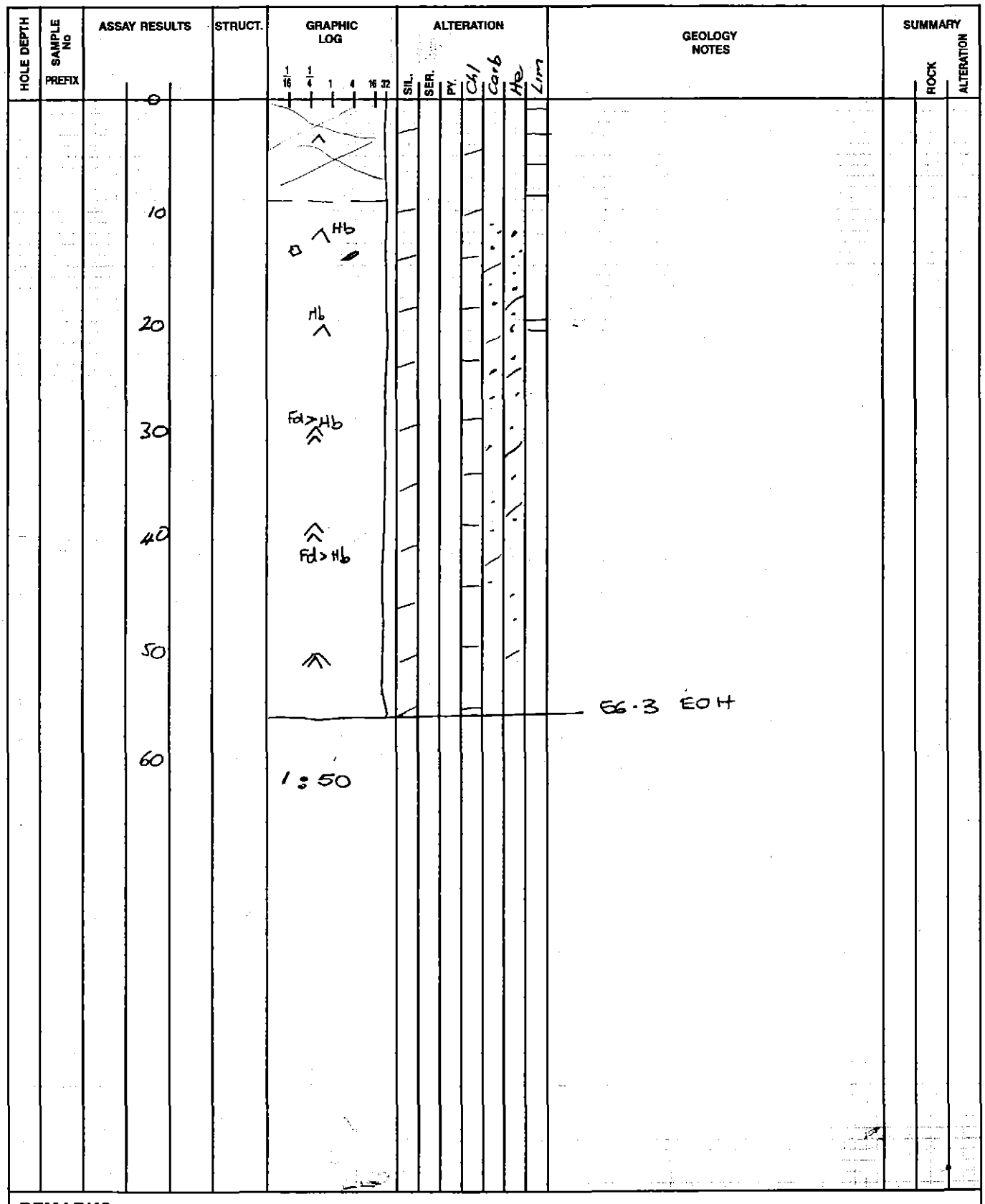
DRILL HOLE No LHD3

SHEET 1 OF 1

Summary

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	: R Hill 1999

- Bedding
- Cleavage
- Foliation
- Fault, Shear
- Breccia
- Broken core
- Disseminated
- Massive
- Pervasive
- Narrow vein
- * Visible gold



REMARKS

607090

RGC EXPLORATION PTY LTD

DRILL HOLE No LHD 3

SHEET 1 OF 2

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Carb Hg Lim)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
0								
10				Lithic clasts?				
20							Ca - Cax	LAF - LAFH
30								
40								

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LHD 3

SHEET 2 OF 2

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT	:
PROSPECT	:
DATE	:
LOGGED BY	:

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION (SIL. SER. PY. Chl Carb Hg)	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
40								
50								
60						56.3m = EOH		

REMARKS

607092

APPENDIX 3

Rock Chip and Drill Core Assays

ANTHONY PROJECT ASSAY SAMPLE DESCRIPTIONS

A. OUTCROP SAMPLES

Sample No.	Description	Litholgy Code	Northing	Easting
173-177	gn gy fg-mg Chl+Ser altered Fd phyric dacitic pumice bx	Ccv	See data shed	
178	muscovite	?	5353600	379880
179	dk gn Fd (Qtz) phyric lava	CcvL	5353900	378800
180	Chl-Ser-Si-Py altered Volcaniclastic?	Ccv?	5353600	379900
181	dk gn fg Fd (Qtz) phyric rock	Ccv-Ccvl	5354200	79380
182	gy bk fd phyric Dacitic lava (bx)	Ccvl	5353640	379250
183	cg Volcanogenic breccia containing ashy silt clasts, pumice + Fd xtals in a matrix of grey black dacitic lava (ignimbrite?) or pumice bx	Ccv	5353640	379251
184	As above but fine to medium grained	Ccv	5353640	379252
185	Grey ashy siltstone	Cya	5354500	379120
186	grey cg Fd phyric dacitic lava	Ccl	5354500	379122
187	Chl-Ser altered Fd phyric dacitic Lava	Ccl	5354535	379150
188	silver yellow Sericite+(Si)+Pyrite schist	Ccl	5354570	379185
189	gn gy moderately Chl-Ser-Py altered Fd Phyric rock (Vc or lava?)	?	5354600	379720
190	gn gy Ser-Chl-Py altered Fd phyric lava	Ccl/Ca?	5354640	379265
191	gy Ser-Chl-Py-Si altered Fd phyric lava	Ca	5354660	379300
192	gn gy Chl+Ser+Py altered Fd phyric dacitic lava	Ca	5354670	379330
193	dk gn Chl+Ser+Py altered Fd (Hb) andesite	Ca		
194	Chl+Ser+Py altered Fd Hb Andesite	Ca	5354690	379370
195	Relatively unaltered cg Hb Fd Andesite	Ca	5354790	379520
196	dk gn Chl+Si+Py (cubes cg) altered Fd (+Qtz) phyric rock (Vc?)	Ca	5354700	381170
263107	Pale khaki brown Cb-Si altered amygdaloidal lava	Ccl?	535850	380620
263108	As above but fg, less amygdaloidal and finer Hb phenos	Ca?	535605	380630
263109	mg Fd phyric lava	Ca	5354800	380620

60709

DataSet	Samp_Id	Project_Code	Samp_Type	Reg_North	Reg_East	AG_A	CU_A	PB_A	ZN_A	P_X	TI_X	V_X	ZR_X
TASNEW	255173	ANTHONY	ROCKCHIP	5352086	380422					690	2770	78	195
TASNEW	255174	ANTHONY	ROCKCHIP	5352083	380331					695	2650	53	217
TASNEW	255175	ANTHONY	ROCKCHIP	5352048	380350					655	2760	46	234
TASNEW	255176	ANTHONY	ROCKCHIP	5352021	380406					620	3020	79	202
TASNEW	255177	ANTHONY	ROCKCHIP	5351944	380363								
TASNEW	255178	ANTHONY	ROCKCHIP	5353600	379880								
TASNEW	255179	ANTHONY	ROCKCHIP	5353900	378800					560	2370	55	190
TASNEW	255180	ANTHONY	ROCKCHIP	5353600	379900					400	2310	176	134
TASNEW	255181	ANTHONY	ROCKCHIP	5354200	379380					530	2860	91	216
TASNEW	255182	ANTHONY	ROCKCHIP	5353640	379250	-1	7	-3	60	188	2040	18	301
TASNEW	255183	ANTHONY	ROCKCHIP	5353640	379250	-1	2	-3	80	125	1970	13	303
TASNEW	255184	ANTHONY	ROCKCHIP	5353640	379250	-1	3	-3	82	134	1680	13	280
TASNEW	255185	ANTHONY	ROCKCHIP	5354500	379120	-1	4	13	15	69	1860	40	141
TASNEW	255186	ANTHONY	ROCKCHIP	5354505	379122	-1	8	-3	31	162	1880	10	287
TASNEW	255187	ANTHONY	ROCKCHIP	5354535	379150	-1	17	-3	57	283	2890	92	235
TASNEW	255188	ANTHONY	ROCKCHIP	5354570	379185	-1	120	63	24	317	3580	271	160
TASNEW	255189	ANTHONY	ROCKCHIP	5354600	379720	-1	24	40	504	655	3050	252	149
TASNEW	255190	ANTHONY	ROCKCHIP	5354640	379265	-1	42	6	706	685	3060	261	120
TASNEW	255191	ANTHONY	ROCKCHIP	5354660	379300	-1	46	49	190	830	3380	261	195
TASNEW	255192	ANTHONY	ROCKCHIP	5354670	379330	-1	70	116	209	1060	3960	318	222
TASNEW	255193	ANTHONY	ROCKCHIP	5354680	379350	-1	9	11	223	935	2900	231	134
TASNEW	255194	ANTHONY	ROCKCHIP	5354690	379370	-1	10	17	234	935	3380	242	158
TASNEW	255195	ANTHONY	ROCKCHIP	5354790	379520	-1	41	-3	74	705	3120	244	137
TASNEW	255196	ANTHONY	ROCKCHIP	5354700	381170	-1	9	-3	58	510	2040	176	107
TASNEW	263107	ANTHONY	ROCKCHIP	5355860	380620	-1	24	5	85	525	3810	225	151
TASNEW	263108	ANTHONY	ROCKCHIP	5356015	380630	-1	60	-3	59	1010	3190	263	154
TASNEW	263109	ANTHONY	ROCKCHIP	5354800	380620	-1	33	83	70	1250	4290	317	251
TASNEW	37791	ANTHONY	ROCKCHIP	5352730	380650	24	65000	35	402				
TASNEW	37792	ANTHONY	ROCKCHIP	5352730	380650	33	45800	64	349				
TASNEW	37794	ANTHONY	ROCKCHIP	5352730	380650								
					Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
					Detection	2	4	5	4	30	50	5	5
					Method	GA101	GA101	GA101	GA101	X401	GX401	GX401	GX401
					Laboratory	Analabs	Analabs	Analabs	Analabs	Analabs	Analabs	Analabs	Analabs

460709

Sample_ID	AG_N	AS_N	AU_N	BA_N	BR_N	Ca_N	CE_N	SR_N	CS_N	CO_N	EU_N	FE_N	HF_N
255173	-5	3	-5	930	-2	1.7	96	80	7	9	1.5	3.65	6
255174	-5	2	-5	1500	-2	-1	102	41	5	12	1.8	4.3	6.6
255175	-5	2	-5	830	2	1.5	95	85	6	4	1.7	3.37	7.5
255176	-5	1	-5	580	2	-1	91	112	7	8	1.7	3.17	6.6
255177													
255178													
255179	-5	6	-5	960	-2	2.2	80	69	7	4	1.3	2.88	6.4
255180	-5	28	-5	600	2	-1	116	234	3	13	1.5	3.15	4
255181	-5	4	-5	1470	-2	2.1	107	67	6	8	2.1	3.45	6.6
255182	-5	3	-5	1300	-2	-1	123	19	4	1	1.7	2.77	9.1
255183	-5	2	-5	890	-2	-1	114	39	4	3	1.8	2.61	9
255184	-5	3	-5	1060	-2	-1	111	-5	4	3	1.6	2.79	8.7
255185	-5	2	-5	1430	-2	-1	119	25	7	-1	0.9	1.01	4.8
255186	-5	3	-5	1020	-2	-1	107	13	10	2	1.2	2	8.6
255187	-5	1	-5	1110	2	-1	93	39	7	6	1	2.3	6.9
255188	-5	137	-5	1650	2	-1	117	317	5	3	1.4	6.76	4.5
255189	-5	6	10	1000	2	-1	146	136	2	4	1.8	5.06	3.9
255190	-5	7	-5	640	-2	-1	114	85	4	14	1.4	5.55	3.8
255191	-5	48	10	1270	2	-1	178	143	6	14	2.4	3.47	5.3
255192	-5	19	40	1540	4	-1	111	195	5	-1	1.8	3.03	5.9
255193	-5	6	-5	1240	2	-1	104	146	4	7	1.3	5.58	3.8
255194	-5	5	-5	2080	3	-1	81	184	5	6	1.2	4.74	3.9
255195	-5	3	-5	1330	-2	-1	113	55	6	16	1.8	4.98	3.7
255196	-5	-1	-5	820	-2	9.6	98	62	3	28	1.5	5.6	3.4
263107	-5	4	-5	2870	3	-1	97	35	2	29	1.4	4.89	4.4
263108	-5	10	-5	1260	4	-1	128	40	1	23	1.4	2.62	4
263109	-5	13	-5	2680	3	-1	186	134	12	12	2.5	4.01	7.6
37791	-5	21600	812	9410	-50		31.6	18.9	-1	26.9	-0.5	12.7	0.97
37792	11	16600	522	2160	-50		17.4	26.8	-1	45.8	-0.5	22	0.5
37794	11.3	328	316	515	-2		45.9	-5	-1	11.7	-0.5	4.75	2.31
Units	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm
Detection	5	1	5	100	2	1	2	5	1	1	0.5	0.05	0.5
Method	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801
Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

609095

Samp_id	P_N	K_N	LA_N	LU_N	MO_N	NA_N	NB_N	SB_N	SC_N	SE_N	SM_N	TA_N	TB_N
255173	-20	2.4	47	0.4	-5	1.73	115	2	13.9	-5	7.3	-1	-5
255174	-20	3.7	47.8	0.6	-5	1.68	140	4.4	14	-5	8.3	-1	-5
255175	-20	2.4	46.9	0.5	-5	1.56	110	3.1	13.6	-5	7.8	-1	-5
255176	-20	2.1	55	0.5	-5	1.5	130	0.6	14.2	-5	7.4	-1	-5
255177													
255178													
255179	-20	3	37	0.4	-5	1.01	150	0.6	12.2	-5	6.3	-1	-5
255180	-20	1.8	67.5	0.2	-5	0.85	70	1	22.6	-5	6.9	-1	-5
255181	-20	2.1	65.7	0.5	-5	2.48	105	0.5	15	-5	9	-1	-5
255182	-20	2.2	56.1	0.6	-5	0.46	135	1.1	12.7	-5	10.1	2	-5
255183	-20	2.6	52.1	0.6	-5	0.27	120	0.4	13	-5	9.6	-1	-5
255184	-20	2.6	51.1	0.6	-5	0.22	115	0.5	11.7	-5	9.2	1	-5
255185	-20	3.2	59.8	0.4	-5	0.03	195	1.1	5.5	-5	6.6	2	-5
255186	-20	2.8	50.3	0.6	-5	0.27	160	0.7	9.8	-5	8.2	1	-5
255187	-20	2.9	45.7	0.4	-5	0.18	130	1	14.3	-5	6.4	1	-5
255188	-20	2.7	61.2	0.2	-5	0.34	100	5	37.3	-5	6.9	2	-5
255189	-20	1.2	79	0.3	-5	0.35	50	0.8	29.4	-5	8.5	1	-5
255190	-20	1.8	61.1	0.3	-5	0.34	52	1	28.4	-5	6.9	-1	-5
255191	-20	2.9	97.2	0.3	-5	0.44	86	9.3	31.8	-5	10.7	-1	-5
255192	-20	3	56.8	0.3	-5	0.41	78	4.1	38	-5	7	1	-5
255193	-20	2	53	0.3	-5	0.59	74	1.4	33.1	-5	6.7	1	-5
255194	-20	2.1	44.2	0.3	-5	1.28	44	1.7	34.7	-5	5.5	1	-5
255195	-20	2.1	57.5	0.3	-5	1.04	105	1.2	30.1	-5	7.2	1	-5
255196	-20	1.6	54.5	0.3	-5	0.24	86	0.6	21.3	-5	5.8	-1	-5
263107	-20	1.1	49.3	0.3	-5	4.16	36	2.1	30.2	-5	5.8	-1	-20
263108	-20	-0.2	72	0.2	-5	6.13	-20	0.5	28.9	-5	7.4	-1	-20
263109	-20	4.4	98.8	0.4	-5	0.3	245	0.6	49.5	-5	11.3	-1	-20
37791	-20	-1	24.4	-0.2	-20	0.085	-20	1500	4.15	69	1.02	-1	80.4
37792	-20	-1	11.5	-0.2	-20	0.091	-20	1560	2.45	64	0.61	-1	46.2
37794	-20	-0.2	30.4	-0.2	-5	0.028	-20	68.8	2.82	21.7	1.07	-1	-5
Units	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection	20	0.2	0.5	0.2	5	0.01	20	0.2	0.1	5	0.2	1	5
Method	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801
Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

607096

Samp_id	TH_N	U_N	W_N	YB_N	ZN_N	ZR_N
255173	18.4	4	-2	2.9	170	-500
255174	18.4	4	-2	3.8	150	-500
255175	19.2	4	-2	3.3	110	-500
255176	18	4	2	3	120	-500
255177						
255178						
255179	15	4	-2	2.9	-100	-500
255180	26.2	5	-2	1.7	230	-500
255181	20.5	4	-2	3.2	130	-500
255182	20.9	4	-2	4.3	-100	500
255183	19	3	-2	4.3	-100	-500
255184	20.1	4	-2	4	-100	-500
255185	35.4	8	-2	2.7	-100	-500
255186	21.9	5	-2	3.9	-100	-500
255187	22.5	4	-2	2.7	-100	-500
255188	23.1	4	-2	1.5	-100	-500
255189	28.2	4	-2	2.2	560	-500
255190	22.3	6	-2	2.1	720	-500
255191	30.9	5	-2	1.9	250	-500
255192	35.3	5	-2	1.8	290	-500
255193	24.2	5	-2	2	270	-500
255194	23.3	6	-2	1.9	300	-500
255195	23.7	5	-2	2.2	100	-500
255196	21	4	-2	1.7	-100	-500
263107	25.8	5	21	1.9	150	-500
263108	26.4	6	28	1.7	100	-500
263109	47.6	10	5	3.1	110	650
37791	10.6	-6	-6	-0.5	422	-500
37792	8.33	-6	-6	-0.5	289	-500
37794	11.2	-2	-2	-0.5	-100	-500
Units	ppm	ppm	ppm	ppm	ppm	ppm
Detection	0.5	2	2	0.2	100	500
Method	GN801	GN801	GN801	GN801	GN801	GN801
Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

160209

ASSAY SAMPLE DESCRIPTIONS

B. HALF CORE SAMPLES

Sample No.	Description	Litholgy Code	Location
255197	gn-gy Cb-Si-Chl-Ser altered amygdaloidal dacitic lava	Ccvl	L.HILL1 (207.2-207.4m)
255198	gn-gy Cb-Si-Chl-Ser altered amygdaloidal dacitic lava	Ccvl	L.HILL1 (117.0m-117.15)
255199	gn gy fg Chl-Ser altered dacitic pumice bx	Ccv	BLD 89-1 (63.2-63.4m)
255200	gn gy Chl-Ser altered dacitic pumice bx containing pink rhyolitic to dacitic lava clasts up to 5cm	Ccv	BLD 89-1 (92.4-92.55m)
263098	gn gy Chl-Ser altered dacitic pumice bx containing pink rhyolitic to dacitic lava clasts up to 5cm	Ccv	BLD 89-1 (108-108.2m)
263099	??		BL008 (536-536.1m)
263100	dk gn Fd Phyric Andesitic lava	Ca	BL008(530-530.2}
263101	Fd phyric andesitic lava	Ca	BL008 (475.9-476)
263102	dk gn amygdaloidal suite III andesitic basalt	Cal?	BL004 (135.5-145.7m)
263103	dk gn amygdaloidal suite III andesitic basalt	Cal?	BL005 (96-96.15)
263104	Carbonate rich basalt	Cal?	Tyn 3 (718-718.25 ft)
263105	cg rhyolitic - dacitic pumice bx	Ccv	Tyn 2 (759.0-759.2 ft)
263106	Fd Q phyric rhyolitic - dacitic lava	Ccvl?	Tyn 2 (875-875.25 ft)

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DataSet	Sample No	Sample Type	Hole Id	Depth From	Depth To	AG_A	AG_N	AS_N	AU_N	BA_N	BR_N	CA_N
TASNEW	1080082	HALFCORE	BL004	197.40	197.60	-1	-5	-1	-5	1690	-1	6.1
TASNEW	1080083	HALFCORE	BL006	350.70	350.90	-1	-5	53	20	1010	1	4.4
TASNEW	255168	HALFCORE	BL005	240.00	240.20	-1	-5	9	-5	1150	-1	3.5
TASNEW	255169	HALFCORE	BL005	275.65	275.90	-1	-5	7	-5	1170	-1	2.9
TASNEW	255170	HALFCORE	BL005	341.90	342.00	-1	-5	23	-5	996	-1	3.9
TASNEW	255171	HALFCORE	BLD89-1	234.00	234.10	-1	-5	3	-5	1590	-1	5.3
TASNEW	255172	HALFCORE	LHD2	15.60	15.80	-1	-5	2	-5	837	1	7.6
TASNEW	255197	HALFCORE	L.HILL1	207.20	207.40	-1	-5	1	-5	1510	-2	2.8
TASNEW	255198	HALFCORE	L.HILL1	117.00	117.15	-1	-5	6	-5	2580	-2	1.8
TASNEW	255199	HALFCORE	BLD89-1	63.20	63.40	-1	-5	1	-5	1270	-2	-1
TASNEW	255200	HALFCORE	BLD89-1	117.10	117.30	-1	-5	1	-5	1220	-2	3.6
TASNEW	263098	HALFCORE	BLD89-1	108.00	108.25	-1	-5	-1	-5	1140	-2	3.9
TASNEW	263099	HALFCORE	BL008	536.00	536.10	-1	-5	12	-5	1390	-2	-1
TASNEW	263100	HALFCORE	BL008	530.00	530.20	-1	-5	11	-5	180	1	2.3
TASNEW	263101	HALFCORE	BL008	475.90	476.10	-1	-5	16	-5	900	1	1.9
TASNEW	263102	HALFCORE	BL004	135.50	135.70	-1	-5	30	-5	1200	-2	4.5
TASNEW	263103	HALFCORE	BL005	96.00	96.15	-1	-5	-1	-5	1550	-2	8.2
TASNEW	263104	HALFCORE	TYN003	718.00	718.25	-1	-5	35	-5	1240	-2	4.4
TASNEW	263105	HALFCORE	TYN002	759.00	759.20	-1	-5	3	-5	820	-2	1.4
TASNEW	263106	HALFCORE	TYN002	875.00	875.25	-1	-5	2	-5	730	-2	2.7

Units	ppm	ppm	ppm	ppm	ppm	ppm	%
Detection	2	5	1	5	100	2	1
Method	GA101	GN801	GN801	GN801	GN801	GN801	GN801
Laboratory	Analabs	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

660709

Sample No	CE_N	CO_N	CR_N	CS_N	CU_A	EU_N	FE_N	HF_N	IR_N	K_N	LA_N	LU_N	MO_N
1080082	220	37	625	-1	44	3.9	5.61	4.2	-20	0.5	112	0.3	-5
1080083	88	21	83	4	57	1.6	5.98	3	-20	2.3	47.4	0.2	-5
255168	159	19	151	8	20	2.3	4.28	4.5	-20	1.5	83.2	0.3	-5
255169	74	17	66	4	208	1.1	4.48	3.3	-20	1.7	39.1	0.3	-5
255170	122	16	106	4	28	2.1	4.13	3.6	-20	0.4	64.3	0.3	-5
255171	135	25	155	1	72	2.1	4.64	3.8	-20	1.3	72.8	0.2	-5
255172	129	30	102	2	12	1.8	5.18	4	-20	0.2	69.1	0.2	-5
255197	90	6	121	4	16	1.6	2.61	5.8	-20	3	45.3	0.4	5
255198	94	10	108	7	10	1.5	2.69	6.3	-20	4	48.1	0.5	-5
255199	118	9	49	5	26	2.6	3.85	6.6	-20	2	60.7	0.4	-5
255200	84	10	70	5	7	1.4	3.52	5.5	-20	2.3	42.7	0.4	-5
263098	87	8	42	5	18	1.3	3.29	5.7	-20	2	42.3	0.4	-5
263099	94	40	53	2	45	0.8	7.12	3.5	-20	-0.2	46.2	0.3	-5
263100	92	32	57	-1	4	0.9	5.43	3.2	-20	-0.2	49	0.3	-5
263101	164	25	143	4	20	2.3	5.87	4.3	-20	0.9	83.6	0.3	-5
263102	255	45	640	-1	61	3.8	5.95	4.3	-20	-0.2	134	0.3	-5
263103	222	39	568	1	66	3.7	5.3	4	-20	1.3	112	0.3	-5
263104	173	32	103	2	26	2.5	5.78	4.9	-20	1.6	90.8	0.3	-5
263105	113	7	14	5	13	1.8	2.46	7.9	-20	2.1	53	0.5	-5
263106	105	7	5	4	5	1.6	2.42	8.2	-20	1.5	49.9	0.5	-5
Units	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
Detection	2	1	5	1	4	0.5	0.05	0.5	20	0.2	0.5	0.2	5
Method	GN801	GN801	GN801	GN801	GA101	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801
Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Analabs	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

607100

Sample No	NA_N	P_X	PB_A	RB_N	SB_N	SC_N	SE_N	SM_N	TA_N	TE_N	TH_N	TI_X	U_N
1080082	2.38	2847	3	40	0.8	33.6	-5	16.2	-1	-5	25.7	2855	6
1080083	0.26	590	116	80	6.9	20.1	-5	6	-1	-5	17.2	2532	3
255168	2.76	1285	-3	65	4.5	28	-5	10.4	1	-5	25.5	2887	7
255169	3.39	716	27	40	1	23.3	-5	4.8	-1	-5	19.5	2715	5
255170	2.22	1064	159	45	4.5	21.1	-5	7.9	-1	-5	26.2	2041	7
255171	2.11	1250	-3	35	1	24.8	-5	8.6	-1	-5	24.1	2201	7
255172	1.72	777	-3	45	1.2	27.8	-5	8.2	-1	-5	22.7	3004	5
255197	0.67	428	6	115	0.9	12.8	-5	7	1	-20	17.6	2507	2
255198	0.75	487	4	115	1.1	13.1	-5	7.4	-1	-20	19.5	2591	5
255199	1.51	402	9	140	0.4	13.9	-5	9.1	-1	-20	19.4	2877	4
255200	1.01	361	-3	110	0.5	12.3	-5	6.8	-1	-20	16.6	2373	4
263098	1.55	365	17	110	0.6	12.4	-5	6.7	1	-20	16.8	2476	3
263099	4.74	590	-3	-20	1.3	27.7	-5	5.8	-1	-20	21.2	2770	5
263100	4.63	545	-3	-20	1.1	27.5	-5	6	-1	-20	18.9	2610	4
263101	1.47	1330	5	26	2	33.5	-5	11.2	-1	-20	30	3370	5
263102	2.47	2760	-3	-20	1.2	37.7	-5	18	-1	-20	28.3	2750	6
263103	1.32	2220	5	30	1.6	33.6	-5	15.9	-1	-20	26.6	2500	7
263104	3.2	1580	-3	44	1.2	33.1	-5	11.8	-1	-20	29.6	2720	7
263105	2.16	290	5	90	0.5	12.2	-5	9.5	-1	-20	19.7	1480	5
263106	2.21	230	4	86	0.3	8.8	-5	8.6	-1	-20	19.5	1720	4

Units	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection	0.01	30	5	20	0.2	0.1	5	0.2	1	5	0.5	50	2
Method	GN801	X401	GA101	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GX401	GN801
Laboratory	Becquerel	Analabs	Analabs	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Analabs	Becquerel

EOI2009

Sample NO	W_A	W_N	YB_N	ZN_A	ZN_N	ZR_A	ZR_N
1080082	218	-2	1.7	46	-100	161	-500
1080083	201	-2	1.5	456	404	99	-500
255168	240	-2	2	92	120	154	-500
255169	216	-2	1.7	151	163	118	-500
255170	162	-2	1.9	237	244	128	-500
255171	168	-2	1.7	35	-100	147	-500
255172	229	-2	1.7	65	-100	135	-500
255197	61	-2	2.8	78	-100	206	-500
255198	78	5	3.1	61	-100	222	-500
255199	91	-2	2.9	68	-100	238	-500
255200	70	-2	2.8	75	-100	196	-500
263098	70	-2	2.7	68	-100	198	-500
263099	209	68	2.1	185	270	118	-500
263100	237	91	2	161	190	110	-500
263101	279	8	2.2	354	440	153	-500
263102	278	9	2.3	89	120	171	-500
263103	204	54	1.8	65	110	156	-500
263104	226	5	2.3	130	170	177	-500
263105	16	55	3.7	41	-100	265	-500
263106	21	27	3.5	40	-100	271	-500
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection	5	2	0.2	4	100	5	500
Method	GX401	GN801	GN801	GA101	GN801	GX401	GN801
Laboratory	Analabs	Becquerel	Becquerel	Analabs	Becquerel	Analabs	Becquerel

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APPENDIX 4

Anthony Geophysics Data Compilation

ANTHONY GEOPHYSICS DATA COMPILATION

Seven colour and two grey scale images have been produced to illustrate some of the regional geophysical characteristics in the Anthony-Henty area.

The major geophysical characteristics are discussed in detail in the main part of this report. References to the source of the data are also given.

List of Geophysical Compilation Images:-

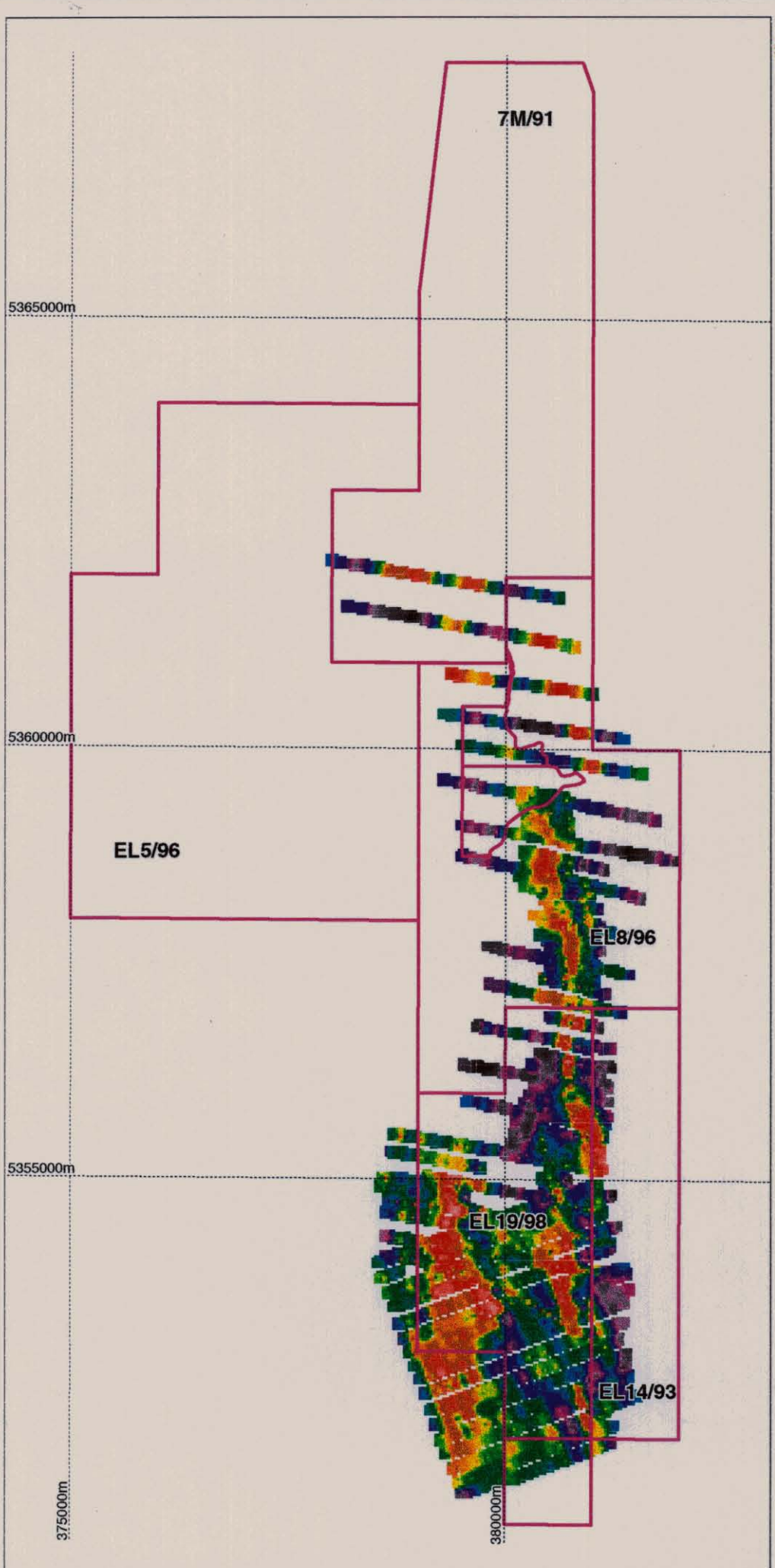
- Electrical IP (Chargeability)
- Electrical IP (Resistivity)
- Total Magnetic Intensity (TMI)
- 1st Vertical Derivative (Colour)
- 1st Vertical Derivative (Grey Scale)
- 2nd Vertical Derivative (Grey Scale)
- Reduced to Pole
- Reduced to Pole 2
- Reduced to Pole (Colour) with 1st Vertical Derivative shading

Note:- Reduced to Pole 2 is a version of Reduced to Pole with slightly different reprocessing to enhance definition in the blue-green areas of the image.

607105

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania
Electrical IP Chargeability Image



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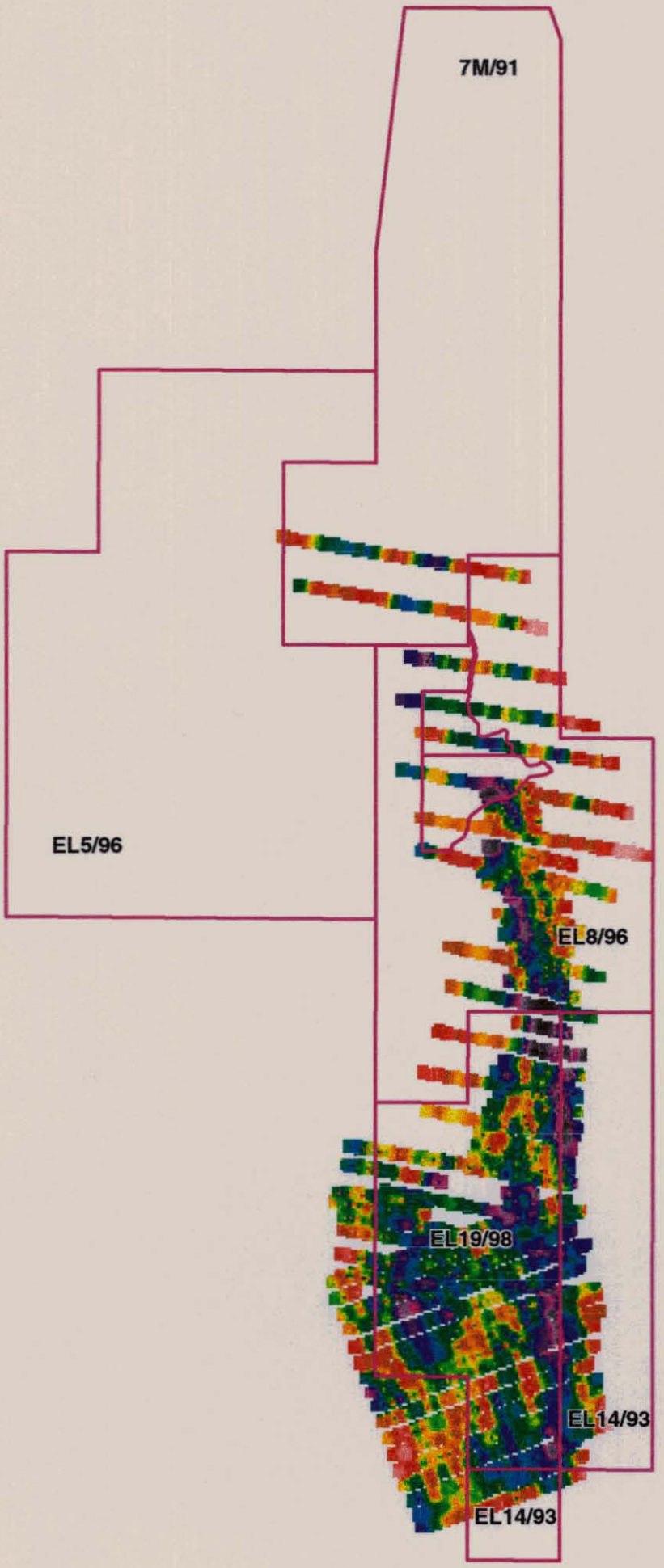
data\mapinfo\workspaces\
WesternTas_Geophys_IPcharge.wor

607106

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gelibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania
Electrical IP Resistivity Image



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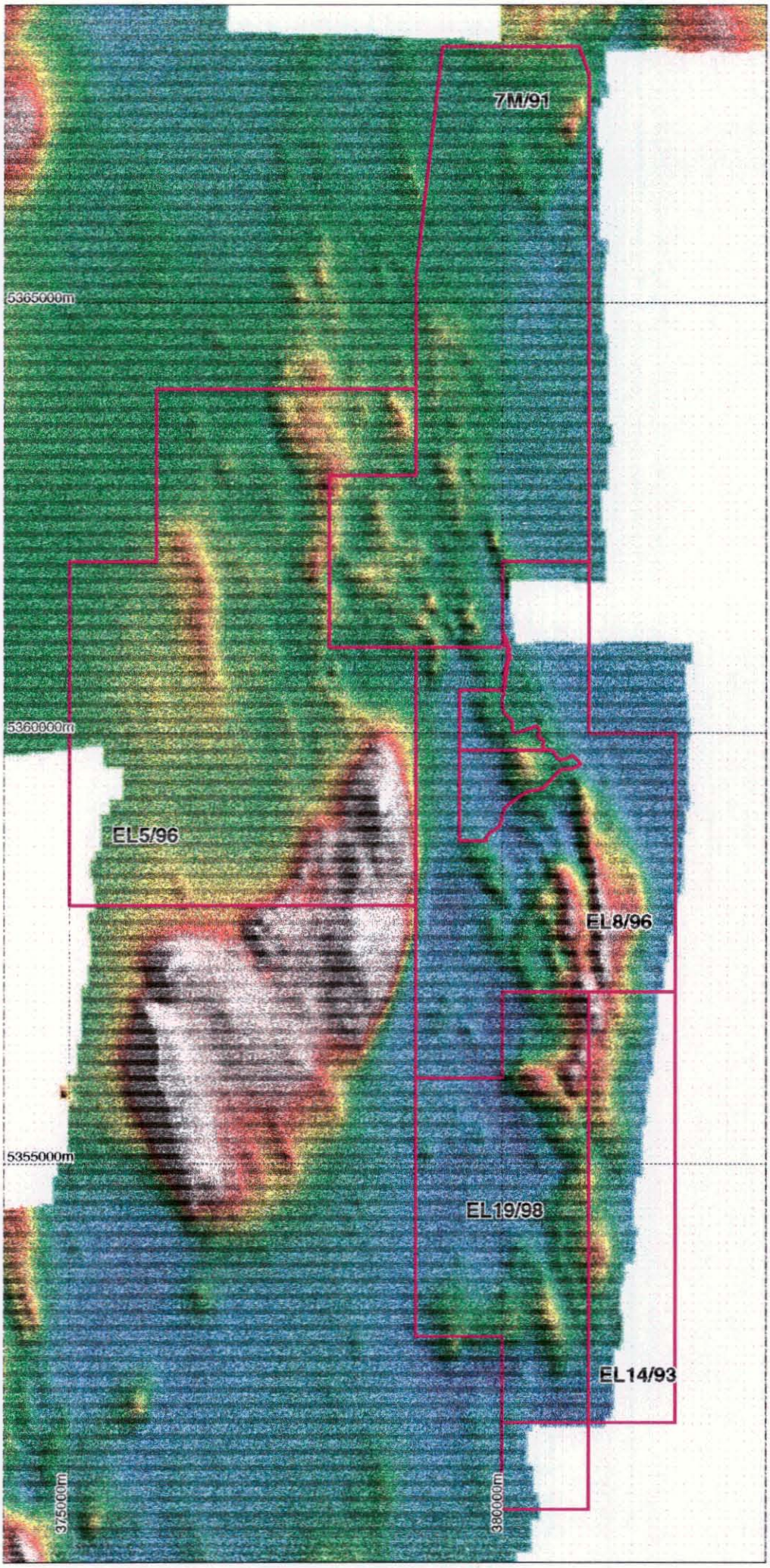
WesternTas_Geophys_IPresis.wor

607107

GOLDFIELDS EXPLORATION

Western Tasmania

TMI Compilation Image



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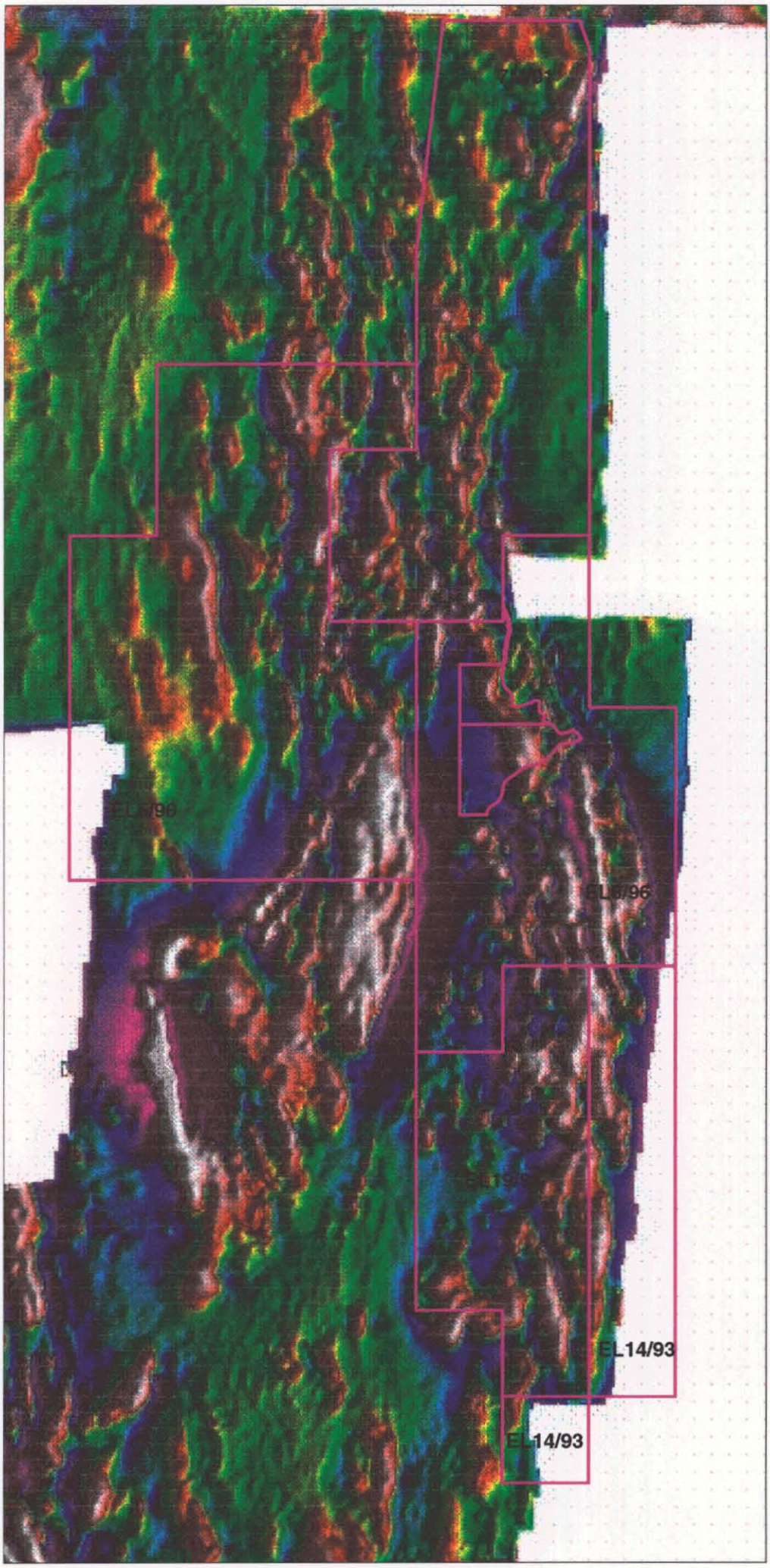
data\mapinfo\workspaces\
WesternTas_Geophys_Comp.wor

607108

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania
1st Vertical Derivative (Colour)



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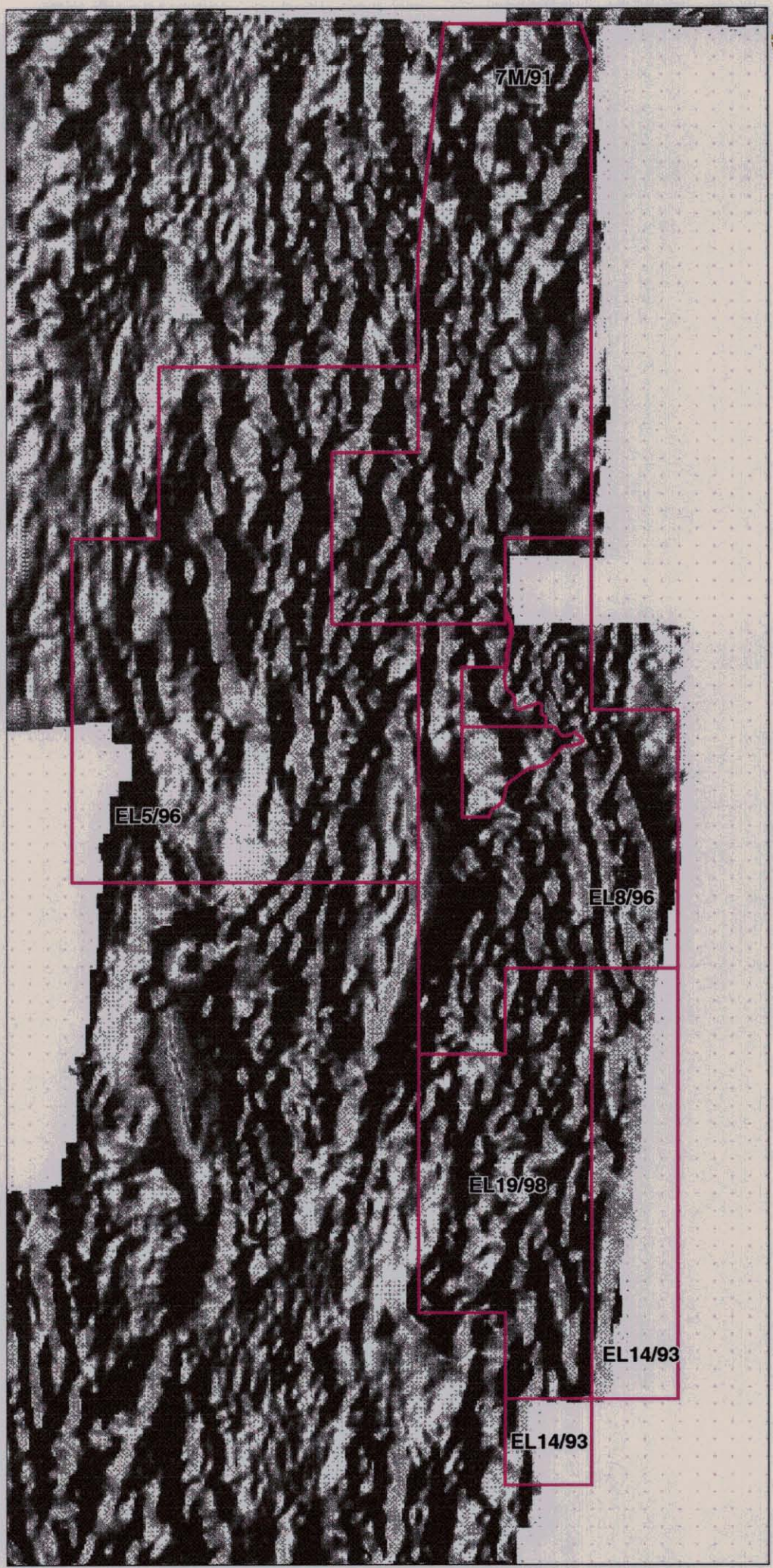
data\mapinfo\workspaces\
WesternTas_Geophys_1vdcolour.wor

607109

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania
1st Vertical Derivative (Grey Scale)



