025001

Aberfoyle Resources Limited
EXPLORATION DIVISION

EXPLORATION LICENCE 103/87

BASIN LAKE

PARTIAL RELINQUISHMENT REPORT

ON EXPLORATION TO APRIL, 1993

VOLUME 1 OF 2

TEXT & APPENDICES

Compiled by:

for

S. M. Richardson

Distribution

Aberfoyle - Burnie	(1/4)
Aberfoyle - Hawthorn	(2/4)
Billiton Australia	(3/4)
Department of Mines	**(4/4)**

Endorsed by:

D B Wallace
REGIONAL EXPLORATION MANAGER

March, 1993

025002

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1.0 INTRODUCTION

The target within EL 103/87 is a volcanic hosted massive sulphide deposit. Within the EL the Mount Read Volcanics are represented by the Eastern Sequence, Tyndall Group and Anthony Road Andesites hosting several significant mineralised alteration zones.

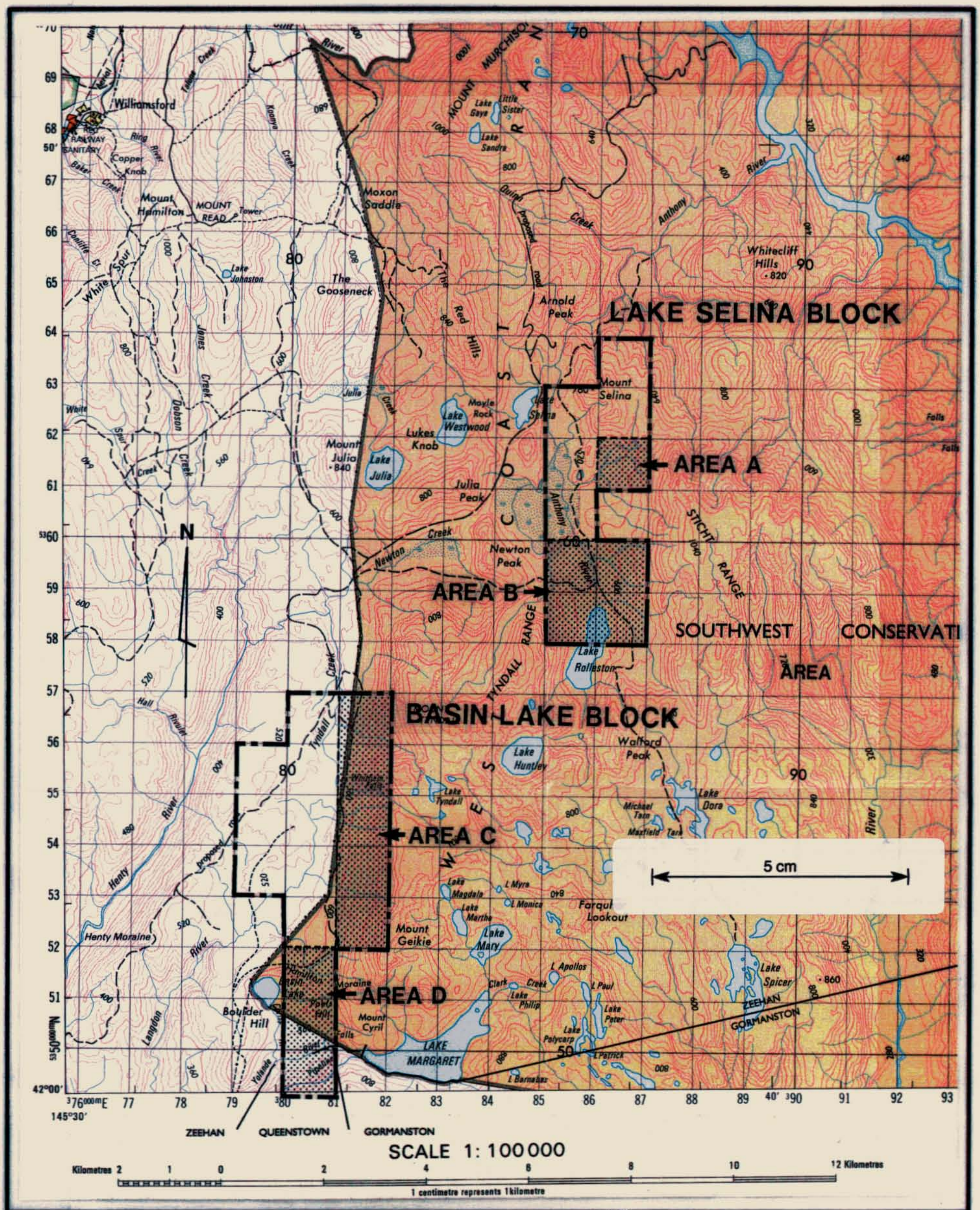
The exploration strategy for EL 103/87 has focussed on deep searching EM methods.

2.0 TENURE

Prior to reduction, Basin Lake EL 103/87 covered an area of 26 sq km in two parts, known as the Lake Selina (10 sq km) and Basin Lake (16 sq km) blocks. These blocks straddle the Anthony Road, recently constructed by the HEC between Queenstown and Tullah.

The licence was granted to the Shell Company of Australia on 21st April, 1988. In June, 1991, Aberfoyle entered a joint venture agreement with Billiton whereby Aberfoyle would fund and manage exploration.

In accordance with statutory requirements, a 50% relinquishment of the licence area is due on the 21st April, 1993. Plate BL-17 (in text) shows the area to be relinquished. For the purposes of this report the relinquished blocks are referred to as areas A to D, as shown on Plate BL-17.



Aberfoyle Resources Limited

EXPLORATION DIVISION

025007

REVISIONS			
Init.	Date	Init.	Date
RdeB	12.3.93		

WESTERN TASMANIA

BASIN LAKE E.L.103/87

PROPOSED RELINQUISHMENT AREAS

Compiled : DBW

Drawn : RdeB

Traced :

Checked :

Location Code :

Scale : 1:100 000

Date : MARCH 1993

Plate No. : BL 17

3.0 LAKE SELINA BLOCK

3.1 PREVIOUS EXPLORATION

Prospector activity at the turn of the century is evidenced by several adits and trenches on copper mineralisation at the Mount Selina Workings.

Modern systematic exploration began in 1969 when Mount Lyell (later Goldfields Exploration) mapped, soil sampled and surveyed with magnetics, IP and SP the area south of 361200N as part of EL 9/66. This work defined the southern end of the Western Pyrite Zone (WPZ) which was tested by drill holes LS1 to 3 in 1970. IP, magnetic surveys and soil sampling of the northern part of the WPZ followed, resulting in drilling of holes LS4 to 7 in 1971-72. All those holes intersected strongly altered felsic volcanics with pyrite-magnetite mineralisation but low base metal values.

In 1979 a Dighem survey of the area north of 361600N indicated that a magnetic signature similar to the WPZ was present 800 m to the east. Follow up mapping and IP surveys resulted in drilling of hole LS8, 600 m north of the present licence area. Disseminated, base metal poor, pyrite-magnetite mineralisation of the Eastern Pyrite Zone (EPZ) was intersected.

During 1984 hole LS10 was drilled to test the EPZ intersecting strongly altered pyritic felsic volcanics anomalous in Cu and Zn. A UTEM survey over a geochemically anomalous area south of the EPZ failed to detect significant conductors but was followed up by hole LS13 in 1986. Weak base metal mineralisation within altered volcanics was intersected.

The Lake Selina block was relinquished as part of EL 9/66 by Goldfields Exploration in August, 1987.

3.2 SUMMARY OF WORK COMPLETED

3.2.1 Introduction

The areas to be relinquished (A and B) are regarded as less prospective than that retained. Work to date indicates the focus of alteration and mineralisation, along the Eastern and Western Pyrite Zones, is in the north of the Lake Selina Block within the retained area.

3.2.2 Geology

The oldest rocks exposed on the Lake Selina Block of EL 103/87 are the Sticht Range Beds. These comprise siliciclastic conglomerate, sandstone and siltstone unconformably overlying Precambrian rocks of the Tyennan Region. The Sticht Range Beds outcrop along the eastern edge of the licence.

Conformably overlying the Sticht Range Beds are quartz phyric lavas, volcaniclastics and intrusives of the Eastern Sequence that outcrop extensively in the centre and north of the licence. These rocks were previously correlated with the Tyndall Group but recent mapping by the Department of Mines indicates that a separate designation is preferable. The Eastern Sequence is inferred to interfinger to the west with the Central Volcanic Complex.

A major NNW trending fault referred to as the Anthony Fault bisects the licence and marks the western boundary of the Eastern Sequence. West of the fault, siliclastic conglomerate and sandstone of the Owen Conglomerate is largely overlain by Pleistocene glacials and Quaternary alluvium.

Two major zones of alteration and mineralisation are present within the Lake Selina block. Known as the Western Pyrite Zone (WPZ) and Eastern Pyrite Zone (EPZ) they comprise north trending silica + sericite + chlorite alteration zones up to about 100 m wide containing disseminated and vein pyrite-magnetite±chalcopyrite mineralisation. Both zones occur in the area to be retained.

Geological mapping of the Lake Selina block has been undertaken by Billiton but was restricted to north of 361600N. The geology of the relinquished areas A and B are shown on 1:5,000 fact maps (Plates LD 56/038 + 039 and interpretive maps (Plates LD 56/036 + 037). An interpretation at 1:10,000 scale is shown on Plate LD 56/007. These areas are dominated by Pleistocene glacials with very little outcrop. Extrapolation of geology from the north however, suggests the glacial cover of the relinquished area is underlain by Sticht Range Beds in the east passing stratigraphically up and to the west through the Eastern Sequence to the inferred Anthony Fault at about 385600E. West of this structure glacials are inferred to overlie Owen Conglomerate.

3.2.3 Ground Magnetics

During 1988 a 10.6 line kilometre ground magnetic survey was undertaken. The aim was to detail aeromagnetic anomalies evident in Department of Mines data. Lines surveyed within the relinquished area are shown on Plate LD 56/1025 whilst stacked profiles are shown on Plates LD 56/1019 + 1020.

Within the SE corner of relinquished area B, a linear magnetic anomaly coincides with a known IP anomaly discovered by Goldfields Exploration. This may represent a southern extension of the Eastern Pyrite Zone.

3.2.4 CSAMT

During 1988 a CSAMT survey was carried out over selected lines throughout EL 103/87. The transmitter dipole was located around 537200N with reading lines within the relinquished area as shown on Plate LD 57/1022. Profiles are shown in Appendix I.

Only one genuine bedrock conductor was apparent within the area to be relinquished. This anomaly is located at 358000N, 385600E (Area B). The response is approximately along strike from a conductive zone, with at least three kilometres strikes length, located to the north within the retained area, 350 m west of the Anthony Fault.

3.2.5 EM-37

In March, 1989 an EM-37 survey was conducted with the principal aim of detailing anomalies detected by the earlier CSAMT survey. Loop locations and reading lines within the area to be relinquished are shown on Plate LD 56/1025. Profiles are attached as Appendix II.

One conductor attributable to a bedrock source is evident from EM-37 data within the area to be relinquished. A strong conductor is suggested off the eastern end of lines 1200N, 1600N and 2000N. This would place the response within the Sticht Range Beds. An EM survey by Aberfoyle on EL 7/91, 2.5 km to the north, suggests that carbonaceous phyllites within the Sticht Range Beds are strong conductors. These conductive units are considered to be the source of the eastern response on lines 1200N-2000N.

The southern end of a series of EM anomalies is evident on and to the south of line 360000N at around 385200E. A conductor with a strike length in excess of four kilometres lies about 350 m west of the Anthony Fault. This conductive zone is the same as that defined by the earlier CSAMT survey. Within the area to be relinquished this conductor appears to have a shallow source, probably within the Pleistocene glacials.

4.0 BASIN LAKE BLOCK

4.1 PREVIOUS EXPLORATION

Modern exploration of the Basin Lake area began with Pickands Mather between 1965 and 1971. An IP survey detected an anomaly NE of Basin Lake resulting in drilling of two inconclusive holes.

In the northern part of the Basin Lake block Mount Lyell conducted IP surveys in 1967-68 culminating in the drilling of diamond hole TYN-1 which intersected graphitic shales. Further IP and magnetic surveys in 1973-74 confirmed several anomalous zones in the north. These were followed up by soil and detailed IP surveys that led to drilling of holes TYN-2 and 3. Both holes intersected mostly pyritic black shales.

In 1978 holes BL-1 and 2 were drilled by Mount Lyell near the earlier inconclusive Pickands Mather holes. Both intersected weak base metal mineralisation within altered felsic volcanics.

During the early 1980's further IP, magnetic and soil geochemical surveys were carried out, resulting in drilling of holes BL-3 to 5. Only pyritic base metal poor mineralisation was intersected but a north trending zone of alteration and sulphide mineralisation was indicated. This zone is referred to as the Basin Lake Pyrite Zone.

In 1985 Goldfields Exploration conducted UTEM and Sirotem surveys over the Basin Lake Pyrite Zone and Leech Hill Pyrite Zones respectively. After reviewing all available geophysical data two targets were tested (TYN-4 and 5) but no mineralisation was intersected.

In August, 1987 the Basin Lake Block was relinquished as part of EL 9/66 by Goldfields Exploration.

4.2 SUMMARY OF WORK COMPLETED

4.2.1 Introduction

The areas to be relinquished (C and D) are considered to be less prospective than those retained. The bulk of area C is underlain by Owen Conglomerate and Tyndall Group volcanics separated by the Great Lyell Fault. The Basin Lake Pyrite Zone lies just to the east of the relinquished area, except in the south, where the eastern edge is included in area C.

Although the bedrock geology of area D is largely unknown its prospectivity is downgraded by significant glacial cover and the lack of targets from a recent UTEM survey.

4.2.2 Geology

Some geological mapping of the relinquished areas has been undertaken by Billiton and is shown on Plate LD 57/024. Interpretive geology is shown on Plates LD 57/030 to 033. Bedrock over large parts of the Basin Lake block is obscured by extensive Quaternary glacials and alluvials.

The north trending Great Lyell Fault runs along the eastern side of the Basin Lake block, within relinquished area C. East of the Great Lyell Fault is a downthrown sequence of siliciclastic conglomerate to sandstone of the Cambro-Ordovician Owen Conglomerate.

Abutting the Great Lyell Fault on the western side is a sequence of felsic to locally andesitic volcaniclastics, epiclastics and lavas of the Tyndall Group. These are inferred to underlie the western side of area C.

The Tyndall Group overlies a sequence of andesitic lavas, volcaniclastics and shallow intrusives known as the Anthony Road Andesites that occupy most of the area to be retained.

Bedrock geology of relinquished area D is almost totally obscured by Quaternary glacial cover. Outcrop in the SW corner indicates the presence of an intrusive quartz-feldspar porphyry. The extent of the body and the nature of the rocks it intrudes is unknown due to glacial cover.

4.2.3 Ground Magnetics

The southern part of the Basin Lake block (349000N-353000N) has been covered by a ground magnetic survey on 400 m spaced lines. Using a station spacing of 10 m, all of area D but only the SW corner of area C was covered. Stacked profiles are shown on Plates X BL 33 and 34.

A significant E-W feature is evident between 351800N and 352200N separating magnetic units in the north from less magnetic stratigraphy in the south. Lack of outcrop precludes accurate identification but the feature may represent the southern limit of the Anthony Road Andesites.

4.2.4 CSAMT

Lines 349000N-353000N were also surveyed with CSAMT. The results of this survey are included as Appendix III.

No significant conductors are evident on lines within relinquished area D. Within area C an eastern conductive trend, probably related to the Great Lyell Fault, is evident as is a trend to the west related to the altered and mineralised volcanics of the Basin Lake Pyrite Zone.

4.2.5 Gravity

* Line 350200N was surveyed with gravity to cover a Mines Department 3 mgal anomaly near Basin Lake. The profile is shown on Plate X BL 35.

An anomaly of 3 mgal was not detected and the original data point is presumed incorrect. A 0.5 mgal anomaly is evident between 380400E and 500E coincident with a shallow CSAMT conductor that probably has a surficial source.

4.2.6 Diamond Drilling - DDH BLD 89-3

i) Introduction

One hole was drilled within the area to be relinquished. During 1989 Billiton drilled a 388 m diamond drill hole in the southern part of the Basin Lake block (area C) to test a CSAMT conductor adjacent to the Great Lyell Fault. A drill log is attached as Appendix IV, whilst a cross section is included as Plate LD 57/012. A summary log is as follows:

0 -	31 m	Glacial scree.
31 -	89 m	Quartz feldspar phyric felsic lava.
89 -	134 m	Sericitic rhyodacitic lava (2-10% pyrite).
134 -	195 m	Feldspar + quartz phyric sericitic rhyodacitic lava (1-5% pyrite).
195 -	232 m	Sericitic foliated pyrite rhyodacitic lava (2-5% pyrite).
232 -	239 m	Chloritic sericitic dacitic lava breccia.
239 -	250 m	Sericitic and silicified dacitic lava.
250 -	311 m	Strongly silicified, K-spar and chlorite altered dacitic lava.
311 -	323 m	Chloritized pumiceous dacitic ? lava.
323 -	327 m	Basaltic dyke.
327 -	336 m	Silicified chlorite K-spar altered dacitic lava.
336 -	361 m	Layered chloritic pumiceous feldspar phyric dacitic epiclastic.
361 -	388 m	Interlayered arenaceous and pelitic sediments with minor pebble conglomerate.
EOH		

This hole intersected a base metal poor alteration zone with disseminated pyrite between 130 and 230 m that was considered to be the source of the CSAMT anomaly.

To the north, along strike from the alteration, a south plunging surface UTEM conductor is recognised from 1985 data on RGC lines 48 to 66S. This conductor did not appear to be tested by drilling. A downhole EM survey of BLD 89-3 by Billiton detected the presence of an off hole conductor centred around 210 m. A potentially coincident DHEM conductor, surface UTEM conductor and alteration zone was considered highly prospective.

ii) DHEM

Perceived problems with data quality from the original DHEM survey prompted Aberfoyle to resurvey the hole. This allowed confirmation and modelling of the response. During January, 1991, BLD 89-3 was resurveyed with a two loop DHEM survey. Loop locations and survey results are included in Appendix V. This survey showed that problems did exist with the original data but confirmed the presence of an off hole conductor. A broad negative trough at medium times in the loop one data (positive for loop 2) defines the response. However, steel casing between 60 and 100 m prevented accurate identification of the conductive source. Indeed, the casing itself could not be positively ruled out as the source.

Whilst compiling data it became apparent that diamond drill hole, BL-2 (800 m north of BLD 89-3) had been incorrectly plotted on previous plans. When correctly located, this hole was found to test the surface UTEM conductor. At the target position, a carbonaceous shale horizon is considered to be sufficiently conductive to explain the surface EM response. No increase in conductivity is apparent toward the south. As the off hole response in BLD 89-3 is inferred to correspond to the surface conductor no further drill testing of this conductor could be justified.

4.2.7 UTEM

Prior to 1991, the prospective volcanics of the Basin Lake EL had been covered in part by UTEM (RGC) and a large area by CSAMT (Billiton) operating in the electrical field perpendicular to strike mode. Perceived problems with this CSAMT configuration in detecting conductors led to a proposal to resurvey the area covered by CSAMT with UTEM.

In February, 1991, a six loop 59 line km UTEM survey was conducted over the Basin Lake block of EL 103/87. Loop locations and survey lines covering the relinquished area are shown on Plate BL-5. Results are attached as Appendix VI.

No significant conductors were detected by this survey.

5.0 REFERENCES

Creagh, C. J.; Hungerford, N. 1989. EL 103/87 - Basin Lake, Progress Report on Exploration for the Period Ending 21st April, 1989. Unpublished Report to the Department of Mines.

Creagh, C. J.; Hungerford, N. 1990. EL 103/87 - Basin Lake, Progress Report on Exploration for the Period Ending 21st April, 1990. Unpublished Report to the Department of Mines.

McNeill, A. W.; Corbett, K. D. 1992. Geology and Mineralisation of the Mount Murchison Area. Mount Read Volcanics Project, Geological Report 3.

Richardson, S.; 1992. Exploration Licence 103/87, Basin Lake, Tasmania. Progress Report for the Period Ending 21st March, 1992. Unpublished Report to the Department of Mines.

Richardson, S.; 1993. Exploration Licence 103/87, Basin Lake, Tasmania. Progress Report for the Period Ending 21st March, 1993. Unpublished Report to the Department of Mines.

APPENDIX I

[redacted] CSAMT SURVEY DATA [redacted]

MT SELINA
for
BILLITON AUSTRALIA

CAGNIARD RESISTIVITY

values in ohm-meters
<RHO-C

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

[1.84M]	25.1K	251
1.58M	15.8K	158
1.00M	10.0K	100
631.K	6310	63.1
398.K	3981	39.8
251.K	2512	[36.3]
158.K	1585	
100.K	1000	
63.1K	631	
39.8K	398	

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 18 Jan 89

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SurveYed= DEC 88

TRANSMITTER DATA
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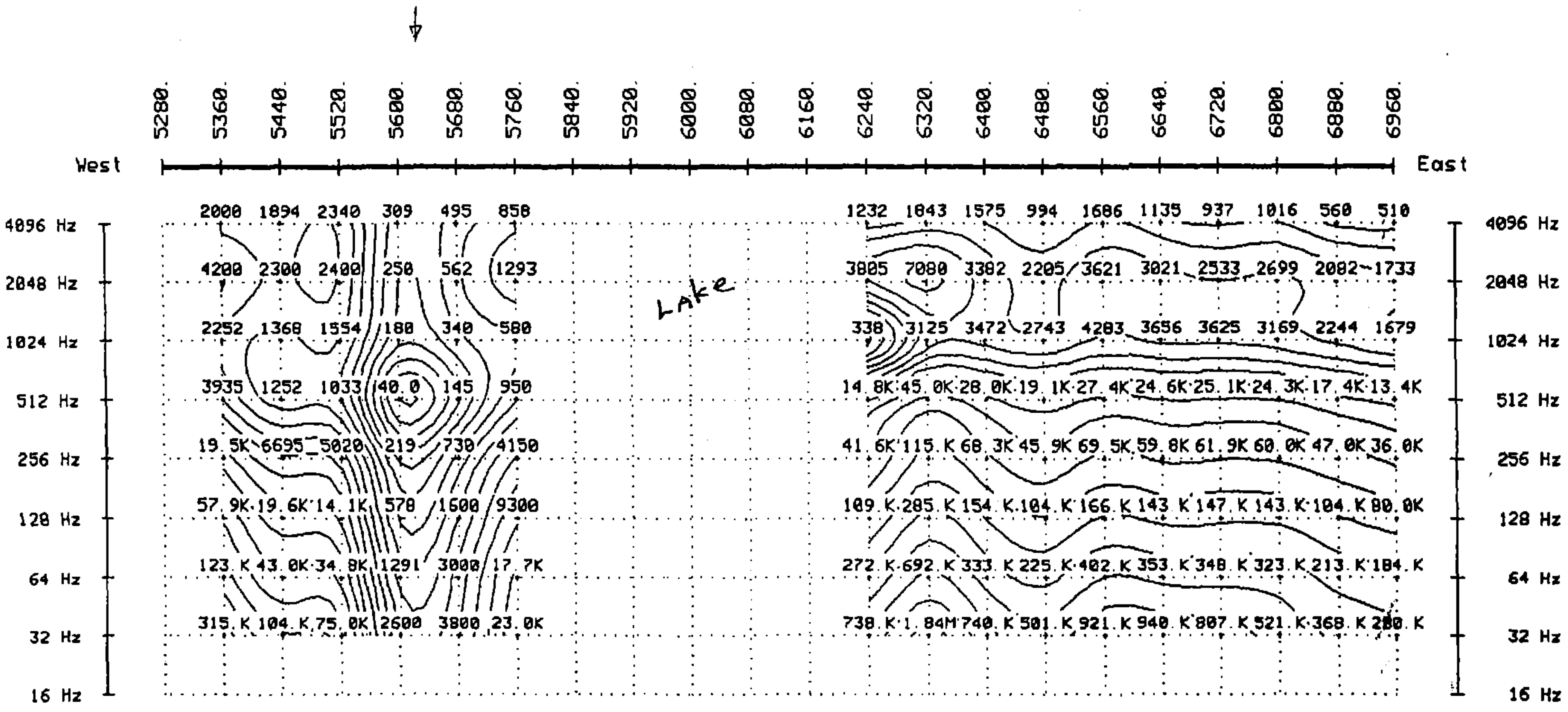
Orient. = East
Distance= 7KM
Rx to Tx= North



025022

Line 358800

MT SELINA
for
BILLITON AUSTRALIA

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 18 Jan 89

CSAMT SURVEY DATA
PHASE DIFFERENCE (E - H)

values in milli-radians
<PDIFF

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Surveyed= DEC 88

TRANSMITTER DATA
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Rx to Tx= North

