97-4100

417001

MICROFILMED
FICHE No.014544-48

RGC Exploration

ACN 001 426 946

EL 14/93

See folio 30

ANNUAL REPORT
DEC 1996 - DEC 1997

TASMANIAN BASE METALS PROJECT

EL 14/93

BASIN LAKE

Vol 1 of 1

Text and Appendices

HELD BY: RENISON LIMITED

MANAGER & OPERATOR: RGC EXPLORATION PTY LTD

AUTHOR(s): Michael Vicary
Chris Dauth
Adam Elliston

11 December, 1997

PROSPECTS: Basin Lake, Tyndall Creek

MAP SHEETS: **1:250,000:Tyndall** **1:100,000: Sophia**
Gormanston **Franklin**

GEOGRAPHIC COORDS **Min East:380 000mE** **Max East: 382 000mE**
Min North: 5349 000mN **Max North:5357 000mN**

COMMODITY(s): Zn, Pb, Cu, Au, Ag

KEY WORDS: Basin Lake, Exhalative Massive Sulphide Deposits, Tyndall Group, Central Volcanic Sequence, Anthony Road Andesite

Distribution:

- **RGC Exploration Information Centre Reference:**
- **RGC Exploration Zeehan**

SUMMARY

EL 14/93 - Basin Lake is located approximately 8 km south of the Henty Mine. The target at Basin Lake is a volcanic hosted massive sulphide deposit developed at the contact between the Anthony Road Andesite and the Tyndall Group, a sequence of interbedded rhyolitic - dacitic volcaniclastic sediments and lavas. This contact is a proven exhalite horizon and hosts mineralisation at Henty, Howard's Anomaly and Comstock.

Re-evaluation of the geology in the south of the EL, has shown that there is a stratigraphically lower exhalite horizon developed at the contact between the Anthony Road Andesite and the underlying Central Volcanics Sequence. An extensive sericite - pyrite alteration zone within a quartz phyric rhyolite intrusion forms the footwall to exhalite horizon. It has been intersected in three drill holes TYN011, TYN015 and BL001 and has a strike length of about 1 kilometre and a true thickness of between 75 and 135m. Massive carbonate horizons thicken away from areas of the most intense footwall alteration.

The EL is covered by extensive glacial deposits (up to 40m thick) and the geological interpretation is based on the results of subglacial diamond drilling, limited geological mapping and a Helimag survey.

The aim of the exploration program at Basin Lake is to test known exhalite horizons close to mineralising structures. Diamond drill core logging and geological mapping has been used to establish a detailed stratigraphy across each exhalite horizon. Rapid along strike changes in lithology, facies and unit thickness are considered to represent the influences of syn-volcanic faulting (growth faults) and the location of such faults is of primary importance as they are the potential pathways for mineralising fluids. The Great Lyell Fault which longitudinally bisects the EL was an active structure during Cambrian volcanism and several diamond drill holes have targeted the intersection of the exhalite horizon with the fault. The Helimag data suggests the presence of a series of E - W cross faults in the EL. Many of these faults have the potential to be mineralising structures.

Recent exploration at Basin Lake has involved lithogeochemical and isotopic analyses to define the TYN011 - TYN015 alteration zone. The results suggest that the Basin Lake Porphyry and Target Horizon are characteristically light rare earth element enriched and are possible Suite II and III correlates. The sulphur and oxygen-carbon isotopes indicate that the alteration zone is typical of low temperature barren systems. The is consistent will the associated low base metals levels. A drill hole TYN016 tested the Target Horizon near a major cross structure, the Hamilton Moraine Fault.

Three drill holes TYN013, TYN014 and BLD89-3 were surveyed by DHEM. A weak off hole conductor was detected in hole BLD89-3.

CONTENTS

LIST OF FIGURES

LIST OF PLANS

LIST OF TABLES

LIST OF APPENDICES

1. INTRODUCTION

EL 14/93 - Basin Lake is held by Renison Limited and is explored by RGC Exploration, both wholly owned subsidiaries of RGC Limited. The licence is located in western Tasmania approximately 12 km north of Queenstown, and is situated on the flank of the Tyndall Range (Figure 1). It was granted on January 14, 1994 and initially had an area of 8 sq km. In January 1995 a further 3 sq km was incorporated into the EL making its present area 11 sq km.

The major access to the EL is via the Anthony Road, approximately 12 km east of the junction with the Zeehan Highway. Access within the EL is provided by a vehicular track which follows a HEC powerline close to the western edge of the EL.

The vegetation consists predominantly of buttongrass plains and light tea tree scrub with some patches of medium eucalypt forest. The area has been extensively glaciated and except for a block of about 0.5 sq km in the north of the EL, the EL is covered by glacial moraine and outwash.

The area was acquired for its potential to host Rosebery style Cu-Pb-Zn-Ag and Henty style Au mineralisation.

2. 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).

417007

RGC Exploration

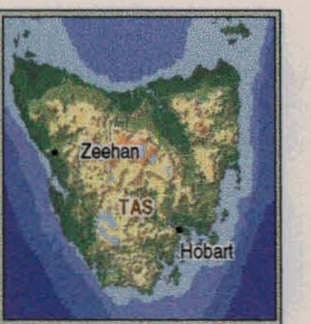
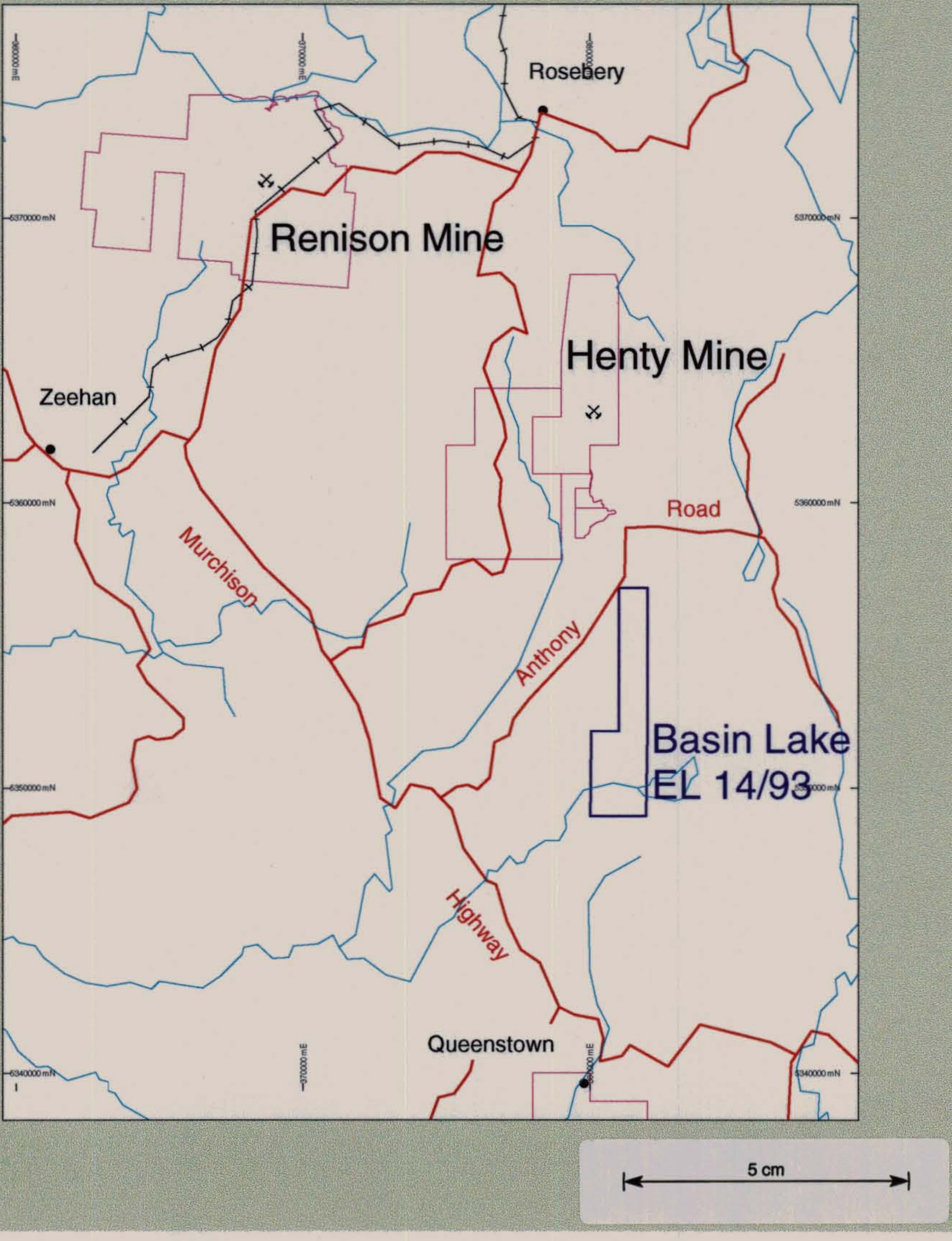


Figure 1.
Basin Lake EL 14/93
Location Map



3. PREVIOUS EXPLORATION - (Modified from Donaldson, 1993)

Exploration prior to 1983 is discussed comprehensively by Fitzgerald in Purvis et *al* 1983 and is presented below.

The first detailed exploration of Basin Lake was carried out by Pickands Mather between 1965 and 1971. Following an initial reconnaissance, they gridded the Mt Read Volcanics-Owen Conglomerate contact for some eleven miles north of the Mt Lyell Mine Lease and surveyed this using a dipole-dipole IP array. The strongest anomaly was located north east of Basin Lake over an area covered by glacial moraine. Two vertical holes (BL801 and BL802) were drilled to test this anomaly, the second being abandoned before reaching target. Pickands Mather ran a Turam EM survey over this zone following the inconclusive drilling, and delineated a linear anomaly just west of the IP anomaly. The response was attributed to pyritic black shales intersected in the upper part of BL801. They carried out no further work here, partly it appears because of serious drilling problems in penetrating the thick glacial over-burden.

The northern part of the Basin Lake area was covered by dipole-dipole IP surveys in 1967-68 over the East Tyndall grid, within Mt Lyell's E.L. 9/66. Two anomalous zones were outlined and two drill targets were identified. These anomalies were resurveyed by gradient array IP in 1973-74 which reaffirmed the drill target in the north western zone. In-fill grids were cut and resurveyed by gradient array IP in the following year which detailed the north west zone into five anomalies. One of these was tested by hole TYN002 drilled in 1975, but subsequent reinterpretation indicates that the anomaly has not been explained. Costeaning and a second drill hole, were recommended to test other anomalies within this zone but the program was not carried out because of budget restrictions at the time.

The rest of the Basin Lake area was pegged by Mt Lyell in 1971 as part of E.L. 41/71 but gridding and detailed exploration did not commence until 1974. The grid was initially mapped and surveyed by gradient array IP and magnetics. Primary anomalies were followed-up by soil geochemistry and infill IP surveys, and two holes (BL001 and 002) were completed in 1978 in the vicinity of the Pickands Mather drillholes. The holes intersected minor base metal mineralisation in a felsic tuffaceous sequence.

Following the results of testing at Howard's Anomaly to the north, the area was further evaluated for possible extensions to the zone. Additional dipole-dipole IP, magnetic and soil geochemistry surveys were carried out and two holes (BL003 and 004) were drilled in 1981.

The most significant result to date at Basin Lake was the discovery in BL004 of a strongly altered and pyritic sequence of epiclastics enclosing a lens of massive pyrite up to 2.5m thick. However, base metal values were low. Additional dipole-dipole IP and Genie EM surveys were carried out in 1982, along with reassaying of drill core and sulphidic outcrops for gold. Work completed after the writing of the summary above includes the drilling of two diamond drill holes and a geophysical review. BL005 was drilled in 1984 to test the southern extension of the massive pyrite and an IP anomaly, results were negative. The other drill hole was drilled by the Mines department in 1984 at the Leech Hill sericite-pyrite alteration zone and intersected minor base metal sulphide in altered andesitic volcanics (Fitzgerald and Pease, 1985).

During the 1985 to 1986 season some mapping was undertaken as well as UTEM and SIROTEM geophysical surveys. These surveys along with previous geophysical data outlined three anomalies that required follow-up work. Results for the Bradshaws Road and Leech Hill pyrite zone were discouraging (Fitzgerald and Cartwright, 1986).

In the following season, 1986/87, minor mapping, drilling and downhole EM surveys were undertaken. Drill holes TYN004 and TYN005 did not intersect any significant mineralisation and downhole EM surveys of TYN004, TYN005 and BL004 indicated that no new significant conductors were present. It was concluded that, although the Basin Lake area had been extensively covered by geophysical surveys and that the diamond drilling was quite widely spaced, it was difficult to identify any further targets for further investigation (Fitzgerald, 1987). The lease covering the Basin Lake area was relinquished in 1987.

The ground within EL 14/93 was held by an Aberfoyle - Billiton Joint Venture as EL 103/87 from 1987 until it was relinquished in April 1993. Work done included limited geological mapping, a limited ground magnetics and CSAMT survey on lines 349000N - 353000N, a gravity survey on line 350200N, and a six loop 59 line km UTEM survey (Richardson, 1993). Diamond drill hole BLD 89-3 was drilled to test a CSAMT anomaly adjacent to the Great Lyell Fault. The hole was collared in a sequence of rhyolitic to dacitic lavas and volcaniclastics (Tyndall Group) and intersected the Great Lyell Fault at 358.6m. A base metal poor alteration zone with disseminated pyrite was intersected from 130 to 230m and was considered to be the source of the CSAMT anomaly. The downhole EM survey of BLD 89-3 by Billiton indicated the presence of an off hole conductor centred around 210m. The hole was later resurveyed by Aberfoyle and the anomaly confirmed. However revaluation of the data suggested that it may be due to a surface conductor tested by drillhole BL002 and no further work was recommended.

EL 14/93 was acquired by RGC after a successful tender for ETA 323. The EL was granted on the 14th January 1994.

In the period January 1994 - January 1995, the first year of tenure, the work completed by RGC Exploration in EL 14/93 - Basin Lake (see Vicary, 1994) includes the following:-

1) Geological Mapping at 1:5000 and 1:1000 scale,
2) Relogging of old drillholes,
3) Drilling of 3 diamond drill holes (TYN006, 007 and 008),

4) Down hole EM survey of TYN006 and 007,
5) 13 lines of Ground Magnetics, and
6) 50 rock chip samples from TYN006, 007 and 008 were analysed.

In the period January 1995 - January 1996 the work completed in EL 14/93 - Basin Lake includes the following (Vicary, 1995):-

1) Drilling of 4 diamond drill holes (TYN009, 010, 011 and 012),
2) A Self Potential Survey near BL001,
3) A Helimag Survey,
4) Down hole EM surveys of holes TYN008 to TYN012, and
5) 315 split core samples from various drill holes were analysed.

In the period January 1996 - January 1997 the work completed in EL 14/93 - Basin Lake includes the following (Vicary, 1996):-

1) Drilling of 3 diamond drill holes (TYN013, 014, and 015),
2) Relogging of BLD89-3, BL001 and BL002,
3) Reprocessing of Helimag data,
4) 8 carbonate samples assayed for oxygen and carbon isotopes,
5) 7 carbonate samples analysed by ICP/NAA analysis,
5) 407 split core samples from various drill holes were analysed.

4. WORK COMPLETED

In the period January 1997 - January 1998 the work completed in EL 14/93 - Basin Lake includes the following:-

1) Drilling of 1 diamond drill hole (TYN016),
2) 43 core samples from TYN011 and TYN015 analysed for a lithogeochemical and alteration study,
3) 11 Lithogeochemical samples of various rhyolites were analysed by NAA and XRF,
4) 6 Carbonate samples analysed for carbon and oxygen isotopes,
5) 6 pyrite samples analysed for sulphur isotopes,
6) 5 samples analysed for lead isotopes,
7) Drill holes TYN013, TYN014 and BLD89-3 surveyed by DHEM.

5. RESULTS

5.1 DIAMOND DRILLING

5.1.1 TYN016

Diamond drill hole TYN016 commenced drilling in mid October and was completed on 24th November at a total of 448.8 metres. The drill hole was sited on a pre existing HEC track and was initially designed to target the base of the Anthony Road Andesite and the contact with the Basin Lake Porphyry, which is considered to be a sea floor position and therefore favourable horizon with respect to VHMS mineralisation.

Fifty eight metres of glacial cover were drilled before intersecting andesitic lavas / intrusions and sediments of the Anthony Road Andesite. Underlying this sequence a 35-40m (true thickness), unit of weakly pyritic black siltstone was encountered before entering a dominantly dacitic sequence of lavas / intrusives and sediments representing the Central Volcanic Sequence. All rocktypes were heavily foliated with typical measurements of 45-50° with respect to the core axis present.

The absence of the Basin Lake Porphyry or target horizon, is at present not understood, although faulting and other structural complexities could well be the reasons why it was not intersected.

Alteration down hole consisted of mainly quartz / chlorite and carbonate veining and minor sericite and pyrite associations. No visible base metal mineralisation was observed or recorded.

The hole has been cased with PVC and a Down Hole EM survey is planned in 1998.

A detailed graphical drill log is presented in Appendix Two. Logging codes are tabulated in Appendix One. A cross section of the drill hole is shown on Plan 1.

5.2 DRILL HOLE CORE GEOCHEMISTRY

5.2.1 TYN016

Nine half core samples (T41795-41800 and T43195-43197) have been submitted for lithogeochemical analysis, the results of which are pending. Elements analysed include a suite of 32 elements by neutron activation analysis, Ti, Zr, V, P by XRF and Cu, Pb, Zn and Ag by AAS.

5.2.2 TYN011 and TYN015 Lithogeochemistry

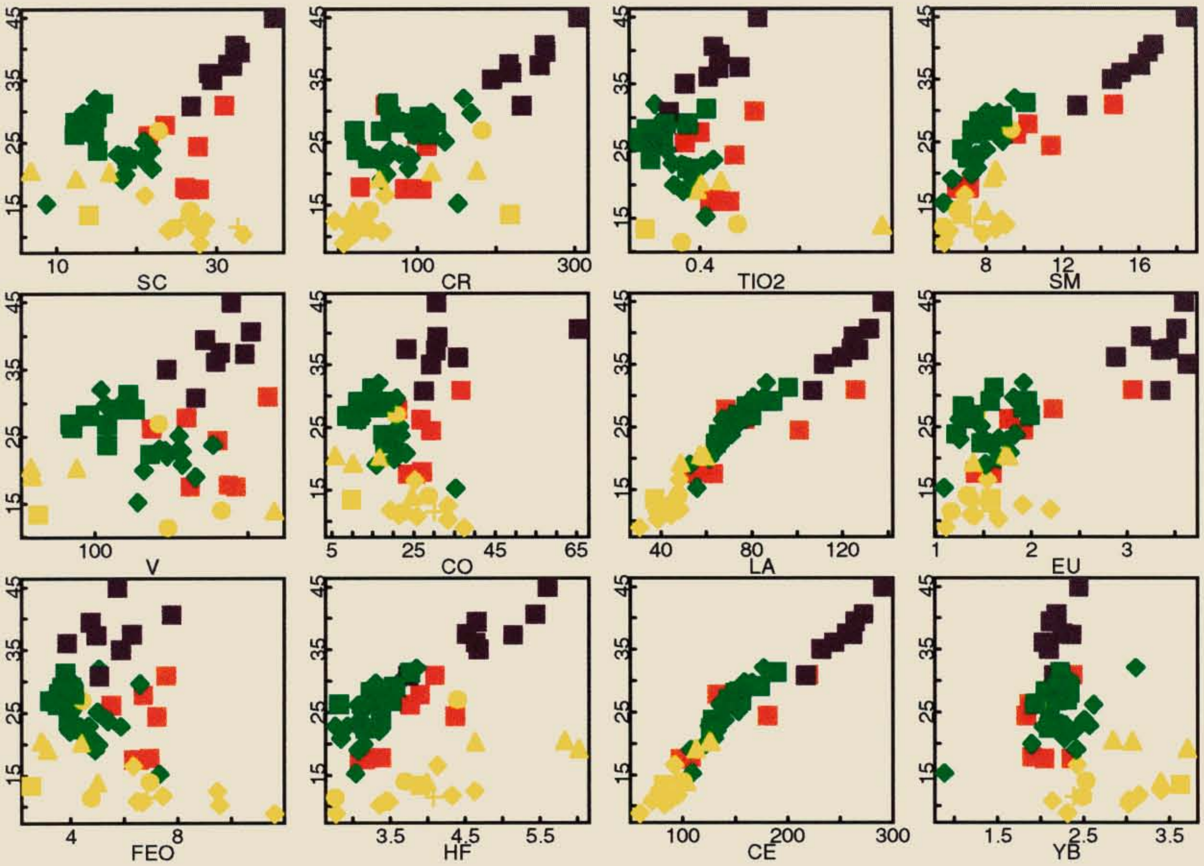
To investigate the lithogeochemistry and to define the alteration characteristics of the Target Horizon and underlying footwall sericite-pyrite alteration zone a series of 43 half core samples were collected at about 10 metre intervals from drill holes

TYN011 and TYN015. These were analysed for a suite of 28 elements by Neutron Activation Analysis by Becquerel and Ti and V by XRF by Analabs. The results are tabulated in Appendix 3. Fifteen other lithogeochemical samples from Vicary, 1995 have also been added to the data base. The RGC in-house geochemical analysis system GAS has been used to process the data.

Figures 2 to 5 show the geochemical variation of several elements. Four lithogeochemical subgroups have been defined and designated a unique colour codes. Plots of Th verse Hf, La verse Hf and Sm verses Hf show that the Central Volcanics Sequence plots on a straight line trend that diverges from the trend defined by the Basin Lake Porphyry, Anthony Road Andesite and Target Horizon subgroups. The Central Volcanic Sequence can also be defined by enrichment in heavy Rare Earth Elements (eg. Yb in Figure 5).

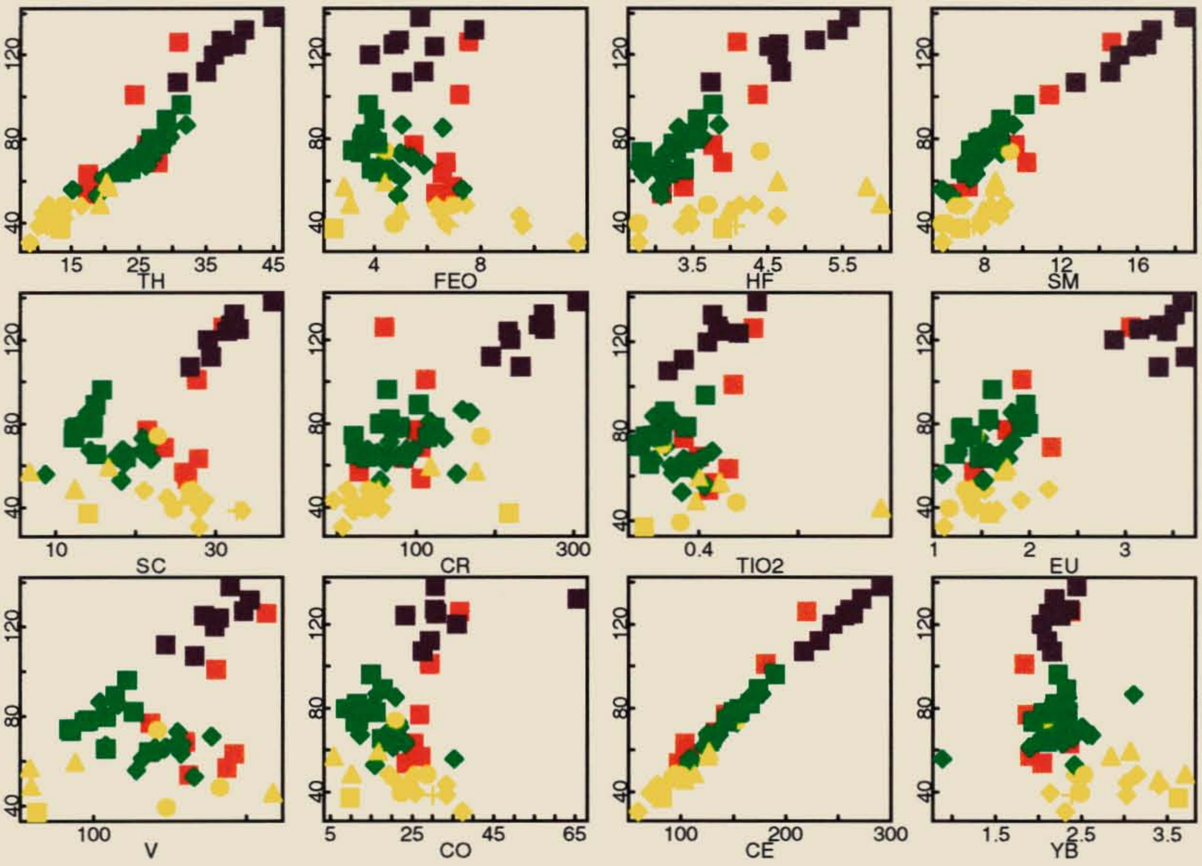
The porphyry is a feldspar - quartz phyric rock and has many textural and facies similarities with rhyolites from the Tyndall Group. It has a rather high Ti/39Hf ratio (NB:- this is directly analogous to Ti/Zr) of 12 to 22 and generally has a composition that is transitional into the more mafic Anthony Road Andesite.

Figure 2 Basin Lake Lithogeochemistry - Th verses various elements



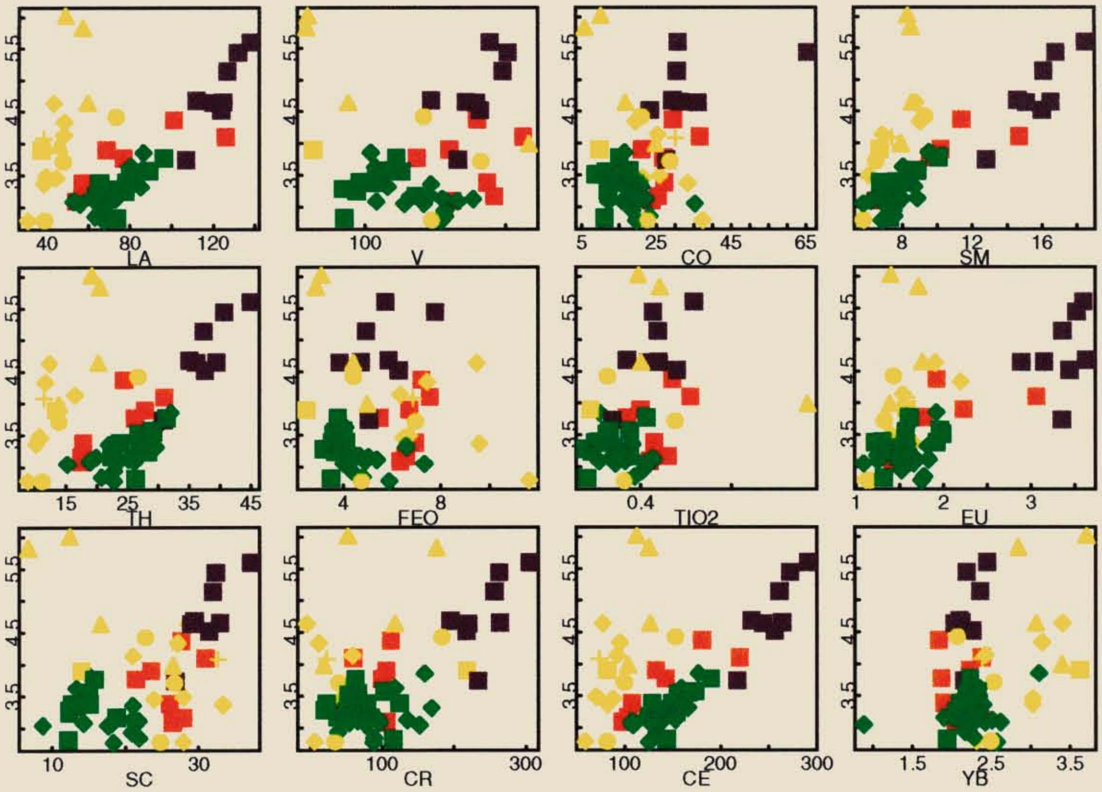
Green Solid Squares	Basin Lake Porphyry	TYN015
Green Solid Diamonds	Basin Lake Porphyry	TYN011
Yellow Solid Squares	Central Volcanic Sequence	TYN011
Yellow Solid Circles	CVS in Target Horizon	TYN015
Yellow Solid Triangles	Central Volcanic Sequence	TYN015
Yellow Solid Diamonds	Other CVS	
Yellow Crosses	Tyndall Group Dacite	
Purple Solid Squares	Target Horizon	TYN015
Orange Solid Squares	Anthony Road Andesite	

Figure 3 Basin Lake Lithogeochemistry - La verses various elements



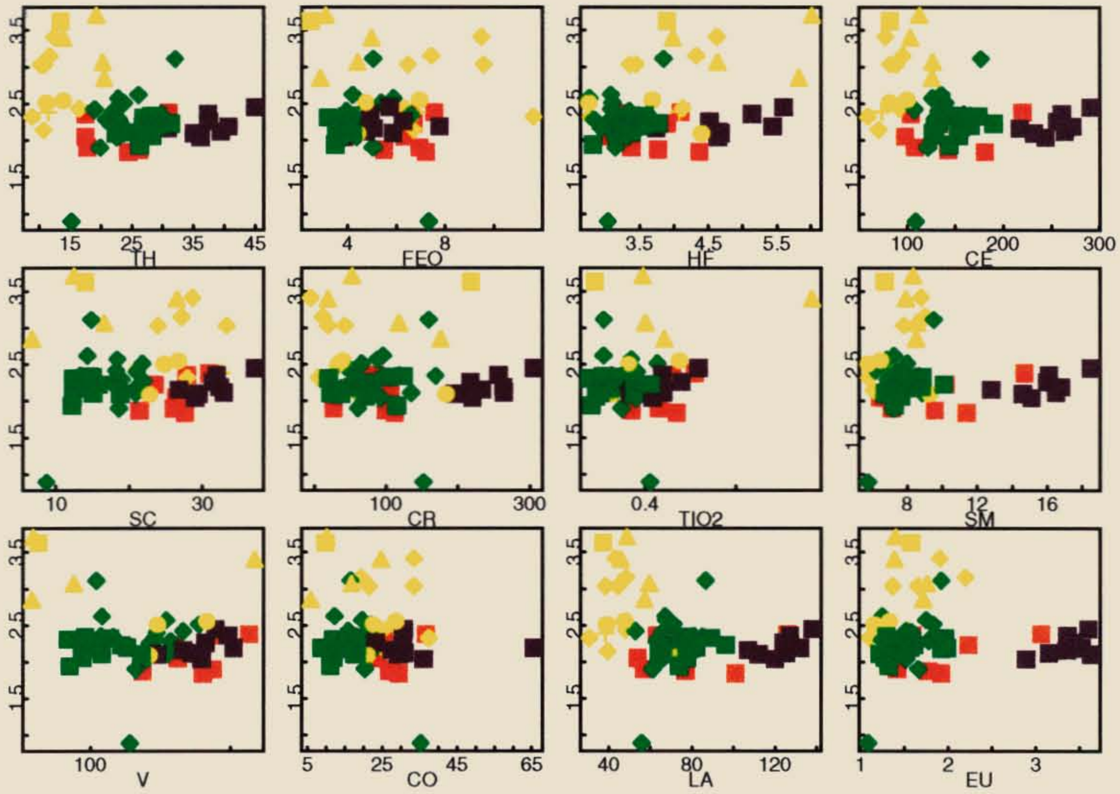
Green Solid Squares	Basin Lake Porphyry	TYN015
Green Solid Diamonds	Basin Lake Porphyry	TYN011
Yellow Solid Squares	Central Volcanic Sequence	TYN011
Yellow Solid Circles	CVS in Target Horizon	TYN015
Yellow Solid Triangles	Central Volcanic Sequence	TYN015
Yellow Solid Diamonds	Other CVS	
Yellow Crosses	Tyndall Group Dacite	
Purple Solid Squares	Target Horizon	TYN015
Orange Solid Squares	Anthony Road Andesite	

Figure 4 Basin Lake Lithogeochemistry - Hf verses various elements



Green Solid Squares	Basin Lake Porphyry	TYN015
Green Solid Diamonds	Basin Lake Porphyry	TYN011
Yellow Solid Squares	Central Volcanic Sequence	TYN011
Yellow Solid Circles	CVS in Target Horizon	TYN015
Yellow Solid Triangles	Central Volcanic Sequence	TYN015
Yellow Solid Diamonds	Other CVS	
Yellow Crosses	Tyndall Group Dacite	
Purple Solid Squares	Target Horizon	TYN015
Orange Solid Squares	Anthony Road Andesite	

Figure 5 Basin Lake Lithogeochemistry - Yb verses various elements



Green Solid Squares	Basin Lake Porphyry	TYN015
Green Solid Diamonds	Basin Lake Porphyry	TYN011
Yellow Solid Squares	Central Volcanic Sequence	TYN011
Yellow Solid Circles	CVS in Target Horizon	TYN015
Yellow Solid Triangles	Central Volcanic Sequence	TYN015
Yellow Solid Diamonds	Other CVS	
Yellow Crosses	Tyndall Group Dacite	
Purple Solid Squares	Target Horizon	TYN015
Orange Solid Squares	Anthony Road Andesite	

To investigate the relationships between the four subgroups defined above and the geochemical suites defined for the Mount Read Volcanics, the data from Crawford, Corbett and Everard, 1992 has been added to the data base and is presented on Figures 6, 7 and 8. To aid correlation the additional colour codes are used:-

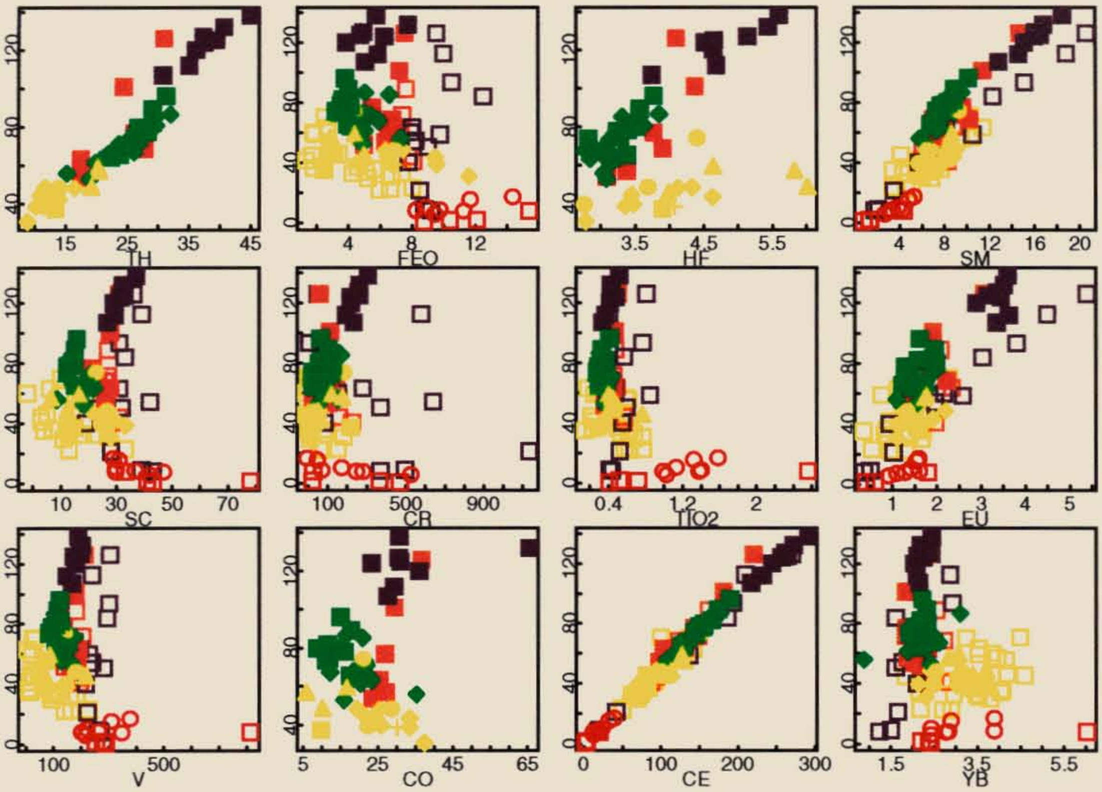
Suite I	Open Yellow Squares
Suite II	Open Orange Squares
Suite III	Open Purple Squares
Suite IV	Open Red Circles
Suite V	Open Red Squares

The following observations can be made:-

1). The extreme LREE enrichment displayed by Suite III is also displayed by rocks from the Target Horizons,
2). Plots of La verses Hf and Zr effectively discriminate Suite I and Suite II rocks,
3). The Basin Lake Porphyry is most likely a felsic variety of Suite II and is chemically distinct from Suite I and the Tyndall Group rhyolites,
4). There is good correlation between the Central Volcanic Rocks from the Basin lake area and Suite I rocks.

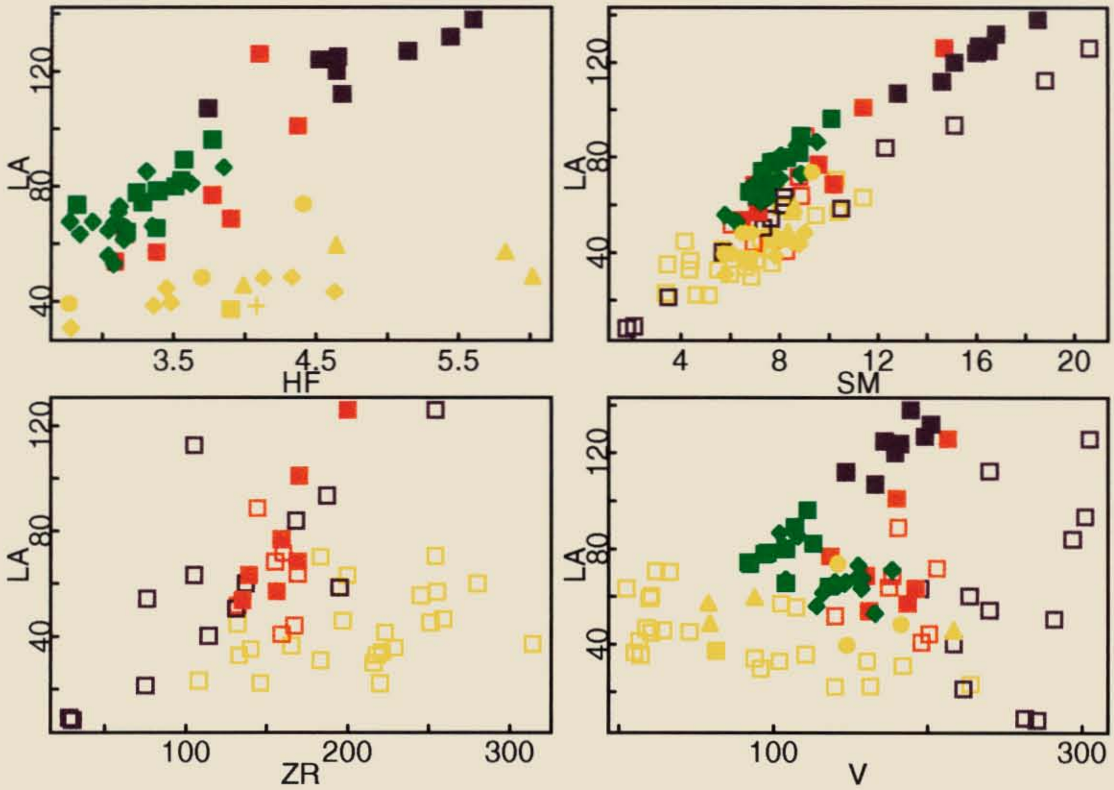
The relationship between the Basin lake Porphyry and other rock type is discussed further in Section 5.2.4.

