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Report Number: 88/11

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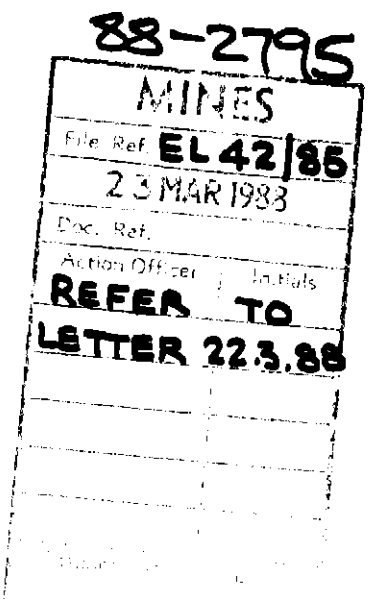

E.L. 42/85, LAKE MACKINTOSH, TASMANIA

ANNUAL REPORT FOR A PERIOD
FROM 21 JANUARY 1987 TO 20 APRIL 1988

By K.O. Airas
2 March 1988

Distribution

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1. INTRODUCTION

This report describes work carried out on the Lake Mackintosh EL 42/85 during the period 21/04/1987 - 20/4/1988 by the Pancon-Outokumpu joint venture.

The main objective of the Lake Mackintosh project has been to explore for VMS-basemetal deposits of the Que River-Hellyer type.

2. LOCATION AND ACCESS

The Exploration Licence is located approximately 15km north-east of Rosebery on the western shore of Lake Mackintosh. The licence area covers rugged terrain on the eastern slopes of Mt Black.

Access is via the H.E.C. road from Tullah to the Mackintosh Dam at the southern boundary of the EL.

3. TITLE

Exploration Licence 42/85 was granted to Pancontinental Mining Limited on 21 April 1986 for a period of one year. The Licence was renewed for another year and will expire on 20 April 1988. An application for renewal has been lodged with the Mines Department so as to enable continuation of the project.

4. PREVIOUS EXPLORATION

The Lake Mackintosh EL 42/85 covers a part of Area 3 of former EL 5/63 held by Comstaff Pty Ltd during the period 1972-1985. Work carried out by Comstaff is summarized in the quarterly report for the period to 20th January, 1987 (Airas, 1987).

5. WORK CARRIED OUT BY PANCONTINENTAL PRIOR TO THIS REPORTING PERIOD

Exploration is being conducted under a joint venture between Pancontinental Mining Limited and Outokumpu Oy of Finland, with Pancontinental as operator.

Work carried out prior this reporting period comprised:-

- a grid, with a 6km baseline and cross-lines every 200m.
- a UTEM survey
- geological mapping
- stream sediment geochemistry

The UTEM survey, which was selected as the principal technique to achieve the objectives of the project, had not located any major anomalies indicating volcanic massive sulphide deposits.

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6. WORK CARRIED OUT DURING THE REPORTING PERIOD

A follow-up exploration program has been carried out, the targets of which were:-

(i) a UTEM geophysical/zinc drainage geochemical anomaly.

(ii a weakly anomalous gold in stream sediment samples on the Lake Mackintosh shoreline.

(iii) an occurrence of hydrothermal alteration on copper mineralisation (Lake Mackintosh Spillway).

Results

(i) Anomaly: isolated weak anomalies up to 230 ppm Zn and up to 80 ppm Pb were encountered and they appear to occur within tuffaceous-epiclastic siltstone adjacent to the contacts of a rhyolitic quartz-feldspar-biotite porphyry. No obvious source for the subtle geochemical anomalies or for the UTEM anomaly has been identified. Potential for massive sulphide mineralisation seems moderately low.

(ii) Anomaly: geochemical sampling bedrock and stream sediments has failed to repeat the previous subtle anomalies, which are suspected to be spurious. Volcanic breccias in this area contain abundant quartz in veins and may be evolved in an environment favourable to formation of epithermal precious metal deposits.

(iii) Anomaly: a chalcopyrite-pyrite stockwork veining carrying bulk grade of around 0.5% Cu and 6 g/t Ag and small lenses of "massive" pyrite-silica with anomalous Pb, Zn, Cu and Ag has been located. These mineralisations are suggested to represent a syngenetic massive sulphide horizon, within highly disrupted Henty Fault Zone. A further geophysical investigation is recommended.

Report

A report on follow-up exploration of the three abovementioned anomalous areas has been written by Walter Herrmann, as a contract geologist (Appendix 1).

A study of the chemical composition of some lithotypes were also carried out (Appendix 2).

7. CONCLUSIONS AND RECOMMENDATIONS

Results

Mapping of the area allowed compilation of a largely interpretative geological map (Herrmann, 1986) and a tentative interpretation of the stratigraphy of the underlying rock sequence (Figures 2 and 3). The UTEM Survey failed to locate any significant anomalies directly indicating a VMS body, but did locate weak anomalies which may represent boundaries between rock types with slightly different conductivity. A weak geochemical anomaly (Zn) coinciding with one of the UTEM anomalies was followed up. In addition a subtle gold anomalous area was resampled.

Reconnaissance mapping in the southern-most part of the EL (Lake Mackintosh Spillway area) has located two interesting styles of sulphide mineralisation:

- chalcopyrite-pyrite stockwork veining carrying bulk grades of around 0.5% copper and 6 g/t silver over four metres extent.

- small lenses of massive pyrite-silica, which carry anomalous levels of lead, zinc, copper and silver (a single rock chip assay 10.39% Pb, 1.76% Zn, 55 g/t Ag); these lenses appear to represent tectonically transported segments of a syngenetic massive sulphide horizon.

Potential for further Exploration

Although only weak anomalies indicative of basemetal mineralisation have been located to date, the EL area still has significant potential for VMS-mineralisation due to the following factors:

* Felsic volcanics of the area belong to the Central Volcanic Sequence of the Mt Read Volcanics. A hiatus in volcanic activity between a dacitic and a rhyodacitic sequence has been suggested, representing a position in the stratigraphy at which massive sulphides may deposit.

* Central Volcanic Sequence lithologies are overlain by a sequence of pyroclastic/epiclastic rocks (Farrell Slates - Dundas Group) in the southwest and northern sections of the grid. The combined UTEM/geochemical Zn anomaly may have the same stratigraphic position, suggesting that this volcanic/sediment contact (transition zone) may be prospective elsewhere in the tenement (Figure 3).

* The Spillway area was not covered by the UTEM Survey, and thus requires geophysical follow-up.

* Weak UTEM anomalies elsewhere within the survey area have not been followed up to date.

8. PROPOSED FUTURE EXPLORATION

The suggested on-going exploration program should be directed towards further follow-up of the three identified anomalous areas, as well as further exploration to evaluate the potential of the two interpreted VMS host horizons. This program would include further geological mapping, geochemistry, EM geophysics and drilling.

REFERENCES

Airas, K.O., 1987,: E.L. 14/85, Lake Mackintosh, Tasmania. Quarterly Report for period to 20th January, 1987. Pancontinental Mining Limited report 87/16 in the files of the Mines Department of Tasmania.

Herrmann, W., 1986: Notes on Geology of EL 42/85, Lake Mackintosh, Tasmania. Pancontinental Mining Limited report 87/7 in the files of the Mines Department of Tasmania.

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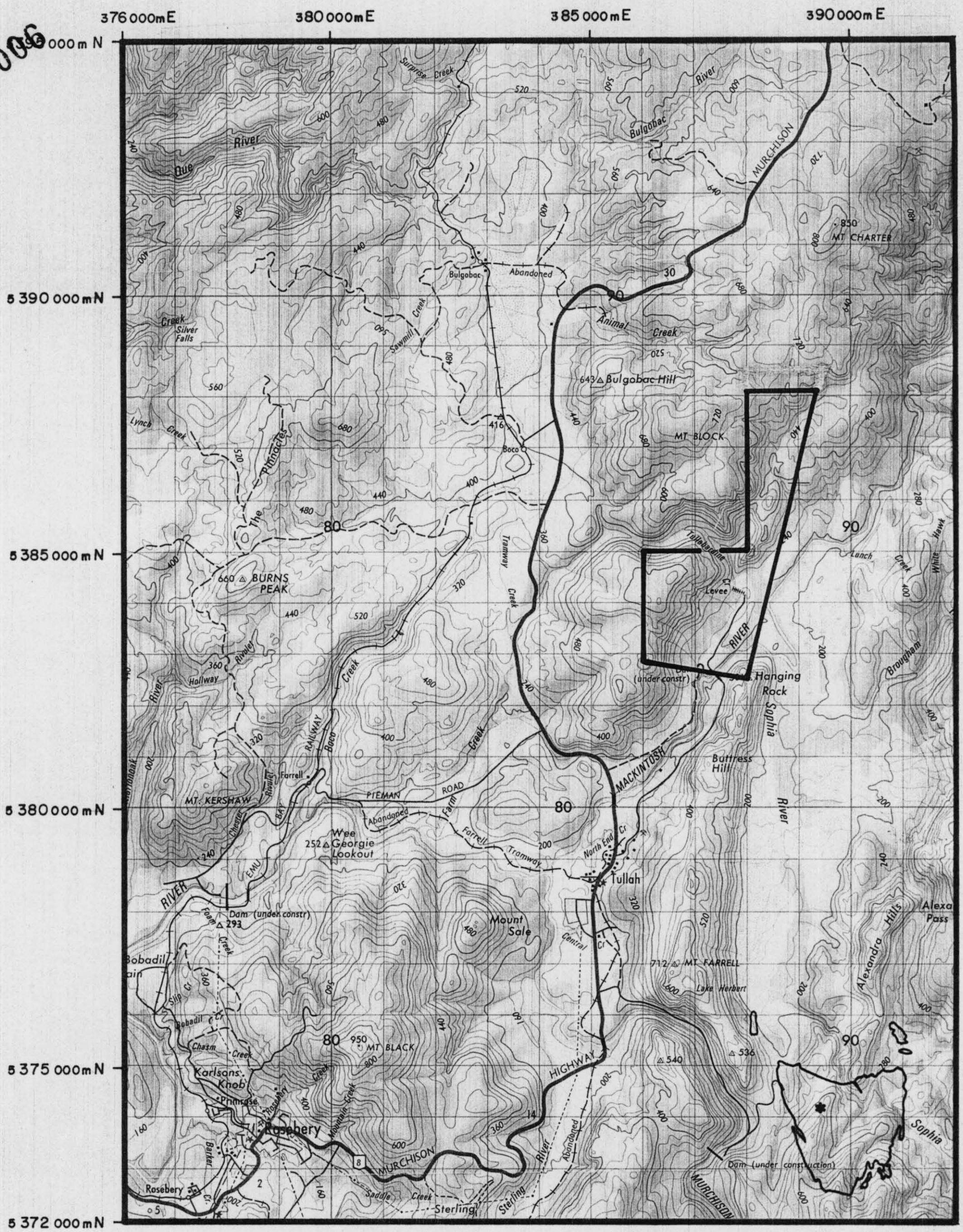

LOCATION PLAN

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LAKE MACKINTOSH PROSPECT - TASMANIA

SCALE 1:100 000

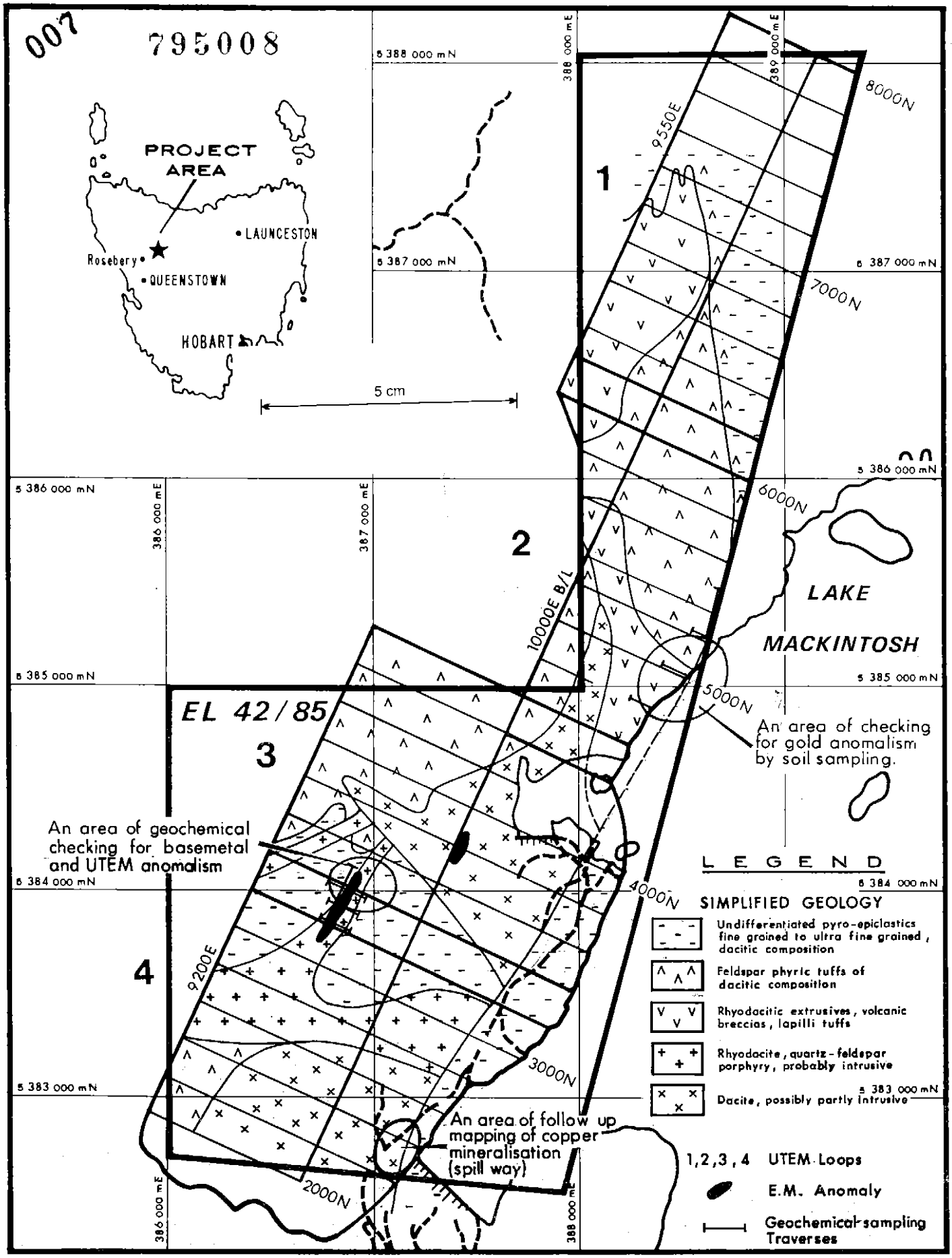
2 1 0 2 4 6

KILOMETRES

5 cm

Figure 1

FIGURE 1



EL 42/85 - LAKE MACKINTOSH, TASMANIA

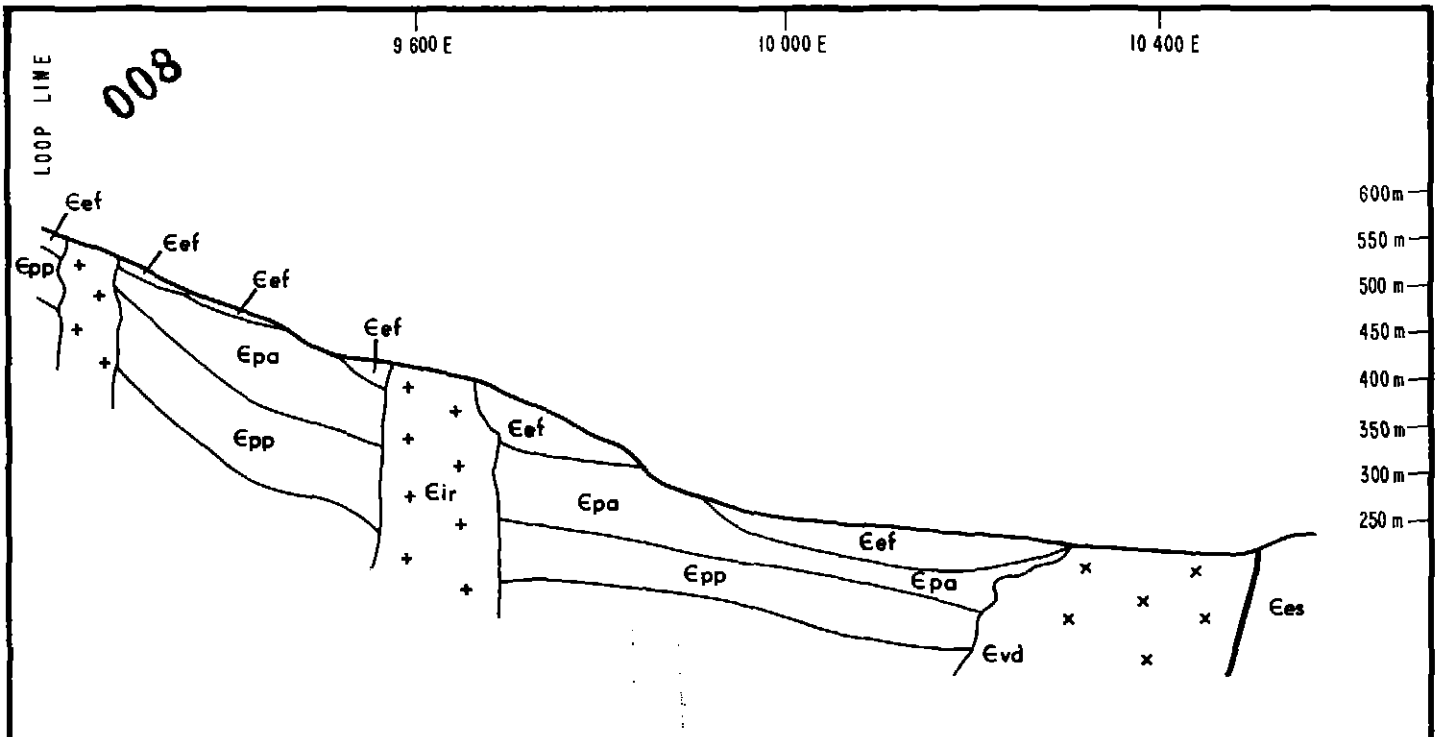
GEOPHYSICAL GRID AND SIMPLIFIED GEOLOGY

SCALE 1:25 000

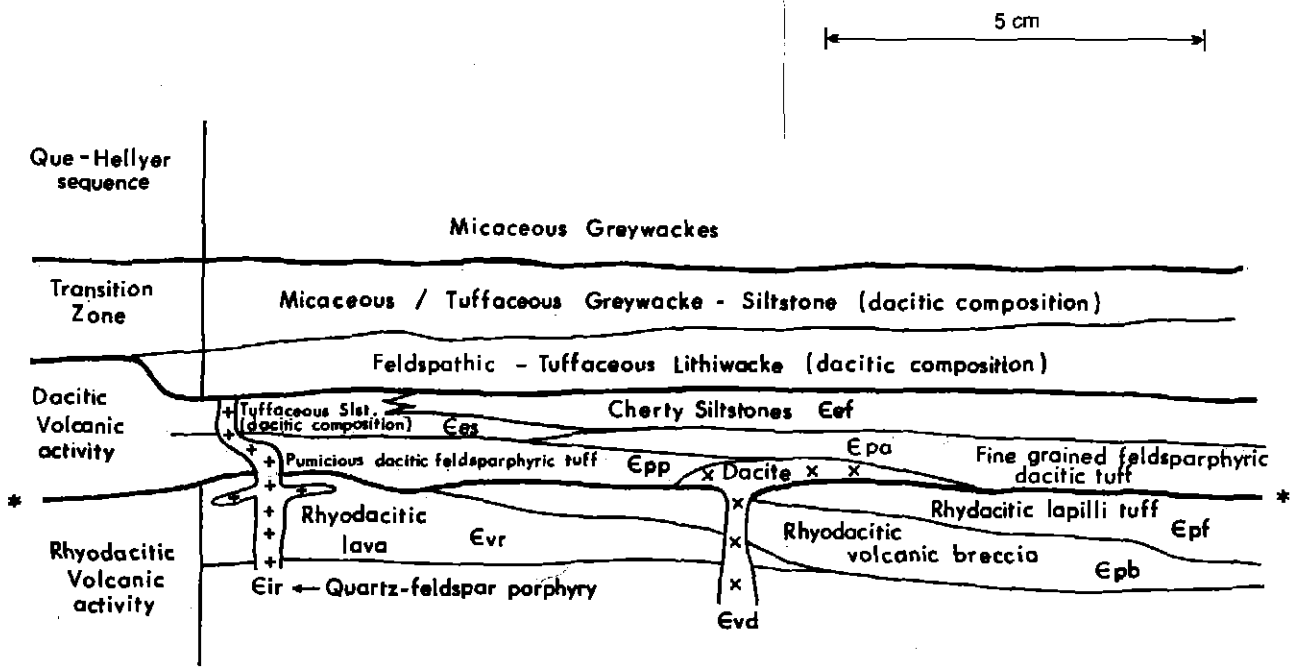
0 500 1000 1500 2000

metres

FIGURE 2



SCHEMATIC CROSS-SECTION
PROFILE 3400N



SCHEMATIC INTERPRETATIVE STRATIGRAPHY

* Interpreted hiatus in volcanism – may represent potential VMS host level.

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PANCONTINENTAL MINING LIMITED
EXPLORATION DIVISION

Lake Mackintosh Prospect
EL 42/85 - Tasmania
SCHEMATIC CROSS SECTION & INTERPRETATIVE STRATIGRAPHY

0 100 200 300 400
metres

Compiled: K.O.A.	Date: JULY 1987	Dwg. No.: 37/D/4
Report No.:	Map Ref.: SK 55-3	Figure 3

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Report Number: 88/11

88-2795

E.L. 42/85, LAKE MACKINTOSH, TASMANIA

ANNUAL REPORT FOR A PERIOD FROM 21 JANUARY 1987 TO 20 APRIL 1988 VOLUME 2 OF 3

By K.O. Airas
2 March 1988

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REPORT ON FOLLOW UP EXPLORATION OF THREE ANOMALOUS AREAS AT LAKE MACKINTOSH EL 42/85

MAY - JUNE 1987

For: Pancontinental Mining Limited
9-13 Young Street, Sydney 2000

By: W. Herrmann
RSD 1066 Devonport 7310

Date: 30th June 1987

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1. INTRODUCTION

Exploration Licence 42/85 occupies an area of about 9 square km situated at the western shore of Lake Mackintosh near Tullah in Western Tasmania.