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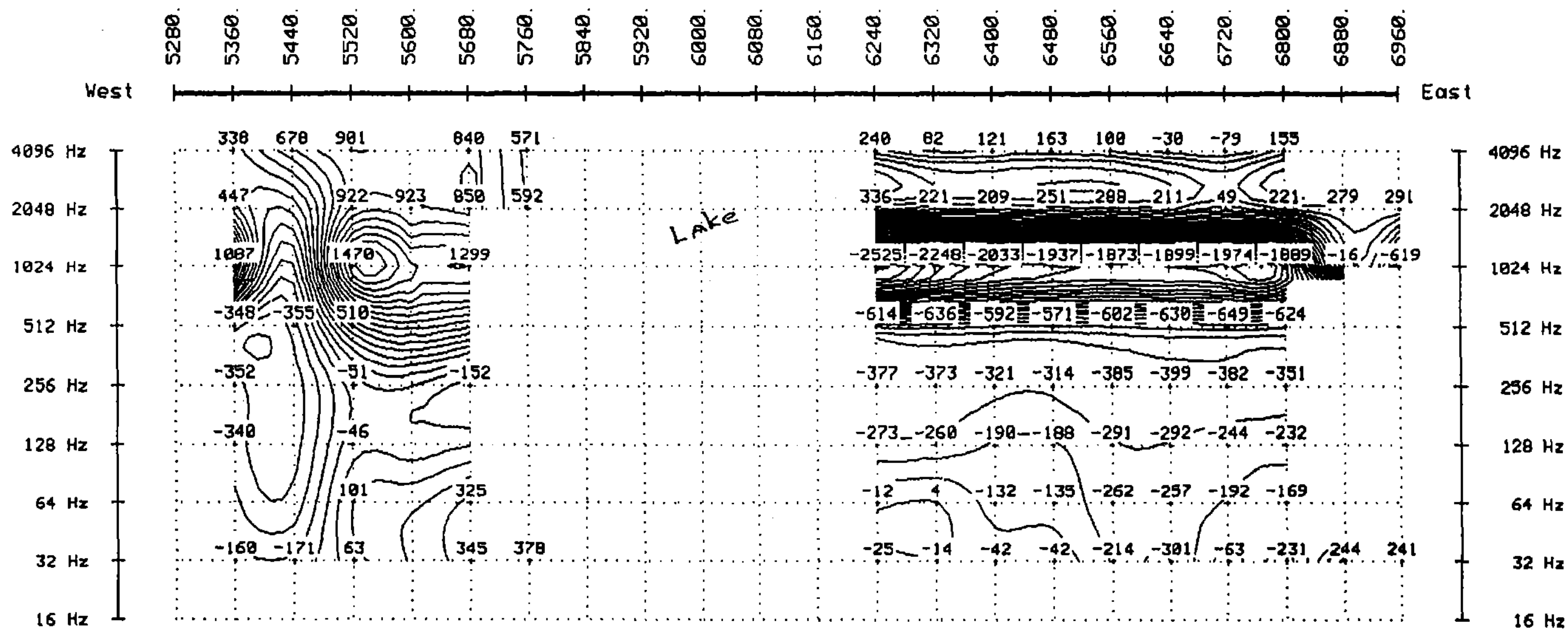
1200	200	-800	-1800	
1100	100	-900	-1900	
1000	0.00	-1000	-2000	
900	-100	-1100	-2100	
800	-200	-1200	-2200	
700	-300	-1300	-2300	



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[redacted] ARITHMETIC CONTOURS

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for
BILLITON AUSTRALIA

ZONGE Job 864
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PLOTTED 11 Jan 89

PHASE DIFFERENCE (E - H)

values in milli-radians
<PDIFF

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Surveyed= DEC 88

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Orient = East
Distance= 7KM
Rx to Tx= North

(Interval: 100.00)

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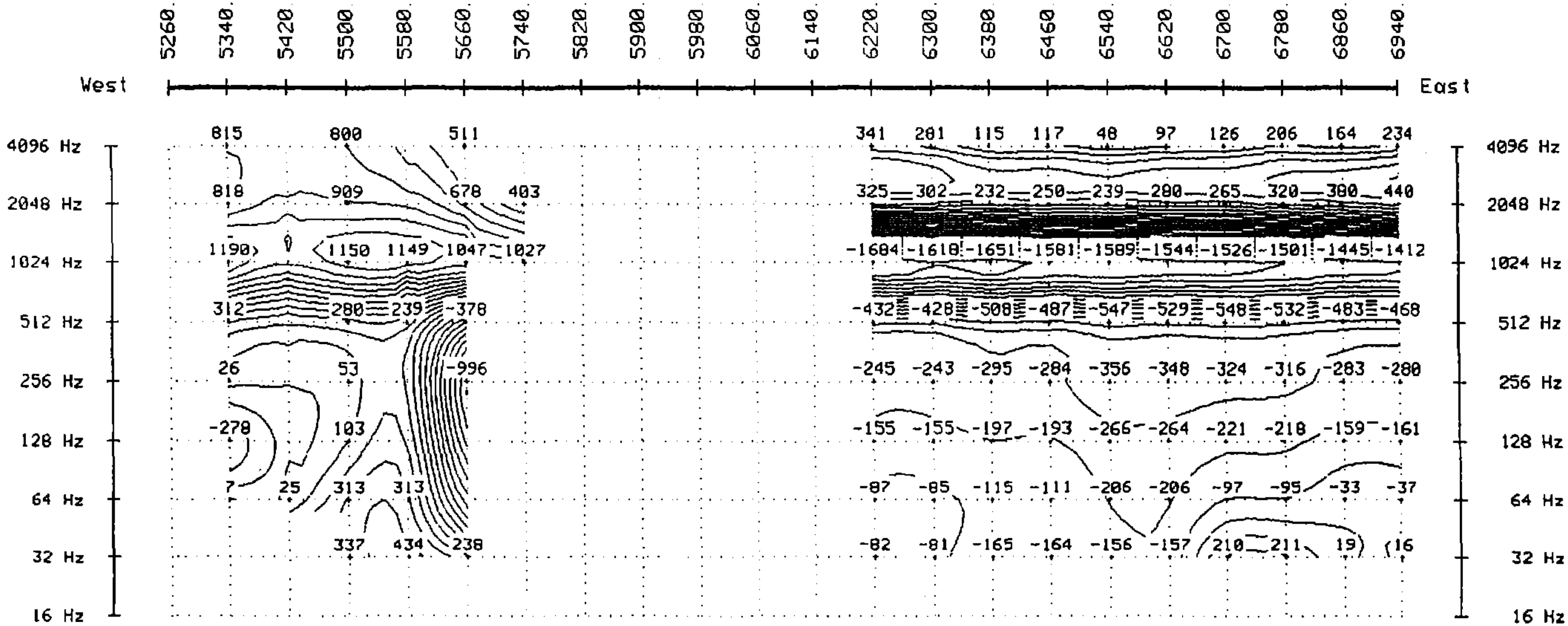

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[redacted] ne [redacted] 358 [redacted] 00 [redacted] CS[redacted]T [redacted]URV[redacted] [redacted]ATA [redacted] [redacted]lot l[redacted]ts] and [redacted]ARI[redacted]IC CO[redacted]OURS [redacted]

MT SELINA
for
BILLITON AUSTRALIA

CAGNIARD RESISTIVITY

values in ohm-meters
<RHO-C

(Interval: 0.20)

[1.16M]	15.8K [192]
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398.K	3981
251.K	2512
158.K	1585
100.K	1000
63.1K	631
39.8K	398
25.1K	251

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 11 Jan 89

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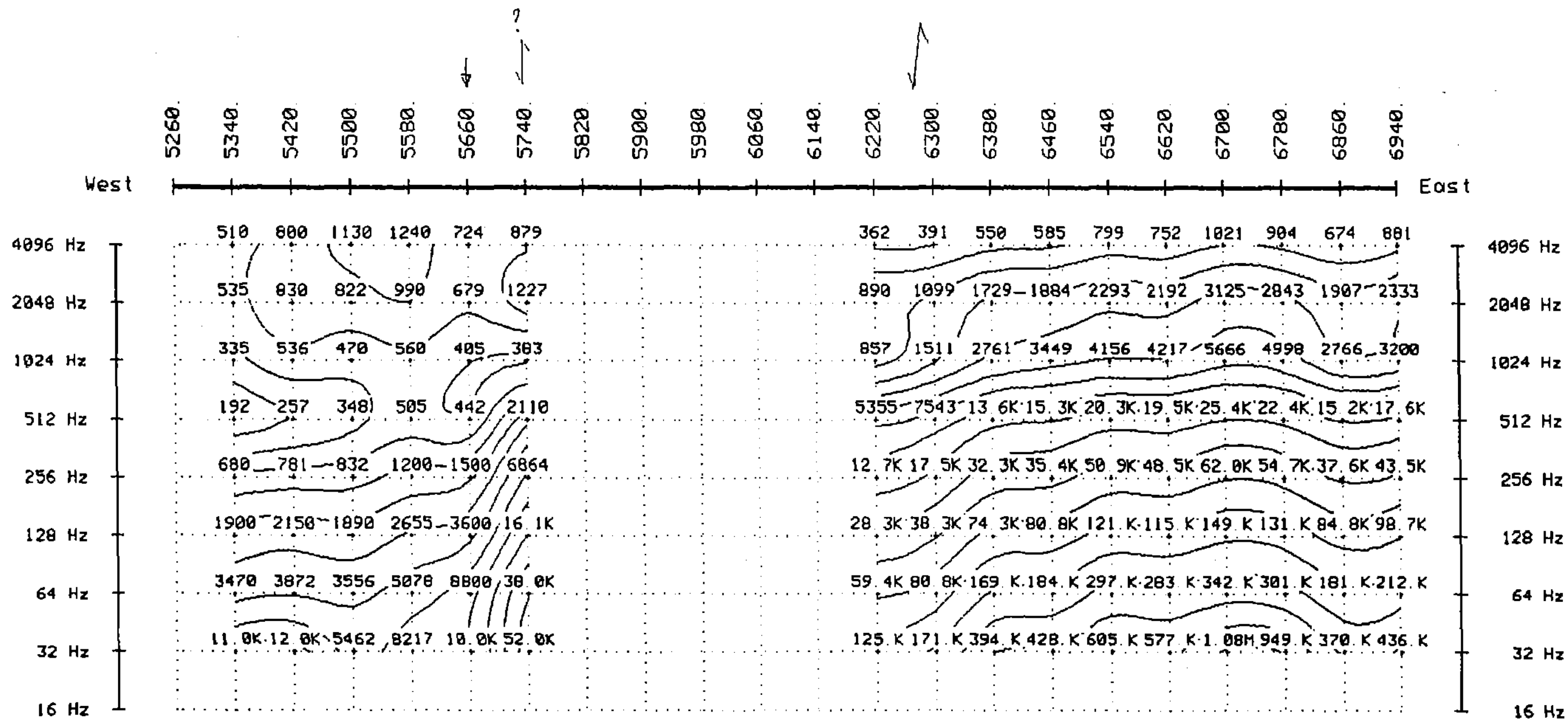
Rx to Tx = North



025025

[redacted]
MT SELINA
for
BILLITON AUSTRALIA

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY
values in ohm-meters
<RHO-C

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

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3.98M	39.8K	398
2.51M	25.1K	251
1.58M	15.8K	158
1.00M	10.0K	100
631.K	6310	63.1
398.K	3981	39.8
251.K	2512	[35.5]

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 11 Jan 89

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SurveYed= DEC 88

TRANSMITTER DATA
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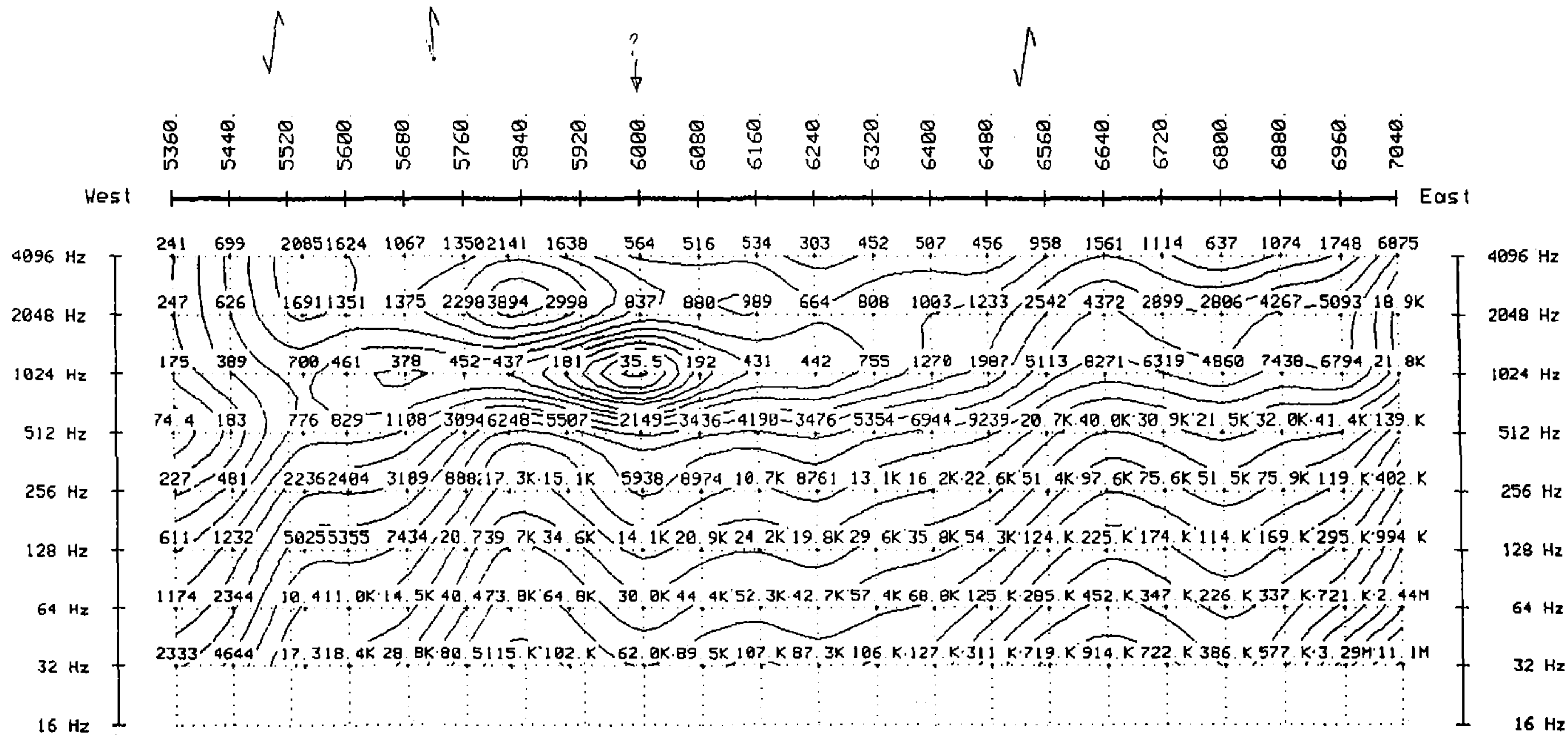

025026

Line 358800
MT SELINA
for
BILLITON AUSTRALIA

ONGE Job 864
LOT BY CPLOT 5.40
PLOTTED 11 Jan 89

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PHASE DIFFERENCE (E - H)

values in milli-radians
<PDIFF

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Surveyed= DEC 88

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Rx to Tx= North

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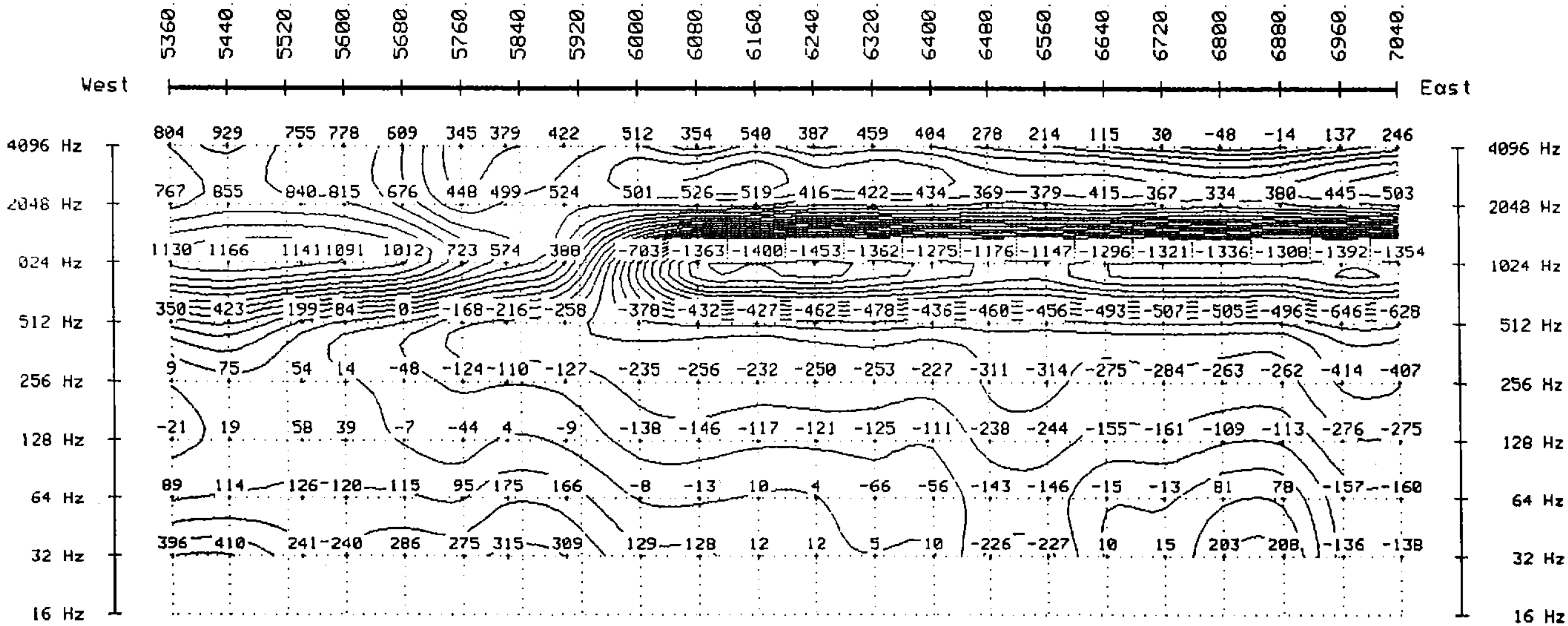

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MT SELINA
for
BILLITON AUSTRALIA

CSAMT SURVEY DATA
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values in ohm-meters
<RHO-C

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(Interval: 0.20)

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398.K	3981	
251.K	2512	
158.K	1585	
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63.1K	631	
39.8K	398	
25.1K	251	

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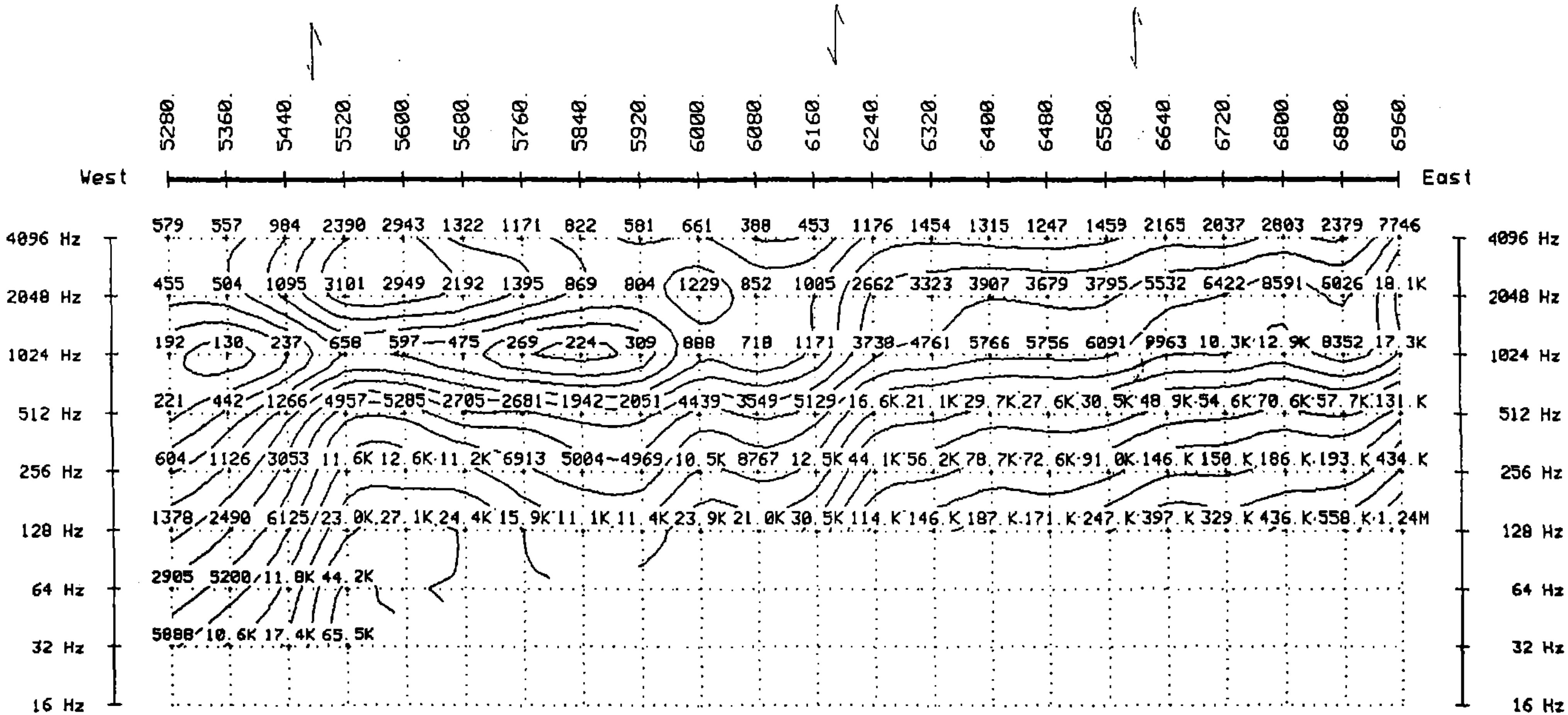

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MT SELINA
for
BILLITON AUSTRALIA

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values in milli-radians
<PDIFF

[Plot limits] and ARITHMETIC CONTOURS
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700	-300	-1300
600	-400	[-1337]
500	-500	
400	-600	

GE Job 864
T BY CPLOT 5.40
TTED 11 Jan 89

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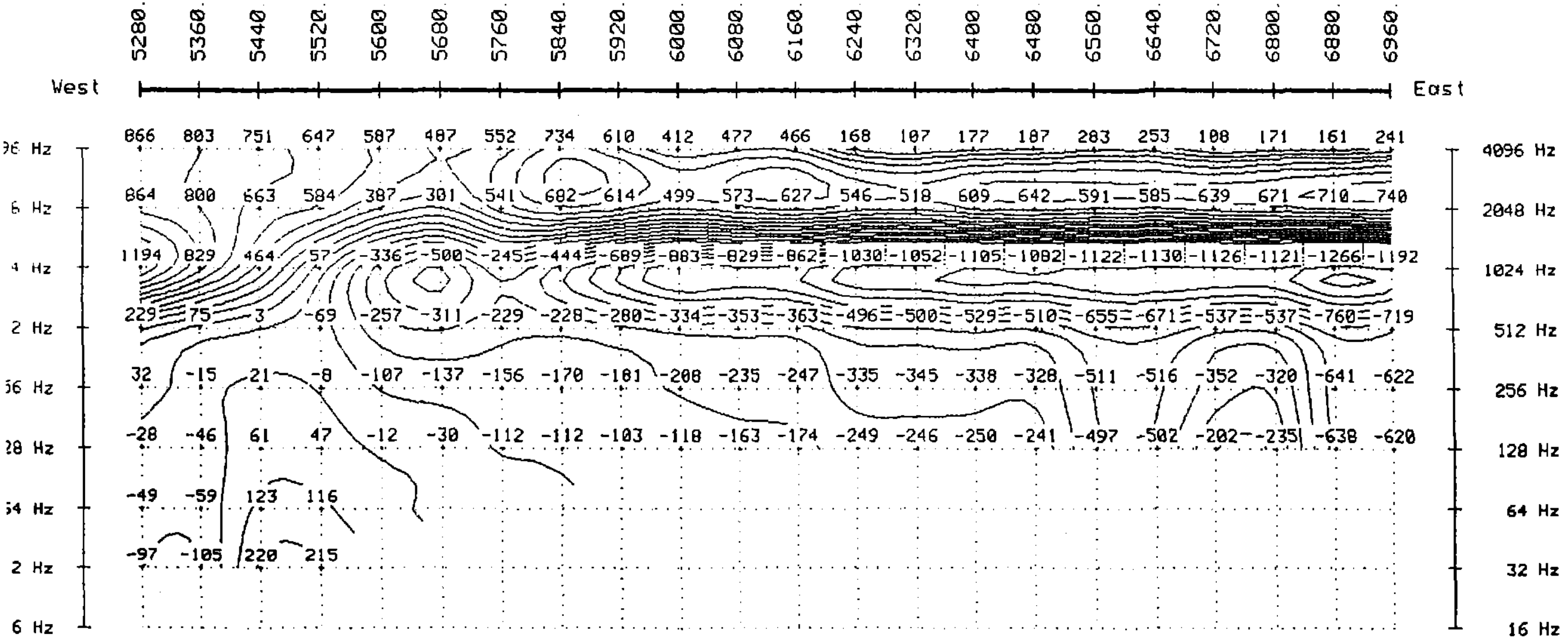
Distance= 7KM
Rx to Tx= North



025029

[redacted]

values in ohm-meters
<RHO-C

(Interval: 0.20)