Figure 6 Basin Lake Lithogeochemistry - La verses various elements



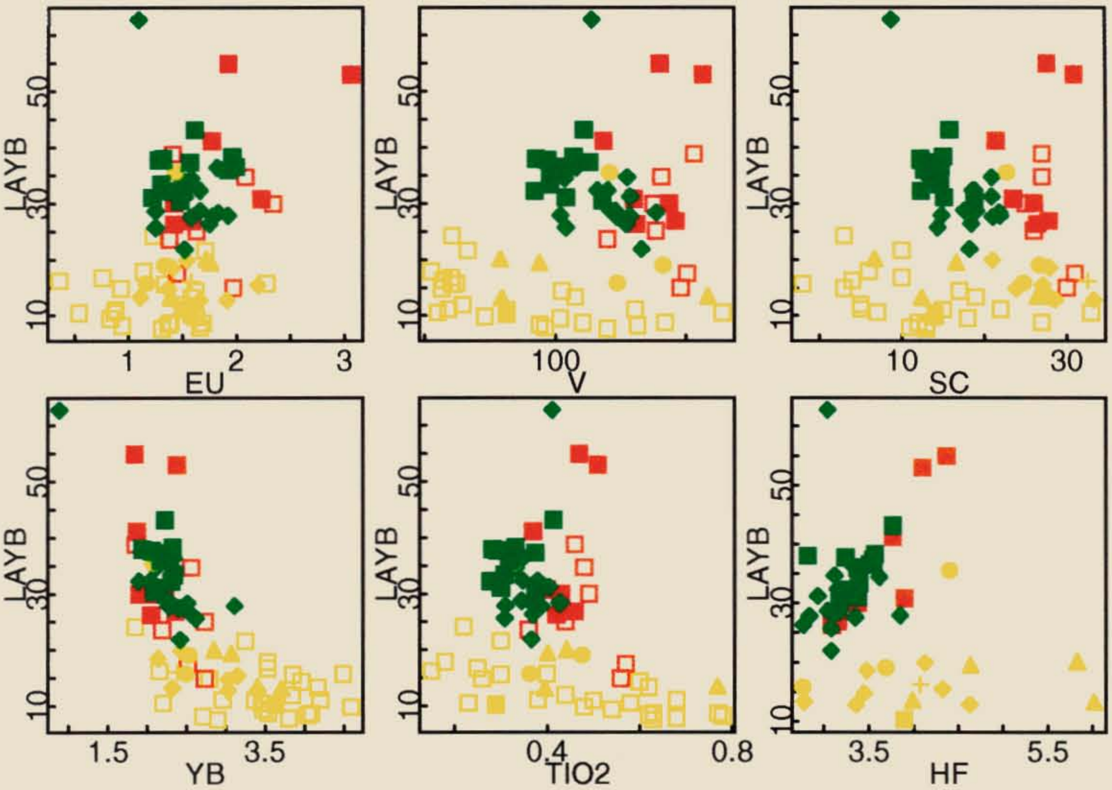
Yellow Symbols	Suite I, Central Volcanic Sequence
Orange Symbols	Suite II, Anthony Road Andesite
Green Symbols	Basin Lake Porphyry
Purple Symbols	Suite III, Target Horizon
Red Symbols	Suite IV and V

Figure 7 Basin Lake Lithogeochemistry - La verses Hf, Zr, Sm and V



Yellow Symbols	Suite I, Central Volcanic Sequence
Orange Symbols	Suite II, Anthony Road Andesite
Green Symbols	Basin Lake Porphyry
Purple Symbols	Suite III, Target Horizon

Figure 8 Basin Lake Lithogeochemistry - La/Yb verses various elements



Yellow Symbols Suite I, Central Volcanic Sequence

Orange Symbols Suite II, Anthony Road Andesite

Green Symbols Basin Lake Porphyry

5.2.3 TYN011 and TYN015 Alteration

Figures 9, 10 and 11 show many of the alteration characteristics of theTYN011 and TYN015 alteration zone. Down hole geochemical trends for TYN015 have been displayed since TYN015 gave a complete geological cross section from the Target Horizon to the Footwall Sericite - pyrite alteration zone. The geology across the sampled interval can be summarised as:-

340 to 470m	Target Horizon
470 to 580m	Basin Lake Porphyry
580 to 610m	Central Volcanic Sequence

Figure 9 shows that the Basin Lake Porphyry is relatively slightly enriched in Zn and depleted in Cu compared to the Target Horizon. The high Cu in the Target Horizon may only be due to the more andesite composition of these rocks.

Figure 10 shows that the Target Horizon has elevated As and Sb compared to the Basin Lake Porphyry. The Th/U ratio is highly variable in the Target Horizon (0 to 8) while the Basin Lake Porphyry has a relatively constant Th/U ratio of about 4.5.

Figure 11 shows that there is an increase in FeO and Na2O relative to the underlying Basin Lake Porphyry. The porphyry has higher K20 due to the development of sericite in the alteration zone. This trend is also displayed by Rb and Cs.

Figure 9 TYN015 Down hole variation of Cu, Pb and Zn

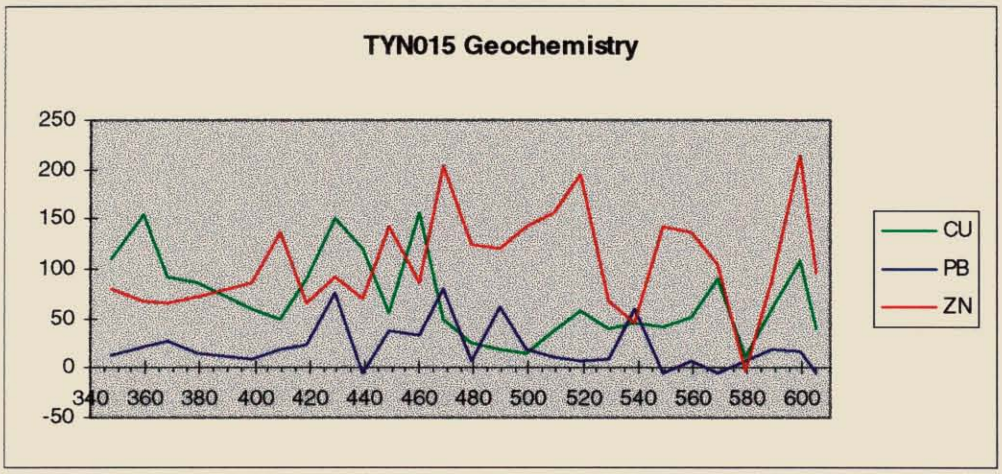


Figure 10 TYN015 Down hole variation of As, Sb, Th, and U

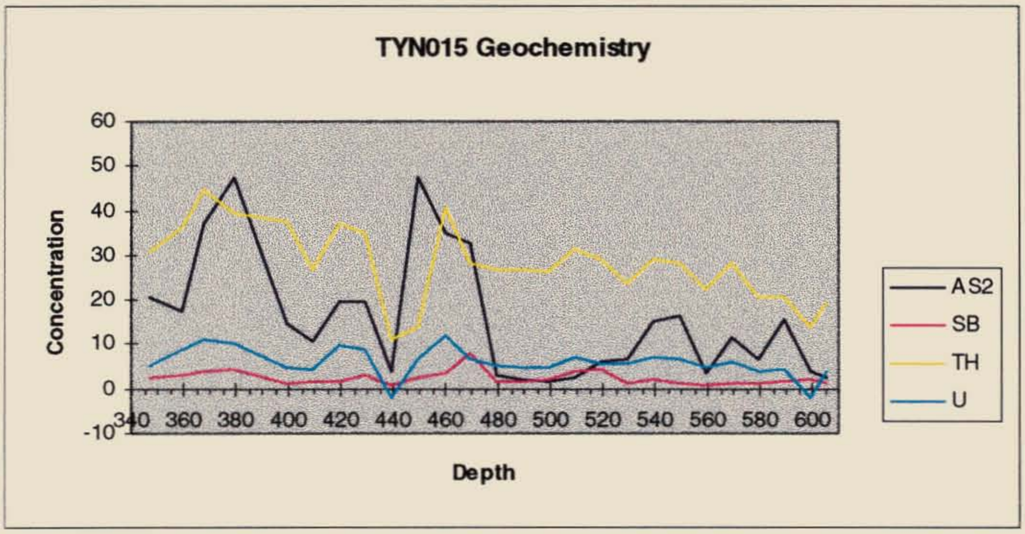
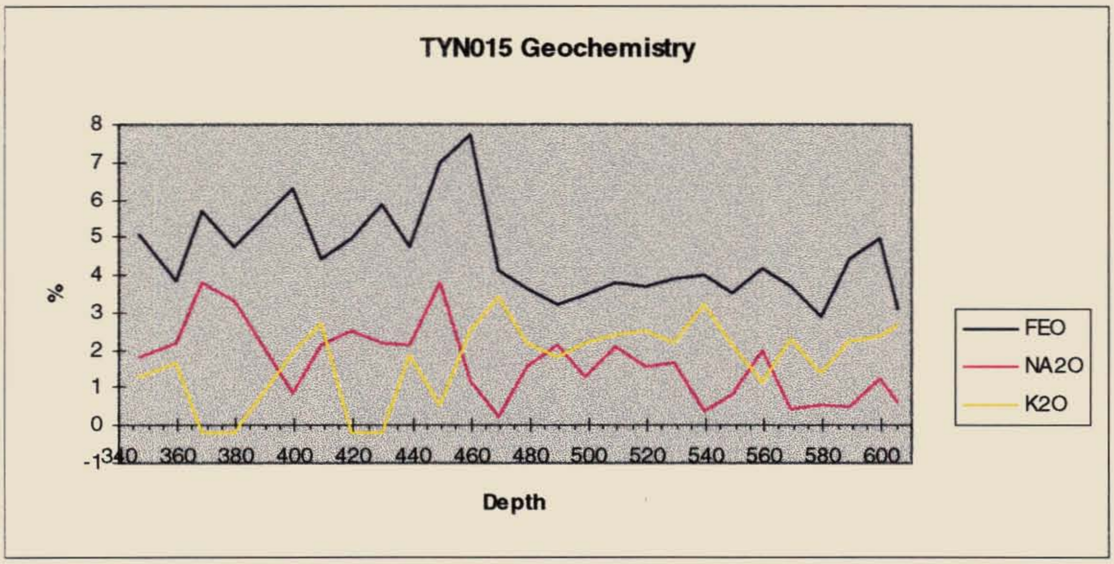


Figure 11 TYN015 Down hole variation of FeO, Na2O and K2O



5.2.4 Basin Lake Porphyry Lithogeochemistry

To determine the relationship between the Basin Lake Porphyry and the Tyndall Group rhyolites, a collection of 11 drill core samples were submitted for NAA and XRF analysis. The results are tabulated in Appendix 4. The following table summarises the details of the samples:-

Table 1 - Porphyry Lithogeochemical Samples

Sample	Hole	From	To	Rock	Unit
44975	TYN009	50.45	50.60	IR<	Basin Lake Porphyry
44976	TYN010	211.45	211.60	IR<	Basin Lake Porphyry
44977	TYN012	207.65	207.80	IR<	Basin Lake Porphyry
44978	MX001	40.05	40.20	IR>	Tyndall Rhyolite
44979	MX001	115.15	115.30	IR>	Tyndall Rhyolite
44980	MX002	99.00	99.20	IR>	Tyndall Rhyolite
44981	MX002	157.95	158.15	IR>	Tyndall Rhyolite
44982	MJ001	214.35	214.50	IR>	Tyndall Rhyolite
44984	MJ002	155.80	155.95	IR>	Tyndall Rhyolite
44985	MJ003	473.00	473.20	IR>	Tyndall Rhyolite
44986	MS6	97.10	97.30	IR>	Tyndall Rhyolite

The Tyndall Group samples were collected from drill holes at Moxon Saddle (MX001 and MX002), Mount Julia (MJ001 - 003) and from the Beatrice Prospect (MS6). The three samples of the Basin Lake Porphyry were collected away from the TYN011 - 15 alteration zone and were relatively unaltered. In hand specimen all the rock samples are quartz ± feldspar phyric rhyolites and are characterised by large 2 - 4 mm diameter quartz phenocrysts. There is a slight decrease in the modal abundance of quartz in the Basin Lake Porphyry.

The eleven lithogeochemical samples have been added to the lithogeochemical data base discussed in the previous section and analysed using the RGC in-house GAS software to assign lithogeochemical groupings.

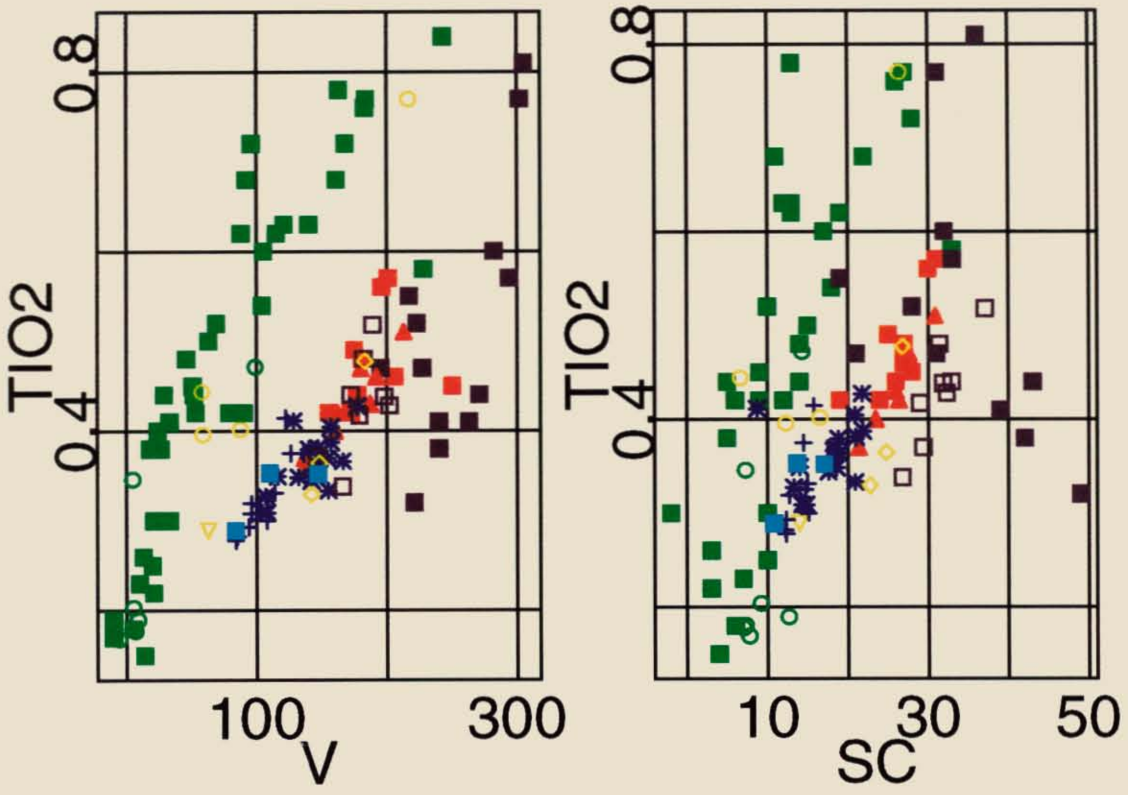
A plot of TiO2 verse V (Figure 12) clearly shows that two main subgroups exist. Each subgroup defines a unique trend with a characteristic gradient or TiO2/V ratio. The high TiO2/V group is represented by Suite I and includes the Tyndall Group rhyolites and the Central Volcanics Sequence. The low TiO2/V group is defined by Suites II and III and includes the Basin Lake Porphyry. The yellow diamonds represent intermixing of the Target Horizon lavas (Suite III) with central Volcanic Sequence sediments (Suite I) and also plot in the low TiO2/V trend.

Figure 13 shows the Th verses Hf variation. The Crawford, Corbett and Everard data set used to define the Mount Read Volcanic geochemical suites was not analysed for Th and Hf and only data from the Basin Lake area and Tyndall Group rhyolite is presented. The plot shows that two distinct populations exist. The Tyndall group rhyolite and (other Suite I rock types) is defined by low Th/Hf where as the Anthony

Road Andesite and the Basin Lake Porphyry (Suites II and III) have a high Th/Hf ratio. The yellow diamonds tend to be grouped with the Suite I rock types on this plot (NB:- this is the preferred correlation).

La/Yb is a good measure of the degree of light rare earth element enrichment and is a good discriminator between the individual suites of the Mount Read Volcanics. Figure 14 shows that the Basin Lake Porphyry shows chemical affinities towards suite II and III (high La/Yb - shown on the plots as LAYB) while Suite I rocks and the Tyndall Group rhyolites have low La/Yb and display a flat trend with varying Hf and Zr contents.

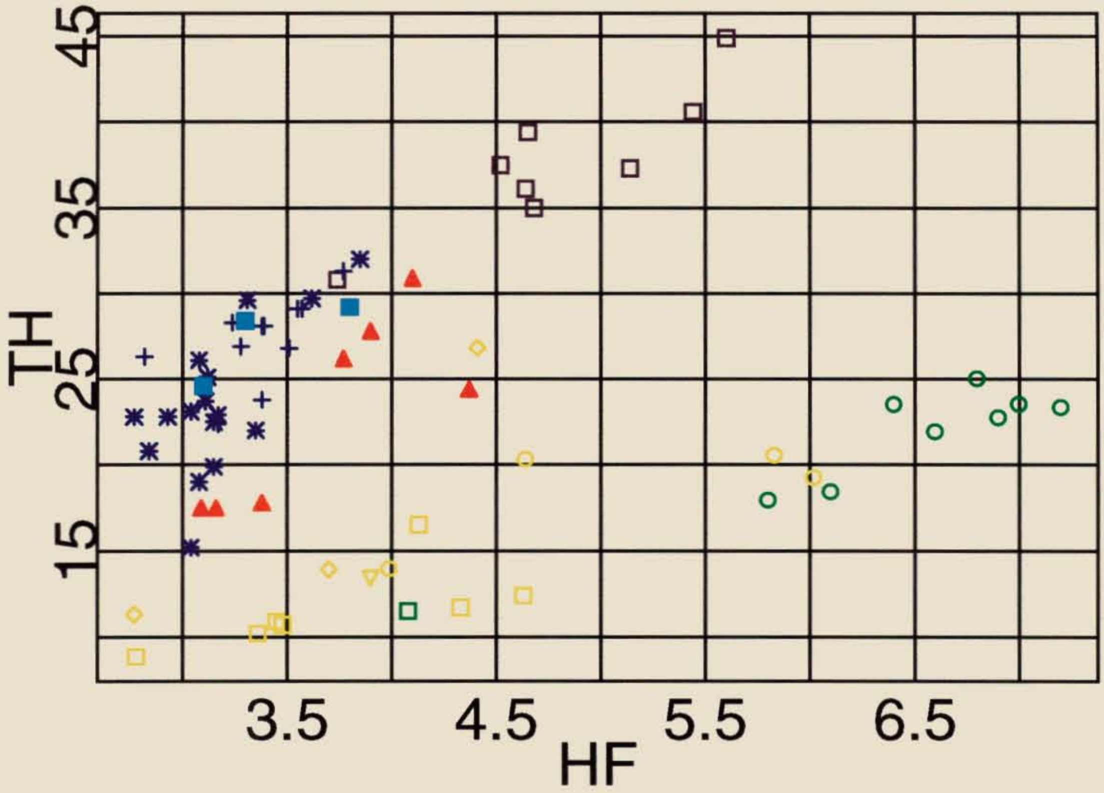
Figure 12. Basin Lake Lithogeochemistry - TiO2 verses V and Sc



Suite 1	
Tyndall Group Rhyolite	Solid Green Square
Tyndall Group Dacite	Open Green Circle
	Open Green Square
CVC - TYN015	Open Yellow Circle
CVC - TYN015	Open Yellow Diamond (mixed with Target Horizon)
CVC - TYN011	Open Yellow Triangle
Other CVC	Open Yellow Square
Suite 2	Solid Orange Square
Anthony Road Andesite	Solid Orange Triangle
Suite 3	Solid Purple Square
Target Horizon	Open Purple Squares
Suite 4 and 5	Solid Red Squares
Basin Lake Porphyry - TYN015	Blue Cross
Basin Lake Porphyry - TYN011	Blue Star
Basin Lake Porphyry - Lithogeo	Light Blue Square

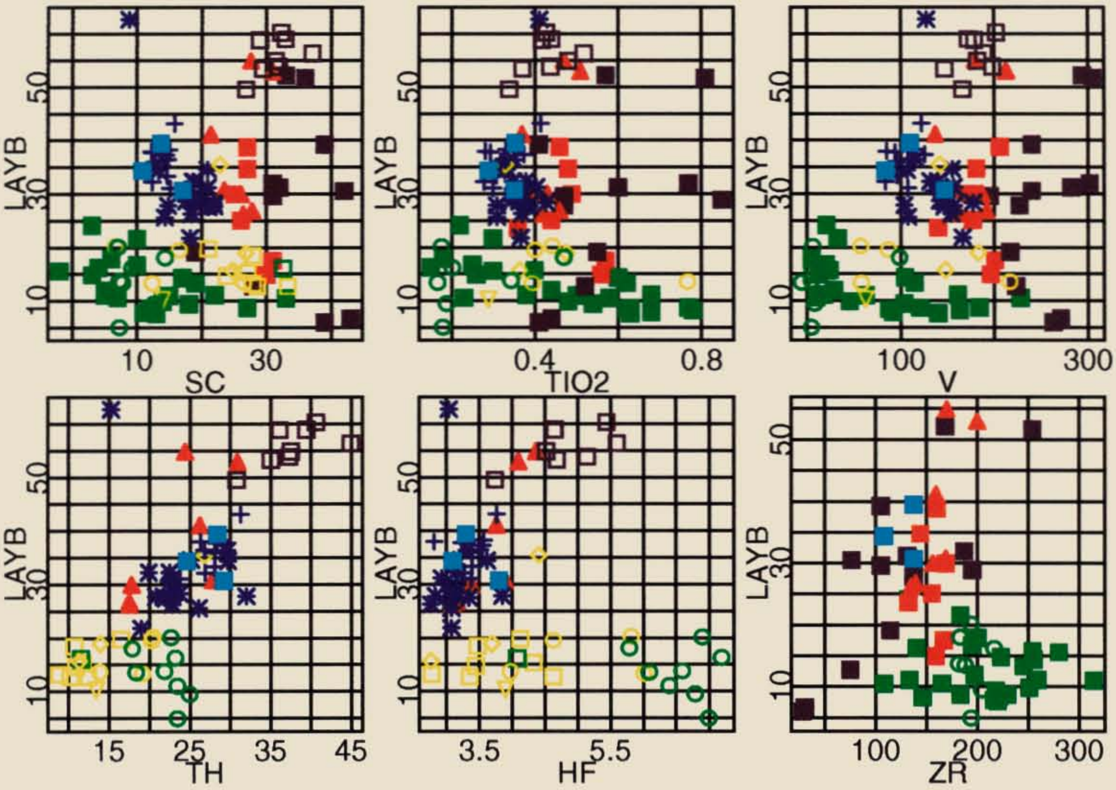
417026

Figure 13. Basin Lake Lithogeochemistry - Th verses Hf



Suite 1	Solid Green Square
Tyndall Group Rhyolite	Open Green Circle
Tyndall Group Dacite	Open Green Square
CVC - TYN015	Open Yellow Circle
CVC - TYN015	Open Yellow Diamond (mixed with Target Horizon)
CVC - TYN011	Open Yellow Triangle
Other CVC	Open Yellow Square
Suite 2	Solid Orange Square
Anthony Road Andesite	Solid Orange Triangle
Suite 3	Solid Purple Square
Target Horizon	Open Purple Squares
Suite 4 and 5	Solid Red Squares
Basin Lake Porphyry - TYN015	Blue Cross
Basin Lake Porphyry - TYN011	Blue Star
Basin Lake Porphyry - Lithogeo	Light Blue Square

Figure 14. Basin Lake Lithogeochemistry - La/Yb verses various elements



Suite 1	Solid Green Square
Tyndall Group Rhyolite	Open Green Circle
Tyndall Group Dacite	Open Green Square
CVC - TYN015	Open Yellow Circle
CVC - TYN015	Open Yellow Diamond (mixed with Target Horizon)
CVC - TYN011	Open Yellow Triangle
Other CVC	Open Yellow Square
Suite 2	Solid Orange Square
Anthony Road Andesite	Solid Orange Triangle
Suite 3	Solid Purple Square
Target Horizon	Open Purple Squares
Suite 4 and 5	Solid Red Squares
Basin Lake Porphyry - TYN015	Blue Cross
Basin Lake Porphyry - TYN011	Blue Star
Basin Lake Porphyry - Lithogeo	Light Blue Square

5.3 OXYGEN AND CARBON ISOTOPES

An additional six carbonate samples (43188 to 43193) were analysed for carbon and oxygen isotopes at the Central Science Laboratory, University of Tasmania. The result are tabulated in Table 2.

Table 2 - Basin Lake Oxygen and Carbon Isotope Samples

Sample	Hole	Depth	Mineral	$\delta^{18}O$	$\delta^{13}C$
37752	TYN006	227.3	Calcite	15.433 ‰	1.127 ‰
37753	TYN006	295.3	Calcite	16.93	1.193
37754	TYN007	105.2	Calcite	14.693	1.494
37755	TYN007	286.4	Calcite	18.475	1.291
34444	BL001	278	Calcite	12.8	1.1
34445	BL002	272.1	Calcite	16.6	1.1
37750	BL003	386.4	Calcite	12.316	1.436
37751	TYN012	209	Calcite	12.41	0.914
43188	TYN013	363.6	Calcite	12.284	-0.736
43189	TYN013	405.8	Calcite	12.362	0.745
43190	TYN014	136.3	Calcite	12.841	0.784
43191	TYN014	222.3	Calcite	11.908	0.812
43192	TYN014	627.2	Calcite	10.569	0.469
43193	TYN015	434.6	Calcite	11.706	1.151

Figure 15 shows the $\delta^{18}O$ and $\delta^{13}C$ variation for all the carbonate samples from the Basin Lake EL.

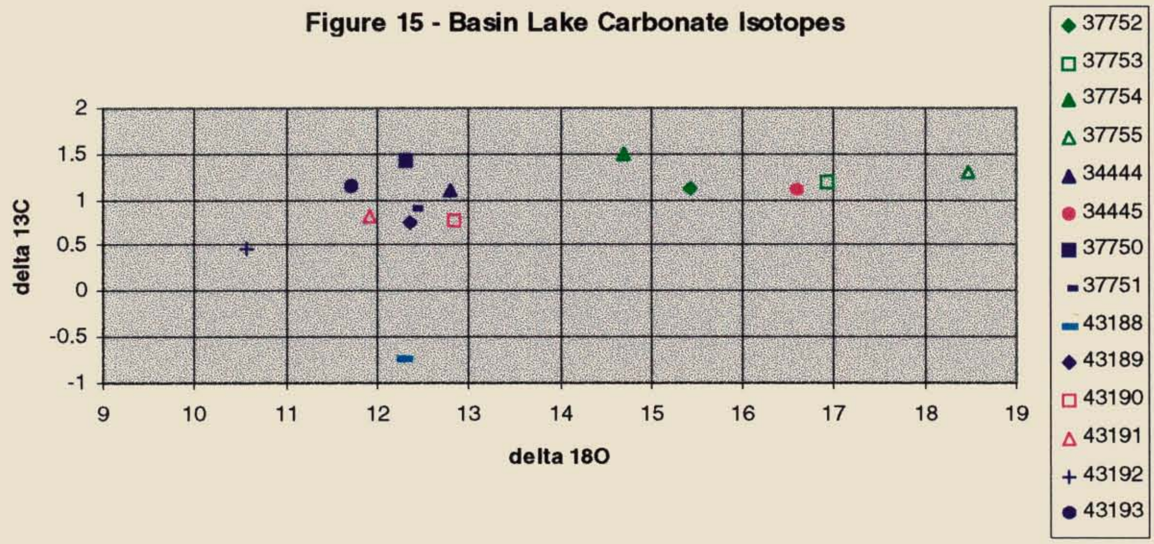


Figure 15 - Basin Lake Carbonate Isotopes

The carbonates have been sampled from three distinct stratigraphic positions and are colour coded accordingly. The stratigraphic horizons are:-

1) Base of the Tyndall Group. Two carbonate horizons are present in the basal formation, or Lynchford Member of the Tyndall Group near Tyndall Creek. They have been tested by two drill holes, TYN006 and TYN007. On Figure 15 they have been colour coded green. They are characterised by high $\delta^{18}O$ values that range from 15.4 to 18.5 ‰. There is some evidence to suggest that the stratigraphically higher carbonate horizon (solid symbols) has slightly lower $\delta^{18}O$ values than the lower carbonate horizon (open symbols) which immediately overlies the Anthony Road Andesite.

2) Anthony Road Andesite Several carbonate horizons are present within the Anthony Road Andesite however they have had limited sampling. On Figure 15 they are colour coded purple. Two samples (43190 and 43191) are from massive carbonate horizons and have similar isotopic values to carbonate values from the Target Horizon. Sample 34445 is from a late stage carbonate vein and has a high $\delta^{18}O$ value of 16.6 ‰. This value is similar to values described above for the carbonate horizons at the base of the Tyndall Group. It is possible that some of the carbonate veining in the Anthony Road Andesite represents feeder veins to stratigraphically higher massive carbonate horizons which occur at the base of the Tyndall Group.

3)Target Horizon Carbonate horizons are associated with the chemically distinct Target Horizon dacites at the contact between the Central Volcanics Sequence and the overlying Anthony Road Andesite. Samples from the Target Horizon have been colour coded blue and light blue on Figure 15. In general, carbonates from the Target Horizon have $\delta^{18}O$ values that range from 10.6 to 12.8 ‰. There is some suggestion that the samples from directly above the TYN011 - TYN015 alteration zone (eg 43192 and 43193) have slightly lower $\delta^{18}O$ values (10.6 to 11.7 ‰) than those distal to the alteration which range from 12.3 to 12.8 ‰. This relationship is considered to develop in response to a temperature gradient over the alteration zone however more sampling is required to clarify this observation. Sample 43188 (light blue symbol) is anomalous and has a $\delta^{13}C$ of -0.736 ‰. It is has an isotopic signature similar to carbonates from the South Hercules deposit (Khin Zaw and Large, 1992).

5.4 SULPHUR ISOTOPES

Six samples from the TYN011 - TYN015 alteration zone were submitted for Sulphur Isotope analysis at the Central Science Laboratory, University of Tasmania. The result are tabulated in the following table:-

Table 3 Basin Lake Sulphur Isotope Samples

Sample	Hole	From	Formation	Rock Type	Mineral	$\delta^{34}S$
37798	TYN015	343.0	CVC	VDFM	Pyrite	3.32
37799	TYN015	563.9	Basin Lake Porphyry	IR>	Pyrite	3.60
43183	TYN011	291.3	Basin Lake Porphyry	IR>	Pyrite	2.96
43184	TYN011	435.2	CVC	VD<F - M	Pyrite	3.88
43185	TYN015	354.0	Target Horizon	LDFB	Pyrite	0.61
43186	TYN015	430.7	Target Horizon	LDFB	Pyrite	3.61

The range in $\delta^{34}S$ isotope values for Cambrian volcanic hosted massive sulphide deposits in western Tasmania is typically +5 to +20 ‰ (Solomon et al, 1988). Large (1989) has subdivided these deposits into two distinct isotopic populations:-

a)	Ore grade massive sulphides	$\delta^{34}S$	+5 to +20 ‰
b)	Barren sulphide zones	$\delta^{34}S$	<+5 ‰

Several barren pyrite zones has been identified and are summarised in the table below:-

Table 4 Tasmanian Barren Sulphide Zones

Deposit	$\delta^{34}S$ Range	Reference
Chester	-3.9 to +0.4 ‰	Collins (1981)
Boco	-1.2 to +4.7	Green (1986)
Basin Lake	-4.6 to +2.4	Solomon et al.(1988)
Howard's Anomaly	-8.3 to +16.8	Solomon et al.(1988)
Cattley Range	No Data	Green and Taheri (1992)
Specimen Creek	-2.92 to -0.12	Jackson (1996)

These deposits are considered to form from a sea water dominated fluid at relatively low temperatures (<200°C). This inhibits inorganic reduction of sea water sulphate and at these low temperatures the fluids cannot carry sufficient base metals and H_2S to form an ore body. Most of the sulphur is probably derived from the surrounding volcanics which are estimated to have a $\delta^{34}S$ value of approximately 0 ‰. Cambrian sea water sulphate has a value of about +30 ‰. Solomon et al, (1988) note that barren sulphide deposits probably form towards the end of a convective cycle when the sea water sulphate has been consumed and reduction ceases. Oxidation of the fluid then may occur as the system cools. Such fluids would have similar isotopic signatures to the host volcanics.

The sulphur isotope values from the TYN011 - TYN015 alteration zone range from 0.61 to 3.88 ‰. This in within the range of isotopic compositions quoted from Solomon et al, (1988) for massive to disseminated pyrite layers in sediments at Basin Lake (NB:- No drill hole was specified however it is most likely that they sampled BL004). It is concluded that the TYN011 - TYN015 has a sulphur isotopic signature similar to several other barren pyrite alteration zones from the Mount Read Volcanics.

5.5 LEAD ISOTOPES

Five samples were submitted to CSIRO for Pb isotope analysis. The samples were collected from various lithologies from and adjacent to the TYN001 and TYN015 alteration zone. Sample particulars and results are presented in the following tables:-

Table 5. Basin Lake Pb Isotope Samples

Sample	Hole	Depth	Formation	Rock Type	Minerals
37795	TYN011	323.4	Basin Lake Porphyry	IR>	Pyr
37796	TYN011	382.7	Central Volcanics	VR>M	Pyr-Gal
37797	TYN015	233.8	Siltstone in ARA	VEIN	Pyr-Gal
37798	TYN015	342.9	Target Horizon	VDFM	Pyr
37799	TYN015	563.9	Basin Lake Porphyry	IR>	Pyr

Table 6. Basin Lake Pb Isotope Results

Sample	206Pb/204Pb	207Pb/204Pb	208Pb/204Pb	Pb (ppm)	Quality
37795	19.424	15.671	39.784	16	0
37796	18.411	15.633	38.299	Galena	3
37797	18.520	15.608	38.373	124	2
37798	23.301	15.878	42.681	7	0
37799	18.430	15.611	38.263	Galena	0

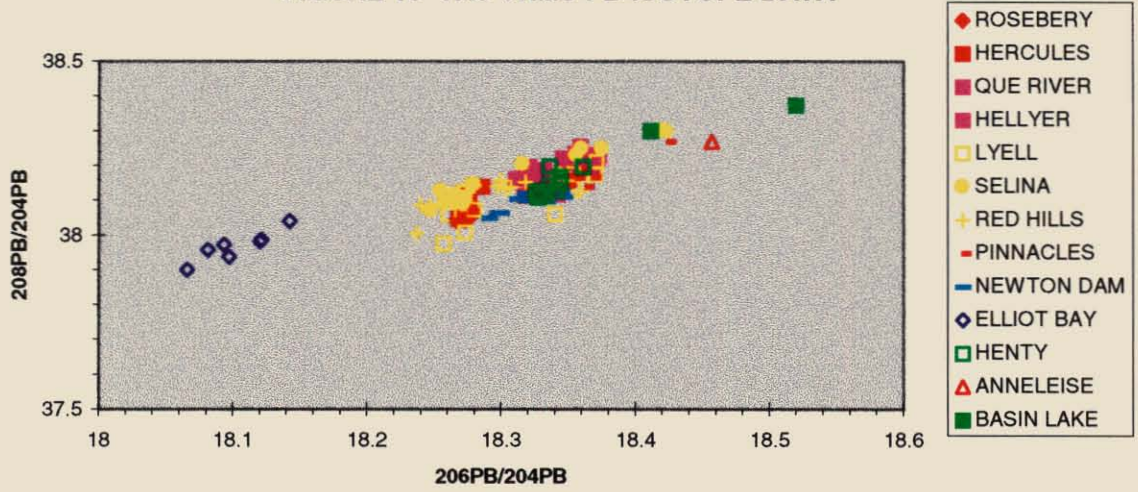
Samples 37795, 37796 and 37799 are samples from the footwall alteration from the TYN011 - TYN015 alteration zone. Sample 37795 has a very low Pb concentration and the Pb isotope results may not be representative of the initial Pb isotopic ratio. Samples 37796 and 37799 possibly record the initial Pb isotopic signature of the rock although the 206Pb/204Pb ratio is higher than recorded for VHMS mineralisation in the Mount Read Volcanics which is typically less than 18.4. These samples have 206Pb/204Pb values that range from 18.4 to 18.5 which although overlaps with field of Devonian lead from the Queen Hill area, is also similar to data from the Henty Fault Zone (Geoff Denton pers comm).

Sample 37798 is from the overlying Target Horizon as has a very low Pb abundance. Its original Pb isotopic signature has not been preserved.

Sample 37797 is from a 0.5 metre wide carbonate - pyrite - galena vein from a black siltstone horizon within the Anthony Road Andesite. It is similar to the other samples from the footwall and has 206Pb/204Pb ratio greater than 18.4 and is consistent with mineralisation from the Henty Fault Zone (Geoff Denton pers comm).

A plot of some of the samples from the TYN011 - TYN015 alteration zone is shown on Figure16.

FIGURE 16 TAS VHMS PB-ISOTOPE DATA



5.6 GEOPHYSICS

5.6.1 DHEM Surveys

Three-component down-hole electromagnetic surveys using the CRONE time-domain EM system were conducted on three diamond drill-holes (TYN13, TYN14, and BLD89-3), at the Basin Lake Project, EL 14/93, in February 1997. The surveys were conducted by Outer-Rim Exploration services for RGC Exploration as part of ongoing exploration for base-metal mineralisation at the project. A detailed technical report by RGC Geophysist Chris dauth is included as Appendix 5.

The aim of the surveys was to determine whether off-hole conductors (conceptually attributed to massive sulphide accumulations) were situated within the vicinity of these existing diamond drill-holes. If such conductors were present, then it is possible that down-hole three-component EM data could be used to accurately locate the massive sulphides, and thus facilitate the design of further exploratory drilling.

Hole depths for TYN13, TYN14, and BLD89-3 were 511.4m, 790.5m, and 388m respectively. TYN13 and TYN14 were drilled in 1996 by RGC Exploration targeting a contact between andesitic and rhyolitic lavas, (the Anthony Road Andesite - Central Volcanic Sequence contact) considered to be prospective for VHMS mineralisation. BLD89-3 was drilled by Billiton in 1989 targeting a CSAMT surface geophysical anomaly. Sericitic alteration, minor pyrite (1-5% commonly within carbonates) and rare sphalerite micro-veins were reported to be intersected in these holes. These geological indicators are generally regarded as favourable for the presence of VHMS mineralisation. Hole BLD89-3 had previously been logged with a single component down-hole electromagnetic sytem and was reported a exhibit a weak off-hole response.

TYN13 results show a strong in-hole response to 120m in all three components that is due to HQ casing remaining in the drill-hole. In addition, a weak early time positive amplitude response is observed in the V-component data from 350m to 390m. This response is not observed in the A and U components, and is most likely attributed to the position of the drill-hole with respect to the primary field (a loop-hole geometrical response).

TYN14 is collared within 50m to the west of a black siltstone horizon. A strong off-hole conductor, located near the hole is evident in the A and V component data in the top 100m if the hole. This is interpreted as a response caused by an interaction between the glacial overburden and the black siltstone which are no doubt in electrical contact. A low amplitude broad wavelength (300m) off-hole response is centred at 420m in TYN14. The response shows a negative A component , a positive to negative cross-over in the V component, and very little U component response. This is typical of a conductor located directly below the drill-hole. Computer modelling using the FILAMENT software showed the centre of the conductor to be approximately 200m off-hole to the west. This places the conductor at the down-dip position of a black siltstone mapped at the surface. Further investigation is not warranted since the conductor does not lie within RGC held ground.

