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98-4175

FINAL REPORT - EL 103/87
BASIN LAKE - RESOLUTE LTD
G MACDONALD/J IKSTRUMS

EL103/87

See folio 7

"Basin Lake" - EL 103/87
Final report
May 1997 - May 1998

RESOLUTE LIMITED
(ACN 009 069 014)

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G MACDONALD/J IKSTRUMS

Grant MacDonald &
John Ikstrums, March 1998

1.0 SUMMARY

EL 103/87 "Basin Lake" in central western Tasmania covers 3 - 5 kilometres of strike of the Mt Read Volcanics, host to world class polymetallic massive sulphides at Rosebery and Hellyer and stringer and disseminated copper at Mt Lyell.

This report is the final for the licence which has reached its tenth year. At this point in time the EL is subject to a joint venture between Resolute (manager), Acacia and Aberfoyle.

The rocks in the licence are from west to east, Yolande River Sequence felsic tuffaceous sediments, Central Volcanic Complex pumice breccia, Anthony Road Andesite coherent andesite and andesitic +/-limestone volcaniclastics overlain by Lynchford Member (Comstock Formation) shales, volcaniclastics and basaltic andesite. Alteration occurs at Bradshaws Road and Leech Hill deeper in the sequence as well as the Langdon Pyrite Zone with its alteration in BL4 and BL5.

Previous exploration has prediminantly targetted stratiform massive sulphide deposits. This exploration has been quite extensive to a depth of ~200 metres. There are no targets other than the upper contact of the Leech Hill alteration or the anomalous copper associated with the Pyrite Corner Fault.

Three shallow diamond drill holes (total 170.5 metres) were drilled in a fence across a 0.3% Cu in a C-horizon soil sample. The central hole LHD-1 intersected 5 metres of pyrite veining in sericite+chlorite+silica altered andesite. Assays whilst elevated are disappointing. No further work is recommended on this target.

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2.0 INTRODUCTION

2.1 Tenure

Resolute Limited entered into a joint venture with Acacia Metals Pty Ltd and Aberfoyle Resources Limited on the 11th of July 1997. Resolute bought Aberfoyles 56.7% share of the existing 1991 joint venture between Aberfoyle and Acacia, with Aberfoyle retaining a 3% net profit royalty. Resolute committed to a level of exploration expenditure with diamond drilling a necessary component. The licence is due for final relinquishment on 21st April 1998.

2.2 Location and Access

EL 103/87 lies approximately mid-way between Queenstown and Tullah on Tasmania's west coast. It is accessible by the bitumen Anthony Road joining these two towns. Access within the licence area is limited. Access along the very eastern side of the EL is provided by the track running beneath the HEC's powerline. The old Howards Road which parallels the Anthony Road (to the latter's west) has been 'rehabilitated' with generally poorly spread out heaps of gravel and peat. The road base remains.

A number of gravel tracks meander into the centre of the EL from the Anthony Road though the track shown on the 1:25 000 sheet crossing Leech Hill has been rehabilitating itself for the last 25 years over Leech Hill itself and beyond.

The licence has been covered by a number of grids over the last 30 years. Aberfoyles 200 metre spaced AMG east-west and co-ordinated grid is still generally open and provides access throughout the licence. Older grids remain open in parts but are generally unreliable. There are also a number of loop lines and access walking tracks. Resolute cut three small drill sites within rainforest on the eastern side of Leech Hill as well as a ~70 metres of new track joining the three sites.

2.3 Land Usage

The licence area consists of Crown Land and an area vested in the H.E.C. Both land uses come under the Mines Act i.e. are open for exploration. The land vested in the H.E.C. is largely around the high tension powerlines and their service track. It is believed that the area of the HEC's proposed Lake Langdon has reverted to Crown Land though this should be confirmed.

2.4 Topography and Vegetation

E.L. 103/87 "Basin Lake" lies along the peneplain between the Tyndall range rising along the eastern side of the licence and the 300 metre deep Henty Gorge to the west. In the south-central part of the licence the Langdon River is beginning to carve out its gorge which lies south of the EL.

The area of this peneplain largely covered by low heath (buttongrass±tea tree) or taller tea-tree in the lower areas and rainforest in the higher areas and low heath on the flanks of the Tyndall Range.

The soil is generally black and peaty, often with gravel at the base and is acidic and reducing.

3.0 EXPLORATION PHILOSOPHY

Resolute's intention in entering into the Basin Lake joint venture was to apply its knowledge of the belt of volcanics which strike though Basin Lake. In particular Resolute was interested in tracing the Henty-Comstock horizon through the licence. This time-stratigraphic horizon is believed to represent the time in the construction of the Mt Read Volcanics during which the high grade gold deposit at Henty and the vast Mt Lyell copper-gold deposit (with associated small but high grade massive sulphides at Comstock) were formed principally by V.H.M.S. type hydrothermal fluids in the footwall to the seafloor.

The evidence that the sea depth along this part of the belt may have been shallow (shallow marine fossils in the Lynchford Member, Comstock Formation limestones) and the empirical evidence from Mt Lyell indicate the potential of the rocks in the footwall to the sea floor with boiling fluids potentially depositing economic mineralisation (gold, copper) in veins, stringers or disseminations. "Basin Lake" contains a number of occurrences of alteration which may be related to structures active during those times when gold may have been introduced (or concentrated) at Henty.

The north-western corner of the licence may contain some strike length of the horizon on which high grade massive sulphide clasts outcrop in the spillway to the Lake Newton dam. There is some possibility that this horizon is a correlate of the Rosebery-Hercules host sequence.

Resolute recognises that large massive sulphide deposits shallower than 200 metres or so (i.e. conductive/chargeable deposits within the range of surface EM/IP) should have been discovered prior to today and that future discoveries will probably lie deeper than this depth and beyond the reach of surface techniques such as soil sampling and ground geophysical techniques (however EM does not sterilise ground to 200 metres, just locate the more obvious conductive deposits). Future discoveries will require a commitment to drill deeper holes based largely on geology with support from deeper seeing geophysical methods, particularly gravity and quality aeromagnetic data. Intersection of alteration/mineralisation may help provide vectors to orebodies.

Gold (+/- copper) mineralisation in syn-volcanic structures should have an associated soil geochemical anomaly (base metals, arsenic, bismuth, gold etc. but spiky data given the chemistry of typical west coast 'peat') and/or I.P. chargeability anomaly (at short dipole spacings). The orientation of most geophysical surveys to date have not been optimal for locating mineralisation in such structures (if indeed such structures exist in Basin Lake).

4.0 GEOLOGY

4.1 Regional Geology

Around 600 Ma attenuation and eventual rifting of continental crust resulted in the formation of a thinned passive continental margin. This passive margin collided with an oceanic arc in the late Early to early Middle Cambrian with major slices of for-arc mafic/ultramafic complexes thrust westwards over Tasmania.

This thrusting locked the plate boundary. Continued compression resulted in the formation of half grabens (relaxation rifts) of which the Dundas Trough (in which the main belt of the Mt Read Volcanics lies) is the main one. The Henty and Great Lyell Faults are bounding faults to this trough.

Initial sedimentation into the Dundas Trough was derived from Proterozoic crystalline crust on the eastern side (Sticht Range Beds) and the mafic/ultramafic complexes and passive margin to the west. This sedimentation was followed by and continued coincidentally (as the Western volcano-sedimentary complexes) with the eruption of the Mt Read Volcanics along the eastern side of the Dundas Trough.

Initial volcanism was predominantly felsic with the predominantly feldspar phyric Central Volcanic Complex (host to the Rosebery, Hercules and Mt Lyell deposits) the major unit whilst the predominantly quartz-feldspar phyric Eastern Quartz-phyric sequence erupted to the east against against the Sticht Range Beds. It is possible that the Rosebery and Hercules deposits lie along a time-stratigraphic horizon near the top of the Central Volcanic Complex correlatable with our (lower) Spillway Horizon

This was followed by andesitic-basaltic volcanism with major units being the Que-Hellyer Volcanics (host to the Hellyer and Que River deposits), the Anthony Road Andesite (within EL 103/87) and a correlate at Comstock (at Mt Lyell).

The final phase of volcanism was felsic with the eruption of the Tyndall Group and correlates to the north.

Mineralisation at Mt Lyell, a footwall stringer style of chalcopyrite-pyrite mineralisation, was formed at the time when the contact between the andesitic-basaltic volcanics and the Tyndall Group was the sea-floor. This is the same horizon on which the Henty gold deposit lies (as the product of intense V.M.S. type footwall alteration. This horizon is referred to as the Henty-Comstock Horizon. It is possible that this horizon is that on which the Hellyer and Que River deposits lie.

Coeval with the deposition of these dominantly volcanic sequences was the deposition of the Western volcano-sedimentary sequences in the western half of the Dundas Trough. These sediments are of mixed volcanic and metamorphic provenance.

The eruption of the Mt Read Volcanics was followed by a phase of compression in the late Cambrian in which major faults were reactivated as reverse faults (e.g. Henty Fault) and new faults were activated (e.g. Rosebery Fault).

The other period of geological history of significance to mineralisation in western Tasmania was the Middle Devonian Tabberrabberran Orogeny in which major faults in western Tasmania (e.g. Henty) were reactivated with sinistral strike-slip movement. The syn- to post- kinematic granitoids associated with this orogeny produced the considerable skarn, greisen and vein style tin deposits (e.g. Renison, Mt Bischoff, Cleveland, King Island) as well as numerous more minor base metal and gold veins.

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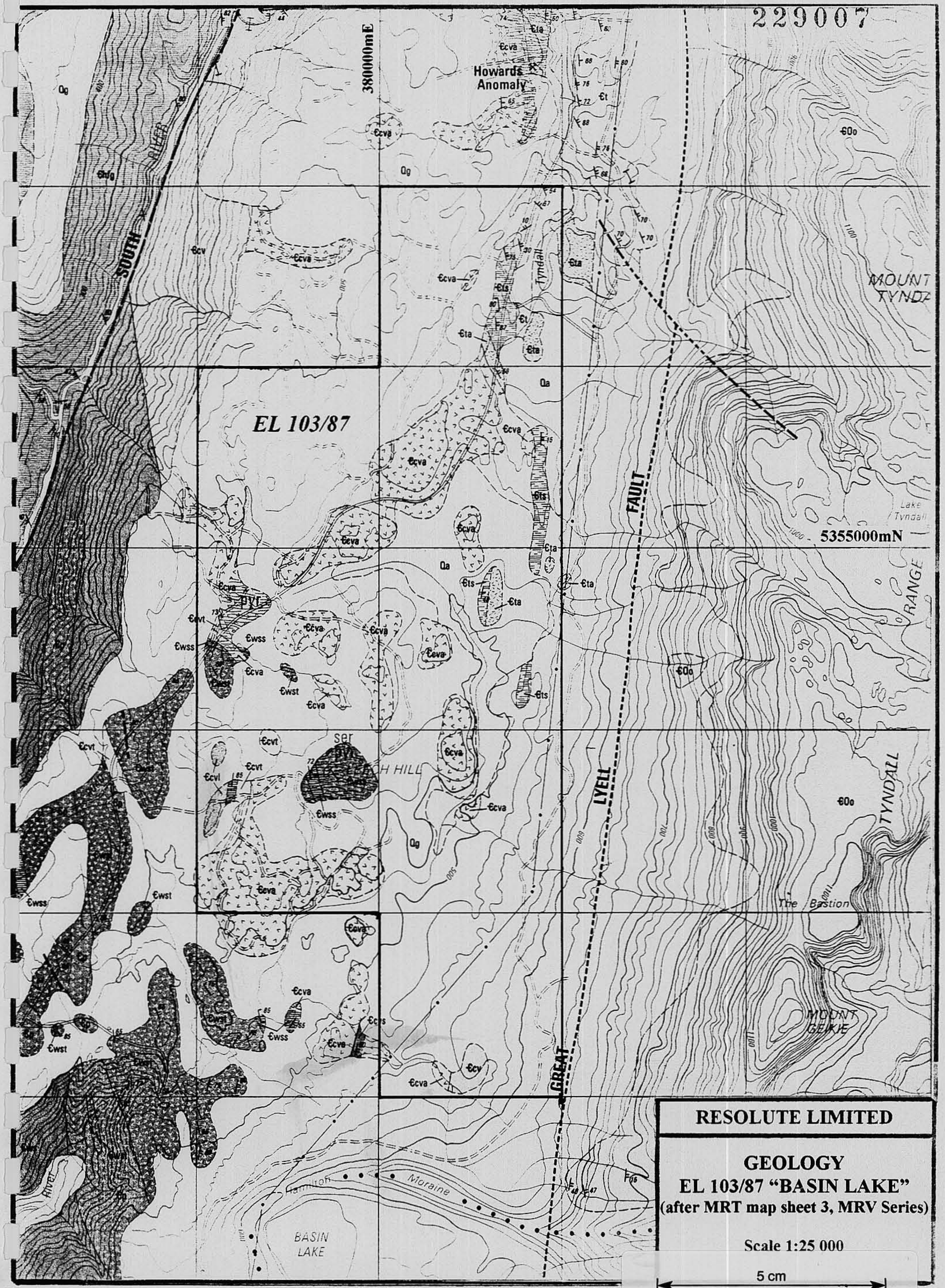


RESOLUTE LIMITED

GEOLOGY
EL 103/87 "BASIN LAKE"
(after MRT map sheet 3, MRV Series)

Scale 1:25 000

5 cm

4.2 Geology of Basin Lake

4.2.1 Introduction

15km's of diamond core from holes over 1000 metres deep and numerous road and canal cuts provide excellent exposure of the sequence immediately north of Basin Lake at South Henty allowing Resolute to gain a reasonably good understanding of the geology there. Basin Lake itself has a more modest 6819.8 metres with lesser outcrop also.