[6.12M]	6310
3.98M	3981
2.51M	2512
1.58M	1585
1.00M	1000
631.K	631
398.K	398
251.K	[382]
158.K	
100.K	
63.1K	
39.8K	
25.1K	
15.8K	
10.0K	

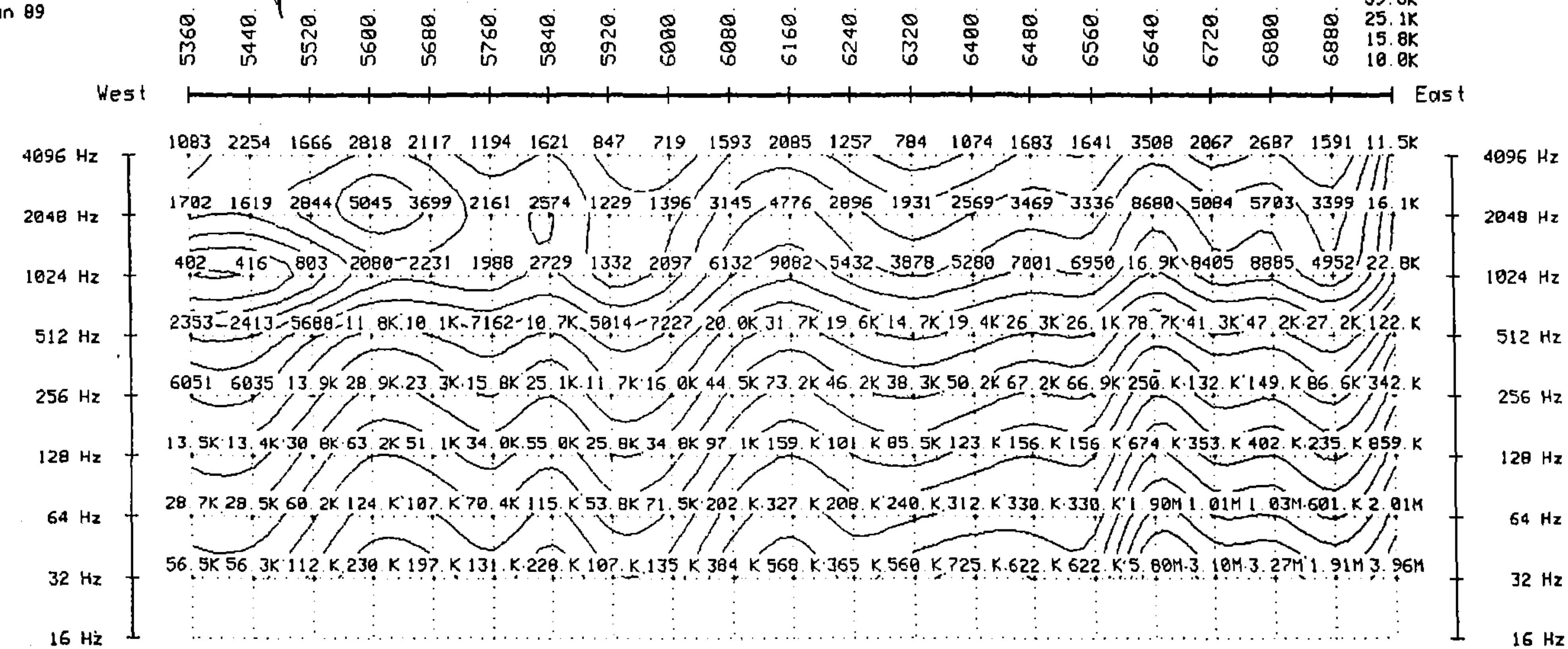
MT SELINA
for
BILLITON AUSTRALIA

CAGNIARD RESISTIVITY

RECEIVER DATA
DiPole Length= 80.m
Stn. SPacing = 80.m
Line Orient= East
DiPole Orient= East
Date of survey= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 05 Jan 89



025030

[redacted] SURVEY DATA [redacted] limits [redacted] and [redacted] ARITHMETIC CONTOUR
(Interval: 100.00)

MT SELINA for BILLITON AUSTRALIA

PHASE DIFFERENCE (E - H)

PHASE DIFFERENCE (E - H)
values in milli-radians
<PDIFF

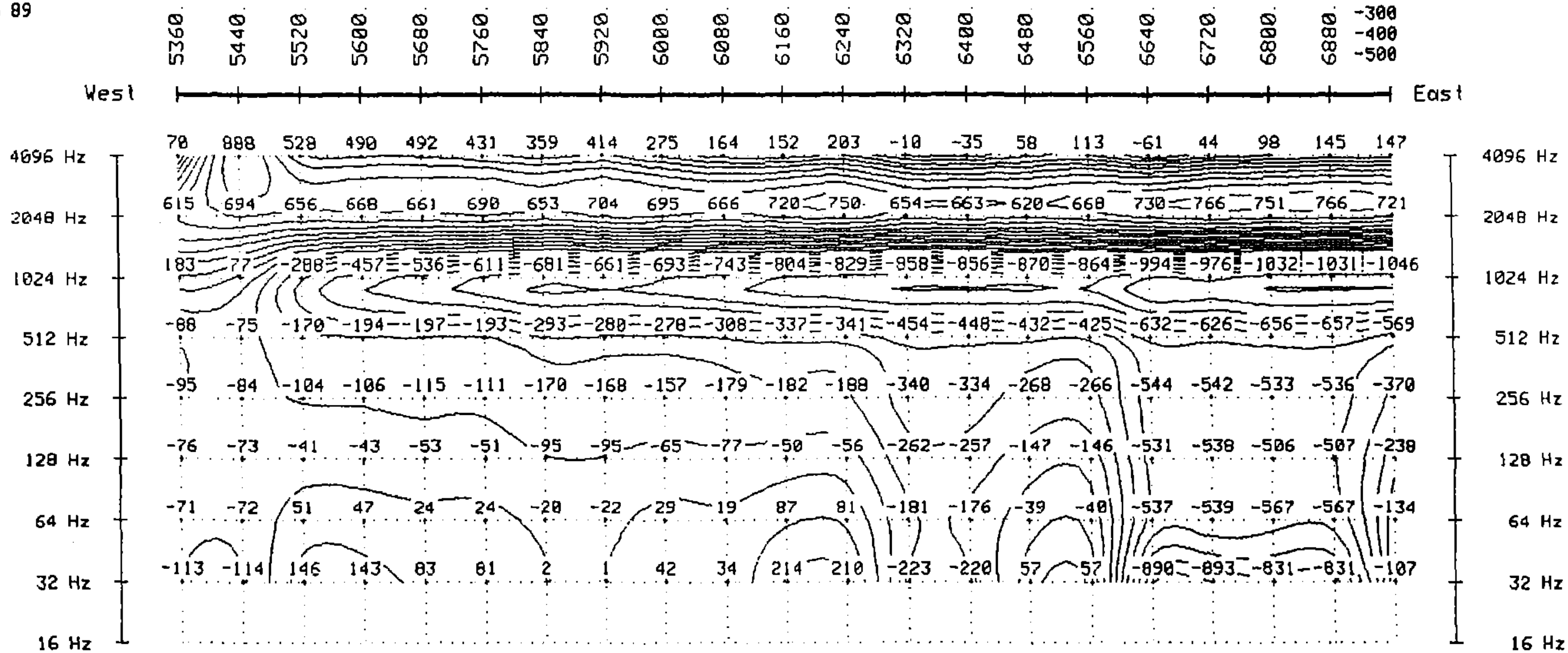
[800]	-600
800	-700
700	-800
600	-900
500	-1000
400	-1100
300	[-1111]
200	
100	
0.00	
-100	
-200	
-300	
-400	
-500	

RECEIVER DATA
DiPole Length= 80.m
Stn. SPacing = 80.m
Line Orient= East
DiPole Orient= East

Date of survey= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 05 Jan 89



025031

[redacted]

MT SELINA

for

BILLITON AUSTRALIA

CSAMT SURVEY DATA

CAGNIARD RESISTIVITY

CAGNIARD RESISTIVITY
values in ohm-meters
(RHO-C

(P[redacted] and L[redacted]ITH[redacted] CONTOUR
(Interval: 0.20)

[14.1M]	15.8K
10.0M	10.0K
6.31M	6310
3.98M	3981
2.51M	2512
1.58M	1585
1.00M	1000
631.K	631
398.K	398
251.K	[285]
158.K	
100.K	
63.1K	
39.8K	
25.1K	

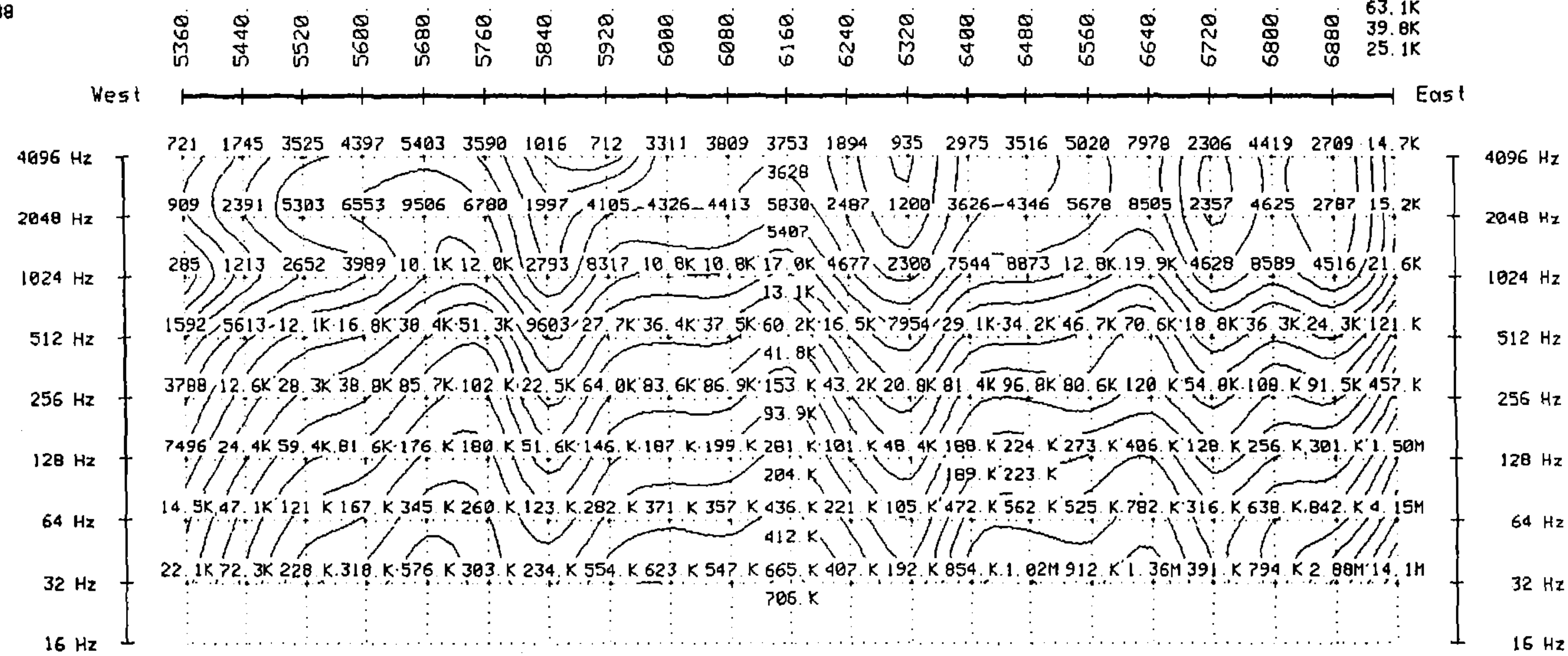
RECEIVER DATA
DiPole Length= 80.m
Stn. SPacing = 80.m

Line Orient= East
DiPole Orient= East

Date of surveY= NOV 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

NGE Job 864
OT BY CPLOT 5.40 UNAVERAGED
OTTED 31 Dec 88



025032

[redacted] Line 560000

MT SELINA

for

BILLITON AUSTRALIA

ONGE Job 864
LOT BY CPLOT 5.40 UNAVERAGED
LOTTED 31 Dec 88

CSAMT SURVEY DATA

PHASE DIFFERENCE (E - H)

RECEIVER DATA
DiPole Length= 80 m
Stn. Spacing = 80 m

Line Orient= East
DiPole Orient= East

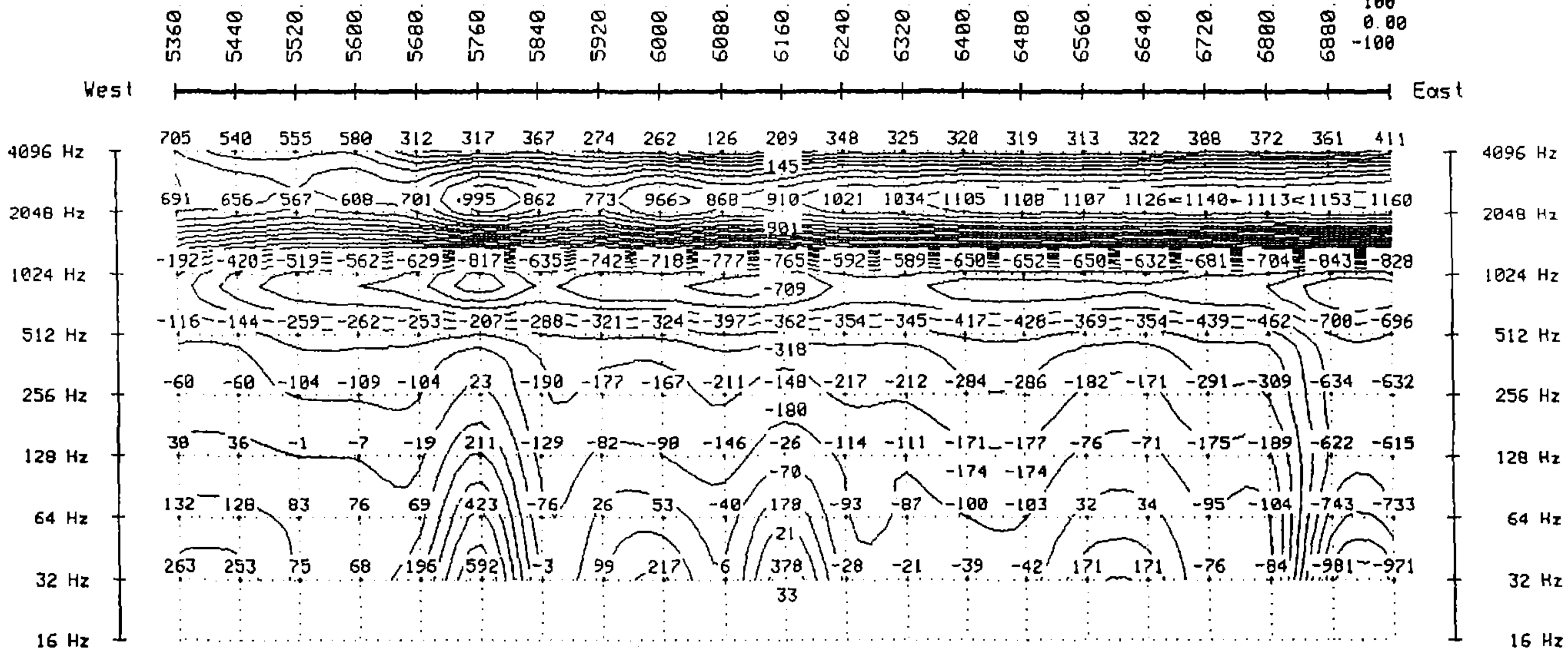
Date of survey= NOV 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

PHASE DIFFERENCE (E - H)
values in milli-radians
(PDIFF

[Plot limits] and ARITHMETIC CONTOUR
(Interval: 100.00)

[1253]	-200
1200	-300
1100	-400
1000	-500
900	-600
800	-700
700	-800
600	-900
500	-1000
400	[-1088]
300	
200	
100	
0.00	
-100	



Line 361200
MT SELINA
for
BILLITON AUSTRALIA

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 13 Jan 89

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY

values in ohm-meters
<RHO-C

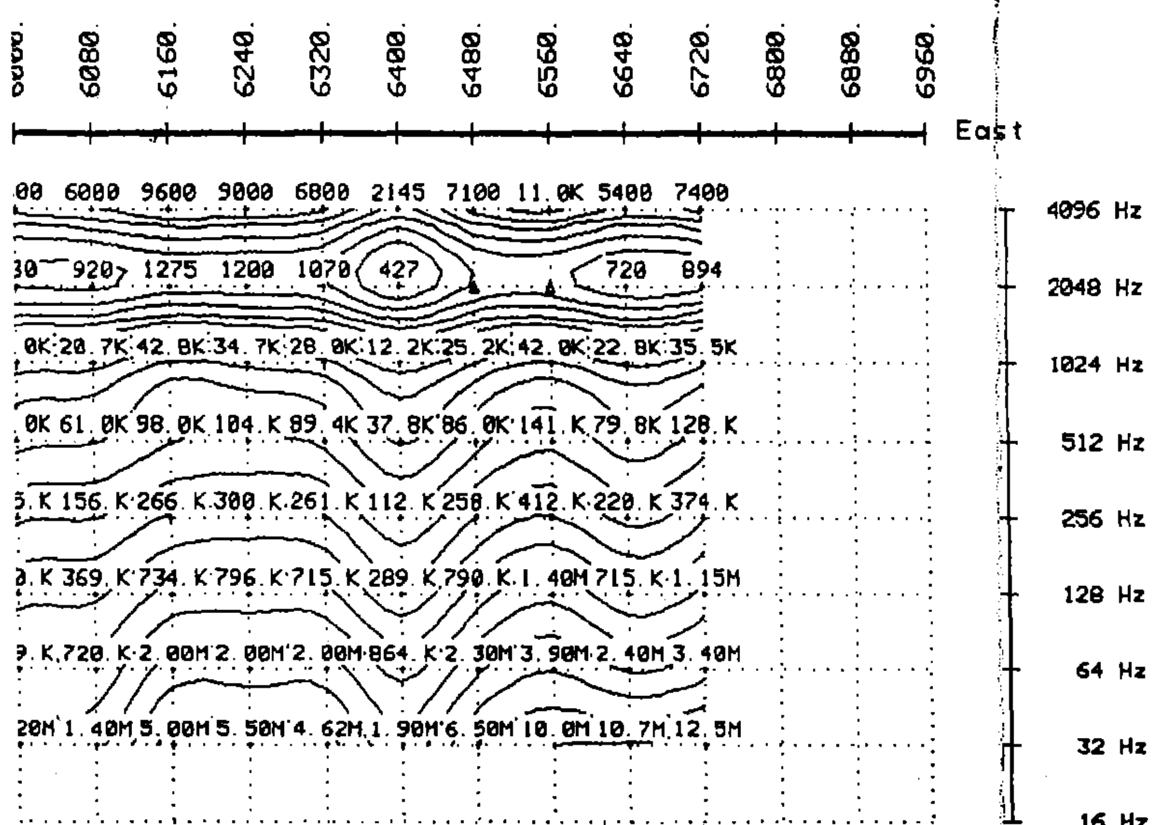
RECEIVER DATA
Length = 80.m Line = East
Spacing= 80.m DiPole= East

Surveyed= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

[12.5M]	158.K	1585
10.0M	100.K	1000
6.31M	63.1K	631
3.98M	39.8K	398
2.51M	25.1K	251
1.58M	15.8K	158
1.00M	10.0K	100
631.K	6310	63.1
398.K	3981	[47.0]
251.K	2512	



025034

Line 361200
MT SELINA
for
BILLITON AUSTRALIA

CSAMT SURVEY DATA
PHASE DIFFERENCE (E - H)

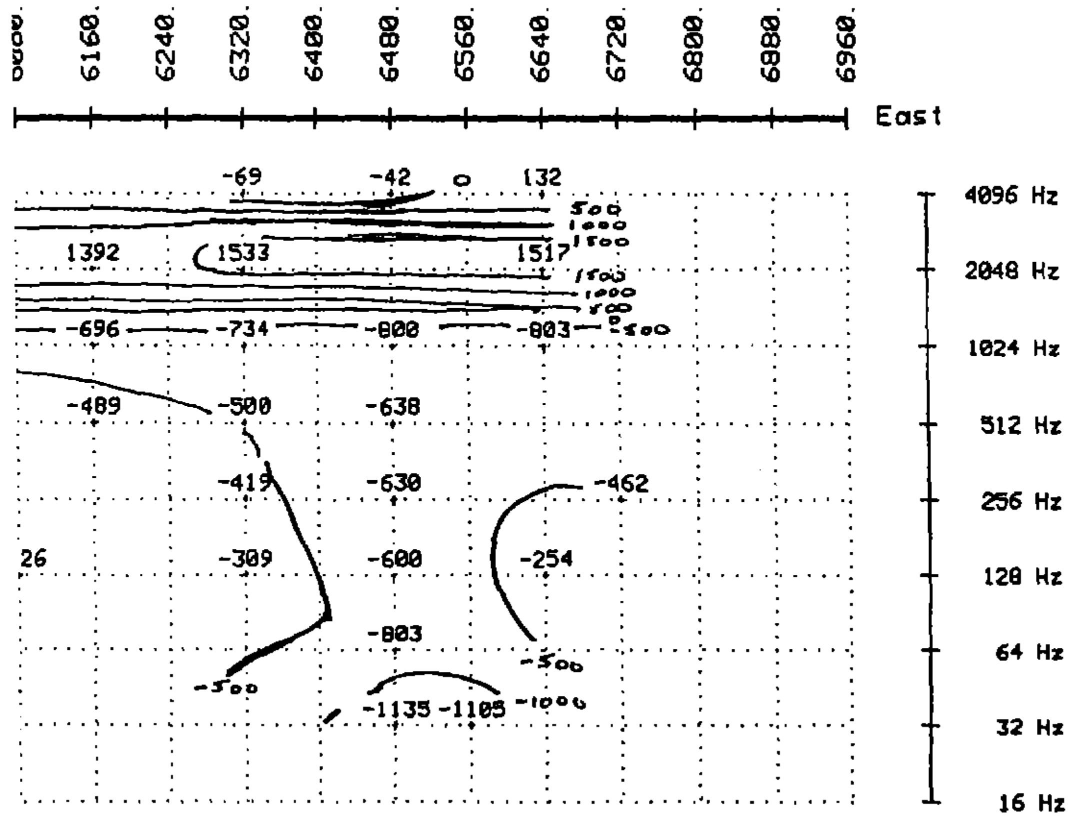
values in milli-radians
<PDIFF

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 13 Jan 89

RECEIVER DATA
Length = 80.m Line = East
Spacing= 80.m DiPole= East

Surveyed= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North



025035

Line 361600
MT SELINA
for
BILLITON AUSTRALIA

ZONGE Job 864
PLOT BY CPLOT 5.40
PLOTTED 12 Jan 89

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY

values in ohm-meters
<RHO-C

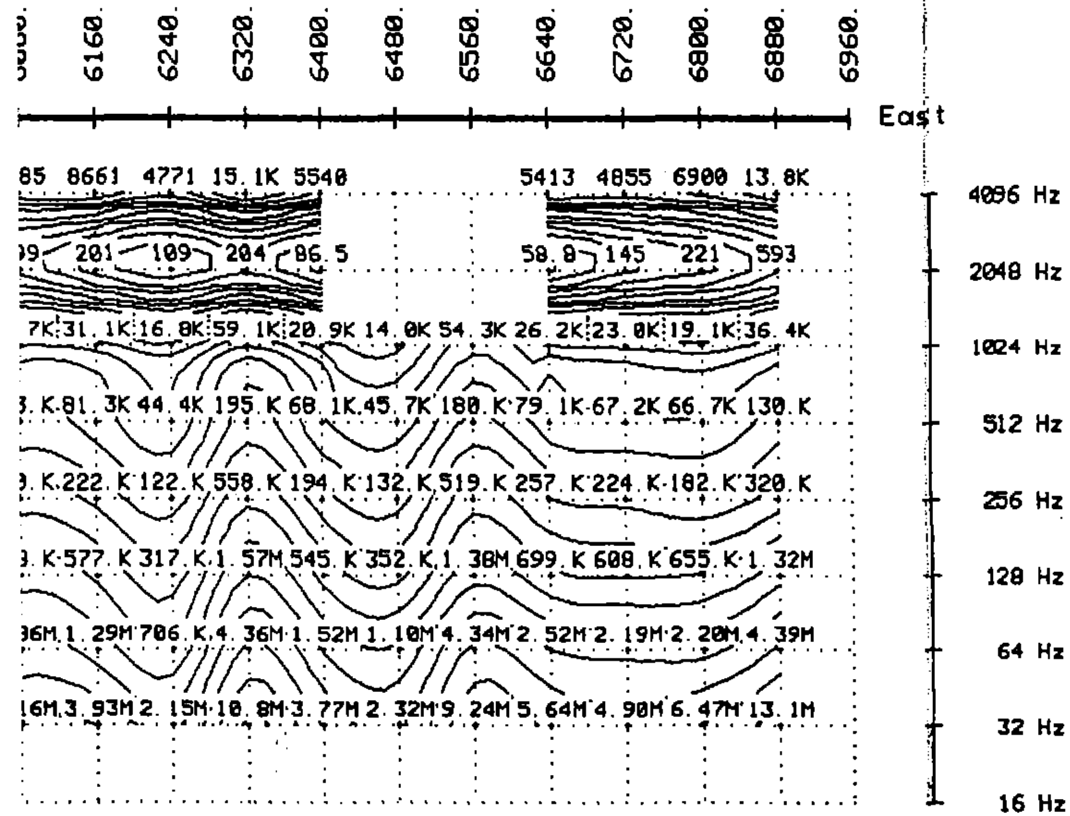
RECEIVER DATA
Length = 80.m Line = East
Spacing= 80.m DiPole= East