Previous down-hole EM on BLD89-3 detected an off-hole response in the axial component centred at 210m. Re-logging of the hole confirms the presence of a very weak off-hole response. Subsequent modelling using FILAMENT software suggest that a weak conductor of limited extent is situated down-dip to the north of BLD89-3. This position of a ENE-WSW striking fault. It is possible that the EM anomaly is due to either weathering, pyrite alteration, or conceivably base-metals mineralisation along or associated with this fault. It is similarly likely that the source of the down-hole EM anomaly is the same body that caused the CSAMT anomaly on which hole BLD89-3 was targeted. Further drill testing in this region to test the anomaly could be justified if it is considered that the current drill pattern is not of a density as to preclude the possibility of an economic sized deposit.

6. DISCUSSION and RECOMMENDATIONS

Since 1994 RGC has drilled 11 holes totalling 5026.9m within EL 14/93. The first two holes TYN006 and TYN007 tested carbonate horizons within the Lower Tyndall Group along strike of weak to moderate base metal mineralisation at Howard's Anomaly. The carbonate horizons are characterised by high $\delta^{18}O$ values that range from 15.4 to 18.5 ‰, lack of Eu enrichment and low base metal abundances. They are considered to represent the low temperature distal equivalents of massive sulphide mineralisation which occurs within the Lower Tyndall Group at Henty and Comstock. These two holes have effectively sterilised the Tyndall Group - Anthony Road Andesite contact(- the Henty Horizon) to the north of the Whitham Bluff Fault to a depth of about 450 m and it is considered unlikely that significant mineralisation will be discovered by testing the horizon at greater depths.

The majority of the diamond drill holes have targeted the strike extent of a zone of weak mineralisation intersected by previous explorers in drill holes (BL001:-4.5m at 0.46% Zn and 0.13% Pb from 296 to 300.5m and 4.5m at 0.44% Zn and 0.11% Pb from 303.5 to 308m and BLD89-3) to the south of the Whitham Bluff Fault. The drilling program has confirmed that the sequence is west facing and the following stratigraphy has been established:-

Youngest	Anthony Road Andesite
	Target Horizon
	Basin Lake Porphyry
Oldest	Central Volcanic Sequence.

The Anthony Road Andesite is a complex sequence of Interbedded andesitic lavas and intrusives with lesser amounts of black siltstone, andesitic volcaniclastic sediments, reworked hyaloclastite sediments and massive carbonate. It is possible that the Anthony Road Andesite was deposited in a elongate sub-basin with two cross structures, the Hamilton Moraine Fault and the Newton Creek Fault, defining the basin margins.

The Target Horizon is a chemically distinct sequence of andesitic to dacitic lavas and intrusives that is interbedded with dacitic volcaniclastic sediments of the underlying Central Volcanic Sequence and varying proportions of carbonate horizons. The lavas and intrusives are characterised by high La/Yb ratios and are compositionally equivalent to Suite III rocks (Crawford, Corbett and Everard, 1992).

A major quartz - feldspar phyric rhyolite, the Basin Lake Porphyry generally underlies the target Horizon. It is chemically distinct from abundant rhyolitic lavas and intrusives that occur in the overlying Tyndall Group and is more compositionally similar to Suite II rocks (ie. Anthony Road Andesite) than to the Tyndall Group rhyolites which belong to Suite I.

The lowest stratigraphic unit in the EL is the Central Volcanic Sequence. This is a complex sequence of interbedded feldspar phyric dacitic volcaniclastic sediments and dacitic lavas and intrusives. Lithogeochemical studies show that they have Suite I affinities.

Massive carbonate horizons occur at several stratigraphic horizons throughout the sequence. The lowest stratigraphic position they have been identified is in the Target Horizon. They occur at numerous levels within the Anthony Road Andesite and two distinct levels have been identified within the Lower Tyndall Group. It is suggested that carbonate deposition was initiated during deposition of the Suite III Target Horizon rocks in the early phase of basin development.

Suite III rocks commonly have phenocrysts of olivine, clinopyroxene and chromite and are compositionally more primitive than Suite I and Suite II rocks. This suggests that deposition of Suite III formed at higher temperatures than the overlying Suite II rocks. It is suggested that the development of Suite III rocks occurred in response to high heat flows generated by the initial rifting phases of the Anthony Road Andesite basin. The high heat flows within the basin produced early massive carbonate horizons with characteristically lower $\delta^{18}O$ values.

Carbonates were continuously deposited throughout the emplacement of the Anthony Road Andesite and occur as massive carbonates, matrix fillings in resedimented hyaloclastite breccias, and late stage cross cutting breccia forming veins. The carbonate horizons in the Lower Tyndall Group have the highest $\delta^{18}O$ values and represent the final phases of carbonate deposition of the Comstock Tuff and overlying Upper Tyndall Group rocks.

The increase in $\delta^{18}O$ values of the carbonates from the Target Horizon to the Lower Tyndall Group is considered to represent the influence of an evolving hydrothermal fluid. It is suggested that carbonate horizons deposited at higher stratigraphic levels reflect deposition at lower temperatures with a greater input of sea water in the system.

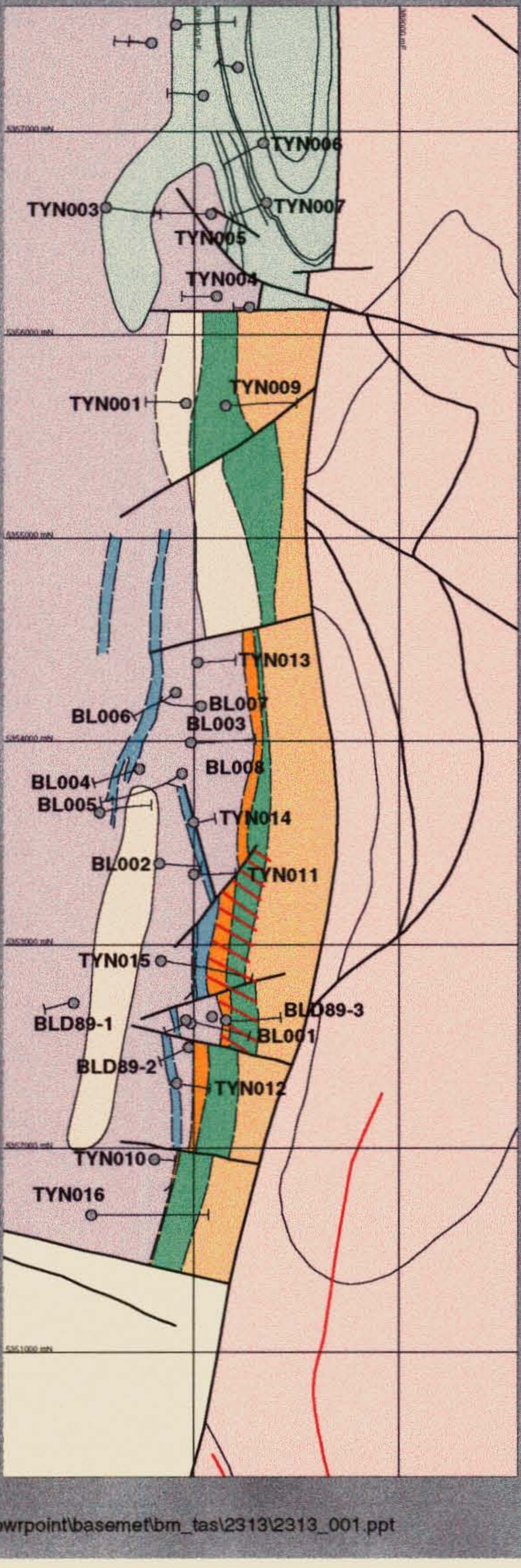
A major sericite - pyrite alteration zone is hosted in the Basin Lake Porphyry and forms the footwall to an inferred sea floor position defined by the presence of carbonate units in the overlying Target Horizon. The alteration zone has been tested over a strike length of about 800 m between drill holes BL001 and TYN011 and it's strike length is defined by two poorly constrained cross faults (Figure 17). These faults may have been active syn-volcanic structures and focussed hydrothermal fluids.

In TYN011 and TYN015 the Basin Lake Porphyry is generally more altered at it's upper and lower contacts. This may suggest that the alteration is synchronous with the intrusion of the porphyry.

Sulphur isotope data from the footwall alteration and for pyrite alteration in the overlying Target Horizon range from 0.61 to 3.88 ‰. These values are typical of low temperature barren hydrothermal systems. The carbonate horizons in the Target Horizon have $\delta^{18}O$ values that range from 10.6 ‰ directly overlying the footwall

RGC Exploration

FIGURE 17 - BASIN LAKE GEOLOGICAL INTERPRETATION



- 🟪 Owen conglomerate
- 🟩 Tyndall Group
- 🟥 Anthony road andesite
- 🟦 Black siltstone
- 🟧 Target horizon
- ⬜ Unassigned (possible target horizon)
- 🟩 Rhyolite intrusive
- 🟧 Central volcanics sequence
- ⬜ Undifferentiated cambrian volcanic rocks
- ▨ Sericite - pyrite alteration

1km

I:\draft\pwrpoint\basemet\bm_tas\2313\2313_001.ppt

5 cm

alteration zone to 12.8 ‰ in more distal zones and are indicative of low temperature sea water dominated systems. Although the apparent isotopic zonation in the Target Horizon away from the alteration zone is consistent with a temperature gradient ther is insufficient data to constrain the direct relationship between the footwall alteration zone and the overlying exhalative system. However, the similarities in the sulphur isotopic values between the target Horizon and the Footwall alteration zone suggest a possible genetic link.

The isotopic data suggests that the alteration is formed by low temperature hydrothermal fluids and is consistent with the base metal poor nature of the alteration.

The exploration within EL 14/93 has failed to locate a high temperature region within the TYN011 - TYN015 alteration zone. Such a zone would be formed by hydrothermal fluids with a greater capacity for transporting significant quantities of base metals and be highly prospective for VHMS mineralisation.

Adjacent to EL 14/93 there appears to be an inferred structural repeat of the Target Horizon in EL 103/87 presently held by a joint venture between Aberfoyle and Resolute. This zone was previously tested by drill holes BL005 and possibly BL004. Significantly BL004 intersected a thin unit of massive sulphide mineralisation which assayed 2m @ 475ppm Cu, 2315ppm Pb, 232ppm Zn, 57ppm Ag, 0.05ppm Au, 655ppm As and 1.7% Ba. Recent drilling by Aberfoyle (BL006, BL007 and BL008) targeted the along strike and down dip extents of this intersection. The base metal rich intersection in BL004 suggests that the alteration and mineralisation occurred at higher temperatures than the TYN011 - TYN015 alteration zone and highlights the high exploration potential of this area.

The exploration within EL14/93 has defined the base of the Anthony Road Andesite as a potential mineralised horizon. The systematic nature of the exploration has characterised the stratigraphy, lithogeochemistry and isotopic signature of this horizon and has generated a database that forms a useful tool for regional exploration and in future target identification.

It is recommended that an application for EL 103/87 be submitted when it is relinquished on 21 April 1998. A successful tender for this ground would also permit testing of the Target Horizon between TYN008 and TYN013. At present it is hard to adequately test this zone from within the present boundaries of EL 14/93.

REFERENCES

Collins., P.L.F., 1981. A sulphur isotope study of the Chester massive pyrite deposit, western Tasmania. Unpubl. Rep. Dep. Mines. Tasm. 1981/27

Corbett, K.D., 1985. The Leech Hill Drill Hole, Western Tasmania, Bradshaws Road. Unpub. Rep. Dept. Mines. Tasm. 1985/54

Corbett, K.D., 1986. Mt Read Volcanics Project Map 3. The Geology of the Henty River - Mt Read Area. 1:25 000 Scale. Dept. of Mines, Tasmania

Fitzgerald, F.G., 1987. EL 9/66 Tyndall Area, Tasmania. Annual Report 1986/87. Goldfields Exploration Pty Ltd.

Fitzgerald, F.G., and Cartwright, A.J., 1986. EL 9/66 Tyndall Area, Tasmania. Annual Report 1985/86 for Parts II, III and IV. Goldfields Exploration Pty Ltd.

Fitzgerald, F.G., and Pease, C.F.D., 1985. EL 9/66 Tyndall Area, Tasmania. Annual Report 1984/85. Goldfields Exploration Pty Ltd.

Gatehouse, G., 1994. Exhalative Carbonate Geochemistry, Western Tasmania. Unpub. Rep. RGC Exploration Pty Ltd.

Green, G.R., 1986. Stable isotope and alteration investigations of the Mount Read Volcanics: 1- the Hercules and Boco areas, in Large, R.R., (ed.) The Mount Read Volcanics and associated ore deposits. 39-41. Geological Society of Australia, Tasmania Division.

Green, G.R., and Taheri, J., 1992. Stable isotopes and geochemistry as exploration indicators. Bull. Geol. Surv. Tasm. 70: 84-91

Jackson, M., 1996. The genisis of volcanic-hosted auriferous quartz veins at the Lynch Creek Au prospect, western Tasmania. Unpubl. BSc(hons) Thesis. University of Tasmania.

Mudge, S.T., 1991. New developments in resolving detail in aeromagnetic data. Exploration Geophysics 1991, V22, pp 277-284

Purvis, J.G., Jones, M.T., Fitzgerald, F.G., and Poltock, R.A., 1983. A geological review of the Tyndall Exploration Licience 9/66, Western Tasmania. Goldfields Exploration Pty Ltd.

Quayle, P.M., 1995. Pasminco Exploration Yolande El 11/85 Joint Venture. Annual and Final Report August 1985 - August 1996.

Richardson, S.M., 1993. EL 103/87 Basin Lake Partial Relinquishment Report on Exploration to April, 1993. Aberfoyle Resources Pty Ltd. TCR 93-3423.

Solomon, M., Eastoe, C.J., Walshe, J.L., and Green, G.R., 1988. Mineral deposits and sulphur isotope abundances in the Mount Read Volcanics between Que River and Mount Darwin, Tasmania. Econ. Geol. 83, 1307-1328.

Stoltz, J., 1996. The use and abuse of immobile element geochemistry for classification and identification of palaeotectonic settings of ancient volcanic sequences. Master of Economic geology Course Work Manual 10. (4th edition) centre for Ore Deposit and Exploration Studies. University of Tasmania. pp 7 - 22.

Vicary, M.J., 1994. EL 14/93 Basin Lake. Annual Report Dec. 1993 - Dec. 1994. RGC Exploration Pty Ltd.

Vicary, M.J., 1995. EL 14/93 Basin Lake. Annual Report Dec. 1994 - Dec. 1995. RGC Exploration Pty Ltd.

Vicary, M.J., 1996. EL 14/93 Basin Lake. Annual Report Dec. 1995 - Dec. 1996. RGC Exploration Pty Ltd.

Khin Zaw and Large, R.R., 1992. The Precious Metal-Rich South Hercules Mineralization, Western Tasmania: A Possible Subsea-Floor Replacement Volcanic-Hosted Massive Sulfide Deposit. Econ. Geol.,87,pp 931-952.

APPENDIX 1

Symbols and Codes used in drill logs

417041

RGC 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

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)

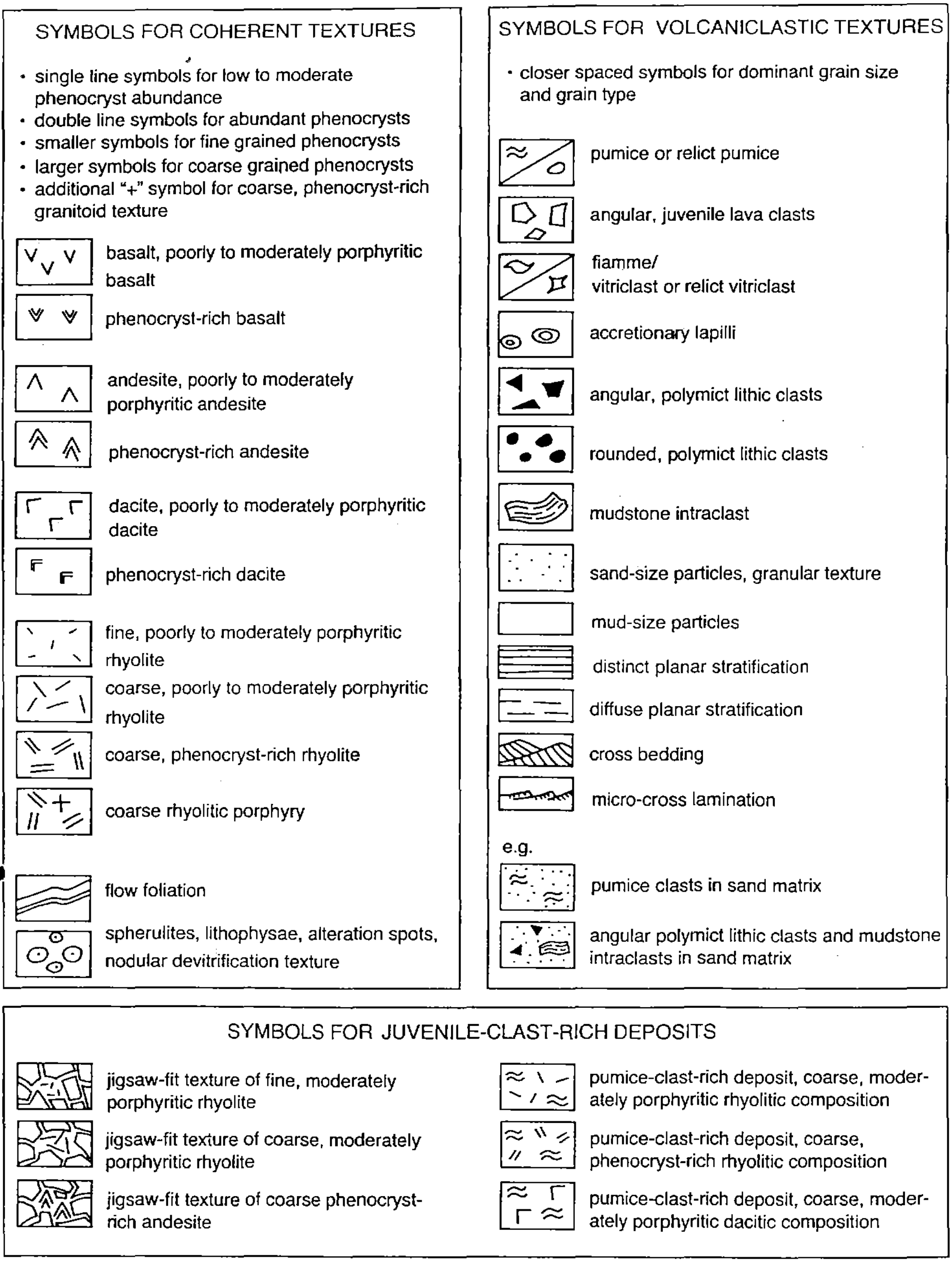


Fig. 9—Recommended composition and texture symbols for graphic logging of volcanic deposits.

(From:- McPhie, Doyle and Allen. CODES 1993)

417043

ROCK TYPE:

ALTR	Altered Rock	GRAN	Granite	QTZT	Quartzite
AREN	Arenite				
ARLB	Arenite, Labile	HORN	Hornfels	SAND	Sandstone
ARLT	Arenite, Lithic			SCHS	Schist
ARKS	Arkose	IRST	Ironstone	SMMS	Semi-Massive Sulphide
				SERP	Serpentinite
BREC	Breccia	LAMP	Lamprophyre	SHAL	Shale
BRPM	Polymict Breccia	LMST	Limestone	SILT	Siltstone
		LTWC	Lithicwacke	SISH	Siltstone with Shale
CARB	Carbonate			SKRN	Skarn
CHRT	Chert	MSGR	Massive Graphite	SLAT	Slate
CLAY	Clay (unconsolidated)	MSPY	Massive Pyrite	STRM	Structural Measurement (alt. STR)
CONG	Conglomerate	MSSL	Massive Sulphide		
CGPM	Polymict Conglomerate	MELA	Melange	TILL	Glacial Till
CGSC	Siliciclastic Congl.	MUDS	Mudstone	TLIT	Tillite
CLOS	Core Loss	MYLN	Mylonite	TRBD	Turbidite
DOLM	Dolomite	NOCR	No core (precollar)	ULMF	Ultramafic
FALT	Fault	PBSS	Pebbly Sandstone	VEIN	Vein
FTBR	Fault Breccia				
FTSZ	Fault/Shear Zone				

Volcanic Rocks

E	Epiclastic	} TYPE
L	Lava	
P	Porphyry	
VG	Volcanic (General)	
V	Volcaniclastic	
A	Andesitic	} COMPOSITION
B	Basaltic	
D	Dacitic	
FL	Felsic	
MA	Mafic	
R	Rhyolitic	
U	Ultramafic	
X	Crystal-rich	
F	Feldspar Phyric	} CRYSTAL TYPE
QF	Quartz-Feldspar Phyric	
Q	Quartz Phyric	
BK	Blocky	} GRAINSIZE
BR	Breccia	
C	Coarse	
M	Medium (Sandy)	
S	Fine (Silty)	
S	Very Fine (Shaley)	
/	Undifferentiated	

Examples

VGFL	Undiff. Felsic Lavas & Volcaniclastics
VBK	Blocky Volcaniclastic
VMAC	Coarse Mafic Volcaniclastic
VDM	Sandy Dacitic Volcaniclastic
VS	Silty Volcaniclastic
VS	Shaley Volcaniclastic
VS/	Undiff Fine-grained Volcaniclastics
VEFL	Felsic Volcaniclastics & Epiclastics
VABR	Andesitic Volcaniclastic Breccia
VGQF	Quartz-Feldspar Phyric Volcanic
LRF	Feldspar-Phyric Rhyolitic Lava
PQF	Quartz-Feldspar Phyric Porphyry
VX/	Undiff. XL-Rich Volcaniclastic
VXQF	Quartz-Feld. Phyric XL-Rich Volcaniclastic
EAXC	Coarse XL-Rich Andesitic Epiclastic
EXM	Sandy XL-Rich Epiclastic
EXS	Silty XL-Rich Epiclastic
EMA/	Undiff. Mafic Epiclastics
EBK	Blocky Epiclastics
EC	Coarse Epiclastics
EDM	Sandy Dacitic Epiclastics
ES	Silty Epiclastics
EBS	Shaley Basaltic Epiclastics

APPENDIX 2

TYN016 Drill Log

417045

RGC EXPLORATION DRILL HOLE RECORD

HOLE NUMBER	TYN016	**DRILLED BY**	DDTAS
PROJECT	Basin Lake	**NORTHING**	5351681.30
PROSPECT	Basin Lake	**EASTING**	380555.58
DESIGNED BY	Michael Vicary	**RL**	605m
LOGGED BY	Adam Elliston	**INCLINATION**	-60
COMMENCED	22/10/97	**AZIMUTH**	090 AMG
FINISHED	24/10/97	**EOH**	448.8m

PURPOSE

TYN016 was targeted at an alteration zone developed at the contact between the Anthony Road Andesite and Central Volcanic Sequence. The hole will test the target horizon about 300m south of TYN010 abd about 200m north of the Hamilton Moraine Fault, a potential growth fault. If any alteration is found in the footwall porphyry the hole should be continued until the Great Lyell Fault is intersected.

SURVEY DATA

DEPTH	INC.	AZ.	DEPTH	INC.	AZ.	DEPTH	INC.	AZ.
0	-60	090	270	-45	096			
50	-60	098	300	-44	096			
90	-60.5	098	330	-43.5	096			
120	-61	099	370	-39.5	096			
150	-56	096	400	-38	097			
180	-52	096	430	-36	097			
210	-51	099	448	-34	097.5			
240	-47.5	097						

DRILLING DATA

HOLE SIZE	DEPTH	COMMENTS
PQ	0 - 21.6	
HQ	21.6 - 136.00	
NQ	136.00 - E.O.H	

SUMMARY

0 - 58.3	Glacials
58.3 - 63.5	Limonitic weathered clays
63.5 - 224.6	Anthony Road Andesite - Andesitic intrusives / lavas & sediments
224.6 - 268.8	Black weakly pyritic siltstone
268.8 - 448.8	Central Volcanic Sequence - dacitic lavas / intrusives & sediments

TYN016 intersected a strongly foliated package of rocks consisting of Andesitic/dacitic intrusive/lava and sediments and black weakly pyritic siltstone. The interpreted target horizon or contaact between the basin lake porphory & Anthony Road Andesite was not intersected suggesting faulting & other structural complexities. No significant alteration or mineralisation was intersected.

417046

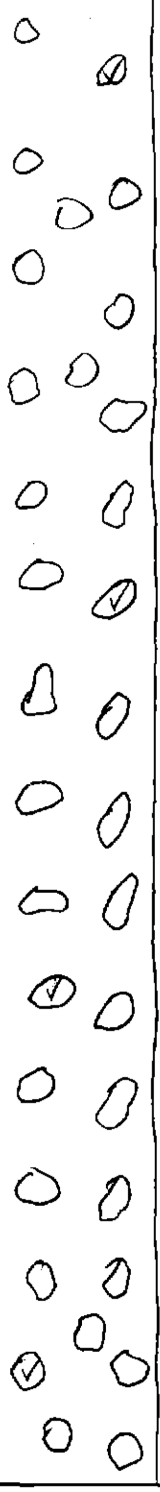
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 1 **OF** 23

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↘	Narrow vein
▵	Breccia	*	Visible gold
▩	Broken core		

PROJECT : BASIN LAKE
PROSPECT : TYNDALL
DATE : Oct / Nov 1997
LOGGED BY : A.L.E

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY FM	ROCK	ALTERATION
0									
1									
2						0 -> 58.30m			
3						Unconsolidated ->			
4						Glacial Tills, clays and sands consisting			
5						of dominant pre E siliclastic cobbles and boulders & some volcanic clasts			
6									
7						Core recovery poor in some places upto 50% particularly in clays +			
8						sands			
9									
10									
11							Qg	TILL	
12									
13									
14									
15									
16									
17									
18									
19									
20									

REMARKS

417047

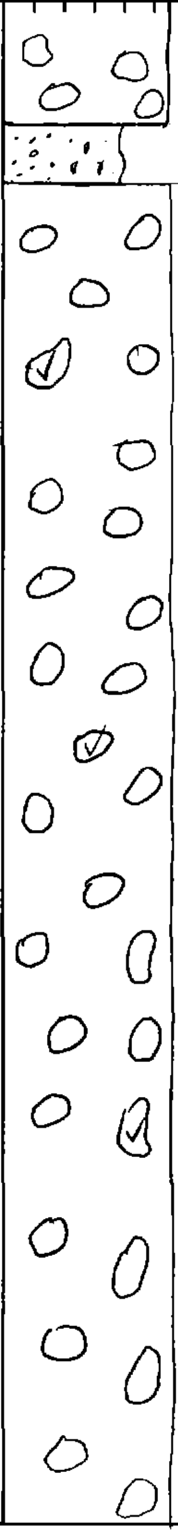
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 2 OF 23

—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear		Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

PROJECT :	Basin Lake
PROSPECT :	TYNDALL
DATE :	Oct /Nov 1997
LOGGED BY :	ALE

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
21								
22						21.6 → 22.4m unconsolidated sands + some gravel silty chips	Qg bed	
23								
24								
25								
26								
27								
28						Glacials as described on page ①		
29								
30								
31								
32							Qg TILL	
33								
34								
35								
36								
37								
38								
39								
40								

REMARKS

417048

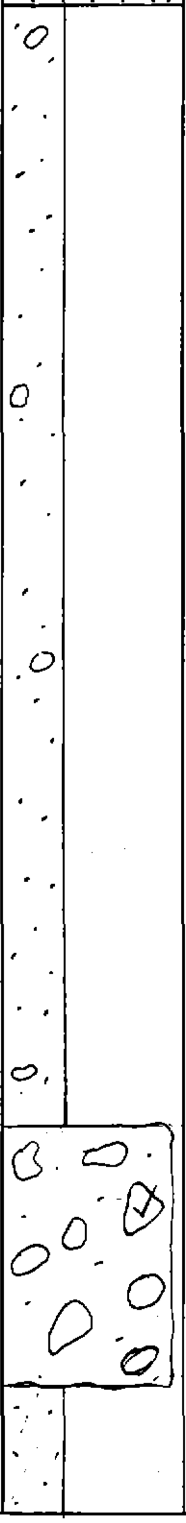
RGC EXPLORATION PTY LTD

——	Bedding	▦	Disseminated
⌴	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿∿	Fault, Shear	⤙	Narrow vein
▵▵	Breccia	*	Visible gold
▩	Broken core		

DRILL HOLE No TYN016

SHEET 3 OF 23

PROJECT	:	BASIN LAKE
PROSPECT	:	TYNDALL
DATE	:	Oct/Nov 1997
LOGGED BY	:	ALE

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION			GEOLOGY NOTES	SUMMARY		
					SIL.	SER.	PY.			ROCK	ALTERATION
41											
42								40.2 → 54.9m.			
43								Brown limonitic clays and sands; Odd clast			
44								of glacial within			
45								up to 50% Core loss.			
46											
47											
48											
49									QS	CLAY	L--S
50											
51											
52											
53											
54											
55											
56								Glacials as described			
57								on page ①.	QS	TILL	
58											
59								58.3 → 63.5m Brown limonitic clays			
60								probably weathered saprock	Es	CLAY	L--S

REMARKS

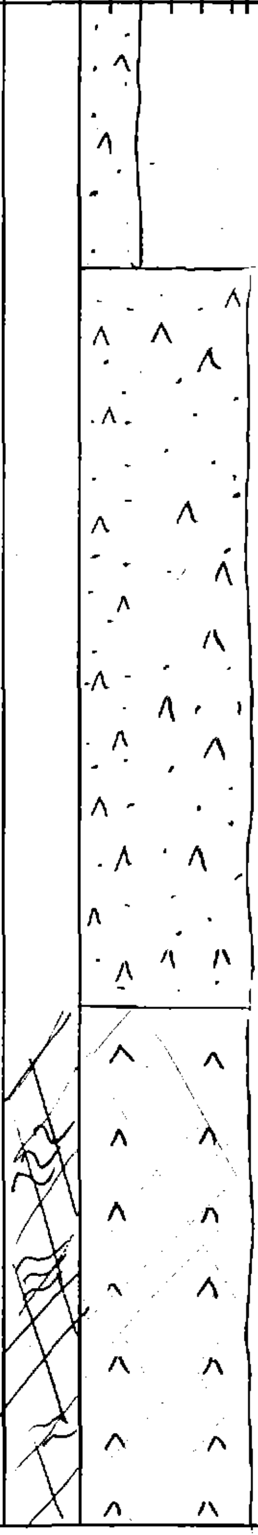
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 4 OF 23

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	Oct/Nov 1997
LOGGED BY :	A.L.E

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	SIL.	SER.	PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
61								Brown limonitic saprolitic clays.	Ea	CLAY	1 L--5
62											
63											
64									Ea	KAE	0--5
65								63.5 → 73.2			
66								cream-lt brn saprolitic/clayey chloritic bedrock → some cleavage textures preserved - probably weathered Andesitic clays			
67											
68											
69											
70											
71											
72											
73											
74								73.2 → 105.5	Ea	KAF	
75							▒	Broken, chloritic, well cleaved Andesitic fspar phyric volcanic. Some mafics (Hornblende?)			
76											
77								Rock has a very good cleavage 030° to C.A. (81.3m)			
78								* Probably a fault zone			
79								fspars sometimes boudinaged			
80								- minor Py mineralisation @			

REMARKS

417050

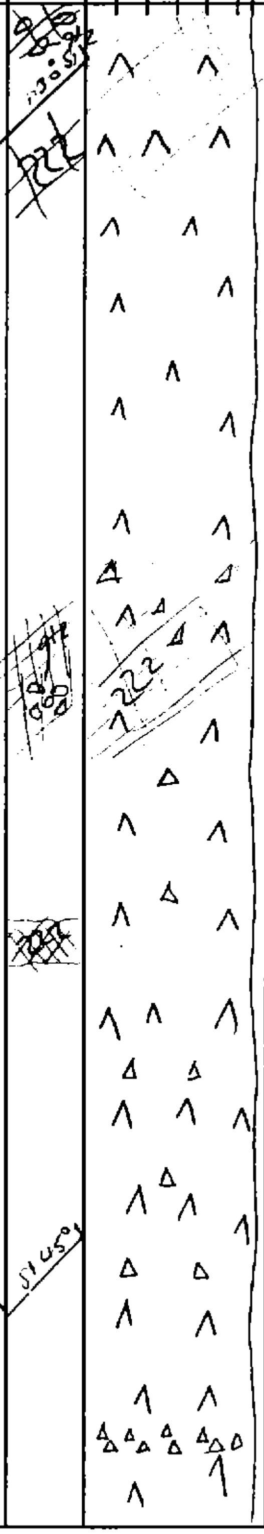
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 5 OF 23

—— Bedding	▨ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
∿ Fault, Shear	↘ Narrow vein
△ Breccia	* Visible gold
▩ Broken core	

PROJECT	:	BASIN LAKE
PROSPECT	:	TYNDALL
DATE	:	Oct /Nov 1997
LOGGED BY	:	A.L.E



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	SUMMARY ROCK	SUMMARY ALTERATION
81						fracture planes (74.6m / 83.6m) - qtz fragments representing veining @ 80.2m -> 80.4m.			OP-S
82						- some limonitic contacts			
83						- Transposition of fspar into cleavage common.			
84							EA		
85								VAF	
86									
87						Brecciation of lavas evident with good 6xx textures @ 98.6 - 99m			
88									
89						89.0 - 89.2 Qtz veining -> manganiferous mineralisation chlorite + some slickensiding			
90									
91						- rock very broken @ 88.4 -> 89.5m and 92:0 -> 92.6			
92									
93						fspars often pink -> red in color suggesting Fe staining	Ea		
94						- Hornblendes to chlorite?		LAFB	
95						Clasts & fspars alike strung out + transposed into cleavage.			O-S
96									
97									
98									
99									
100									

REMARKS

417051

RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 6 **OF** 23

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	Oct /Nov 1997
LOGGED BY :	A.L.E

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

HOLE DEPTH	SAMPLE No PREFIX 1417	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION SIL. SER. PY. Q	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
101	95					Chloritic often broken + bxxed Andesitic lavas			
102									
103									
104							EA	LAFB	0-5
105						105.5 → 106.2			
106			So 45° to CA			small unit of ashy siltstone + fg siltstone with grading downhole			
107						106.2 → 107.5m – Broken chloritic Andesitic volcanic	EA	K'AF	0-5
108						107.5 → 109.7m		VDFA	Q-4
109			qtz			Interbedded laminated ashy siltst. and a small unit of Andesitic Volcaniclastic fspar phyric sst. qtz vein ± 65° to C.A @109.4			
110						109.7 → 121.75m			
111						dk gy foliated (≃30° to CA)			
112						Andesitic lavas (fspar phyric) (chloritic)			
113						bxx's common ie @ 115.5m 110.3m 114.55→115.6m			
114									
115							EA		
116						small ashy slst unit ≃ 3cm wide @115.6		LAFB	0c-5
117						– Andesites more coherent and not as broken!			
118									
119									
120									

REMARKS

417052

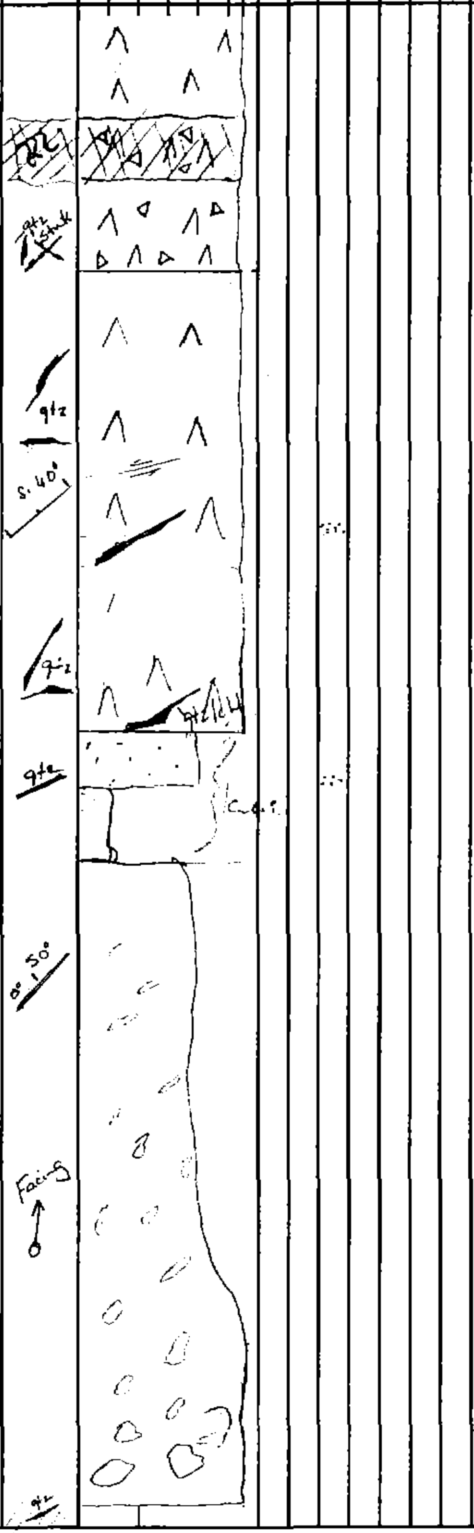
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 7 **OF** 23

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	OCT/NOV 1997
LOGGED BY :	A.L.E

——	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		



HOLE DEPTH	SAMPLE No PREFIX T417	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
121							Ea	LAF	
122						121.75 — 122.3m Small crush/fault zone - quite chloritic/cataclasite?		FALT	Q-4
123						122.3 → 124.5m bm Andesitic volcanic lava? with some qtz stockwork veining		LAFB	Q-5
124									
125						124.5 → 129.60m. Well foliated Andesitic Volcanic qtz stockworks (Devonian?) common.			
126									
127						- minor leucoxene spotting present			
128	96						Ea	LAF	Q-4
129									
130						129.6 ⇒ 131.25m Volcaniclastic sandstone	Ea	VAFM	
131						Ashy Siltstone (129.71-	Ea	VAFF	
132									
133						131.25 → 139.65m Mass flow textured Andesitic rock - clasts of f.g cherty ashy silt to 12cm			
134									
135									
136									
137							Ea.	VAFC-FT	
138									
139									
140						139.65 → 140.36m Ashy Silt - crush Zone		FAULT	

REMARKS

417053

RGC EXPLORATION PTY LTD

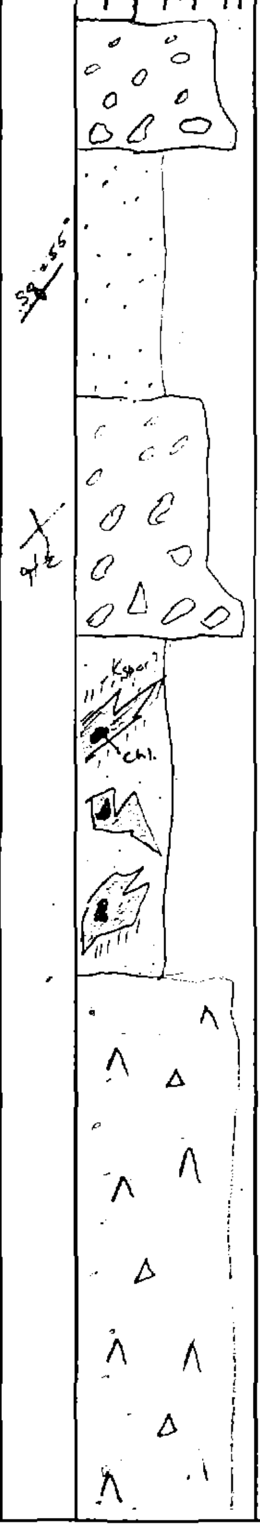
DRILL HOLE No TYN016

SHEET 8 OF 23

—	Bedding	░	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	✓	Narrow vein
▵	Breccia	*	Visible gold
▩	Broken core		