Most core was relogged with some reconnaissance mapping also done as part of Resolutes work this year. These logs are included in appendix A. A more comprehensive reinterpretation of the geology was not attempted as such work would have required the incorporation of the geophysical data i.e. aeromagnetics and gravity as well as the electrical geophysical surveys (IP, EM, CSAMT). This data was appraised but no plans were drafted.

The geology of the licence is discussed with reference to this relogging/check mapping and some reference to previous mapping (particularly Aberfoyle's Interpretative Geology at 1:5000 on sheet BL6 in Lewis, 1995).

Much of the eastern part of the licence is covered with glacials and alluvials. In areas with no outcrop some reliance is placed on “wacker” C-horizon soil chips.

4.2.2 Yolande River Sequence

The oldest unit outcropping in the licence area is the Yolande River Sequence in the far western part. This unit of volcaniclastic sandstones and siltstones of felsic provenance outcrops along the Anthony Road just north of Lake Langdon and is intersected in TYN2 where it is logged by A Jones (unpublished notes) as a sequence of graded beds of feldspathic pumiceous volcaniclastics, sandstones, siltstones and mudstones of metres to tens of metres thickness, facing eastwards. It is locally folded in outcrop but is predominantly moderately to steeply east dipping. A brief inspection of the TYN2 core confirms the similarity between these sediments and those which underlie the footwall pumice breccia unit further north on South Henty.

4.2.3 Footwall Pumice Breccia

In TYN2 this essentially unaltered Yolande River Sequence is overlain by a unit of feldpsar phyric pumice breccia, also essentially unaltered. The pumice breccia contains rare (~0.5-1/m) pale cherty clasts to ~25mm diameter. Similar clasts are seen in pumice breccia outcropping in the spillway to the Newton Dam on South Henty in the same stratigraphic position with respect to the Yolande River Sequence. Rod Allen speculates that these rocks are correlates of the rocks in the immediate footwall to the Rosebery massive sulphide deposits.

However, similar clasts are contained in a stratigraphically higher pumice breccia unit intersected in BL1and it is considered perhaps more likely that these clasts represent similar eruptive, depositional and/or diagenetic processes with some clasts suggestive of silicification of feldspar phyric pumice. The pumice breccia occurs as graded beds with dark grey shaley siltstone or shaley tops indicating deposition by turbiditic processes..

The same unit is intersected in LH1 ~600 metres south along strike but ~250 metres further eastwards than TYN2 sugesting that the pumice breccia may be up to ~500 metres thick.

Here the pumice breccia is intruded by feldspar hornblende phyric andesite dykes with two possible extrusive units in the upper part of the hole. Contacts are generally sharp. The pumice breccia becomes increasingly sericite+silica+pyrite altered downhole though the limited assaying indicates that the base metal and gold levels are low. Ti/Zr ratios for the 7? (- there is some confusion as to a samples location) samples from this unit assayed for the trace elements are 6.8, 7.1, 7.8, 8.4, 9.1, 13.6, and 23.4 (?). Based upon Resolute's comprehensive lithogeochemical data set for the South

Henty licence, the first five indicate a rhyolitic composition with the latter two samples possibly reflecting some mixing of more felsic material with more dacitic/andesitic material. The top of this large but apparently predominantly single unit of pumice breccia is not seen with the hole finishing in an andesitic intrusive.

The 6.8 - 9.1 Ti/Zr ratios are typical of the pumice breccia which outcrops near the base of the spillway on South Henty. Here this unit is overlain by a unit of basaltic breccia to siltstone grade volcaniclastics which is in turn overlain by polymict breccias with outcropping high grade massive sulphide clasts. Recent drill intersections on South Henty near the spillway show the pumice breccia to overlie felsic volcaniclastic sandstones and siltstones interpreted to be rocks of the Yolande River Sequence. This is the same relationship as seen in TYN2.

The pumice breccias intersected in LH1 and outcropping along overgrown logging tracks to the north and possibly outcropping on the Anthony Road at 379250mE 5354625mN and just north again on Bradshaws Road (Corbett, 1985) are probably correlates of the spillway pumice breccia. The generally massive pumice breccia unit may well have extended uninterrupted over 7km's of strike prior to the Anthony Road Andesite both intruding into and extruding onto it. Drill intersections in LH1 and the gross field relationships both on Basin Lake and to the north support this interpretation.

The source of the massive sulphide clasts in the spillway may lie at the top of the pumice breccia or in the rocks immediately overlying the pumice breccia.

In this case the occurrence of hydrothermal alteration in this unit, probably in the proximal or immediate footwall to that horizon on which massive sulphide clasts were being deposited is highly significant. The upper contact of this unit is not seen on Basin Lake unless it outcrops on Anthony Road and Bradshaws Road as shown by Corbett (1985) in which case it is perhaps unsurprisingly feldspar hornblende phyric andesite, probably intrusive, though possibly extrusive.

4.2.4 Anthony Road Andesite

The Anthony Road Andesite (ARA) is an ~2km thick complex of dominantly andesitic, lesser dacitic, extrusives and intrusives, generally feldspar hornblende phyric or feldspar phyric. The ARA outcrops along the Anthony Road and has been intersected in most drill holes. It outcrops over much of the licence.

In the western part of the licence the ARA is almost invariably coherent feldspar hornblende phyric andesite. In the eastern part of the licence the ARA becomes less homogenous with various units of andesite breccia of hyaloclastic origin. These andesitic rocks are overlain but also intrude a package of black shales, limestone, andesitic sandstones and a distinctive basaltic andesite. This package is overlain in part by further andesitic breccia often with a calcareous matrix.

The package of shales, limestone, sandstones and basaltic andesite are very similar to the rocks of the Lynchford Member of the Comstock Formation intersected on South Henty and are interpreted to be correlates of these rocks. The andesite breccia is very similar to breccias in the Anthony Road Andesite.

Thus the contact between the Anthony Road Andesite and the overlying Lynchford Member of the Comstock Formation is interdigitated with andesitic volcanism continuing into the Comstock Formation. This relationship is also seen around the pump station on South Henty with outcropping coherent andesite as well as in the gross andesitic composition of the sandstones (determined from Ti/Zr ratios) from the lower part of the Mt Julia Member of the Comstock Formation.

The Anthony Road Andesite is interpreted to have been a marine stratovolcano with its top probably shallow submarine. There are similar andesite bodies in similar stratigraphic positions to the north and south in the Mt Read Volcanics.

Aberfoyle differentiate between magnetic and non-magnetic units within the Anthony Road Andesite. A similar differentiation was made on South Henty where magnetic andesite was shown to be magnetite bearing coherent FHbpA and detrital magnetite bearing andesite clastics in the upper part of the ARA and FHbpA intrusive stocks deeper in the volcano. A similar explanation is likely on Basin Lake except that the deeper intrusives don't appear to be as significant.

The shale intersected in BLD 89-1 is interpreted to lie within the main body of andesite, representing a period of local quiescence.

4.2.5 Lynchford Member - Comstock Formation

As discussed above the package of black shales, limestone, andesitic sandstones and distinctive basaltic andesite intersected in DDH's BL4 and BL5 are interpreted to be from the Lynchford Member of the Comstock Formation. Further north shales and limestones intersected in TYN3 and TYN1 are probably also from the Lynchford Member. These shales are overlain by breccias of andesitic composition.

Two holes which were drilled into the sequence east of the eastern boundary of the EL, i.e. BL1 and BLD 89-3 were logged in this work. These two holes intersected a unit of weakly sericite+silica+pyrite altered quartz feldpsar phyric dacite or andesite, with quartz crystals to ~5mm in diameter with embayed edges and creamy melt inclusions, and feldspar phyric pumice breccia. Between the weakly altered coarsely quartz phyric unit and the overlying feldspar phyric pumice breccia with rare but distinctive pale cherty clasts, BLD 89-3 also intersected graded beds of andesite and dacite breccia, intrusive feldspar phyric andesite and some beds of sandstone or breccia with aphyric or feldspar phyric pinky orange clasts. These rocks are also all from the Lynchford Member of the Comstock Formation.

Crystal rich sandstones and breccias of the Mt Julia Member of the Comstock Fomation (previously called the Comstock Tuff) are only mapped on the eastern ends of some lines in the northern part of the licence.

The Lynchford Member is considered to contain the time-stratigraphic horizon on which the massive sulphide lenses at Comstock and Henty are interpreted to lie and in whose footwall the Henty and Mt Lyell orebodies were deposited. The precise location of this horizon is either at or near the base of the Lychford Member. However, except for the alteration in the quartz phyric unit, further discussed below, there are no significant occurrences of alteration or mineralisation in the Lynchford Member on Basin Lake.

4.2.6 Structure

The gross structure if the sequence at Basin Lake is steeply east dipping and facing with the Great Lyell Fault cutting the sequence off at depth below the eastern border of the EL. Folds in the sequence intersected by BL4 and BL5 and possibly also in the north in TYN3 and TYN5 are probably parasitic folds related to broader scale folding i.e. on the eastern limb of a regional anticline.

Aberfoyle interpreted a number of north-west/south-east trending structures from their helimag data set. Most of these structures have no basis in the field, however, the Tyndall Creek Fault, South Tyndall Fault and the Pyrite Corner Fault have some legitimacy. The latter fault is shown in Aberfoyle's interpretative geology to have a sinistral sense of movement.

4.2.7 Alteration

There are a number of occurrences of alteration on Basin Lake. None of these are associated with any significantly elevated base metal or gold values. The most significant occurrence of sulphide is the 11 metres of massive pyrite reported to have been intersected in BL4 (Langdon Pyrite Zone).

Bradshaws Road

Sericite+pyrite+silica alteration outcrops along Bradshaw's Road in andesite. Aberfoyle relate the alteration to movement on the Pyrite Corner Fault in the Cambrian. The alteration forms part of the anomalous chargeability zone extending from individual zones numbered 9, 10 and 12 by Bishop (1986) on lines 8N to 2N on the East Tyndall grid and down onto the Basin Lake grid. TYN2 tested the highest part of this zone on line 4N with a 2 metre thick pyritic black shale intersected ~203 metres downhole is considered to be responsible for the anomalous chargeability in this part of the zone.

The Bradshaws Road alteration lies to the north of the zone tested by TYN2.

There are similar occurrences of pyritic alteration further north at Howards Anomaly. Bradshaw's Road alteration may have a genesis similar to this or it may equally well be related to the Pyrite Corner Fault.