Surveyed= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

[13.1M]	158.K	1585
10.0M	100.K	1000
6.31M	63.1K	631
3.98M	39.8K	398
2.51M	25.1K	251
1.58M	15.8K	158
1.00M	10.0K	100
631.K	6310	63.1
398.K	3981	[58.7]
251.K	2512	



025036

Line 361600
MT SELINA
for
BILLITON AUSTRALIA

ONGE Job 864
LOT BY CPLOT 5.40
LOTTED 12 Jan 89

CSAMT SURVEY DATA
PHASE DIFFERENCE (E - H)

values in milli-radians
<PDIFF

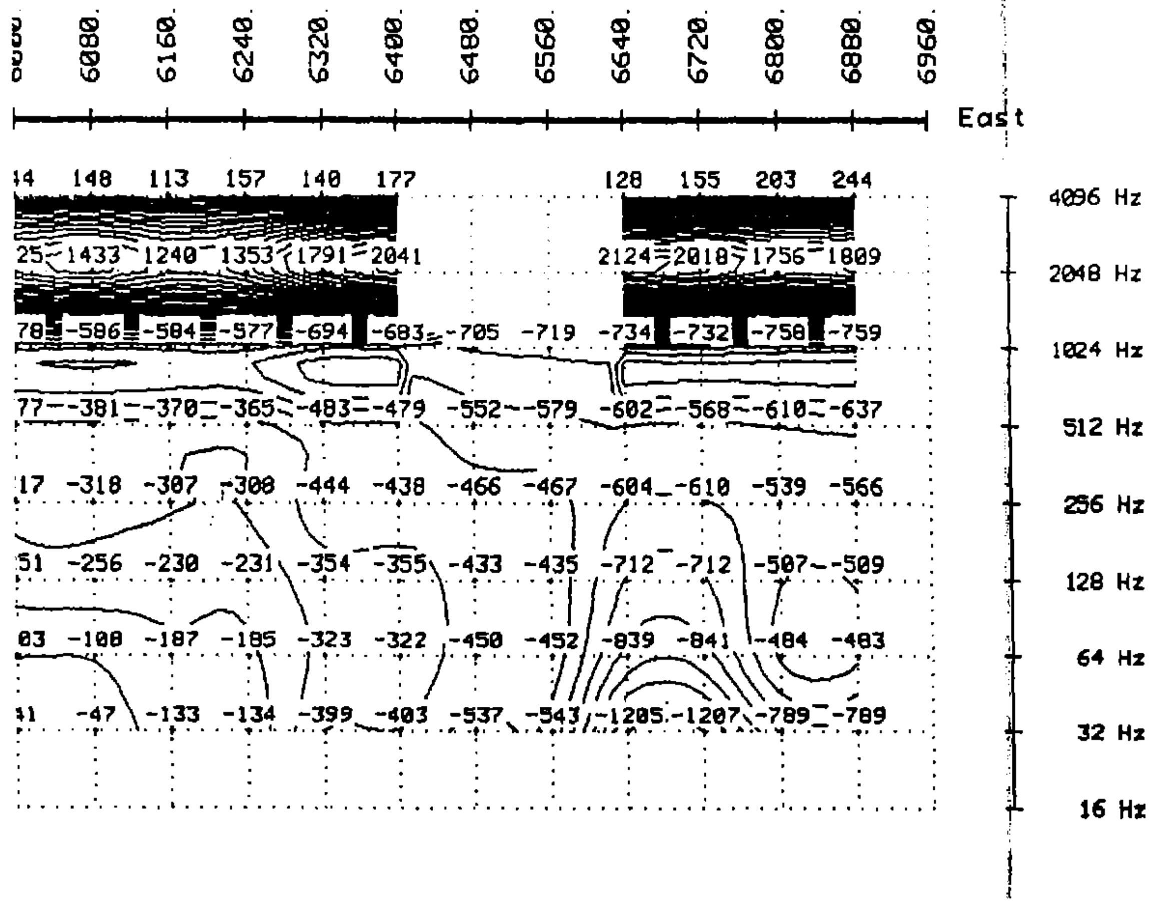
RECEIVER DATA
Length = 80.m Line = East
Spacing= 80.m DiPole= East

Surveyed= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

[Plot limits] and ARITHMETIC CONTOURS
(Interval: 100.00)

[2146]	1200	200	-800
2100	1100	100	-900
2000	1000	0.00	-1000
1900	900	-100	-1100
1800	800	-200	-1200
1700	700	-300	[-1205]
1600	600	-400	
1500	500	-500	
1400	400	-600	
1300	300	-700	



025037

Line 362000
MT SELINA
for
BILLITON AUSTRALIA

GE Job 864
T BY CPLOT 5.40
TTED 13 Jan 89

CSAMT SURVEY DATA
CAGNIARD RESISTIVITY

values in ohm-meters
<RHO-C

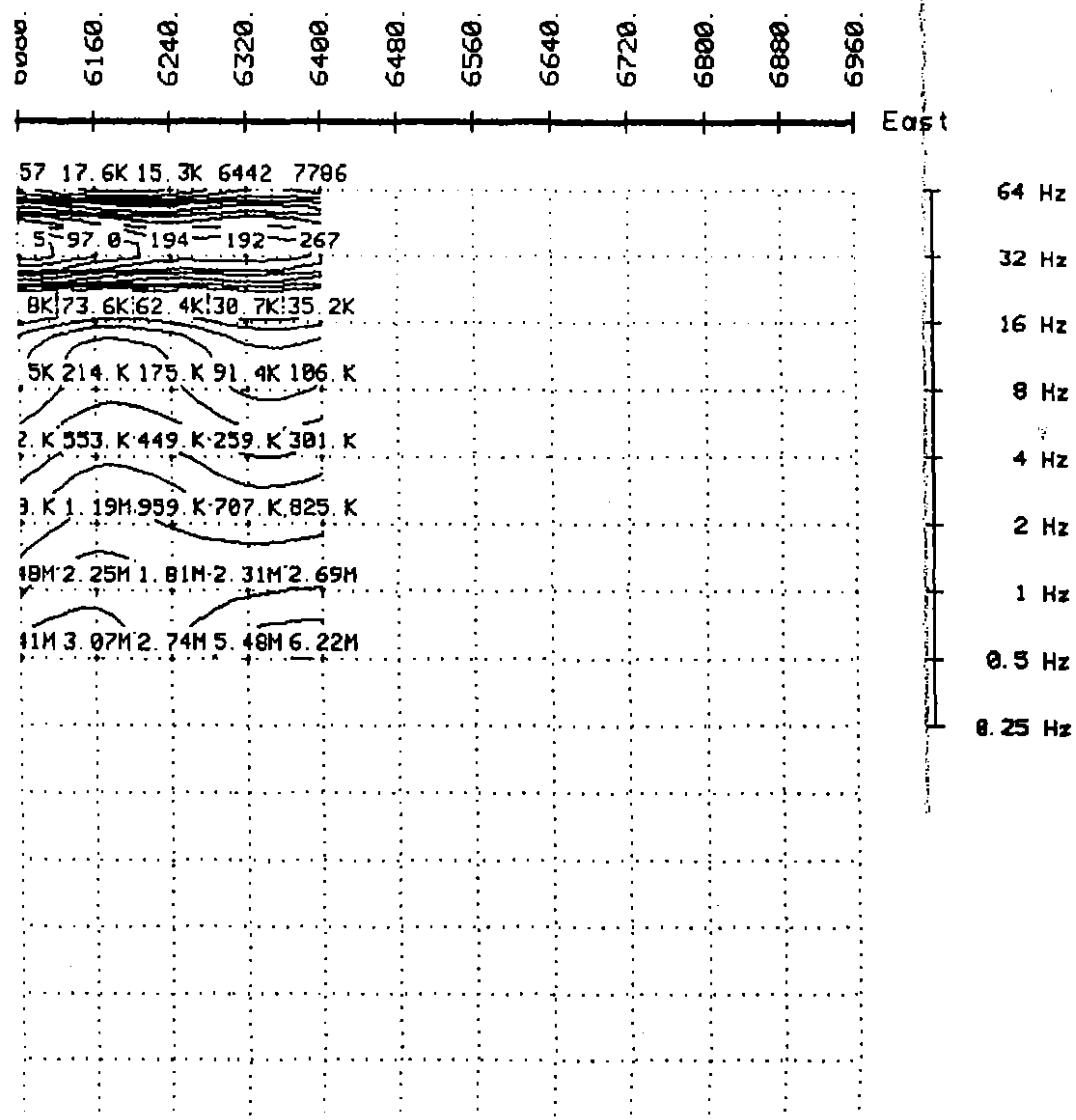
RECEIVER DATA
Length = 80.m Line = East
Spacing= 80.m DiPole= East

Surveyed= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

[6.32M]	100.K	1000
6.31M	63.1K	631
3.98M	39.8K	398
2.51M	25.1K	251
1.58M	15.8K	158
1.00M	10.0K	100
631.K	6310	63.1
398.K	3981	[53.6]
251.K	2512	
158.K	1585	



025038

Line 362000
MT SELINA
for
BILLITON AUSTRALIA

GE Job 864
T BY CPLOT 5.40
TTED 13 Jan 89

CSAMT SURVEY DATA
PHASE DIFFERENCE (E - H)

values in milli-radians
<PDIFF

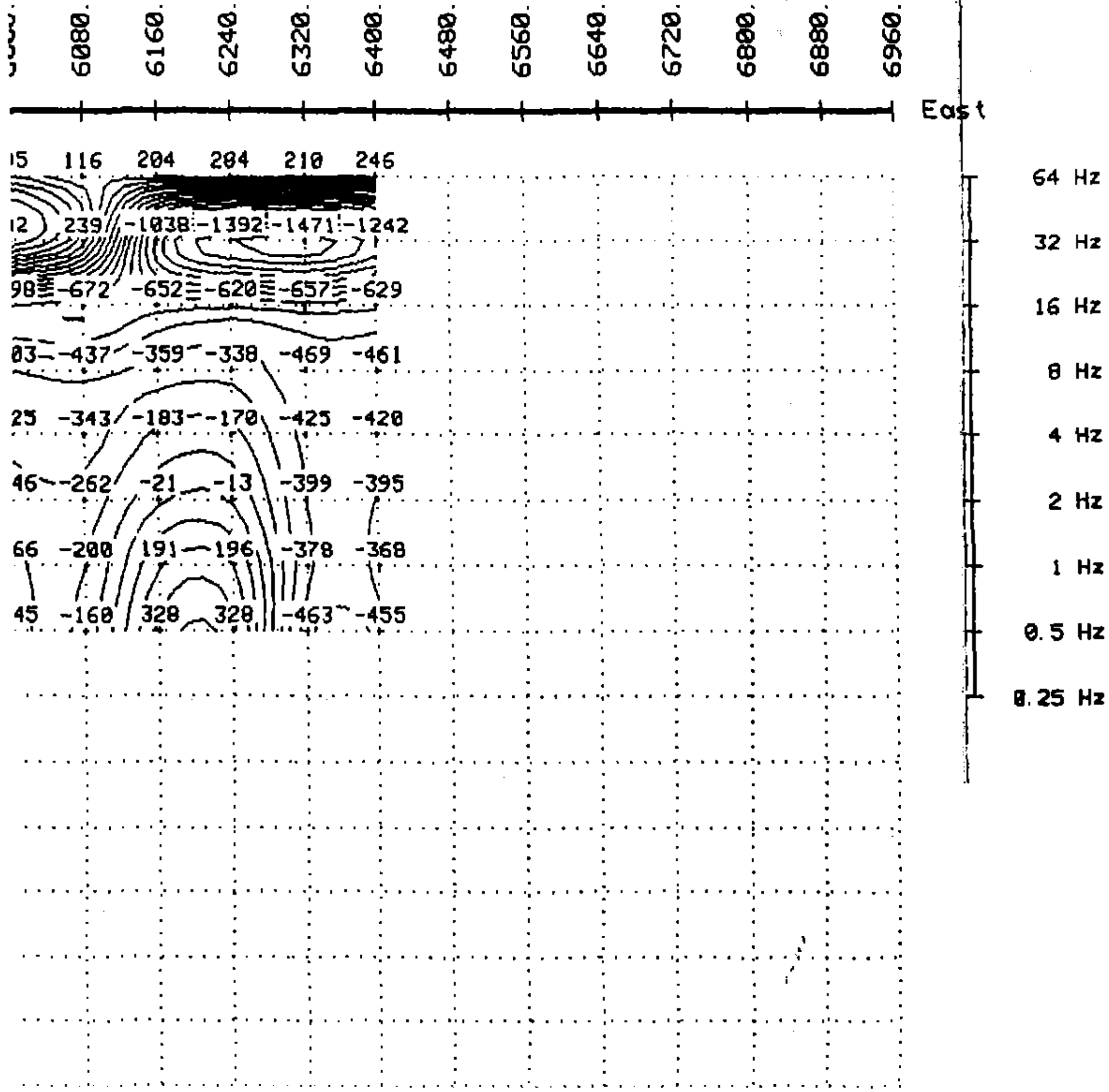
RECEIVER DATA
Length = 80.m Line = East
SPacing= 80.m DiPole= East

SurveYed= DEC 88

TRANSMITTER DATA
Length = 1500M
Orient. = East
Distance= 7KM
Rx to Tx= North

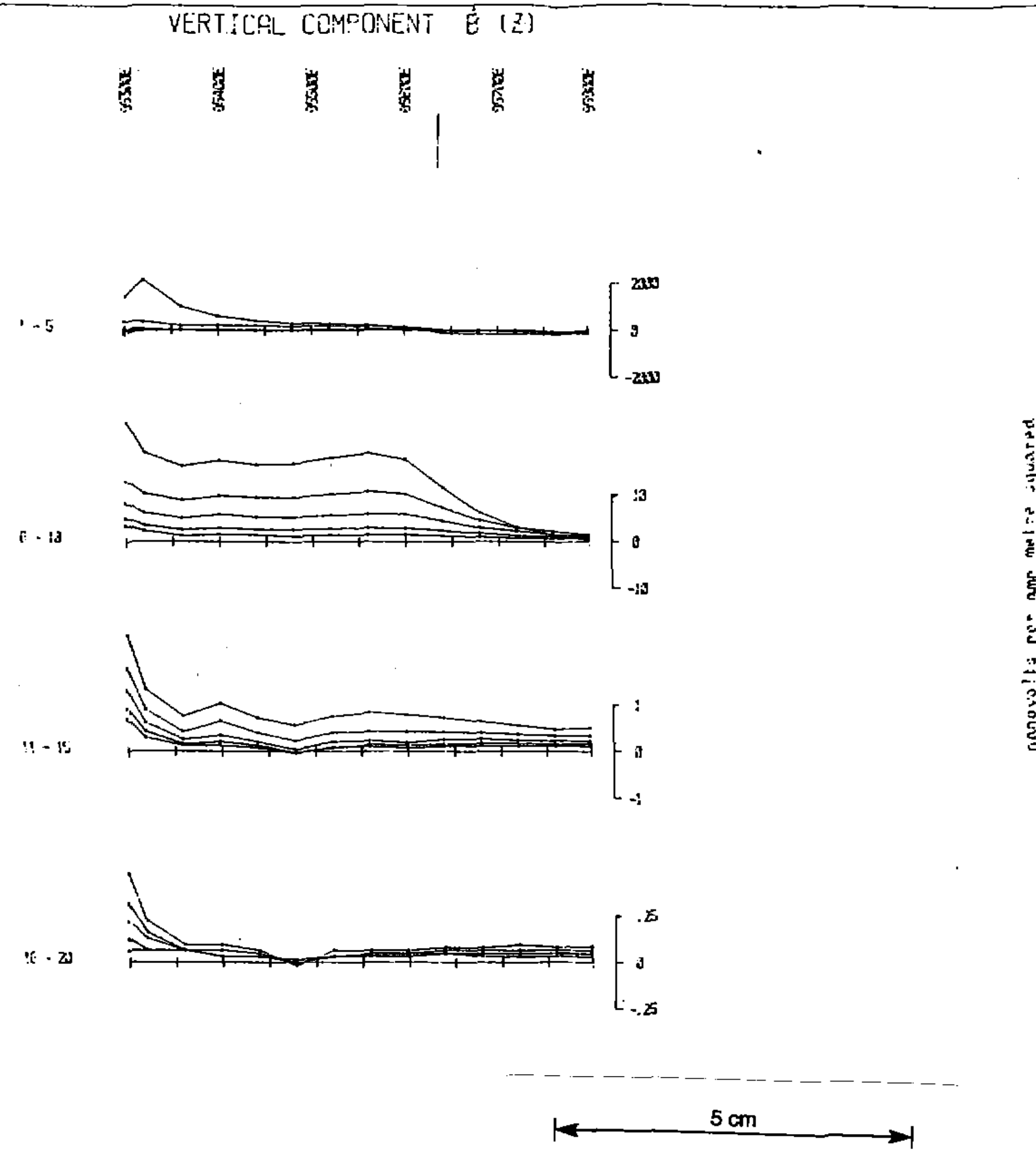
[Plot limits] and ARITHMETIC CONTOURS
(Interval: 100 00)

[1435]	500	-500	[-1473]
1400	400	-600	
1300	300	-700	
1200	200	-800	
1100	100	-900	
1000	0.00	-1000	
900	-100	-1100	
800	-200	-1200	
700	-300	-1300	
600	-400	-1400	



025039

APPENDIX II



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

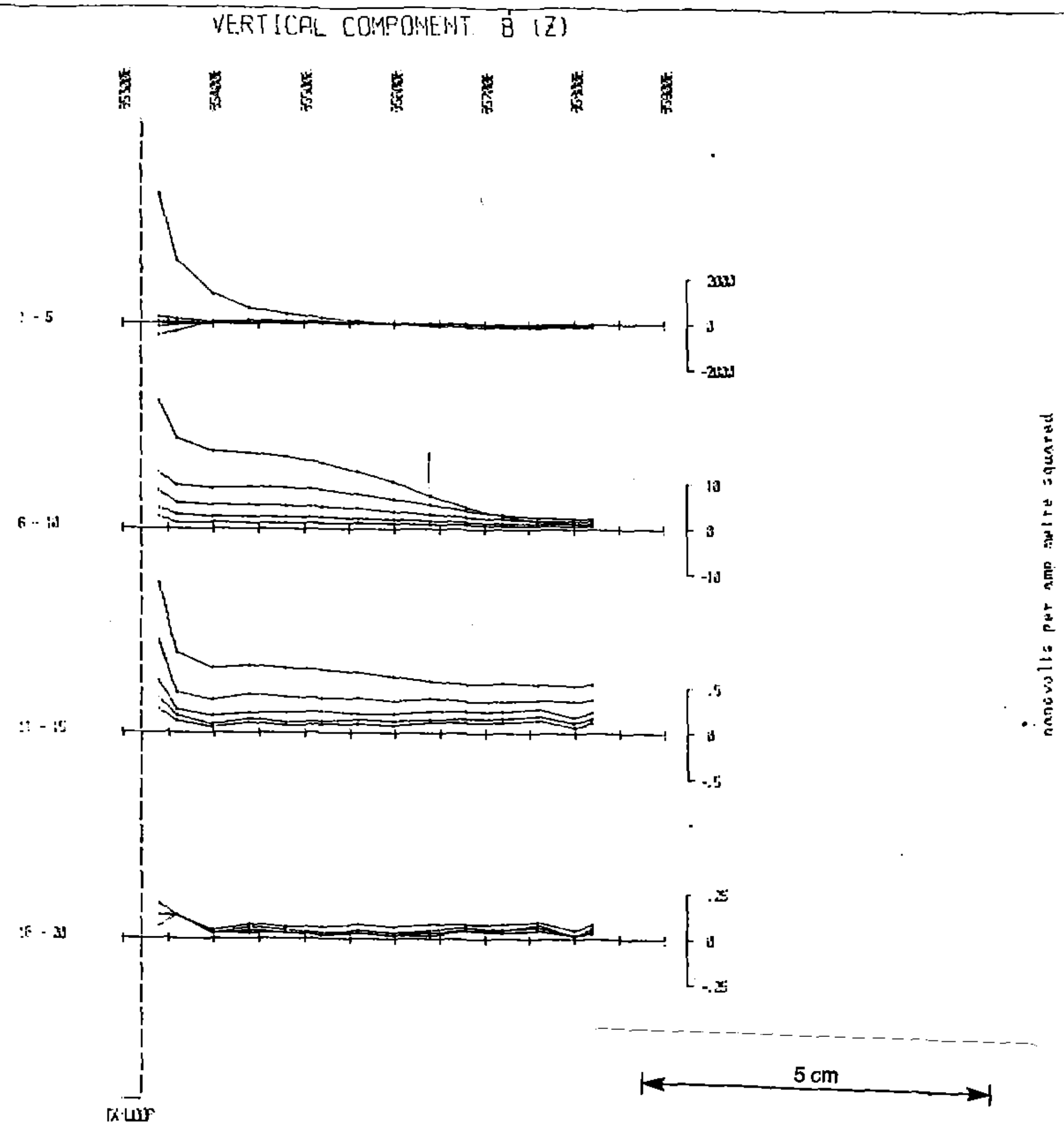
TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	: 5790N 95000E
	: 5920N 95240E
TX LOOP SIZE	: 1400m X 300 m
TX TURN OFF TIME	: 293 microsecs.
FIRST GATE TIME	. 93.5 microsecs.
CURRENT	. 9.58 amps
FREQUENCY	: 25 Hz.
INTEGRATION TIME	: 1024 cycles
SYNC MODE	: CRYSTAL
HORIZONTAL SCALE	: 1:5000
SURVEYED BY	: SMBG
DATE	: 10/03/1999

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT NO. A-120

CLIENT.	: BILLITON AUSTRALIA
PROJECT.	. LAKE SELINA
AREA.	: ROSEBERY
LINE.	: 5900N 2
TX LOOP	4

025041



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

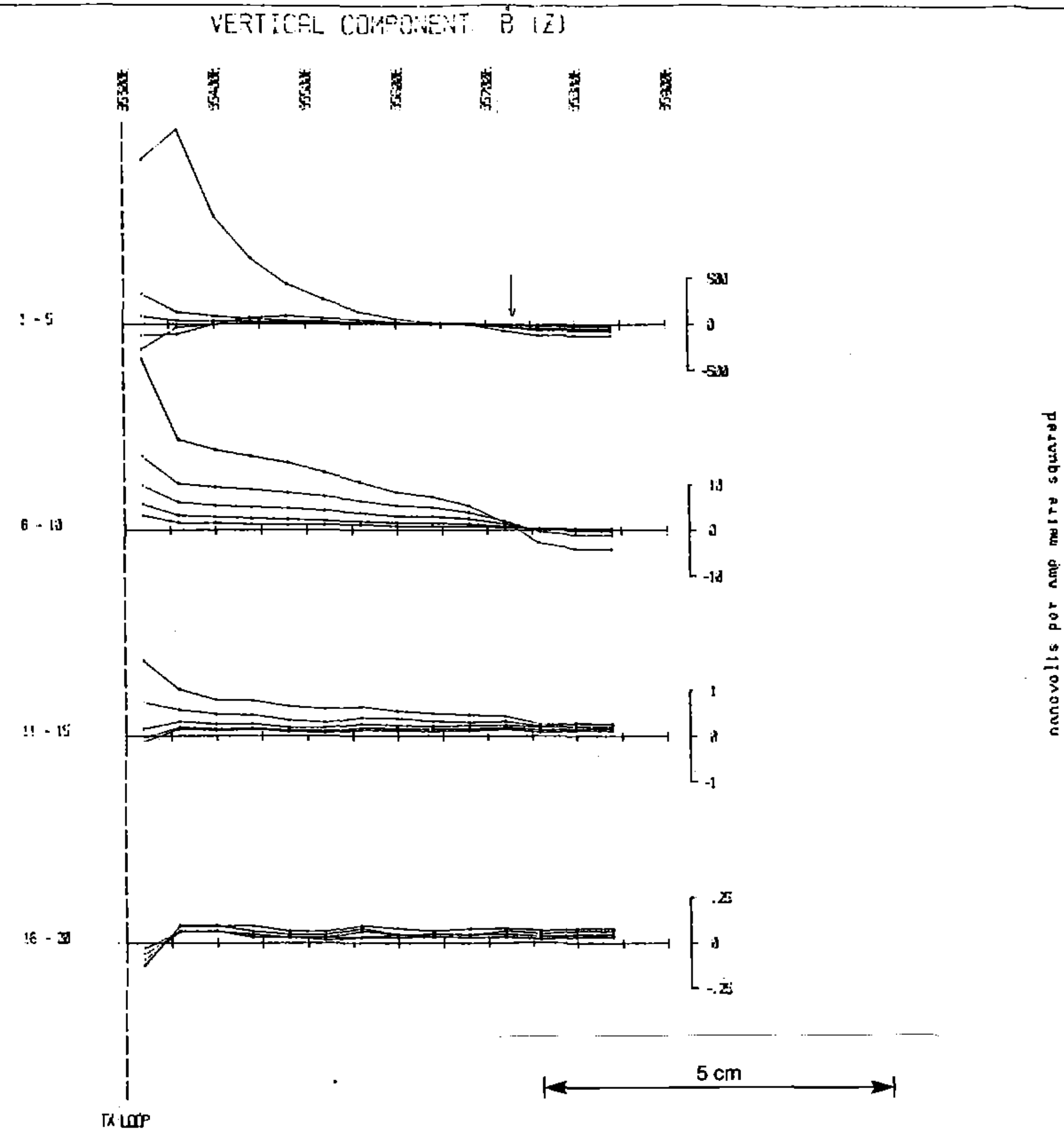
TIME DERIVATIVE OF FLUX DENSITY (Ḃ)