The area is currently being explored by Pancontinental Mining Limited, principally for volcanogenic polymetallic massive sulphide deposits.

During the latter half of 1986 Pancontinental undertook drainage geochemical sampling, geological mapping and UTEM II geophysical surveys essentially covering the entire E.L. The results of drainage geochemical sampling and geological mapping were reported by Herrmann, December 1986.

Three areas were selected, by Pancontinental, for follow up exploration:

1) A Utem II/Zinc drainage geochemical anomaly near 9600E/3400N. Preliminary assessment by re-mapping and C-Horizon soil and rock geochemical sampling.

2) Weakly anomalous gold in -80 mesh sediment samples from three small streams draining directly into Lake Mackintosh between lines 4800N and 5400N. Assessment by C-Horizon soil geochemical and panned concentrate sampling.

3) An occurrence of hydrothermal alteration and copper mineralisation below the Lake Mackintosh Spillway. Initial assessment by inspection and rock chip sampling.

This report presents the results of these preliminary follow up programmes.

The C-Horizon geochemical sampling was carried out on a contract basis by Nick Poltock Exploration during May 1987. The re-mapping, rock sampling and panned concentrate sampling was undertaken, also on a contract basis, by W. Herrmann during three days in mid June 1987.

2. SUMMARY AND CONCLUSIONS

Initial evaluation of three anomalous areas in EL 42/85 has involved a combination of bedrock geochemical sampling, rock chip sampling and panned concentrate stream sediment sampling.

Geochemical sampling over a coincident UTEM-Zinc drainage geochemical anomaly near 9600E/3400N has partly defined isolated weak anomalies peaking at 230 ppm Zn and 80 ppm Pb which are of about the same order as the drainage geochemical values. They appear to occur within tuffaceous-epiclastic siltstone units adjacent to the intrusive (?) contacts of a distinctive rhyolitic quartz-feldspar-biotite porphyry. No obvious source for the subtle geochemical anomalies has been identified. It is hypothesized, that minor base metals may occur in occasional quartz veinlets which have been observed in the siltstones, possibly concentrated close to the intrusive porphyry contacts and genetically related to it.

The source of the UTEM anomaly remains obscure. No hydrothermal alteration has been recognized in the area. Potential for massive sulphide mineralisation seems moderately low.

Geochemical sampling of bedrock, outcrops and stream sediment panned concentrates, in the vicinity of previously indicated -80 mesh fraction gold drainage anomalies along the lake shore near 5000N, has failed to locate a significant distribution of anomalous gold.

It is suspected that the original -80 mesh anomalies were spurious.

Nevertheless, some coarse felsic volcanic breccias exposed in this area contain abundant quartz in veins and open space fillings which may have evolved in an environment favourable to formation of "epithermal" precious metal deposits. Consideration of an exploration programme specifically for this target may be justified.

Reconnaissance mapping of the Lake Mackintosh Spillway area has located two interesting styles of sulphide mineralisation:

1) Chalcopyrite-pyrite stockwork veining carrying bulk grade of around 0.5% copper and 6 g/t Silver over a few metres extent.

2) Small lenses of "massive" pyrite - silica which carry anomalous levels of lead, zinc, copper and silver and which appear to represent tectonically transposed segments of a syngenetic massive sulphide horizon.

The structural and geographical location of both occurrences, within the highly disrupted Henty Fault Zone and close to the Mackintosh Dam and Power Station, creates exploration difficulties but it is suggested that further geophysical investigation should be undertaken.

3. UTEM II/ZINC DRAINAGE GEOCHEMICAL ANOMALY NEAR 9600E/3400N

Herrmann (1986) commented briefly on a cluster of weakly anomalous zinc values (100-165 ppm) associated with anomalous manganese values (1800-6200 ppm) in -80 mesh fraction sediments from streams near 3400N and 3800N.

Interpretation of UTEM II data, "inhouse" by Pancontinental, indicated the presence of a fairly deep anomalous source, possibly a conductor or lithological contact, observed on three lines and suggesting a NNE linear trend from 9760E/3400N to 9680E/3800N (Airas, May 1987) (See Figure 1).

The UTEM Anomaly is coincident with the area of Zn/Mn stream geochemistry. Although the UTEM anomaly source appeared to be "deep" it was considered that an initial follow up by C-Horizon geochemistry would help to define the zinc anomaly and provide more detailed geological information which could help the geophysical interpretation.

3.1 Soil Geochemical Sampling

The soil geochemical sampling and minor additional track cutting was carried out by Nick Poltock Exploration according to approximate specifications provided by Airas, (10/3/87).

Samples were collected at 20m intervals over short traverses along existing grid lines 3200 and 3400N, as well as additional traverses on newly cut lines 3300N and 9640E. (See Figure 2).

Poltock and Company used a portable Wacker drill fitted with a 20mm barrel providing about 100 gm of sample. Samples were obtained at the maximum limit of penetration of the drill in this case varying from 0.7 to 6.4 metres depth (Figure 3). Logging of the samples (Appendix II) indicated that most holes penetrated into true C-Horizon soil profile. Where possible, samples were obtained from rock outcrops.

The samples were analysed by ANALABS at Burnie, Tasmania by the following procedures:

Preparation:	Method:
Drying	005
Pulverizing	016

Analysis (of whole soil/rock):

Cu, Pb, Zn, Fe, Mn, Ag	101	(perchloric digest/AAS)
As	114	(vapour gen./AAS)
Au	309	(30g. fusion/AAS).

The analytical results are included in Appendix I, (Report No. 109.5.08.04532) and graphically portrayed on Figures 5 and 6.

Geochemical maxima compared with (visually estimated) background levels are as follows:

Element	Maxima	Background	
Cu	50	5 – 10	(ppm)
Pb	80	10	(ppm)
Zn	230	50	(ppm)
Fe	3.5	1 – 1.5	(%)
Mn	3050	100–200	(ppm)
Ag	1	<0.5	(ppm)
As	160	15	(ppm)
Au	All below detection limit 0.008 ppm		

3.2 Discussion of Results

An attempt at re-mapping the area of follow-up failed to reveal any exposures additional to those shown by Herrmann, 1986, Plate 1.

The area is covered by heavy "horizontal" scrub and there is very little outcrop, or indeed float, apart from those previously mapped in the stream bed. Logging of rock chips in C-Horizon soil samples however proved to be worthwhile and confirmed that the area sampled is underlain principally by a quartz-feldspar-biotite porphyry (Eir) and fine grained felsic tuffs and/or tuffaceous siltstones (Epa, Eef). (See Appendix II, Figure 4).

The distinctive quartz and biotite phenocrysts of Eir render it easily recognizable in rock chips. The C-Horizon chips of the finer grained tuffs (Epa?) are usually more weathered and their only megascopically recognizable features are fine granular (clastic) fabrics. Whether these represent pyroclastic vitric tuffs or reworked epiclastic siltstones is difficult to determine even in outcrop. In the EL 42/85 area fine grained rocks of pyroclastic origin probably form a continuum in the series Epa, Ees, Eef (See: Herrmann 1986; Appendix 4, Petrographic description by Barron, Specimens M69, M119. M67).

The outcrop of Eir porphyry at the stream confluence near 9640E/3500N contains xenoliths of fine grained felsic "tuff" and these together with the generally cross cutting boundaries and compositional uniformity of the porphyry suggest an intrusive origin for it.

The obviously interpretative geological boundaries shown on Figure 4 are intended to imply a generally north trending, east dipping stratigraphy in Eef, Epa? type volcaniclastics, cross cut by irregular intrusive bodies of Eir porphyry locally containing xenoliths and perhaps "rafts" of the country rock.

The apparent position of the UTEM anomaly is a little to the north east of the area sampled and there is no geological exposure in its vicinity on lines 3400N and 3600N. Its strike trend however, is similar to the interpreted structural trend and it is possible that the anomaly relates to the base of an Eef unit overlying Epa? just east of the area sampled. (Figure 4). The nearest outcrop to this position is that occurring at 9800E/3400N which consists of pale grey (tan where oxidised) flinty weakly laminated vitric tuffaceous siltstone (Eef). Bedding appears to dip at 70° to the east. There are fine, slightly wavy sedimentary laminations suggesting possible minor soft sediment slumping. It exhibits no signs of alteration, mineralisation or veining and a rock chip sample of it (E101509) (Appendix I) returned assay values indicative of a barren rock.

Slightly further afield, but still within several hundred metres of the UTEM anomaly, several available whole rock analyses (Herrmann, 1986; Appendix 3, Sample Nos: M40, M55, M67, M69) fail to show depletion of sodium or strontium which might be expected in the (footwall) vicinity of a (proximal) volcanogenic massive sulphide deposit.

The C-Horizon soil geochemical results, (Figures 5 and 6) indicate that the greatest concentrations of Pb, Zn occur in Eef and Epa? units adjacent to Eir porphyry contacts near the western ends of sampled traverses on 3300N and 3400N. There is a faint suggestion (rather marked in the case of Arsenic) of a south eastward geochemical trend cross cutting the north east trending "fingers" of Eir porphyry. This, however, may be a figment of interpretative contouring. A more conservative style of contouring would confine the major Pb, Zn "highs" to several separate areas characterized by close proximity to Eir porphyry contacts (Figure 7).

The "spot" Pb, Zn anomaly at 9600E/3300N is interesting for the presence of a few chips (in the C-Horizon sample) of transparent vein quartz. The only signs of mineralisation in the stream bed outcrops at 9520 - 9560E on 3400N (the site of the strongest "bedrock" anomaly and second strongest drainage anomaly) are occasional veinlets of quartz of variable orientation, mostly < 5mm in width and of frequency < 1 vein per metre. Some veins show weak Fe, Mn oxide staining and the quartz often has an across vein fibrous or "toothy" habit.

I took a selective sample from the outcrop at 9540E/3400N (E101508) of rock in which much veinlets constituted about 2% of the sample. The Pb, Zn values of 50, 180 ppm respectively are slightly lower but broadly comparable to the results obtained on Nick Poltocks' samples.

In the absence of any obvious signs of mineralisation I am inclined to attribute these rather subtle Pb, Zn (and etc) anomalies to possibly weakly mineralised quartz veinlets of low intensity which may be localised near intrusive contacts of the Eir porphyry and perhaps genetically related to it.

The coincidence of bedrock and drainage Zinc anomalies suggests that drainage geochemistry has been an effective exploration tool in this environment.

The only other exposure I encountered and considered worth sampling in this follow up area were a few floaters, near 9870E/3200N, of flinty, laminated to massive vitric tuffaceous siltstone (Eef) with traces (~0.1%) of Pyrite on joint planes. A high graded sample (E101507) returned a faintly anomalous Zn value of 110 ppm with other metals at background level.

Although far from exhaustive, the results of C-Horizon geochemical sampling are not very encouraging. If desired, the bedrock sampling traverses could be extended westwards on lines 3200N, 3400N and perhaps also on 3600N to test the hypothesis that the anomalies are due to minor quartz veining related to contacts of the intrusive porphyry and to provide more complete coverage of the catchment area of the principal anomalous streams.

4. GOLD DRAINAGE ANOMALY AT LAKESHORE NEAR 5000N

The 1986 drainage sampling programme (Herrmann, 1986) indicated anomalous levels of gold in -80 fraction sediment samples from three small streams draining directly into Lake Mackintosh along the shoreline between lines 4800N and 5400N.

Analysis had been by AMDEL. In view of the fact that this laboratory, at about that time, had provided some inaccurate gold analyses (on rock chip samples) from another Pancontinental exploration project it was considered prudent to re-sample the anomalous sites and reassay by two laboratories.

Results of the two phases of sampling were as follows:
(Results in g/t Au)

1st Phase		2nd Phase		
Sample No.	Au (AMDEL)	Sample No.	Au (AMDEL)	Au (ANALABS)
15899	0.18	(Not resampled due to high lake level)		
15900	0.02	15946	0.04	0.30
15901	0.18	15948	0.04	<0.008

The resample results were enigmatic, perhaps suggesting a sampling problem with errattic distribution of fine granular gold. Accordingly a brief follow up programme involving panned concentrate sediment sampling and bedrock geochemical sampling was devised.

4.1 Soil Geochemical Sampling

"Bedrock" soil geochemical sampling and minor associated track cutting (4800N) was carried out by Nick Poltock Exploration according to specifications provided by Airas (10/3/87).

Samples were collected at 20m intervals along 4 short traverses in the vicinity of the anomalous streams (Figure 8 and 9). Poltock and Co. used a portable Wacker drill with a 32mm sample barrel providing about 1–2 kg of sample obtained from the maximum limit of penetration of the drill varying from 0.4 to 3.9m (Figure 10).

Where possible rock chip samples were taken from outcrop in lieu of bedrock drilling. Logging of the samples (Appendix II) indicates that many of the Wacker drill holes terminated in gravelly soils derived from superficial fluvioglacial deposits (Figure 11) and that geochemical values therefrom would not be representative of the underlying bedrock.

Samples were analysed by ANALABS at Burnie, Tasmania according to the following procedure:

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Preparation:	Method:
Drying	005
Splitting	013
Pulverizing	016

Analysis (of "whole" soil/rock):

Au	309	(30g Fusion/AAS)

The gold results are included in Appendix I and portrayed in Figure 9.

Only one sample (the first of the batch of 29 samples) reported above the detection limit (0.008) at 0.05 g/t Au.

4.2 Panned Concentrate Sampling

The three stream sites were revisited and the sediments sampled and concentrated by panning on site. Approximately 5kg of -7 mm mesh sediment from the best available sediment trap sites in each stream, was panned down to about 2-3g of concentrate to allow in field examination of the "heavy" minerals.

Concentrates were submitted to ANALABS, Burnie, where they were dried, weighed and the whole concentrate analysed for gold by Method 309 (Fusion/AAS).

Analytical results are included in Appendix I.

In field examination of the concentrates, indicated that they all consisted predominantly of quartz sand with minor proportions (< 1 to 2%) of magnetic black sand, probably magnetite, and traces of a pink transparent mineral possibly spinel or garnet. None of the concentrates contained visible gold.

Analytical results were all below the detection limit (0.008 g/t) for gold.

4.3 Discussion of Results

Logging of the samples obtained by Wacker Drill, (Appendix II) indicates that the majority, particularly those close to the lakeshore, represented superficial fluvioglacial cover or at best clayey B-Horizon soil. Only a few samples resembled the pale powdery clay with rock chips typical of C-Horizon developed on felsic volcanics. The "outcrop" samples, taken further away from the lakeshore, are probably representative of local bedrock geology but due to the steep ridge immediately to the west (and consequent shedding of talus and large boulders) it is often difficult to determine whether the "outcrop" is in situ or has come down from the ridge.

In any case the gold assay results of Wacker Drill and "outcrop" samples are not encouraging. Only one sample (E101438) contains above detection limit gold at 0.05 g/t. Although this sample is in the middle of an analytical batch, it is the first of the large samples (1-2 kg) obtained with the 32mm Wacker sampling barrel. (Samples E101401 - 437 (Section 3.1 this report) were of about 100gm each and probably the whole was pulverized; Samples E101438-466 of 1-2 kg each would have required splitting before pulverizing). The fact that this isolated above background sample occurs as the first of a group strongly suggests a contamination problem, either at the sampling or analytical preparation stage.

The absence of gold from the panned concentrate samples is likewise discouraging and casts doubt over the validity of the previous and inconsistent -80 fraction stream sediment anomalies.

An outcrop on the shoreline at about 4900N (Figure 11) consists of coarse volcanic breccia with small to large (300mm) fragments of pinkish grey feldspar phyric, sometimes flow banded, rhyolite in a mottled dark greenish grey fine grained lapilli-crystal-vitric "tuff" matrix. The fragment to matrix ratio is about 3:1. Rare fragments contain traces of disseminated pyrite but feldspars appear to be quite fresh. Two styles of veining occur:

1) rare narrow (<5mm) planar quartz veinlets of frequency < 1 vein/metre.

2) localized larger en echelon tension gash veins filled with grey quartz and massive compact granular chlorite.

Rocks containing the two types of veining were sampled for E101504, E101505 respectively but both returned assays of <0.008 g/t Au. (Appendix I).

On the shore line near 4660N there are numerous loose boulders of broadly similar coarse volcanic breccia, probably derived from the ridge to the west. Some contain irregular patches, veins and interfragment space fillings of white quartz; some resemble Evd type amygdaloidal dacite with abundant quartz filled amygdales defining a flow fabric and there are occasional planar cross cutting quartz veinlets.

Quartz as veins, veinlets, patches and amygdale fillings constitutes some 2-3% of the volume but the rocks otherwise do not show pervasive silicification, feldspar alteration, or sulphide mineralisation. A grab sample from these boulders (E101506) returned an assay of 0.010 g/t Au which is just a whisker above the detection limit and probably of no significance.

The follow up sampling program whilst only partly effective with respect to C-Horizon/bedrock sampling, has failed to substantiate the -80 fraction stream sediment anomalies. Rock chip sampling has thus far failed to detect any significant gold mineralisation. Nevertheless, coarse fragmental felsic volcanics, which at some stage must have been highly permeable and could have provided favourable environments for formation of "epithermal" precious metal deposits occupy a large part of the steep ridge to the west of the area sampled. Abundance of silica in veins and open space fillings in some of the local rocks indicates at least low temperature hydrothermal circulation.

Although the validity of the original gold drainage anomalies seems doubtful there may be justification for a more extensive rock chip sampling programme with analytical methods specifically designed to identify exposed or concealed "epithermal" precious metal deposits.

5. COPPER MINERALISATION BELOW MACKINTOSH SPILLWAY

My original mapping (Herrmann, 1986) in the area of the Lake Mackintosh Spillway was only partial due to the lake spilling during the spring of 1986. Following a report of an occurrence of alteration and copper mineralisation in that area (K. Airas, pers. comm) I made a hasty revisit.

5.1 Rock Chip Sampling/Geology/Discussion

Copper mineralisation was found to occur at the probably faulted contact between (Evd) dacite and (Ees) tuffaceous sericitic siltstone at the confluence of water courses about 120m west of the western end of the Mackintosh Dam.

The principal development of mineralisation occupies a 50–100mm wide fissure which trends 075° and dips at 60° to the south, thus cross cutting and apparently post dating the steep northerly trending local cleavage. The fissure is exposed for only about 3m length, petering out both eastward and westward. It consists of a rather irregular and poorly defined system of anastomosing veinlets composed of grey quartz and minor carbonate with slugs and patches of chalcopyrite (partly oxidized to chalcocite and malachite) and lesser pyrite. A high graded sample of this material (E101510) returned an assay of 6.85% Cu, 31 g/t Ag and (absurdly low) 0.5% Fe. Narrow irregular veinlets of similar composition form a stockwork of moderate intensity in a poorly defined patch of about 3m diameter immediately into the footwall (north) of the principal 075° trending fissure. Common veinlet orientations within this zone are subparallel to the 075° trend, also about 330° with steep dips, and other variable orientations. My general impression is that the vein systems mainly cross cut and post date cleavage formation but have been at least partly influenced by the presence of cleavage. The veinlets are mostly 1–5 mm in thickness and of short persistence, generally only 50–100mm in length. A representative chip sample over approximately 3m northwards through this stockwork (E101511) (Figure 12) returned an assay of 0.53% Cu and 6 g/t Ag.

Representative chip samples to west, east and south of the observed mineralisation (Figure 12, E101512, 513, 514) returned low values in the range 5–90 ppm Cu.

The mineralisation thus appears to be confined to a very small area apparently within (feldspar, phyric, amygdaloidal) Evd type dacite immediately adjacent to the probably faulted contact with Ees type tuffaceous sericitic siltstone. The latter contains local minor (1%) disseminated pyrite mineralisation but insignificant levels of base metals. The dacite host appears to be weakly silicified and sericitized close to the contact but this may be in part related to strain and cleavage formation. The presence of strong cleavage and associated sericite causes difficulty in differentiating the two (?) rock types in the field and in exactly defining the contact.

On mapping further up the watercourse to the westward from the copper occurrence, I was surprised to find that the Evd dacite persists in outcrop for only about 50m and is in sharp (probably faulted) contact with interbedded tuffaceous-epiclastic lithiwackes and grey to black siltstone and slate similar to those occurring in the Spillway area east of the dacite contact. (See updated 1:5,000 Geological Plan, Plate 1). These sediments pass westwards into coarse fragmental felsic volcanic epiclastics with abundant rafts and fragments of dismembered black shale-siltstone beds. The fabric is partly epiclastic but evidently largely tectonic with intense deformation and partial transposition of layering parallel to cleavage. There are some clastic dykes and etc indicating that some of the coarser epiclastics were rather mobile during deformation.

It seems that the dacite unit hosting the copper occurrence represents an allochthonous fault slice of the volcanic sequence to the west which has been tectonically incorporated within the ("Farrell Slate") sedimentary sequence. An alternative interpretation could be that the dacite represents a small intrusive body with contacts modified by strong deformation.

In the north bank of the watercourse exposure, about 2m west of the contact of this dacite "allochthon" there occur two small lenses of "massive" pyrite within felsic tuffaceous-epiclastic siltstone. The lenses are about 100 x 300mm and 150 x 600 mm in size (the larger one is covered by overburden to the north) and are aligned with the prominent north trending steep dipping fabric.

027

Their composition is of about 30% pyrite in a matrix of fine sintery dark grey silica. Although partly recrystallized, the pyrite occurs in fine, persistent parallel laminae strongly resembling sedimentary bedding. A grab sample representative of these lenses (E101515) returned analyses of 0.05% Cu, 0.39% Pb, 1.76% Zn, 55 g/t Ag, 0.12% As and a ridiculous 0.52% Fe.

Given the abundant evidence of tectonic transposition in the enclosing sediments, it is very likely that these pyritic lenses represent dismembered segments or boudins of a syngenetic massive sulphide horizon. Such a horizon would be of obvious significance to exploration for polymetallic volcanogenic massive sulphide deposits which are the principal target in EL 42/85.