Leech Hill

Alteration outcrops further south at Leech Hill. The alteration was tested by DDH LH1 drilled by the Mines Department. The hole was drilled eastwards and intersected increasingly sericite+pyrite+silica altered pumice breccia between unaltered andesite intrusives. The alteration is of a style perhaps moderately distal to a major fluid pathway. The significance of the location of the alteration in this correlate of the Footwall Pumice Breccia has been discussed above. .

There is no significant anomalous base metal or gold mineralisation associated with this alteration.

BLD 89-3 and BL1 Zone

~200 metres east of the south-eastern corner of the licence two holes (also an early Pickands Mather hole BL801) have intersected sericite+pyrite+silica altered quartz (coarse ~5mm) feldspar phyric dacite (QFpD) with alteration most intense around the edges of the unit. A similar unit is seen to the north around Lake Newton. It shows some similarities in alteration style and zonation. In BLD 89-3 the QFpD is overlain by chlorite+/-sericite+/-pyrite altered basalt, coherent at first then a hyaloclastic breccia. Alteration has essentially died out by the upper contact of this basalt unit. In BL1 the QFpD is overlain by a feldpsar phyric pumice breccia, perhaps correlatable with a similar unit in BLD 89-3 from ~307 to ~322 metres (and suggesting considerable lensing out of units along strike between both holes).

There is some suggestion that these coarsely quartz phyric units may be playing a role in their own alteration, perhaps generating or mobilising fluids. Where seen within the belt this unit is often sericite+pyrite+silica altered (see BL6).

Although this alteration lies outside of the licence it is evidence of alteration beneath the Lynchford Member. It downgrades the potential of the southern part of the licence. This area appears to consist of andesitic volcaniclastics and lesser coherent andesite with a black shale responsible for the UTEM anomaly tested by BLD 89-1.

Langdon Pyrite Zone

This zone includes that area referred to previously as the Basin Lake pyrite zone. It extends over the gradient array zones 5a, 5b and 6 from Bishop (1986). Aberfoyles "wacker" C-horizon soil sampling extended the known area of outcropping alteration. Prior to this the zone had been drilled with BL4 and BL5, both intersecting pyrite within a tuffaceous shale. Although logged as 11 metres of massive pyrite there is little truly massive pyrite left in BL4 (though much core is missing). The massive pyrite is underlain (uphole as graded bedding indicates an overturned sequence) by sericite+pyrite+silica altered andesitic clastics with a further 90 metres of shales and andesitic volcaniclastics before the basaltic andesite is intersected. Alteration in BL5 is more tightly focussed between 225 and 235 metres.

Sericite+pyrite+silica alteration in BL6 is intersected within the coarsely quartz phyric QFpD unit and overlying andesitic volcaniclastics between 340 and 390 metres. This zone was not intersected in BL7 indicating that it is subvertical if it has any strike extent. Assuming that the hole was drilled down sequence this zone lies within the Anthony Road Andesite in the footwall to the Lynchford Member.

In BL8 alteration extends throughout the hole below the Pyrite Corner Fault which is itself not significantly altered. The Lower Tyndall Group rhyolites described by Aberfoyle (Hicks, 1996) from below the fault are the coarsely quartz phyric QFpD which are again weakly altered. Basaltic andesite was not intersected. The pyritic calcareous tuffaceous siltstone intersected ~840 metres is similar in appearance to the pyritic shales in BL4 and BL5.

There is no obvious vector to be drawn from these holes except towards BL4. Alteration in BL4 and BL5 is correlatable. The alteration does appear to lie in the footwall of the massive pyrite bearing tuffaceous sediments with the sequence folded.

Alteration in BL8 is similar in style and setting to that intersected in BL6 and is again largely focussed within the QFpD unit and adjacent rocks.

5.0 PREVIOUS EXPLORATION

5.1 Introduction

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

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

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

5.2 Pickand and Mather

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The first anomaly, on line 16N, 250mE, was defined by coincident dipole-dipole IP/weak UTEM anomalies over pyritic volcaniclastics adjacent to black shales with up to 4000ppm Pb in outcrop 300m's south along strike (this zone was tested subsequently by TYN5). The second anomaly, on line 14.5N at 585mE was defined by a good UTEM over glacial cover with up to 4000ppm Pb from outcrop 170m's west (footwall?) (this zone has not been drilled). The third anomaly, from 12N, 1000mE to 10.5N, 1100mE is defined by a strong gradient array IP anomaly and moderately high resistivity (no EM coverage) associated with hematite+carbonate+/-pyrite altered volcaniclastics and moderately anomalous Pb (500) and Cu (680) in soils.

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

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

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

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

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

The licence was subsequently relinqished.

5.4 Mines Department; Corbett (1985) - Unpublished report 1985/54

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

5.5 1988 - 1998; Billiton(Acacia)/Aberfoyle/Resolute

Billiton successfully tendered for the area as part of a larger EL 103/87 and were granted the licence on 21st April 1988.

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

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

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

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

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

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

1989-90 (Creagh and Hungerford, 1990 [90-3099])
Billiton's work followed up on all recommendations made in the previous year. Three holes were drilled for 873 metres. BLD89-1 (235m) was targetted on the western anomalous trend intersecting a black shale amongst a sequence of andesitic volcaniclastics between coherent andesite. There is some weak sericite+pyrite alteration but the shale explains the anomaly.

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

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

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

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

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

1990-91 (Randell, 1991 [TCR 91-3244])
No actual field work was done in this year with the report principally detailing the results of the CSAMT survey. The results of DHEM on BLD89-3 were again said to be unavailable. Limited further lithogeochmical sampling of drill core was also done.

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

Further comment was made regarding the definition of a major lithological break defined by low or high levels of Ti and Zr correlating with the contact between Central Volcanic Complex rocks and the Tyndall Group. Billiton define three horizons of interest within Basin Lake based upon this work I would suggest that all three are in fact essentially the same horizon (or within the same rekatively thin sequence of rocks). No recommendations are made other than the drilling of three DDH's. The licence was subject a joint venture negotiations with Aberfoyle at the time of reporting.

Aberfoyle joint ventured into the licence and became manager.

1991-92 (Richardson, 1992 [TCR 92-3345])

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

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

1993-94 (Sharpe, 1994 [TCR 94-3552])

Aberfoyles work was based around a high resolution helimagnetic-radiometric survey. The licence was remapped with samples collected for both lithogeochemcial and petrological analysis.

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

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

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

1994-95 (Lewis, 1995 [95-3716])

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

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

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

Anomaly 1 from lines 4000N to 4400N is associated with sericite+silica+pyrite altered volcaniclastics (maximum 372ppm Cu, 1062ppm Pb, 1246ppm Zn, 7600ppm Ba and 0.068ppm Au). This alteration correlates with that seen in BL4 and coincides with the Pyrite Corner Fault which is marked by anomalously west-north-west trending S0 and S1 in outcrop. The "wacker" sampling and mapping also resulted in the location of outcropping basaltic andesite between lines 4200N and 5000N correlatedwith that intersected in BL4.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5.6 Conclusions

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

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

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

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

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

6.0 WORK DONE/RESULTS

6.1 Introduction

Initial work consisted of appraising the previous exploration data. The summary of this previous exploration in section 5.0 is taken from this work. Consideration was given to potential drill targets as a priority. Other targets recognised were further stratigraphic drilling along strike from BL5 or up sequence from LH1. However, the circumstances required a lucky strike with immediate consequences rather than further defining the alteration associasted with the other two targets. It was felt that the soil geochemical anomaly apparently associated with the Pyrite Corner Fault may have some potential for this.

6.2 Leech Hill drilling

6.2.1 Introduction

Three shallow diamond drill holes were completed for 170.5 metres to specifically test a single anomalous Cu soil sample associated with a structure mapped by Aberfoyle as the Pyrite Corner Fault. The anomalous soil sample was taken from an area (with no outcrop) of sericitic, pyritic alteration, defined as Aberfoyle's Target 2 (Hicks, 1996).

Aberfoyle describe the results of 'wacker' (bedrock C-horizon) sampling from their Langdon Pyrite Zone prospect as identifying two geochemically anomalous zones with maximum values of 0.34% Cu "associated with moderate to intense sericite+silica+pyrite alteration. Anomalous geochemistry, copper in particular, extends along the Pyrite Corner Fault Zone and laterally along strike to the north" (Richardson , 1996).

Aberfoyle defined their target as "a geological target downdip and along strike to the NW of the massive pyrite intersected in BL4, within the Pyrite Corner Fault Zone" (as above). The target was to have been tested by Aberfoyle's BL6 but drilling problems saw the hole abandoned early. The drilling completed by Resolute has tested this 0.34% Cu sample in a shallower position than that envisaged by Aberfoyle who consider the surface to be essentially sterilised by previous EM surveys.

Although the fault has had a post-Cambrian history as a dextral wrench it was speculated that the fault may be a reactivation of a Cambrian structure with the phyllosilicate rich alteration associated with the Cambrian event focussing the later deformation. The proximity of the structure to the massive pyrite lenses intersected in BL4 and BL5 in a similar setting to the Comstock part of the Mt Lyell field suggests a possible role as a conduit of fluid. Given that the sea-floor may have been shallow at the time (based on knowledge of the belt elsewhere) potential ore positions are to be found in the rocks in the footwall to the sea-floor at the time.

Although a single hole had been proposed, environmental considerations meant that the target could not be drilled with a skid mounted rig, hence the decision to utilise Nick Poltock's portable drilling rig.

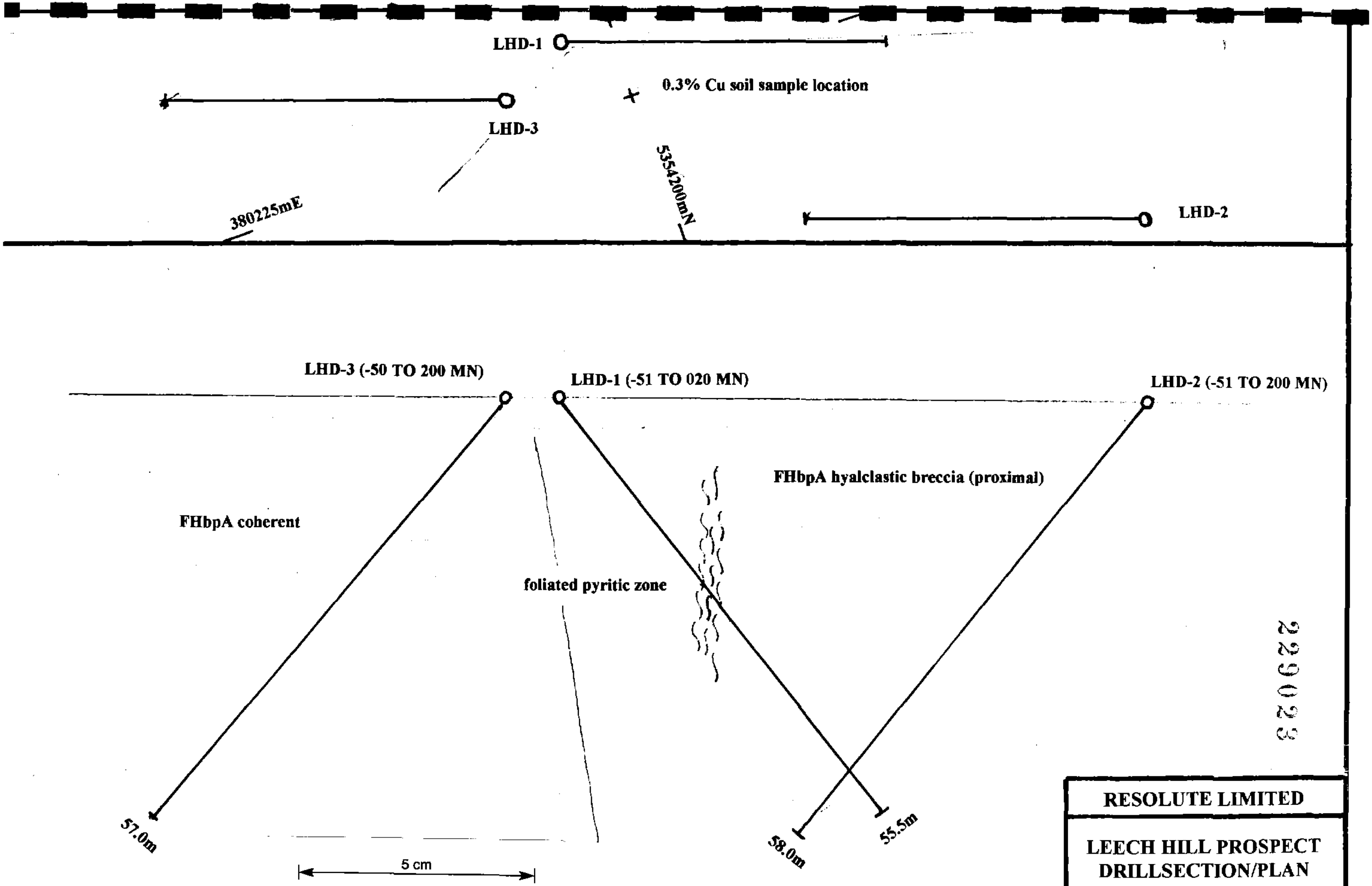
6.2.2 Work completed and results

170.5 metres were drilled in three shallow diamond drill holes. Full details regarding the location, azimuth etc. of the holes are given in the following table:

Drill hole specifications

Hole No.	Easting (mE)	Northing (mN)	Azimuth (mag.)	Inclination	Depth
LHD1	380216.9	5354187.3	020°	-51°	55.5m
LHD2	380255	5354247.2	200°	-51°	58.0m
LHD3	380221.1	5354184.6	200°	-50°	57.0m

Nb: AMG co-ordinates are with respect to grid ped 5354200N 380225E



229023

RESOLUTE LIMITED

LEECH HILL PROSPECT
DRILLSECTION/PLAN

SCALE 1:500

The holes were drilled as a fence though after LHD1 was completed it was considered to be optimal to drill the other way as the veining in LHD1 is at 40 - 45° core axis. A long section and plan is included in figure 2.

The holes intersected andesitic volcanics of the Anthony Road Andesite. The nature of the andesite varied from massive and coherent in DDH LHD3 to brecciated (hyaloclastic and relatively proximal) in the other two holes. The drilling was done almost down dip of the stratigraphy in order to intersect the structure.

Pyritic alteration was only intersected in LHD1 where it is most intense (~3% pyrite t/o) from 25.5m to 30.0m, apparently associated with shears/faults at 28.2 and 31m. The pyrite alteration is associated with weak sericite±chlorite±silica and carbonate alteration. The pyrite is in veinlets and breccia fill with silica and chlorite generally. There are no other sulphides other than pyrite and trace chalcopyrite including a narrow vein with chalcopyrite in LHD1.

42 samples of (almost all) 1 metre split core were taken from each of the three holes with LHD1 (31 samples), LHD2 (3) and LHD3 (8). Results are disappointing with all Au <0.01g/t and all Cu <946ppm. As, Ag, Pb and Zn results are all low (i.e. background).

The intriguing result comes from LHD1 where the better Cu values are found in all but the pyritic zone from 25 to 30m. Cu results from the pyritic zone are essentially at background levels.

6.2.3 Conclusions

The tenor of the assays from the drilling satisfactorily explain the soil geochemical anomaly. There is no further potential indicated by the results of the drilling and so no further work is recommended.

Appendix A.

Drill logs for LHD-1, LHD-2 and LHD-3

Diamond Drill Log

Hole No: LHD-1

Depth: 55.5 metres (0m NQ 36.0m BQ 55.5m)

Azimuth: 020° (magnetic)
Inclination: 51°

Drilled by: Nick Poltock with custom portable DDH in Dec' 97.

From	To	Description	Sample No.	From	To	Assays (ppm)					
						Au	Ag	As	Cu	Pb	Zn
0.0	**66.6**	Feldspar Hornblende phyric andesitic hyaloclastic monomict breccia, weakly sericite, chlorite and/or carbonate altered with ~3% pyrite from 25.5 to 30m with pyrite in later stage fine fracture fill veinlets. Sulphide is probably associated with shearing e.g. 30.2 to 31.8 and 28.2m. Colour generally greenish grey below 12.3m due to chlorite alteration, yellowish . orange above this due to weathering. Andesite clasts sub-angular suggesting proximity to massive andesite as indicated by LHD2 and 3. 0.0 - 12.3m Weathered with ferruginous fractures. Core is of same rock as below. Some minor chlorite veining. 12.3 - 25.5m Light greenish grey FHbpA hyalo monomict bx with weak pervasive carbonate (calcitic to more sideritic) alteration and trace pyrite as disseminations and in fine fracture fill veinlets. 20mm chlorite+ pyrite+chalcopyrite vein at 13.8m. Weathered zones at 16.0 - 17.2m, and 23.7 - 24.5m. 25.5 - 30.0m Mineralised zone! ~3% pyrite t/o in weakly silicified, sericite and chlorite altered andesite bx as above but generally moderately foliated at ~30° core axis with mineralisation apparently associated with shears at 28.2m and possibly a downhole bounding fault at ~31m. 30.0 - 32.0 Broken core - fault. ~10 carbonate (ankeritic? pale pinky	852711	1.5	3.0	<0.01	<1	<1	402	17	67
			852712	3.0	4.0	<0.01	<1	14	946	55	102
			852713	4.0	5.0	<0.01	<1	11	765	56	71
			852714	5.0	6.0	<0.01	<1	10	241	46	59
			852715	6.0	7.0	<0.01	<1	3	177	16	77
			852716	7.0	8.0	<0.01	<1	<1	316	37	70
			852717	8.0	9.0	<0.01	<1	9	31	26	60
			852718	9.0	10.0	<0.01	<1	2	38	17	59
			852719	10.0	11.0	<0.01	<1	5	66	21	63
			852720	11.0	12.0	<0.01	<1	7	63	15	58
			852721	12.0	13.0	<0.01	<1	7	198	20	67
			852722	13.0	14.0	<0.01	<1	10	622	15	55
			852723	14.0	15.0	<0.01	<1	2	375	18	47
			852724	15.0	16.0	<0.01	<1	5	245	15	53
			852725	16.0	17.0	<0.01	<1	10	207	11	62
			852726	17.0	18.0	<0.01	<1	9	720	23	51
			852727	18.0	19.0	<0.01	<1	<1	105	18	57
			852728	19.0	20.0	<0.01	<1	26	274	49	48
			852729	20.0	21.0	<0.01	<1	8	200	29	46
			852730	21.0	22.0	<0.01	<1	3	249	79	51
			852731	22.0	23.0	<0.01	<1	18	121	108	54
			852732	23.0	24.0	<0.01	<1	2	102	87	60
			852733	24.0	25.0	<0.01	<1	4	121	73	81

From	To	Description	Sample No.	From	To	Assays (ppm)					
						Au	Ag	As	Cu	Pb	Zn
		brown) and minor brecciated quartz veining	852734	25	26	<0.01	<1	1	43	98	75
			852735	26	27	<0.01	<1	<1	22	23	79
		32.0 - 55.5m FHbpA breccia as above but well defined clasts.	852736	27	28	<0.01	<1	16	40	46	90
		Fine grained med. grey cherty material in matrix poss. silica+carbonate	852737	28	29	<0.01	<1	17	20	21	76
		may be preferential alteration of matrix to clasts but altn. is somewhat	852738	29	30	<0.01	<1	<1	61	49	66
		irregular. Zone pinky brown carbonate veining 50.0 - 50.5m	852739	30	31	<0.01	<1	4	425	22	83
			852740	31	32	<0.01	<1	2	311	8	96
			852741	32	33	<0.01	<1	8	44	<3	107

Diamond Drill Log

Hole No: LHD-2

Depth: 58.0 metres (0m NQ 34.5m BQ 58.0m)

Azimuth: 200° (magnetic)
Inclination: 50°

Drilled by: Nick Poltock with custom portable DDH in Dec' 97.

From	To	Description	Sample No.	From	To	Assays (ppm)					
						Au	Ag	As	Cu	Pb	Zn
0.0	58.0	Hornblende Feldspar phyric andesite breccia. Purple greenish grey to 42.0m, greenish grey below this. In parts the breccia texture looks in-situ hydrothermal in style, however, it is interpreted to be a primary clastic texture with the matrix being exploited by chlorite±carbonate. Distinctive rounded weathering effects associated with ferruginous zones in the matrix though no suggestion of sulphides. Typical zone sampled from 29.0 to 32.0m. Negligible veining or alteration in core.	852751 852752 852753	29.0 30.0 32.0	30.0 31.0 32.0	<0.01 <0.01 <0.01	<1 <1 <1	1 8 7	17 13 53	13 4 <3	66 67 75

Diamond Drill Log

Hole No: LHD-3

Depth: 57.0 metres (0m NQ 34.7m BQ 57.0m)

Azimuth: 200° (magnetic)
Inclination: 51°

Drilled by: Nick Poltock with custom portable DDH in Dec' 97.

From	To	Description	Sample No.	From	To	Assays (ppm)					
						Au	Ag	As	Cu	Pb	Zn
0.0	57.0	Coherent hornblende feldspar phyric andesite with green chloritic hornblende to 3mm ~5% and feldspars ~1mm. Weathered to 8.2m Weakly foliated at 20° core axis. Negligible sulphides. Ferruginous zones at 19.3m, 31.1m 39.8m, 53m and 55.8 - 57m. Sampled the weathered material in the upper part of the hole due to its proximity to LHD1.	852761	0.0	1.0	<0.01	<1	<1	28	4	89
			852762	1.0	2.0	<0.01	<1	3	9	<3	95
			852763	2.0	3.0	<0.01	<1	8	17	<3	89
			852764	3.0	4.0	<0.01	<1	4	11	<3	88
			852765	4.0	5.0	<0.01	<1	4	8	<3	87
			852766	5.0	6.0	<0.01	<1	<1	5	<3	90
			852767	6.0	7.0	<0.01	<1	4	6	<3	110
			852768	7.0	8.0	<0.01	<1	1	11	<3	107

Appendix B.

Assay result sheets

229031

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St, Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014183
Your reference : **James Reid**
Project code : Drill Core
Date received : 12/01/98
Date reported : 16/01/98

James Reid
Field Technician

Resolute Resources Limited
P.O. Box 63
ZEEHAN

TAS 7469

Number of pages of results : 2
Number of Samples : 42
First Sample : 852711
Last Sample : 852768

Electronic Data Transmission :
Modem / /
Facsimile / /
Disk Report / /

Authorised by ....
On behalf of:

Richard Newman
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory
for preparation and/or analysis as requested by the client.