TX LOOP SIDES	:	57900N 95000E
	:	59200N 95300E
TX LOOP SIZE	:	1300m X 300 m
TX TURN OFF TIME	:	293 microsecs.
FIRST GATE TIME	:	93.5 microsecs.
CURRENT	:	9.58 amps
FREQUENCY	:	25 Hz.
INTEGRATION TIME	:	1024 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	SMEG
DATE	:	16/03/1999

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 2-109

CLIENT.	:	BILLITON AUSTRALIA
PROJECT.	:	LAKE SELINA
AREA.	:	ROSEBERY
LINE.	:	59200N Z
TX-LOOP	:	4

025042



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

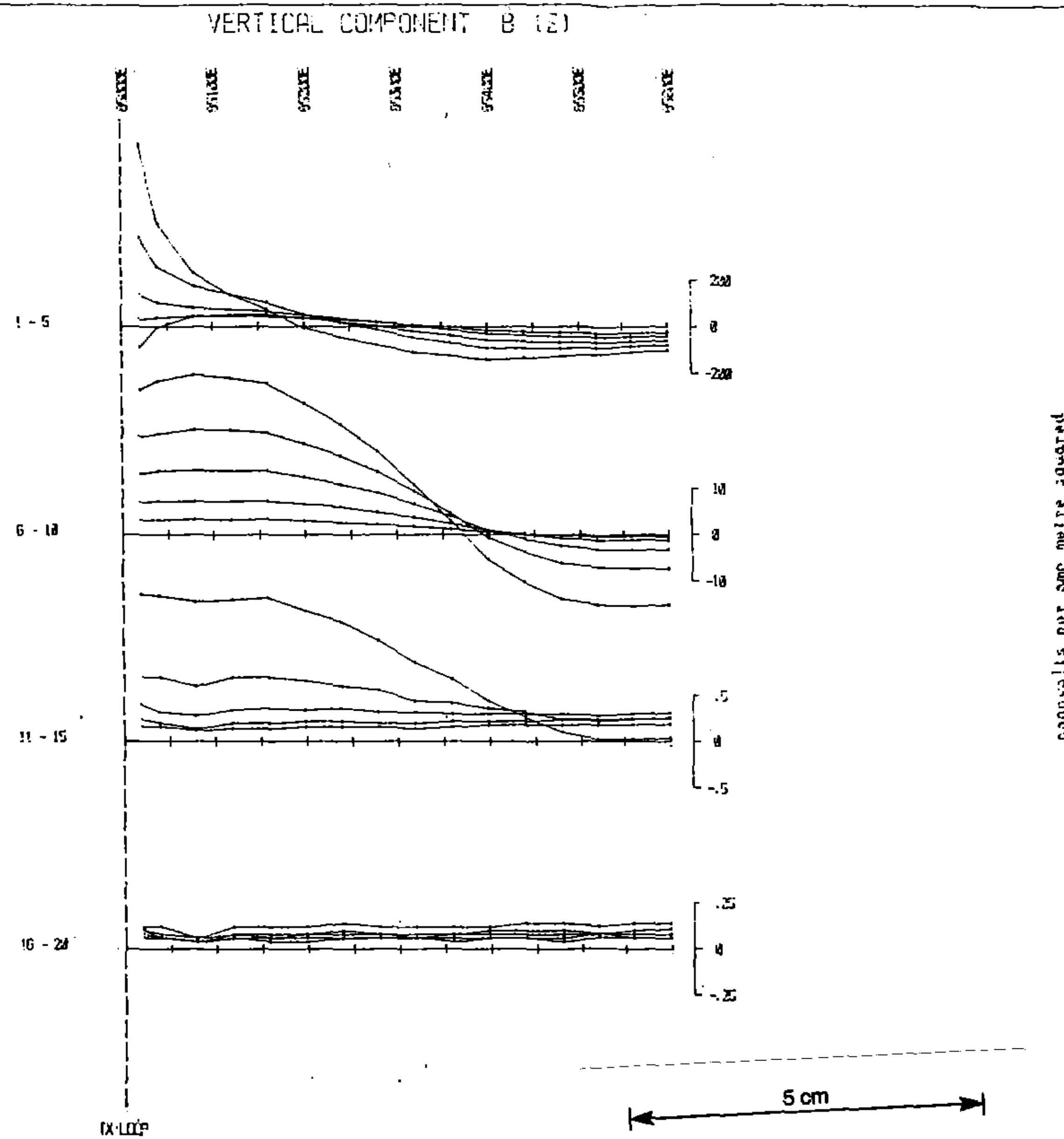
TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	: 57300N 95000E
	: 59200N 95300E
TX LOOP SIZE	: 1400m X 300 m
TX TURN OFF TIME	: 293 microsecs.
FIRST GATE TIME	: 93.5 microsecs.
CURRENT	: 9.50 amps
FREQUENCY	: 25 Hz.
INTEGRATION TIME	: 1024 cycles
SYNC MODE	: CRYSTAL
HORIZONTAL SCALE	: 1:5000
SURVEYED BY	: SMBG
DATE	: 16/03/1990

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.

PROJECT NO. 4-109

CLIENT.	: BILLITON AUSTRALIA
PROJECT.	: LAKE SELINA
AREA.	: ROSEBERY
LINE.	: 58400N Z
TX LOOP	: 4



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

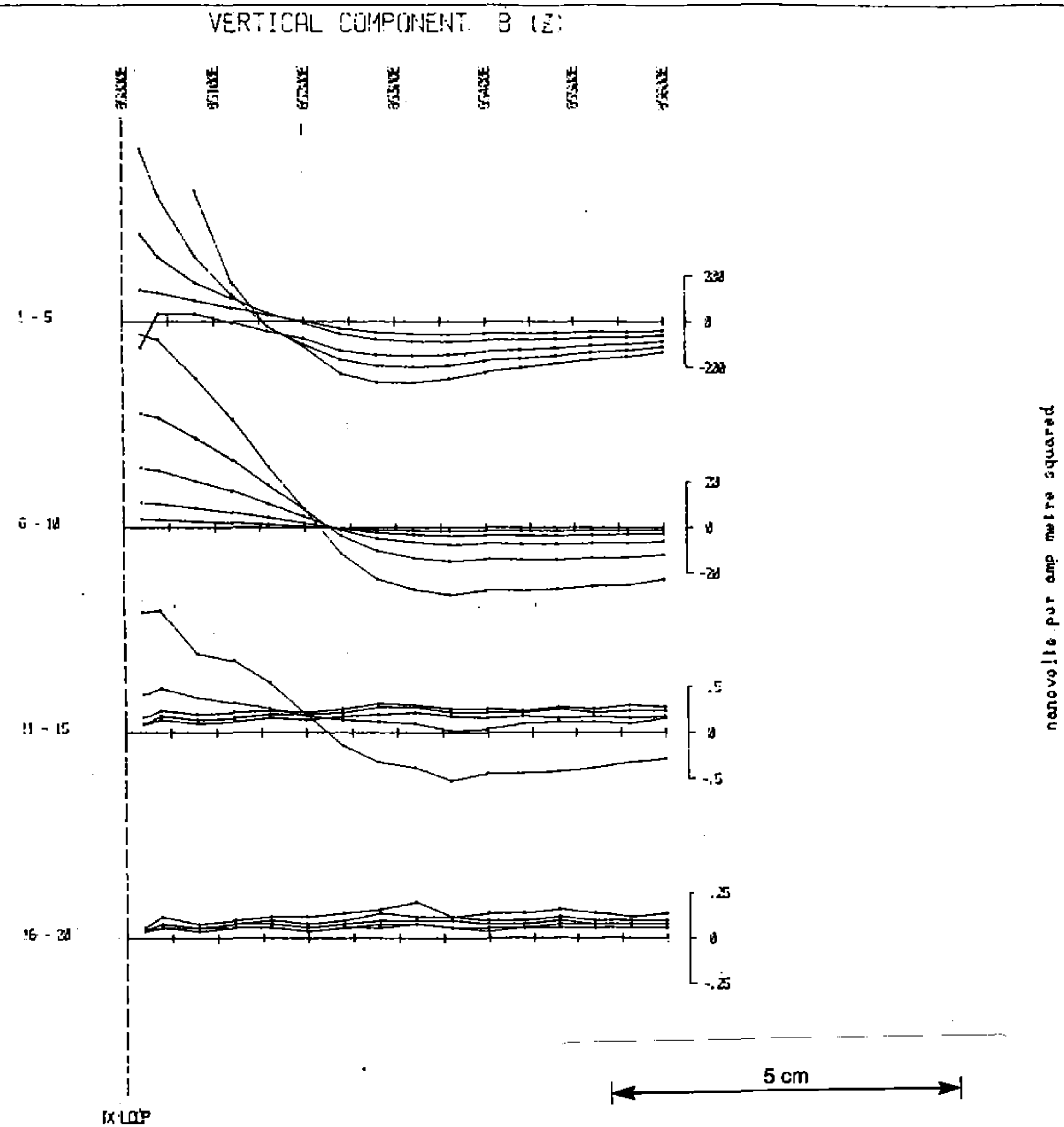
TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	: 59200N	94400E
	: 60900N	95000E
TX LOOP SIZE	: 1000m X 600 m	
TX TURN OFF TIME	: 312 microsecs.	
FIRST GATE TIME	: 93.5 microsecs.	
CURRENT	: 2.50 Amps	
FREQUENCY	: 25 Hz.	
INTEGRATION TIME	: 1024 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: SMBG	
DATE	: 09/03/1999	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. — PROJECT NO. 3-109

CLIENT.	: BILLITON AUSTRALIA.
PROJECT.	: LAKE SELINA
AREA.	: ROSEBERRY
LINE.	: 59200N Z
TX LOOP	: 1

025044



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

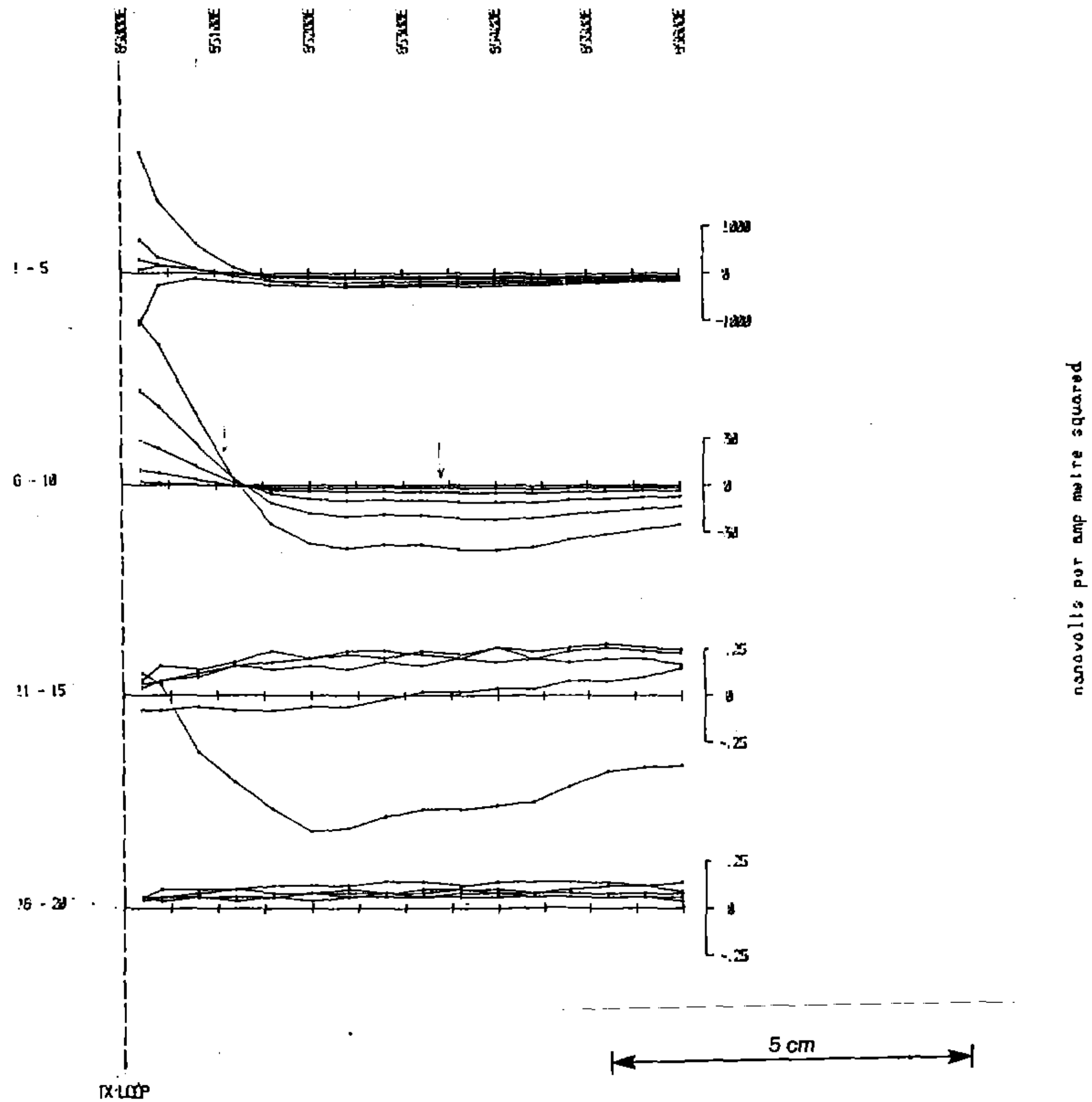
TX LOOP SIDES	: 59200N	84400E
	: 60900N	85800E
TX LOOP SIZE	: 1000m X 600 m	
TX TURN OFF TIME	: 312 microsecs.	
FIRST GATE TIME	: 89.5 microsecs.	
CURRENT	: 7.50 amps	
FREQUENCY	: 25 Hz.	
INTEGRATION TIME	: 1024 cycles	
SYNC MODE.	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: SMBG	
DATE.	: 29/03/1999	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 4-189

CLIENT.	: BILLITON AUSTRALIA.
PROJECT.	: LAKE SELINA
AREA.	: ROSEBERRY
LINE.	: 59000N Z
TX LOOP	: 1

0250045

VERTICAL COMPONENT B (Z)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

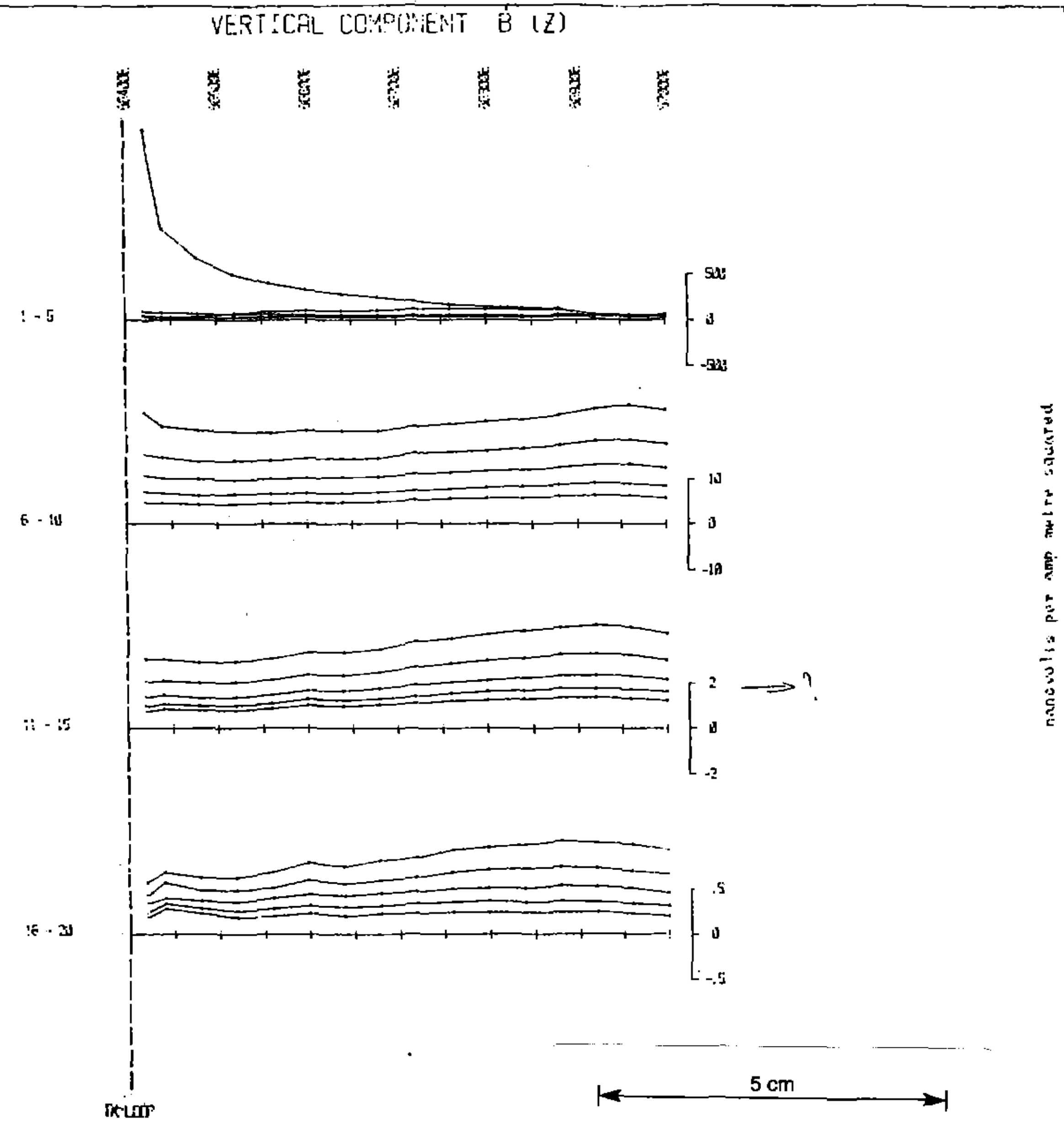
TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	:	59220N 84400E
	:	60300N 85000E
TX LOOP SIZE	:	1000m X 600 m
TX TURN OFF TIME	:	312 microsecs.
FIRST GATE TIME	:	89.5 microsecs.
CURRENT	:	7.50 amps
FREQUENCY	:	25 Hz.
INTEGRATION TIME	:	1024 cycles
SYNC MODE	:	CRYSTAL
HORIZONTAL SCALE	:	1:5000
SURVEYED BY	:	SMBG
DATE	:	09/03/1989

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 4-100

CLIENT	:	BILLITON AUSTRALIA.
PROJECT	:	LAKE SELINA
AREA	:	ROSEBERRY
LINE	:	0R000N Z
TX LOOP	:	1

025046



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

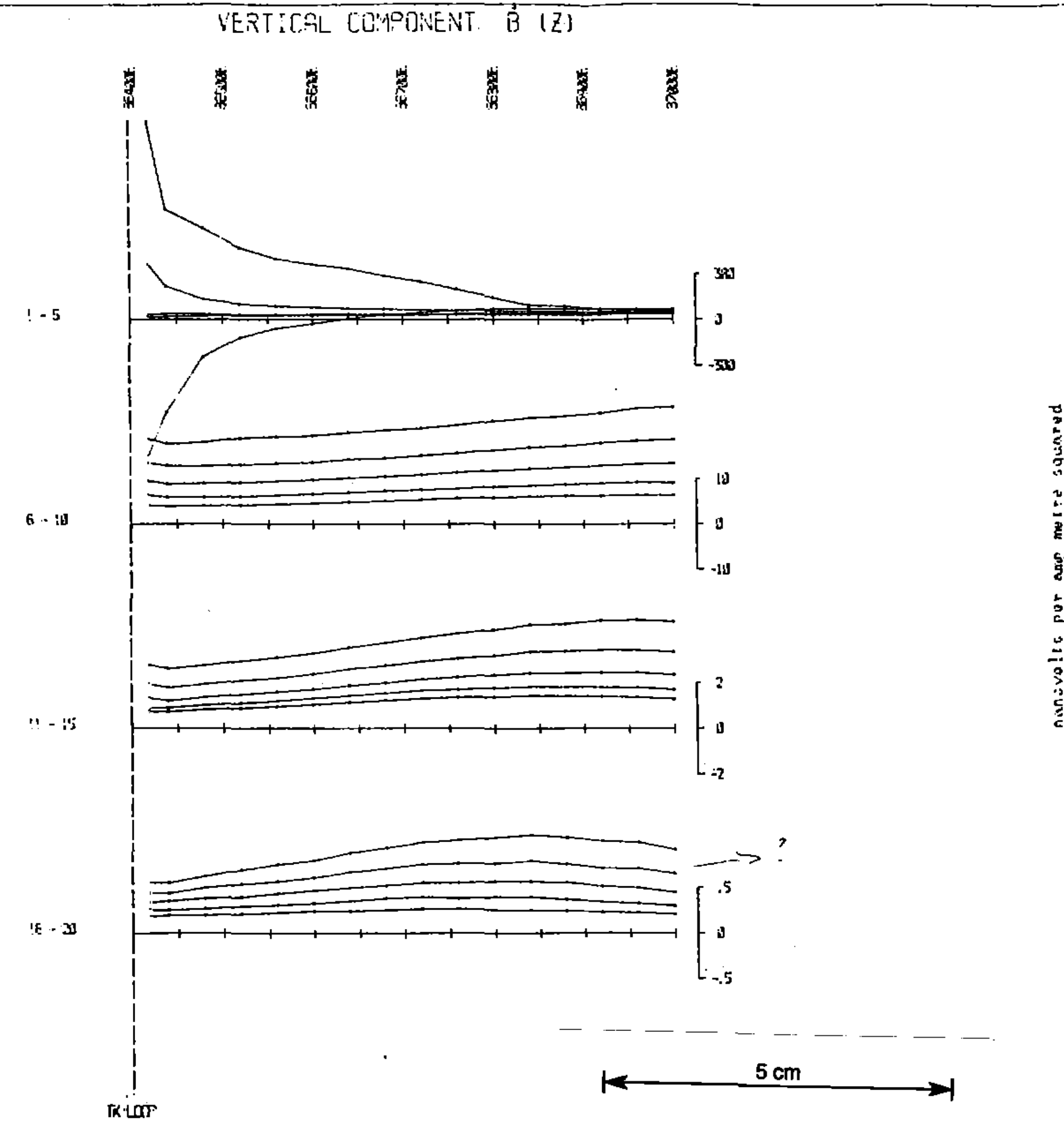
TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	: 61200N 95600E
	: 62000N 96400E
TX LOOP SIZE	: 800 m X 800 m
TX TURN OFF TIME	: 300 microsecs.
FIRST GATE TIME	: 93.5 microsecs.
CURRENT	: 10.6 amps
FREQUENCY	: 25 Hz.
INTEGRATION TIME	: 1024 cycles
SYNC MODE	: CRYSTAL
HORIZONTAL SCALE	: 1:5000
SURVEYED BY	: SMPF
DATE	: 05/03/1999

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT NO. 4-109

CLIENT.	. BILLITON AUSTRALIA.
PROJECT.	. LAKE SELINA
AREA	. ROSEBERRY
LINE.	: 61200N Z
TX LOOP	. 3

025047



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (Ḃ)