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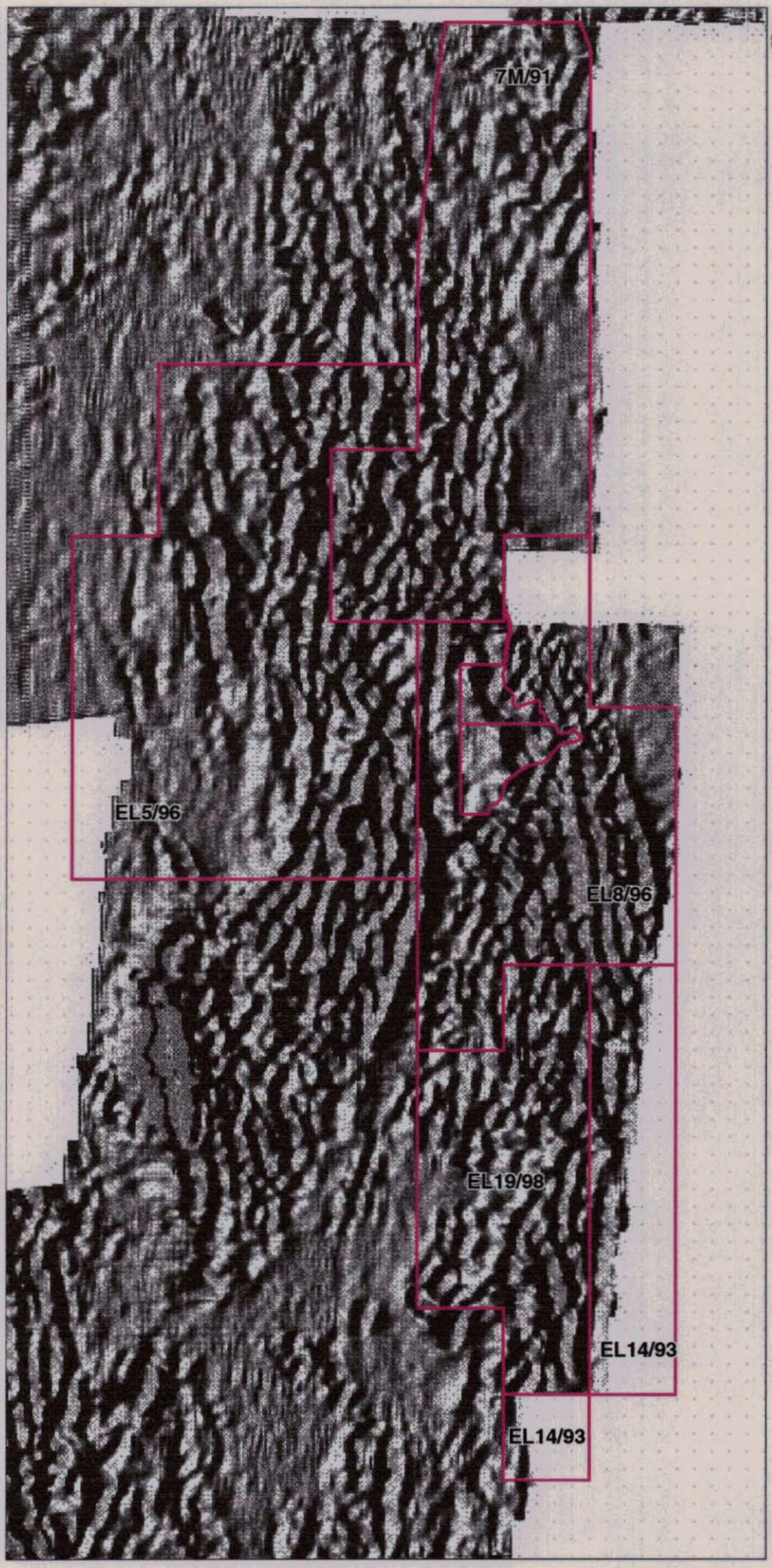
data\mapinfo\workspaces\
WesternTas_Geophys_1vdgrey.wor

607110

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St. Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania

2nd Vertical Derivative (Grey Scale)



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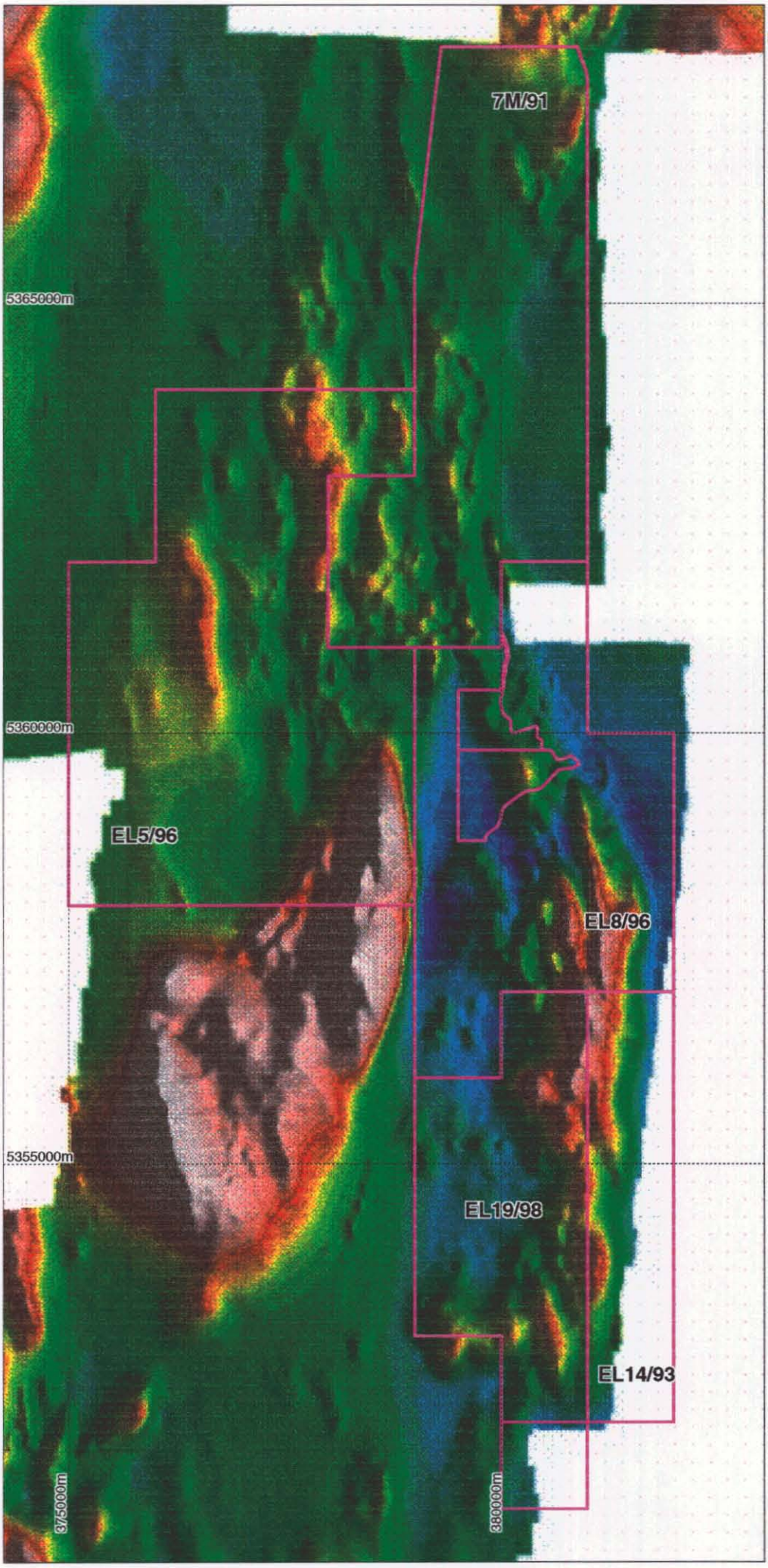
data\mapinfo\workspaces\
WesternTas_Geophys_2vdgrey.wor

607111

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania
Reduced To Pole (Colour)



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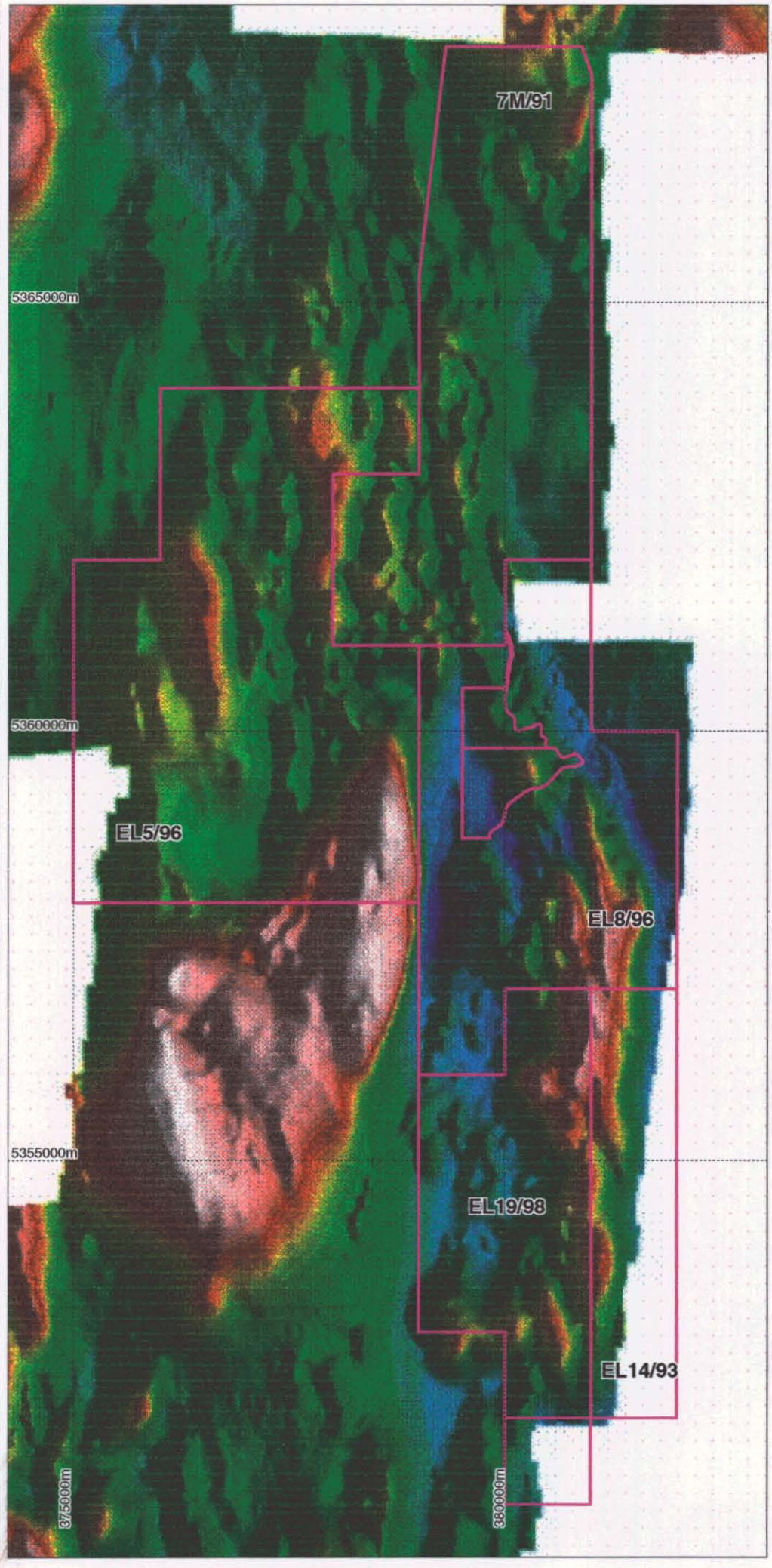
data\mapinfo\workspaces\
WesternTas_Geophys_RTPcolour.wor

607112

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania

Reduced To Pole (Colour)



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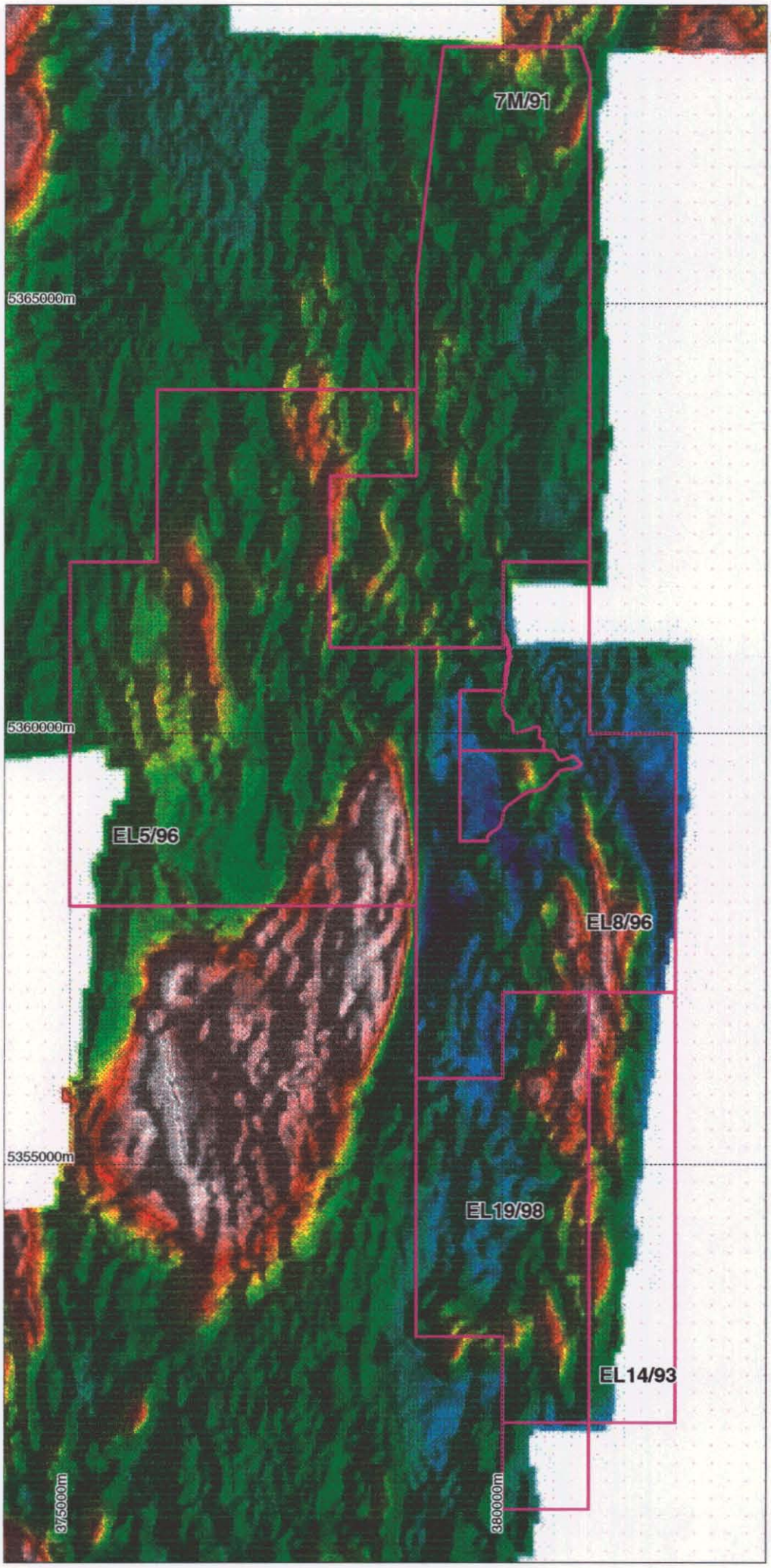
data\mapinfo\workspaces\
WesternTas_Geophys_RTP2colour.wor

607113

GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Western Tasmania
Reduced To Pole & 1st Verical Derivative (Colour)



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data\mapinfo\workspaces\
WesternTas_Geophys_RTP1vdcolour.wor

99_4375A

Annual Report 1998-1999 - Tasmanian Gold Project - EL 19/98 -Anthony
Goldfields Exploration Pty Ltd*
Hill, R.: Vicary, M.J. EL19/98

APPENDIX 5

607114

Basin Lake and South Henty CSAMT Technical Report

C Dauth, 1999

99-4375A

GOLDFIELDS EXPLORATION 607115

GOLDFIELDS EXPLORATION PTY LTD
ACN 067 813 932
89 Burswood Road P.O. Box 322 Victoria Park WA 6100
Telephone: (08) 9442 8110 Facsimile: (08) 9442 8181

TECHNICAL NOTE

goltccs.dot

To : Michael Asten and Michael Vicary

cc : RGC Exploration Information Centre Reference:

From : Chris Dauth

Date : 8 January, 1999

Subject : Basin Lake and South Henty Project CSAMT

INTRODUCTION

This TECHNICAL NOTE summarises survey specifications and results from an existing CSAMT survey conducted by Billiton Exploration in 1989-90 over the Basin Lake Project in Western Tasmania, now held by Goldfields Exploration. A survey design is outlined for additional CSAMT surveying proposed to be conducted by Goldfields Exploration over adjacent tenure. A location diagram is presented in Figure 1. The project is situated within the Mt Read Volcanic Belt of Western Tasmania, and is prospective for Henty style gold mineralisation, Mt Lyell style Cu-Au mineralisation, and Rosebery style base-metals mineralisation.

Goldfields Exploration are currently exploring tenure extending south from the Henty Gold Mine in a thin north-south striking belt up to three kilometres wide for a strike length of approximately 15km. Exploration is focused upon Henty style gold mineralisation, and Mt Lyell style Cu-Au mineralisation. Both styles can be associated with significant sulphide mineralisation (dominantly pyrite and chalcopyrite) and hence may provide targets for use of electrical geophysical techniques. Conceptually large accumulations of such conductive sulphide minerals would form low resistivity zones in a CSAMT section (a deep probing electromagnetic geophysical technique), and thus provide viable drill targets.

Techniques with a great depth of investigation are applicable in the region, and deep drill targets (up to 500m) are currently considered viable exploration targets. Induced polarisation coverage is relatively complete over this belt, however results are considered to have not generally tested below 100-200m depth. Therefore, the current target depth for exploration in the region may be regarded as the interval between 100m to 500m below surface. It is for this reason that CSAMT is considered a suitable exploration technique.

GROUND HOLDING

Basin Lake exists in the south of the Goldfields ground holding and is adjacent to the Anthony ground. South Henty is situated north of the Basin Lake and Anthony ground with a northern tenement boundary adjacent to the Henty Mine Lease (Figure 1). Tenure for all areas form a continuous north-south belt that is currently being explored primarily for gold mineralisation by

Goldfields Exploration. The White Spur ground held by RGC in the west is not being investigated by Goldfields Exploration.

The Henty Mine Lease is held by Goldfields Ltd and contains the Henty Gold Mine Operation. One or two lines of CSAMT are being planned to traverse the Mt Julia Prospect within the Henty Mine Lease. These are yet to be confirmed due to several logistical reasons.

The South Henty ground is a JV between Goldfields Ltd and Resolute Ltd currently being operated by Goldfields Exploration.

The Anthony ground was operated until 1998 by Aberfoyle Ltd after which is was acquired by Goldfields Ltd. From 1987-91 the ground was operated by Billiton who conducted the 1989-90 CSAMT survey.

The Basin Lake ground is currently held by RGC Ltd. Goldfields Ltd are likely to become operators of this ground in JV with RGC (yet to be confirmed).

A good summary of the exploration history over the Anthony and Basin lake ground is provided by McDonald and Ikstrums (1998). A photocopy of the relevant section is provided in APPENDIX I of this TECHNICAL NOTE. A thorough compilation of all historical induced polarisation (IP) surveys prior to 1982 is provided by Bishop 1982. Subsequent IP work in the region has been non-extensive limited to localised surveys by Aberfoyle and Resolute on the South Henty ground. Several UTEM surveys were conducted and are referenced in the report by McDonald and Ikstrums (1998).

GEOLOGY

This summary is biased towards the Basin Lake ground but is applicable in a general sense to the entire belt (taken from Dauth 1997 derived from several sources).

Basin Lake comprises a sequence of Cambrian felsic to locally andesitic volcaniclastics, epiclastics and lavas abutting to the western side of a topographic ridge defined by the north-south striking Great Lyell Fault. To the eastern side of the Great Lyell Fault exists a ridge of Ordovician siliclastics forming part of the Tyndall Ranges (Owen Conglomerate). The Cambrian volcanics are generally separated into two mappable units; Anthony Road Andesites; and Central Volcanic Sequence. Exploration has currently focused on a potentially favourable exhalative horizon at the contact of the Central Volcanic Sequence and the Anthony Road Andesite. Massive carbonate horizons are commonly found on this horizon, and may be interpreted as distal, low temperature exhalative facies. Up to 80m of glacial till overlies much of the Basin Lake EL, proving a significant obstacle to effective exploration

Exploration at Basin Lake has historically been driven by drill testing geophysical anomalies (mostly surface IP and EM techniques), and more recently has focused on systematic drilling of defined prospective horizons with DHEM follow-up. Several significant hydrothermal alteration systems have been delineated in the region either at the surface (eg Bradshaw Road, and Howards Anomaly) or through drilling (including the South Henty system below the Tyndall Mine and that intersected at Basin Lake). At South Henty several holes drilled by both Resolute and Goldfields have intersected a quartz-sericite-pyrite alteration system with associated Au mineralisation. At Basin Lake drillhole BLD89-3 targeting a CSAMT anomaly intersected sericitic alteration, minor pyrite (1-5% commonly within carbonates) and rare sphalerite micro-veins. An RGC drillhole TYN15 only several hundred metres to the north of BLD89-3 intersected a wide zone of sericite-pyrite alteration from 338.8-588.4m. These geological

indicators are generally regarded as favourable for the presence of VHMS mineralisation and are also similar in alteration style to that observed at Henty and Mt Lyell.

A number of cross-cutting structures have been either mapped or inferred on the ground, or delineated from helimagnetic data. These may form favourable sites for mineralisation. Current models suggest that the Great Lyell Fault is a known Cambrian mineralising structure, and that it dips at approximately 70° to the west. Cross-cutting structures intersecting the Great Lyell Fault may similarly provide favourable exploration targets.

BILLITON 1989-90 CSAMT

In 1989-90 Billiton conducted a CSAMT survey that extended throughout much of the Anthony and Basin Lake ground. The survey did not extend to the north onto the South Henty or Henty Mine Lease ground. The survey incorporated approximately 24 line kilometres of data acquisition on 25 east-west oriented lines at approximately 400m line interval.

Survey Specifications

Technique: CSAMT
Contractor: ZONGE
Survey Date: 1989-90
Job No.: 864 (lines 349000-353000N) and 968 (lines 3000N-7000N)
Line Spacing: 400m
Station Interval: 80m (three lines completed at 40m station interval)
Dipole Spacing: 80m
Receiver: ZONGE GDP16/3
Transmitter Position 1: located to the north on 5359500mN 1.5km long oriented E-W (all lines)
Transmitter Position 2: located to the south on 5351600mN 1.5km long oriented E-W (lines 5800 to 7000 only)

The results were reported by Zonge and by Billiton and are presented within the annual report by Creagh and Hungerford 1990. The final report by Zonge and a memo written by Hungerford are provided in APPENDIX II and APPENDIX III of this TECHNICAL NOTE respectively. The report by Zonge provides 1D smooth inversion results for five lines in total.

Digital survey data were recovered by ZONGE under instruction by Goldfields Exploration in late 1998. Results were reprocessed (Job #421) and digital data provided in addition to hardcopy pseudosections of Cagniard Resistivity, Phase, and static corrected Cagniard Resistivity (static corrected using a 5 point TMA filter at 2048Hz). Copies of all sections are provided in APPENDIX IV of this TECHNICAL NOTE. Digital data diskettes are provided in the sleeve of this TECHNICAL NOTE. A plan showing the location of all CSAMT stations is presented in Plan 1. This plan also shows geology, cultural features (roads etc), and 50m topographical contours. It should be pointed out that there were several problems with the actual northing location of several of the Billiton CSAMT lines, and some lines have true AMG Zone 55 northings that don't correspond directly with the defined line number. Plan 1 does show the correct CSAMT station locations. CSAMT survey line numbers and corresponding correct AMG Zone 55 line coordinate northings are provided below:

CSAMT Line	AMG Zone 55 Northing (mN)
349000	5349000
349400	5349400
349800	5349800

350200	5350200
350600	5350600
351000	5351000
351400	5351400
351800	5351800
352200	5352135
352600	5352485
353000	5352920
3400	5353400
3800	5353800
4200	5354200
4600	5354600
5000	5355000
5400	5355400
5800	5355800
6200	5356200
6600	5356600
7000	5357000

Three main issues regarding the survey need to be taken into account when considering future work with this data, and additional CSAMT acquisition:

1. The northern survey (Job 968 lines 3000N-7000N) does not appear to have been as rigorously interrogated as the southern survey (Job 864 lines 349000N-353000N). A vast amount of geological information could yet be extracted from the data.
2. Much of the data appear to have been acquired in the "near-field". This is well emphasised in the report by Zonge. The "near-field" data become particularly evident on the northern-most lines which were as close at 2.5km to the northern transmitter position. Inversion may not be too effective with these "near-field" dominated data.
3. Only several selected lines were inverted to provide sections that are readily able to be interpreted by geologists. In addition, early algorithms may not have been entirely suitable. Inversion of results with currently available inversion and processing algorithms may result in extraction of much additional valuable geological information.

Data from two lines have been selected for trial inversion. The purpose of this trial is determine inversion and processing parameters that should be applied (or determine if they should be applied at all) on the entire database and on future CSAMT surveys in the region. Data from lines 352600N and 353000N have been selected as they have suitable geological control. Processing sequences recommended for trial include:

- 1D inversion on data with a 5 point TMA statics filter correction
- 2D inversion on data with a 5 point TMA statics filter correction
- 2D inversion on data with no statics correction
- 1D inversion on data with EMAP statics correction
- 2D inversion on data with EMAP statics correction

Results would then be compared with known geological sections, and also viewed with a pure "physicist" understanding of what should be achievable from depth soundings with decreasing EM frequency. Recommendations would be sought as to the most suitable (and economically viable) method for data modelling. Simplified geological sections have been sketched for the purpose of calibration of modelling. More detailed sections at suitable scales will be required to

be produced by project geologists once the trial inversions have been completed, however for initial work, the sections in Figure 2 and Figure 3 for Line 532600N and 533000N respectively should prove useful.

ADDITIONAL SURVEY

Goldfields Exploration have contracted ZONGE to complete approximately 26 line kilometres of CSAMT surveying on east-west lines extending throughout the South Henty Project with the possibility of one or two lines over the Mt Julia Prospect within the Henty Mine Lease. The survey would extend north from the northern-most line covered by the Billiton survey of 1989-90. An overlap of three lines has been planned to ensure results from both surveys are able to be correlated (although some reduction in the total extent of this overlap is likely to be recommended). Fourteen lines are being prepared for surveying at 400m line spacing. Unfortunately, one of the main areas of interest (the South Henty Prospect near the Tyndall Mine) is surrounded by dams making access impossible.

A station and receiver dipole spacing of 50m has been recommended. A transmitter of 1.8 km length, oriented E-W on 5350600mN extending from 379100mE (road intersection) to 380900mE has been recommended. This transmitter position has been chosen as a compromise between logistical and geological constraints upon suitable locations. A transmitter located to the north would place it on the northern side of a significant geological boundary in a different volcanic sequence. A transmitter location further to the south would not possible due to logistical difficulties. The proposed transmitter location on 5350600mN would be within 5.4km of the most southern CSAMT line, hence "near-field" effects may extend significantly further into the lower frequencies in the southern lines than those in the north.

Following is the designed survey coverage:

Line (mN)	Min. East (mE)	Max. East (mE)	Length	Comments
5356200	379000	380500	1500m	
5356600	379000	380750	1750m	
5357000	379000	380900	1900m	
5357400	379000	381700	2700m	less 100m due to lake
5357800	379000	381700	2700m	less 100m due to lake
5358200	379150	381650	2500m	less 100m due to lake
5358600	379150	381600	1550m	less 900m due to lake
5359000	379200	381500	2300m	less 100m due to lake
5359400	379200	381100	1900m	
5359800	379200	380700	1500m	
5360200	379200	380650	1450m	
5360600	379200	380350	1150m	
5361000	379200	380000	800m	
5361800	379500	380000	500m	Mt Julia line
		TOTAL =	24,200m	

The location of proposed CSAMT survey stations is presented in Plan 2.

REFERENCES

Bishop, J. R., 1982 An Evaluation of Geophysical Surveys Over the East Tyndall and Basin Lake Grids, E.L. 9/66, Report for the My Lyell Mining and Railway Company, RGC/Goldfields Exploration Library Ref. No. 2313-8201

Creagh, C. J., and Hungerford, N., 1990, E.L. 103/87 - Basin Lake, Progress report on Exploration for the period Ending 21st April 1990; TCR Report No. 90-3099

Dauth, C., 1997, Basin Lake Down-Hole Electromagnetic Survey Results, February 1997; RGC Exploration Internal Report within Report No. 2313-9703

McDonald, G., and Ikstrums, J., 1998, "Basin Lake" - EL103/87 Final Report May 1997 - May 1998, Resolute Limited; TCR Report No. 98-4175

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GOLDFIELDS EXPLORATION

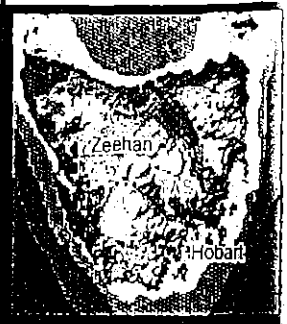
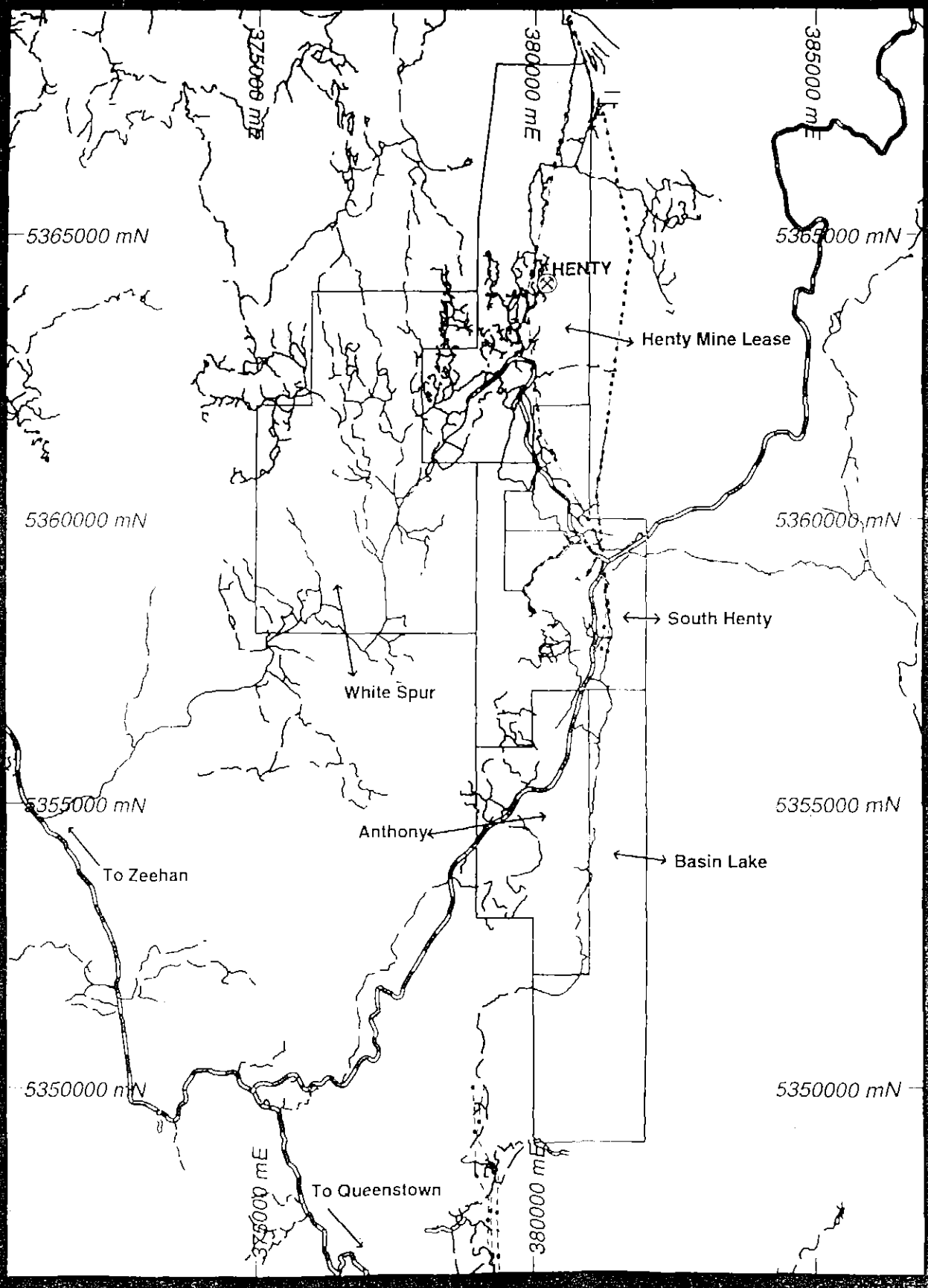


Figure 1. Location Diagram



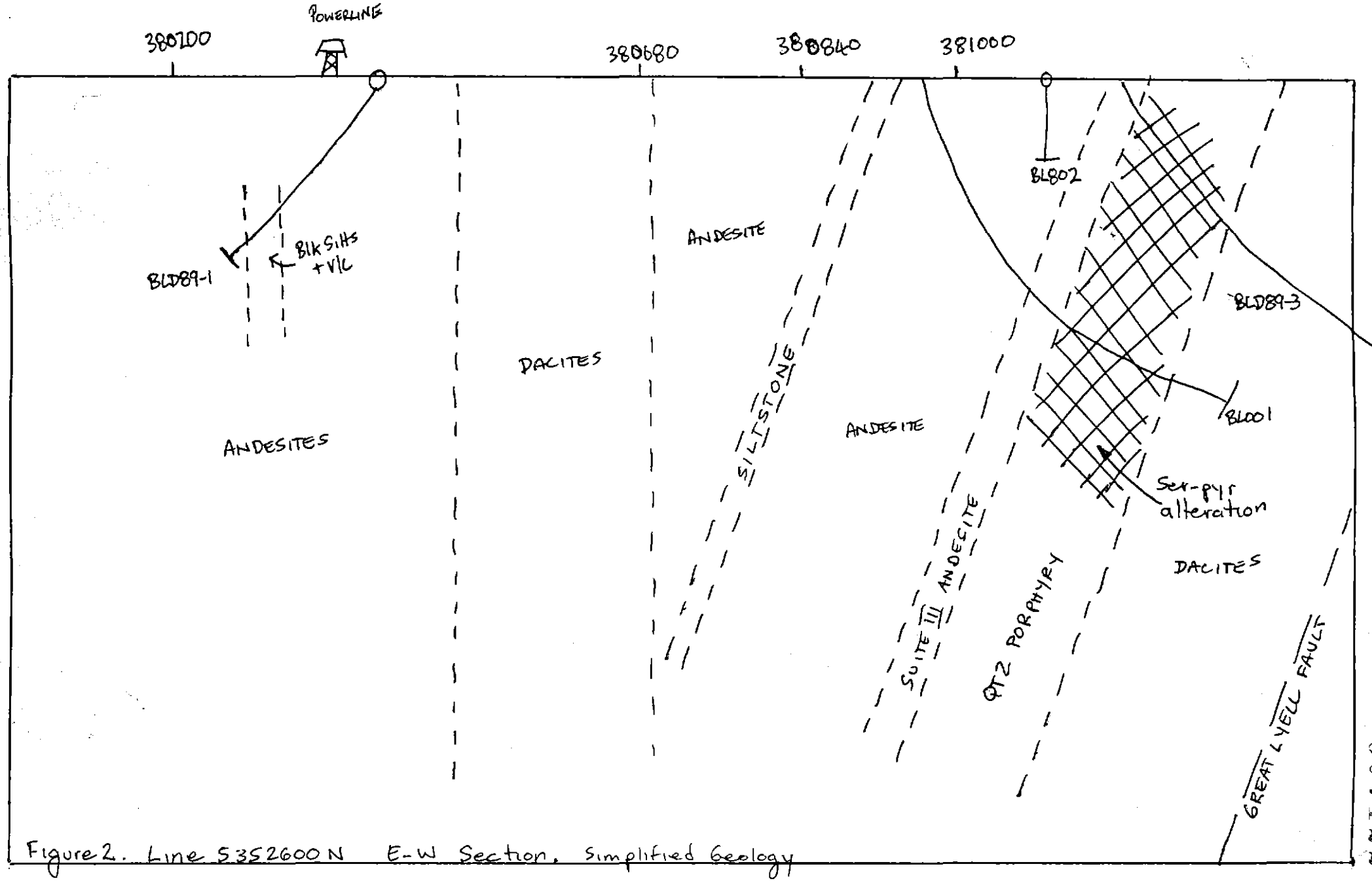


Figure 2. Line 5352600 N E-W Section, Simplified Geology

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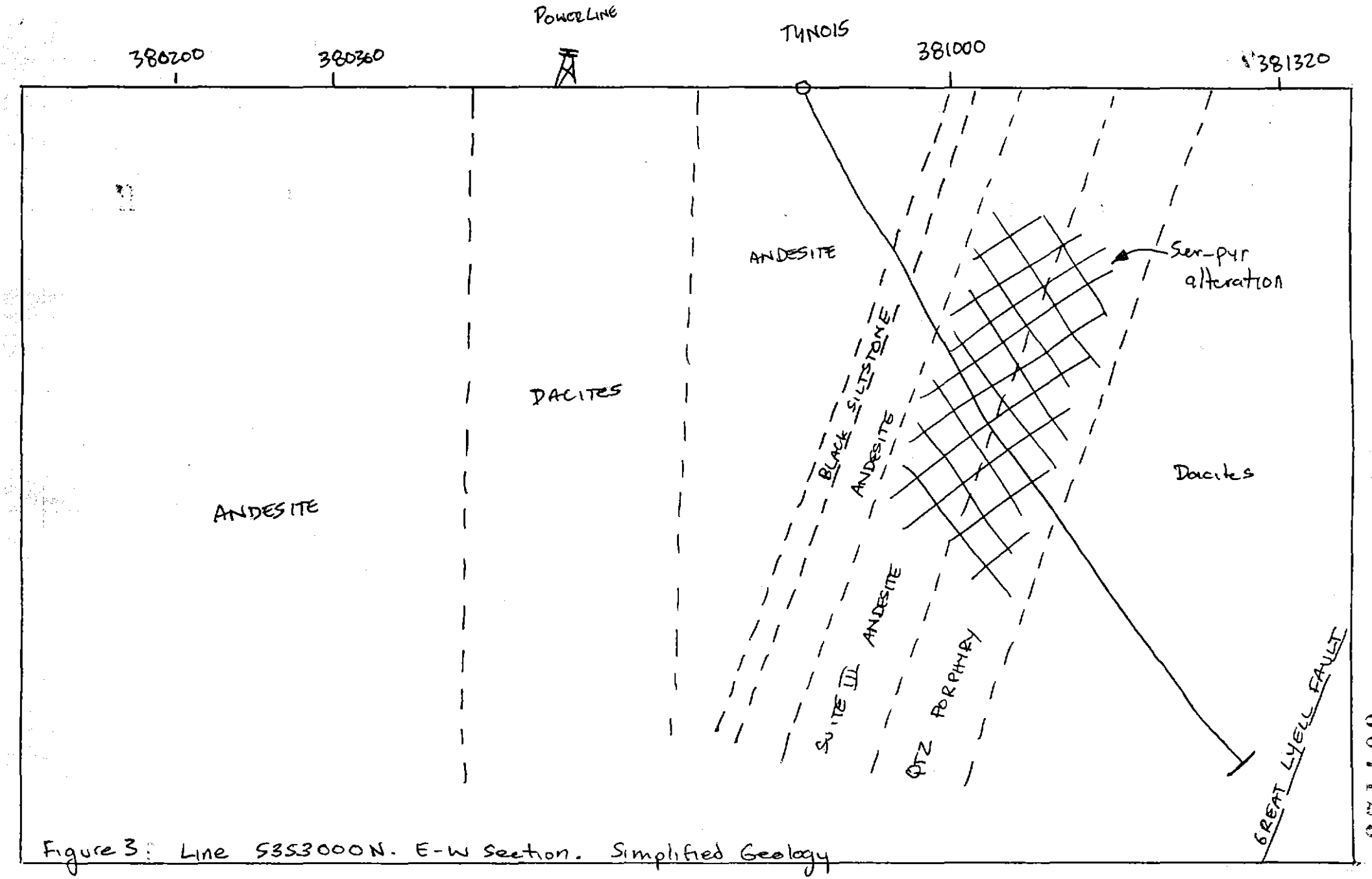

Figure 3: Line 5353000N. E-W Section. Simplified Geology

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APPENDIX I

Basin Lake Previous Exploration History

Copied from

McDonald, G., and Ikstrums, J., 1998, "Basin Lake" - EL103/87 Final Report May 1997 - May 1998, Resolute Limited; TCR Report No. 98-4175

5.0 PREVIOUS EXPLORATION

5.1 Introduction

The history of exploration on "Basin Lake" reads very similarly to that of "South Henty's", at least up until 1985 when the Mt Lyell M & R Co.'s large holding in EL 9/66, in which much of "Basin Lake" lies, was relinquished.

The earliest phase of exploration was carried out by prospectors in the latter part of the last century. Evidence for their endeavours can be seen throughout the west coast by the numerous old workings in very inaccessible areas. There are no such workings known of in the Basin Lake area.

Modern exploration commenced in the 1950's. The area covered by the current "Basin Lake" licence was previously held as part of Pickands Mathers licence in the late 1950's. In 1966 much of the area was included in the Mt Lyell M & R Co.'s (to become Goldfields Exploration) large E.L. 9/66 and remained so until 1985. The other part of the current "Basin Lake" area was covered by EL 41/71 until 1973 when EL 41/71 was incorporated into EL 9/66. EL 9/66 was dropped in 1986 with the area included in EL 103/87 which was initially held by Billiton (Acacia) and later joint ventured to Aberfoyle and finally Rsolute.

5.2 Pickand and Mather

The reporting of exploration by Pickands Mather was not available. The results of their work has largely been superceded.

5.3 1966 - 1987; Mt Lyell M & R Co. (became Goldfields Exploration)

1966-67 (Elms, 1967 [TCR 67-475])

The Basin Lake area was included in the Mt Lyell M & R Co.'s East Tyndall grid which extended from ~5353800mN (middle of Basin Lake) to the north of Henty with ~400 metre spaced magnetic east-west lines. The grid was covered by McPhar's reconnaissance dipole-dipole IP survey. Only even numbered lines were cut and surveyed in this initial work.

Another large grid (West Tyndall grid) covering a similar area of country to the west of the Henty Gorge was also surveyed. Both data sets are considered to be of good quality and has been reinterpreted twice subsequently (Irvine, 1974; and Bishop, 1984) in reviews of previous IP surveying. The locations of this survey are compiled by Bishop (1984).

1967-68 (Newnham, 1968 [TCR 68-527])

Work in this year involved further infill gridding, mapping, soil sampling and IP surveying. Anomalies defined from the previous years work were infilled with two or four lines adjacent to each.

IP anomalies A, B, C-1 and the southern end of C-2 were defined in Basin Lake on the East Tyndall grid. Anomalies defined by this work have been repeated in subsequent surveys and the nomenclature remains. Anomaly A corresponds to the Leech Hill alteration zone. Anomaly B corresponds to the Langdon Pyrite Zone of Aberfoyle (Lewis, 1995) whilst anomaly C-2 is the southern end of the Howards Anomaly zone.

Soil sampling was from the A-horizon and subsequent surveys have superceded these results. Samples were taken from the A-horizon, often from very peaty material and often over metres of glacials making such data of dubious use.

Drill testing of anomalies A and B was not prioritised, however, at the time of writing the report, a hole (TYN 1) was being drilled on line 12N to test the strongest part of the C-1 anomaly with a second hole planned for the southern part of the C-2 zone on lines 16N or 18N but on the South Henty licence (HA1/2).

1968-69 (Newnham, 1969 [TCR 69-569])
By the end of this year the regional mapping, soil sampling and IP had been completed over the East Tyndall grid. The IP surveying had defined essentially four anomalous zones named A, B, C-1 and C-2 (northwards) (in Bishop, 1984). DDH TYN 1 was drilled into the C-2 IP anomaly on line 12N, intersecting pyritic shales from 119m to 157m considered to explain the anomaly. The shales are at the base of the Tyndall Group.

From 1969 to 1973 no fieldwork was conducted in the Basin Lake area.

1973-74 (Wells, 1973 [TCR 73-970])
Some limited mapping was carried out in the northern part of Basin Lake. The McPhar IP survey was re-interpreted by Irvine (1974) with some limited gradient array IP to check anomalies A and B. A recommendation was made for anomaly A to be drill tested. The geophysical coverage was considered to not extend sufficiently westwards (especially on line 8N) to cover a zone of gossan development in the S.W. margin of the andesites (outside of the EL).

1974-75 (Stevens-Hoare, 1975 [TCR 75-1149])
Work in 1974-75 was conducted on the new Basin Lake grid (80 - 100 metre spaced lines) with a gradient array IP survey over the whole grid. The surveying broke up the McPhar anomalies (the locations of these are presumably shown on figures 12 and 13 but these are not included on the microfiche copy of the report). Bishop (1984) numbers these anomalies from 1 to 12.

Recommendations are made for further work on some anomalous responses. A detailed ground magnetics survey (superceded by the later helimag survey) was conducted as well as soil sampling.

DDH TYN 2 was targetted on anomaly A on line 4N with the anomaly attributed to a ~2 metre thick lens of pyritic black shales intersected around 204m at the contact between Yolande River Sequence felsic tuffaceous sediments and overlying feldspar phyric pumice breccia. TYN 3 was targetted on the southern end of anomaly C-2 with the IP response attributed to a folded body of pyritic black shale intersected between 279.6m and 318.4m.

1975-76 (Brophy and Stevens-Hoare, 1976 [TCR 76-1176])
A-horizon soil sampling was completed over the three areas of anomalous IP on the Basin Lake grid. Soil samples included a mixture of C and A-horizon samples with a number of samples taken over glacial material.

1976-77 (Meares, 1977 [TCR 77-1228])
The A horizon soil sampling, completed over the three zones which registered chargeability responses in the 1975 gradient IP, is further discussed.

The three zones covered are referred to as the NW, SW and East zones. The NW zone is the area of anomaly A (anomalies 10 and 12 from the 1975 gradient array IP survey) with the soil sampling also extended to include anomalies 7 and 8 on lines 24S and 30S. Low order Pb anomalies (129 and 114ppm) were not tested by TYN 2 which was targetted on the northern end of this chargeable zone in 1968 and intersected black shales.

The East zone runs the length of the eastern side of the grid and includes anomaly B (5, 6, 6a, 9 and 11) and 1 at the southern end.

Recommendations were made for infill gradient IP, soil geochemistry and the drill testing of mineralisation intersected in previous DDH BL802 (just west of the EL boundary) as well as coincident chargeability/Pb soil anomalies.

1977-78 (Meares, 1978 [TCR 78-1296])
Mt Lyell were more interested in the Henty Adits prospect in this year though most recommendations made in the previous year were followed

Anomalous Zn in soils coincident with a chargeability anomaly on line 48S (850E to 1000E) were tested by costeaning with the IP anomaly found to be due to black shale and the soil anomaly found to be due to secondary enrichment in bog ironstone which had developed over andesite.

In fill IP and soil sampling was completed followed by BL1, drilled eastwards on line 72S near BL802 also testing a Pickand Mather chargeability anomaly. BL1 intersected over 170 metres of strongly sericitised and pyritised quartz (coarse rounded embayed crystals to ~5mm) feldpsar phyric dacite (293m to 447m) and the immediately overlying feldspar phyric pumice breccia from 294.7 to 462.85 metres with a 1cm band of pyrite+galena at 303.9m. Best assays were 296 - 308, 9m @ 0.11% Pb, 0.45% Zn and 4g/t Ag.

BL2 was drilled on line 48S to follow-up the alteration intersected in BL1 and also tested the 5 anomaly from the 1975 survey. The hole intersected a carbonaceous pyritic shale unit from 197.05 - 222.65 metres overlain and underlain by coherent andesite and andesitic breccia. The only significant assay was 161.5 to 166 metres, 4.5 metres @ 0.21% Pb, 0.05% Zn and 1g/t Ag. This pyritic carbonaceous shale was interpreted to be a correlate of the alteration intersected in BL1.

The only work recommended was a single hole to follow up the intersection of alteration in BL1, however, the hole was ranked as a low priority and has never been drilled.

No work was done from 1978 to 1980 on Basin Lake.

1980-81 (Meares et al 1981 [TCR 81-1660])
Work on Basin Lake recomenced focussing on two discrete areas on the Basin lake grid with a magnetic anomaly centred on 30S 8200'E and a gradient array IP anomaly centred on 36S 5900'E.

Ground magnetics had defined a broad 300-500 gamma above background ground magnetics anomaly thought to be due to a similar haematite+carbonate unit s found in BL2 ~550 metres south along strike. BL3 was targetted on this anomaly on line 30S. The hole intersected a package of andesitic clastics and coherent andesite with variable carbonate and with the magnetic anomaly due to detrital magnetite in sandier units. There is some weak chlorite and/or sericite alteration described around ~393.5m.

Dipole-dipole IP was surveyed over anomalies B6 and B6a on lines 30S and 36S with the better anomaly defined on line 30S. DDH BL4 was designed to test this chargeability anomalies associated with low order Pb and Zn soil anomalies. The hole intersected a package of coherent andesite, andesitic breccia and sandstone, basaltic andesite intrusives/extrusives, black pyritic mudstones with 11 metres of massive pyrite (from 64.7m to 76m - there is little core left with perhaps only 1.3 metres of massive pyrite with the remaining material pyritic ashy mudstone).

Andesitic breccias, probably in the footwall to the massive pyrite lense, are sericite+pyrite+silica altered from 10m to 64.7m. The shales immediately downhole from the massive pyrite are also pyritic and sericitic for ~10 metres. With this and the 'massive pyrite' zone assaying 17.2 metres @ 11.3 g/t Ag. The massive pyrite horizon was considered to represent a potentially mineralised horizon.

1981-82 (Meares et al 1982 [TCR 82-1791])
Limited work was conducted in this year with some limited rock sampling and dipole-dipole IP over a previously defined gradient array anomaly at 5500'E on line 78S (Anomaly 1). A Genie EM survey

was run over lines 00S to 36S and 78S with no anomalous responses (the system could not see the massive pyrite in BL4 at a depth of ~50 metres).

The significance of the intersection of massive pyrite and the correlation of the host rocks with those hosting high grade but small pyrite+sphalerite+galena and pyrite+chalcopyrite massive sulphide lenses at Comstock, stratigraphically overlying the extensive Mt Lyell hydrothermally altered/mineralised zone, was a significant conclusion and the first reported discussion (in annual reports at least) of possibility of a highly propsective horizon extending from Mt Lyell northwards ~20 km to Basin Lake- East Tyndall (inc. Howards Anomaly). The horizon is described as being at the contact of the overlying haematite carbonate horizon and underlying sericitic alteration. The host rocks to this favourable horizon are described as medium grained andesitic tuffs, minor dacitic tuffs, black shales cherts and carbonates.

In spite of this no work was recommended and no work was done in the Basin Lake area from 1982 to 1984.

1984-85 (Fitzgerald and Pease, 1985 [TCR 85-2459])
Work in 1984-85 essentially involved the drilling of BL5 to follow-up the 11 metres of massive pyrite intersected by BL4 as the licence was due for relinquishment on the following year.

BL5 was drilled towards the east around 160 metres south along strike from BL4. The hole intersected a similar sequence to BL4 (but in reverse) with 6m @ 0.2% Zn, 0.1% Pb and 1.8m @ 3.5 g/t Ag. There is not the same degree of alteration around this intersection as in BL4, nor is there massive pyrite.

1985-86 (Fitzgerald and Cartwright, 1986 [TCR 86-2566])
As the licence was into its final year a final pass was made in order to test for the more obvious targets. Work consisted of gridding in preparation for mapping and EM surveying.