The association of quartz + carbonate in cross cutting chalcopyrite veinlets of the copper occurrence (described above) suggests a late tectonic (Devonian) origin similar to the quartz + sideritic carbonate tension gash fillings which are present on a minor scale elsewhere in the area. However, an origin involving deformation of a VMS footwall chalcopyrite-pyrite stringer zone, or remobilization of such stringer mineralisation, cannot be ruled out.

There are several negative factors to assessment and exploration for extensions of both the copper veins and pyritic lenses occurrences:

1) The occurrences are within 100m of the southern boundary of the E.L.

2) They are close to a HEC dam and power station, presumably on land controlled by the HEC.

3) Their location within intensely deformed rocks of the Henty Fault Zone will make structural/stratigraphic interpretation extremely difficult.

4) Much of the area and presumable extension to NNE is covered by fluvioglacial deposits in the old valley of Tullabardine Creek.

Nevertheless their recognition provides an opportunity for laboratory and in situ conductivity measurements which may assist interpretation of the 1986 UTEM II geophysical survey.

028

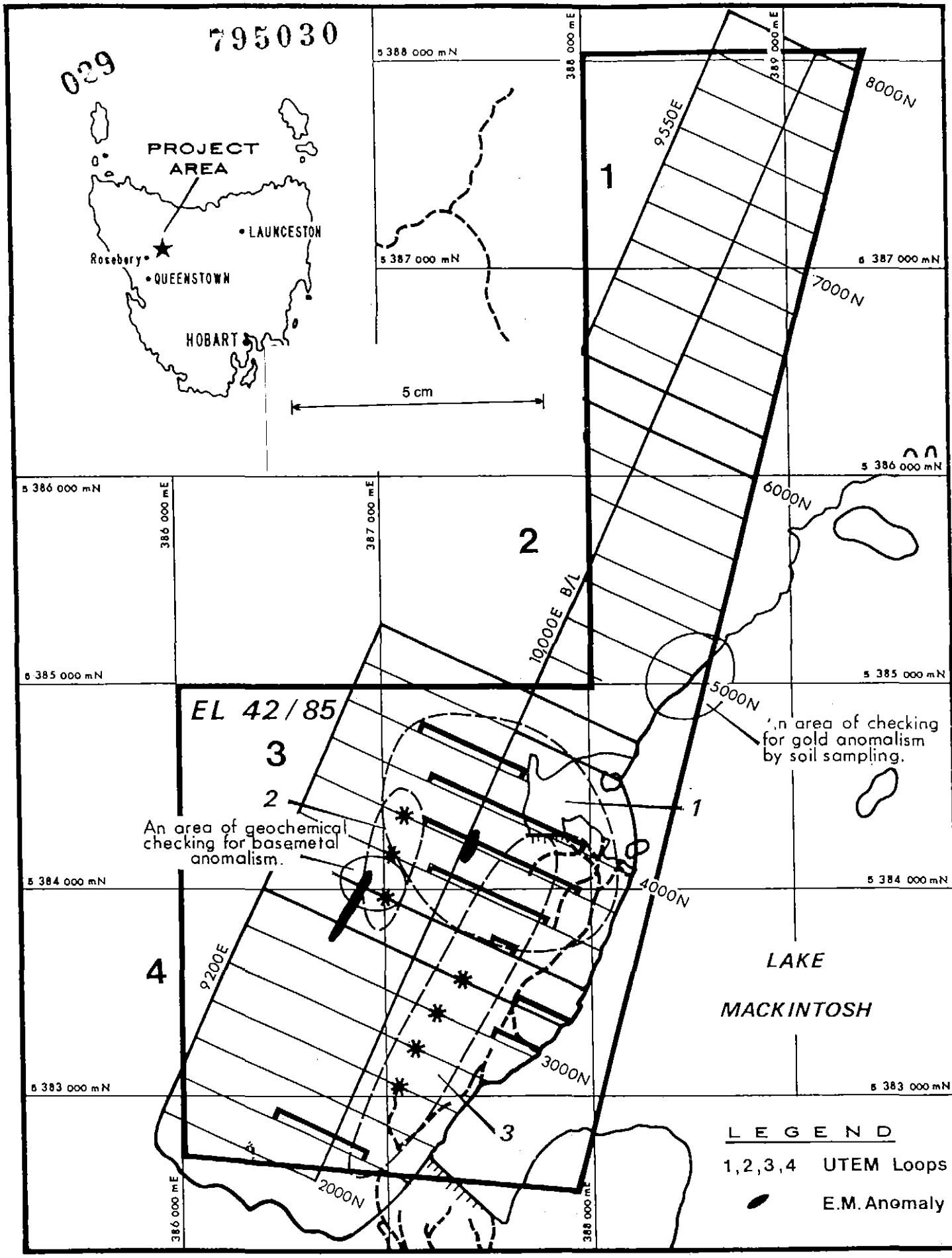
795029

Figure 1 (from: Airas 29/5/87) shows a chain of UTEM anomalies at about the same structural position as these sulphide mineral occurrences extending from 2600N to 3800N.

These anomalies probably reflect a not unexpected high conductivity in the "Farrell Slates" in contrast to the dominantly volcanic sequence to the west. The pattern of a fairly discreet chain of anomalies not generally extending eastward to the lakeshore suggests a rock/conductivity boundary although it could also reflect a greater proportion of black slates near the western margin of the "Farrell Slates" or increased conductivity along some boundary fault.

I can offer no good explanation for the broad area of slightly above background conductivity around Tullabardine Dam. (Figure 1, Anomaly group 3). Perhaps this reflects slightly higher conductivity in the (Evd) dacite lithotype which may represent an intrusive body. There is a partial analogue to this situation in the faint anomaly on line 2200N. The theory could be inconclusively tested by re-examining UTEM profiles for lines 7400N and 7600N which cross a small (perhaps intrusive) area of similar (Evd) dacite although in this case the surrounding rocks are sediments (similar in general to the "Farrell Slates") and the conductivity contrast may be reversed.

Given the difficulties of a structural mapping or geochemical follow up of the copper vein and pyritic lense occurrences the best approach may be to investigate the actual conductivity characteristics of the observed mineralisation; with these in view reassess the existing UTEM data to determine if the survey parameters were appropriate to definition of such mineralisation (of an appropriate thickness) and give consideration to further specific geophysical surveys in the area east of the 10,000E base line and south of Tullabardine Dam.



EL 42/85 - LAKE MACKINTOSH TASMANIA

UTEM ANOMALIES

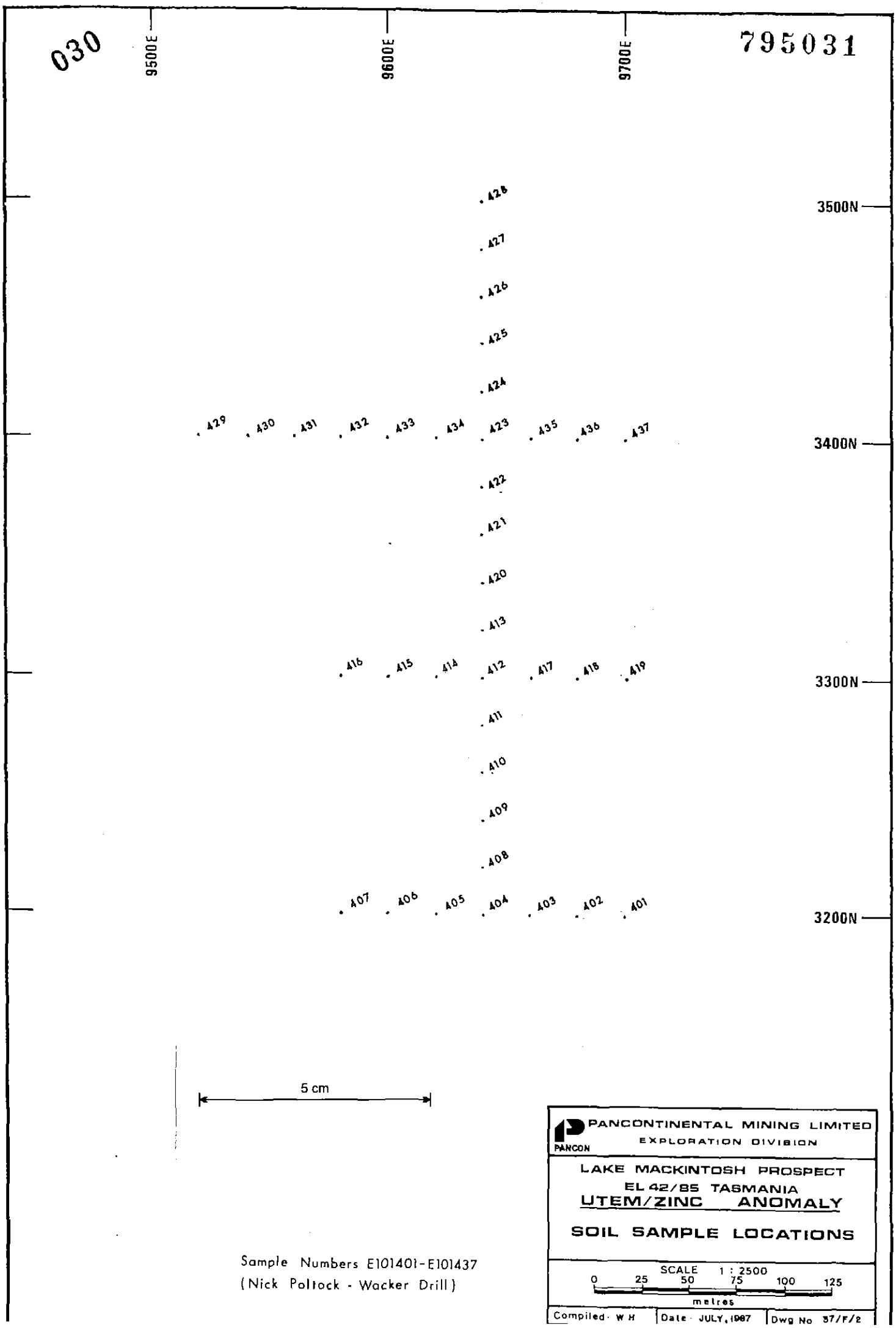
LEGEND

Over 2% in 2ms channel

Anomaly

SCALE 1:25 000

0 500 1000 1500 2000


030
795031
9500E
9600E
9700E
3500N
3400N
3300N
3200N
428
427
426
425
424
429
430
431
432
433
434
423
435
436
437
422
421
420
413
416
415
414
412
417
418
419
411
410
409
408
407
406
405
404
403
402
401
5 cm
PANCONTINENTAL MINING LIMITED
PANCON
EXPLORATION DIVISION
LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
UTEM/ZINC ANOMALY
SOIL SAMPLE LOCATIONS
SCALE 1 : 2500
0 25 50 75 100 125
metres
Compiled · W H
Date · JULY, 1987
Dwg No 37/F/2
Sample Numbers E101401-E101437
(Nick Pollock - Wacker Drill)

9500E 9600E 9700E

3500N
3400N
3300N
3200N

.O/C .1·2 .0·7 .1·5 .1·0

.O/C .O/C .O/C .O/C .1·2 .1·6 .0·8 .1·2 .0·9 .1·4

.1·0 .5·6 .4·0 .0·9

.1·0 .1·8 .0·9 .6·0 .4·4 .5·0 .4·2

.1·3 .1·8 .1·2 .2·2

.6·4 .4·6 .2·3 .4·4 .0·8 .6·4 .1·6

5 cm

O/C : Rock sample from outcrop

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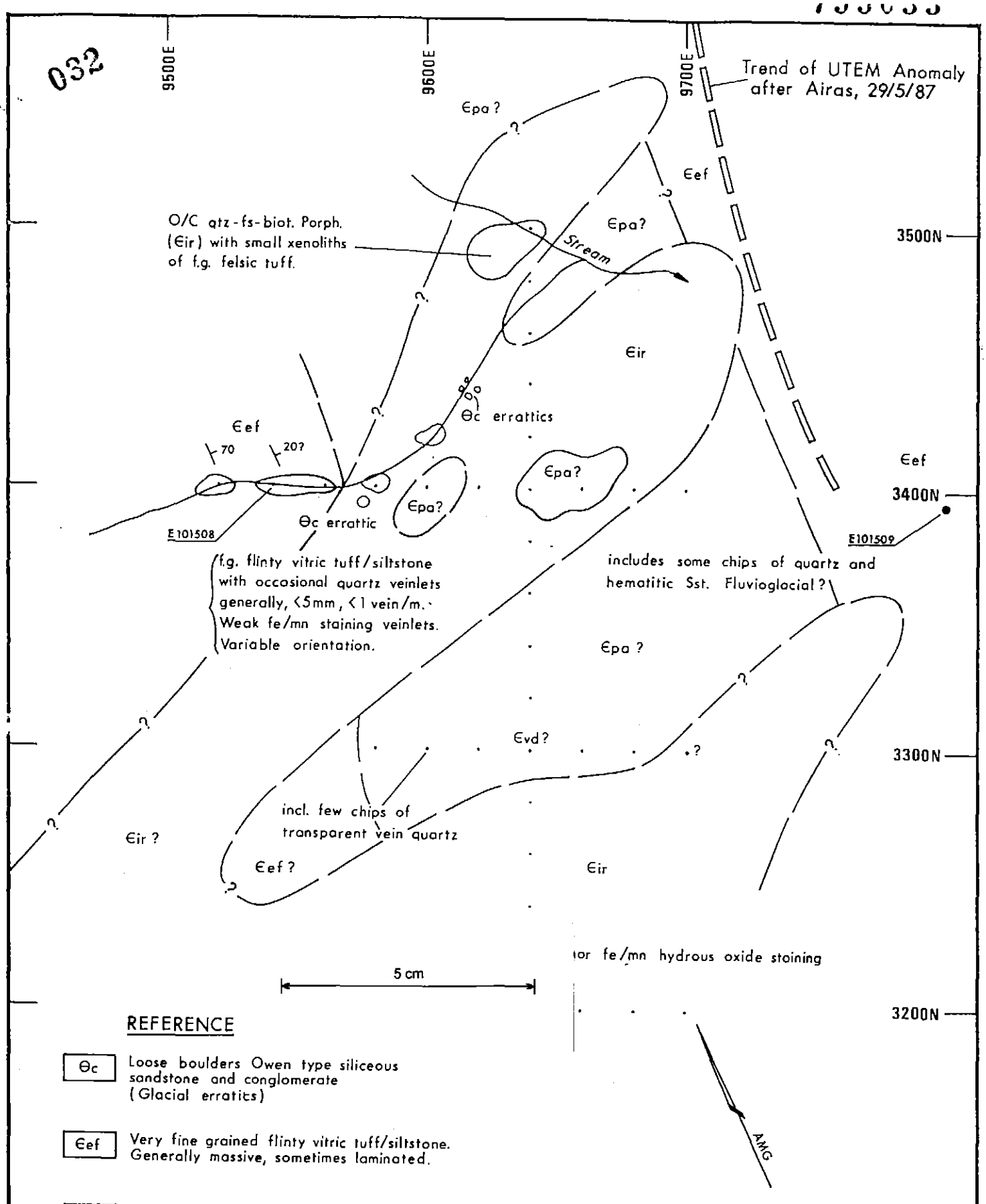
PANCON EXPLORATION DIVISION

LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
UTEM/ZINC ANOMALY
C-HORIZON
SOIL SAMPLE DEPTHS
(DEPTHS IN METRES)

SCALE 1 : 2500
0 25 50 75 100 125
metres

Compiled: W.H.	Date: JULY, 1987	Dwg No.: 37/F/3
Report No 87/43	Map Ref SK 55-3	Figure 3



REFERENCE

- **Θc** — Loose boulders Owen type siliceous sandstone and conglomerate (Glacial erratics)
- **Eef** — Very fine grained flinty vitric tuff/siltstone. Generally massive, sometimes laminated.
- **Epa?** — In C-Horizon chips: tan coloured weathered rock with f.g. granular fabric. Probably felsic tuff and/or vitric tuff/siltstone.
- **Eir** — Rhyolitic quartz, feldspar, biotite Porphyry.
- **Evd** — Dacitic feldspar, ferromagnesian phyric extrusive/intrusive.

PANCONTINENTAL MINING LIMITED
PANCON EXPLORATION DIVISION

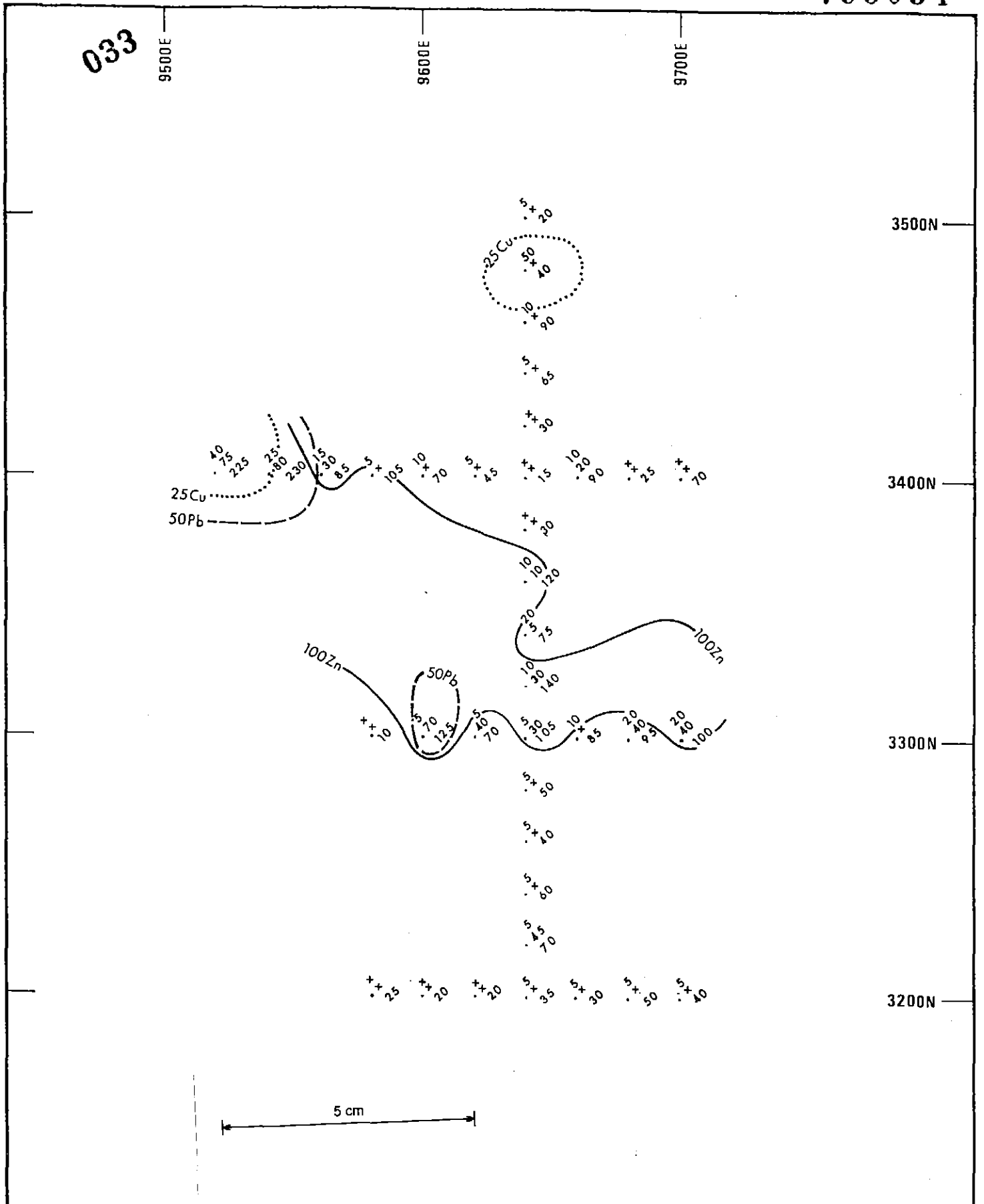
LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
UTEM/ZINC ANOMALY
BEDROCK GEOLOGY
DETERMINED FROM ROCK CHIPS IN C-HORIZON SOIL SAMPLES

SCALE 1 : 2500
0 25 50 75 100 125
metres

Compiled: W.H.	Date: JULY, 1987	Dwg.No.: 37/P/4
Report No.: 87/43	Map Ref.: 8K56-3	Figure 4

795034

033



Cu Copper
Pb Lead
Zn Zinc
} in p.p.m.

× below detection (<5 p.p.m.)