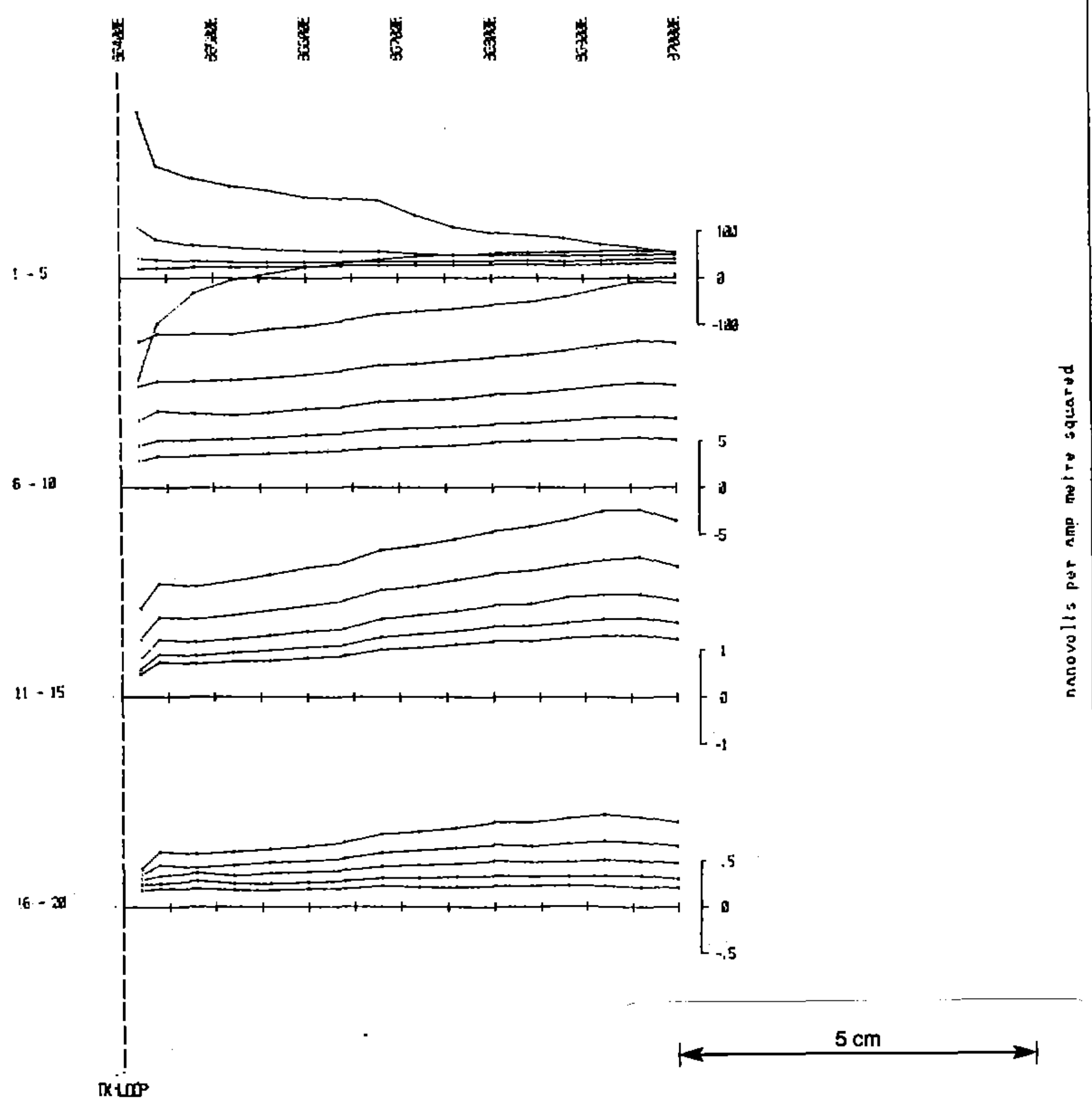
TX LOOP SIDES	: 61200N 95500E
	: 62000N 96400E
TX LOOP SIZE	: 900 m X 900 m
TX TURN OFF TIME	: 500 microsecs.
FIRST GATE TIME	: 99.5 microsecs.
CURRENT	: 10.6 amps
FREQUENCY	: 25 Hz.
INTEGRATION TIME	: 1024 cycles
SYNC MODE	: CRYSTAL
HORIZONTAL SCALE	: 1:5000
SURVEYED BY	: SMFF
DATE	: 05/03/1990

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD. | PROJECT NO. 4-123

CLIENT.	: BILLITON AUSTRALIA.
PROJECT.	: LAKE SELINA
AREA	: ROSEBERRY
LINE.	: 61600N 2
TX LOOP	: 3

025048

VERTICAL COMPONENT $\dot{B}$ (Z)



EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

TX LOOP SIDES	: 61200N	95600E
	: 62000N	96400E
TX LOOP SIZE	: 900 m X 900 m	
TX TURN OFF TIME	: 300 microsecs.	
FIRST GATE TIME	: 99.5 microsecs.	
CURRENT	. 10.6 amps	
FREQUENCY	: 25 Hz.	
INTEGRATION TIME	: 1024 cycles	
SYNC MODE	: CRYSTAL	
HORIZONTAL SCALE	: 1:5000	
SURVEYED BY	: SHFF	
DATE	: 05/03/1999	

SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT. NO. 4-109

CLIENT.	: BILLITON AUSTRALIA.
PROJECT.	: LAKE SELINA
AREA.	. ROSEBERRY
LINE.	: 62000N Z
TX LOOP	: 3

025049

APPENDIX III

025051

FINAL REPORT

CSAMT SURVEY
BASIN LAKE PROSPECT
for
Billiton Australia

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

DEVONPORT COPY

Executive Summary

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

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

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

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

Project Logistics

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

Geology

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

Data Presentation

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

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

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

The other information is provided as figures:

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

Data Quality

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

Data Interpretation

Near-Field Effects

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

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

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

Surface Anisotropy Effects

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

Cultural Contamination

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

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

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

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

Topographic Effects

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

Line-by-Line Interpretation

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

There are no other conductors evident on this line.

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

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

Conclusions

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

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

References

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

Scott MacInnes Geophysicist

Norm Carlson Geophysicist

CSAMT Smooth-model Inversion

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

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

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

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

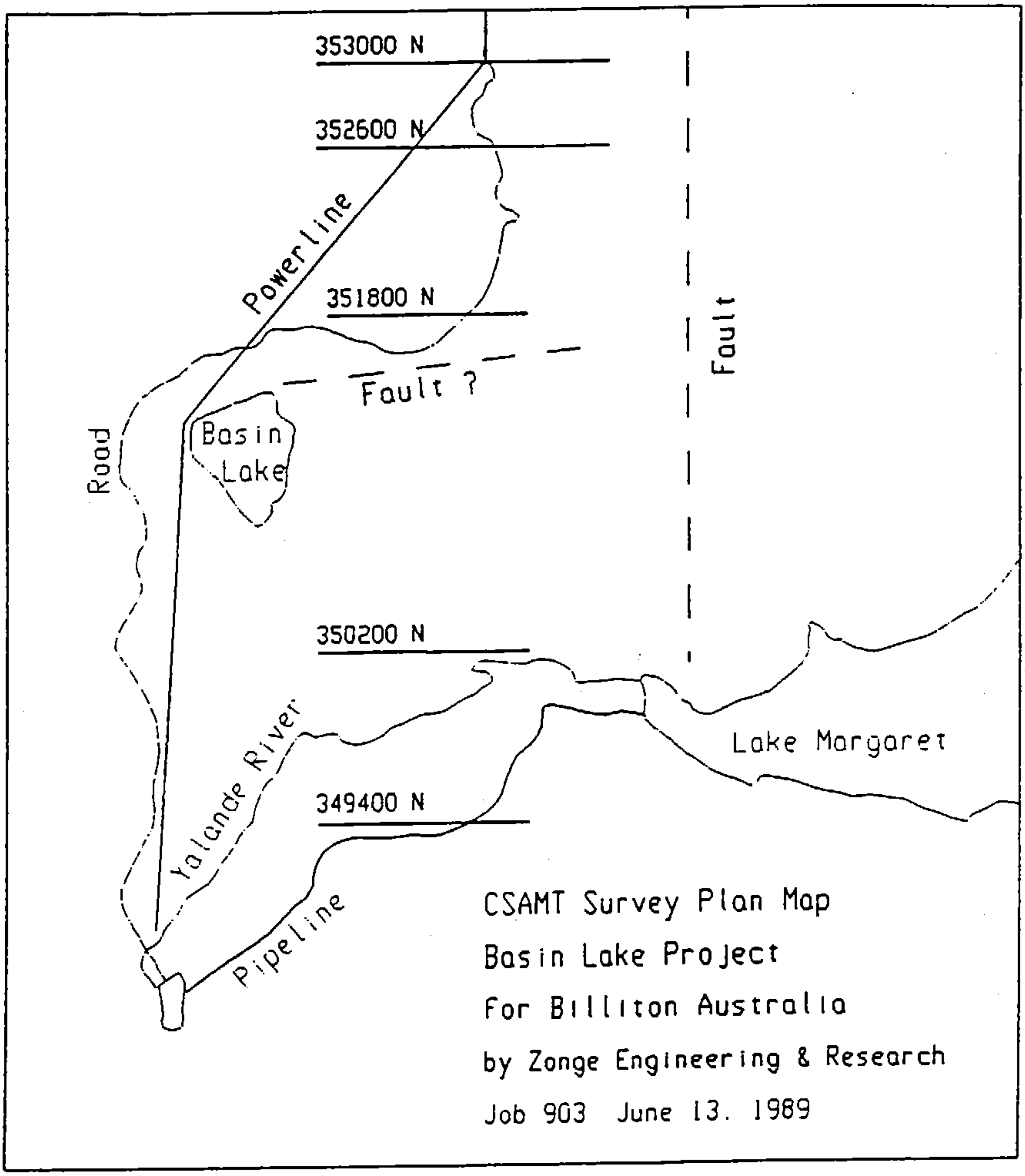


Figure 1: CSAMT line location map.

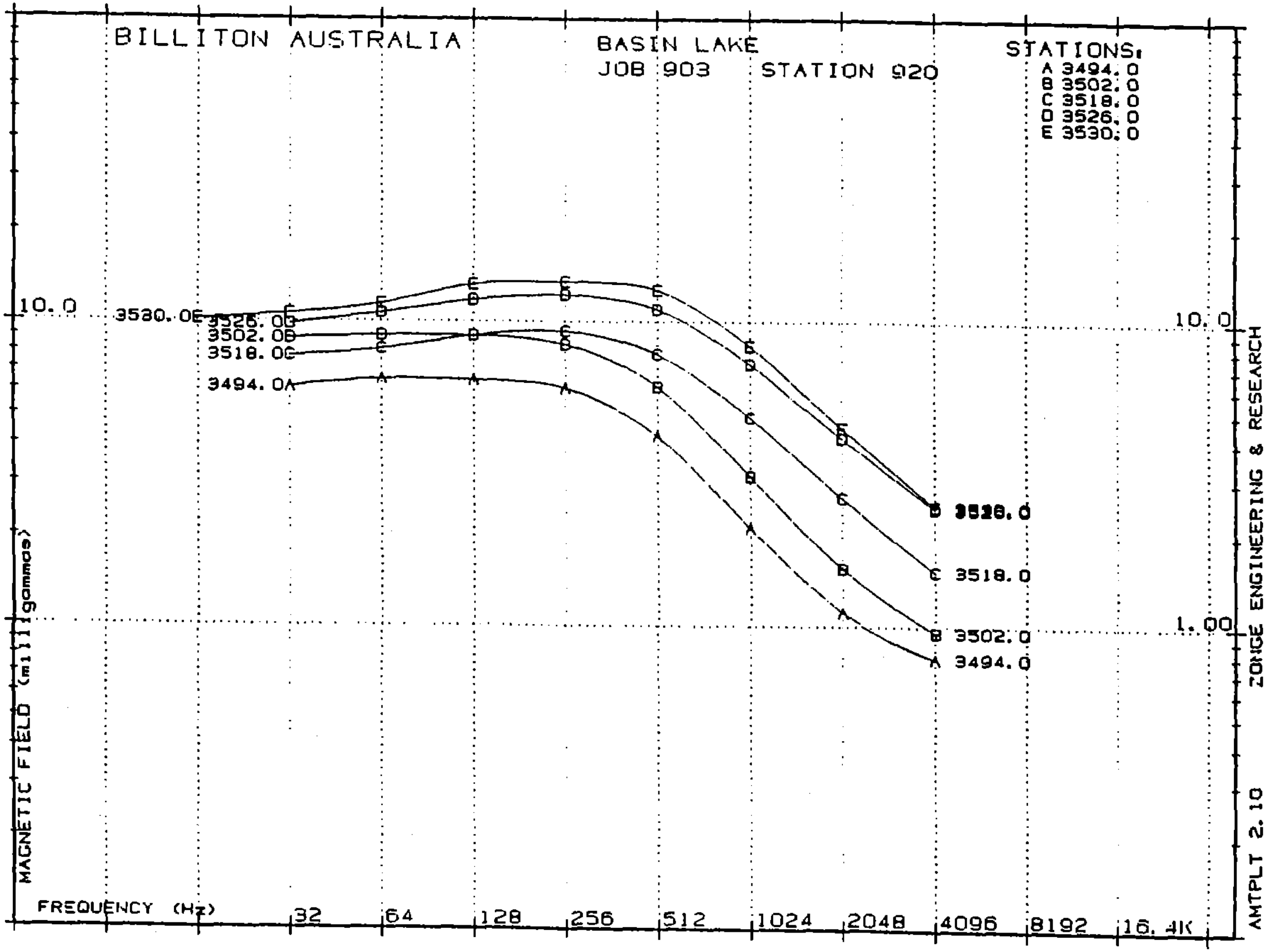


Figure 2: Log-log plot of magnetic-field amplitude versus frequency.

025060

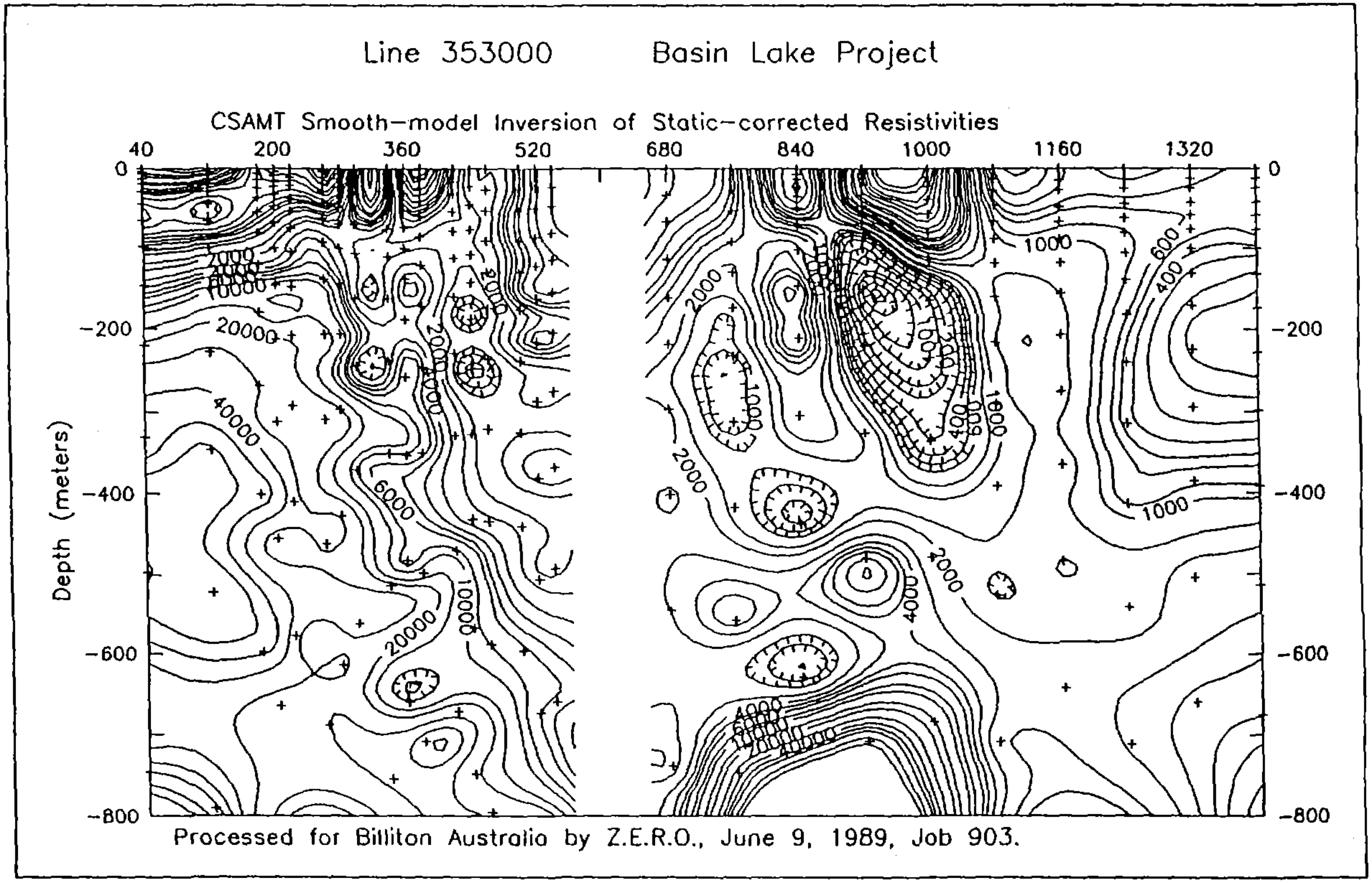


Figure 3: Smooth-model inversion for line 353000N.

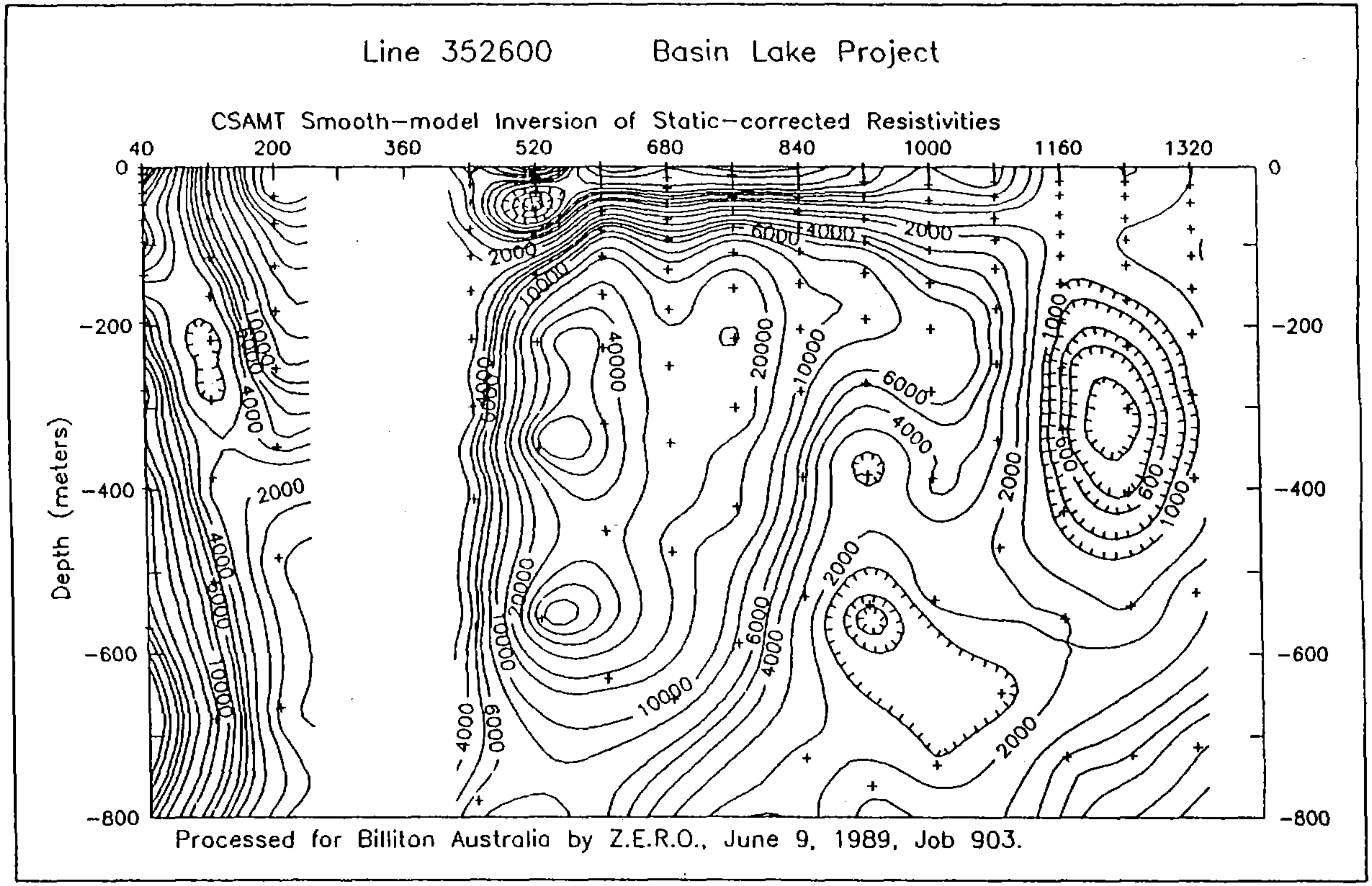


Figure 4: Smooth-model inversion for line 352600N.

025062

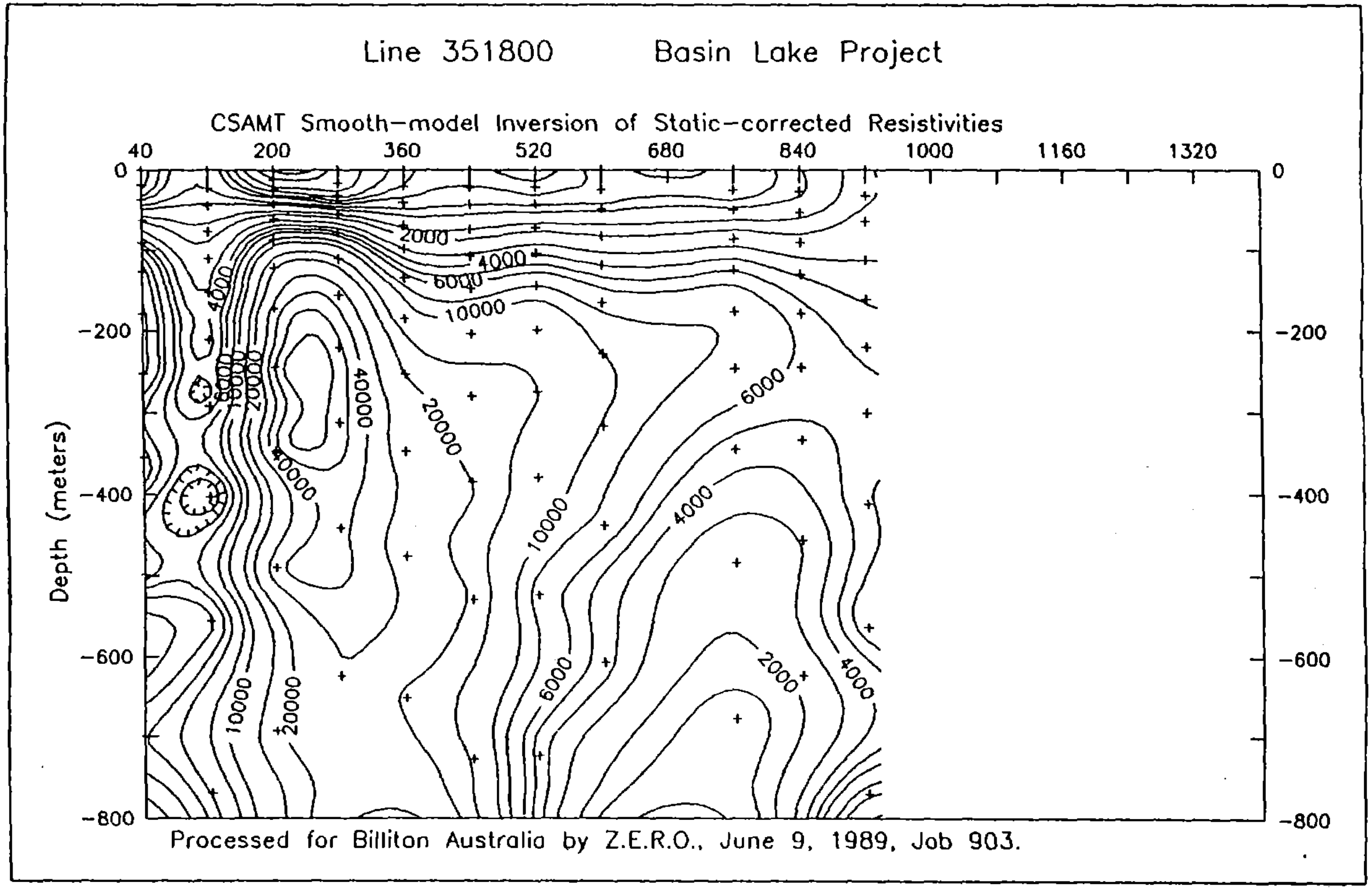


Figure 5: Smooth-model inversion for line 351800N.