The mapping focussed on new exposure along the Anthony Road as well as drill core. Quartz+sericite+pyrite alteration is described from the "sulphide facies" with "minor base metals and the local occurrence of bedded massive pyrite", interpreted to represent a deeper subaqueous reducing environment with the overlying "oxide facies" hematite+/-magnetite+carbonate representing a shallow subaqueous oxidising environment. The change from dominantly sericitic+pyritic to hematite+carbonate alteration occurs at the contact between the top of the Anthony Road Andesite and the base of the Tyndall Group. Further quartz+sericite+pyrite alteration occurs deeper in the volcanic pile at the Leech Hill and Bradshaws Road alteration zones.

A UTEM survey was conducted over the prospective "sulphide facies" i.e. basal Tyndall Group on the eastern side of the licence. A smaller loop enabled coverage of the Bradshaws Road alteration zone. A Sirotem survey was conducted separately over the Leech Hill alteration. Bishop interpreted 10 anomalies (A to J). Bishop's compilation (in appendix A) is discussed in detail by Fitzgerald in Fitzgerald and Cartwright (1986) with consideration of the EM anonalies against the results of previous geophysics and drilling.

In conclusion Bishop/Fitzgerald defined three zones warranting further work, all three lying within the prospective "sulphide facies".

The first anomaly, on line 16N, 250mE, was defined by coincident dipole-dipole IP/weak UTEM anomalies over pyritic volcaniclastics adjacent to black shales with up to 4000ppm Pb in outcrop 300m's south along strike (this zone was tested subsequently by TYN5). The second anomaly, on line 14.5N at 585mE was defined by a good UTEM over glacial cover with up to 4000ppm Pb from outcrop 170m's west (footwall?) (this zone has not been drilled). The third anomaly, from 12N, 1000mE to 10.5N, 1100mE is defined by a strong gradient array IP anomaly and moderately high

*** Check this UTEM target.

resistivity (no EM coverage) associated with hematite+carbonate+/-pyrite altered volcaniclastics and moderately anomalous Pb (500) and Cu (680) in soils.

EM surveys over the Bradshaws Road and Leech Hill alteration zones did not record responses due to massive sulphide mineralisation.

Recommendations are made for testing the better two of these anomalies with drilling with DHEM as well as DHEM on BL4 (if the hole is open).

1986-87 (Fitzgerald, 1987 [TCR 87-2675])
This work was subsequently carried out. TYN4 tested the second target zone (14.5N 585mE) intersecting andesitic lavas and breccias with marly finer volcaniclastics and bedded limestones in the upper part of the hole, but no sulphides or sericitic+pyritic alteration. The EM anomaly was explained as being probably due to a glacial trough. TYN5 tested the first target zone completing a scissor pair with TYN3. TYN5, 400 metres north along strike from TYN4, intersected a very similar sequence to TYN4. No source of the IP was intersected. Samples of magnetite bearing felsic lavas from the third target zone (12N, 1000mE to 10.5N, 1100mE) were tested petrophysically to see if they were the source of the IP anomaly with the result negative.

DHEM was completed on both TYN4 and 5 and BL4 (only to 62m). There were no anomalous responses except in TYN5 where an offhole response is attributed to conductive black black shales intersected just to the west in TYN3.

No further work is recommended with "the general paucity of base metal mineralisation within this large hydrothermally altered sulpidic belt is discouraging. Apart from costly stratigraphic drilling of this belt it is difficult to identify further targets that warrant additional investigationin the area."

The licence was subsequently relinqished.

5.4 **Mines Department; Corbett (1985) - Unpublished report 1985/54**
The Mines Department drilled a 504 metre deep stratigraphic hole into pyritic alteration poorly exposed just west of Leech Hill. The alteration lies near the contact of the western volcano-sedimentary sequence and central volcanic sequence. The hole LH1 was drilled eastwards and was still in alteration when stopped. The stratigraphic top of the alteration system was not pierced by the hole. Assays are all around background except for Cu with a maximum of 280 ppm.

5.5 1988 - 1998; **Billiton(Acacia)/Aberfoyle/Resolute**
Billiton successfully tendered for the area as part of a larger EL 103/87 and were granted the licence on 21st April 1988.

1988-89 (Creagh and Hungerford, 1989 [TCR 89-2928])
Billiton's work focussed upon the area south of line 352000N and consisted of a CSAMT survey on 400 metre spaced lines, ground magnetics, gravity and Max-Min EM surveys. An attempt was made to read lines 352800mN and 352700mN with with the Zonge GDP-12 system but noise and equipment problems made this data worthless.

The licence was remapped with little variation from previous work. Billiton did note the proximity of the Leech Hill and Bradshaws Road alteration zones to the western margin of the central intrusive porphyry. They also noted the existence of a "distinctive pyroxene basalt lava in BL4".

The CSAMT survey defined three anomalous trends north of 351800N (up to 353000N) with the eastern trend probably the Great Lyell Fault, the central trend corresponding with the lower or basal Tyndall Group rocks targetted by Goldfields. The western zone is more enigmatic.

Max-Min was read over the central and western anomalous trends on lines 353000N and 352600N, in the south-eastern corner of the licence, confirming the existence of the central trend but no the western which is interpreted to be deeper than 75 metres. Gravity readings were made over CSAMT anomalies on lines 352800N and 352600N. There is no anomalous gravity associated with these anomalies.

Recommendations are made for continuing the gridding/CSAMT/mapping on 400 metre spaced lines to the northern boundary of the licence. Specific anomalies are outlined in the conclusions:

- moderate gravity anomaly on line 350200N coincident with a weak shallow CSAMT anomaly
- Coincident anomalous CSAMT, Max-Min, UTEM, IP and weak base metal mineralisation on line 352600N at 380850E (central trend)
- CSAMT anomalies on lines 352600N and 353000N at 380300E (western trend) with weak coincident Max-Min response.

1989-90 (Creagh and Hungerford, 1990 [90-3099])

Billiton's work followed up on all recommendations made in the previous year. Three holes were drilled for 873 metres. BLD89-1 (235m) was targetted on the western anomalous trend intersecting a black shale amongst a sequence of andesitic volcaniclastics between coherent andesite. There is some weak sericite+pyrite alteration but the shale explains the anomaly.

BLD89-2 was targetted on the coincident CSAMT/Max-Min/UTEM/IP/weak base metal mineralisation. It too intersected black shales which explain all anomalies (except the anomalous base metals).

BLD89-3 was targetted on the eastern trend of CSAMT anomalies. It was drilled eastwards i.e. up sequence, intersecting a zone of pyrite+/-sericite+/-chlorite alteration between 90m and 250m but particularly from 170m to 220m. Although undetailed Billiton conclude that the location of this alteration is analogous with that of Mt Lyell. The alteration occurs in the base of what is probably a basaltic unit and in the underlying coarsely quartz phyric dacite. The basalt is overlain by feldspar crystal volcaniclastics, feldspar phyric andesite, basalt breccia, feldspar phyric pumice breccia and other clastics of the Lower Tyndall Group. The Great Lyell Fault as passed through at 361 metres.

DHEM on the first two holes did not define any further targets.

The CSAMT survey data had not been interpreted at time of reporting.

Billiton also discuss the resukts of a lithogechemical sampling along the Anthony Road and some drill core. They briefly discuss their research on the Mt Read's and their recognition of "two compositionally and spatially distinctrock types whose contact horizon occurs at or close to the known massive sulphide deposits of western Tasmania" and that this horizon passes through Basin Lake (the base of the Tyndall Group).

1990-91 (Randell, 1991 [TCR 91-3244])

No actual field work was done in this year with the report principally detailing the results of the CSAMT survey. The results of DHEM on BLD89-3 were again said to be unavailable. Limited further lithogeochmical sampling of drill core was also done.

The CSAMT survey defined 14 anomalies. These are discussed again individually. Most were subsequently found to be due to black shales or known pyritic alteration

Further comment was made regarding the definition of a major lithological break defined by low or high levels of Ti and Zr correlating with the contact between Central Volcanic Complex rocks and the Tyndall Group. Billiton define three horizons of interest within Basin Lake based upon this work. I

would suggest that all three are in fact essentially the same horizon (or within the same relatively thin sequence of rocks). No recommendations are made other than the drilling of three DDH's. The licence was subject a joint venture negotiations with Aberfoyle at the time of reporting.

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Aberfoyle joint ventured into the licence and became manager.

1991-92 (Richardson, 1992 [TCR 92-3345])
The whole of the Basin Lake licence was covered by a UTEM survey on Aberfoyles 200 metre spaced east-west grid. Aberfoyle concluded that there are no significant conductors. DHEM was also carried out on BLD 89-3 with an off hole response attributed to a shale intersected by the previously drilled BL2.

No work was done on the Basin Lake part of EL 103/87 in the 1992-93 year. Half of the existing area of the Basin Lake part of EL 103/87 was relinquished including the 1km wide strip down the eastern side of the current Basin Lake EL.

1993-94 (Sharpe, 1994 [TCR 94-3552])
Aberfoyles work was based around a high resolution helimagnetic-radiometric survey. The licence was remapped with samples collected for both lithogeochemcial and petrological analysis.

The helimag and mapping indicated that there is a significant variation in the level of magnetism in the Anthony Road Andesite with the non-magnetic type due to hydrothermal alteration. All samples assayed for whole rock returned andesitic Ti/Zr (between 17 and 22) and thus are andesitic.

The Pyrite Corner Fault is defined in this work. This noth west trending zone is traceable from the Bradshaws Road alteration (now freshly exposed in Anthony Road outcrop) up into the Tyndall Range. The Leech Hill alteration is considered to be spatially correleated with this Pyrite Corner Fault zone.

The only specific recommendations are those for "wacker" C-horizon soil geochemistry from Lower Tyndall Group rocks covered by glacials.

1994-95 (Lewis, 1995 [95-3716])
The Tyndall Creek grid was cut in the very northern part of the licence to follow up outcropping massive barite+sulphide located in Tyndall Creek just north of the northern EL boundary i.e. in South Henty. The north-east/south-west oriented grid was soil sampled with "wacker" C-horizon soil samples, surveyed by Aberfoyle's Zonge IP system and surveyed by UTEM by Lamontagne Geophysics.

An anomalous chargeability response was recorded corresponding to the C2 anomaly defined by early IP surveying and tested already by TYN3 and TYN5 (scissor holes through the zone). There were no resposes attributable to massive sulphides from the surface EM survey. The wacker sampling located a zone of anomalous Ag+Zn+As in a zone along strike from the Howards Anomaly "silver zone" to the north. The zone has aparently been tested by TYN3 and TYN5 as well HA5 to the north. There is some possibility. DHEM could not be read as the hole had collapsed.

Further grid was cut along the eastern part of the licence designed to cover. A number of anomalous zones were defined by this work. However, only two were prioritised for further work, both from line 4200N. This area had become the Langdon Pyrite Zone by 1995-96.

Anomaly 1 from lines 4000N to 4400N is associated with sericite+silica+pyrite altered volcaniclastics (maximum 372ppm Cu, 1062ppm Pb, 1246ppm Zn, 7600ppm Ba and 0.068ppm Au). This alteration correlates with that seen in BL4 and coincides with the Pyrite Corner Fault which is marked by anomalously west-north-west trending S0 and S1 in outcrop. The "wacker" sampling and mapping

also resulted in the location of outcropping basaltic andesite between lines 4200N and 5000N correlatedwith that intersected in BL4.

Aberfoyle consider the IP anomaly immediately east of the pit they excavated on line 4200N beneath the centre of the anomaly to possibly represent the northern extension of the 11 metres of pyrite intersected in BL4 and proposed a hole to intersect this horizon >250 metres below the surface (below surface EM range?) where the horizon intersects the Pyrite Corner Fault.

The second anomalous zone follows this structure to the north-west and is defined by disseminated pyrite+chalcopyrite (Cu to 3349ppm) in sericite altered andesite. There is some associated anomalous IP chargeability.

1995-96 (Richardson, 1996 [TCR 96-3855])
Work focussed on the Langdon Pyrie Zone. DDH BL6 (510.6m) was designed to test two targets. The first is defined from the previous years work as coincident IP down dip from anomalous base metals in soils, considered to correspond to the favourable Lower Tyndall Group rocks. The second target was geological, being the intersection of the Pyrite Corner Fault down dip and along strike from BL4's intersection.

The hole was collared in andesite and not Lower Tyndall Group rocks as planned. Drilling conditions meant that the second target could not be reached. The first target is explained by silica+sericite+pyrite alteration of the coarsely quartz phyric unit between 359.1m and 391.7m with best results 342.2 - 344.3m, 2.1m @ 0.56% Cu (Pb 310ppm, Zn 140ppm, Ag 7.4ppm) and 371.3 - 373.3, 2.0m @ 0.17% Cu (Pb 127ppm, Zn 140ppm) with the best Au 0.5m @ 1.5g/t.

DHEM could only be read between 230m and 360m but located an offhole response below BL6, down dip from the alteration intersected in BL6.

BL7 was designed to test this offhole DHEM anomaly. The hole, collared ~250 metres east from BL6 also collared in andesite remaining in so throughout. The better assays (core grinds) come from apparently unmineralised andesite between 259.3m - 324.0m averaging 0.14% Zn.

During the drilling of the hole it became apparent that it would need to be much deeper than originally planned (due to the steeper bedding than expected). The hole was stopped and surveyed by DHEM down open hole with results still awaited at time of reporting, however, the anomaly can still be seen but it is not near BL7.

The only significant alteration is moderate sericite+chlorite+pyrite alteration in the lowermost 33 metres of the hole.

1996-97 (Hicks, 1997 [TCR ??-????])
Work again focussed on the Langdon Pyrite Zone prospect with the drilling of BL8 (883.5m) which was designed to test the Lower Tyndall Group rocks adjacent to the Great Lyell and Pyrite Corner Faults, both considered to be synvolcanic structures.

The Langdon Pyrite Zone prospect was defined by the intersection of the Pyrite Corner Fault with the Lower Tyndall Group. The Pyrite Corner Fault was considered to be a Cambrian structure as (a) it is the focus of pyritic alteration and anomalous Cu known to extend from Pyrite Corner to the Langdon Pyrite Zone, (b) there is a facies variation across the fault with shale dominated to the north and volcaniclastic to the south, and (c) the fault marks (approximately) the boundary between magnatic and non-magnetic andesite. The fault is also considered also shows dextral movement in the Devonian.

The hole was collared in andesite and remained in andesite breccia with variable carbonate until the Pyrite Corner Fault was intersected at 406.3 metres. Below the fault a sequence of coarsely quartz (~5mm) feldpsar (~1mm) phyric dacites, andesite+/-carbonate breccias and lesser finer grained units is weakly altered to ~700 metres.

A pyritic ashy tuffaceous siltstone was intersected from 834 to 841.8 metres, however, Zn is only 1148ppm (Pb 668ppm).

There were no anomalous responses rom the DHEM. A reinterpretation of the DHEM in BL7 was conducted with the conclusion being drawn that the response is a surficial effect.

Resolute acquired Aberfoyle's share in the JV (57%) in 1997.

5.6 Conclusions

Exploration has been directed towards stratiform massive sulphides with stringer/disseminated chalcopyrite an early target style. This exploration has concentrated on the Lynchford Member, Comstock Formation, the basal member of the Tyndall Group. Further exploration has also targetted the two occurrences of pyritic alteration deeper in the sequence i.e. Bradshaws Road (Pyrite Corner) and Leech Hill alteration zones as well as discrete geophysical anomalies.

The upper prospective stratigraphic horizon, the Henty-Comstock horizon, at the base of or within the Lynchford Member, only lies within EL 103/87 for ~ 1.5 kilometres. Over this length it has been quite adequately tested with extensive EM, IP, CSAMT and a number of drill holes. Massive pyrite intersected in BL4 is from this horizon, followed up with lesser success by BL5. There is some strike potential of this horizon to the south of BL5 beyond EM/IP/CSAMT range.

The lower horizon has been partially tested by LH1 and TYN2, though neither passed through the upper contact. EM and CSAMT responses in the immediate area appear to be picking out the black shale intersected by TYN2. There are no CSAMT or EM anomalies north of TYN2 along the projected strike of this horizon southwards from South Henty.

There has been no exploration directed towards discrete structurally hosted mineralisation.

There are no obvious high priority targets which remain untested from exploration to date other than the upper contact of the Leech Hill alteration zone. The anomalous copper zone coincident with the Pyrite Corner Fault is a potential target for a shallow drilling programme.

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APPENDIX II

CSAMT SURVEY REPORT
ZONGE Engineering Final Report

Copied from the APPENDIX of
Creagh, C. J., and Hungerford, N., 1990, E.L. 103/87 - Basin Lake, Progress report on Exploration for the period Ending 21st April 1990; TCR Report No. 90-3099

607135

FINAL REPORT

CSAMT SURVEY
BASIN LAKE PROSPECT
for
Billiton Australia

Zonge Engineering & Research Organization, Inc.
3322 East Fort Lowell Road, Tucson, Az 85716 (602)327-5501

DEVONPORT COPY

Executive Summary

Five of eleven CSAMT lines run for Billiton Australia by Zonge Engineering Australia, Ltd., were processed and interpreted by Zonge Engineering (U.S.). We static-corrected the data using our phase-integration technique, and then performed smooth-model inversions to produce interpretable electrical cross-sections.

The data are of good quality except in the vicinity of a power line, where high noise levels and current-channeling effects invalidated data over a 200 meter wide swathe.

Several north-south trending, conductive features are present in the data. Their persistence from line to line indicates geologic structures with significant strike extent. The data indicate anisotropic geology with strong lateral resistivity contrasts. A narrow, steeply dipping conductive feature on the western ends of lines 353000N and 352600N may be an attractive exploration target.

A second conductive feature is present on the eastern ends of the five lines. It is rather broad and dips at a moderate to steep angle to the west. This second feature is coincident with a known fault.

Project Logistics

The CSAMT project was contracted by Zonge Engineering Australia, Ltd., which can provide details of survey logistics. Work was done on eleven east-west lines using a dipole length of 80 meters, with detailing over part of line 353000N using 40 meter dipoles. Data were obtained between 32 and 4096 Hz. One electric-field and one magnetic-field component were measured at each station using a GDP-12 receiver. This report reviews the results from five of the eleven lines surveyed. Line locations are shown on a plan map in figure 1.

Geology

The survey area is dominated by Cambrian volcanics of very high resistivity, overlain in the south by about 50 meters of resistive glacial cover.

Data Presentation

Billiton has already received Cagniard resistivity and phase difference data. The data presented in this report are static-corrected apparent resistivity and smooth-model inversions.

The static-corrected data are located in plates at the back of this report:

Plate 1	Static-corrected resistivity, line 353000N a=80m
Plate 2	Static-corrected resistivity, line 353000N a=40m
Plate 3	Static-corrected resistivity, line 352600N a=80m
Plate 4	Static-corrected resistivity, line 351800N a=80m
Plate 5	Static-corrected resistivity, line 350200N a=80m
Plate 6	Static-corrected resistivity, line 340400N a=80m

The other information is provided as figures:

Fig. 1	Location map
Fig. 2	Selected magnetic field plots
Fig. 3	Smooth-model inversion, line 353000N
Fig. 4	Smooth-model inversion, line 352600N
Fig. 5	Smooth-model inversion, line 351800N
Fig. 6	Smooth-model inversion, line 350200N
Fig. 7	Smooth-model inversion, line 340400N

Data Quality

The data are typically of good quality. Error bars on resistivity and phase are generally ±10% or better, although data at 2048 Hz is often somewhat noisier. Data near the power line on lines 353000N and 352600N are very noisy and reflect strong cultural contamination.

Data Interpretation

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Near-Field Effects

The extremely high resistivities in this area place most of the data in the near-field zone. The transition zone notch typically occurs near 1024 Hz, with near-field saturation occurring at frequencies of about 256 Hz and below. In general, only data at 4096 Hz are truly in the far-field zone. Figure 2 shows averaged magnetic-field magnitude curves for each line as an illustration of the onset of near-field data (see Zonge and Hughes, in press). Figure 2 shows nearly constant magnetic field amplitudes at frequencies below 256 Hz. Frequency independent magnetic-field amplitudes are characteristic of near-field data.

The occurrence of near-field data has important implications for this project. Near-field data are more sensitive to lateral variations in resistivity than far-field data and penetration depths are controlled more by the geometric relationship between source and receiver than by frequency. Reducing the frequency of a near-field measurement will not achieve greater depth penetration.

The implication of this is that data below 256 Hz should be interpreted with great caution. Above 256 Hz, the soundings generally are sensitive enough to frequency to be useful for interpretation.

Surface Anisotropy Effects

The northern three lines have data which suggest a very pronounced conductor at the surface. Plots of log(resistivity) versus log(frequency) show responses which are far more exaggerated than would be expected from a 1D (layered) environment. It is probable that the effect is due to strong surface anisotropy. The anomalously high phase-difference values observed at Basin Lake are also consistent with anisotropic geology. The effect is strongest on the most northern line, diminishing to the south. It is possible that the glacial cover to the south mitigates the anisotropic response. Alternatively, the anisotropic material may be confined to the north of the east-west fault shown in figure 1. Anisotropic geology is probably contributing to the dramatic contrasts in apparent resistivity observed in this area.

Cultural Contamination

Two cultural features are observed in this data set. The most disruptive is the power line which crosses the two northern-most lines. This causes two problems: high noise levels and current-channeling.

High noise levels not only cause scattered data values, but may also saturate the CSAMT magnetic antenna. The result is noisy, peculiarly shaped resistivity sounding curves within several stations of the power line.

Current-channeling is particularly troublesome at Basin Lake due to the high surface resistivities. The CSAMT source fields are strongly coupled into the transmission wires. This problem is exacerbated by the fact that the western electrode of the source bipole was placed very close to the power line. This may

have allowed direct conduction of current down the power line into the area of exploration.

The data show unrealistic patterns of high and low resistivities beneath the power line. These patterns are typical of high-power transmission lines and of direct current-channeling from the source bipole. The result is that several stations on either side of the power line on the northern two lines are not suitable for interpretation. The data have been removed in the smooth-model inversions. This interrupts the continuity of the lines, but the remaining data set is still interpretable.

Topographic Effects

The survey area is relatively flat and produces insignificant topographic effects. Steep topography to the east of the survey area has no discernable effect on the CSAMT data.

Line-by-Line Interpretation

Line 353000N. This line was run with 80 meter dipoles, and part of it was detailed with 40 meter dipoles. Measurements from both data sets are in close agreement.

The 80 meter static-corrected data (plate 1) show surface anisotropy and power line contamination, as discussed above. Figure 3 shows the smooth-model inversion. A nearly vertical contact occurs near station 300, with resistive material to the west and more conductive material to the east. At depth the contact may assume a more easterly, shallower dip. This effect is more pronounced on this line than on any of the other four lines evaluated in this report.

Figure 3 appears to outline a conductive body between stations 300 and 520. Such a body may be of strong exploration interest. However, a key point to note is that the resistor centered on the power line gives this conductor its distinct shape. If the resistor is real, then the conductor is a localized feature; if the resistor is artificial, the conductor is more likely to be the west end of a broad conductive area, a less interesting result. Hence, it is crucial to understand the nature of the resistor.

The fact that the resistor is centered on the power line is not encouraging. Looking at plate 1, we note that all the surface within two stations of the power line is anomalously resistive. The resistor in figures 3 is the result of resistive stations which we did not choose to blank out of the inverted data. It is our opinion that the resistor is artificially induced by the power line.

This finding weakens support for a distinct conductive body in this area. However, magnetic-field information indicates strong lateral contrasts. In the 40 meter dipole data there is a symmetric pattern of low magnetic-field amplitude at station 300, flanked on both sides by symmetrical high amplitude values. The feature is some 200 meters in apparent width. The electric field shows little disturbance in this area; hence there is a distinct resistivity feature near station 300. The feature's unique behavior and almost perfect symmetry suggest a narrow sheet-like or pipe-like vertical conductor. Its lateral dimension is probably less than 80 meters.

We conclude that there is evidence for a steeply-dipping, distinct conductor centered near station 300. The evidence is not conclusive. However, even if one adopts the conservative view that there is no distinct conductor but only a geologic contact, the steep contact at station 300 may still of strong exploration interest.

Other conductors are found east of the structure. The most prominent are found between stations 920 and 1000 and on the extreme east end of the line. These are strong in amplitude and coherent in shape, and might represent exploration targets.

The pronounced apparent resistor centered at depth below station 840 is in the deep near-field and may very well be a geometric effect unrelated to geology under the measurement location. Based upon the available data, no firm conclusion can be drawn on this feature.

Line 352600N. Plate 3 shows the static-corrected resistivity data for this line. Note the power line crossing at station 200. Figure 4 shows the more useful smooth-model inversion. As on the previous line, there is a contact associated with an apparent conductor dipping steeply to the east, this time on the far west end of the line. Unlike the previous line, however, the ground to the east of the contact is not consistently conductive all the way to the east.

As before, we consider whether or not the conductor below station 120 is real or not. Again there is a resistor west of the power line which may be artificial, tending to enhance the appearance of a conductor. But the magnetic field again shows a symmetrical perturbation similar to that observed on line 353000N, suggesting a steeply-dipping conductive sheet or pipe. Thus it is probable that the conductor is real; certainly there is a major contact there. The dip is roughly 70 degrees to the east, as opposed to the near-vertical easterly dip on line 353000N. This might represent an attractive exploration target.

The other feature of interest on this line is the conductor centered on station 1240 and the deeper conductor to the west and deeper. Actually these are both lows in a broad conductive zone which drops roughly vertically from the surface, then dips at an intermediate angle to the west. Although more data would be needed to the east in order to better define this feature, it is most likely a conductive structure.

Line 351800N. Plate 4 shows the static-corrected data for this line. No culture crosses the line to disturb the interpretability of the data.

Figure 5 shows the smooth-model inversion for the line. A narrow conductor is observed beneath station 120. The data do not extend far enough to the west to fully define it, but it appears that the conductor is narrow (probably less than 80 meter wide) and steep in angle (nearly vertical, with a possible westerly dip at depth). This may be the same conductor observed on the more northern lines, but here it is much less pronounced.

A second conductor is observed on the east end of the line at depth. It is broad (roughly 100 meters) and dips at perhaps 75 degrees to the west. It is similar to the one observed on line 352600N but may be deeper.

Line 350200N. Plate 5 shows the static-corrected data for this line. The data behavior is very "normal," with no peculiar surface or other effects.

Figure 6 shows the smooth-model inversion for the line. A narrow conductor is observed beneath station 120, as on line 351800N. The data suggest only a moderate conductor, narrow in width (perhaps 50 meters), with a very nearly vertical dip. It is evident only in the intermediate depths, not at the surface or at depth.

There are no other conductors evident on this line.

Line 349400N. Plate 6 shows the static-corrected data for this southern line. Figure 7 shows the smooth-model inversion for the line. The conductor seen on the other lines is not immediately evident here, but we speculate that it is the feature barely detected by station 40. If so, it confirms a NNE trend to the conductor.

A broad, moderately conductive zone is observed between stations 520 and 880. It seems to be intermediate in depth, not coming to the surface or extending very deep. It is thus similar to the feature seen on line 350200N.

Conclusions

From a geophysical viewpoint, the data clearly identify two interesting conductive features. Communications from Billiton Australia indicate that the western conductor on the northern lines is the most interesting exploration target. Despite complications from the power line, we consider this to be a real conductor which is associated with a significant structure or contact. The feature's appearance on both line 35300N and 352600N indicate that it is a conductor with significant strike extent.

Billiton may benefit from additional processing on the remaining six lines of CSAMT. We took a quick look at two of these, and believe more work could be profitable. Scott MacInnes can discuss the details if you wish.

References

Zonge, K.L., and Hughes, L.J., in press, Controlled source audio-frequency magnetotellurics, *in* E.M. Methods, M.N. Nabighian (Ed.), Society of Exploration Geophysicists.

Scott MacInnes Geophysicist

Norm Carlson Geophysicist

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CSAMT Smooth-model Inversion

Smooth-model inversion is a robust method for converting CSAMT measurements to profiles of resistivity versus depth. Observed apparent resistivity and phase data for each station are used to determine the parameters of a layered-earth model. Layer thicknesses are fixed by calculating source-field penetration depths for each frequency. Layer resistivities are adjusted iteratively until the modeled CSAMT response is as close as possible to observed data. Smoothness constraints restrict layer resistivities to minimum variation from layer to layer.

The algorithm for calculating the CSAMT response of a layered model includes the effects of finite transmitter-receiver separation and a three-dimensional source field. Accurate impedance values are calculated for all frequencies and transmitter-receiver separations.

The result of smooth-model inversion is a set of estimated resistivities which vary smoothly with depth. Lateral variation is determined by inverting successive stations along a line. Results for a complete line can be presented in pseudosection form by contouring model resistivities. For contouring, resistivity values are placed at the midpoint of each layer, forming a column below every station. The columns form an array representing modeled resistivities in cross-section.

Inverting apparent resistivity and phase to a smoothly varying model resistivities is an effective way to display the information inherent in CSAMT measurements. Smooth-model inversion does not require any a priori estimates of model parameters. The data are automatically transformed to resistivity as a function of depth. Models with smoothness constraints are complementary to more detailed models incorporating a priori geologic constraints.

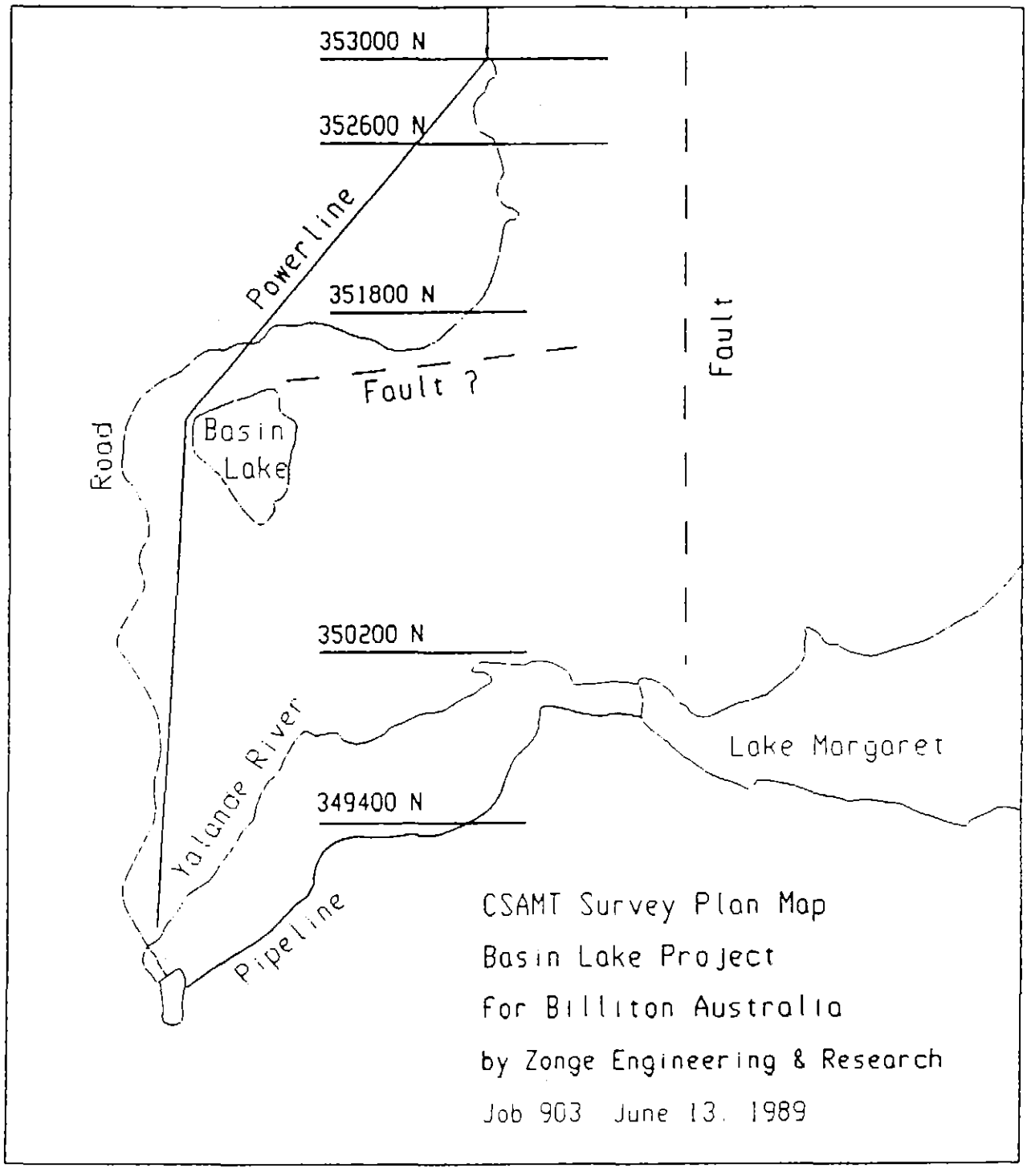

Figure 1: CSAMT line location map.

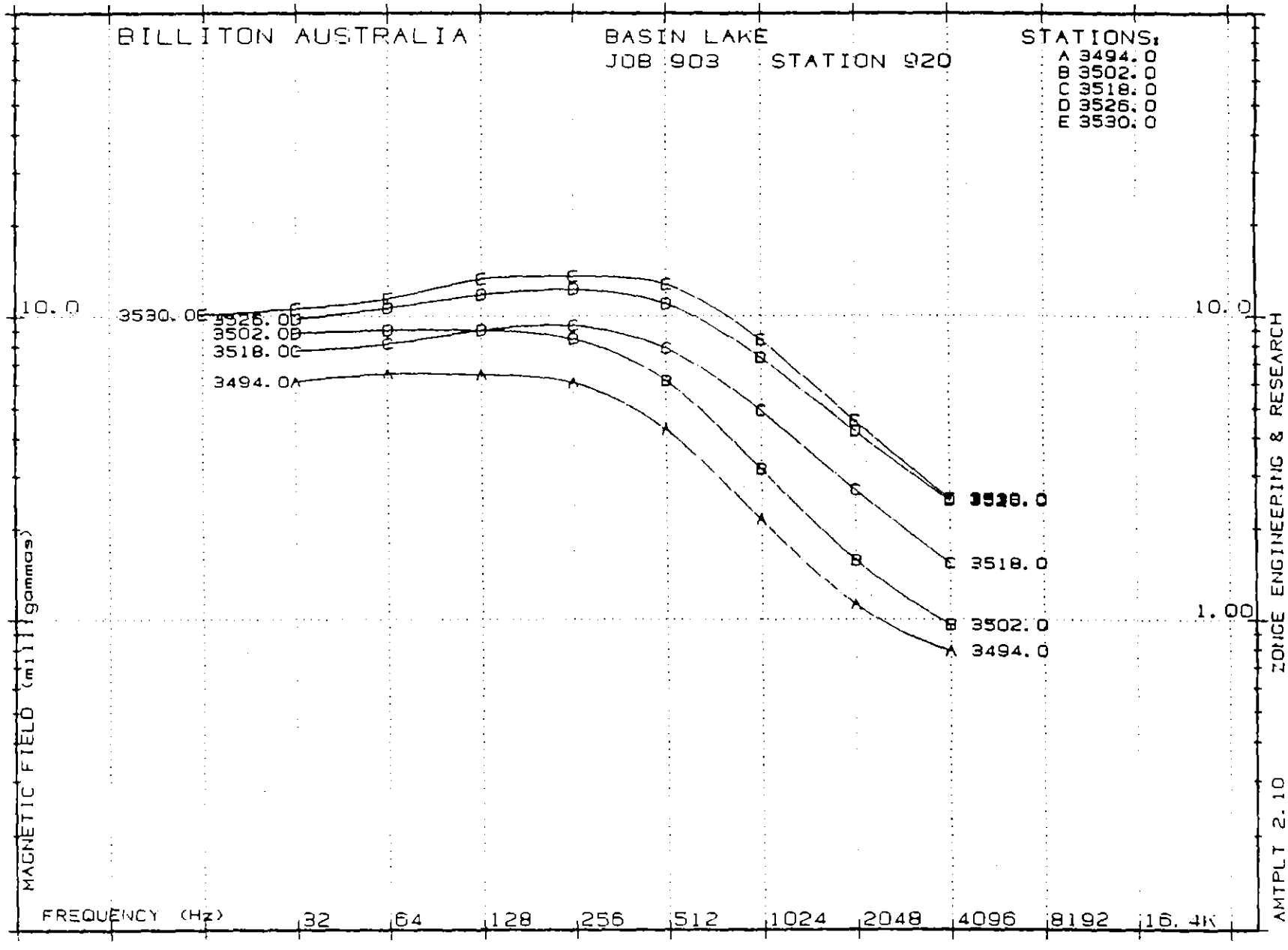

Figure 2: Log-log plot of magnetic-field amplitude versus frequency.

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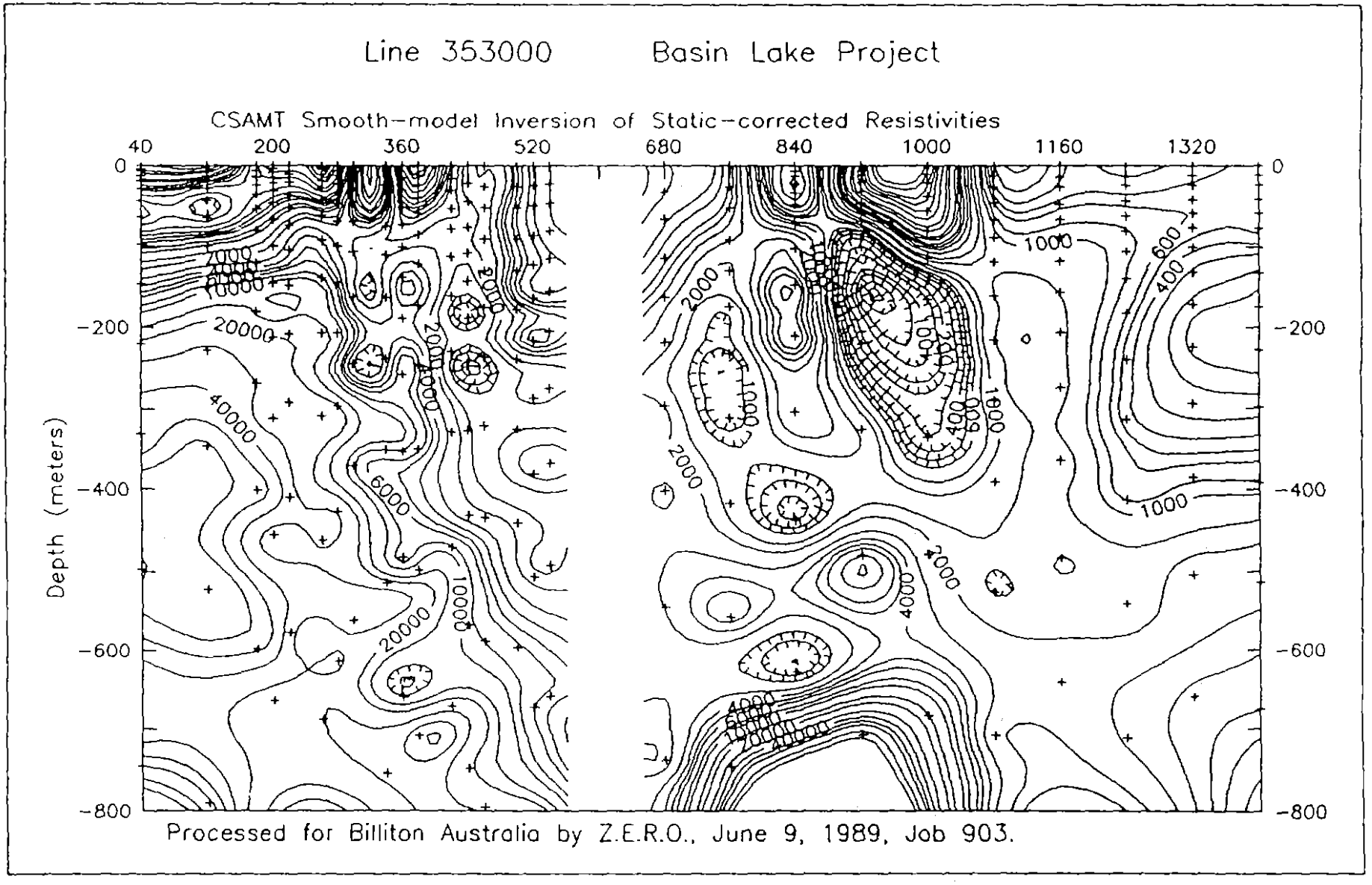

Figure 3: Smooth-model inversion for line 353000N.

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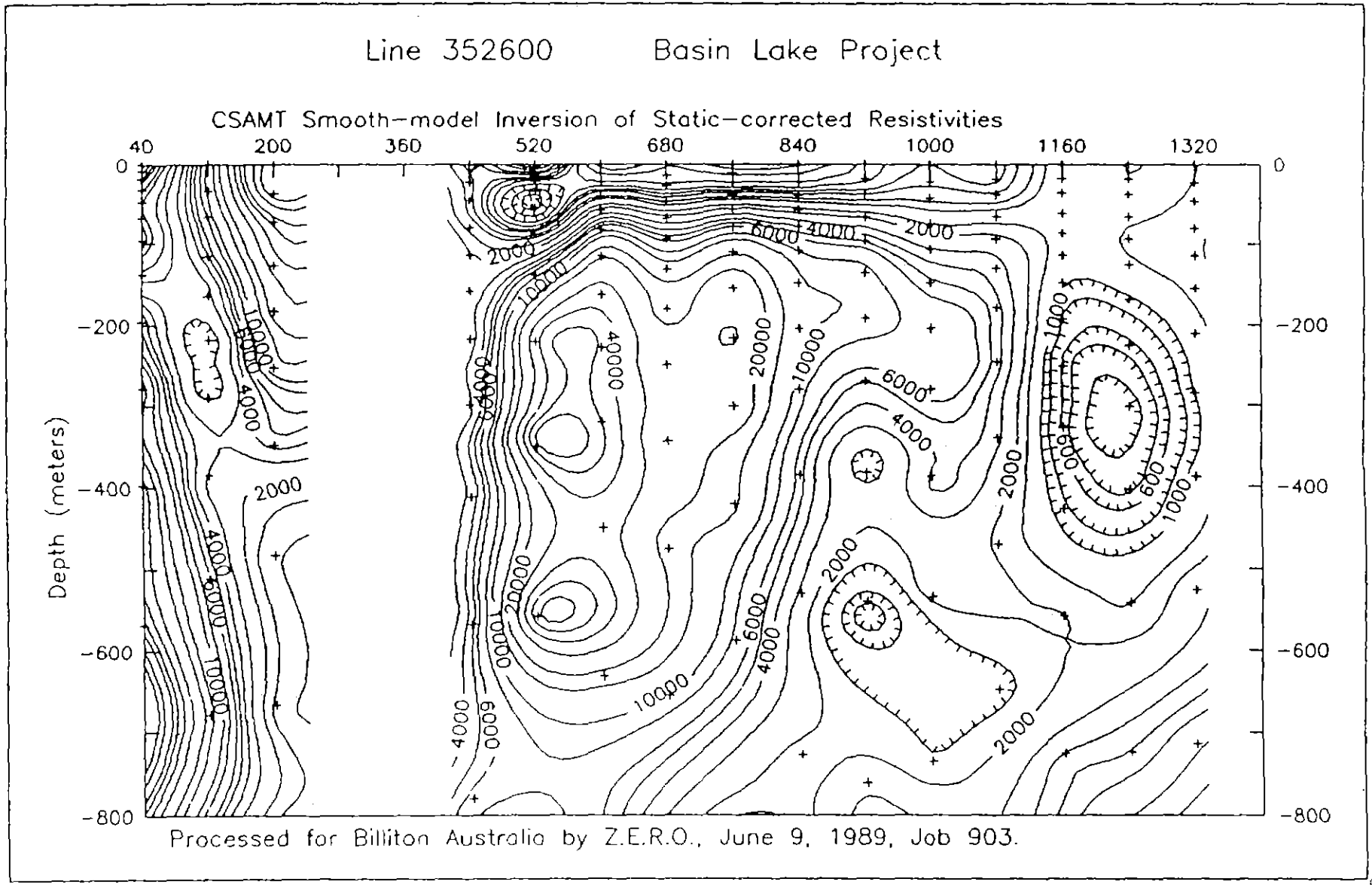

Figure 4: Smooth-model inversion for line 352600N.

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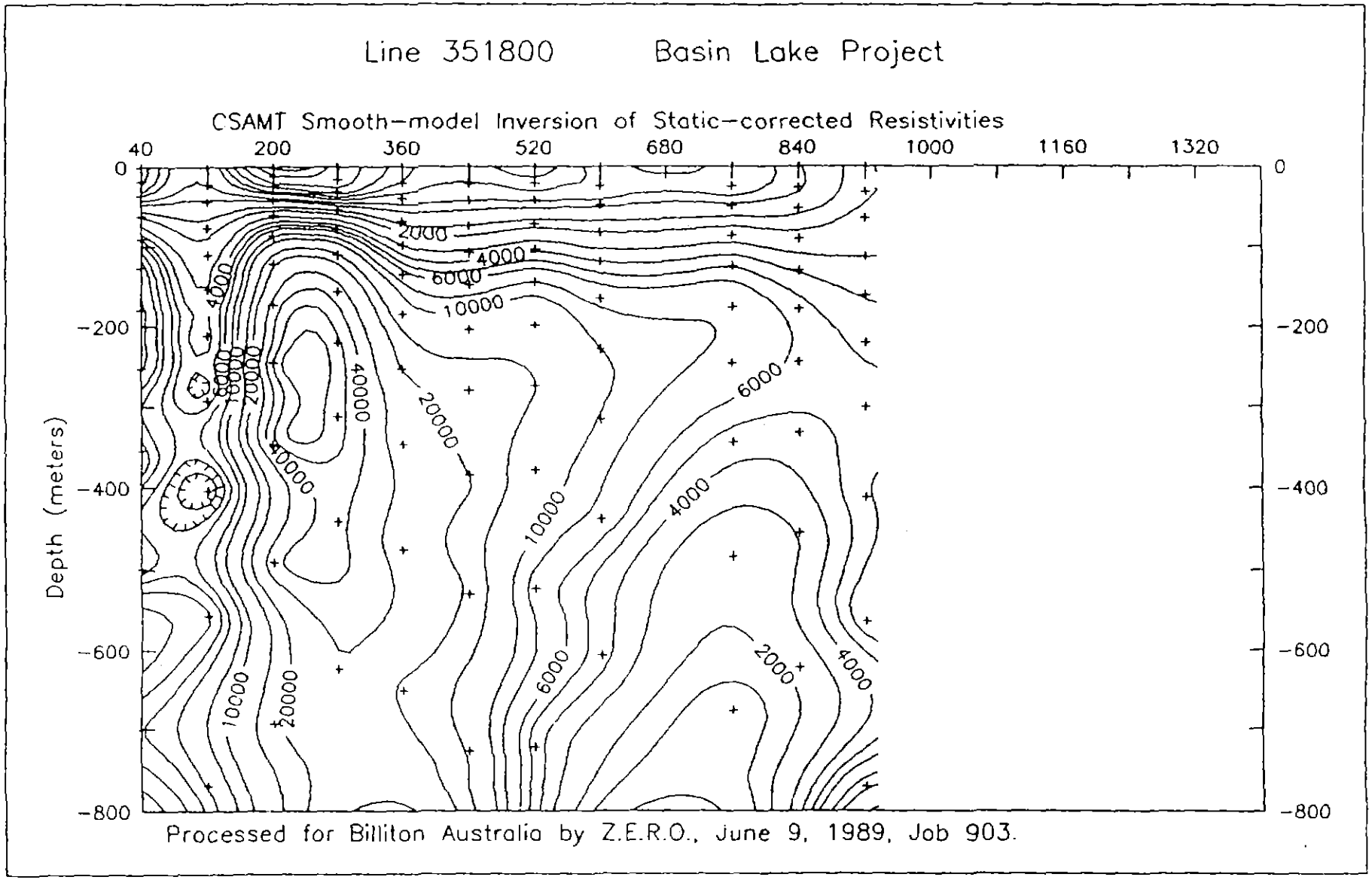

Figure 5: Smooth-model inversion for line 351800N.

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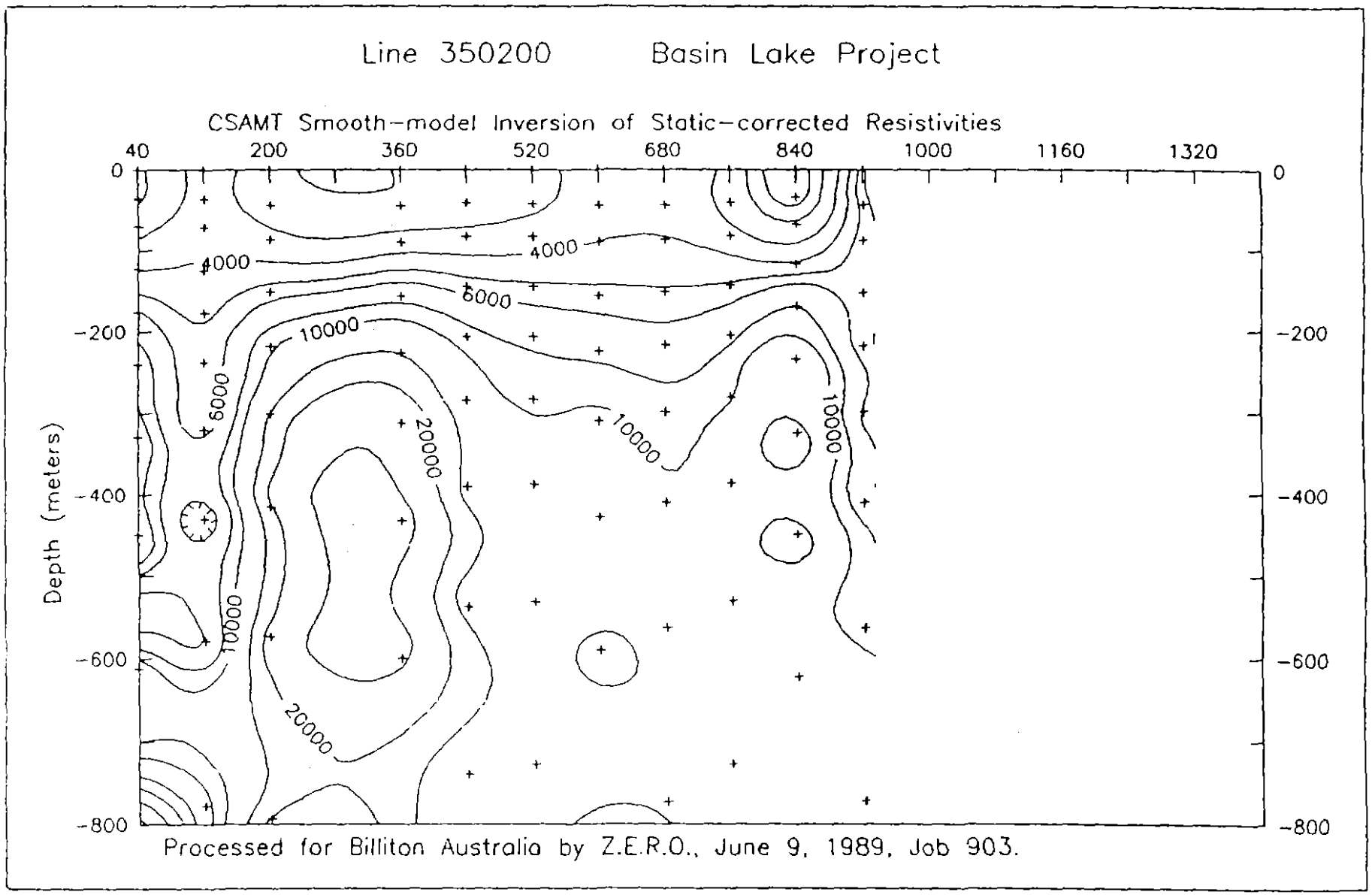

Figure 6: Smooth-model inversion for line 350200N.