PROJECT	: Basin Lake
PROSPECT	: Tynmall
DATE	: Oct/Nov 1997
LOGGED BY	: A.L.E

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
141						140.36 → 142.0m Volcaniclastic - Andesitic Massflows	Ec	VAFCM	
142									
143						142.0 → 145.15m Fine grained foliated Andesitic volcaniclastic	Ec	VAFM	
144									
145									
146						145.15 → 148.2m. Andesitic Volcaniclastic Mass flow	Ea	VAFM-C	
147									
148									
149						149.2 → 152.8m. Zone of intense qtz veining + silicification (Devonian?). Clots of chlorite common and some Kspar alteration - Host rock hard to distinguish - VAFM?	Ec	VAFM	Q--Z
150									
151									
152									
153									
154									
155						152.8 → 175.7m. dk grey f-gr porphyritic Andesitic, coherent volcanic - breccia/hyaloclastite textures common - leucoxene spotting - well foliated.	Ec	LAFB	
156									
157									
158									
159									
160									



REMARKS

417054

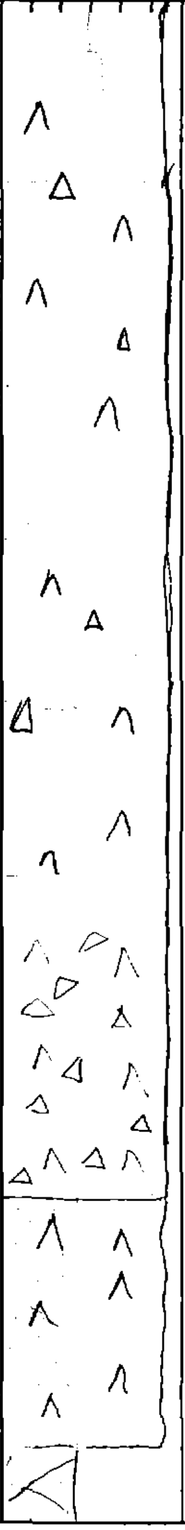
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 9 **OF** 23

PROJECT : Basin Lake
PROSPECT : Tyndall
DATE : Nov 1997
LOGGED BY : A.L.E

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↙	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		



HOLE DEPTH	SAMPLE No PREFIX T417	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL.	SER.	PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
								D no.			
161											
162											
163											
164											
165								- Minor bxx @ 165.1 qtz vns @ 165.34 166.62 + 67 166.9 167.1			Q-5
166											
167											
168								167.0 → 171.47m Andesitic lavas → interbedded w/ siltstone unit.			
169											
170									Ea	LAFB	
171											
172											
173								171.47 → 175.7m. Andesitic fspa phyric lava with auto bxx textures - leucoxene spotting common - silicification + chloritisation of matrix around some bxx clasts.			
174									Ea	LAFB	QA-5
175											
176								175.7 → 179.0m. Coherent Andesitic lavas feldspar phyric. foliation not as pronounced as further up hole			
177											
178	97								Ea	LAF	
179											
180								179.6 → 182.33 Zone of silicification + qtz stock			Q-6

REMARKS

417055

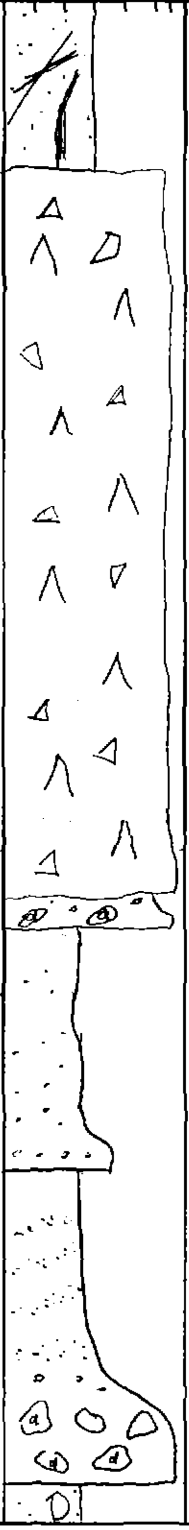
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 10 OF 23

——— Bedding	▨ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
〰 Fault, Shear	Narrow vein
Breccia	* Visible gold
▩ Broken core	

PROJECT	: Basin Lake
PROSPECT	: Tyndall
DATE	: Nov 1997
LOGGED BY	: A.L.E



HOLE DEPTH	SAMPLE No PREFIX T417	ASSAY RESULTS			STRUCT.	GRAPHIC LOG	ALTERATION SIL.	SER.	PY.				GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
181													Ditto	Ec	VAFM	Q--S
182																
183																
184																
185													182·33 → 191·65m.			
186													Brecciated Andesitic lavas with minor qtz veining			
187																
188														Ec	LAFB	Q--S
189					Tpj											
190	98				qtz vns											
191																
192													191·65 → 192·14m -Small mass flow unit with dacitic clasts.			
193													192.14 → 193·9m - Sandstone base grading to ashy Slst top.			
194					facing									Ec	VDFM	
195																
196													192·14 → 199·43			
197													Dacitic massflow/breccia grading up hole to a series of sandstone + siltstone tops			
198														Ec	VDFC-M	
199													199·43 → 203·14m			
200													Volcaniclastic Andesitic Sandstone			

REMARKS

417056

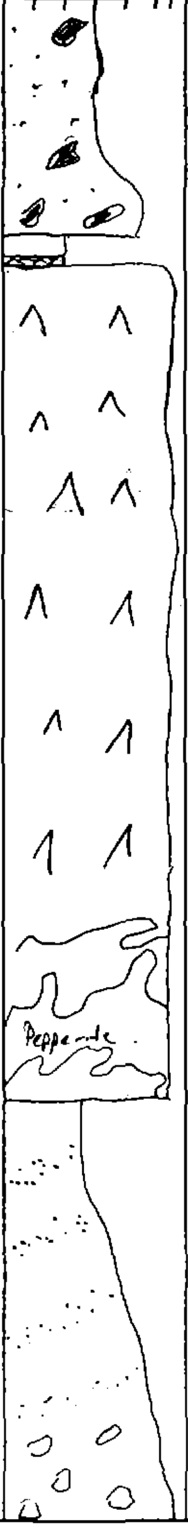
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 11 OF 23

─	Bedding
└┘	Cleavage
▲	Foliation
〰	Fault, Shear
▵▿	Breccia
▩	Broken core
░	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT : Basin Lake
PROSPECT : Tyndall
DATE : Nov 1997
LOGGED BY : A.L.E



HOLE DEPTH	SAMPLE No PREFIX T417	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
						with large fragments of black shale. - rip up texture?		
201								
202							Ea VDFL	
203			qtz			203.14 → 203.55 - black shale + minor qtz vns + small crush zone	Bl.	
204								
205						203.55 214.42m coherent Andesitic lavas with micro qtz vns common to 206.7m		
206	99		qtz					
207								
208						Peperitic contact with siltstones - 212.11 - 214.42m		
209								
210							Ea LAF	Q--3
211								
212								
213								
214								
215								
216						214.42 → 221.5m graded sequence with mass flow textures (Andesitic) @ base grading to a sequence of dacitic sandy + silty tops		
217							Ea VDFC-F	
218								
219								
220								

REMARKS

417057

RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 12 OF 23

- —— Bedding
- ⊔ Cleavage
- ▲ Foliation
- 〰 Fault, Shear
- △▽ Breccia
- ▩ Broken core
- ░ Disseminated
- ■ Massive
- ▨ Pervasive
- ↘ Narrow vein
- * Visible gold

PROJECT : Basin Lake
PROSPECT : Tyndall
DATE : Nov 1997
LOGGED BY : A.L.E

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
221						Ditto.	Ea		
222						221.5 – 221.84 – Black Shale grading to Andesitic Ashy siltstone @ top.	Ea	VDFC-M	
223									
224						221.84 → 224.6m. Chaotic Andesitic mass flow with andesitic clasts to 6cm			
225									
226			qtz vn			224.6 → 268.8m.			
227						Black shales with interbedded Ashy + sandstone units. Pyrite clots + disseminations in black siltstone common.			
228									
229			facing			*229m → Small flame structure between Ashy unit up hole + black shale downhole ∴ facing up hole			
230									
231									
232									
233									
234			45°				Eas	SILT	P--1
235									
236									
237									
238									
239									
240									

REMARKS

417058

RGC EXPLORATION PTY LTD

DRILL HOLE No TyN016

SHEET 13 OF 23

— Bedding
⊔ Cleavage
▲ Foliation
〰 Fault, Shear
△ Breccia
▩ Broken core
░ Disseminated
■ Massive
▨ Pervasive
↘ Narrow vein
* Visible gold

PROJECT	:	Basin Lake
PROSPECT	:	Tyndall
DATE	:	Nov 1997
LOGGED BY	:	A.C.E

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS			STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL.	SER.	PY.				GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
241																
242																
243																
244													Black laminated siltstone			
245																
246																
247																
248																
249																
250														Eas	SILT	P--1
251																
252																
253																
254																
255																
256																
257																
258																
259													Dacitic unit within siltstone			
260																

REMARKS

417059

RGC EXPLORATION PTY LTD

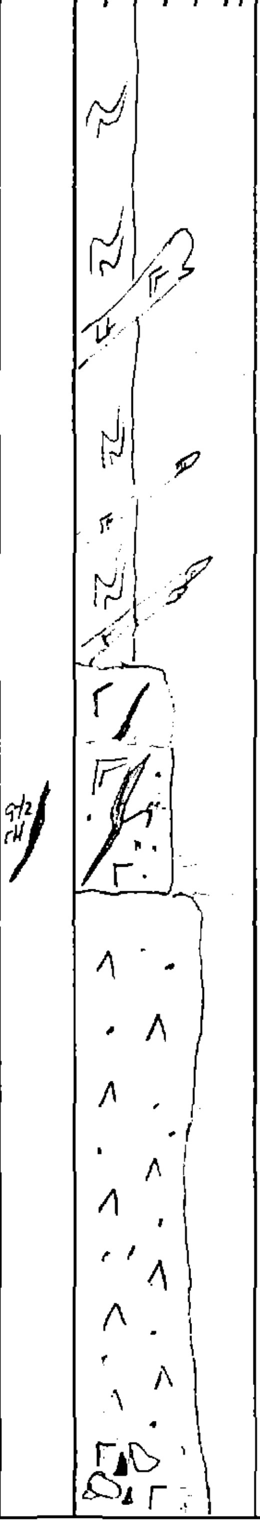
DRILL HOLE No TYN016

SHEET 14 OF 23

—	Bedding
⌴	Cleavage
▲	Foliation
〰	Fault, Shear
▨	Breccia
▩	Broken core
░	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT : Boori lake
PROSPECT : TYNDALL
DATE : Nov 1997
LOGGED BY : A.L.E

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
261								
262								
263								
264						Ditto		
265							Eo3	SILT / VOFM P--
266								
267								
268								
269								
270						268.8 -> 271.8m - Dacitically dominant unit with qtz veining subparallel + oblique to C.A - clots of chlorite in qtz common.	Ecv	VOFM Q--6
271			qtz cH					
272								
273						271.8 -> 282.69		
274						Andesitic fels phyric unit with 6xx textures + dacitic interbedding from ≥ 270m - unit ends with dacitic vole.		
275								
276								
277							Ecv	VAFM / VOFB
278								
279								
280								



REMARKS

417060

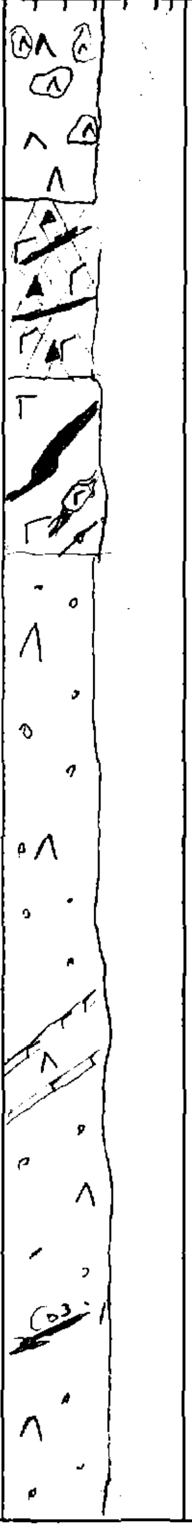
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 15 OF 23

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	NOV 1997
LOGGED BY :	A.L.E

— 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.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
281						Ditto.	Ecv	VAFB	
282									
283						282-69 -> 285m	Ecv	FALT	Q--5
284						Broken faulted dacitic based + qtz veined unit - bx matrix chlorite/qtz			
285							Ecv	VDFC-M	
286			qtz. vning						
287						285.0 -> 287.15			
288						Complex dacitic zone x cut by chlorite/qtz veins with rare clasts of dacite (rounded augen like) present with foliation wrapping around it in the augen like fashion - minor py in clast.	Ecv	VAFM / VDFM	C--2
289									
290									
291									
292									
293									
294						287.15 -> 304.35m			
295						Well foliated Andesitic volcanic. sandstone? dacitic (minor) units between 294-295m.			
296									
297						- CO3 vns between 297-297.5 & @ 301.56m			
298			CO3 vns.						
299						-296.5m - Aspentic contact? with Ashy bx unit.			
300									

REMARKS

417061

RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 16 **OF** 23

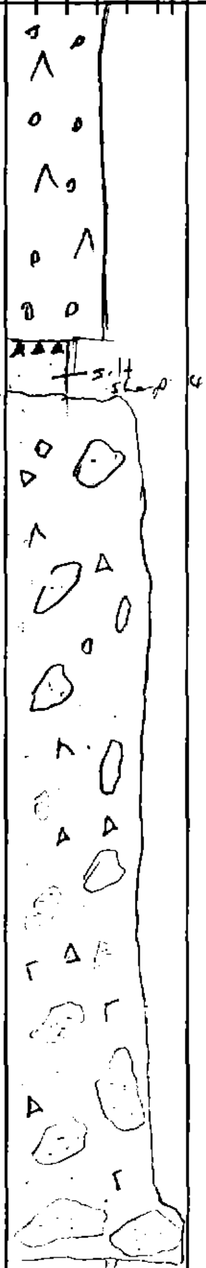
——	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿∿	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

PROJECT : BASIN LAKE

PROSPECT : TYNDAL

DATE : NOV 1997

LOGGED BY : A.C.E



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY ROCK		ALTERATION
301									
302									
303									
304									
305			6xx				ECV	VD-AFB	OQS4
306						304·35 → 316·85m			
307						chaotic Andesitic/dacitic			
308						Volcaniclastic bxx.			
309						- alternating wispy dacitic / andesitic bands.			
310						qtz veining common but not massive - in micro faults + displacements			
311									
312									
313									
314									
315						- large clasts of black siltstone as lithoclasts in sst.			
316									
317						316·85 → 331·2m	ECV	VDFM	O-S4
318						wispy foliated chloritic - dacitic reworked fspr phyric sandstone			
319						fspr ± qtz clasts often reworked + rotated with foliation wrapping			
320						around them			

REMARKS

417062

RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 17 OF 23

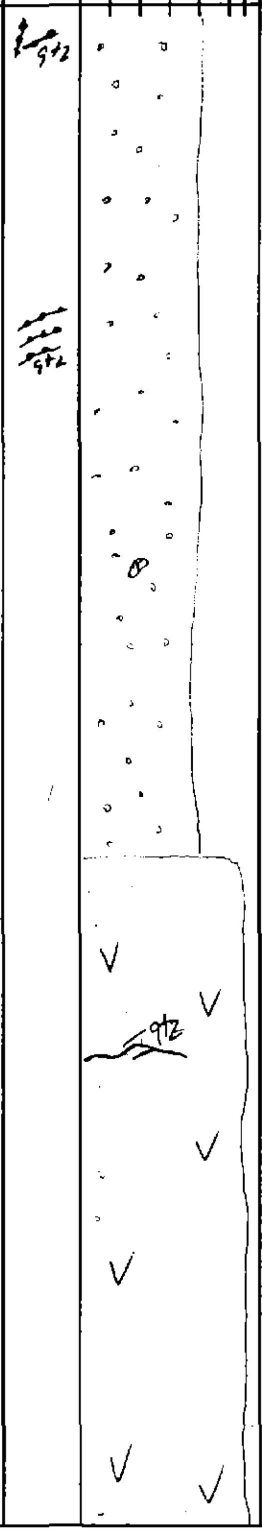
Bedding	▒ Disseminated
Cleavage	■ Massive
Foliation	▨ Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
▩ Broken core	

PROJECT : BASIN LAKE

PROSPECT : TYNDALL

DATE : NOV 1997

LOGGED BY : A.L.E



HOLE DEPTH	SAMPLE No PREFIX T41	ASSAY RESULTS	STRUCT.	ALTERATION SIL.	SER.	PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
321			qtz				Ditto - qtz veining common			
322										
323										
324										
325			qtz							
326								Ecv	VDFM	0054
327										
328										
329										
330										
331										
332							331·2 → 342·0 → Basaltic dyke? qtz vein @ 333·75m			
333										
334							331·2 → 342·0			
335	800						- Basaltic/Andesitic dyke? with minor qtz veining, trace pyrite @ fracture surfaces			
336								Ecv	IB	0C53
337										
338										
339										
340										

REMARKS

417063

RGC EXPLORATION PTY LTD

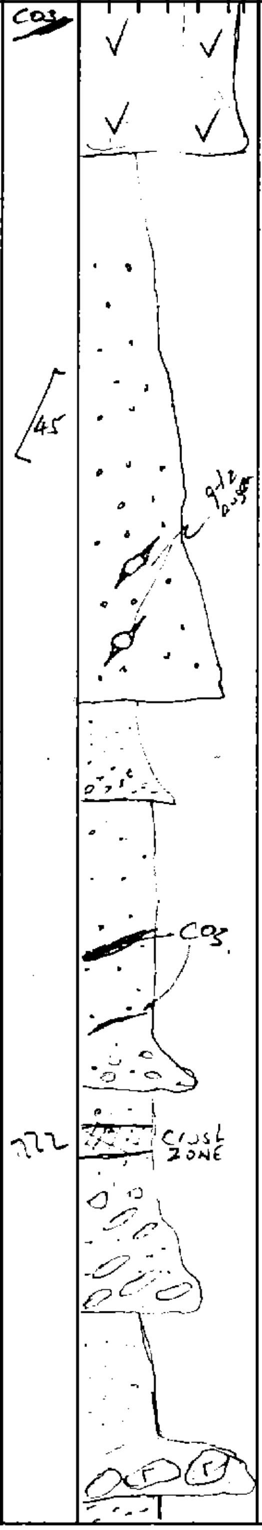
DRILL HOLE No TYN016

SHEET 18 **OF** 23

— Bedding	▨ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
~ Fault, Shear	↘ Narrow vein
▵ Breccia	* Visible gold
▩ Broken core	

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	Nov 1997
LOGGED BY :	A.C.E

HOLE DEPTH | **SAMPLE No** PREFIX 1431 | **ASSAY RESULTS** | **STRUCT.** | **GRAPHIC LOG** $\frac{1}{16}$ $\frac{1}{4}$ 1 4 16 32 | **ALTERATION** SIL. SER. PY. | **GEOLOGY NOTES** | **SUMMARY** ROCK ALTERATION



HOLE DEPTH	SAMPLE No	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
341	95	Ditto - CO3 vn @ 340.5m			
342					
343		342.0 -> 349.2			
344		Fspar Phyric foliated clastic (wgts) sandstone. xtals dark in color - silicified? often a reddish hor stained color			
345–348		large rounded qtz augen to 1cm present @ 348m foliation clearly wraps around them i.e. pre foliation.	EcV	VDFM	S--2
349		349.2 -> 351.35			
350		Ditto no qtz augen	EcV	VDFM	S--2
351–354		351.35 355.50 Well foliated dacitic c.g -> f.g sst - many CO3 veining	EcV	VDFC-M	C--3
355				FLT	
355–357		355.50 -> 357.2m. new flow with a box of dacitic lava clasts. at frac ly grading into a sst top. again well foliated - clasts well rounded @ times.	EcV	VDFC-M	S--2
358–359		357.2 -> 359.7m Ditto - Clasts to 5cm.	EcV	VDFC-M	S--2
360					

REMARKS

417064

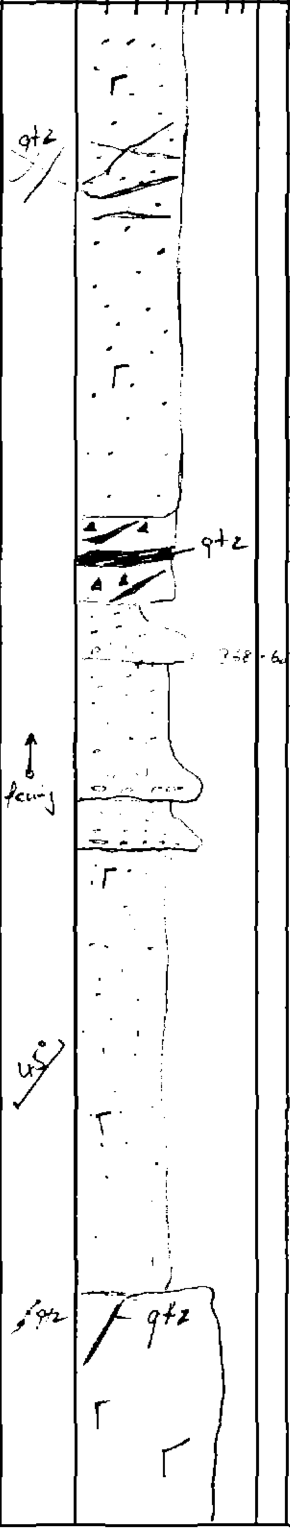
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 19 OF 23

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	╲	Narrow vein
△▽	Breccia	*	Visible gold
▩	Broken core		

PROJECT	: BASIN LAKE
PROSPECT	: TYNDALL
DATE	: Nov 1997
LOGGED BY	: A.L.E



HOLE DEPTH	SAMPLE No PREFIX 1431	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY ROCK	ALTERATION
361						359.7 → - 366.75 well foliated altern. mostly clastic? sst. - qtz vein to 1cm thick common		
362			qtz					
363								
364							Ecv VDFM	QS-4
365								
366								
367				qtz		366.75 → 367.83m brecciated + qtz filled clastic zone - qtz with clots of chlorite	Ecv VDFB	Q-5
368				368.6				
369	96					367.9 → 371.10m series of graded clastic beds - foliated	Ecv VDFM-F	S-2
370			facing					
371								
372						371.10 → 376.9m well foliated clastic sst. mostly chlorite alt		
373								
374			45°					
375							Ecv VDFM	S-2
376								
377			qtz	qtz				
378						376.9 → 383.76m clastic intensive bx qtz veined zone - small crush zones 377→378m - well foliated some massive qtz vns from 381.8		
379							Ecv VDFB	Q-4
380								

REMARKS

417065

RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 20 **OF** 23

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	NOV 1997
LOGGED BY :	A.L.E

——	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△▽	Breccia	*	Visible gold
▩	Broken core		

HOLE DEPTH	SAMPLE No PREFIX 1431	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
381						- Albitisation evident.			
382			qtz in			- unit darker than that down hole up cHC			
383									
384									
385						383.76 -> 398.10m			
386						Amygdaloidal intrusive unit - well stockworked with CO3/qtz veins -amygdales now CO3 altered - probably dacitic composition ?			
387									
388	97								
389									
390			qtz/CO3 stockwork						
391									
392							EcV	IBF	QCA5
393									
394									
395									
396									
397									
398						398.10 -> 400.10m			
399						well foliated sstone qtz vn (3cm) @ 398.57m	EcV	VDFM	QS_4
400									

REMARKS

417060

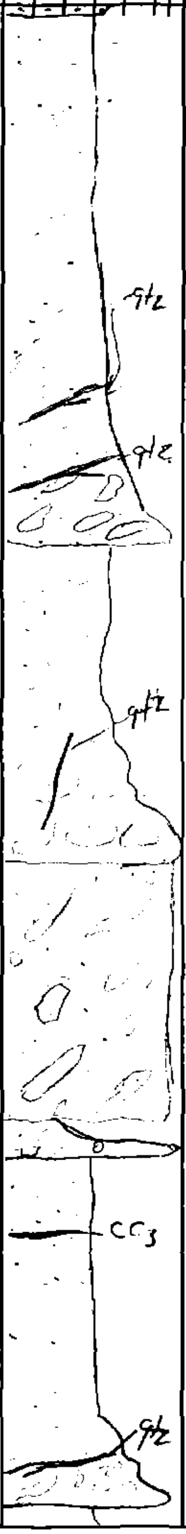
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 21 OF 23

———	Bedding
⊔	Cleavage
▲	Foliation
〰	Fault, Shear
▨	Breccia
▩	Broken core
░	Disseminated
■	Massive
▧	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	NOV 1997
LOGGED BY :	A.L.E



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY ROCK	SUMMARY ALTERATION
401						400.10 → 407.05	Ecv VDFC-M	QS-5
402						foliated wispy mainly clastic finer grained volcaniclastic		
403						chlorite wisps common - Base clasts to 2cm:		
404						- qtz vein @ 406.6m 405.6 -		
405								
406								
407								
408						407.05 → 411.34	Ecv VDFC-M	QS-4
409						Both - mass flow unit.		
410			↑					
411								
412						411.34 → 414.63	Ecv VDFC	
413						other coarse grained foliated clastic unit - clasts strike stretched with prevailing foliation.		
414						no real sorting or grading in bxx?		
415						414.63 → 415.06m - small mass flow unit.	Varh	
416						4		
417						414.63 → 419.9m	Ecv VDFM-C	QCS6
418						Both - some qtz/CO3 vns		
419								
420								

REMARKS

417067

RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 22 **OF** 23

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

PROJECT :	BASIN LAKE
PROSPECT :	TYNDALL
DATE :	NOV 1997
LOGGED BY :	A.C.E

HOLE DEPTH | **SAMPLE No PREFIX** | **ASSAY RESULTS** | **STRUCT.** | **GRAPHIC LOG** 1/16 1/4 1 4 16 32 | **ALTERATION** SIL. SER. PY. | **GEOLOGY NOTES** | **SUMMARY** ROCK ALTERATION

HOLE DEPTH	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	419.9 → 436.13m.			
421				
422	Mass flow (dacitic) unit with qtz vns to 1cm thick + slickenside common - leucoxene spotting present			
423				
424				
425				
426				
427				
428				
429		Ecv	VDFC-M	QS-5
430				
431				
432				
433				
434				
435				
436				
437	436.13 → 438.13 - fsp porphyritic dacitic lava. Albite altered zone	Ecv	LDE	A-4
438				
439	438.13 → 440.70m. darker dacitic lava? = less altered	Ecv	LDF	QC-71
440				

REMARKS

417068

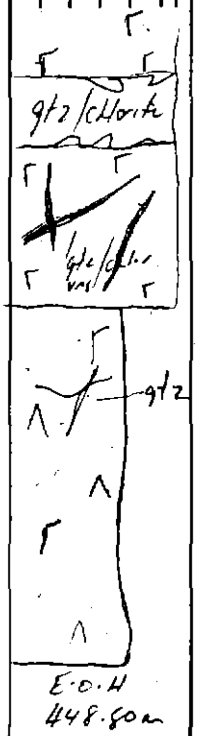
RGC EXPLORATION PTY LTD

DRILL HOLE No TYN016

SHEET 23 OF 23

—— Bedding
⊔ Cleavage
▲ Foliation
〰 Fault, Shear
▵▵ Breccia
▩ Broken core
▨ Disseminated
■ Massive
▨ Pervasive
↘ Narrow vein
* Visible gold

PROJECT	: BASIN LAKE
PROSPECT	: TYNDALL
DATE	: NOV 1997
LOGGED BY :	A.C.E

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
						qtz veins to 1m of core			
441									
442						443.7 → 444.14m		QTZ	
443			(			Dacitic levels? + silicification / qtz veining & Albitisation	Ecv	LDFB	QO-6
444									
445									
446						444.14 – 448.8 E.O.H.			
447						Alternating units merging into one another of fg foliated dacite/andesite association.	Ecv	LAF/LDF	QC-4
448						- Some minor qtz vns.			
449									
450									

REMARKS

MAGNETIC SUSCEPTIBILITY

PROSPECT: TYNDALL

HOLE: TYN016

DATE: 11/11/1997 - 26/11/1997

OPERATOR: SCOTT HEFFERNAN, DOUG GREEN

MAGNETIC SUSCEPTIBILITY LOG

RGC Exploration Pty Ltd

Prospect: Tyndall
Date: 11/11/97
Hole: TYN16 Sheet 1 of 2
Operator Scott Heffernan
Instrument: Gms2
Units (SI or CGS): SI

Sample # or Depth	Core Size	Sensor Location	Reading	Reading Rar		Correction Factor	Corrected Reading
				Min	Max		
Tray 1 floater 2M	PQ	2	1100	700	1200		
2-10	PQ	2	0	0	0		
11	PQ	2	0	0	2204		
12-18	PQ	2	0	0	0		
19	PQ	2	0	0	400		
20	PQ	2	0	0	0		
21-136	HQ	2	0	0	0		
137-232	NQ	2	0	0	0		
233-274	NQ	2	0	0	0		
275	NQ	2	11				
276-278	NQ	2	0				
279	NQ	2	6				
280-232	NQ	2	0				
333	NQ	2	15				
334	NQ	2	0				
335	NQ	2	15				
336	NQ	2	12				
337	NQ	2	21				
338-348	NQ	2	0				
349-392	NQ	2	0				
393	NQ	2	80	406	42		
394	NQ	2	21				
395	NQ	2	55				

SENSOR LOCATION refers to how the sensor is oriented with respect to the rock sample or core.

1. = Flush (sensor placed flat against cut core, or rock face)
2. = Core perpendicular (sensor placed at right angles to the axis of a core sample)
3. = Core parallel (sensor placed along the axis of a core sample)
4. = Irregular (sensor placed on broken rock chips or irregular shaped rock specimen)

READING RANGE should be filled in when susceptibility measurements vary for a particular rock specimen or sample interval.

CORRECTION FACTOR and CORRECTED READING need not be filled in until computer data entry. These values will depend on the CORE SIZE, SENSOR LOCATION, and INSTRUMENT.

MAGNETIC SUSCEPTIBILITY LOG

RGC Exploration Pty Ltd

Prospect: Tyndall
Date: 26/11/97
Hole: TYN16 Sheet 2 of 2
Operator Scott Heffernan & Doug Green
Instrument: Gms2
Units (SI or CGS): SI

Sample # or Depth	Core Size	Sensor Location	Reading	Reading Range		Correction Factor	Corrected Reading
				Min	Max		
396	NQ	2	120	54	380		
397	NQ	2	300	78	907		
398	NQ	2	27				
399-448	NQ	2	0				

SENSOR LOCATION refers to how the sensor is oriented with respect to the rock sample or core.

1. = Flush (sensor placed flat against cut core, or rock face)
2. = Core perpendicular (sensor placed at right angles to the axis of a core sample)
3. = Core parallel (sensor placed along the axis of a core sample)
4. = Irregular (sensor placed on broken rock chips or irregular shaped rock specimen)

READING RANGE should be filled in when susceptibility measurements vary for a particular rock specimen or sample interval.

CORRECTION FACTOR and CORRECTED READING need not be filled in until computer data entry. These values will depend on the CORE SIZE, SENSOR LOCATION, and INSTRUMENT.

417072

APPENDIX 3

TYN011 and TYN015 Lithogeochemistry

SAMPLE	HOLE	DEPTHF	DEPTHT	NORTH	EAST	RL	UNIT	TIO2	FEO	NA2O	K2O	P2O5	CR	V
41711	TYN006	346.09	346.25	NA	NA	NA	Andesite	0.42	6.34	3.29	2.84	2.25	106	162
41712	TYN006	354.21	354.38	NA	NA	NA	Andesite	0.46	6.56	6.21	1.39	0.26	84.1	192
41713	TYN007	333.85	333.97	NA	NA	NA	Andesite	0.43	6.94	4.97	3.36	0.31	26.9	187
41714	TYN008	144.4	144.89	NA	NA	NA	Andesite	0.51	7.55	7.13	-0.24	0.55	59.8	213
41715	TYN008	157.17	157.29	NA	NA	NA	Andesite	0.47	7.21	7.23	-0.24	0.43	112	180
41716	TYN008	175.8	175.92	NA	NA	NA	Andesite	0.37	5.5	4.96	1.41	0.36	100	137
41717	TYN008	204.32	204.39	NA	NA	NA	Andesite	0.40	6.7	7.28	1.7	0.39	106	160
41729	TYN009	81.08	81.25	NA	NA	NA	CVC-Dacite	NA	7.43	6.43	1.36	NA	12.2	NA
41730	TYN009	113.4	113.54	NA	NA	NA	CVC-Dacite	NA	9.57	4.69	1.58	NA	19.2	NA
41731	TYN009	135.72	135.89	NA	NA	NA	CVC-Dacite	NA	6.47	3.96	2.37	NA	42.6	NA
41732	TYN009	339.79	339.95	NA	NA	NA	CVC-Dacite	NA	6.34	3.11	2.94	NA	58.6	NA
41733	BLD98-3	241.38	241.53	NA	NA	NA	CVC-Dacite	NA	11.61	2.88	1.04	NA	6.1	NA
41734	BLD98-3	258.17	258.3	NA	NA	NA	CVC-Dacite	NA	9.48	7.36	-0.24	NA	-5	NA
41735	BLD98-3	289.88	290.02	NA	NA	NA	CVC-Dacite	NA	6.69	3.75	1.12	NA	55.8	NA
41736	TYN007	87.92	88	NA	NA	NA	TYN - Dacite	NA	6.84	2.93	2.27	NA	23	NA
37617	TYN011	369	370	5353348.88	381131.55	235.86	CVC-Qtz Porph	0.36	4.67	0.437	2.71	NA	63.9	146
37628	TYN011	379	380	5353349.33	381137.05	227.53	CVC-Qtz Porph	0.34	4.02	0.382	2.66	NA	77.9	142
37638	TYN011	389	390	5353349.85	381142.78	219.35	CVC-Qtz Porph	0.41	7.32	0.939	2.16	NA	152	128
37649	TYN011	399	400	5353350.38	381148.66	211.27	CVC-Qtz Porph	0.43	5.39	0.471	2.2	NA	66	177
37659	TYN011	409	410	5353350.83	381154.59	203.23	CVC-Qtz Porph	0.35	6.58	0.45	1.7	NA	169	116
37670	TYN011	419	420	5353351.19	381160.57	195.23	CVC-Qtz Porph	0.33	4.09	0.289	2.66	NA	118	107
37681	TYN011	429	430	5353351.49	381166.6	187.26	CVC-Qtz Porph	0.31	5.06	0.585	2.45	NA	159	104
37691	TYN011	439	440	5353351.76	381172.68	179.32	CVC-Qtz Porph	0.39	4.81	1.31	1.76	NA	88.9	157
37702	TYN011	449	450	5353351.99	381178.81	171.42	CVC-Qtz Porph	0.40	4.34	2.71	1.56	NA	38.2	157
37712	TYN011	459	460	5353352.18	381184.98	163.56	CVC-Dacite	0.29	2.5	0.636	1.44	NA	218	63
37925	TYN011	289	290	5353347.22	381097.91	308.23	CVC-Qtz Porph	0.33	4.99	2.65	1.24	NA	135	155
37946	TYN011	309	310	5353347.35	381105.19	289.6	CVC-Qtz Porph	0.37	4.9	1.8	2.53	NA	54.3	166
37956	TYN011	319	320	5353347.48	381108.93	280.33	CVC-Qtz Porph	0.37	5.88	0.542	3.68	NA	87.8	154
37967	TYN011	329	330	5353347.66	381112.76	271.09	CVC-Qtz Porph	0.31	4.22	0.927	3.06	NA	95.9	108
37977	TYN011	339	340	5353347.88	381116.83	261.96	CVC-Qtz Porph	0.38	3.96	2.78	1.78	NA	50.8	147
37988	TYN011	349	350	5353348.16	381121.34	253.04	CVC-Qtz Porph	0.38	4.36	1.95	2.18	NA	92.2	140
37998	TYN011	359	360	5353348.49	381126.28	244.35	CVC-Qtz Porph	0.35	5.03	1.46	1.93	NA	61	132
43409	TYN015	347	348	5352897.25	381007.11	271.04	RA-target horizo	0.34	5.06	1.83	1.3	NA	233	166
43422	TYN015	359	360	5352896.3	381013.38	260.85	RA-target horizo	0.42	3.85	2.22	1.66	NA	220	179
43431	TYN015	368	369	5352895.59	381018.1	253.22	RA-target horizo	0.52	5.73	3.79	-0.2	NA	305	189
43443	TYN015	379	380	5352894.58	381023.88	243.92	RA-target horizo	0.44	4.74	3.31	-0.2	NA	264	172
43464	TYN015	399	400	5352892.42	381034.4	227.04	RA-target horizo	0.48	6.27	0.865	1.95	NA	217	182
43474	TYN015	409	410	5352891.3	381039.67	218.62	CVC-Dacite	0.33	4.44	2.16	2.73	NA	184	142
43485	TYN015	419	420	5352890.18	381044.95	210.2	RA-target horizo	0.44	4.95	2.54	-0.2	NA	256	198
43495	TYN015	429	430	5352889.05	381050.25	201.79	RA-target horizo	0.37	5.86	2.2	-0.2	NA	195	147
43506	TYN015	439	440	5352887.92	381055.57	193.41	CVC-Dacite	0.36	4.77	2.15	1.86	NA	35.2	148

2313LITH

SAMPLE	HOLE	DEPTHF	DEPTHT	NORTH	EAST	RL	UNIT	TIO2	FEO	NA2O	K2O	P2O5	CR	V
43516	TYN015	449	450	5352886.78	381060.93	185.04	CVC-Dacite	0.48	6.97	3.81	0.54	NA	40.5	183
43528	TYN015	459.8	461	5352885.51	381066.8	175.94	\RA-target horizo	0.43	7.76	1.21	2.51	NA	263	202
43537	TYN015	469	470	5352884.42	381071.74	168.38	CVC-Qtz Porph	0.31	4.11	0.22	3.41	NA	124	96
43547	TYN015	479	480	5352883.17	381077.21	160.1	CVC-Qtz Porph	0.33	3.61	1.55	2.18	NA	53.7	108
43558	TYN015	489	490	5352881.92	381082.72	151.85	CVC-Qtz Porph	0.28	3.21	2.14	1.8	NA	20.3	84
43568	TYN015	499	500	5352880.69	381088.27	143.63	CVC-Qtz Porph	0.28	3.5	1.28	2.17	NA	115	85
43579	TYN015	509	510	5352879.48	381093.86	135.42	CVC-Qtz Porph	0.41	3.79	2.08	2.42	NA	62.8	122
43589	TYN015	519	520	5352878.31	381099.49	127.24	CVC-Qtz Porph	0.38	3.67	1.53	2.49	NA	66.1	126
43599	TYN015	529	530	5352877.21	381105.15	119.07	CVC-Qtz Porph	0.30	3.92	1.68	2.21	NA	22.2	108
43610	TYN015	539	540	5352876.17	381110.85	110.92	CVC-Qtz Porph	0.33	4.01	0.375	3.22	NA	103	114
43620	TYN015	549	550	5352875.11	381116.58	102.79	CVC-Qtz Porph	0.32	3.54	0.79	2.13	NA	78.6	96
43631	TYN015	559	560	5352873.94	381122.34	94.7	CVC-Qtz Porph	0.38	4.18	1.97	1.11	NA	37.6	136
43641	TYN015	569	570	5352872.67	381128.12	86.64	CVC-Qtz Porph	0.29	3.69	0.446	2.29	NA	71.6	94
43652	TYN015	579	580	5352871.34	381133.93	78.61	CVC-Dacite	0.44	2.89	0.541	1.38	NA	176	58
43662	TYN015	589	590	5352870.05	381139.77	70.6	CVC-Dacite	0.40	4.41	0.473	2.26	NA	118	88
43672	TYN015	599	600	5352868.78	381145.64	62.6	CVC-Dacite	0.77	4.99	1.22	2.34	NA	18.9	217
43679	TYN015	605	606	5352868.03	381149.18	57.81	CVC-Dacite	0.40	3.11	0.586	2.7	NA	52.2	59
41795	TYN016	100.35	100.45	NA	NA	NA	LAFB	NA	NA	NA	NA	NA	NA	NA
41796	TYN016	127.9	128.05	NA	NA	NA	LAF	NA	NA	NA	NA	NA	NA	NA
41797	TYN016	178.05	178.2	NA	NA	NA	LAF	NA	NA	NA	NA	NA	NA	NA
41798	TYN016	190.24	190.42	NA	NA	NA	LAFB	NA	NA	NA	NA	NA	NA	NA
41799	TYN016	206.2	206.35	NA	NA	NA	LAF	NA	NA	NA	NA	NA	NA	NA
41800	TYN016	334.9	335.05	NA	NA	NA	IB	NA	NA	NA	NA	NA	NA	NA
43195	TYN016	341.2	341.4	NA	NA	NA	IB	NA	NA	NA	NA	NA	NA	NA
43196	TYN016	369.25	369.45	NA	NA	NA	VDFM	NA	NA	NA	NA	NA	NA	NA
43197	TYN016	388.95	389.1	NA	NA	NA	IDF	NA	NA	NA	NA	NA	NA	NA
							Units	%	%	%	%	%	ppm	ppm
							Detection	100 ppm	0.026	0.013	0.24	0.011	5	5
							Method	X401	GN801	GN801	GN801	X401	GN801	X401
							Laboratory	Analabs	Becquerel	Becquerel	Becquerel	Analabs	Becquerel	Analabs