025063

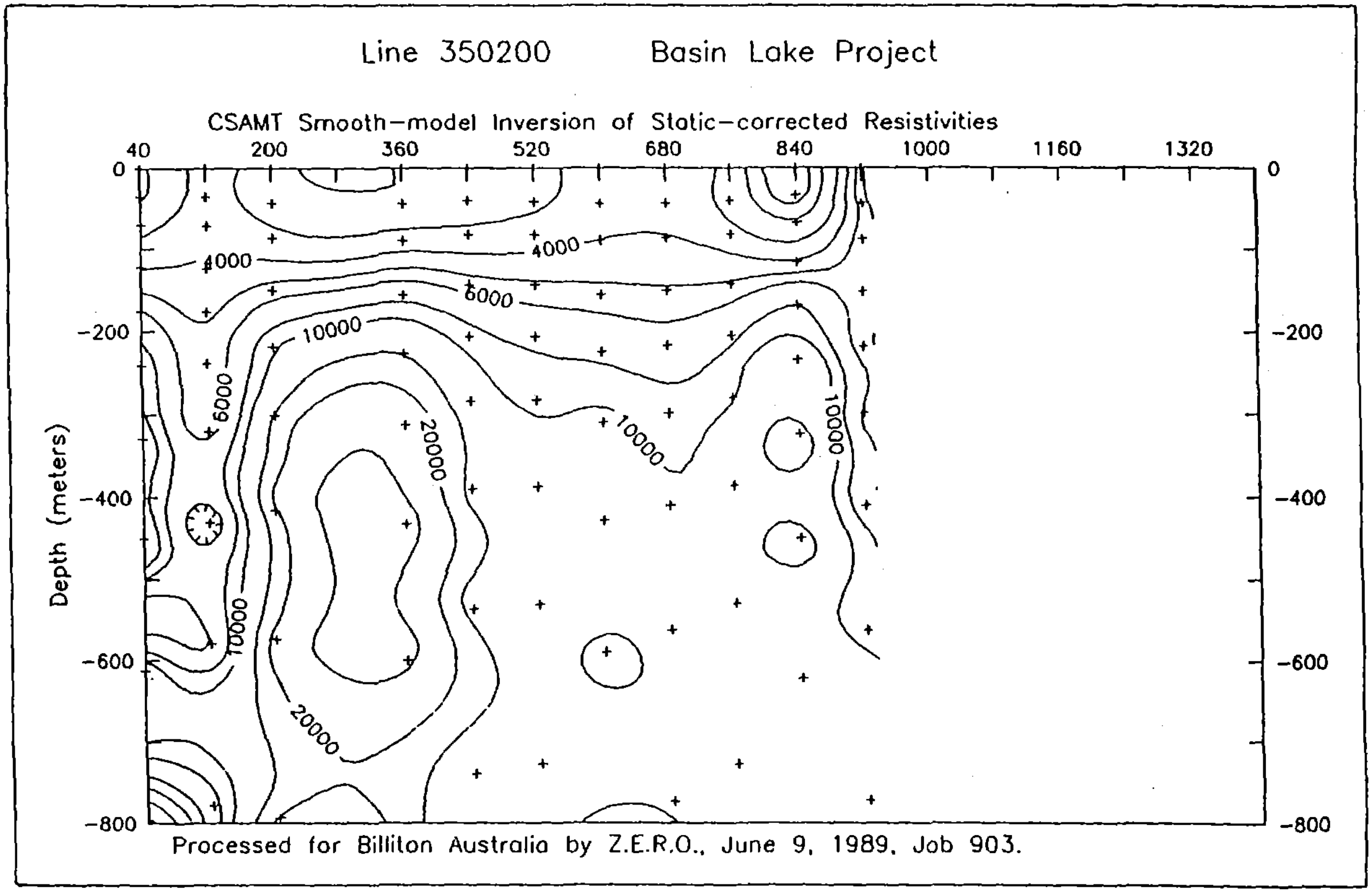


Figure 6: Smooth-model inversion for line 350200N.

025064

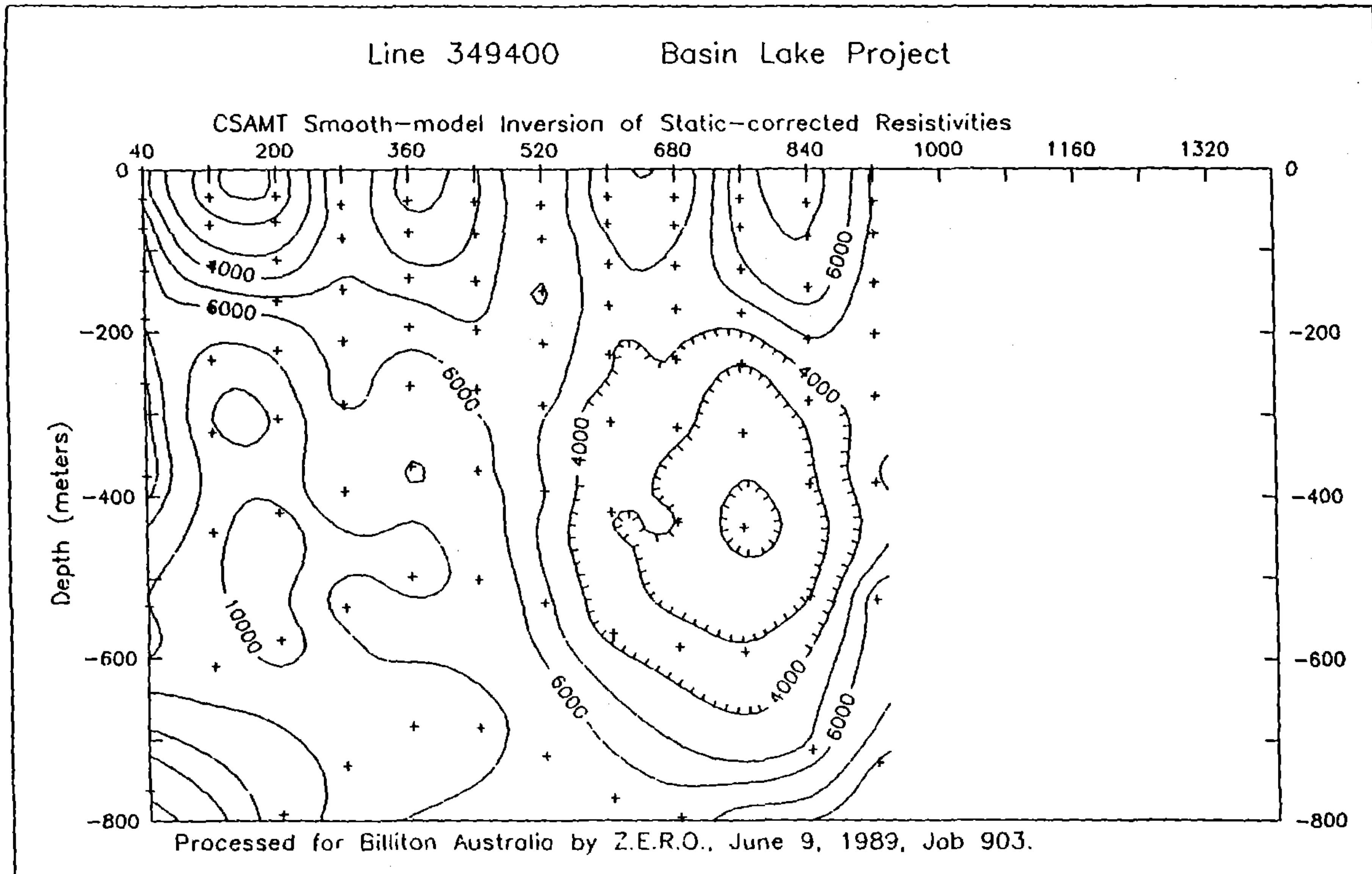
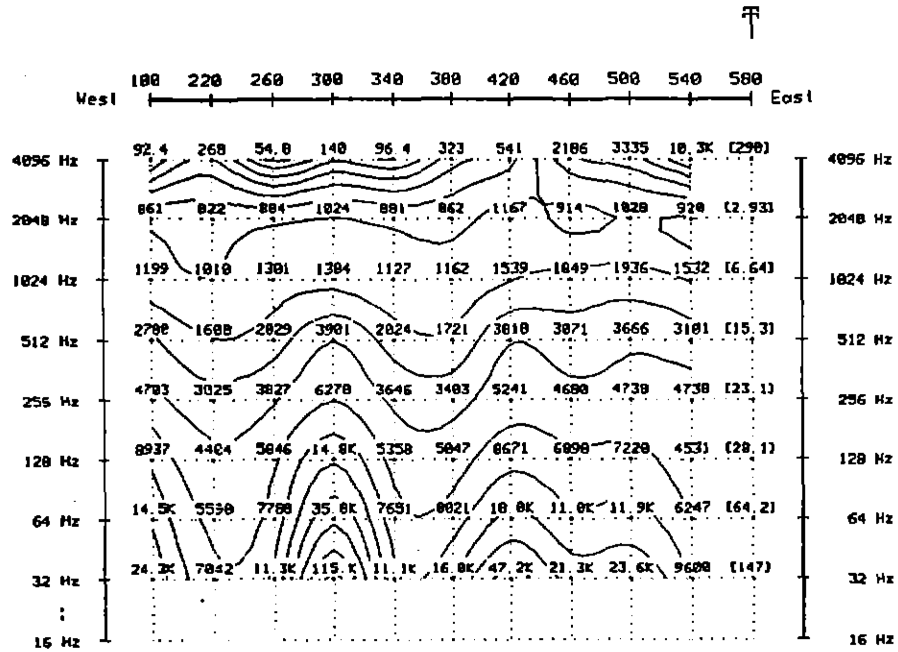


Figure 7: Smooth-model inversion for line 349400N.

025065



STATIC CORRECTED RESISTIVITY
HO: 718, PHZ: 546 , FREQ 14- 2048.

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

[115.K]	158
100.K	100
63.1K	63.1
39.8K	[54.8]
25.1K	
15.8K	
10.0K	
6310	
3981	
2512	
1585	
1000	
631	
398	
251	

ZONGE Job 903
PLOT BY CPLOT 5.40
PLOTTED 14 Jun 89

CSAMT SURVEY DATA
STATIC CORRECTED RESISTIVITY

Line 353000
BASIN LAKE
for
BILLITON AUSTRALIA

RECEIVER DATA
DiPole Length= 40.m
Stn SPacing = 40.m
Line Orient= East
DiPole Orient= East
Date of survey= NOV 88

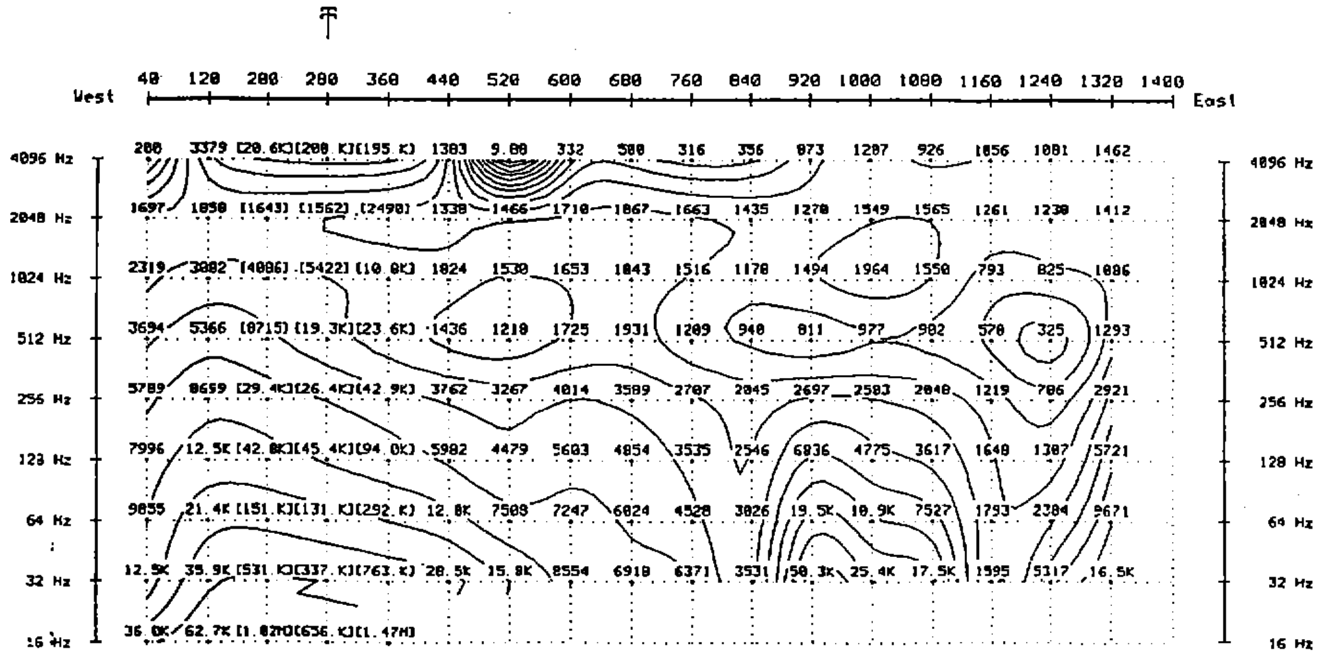
TRANSMITTER DATA
Length = 1400M
Orient. = East
Distance= 7KM
Rx to Tx= North

CULTURE SYMBOL LEGEND
Major Powerline

Plate 2: Line 35300N, a=40m.

ZONGE ENGINEERING & RESEARCH ORGANIZATION

025066



STATIC CORRECTED RESISTIVITY
RHO 1557 PHZ 593 FREQ. 2048

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)

[62.7K]	63.1
39.8K	39.8
25.1K	25.1
15.8K	15.8
10.0K	10.0
6310	[9.00]
3981	
2512	
1585	
1000	
631	
398	
251	
158	
100	

ZONGE Job 903
PLOT BY CPLOT 5.40
PLOTTED 10 Jun 89

CSAMT SURVEY DATA
STATIC CORRECTED RESISTIVITY

Line 352600
BASIN LAKE
for
BILLITON AUSTRALIA

RECEIVER DATA

TRANSMITTER DATA

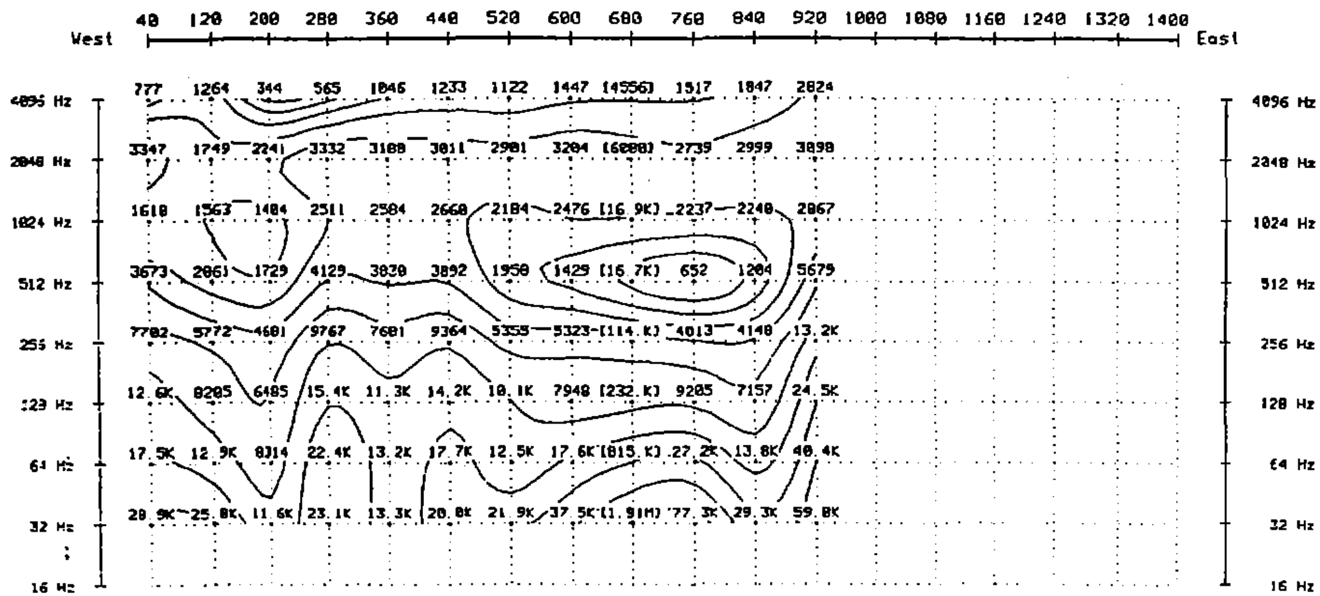
CULTURE SYMBOL LEGEND

Major Powerline

Plate 3: Line 35260N, a=80m.

ZONGE ENGINEERING & RESEARCH ORGANIZATION

025067



STATIC CORRECTED RESISTIVITY
RHO 3074 PHZ 590 FREQ 2048

[Plot limits] and LOGARITHMIC CONTOURS
(Interval, 0.20)
[82.2K]
63.1K
39.8K
25.1K
15.8K
10.0K
6310
3981
2512
1585
1000
631
398
[332]

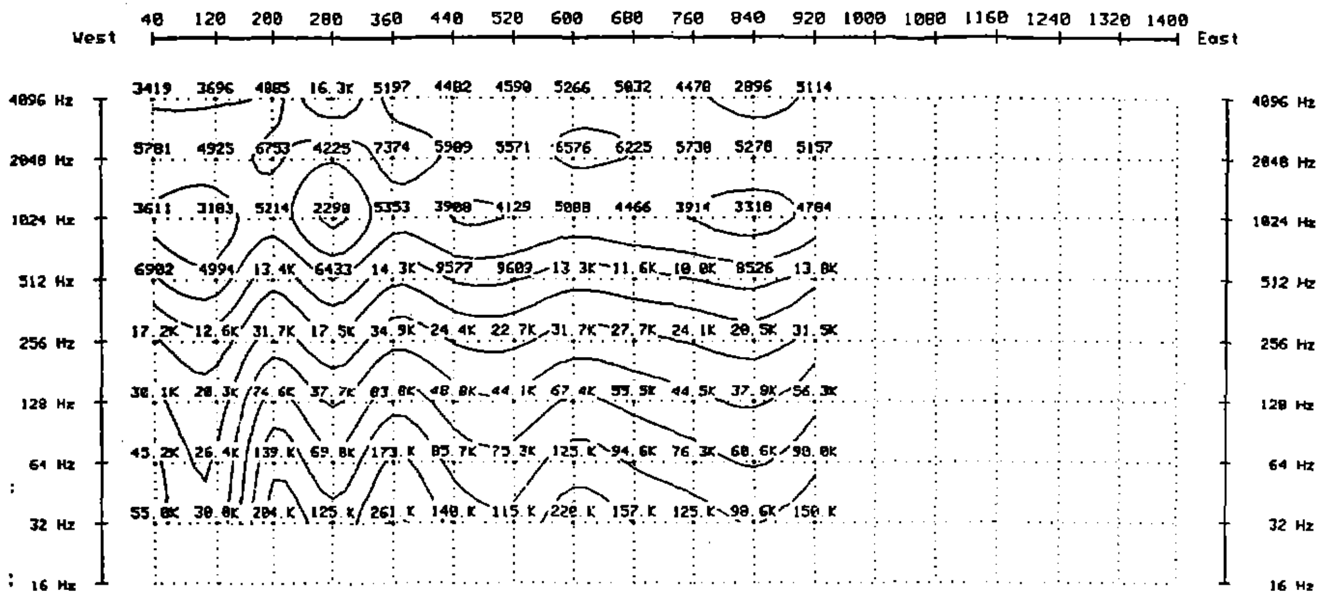
ZONGE Job 983
PLOT BY CPLOT 5.40
PLOTTED 10 Jun 89

CSAMT SURVEY DATA
STATIC CORRECTED RESISTIVITY

Line 351800
BASIN LAKE
for
BILLITON AUSTRALIA

Plate 4: Line 35180N, a=80m.

025068



STATIC CORRECTED RESISTIVITY
RHO: 5760 PHZ: 492 FREQ: 2048

(Plot limits) and LOGARITHMIC CONTOURS
(Interval: 0.20)
(261.K)
251.K
158.K
100.K
63.1K
39.8K
25.1K
15.8K
10.0K
6310
3981
2512
(2290)

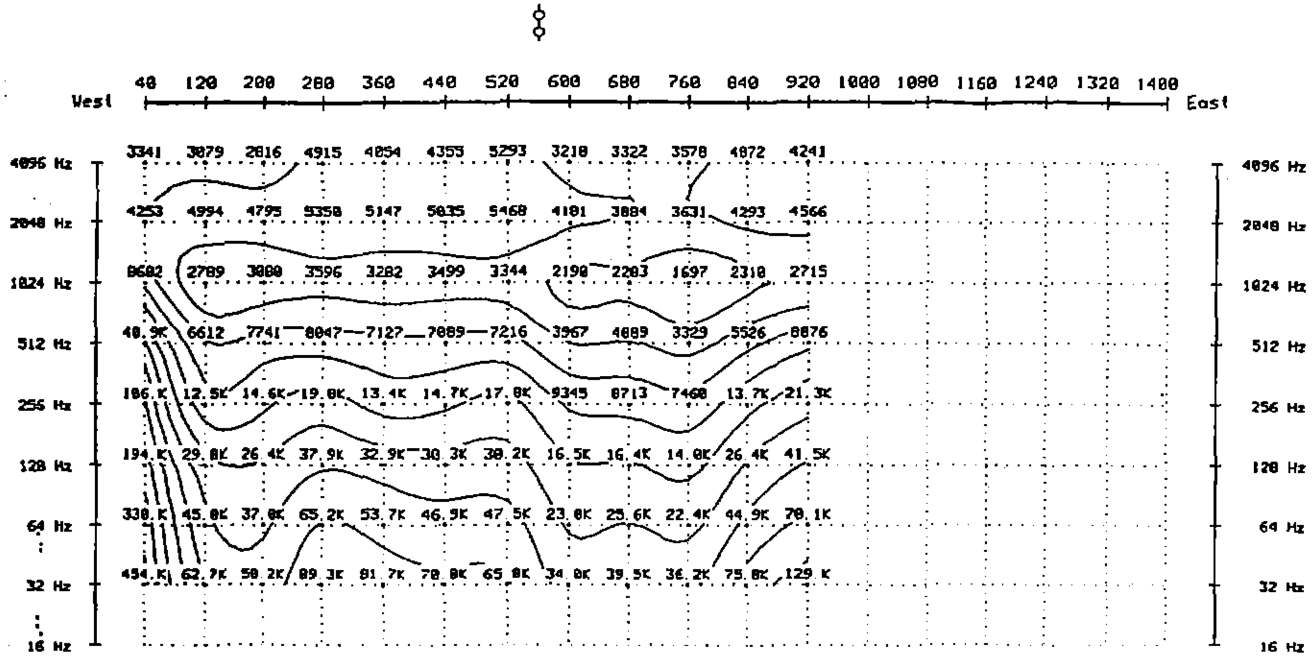
ZONGE Job 983
PLOT BY CPLOT 5.40
PLOTTED 10 Jun 89

CSAMT SURVEY DATA
STATIC CORRECTED RESISTIVITY

Line 350200
BASIN LAKE
for
BILLITON AUSTRALIA

Plate 5: Line 35020N, a=80m.

025069



STATIC CORRECTED RESISTIVITY
RHO:4600 PHZ:577 FREQ:2048

[Plot limits] and LOGARITHMIC CONTOURS
(Interval: 0.20)
[454.K]
398.K
251.K
158.K
100.K
63.1K
39.8K
25.1K
15.8K
10.0K
6310
3981
2512
[1697]

ZONGE Job 903
PLOT BY CPLOT 5.40
PLOTTED 10 Jun 89

CSAMT SURVEY DATA
STATIC CORRECTED RESISTIVITY

Line 349400
BASIN LAKE
for
BILLITON AUSTRALIA

CULTURE SYMBOL LEGEND
Pipeline

Plate 6: Line 34940N, a=80m.

02507

APPENDIX IV

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

HEADING SHEET

COLLAR INFORMATION

DATA TYPE	COLLAR CO-ORDINATES EASTING	NORTHING	ELEVATION	COLLAR SURVEY AZIMUTH	DIP	HOLE NAME	TOTAL DEPTH	HOLE TYPE	DESC CODE	REMARKS
	381140	352760		095	60	BLD89-3				

PROJECT	BASIN LAKE	HOLE NAME	BLD 89-3
LOGGED BY	J. RANDELL	TOTAL DEPTH	388·4m
CONTRACTOR	DIAMOND DRILLING TAS	RIG	LY 38.
CREW	K. HOW	DATE STARTED	18/9/89 FINISHED 25/10

CORE STORAGE: Nº OF TRAYS	CORE STORAGE: LOCATION	SAMPLE STORAGE
	DEVONPORT	DEVONPORT

M&P LAB	A. CRAWFORD	ASSAY LAB	ANALABS

DESC.	SIZE	FROM	TO	TOTAL	REMARKS
NON CORE	HW	0	4	4	
CORE	HQ	4	102	98	
	NQ	102	388	286	
	BQ				
CASING					
CASING LEFT	PVC	0	388		(S) steel (P) plastic

SURVEY INFORMATION

DISTANCE FROM COLLAR TO TOP	TO BOTTOM	AZIMUTH	DIP	REMARKS
0		095	60	
50		—	57	
100		090	54	
150		089	48	
195		087	42	
250		084	41	
300		083	39	
350		085	37	

PLOTTING KEY

SYMBOL DES. CODE	G/LOG	INTERVAL FROM	TO	SYMBOL DES. CODE	G/LOG	INTERVAL FROM	TO

ASSAY INFORMATION

DISTANCE FROM COLLAR TO TOP	TO BOTTOM							SAMPLE Nº	CORE ANGLE	ROCK TYPE	DIAM	DESC CODE	GRAPHIC LOG

DESCRIPTIVE LOG

0 – 31·4 // GLACIAL SCREE (OWEN CONGLOMERATE)

0 – 7·1. Pebble conglomerate
7·1 – 7·4. Purple hematitic sandstone
7·4 – 10·3. Pebble-cobble conglomerate
10·3 – 11·5. Pink coarse sandstone
11·5 – 28·0. Pink-purple pebble-cobble conglomerate.
28·0 – 28·6. Purple sandstone.
28·6 – 31·4. Pebble conglomerate.

31·4 – 73·5 // CLAY (EX-VOLCANIC.)

Pale grey-green clay, very poor core recovery. Coarse quartz grains ~20% throughout. Minor patches of disseminated pyrite, up to 7 %.

73·5 – 89·4 // WEATHERED QUARTZ-FELDSPAR PHYRIC FELSIC LAVA.