PANCONTINENTAL MINING LIMITED
PANCON EXPLORATION DIVISION

LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
UTEM/ZINC ANOMALY
C-HORIZON SOIL
GEOCHEMICAL RESULTS
COPPER, LEAD, ZINC

SCALE 1 : 2500
0 25 50 75 100 125
metres

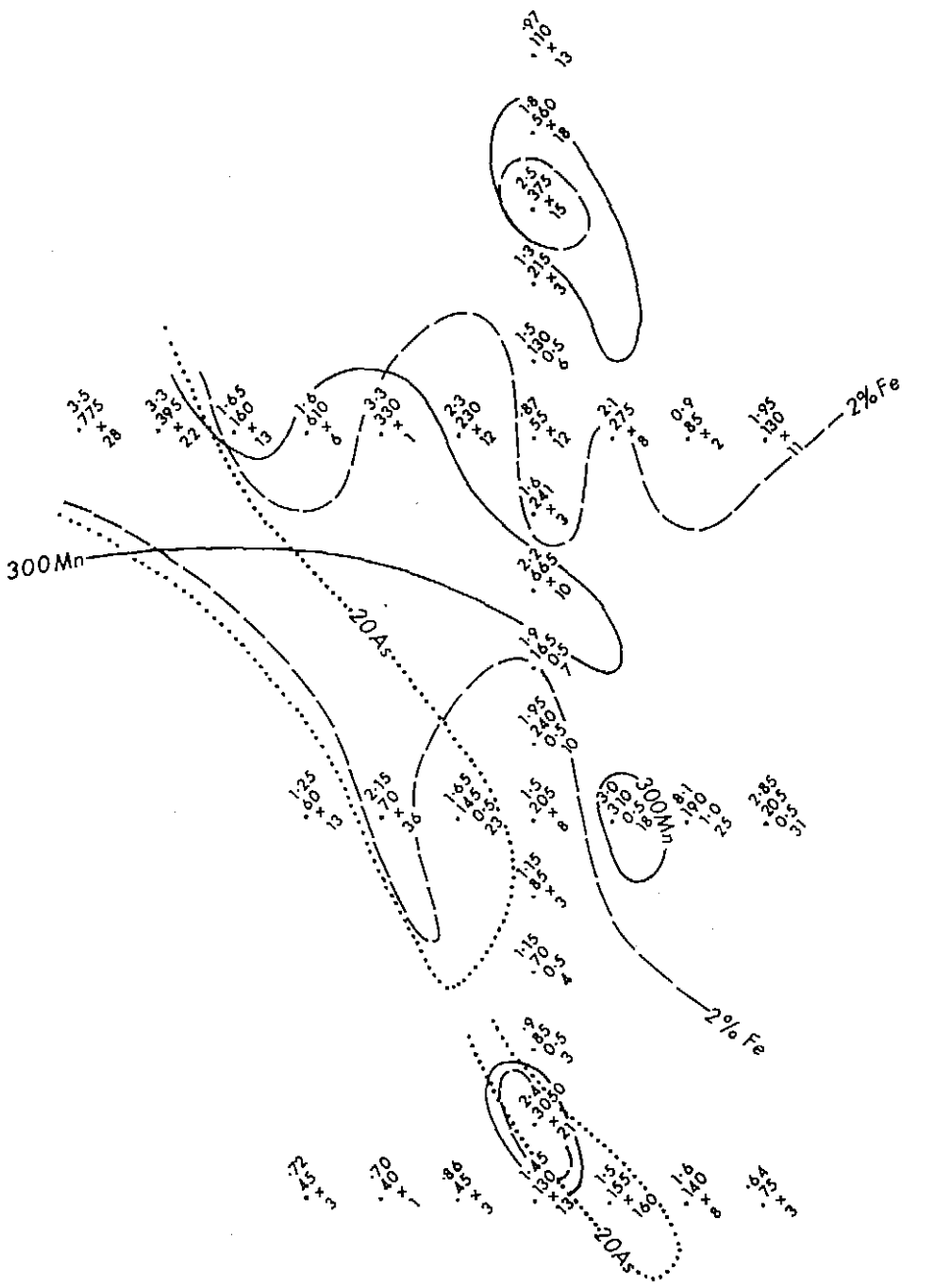
Compiled: W.H. | Date: JULY, 1987 | Dwg. No.: 37/F/6

795035

034

9500E 9600E 9700E

3500N 3400N 3300N 3200N



5 cm

2% Fe contour

300ppm Mn contour

20 ppm As contour

Fe % ..... Iron
Mn ppm..... Manganese
Ag ppm..... Silver
As ppm..... Arsenic

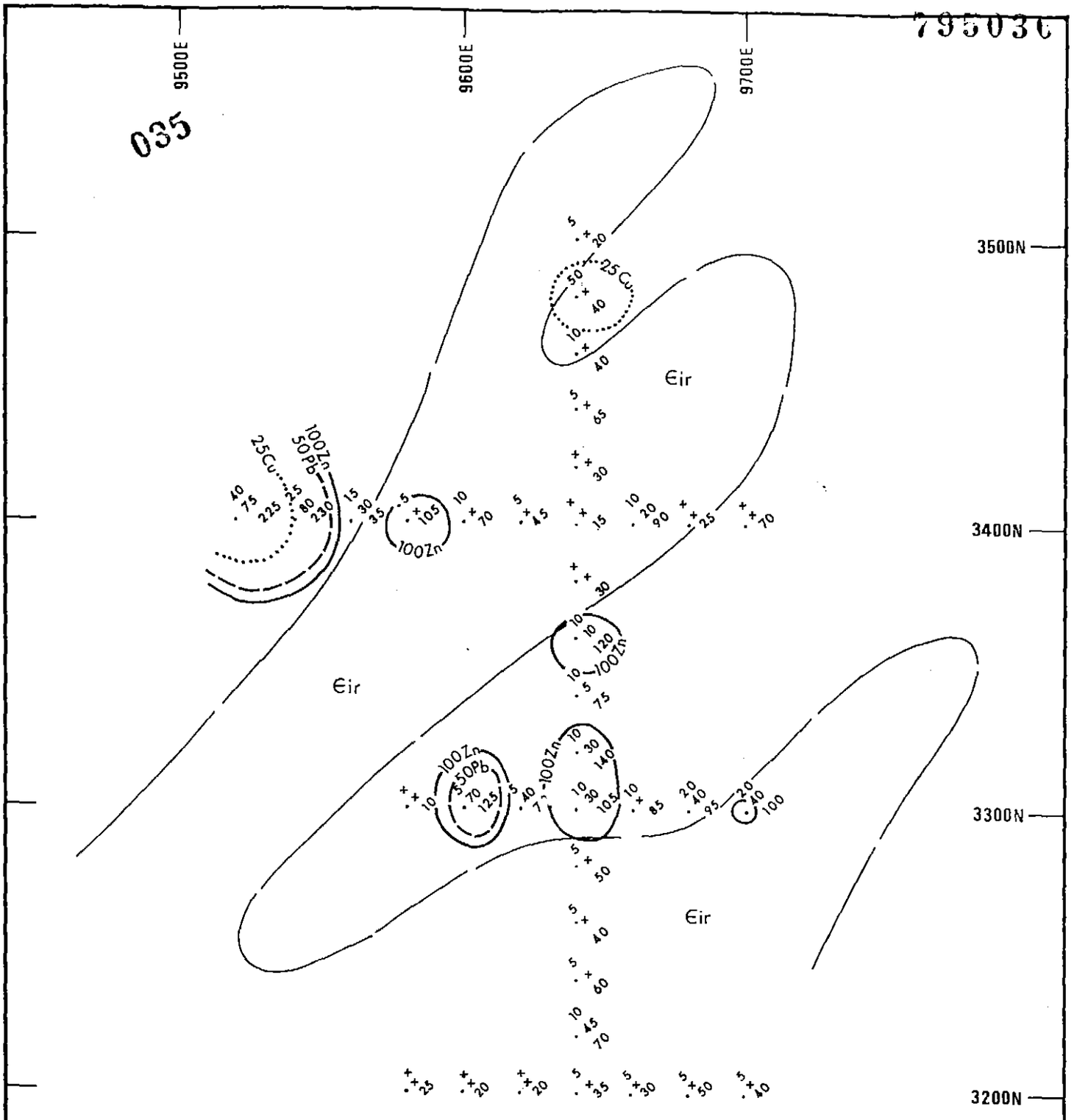
× Ag below detection (<0·5ppm)

PANCONTINENTAL MINING LIMITED
PANCON EXPLORATION DIVISION

LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
UTEM/ZINC ANOMALY
C-HORIZON SOIL
GEOCHEMICAL RESULTS
IRON, MANGANESE, SILVER, ARSENIC

SCALE 1 : 2500
0 25 50 75 100 125
metres

Compiled: W.H.	Date: JULY, 1987	Dwg.No.: 37/F/6
Report No.: 87/43	Map Ref.: SK 66-3	Figure 6



Cu Copper
Pb Lead } in p.p.m.
Zn Zinc

× below level of detection (<5 p.p.m.)

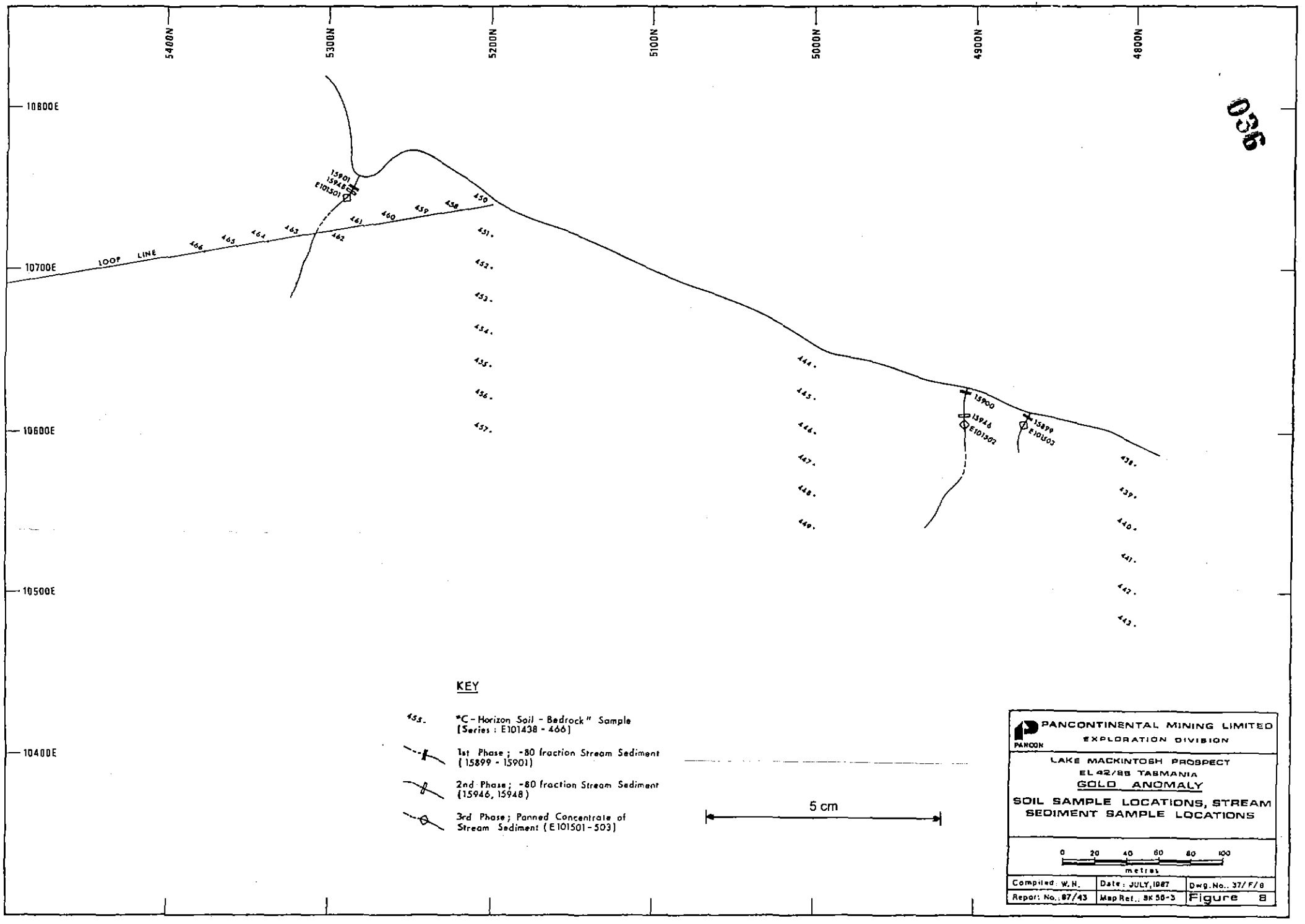
5 cm

PANCONTINENTAL MINING LIMITED
PANCON EXPLORATION DIVISION

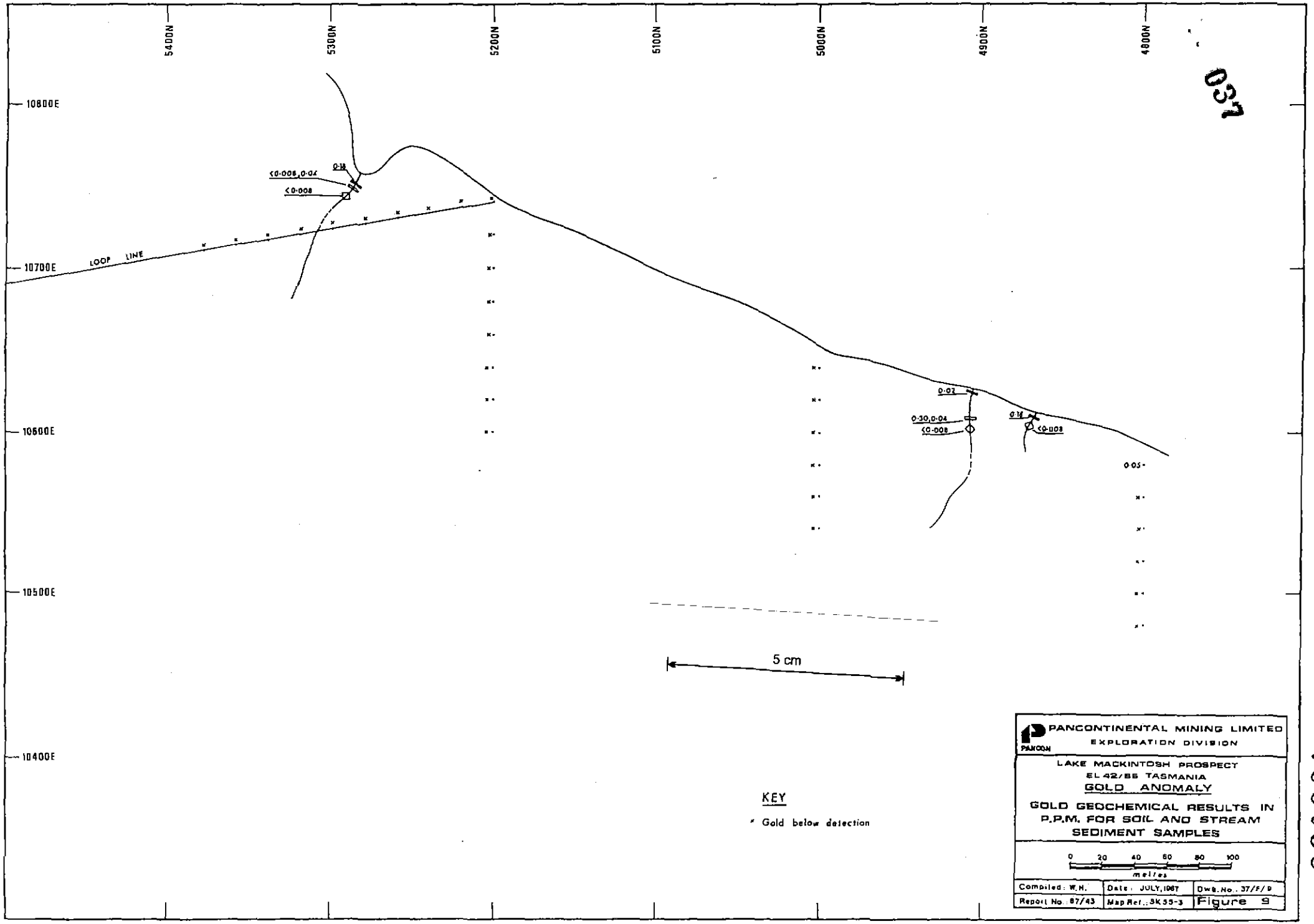
LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
UTEM/ZINC ANOMALY
C-HORIZON SOIL
GEOCHECHEMICAL RESULTS
COPPER, LEAD, ZINC
ALTERNATIVE CONTOURING

SCALE 1 : 2500
0 25 50 75 100 125
metres

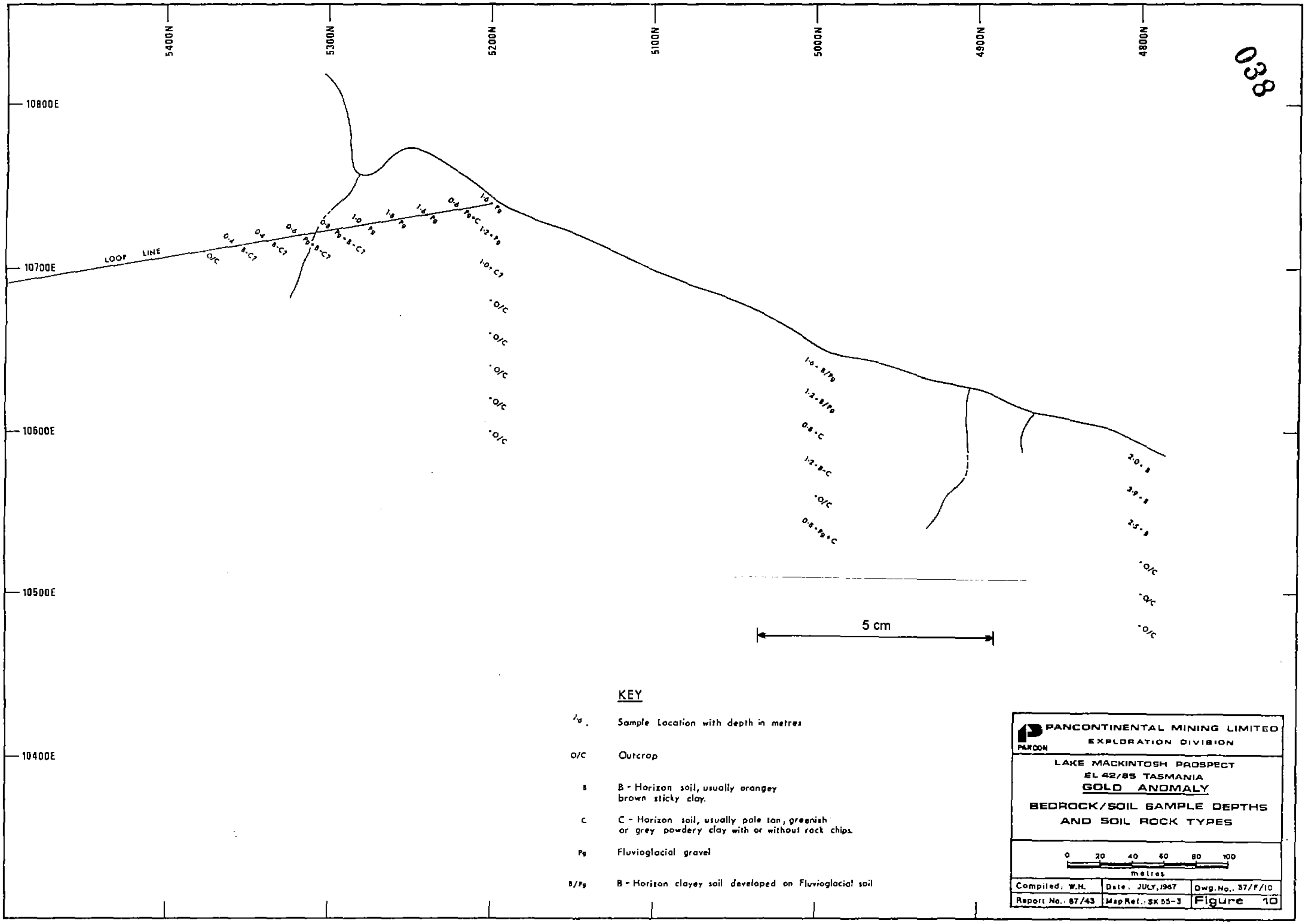
Compiled: W.H.	Date: JULY, 1987	Dwg.No.: 37/F/7
Report No: 87/43	Map Ref: 9K86-3	Figure 7


5400N
5300N
5200N
5100N
5000N
4900N
4800N
10800E
10700E
10600E
10500E
10400E
LOOP LINE
15901
15948
E101501
15900
15946
E101502
15899
E101503
KEY
455. "C - Horizon Soil - Bedrock" Sample (Series : E101438 - 466)
1st Phase ; -80 fraction Stream Sediment (15899 - 15901)
2nd Phase ; -80 fraction Stream Sediment (15946, 15948)
3rd Phase ; Panned Concentrate of Stream Sediment (E101501 - 503)
5 cm
PANCONTINENTAL MINING LIMITED
EXPLORATION DIVISION
PANCON
LAKE MACKINTOSH PROSPECT
EL 42/88 TASMANIA
GOLD ANOMALY
SOIL SAMPLE LOCATIONS, STREAM SEDIMENT SAMPLE LOCATIONS
0 20 40 60 80 100
metres
Compiled: W.H.
Date: JULY, 1987
Dwg. No.: 37/F/8
Report: No.: 87/43
Map Ref.: SK 56-3
Figure 8