SAMPLE	SC	ZR	NB	Y	RB	BA	LA	CE	SM	EU	YB	LU	AG1	AG2	AS	AU1	AU2
41711	26.4	135	3	24	-20	960	53.8	98.2	6.47	1.42	2.05	0.33	NA	-5	8.44	NA	-5
41712	27.8	139	5	22	25	399	63.3	104	7.09	1.59	2.36	0.32	NA	-5	16.8	NA	-5
41713	26	156	6	23	105	7830	57	108	7.13	1.42	1.9	0.28	NA	-5	10.9	NA	-5
41714	30.9	200	9	31	-20	895	126	220	14.7	3.06	2.38	0.39	NA	-5	12.9	NA	-5
41715	27.6	170	6	19	-20	320	101	181	11.4	1.92	1.84	0.26	NA	-5	8.55	NA	-5
41716	21.4	159	5	18	23.7	764	76.9	143	9.59	1.77	1.87	0.28	NA	-5	3.64	NA	-5
41717	23.5	169	7	25	52.3	726	68.6	133	10.2	2.23	2.23	0.29	NA	-5	10	NA	-5
41729	27.1	NA	NA	NA	-20	473	48.4	96	9.04	2.2	3.15	0.48	-2	NA	27.1	NA	-5
41730	33.3	NA	NA	NA	67.3	1280	38.5	82.6	7.83	1.66	3.03	0.46	-2	NA	9.45	NA	-5
41731	23.9	NA	NA	NA	76.3	479	44.5	88.7	8.51	1.37	3.03	0.48	-2	NA	4.26	NA	-5
41732	21	NA	NA	NA	78.1	1140	48.1	92.8	6.88	1.54	2.43	0.34	-2	NA	3.24	NA	-5
41733	27.9	NA	NA	NA	63.6	442	30.7	59.7	5.81	1.11	2.32	0.32	-2	-5	2.53	NA	-5
41734	28.6	NA	NA	NA	-20	198	43.3	77.8	8.81	1.91	3.41	0.5	-2	-5	3.78	NA	-5
41735	27.9	NA	NA	NA	67.3	296	39.5	70.8	6.1	1.41	2.14	0.29	-2	-5	1.98	NA	-5
41736	32.6	NA	NA	NA	82.6	601	38.5	74.3	7.43	1.58	2.39	0.33	-2	-5	2.24	NA	-5
37617	19	NA	NA	NA	96.7	941	65.4	129	6.88	1.25	2.29	0.32	-1	-5	40	-0.008	7.8
37628	17.6	NA	NA	NA	106	1360	64.5	129	6.95	1.66	2.25	0.32	-1	-5	57.4	0.018	19.7
37638	8.73	NA	NA	NA	77.5	995	55.8	109	5.78	1.09	0.89	-0.2	-1	-5	68.5	0.038	53.6
37649	21.8	NA	NA	NA	94.5	1860	71	140	8	1.83	2.51	0.34	-1	-5	36.8	0.013	14.8
37659	14	NA	NA	NA	67.2	1590	85.1	166	8.69	1.82	2.34	0.34	-1	-5	18.1	0.024	25
37670	13.3	NA	NA	NA	90.9	2060	80.8	159	8.05	1.58	2.35	0.32	-1	-5	20	0.008	12.9
37681	14.8	NA	NA	NA	80.6	1510	86.5	177	9.52	1.92	3.11	0.4	-1	-5	33.5	0.03	28.2
37691	21.9	NA	NA	NA	55.2	1390	63.2	130	7.55	1.78	2.28	0.33	-1	-5	12	0.009	-5
37702	20.9	NA	NA	NA	86.8	916	67.6	134	7.51	1.52	2.17	0.29	-1	-5	5.82	-0.008	-5
37712	14	NA	NA	NA	59.9	726	37.3	82.5	6.74	1.58	3.63	0.52	-1	-5	21.5	-0.008	-5
37925	20.9	NA	NA	NA	51.5	742	73	153	8.86	1.47	2.11	0.26	-2	-5	22	-0.008	-5
37946	18.2	NA	NA	NA	130	642	52.8	108	6.23	1.52	2.42	0.34	-2	-5	16.4	-0.008	-5
37956	18.4	NA	NA	NA	156	1310	67.5	126	6.82	1.75	2.57	0.37	-2	-5	41.9	-0.008	12.2
37967	14.3	NA	NA	NA	123	866	67.1	136	7.25	1.25	2.62	0.33	-2	-5	64.4	-0.008	-5
37977	21	NA	NA	NA	99	616	66	133	7.42	1.58	2.4	0.31	-2	-5	43	-0.008	-5
37988	18.8	NA	NA	NA	104	643	65.9	130	7.13	1.52	2.04	0.26	-2	-5	32.4	-0.008	-5
37998	18.6	NA	NA	NA	81.3	632	61.3	122	7.24	1.66	1.9	0.27	-2	-5	31.9	-0.008	-5
43409	26.8	NA	NA	NA	34.7	666	107	217	12.8	3.35	2.16	0.3	-2	-5	20.7	-0.008	-5
43422	29	NA	NA	NA	68	1255	120	244	15.1	2.89	2.04	0.28	-2	-5	17.4	-0.008	-5
43431	37.1	NA	NA	NA	32.7	704	138	291	18.5	3.6	2.45	0.3	-2	-5	37.3	-0.008	-5
43443	32.9	NA	NA	NA	-20	746	125	264	16.5	3.15	2.12	0.31	-2	-5	47.5	-0.008	-5
43464	31.4	NA	NA	NA	84	1290	124	256	16	3.44	2.26	0.33	-2	-5	14.9	-0.008	-5
43474	22.8	NA	NA	NA	113	1325	73.6	154	9.33	1.44	2.08	0.31	-2	-5	10.6	-0.008	-5
43485	31.9	NA	NA	NA	-20	1130	127	261	16.1	3.36	2.36	0.31	-2	-5	19.6	-0.008	-5
43495	29.4	NA	NA	NA	-20	206	112	232	14.6	3.63	2.1	0.26	-2	-5	19.5	-0.008	-5
43506	24.8	NA	NA	NA	78.9	424	39.1	82.8	5.8	1.17	2.5	0.33	-2	-5	3.91	-0.008	-5

SAMPLE	SC	ZR	NB	Y	RB	BA	LA	CE	SM	EU	YB	LU	AG1	AG2	AS	AU1	AU2
43516	26.8	NA	NA	NA	37.8	718	48	101	6.53	1.34	2.54	0.34	-2	-5	47.5	-0.008	-5
43528	32.3	NA	NA	NA	111	2035	132	272	16.8	3.52	2.19	0.29	-2	-5	34.9	-0.008	-5
43537	14.6	NA	NA	NA	120	1365	78.1	150	7.69	1.3	2.34	0.36	-2	-5	32.8	-0.008	-5
43547	14.7	NA	NA	NA	94.1	1500	79.9	156	8.29	1.99	2.19	0.33	-2	-5	2.92	-0.008	-5
43558	12.3	NA	NA	NA	91.2	861	74.4	144	7.29	1.39	2.31	0.3	-2	-5	2.29	-0.008	-5
43568	12.2	NA	NA	NA	92.3	1105	73.6	144	7.3	1.32	1.94	0.25	-2	-5	1.78	-0.008	-5
43579	15.8	NA	NA	NA	101	600	96.2	190	10.1	1.61	2.23	0.33	-2	-5	2.71	-0.008	-5
43589	14.5	NA	NA	NA	99.4	806	82.1	166	8.78	1.57	2.2	0.32	-2	-5	6.15	-0.008	-5
43599	15.1	NA	NA	NA	77	624	65.5	129	6.76	1.22	2.11	0.32	-2	-5	6.7	-0.008	-5
43610	15	NA	NA	NA	94.1	834	89.2	174	8.86	1.96	2.33	0.32	-2	-5	15.3	-0.008	-5
43620	12.7	NA	NA	NA	61.1	948	78.4	156	7.92	1.92	2.18	0.32	-2	-5	16.5	-0.008	-5
43631	18.8	NA	NA	NA	51.6	1380	64.1	127	7.06	1.48	2.1	0.25	-2	-5	3.54	-0.008	-5
43641	12.3	NA	NA	NA	71.9	1230	77.7	154	7.66	1.28	2.06	0.32	-2	-5	11.6	-0.008	-5
43652	6.72	NA	NA	NA	48.1	444	57.2	126	8.52	1.72	2.85	0.41	-2	-5	6.67	-0.008	-5
43662	16.6	NA	NA	NA	91.1	1005	59.6	127	8.59	1.76	3.07	0.4	-2	-5	15.5	-0.008	13.2
43672	26.5	NA	NA	NA	103	3965	45.8	104	7.93	1.39	3.4	0.44	-2	-5	4	-0.008	-5
43679	12.4	NA	NA	NA	124	886	48.8	113	8.35	1.4	3.71	0.53	-2	-5	2.38	-0.008	-5
41795	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41796	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41797	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41798	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41799	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43195	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43196	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43197	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	0.1	5	3	3	20	100	0.5	2	0.2	0.5	0.2	0.2	2	5	1	0.008	5
	GN801	X401	X401	X401	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GA101	GN801	GN801	GG309	GN801
	Becquerel	Analabs	Analabs	Analabs	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Analabs	Becquerel	Becquerel	Analabs	Becquerel

SAMPLE	BR	CO	CS	CU	HF	IR	MO	PB	SB	SE	SN	TA	TE	TH	U	W	ZN
41711	-2	23.6	1.02	68	3.09	-20	-5	-5	1.57	-5	-500	1.85	NA	17.5	2.63	-2	150
41712	-2	25.4	-1	27	3.16	-20	-5	-5	2.6	-5	-500	3.73	NA	17.5	-2	-2	186
41713	-2	27.1	9.32	8	3.38	-20	-5	-5	5.59	-5	-500	-1	NA	17.8	-2	-2	237
41714	-2	36.7	2.2	12	4.1	-20	-5	-5	2.16	-5	-500	3	NA	30.9	-2	-2	382
41715	-2	29.4	2.03	14	4.37	-20	-5	7	1.87	-5	-500	-1	NA	24.4	-2	-2	213
41716	-2	26.9	1.71	46	3.77	-20	-5	12	1.55	-5	-500	1.55	NA	26.2	2.72	-2	164
41717	-2	21.1	-1	11	3.9	-20	-5	-5	1.79	-5	-500	-1	NA	27.8	-2	-2	200
41729	-2	19.4	2.82	111	4.33	-20	-5	9	0.74	NA	-500	-1	NA	11.7	-2	-2	297
41730	-2	33.4	8.09	85	3.36	-20	-5	18	0.93	NA	-500	-1	NA	10.2	-2	-2	260
41731	-2	21.5	5.25	145	3.45	-20	-5	9	1.33	NA	-500	2.28	NA	10.9	2.14	-2	188
41732	-2	25.4	5.82	50	4.13	-20	-5	19	1.06	NA	-500	-1	NA	16.5	2.38	-2	144
41733	-2	37.4	2.72	217	2.78	-20	-5	8	3.78	NA	NA	1.86	NA	8.86	-2	-2	467
41734	-2	33.5	-1	56	4.63	-20	-5	48	2.7	NA	NA	1.97	NA	12.4	-2	-2	413
41735	-2	25.9	6.28	54	3.48	-20	-5	15	2.1	NA	NA	-1	NA	10.7	-2	-2	167
41736	-2	30.2	3.69	83	4.08	-20	-5	16	1.68	NA	NA	1.4	NA	11.5	-2	-2	217
37617	-2	18.7	6.74	53	3.17	-20	-10	104	2.09	-5	NA	-1	-5	22.9	5.5	-2	652
37628	-2	19.3	5.62	57	3.04	-20	-5	331	1.6	-5	NA	-1	-5	23.1	4.63	-2	903
37638	-2	35.3	6.8	181	3.04	-20	-5	36	3.52	-5	NA	-1	-5	15.2	4.17	-2	24
37649	-2	21.9	5.04	193	3.11	-20	-5	103	1.78	-5	NA	-1	-5	23.7	4.39	-2	403
37659	-2	20.9	4.42	98	3.31	-20	-10	6	1.02	-5	NA	-1	-5	29.6	8.89	-2	10
37670	-2	15.1	5.72	122	3.62	-20	-5	16	1.07	-5	NA	1.45	-5	29.7	6.83	-2	282
37681	-2	16.5	9.07	212	3.85	-20	-10	42	2.05	-5	NA	-1	-5	32	7.02	-2	48
37691	-2	23.2	4.91	62	2.84	-20	-5	25	1.42	-5	NA	-1	-5	20.8	4.53	-2	100
37702	-2	18.5	3.24	62	2.93	-20	-5	7	1.54	-5	NA	1.17	-5	22.8	5.81	-2	71
37712	-2	9.83	5.32	34	3.9	-20	-5	21	1.24	-5	NA	1.2	-5	13.4	3.66	-2	54
37925	-2	21.6	2.78	47	3.12	-20	-10	109	1.4	-5	NA	1.87	-5	25.1	4.45	-2	334
37946	-2	15.9	4.65	20	3.08	-20	-5	80	1.77	-5	NA	1.1	-5	19	3.56	-2	76
37956	-2	19.6	6.11	97	2.77	-20	-10	90	3.49	-5	NA	-1	-5	22.8	6.02	-2	280
37967	-2	12.2	5.21	31	3.08	-20	-5	57	1.84	-5	NA	1.79	-5	26.1	4.13	-2	551
37977	-2	20.6	2.99	55	3.35	-20	-5	83	6	-5	NA	-1	-5	22	4.51	-2	65
37988	-2	20.3	5.22	47	3.15	-20	-10	66	5.11	-5	NA	1.57	-5	22.5	3.85	-2	44
37998	-2	20.3	4.38	57	3.15	-20	-5	98	3.37	-5	NA	1.2	-5	19.9	4.09	-2	93
43409	-2	27.6	2.41	110	3.74	-20	-5	12	2.35	-5	NA	3.69	-5	30.8	5.37	-2	79
43422	-2	36	2.74	154	4.64	-20	-10	21	3.18	-5	NA	2.78	-5	36.1	8.66	-2	67
43431	-2	30.7	-1	92	5.6	-20	-10	28	3.88	-5	NA	2.18	-5	44.9	11.1	-2	66
43443	-2	31	-1	86	4.65	-20	-10	14	4.27	-5	NA	-1	-5	39.4	10	-2	72
43464	-2	23.3	2.3	60	4.52	-20	-5	9	1.39	-5	NA	1.81	-5	37.5	4.74	-2	86
43474	-2	21.1	4.9	50	4.41	-20	7.8	19	1.48	-5	NA	2.95	-5	26.8	4.4	-2	137
43485	-2	30.5	1.64	90	5.14	-20	-10	22	1.65	-5	NA	2.66	-5	37.3	9.72	-2	66
43495	-2	29.3	-1	150	4.68	-20	-10	75	2.87	-5	NA	-1	-5	35	8.78	-2	91
43506	-2	22.6	3.25	121	2.77	-20	-5	-5	0.8	-5	NA	1.18	-5	11.3	-2	-2	70

SAMPLE	BR	CO	CS	CU	HF	IR	MO	PB	SB	SE	SN	TA	TE	TH	U	W	ZN
43516	-2	28.8	2.18	55	3.7	-20	8.1	38	2.41	-5	NA	-1	-5	13.9	6.72	-2	142
43528	-2	65.5	4.85	156	5.44	-20	-15	34	3.6	-5	NA	2.2	-5	40.6	11.8	-2	86
43537	-2	16.1	5.82	49	3.39	-20	-10	79	8.01	-5	NA	1.14	-5	28.1	6.57	-2	203
43547	-2	8.77	4.81	25	3.51	-20	-5	7	1.46	-5	NA	1.19	-5	26.8	5.47	-2	124
43558	-2	11.9	5.55	18	3.28	-20	-5	62	1.87	-5	NA	2.12	-5	26.9	4.75	-2	120
43568	-2	11.1	5.35	14	2.82	-20	-5	18	2.09	-5	NA	1.18	-5	26.3	5	-2	143
43579	-2	15	5.8	38	3.77	-20	-10	11	4	-5	NA	-1	-5	31.3	7.25	-2	156
43589	-2	11.5	5.55	57	3.55	-20	-5	6	4.22	-5	NA	1.31	-5	29.1	5.74	-2	195
43599	-2	17.6	4.08	40	3.38	-20	-5	8	1.32	-5	NA	1.57	-5	23.8	5.62	-2	67
43610	-2	17.8	9.17	46	3.57	-20	-10	59	2.21	-5	NA	2.24	-5	29.1	7.04	-2	45
43620	-2	13.8	3.91	41	3.38	-20	-5	-5	1.04	-5	NA	-1	-5	28.1	6.76	-2	142
43631	-2	18	1.9	51	3.17	-20	-5	6	0.89	-5	NA	2.17	-5	22.4	4.93	-2	136
43641	-2	12	4.97	89	3.24	-20	6.3	-5	1.29	-5	NA	-1	-5	28.3	5.94	-2	105
43652	-2	5.84	5.24	10	5.83	-20	-5	6	1.4	-5	NA	1.01	-5	20.5	4.12	-2	-4
43662	-2	16.8	15.4	60	4.64	-20	-5	19	1.68	-5	NA	-1	-5	20.3	4.48	-2	87
43672	-2	24.7	7.06	108	3.99	-20	-5	17	1.9	-5	NA	2.12	-5	13.9	-2	-2	214
43679	-2	10.2	4.66	40	6.02	-20	-5	-5	1.38	-5	NA	-1	-5	19.2	3.97	-2	96
41795	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41796	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41797	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41798	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41799	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
41800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43195	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43196	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43197	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	2	1	1	4	0.5	20	5	5	0.2	5	500	1	5	0.5	2	2	4
	GN801	GN801	GN801	GA101	GN801	GN801	GN801	GA101	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GN801	GA101
	Becquerel	Becquerel	Becquerel	Analabs	Becquerel	Becquerel	Becquerel	Analabs	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Analabs

APPENDIX 4

Quartz Porphyry Lithogeochemistry

417080

2313 BASIN LAKE PORPHYRY LITHOGEOCHEMICAL SAMPLES

Sample	UNIT	HOLE	DEPTHF	DEPTHT	Au	Ag	As	Ba	Br	Ca	Ce	Co	Cr
44975	CVC	TYN009	50.45	50.6	20	-5	3	4210	-2	1.1	131	17	10
44976	CVC	TYN010	211.45	211.6	-5	-5	1	995	-2	2	118	12	9
44977	CVC	TYN012	207.65	207.8	-5	-5	2	805	-2	2.1	139	12	10
44978	TG	MX001	40.05	40.2	10	-5	2	1130	-2	-1	117	-1	-5
44979	TG	MX001	115.15	115.3	-5	-5	157	884	-2	-1	143	4	-5
44980	TG	MX002	99	99.2	-5	-5	1	1940	-2	-1	222	6	-5
44981	TG	MX002	157.95	158.15	-5	-5	-1	504	-2	2.2	51	2	-5
44982	TG	MJ001	214.35	214.5	-5	-5	-1	952	-2	-1	124	-1	7
44984	TG	MJ002	155.8	155.95	-5	-5	2	1360	-2	-1	118	-1	8
44985	TG	MJ003	473	473.2	-5	-5	1	673	-2	-1	122	-1	8
44986	TG	MS6	97.1	97.3	-5	-5	5	787	-2	1.7	110	10	8
				Units	ppb	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
				Detection	5	5	1	100	2	1	2	1	5
				Method	N701	N701	N701	N701	N701	N701	N701	N701	N701
				Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

2313 BASIN LAKE PORPHYRY LITHOGEOCHEMICAL SAMPLES

Sample	Cs	Eu	Fe	Hf	Ir	K	La	Lu	Mo	Na	Rb	Sb	Sc
44975	3	1.3	4.04	3.8	-20	3.2	70.6	0.3	-5	3.77	85	1.1	17.1
44976	7	1.1	2.76	3.1	-20	2.1	65.3	0.3	-5	1.02	95	2.1	10.8
44977	7	1.5	3.1	3.3	-20	2.8	74.9	0.3	-5	0.87	100	1.8	13.7
44978	4	1.4	1.37	6.6	-20	3.6	54.6	0.6	-5	1.66	130	0.6	7.3
44979	5	1.8	1.31	7.2	-20	3.4	66.1	0.6	-5	0.07	160	67.1	9.3
44980	3	2.4	1.84	6.9	-20	4.1	110	0.8	-5	1.36	150	0.6	7.1
44981	2	0.8	1.42	7	-20	3.5	22.9	0.7	-5	0.16	175	0.7	7.3
44982	2	1.2	1.64	6.8	-20	2.2	56.2	0.8	-5	3.27	70	0.8	12.7
44984	-1	1.5	1.09	6.4	-20	2.7	55.3	0.7	-5	3.32	45	0.6	5.8
44985	-1	1.3	0.83	6.1	-20	-0.2	57.4	0.6	-5	5.47	-20	0.5	7.8
44986	-1	1.5	3.43	5.8	-20	1.9	54	0.4	-5	4.21	45	0.4	14.4
Units	ppm	ppm	%	ppm	ppb	%	ppm	ppm	ppm	%	ppm	ppm	ppm
Detection	1	0.5	0.02	0.5	20	0.2	0.5	0.2	5	0.01	20	0.2	0.1
Method	N701	N701	N701	N701	N701	N701	N701	N701	N701	N701	N701	N701	N701
Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel

417082

2313 BASIN LAKE PORPHYRY LITHOGEOCHEMICAL SAMPLES

Sample	Se	Sm	Ta	Te	Th	U	W	Yb	Zn	Ti	V	Zr	P
44975	-5	8.1	1	-5	29.2	6	-2	2.3	367	2113	147	137	583
44976	-5	6.7	-1	-5	24.6	7	-2	1.9	256	1731	84	108	363
44977	-5	7.4	2	-5	28.4	7	-2	1.9	292	2117	110	137	463
44978	-5	9.7	2	-5	21.9	4	-2	4	102	2067	5	182	32
44979	-5	11.3	-1	-5	23.3	6	3	4.1	146	1220	6	217	52
44980	-5	18.9	1	-5	22.7	8	-2	5.5	114	1061	7	194	46
44981	-5	5.6	1	-5	23.5	5	-2	4.7	-100	1078	5	194	48
44982	-5	10.1	1	7	25	9	-2	6	102	1136	9	205	48
44984	-5	10.7	2	-5	23.5	4	-2	5.1	-100	NA	NA	NA	NA
44985	-5	10.2	2	-5	18.4	5	-2	4.3	-100	1006	-5	188	-30
44986	-5	8.4	-1	-5	17.9	4	-2	3	488	2822	99	183	463
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Detection	5	0.2	1	5	0.5	2	2	0.5	100	100	5	5	30
Method	N701	N701	N701	N701	N701	N701	N701	N701	N701	X401	X401	X401	X401
Laboratory	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Becquerel	Analabs	Analabs	Analabs	Analabs

APPENDIX 5

DHEM Survey

417084

RGC Exploration

ACN 001 426 946

INTERNAL REPORT

BASIN LAKE

EL 14/93

BASIN LAKE DOWN-HOLE ELECTROMAGNETIC SURVEY RESULTS, FEBRUARY 1997

Vol 1 of 1

HELD BY: RGC Limited

MANAGER & OPERATOR: RGC Exploration Pty Ltd

AUTHOR(s): Chris Dauth

8 December, 1997

PROSPECTS: Basin Lake

MAP SHEETS:	**1:100,000: Sophia**	**1:250,000: Queenstown**
GEOGRAPHIC COORDS	**Min East: 381 000 mE** **Min North: 5 350 000mN**	**Max East: 382 000 mE** **Max North: 5 357 000mN**

COMMODITY(s): Cu, Pb, Zn, Ag and Au

KEY WORDS: base-metals, conductivity, down-hole, electromagnetics, EM, mineralisation, three-component, time-domain

Distribution:

o **RGC Exploration Information Centre Reference:**
- **RGC Zeehan**

SUMMARY

Three-component down-hole electromagnetic surveys using the CRONE time-domain EM system were conducted on three diamond drill-holes (TYN13, TYN14, and BLD89-3), at the Basin Lake Project, EL 14/93, in February 1997. The surveys were conducted by Outer-Rim Exploration services for RGC Exploration as part of ongoing exploration for base-metal mineralisation at the project.

The aim of the surveys was to determine whether off-hole conductors (conceptually attributed to massive sulphide accumulations) were situated within the vicinity of these existing diamond drill-holes. If such conductors were present, then it is possible that down-hole three-component EM data could be used to accurately locate the massive sulphides, and thus facilitate the design of further exploratory drilling.

Hole depths for TYN13, TYN14, and BLD89-3 were 511.4m, 790.5m, and 388m respectively. TYN13 and TYN14 were drilled in 1996 by RGC Exploration targeting a contact between andesitic and rhyolitic lavas, (the Anthony Road Andesite - Central Volcanic Sequence contact) considered to be prospective for VHMS mineralisation. BLD89-3 was drilled by Billiton in 1989 targeting a CSAMT surface geophysical anomaly. Sericitic alteration, minor pyrite (1-5% commonly within carbonates) and rare sphalerite micro-veins were reported to be intersected in these holes. These geological indicators are generally regarded as favourable for the presence of VHMS mineralisation. Hole BLD89-3 had previously been logged with a single component down-hole electromagnetic system and was reported to exhibit a weak off-hole response.

TYN13 results show a strong in-hole response to 120m in all three components that is due to HQ casing remaining in the drill-hole. In addition, a weak early time positive amplitude response is observed in the V-component data from 350m to 390m. This response is not observed in the A and U components, and is most likely attributed to the position of the drill-hole with respect to the primary field (a loop-hole geometrical response).

TYN14 is collared within 50m to the west of a black siltstone horizon. A strong off-hole conductor, located near the hole is evident in the A and V component data in the top 100m of the hole. This is interpreted as a response caused by an interaction between the glacial overburden and the black siltstone which are no doubt in electrical contact. A low amplitude broad wavelength (300m) off-hole response is centred at 420m in TYN14. The response shows a negative A component, a positive to negative cross-over in the V component, and very little U component response. This is typical of a conductor located directly below the drill-hole. Computer modelling using the FILAMENT software showed the centre of the conductor to be approximately 200m off-hole to the west. This places the conductor at the down-dip position of a black siltstone mapped at the surface. Further investigation is not warranted since the conductor does not lie within RGC held ground.

Previous down-hole EM on BLD89-3 detected an off-hole response in the axial component centred at 210m. Re-logging of the hole confirms the presence of a very weak off-hole response. Subsequent modelling using FILAMENT software suggest that a weak conductor of limited extent is situated down-dip to the north of BLD89-3. This position lies in the vicinity of the position of a ENE-WSW striking fault. It is possible that the EM anomaly is due to either weathering, pyrite alteration, or conceivably base-metals mineralisation along or associated with this fault. It is similarly likely that the source of the down-hole EM anomaly is the same body that caused the CSAMT anomaly on which hole BLD89-3 was targeted. Further drill testing in

this region to test the anomaly could be justified if it is considered that the current drill pattern is not of a density such as to preclude the possibility of an economic sized deposit.

CONTENTS

LIST OF FIGURES

1. INTRODUCTION

Basin Lake (EL 14/93), situated approximately 8km south of the Henty Mine, Western Tasmania (Figure 1), is currently being explored by RGC Exploration for its potential to host Rosebery style Cu-Pb-Zn-Ag volcanic hosted massive sulphide (VHMS) deposits. This report presents the results of a three-component down-hole electromagnetic (DHEM) geophysical survey conducted as part of ongoing exploration activities.

The project encompasses a narrow north-south trending EL that covers a geological contact between dominantly andesitic lavas of the Anthony Road Andesite, and rhyolitic lavas of the Central Volcanic Sequence. The eastern side of the EL features a prominent topographical ridge associated with the Great Lyell Fault, to the east of which lies resistant Ordovician siliclastics. Much of the EL is covered by glacial till up to 80m in thickness.

DHEM surveys were conducted on three holes at the Basin Lake Project during February 1997 to determine whether off-hole conductors existed that might be targeted in further drilling. It is a feasible model, that off-hole EM conductors might be associated with base-metal rich massive sulphide mineralisation, and it is for this reason that use of DHEM often forms a routine component of VHMS exploration.

2. GEOLOGY

This description of the geological setting at Basin Lake is derived largely from drill logs of TYN13, TYN14, and TYN15 (extracted from the RGC database), and reports by Vicary (1995), Vicary (1994) and Richardson (1993).

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 been historically been driven by drill testing geophysical anomalies (mostly surface EM techniques), and more recently has focused on systematic drilling of the prospective horizon with DHEM follow-up. TYN13 and TYN14 were drilled in 1996 by RGC Exploration targeting the prospective contact between andesitic and rhyolitic lavas. BLD89-3 was drilled by Billiton in 1989 targeting a CSAMT surface geophysical anomaly. Sericitic alteration, minor pyrite (1-5% commonly within carbonates) and rare sphalerite micro-veins were reported to be intersected in these holes. These geological indicators are generally regarded as favourable for the presence of VHMS mineralisation. TYN15 was also drilled in 1996 by RGC Exploration only several hundred metres to the north of BLD89-3, however it was unable to be logged with DHEM due to drill casing remaining in the hole. TYN15 was drilled to a depth of 822.5m, and intersected a wide zone of sericite-pyrite alteration from 338.8-588.4m.

A number of cross-cutting structures have been either mapped or inferred on the ground, or delineated from helimagnetic data. These are indicated on the survey layout plan and geological summary in Figure 2. 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.

3. PREVIOUS GEOPHYSICS

Previous exploration programs at Basin Lake extend back to the 1960's when IP was used across the region. Many of these early anomalies were drill tested at the time, and generally intersected pyritic black siltstone horizons. Since then, further IP, UTEM, SIROTEM, GENIE-EM, DHEM, DHIP, CSAMT, gravity, magnetics, CSAMT, and SP have all been trialed to some extent. Numerous anomalies have been detected by the various techniques, and follow-up drilling has failed to intersect significant economic mineralisation in all cases. Some holes have intersected minor base metals and/or pyrite alteration, but generally, anomalous electrical response has been attributed to pyritic black siltstones.

Previous DHEM surveys have failed to result in delineation of any significant anomalies. A weak axial component (A) anomaly was detected in a single component survey conducted on BLD89-3 centred at 210m. This anomaly was confirmed on a subsequent survey. Originally BLD89-3 was drilled to test a CSAMT anomaly. Digital data for these surveys was not available at the time of writing this report, so copies of the results from Richardson (1993) have been placed into the context of this report. These results are only photocopy quality. Figure 3 shows the layout of the CSAMT survey. Results from a 1D inversion of line 5352660mN are presented in Figure 4. Axial component DHEM results from BLD89-3 are displayed in Figure 5 to Figure 9. The DHEM anomaly in BLD89-3 is reported to correspond with a surface UTEM anomaly located to the north. The UTEM anomaly is reported from RGC data on lines 48-66S acquired in 1985. Unfortunately, a report on the 1985 UTEM survey does not exist in the RGC Library archives, and only the raw data on local grid co-ordinates as a hardcopy is available. Re-digitising and conversion to current grid co-ordinates would be a significant job, and has not been conducted as part of this report compilation. The CSAMT results (Figure 4, Line 532600mN AMG) show a good conductor centred at 381240mE AMG. In addition, a small gravity line delineated a residual anomaly at the same position on this line, Creagh and Hungerford 1989.

Hole BLD89-3 was targeted at the CSAMT anomaly, but failed to intersect significant sulphides or black siltstone that could explain the anomaly (contrary to the report by Richardson 1993 which stated that a base-metal poor alteration zone with disseminated pyrite between 130 and 230m was once considered to be the source of the CSAMT anomaly). The DHEM results (Figure 5-9) give evidence that an off-hole conductor exists centred at approximately 210m. Diamond hole BL-2 (800m to the north of BLD89-3) did intersect a carbonaceous shale horizon that could explain the UTEM anomaly. It has also been inferred in the report by Richardson (1993), that the DHEM anomaly in BLD89-3 can be explained by the shallow conductor (carbonaceous shale) intersected in BL-2. It has similarly been suggested that steel casing remaining in the hole BLD89-3 to 100m could also not be ruled out as the anomalous source. It is the opinion of the author of this report that none of the above suggestions could sufficiently explain the DHEM off-hole anomaly in BLD89-3, and it was decided to re-log the hole, once again, with a three-component system to try and better resolve the anomaly.

4. THEORETICAL CONSIDERATIONS

Following is a brief summary on the theoretical factors that must be considered with regard to DHEM survey techniques.

A time domain electromagnetic system was used for the survey in a fixed transmitter and roving receiver configuration. The nature of the response can be rather complex, and is dependent on a number of factors. These can be both geological and system configuration in origin. Firstly, the position of the transmitter loop with respect to the drill-hole and the geological target is critical, and different loop positions will generate different responses. The causes, and signature of different responses from different loop-hole-geology orientations are too numerous and complex for even brief summary in this report. Different responses are expected from different transmitter loop positions, and anomalous response may simply be due to loop-hole position rather than geology. Interrogation of data using modelling software, case examples, and simple electromagnetic theory is a requirement for interpretation to avoid identification of false anomalies.

It should be kept in mind, that for a geological target to provide an electromagnetic response, it must have a connection of conductive minerals. Therefore, disseminated sulphides are not expected to provide a good EM response. Also, the sulphides must be highly conductive. In areas where zinc mineralisation is being sought it must be understood that sphalerite is not a particularly good conductor. In fact, sphalerite may act as an insulator about other conductive minerals (chalcopyrite, galena, and pyrite), and making a massive sulphide body a poor conductor.

The survey was conducted using the CRONE three-component receiver. Sign conventions are that the Z component is the axial component (A), positive polarity up-hole; the X component is in the plane of the hole azimuth axis at 90° from the hole dip (V), positive polarity upwards; and the Y component is at 90° perpendicular to the hole azimuth, positive polarity to the left hand side of the down-dip facing hole azimuth. The XYZ components should refer to geographical co-ordinates based on the local grid where Z is up, X is east-west, and Y is north-south (ie AMG in this case).

5. SURVEY PARAMETERS

The diamond hole BLD89-3 was drilled in 1989 and is collared at 381200mE, 5352660mN and approximately 655mRL. The hole was drilled to a depth of 388m at a dip and azimuth of approximately 50° and 090° respectively.

The diamond hole TYN13 was drilled in 1996 and is collared at 381018mE, 5354389mN and 550mRL. The hole was drilled to a depth of 550m at a dip and azimuth of approximately 77° and 090° respectively.

The diamond hole TYN14 was drilled in 1996 and is collared at 380999mE, 5353603mN and approximately 570mRL. The hole was drilled to a depth of 6790m at a dip and azimuth of approximately 87° and 090° respectively.

The three component DHEM survey was conducted using the CRONE system, by OUTER-RIM Exploration Services in February 1997. Data were collected on a 20 msec and 50msec time-base over 20, 31 or 36 channels at 10 m and 5 m station interval. Ramp-time was set at

1.0 or 0.5 msec, and receiver-transmitter synchronisation achieved through cable connection. Primary fields were measured during the turn-off ramp.

Loop positions and dimensions are displayed in Figure 2. Single 400 x 400m transmitter loops were used for TYN13 and TYN14, and two loops 200 x 300m, and 300 x 350m for BLD89-3. Currents were 14 Amps, 14 Amps, 16 Amps and 16 Amps respectively. All three-components (A, U, and V) were recorded for each loop position. The time rate of change of the secondary magnetic field is measured in the receiver coil (amplified area 6500 m^2) in units of nT/sec.

6. RESULTS/DISCUSSION

Results from all holes and transmitter loops have been plotted as profiles in Figures 10-21. Results are plotted on both linear, and logarithmic vertical axis. Survey details and hole details (including loop location with respect to the drill-hole) are presented on the plots. Digital data are provided in the sleave of this report to facilitate further plotting and/or modelling of results as required. Data have been modelled using EMVISION and FILAMENT software packages. It **must** be pointed out that the sign convention applied in the FILAMENT package is **not** the same as that observed in the field data (it is the opinion of the author that this is a software bug that should be rectified). Therefore, in the modelling results, the V and U components have actually been interchanged. That is, the U component in the plotted profiles is actually the V component in the modelled profiles (and visa versa). Observation of the primary field models (Figure 22) will confirm this change in sign convention.

6.1 TYN13

TYN13 results show a strong in-hole response to 120m in all three components that is due to HQ casing remaining in the drill-hole. The drill log from this hole reports "some rods left in the hole" over the interval 31.5-109.2m. In addition, a weak early time positive amplitude response as a deflection is observed in the V-component data from 350m to 390m. The response is observed to channel 6 (including the primary field channel). A corresponding anomaly is not observed in the A and U components, and therefore the V response is most likely attributed to the position of the drill-hole with respect to the primary field (a loop-hole geometrical response). It should however be pointed out, that this depth (362.5m) is where the drill-hole intersected the target horizon after 362m of Anthony Road Andesite. It may therefore be interpreted that the change in electrical response is due to a change in geology. The change in geology also corresponds with a sudden decrease in the inclination of the hole (assumed to be similarly due to the change in geology, thus drilling conditions). The change in V component response could well be explained by the changing hole-loop geometry, and therefore the direct geological source has been discounted. Modelling would be able to confirm this interpretation, however, was not conducted due to satisfaction with the current interpretation, and lack of interest in the response at any rate.

No significant anomalies attributable to geological sources are considered worthy of follow-up from the TYN13 DHEM results.

6.2 TYN14

TYN 14 was logged to a depth of 665m using initially a 50msec time base, to 36 channels (45msec), 1msec ramp, and 400 x 400m transmitter loop at 14 Amps. This data was observed in the field to be of a dubious nature (ie the late time data was particularly uncharacteristic of the area showing far too "clean" a decay curve). It was found that the cable head had wiring problems, and this data should be disregarded. Results are not presented in this report. The hole was then re-logged at a 20msec time base, to 20 channels (14.5msec), 1msec ramp, and 400 x 400m transmitter loop at 14 Amps. These results are presented in Figures 13-15.

TYN14 is collared within 50m to the west of a 170°-350° striking black siltstone horizon, dipping steeply to the west. The hole also intersected 42m of glacials from the surface. Anthony road Andesite was intersected to 615m depth, then only minor haematitic carbonates within interbedded dacitic volcaniclastic sediments and lavas at the target horizon.