229032

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 31 6837
Facsimile : (004) 31 8890

Our reference : BU014183
Your reference : **James Reid**
Project code : *Drill Core*
Report date : 16/01/98
Report status : Final
Page : 1 of 2

ANALYTICAL DATA

Sample	Au	Au(R)	As
852711	<0.01	--	<1
852712	<0.01	--	14
852713	<0.01	--	11
852714	<0.01	--	10
852715	<0.01	--	3
852716	<0.01	--	<1
852717	<0.01	--	9
852718	<0.01	<0.01	2
852719	<0.01	<0.01	5
852720	<0.01	--	7
852721	<0.01	--	[illegible]
852722	<0.01	--	10
852723	<0.01	--	2
852724	<0.01	--	5
852725	<0.01	--	10
852726	<0.01	--	9
852727	<0.01	--	<1
852728	<0.01	--	26
852729	<0.01	--	8
852730	<0.01	--	3
852731	<0.01	--	18
852732	<0.01	--	2
852733	<0.01	--	4
852734	<0.01	--	1
852735	<0.01	<0.01	<1
852736	<0.01	--	16
852737	<0.01	--	17
852738	<0.01	--	<1
852739	<0.01	--	4
852740	<0.01	--	2
852741	<0.01	--	8
852751	<0.01	--	1
852752	<0.01	--	8
852753	<0.01	<0.01	7
852761	<0.01	--	<1
852762	<0.01	--	3
852763	<0.01	--	8
852764	<0.01	--	4
852765	<0.01	--	4
852766	<0.01	--	<1
852767	<0.01	<0.01	4
852768	<0.01	--	1
Method	F650	F650	H102
Units	ppm	ppm	ppm
Detection Limit	0.01	0.01	1

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

229033

A N A L A B S

Analabs Pty. Ltd.
ACN 004 591 664
14 Thirkell St. Burnie
Tasmania 7320
Telephone : (004) 3 6837
Facsimile : (00 3 8890

Our reference : BU014183
Your reference : **James Reid**
Project code : Drill Core
Report date : 16/01/98
Report status : Final
Page : 2 of 2

ANALYTICAL DATA

Sample	Cu	Pb	Zn	Ag	As
1-5→3m 852711	402	17	67	<1	<50
852712	946	55	102	<1	<50
852713	765	56	71	<1	<50
852714	241	46	59	<1	<50
852715	177	16	77	<1	<50
852716	316	37	70	<1	<50
852717	31	26	60	<1	<50
852718	38	17	59	<1	<50
852719	66	21	63	<1	<50
852720	63	15	58	<1	<50
852721	198	20	57	<1	<50
852722	622	15	55	<1	<50
Hole 1 852723	375	18	47	<1	<50
852724	245	15	53	<1	<50
852725	207	11	62	<1	<50
852726	720	23	51	<1	<50
852727	105	18	57	<1	<50
852728	274	49	48	<1	<50
852729	200	29	46	<1	<50
852730	249	79	51	<1	<50
852731	121	108	54	<1	<50
852732	102	87	60	<1	<50
852733	121	73	81	<1	<50
852734	43	98	75	<1	<50
852735	22	23	79	<1	<50
852736	40	46	90	<1	<50
852737	20	21	76	<1	<50
852738	61	49	66	<1	<50
852739	425	22	83	<1	<50
32-33 852740	311	8	96	<1	<50
852741	44	<3	107	<1	<50
29-30 852751	17	13	66	<1	<50
Hole 2 852752	13	4	67	<1	<50
31-32 852753	53	<3	75	<1	<50
852761	28	4	89	<1	<50
1-2m 852762	9	<3	95	<1	<50
852763	17	<3	89	<1	<50
Hole 3 852764	11	<3	88	<1	<50
852765	8	<3	87	<1	<50
852766	5	<3	90	<1	<50
852767	6	<3	110	<1	<50
8-9 852768	11	<3	107	<1	<50
Method	A102	A102	A102	A102	A102
Units	ppm	ppm	ppm	ppm	ppm
Detection Limit	2	3	2	1	50

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

ANALABS

ANALYSIS DESCRIPTION

Job number : BU014183 Order number : James Reid

Scheme code : S033 - Drillcore/Rock; Dry, Jaw crush, Fine pulv, Ring

Sample preparation. Drillcore,Rock samples; Dry,
Jaw crush, Fine pulverise, Ringmill, <3.5kg

Scheme code : F650 - 50g fire assay, Lead collection, AAS

Fire assay, Lead collection, Aqua Regia digest,
AAS, 50g sample.

Scheme code : G102 - Triple acid digest, Geochemical samples

Triple acid digest, (HCl,HNO3,HClO4), Geochemical
samples.

Scheme code : A102 - AAS analysis

AAS analysis of sample after G102 digest.

Scheme code : H102 - Hydride AAS analysis

Hydride AAS analysis after G102 digest.

229035

Appendix C.

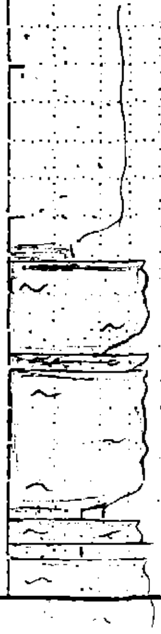
Graphic logs of some previous DDH's

GRAPHIC CORE LOG

Scale 1: 1000
By C MacDonald
Date 20th October 1997
Page of

Hole No. TYN 2 Depth m
Project BASIN LAKE
Section
Collar co-ords E N RL
Az. °G °M Incl. °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
0			5 cm
20			
40			
60			
80			
100			Gy sands + siltstone, bdd to msv No sd
120			Yalack River Sequence sediments.
140			
160			
180			
200		⇩ Gross fining as well as individual graded units. 0.5% Zn (5')	d gy mst - ~~and~~ graphitic ? c fg py Del (FPB) rhyolitic pumice bx c and cherty clasts. Some clasts look FpD but interpd as Fp pu bx clasts Unaltered.
220		0.15% Cu (5')	
240			almost blk shaley slt.
250			



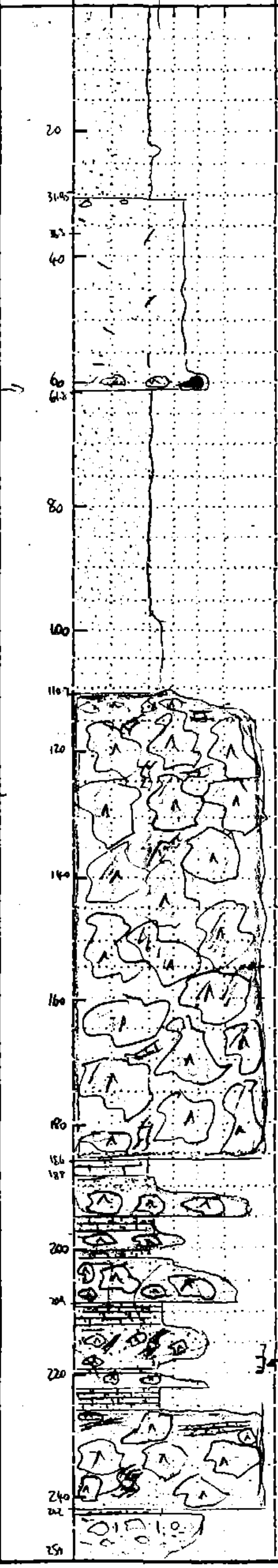
229037

GRAPHIC CORE LOG
Scale 1: 1000
By G MacDonald
Date Oct 97
Page 1 of 2

Hole No. TYN 3 Depth 364.2 m
Project BASIN LAKE
Section
Collar co-ords
Az. °
RL
°

5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	



tan (wg wed) slt + F xtal sst

So ~ 30°

ARA type Q
F xtal rich v/clastic Msv. Oc lithics (esper downhole) ~~either~~ F xtal sst/bv or poss ~~prmx~~ becomes marly gy + blotchy downhole. ARA type Q rare but to 4mm. F 1-2 mm wk to cm. Pale pink albite? alt^n.
Becomes be slw SA – ī Fp clasts
Altered (si-ser-py?) zone. Much more q. than F now

So 25°

Gy ashy slt ī diffuse d.gy / l.gy bg defining So – becomes sandier ~~towards~~ btw 94.0m ē F xtals – also more tan. Single large unit as no internal contacts. Has tiger striped appearance.

So ~30°

Blocky FHbpA clasts ī epidote altd mx as hyaloclastite bx in sed lst / marly slt ī some later remob cb vg. Sed lst is often not in clear beds but as diffuse cb – the mx. Bottom – top similar? This is the andesite / lst facies ī the epi alt^n of clasts unusual. This epi alt^n is not seen in the lower

← So 50°

possibly darker to Package of marly slt/sst (overprinting gy.gr slt/sst) cm/gy/p.pk in colour ī Fp A? (poss D) clasts in marly sst / lst or calcite (recrystallised cb?) Andesite + lst looks more interbedded here ī the marly sst / lst gb occurring in broader intervals + in graded tops. Lots of cb in mx to bx's also Mn vug. Unusual py as

py only ←
Marly ss / lst ī sursed py ī cek. from 216-219m. The pyrite is a later stage (how late?) but is assd ī calc of the type seen in mx to bx. Suggestion of very early (pre-diagenetic?) origin.

So 80°

↑ ← ashy ts sst

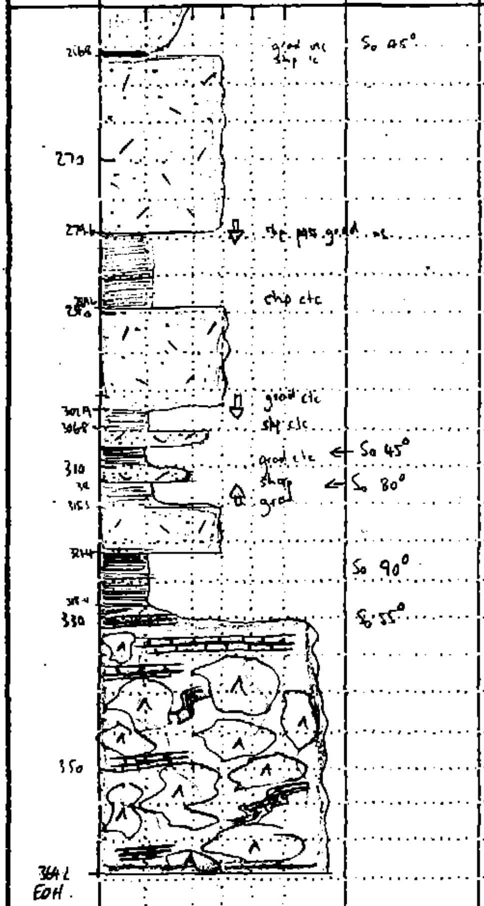
Ship ne the bx ī subaq pgn aphyric volc clasts in cb mx becomes less cb downhole + more ashy sst + slt

GRAPHIC CORE LOG

Scale 1: 1000	Hole No. Tw 3 Depth m
By G MacDonald	Project
Date Oct '97	Section
Page 2 of 2	Collar co-ords RL
	Az. °G

5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure



Black pyr-tc shale

Mott gy f xtal rich vlcclastic ī poss clc Hb? [dark clots) + mn dsd py. Ba vng @ 265.5 As for unit above bdr.

Black pyritic shale ī py ī calc in So/S, conf vn' to a few mm, also dsd + poss intlay. No beds of py.
Fxtal sst as above

Fxtal sst as above.
Black pyritic shale - apparently grad lc.

Marly slt top but ī clasts F Hb' p A
ī A clast composition increasing downhole. Intubedded marly slt between clasts as well as later vng.

7 purple used to indicate limestone-andesite bx facies but actual andesite should be blue L

GRAPHIC CORE LOG

Hole No. TYN 5 Depth 372.7 m
Scale 1:1000
Project BASIN LAKE
By G MacDonald
Section
Date Oct '97
Collar co-ords RL °
Page 1 of 2
Az. °G
5 cm

FHbpA Gly coherent c ocl clastic(?) zones. Ppl colored due to hmt alteration. Coherent zones contain ~5% 1-2mm pale F + ~3% 2mm ppl (now hmt) Hb xtals, wg foliated @ ~45°ca. Apparently clastic zones contain FHbpA identical to the coherent as rounded clasts to ~100mm in a F, Hb xtal mx. Clastic text defined more by roundedness of clasts? than variation in grainsize between clast + mx. Mx supported gly. Also bxd zones c hmt vng? Suggestion that this intersection is of an submarine andesitic extrusive(?) [PTO]

Ang clasts FHbpA mixed c pl sed | lst + marly sst. As if FHbpA extr has spalled off | into unconsolidated sed lst + slumped together. 2 gens cb - sed lst + remobed into vn'

Gn slt/sst

Lst - marly gy slt ~ 95% cb + gy slt stylolites in the fn @ 40°ca. ← actually only a lge cb zone within or ~m units

FHbpA / lst bx as for 67.3 - 84.9m.

Lst - Again marly interbed of overall unit.

FHbpA c only mn sed lst ibds c cb vng more prominent. Msv py vn' assd c calc from 132.5 - 133.5 (massaged)

Lst c ibdd slt inc ~5-10 mm syn-sed py (soft sed def?)