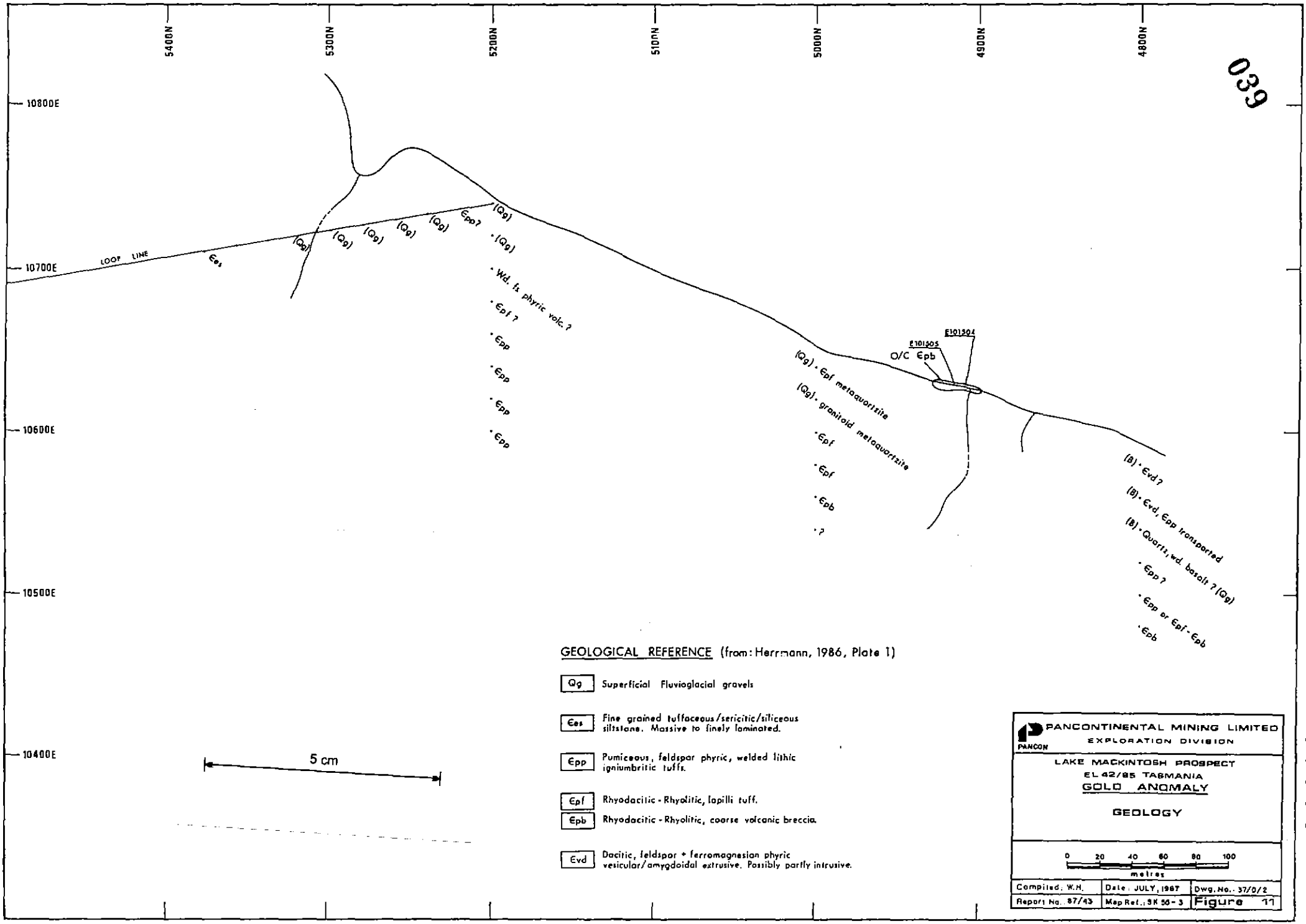
036


5400N
5300N
5200N
5100N
5000N
4900N
4800N
10800E
10700E
10600E
10500E
10400E
LOOP LINE
<0·008, 0·04
0·18
<0·008
0·07
0·30, 0·04
<0·008
0·16
<0·008
0·05
5 cm
KEY
* Gold below detection
PANCONTINENTAL MINING LIMITED
EXPLORATION DIVISION
LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
GOLD ANOMALY
GOLD GEOCHEMICAL RESULTS IN P.P.M. FOR SOIL AND STREAM SEDIMENT SAMPLES
0 20 40 60 80 100
metres
Compiled: W.H.
Date: JULY, 1987
Dwg. No.: 37/F/9
Report No.: 87/43
Map Ref.: SK 55-3
Figure 9

038


5400N
5300N
5200N
5100N
5000N
4900N
4800N
10800E
10700E
10600E
10500E
10400E
LOOP LINE
O/C
5 cm
KEY
Sample Location with depth in metres
O/C Outcrop
B B - Horizon soil, usually orangey brown sticky clay.
C C - Horizon soil, usually pale tan, greenish or grey powdery clay with or without rock chips.
Fg Fluvioglacial gravel
B/Fg B - Horizon clayey soil developed on Fluvioglacial soil
PANCONTINENTAL MINING LIMITED
EXPLORATION DIVISION
PANCON
LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
GOLD ANOMALY
BEDROCK/SOIL SAMPLE DEPTHS AND SOIL ROCK TYPES
0 20 40 60 80 100
metres
Compiled: W.H.
Date: JULY, 1987
Dwg. No.: 37/F/10
Report No.: 87/43
Map Ref.: SK 55-3
Figure 10

79509



GEOLOGICAL REFERENCE (from: Herrmann, 1986, Plate 1)

Qg	Superficial Fluvioglacial gravels
Ees	Fine grained tuffaceous/sericitic/siliceous siltstone. Massive to finely laminated.
Epp	Pumiceous, feldspar phyric, welded lithic ignimbritic tuffs.
Epf	Rhyodacitic - Rhyolitic, lapilli tuff.
Epb	Rhyodacitic - Rhyolitic, coarse volcanic breccia.
Evd	Dacitic, feldspar + ferromagnesian phyric vesicular/amygdoidal extrusive. Possibly partly intrusive.

PANCONTINENTAL MINING LIMITED
EXPLORATION DIVISION
PANCON

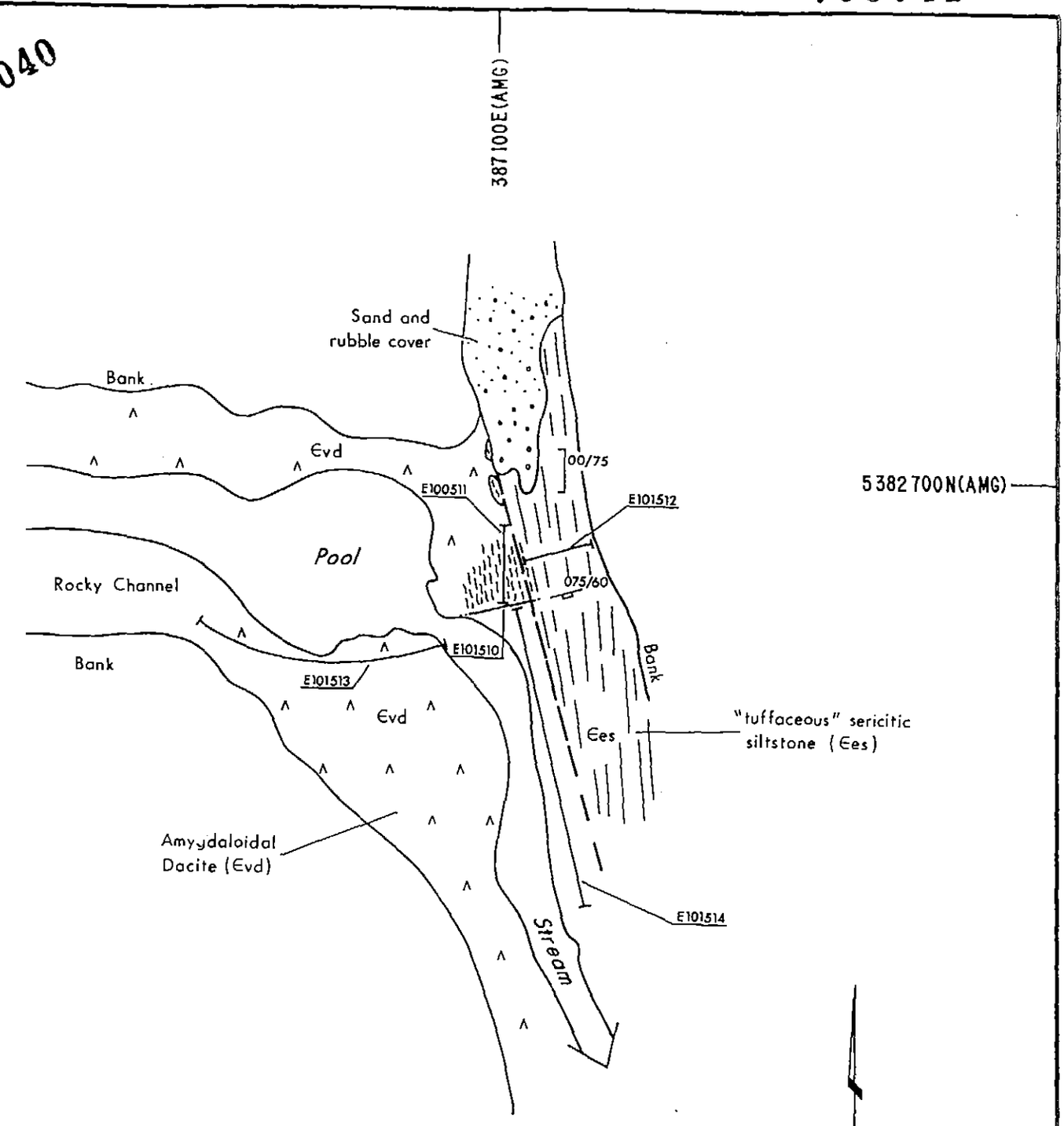
LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
GOLD ANOMALY

GEOLOGY

0 20 40 60 80 100
metres

Compiled: W.H.	Date: JULY, 1987	Dwg. No.: 37/0/2
Report No.: 87/43	Map Ref.: SK 56-3	Figure 11

040



KEY

Chalcopyrite veining

E101511 Rock chip sample traverse

5 cm

PANCONTINENTAL MINING LIMITED
PANCON EXPLORATION DIVISION

LAKE MACKINTOSH PROSPECT
EL 42/85 TASMANIA
SPILLWAY COPPER OCCURRENCE
SKETCH PLAN

SCALE 1:200(Approx.)
0 2 4 6 8 10
metres

Compiled: W.H.	Date: JULY, 1987	Dwg.No.: 37/D/3
Report No 87/43	Map Ref SK55-3	Figure 12

041

APPENDIX I

Analytical Reports

Analabs: 109.5.08.04532
109.5.08.04546

042

795043

ANALABS

A Division of Wardrop & Paterson & Co. (N.Z.) Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER NO.	PAGE
	109.5.06.04532	16/06/87	51535	1 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Mn	Ag	As	Au	AuChk
	E101401	5	<5	40	0.64	75	<0.5	3	<0.008	-
	E101402	5	<5	50	1.60	140	<0.5	8	<0.008	-
	E101403	5	<5	30	1.50	155	<0.5	160	<0.008	-
	E101404	5	<5	35	1.45	130	<0.5	13	<0.008	-
	E101405	<5	<5	20	0.86	45	<0.5	3	<0.008	-
	E101406	<5	<5	20	0.70	40	<0.5	1	<0.008	-
	E101407	<5	<5	25	0.72	45	<0.5	3	<0.008	-
	E101408	10	45	70	2.40	3050	<0.5	21	<0.008	-
	E101409	5	<5	60	0.90	85	0.5	3	<0.008	-
	E101410	5	<5	40	1.15	70	0.5	4	<0.008	-
	E101411	5	<5	50	1.15	85	<0.5	3	<0.008	<0.008
	E101412	10	30	105	1.50	205	<0.5	8	<0.008	-
	E101413	10	30	140	1.95	240	0.5	10	<0.008	-
	E101414	5	40	70	1.65	145	0.5	23	<0.008	-
	E101415	5	70	125	2.15	70	<0.5	36	<0.008	-
	E101416	<5	<5	10	1.25	60	<0.5	13	<0.008	-
	E101417	10	<5	85	3.00	310	0.5	18	<0.008	-
	E101418	20	40	95	3.10	190	1.0	25	<0.008	-
	E101419	20	40	100	2.85	205	0.5	31	<0.008	<0.008
20	E101420	20	5	75	1.90	165	0.5	7	<0.008	-
	E101421	10	10	120	2.20	665	<0.5	10	<0.008	-
22	E101422	<5	<5	30	1.60	241	<0.5	3	<0.008	-
23	E101423	<5	<5	15	0.87	55	<0.5	12	<0.008	-
24	E101424	<5	<5	30	1.50	130	0.5	6	<0.008	-
25	E101425	5	<5	65	1.30	215	<0.5	3	<0.008	-

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED

043

795044

ANALABS
A Division of [illegible]

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	109.5.08.04532	16/06/87	51535	2 of 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Mn	Ag	As	Au	AuChk
	E101426	10	<5	90	2.50	375	<0.5	15	<0.008	-
	E101427	50	<5	40	1.80	560	<0.5	18	<0.008	-
	E101428	5	<5	20	0.97	110	<0.5	13	<0.008	<0.008
	E101429	40	75	225	3.50	775	<0.5	28	<0.008	-
	E101430	25	80	230	2.30	395	<0.5	22	<0.008	-
	E101431	15	30	85	1.65	160	<0.5	13	<0.008	-
	E101432	5	<5	105	1.60	610	<0.5	6	<0.008	-
	E101433	10	<5	70	3.30	330	<0.5	11	<0.008	-
	E101434	5	<5	45	2.30	230	<0.5	12	<0.008	-
	E101435	10	20	50	2.10	275	<0.5	8	<0.008	-
	E101436	<5	<5	25	0.90	85	<0.5	2	<0.008	-
	E101437	<5	<5	70	1.95	130	<0.5	11	<0.008	-
	E101438	-	-	-	-	-	-	-	0.050	-
	E101439	-	-	-	-	-	-	-	<0.008	-
	E101440	-	-	-	-	-	-	-	<0.008	-
	E101441	-	-	-	-	-	-	-	<0.008	<0.008
17	E101442	-	-	-	-	-	-	-	<0.008	-
	E101443	-	-	-	-	-	-	-	<0.008	-
	E101444	-	-	-	-	-	-	-	<0.008	-
20	E101445	-	-	-	-	-	-	-	<0.008	-
	E101446	-	-	-	-	-	-	-	<0.008	-
	E101447	-	-	-	-	-	-	-	<0.008	-
23	E101448	-	-	-	-	-	-	-	<0.008	-
24	E101449	-	-	-	-	-	-	-	<0.008	-
25	E101450	-	-	-	-	-	-	-	<0.008	-

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
\- = element not determined

AUTHORISED [illegible]

044

ANALABS

A Division of Macdonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	109.5.08.04532	16/06/87	51535	3 OF 3

SAMPLE No.	Cu	Pb	Zn	Fe	Mn	Ag	As	Au	AuChk
E101451	–	–	–	–	–	–	–	<0.008	–
E101452	–	–	–	–	–	–	–	<0.008	–
E101453	–	–	–	–	–	–	–	<0.008	–
E101454	–	–	–	–	–	–	–	<0.008	–
E101455	–	–	–	–	–	–	–	<0.008	<0.008
E101456	–	–	–	–	–	–	–	<0.008	–
E101457	–	–	–	–	–	–	–	<0.008	–
E101458	–	–	–	–	–	–	–	<0.008	<0.008
E101459	–	–	–	–	–	–	–	<0.008	–
E101460	–	–	–	–	–	–	–	<0.008	–
E101461	–	–	–	–	–	–	–	<0.008	<0.008
E101462	–	–	–	–	–	–	–	<0.008	–
E101463	–	–	–	–	–	–	–	<0.008	–
E101464	–	–	–	–	–	–	–	<0.008	–
E101465	–	–	–	–	–	–	–	<0.008	–
E101466	–	–	–	–	–	–	–	<0.008	–
DETECTION	5	5	5	0.05	5	0.5	1	0.008	0.008
UNITS	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM	PPM
METHOD	101	101	101	101	101	101	114	309	309

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

045

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ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

Phone (09) 458 7999 | 52 Murray Road, Welshpool, W.A. 6106 | Telex AA92560
TLX: AA 93224

ANALYTICAL REPORT No. [illegible]

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

ORDER No.	PROJECT
[illegible]	

Kam Arvas
Pancontinental Mining Ltd.
2nd Floor, [illegible] Young St.
Sydney
N.S.W. 2000

DATE RECEIVED	RESULTS REQUIRED
[illegible]	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	23/[illegible]/87	1	10

PREP. CODE	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	B191561-[illegible]	WC							[illegible]		
	B191561-[illegible]	PU							[illegible]		
	B191564-[illegible]	WC							[illegible]		
	B191564-[illegible]	WC							[illegible]		
	B191567-[illegible]	WC							[illegible]		

RESULTS TO

[illegible]
Pancontinental Mining Ltd.
2nd Floor, [illegible] Young St.
Sydney
N.S.W. 2000

RESULTS TO

[illegible]
Pancontinental Mining Ltd.
[illegible]
Accounts
[illegible]

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
drill core	WC	perchloric acid	A1	cold acid	CA	atomic absorption	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cuttings	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
pulp	PU	HF mixture	A6	ignition	IG	titration	TTN
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
tissue	Ti	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS					fluorescence	FLUOR
heavy mineral	HM					inductively coupled plasma	ICP

[illegible]

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046

ANALABS

A Division of Mandalong Holdings (NSW) Pty Ltd

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER NO.	PAGE
	109.5.08.04546	25/06/87	51535	1 of 2

TUBE No.	SAMPLE No	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Fe
1	E101501	-	-	-	-	-	-	-	-	-
2	E101502	-	-	-	-	-	-	-	-	-
3	E101503	-	-	-	-	-	-	-	-	-
4	E101504	15	-	<5	-	30	-	<0.5	-	2.40
5	E101505	20	-	5	-	25	-	<0.5	-	2.00
6	E101506	5	-	15	-	25	-	<0.5	-	2.05
7	E101507	25	-	25	-	110	-	<0.5	-	1.45
8	E101508	35	-	50	-	190	-	<0.5	-	3.40
9	E101509	10	-	15	-	20	-	<0.5	-	0.90
10	E101510	-	68500	-	75	-	400	-	31	0.50
11	E101511	9525	-	30	-	95	-	6.0	-	2.05
12	E101512	90	-	15	-	15	-	<0.5	-	0.77
13	E101513	25	-	10	-	35	-	<0.5	-	1.25
14	E101514	5	-	5	-	35	-	<0.5	-	0.60
15	E101515	-	540	-	3900	-	17600	-	55	0.52
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	25	5	25	5	25	0.5	2	0.05
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%
25	METHOD	101	104	101	104	101	104	101	104	101

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
— = element not determined

AUTHORISED SIGNATURE

047

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ANALABS

A Division of Macdonald Hamilton & Co. (Pty) Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	109.5.08.04546	25/06/87	51535	2 of 2

TUBE No.	SAMPLE No.	Mn	As	Wgh	Au	AuChk
1	E101501	-	-	2.3	<0.008	-
2	E101502	-	-	3.3	<0.008	-
3	E101503	-	-	2.3	<0.008	-
4	E101504	345	2	-	<0.008	-
5	E101505	320	1	-	<0.008	-
6	E101506	470	4	-	0.010	-
7	E101507	140	3	-	<0.008	<0.008
8	E101508	480	33	-	<0.008	-
9	E101509	100	7	-	<0.008	-
10	E101510	40	33	-	<0.008	-
11	E101511	530	39	-	<0.008	-
12	E101512	35	18	-	<0.008	-
13	E101513	240	8	-	<0.008	-
14	E101514	60	6	-	<0.008	-
15	E101515	95	1200	-	<0.008	-
16						
17						
18						
19						
20						
21						
22						
23	DETECTION	5	1	0.1	0.008	0.008
24	UNITS	PPM	PPM	GMS	PPM	PPM
25	METHOD	101	114	199	309	309

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
N = element not detected at the specified detection limit
- = element not analysed

AUTHORISED SIGNATURE

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APPENDIX II

Geological Log of Chips from "C-Horizon" Soil Sampling.

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E.L. 42/86

LAKE MACKINTOSH, TAS.

"C-HORIZON" SOIL SAMPLES

E101401 - 101466

May 1987

Sampled by: N.Pitfield

Logged by: M.Hermann.

GEOLOGICAL LOG OF CHIPS

E 101401 — Pale grey gritty clay ex quartz phyric felsic volcanic. Few chips of white vein quartz and rounded grey quartzite.

E 101402 — light tan colored clay with clear quartz crystals and weathered flakes of biotite, obviously relict phenocrysts of (€ir type) weathered quartz-feldspar-biotite porphyry.

E 101403 — Tan, crumbly clay with few relict quartz and biotite phenocrysts.

E 101404 — Pale buff-tan compact clay with quartz and weathered biotite relict phenocrysts, obviously weathered €ir.

E 101405 — As above, retains pale creamy-pink colour of felsic matrix (weathered)

E 101406 — Pale greenish grey weathered €ir
In situ quartz phenocrysts and weathered biotite flakes.

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E 101407 As for 101406, pale buff colour.

E 101408 Light tan clayey weathered €in stained darker brown in patches by Fe/Mn hydrous oxides. (minor) Distinct velict quartz, biotite phenocrysts.

E 101409 Pale buff coloured weathered €in (quartz, feldsp biotite porphyry). Distinctive velict phenocrysts.

E101410 Light tan weathered €in.
Distinct velict quartz, biotite phenocrysts.

E101411 Buff coloured weathered €in.
Distinct velict quartz, biotite phenocrysts.

E101412 Light greenish grey clay with 'chips' of similar greenish-grey feldspar + ferromagnesian (pyroxene?) porphyritic rock. Not noticeably vesicular but probably similar to type €vd. Not detectably magnetic.

E101413 Light tan-olive colour, compact clay. Fine granular fabric. No quartz phenocrysts, probably weathered tuff?

E101414 Tan, weathered rock with fine granular fabric, probably weathered felsic tuff?

E101415 As for 101414. Some chips relatively fresh, chalky fine tuff? Few chips of clear vein quartz.

E 101416 Light grey to tan, weathered f.g. felsic tuff?

E101417 light olive-tan weathered rock with fine granular fabric, probably weathered felsic tuff.

E101418 Tan, compact granular, clayey weathered rock. Possibly weathered felsic tuff?

E101419 Orange-Pinkish tan clayey weathered rock. Seems to contain some wd. veiled fs. phenocrysts and also small quartz grains which appear subrounded. Original composition uncertain could be soil derived on Ein?

E101420 Mostly greyish brown clay with chips of various volcanics, B-C horizon? Lesser amount powdery pale C-Horizon and few chips of pale grey fine grained felsic ash tuff.

E101421 Pale buff-tan clayey weathered rock, fine relict granular fabric, probably ex felsic pyroclastic?

E101422 Chips: pale grey weakly foliated, (flow foliated or pyroclastic compaction?) quartz and ferromagnesian (biotite?) phyric volcanic. Looks pyroclastic but could be fine flow banded? variant of Ein. Quartz grains resemble Ein phenocrysts.

E 101423 Pale buff grey to tan fine granular weathered volc., probably ex felsic tuff. Aphyric
Part of sample in pale grey gritty clay with 2-3 mm quartz granules, probably B horizon transported from Ein.

E101424 Buff-tan weathered Ein.
Distinctive quartz and biotite relict phenocrysts

E101425 Pale buff grey wd. Ein as for 101424

E 101426 Tan, fine granular felsic tuff.

E101427 Pale tan-grey, fine grained felsic tuff.

E101428 (o/c sample)
Pale pinkish buff Quartz-feldspar bistite porphyry (Ein)

E101429 (o/c sample)
Tan, v.f.g. weakly foliated or cleaved ? felsic vitric ash tuff/siltstone

E101430 (o/c sample)
Tan, v.f.g. felsic vitric ash tuff/siltstone (Ees-Eef type)

E101431 (o/c sample)
Exactly as for 101430

E101432 (o/c sample)
Pale greyish tan (somewhat weathered) Qtz-feldspar-biot porphyry (Ein)

E101433 Tan, fine granular felsic tuff

E101434 Tan, clayey weathered rock, some quartz grains ex Eir. Also some chips vein quartz and hematitic sst, (probably ex Ovce) suggesting some fluvioglacial material over bedrock.