A strong off-hole conductor, centred to the west of the hole is evident in the A, V, and U component data in the top 100m of the hole (Figure 13, 14, and 15 respectively). The early time U component data show numerous cross-overs from positive to negative polarity. This polarity flipping response is a loop-hole geometry response, as a result of the hole being located in the centre of the loop and oriented at 90° from a side. The strong off-hole conductor response is that of a body, dipping shallowly to the west. This is interpreted as being due to the glacial overburden in interaction with the black siltstone. At later times, the polarity of the anomaly changes for all three components. This is a likely response of the "smoke ring" (ie the effective current filament in the overburden) expanding with time, and extending past the drill-hole, and having a centre moving to the north-east (this is possibly consistent with increasing glacial thickness). The modelled FILAMENT output in Figure 22, shows body number 1 as the position of the current filament at the first time gate (this body is actually disabled in the modelled response of Figure 22 as this was a primary field response where only filament 2 was active). Figure 23 shows the body 1 position has moved in time (0.482msec). The response measured in TYN14 is due to the overburden response, most likely being driven by the black siltstone in which it is in contact. The fact that similar responses are not observed elsewhere at Basin Lake where overburden is intersected, indicates that the black siltstone is a vital component of the electrical system.

A low amplitude broad wavelength (300m) off-hole response is centred at 420m in TYN14. The response shows a negative A component, a positive to negative cross-over in the V component, and very little U component response. This is typical of a conductor located directly down-dip and below the drill-hole. Computer modelling using the FILAMENT software was conducted over several time gates. The one considered to be most characteristic of the anomaly is presented in Figure 23 (0.482msec). Body number 1 represents an overburden response, and body 3 represents the current filament within a down-dip conductor. The conductor is centred on 380670mE, 5353580mN, dipping 60° to the west on an azimuth of 260°. The centre of the filament is at an RL of 20m (ie vertical depth of approximately 500m). The conductor is located approximately 200m below, and to the west of the hole. The position of the conductor does correspond with the down-dip position of a black siltstone unit mapped at the surface approximately 50m west of the drill collar. The conductor could therefore represent a more conductive portion of the siltstone (pyrititic/graphitic), or conceptually an accumulation of base-metal sulphides (discrimination with this geophysical data is not possible).

6.3 BLD89-3

BLD89-3 was re-logged with a three component system by RGC Exploration of the basis that the new data would better facilitate determining the geometry and location of a subtle anomaly previously detected by Billiton with a single component system (Figure 5-9).

The hole was logged with two transmitter loop positions (EAST and WEST for the purpose of this report). Results are presented in Figure 16, 17 and 18 for the A, V, and U components for the EAST loop, and Figure 19, 20, and 21 for the A, V, and U components for the WEST loop.

Strong in-hole responses are recorded in the top 100m of the hole due to steel casing.

Previous down-hole EM on BLD89-3 detected an off-hole response in the A component centred at 210m. Re-logging of the hole confirms the presence of a very weak off-hole response centred around 200m. This off-hole response is observed as being evident for both the EAST and WEST transmitter loop positions, however the geometrical source of the anomaly is interpreted to be different for each loop. This is later substantiated by FILAMENT modelling results, suggesting multiple conductors were present. The different transmitter loop responses are a likely consequence of better electromagnetic coupling of different conductors using the different loops.

The EAST and WEST loop results show both U and V component anomalies, and subtle (if at all recognisable) A component response. The A component response observed in the Billiton data (Figure 5-9) is not well repeated by the axial component of the CRONE three-component data. A reason for this is currently unable to be drawn, especially considering that the EAST transmitter (RGC 1997) and LOOP 1 transmitter (Billiton 1991) positions are essentially the same.

Modelling results for the EAST loop are presented in Figure 24. These show a current filament modelling the half-space smoke ring (filament 1), and a target conductor (filament 2). The target filament is centred on 381197mE, 5352690mN at an RL of 409m (approximately 150m from the surface). This position lies in the vicinity of the position of a ENE-WSW striking fault. It is possible that the EM anomaly is due to either weathering, pyrite alteration, or conceivably base-metals mineralisation along or associated with this fault. It is similarly likely that the source of the down-hole EM anomaly is the same body that caused the CSAMT anomaly on which hole BLD89-3 was targeted. The modelling results show a relatively good fit with the U and V components, however, a negative deflection in the modelled A component is not apparent in the observed data. It is interesting to note, that this modelled deflection in the A component would correlate very well with the position of the single component response recorded by Billiton. This fact does cast some doubt on the integrity of the CRONE A component data for this hole (this is purely speculative, and is unable to be confirmed). It is perhaps equally likely that the model used in FILAMENT was too simplified, and that an interacting multiple body approach may be necessary. Further drill testing in this region to test the anomaly could be justified if it is considered that the current drill pattern is not of a density such as to preclude the possibility of an economic sized deposit.

Modelling on the WEST transmitter loop data (Figure 25 and 26) show two current filament positions that enable good fits between the modelled and observed field data. These conductors dip to the west, and are situated down-dip of a black siltstone that has been mapped striking at the surface (see Figure 2). It is interpreted that the conductors coupled by the WEST transmitter loop are situated within this black siltstone horizon, and either represent more pyritic/graphitic sections, or conceptually base-metal sulphide rich bodies within the black siltstone. The conductive filaments are both situated outside of RGC held ground.

6. RECOMMENDATIONS

The following recommendations are made from the results of the three-component down-hole electromagnetic survey:

- No targets were generated in the vicinity of TYN13.

- A conductor was detected in the DHEM results from TYN14, however the modelled response is outside of RGC held ground, so further investigation is not warranted. In addition, the response is situated down-dip from a black siltstone horizon which could well be the source of the response.
- The DHEM response observed in BLD89-3 by Billiton during 1991 was repeated by the RGC CRONE survey, however the amplitude of the response was very small, and the shape of the anomaly did not readily facilitate computer modelling. Computer modelling was conducted attempted on the data, however there remains some uncertainties with the model (likely to be attributed to multiple conductor interaction), and the resultant modelled target conductor centre is by no means a unique solution. Given the modelled conductor is located to the north, and down-dip of BLD89-3, it must be considered as to whether there is enough space geometrically to place a sizeable base-metal sulphide accumulation to warrant further investigation. Factors in favour of further investigation include the presence of an unexplained CSAMT anomaly coincident with the DHEM response. These are currently unexplained by the geology (there are no mapped black siltstones at the position of the modelled DHEM or CSAMT anomaly location). In addition, the best sulphide intersections at Basin Lake are recorded in BL1 (4.5m @ 0.14% Pb, 0.46% Zn and 4g/t Ag) which is collared approximately 200m to the west, and drilled down-dip of BLD89-3. Options that could be considered for follow-up of the DHEM response include:
    - direct drill targeting the centre of the modelled DHEM response.
    - review existing UTEM data over Basin Lake to see if the DHEM modelled response has a corresponding surface anomaly.
    - conduct several lines of gravity over the target zone.
    - conducting a detailed TEM surface survey (such as SIROTEM, CRONE, or EM37) over the modelled body to see if it can be repeated before committing a drill-hole.
    - further DHEM on BLD89-3 using several more transmitter loops to try and better position the conductor.

7. REFERENCES

Creagh, C. J., and Hungerford, N., 1989, EL 103/87 Basin Lake, Progress Report on Exploration for the Period Ending 21st April 1989; Billiton Australia Report 08.4246, Tasmanian Mines Dept. Ref 89-2928.

Richardson, S. M., 1993, Exploration Licence 103/87 Basin Lake Partial Relinquishment Report on Exploration to April 1993; Aberfoyle Resources Ltd Report to Tasmanian Mines Department.

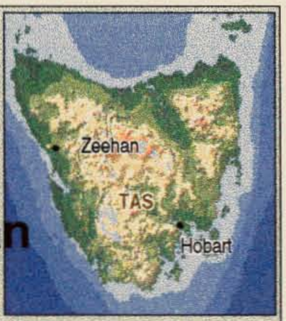
Vicary, M. J., 1994, EL 14/93 "Basin Lake" Annual Report Dec 1993 - Dec 1994; RGC Exploration Annual Report to Tasmanian Mines Department.

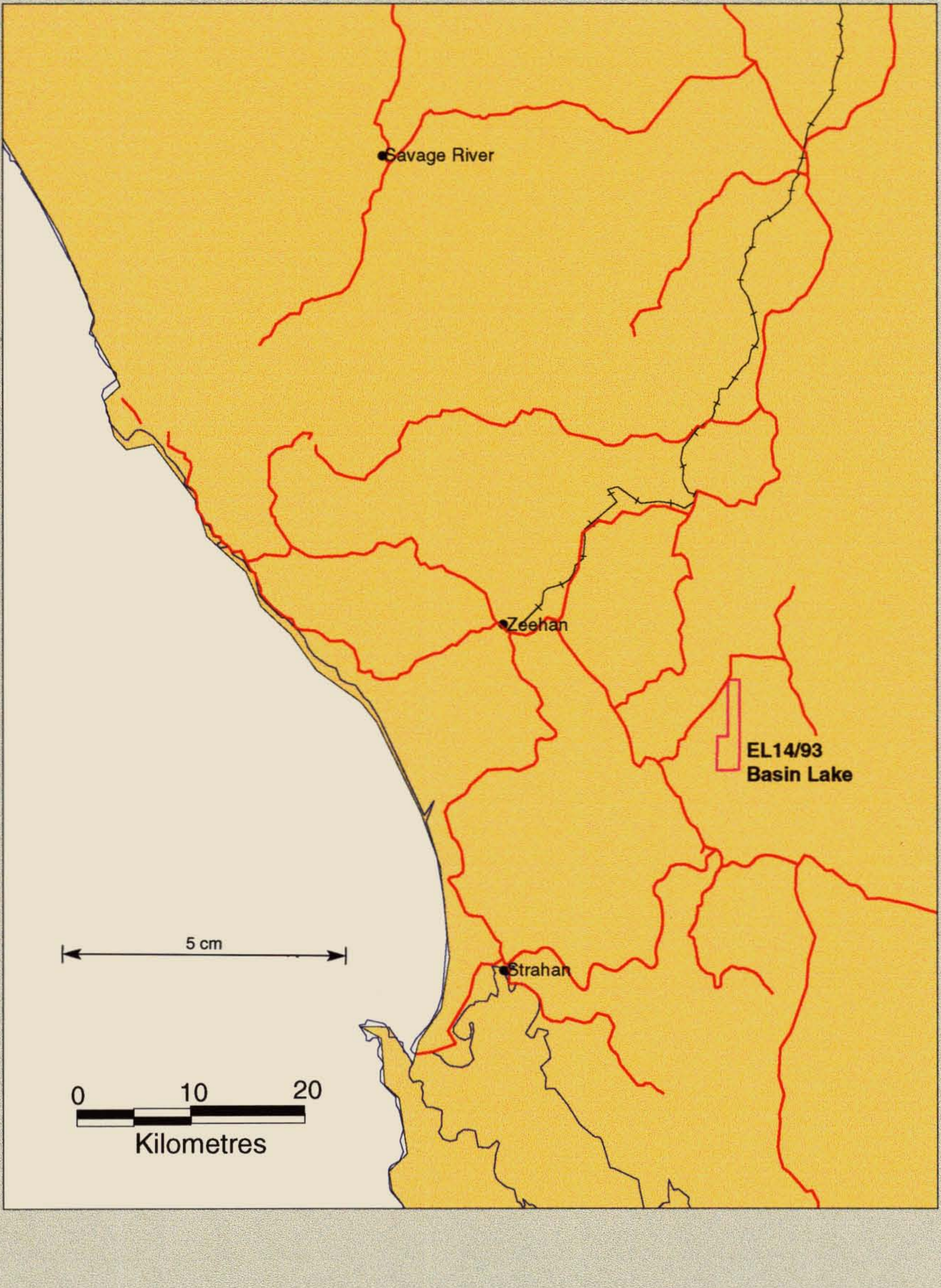
Vicary, M. J., 1994, EL 14/93 "Basin Lake" Annual Report 1995; RGC Exploration Annual Report to Tasmanian Mines Department.

RGC Exploration

417095

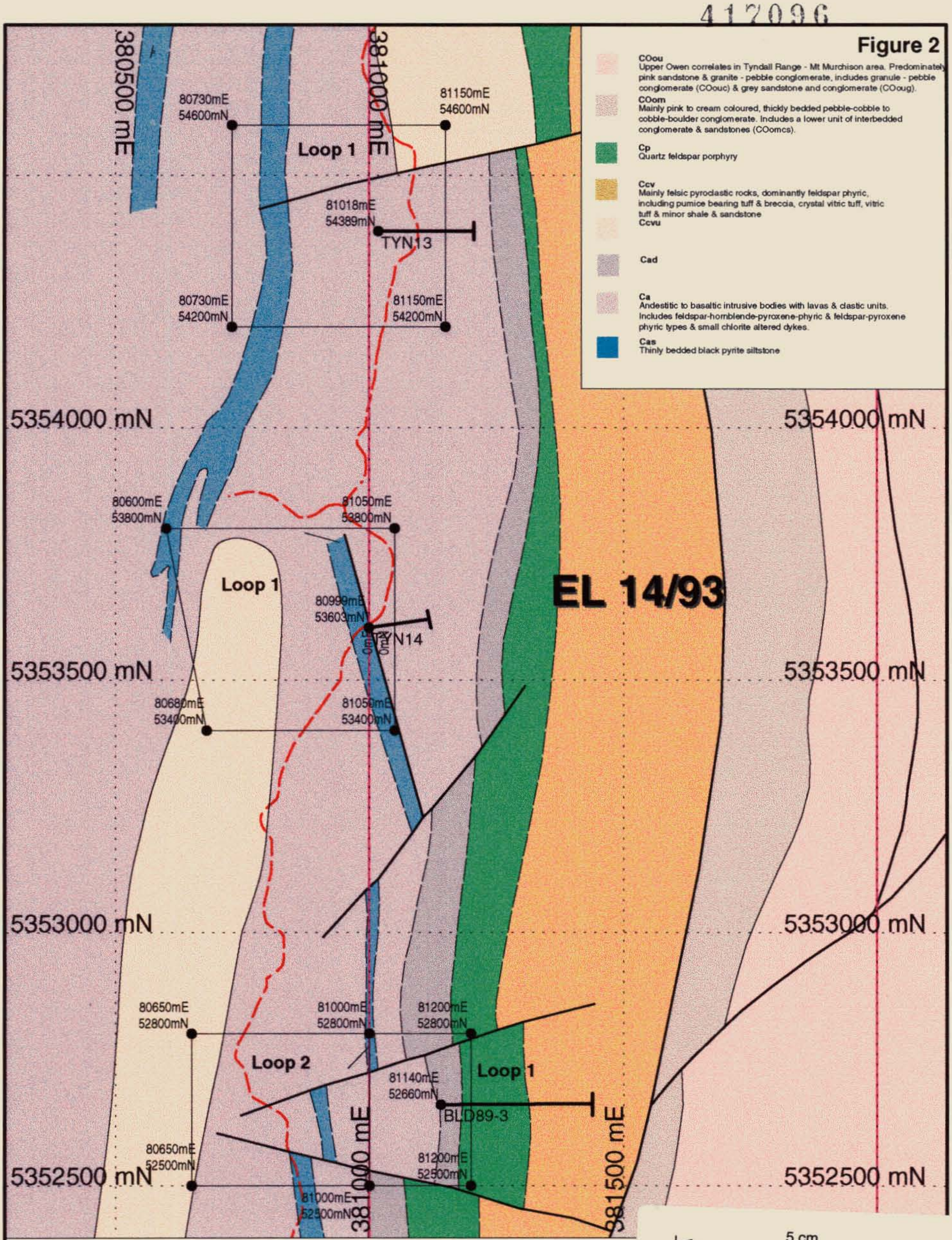
Figure 1. Basin Lake Project Location Plan





417096

Figure 2



RGC Exploration

Scale 1:10,000

0 100 200 500 1000m

Distances in metres

Basin Lake Project
Down-Hole EM Survey Layout
and Hole Locations

Compiled by C. Dauth Date Nov 1997

Projection: UTM
Zone: 55
Grid: AMG
Spheroid: ANS66

Survey Parameters

Contractor: OUTER-RIM
Equipment: 3C CRONE
Components: X,Y, & Z
Date: February 1997

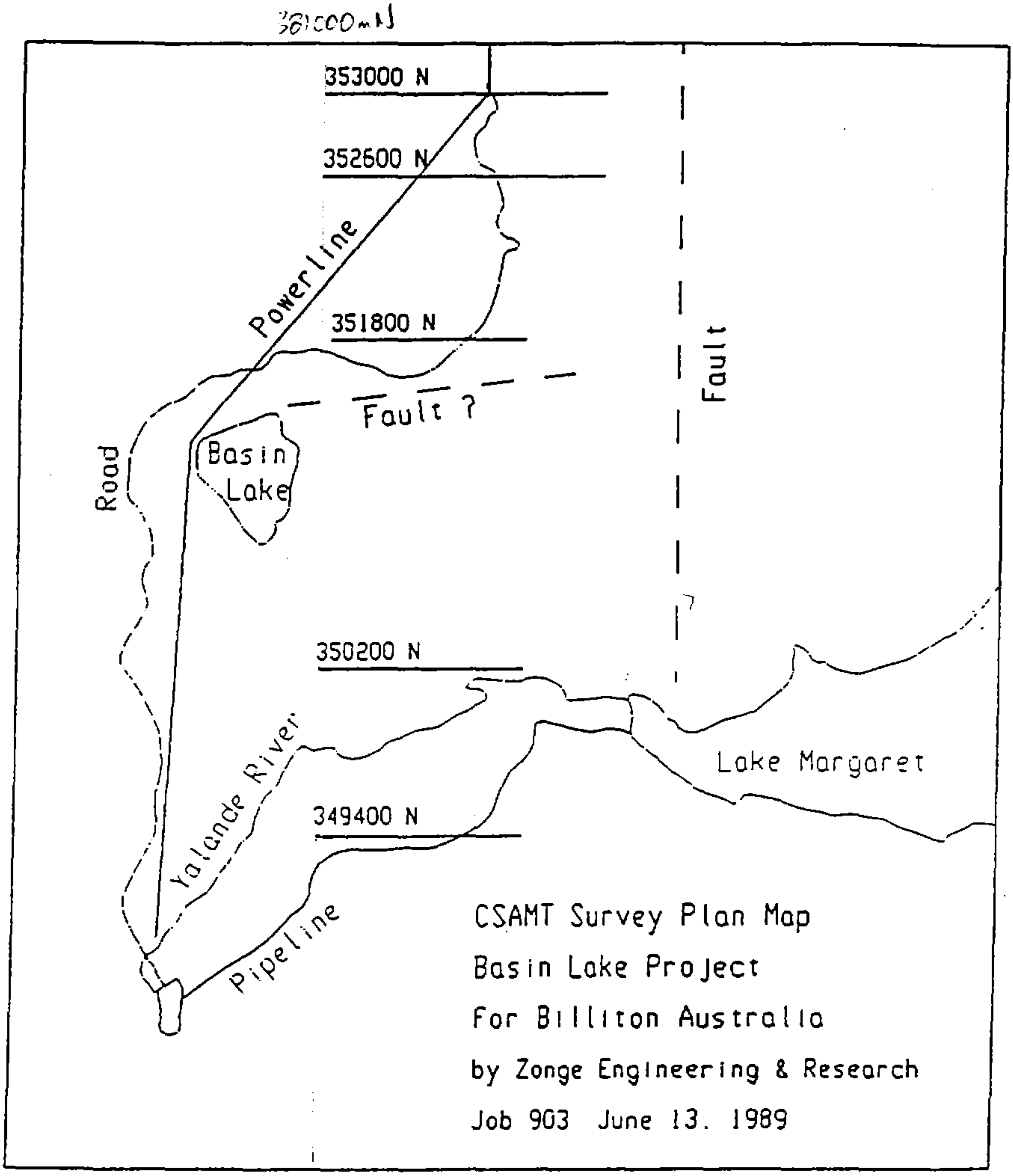


Figure 3 CSAMT line location map.

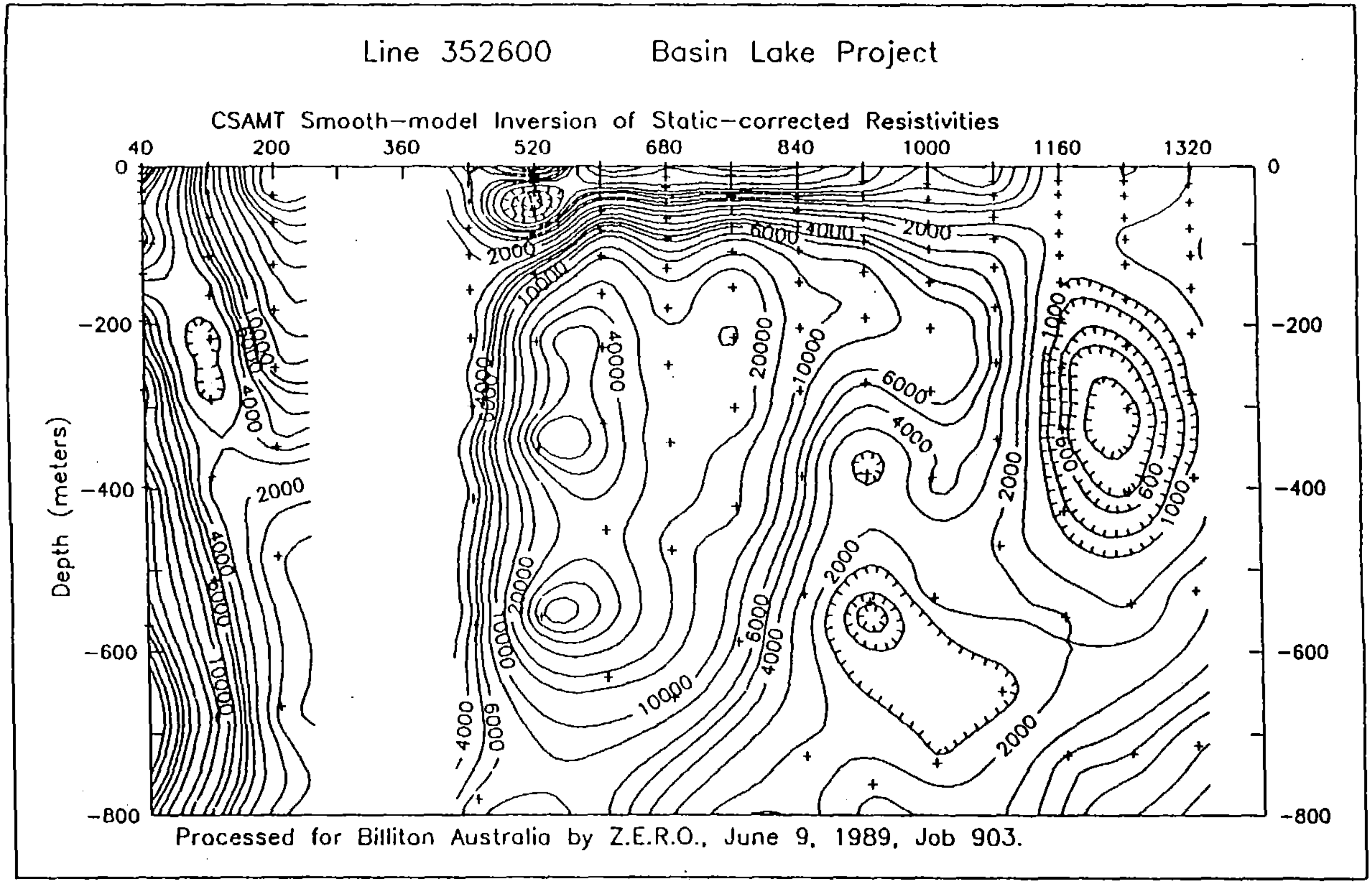
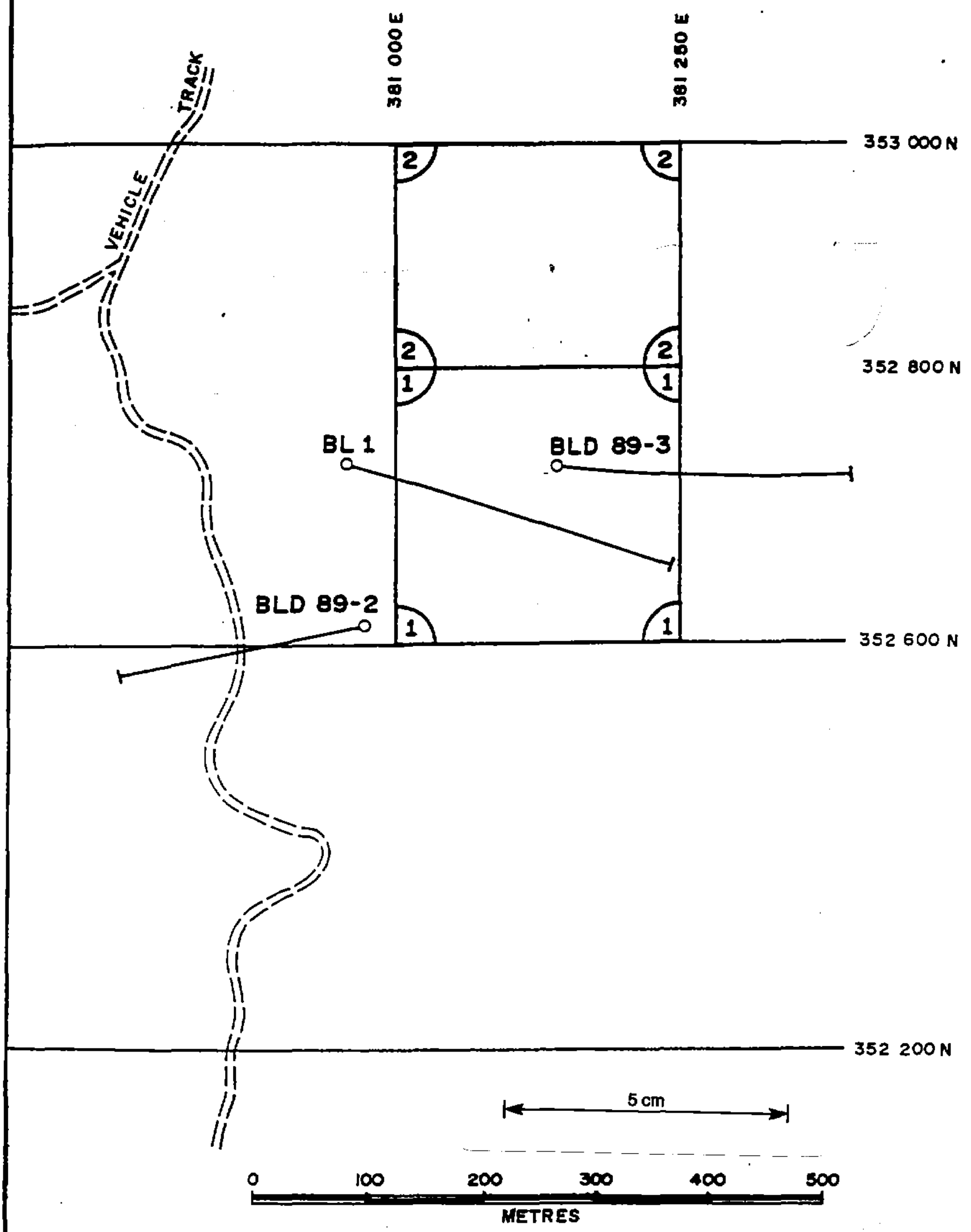


Figure 4: Smooth-model inversion for line 352600N.

Figure 5



Aberfoyle Resources Limited
EXPLORATION DIVISION

REVISIONS			
Init.	Date	Init.	Date

Location Code :