FHbpA as for 119 - 139m. Mn sed Distinguished from ov unit by initial absence of sed lst however rock becomes more cb rich blw ~ 168 c a poss fine grained? ie to ~8mm from 184 - 194 has cb mx - poss marly. Much cb vng inc pk (Mn?) cb

Single coherent block/unit of FHbpA. Epi ± chl ± cb (+ pk) vng (late stage). Single marly slt interbed @ 239 - 240 m

(see next page)

229040

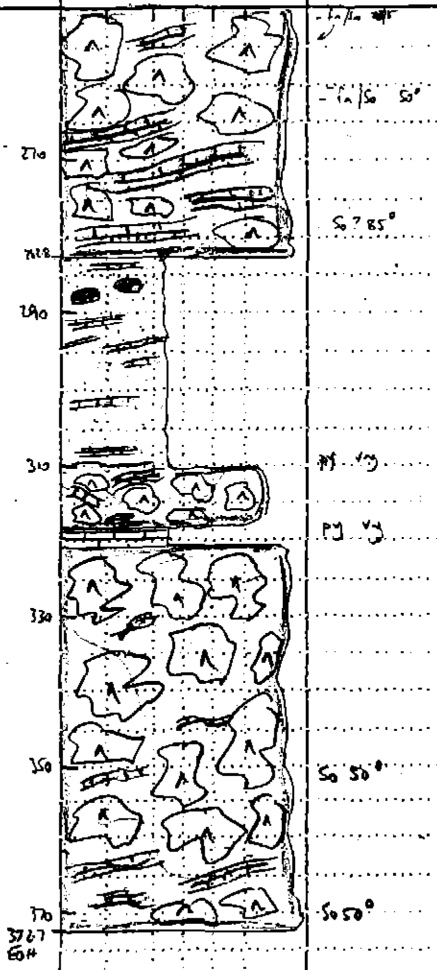
GRAPHIC CORE LOG

Scale 1:1000
By C MacDonald
Date Oct '97
Page 2 of 2

Hole No. TYN 5
Project
Section
Collar co-ords
Az. °G

Depth m
5 cm
RL
°

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



FHbpA bx c̄ lst beds as prov.ably
as if fragmenting FpHbpA spalling into sed lst (uncon)

Gn marly sll c̄ varying amounts of cb
in beds, as nodules & some in situ nodules (diffuse)

Py vg assd c̄ calc typical of calcite here.
pre-delm
More dk gn FHbpA bx/lst. Sed
lst eg 351.0 interbedded c̄ coherent
dk gn FHbpA – cb content ~ 30%
blw 362

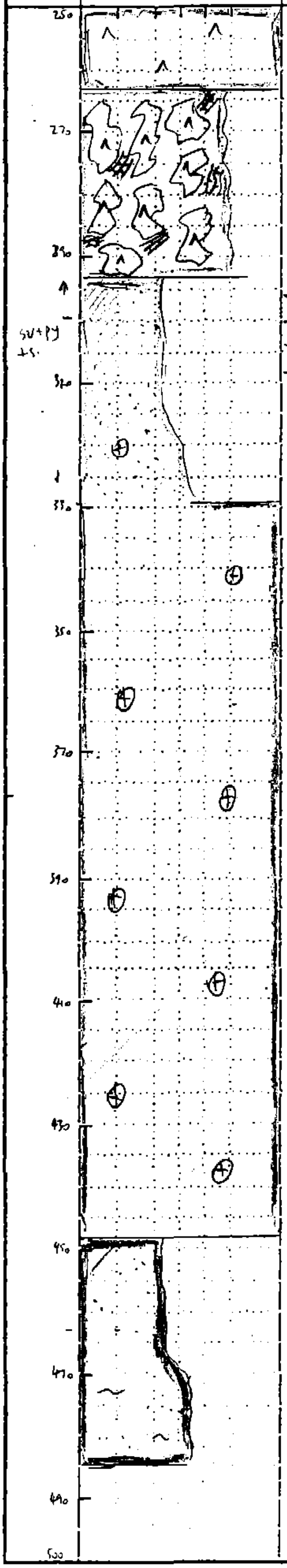
GRAPHIC CORE LOG

Scale 1: 1000
By G MacDonald
Date Oct 97
Page 1 of 1

Hole No. BC1
Depth 484.0 m
Project BASIN LAKE.
Section
Collar co-ords
Az. °G
RL

5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



Sim A
ie FHbpA
msv a bxd
mn ep.
vmn cb

F HbpA bx ~ msv a lesser cb z'

cb/ad bx facies

← Contact not exact

] 3-e 0.46% Zn

Fine ashy top to m QFpD

] 3-e 0.46% Zn extrusive Qcl ARA Q xtals

vis

QFp D Sy foliated Vy altd - ser + py ± s on margins

Glassy shard rich top to m pn bx.

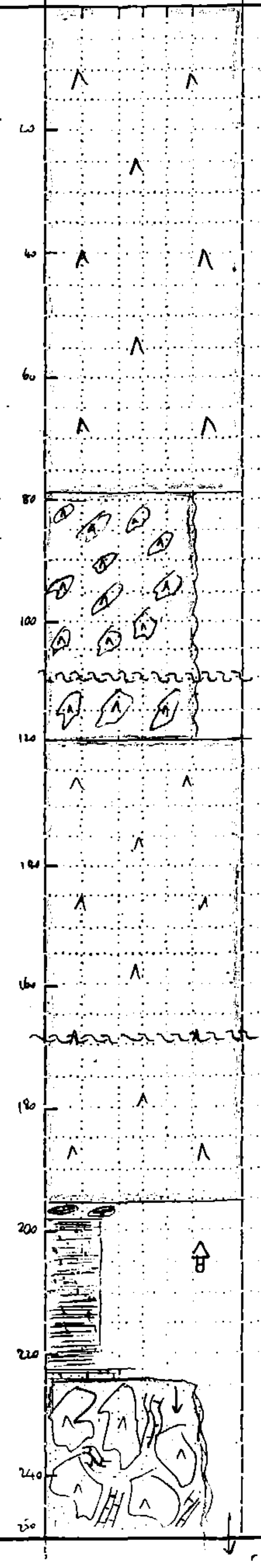
↙ plc alb + chl altd contorted Fp pumice bx - not "Comstock Tuff" Looks dac/rhy?

229042

GRAPHIC CORE LOG
Scale 1:1000
By G MacDonald
Date Oct 97
Page 1 of 1

Hole No. BL2
Depth m
Project BASIN LAKE
Section
Collar co-ords
Az.
RL
5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure



~~F~~HbpA Msv Z epi alt^n also
pk alb vng hmt/jasp vng
~~f~~olcted Mod gr (Hb mirky)
+ not particularly Hb r ie
F ~10% 1-2mm pale cm Hb ~2% < 4mm
Ocl py veins

FHbpA bx - def clastic - rounded (partly at least due to D_n) ? monomict tlo
Vg ser+chl + altd

dip slip (slicks on chl)
~5-10° CA

← contact poss not exactly here

FHbpA as for 0-78m
/ vg ser+chl altd
Ocl py v' also e' diffuse
py alt^n

← basal contact poss bx.
D gy to bk. Sl alug slt ⇒ shale c -
Carbonate in mx Cb nodules, lenses etc
Wispy bd' py also clots + fg dsn' ~0.5%
Finely bd Vg carbonate rich

← more cb rich z
Cb | And bx facies Initially and is not gr, later p pk/ppl

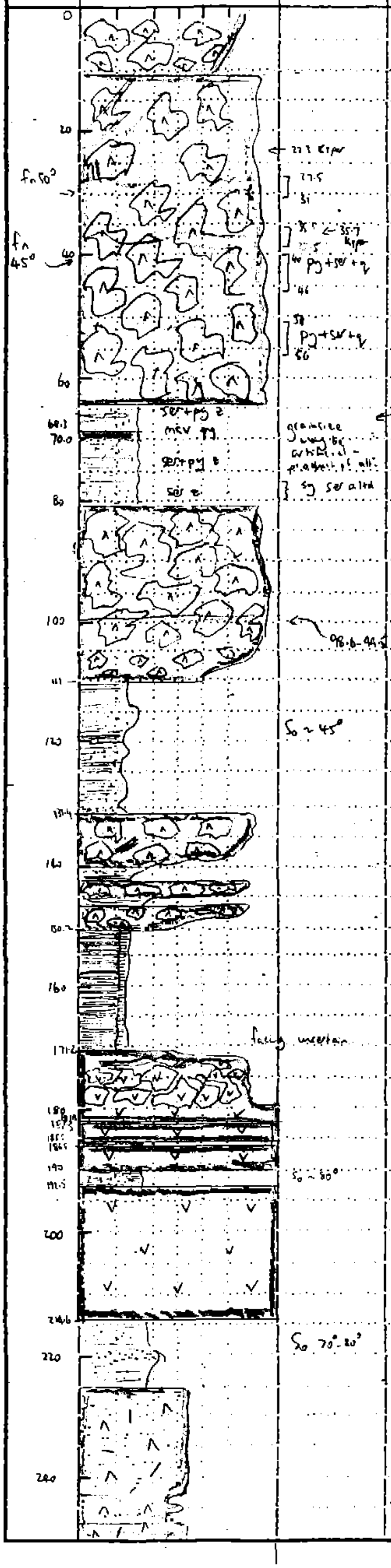
cont

GRAPHIC CORE LOG

Scale 1:1000
By G. MacDonald
Date Oct 97
Page 1 of 2

Hole No. BL4
Depth 289.9 m
Project BASIN LAKE
Section
Collar co-ords
Az. °G
5 cm
RL °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



F Hb? p A bx

Difficult to log as v altd in parts. F(Hb)pA either coherent in parts or clastic t/o ē lge blocky clasts. Alt^n is v strong + is ser + py + si. Some mn pink z' assd ē py vn' may be Kspar. No epi alt^n.
Ser+py+si is in shear bands. There is no suggestion whether or not more porous clastic (pre consolidation) zones are being exploited by the fluids

sg (fg py) ashy ts slt as for blw msv fg py.
Msv fg py - foliated 70° ~ 100% fg py.
sg ashy ts slt msv ē fg m py to ~ 20% t/o ser mx. foliated @ 40 ca ts slt aa

F (Hb?) p A (but possibly basalt) Γ cb altd - m.i. cb. def proximal hyaloclastite. Some "sandy" zones but in ¼ core.
98.0-99.5 m zone ē py bands @ 70% assd ē ser + calc possibly as an altd interbed in si+ser+py altd
Interbedded bk shaley slt + gy gn ts sst

FHbpA bx. D gn clasts - angular ē calc between fragments. Proximal hyaloclastite
Two Bx units - apparently dh fining. Clasts are F±HbpA, but possibly basalt. Dk gy cb (calc?) rich Bk pyritic mdstone/sh. Massive Py ē calc in oct. clots + drei

Almost crackle bx ē calc filling frac but is possibly hyaloclastic - d gn porph rock ē a fg. gy gn gmass. Massive zones have dk gn px (4mm) + F (1mm but now cb altd) with large 10mm calc filled vls. In finer grained z' the px look like chl flecks (1-2mm).
Bk slt/sh ± pyritic interbeds (ripped up from uphole slt/sh) ~171.5 + 172.5 but not peperitic contacts.