E101435 Pale buff-grey fine grained felsic tuff

E101436 Pale grey weathered Qtz-Feldspar-Biot porphyry (Eir)

E101437 Buff, compact granular clayey weathered rock, no phenocrysts, granular relict texture suggests originally felsic tuff?

E101438 Orangey brown clay (B Horizon type) numerous large stones & feldspar-ferromagnesian phyric vesicular "dacite" (Evd) some with quartz veinlets. Could be fragmental? Probably floaters in B-Horizon

E101439 Orange-brown (B-Horizon) clay. Some pebbles & Evd and Epp type.

E101440 Orange-brown (B-Horizon) clay. Rock frags variable, quartz and weathered f.g. mafic (basalt?

E101441 (o/c) Weakly silicified, weathered fs phyric tuff weakly lithic, possibly Epp type

E101442 (o/c) Siliceous looking, perhaps weakly silicified grey feldspar phyric pyroclastic probably Epp or Epf-Epb

E101443 (o/c) Weakly fragmental greenish grey to pink colour, fs = ferromagnesian phyric (Evd type) Lava/lava breccia
Epb category Distinctly magnetic

E101444 Grey sandy pebbly loam.
Pebbles often rounded include Epf (lapilli tuff) and meta quartzite.
Probably A-B horizon mixture of scree and fluvioglacial deposits

E101445 Dark (greenish) grey sandy loam.
Few rounded pebbles include "granite" and meta quartzite.
Suspect residual A-B soil horizon developed on fluvioglacial.

E 101446 Pale grey/brn clayey soil (probably weakly developed A-C horizon mantling sub o/c) with numerous rock fragments of feldspar phyric lapilli tuff Epf type.

E101447 Grey to brown clay with fragments of weathered fs plagioclase Epf type volcanic rock.

E101448 (o/c) Pink fs plagioclase "rhyolite" probably Epls ?

E101449 Mixture: (a) Pale grey sandy soil with rounded quartzite pebbles, obviously superficial A-B fluvioglacial derived soil
(b) light tan clayey colluvial soil, no recognizable chips

E101450 Pale grey sand, rounded quartzite pebbles, transported sandy fluvioglacial soil.

E101451 Pale grey tan sandy clay with abundant rounded quartzite pebbles.
Probably mostly or all fluvioglacial derived

E101452 Pale grey clayey soil. A-C ?
Few chips weathered fs plagioclase siliceous volc.

E101453 (o/c) Pale greenish gray siliceous fs-(qtz) plagioclase pyroclastic. Probably finer variant of Epf.

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E101454 (o/c) Pale grey fs plagioc pumiceous tuff / ignimbrite (€ pp)

E101455 (o/c) €pp as for 101454

E101456 (o/c) €pp as for 101454

E101457 (o/c) €pp as for 101454

E101458 Pale grey sandy soil ± rounded quartzite pebbles. Also mixture with tan clayey C-Horizon soil and angular fragments weathered pale tan fs plagioc volcanic. (pyroclastic?)

E101459 Brown sandy soil, variable rounded pebbles, quartzite and basaltic, Probably mostly fluvioglacial / scree derived

E101460 As for 101459

E101461 Compact grey sandy clay with rounded meta quartzite pebbles - fluvioglacial.

E101462 As for 101461
Also some orangey brown clay, possibly from C-Horiz? below glacials?

E101463 As for 101462

E101464 Grey clayey soil, minor organic material (roots) No chips.

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E101465 Grey clayey soil, some chips white quartz, probably bleached B (A-B) or leached C Horizon soil. No recognizable bedrock chips.

E101466 (S/C) Greenish grey, med-f.g. granular siliceous talk, Ees type.

Lake Mackintosh

GEOLOGICAL LEGEND

QUATERNARY

- Qg — Superficial fluvioglacial gravels.

JURASSIC ?

- Jdl — Dolerite (Post tectonic - intrusives ?)

EARLY ORDOVICIAN "OWEN CONGLOMERATE"

- Oc — Siliceous/quartzitic pebbly - conglomerate and sandstone.

CAMBRIAN

"FARRELL SLATES" - "DUNDAS GROUP" EQUIVALENTS

- Ess — Grey to black slate. Sometimes wealdy pyritic.
- Esg — Micaceous and/or tuffaceous fine to medium grained greywacke and siltstone, massive or laminated/turbiditic.
- Esl — Medium to coarse grained feldspathic/tuffaceous lithiwacke.

UNDIFFERENTIATED PYRO - EPI - CLASTICS

- Ees — Fine grained tuffaceous/sericitic/siliceous siltstone ? ; massive to finely laminated.
- Eef — Ultra fine grained, pale grey tuffaceous - cherty siltstone ? ; usually massive, rarely laminated or brecciated.

"MT. READ VOLCANICS" "CENTRAL VOLCANIC SEQUENCE"

- Epa — Fine to medium grained felsic, usually feldspar phyric, tuffs; occasionally well bedded.
- Epp — Pumiceous, feldspar phyric, wealdy lithic, ignidioritic tuffs.
- Epf — "Rhyodacitic - Rhyolitic" lapilli tuffs, often pumiceous.
- Epb — "Rhyodacitic - Rhyolitic" coarse volcanic breccia.
- Evr — "Rhyodacitic - Rhyolitic" feldspar (qtz) phyric extrusives. Often partly autobrecciated.
- Evd — "Dacitic" feldspar + ferromagnesian phyric, vesicular/amygdoidal extrusives. Possibly partly intrusive.
- Eir — "Rhyolitic" Quartz + feldspar ± biotite Porphry. Probably intrusive.

GEOLOGICAL SYMBOLS

Generally according to BMR System (1963)

- Banding in igneous rocks.
- Bedding
- Bedding with younging direction
- Cleavage
- Joint
- Other planar features, contacts, fault planes etc.
- Direction and plunge of vesicle/amygdale lineation in Evd.
- Outcrop Boundary.
- Area of float, scree
- Bedrock sample location
- 101509 — Rock chip sample location
- E.L. boundary
- 5 383 000 mN — A.M.G. co-ordinates
- Topographic contours in metres
- Track
- Creek

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5 cm

PANCONTINENTAL MINING LIMITED
PANCON — EXPLORATION DIVISION

LAKE MACKINTOSH PROSPECT
E.L. 42/86 - TASMANIA

GEOLOGICAL PLAN

Vol 2/3
88-2795

SCALE 1: 5000

0 100 200 300 400 500
METRES

Compiled W.H.	Date December 1986	Dwg. No 37/D/1
Report No 87/43	Map Ref. SK 55-3	PLATE 1

Updated: JUNE, 1987

6534

PROJECT AREA
Rosebery
LAUNCESTON
QUEENSTOWN
HOBART

LOCATION PLAN

058

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Report Number: 88/11

88-2795

E.L. 42/85, LAKE MACKINTOSH, TASMANIA

ANNUAL REPORT FOR A PERIOD
FROM 21 JANUARY 1987 TO 20 APRIL 1988
VOLUME 3 OF 3

By K.O. Airas
2 March 1988

Distribution

Original
Copy 1: PML - Archives
Copy 2: PML - File 5303.2
Copy 3: Outokumpu Oy
Copy 4: Department of Mines, Tasmania
Copy 5: Billiton Australia

87/46

ON THE CHEMICAL COMPOSITION OF SOME LITHOTYPES THE LAKE MACKINTOSH EL (42/85)

By K.O. Airas

Contents

Appendices

Figures

Distribution

Original
1. PML - Archives
2. PML - File
3. Outokumpu

060

1. INTRODUCTION

This report describes the chemical composition and compositional relationship of some lithotypes within the Lake Mackintosh area (EL 42/85). The results are additional to the results of the mapping and petrological study described in the previous report "Notes on the geology of EL 42/85 Lake Mackintosh, Tasmania" by W. Herrmann (Report No 87/7).

2. SAMPLES, CHEMICAL ANALYSIS AND PETROLOGICAL STUDY

This study comprises 10 rock specimens from outcrops, representing each one of the principal (mainly volcanic) lithotypes encountered during mapping. Samples and analysis are described in Wally Herrmann's report. The report of the petrological study has been appended to Wally's report.

Analytical results and routine whole rock geochemical diagrams have been appended to this report.

3. DISCUSSION

The samples can be divided to three separate groups according to their stable element composition. The first group includes rhyodacitic feldspar-phyric extrusives, coarse volcanic breccia and lapilli, often pumiceous, tuff. The second group comprises fine grained felsic quartz-phyric tuffs, pumiceous, weakly lithic tuffs and feldspar/ferro-magnesian-phyric extrusives or intrusives as well as undifferentiated pyroclastics and epiclastics. One single sample from a dolerite forms the third group.

The close resemblance in the chemical composition of the pyroclastics and epiclastics to the feldspar-phyric tuffs of dacitic composition may support an interpretation that the dacitic volcanism is the latest volcanic event providing material for the commencement of deposition of the overlying epiclastics and pyroclastics. This suggests that the more felsic rhyodacitic tuffs to underlie the dacitic volcanics, and are lower in the stratigraphy.

The chemical analyses do not indicate evidence of important hydrothermal alteration (except in one sample M113 rhyodacitic lava) or anomalous base metal contents. One sample shows high alteration index (A.I, see app. 1) mainly because low sodium and high potassium values. No other significant sign of alteration is found.

4. CONCLUSION

The geochemical results allow grouping of samples representing compositionally similar lithotypes. This fits well and will support observation and interpretation made during the mapping. Groups of similar lithotypes will allow to draw a conclusion of different volcanic events and subsequent stratigraphic units and order within the EL area.

Although there is only one sample per lithotype and therefore any firm conclusion can't be drawn about the geochemistry of the rock types, the study shows practical benefits of whole rock analyses for purposes of a reconnaissance mapping by enabling or supporting to recognize the chemical characters of the rocks. The series of analyses forms also a data base to make comparisons between different areas.

APPENDIX 1

GEOCHEMICAL DATABASE AND DIAGRAMS

- LIST OF ANALYTICAL RESULTS
- ALTERATION INDEXES
- Zr/TiO2 vs Nb/Y - DIAGRAM
- VARIATION DIAGRAMS FOR ALTERATION AND DIFFERENTIATION

  Ti/Zr vs SiO2
  vs TiO2
  vs Fe2O3
  vs MgO
  vs Na2O
  vs K2O

- HARKER DIAGRAMS
  SiO2 vs TiO2
  CaO
  MgO
  Na2O
  KaO
  Ba
  Cr
  Sr

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GEOCHEMICAL DATABASE SUMMARY 12-FEB-1987 Project: LAKE MACKINTOSH

	M40	M55	M63	M67	M69	M72	M78
- Elements assayed in percent -							
SIO2	73.50	62.00	55.50	75.30	64.90	68.40	71.70
TIO2	0.24	0.71	1.31	0.26	0.72	0.51	0.36
AL203	12.30	15.40	15.20	13.00	15.60	14.50	13.50
FE203	2.02	5.75	11.10	2.14	5.10	4.50	2.26
MNO	0.02	0.10	0.17	0.05	0.09	0.06	0.07
MGO	0.49	1.76	3.20	0.72	1.42	1.20	0.55
CAO	0.15	2.98	6.50	1.42	2.42	2.70	2.78
NA2O	2.00	3.30	3.22	2.24	3.82	3.96	2.22
K2O	6.25	3.76	1.98	4.46	4.08	3.60	3.56
P2O5	0.01	0.11	0.22	0.01	0.14	0.08	0.01
LOI	1.45	1.86	2.20	1.24	1.82	1.20	1.56
- Elements assayed in PPM -							
AG	0.10	0.10	0.10	0.10	0.10	0.10	0.10
AS	2.00	7.00	2.00	4.00	6.00	7.00	2.00
CU	5.00	6.00	13.00	6.00	1.00	6.00	2.00
MN							
PB	10.00	36.00	20.00	50.00	24.00	20.00	28.00
ZN	36.00	86.00	82.00	39.00	42.00	30.00	33.00
BA	1240.00	910.00	560.00	930.00	1100.00	790.00	730.00
BI	4.00	4.00	4.00	4.00	4.00	4.00	4.00
CO	3.00	91.00	17.00	4.00	8.00	8.00	2.00
CR	46.00	32.00	64.00	5.00	16.00	16.00	5.00
MO	4.00	4.00	4.00	4.00	4.00	4.00	4.00
NB	16.00	12.00	6.00	16.00	14.00	10.00	12.00
NI	4.00	5.00	4.00	4.00	4.00	9.00	4.00
RB	155.00	135.00	47.00	200.00	140.00	62.00	140.00
SB	4.00	4.00	4.00	6.00	4.00	8.00	4.00
SE	2.00	2.00	2.00	2.00	2.00	3.00	2.00
SR	105.00	415.00	455.00	165.00	450.00	280.00	340.00
V	10.00	10.00	10.00	10.00	10.00	10.00	10.00
W	10.00	10.00	10.00	10.00	15.00	10.00	10.00
Y	32.00	38.00	34.00	44.00	40.00	38.00	34.00
ZR	155.00	210.00	265.00	115.00	245.00	200.00	250.00
Ti/Zr	9.3	20.3	29.6	13.6	17.6	15.3	8.6

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GEOCHEMICAL D Page 1

	M113	M119	M121
- Elements as			
SIO2	75.90	70.00	74.50
TIO2	0.25	0.56	0.30
AL2O3	11.00	13.50	12.90
FE2O3	1.29	4.10	2.00
MNO	0.03	0.09	0.05
MGO	0.18	0.83	0.43
CAO	0.36	1.09	0.67
NA2O	0.54	4.36	2.40
K2O	8.50	1.82	4.72
P2O5	0.01	0.14	0.02
LOI	0.76	2.54	1.39
- Elements as			
AG	0.10	0.10	0.10
AS	2.00	7.00	10.00
CU	3.00	9.00	4.00
MN			
PB	92.00	52.00	32.00
ZN	16.00	42.00	25.00
BA	1220.00	490.00	980.00
BI	4.00	4.00	4.00
CO	2.00	3.00	2.00
CR	6.00	22.00	22.00
MO	4.00	4.00	4.00
NB	10.00	10.00	14.00
NI	5.00	2.00	3.00
RB	210.00	48.00	160.00
SB	4.00	6.00	6.00
SE	2.00	2.00	2.00
SR	140.00	435.00	335.00
V	10.00	10.00	10.00
W	10.00	10.00	10.00
Y	38.00	36.00	40.00
ZR	200.00	200.00	255.00
Ti/Zr	3.98	16.8	8.0

065

795067

Project LAKE MACKINTOSH

Sample No. M113

Element value for MGO	=	0.180
Element value for K2O	=	8.500
Element value for NA2O	=	0.540
Element value for CAO	=	0.360
Alteration index =	90.605	

Project LAKE MACKINTOSH

Sample No. M119

Element value for MGO	=	0.830
Element value for K2O	=	1.820
Element value for NA2O	=	4.360
Element value for CAO	=	1.090
Alteration index =	32.716	

Project LAKE MACKINTOSH

Sample No. M121

Element value for MGO	=	0.430
Element value for K2O	=	4.720
Element value for NA2O	=	2.400
Element value for CAO	=	0.670
Alteration index =	82.652	

Project LAKE MACKINTOSH

Sample No. M40

Element value for MGO	=	0.490
Element value for K2O	=	6.250
Element value for NA2O	=	2.000
Element value for CAO	=	0.150
Alteration index =	75.816	

Project LAKE MACKINTOSH

Sample No. M55

Element value for MGO	=	1.760
Element value for K2O	=	3.760
Element value for NA2O	=	3.300
Element value for CAO	=	2.980
Alteration index =	46.780	

Project LAKE MACKINTOSH

Sample No. M63

Element value for MGO	=	3.200
Element value for K2O	=	1.980
Element value for NA2O	=	3.230
Element value for CAO	=	6.500
Alteration index =	34.765	

066

795068

Project LAKE MACKINTOSH

Sample No. M67

Element value for MGO	=	0.720
Element value for K2O	=	4.460
Element value for NA2O	=	2.240
Element value for CAO	=	1.420
Alteration index =	58.597	

Project LAKE MACKINTOSH

Sample No. M69

Element value for MGO	=	1.420
Element value for K2O	=	4.080
Element value for NA2O	=	3.820
Element value for CAO	=	2.420
Alteration index =	46.848	

Project LAKE MACKINTOSH

Sample No. M72

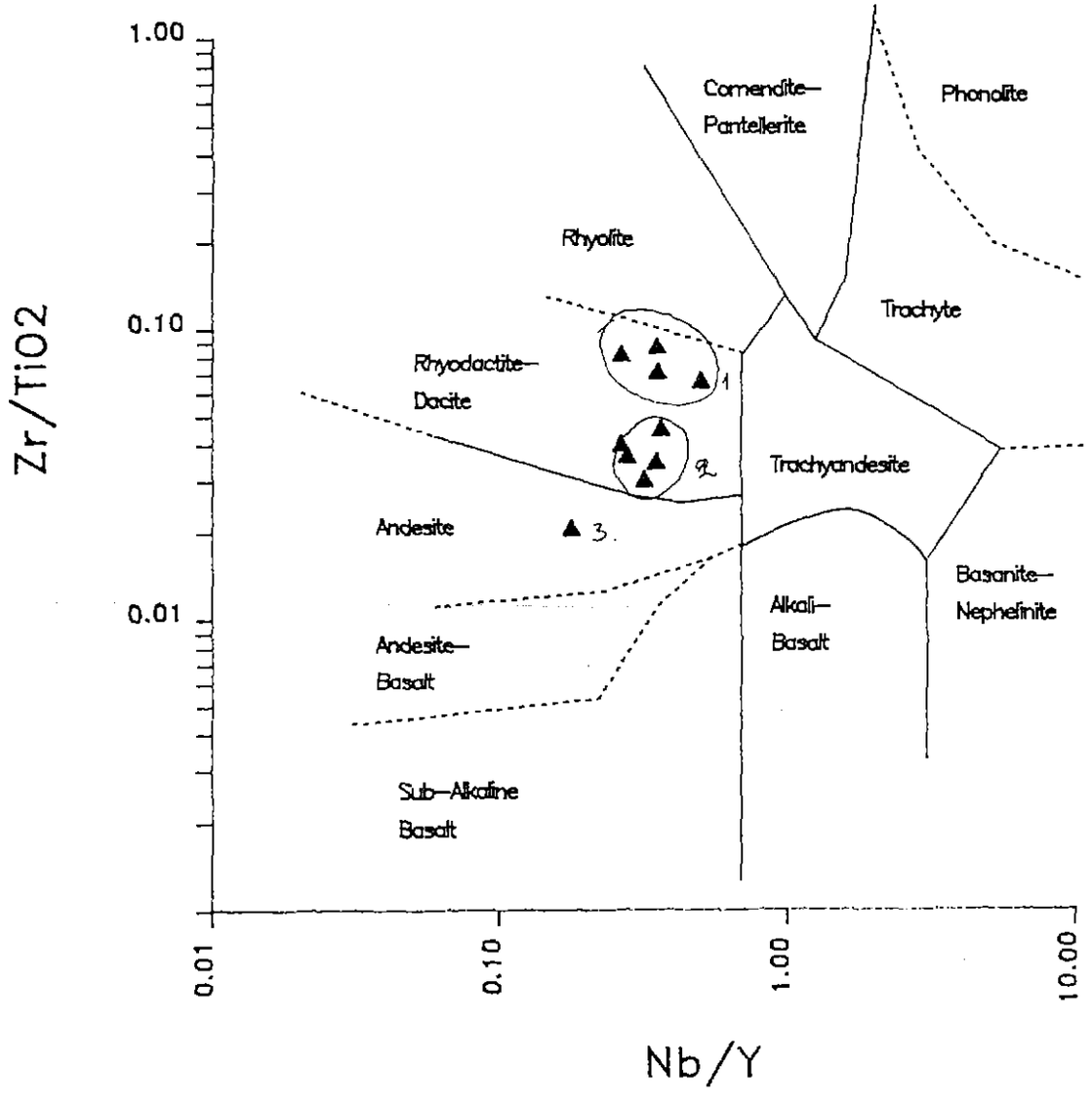
Element value for MGO	=	1.200
Element value for K2O	=	3.600
Element value for NA2O	=	3.960
Element value for CAO	=	2.700
Alteration index =	41.885	

Project LAKE MACKINTOSH

Sample No. M78

Element value for MGO	=	0.550
Element value for K2O	=	3.560
Element value for NA2O	=	2.220
Element value for CAO	=	2.700
Alteration index =	45.115	