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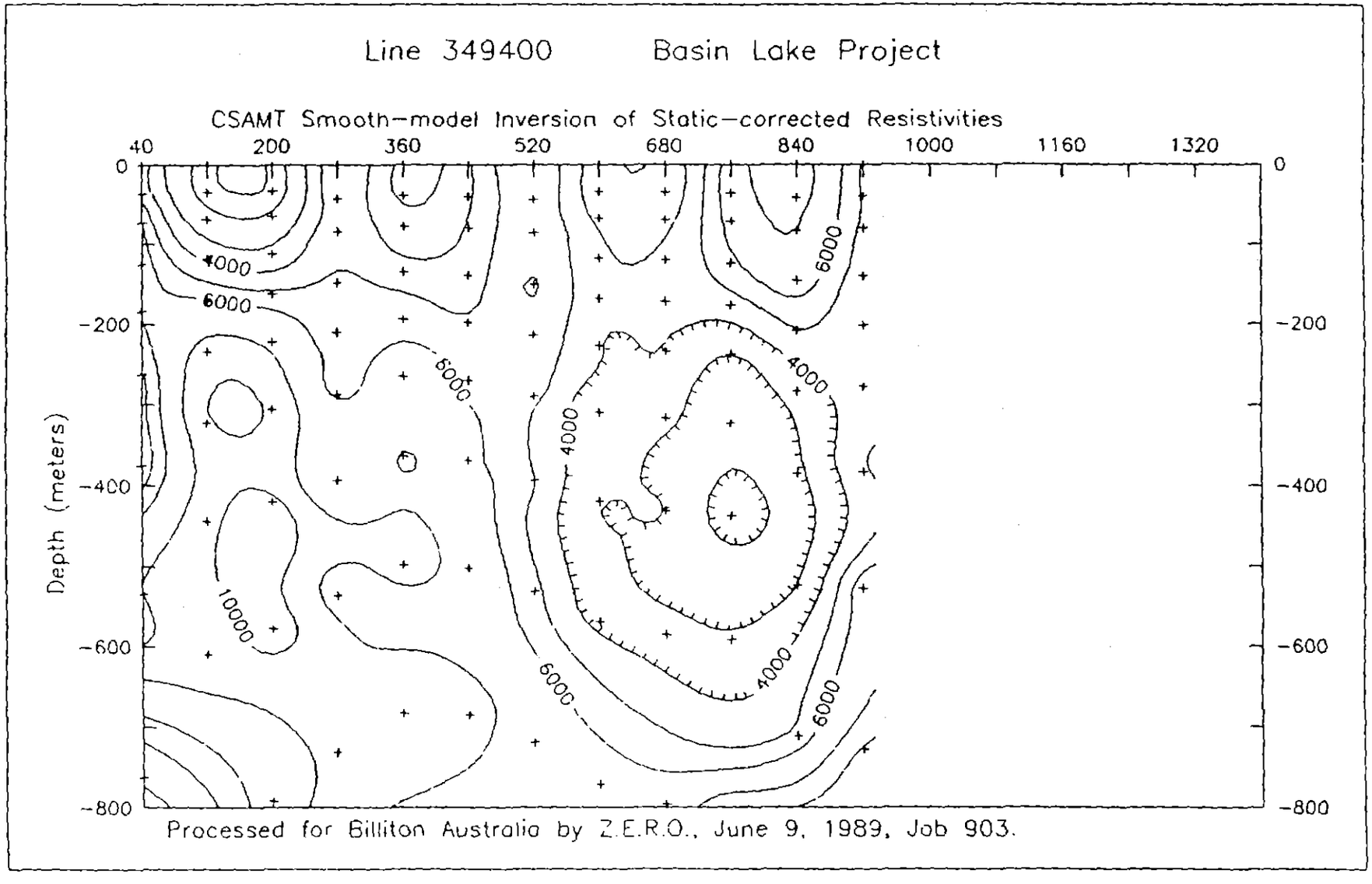

Figure 7: Smooth-model inversion for line 349400N.

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APPENDIX III

CSAMT SURVEY INTERNAL MEMO
Billiton MEMO on survey results

Copied from the APPENDIX of
Creagh, C. J., and Hungerford, N., 1990, E.L. 103/87 - Basin Lake, Progress report on Exploration for the period Ending 21st April 1990; TCR Report No. 90-3099

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607151 LD57 744

MEMORANDUM

DATE: 10 April 1990

FROM: BXN:MELBOURNE

TO: BXH:DEVONPORT

SUBJECT: BASIN LAKE CSAMT SURVEY - MARCH 1990

Herewith a few preliminary comments on the results.

There do not appear to be any CSAMT anomalies characteristic of a large deposit of massive sulphides, although there are some conductors worth remarking on. However, some of these have already been detected as UTEM anomalies and drilled. In general, the CSAMT survey seems to have detected great lateral variability in resistivity, giving rise to unusual phase effects. These are probably due to considerable lateral changes in lithology across a mixed and steeply-dipping sequence of volcanics and sediments. The only area which appears to lack variability is the north-west of the grid, where there are presumably more massive monotonous rocks (porphry?).

353400N: Low resistivity zone at 81020E. Correlates with carbonaceous shale unit drilled by BL2 (UTEM anomaly).

353800N: BL4 tested a low resistivity zone (UTEM anomaly) at 80560E and intersected black pyritic shales. There is also an interesting conductor at 80880E which appears not to have been tested. It may, however, be a strike continuation of the conductor drilled by BL2 (see RGC's UTEM plan - conductor G). There were no significant conductors tested by the Leech Hill drill hole.

354200N: TYN-2, originally drilled on an IP/Resistivity anomaly, intersected a black shale unit mildly anomalous in base metals. It was also a weak UTEM anomaly and is a CSAMT conductor.

354600N: A conductor at 80360-80440E may well be a further continuation of the conductor mentioned on 353800N. It correlates with UTEM trend D.

355800N: TYN-1 appears to have drilled to the west of a CSAMT/weak UTEM conductor at 81080E which has an unusual phase response (due to nearby powerline). An interesting response also occurs at 81400E which must be close to the Great Lyell Fault.

356200N: A conductor occurs at 81000E which is probably related to the one on 355800N. TYN-4 appears to have drilled this position, but not clearly explained the UTEM and CSAMT conductors. (The UTEM anomaly was attributed to a glacial trough). Down-hole TEM is really required to determine whether a bedrock conductor occurs near TYN-4 which appears to have intersected some quite interesting rock types. A nearby conductor at 81160 is also of some interest (not covered by UTEM).

356600N: TYN-3 and TYN-5 tested a weak UTEM conductor and intersected pyritric black shales (TYN-3). These shales are evident as a CSAMT conductor at 380880E. A conductor also occurs at 381320E. This appears to have a dip to the east and some phase correlation, which makes it interesting. There is no UTEM coverage.

357000N: A conductor at 80700E may be a continuation of that tested by TYN-3. There is also a weak conductor at 81580E adjacent to the great Lyell Fault.

CONCLUSIONS:

There do not appear to be many strong CSAMT anomalies that have not been already tested by drilling on UTEM anomalies. The exceptions are at the eastern end of line 355800N, and on 353800N at 80880E, and on 356600N at 381320E. These are all worth ground checks prior to deciding on drilling.

Transparencies of the CSAMT profiles will be sent to you from Melbourne drafting in due course.

Some data-processing is still being completed by Zonge. I will do a final interpretation when I return.

N. Hungerford
Chief Geophysicist

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APPENDIX IV

CSAMT SURVEY RESULTS FROM THE BILLITON 1989-90 BASIN LAKE SURVEY

Hardcopy and digital data
produced by Zonge December 1998
Job # 421

607154

cp

Data Processing Checklist for Goldfields Exploration
Job # 421
29 December 1998

Job 864 Basin Lake CSAMT

Line	Stations	A-sp	CagR	ZPHz	StaR
349000N	40-920E	80m	X	X	X
349400N	40-920E	80m	X	X	X
349800N	40-920E	80m	X	X	X
350200N	40-920E	80m	X	X	X
350600N	40-920E	80m	X	X	X
351000N	40-920E	80m	X	X	X
351400N	40-920E	80m	X	X	X
351800N	40-920E	80m	X	X	X
352200N	40-1320E	80m	X	X	X
352600N	40-1320E	80m	X	X	X
353000N	380180-380580E	40m	X	X	X
350000N	380040-381400E	80m	X	X	X

TOTAL NUMBER OF LINES = 12

Job 968 Basin Lake CSAMT

Line	Stations	A-sp	CagR	ZPHz	StaR
3000N	79040-79920E	80m	X	X	X
3400N	79020-81580E	40m	X	X	X
3800N	79040-81600E	80m	X	X	X
4200N	79040-81440E	80m	X	X	X
4600N	79000-81560E	80m	X	X	X
5000N	79080-81560E	80m	X	X	X
5400N	79080-81560E	80m	X	X	X
5800N	79080-79640E	80m	X	X	X
5800N	80360-81080E	80m	X	X	X
6200N	80040-81560E	80m	X	X	X
6600N	80040-81560E	80m	X	X	X
7000N	80060-81620E	40m	X	X	X
7000N	80060-81020E	80m	X	X	X

TOTAL NUMBER OF LINES = 13

99_4375B

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Hill. R.: Vicary. M.J. EL19/98

607155

APPENDIX 6

Zonge trails of Inversion on Billiton Basin Lake CSAMT Data

M Asten, 1999

Flagstaff Geo-Consultants

Note to: Michael Vicary
Senior Geologist, Goldfields Exploration

From: Michael Asten

22/2/99

RE: Zonge trials of inversions on Biliton Basin Lake CSAMT Data

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Paul Hamlyn	Geologist
Michael Asten	Geophysicist
Ross Caughey	Geologist
Alaster Edwards	Geologist

Zonge have completed a set of 1D CSAMT inversions (includes far-field, near field and transition-zone modelling) and a set of 2D AMT inversions (uses far-field data only, and is distorted by transition-zone effects).

For each line supplied, Zonge performed

- 1D inversion on Cagniard resistivities without static correction
- 1D inversion on Cagniard resistivities after Zonge 5-point static correction
- 1D inversion on Cagniard resistivities after EMAP-filtering (data-adaptive) static correction performed by myself
- 2D inversion on each of the above.

In addition to Zonge inversion products, I have supplied

- Frequency pseudosection of EMAP-smoothed Cagniard resistivities
- Parasection of Bostick depths
- Interpolated parasection of Bostick depths.

Lines processed were

- Mt Lyell public domain data, Line 29000W (also known as 586M30).
- Basin Lake line 352600N
- Basin Lake line 353000N.

INTERPRETATION

Bear in mind that frequency pseudo-sections, Bostick inversions (by Flagstaff), 1D inversions (by Zonge) and 2D inversions (by Zonge) are all representations of the CSAMT data, not interpreted sections, and each representation has its own strengths and weaknesses in terms of how noise in the data affects the image, and in how processing limitations affect the output

Flagstaff Geo-Consultants includes A & J Edwards & Associates Pty Ltd ACN082 417 810, Chromite Pty. Ltd. ACN 006 151 079, Cropten Pty. Ltd. ACN 006 146 441, Earth Bytes Pty Ltd CAN 081 437 587, Geophysical Exploration Consultants Pty. Ltd. ACN 005 890 415, Hungerford Geophysical Consultants Pty. Ltd. ACN 064 811 490, Michael Asten & Associates Pty. Ltd. ACN 077 755 474 and Ore Research and Exploration Pty. Ltd. ACN 006 859 856.

image. Interpretation is therefore best done by comparing multiple representations of the data with known geological constraints.

Mt Lyell Line 29000W

Frequency pseudo-sections of raw Cagniard resistivities and Zonge static-corrected data both show strong static effects which are visible as vertical striping. Such striping is also apparent on 1D inversions.

EMAP-filtered data shows oblique "shape" to the conductors, on each of the frequency pseudo-section, the Bostick depth parasection, and the1D inversion parasection. (Note that the eastern edge of the line is corrupted by strong noise in middle frequencies, which appears to give false conductive anomalies). Do we have geological data on dip of Mt Lyell mineralisation and alteration at depth?

The FW lens and EP17 lens, at positions noted by Bishop and Lewis (1988), are the most obvious near-surface conductors. The most interesting new results are conductors at 750mE 300 m depth, and 450mE 500-600m depth. Both these conductors show on Bostick and 1D inversions.

The 2D inversions for Mt Lyell Line 29000E are curious. The three inversions (no static corrections, Zonge static corrections, and EMAP corrections) give remarkably similar parasections, despite the fact that the frequency pseudo-sections from which they are derived, are very different. This result should be followed up further with Zonge. (Note that 2D inversions are restricted to the depth range 300 m, by their requirement that input data be strictly far-field data).

Basin Lake (Biliton) Line 352600N

Pseudosections and 1D inversion parasections appear to show a near-surface conductor at 380840E, corresponding to a known siltstone, and an apparent conductor at 381240E 300-500m depth which appears to be the target for drill-hole BL001.

However when the data is EMAP-filtered, the near-surface conductor is barely visible, ie it is largely a static effect. The siltstone thus appears not to be visible in the data. This result is quite explicable, in that a narrow sub-vertical conductor parallel to strike, is expected to be "transparent" to CSAMT with this transmitter-receiver geometry (transmitter oriented E-W and placed perpendicular to strike). We would expect however, that an alteration zone having significant width, would be visible in CSAMT data with this transmitter-receiver geometry.

On the EMAP-filtered data, we also observe that the deep conductor, while still present in the images, is both west-shifted and deeper after the removal of statics. It is best seen on the frequency pseudosection and the interpolated Bostick depth parasection, at 381160mE 350m depth, ie it appears to be about 100m below the zone tested by hole BL001. [Geophysical note: This conductor requires some caution in interpretation, as it lies near the CSAMT transition zone notch. However the fact that it shows a lateral maximum, and shows in 1D

inversions which include a correction for the transition zone, suggests that evidence for a real conductor is significant.]

The 2D inversion parasections from Zonge are again curious, in that the images of raw and static-corrected data are very similar, despite frequency pseudo-sections input to the inversion being very different. It is intriguing to note that the two known siltstones on the geological section lie close to two conductors shown on the 2D inversions; I don't dismiss the importance of this, but I find it almost too good to be true in the context of all the above discussion.

Basin Lake (Biliton) Line 353000N

Results in terms of static correction on this line are very similar to those noted above for Line 352600N.

The most interesting result is evidence for a conductor at 381160mE 350m depth, which aligns with that observed on Line 352600N. Hole TYN015 has drilled beneath this zone, so as with the previous line, there is some evidence for an untested conductive zone near the qz-porphry/dacite boundary, and extending east in the dacites. Whether this zone can justify a further drill hole depends on whether the prevailing geological model can accommodate the concept of a flat-lying alteration zone dominantly in dacites.

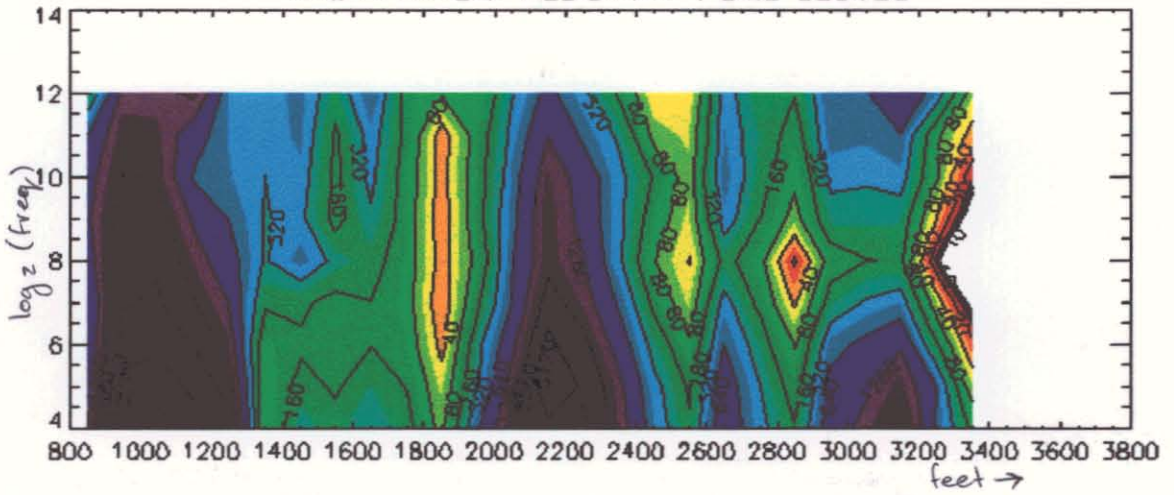
Another conductor, probably sub-vertical, can be identified at 380840mE, depth order 200m, and is probably evidence for the known siltstone horizon, although it does lie about 100m west of the siltstone horizon marked on the geological sketch provided by Goldfields. This conductor is imaged clearly on the 2D inversions by Zonge.

RECOMMENDATIONS FOR FUTURE CSAMT PROCESSING

The EMAP smoothing process is superior to the Zonge static correction process. I recommend that the existing lines of Biliton CSAMT data, and the Goldfields data to be acquired next month, be processed using the EMAP filter and Bostick inversion by Flagstaff, and that filtered data be inverted (1D) by Zonge. Use of 2D inversion by Zonge might be an option on an occasional basis, depending on results obtained from the routine processing recommended.

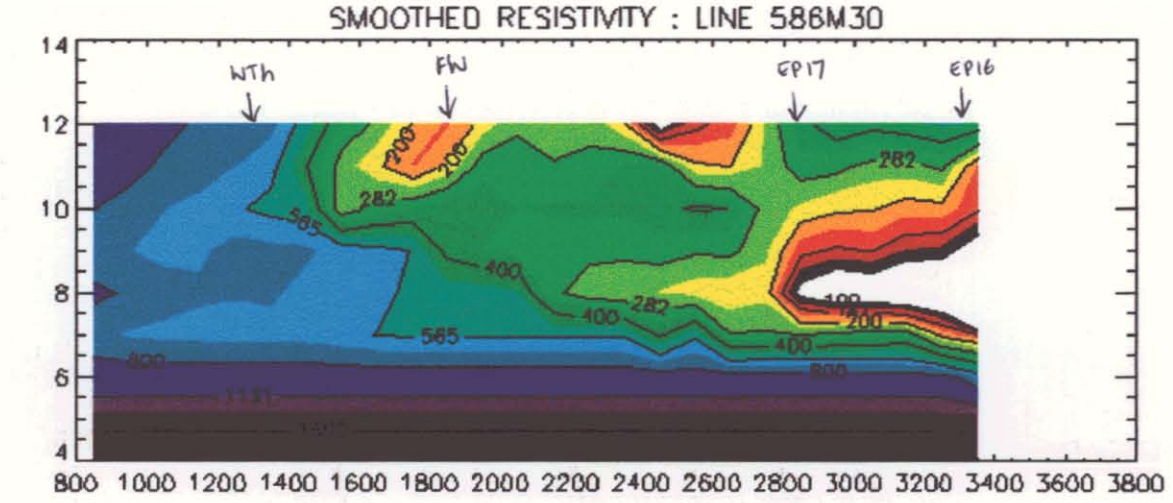
Michael W Asten
Consulting Geophysicist

RAW APPARENT RESISTIVITY : LINE 586M30



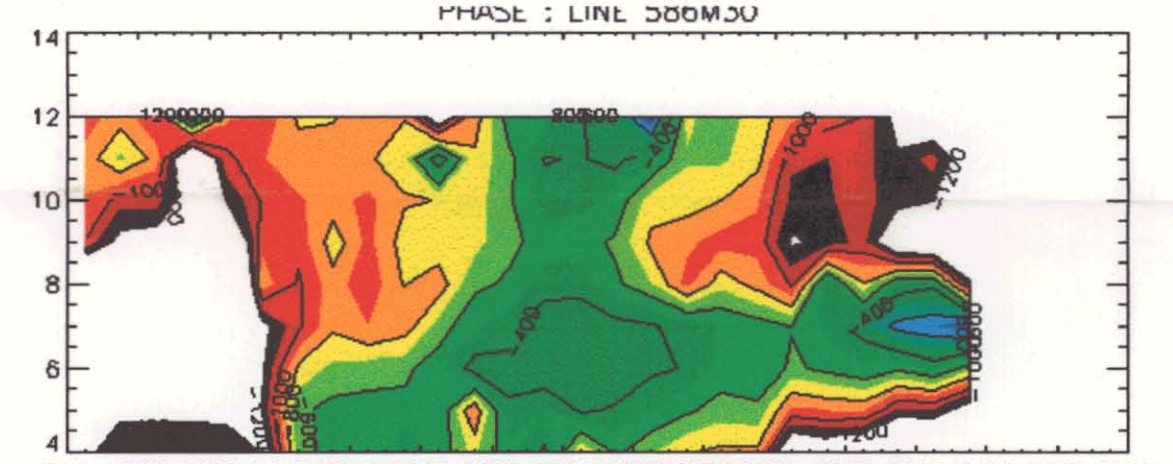
Zonge Stat-Corr RESISTIVITY : LINE 586M30

SMOOTHED RESISTIVITY : LINE 586M30



EMAP Filter Coeffs : LINE 586M30

PHASE : LINE 586M30



GOLDFIELDS EXPLORATION
Mt Lyell CSAMT Data 1986 LINE 29 W Re-Processed with EMAP filter Jan 1999
Drawn by: Flagstaff Geo-Consultants 14/1/99

Flagstaff GeoConsultants

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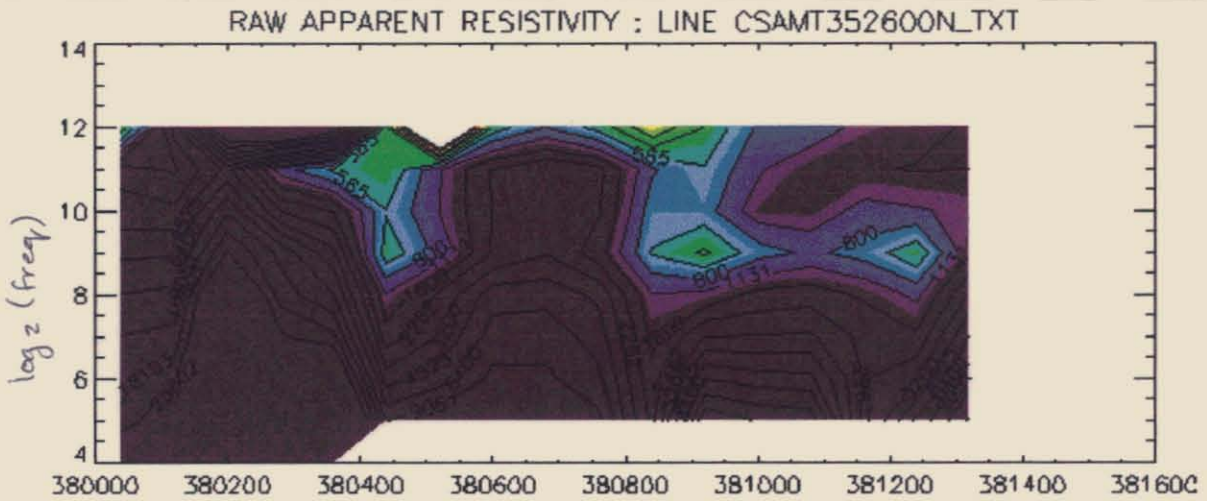

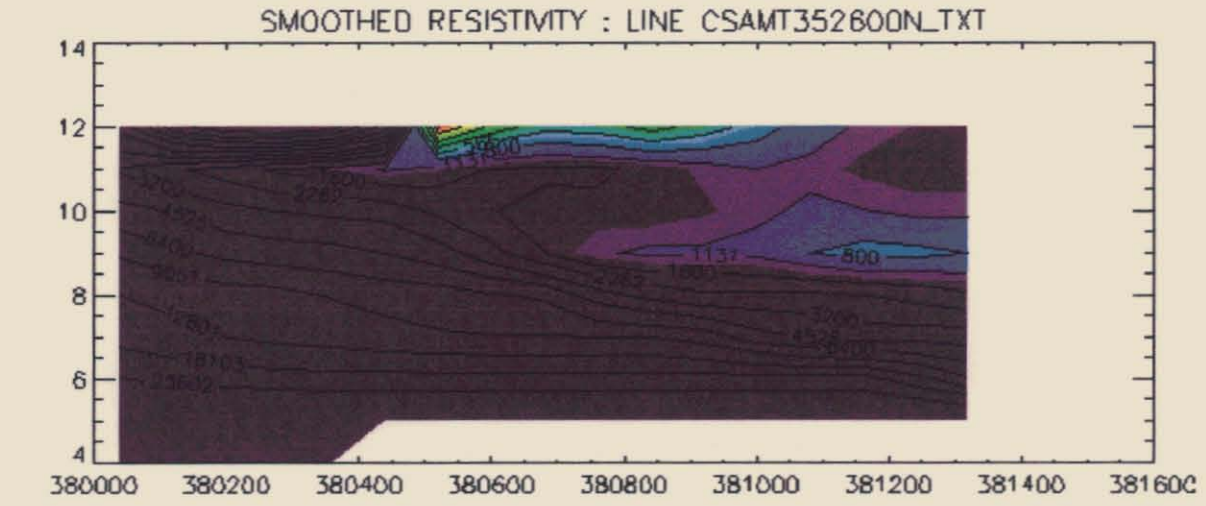

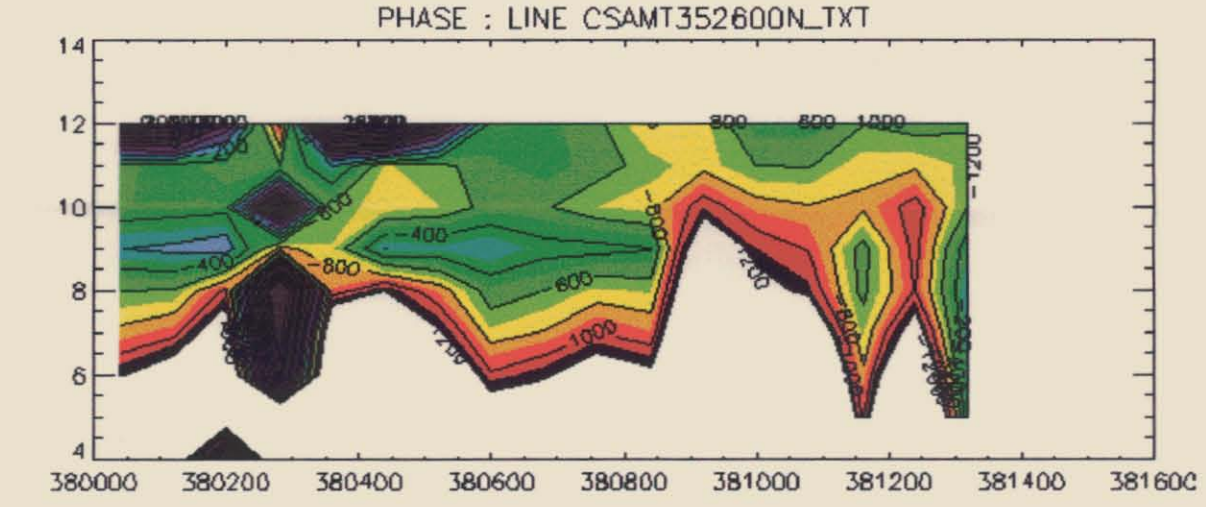

GOLDFIELDS EXPLORATION

BASIN LAKE CSAMT DATA 1989. Line 352600N

Re-Processed with EMAP filter Jan 1999

Drawn by: Flagstaff Geo-Consultants
14/1/99

Flagstaff GeoConsultants

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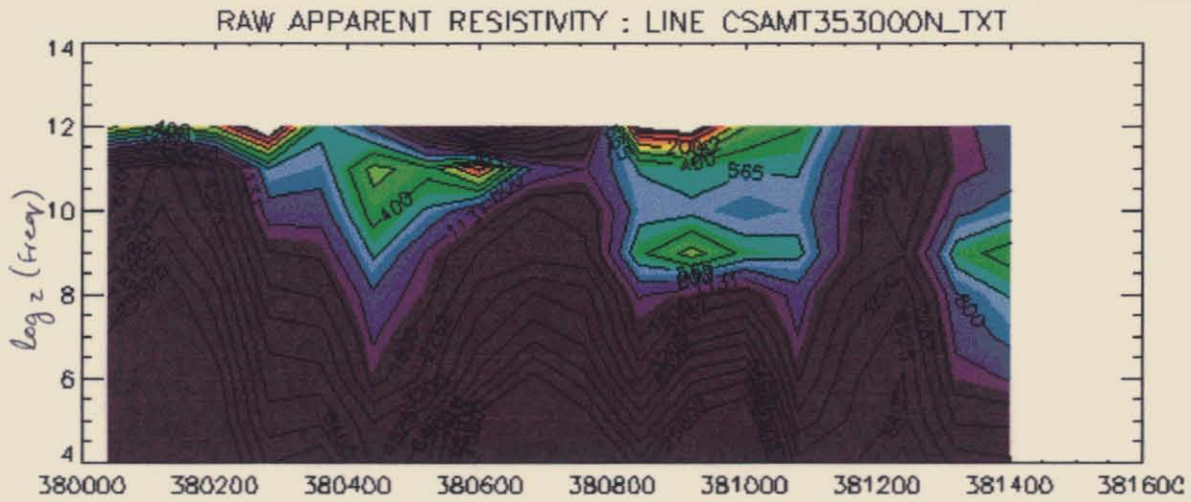

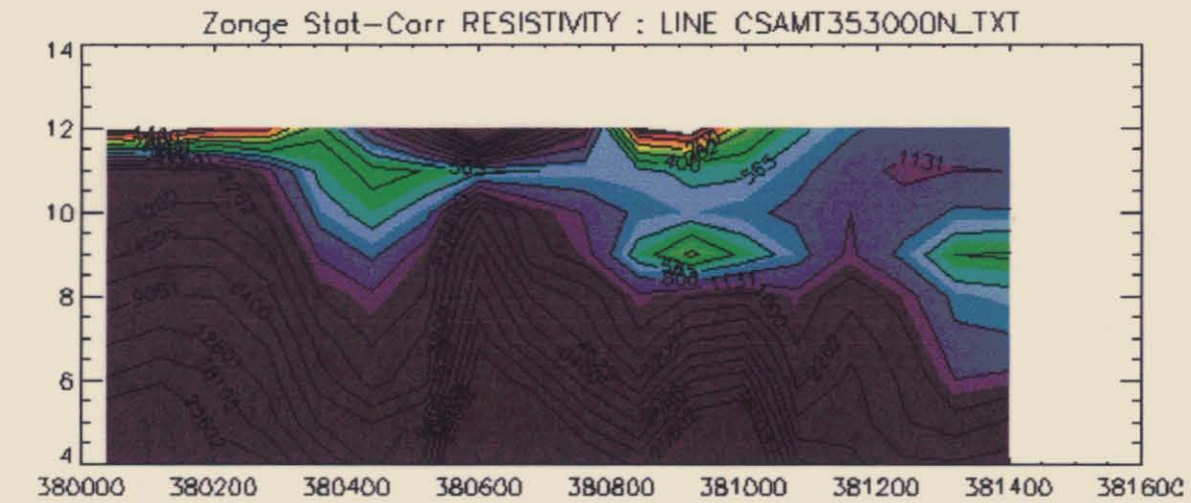

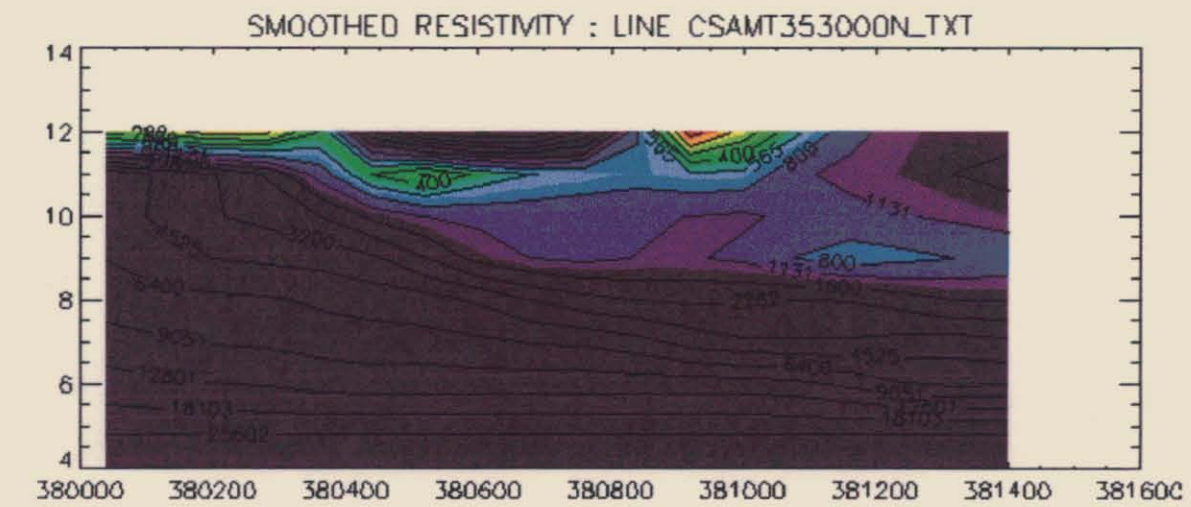

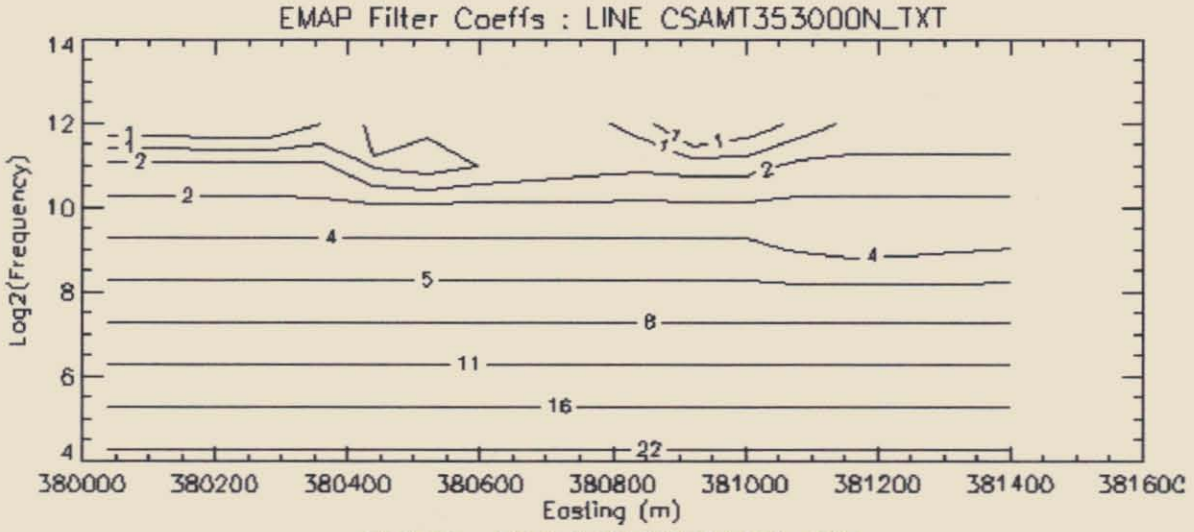

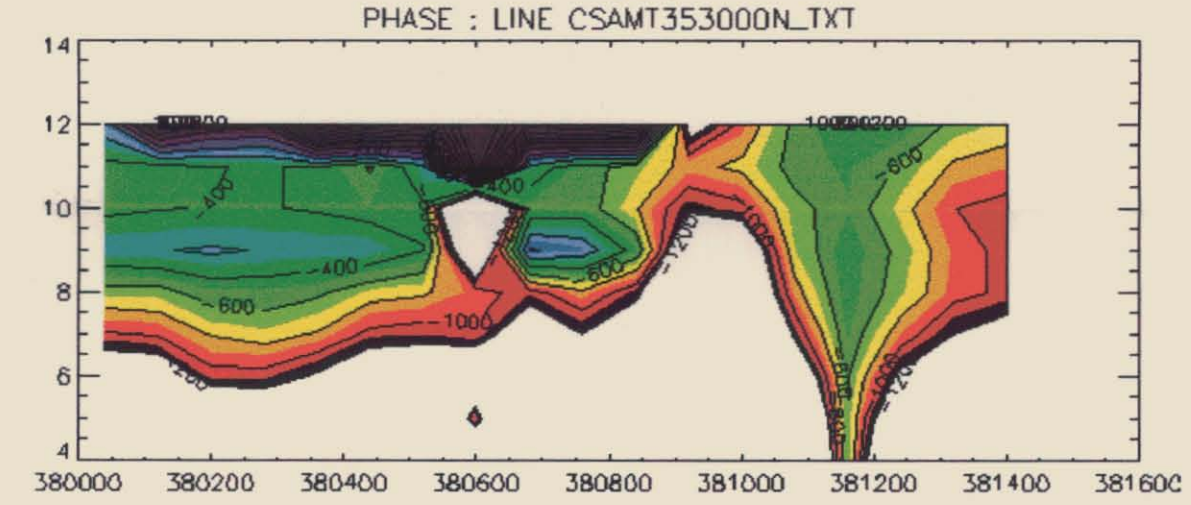

GOLDFIELDS EXPLORATION

BASIN LAKE CSAMT DATA 1989. Line 353000N

Re-Processed with EMAP filter Jan 1999

Drawn by: Flagstaff Geo-Consultants
14/1/99

Flagstaff GeoConsultants

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APPENDIX 7

Review of Billiton CSAMT Data Anthony Road Area. W Tasmania Basin Lake EL 19/98

M Asten, 1999

99-4375

607163

Flagstaff GeoConsultants

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Alaster Edwards	Geologist
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Review of Billiton CSAMT data
(Anthony Road area, W. Tas)
Basin Lake EL 19/98

Michael W. Asten.
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22/9/99

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INTRODUCTION

The Basin Lake (Anthony Road) area covered by EL19/98 was held by Billiton from 1987-91, who conducted two CSAMT surveys in 1988-90. This report presents a re-interpretation of that data, using recent processing enhancements plus more recent geological data for constraining the interpretation.

The historical data and known geology is described by Dauth (1999).

The Billiton CSAMT data covers lines at 400 m intervals from line 5351000N to line 5357000N (Five additional lines exist to the south, to 5354900N, but these are outside the EL, and have not been reprocessed).

The electric dipole spacing for the surveys was 80m, with the exception of lines 5353400N and 5357000N, where a dipole length of 40m was used.

The data appears to have been acquired in two surveys by Zonge Engineering and Research Organisation (Aust.) Pty Ltd, being Job 864 (Nov 1988) covering lines 5349000N to 5753000N, and Job 968 (Jan 1990) covering lines 5353400N to 5357000N.

Line 5353000N also contains a short section of data at 40m dipole spacing. Line 5357000N also contains partial coverage at 80m spacing. Such fragments of data have been viewed, but are not included here, as they appear not add to the information content of the survey.

A recent new survey conducted by Zonge for Goldfields Exploration (Feb 1999) gives a partial overlap, covering lines 5356200N to 5362000N, using 50m electric dipoles. The additional coverage, to the west of that covered in the Billiton data, shows resistive ground, and has therefore not been integrated into this data set.

Job 864 covering the southern lines used a maximum transmitter frequency of 4096 Hz. Later surveys used a maximum frequency of 8092 Hz, which gives better definition of nearr-surface resistivities in this resistive ground.

Data from jobs 864 and 968 was unarchived, re-processed and re-formatted by Zonge in Dec. 1998. The data was then converted to full AMG coordinates and filtered using the EMAP process (Torres-Verdin and Bostick, 1992) by this author. The EMAP filtering process gives a dramatic reduction in magneto-telluric static effects, which makes interpretation of the data via resistivity-frequency pseudo-sections significantly more reliable.

Note that conversion to true AMG requires re-labeling of line numbers; in particular the following lines are shifted:

OLD LABEL	NEW LABEL
352200N	5352135N
352600N	5352485N
353000N	5352920N.

The EMAP filtered data was then transformed to resistivity-depth parasections, using the Bostick transform (Jones, 1983). While the Bostick transform is a one-dimensional (layered-earth) transform, when coupled with EMAP filtering it gives results close to two dimensional inversion (Torres-Verdin and Bostick, 1993).

A significant constraint on interpretation of this data is that the transistion zone for the controlled source occurs at 1024Hz or 512Hz, and much of the data acquired (frequencies 256 Hz to 8 Hz) is in the near field. This means that the intrinsic depth sensitivity of the CSAMT data is lost at these lower frequencies, and the Bostick transform becomes a weaker approximation for the purpose of extracting resistivity and depth data.

The CSAMT data also suffers from significant noise problems particularly (but not only) in the vicinity of a high-tension power line crossing the entire EL (north to south). Such noise sources make it necessary to delete selected frequency points from the data (via the "skip-flag" with Zonge file format). Some time was spent in discussion with Zonge personnel in order to exclude such data prior to EMAP filtering.

In addition to Bostick transformation, the EMAP-filtered data was inverted to resistivity-depth parasections by Zonge, using their proprietary 1D smooth-model inversion algorithm. This process has the advantage of retaining validity for transition-zone and near-field data, and it produces more stable resistivity estimates than the Bostick transformation. However the method appears to be poorer than the Bostick method in imaging up dipping conductors. Thus the optimum interpretation process is to view the data via both Bostick and smooth-model inversions.

Selected profiles have also been processed by Zonge using a proprietary 2D smooth-model inversion algorithm. The results of 2D inversion are limited by the fact that the 2D algorithm (like the Bostick transform) cannot process near-field data.

PLOTS PRESENTED

For each survey line, plots of EMAP-filtered resistivities, raw Bostick resistivities and depths, and Bostick resistivities interpolated over depth are presented. These are at scale 1:5000, and are included in this report as a PowerPoint file (Office 97 format). The plots are also included as hardcopy prints, reduced to A3 pages.

Parasections of raw Bostick resistivities show symbols giving depth estimates of resistivity solutions at each frequency. These symbols are colour-coded for resistivity using the same scale as that used for the contoured resistivity in the plots of interpolated Bostick resistivity. Some Bostick resistivities have poor confidence due to the apparent

resistivity-frequency curve violating alowable slopes (+-1). This phenomenon is usually due to noisy data; such Bostick solutions are identified on the plots by crosses or + symbols within the raw Bostick resistivity box symbol.

Two types of plan-view presentations of the data are included. Frequency slices of EMAP-filtered resistivities are a useful stable method of showing resistivities at near surface (using 8192 or 4096 Hz) or at depths in the range 300-500m (using 1024 or 512 Hz).

Depth slices of Bostick resistivities give better resolution of variation of resistivity with depth, but these products tent to be noisy, since "bad" resistivity estimates corrupted by noise give "bulls-eyes" of high or low resistivity estimates, especially in the vicinity of power lines. Depth slices are presented for depths corrected for topographic variations referred to the maximum elevation of 660 m, hence depth slices 200, 300, 400 and 500m correspond to RLs of +460, +360, +260, and +160m RL.

All plan-view images and maps are presented at scale 1:10,000.

INTERPRETATION

The most useful map product for interpretation of near-surface geology is the top-most "depth-slice" draped on topography (PLATE 1). This is essentially the same as a frequency-slice of resistivities at 8192 Hz, with fill in from lower frequencies where 8192 Hz data does not exist.

Note that the lateral resolution of the CSAMT method is limited by the wavelength of EM radiation measured. Lateral resolution is of similar order to depth penetration; for rocks of 1000 ohm.m resistivity, such resolution is of order 120 m, 250 m and 500 m, for frequencies 8192 Hz, 2048 Hz and 512 Hz respectively. Thus we cannot expect to literally outline the margins of outcropping siltstones with tens of metres of thickness. Ratherm we expect the CSAMT method to show a thin good conductor as a broad zone of moderate conductivity.

Seven zones of new surface conductive alteration or black siltstones are identified from PLATE 1. These are annotated in red on PLATE 6.

Zone 1A, 1B: correlates with the line of outcrop of black siltstone (Cas).
Zone 1B appears to have been tested with holes TYN11 and TYN14; both of these holes penetrate a thick fault containing alteration asssociated with the fault zone. This makes possible an interpretation hypothesis that the conductive trend represented by Zones 10-1A-1B-2 could be the response of a thick fault zone, not necessarily or not entirely the response of black siltstones.

Zone 2: a continuation northwards of Zone 1. This Zone appears to have been drill-tested with holes BL6, BL7, however there is no black siltstone in the cores from these holes. BL6 shows some sericite-pyrite alteration.

Zone 3B: A weakly-conductive zone; may be a northward extension of Zone 1-2 (siltstones) or a separate, alteration zone in felsic pyroclastics.

Zone 3A: extends from holes TYN001 to TYN004, but may not have been tested by either hole. TYN001 contains an intersection of black siltstone, but TYN004 intersected only andesites, despite apparently being targeted on the eastern conductor of a pair of conductor mapped by Aberfoyle Exploration using UTEM.

Zone 4: Follows mapped volcano-clastics (Cttl) from hole TYN003, possibly SSE to Zone 3A, or more probably SSW (parallel with the road) to join Zone 5. Appears to be drill tested with TYN003 and TYN005. This conductor correlates with the location of the western conductor of a pair of conductors mapped by Aberfoyle Exploration using UTEM.

Zone 5: This is a NE oriented trend parallel with the Anthony Road. The most interesting part is the southern end, vicinity of TYN002, but the main zone of the anomaly has not been drill tested. This Zone is a magnetically quiet area; it is highly likely to be a zone of alteration. Inversion of old dipole-dipole IP data (1967) in this area is recommended for added study.

Zone 6: This is an area untested by drilling, mapped as siltstone (Cas) in 1996, and as volcano-clastics (Cttl) in 1999. It is an area of low magnetic activity and is likely to contain alteration. Black siltstone has been observed in a costean in this locality, and a gradient-array IP anomaly was recorded by Mt Lyell M&R Co.

Zone 7: Located at eastern end of line 5356200N, vicinity of a mapped E-W fault. Not drill tested to date. Hole TYN008 near the zone was directed west (away from the zone), but that hole did show a high degree of fracturing in the core, indicative of proximity to a fault zone.

Review of frequency-slice EMAP-filtered resistivities for 2048Hz and 512Hz (Plates 2 and 3) highlights those parts of the conductive zones which extend to depth. Such zones are outlined on PLATE 6 in green and blue shading.

Zone 1A (extending east into **Zone 9**) is the largest such area; it has been drill tested with BL001 and TYN015, but there is scope for further testing.

Zone 3A (north of TYN001) is not drill tested. (This zone must be interpreted with caution, due to the existence of power-line noise in the data, but I believe the evidence does point to a conductive zone of probable alteration). This Zone is also of interest in that it is a magnetically-quiet zone.

Zone 7 is probably on eastward, down-dip extension of Zone 3A, near the Great Lyell Fault, east of TYN008. It is untested by existing drilling.

Zones 3B, 5 and 6 also show sub-areas with conductivity extending to order 200m depths.

Zone 10 shows as a distinct anomaly at the eastern end of line 5351800N, located 200m south of hole TYN010. This anomaly does not appear to be due to noise or other non-geological causes, but being located at the end of a survey line, and without continuity north or south, it should be defined with additional geophysics (IP or CSAMT) before drilling. The Zone is magnetically quiet and therefore may represent a zone of alteration.

Interpretation of depth-slices and parasections of Bostick resistivities requires some care. "Bulls eyes" are unlikely to be significant (since they are often caused by noise in the data affecting the transform maths) but conductive trends with consistency from line to line are of interest. Reference to parasections is also necessary, due to the fact that the "transition-zone notch" gives low apparent resistivities when the CSAMT data lies in the transition-zone; the presence of this notch can be misleading when interpreting conductors at depth.

Zones 1A, 1B: The depth slice at 200m gives an image over the EL broadly similar to the 2048Hz frequency slice (as expected). However it accentuates the western margin of Zones 1A- 1B, which correlates with the presence of black siltstones intersected in hole BLD89-1.

Zones 9, 1C and 10: The depth slice 300m (PLATE 4) image highlights Zone 9, and also shows Zone 1C located west of Zone 1B. The Zone 1C has been tested by holes BL004 and BL008, and lies along strike from black siltstones intersected in BLD89-1. It is also significant that BL004 shows an intersection of black siltstone plus massive pyrite. Hole BL008 shows weak alteration and no black siltstone. This zone needs to be compared in section with the two drill holes for further analysis.

Some confirmation of Zone 3A is also given by the depth slice 300 m, but the evidence is dubious due to high noise levels in the data.

The depth slices 400m, and 500m (PLATE 5) show images which suggest that the Zone 9 conductor plunges northwards. These images also give further support to Zone 10 on line 5351800N.

Zones 7, 8: The deep depth slices at 400 m and 500 m also give support for the existence of deep alteration in the north-east of the EL, labelled as Zone 8, and partly overlapping Zone 7. The association of these features with major east-west faulting gives them added interest as potential zones of alteration.

NOTES ON EXISTING IP/TEM DATA

Dipole-dipole IP data exists for part of the prospect, acquired circa 1967 by the Mt Lyell M & R Co. Inversion of the old data, using recent developments in IP modelling software, is recommended in order to integrate IP (chargeability) data with the resistivity data acquired from the CSAMT survey.

IP lines 13N-18N extend to 381200E, which gives partial coverage over Zones 7 and 8. This is of particular interst in view of the noise problems on the CSAMT data; confirmation of the CSAMT anomaly might justify drill testing without further geophysics.

IP lines 2N to 8N cross hole TYN002 and Zone 5, and are of interest in confirming (or not) the existence of alteration in the Zone.

Borehole EM data exists for holes TYN011, 12, and BLD89-3. This data should be reviewed as part of an assessment of the geophysical expression of alteration in Zones 1A and 9.

RECOMMENDATIONS

1) Zones 3A, 5 and 6 are new areas prospective for alteration. These should be drilled to 200 m depth. IP data from 1967 exists over the zone and should be inverted.