D gy slt > gy gn ts slt/sst. Facing evidence unconvincing but perhaps dh.
Hb (to 8mm) F xtal' sst / tuff ← xtals ab euhedral but irreg distributed
finer sandier zones suggest grading up downhole
Hb (to 8mm) F xtal sst / tuff (euhedral xtals)

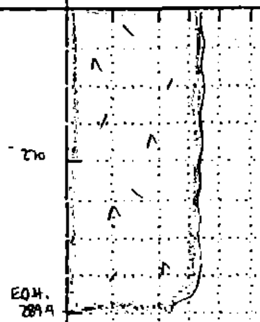
GRAPHIC CORE LOG

Scale 1: 1000
By G MacDonald
Date Oct '97
Page 2 of 2

Hole No. BL4
Depth m
Project
Section
Collar co-ords
Az. °
RL

5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description
			Hbf xtal sst / tuff (conv) epi alt gives pseudoclastic appearance. Massive unfoliated.
			Some interbedded sandier zones suggestive of grading



GRAPHIC CORE LOG

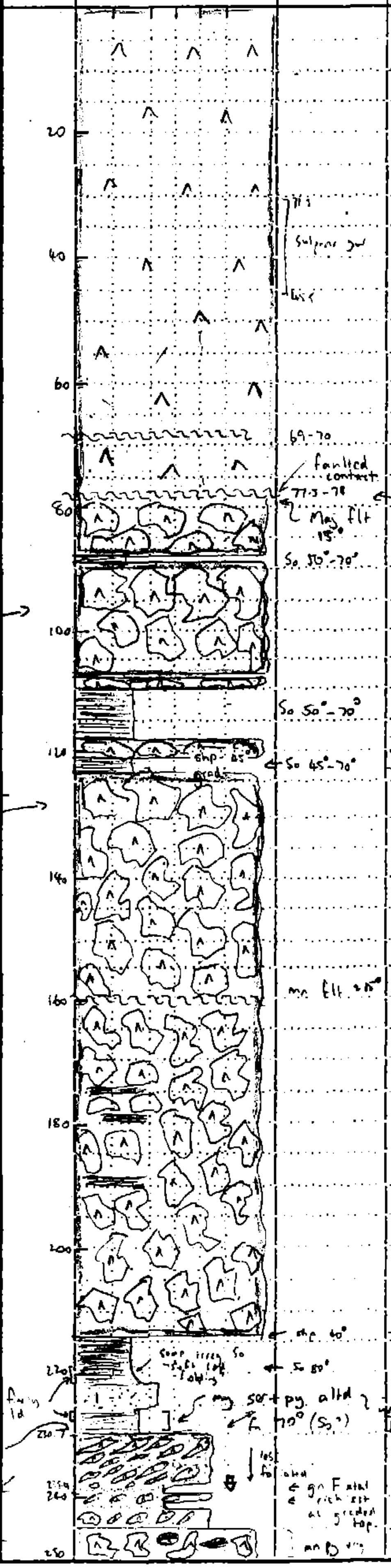
Scale 1:1000
By G MacDonald
Date Oct '97
Page 1 of 2

Hole No. BL5 Depth 345.5 m
Project BASIN LAKE
Section
Collar co-ords
Az. °

5 cm

RL °

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure



shown as FHbpA probly OK.

probly basaltic adesite

faulted

"gy ..."

FHbpA F (1-2mm, 25-30% wt) & Hb d gn to 10mm, tab., 5%). Mn dsd py +/o. Prev logged as sst

Hb F xtal sst c Hb ~6mm & F ~2mm ma mx. Hb & F v euhedral but amount of xtals ~ 90%. Possibly coherent in parts (between faults?) but def as above clastic also.

appears to be fg slt unit caught up in flt

FHbpA / lst facies. Blocky ang juv/prox hyalo (cont) Black py shaley slt lbd, calcareous

clasts - jigsaw fit - in wt recrystallised calc mx - no marly sandy/silty beds or pink/cm bedded lst but calc looks syn-sed & not late hydrothermal bx.

Black pyritic shaley slt, calcareous

FHbp A / lst as above,

Black pyritic shaley slt, calcareous

FHbPxpA / lst as for FHbpA. F are 1-2mm & wt, Hb ol gn & hex to 10mm, small d gn clc & pods are probly alt px. The rock looks transitional between B & A. The facies is typical of the above with blocky FHbPxpA in a wt calc mx (but less than above) c ocl bk shaley slt rafts.

Black pyritic shaley slt becoming siltier then v. F xtal sst (221-225.5) with ~1-2% BJ And Slt (225.5-(230.1)) not obv mzd horizon. Rather all py & ser look to be same alt?

Mg ser + calc + py altd c ser & calc in discrete fn bands c Cy dsd py (0.5%) py & trails to ~239. Was FHbpA bx c mx & F xtal ssts.

FpA(? - looks andesitic) + lst bx with marly sst mx
c pi gneiss

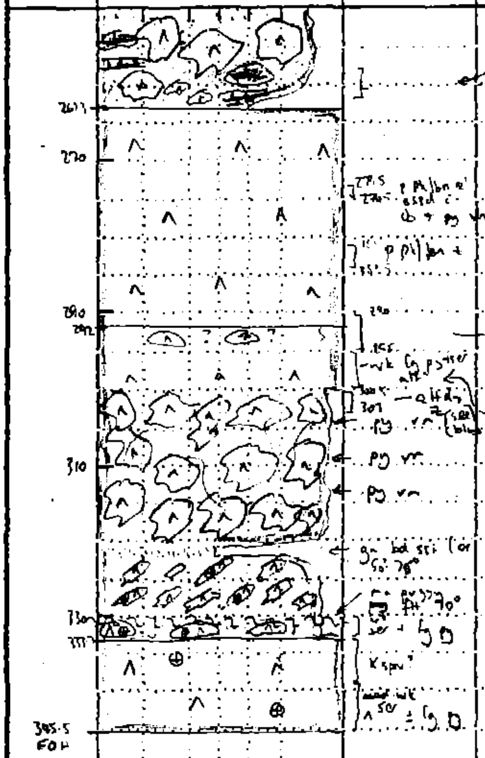
↑ as pgn marly ssts/slt.

GRAPHIC CORE LOG

Scale 1: 1000
By C MacDonald,
Date Oct '97
Page 2 of 2

Hole No. BL5
Project
Section
Collar co-ords
Az. °G °M Incl. °
Depth m
RL
5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



FpA + FHbpA + marly sst clasts in polymict FHbpA clasts bx – perhaps more medial

Massive pl/pf' F xtal rich ± ocl Hb probly ≈ coherent F ± HbpA Foliated + not obviously clastic (≠ supported sst)

but still only minor py of trans lower ≥'

Altered zone hay pres as "epiclastic" but since over + un rocks sim this poss bly just F ± HbpA as above Foliated

Now blocky hyalo c mv py ± calc vng

Epi alt ≈ epi + calc vng postdates py + calc but not necess by long time.

Polymict bx – sy altd Apparently F ± HbpA and F ± Hb mn ARA type Q p A clasts in perhaps "ashy" mx

Bx 1 of

FpA c ocl ARA type Q xtals (~4mm embayed c fm inclusions)" – v F rich 1-2mm pl/ or lg F, Rk gly gy gr but pl/ or from 331.7 – 335 (Kspar alt?) Becoming more fol dh, 70° ca

but c ocl ~4mm ARA type Q xtals vis, Alt is ser + py giving an "ashy" gy to p gn colour + destroying F xtals where more intense. Poss more fg ≥ than shown. No mn py sy shears but this alt not obv flt related.

FpA bx also Alt as fn type mi calc (mi pk) + qtz (inc fg chalcedony) + ser c a pl/ln Kspar? selvedge ≥

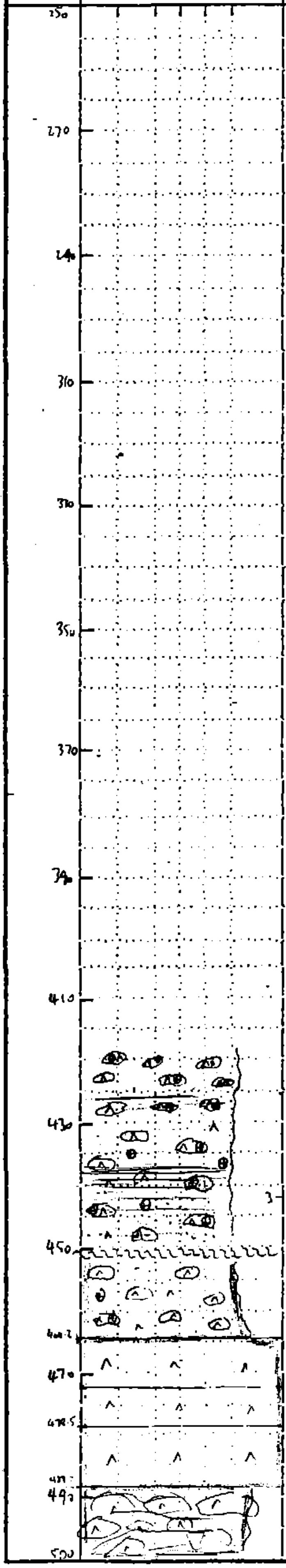
300.5 – 303 Ser + py + si altd sy fol 70° ~ 2% py.

probly should be ☐

229047

GRAPHIC CORE LOG	**Hole No.** BL8	Depth 883.5 m
Scale 1: 1000	Project	
By G MacDonald	Section	5 cm
Date Oct 97	Collar co-ords	RL
Page 1 of 3	Az. °G	°

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



7 h 30°

3-4% py +/o

puggy flt 35°

contacts not obv

418 – Alt^n is not stratiform – nor it is in the immediate vicinity of an obv horizon. Some suggestion that alt^n may be picking out more "permeable" ie v/clastic as against coherent. No major shears except ~451. (is py is not relative)

Monomict? ~3% (not am, calc) (or polymict?) F>>Q+Hb or F>Q>>Hb (more Q xtals)

F>Q (Hb?) p A lava bx. (becoming more sandy mx rich dn) My chl + ser + calc ± py

Λ gn, mglsy foliated Pl long F (1-2 mm) ~ 4mm. ARF q xtals gly then. Becomes gy si + ser ± py alt^n blw 424.5 broadly coinc c sadier bx. Some yw cb alt^n (of F). Some v py zones espec ~437-438 @ ~20% py – mn Δ as alt^n – semimassive perhaps in core of alt^n } but as deformed py zones to 25mm th in gy chl-ser+py alt^n

Clastic text poss pseudoclastic largely but def clastic. Amount q xtals in rock varies, also in clasts. Ov in rocks v sim ie FHbQpA. This perhaps poly

D gn wy chl alt^d. Pale 1-2 mm F (~25% – rich) > Hb p A ± Q. Massive, coherent, foliated 35°. May be clastic but v alt^d so poss "pseudo". Si+ser+py but pk Fs ok.

More likely to be genuine clastic. Fy gy mx poss alt^n – clasts gn to yw gr FHbQpA. no ARF Q

229048

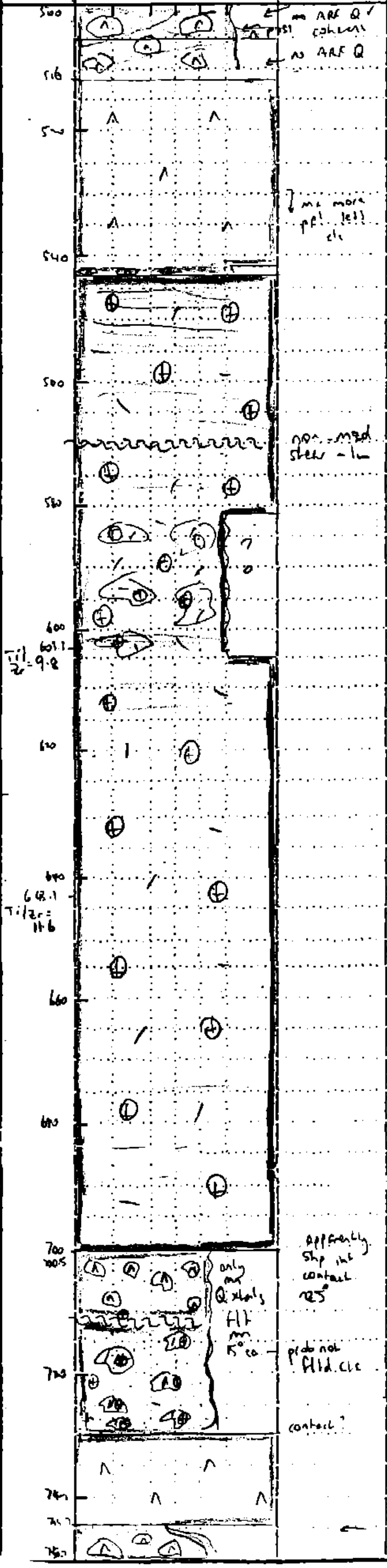
GRAPHIC CORE LOG

Scale 1: 1000
By G MacDonald
Date Oct '97
Page 2 of 3

Hole No. BL 8
Depth m
Project
Section
Collar co-ord
Az. –
RL
°

5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



coherent

base.

D gn FHb ≥ A + Q
neg. sol. a only late stage calc veing.

QFpD (ARF q xtals) fol w/ 4ey si ser ± py
alld. Obviously coherent in parts - poss
clastic in others. 4mm Q ē melt inclusions
~ 4% ~ 20% w/ 2mm F.
/ @ 18° also sub parallel to core.