NORTH WEST TASMANIA
BASIN LAKE EL 103/87
BLD 89-3 JAN. 1991 DHEM SURVEY
LOOP LOCATION PLAN

Scale : AS SHOWN
Date : MARCH 1992

Compiled : S. R.
Drawn : J. M. S.
Traced :
Checked :
Plate No. : BL 12

Figure 6

417100

Fig 3a

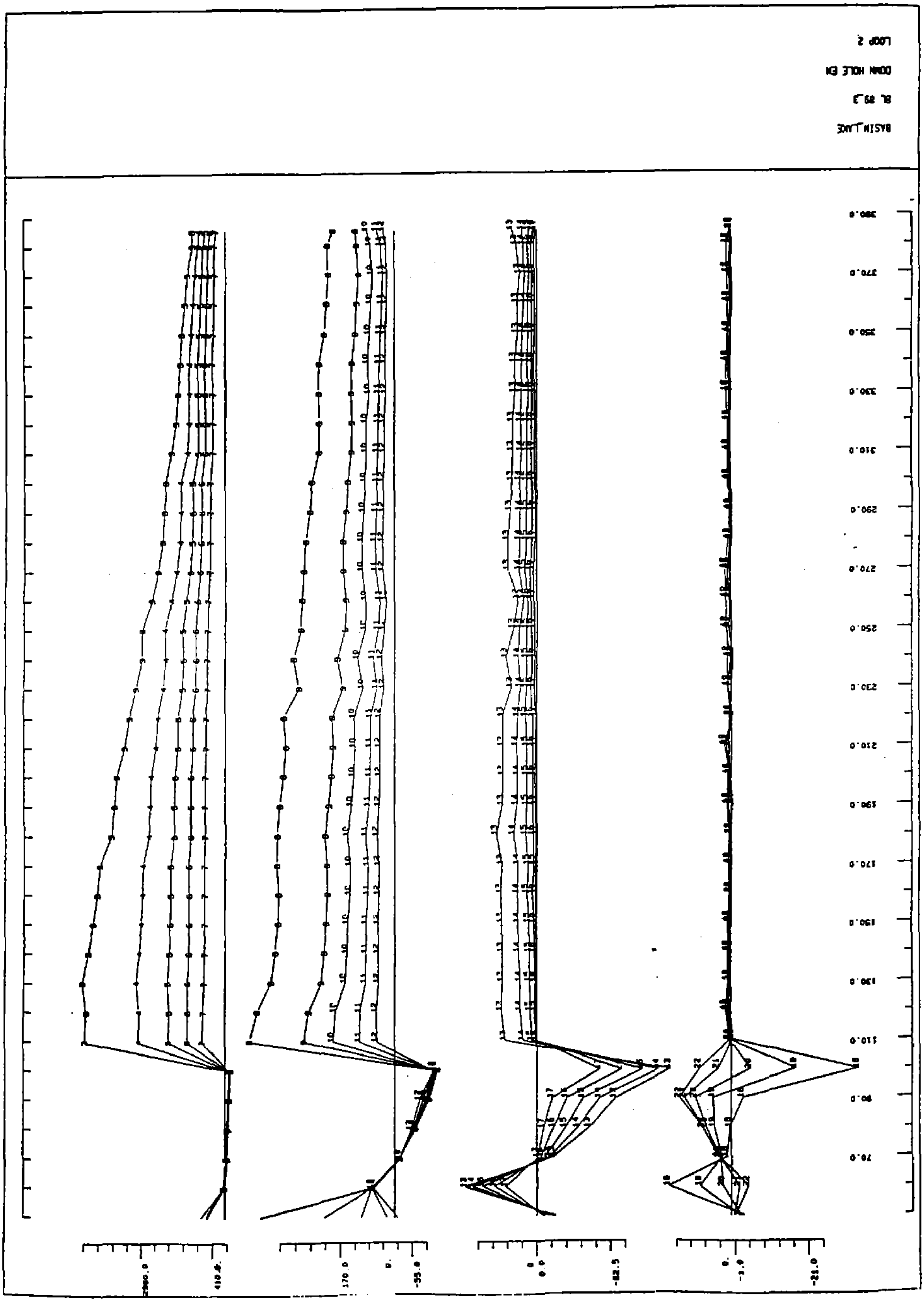


Figure 7

417101

Fig 2

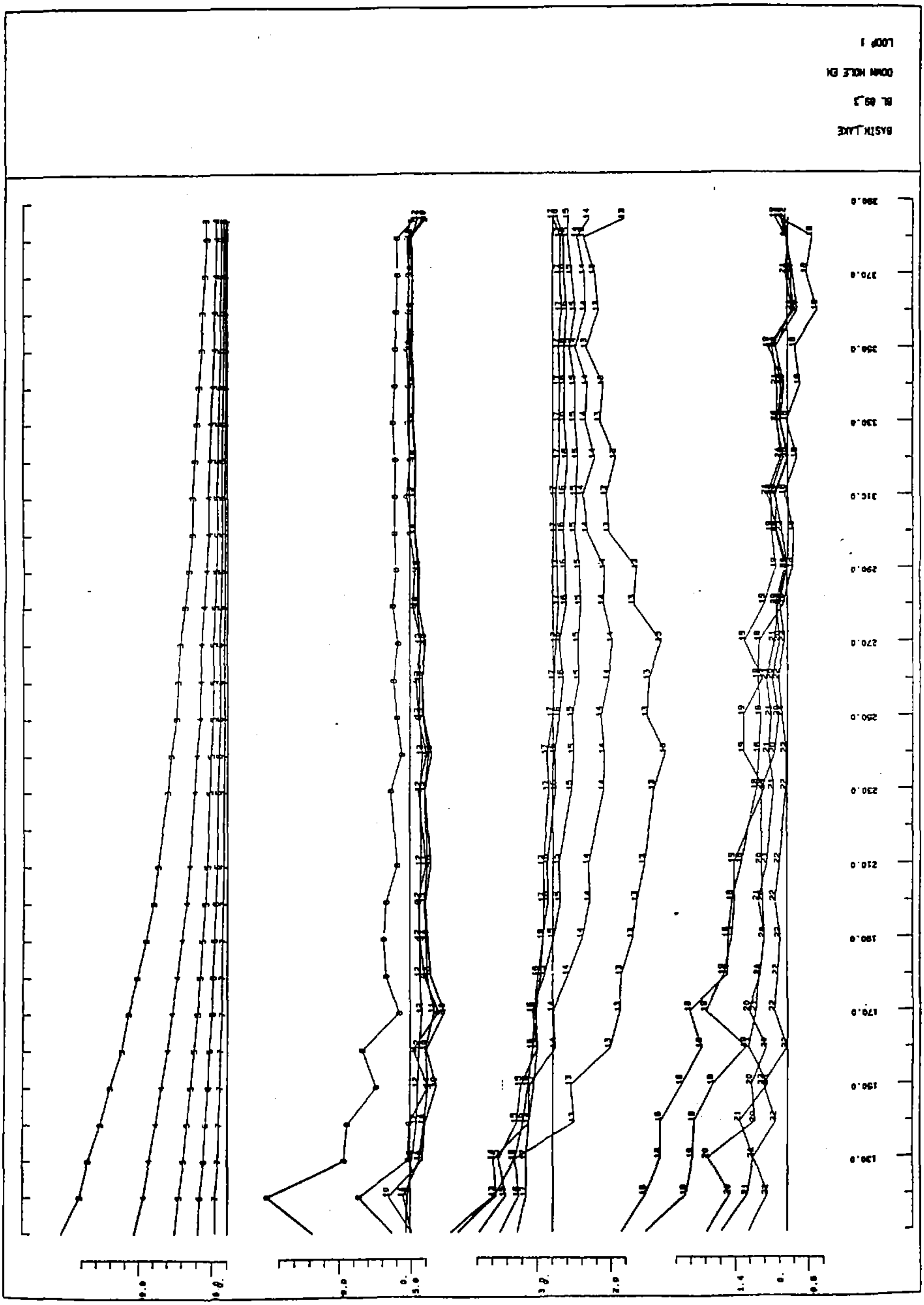


Figure 8

417102

Fig 2a

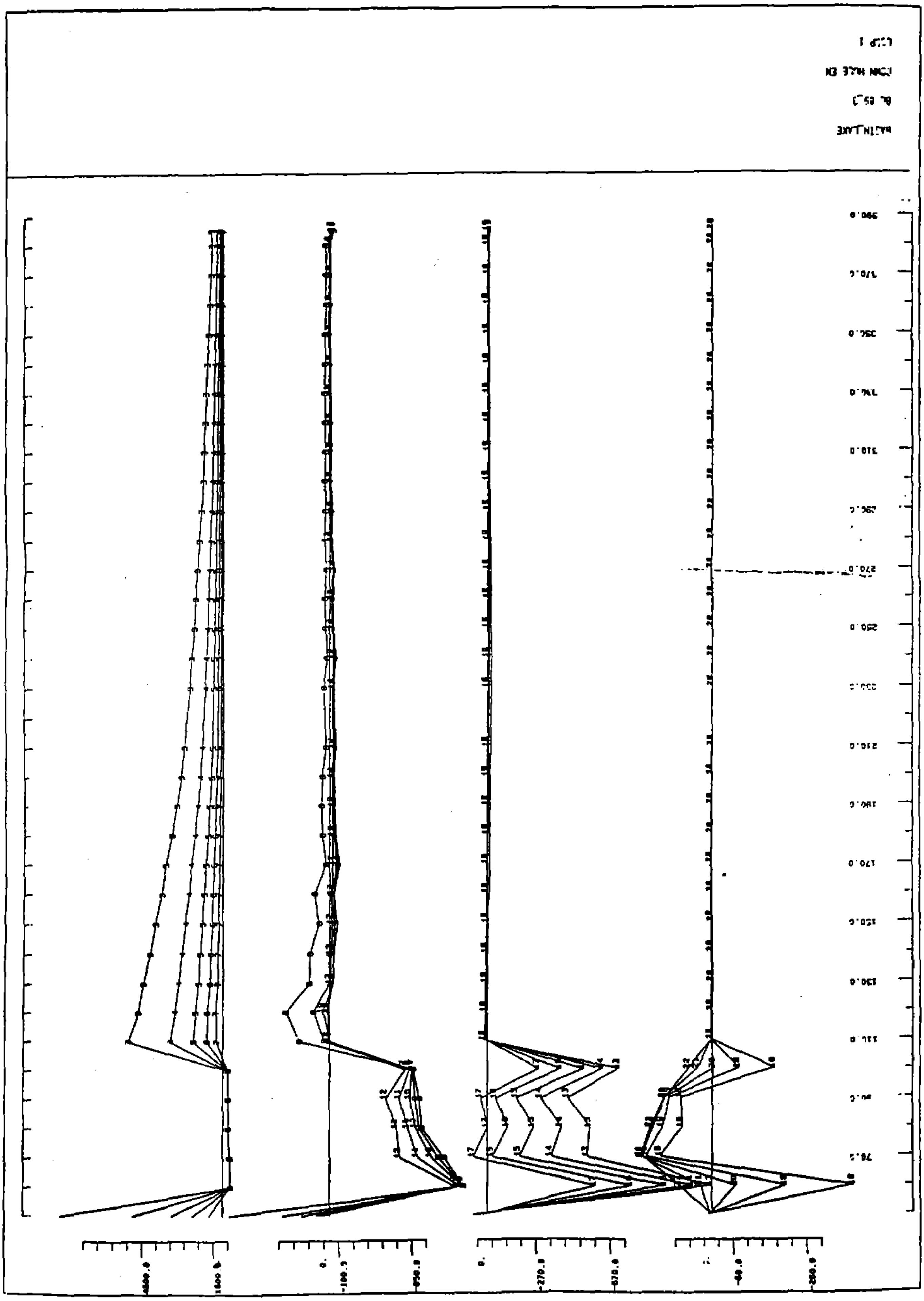
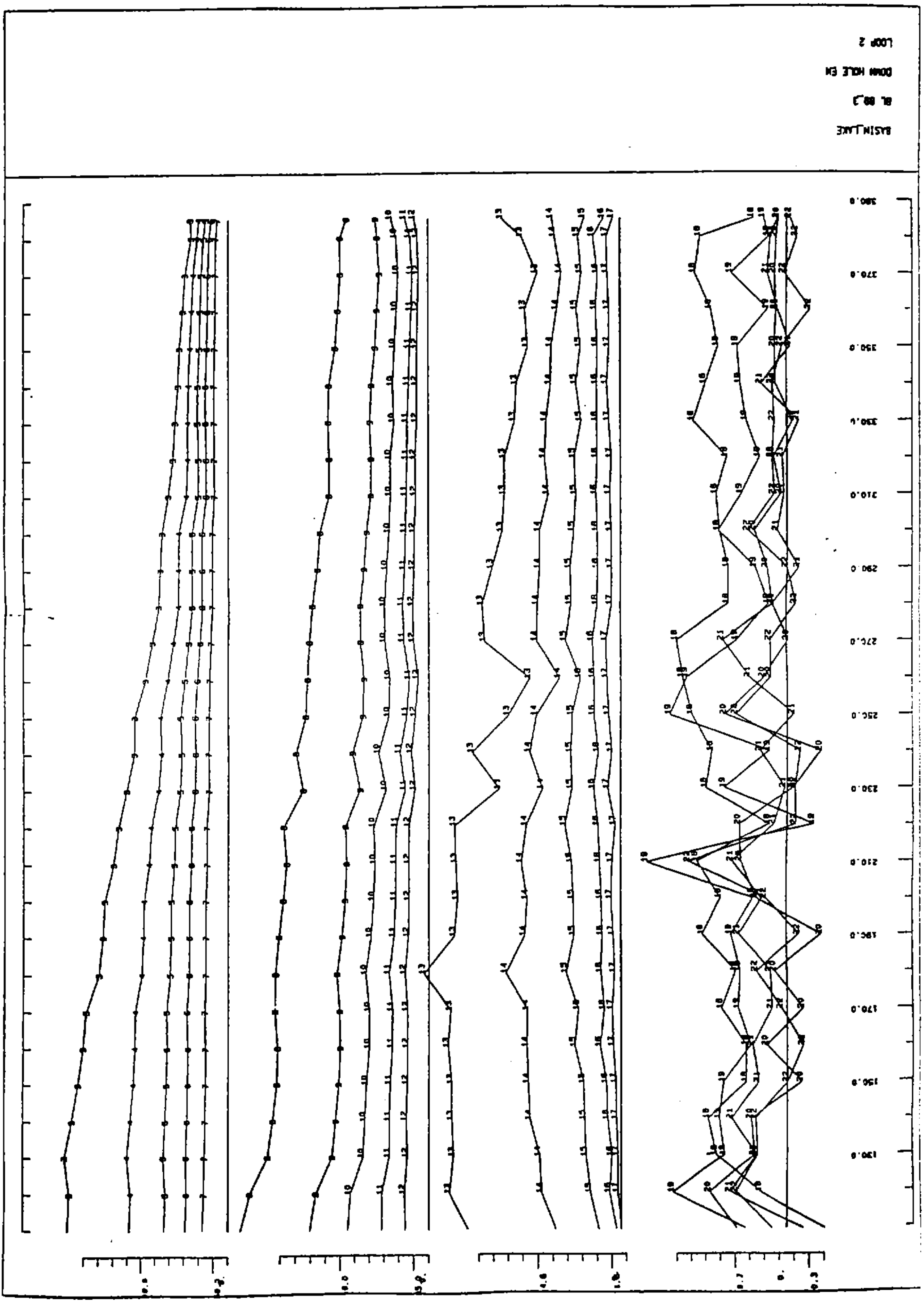
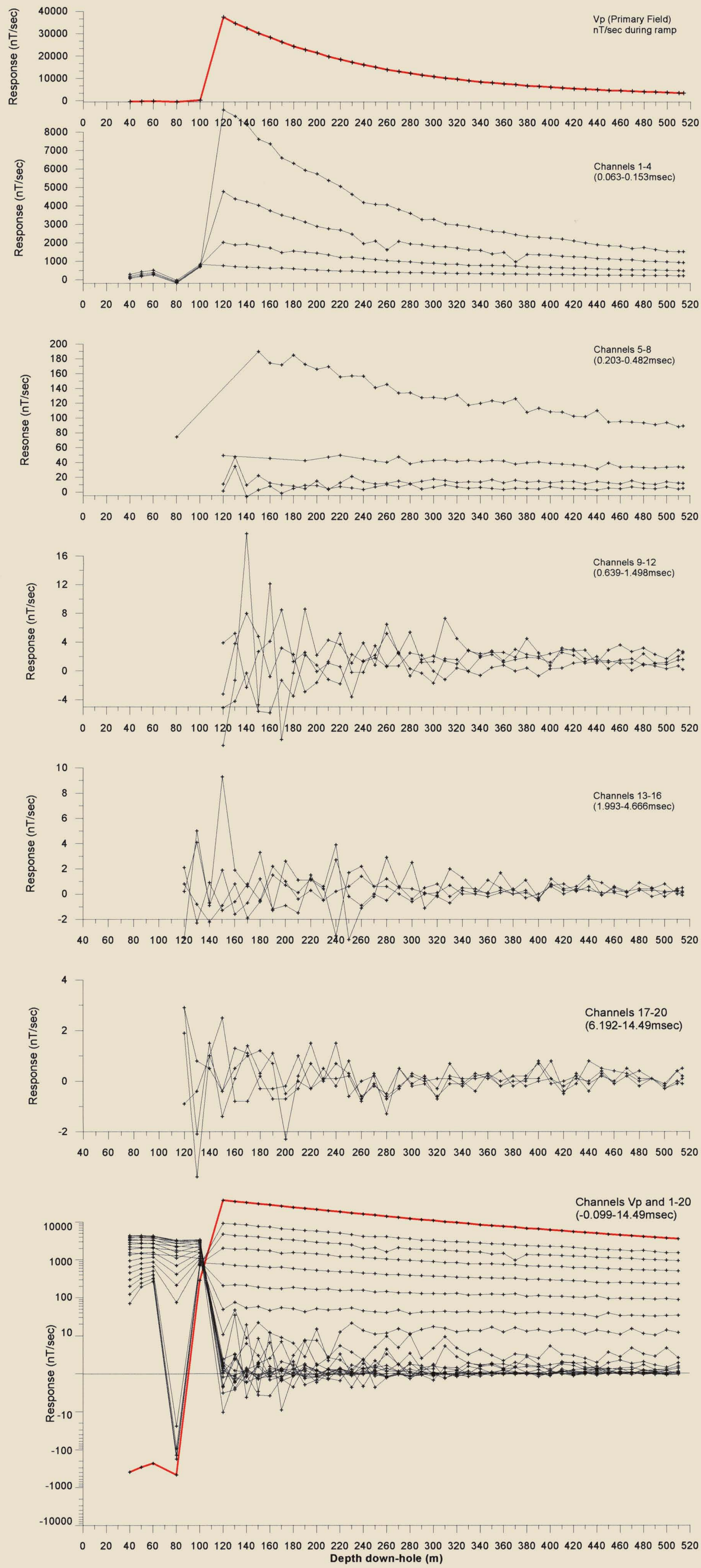


Figure 9

417103

Fig 3





417104

RGC Exploration

Basin Lake Project
Down-Hole EM Results
Axial Component
TYN13

Hole Specifications

Hole Number: TYN13
Completed: June 1996
Collar Easting: 381018mE
Collar Northing: 5354389mN
RL: 550m
Inclination: 77 degrees
Azimuth: 090 degrees AMG
EOH: 511.5m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 400x400m
Current: 14A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

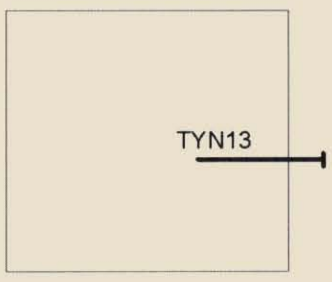
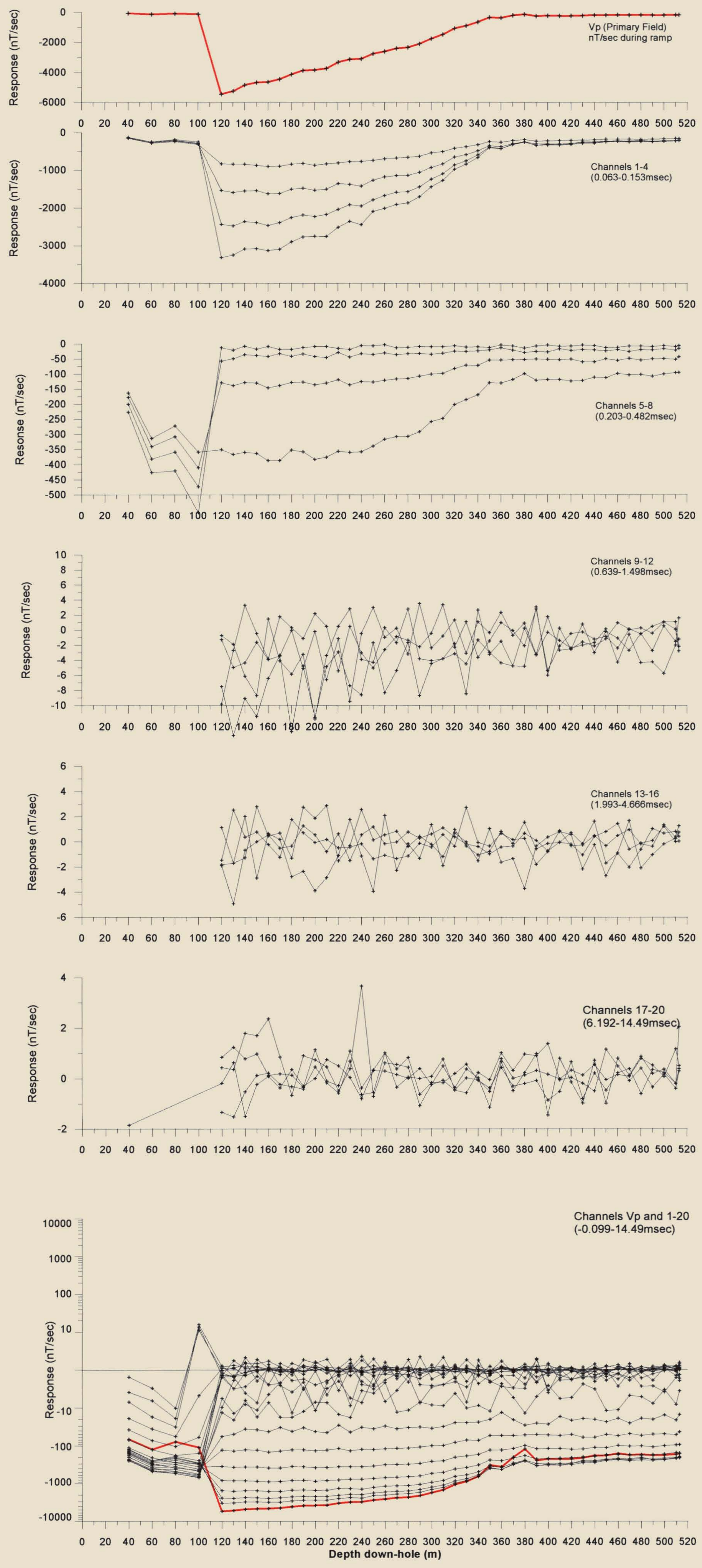


Figure 10

Compiled by C Dauth *Date November 1997*



417105

RGC Exploration

Basin Lake Project
Down-Hole EM Results
V Component
TYN13

Compiled by C Dauth *Date November 1997*

Hole Specifications

Hole Number: TYN13
Completed: June 1996
Collar Easting: 381018mE
Collar Northing: 5354389mN
RL: 550m
Inclination: 77 degrees
Azimuth: 090 degrees AMG
EOH: 511.5m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 400x400m
Current: 14A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

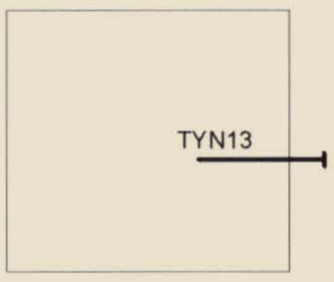
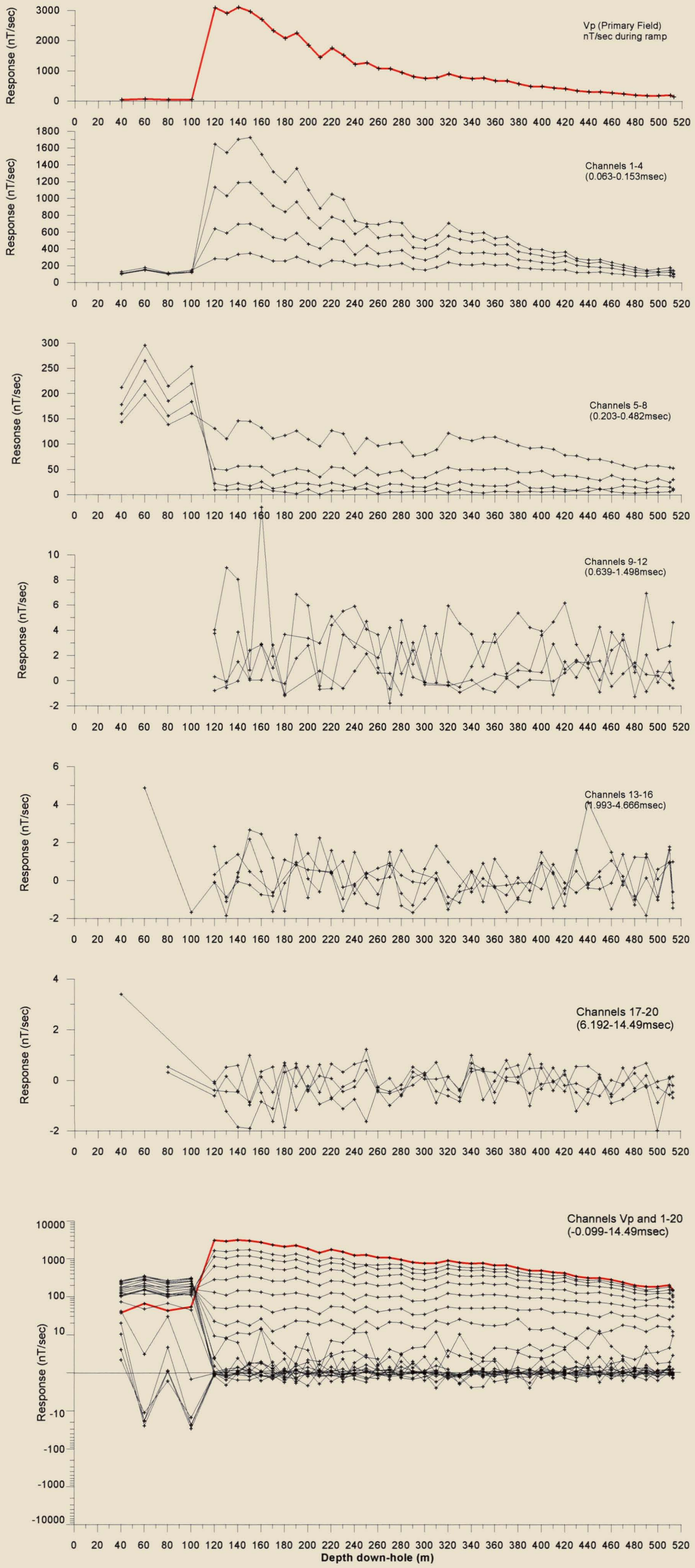


Figure 11



417106

RGC Exploration

Basin Lake Project
Down-Hole EM Results
U Component
TYN13

Compiled by C Dauth Date November 1997

Hole Specifications

Hole Number: TYN13
Completed: June 1996
Collar Easting: 381018mE
Collar Northing: 5354389mN
RL: 550m
Inclination: 77 degrees
Azimuth: 090 degrees AMG
EOH: 511.5m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 400x400m
Current: 14A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

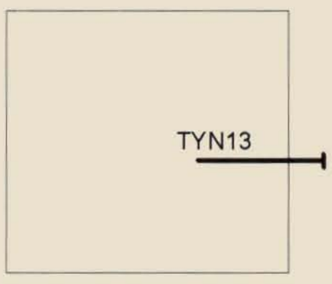
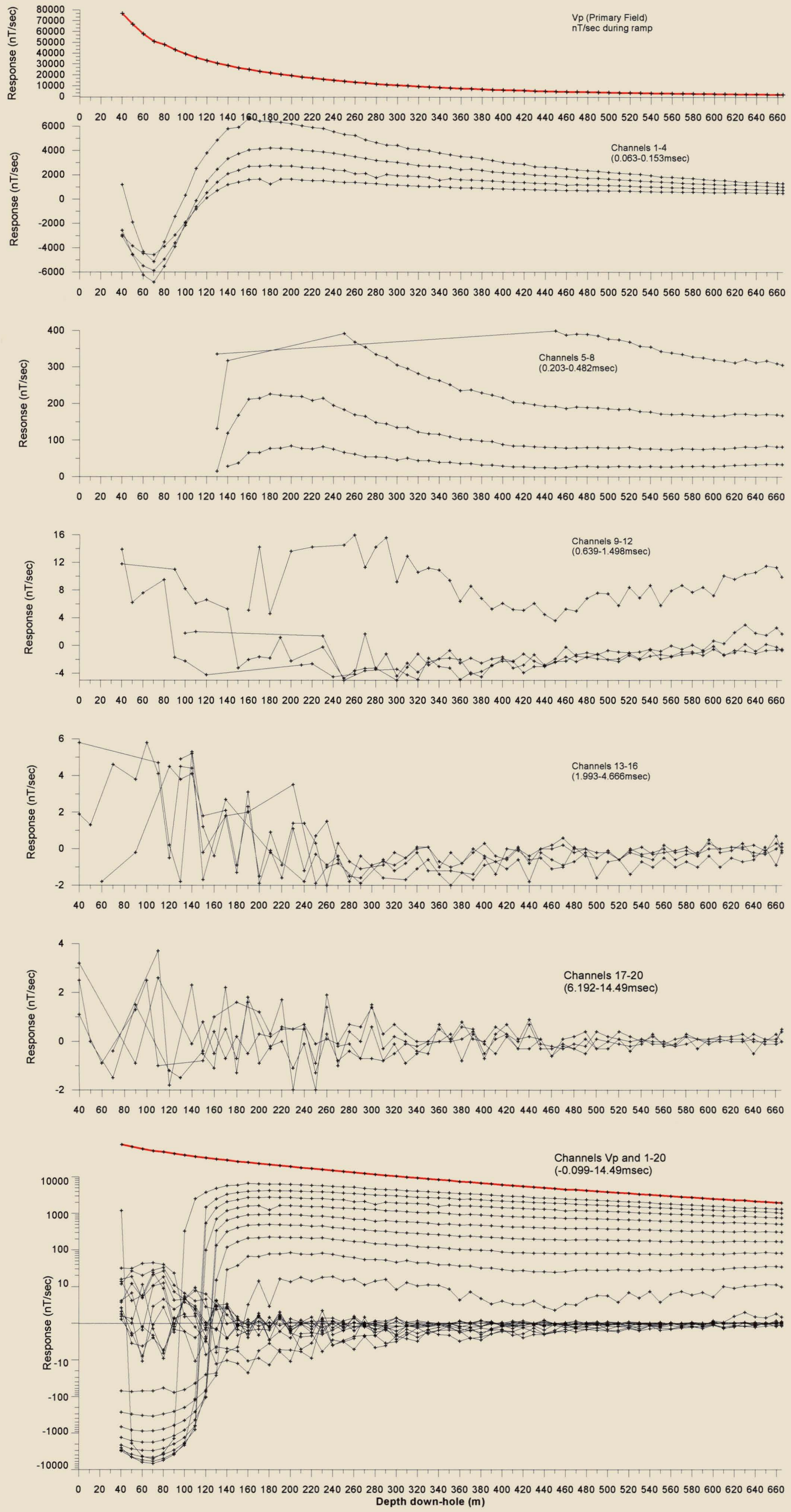


Figure 12



417107

RGC Exploration

Basin Lake Project
Down-Hole EM Results
Axial Component
TYN14

Compiled by C Dauth Date November 1997

Hole Specifications

Hole Number: TYN14
Completed: Sept 1996
Collar Easting: 380999mE
Collar Northing: 5353603mN
RL: 570m
Inclination: 87 degrees
Azimuth: 090 degrees AMG
EOH: 790.5m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 400x400m
Current: 14A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

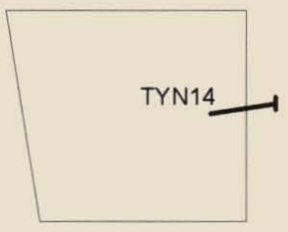
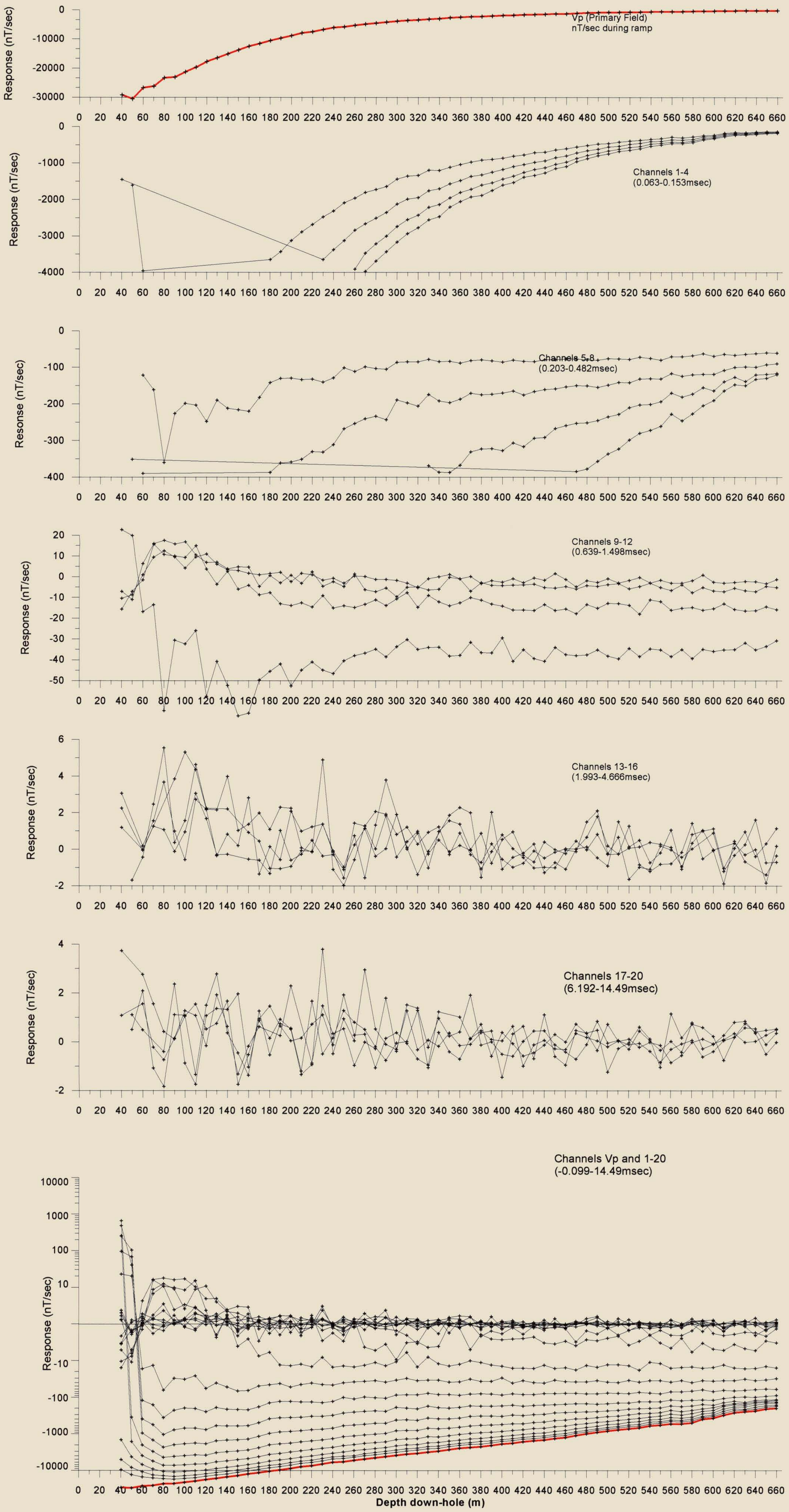


Figure 13



417108

RGC Exploration

Basin Lake Project
Down-Hole EM Results
V Component
TYN14

Compiled by C Dauth Date November 1997

Hole Specifications

Hole Number: TYN14
Completed: Sept 1996
Collar Easting: 380999mE
Collar Northing: 5353603mN
RL: 570m
Inclination: 87 degrees
Azimuth: 090 degrees AMG
EOH: 790.5m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 400x400m
Current: 14A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

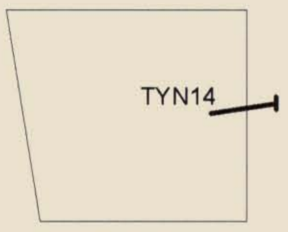
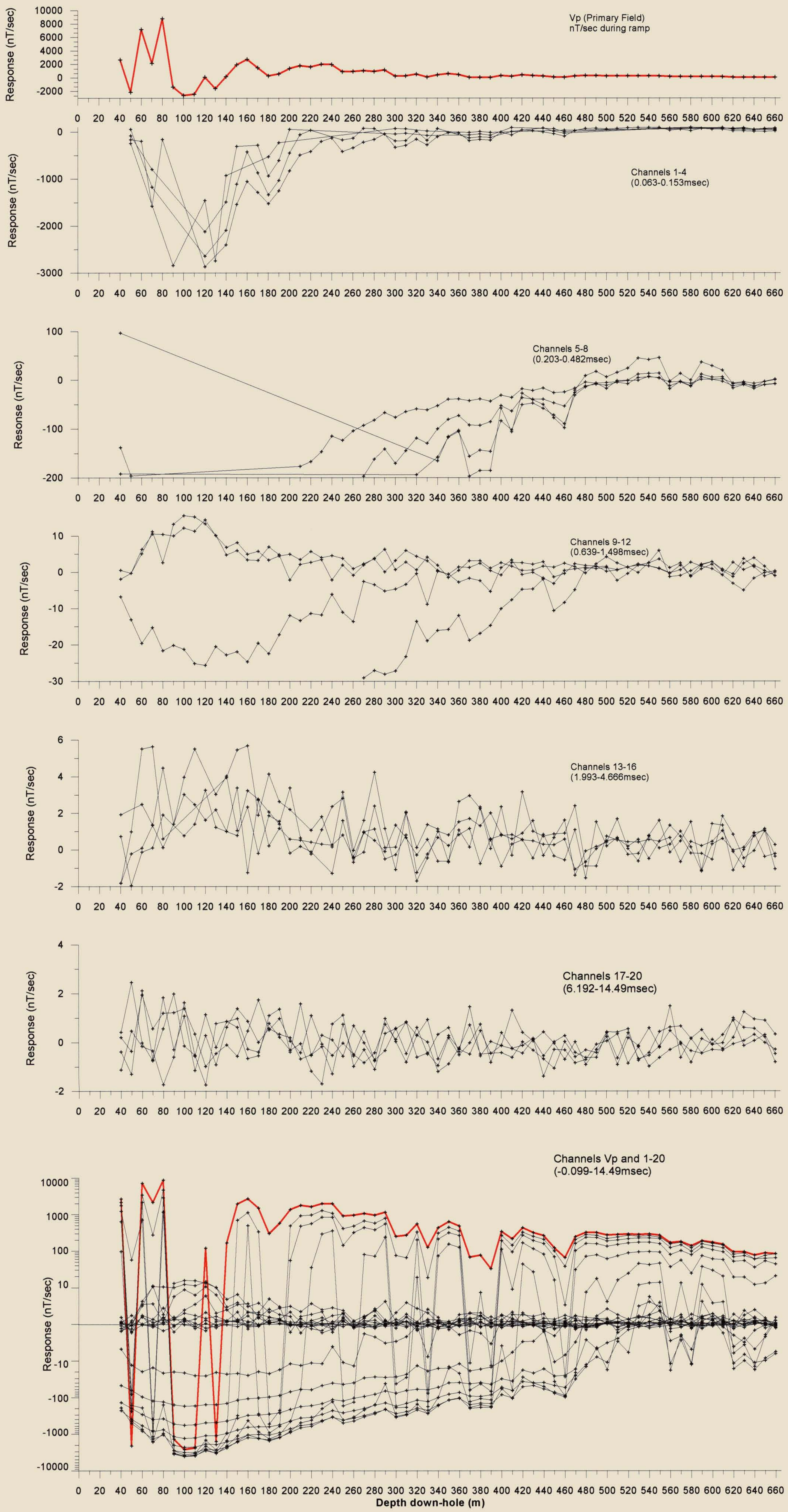


Figure 14



417109

RGC Exploration

Basin Lake Project
Down-Hole EM Results
U Component
TYN14

Compiled by C Dauth *Date November 1997*

Hole Specifications

Hole Number: TYN14
Completed: Sept 1996
Collar Easting: 380999mE
Collar Northing: 5353603mN
RL: 570m
Inclination: 87 degrees
Azimuth: 090 degrees AMG
EOH: 790.5m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 400x400m
Current: 14A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

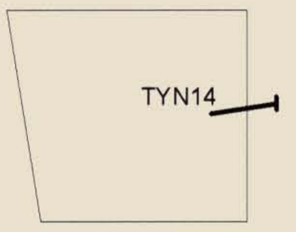
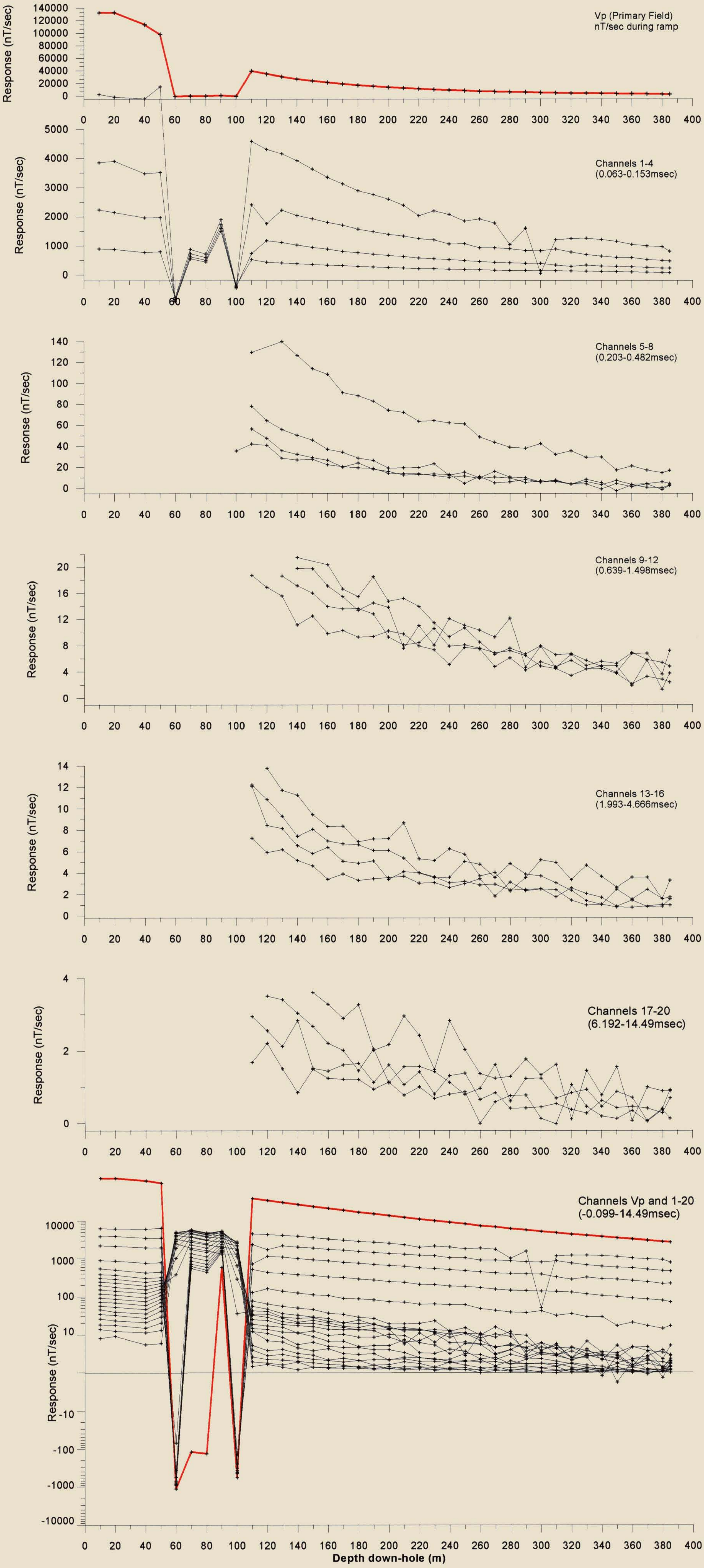


Figure 15



417110

RGC Exploration

Basin Lake Project
Down-Hole EM Results
Axial Component East Loop
BLD89-3

Compiled by C Dauth Date November 1997

Hole Specifications

Hole Number: BLD89-3
Completed: 1989
Collar Easting: 381140mE
Collar Northing: 5352760mN
RL: 660m
Inclination: 55 degrees
Azimuth: 090 degrees AMG
EOH: 388.4m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 200x300m
Current: 16A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

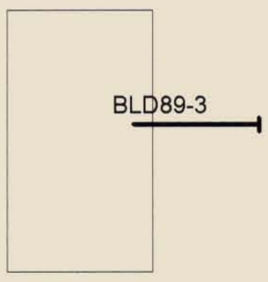
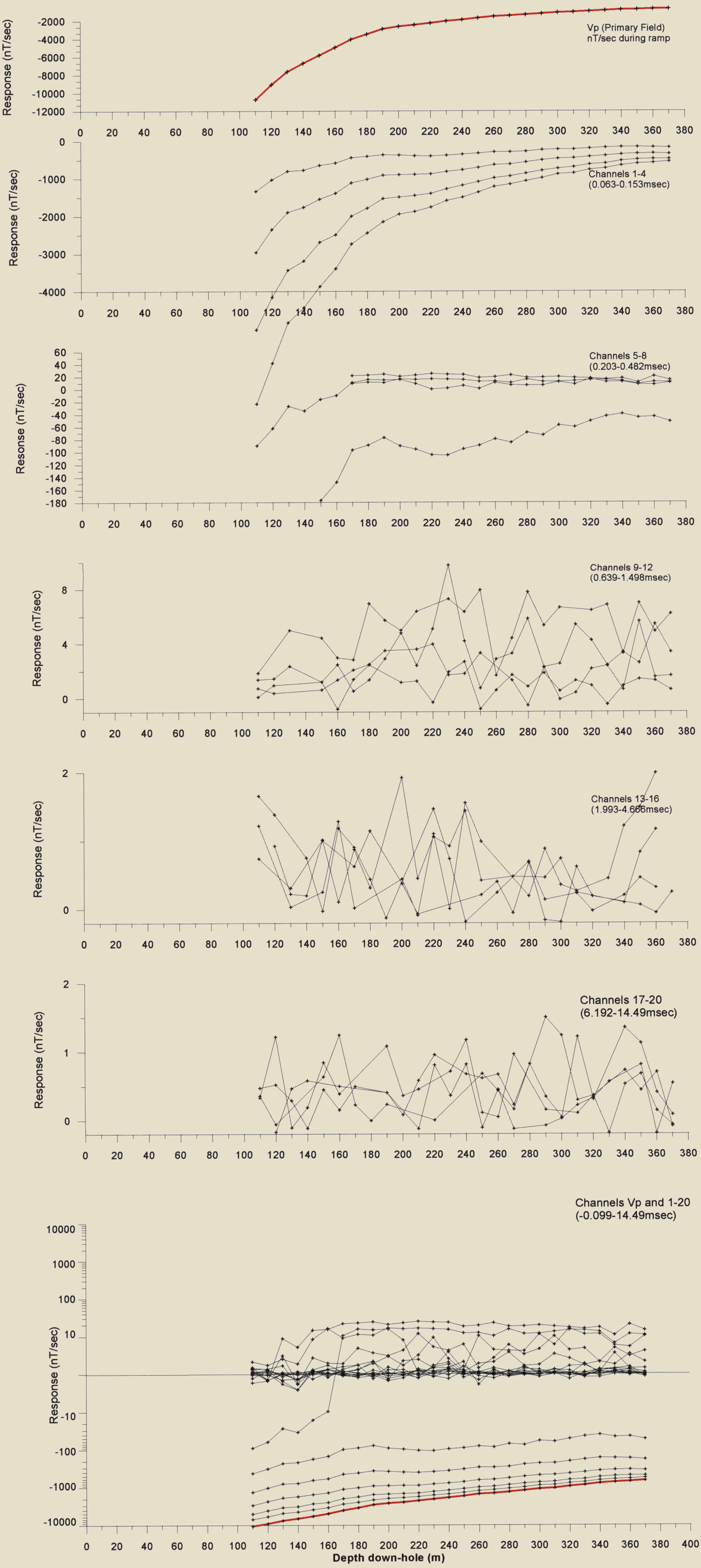


Figure 16



417111

RGC Exploration

Basin Lake Project
Down-Hole EM Results
V Component East Loop
BLD89-3

Compiled by C Dauth *Date November 1997*

Hole Specifications

Hole Number: BLD89-3
Completed: 1989
Collar Easting: 381140mE
Collar Northing: 5352760mN
RL: 660m
Inclination: 55 degrees
Azimuth: 090 degrees AMG
EOH: 388.4m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 200x300m
Current: 16A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

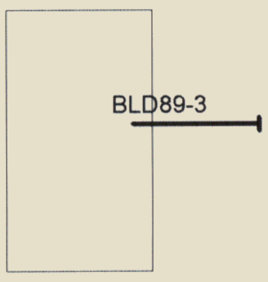
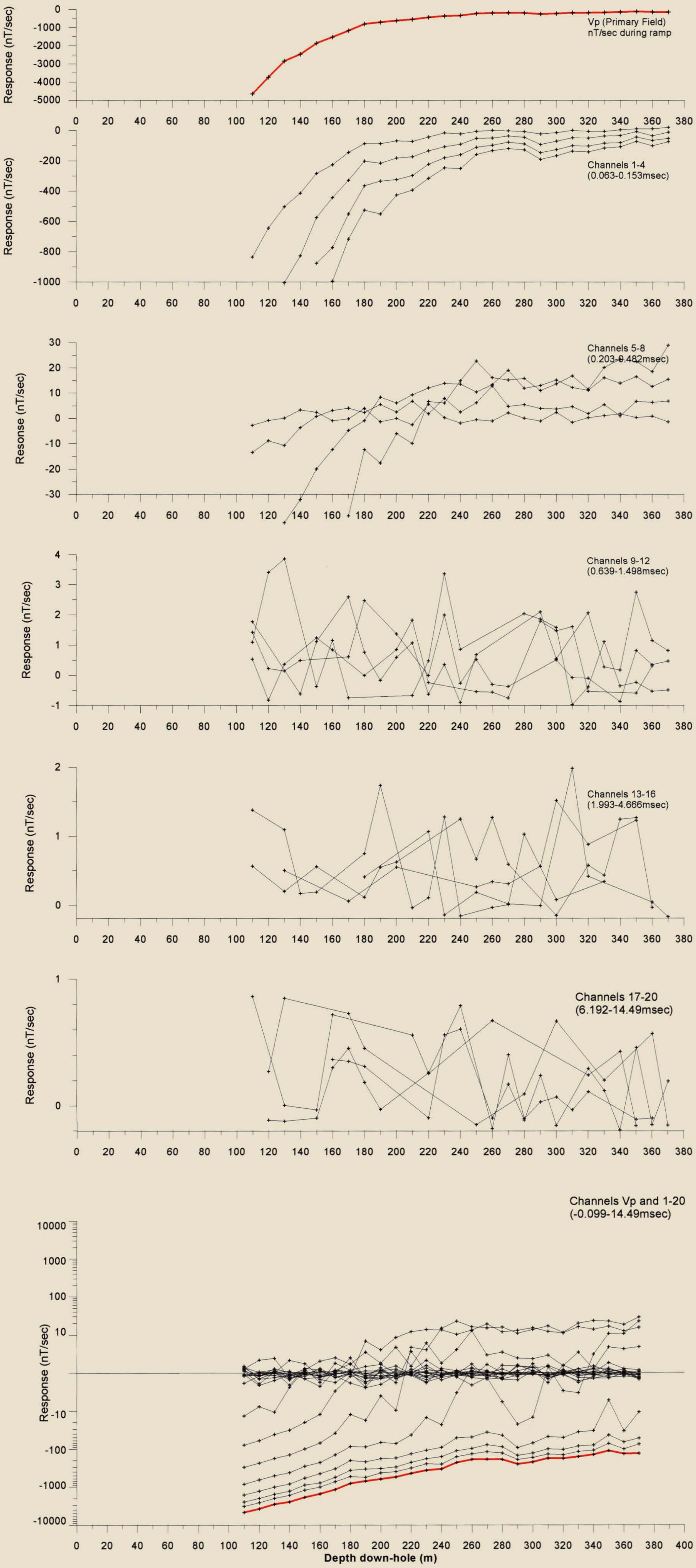