2) Zones 7,8 give a new target area with potential for alteration to depths exceeding 400 m. Due to high noise in the CSAMT data in these zones, further geophysics (eg IP) is recommended prior to drilling. Study zone 8 in section with holes TYN009 and TYN001, and with re-interpreted IP data.

3) Zone 10 is a new target with potential for alteration to depths exceeding 400 m. Due to the location of this zone at the end of line 5351800N, and lack of continuity north or south, this zone requires further geophysics prior to drilling.

4) Study Zone 1C in section, with holes BL004 and BL008. Drilling to 300 m depth is required to adequately test this.

5) Zone 9 has previously shown significant alteration in drill core, and the CSAMT anomaly persisting to depth gives the zone continuing interest. Examination of the parasections suggests that the strongest resistivity lows have not been tested. Re-examination of the drill core and available borehole EM data with the CSAMT parasections, is required in order to target further drilling.

REFERENCES

Dauth, C., 1999, Basin Lake and South Henty Project CSAMT, Technical Note 8 Jan 99, Goldfields Exploration.

Jones, A.G., 1983, On the equivalence of the "Niblett" and "Bostick" transformations in the magnetic-telluric method: Journal of Geophysics, v.53, 72-73.

Torres-Verdin, C., and Bostick, F.X., 1992, Principles of spatial surface electric field filtering in magnetic-tellurics; electromagnetic array profiling (EMAP): Geophysics v.57, 603-622.

LIST OF PLATES INCLUDED IN THIS REPORT

PLATE 1 Basin Lake EL19/98
Depth Slice top 50m, dropped on topography

PLATE 2 Frequency slice 2048 Hz

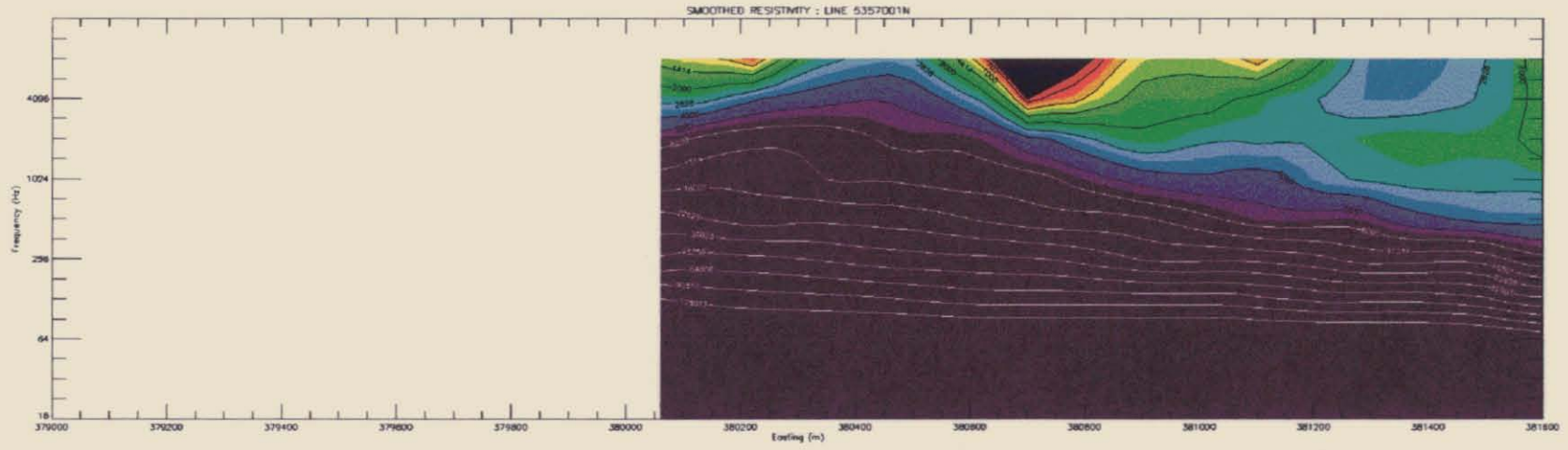
PLATE 3 Frequency slice 512 Hz

PLATE 4 Depth slice 300m below topographic maximum i.e. at RL = +360m

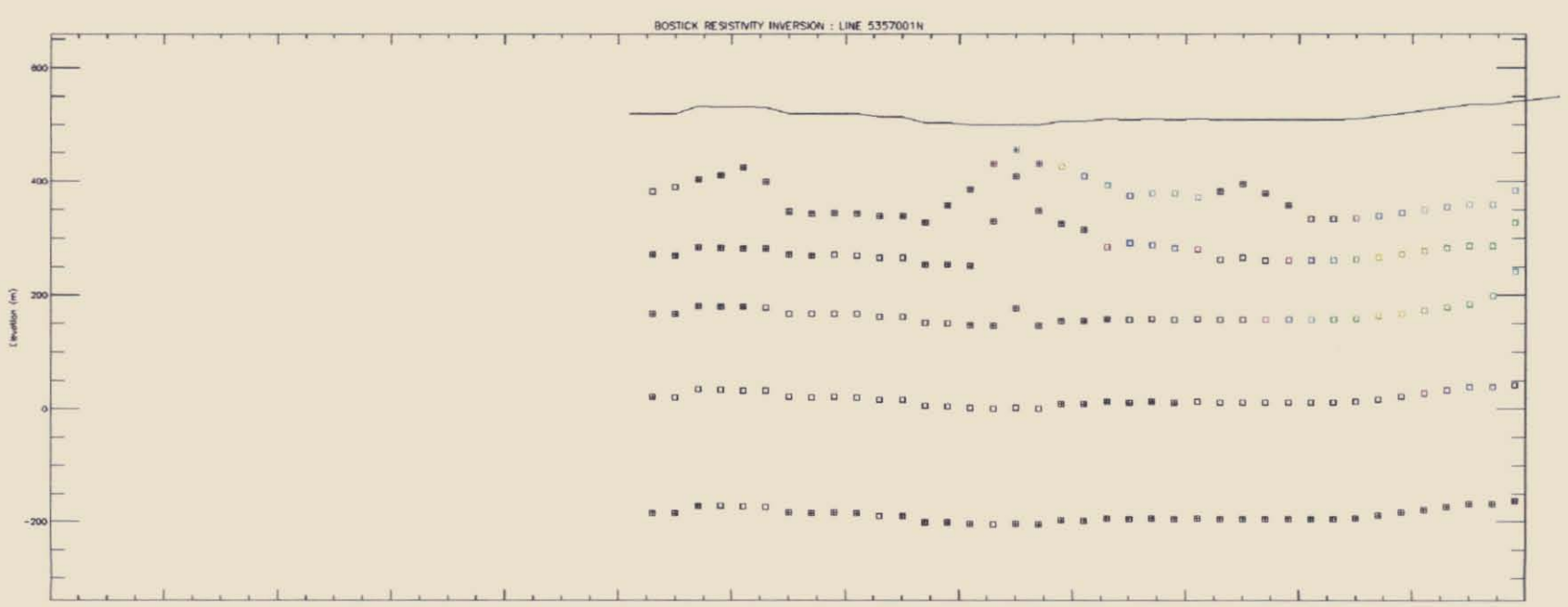
PLATE 5 Depth slice 500m below topographic maximum, i.e. at RL = +160m

PLATE 6 Basin Lake EL19/98
Conductive trends interpreted from CSAMT surveys

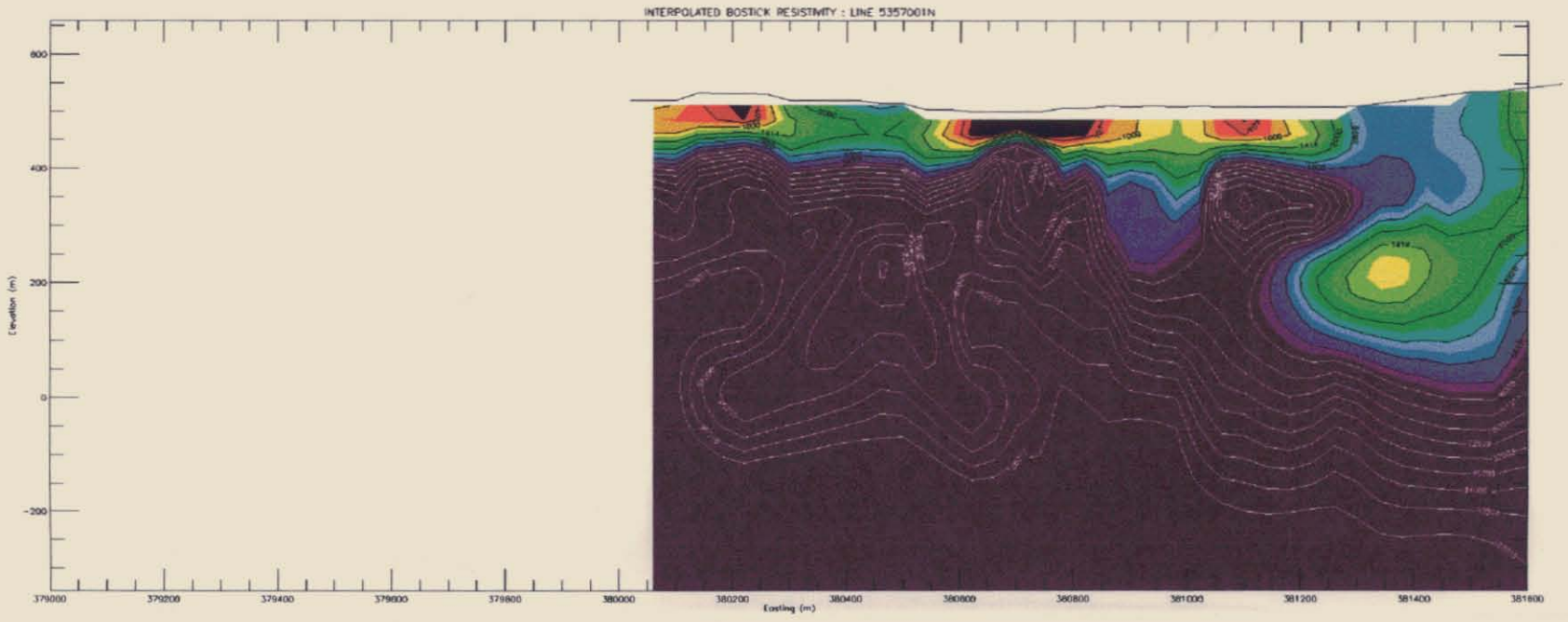
SMOOTHED RESISTIVITY : LINE 5357001N



BOSTICK RESISTIVITY INVERSION : LINE 5357001N



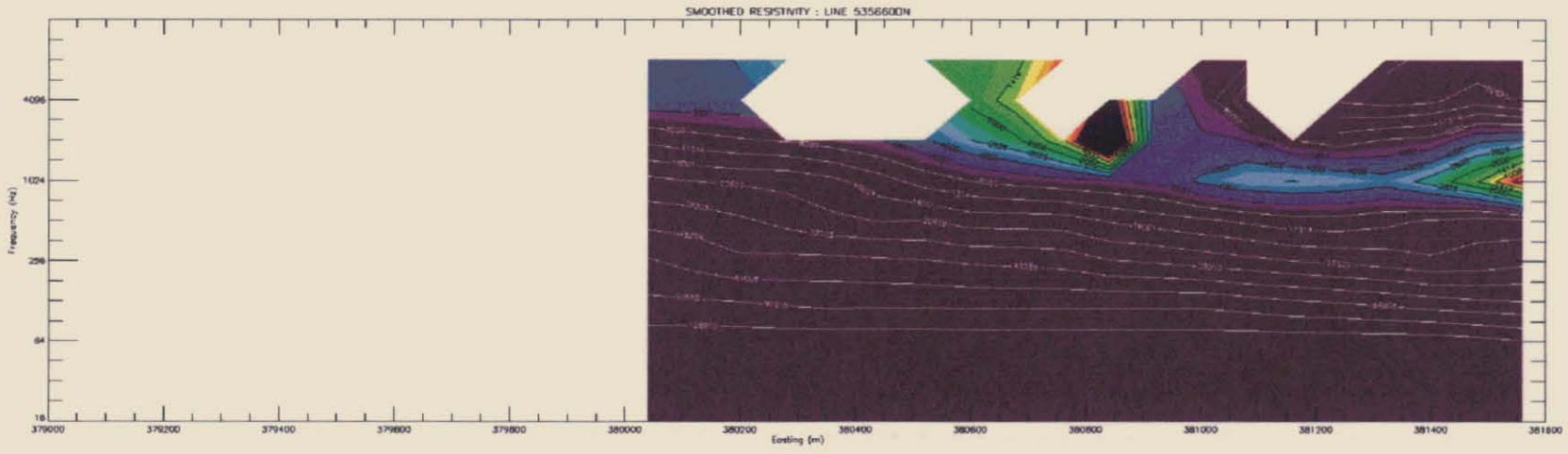
INTERPOLATED BOSTICK RESISTIVITY : LINE 5357001N

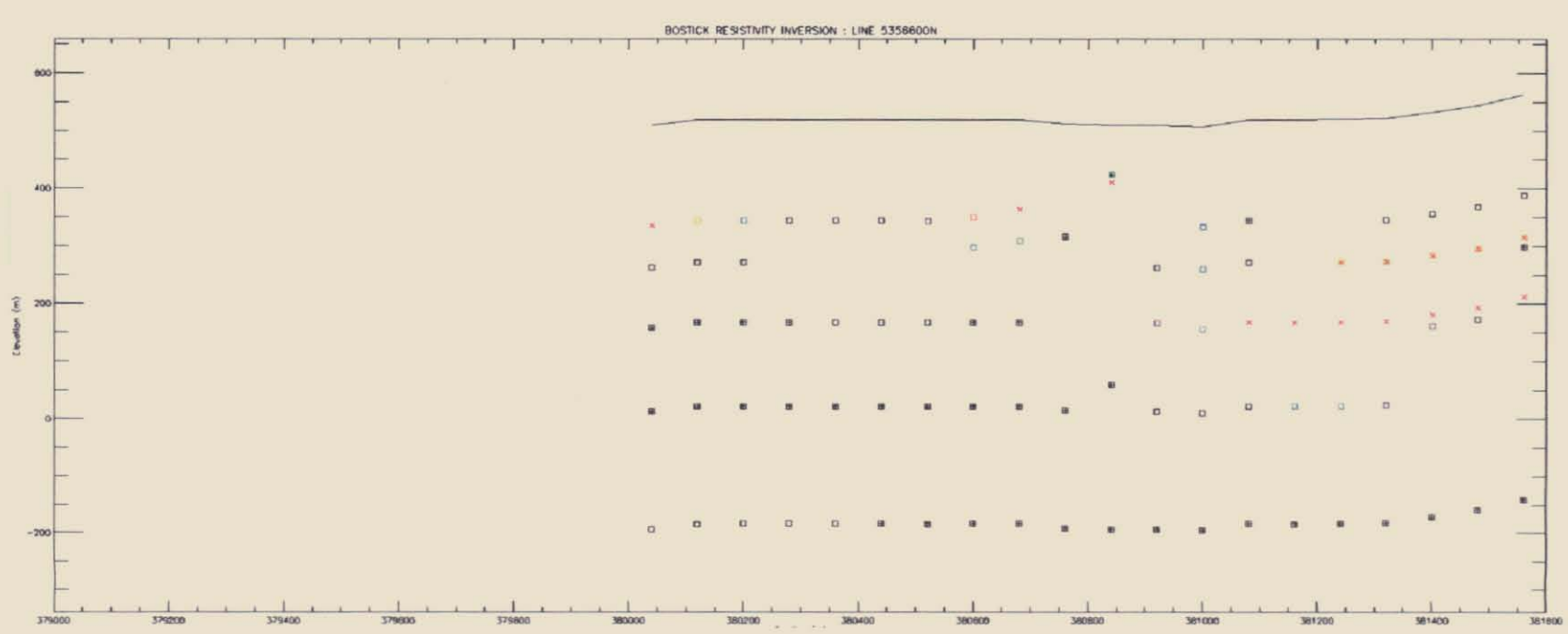


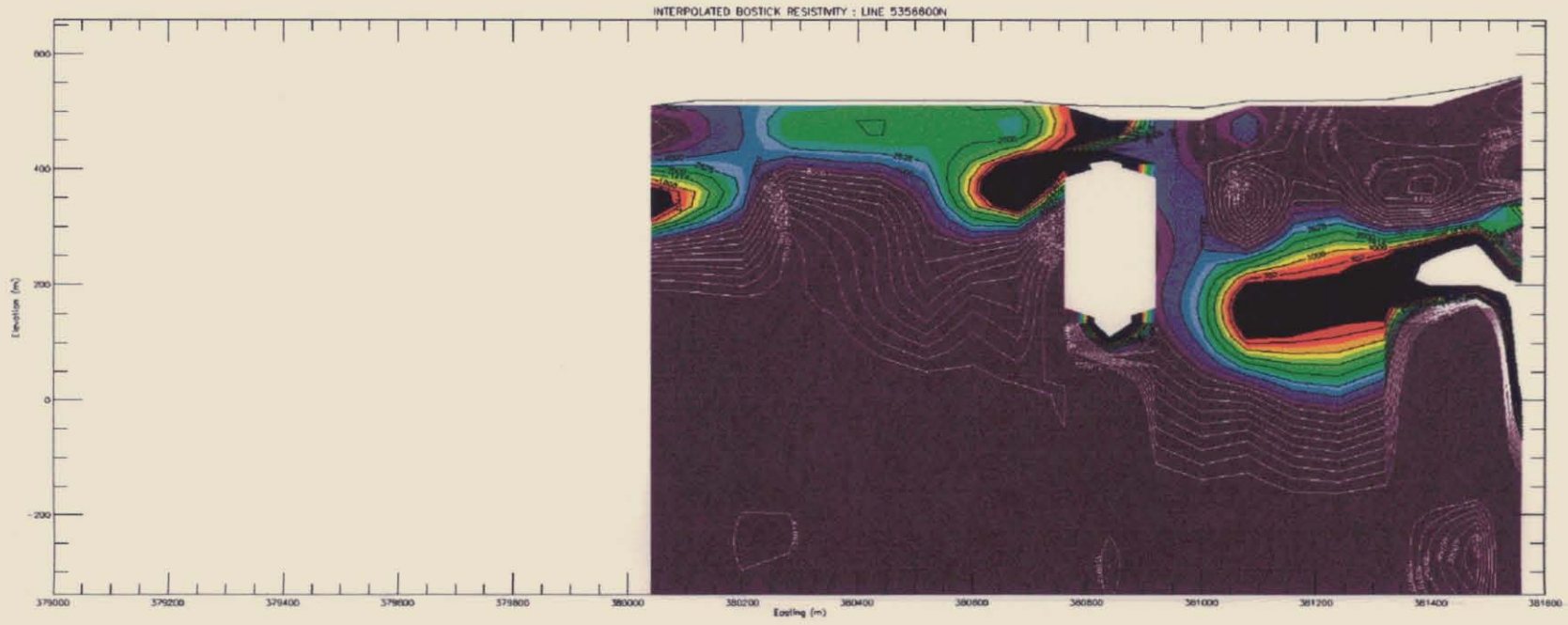
LINE 5357001N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5357000N. 40 m dipoles. Re-Processed with EMAP filter and Bostick inversion Sep 1999
Drawn by: Flagstaff Geo-Consultants 16/9/99

607171





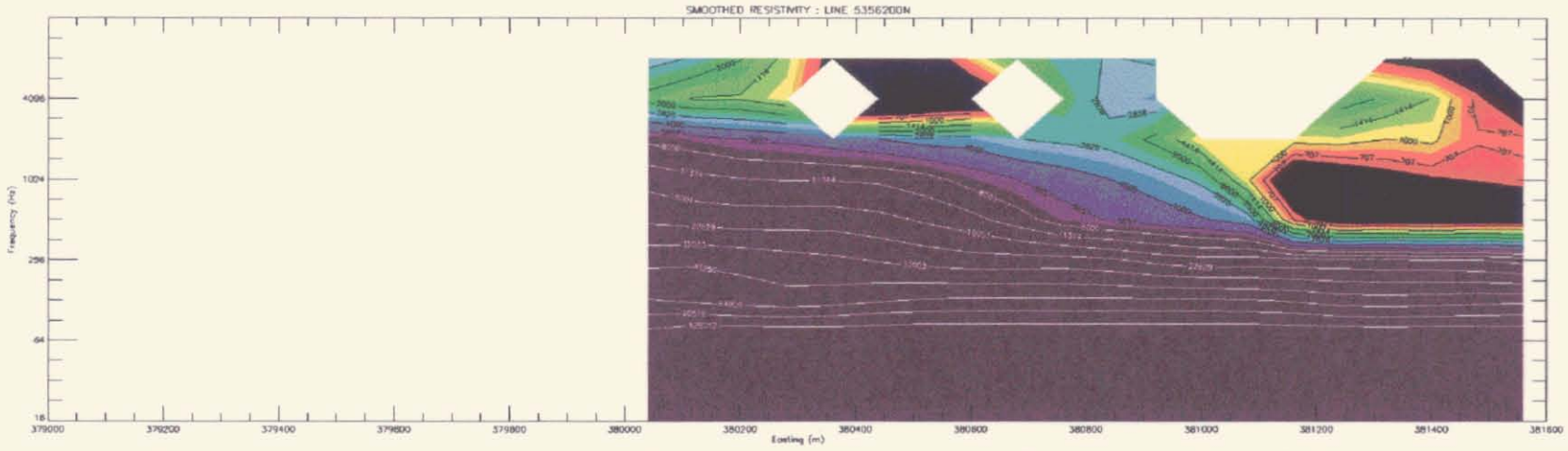


LINE 5356600N

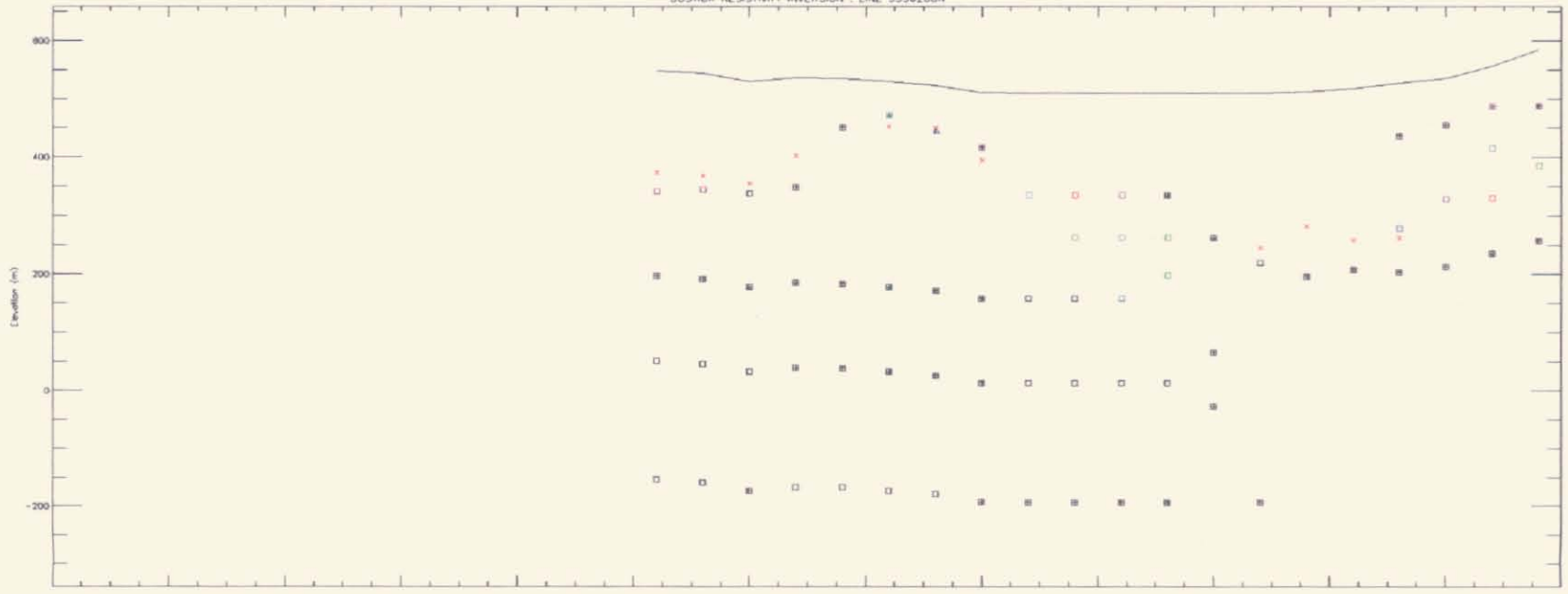
GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5356600N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Fitzgerald Geo-Consultants 29/8/99

607172

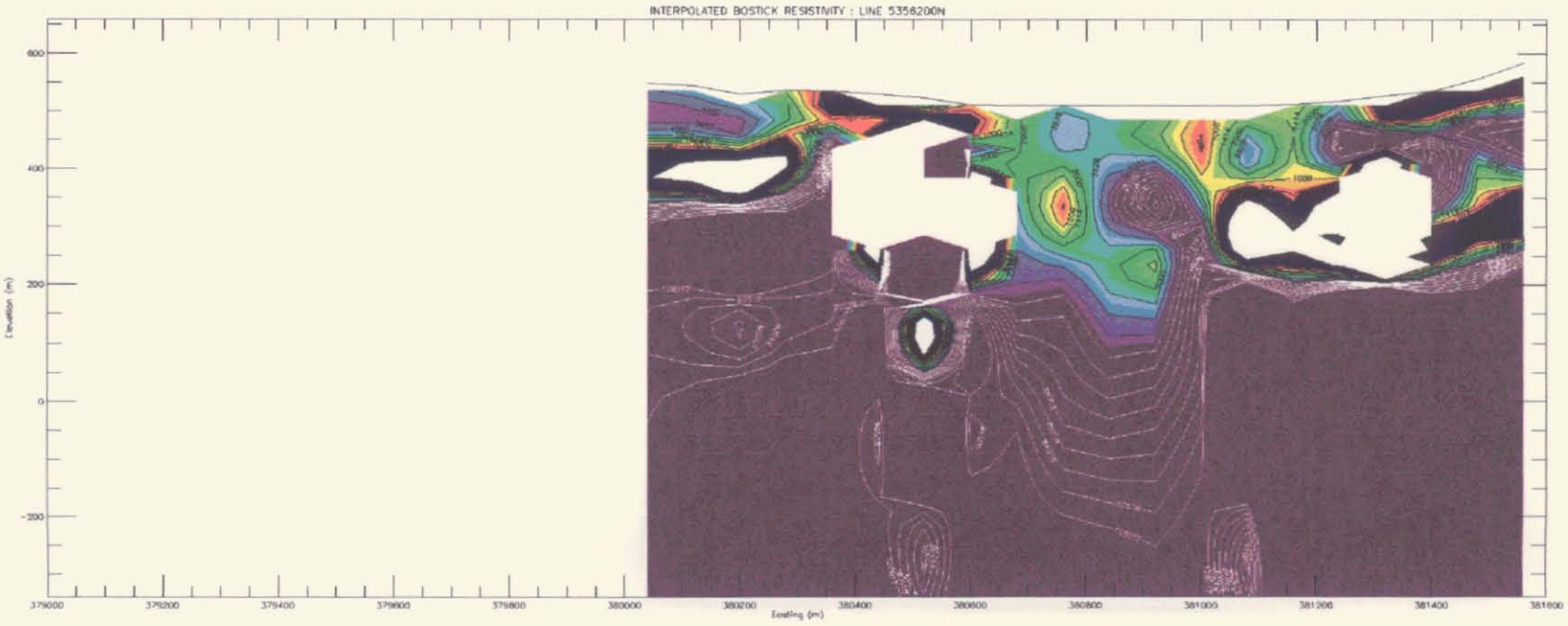
SMOOTHED RESISTIVITY : LINE 5356200N



BOSTICK RESISTIVITY INVERSION : LINE 5356200N



INTERPOLATED BOSTICK RESISTIVITY : LINE 5356200N



LINE 5356200N

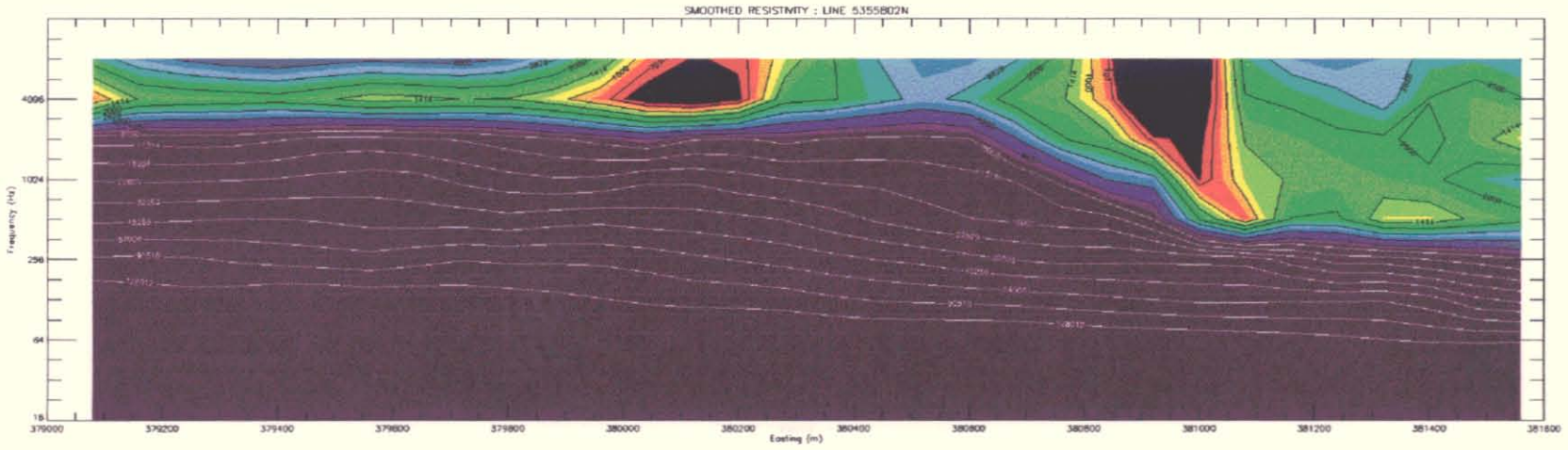
GOLDFIELDS EXPLORATION

Basin Lake CSAMT Data 1988-90. Line 5356200N.
Re-Processed with EMAP filter and Bostick inversion
Aug 1999

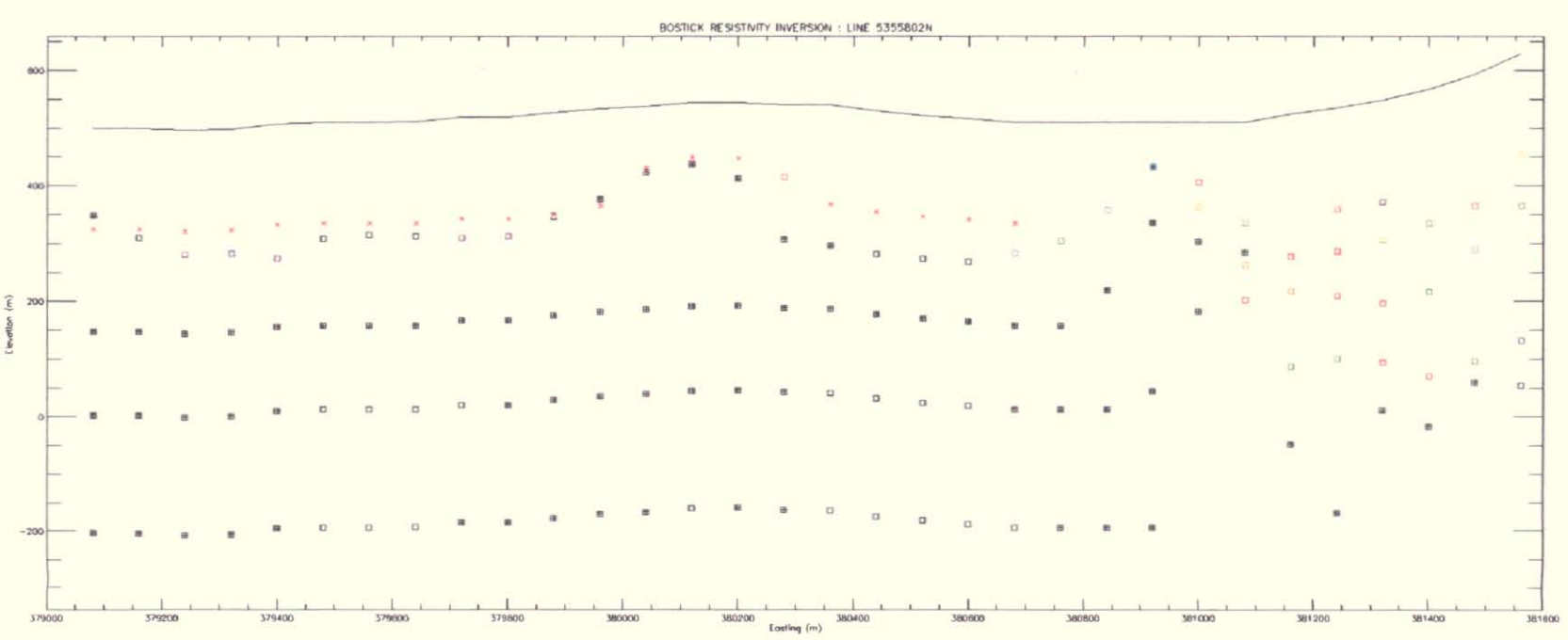
Drawn by: Flagstaff Geo-Consultants
29/8/99

60713

SMOOTHED RESISTIVITY : LINE 5355802N



BOSTICK RESISTIVITY INVERSION : LINE 5355802N

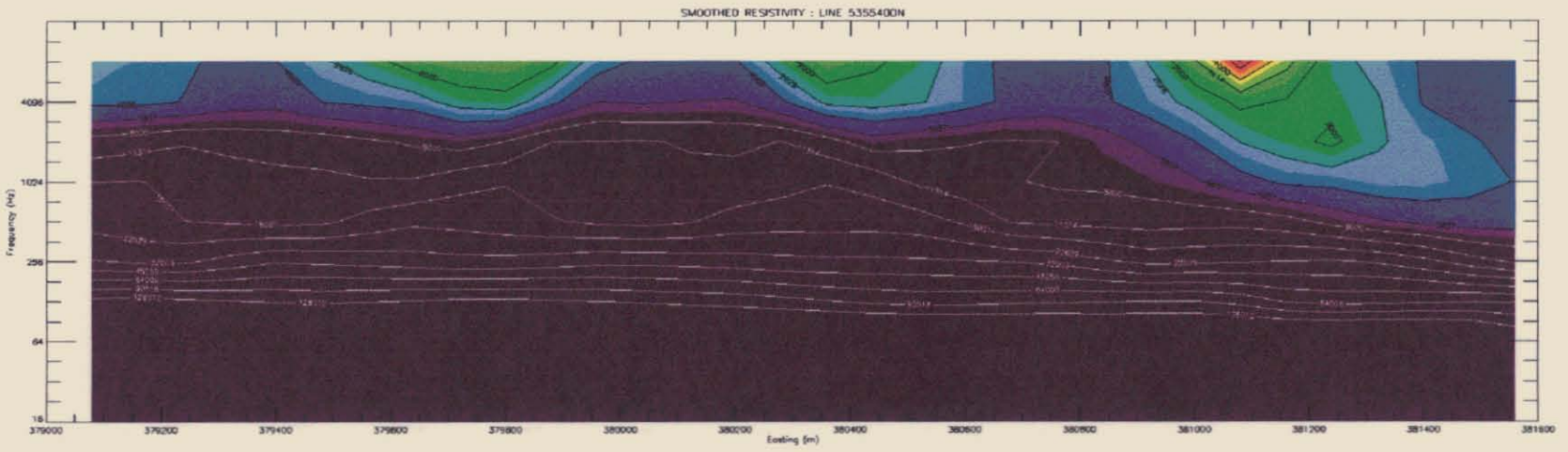


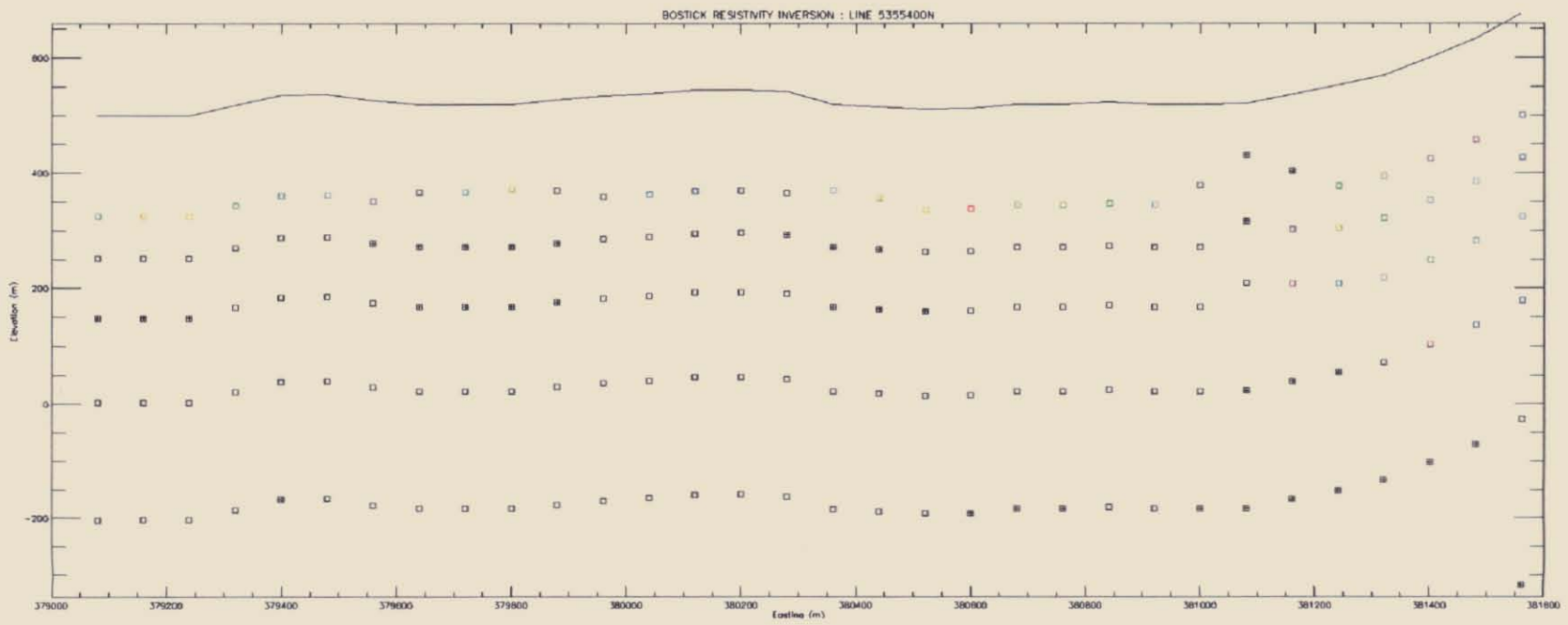
LINE 5355802N

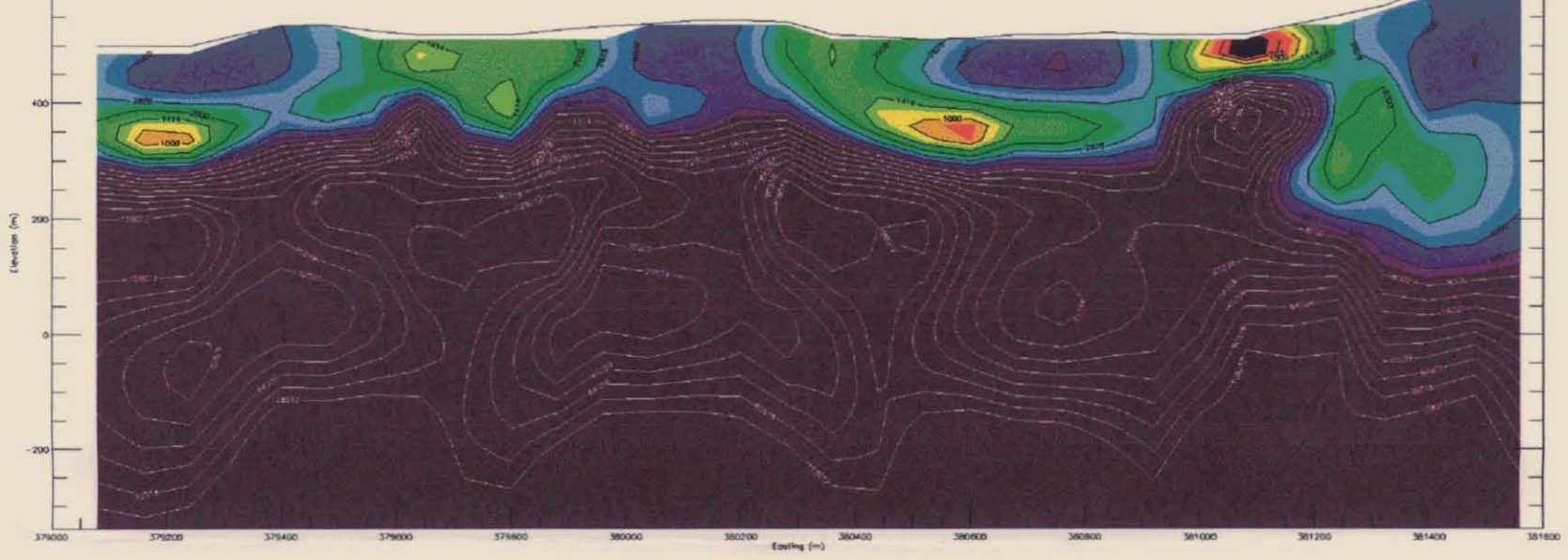
GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5355800N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by : Flagstaff Geo-Consultants 9/8/99

Flagstaff Geoconsulting

E 2 1 1 0 9



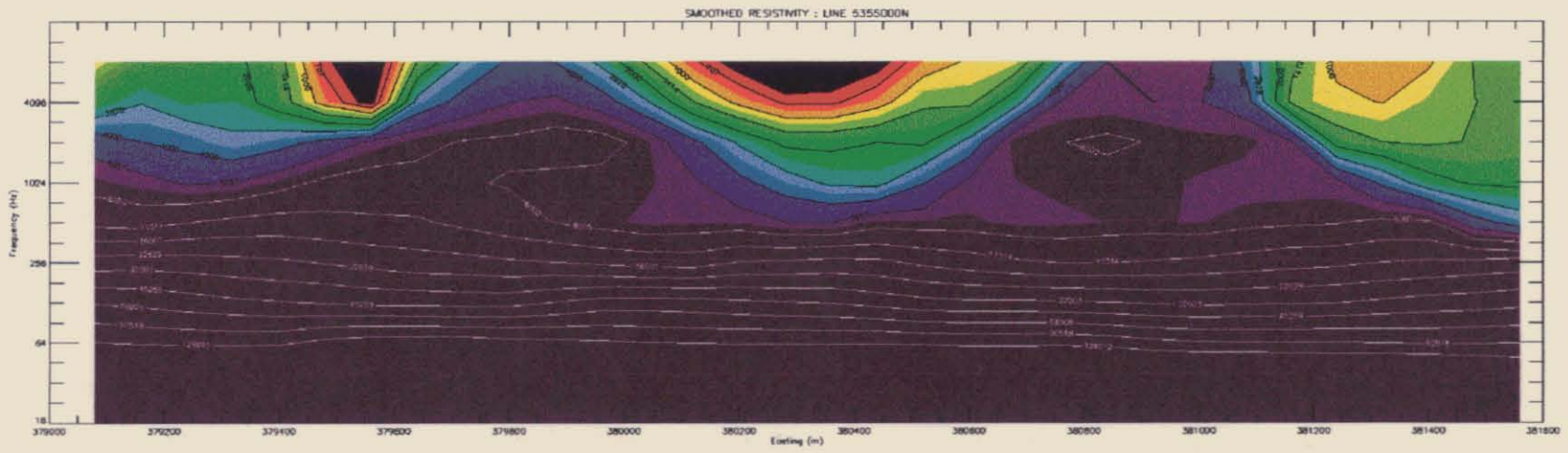


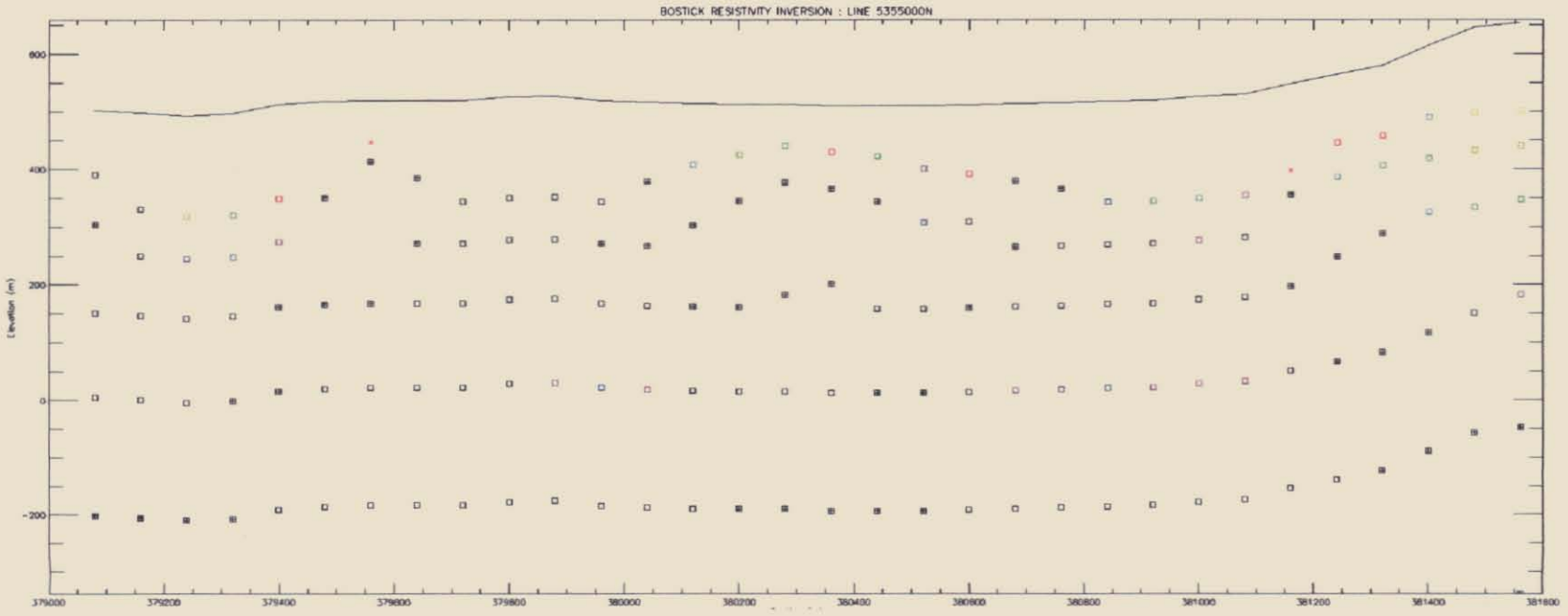


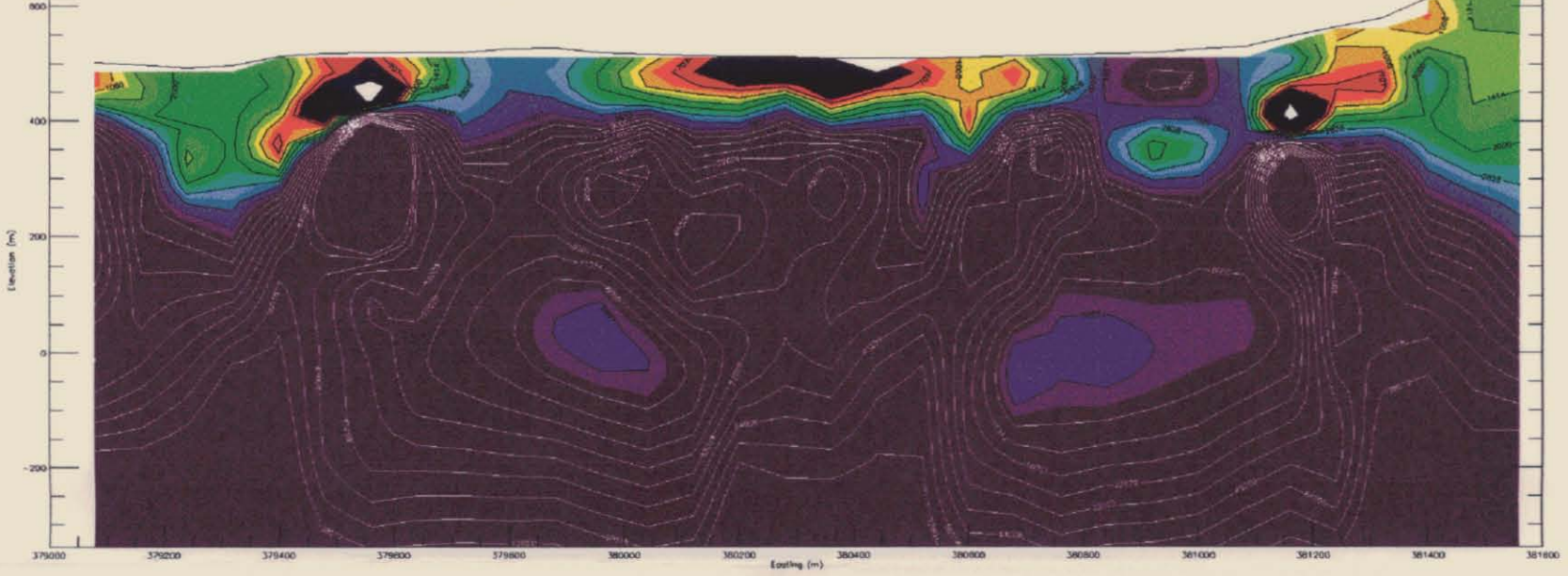
LINE 5355400N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5355400N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