Host volcanic rocks – Lake Mackintosh



PANCONTINENTAL

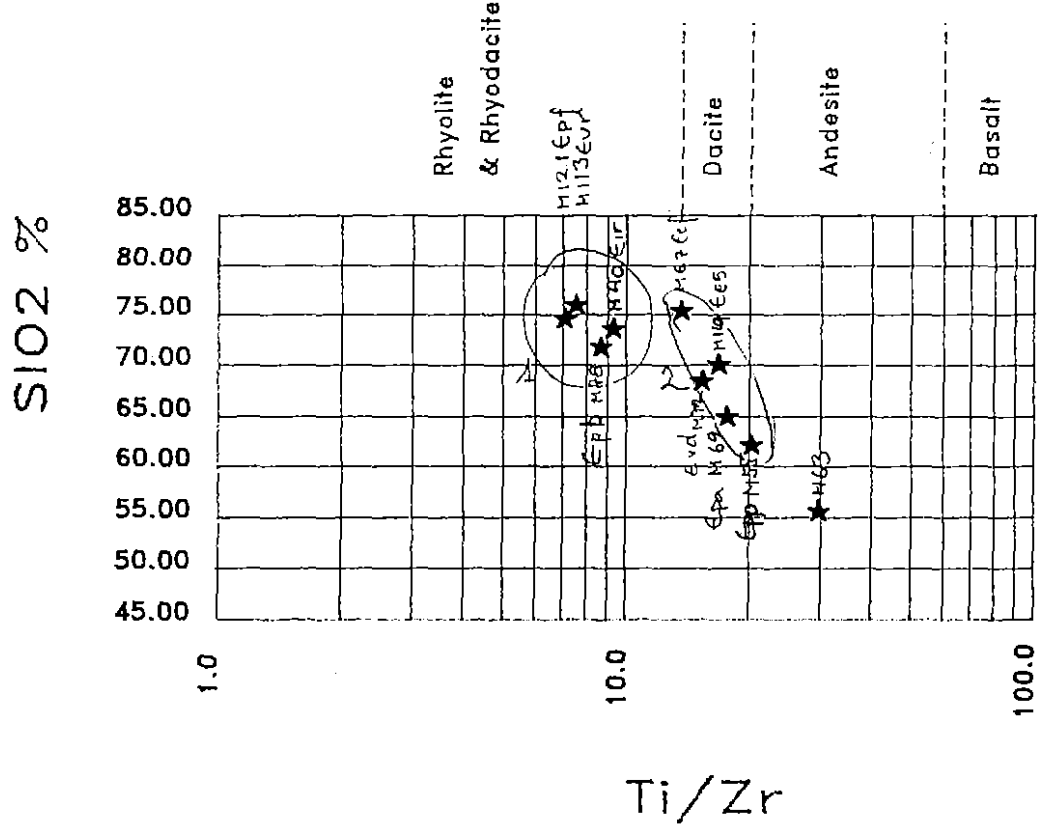
1 Rhyodacitic extrusives, volcanic breccias, lapilli tuffs and quartz-feldspar porphyry

2. Dacite, dacitic feldsparphyric tuffs and undifferentiated pyro-epi-clastics of dacitic composition

3. Dolerite

12–FEB–1987

Variation diagram – Lake Mackintosh



068

PANCONTINENTAL

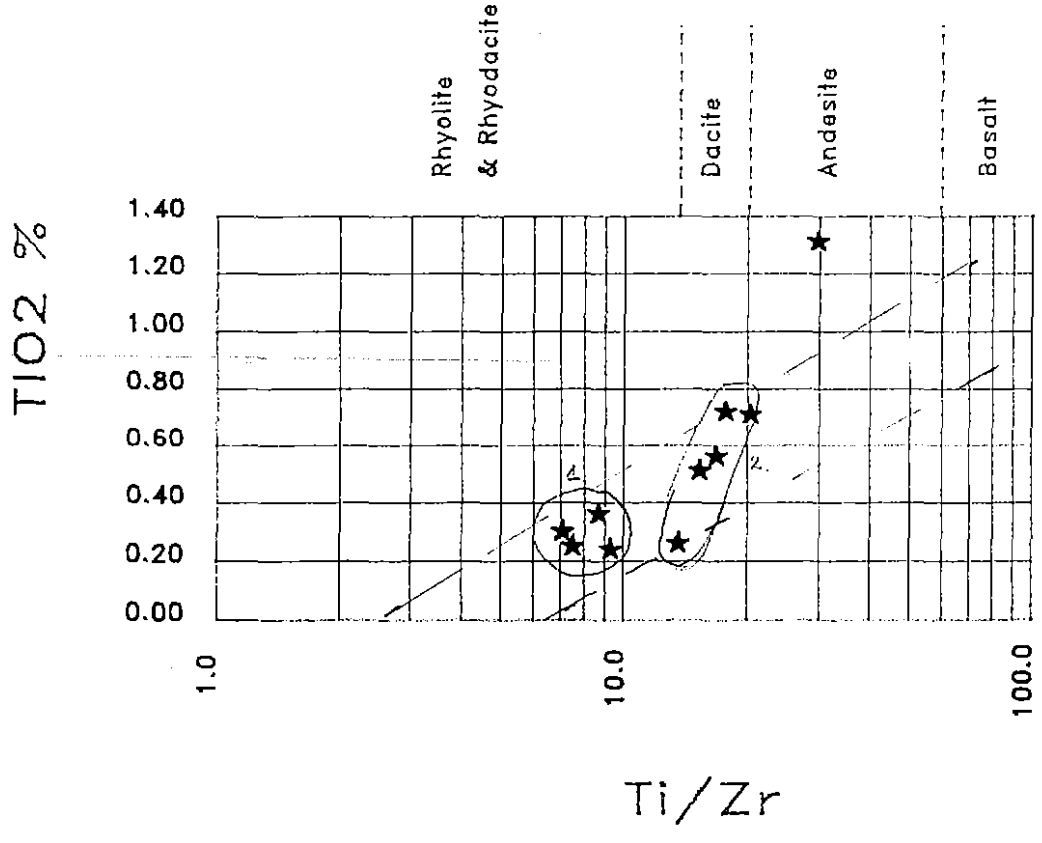
Sample list

		Group
M113	Evr	1
M119	Ees	2
M121	Epf	1
M40	Eir	1
M55	Epp	2
M63	Jdl	3
M67	Eef	2
M69	Epa	2
M72	Evd	2
M78	Epb	1