Figure 17



417112

RGC Exploration

Basin Lake Project
Down-Hole EM Results
U Component East Loop
BLD89-3

Compiled by C Dauth Date November 1997

Hole Specifications

Hole Number: BLD89-3
Completed: 1989
Collar Easting: 381140mE
Collar Northing: 5352760mN
RL: 660m
Inclination: 55 degrees
Azimuth: 090 degrees AMG
EOH: 388.4m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 200x300m
Current: 16A
Time Base: 20msec
Ramp Time: 1msec
Units: nT/sec
Current: 14A

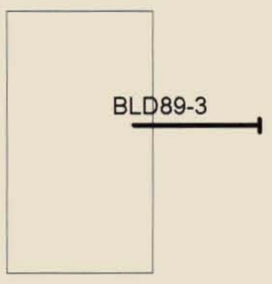
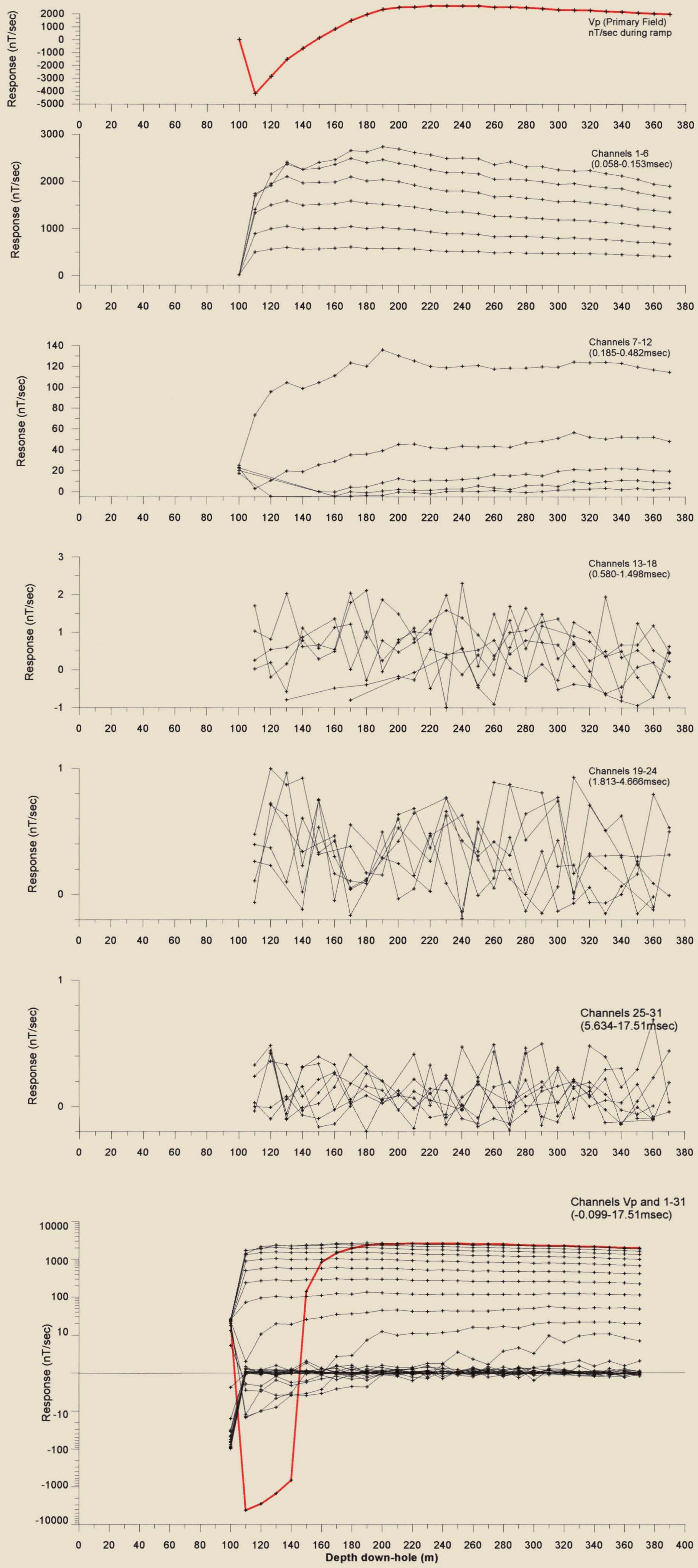


Figure 18



417113

RGC Exploration

Basin Lake Project
Down-Hole EM Results
Axial Component West Loop
BLD89-3

Compiled by C Dauth Date November 1997

Hole Specifications

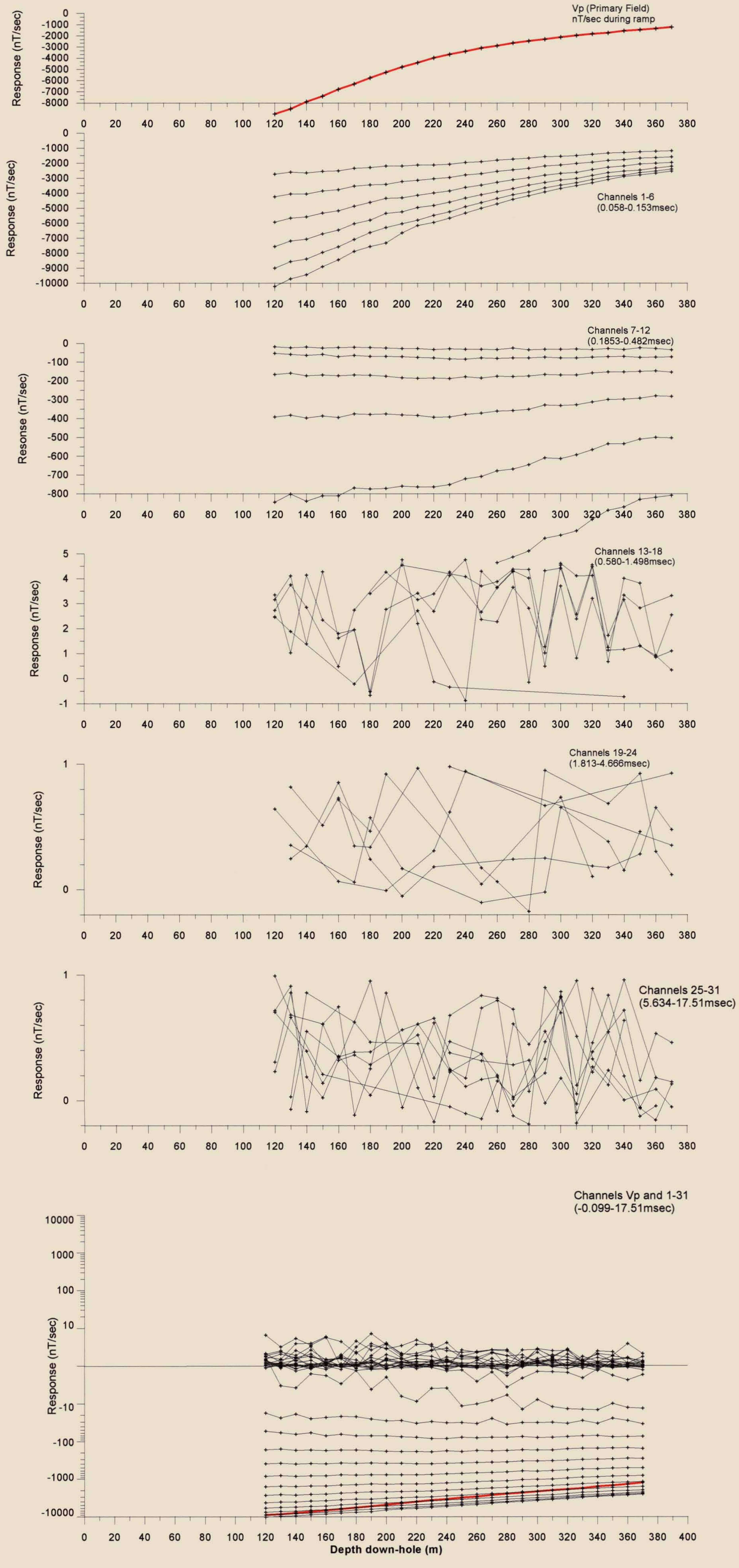
Hole Number: BLD89-3
Completed: 1989
Collar Easting: 381140mE
Collar Northing: 5352760mN
RL: 660m
Inclination: 55 degrees
Azimuth: 090 degrees AMG
EOH: 388.4m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 300x350m
Current: 16A
Time Base: 20msec
Ramp Time: 0.5msec
Units: nT/sec

BLD89-3

Figure 19



417114

RGC Exploration

Basin Lake Project
Down-Hole EM Results
V Component West Loop
BLD89-3

Hole Specifications

Hole Number: BLD89-3
Completed: 1989
Collar Easting: 381140mE
Collar Northing: 5352760mN
RL: 660m
Inclination: 55 degrees
Azimuth: 090 degrees AMG
EOH: 388.4m

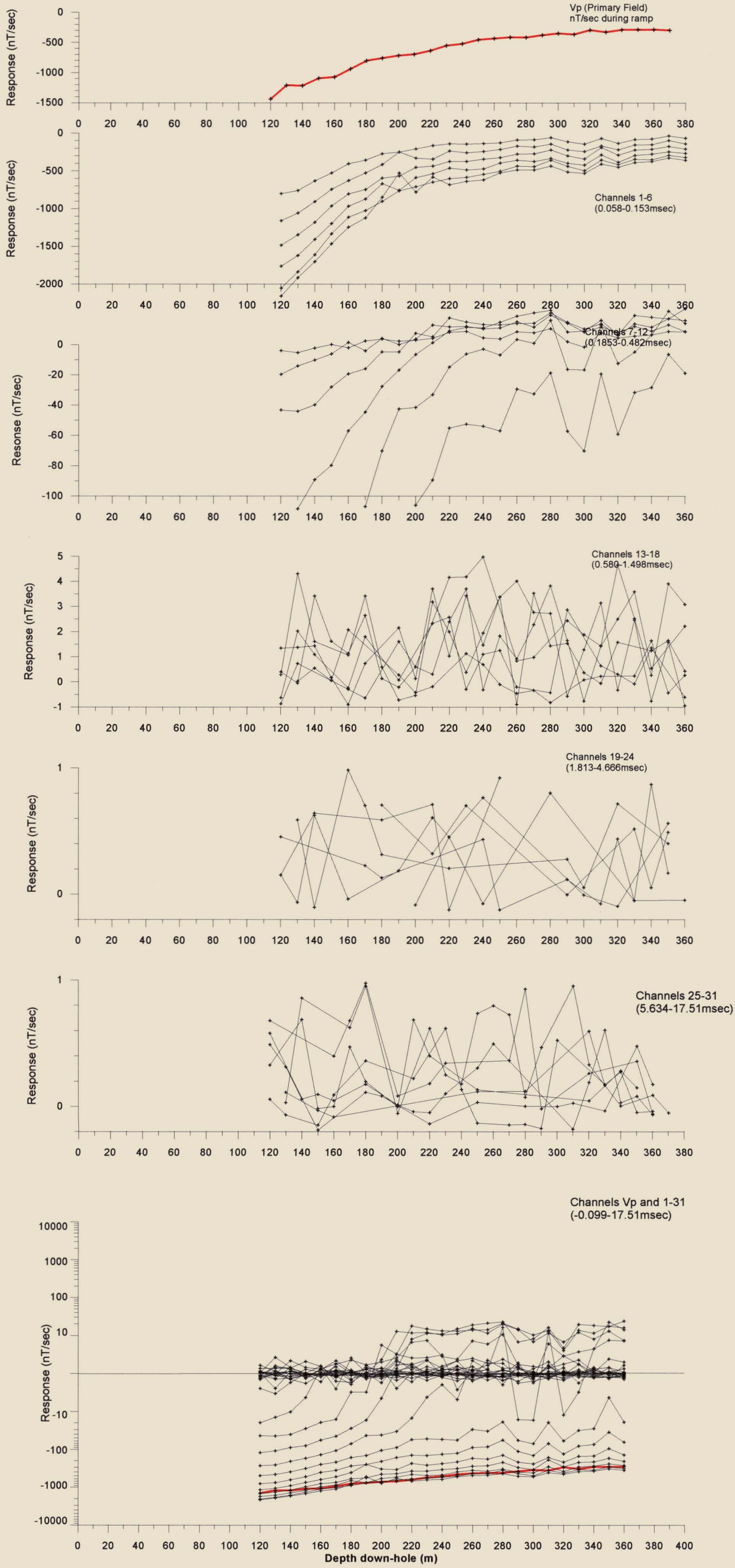
DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 300x350m
Current: 16A
Time Base: 20msec
Ramp Time: 0.5msec
Units: nT/sec

BLD89-3

Figure 20

Compiled by C Dauth   *Date November 1997*



417115

RGC Exploration

Basin Lake Project
Down-Hole EM Results
U Component West Loop
BLD89-3

Compiled by C Dauth *Date November 1997*

Hole Specifications

Hole Number: BLD89-3
Completed: 1989
Collar Easting: 381140mE
Collar Northing: 5352760mN
RL: 660m
Inclination: 55 degrees
Azimuth: 090 degrees AMG
EOH: 388.4m

DHEM Specifications

Contractor: OUTER RIM
Survey Date: Feb 1997
System: CRONE TEM 3 Component
Tx Loop Size: 300x350m
Current: 16A
Time Base: 20msec
Ramp Time: 0.5msec
Units: nT/sec

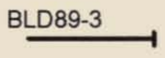
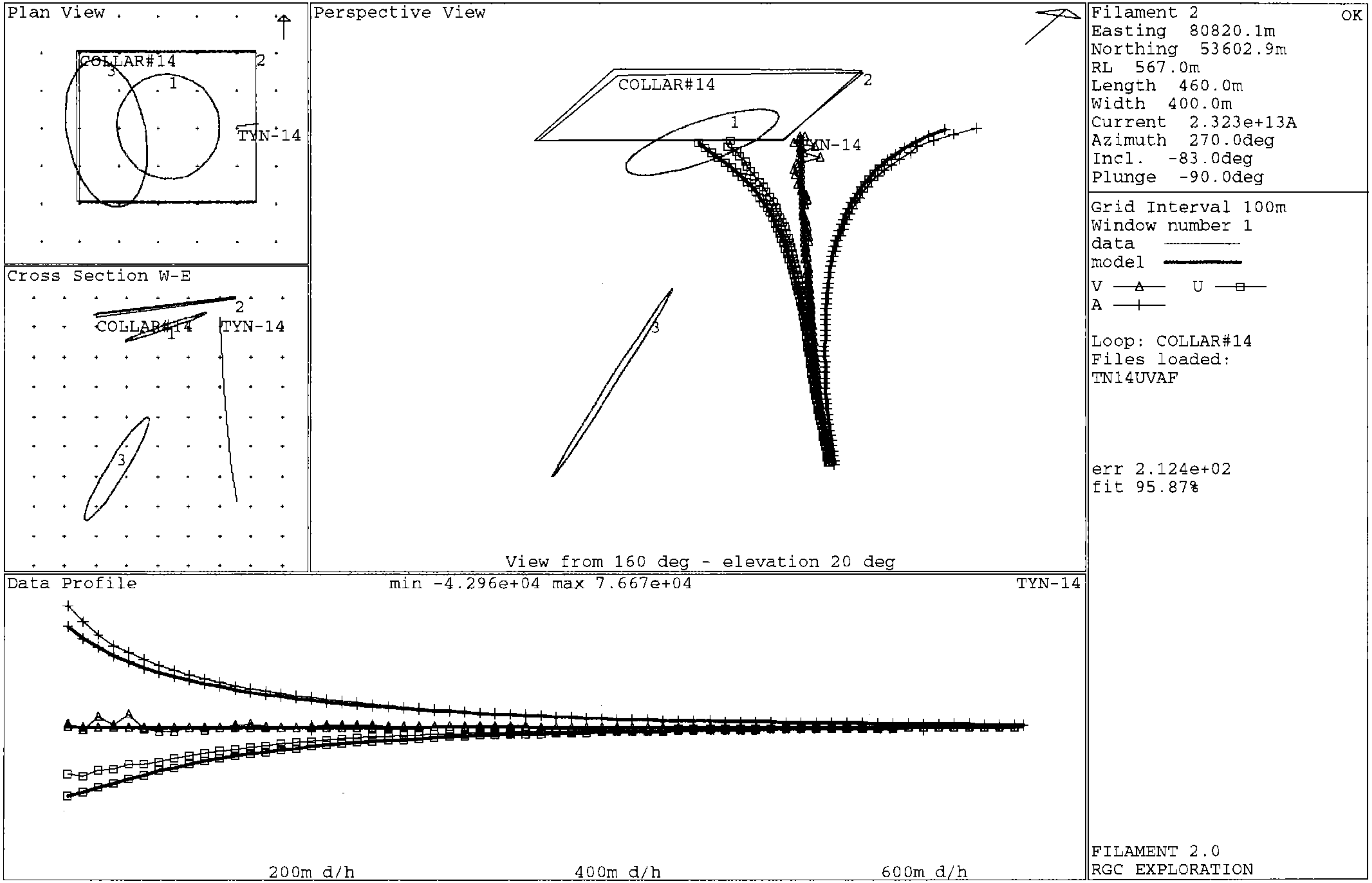


Figure 21



Filament 2
Easting 80820.1m
Northing 53602.9m
RL 567.0m
Length 460.0m
Width 400.0m
Current 2.323e+13A
Azimuth 270.0deg
Incl. -83.0deg
Plunge -90.0deg

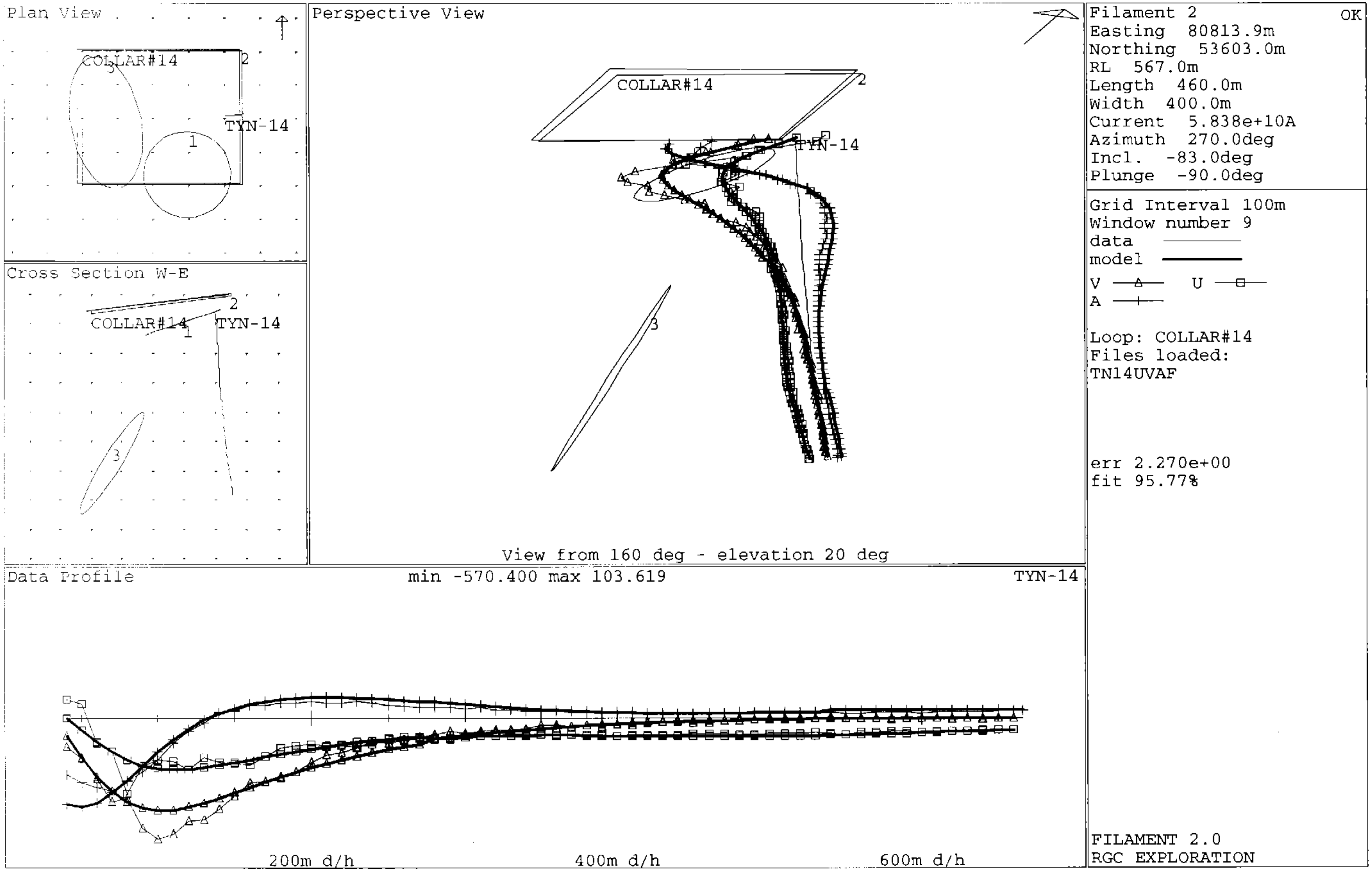
Grid Interval 100m
Window number 1

Loop: COLLAR#14
Files loaded:
TN14UVAF

err 2.124e+02
fit 95.87%

FILAMENT 2.0
RGC EXPLORATION

Figure 22. TYN14 Primary Field Model



Filament 2 OK
Easting 80813.9m
Northing 53603.0m
RL 567.0m
Length 460.0m
Width 400.0m
Current 5.838e+10A
Azimuth 270.0deg
Incl. -83.0deg
Plunge -90.0deg

Grid Interval 100m
Window number 9

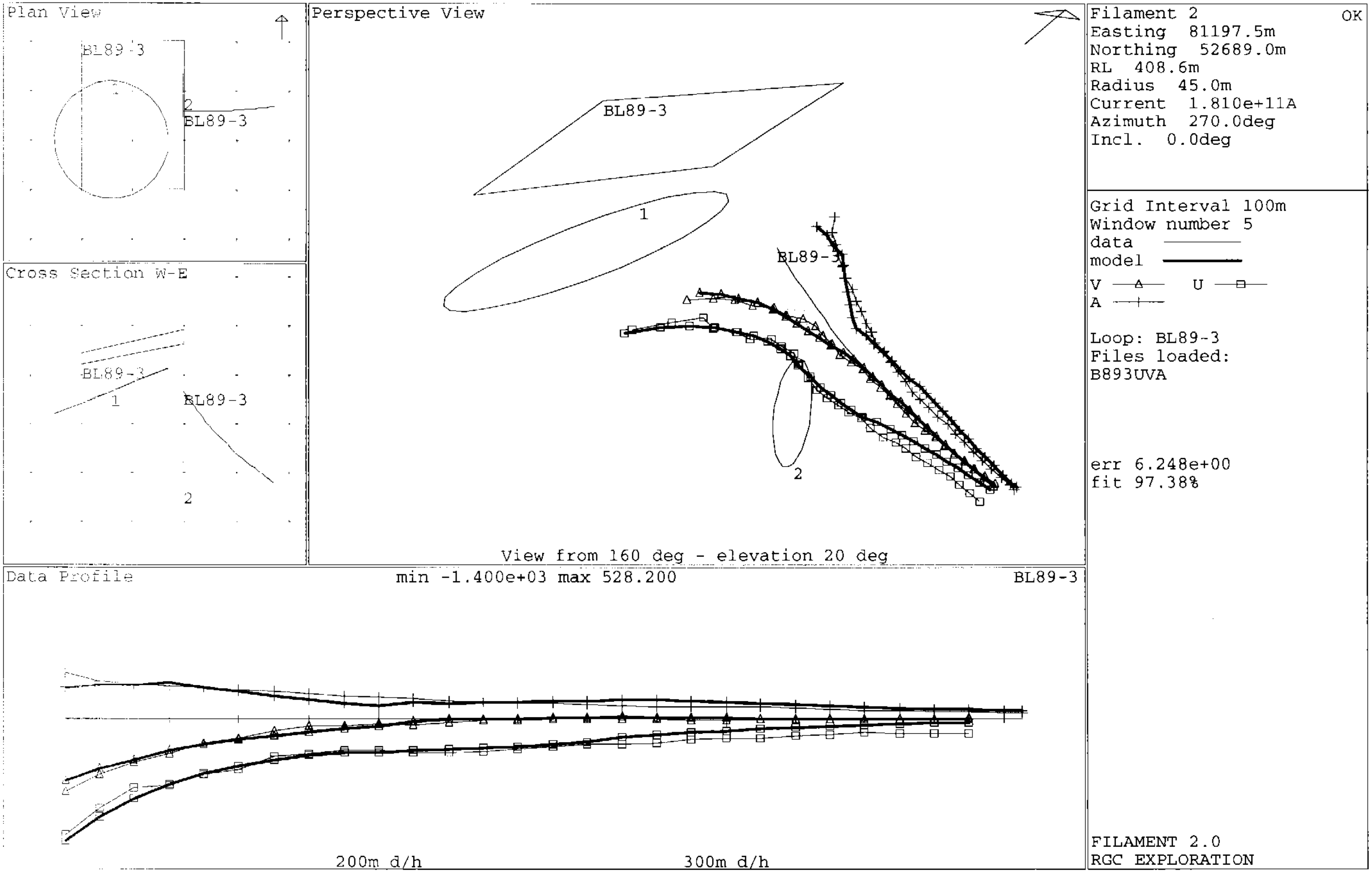
Loop: COLLAR#14
Files loaded:
TN14UVAF

err 2.270e+00
fit 95.77%

FILAMENT 2.0
RGC EXPLORATION

Figure 23. TYN14 Ch 8 (0.482msec)

417117



Filament 2 OK
Easting 81197.5m
Northing 52689.0m
RL 408.6m
Radius 45.0m
Current 1.810e+11A
Azimuth 270.0deg
Incl. 0.0deg

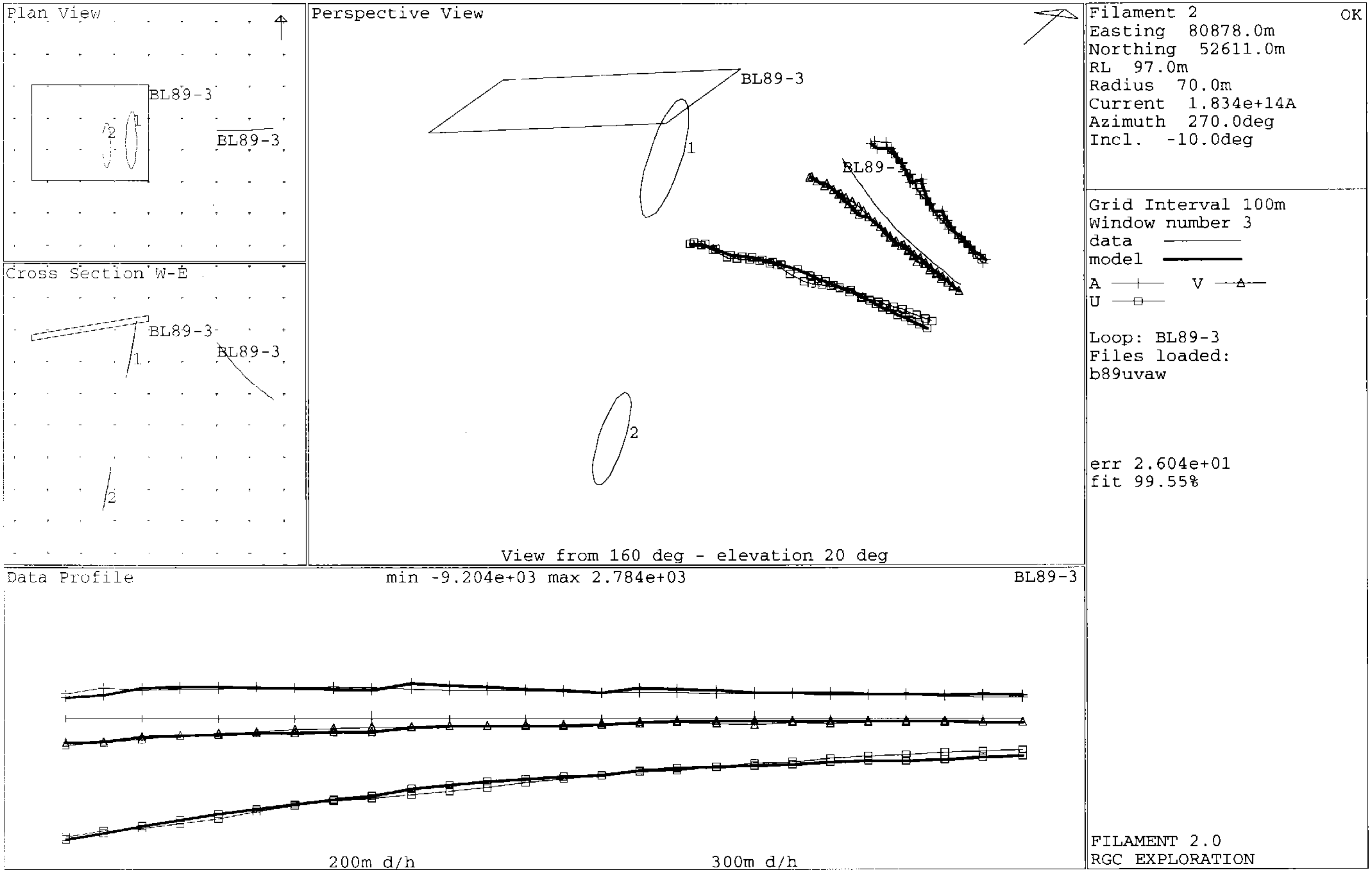
Grid Interval 100m
Window number 5
data
model
V U
A

Loop: BL89-3
Files loaded:
B893UVA

err 6.248e+00
fit 97.38%

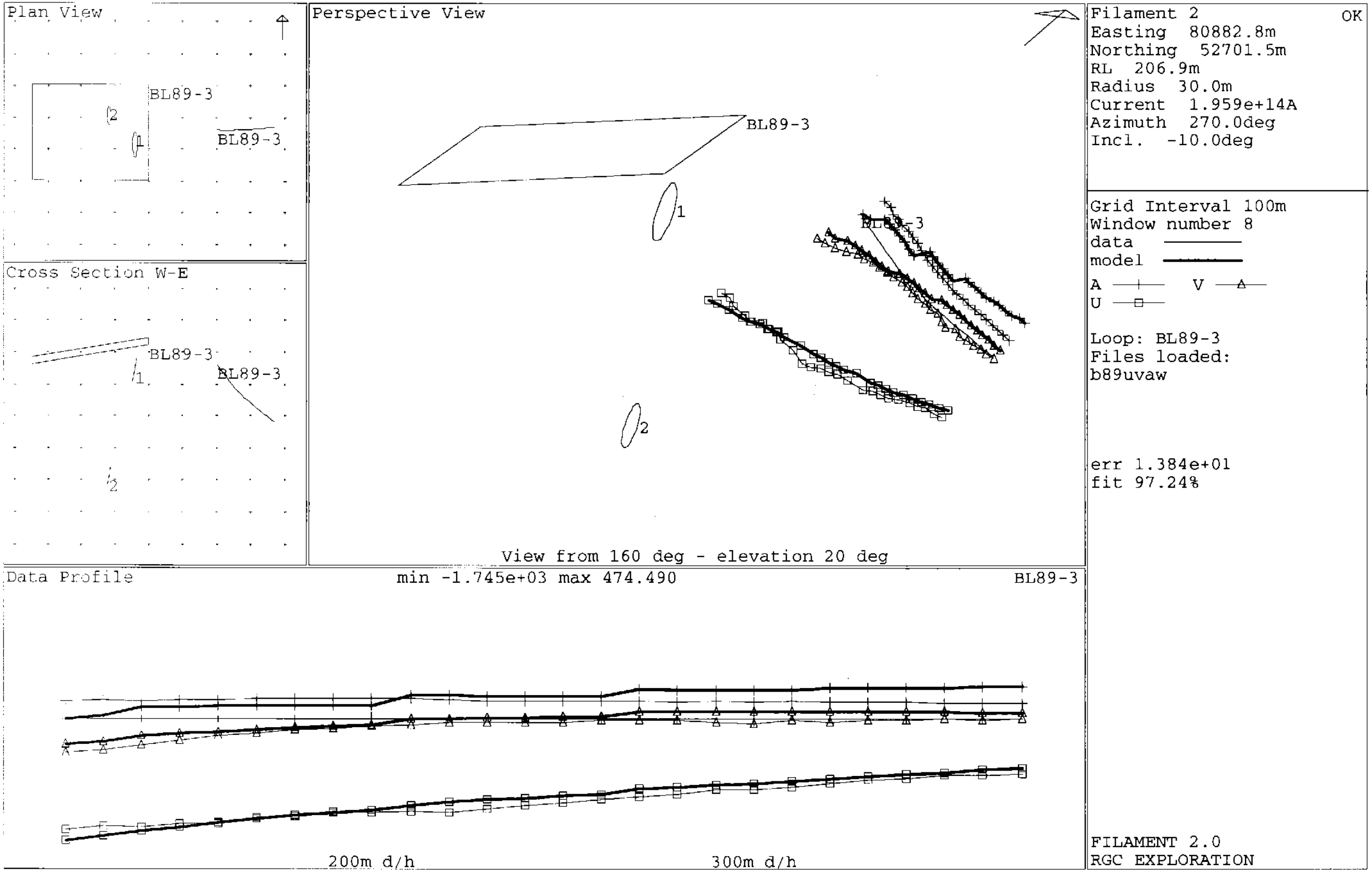
FILAMENT 2.0
RGC EXPLORATION

Figure 24. BLD89-3 East Loop Ch 4 (0.153msec)



```
Filament 2                OK
Easting  80878.0m
Northing  52611.0m
RL  97.0m
Radius  70.0m
Current  1.834e+14A
Azimuth  270.0deg
Incl.  -10.0deg

Grid Interval 100m
Window number 3

Loop: BL89-3
Files loaded:
b89uvaw

err 2.604e+01
fit 99.55%

FILAMENT 2.0
RGC EXPLORATION
```

Figure 25. BLD89-3 West Loop Ch 2 (0.072msec)



Filament 2
Easting 80882.8m
Northing 52701.5m
RL 206.9m
Radius 30.0m
Current 1.959e+14A
Azimuth 270.0deg
Incl. -10.0deg

Grid Interval 100m
Window number 8

Loop: BL89-3
Files loaded:
b89uvaw

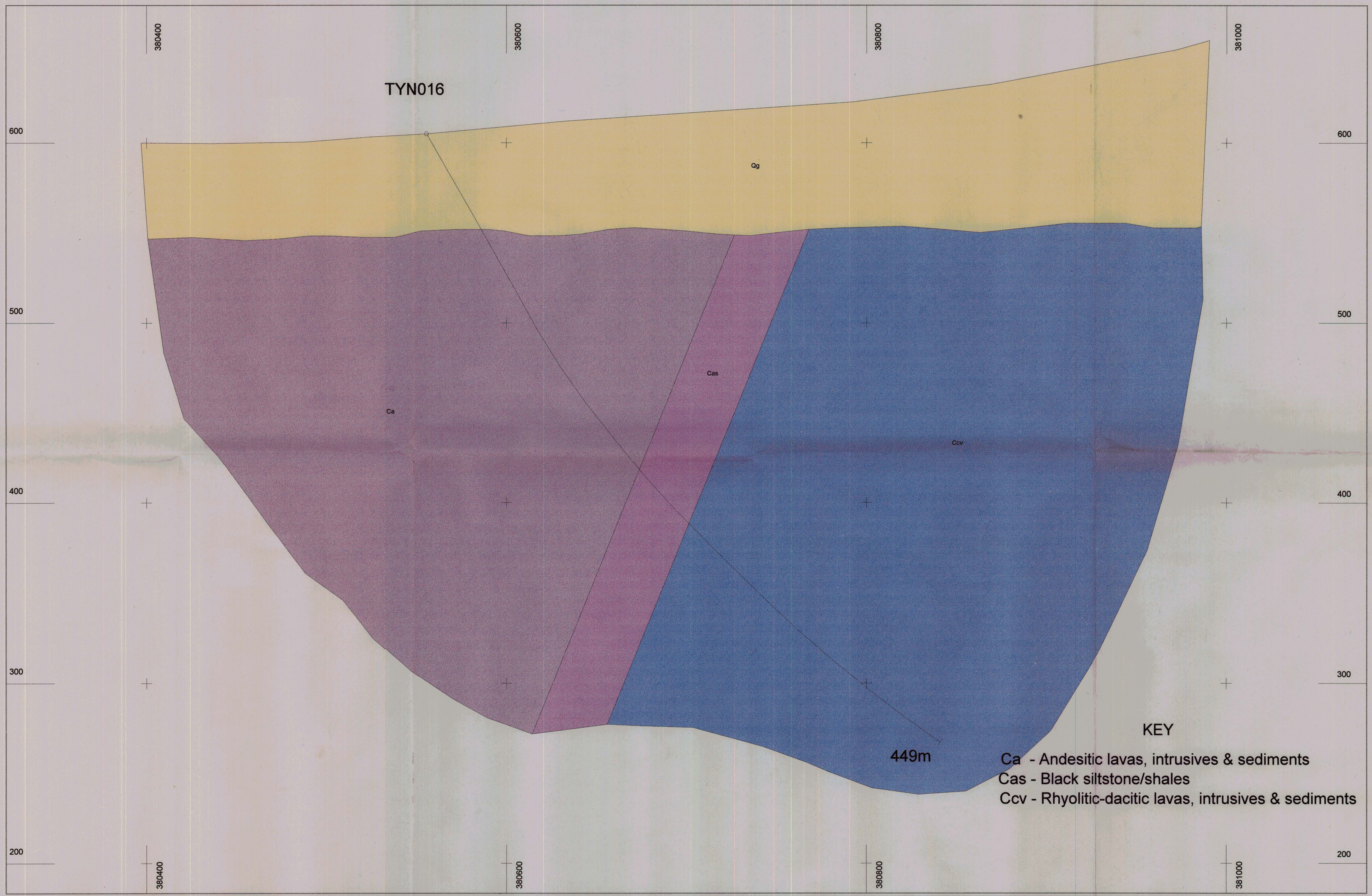
err 1.384e+01
fit 97.24%

FILAMENT 2.0
RGC EXPLORATION

Figure 26. BLD89-3 West Loop Ch 7 (0.185msec)

417120

PLANS



5 cm

Scale
1:1000

DATE
01/12/97

SHEET
1 of 1

FILE :

TYN016 Drill Hole Plan

Section along 5351670 mN

417122