60175



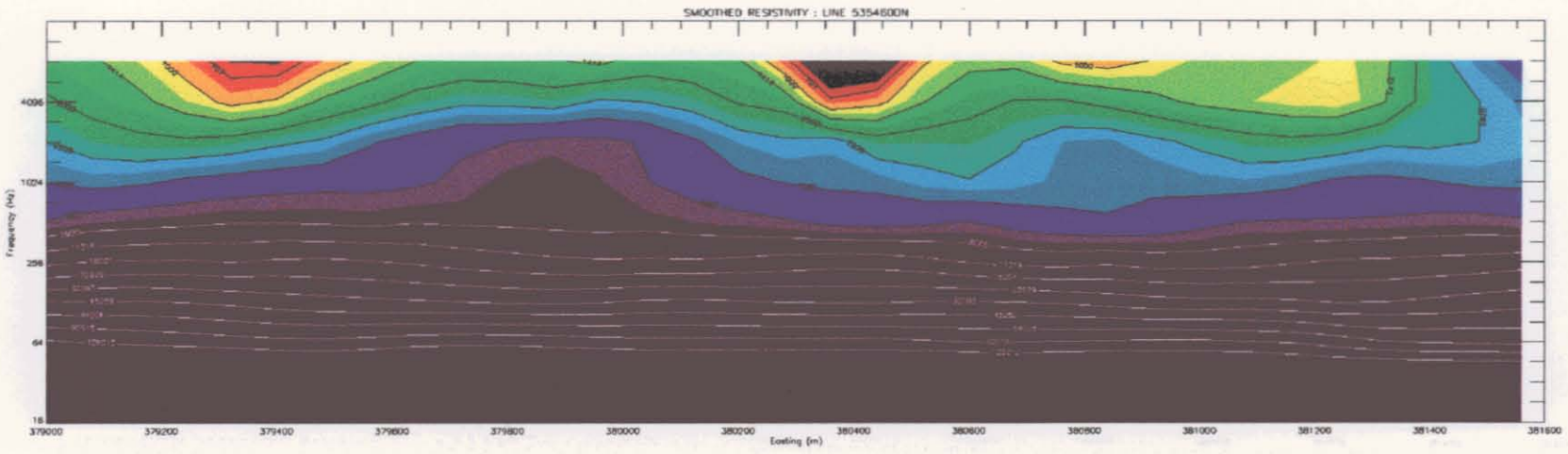


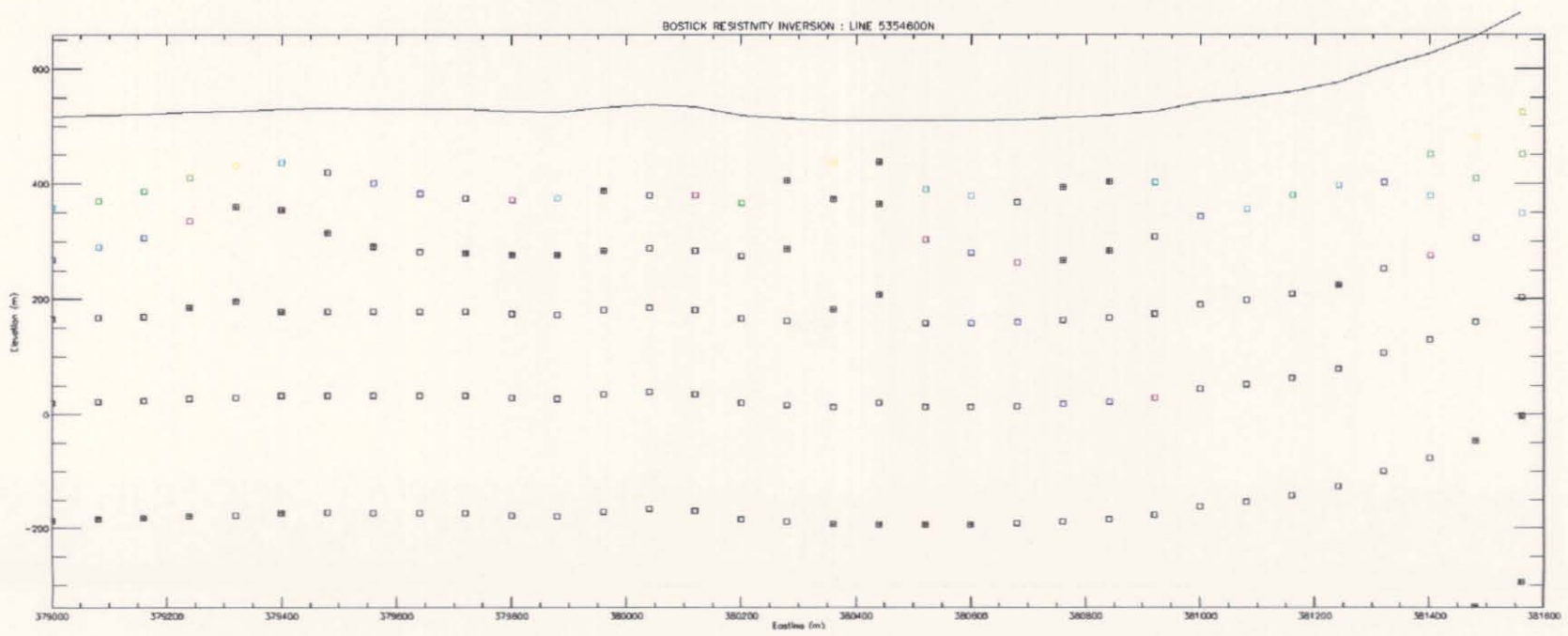


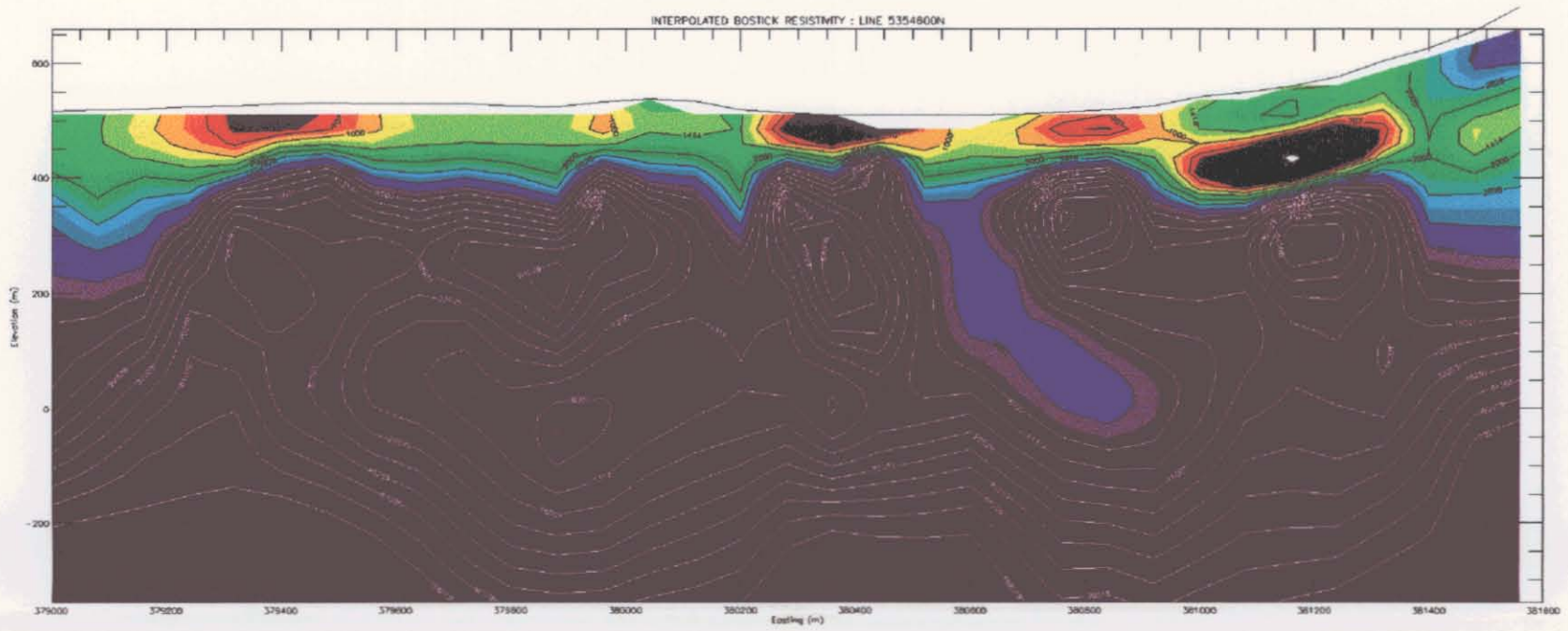
LINE 5355000N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5355000N. Re-Processed with EMAP filter and Bostick inversion Aug 1999.
Drawn by : Flagstaff Geo-Consultants 29/8/99

9271709



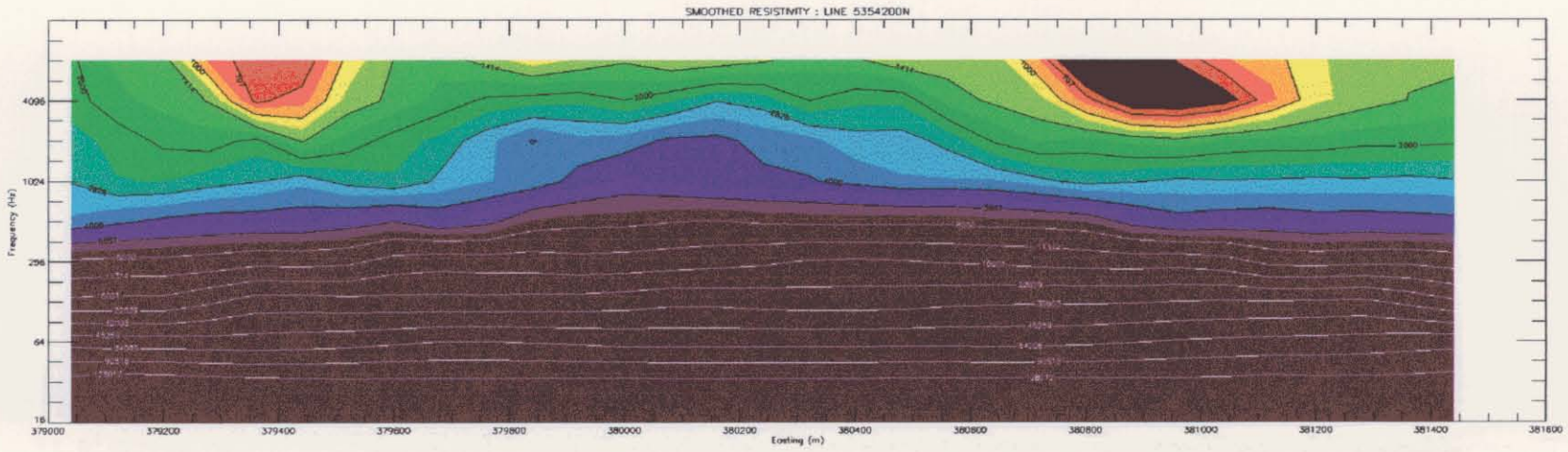


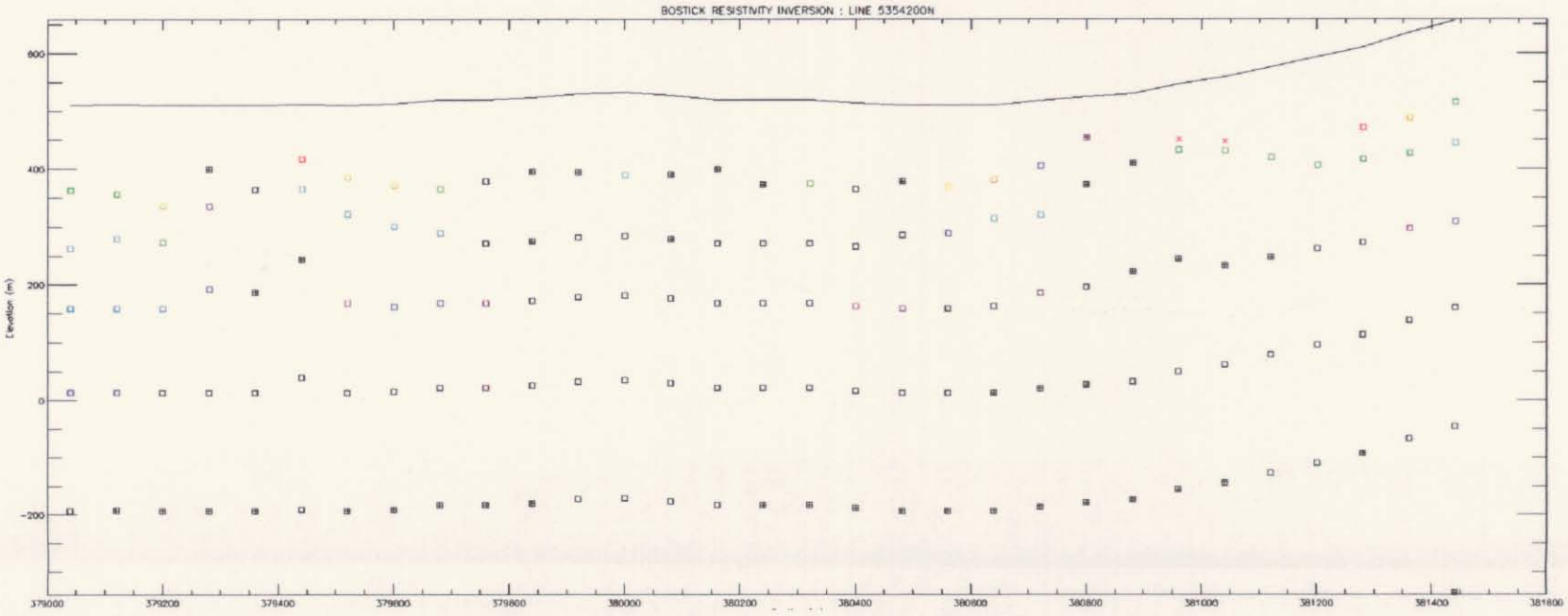


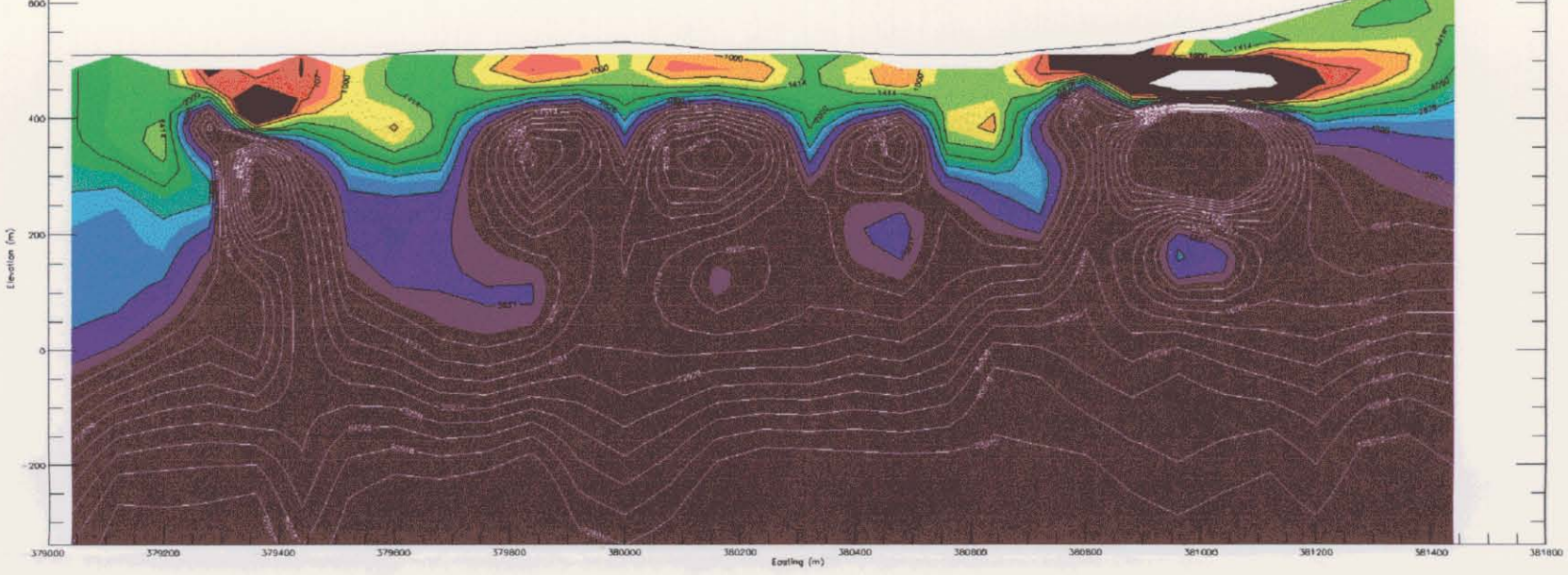
LINE 5354600N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5354600N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 25/8/99

6071771



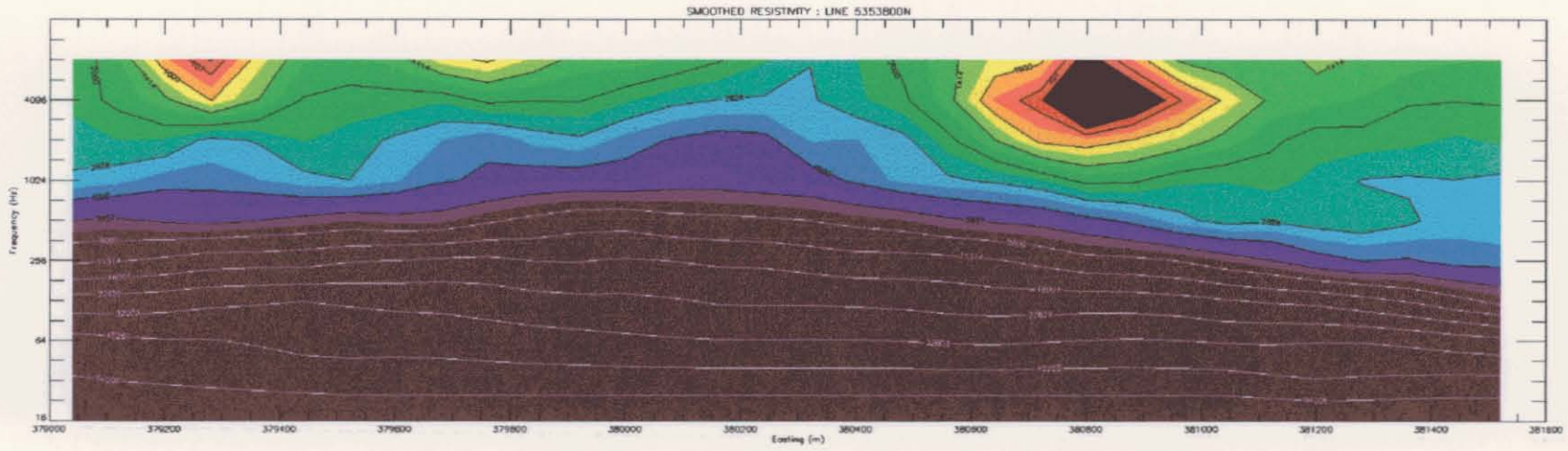


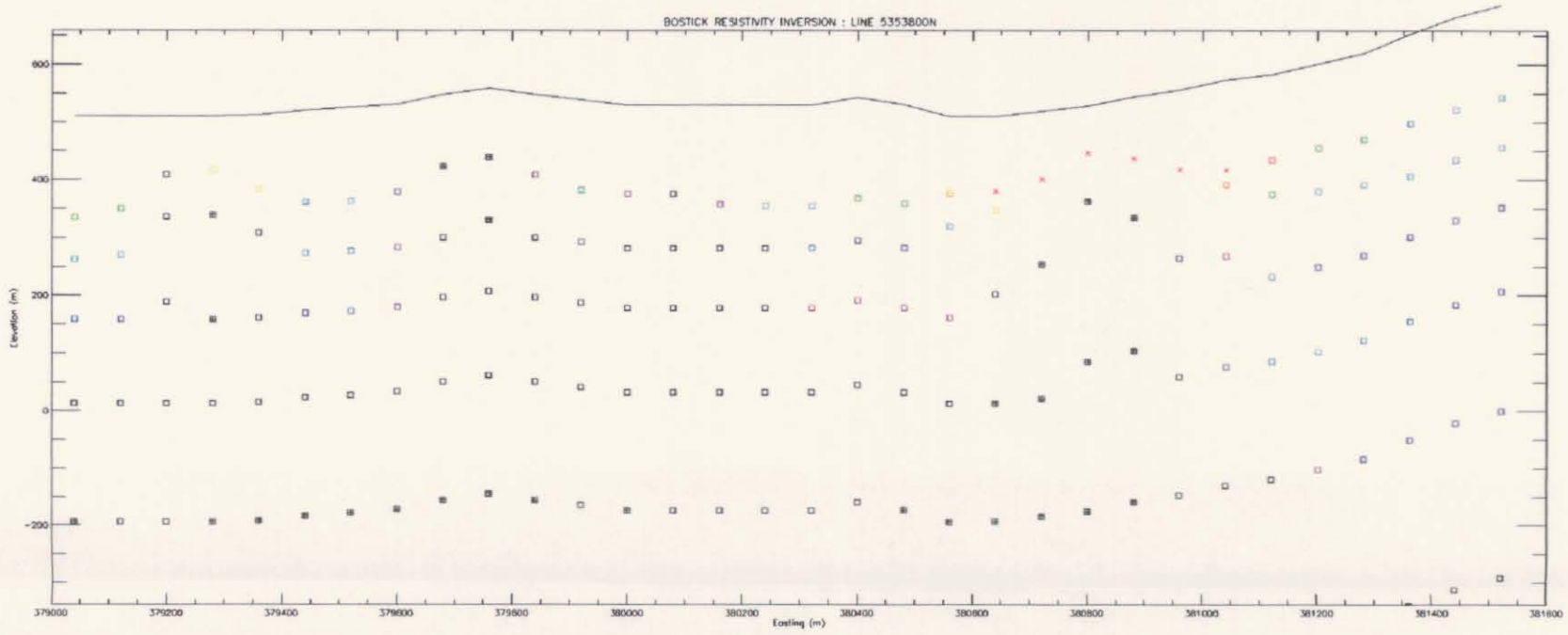


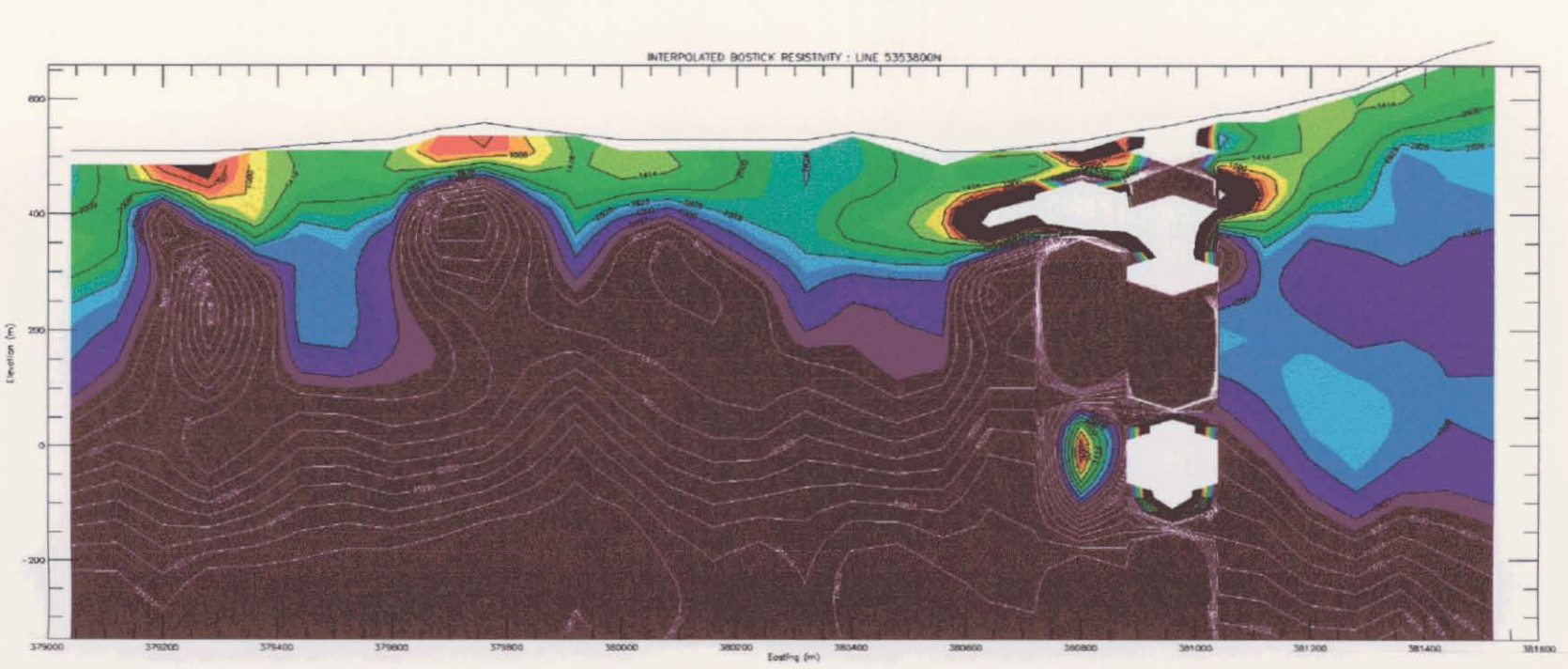
LINE 5354200N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5354200N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 25/8/99

607178



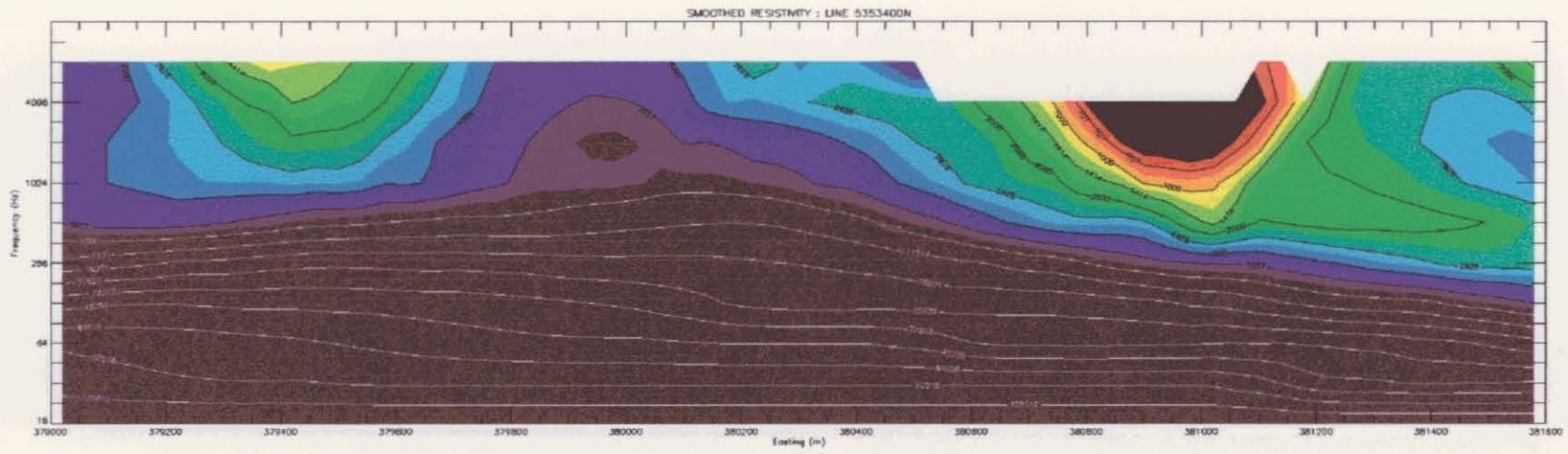


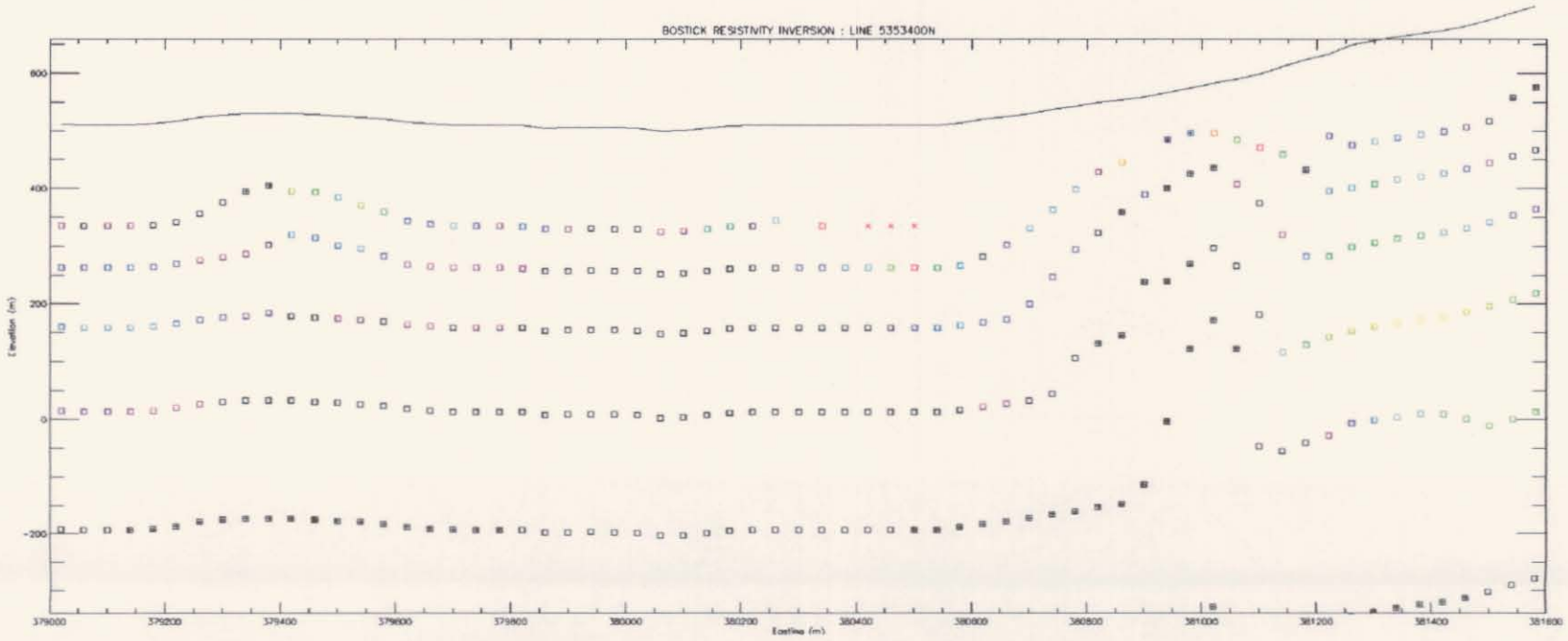


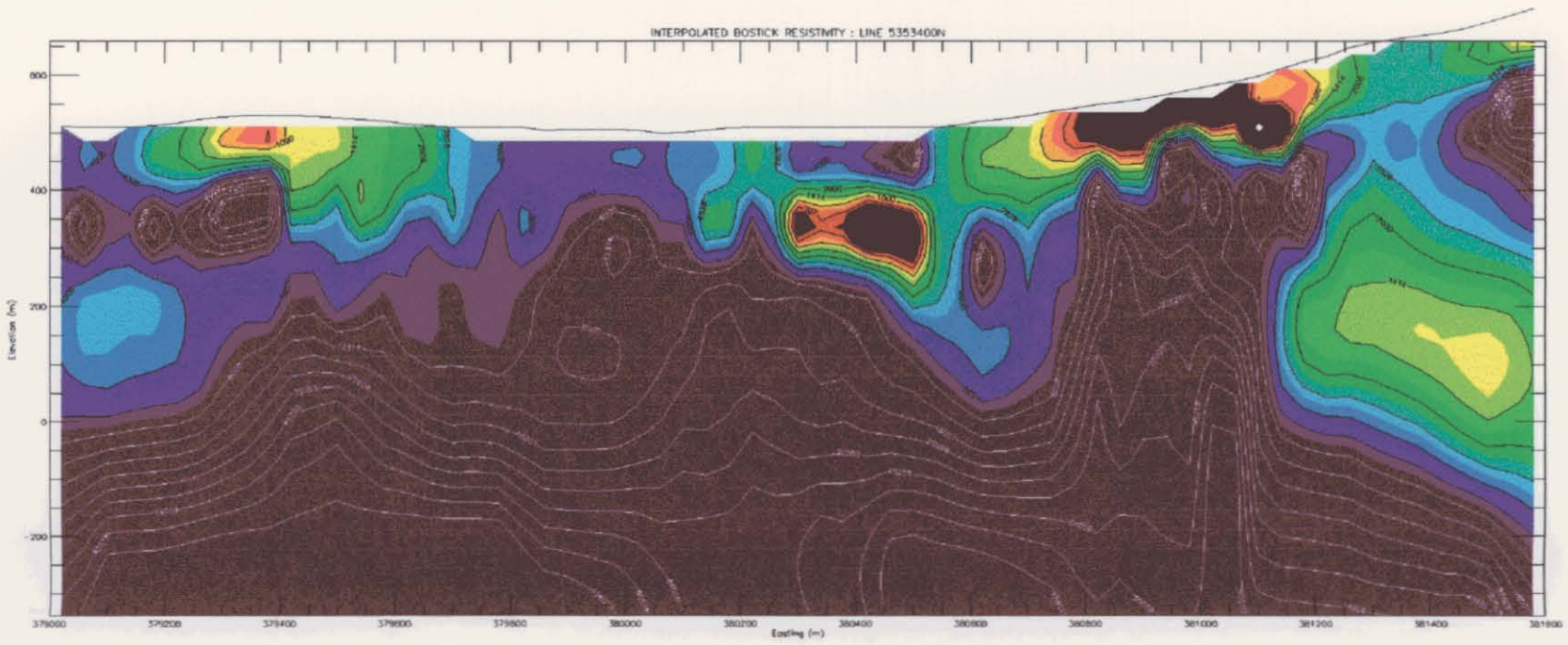
LINE 5353800N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5353800N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

60717 9



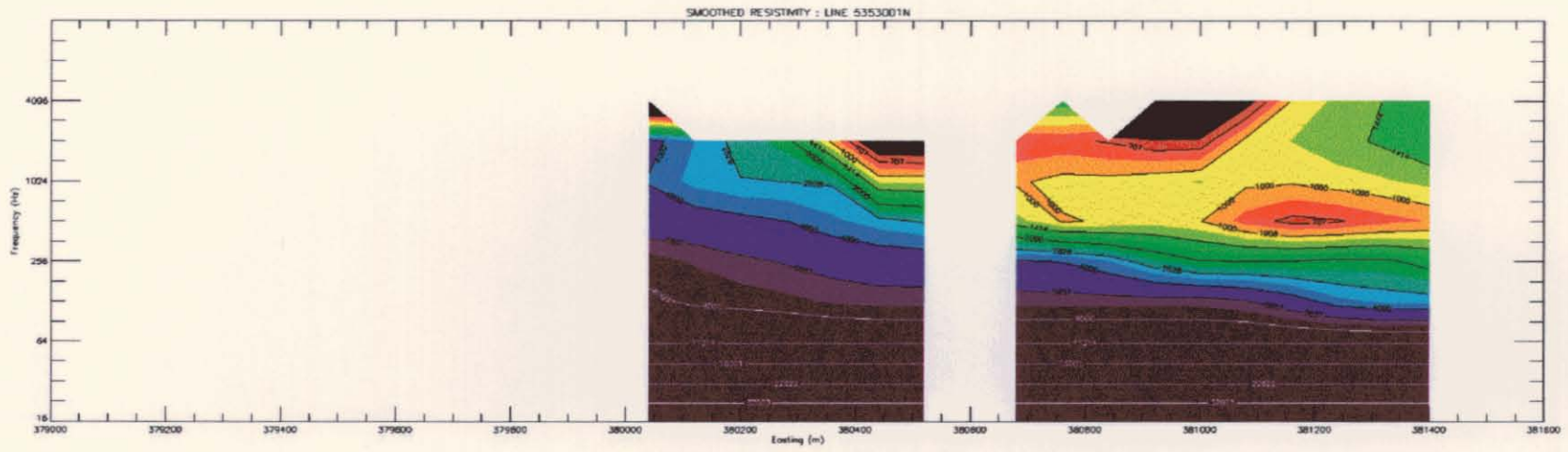


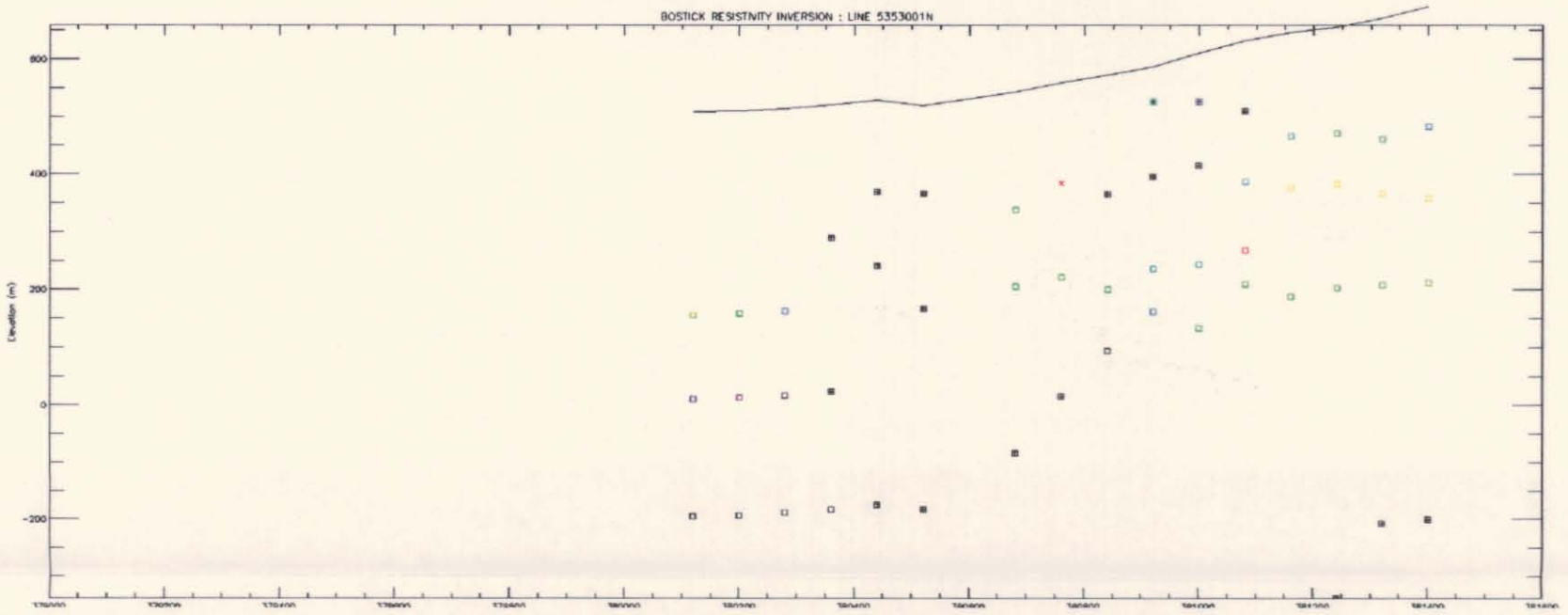


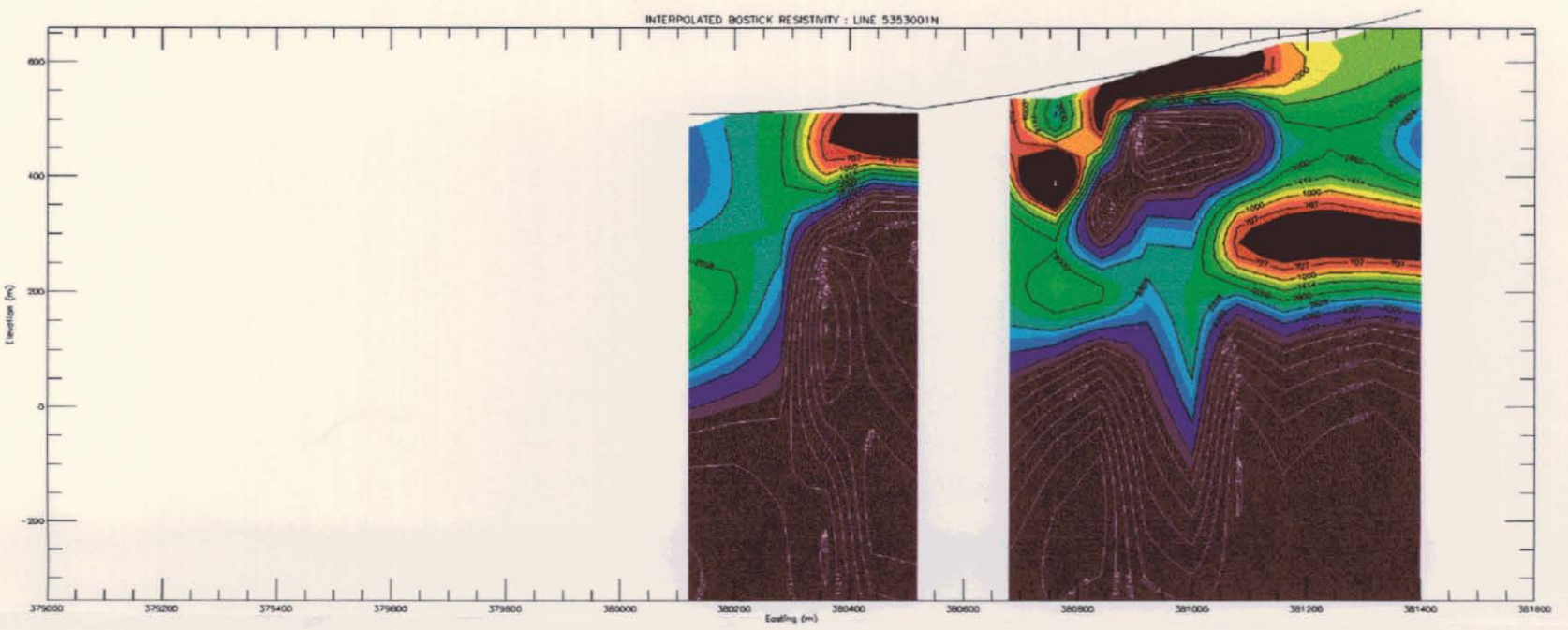
LINE 5353400N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5353400N. 40 m dipoles. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/2/99

C01-460



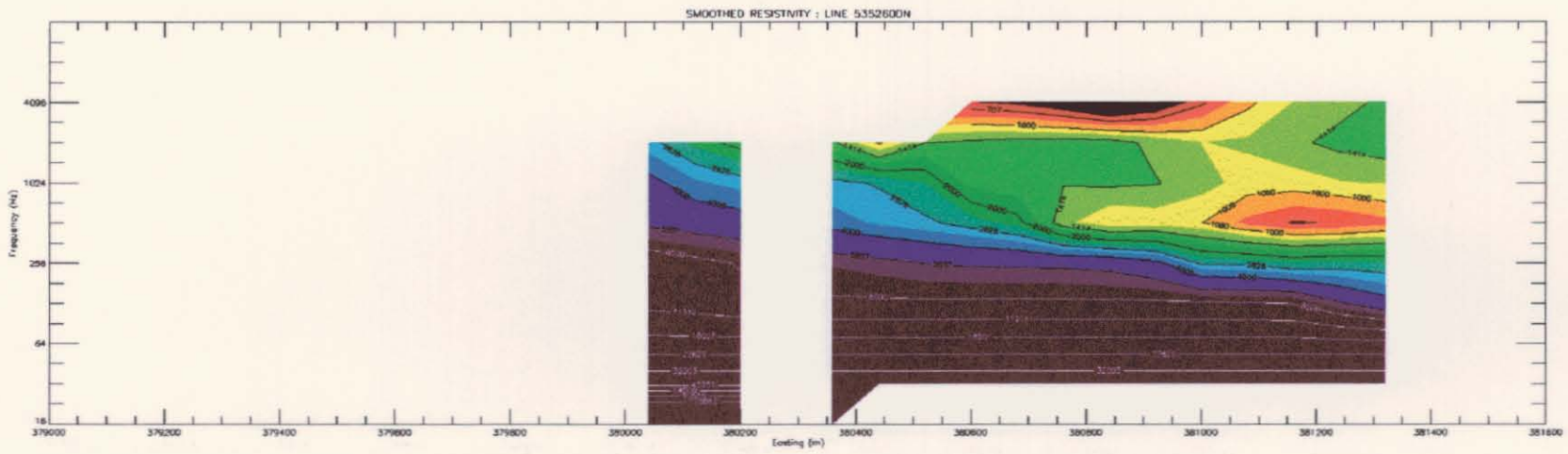


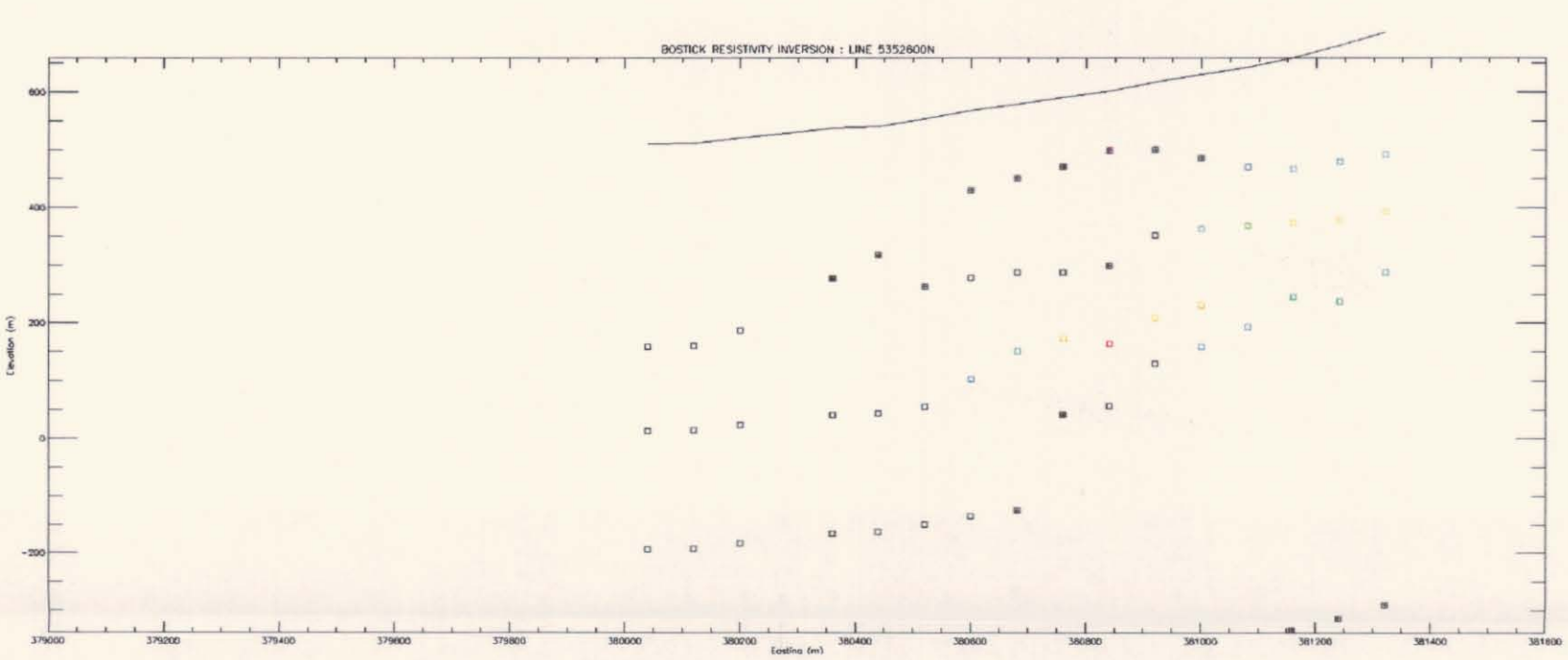


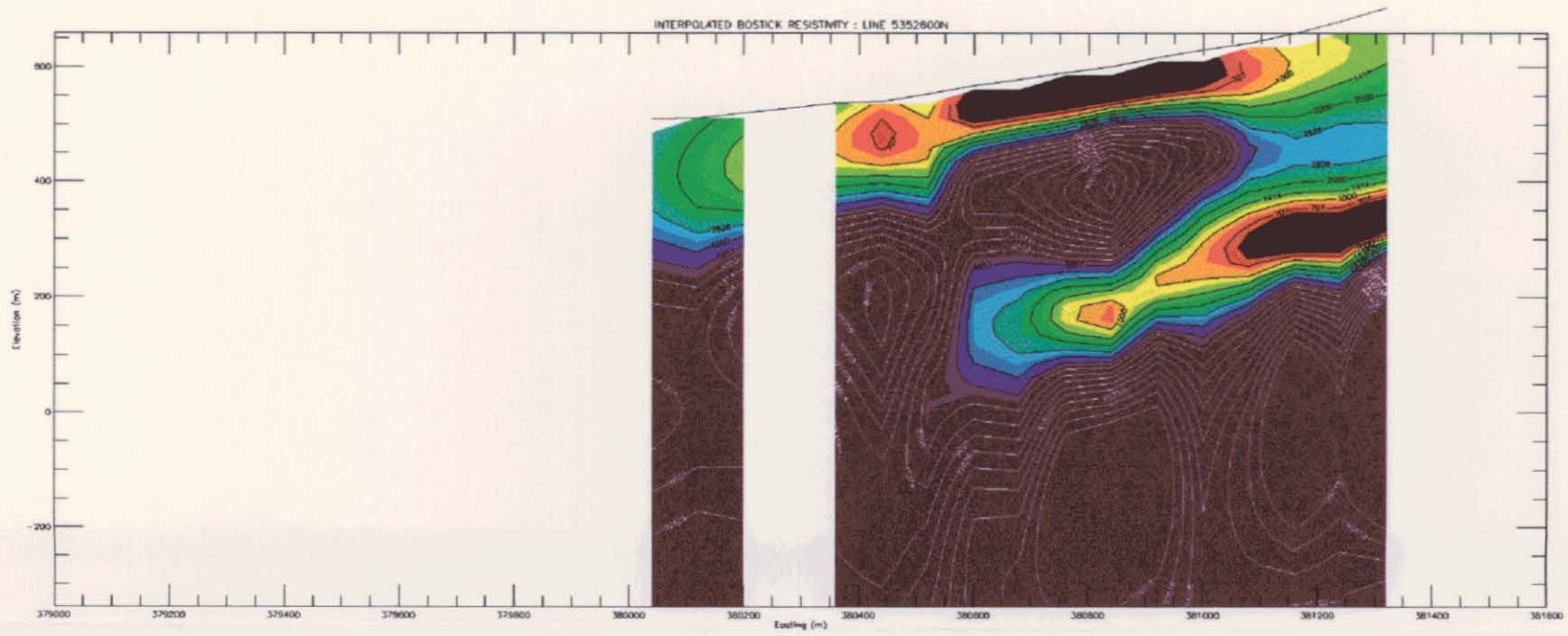
LINE 5353001N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5353000N.
Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