23–FEB–1987

295070

Variation diagram — Lake Mackintosh



069

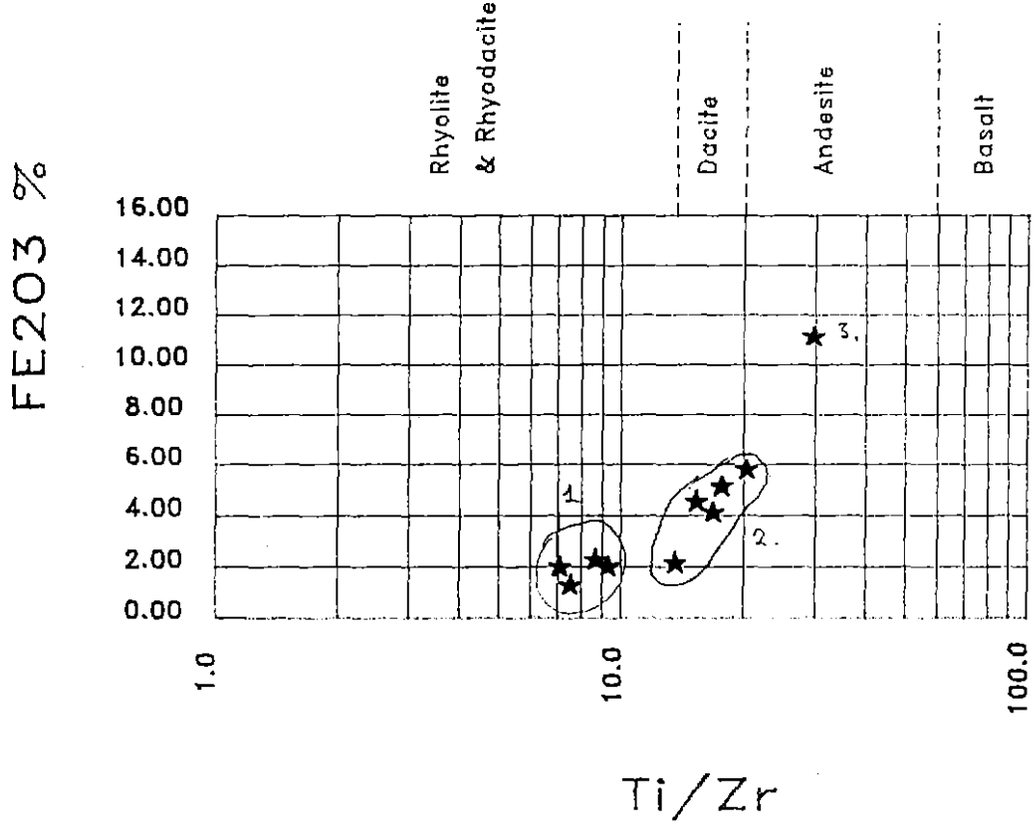
PANCONTINENTAL

Sample list

M113
M119
M121
M40
M55
M63
M67
M69
M72
M78

23-FEB-1987

Variation diagram – Lake Mackintosh



070

PANCONTINENTAL

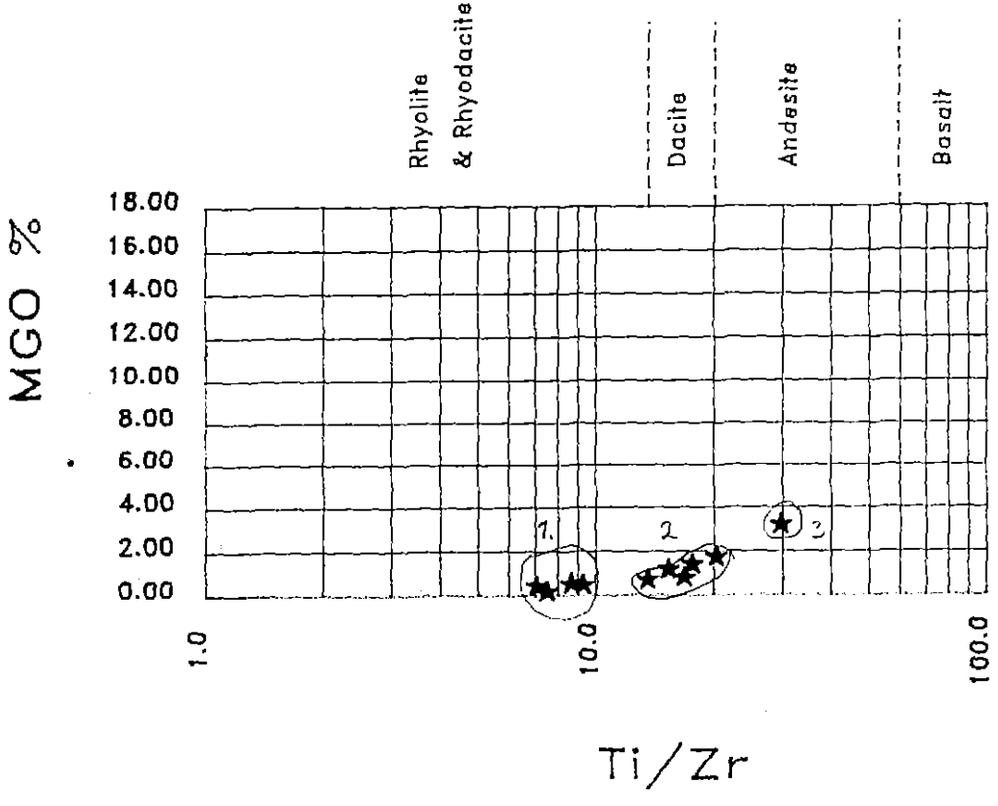
Sample list

M113
M119
M121
M40
M55
M63
M67
M69
M72
M78

23-FEB-1987

79072

Variation diagram – Lake Mackintosh



PANCONTINENTAL

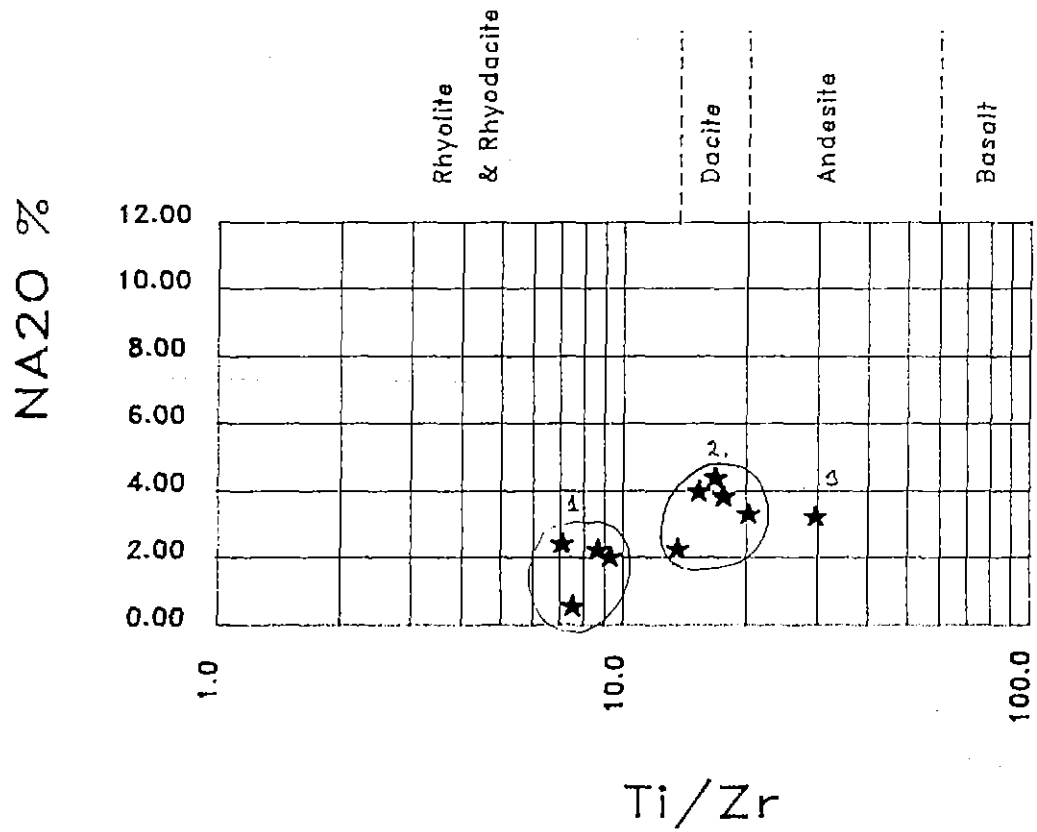
Sample list

M113
M119
M121
M40
M55
M63
M67
M69
M72
M78

23-FEB-1987

79307B

Variation diagram – Lake Mackintosh



072

PANCONTINENTAL

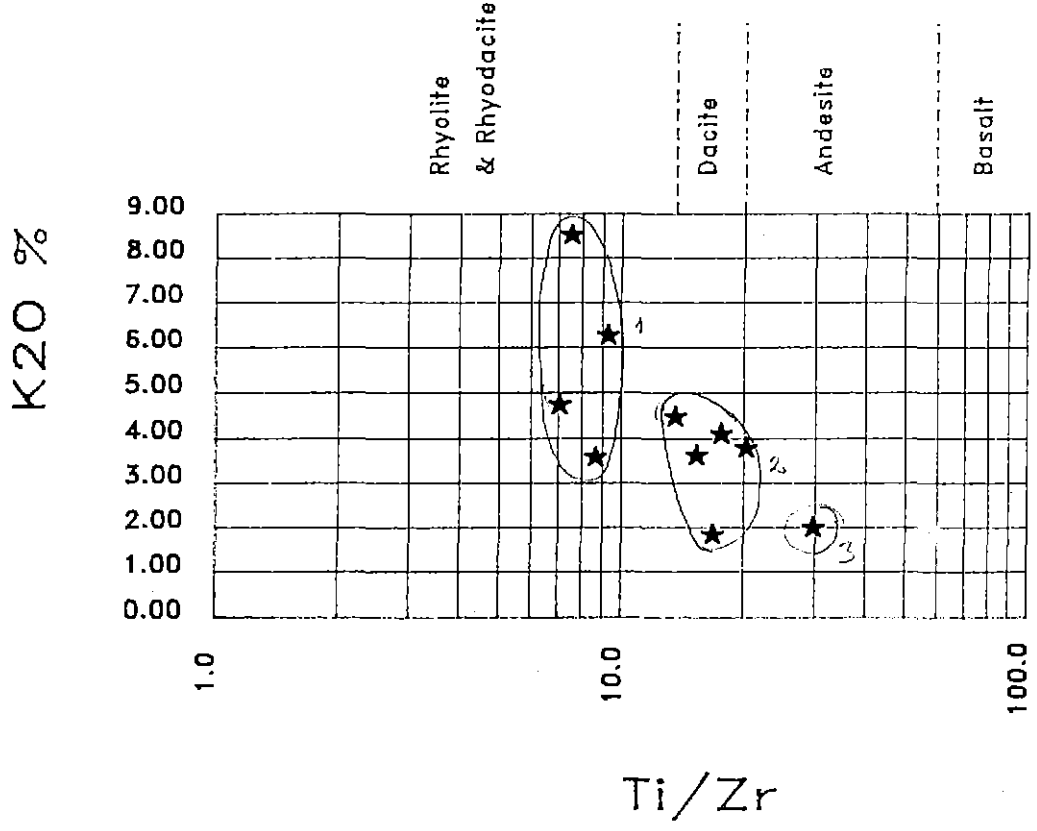
Sample list

M113
M119
M121
M40
M55
M63
M67
M69
M72
M78

23-FEB-1987

793074

Variation diagram – Lake Mackintosh



073

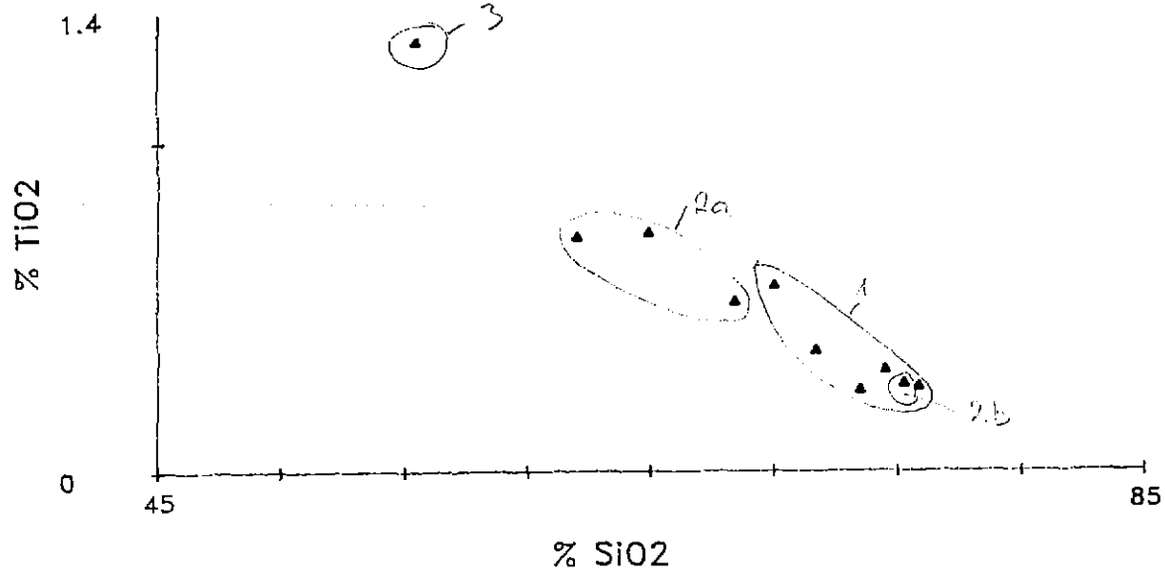
PANCONTINENTAL

Sample list

M113
M119
M121
M40
M55
M63
M67
M69
M72
M78

23-FEB-1987

Harker diagram – LAKE MACKINTOSH



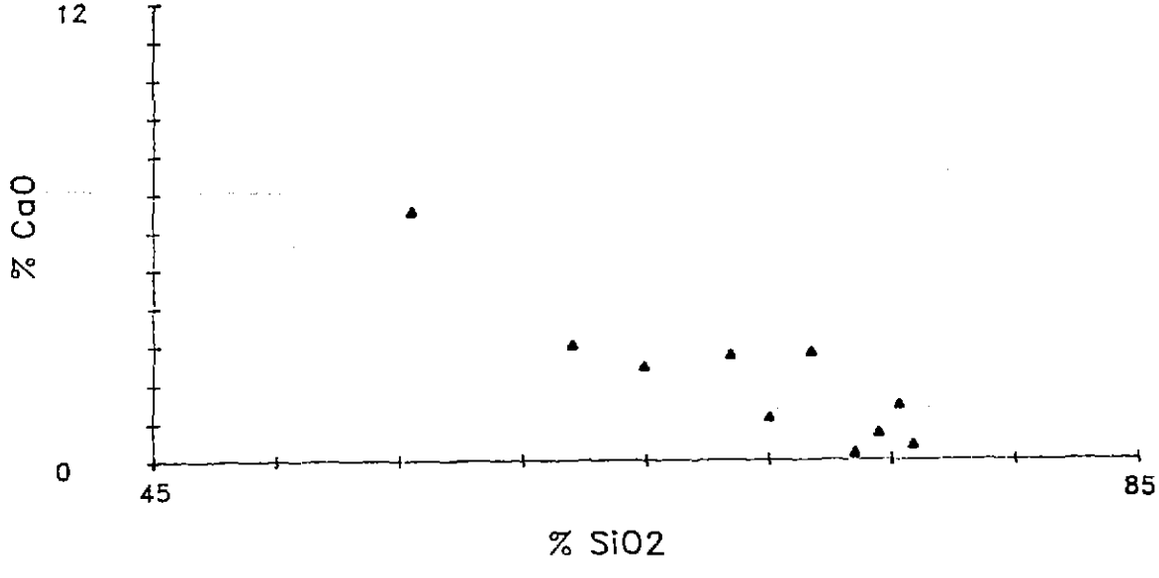
074

PANCONTINENTAL

940264

6–FEB–1987

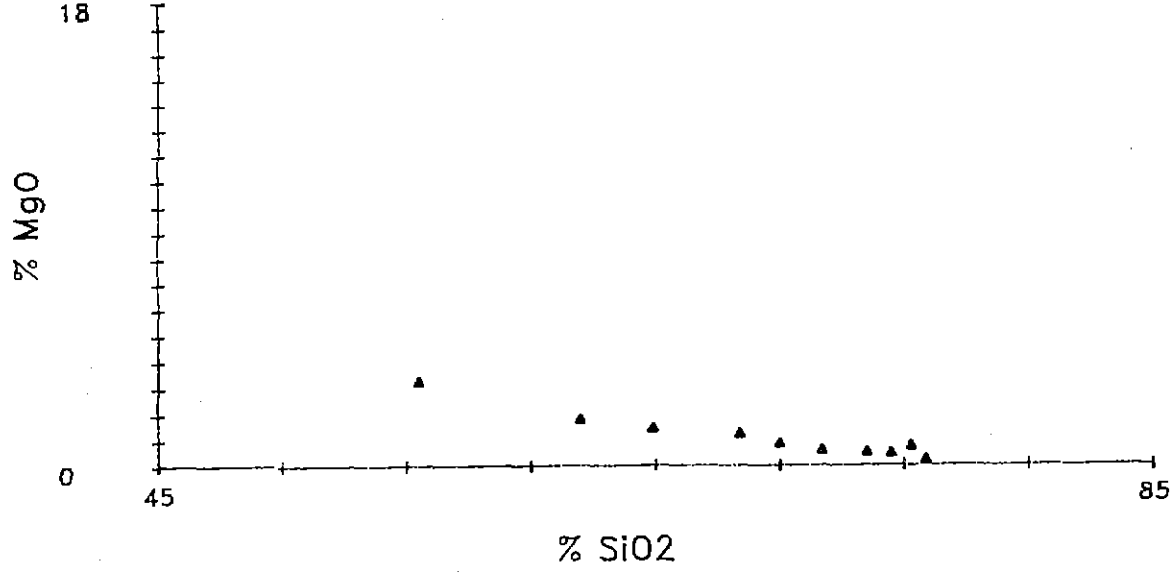
Harker diagram – LAKE MACKINTOSH

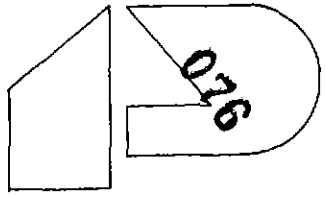


PANCONTINENTAL

6-FEB-1987

Harker diagram – LAKE MACKINTOSH



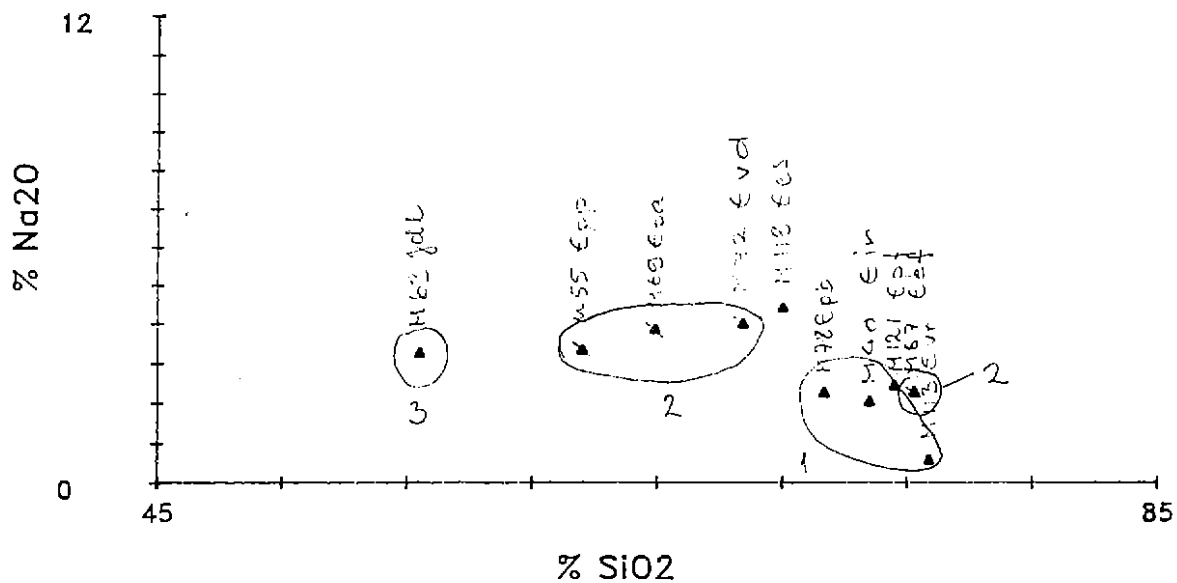


PANCONTINENTAL

6-FEB-1987

7930787

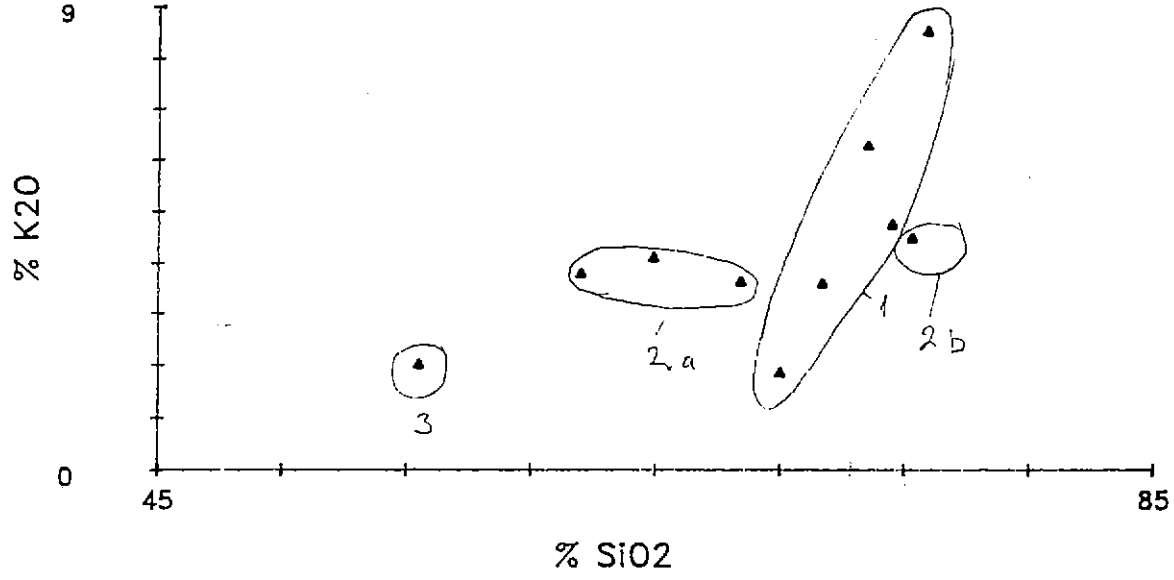
Harker diagram – LAKE MACKINTOSH



PANCONTINENTAL

6–FEB–1987

Harker diagram – LAKE MACKINTOSH



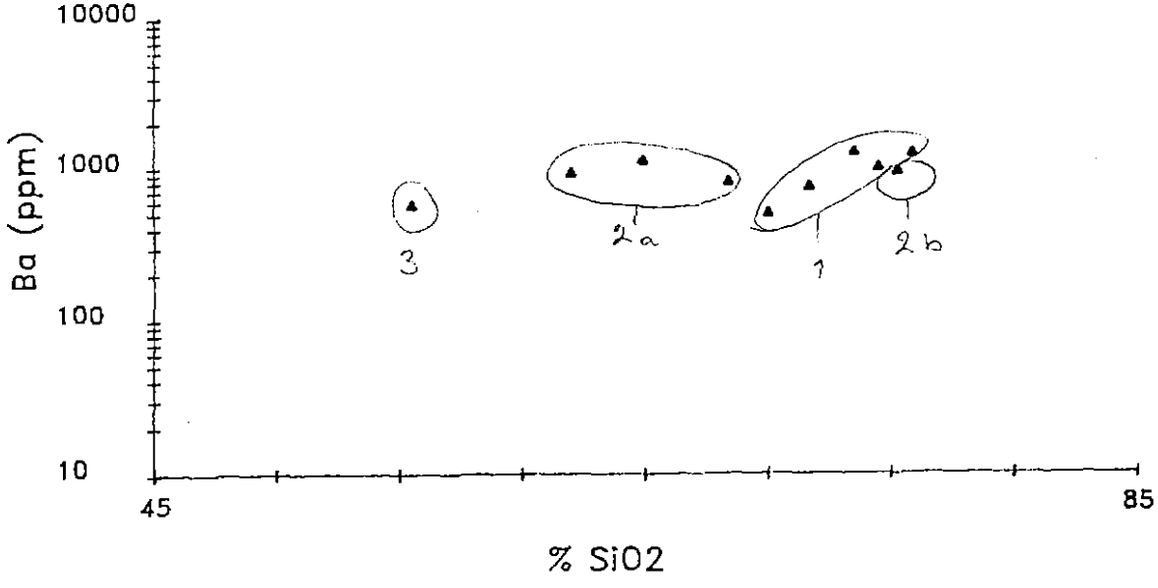
078

PANCONTINENTAL

6-FEB-1987

7905080

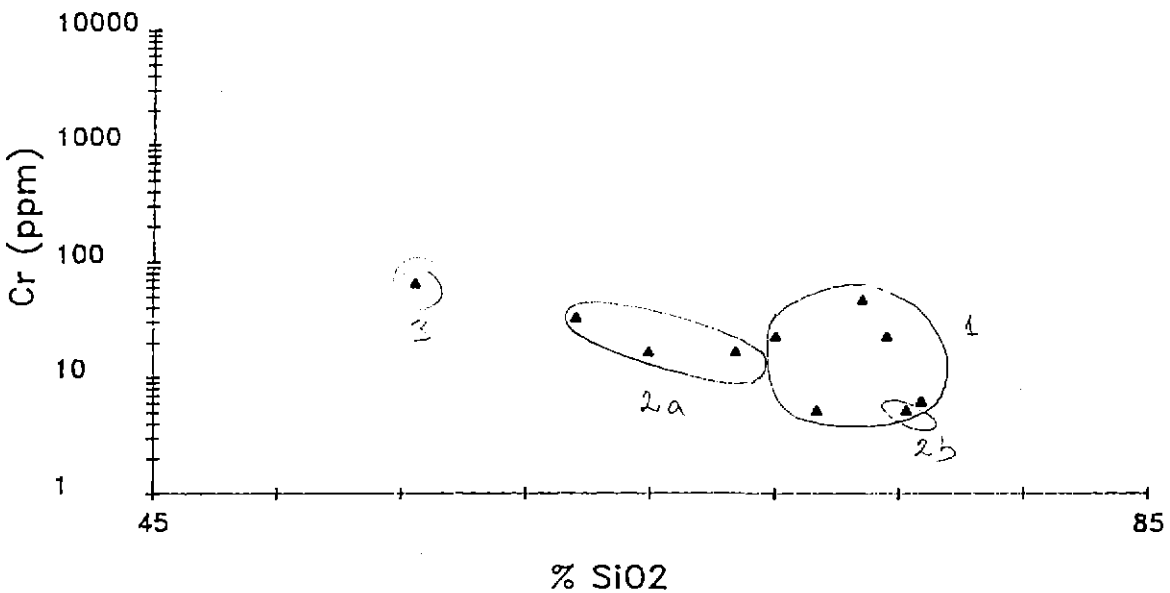
Harker diagram – LAKE MACKINTOSH



PANCONTINENTAL

6–FEB–1987

Harker diagram – LAKE MACKINTOSH

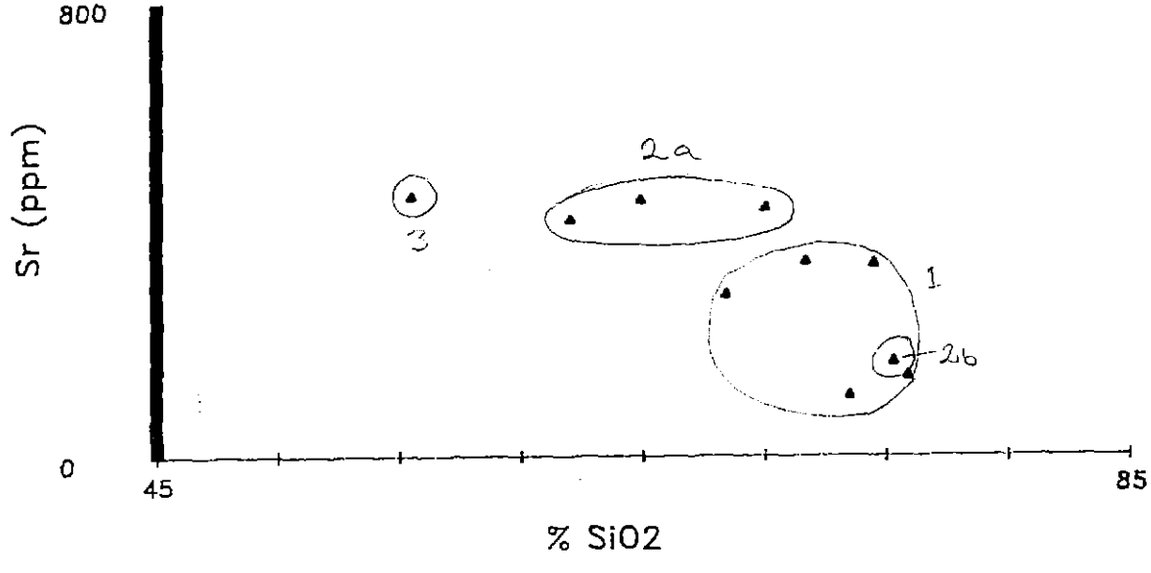


080

PANCONTINENTAL

6–FEB–1987

Harker diagram – LAKE MACKINTOSH

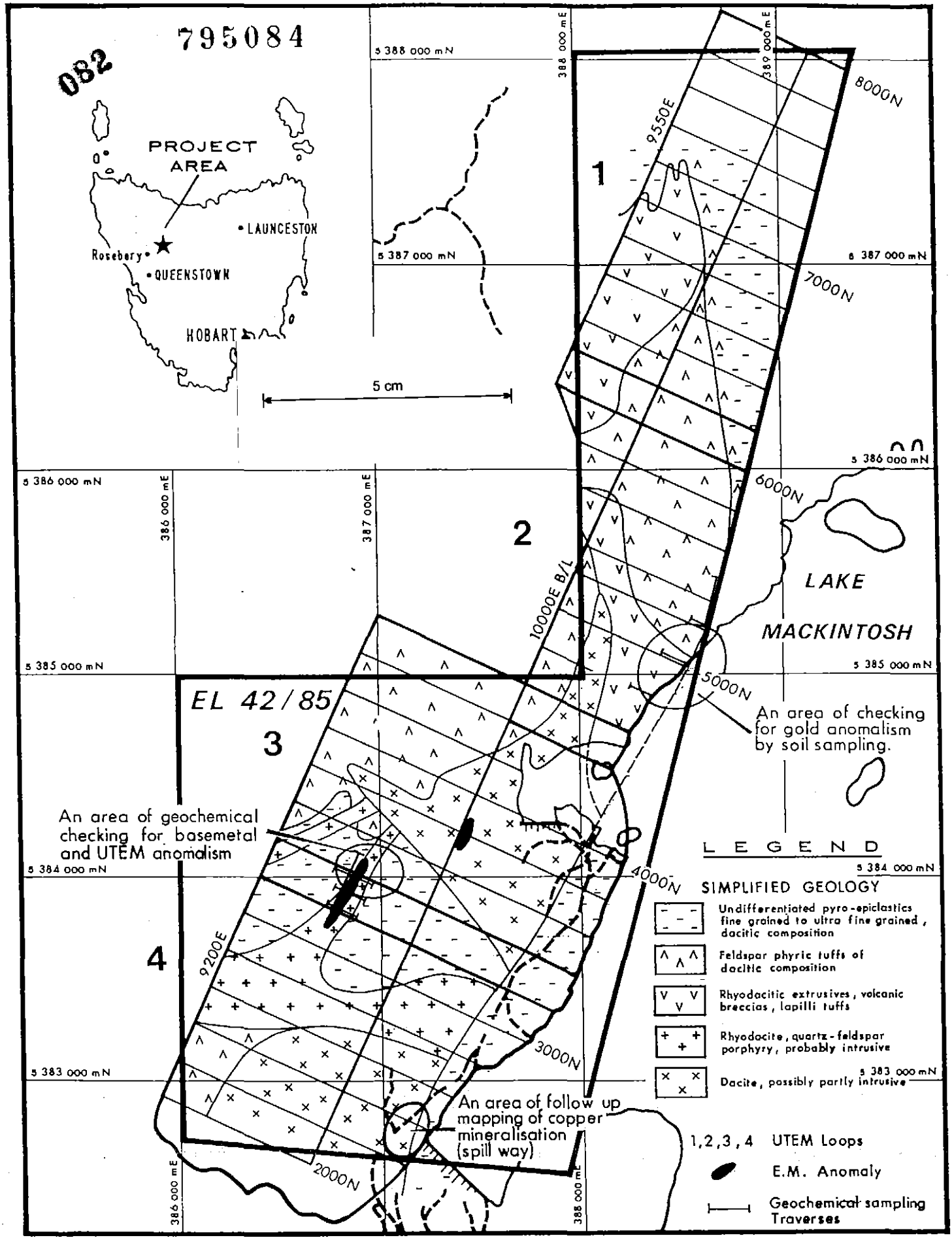


081

PANCONTINENTAL

6-FEB-1987

7950083



EL 42/85 - LAKE MACKINTOSH, TASMANIA

GEOPHYSICAL GRID AND SIMPLIFIED GEOLOGY

SCALE 1:25 000

0 500 1000 1500 2000

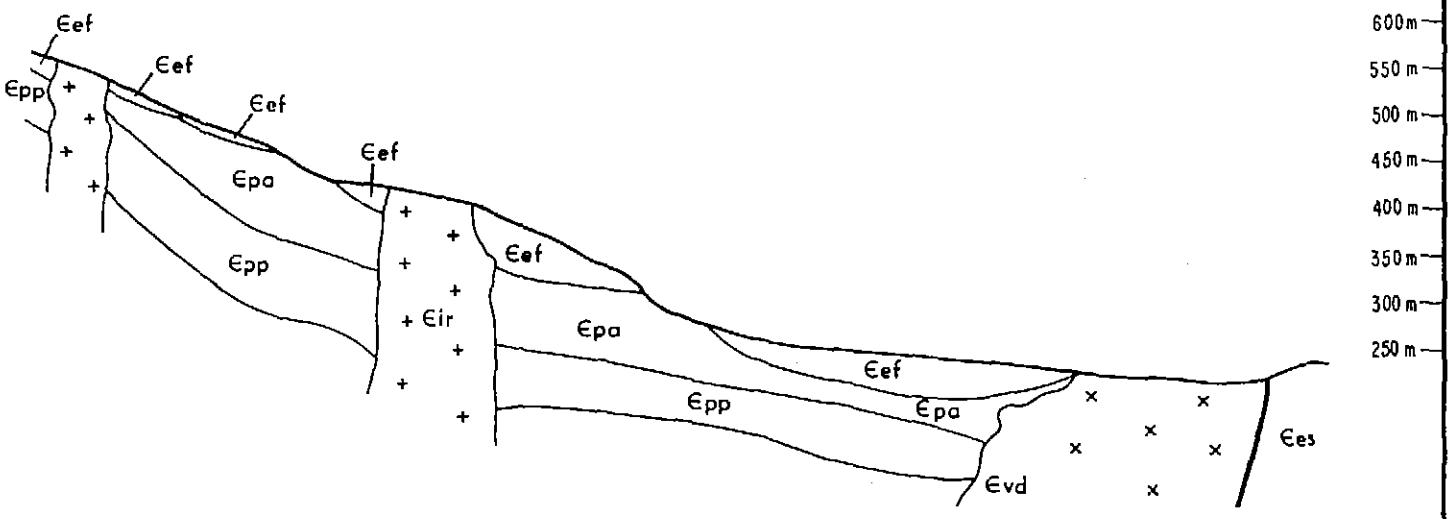
metres

FIGURE 1

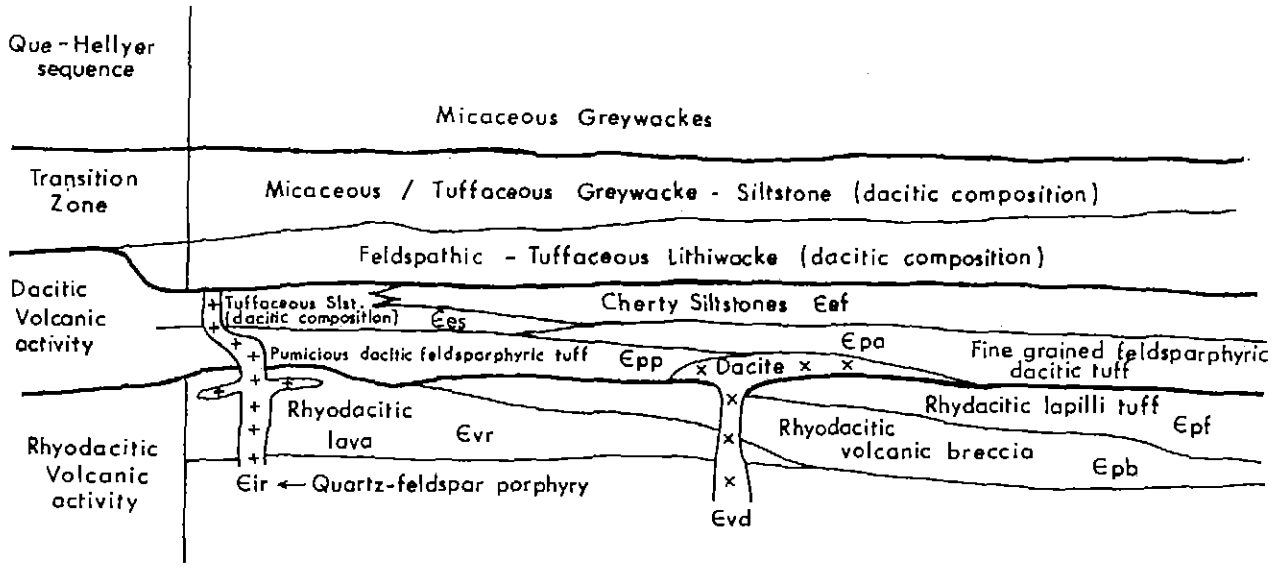
795085

LOOP LINE 083

9 600 E 10 000 E 10 400 E



SCHEMATIC CROSS-SECTION
PROFILE 3400N



SCHEMATIC INTERPRETATIVE STRATIGRAPHY

5 cm

PANCONTINENTAL MINING LIMITED
PANCON EXPLORATION DIVISION

Lake Mackintosh Prospect
EL 42/85 - Tasmania
SCHEMATIC CROSS SECTION & INTERPRETATIVE STRATIGRAPHY

0 100 200 300 400
metres

Compiled: K.O.A.	Date: JULY 1987	Dwg.No.: 37/D/4
Report No.:	Map Ref: SK 55-3	Figure 2