Shown as clastic but poss only pseudo clastic
ē alt producing 'clastic' texture - perhaps
exploiting some hydraulic bx

ocl gg sil py z' as
diffuse alt - poss clastic
but I think more pseudoclastic

Cong. sd FQpD clasts
in d gn mx

F >> QpA ~~mx~~ ē ppl mx

poss graded top

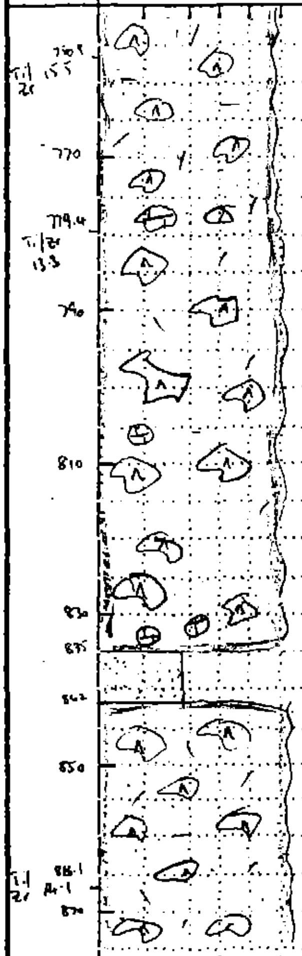
229049

GRAPHIC CORE LOG

Scale 1: 1000
By G MacDonald
Date Oct '97
Page 3 of 3+

Hole No. BL8
Depth m
Project
Section
Collar co-ords
Az. °G
5 cm
RL

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



16 bx

F > HbQ p A - looks dacitic in part but Hb?

"Polymict" bx c̄ clasts (lgly nodule growth do) but in FHbpA bx ag clasts No sd'

Gy to p gg rsty to slt'

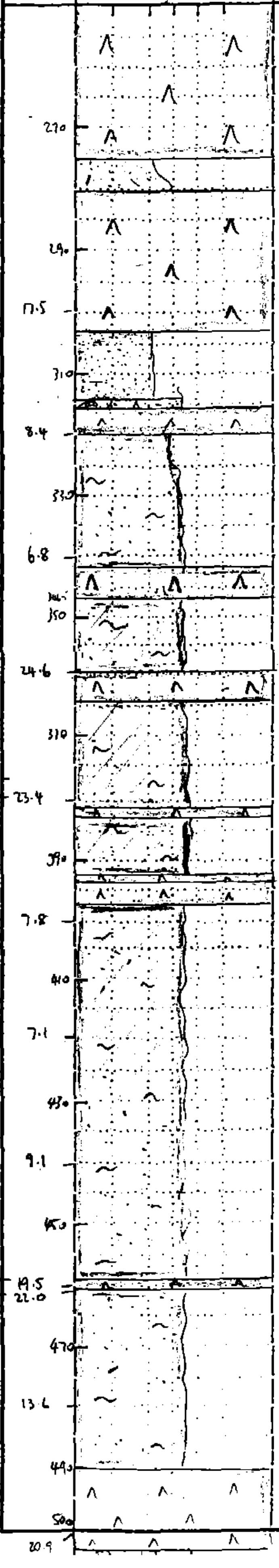
F>Hbp A Bxd but not obv graded except possibly top grades into slt lenong gr ep alt? is pervasive m alt–
Clast c'h Fol

229050

GRAPHIC CORE LOG
Scale 1: 1000
By
Date 20th Oct 1997
Page 1 of 1

Hole No. LH1
Depth m
Project
Section
5 cm
Collar co-ords
RL
Az.

Depth m | Mean Grainsize Mud 0.5 2 8 32 mm | Max. clast φ & Structure | Description



bge gn wy ser, tc to mn py altd F Hb (mwky p lemon gn pseudomorphs) p A
This is possibly a xtal tuff. Contacts are sharp in this ~ un andesite, but uphole is vesicular.

bge gn fc ts slt - msv. Sharp uc - lc

F Hb (mwky) p A aa
Foliated 70° Xtal rich c̄ ~15-20% F + 5-10% Hb now clr (conc̄ ~~due~~ to f° in part)

Sees. 45°-50°

bge gn fg ts slt - msve becoming wy bedded dh - Becomes darker grey (to mod gy) dh

Clastic top - F + Hb xtals + clasts aphyric ad - shown as coherent FHbpA aa but poss ct ~~-det~~

p bge gn tvp pk + ocl w/rgd typical (FPB) rhyolitic pumice bx c̄ ocl rdd shg clasts + mott appearance

FHbpA looks coherent c̄ shp uc + lc - poss int

pu bx aa wk ser + py alt° wy altd ser + py

FHbpA marginal uc difficult, lower ctc shp - Hb altd to py.

Alt° is pervasive ser ± si c̄ py in bb's - often aft Hb and/or F
And dykes gly more clr c̄ py alt° of Hb + F

altd but sample looks more like pu bx

} one unit

felsic pumice bx (?) aa (?) - not as obviously pumx but still ocl shg clasts however, wk / mod ser + py + si alt° gives rock finer g appearance in parts - may be primary sandy/silty zones

all A

mix°

FHbpA dyke - shp uc

*

T. /Zx says dacite - poss a discrete unit but shown as pu bx.

bx c̄ Hb ... mark A clasts

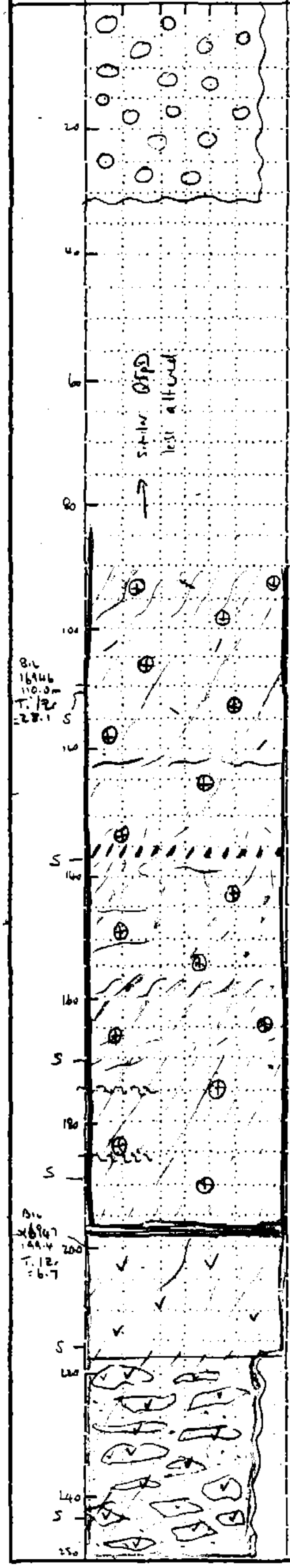
229051

GRAPHIC CORE LOG

Scale 1: 1000
By C. MacDonald Oct '97
Date
Page 1 of 2

Hole No. BLD 84-3
Depth m
Project
Section
5 cm
Collar co-ords
RL
Az. °C
°

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



Glacial cover

wk to mg Kspar ± ser ± py altd, mg foliated QFp A(?) - looks like QFpD in SHD-11. ~15% Q + 5mm in diam. These are ARA type Q xtals c̄ melt inclusions + embayed edges. F pk/bn ~10% ~2mm. Alt^n occurs as occ zones of pervasive weak Kspar alt^n indicated by pk/org/bn discolouration - assd c̄ py + fine vnl conf fn. Increasingly dn are z' sericite + silica + py alt^n [TS 16910 says calc alt^n but no calc in HS - poss

fn 60° ← more pervasive Kspar + "py vnt' conf fn) mainly org patches (not elevated)]

Alt^n (sericite + py) alt^n zones generally have a stronger central, often more silica ± pyritic often assd c̄ mn proggy flts + late stage quartz + cb (weathering yw bn) vn'. Although it may be argued that this alt^n is related to the proggy flts and/or q c^{cb} vn' ← siliceous, sy ser core sy sts ~5% py] it is equally arguable that both shearing + vng exploited these sericitic z', :

mn proggy shear

fn 50°
mn proggy shear

← shp std contact

interpd to be Basalt — Not Qp as some show there are q fld vl'

Py as frac vnt conf fn

Dk gn, mg fol, chloritic ± sericite ± py altd Fp lock c̄ chl ± calc vl' - apparently coherent to ~218m c̄ clastic textures b/w. Zones of more sericitic alt^n have "leopard spot" text just like NC1. Cannot believe Ti/Zr. This looks v much like HBB bw in NC1 c̄ the more coherent basalt associated :

mg to sy fol 50°

Py in vn conf fn

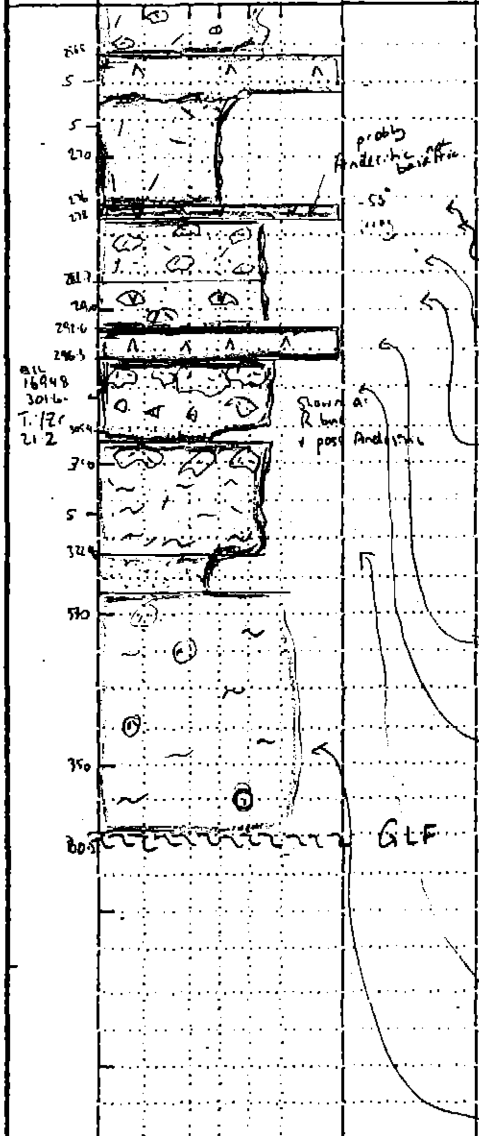
229052

GRAPHIC CORE LOG
Scale 1:
By
Date
Page 2 of 2

Hole No. BD 89-3 Depth m
Project
Section
Collar co-ords RL
Az. °

5 cm

Depth m	Mean Grainsize Mud 0.5 2 8 32 mm	Max. clast φ & Structure	Description



Blotchy pk/or ann. Aphyric org clasts look rhyo but no q in mx. F xtals but misty - grossly like MSA bx but could be andesitic F (s/c, 2mm, 10%) in dk gy/ppl - andesite - extrusive with some bx in last 10 cm. extrusive

Mott cr/gn F (~mm 15% p pk) rich v/clastic irreg distrib F xtals + apparent graded top (dh) suggestive of pumice bx - prob Basaltic. No alt (no rdc)

Mafic dyke F (calc altd) + poss chl altd mc (or chl altd F) p c calc filled vl - not obv sim to underlying basalt. (upper)

pk/org llo aphyric

org clasts gly recognisable sand > 100 - no q. Dim to 250.256.8

Polymict bx but basaltic (?) dk gn Fp clast c wispy edges typical HBS + <10% pk/org aphyric clasts.

F murky mc p A dk ppl mx - probly dyke - shp uc + lc uc @ 25°, lc @

pk org F.p - look poss andesitic - these are the pk/org Fp + less dgclc Fp clasts in MTC ssts/bx. Both from same unit apparently. Fp A bx base fining up to gn (basaltic?) sst top.

as for ov unit to 311 ie pk/org (no clt) Fp But grades into Fp pumice bx c a sandier top

Another Fp pumice bx c ocl cherty clasts - pale pinky org aphyric

V messy rock c clearly clastic but mainly pale pink (cm) dk gn. Ocl clasts of pk org Fp volcanic + Fp pumiceous mx - interpd as Fp pum bx - note similar clasts to FPB in SM Hedy.