6027181



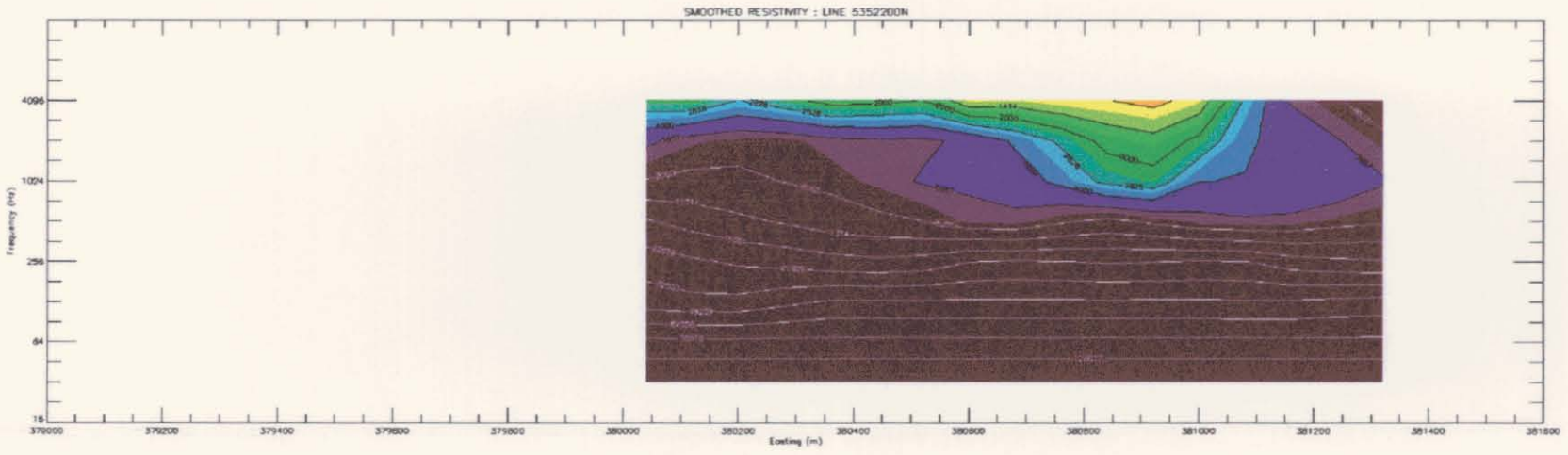


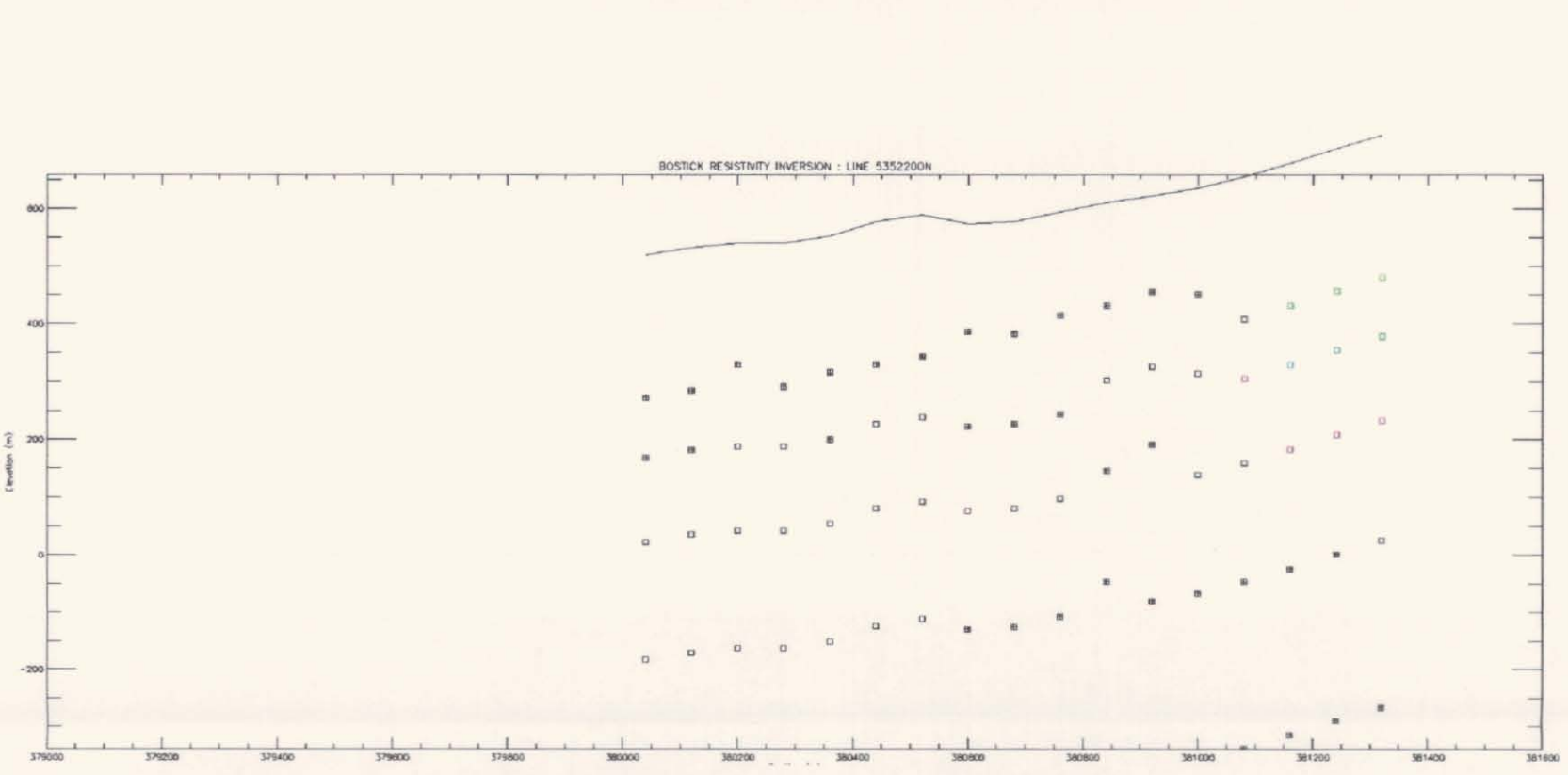


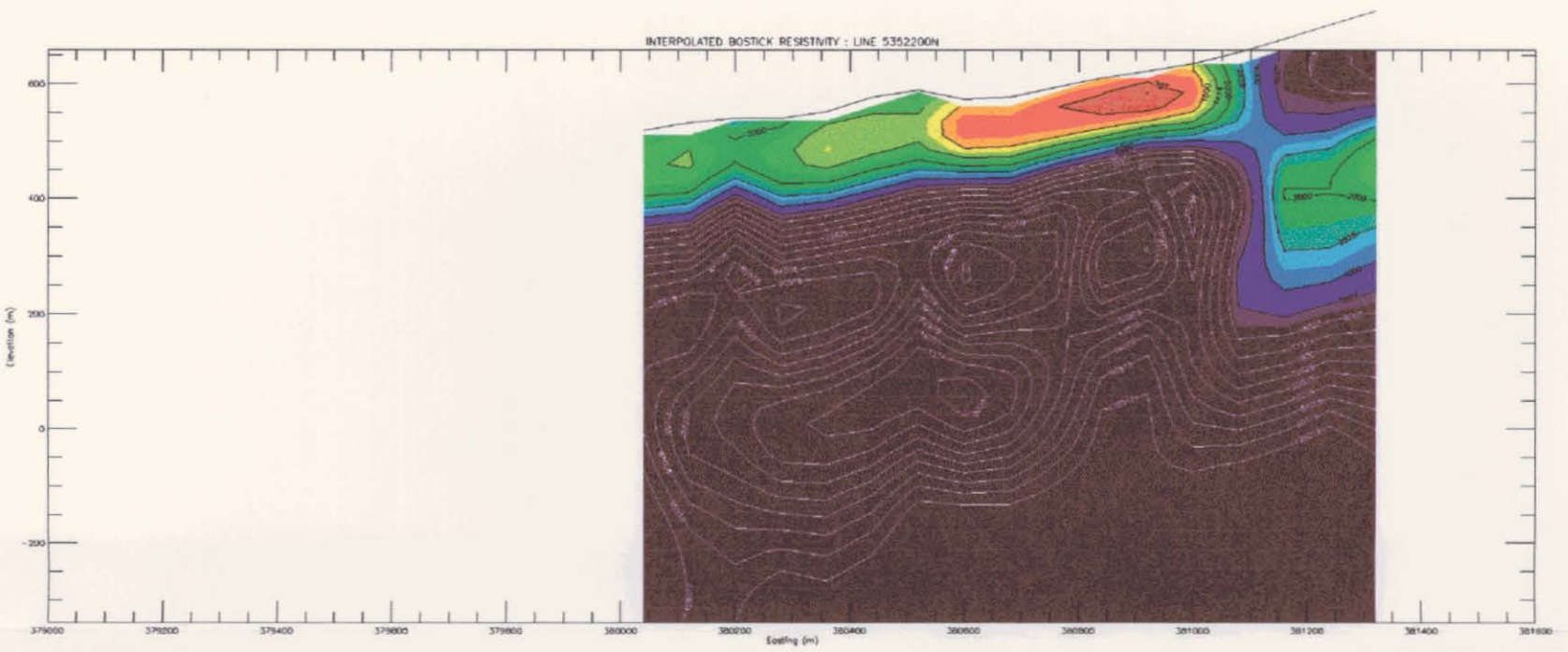
LINE 5352600N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5352600N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

607182





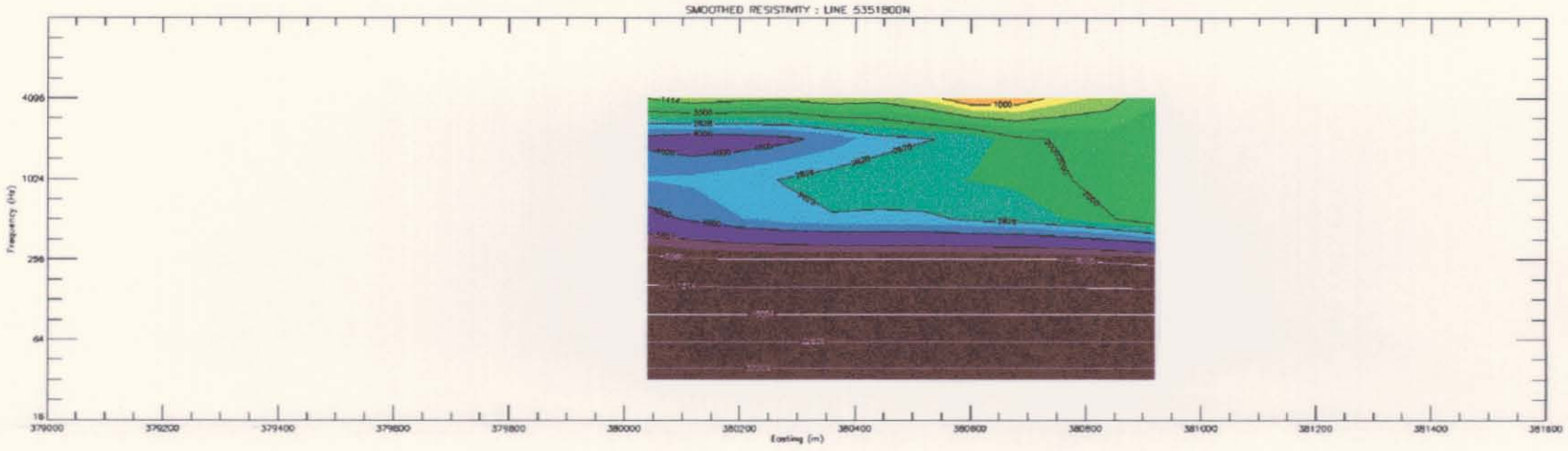


LINE 5352200N

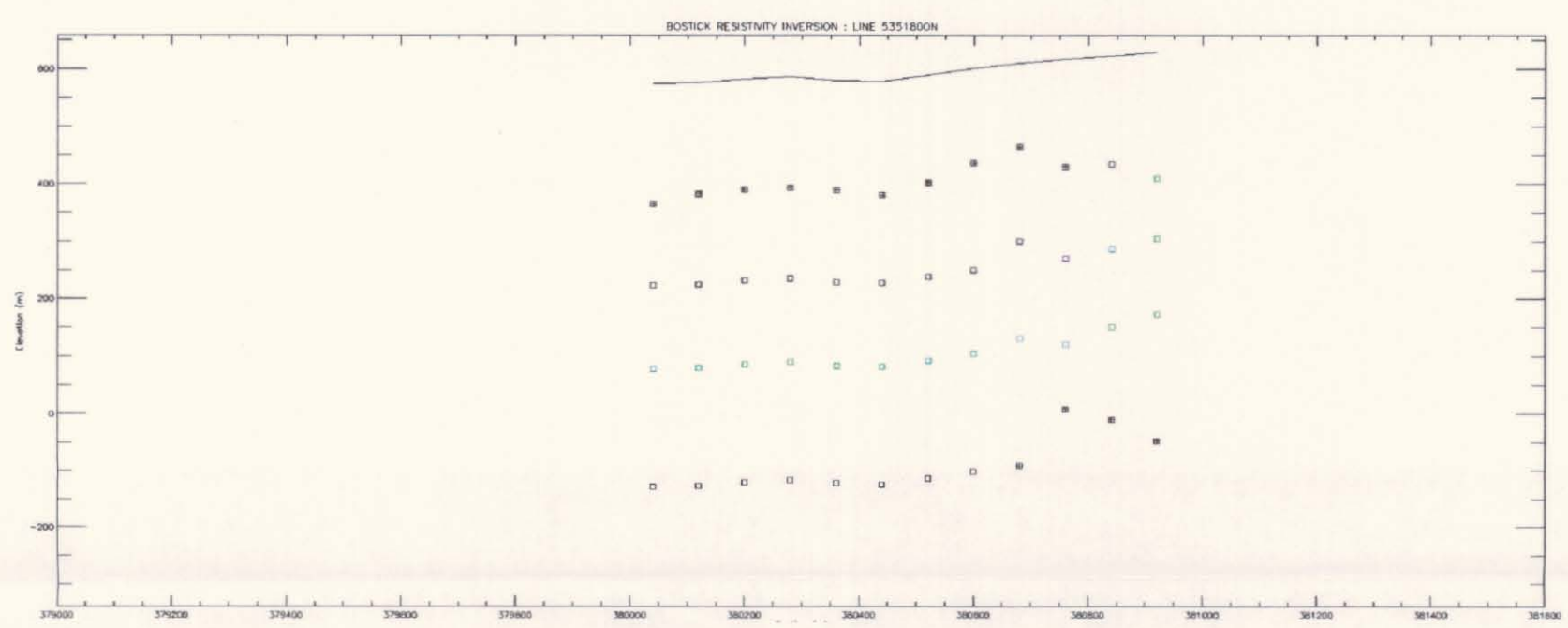
GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5352200N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

607183

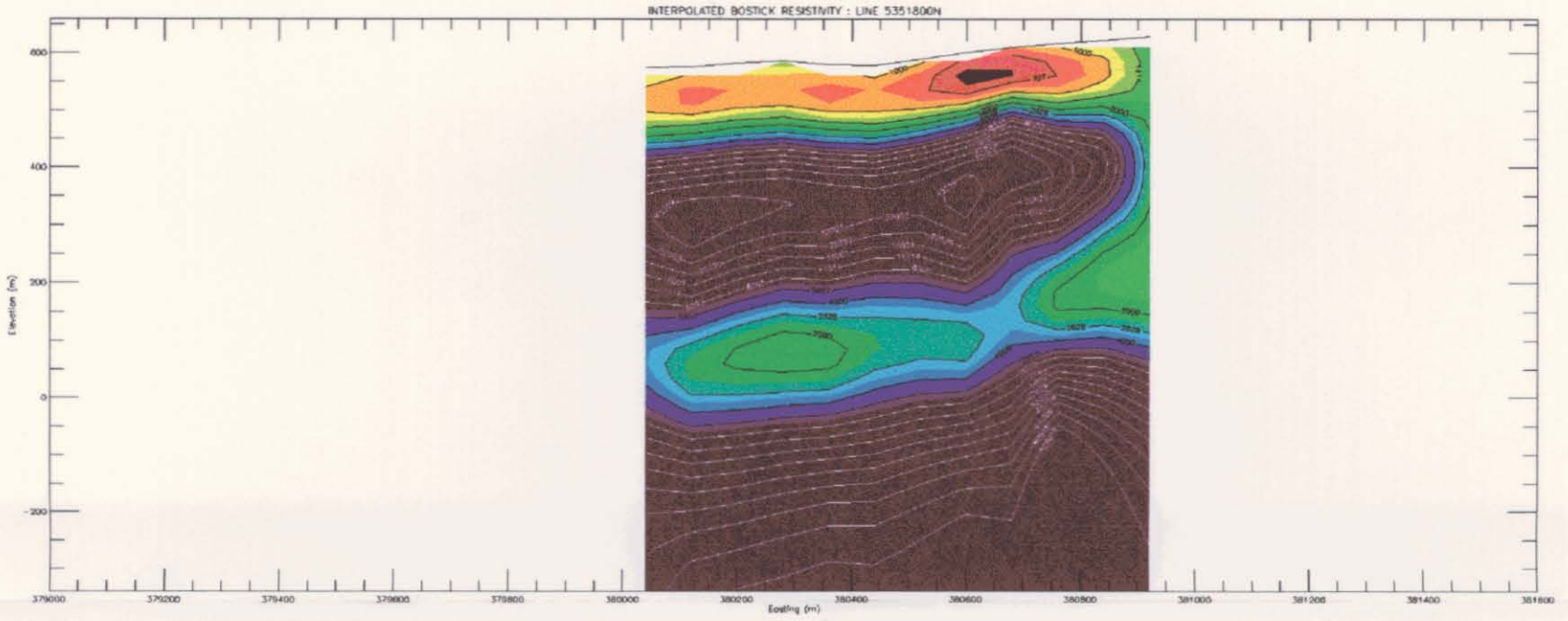
SMOOTHED RESISTIVITY : LINE 5351800N



BOSTICK RESISTIVITY INVERSION : LINE 5351800N



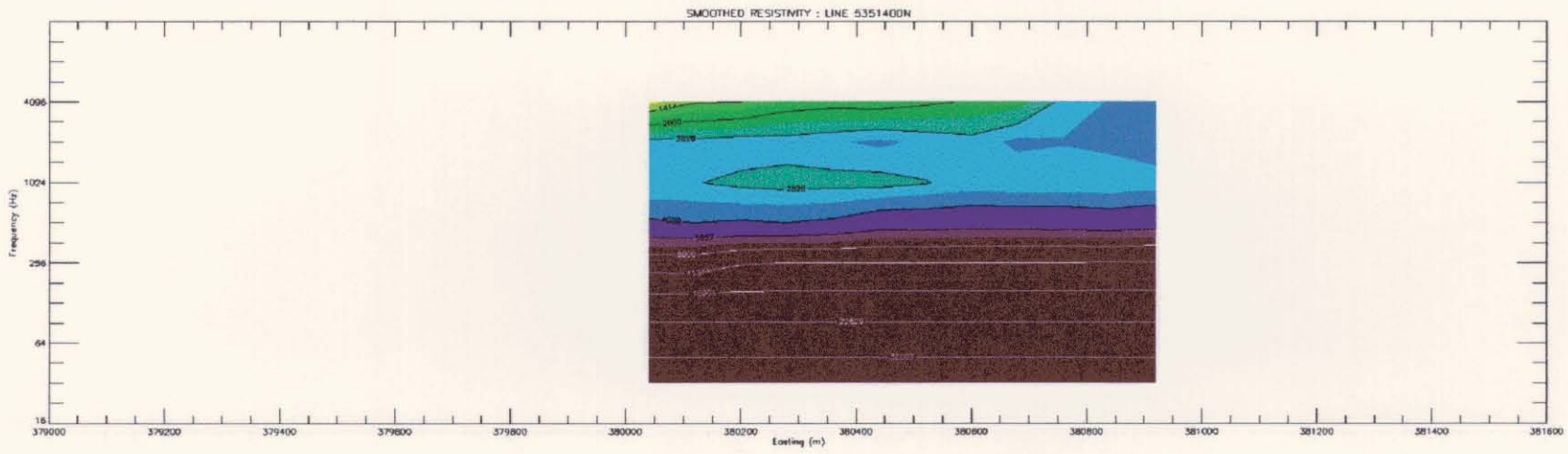
INTERPOLATED BOSTICK RESISTIVITY : LINE 5351800N

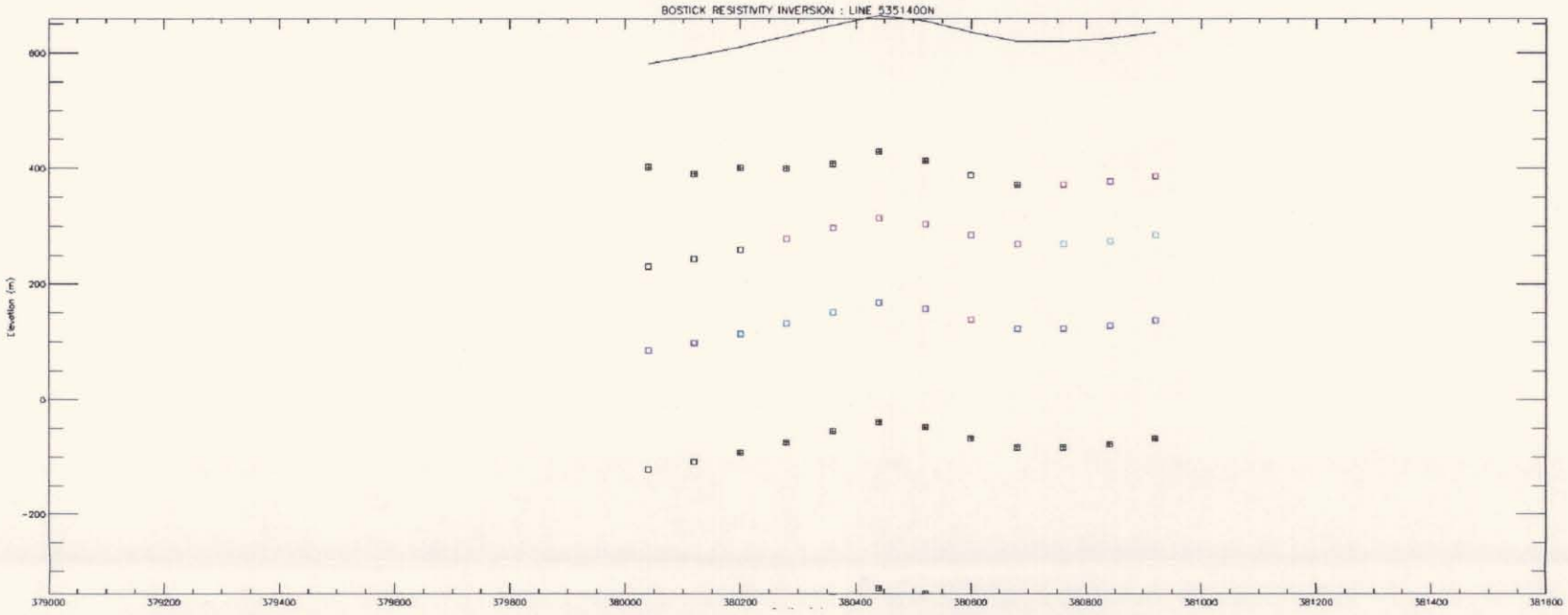


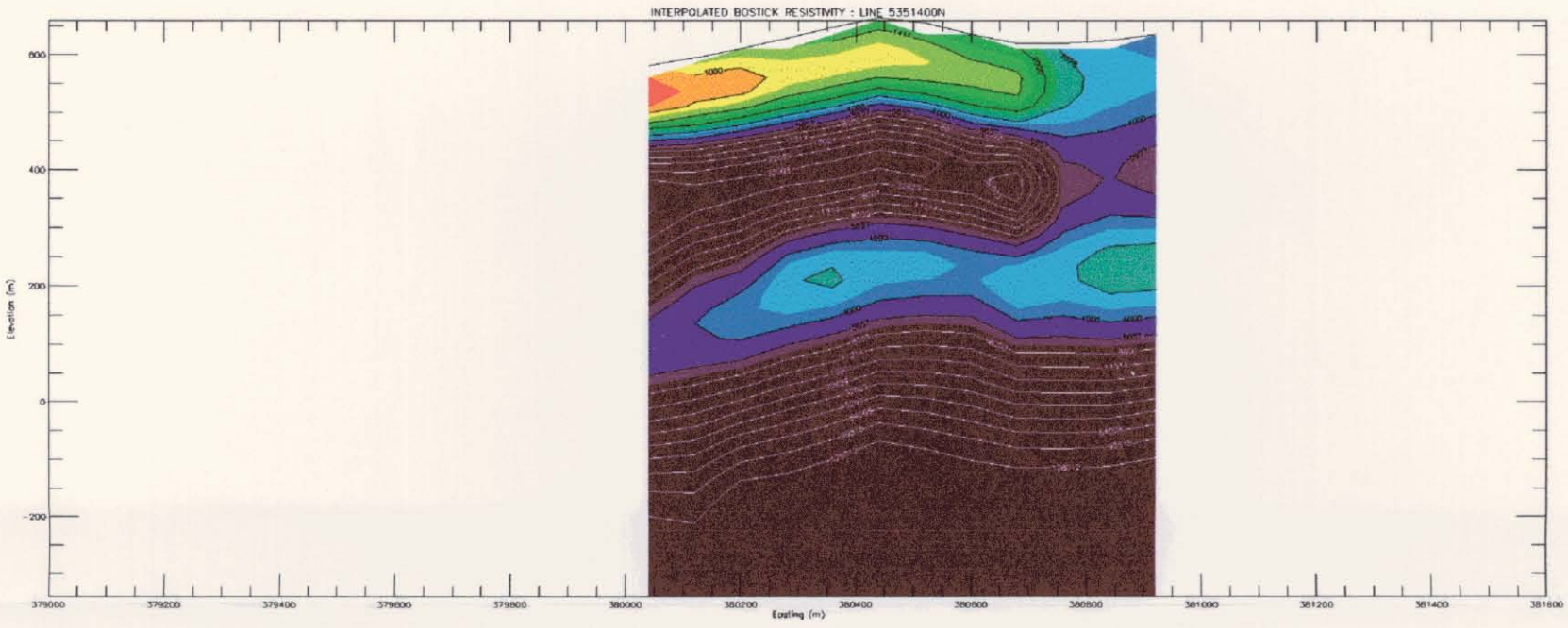
LINE 5351800N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5351800N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

6071184



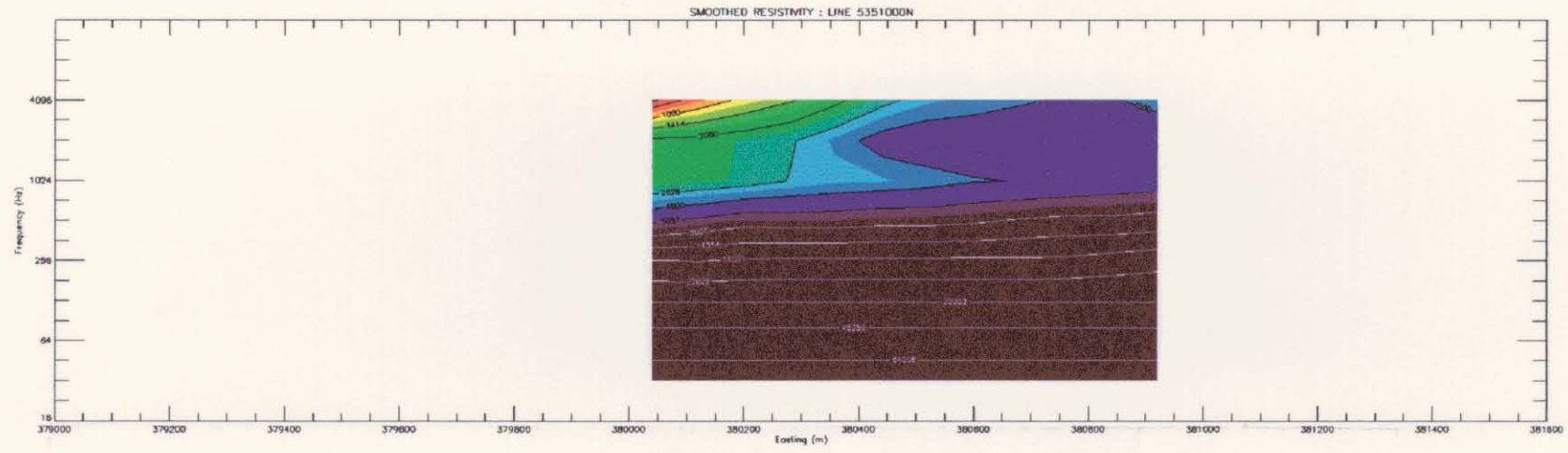


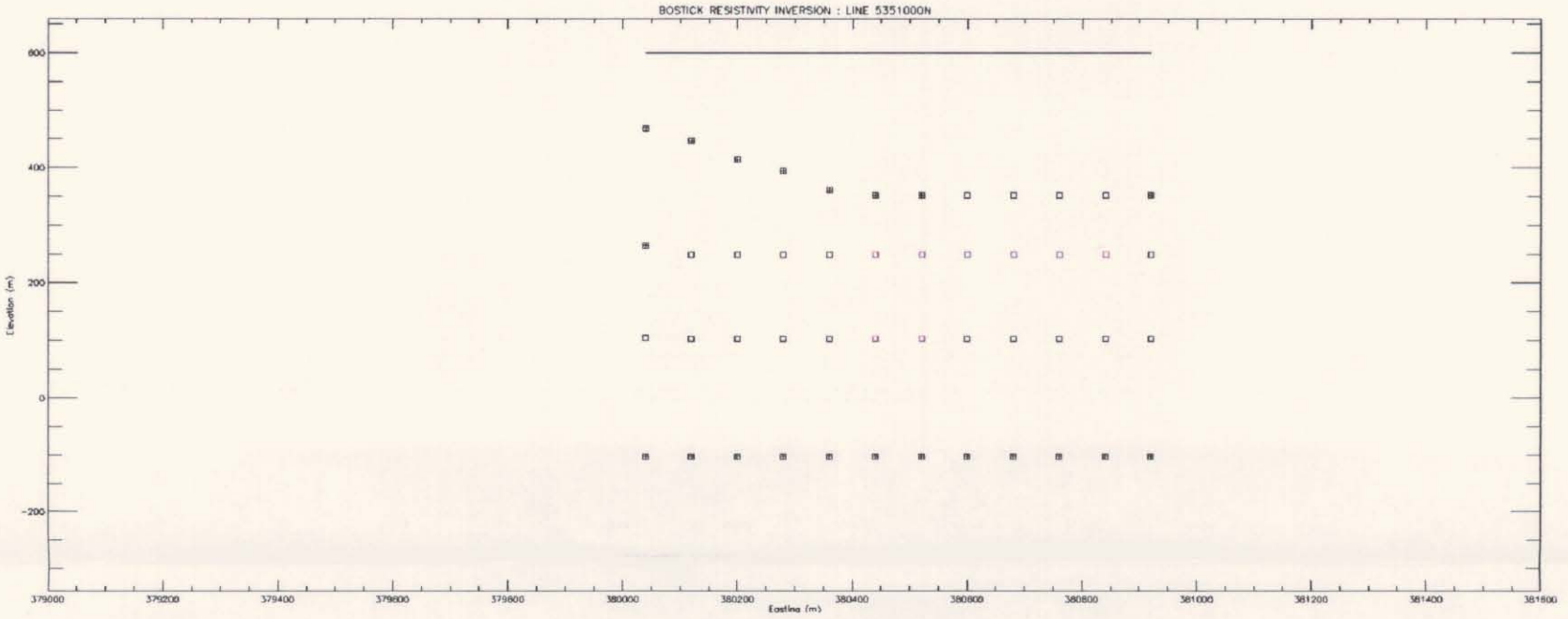


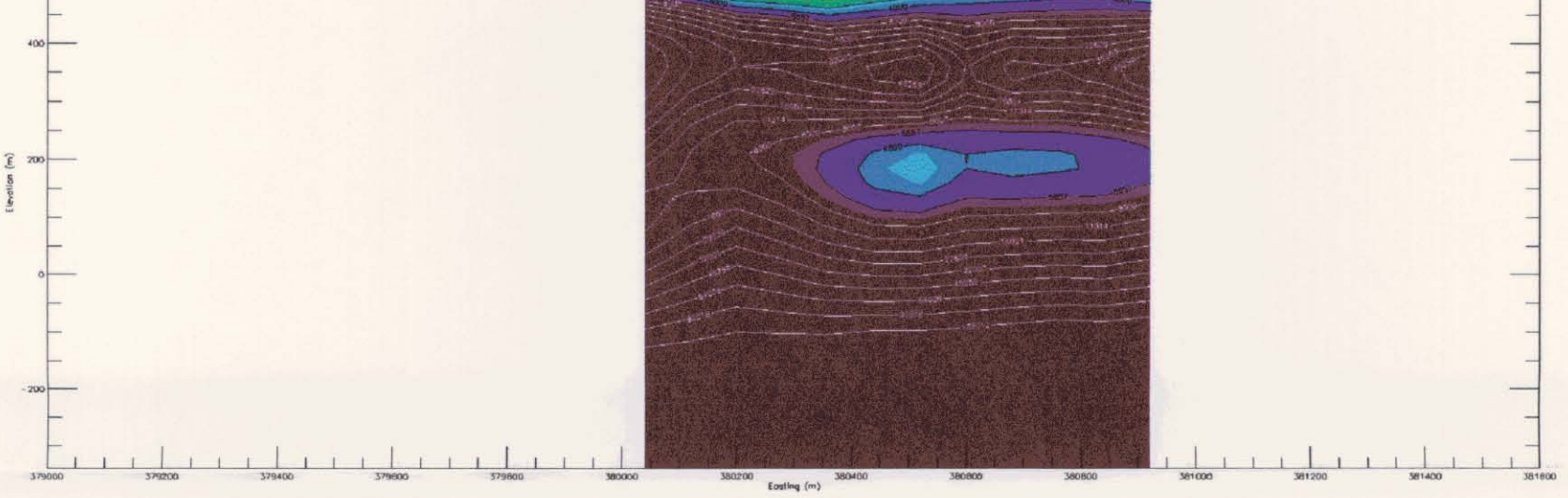
LINE 5351400N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5351400N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

607185



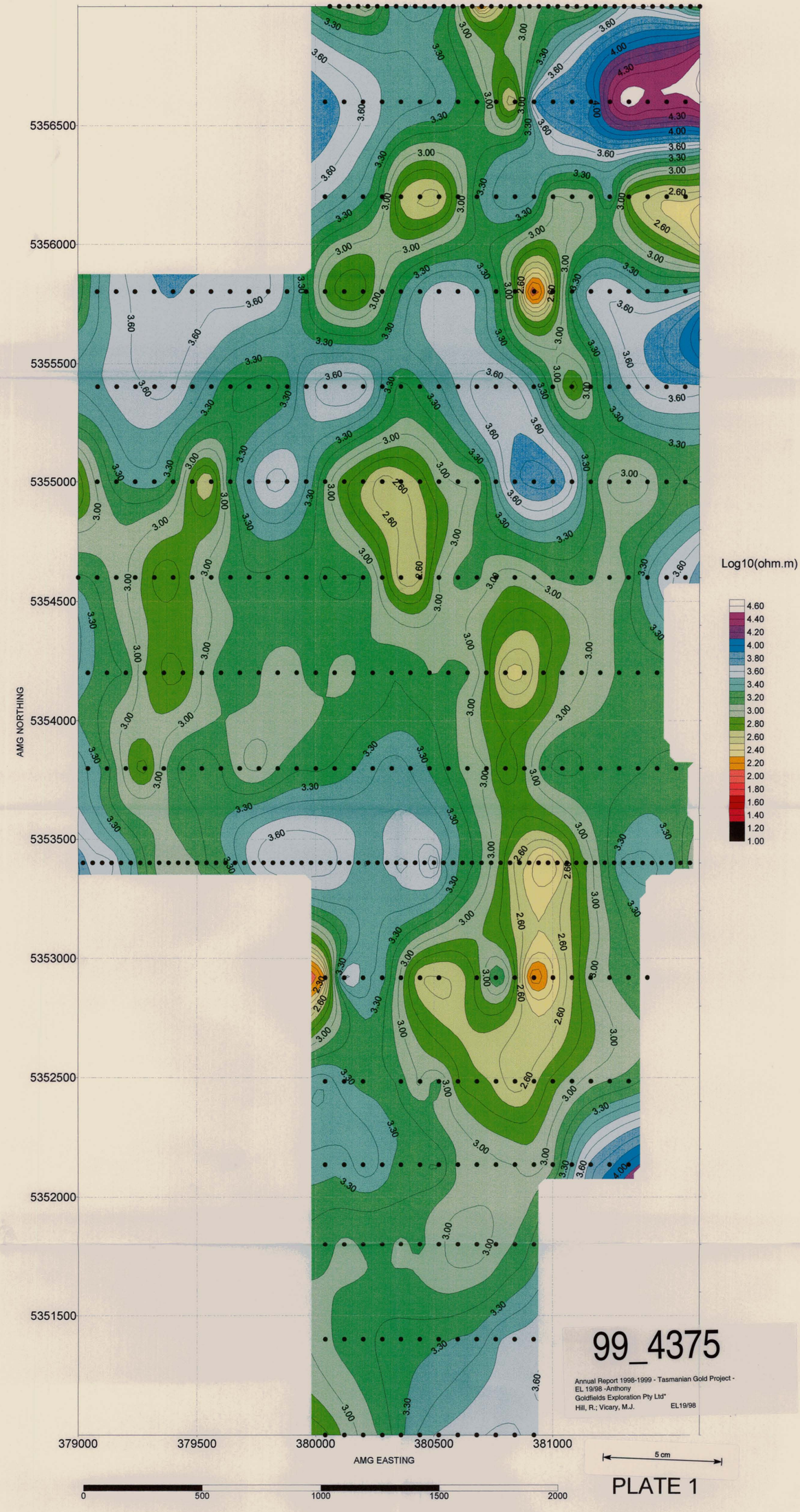




LINE 5351000N

GOLDFIELDS EXPLORATION
Basin Lake CSAMT Data 1988-90. Line 5351000N. Re-Processed with EMAP filter and Bostick inversion Aug 1999
Drawn by: Flagstaff Geo-Consultants 29/8/99

607186



99_4375

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Goldfields Exploration Pty Ltd*
Hill, R.; Vicary, M.J. EL19/98

PLATE 1

GOLDFIELDS EXPLORATION

BASIN LAKE (TAS) - CSAMT INTERPRETATION
Bostick Resistivity
Depth Slice draped on topographic surface

Drawn by: Flagstaff Geo-Consultants
16/9/99

Flagstaff Geo-consultants

607187

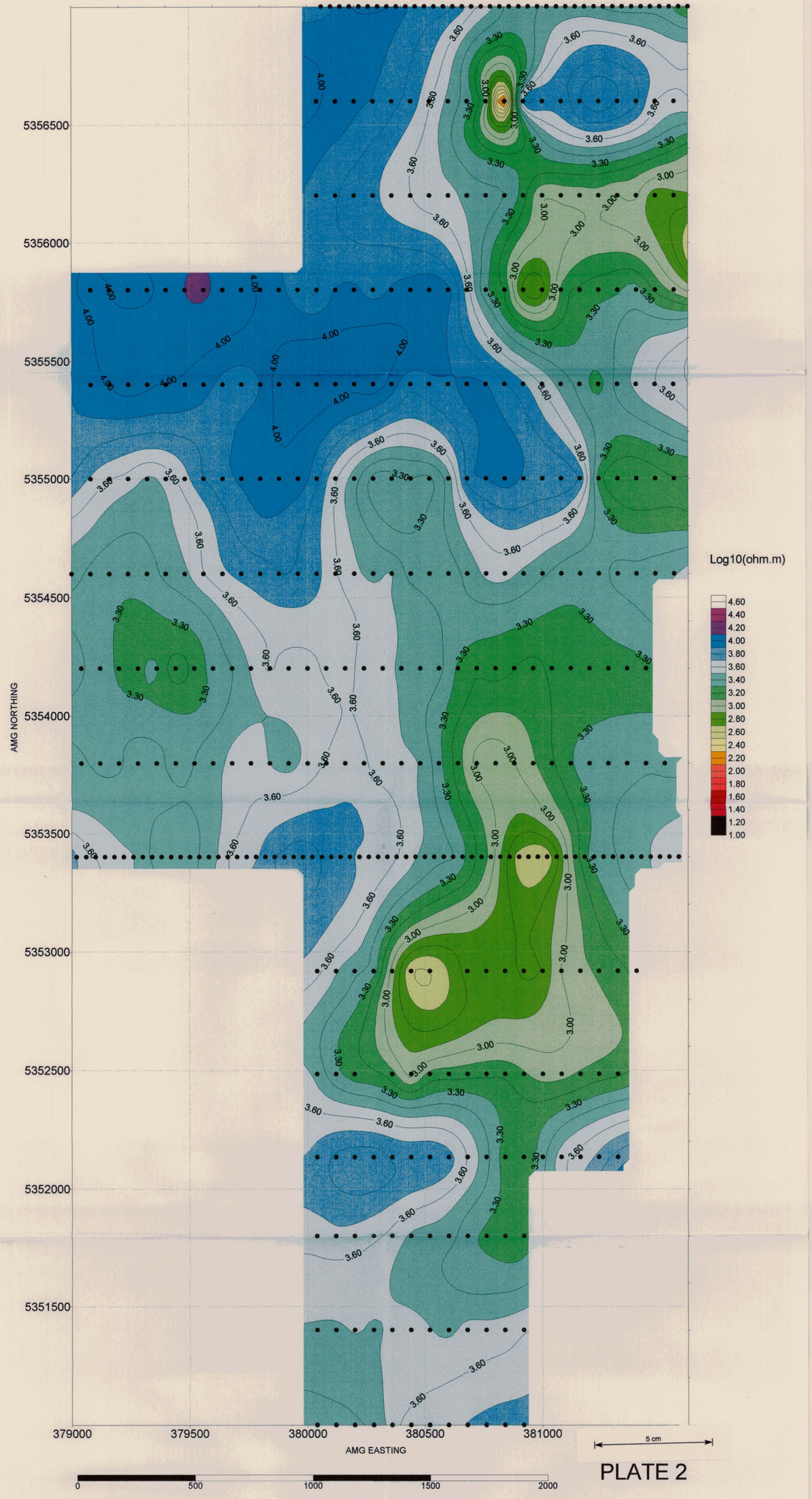

PLATE 2

607188

99_4375

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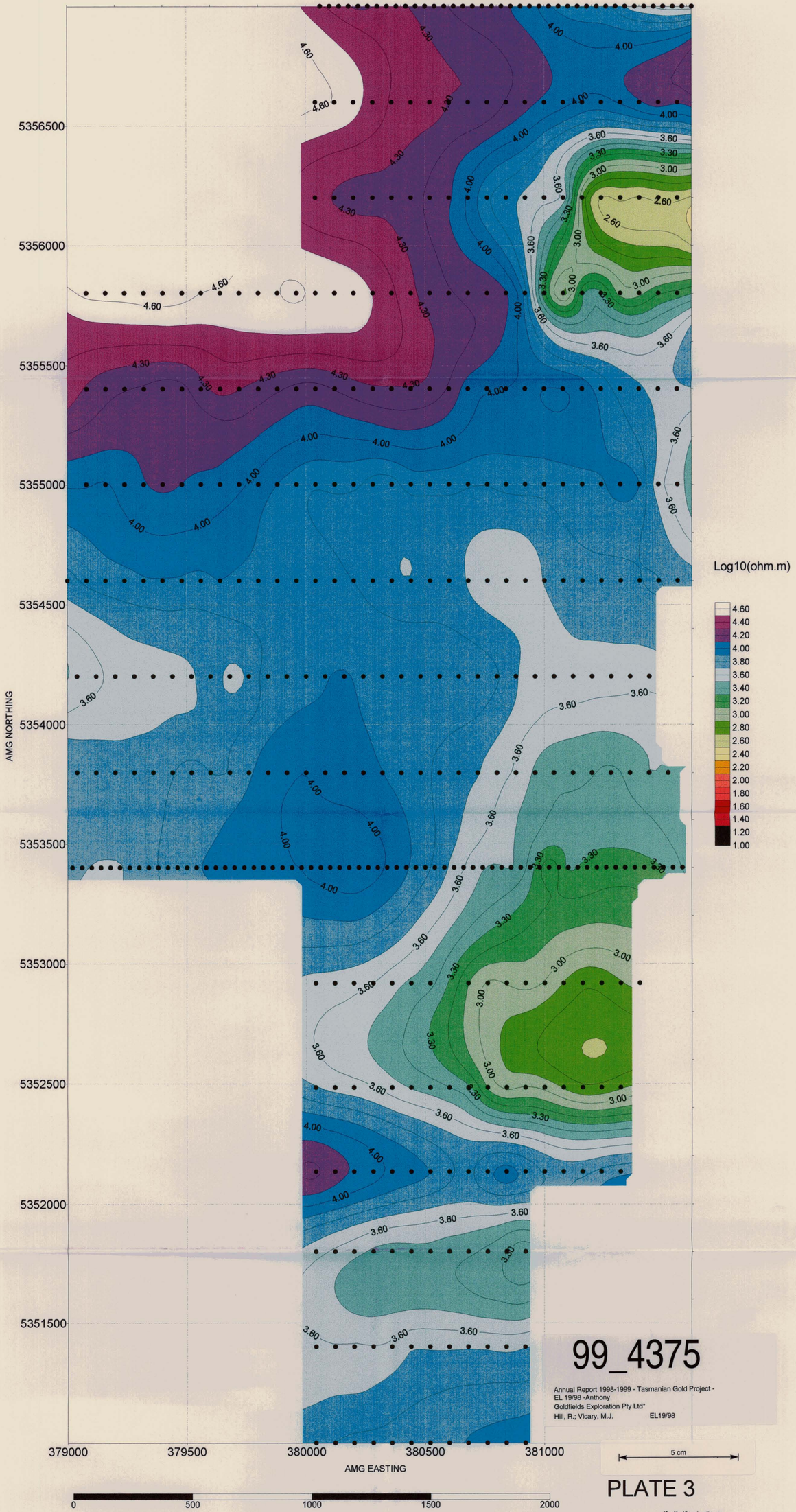
Goldfields Exploration Pty Ltd*
Hill, R.; Vicary, M.J.
EL19/98

GOLDFIELDS EXPLORATION

BASIN LAKE (TAS) - CSAMT INTERPRETATION
EMAP - Cagniard Resistivity
Frequency Slice 2048 Hz (Depths 100-300 m)

Drawn by: Flagstaff Geo-Consultants
6/9/99

Flagstaff Geo-consultants



99_4375

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Goldfields Exploration Pty Ltd*
Hill, R.; Vicary, M.J. EL19/98

PLATE 3

607189

GOLDFIELDS EXPLORATION

BASIN LAKE (TAS) - CSAMT INTERPRETATION
EMAP - Cagniard Resistivity
Frequency Slice 512 Hz (Deep depths 300+ m)

Drawn by: Flagstaff Geo-Consultants
6/9/99

Flagstaff Geo-consultants

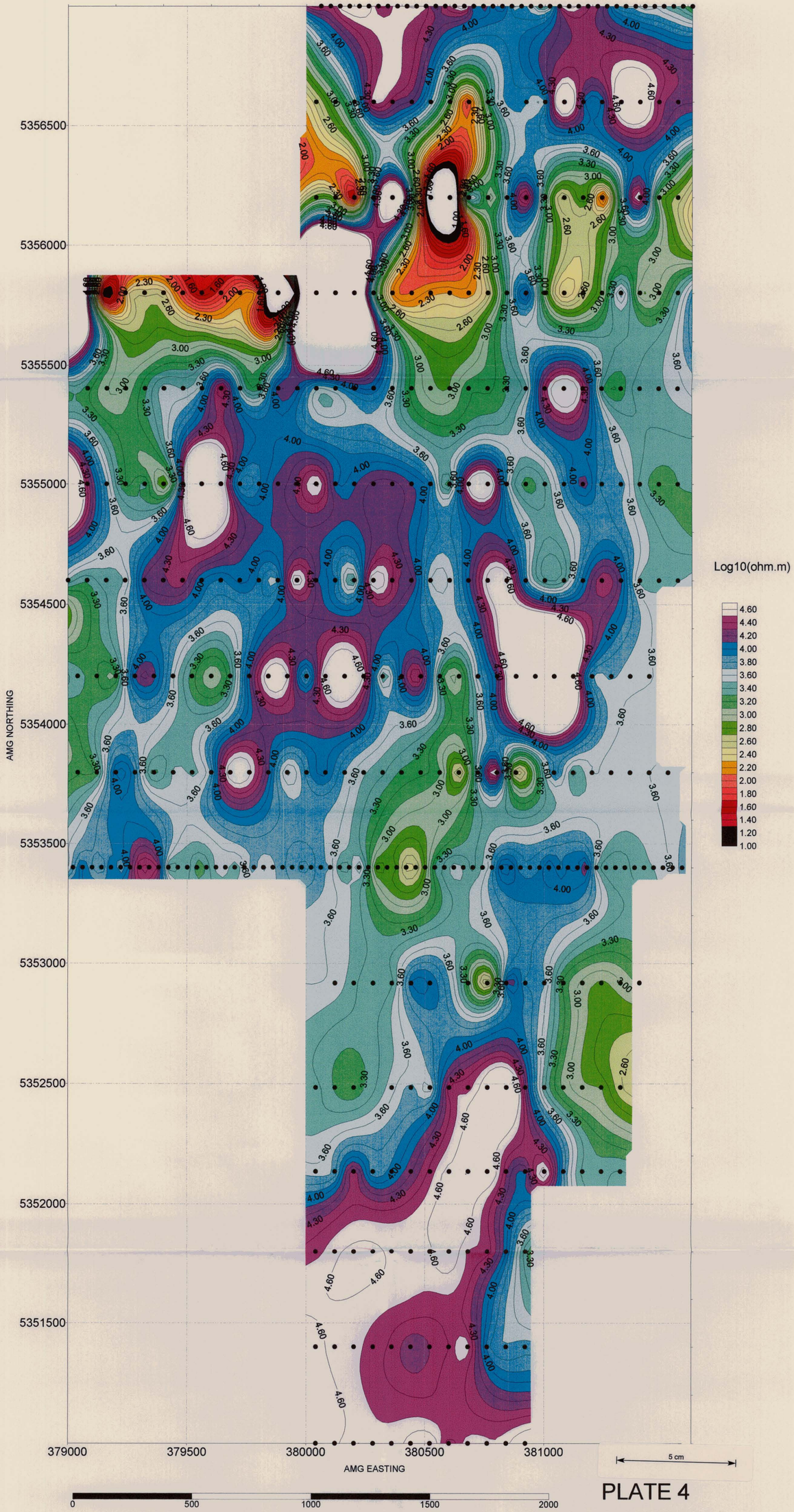

PLATE 4

607190

99_4375

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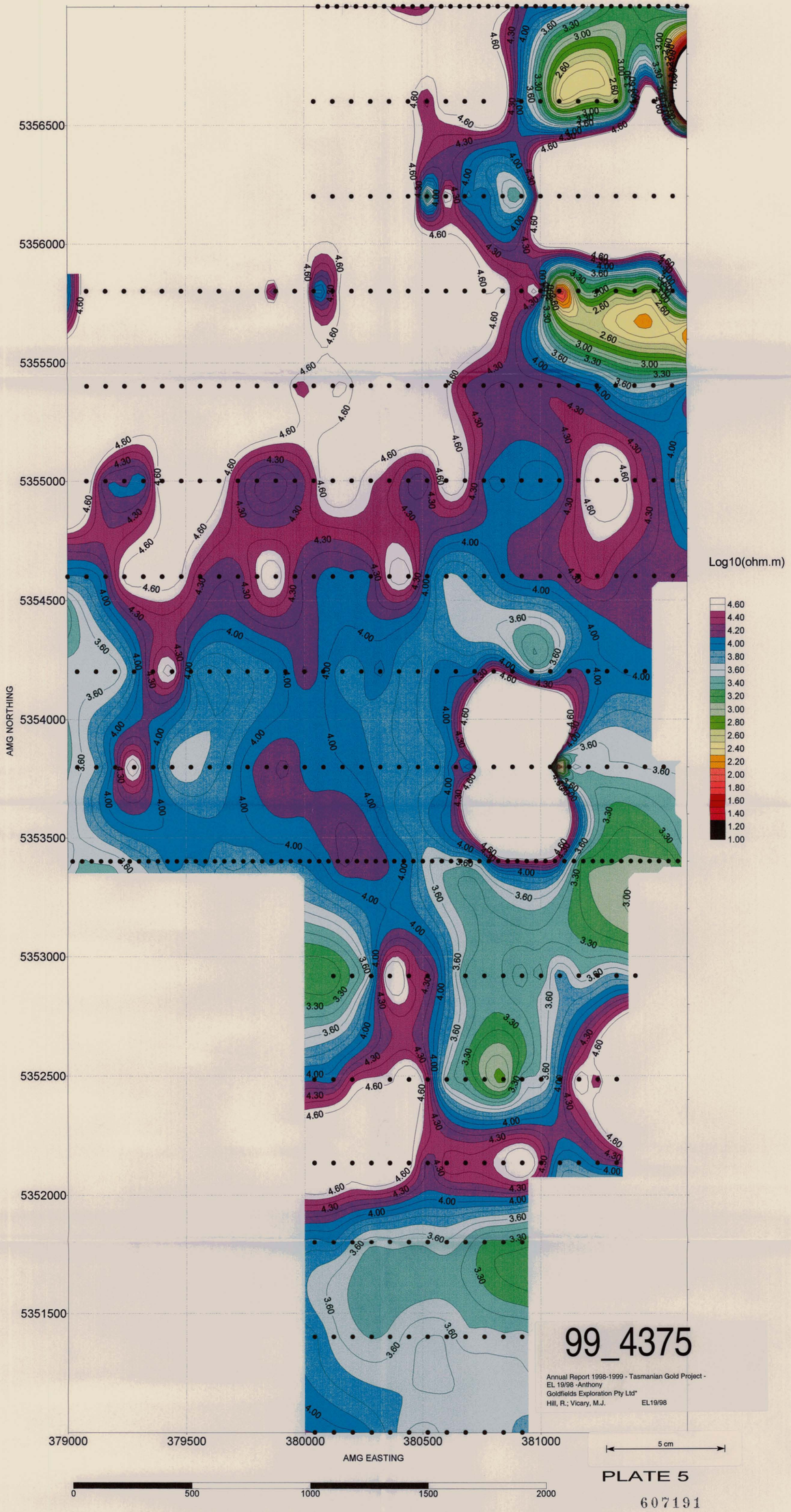
Hill, R.; Vicary, M.J. EL19/98

GOLDFIELDS EXPLORATION

BASIN LAKE (TAS) - CSAMT INTERPRETATION
Bostick Resistivity
Depth Slice 300 m, = +360 m RL

Drawn by: Flagstaff Geo-Consultants
16/9/99

Flagstaff Geo-consultants



99_4375

Annual Report 1998-1999 - Tasmanian Gold Project - EL 19/98 -Anthony
Goldfields Exploration Pty Ltd*
Hill, R.; Vicary, M.J. EL19/98

5 cm

PLATE 5

607191

GOLDFIELDS EXPLORATION

BASIN LAKE (TAS) - CSAMT INTERPRETATION
Bostick Resistivity
Depth Slice at 500 m, RL=160 m.

Drawn by: Flagstaff Geo-Consultants
6/9/99

Flagstaff Geo-consultants

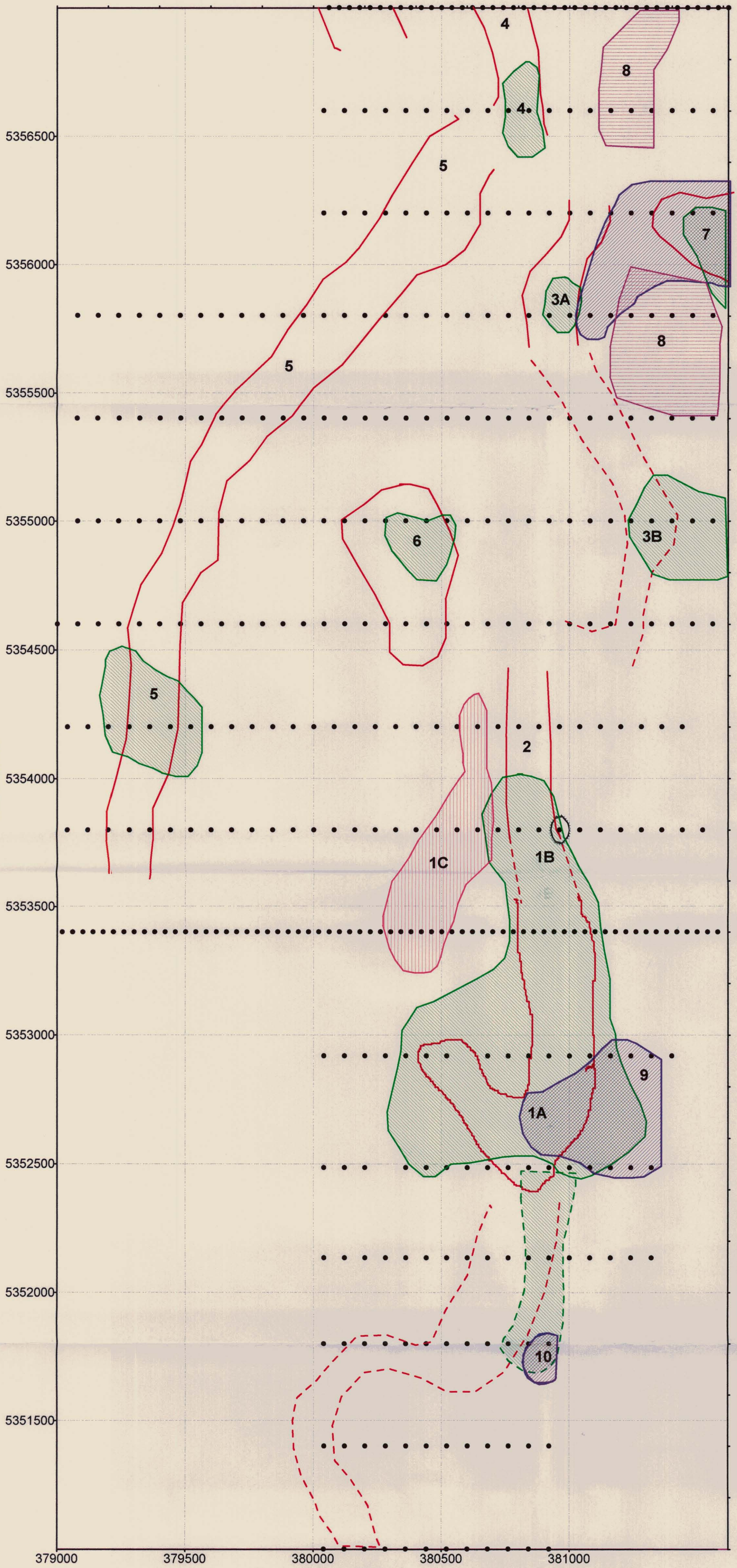


PLATE 6

KEY

- CSAMT Receiver sites 1988-90
- Edges of surficial conductors (top 100 m)
- Conductor at depth 100-200 m (from 2048 Hz data)
- Conductor at depth 200-400 m (from 2048 Hz data)
- Conductor from depthslice at RL +360 m
- Conductor from depth slice at RL +260 to 160 m
- 1B — Zone number (see text of report)

GOLDFIELDS EXPLORATION

EL 19/98 BASIN LAKE - ANTHONY AREA (W. TAS.)
Zones of alteration and black siltstones (low-resistivity zones) re-interpreted from Biliton CSAMT data 1988-90.

Drawn by: Flagstaff Geo-Consultants (Michael Asten) 20/9/99.

Flagstaff Geo-consultants

5 cm

99_4375

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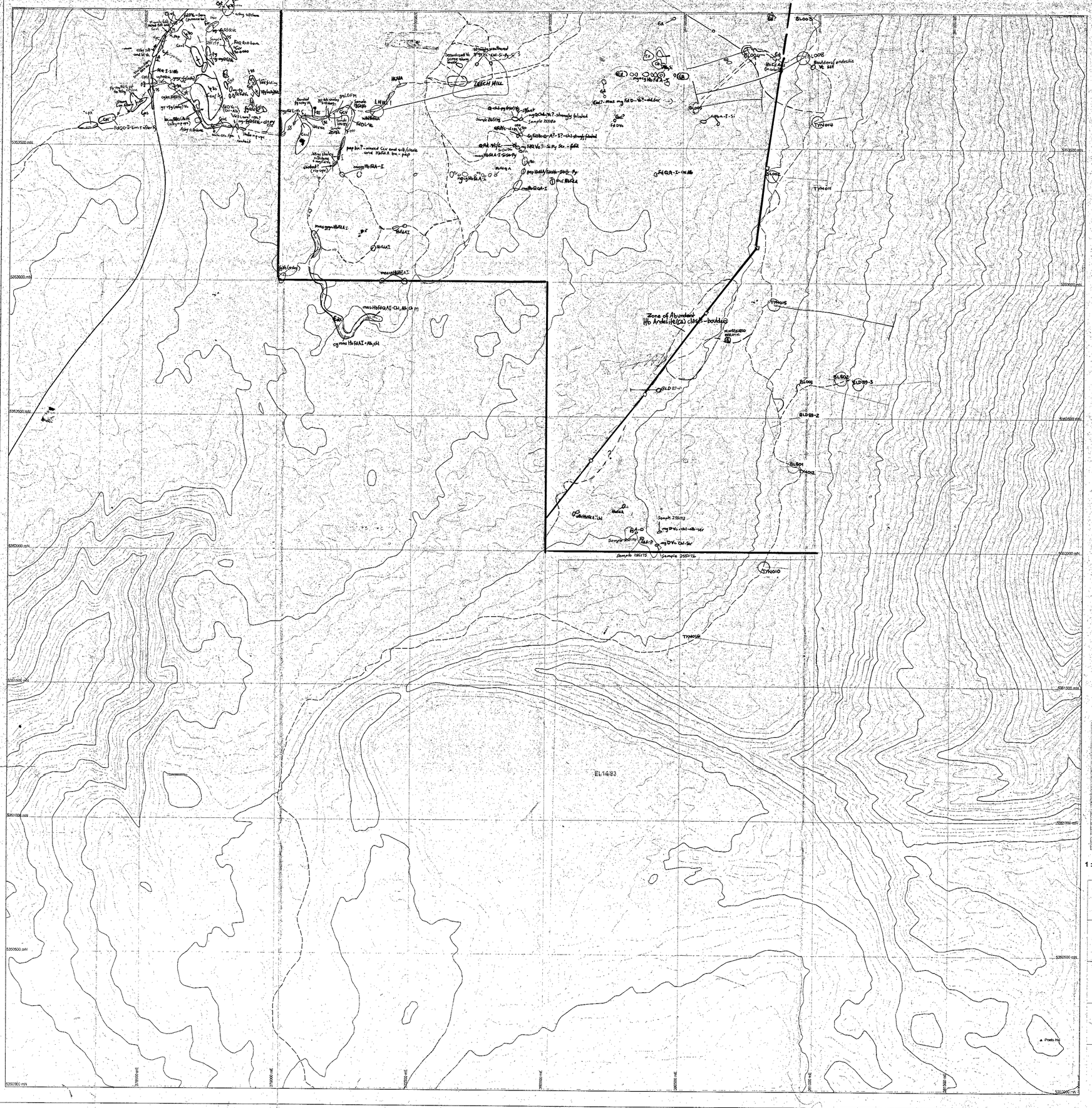
Hill, R.; Vicary, M.J. EL19/98

607192



Qu Undifferentiated Quaternary sediments

Qg Mainly limestone commonly decomposed to black clay "pug"

COou Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone & granite - pebble conglomerate. Includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).

COoug Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone and granule - pebble conglomerate. Includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).

COom Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs).

COomcs Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs)

COnsc Mainly thinly bedded quartzitic sandstone & pebbly sandstone with bands of pebble-conglomerate - Newton Creek Sandstone.

COnscong Mainly thinly bedded siltstone, quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.

COnsc Mainly pebble conglomerate with minor thinly bedded quartzitic sandstone & pebbly sandstone - Newton Creek Sandstone.

Oc Mainly volcaniclastic conglomerate with minor siltstone and volcaniclastic sandstone.

Ocs Bedded sandstone - siltstone units

Mainly crystal - rich volcanic sandstone (quartz-feldspar phyric). Comstock Tuff and correlates.

Chert rich mass flow horizon. Basal unit to Comstock Tuff.

Crystal - rich volcanic sandstone (feldspar-pyroxene phyric), litho-rich bases with minor ash, sandstone &limestone. Lynchford Tuff & correlates.

Quartz phyric lava & tuff. Possibly equivalent to Lower Tyndall Group.

Quartz-feldspar phyric lava

Sulphide Lenses

Ds Andesitic to basaltic intrusive bodies with lavas & clastic units. Includes feldspar-hornblende-pyroxene-phyric & feldspar-pyroxene phyric types & small chlorite altered dykes.

Dps Thinly bedded black pyritic siltstone

Dav Andesitic to basaltic clastic units

Dd Basalt. Henty Dyke Swarm

Dbs Interbedded basaltic lava & volcaniclastic sediments

Dsv

Dsv Interbedded dacitic volcaniclastic sandstone and siltstone

Dtv Mainly felsic pyroclastic rocks, dominantly feldspar phyric, including pumice bearing tuff & breccia, crystal vitric tuff, vitric tuff & minor shale & sandstone

Dmv

Dfd Mainly felsic felspar phyric lava and intrusives; massive to flow banded or autobrecciated, with rare colmnar jointing

Dsh Units of bedded siltstone, sandstone, tuff & agglomerate

Undifferentiated massflows, sandstones & black siltstones

Dph Ashy siltstone

Felsic porphyry bodies, intrusive & partly extrusive.

Dyt Units of bedded siltstone, sandstone

Dbs Black siltstone

Dgy Dominantly greywacke & mudstone with some interbedded vitric tuff, crystal tuff & crystal-lithic tuff

Interbedded vitric tuff, crystal tuff, siltstone, slate, sandstone & agglomerate.

Volcaniclastics

Undifferentiated Lower White Spur Formation

Crystal rich volcaniclastics sandstone

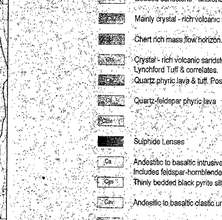
Dhs Siltstone & sandstone

Quartz feldspar porphyry

Cum Ultramafics

Unknown unit

Geological boundary, accurate
Geological boundary, inferred
Fold feature
Fault, position accurate
Inferred Fault
Concealed Fault
Underground Mine
Open Cut Mine
Mineral Deposit
Mineral occurrence
Prospect, explored
Abandoned Mine
Built up populated area
Homestead (Postcard)
Building
Railway Station
Beacon, Lighthouse
Airport or Aerodrome
Bridge
Road tunnel
Monument, Statue, Cross
Landmark Object
Named Relief Feature
Mountain or mountain range
Pass
Cliff, Escarpment, Breakaway
Sand Ridge or Sand Dunes
Spur, Spur line
Rock
Plateau
Valley
Gully, Gap
Cave, Cavern
Island
Point
Pool, Pond, Watermark, Rockhole
Swamp
Waterfall
Dam
Spring
Ford
Mineral, Mineing Pen, Port
Highway
Secondary Road
Minor Road
Vehicle Track
Railway
Landing Ground
Powerline
Contour line
Watercourse
Perennial Lake



5 cm

0 250 500 1000

Scale 1 : 5 000

Distances in Metres
Major Contour Interval 50m
Minor Contour Interval 10m
AMG Zone 55

1 : 5 000 Sheet Index

White Spur 53	Mount Julia 32	Julia Peak 11
Howard's Road 52	31	Mount Tyndall 10
Henty Gorge 51		The Bastion 9
50	Crown Hill 29	Mount Cyril 8
East Sister 49	Davies Hill 28	Cape Horn Spur 7

RGC Exploration

Mt Read Volcanics Belt
Tasmania

99_4375

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607193

SHEET 30
Poet's Hill

GEOLOGICAL INTERPRETATION

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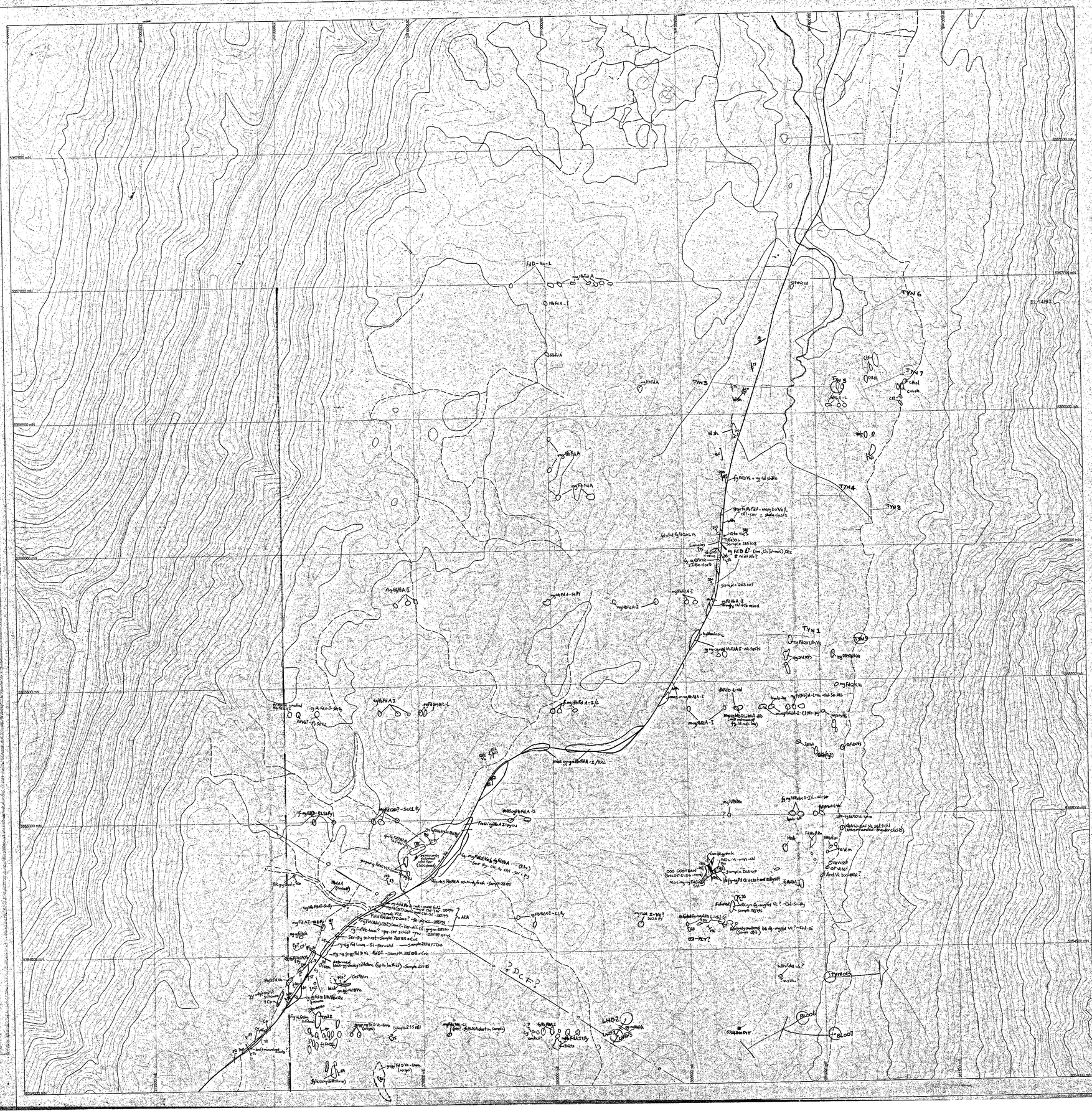
Date: October 1997

PLAN 1



Qu	Undifferentiated Quaternary sediments
Qal	Mainly limestone commonly decomposed to black clay "pug"
COou	Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone & granite - pebble conglomerate, includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).
COoug	Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone and granule - pebble conglomerate, includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).
COcm	Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COcmcs)
COcmcs	Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COcmcs)
COns	Mainly thinly bedded quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.
COnsh	Mainly thinly bedded siltstone, quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.
COpnc	Mainly pebble conglomerate with minor thinly bedded quartzitic sandstone & pebbly sandstone - Newton Creek Sandstone.
Cto	Mainly volcaniclastic conglomerate with minor siltstone and volcaniclastic sandstone.
Cts	Bedded sandstone - siltstone units
Cpp	Mainly crystal - rich volcanic sandstone (quartz-feldspar phyric), Comstock Tuff and correlates.
Cpc	Chert rich mass flow horizon. Basal unit to Comstock Tuff.
Cft	Crystal - rich volcanic sandstone (feldspar-pyroxene phyric), lithic-rich bases with minor ash, sandstone & limestone. Lynchford Tuff & correlates.
Cqv	Quartz phyric lava & tuff. Possibly equivalent to Lower Tyndall Group.
Cqt	Quartz-feldspar phyric lava
Cqtf	
	Sulphide Lenses
Ca	Andesitic to basaltic intrusive bodies with lavas & clastic units. Includes feldspar-hornblende-pyroxene-phyric & feldspar-pyroxene phyric types & small chlorite-altered dykes
Cps	Thinly bedded black pyrite siltstone
Cav	Andesitic to basaltic clastic units
Cb	Basalt, Henty Dyke Swarm
Cbh	Interbedded basaltic lava & volcaniclastic sediments
Cad	
Cbv	Interbedded dacitic volcaniclastic sandstone and siltstone
Cbc	Mainly felsic pyroclastic rocks, dominantly feldspar phyric, including pumice bearing tuff & breccia, crystal vitric tuff, vitric tuff & minor shale & sandstone
Cdc	
Cdl	Mainly felsic felspar phyric lava and intrusives; massive to flow banded or autobrecciated, with rare colmnar jointing
Cds	Units of bedded siltstone, sandstone, tuff & agglomerate
Cs	Undifferentiated massflows, sandstones & black siltstones
Cyp	Ashy siltstone
Cpb	Felsic porphyry bodies, intrusive & partly extrusive.
Cys	Units of bedded siltstone, sandstone
Cysc	Black siltstone
Csg	Dominantly greywacke & mudstone with some interbedded vitric tuff, crystal tuff & crystal-lithic tuff
Cyt	Interbedded vitric tuff, crystal tuff, siltstone, slate, sandstone & agglomerate.
Cyv	Volcaniclastics
Cyc	Undifferentiated Lower White Spur Formation
Cyp	Crystal rich volcaniclastics sandstone
Chs	Siltstone & sandstone
Cqp	Quartz feldspar porphyry
Cum	Ultramafics
	Unknown unit

Geological boundary, accurate
Geological boundary, inferred
Fold feature
Fault, position accurate
Inferred fault
Concealed fault

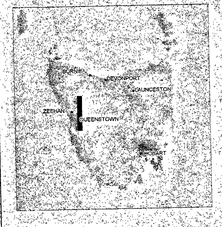
Underground Mine
Open Cut Mine
Mineral Deposit
Mineral occurrence
Prospect, explored
Abandoned Mine

Built up populated area
Homestead (Pastoral)
Building
Railway Station
Beacon, Lighthouse
Airport or Aerodrome
Bridge
Pipeline
Monument, Statue, Cross
Landmark Object

Named Relief Feature
Mountain or mountain range
Pass
Cliff, Escarpment, Breakaway
Sand Ridge or Sand Dunes
Spur, Spur line
Rock
Plateau
Valley
Gully, Gap

Cave, Cavern
Island
Point
Pool, Pond, Waterhole, Rockhole
Swamp
Waterfall
Dam
Spring
Ford
Marine, Mooring Pen, Port

Highway
Secondary Road
Minor Road
Vehicle Track
Runway
Landing Ground
Powerline
Contour line
Watercourse
Perennial Lake



5 cm

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Scale 1 : 5 000

Distances in Metres
Major Contour Interval 50m
Minor Contour Interval 10m
AMG Zone 55

1 : 5 000 Sheet Index

Moores Pimple 54	Henty 33	The Red Hills 12
White Spur 53	Mount Julia 32	Julia Peak 11
Howard's Road 52		Mount Tyndall 10
Henty Gorge 51	Poets Hill 30	The Bastion 9
50	Crown Hill 29	Mount Cyril 8

RGC Exploration

Mt Read Volcanics Belt Tasmania

C07194

SHEET 31

99_4375

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GEOLOGICAL INTERPRETATION

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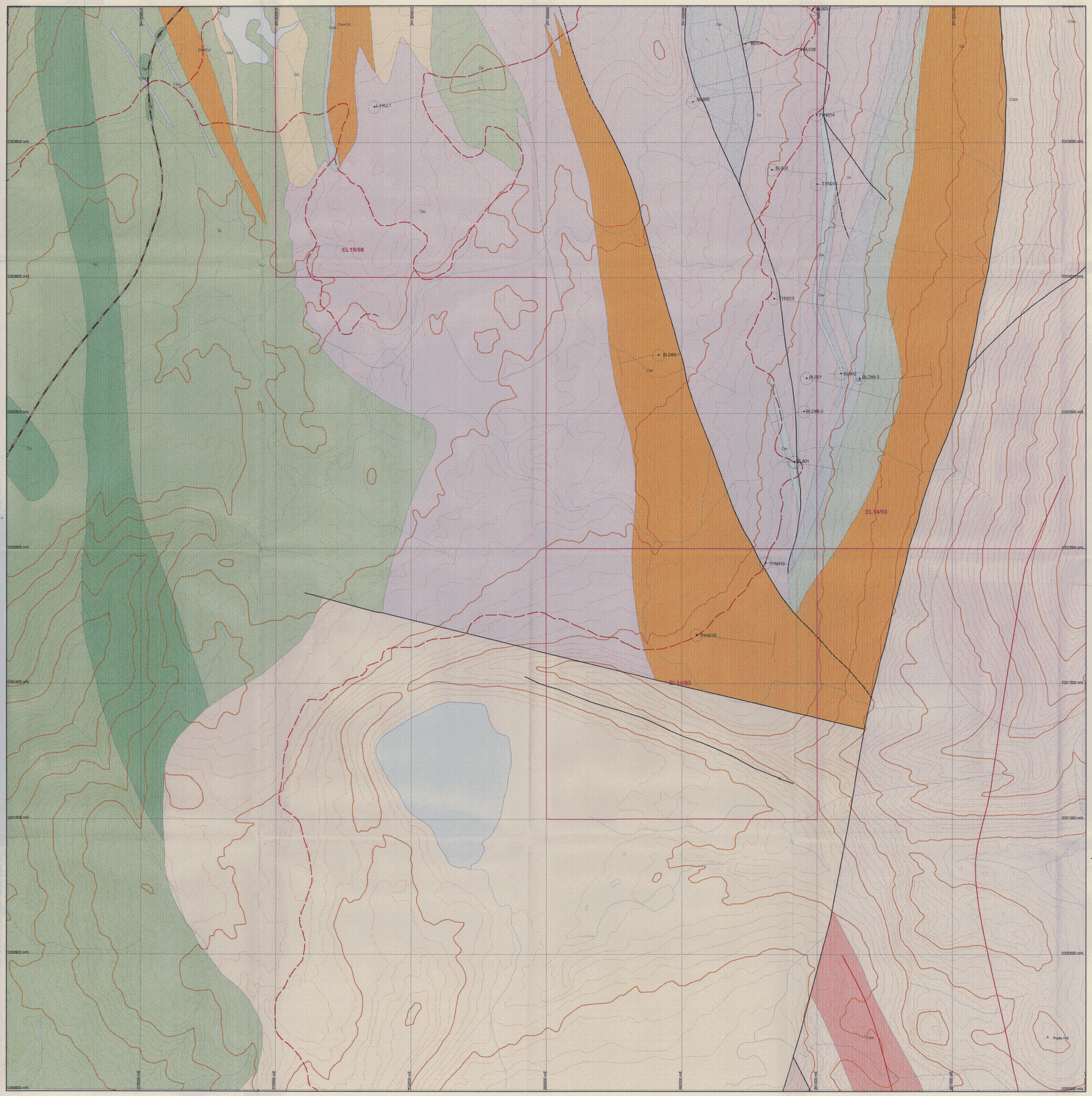
Date: October 1997

PLAN 2

607195

PLANS



Qu Undifferentiated Quaternary sediments

Qgl Mainly limestone commonly decomposed to black clay "pug"

COou Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone & granite - pebble conglomerate, includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).

COoug Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone and granule - pebble conglomerate, includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).

COom Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs).

COomcs Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs)

COon Mainly thinly bedded quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.

COsmph Mainly thinly bedded siltstone, quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.

COsed Mainly pebble conglomerate with minor thinly bedded quartzitic sandstone & pebbly sandstone - Newton Creek Sandstone.

Ocv Mainly volcaniclastic conglomerate with minor siltstone and volcaniclastic sandstone.

Os Bedded sandstone - siltstone units

Ok Mainly crystal - rich volcanic sandstone (quartz-feldspar phyric). Cornstock Tuff and correlates.

Obgf Chert rich mass flow horizon. Basal unit to Cornstock Tuff.

Old Crystal - rich volcanic sandstone (feldspar-pyroxene phyric), lithic-rich bases with minor ash, sandstone & limestone. Lynchford Tuff & correlates.

Olv Quartz phyric lava & tuff. Possibly equivalent to Lower Tyndall Group.

Ol Quartz-feldspar phyric lava

Olfs

Olfs Graded crystal-rich volcanic sandstone (feldspar-quartz phyric) with interbedded black siltstone (Lynchford Tuff correlate)

Sulphide Lenses

Ca Andesitic to basaltic intrusive bodies with lavas & clastic units. Includes feldspar-hornblende-pyroxene-phyric & feldspar-pyroxene phyric types & small chlorite altered dykes.

Cas Thinly bedded black pyrite siltstone

Cav Andesitic to basaltic clastic units

Cb Basalt. Henty Dyke Swarm

Cbi Interbedded basaltic lava & volcaniclastic sediments

Cbl Interbedded basaltic lava & volcaniclastic sediments

Cac

Cdv Interbedded dacitic volcaniclastic sandstone and siltstone

Cfv Mainly felsic pyroclastic rocks, dominantly feldspar phyric, including pumice bearing tuff & breccia, crystal vitric tuff, vitric tuff & minor shale & sandstone

Cld Mainly felsic feldspar phyric lava & intrusives; massive to flow banded or autobrecciated, with rare columnar jointing

Cmu

Cld Mainly felsic felspar phyric lava and intrusives; massive to flow banded or autobrecciated, with rare colmnar jointing

Cm Units of bedded siltstone, sandstone, tuff & agglomerate

Cy Undifferentiated massflows, sandstones & black siltstones

Cya Ashy siltstone

Cpr Felsic porphyry bodies, intrusive & partly extrusive.

Cys Units of bedded siltstone, sandstone

Cysa Black siltstone

Cgg Dominantly greywacke & mudstone with some interbedded vitric tuff, crystal tuff & crystal-lithic tuff

Cpf Interbedded vitric tuff, crystal tuff, siltstone, slate, sandstone & agglomerate.

Cpv Volcaniclastics

Cph Undifferentiated Lower White Spur Formation

Cpt Crystal rich volcaniclastics sandstone

Cts Siltstone & sandstone

Geological boundary, accurate
Geological boundary, inferred
Fold feature
Fault, position accurate
Inferred Fault
Concealed Fault
Major Mine site
Mineral Deposit
Abandoned Mine site
Prospect
Mineral Occurrence
Built up populated area
Homestead (Pastoral)
Building
Railway Station
Beacon, Lighthouse
Airport or Aerodrome
Bridge
Road tunnel
Monument, Statue, Cross
Landmark Object
Named Relief Feature
Mountain or mountain range
Pass
Cliff, Escarpment, Breakaway
Sand Ridge or Sand Dunes
Spur, Spur line
Rock
Plateau
Valley
Gully, Gap
Cave, Cavern
Inland
Point
Pool, Pond, Waterhole, Rockhole
Swamp
Waterfall
Dam
Spring
Ford
Marina, Mooring Pen, Port
Highway
Secondary Road
Minor Road
Vehicle Track
Runway
Landing Ground
Powerline
Contour line
Watercourse
Perennial Lake

5 cm

0 250 500 1000

Scale 1 : 5 000

Distances in Metres
Major Contour Interval 50m
Minor Contour Interval 10m
AMG Zone 55

1 : 5 000 Sheet Index

White Spur 53	Mount Julia 32	Julia Peak 11
Howard's Road 52	Anthony 31	Mount Tyndall 10
Henty Gorge 51	Poets Hill 30	The Bastion 9
Lhotse Face 50	Crown Hill 29	Mount Cyril 8
East Sister 49	Davies Hill 28	Cape Horn Spur 7

Plan 3

99_4375

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Goldfields Exploration Pty Ltd"
Hill, R.; Vicary, M.J. EL19/98

Mt Read Volcanics Belt Tasmania

607196

SHEET 30 Poet's Hill

GEOLOGICAL INTERPRETATION

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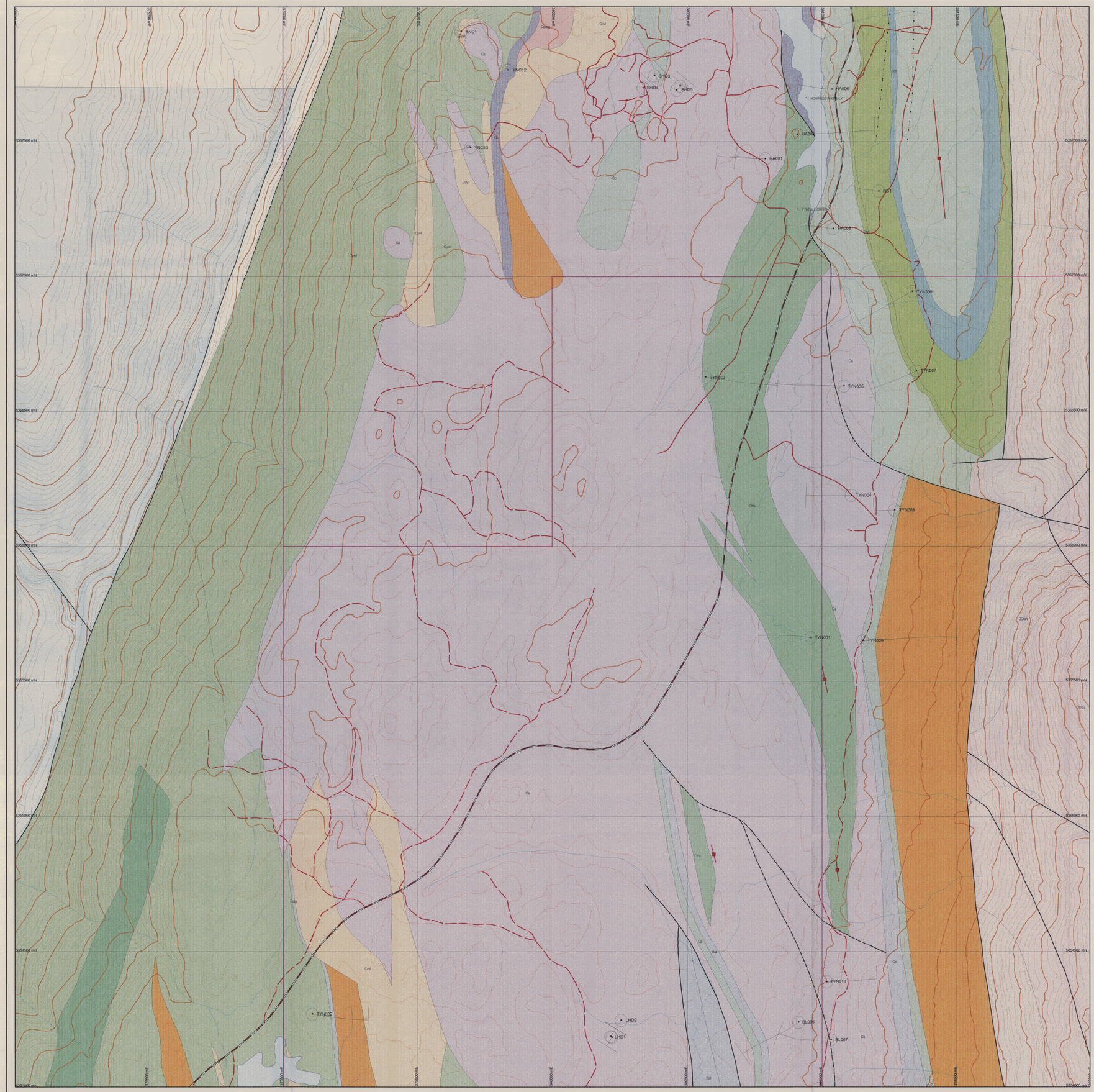
Date: October 1997



Qu Undifferentiated Quaternary sediments

Qpl Mainly limestone commonly decompcsed to black clay "pug"

COcu Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone & granite - pebble conglomerate, includes granule - pebble conglomerate (COcuc) & grey sandstone and conglomerate (COcug).

COcug Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone and granite - pebble conglomerate, includes granule - pebble conglomerate (COcuc) & grey sandstone and conglomerate (COcug).

COom Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs).

COomcs Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs)

COnc Mainly thinly bedded quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.

COscgb Mainly thinly bedded siltstone, quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.

COsnc Mainly pebble conglomerate with minor thinly bedded quartzitic sandstone & pebbly sandstone - Newton Creek Sandstone.

Ov Mainly volcaniclastic conglomerate with minor siltstone and volcaniclastic sandstone.

Ovs Bedded sandstone - siltstone units

Ovl Mainly crystal - rich volcanic sandstone (quartz-feldspar phyric). Comstock Tuff and correlates.

Ovlgl Chert rich mass flow horizon. Basal unit to Comstock Tuff.

Ovlf Crystal - rich volcanic sandstone (feldspar-pyroxene phyric), lithic-rich bases with minor ash, sandstone & limestone. Lynchford Tuff & correlates.

Ovr Quartz phyric lava & tuff. Possibly equivalent to Lower Tyndall Group.

Ovfp Quartz-feldspar phyric lava

Ovfp

Ovfpl Graded crystal-rich volcanic sandstone (feldspar-quartz phyric) with interbedded black siltstone (Lynchford Tuff correlate)

Sulphide Lenses

Ov Andesitic to basaltic intrusive bodies with lavas & clastic units. Includes feldspar-hornblende-pyroxene-phyric & feldspar-pyroxene phyric types & small chlorite altered dykes.

Ovs Thinly bedded black pyrite siltstone

Ovv Andesitic to basaltic clastic units

Ovb Basalt Henty Dyke Swarm

Ovh Interbedded basaltic lava & volcaniclastic sediments

Ovl Interbedded basaltic lava & volcaniclastic sediments

Ovc

Ovlv Interbedded dacitic volcaniclastic sandstone and siltstone

Ovv Mainly felsic pyroclastic rocks, dominantly feldspar phyric, including pumice bearing tuff & bnccia, crystal vitric tuff, vitric tuff & minor shale & sandstone

Ovvf Mainly felsic feldspar phyric lava & intrusives; massive to flow bended or autobrecciated, with rare columnar jointing

Ovvv

Ovl Mainly felsic felspar phyric lava and intrusives; massive to flow bended or autobrecciated, with rare colmnar jointing

Ovs Units of bedded siltstone, sandstone, tuff & agglomerate

Ov Undifferentiated massflows, sandstones & black siltstones

Ovs Ashy siltstone

Ovp Felsic porphyry bodies, intrusive & partly extrusive.

Ovs Units of bedded siltstone, sandstone

Ovss Black siltstone

Ovg Dominantly greywacke & mudstone with some interbedded vitric tuff, crystal tuff & crystal-lithic tuff

Ovf Interbedded vitric tuff, crystal tuff, siltstone, slate, sandstone & agglomerate.

Ovv Volcaniclastics

Ovh Undifferentiated Lower White Spur Formation

Ovs Crystal rich volcaniclastics sandstone

Ovs Siltstone & sandstone

Geological boundary, accurate
Geological boundary, inferred
Fold feature
Fault, position accurate
Inferred Fault
Concealed Fault
Major Mine site
Mineral Deposit
Abandoned Mine/site
Prospect
Mineral Occurrence
Built up (populated) area
Homestead (Pastoral)
Building
Railway Station
Beacon, Lighthouse
Airport or Aerodrome
Bridge
Road tunnel
Monument, Statue, Cross
Landmark Object
Named Relief Feature
Mountain or mountain range
Pass
Cliff, Escarpment, Breakaway
Sand Ridge or Sand Dunes
Spur, Spur line
Rock
Plateau
Valley
Gully, Gap
Cave, Cavern
Island
Point
Pool, Pond, Waterhole, Rockhole
Swamp
Waterfall
Dam
Spring
Ford
Marina, Mooring Pen, Port
Highway
Secondary Road
Minor Road
Vehicle Track
Runway
Landing Ground
Powerline
Contour line
Watercourse
Perennial Lake

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Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

0 250 500 1000

Scale 1 : 5 000

5 cm

Distances in Metres
Major Contour Interval 50m
Minor Contour Interval 10m
AMG Zone 55

Plan 4

Mt Read Volcanics Belt Tasmania

99_4375

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607197

SHEET 31
Anthony

GEOLOGICAL INTERPRETATION

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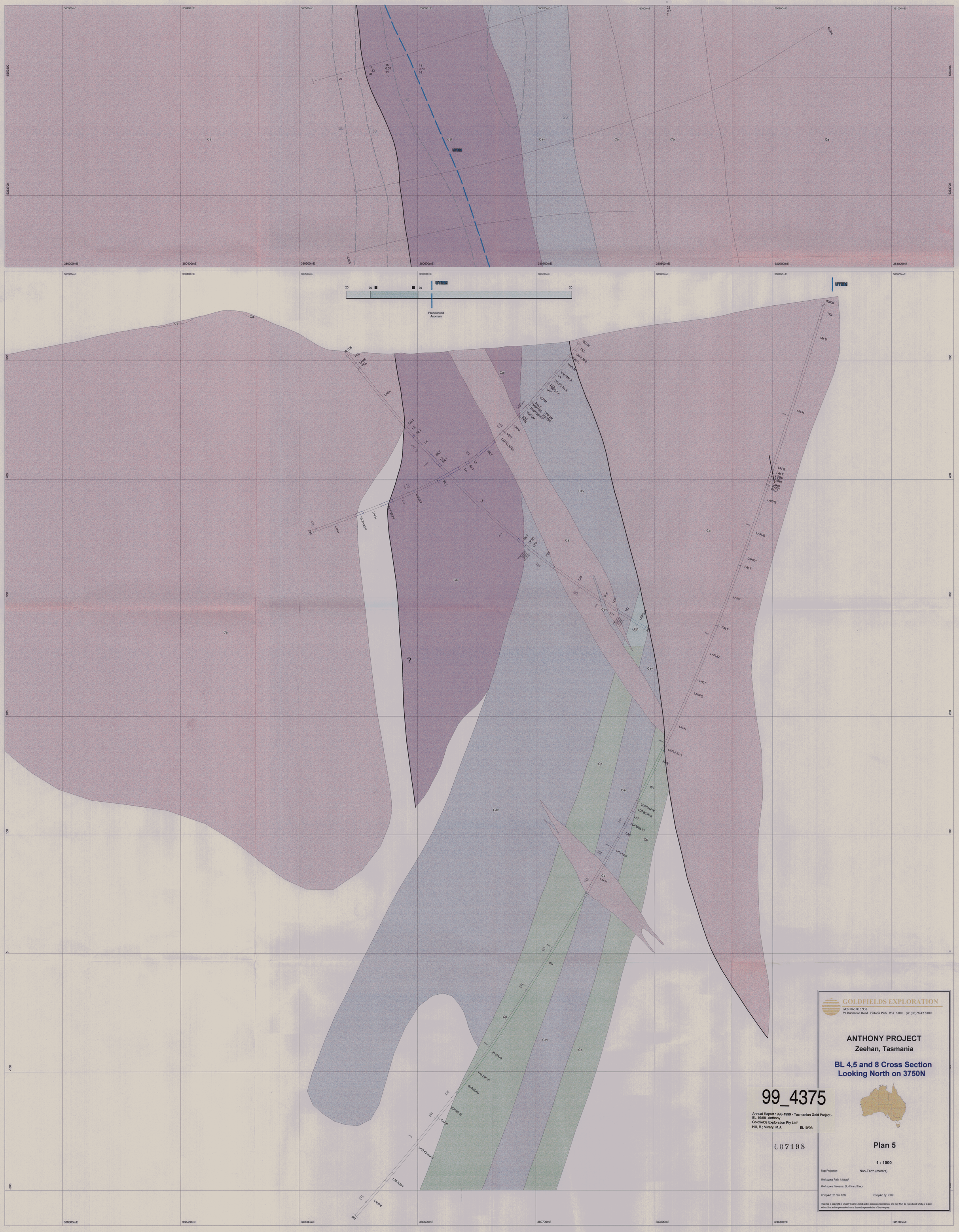
Date: October 1997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ANTHONY PROJECT
Zeehan, Tasmania

BL 6 and 7 Cross Section Looking North on 4175N

Plan 6

1 : 1000

Map Projection: Non-Earth (meters)

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Workspace Filename: BL 6,7.wor

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High Mag (>2100)

BL006 BL007

TILL CLAY LAFH FALT LAFH LAFH FALT LAFH LAFH LAFH LAFH LAFH LAFH LAFH LAFH LAFHQ CARB VAFHQ FALT IAFHQ FALT IAFHQ IR<S LAFH/VAFH? IR<MVD<M IR< FALT FALT IR< 511 Sp Ca Cp Cp Cav Ca Ca Cal Cp Cp Ca LAFH VAFH FALT LAFH-CARB IR< FALT/VD<M VD<M IR<?/LAFO? 700 ?

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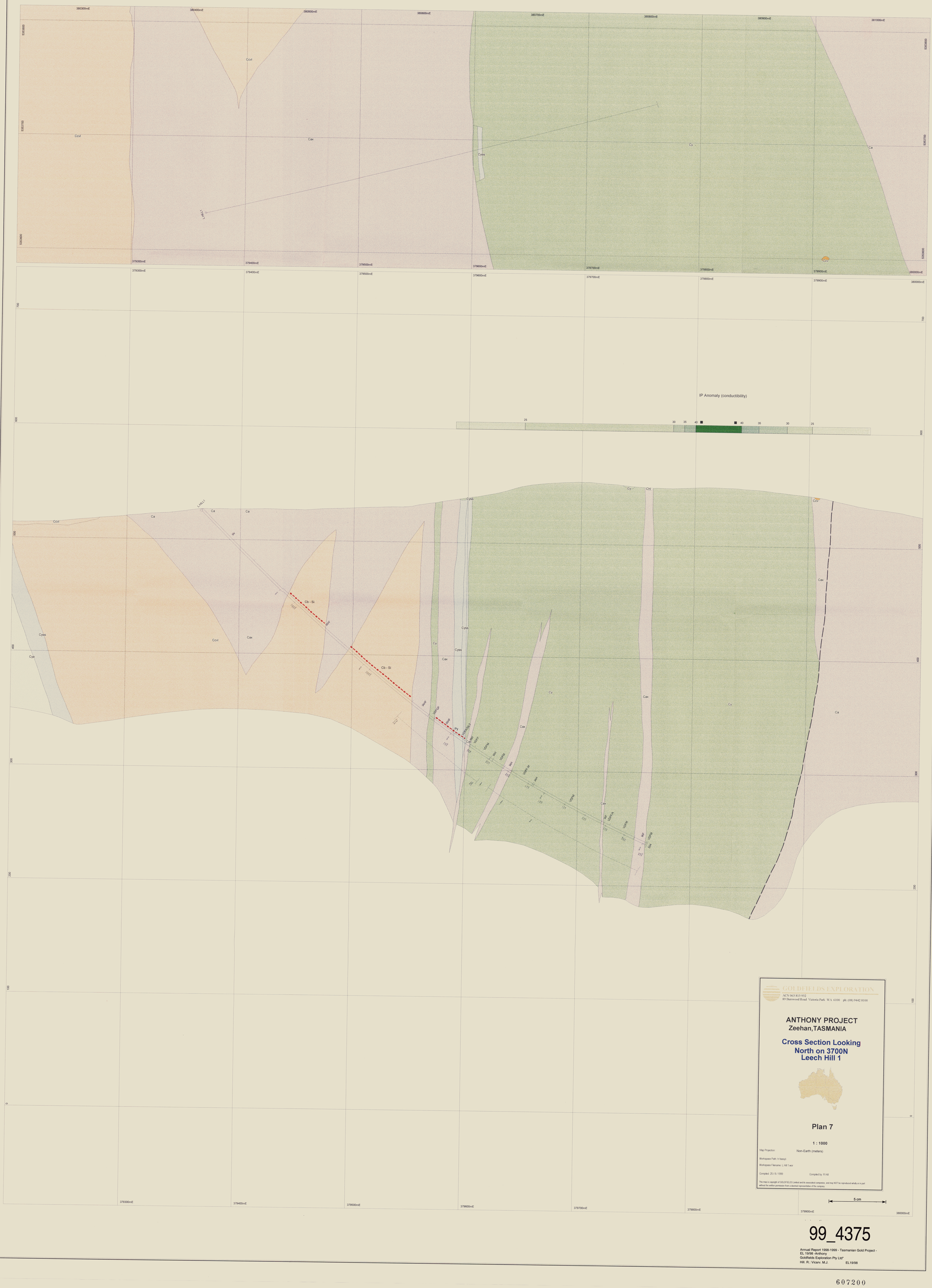

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ANTHONY PROJECT
Zeehan,TASMANIA

Cross Section Looking North on 3700N Leech Hill 1

Plan 7

1 : 1000

Map Projection: Non-Earth (meters)

Workspace Path: h:\tassy\

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