73·5 – 76·4. Yellow brown quartz phyric clay.
76·4 – 79·8. Quartz + yellow brown clay.
79·8 – 84·3. Becoming more competent. Pale

DRILLING OBJECTIVES / SUMMARY: Collared to test a CSAMT anomaly at or near the Great Lyell Fault and to extend through the fault into Owen Conglomerate.

REPORT REFERENCE:

SHEET 1 OF 9

02507 2

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT: BASIN LAKE
HOLE NAME: BLD 89-3
LOGGED BY: J. RANDELL
TOTAL DEPTH:

Assay info	Distance from collar: To top	To bottom	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppm	As ppm	Ba ppm	Sample No
SP	89.4	91.0	25	60	110	<0.5	<0.008	10	1300	17201
SP	91.0	93.0	45	30	100	<0.5	<0.008	<2	1420	17202
SP	93.0	95.0	20	20	70	<0.5	<0.008	2	1400	17203
SP	95.0	97.0	25	15	70	1.0	<0.008	<2	1600	17204
SP	97.0	99.0	25	<5	75	<0.5	<0.005	<2	1550	17205
SP	99.0	101.0	25	25	85	<0.5	<0.005	<2	1600	17206
SP	101.0	103.0	20	25	100	<0.5	<0.005	<2	1600	17207
SP	103.0	105.0	20	20	80	<0.5	<0.008	2	1200	17208
SP	105.0	107.0	20	20	120	<0.5	<0.008	<2	1200	17209
SP	107.0	109.0	35	20	85	<0.5	0.032	<2	2250	17210
SP	109.0	111.0	25	10	70	<0.5	<0.025	2	1500	17211
SP	111.0	113.0	15	15	75	<0.5	<0.005	<2	1300	17212
SP	113.0	115.0	15	10	25	<0.5	<0.005	<2	1200	17213
SP	115.0	117.0	20	5	90	1.5	<0.008	<2	1300	17214
SP	117.0	119.0	20	10	80	<0.5	<0.005	<2	1190	17215
SP	119.0	121.0	25	60	120	<0.5	<0.008	7	1200	17216
SP	121.0	123.0	25	55	90	<0.5	<0.008	2	1850	17217
SP	123.0	125.0	20	<5	100	<0.5	<0.008	3	1300	17218
SP	125.0	127.0	25	30	80	<0.5	0.044	15	760	17219
SP	127.0	129.0	25	40	70	<0.5	<0.008	15	1000	17220
SP	129.0	131.0	20	20	90	<0.5	<0.005	15	990	17221
SP	131.0	133.0	20	20	85	<0.5	<0.005	9	1050	17222
SP	133.0	134.4	15	10	120	<0.5	<0.005	9	1050	17223

ASSAY INFORMATION

DESCRIPTIVE LOG

yellow brown coarsely quartz + feldspar phyric volcanic. Vague layering at 40° LCA.
84.3 – 89.4 Pale green-white coarse quartz, medium feldspar phyric chloritic moderately layered volcaniclastic, dacitic to andesitic. Becoming fresher down hole, layering at 45° LCA. Chloritic wisps ex pumice. Minor K-spar alteration.

89.4 – 134.4 // FRESH SERICITIC (+ K-SPAR – PYRITE) RHYODACITIC LAVA

Upper contact sharp but obscure. Strong sericitic alteration, chloritic alteration very patchy. Kspar ubiquitous but variable in intensity. Generally feldspar phyric to 89.4 m.
Fine disseminated pyrite as fracture fill usually accompanied by sericite, estimated 2-3%.
Quartz rich phyric component from 93 m, moderate to strong K-spar! Vague layering at 50° LCA
? Carbonate altered volcanics 97.5 – 97.8.
At 95.0 5-10% py dissem. as patches.
100 – 100.5 Vuggy quartz stockwork composed of 15-20% quartz veins.
104 – 106 m. Gradual change to more massive volcanics quartz + K felds phenocrysts. Appears more like a dacitic lava.
Further down hole, K-spar decreases, becomes chloritic + sericitic.
106 – 109 m Few quartz tension gash veins.
T.S. 16909 110 m. Fine dissem. pyrite in fractures, irregular.
Unit contains more feldspar than quartz

Disseminated pyrite in fracture planes, also minor irregular patches 5 cm wide ~1%.

Towards 130 m, stronger sericitic alteration more strongly layered.
Bottom contact gradational over 10 cms but layering suggests 55° LCA contact.

134.4 – 195.4 // FELDSPAR – QUARTZ PHYRIC SERICITIC PYRITIC DACITIC – RHYODACITIC LAVA.

134.4 – 135.5. Strongly broken core sheared very strong sericitic alteration.

SAMPLE: 16909

SUMMARY:
This is a quartz+plagioclase-phyric rhyodacitic lava showing relatively intense calcite-sericite alteration.

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT: BASIN LAKE | HOLE NAME: BLD 89-3
LOGGED BY: J. RANDELL | TOTAL DEPTH:

ASSAY INFORMATION

		From (to top)	To (bottom)	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppm	As ppm	Ba ppm	Sample No
S	P	134.4	136.0	20	50	15	1.5	0.011	10	1450	17224
S	P	136.0	138.0	25	25	50	<0.5	0.012	10	1300	17225
S	P	138.0	140.0	15	20	25	<0.5	0.011	7	710	17226
S	P	140.0	142.0	20	15	50	<0.5	0.014	4	420	17227
S	P	142.0	144.0	50	<5	75	<0.5	0.013	<2	580	17228
S	P	144.0	146.0	40	<5	80	<0.5	<0.008	<2	560	17229
S	P	146.0	148.0	40	10	75	<0.5	0.009	<2	550	17230
S	P	148.0	150.0	20	<5	75	<0.5	<0.008	<2	500	17231
S	P	150.0	152.0	20	<5	65	<0.5	0.017	2	620	17232
S	P	152.0	154.0	10	<5	80	<0.5	0.012	<2	610	17233
S	P	154.0	156.0	20	<5	75	1.5	0.011	<2	170	17234
S	P	156.0	158.0	15	<5	60	<0.5	0.011	2	570	17235
S	P	158.0	160.0	25	10	80	0.5	0.013	4	710	17236
S	P	160.0	162.0	60	<5	115	<0.5	0.012	2	1200	17237
S	P	162.0	164.0	50	<5	70	<0.5	0.017	<2	1000	17238
S	P	164.0	166.0	60	10	80	0.5	0.015	<2	1350	17239
S	P	166.0	168.0	50	<5	75	<0.5	0.012	<2	910	17240
S	P	168.0	170.0	80	20	120	1.5	0.014	2	850	17241
S	P	170.0	172.0	40	10	115	<0.5	<0.008	3	710	17242
S	P	172.0	174.0	100	25	80	0.5	0.013	30	160	17243
S	P	174.0	176.0	65	80	125	0.5	0.013	25	820	17244
S	P	176.0	178.0	90	100	285	<0.5	0.013	10	1100	17245
S	P	178.0	180.0	75	40	280	1.5	0.018	15	1100	17246
S	P	180.0	182.0	65	10	60	0.5	0.020	15	1000	17247
S	P	182.0	184.0	35	50	140	<0.5	0.020	3	770	17248
S	P	184.0	186.0	35	45	170	0.5	0.015	10	820	17249
S	P	186.0	188.0	37	55	145	<0.5	0.012	4	870	17250
S	P	188.0	190.0	30	80	140	<0.5	0.013	15	840	17251
S	P	190.0	192.0	20	20	200	0.5	0.013	20	1100	17252
S	P	192.0	194.0	20	10	175	<0.5	<0.005	8	740	17253
S	P	194.0	195.4	30	30	200	<0.5	<0.008	4	1200	17254
S	P	195.4	198.0	25	30	195	<0.5	0.010	7	1100	17255

SAMPLE: 16910

SUMMARY:

This is a foliated former quartz+plagioclase-phyric rhyolitic or rhyodacitic lava with calcite-sericite alteration which is less well-developed than the previous sample. The original rock from which this sample was derived via foliation development was identical to sample 16909.

SAMPLE: 16911

SUMMARY:

This is a sparsely plagioclase-phyric, formerly glassy dacitic to rhyodacitic lava with strong calcite-dominated alteration, and cut by discrete well-spaced microshear zones in which sericite is extensively developed. This sample is petrographically unlike the two previous samples, and clearly comes from a different flow.

SAMPLE: 16912

SUMMARY:

This is a foliated quartz+plagioclase-phyric rhyolitic lava with sericite-calcite-pyrite alteration pre-foliation.

DESCRIPTIVE LOG

Graphic log		Descriptive log
		135.5 – 142 Well foliated (55-60° LCA) sericitic
T.S.	16910	volcaniclastic. Qrtz Strong sericitic alteration
	137.5m	Also ubiquitous fine disseminated pyrite 2-5%
		along foliation planes.
		142 – 150m. More chloritic less sericitic, less
		pyritic. Fine chlorite veining, also minor quartz
		qtz veins. Quartz + feldspar phyric. Moderate
		layering 45° LCA.
		150 – 152.6. Strong sericite alteration, little
		chlorite. Pyrite occurs as irregular veinlets
		parallel to foliation + disseminated.
		152.6 – 155.7. Moderate chlorite + sericite alteration
		Some white quartz bands at 155m. Little dissem.
		pyrite in this zone.
		159.2 – 160. Moderate pink K-spar alteration
T.S.	16911	161.2 – 167.8. Moderately chloritic but banded. At
	162.0m	45°-50° LCA. Little or no pyrite.
		167.8 – 171.2. Sericitic with irregular veinlets
		and lenses pyrite (1-5%) Not banded.
		171.2 – 174. Weak to mod. broken core + bands white quartz.
		172.9 – 181.3. Increasing sericite + pyrite (5-7%)
		alteration. Generally strongly sericitised
		variable pyrite from weak disseminations to
		10-15% in localized bands. Foliation 45° LCA
		181.3 – 188.6 More chloritic less sericite less
		pyrite. Moderately broken core + thick quartz
		veins 184.6 – 185.5m.
T.S.	16912	188.6 – 191.4. Moderately sericitised + pyrite
	188.6m	(up to 5%), well foliated.
		191.4 – 195.4. Estimated 40% white quartz
		bands + irreg. quartz in chloritic clastics.
		Little sulphide ~1%.
		195.4 – 231.8 // SERICITIC FOLIATED PYRITIC FINE GRAINED RHYODACITIC LAVA
		Moderately sericitised, well layered, pyrite 3-5%.

025074

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT: BASIN LAKE
HOLE NAME: BLD 89-3
LOGGED BY: J. RANDELL
TOTAL DEPTH:

		Distance from collar: To top	Distance from collar: To bottom	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppm	As ppm	Ba ppm	Sample No	Core angle	Rock type		Desc code	Graphic log
S	P	198.0	200.0	115	5	235	<0.5	0.010	3	1320	17256					
S	P	200.0	202.0	130	<5	155	<0.5	<0.008	6	1550	17257					T.S.
S	P	202.0	204.0	135	<5	180	<0.5	0.004	10	1150	17258					
S	P	204.0	206.0	250	15	140	<0.5	0.014	15	820	17259					
S	P	206.0	208.0	175	<5	125	0.5	<0.008	20	240	17260					
S	P	208.0	210.0	120	<5	132	<0.5	<0.008	10	210	17261					
S	P	210.0	212.0	100	<5	160	<0.5	<0.008	9	390	17262					
S	P	212.0	214.0	135	<5	160	<0.5	0.003	4	920	17263					
S	P	214.0	216.0	195	<5	150	<0.5	0.012	2	800	17264					
S	P	216.0	218.0	125	<5	130	<0.5	<0.008	3	780	17265					
S	P	218.0	220.0	150	110	430	<0.5	<0.008	10	520	17266					
S	P	220.0	222.0	175	20	315	<0.5	<0.008	1	630	17267					
S	P	222.0	224.0	175	<5	235	<0.5	0.009	<2	240	17268					
S	P	224.0	226.0	185	5	220	<0.5	0.013	5	420	17269					
S	P	226.0	228.0	110	<5	130	<0.5	0.011	2	910	17270					
S	P	228.0	230.0	15	<5	160	<0.5	<0.008	<2	860	17271					
S	P	230.0	231.8	75	<5	130	<0.5	<0.008	<2	720	17272					
S	P	231.8	234.0	200	<5	150	<0.5	0.015	5	800	17273					
S	P	234.0	236.0	180	<5	150	<0.5	0.032	<2	1500	17274					
S	P	236.0	238.0	130	<5	165	<0.5	0.011	<2	470	17275					
S	P	238.0	239.3	185	45	170	<0.5	0.012	<2	1100	17276					

ASSAY INFORMATION

SAMPLE: 16913

SUMMARY:

This is a foliated formerly poorly quartz+feldspar-phyric rhyolitic or rhyodacitic lava that suffered sericitization, probably followed by chlorite-pyrite alteration, and then calcite-veining coeveal with foliation development.

SAMPLE: 16914

SUMMARY:

This is a strongly foliated sericite-chlorite-pyrite schist derived from a rock very similar to 16913 by more intense foliation development in a higher strain zone.

SAMPLE: 16915

SUMMARY:

This is a formerly dacitic vesicular lava breccia that has suffered strong chloritization and shows a weak foliation.

DESCRIPTIVE LOG

Becoming finer grained, not quartz or feldspar phyric.

T.S. 16913 198.2m — Weak to moderate chloritic alteration, fine chloritic layering 40° LCA. Pyrite mainly as thin bands/laminations often re-crystallized to medium grained euhedral clusters.

211.2 - 211.8. Strongly broken core.

211.8 - 215.0. Moderately chloritic + strongly sericite altered. Few irreg. distributed pyrite disseminations + veinlets.

215 - 216.6. Strong sericite + silica alteration. Strong pyrite laminations + disseminations up to 5-15% along foliation planes at 40° LCA.

216.6 - 219.4. Moderately chloritic alteration, irreg. crackle quartz veins with some pumiceous clasts. Minor pyrite to 2%.

219.4 - 220. Well laminated (55° LCA) strongly sericitic + silicified + up to 10% fine disseminated pyrite in laminations.

T.S. 16914 220.4m — 220 - 231.8. Fine grained chloritic, mod-strong irregular quartz veinlets, little pyrite.

231.8 — 239.3 // CHLORITIC SERICITIC DACITIC LAVA BRECCIA

Upper contact gradational over 20 cms. - well layered 50° LCA.

T.S. 16915 238.9m — Lithic fragments variable in size ash → 4cm mostly subrounded and composed of predominantly very fine grained ash. Minor quartz phenocrysts.
Pyrite absent.
Lower contact sharp at 45° LCA.

239.3 - 250.2 // STRONGLY SERICITIC SILICIFIED AND CHLORITE SPOTTED DACITIC LAVA

Irregular distribution of up to 2.5cm lithic fragments (subrounded). Intensely chlorite

SHEET 4 of 9

025075

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT: BASIN LAKE | HOLE NAME: BLD 89-3
LOGGED BY: J. RANDELL | TOTAL DEPTH:

ASSAY INFORMATION

Distance from collar to top	Distance from collar to bottom	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppm	As ppm	Ba ppm	Sample No
239.3	241.0	160	<5	180	<0.5	0.070	<2	1100	17277
241.0	243.0	265	<5	210	<0.5	0.016	<2	1000	17278
243.0	245.0	125	830	240	<0.5	0.013	<2	1000	17279
245.0	247.0	125	2290	265	<0.5	<0.008	5	1250	17280
247.0	249.0	190	<5	225	<0.5	0.011	<2	1150	17281
249.0	251.0	145	<5	173	<0.5	0.015	<2	1200	17282

SAMPLE: 16916

SUMMARY:
This is a strongly feldspar-phyric dacitic lava that has been intensely chlorite altered without pyrite mineralization.

SAMPLE: 16917

SUMMARY:
This is a relatively weakly altered massive plagioclase-phyric dacitic lava or pumiceous tuff lacking the intense chlorite alteration that characterized many of the previous samples.

SAMPLE: 16918

SUMMARY:
This is a lava breccia derived from a rhyolitic or rhyodacitic glassy, sparsely plagioclase-phyric flow. It shows fairly strong sericite alteration, but no chlorite alteration.

DESCRIPTIVE LOG

spotted + well layered generally 45-50° LCA.
T.S. 16916 246.7m — 241.6 - 244.3. Some irregular quartz veins.

No sulphide visible.
Lower contact sharp but sheared and obscured.

250.2 - 311.2 // STRONGLY SILICIFIED K-SPAR AND CHLORITE ALTERED DACITIC LAVA.

Generally strongly silicified, sometimes massive but some pumiceous layers. Irregular K-spar alteration of feldspar phenocrysts.

250.2 - 258.4. Strongly chloritic, massive but often with silicified K-spar - quartz breccia zones.

258.4 - 260.5. Non chloritic strongly feldspar phyric but also silicified. Fine quartz crackle veining.

260.5 - 263.4. Moderately chloritic, silicified and quartz crackle veined.

263.4 - 266. Moderately broken core, strongly silicified + pink K-spar alteration.

No sulphide observed except speck Cpy @ 261.5m.

266 - 268.7. Moderately chloritic, massive silicified and feldspar phyric.

268.7 - 270.2. Strong siliceous zone 80% quartz.

T.S. 16917 274.6m — 270.2 - 278.3. Moderately chloritic and strongly silicified. Strongly feldspar phyric. Strong brecciation at 276.2m. From 276.4 - 278.3 massive strongly chloritic but not feldspar porphyritic.

278.3 - 287.3. Moderate to strong K-spar + silica alteration. Kspar replaces feldspar porphyroblasts
T.S. 16918 284.2m — but also occurs at fine matrix with patchy but pervasive silica alteration.
From 283.8 - 286.2m, mod-strong white carbonate veining and strong autobrecciation with fine pumiceous bands. Maybe a hyaloclastite.

0250076

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT	BASIN LAKE	HOLE NAME	BLD 89-3
LOGGED BY	J. RANDELL	TOTAL DEPTH	

DISTANCE FROM COLLAR TO TOP	TO BOTTOM	SAMPLE No	CORE ANGLE	ROCK TYPE	DIAM	DESC CODE	GRAPHIC LOG			DESCRIPTIVE LOG
										287·3 – 290·3. Strongly chloritic vague foliation or flow banding at 55° LCA. Generally massive but with fine carbonate-quartz veining. Not feldspar phyric.
										290·3 – 291·4. Moderately chlorite and irreg. K-spar alteration. Some irregular quartz veinlets. Some minor autobreccia.
										291·4 – 292·5. Strongly chloritic with irregular quartz veins and patches.
										292·5 – 296·3. Massive strongly silicified, weak irregular feldspar porphyroblasts. Irregular fine quartz veinlets with pyrite on shear planes in bleached zone from 294·2 – 294·5.
										296·3 – 305·2. Moderate K-spar and strong silica alteration. Weak irregular feldspar phyric. Irregular K-spar alteration, some bleaching occur. Autobrecciation 299·7 – 299·9. At 303·5 – 303·8 90% silica 10% chlorite + Kspar.
										305·2 – 307·4. Moderately chloritic no Kspar but fine quartz crackle veining. Some brecciation at 305·8.
										307·4 – 311·2. Moderate irregular K-spar + bleaching + strong silica alteration, very irreg and patchy. Minor fine quartz-carbonate veinlet. Strongly broken core 307·7 – 307·8.
										311·2 – 323·1 // CHLORITIZED WEAKLY K-SPAR ALTERED PUMICEOUS DACITIC LAVA/VOLCANICLASTIC
							T.S.	16919 316·2m		Gradational contact. Vague foliation developed at 55° LCA. Minor bands and clasts of chloritized pumice.
										321·4 – 322·1. Strongly feldspar phyric pumiceous chlorite layered volcaniclastic.
										322·1 – 323·1. Strong silica + sericite + Kspar.
										Lower contact sharp but brecciated at 65° LCA.

ASSAY INFORMATION

SAMPLE: 16919

SUMMARY:

This is a pumiceous lithic tuff composed of sparsely plagioclase-phyric formerly glassy dacitic lava and pumice fragments in a devitrified glassy matrix.

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT	BASIN LAKE	HOLE NAME	BLD 89-3
LOGGED BY	J. RANDELL	TOTAL DEPTH	

DISTANCE FROM COLLAR TO TOP	TO BOTTOM								SAMPLE Nº	CORE ANGLE	ROCK TYPE	DIAM	DESC CODE	GRAPHIC LOG		DESCRIPTIVE LOG

ASSAY INFORMATION

DESCRIPTIVE LOG

323·1–327·3 // FINE GRAINED MASSIVE BASALTIC DYKE

Moderately magnetic, chloritic, weakly quartz crackle veined. Minor K-spar altered feldspar clots.

327·3 – 336·4 // SILICIFIED VARIABLY K-SPAR AND CHLORITE ALTERED DACITIC LAVA/ VOLCANICLASTIC

Upper contact sharp at 45° LCA. Also bleached.

Strong pervasive silicification but variable patchy K-spar + minor chlorite.
Strongly feldspar phyric.

333·2 – 333·8. 8–2 silica.

333·8 – 336·4. Strongly chloritic, crackle veined + strong silicification. Minor zones of chloritized pumice + ? lava clasts.

336·4 – 360·5 // LAYERED CHLORITIC PUMICEOUS FELDSPAR PHYRIC DACITIC EPICLASTIC.

Upper contact gradational.

Moderately well layered broken core.
Dominantly pumiceous to 339m.

339 – 341·5. Minor chloritic pumice clasts in sericite-chlorite matrix with minor large (5–6cm) subrounded K-spar altered ? lava clasts.

341·5 – 342·6. Strong chlorite anastomosing veinlets in strongly feldspar phyric dacitic epiclastic. Clasts of sub elongate fine volcaniclastics and subrounded K-spar silicified volcanics

342·6 – 347·8. Strongly silicified moderately K-spar altered strongly chloritic and quartz veined in clast dominant breccia. Lower 2m is strongly K-spar altered. Clasts quite variable in size up to 3-4cms and dominantly K-spar silicified lava.

025078

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT	BASIN LAKE	HOLE NAME	BLD 89-3
LOGGED BY	J. RANDELL	TOTAL DEPTH	

DISTANCE FROM COLLAR: TO TOP | TO BOTTOM | SAMPLE No | CORE ANGLE | ROCK TYPE | DIAM | DESC CODE | GRAPHIC LOG

ASSAY INFORMATION

SAMPLE: 16920

SUMMARY:
This is a strongly foliated, abundantly plagioclase-phyric, sericitized pumiceous crystal tuff.

GRAPHIC LOG		DESCRIPTIVE LOG
		347·8 - 349·7. Massive siliceous weakly quartz veined and fractured? hematitic volcanic.
T.S.	16920 355·1m	349·7 - 358·6. Strongly feldspar phyric chloritic pumiceous dacitic volcaniclastic. Minor zones of subangular fine volcaniclastic clasts. Other zones of bleached silicified quartz veined rhyodacitic lava breccia. Minor lithic component only but increasing down hole.
		358·6 - 360·3. Rounded pebble of hematitic conglomerate in intensely chloritic and silicified ± K-spar volcanics. Lower 30cms intensely silicified. Vague layering 65°LCA.
		360·3 - 360·5. Green + grey puggy clays.
		360·5 - 388·4 // INTERLAYERED ARENACEOUS AND SILTY SEDIMENTS.
		360·5 - 361·5. Massive silicified sandstone
		361·5 - 361·8. Pebble conglomerate, well rounded quartz pebbles in chloritic sandy matrix.
		361·8 - 363·8. Interlayered chloritic sandstone and siltstone. Bedding at 65°LCA.
		363·8 - 366·0. Intensely broken core sheared chloritic shale, not laminated but strongly brecciated
		366·0 - 375·0. Mixed chloritic sandstone and fine siltstone. Often in fine laminations 60°LCA or as irregular pods/bands. Mainly fine sand size sediments.
		366·3. Fine scour marks ⇒ UP HOLE FACING
		370·7. " " " " " "
		Broken core to 369·5.
		375·0 - 377·7. More uniformly laminated, becoming dominant sand size, laminations consistent at 60°LCA.
		377·7 - 384·3. Some irregular laminations and pods bands becoming mixed from fine silts to fine sands. Strongly broken at bottom.

025079

SHLMET SYSTEM
METRIC
DECIMAL POINTS AS REQUIRED

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

CONTINUATION SHEET

PROJECT	BASIN LAKE	HOLE NAME	BCD 89-3
LOGGED BY	J. RANDELL	TOTAL DEPTH	

DISTANCE FROM COLLAR: TO TOP / TO BOTTOM — SAMPLE No — CORE ANGLE — ROCK TYPE — DIAM — DESC CODE — GRAPHIC LOG — ASSAY INFORMATION

CORE RECOVERIES

FROM	TO	INT	REC	%
4.5	5.4	0.9	0.5	56
5.4	7.1	1.7	0.5	29
7.1	9.3	2.2	1.6	73
9.3	10.5	1.2	0.9	75
10.5	11.7	1.2	0.4	33
11.7	14.1	2.4	1.0	42
14.1	15.7	1.6	1.0	63
15.7	17.9	2.2	1.3	59
17.9	18.5	1.6	0.7	44
19.5	20.8	1.3	0.8	62
20.8	21.3	0.5	0.4	80
21.3	22.4	1.1	0.8	73
22.4	22.9	0.5	0.2	40
22.9	23.9	1.0	0.5	50
23.9	24.6	0.7	0.4	57
24.6	25.2	1.6	0.4	25
25.2	28.0	2.8	2.0	71
28.0	28.7	0.7	0.3	43
28.7	29.4	0.7	0.3	43
29.4	29.9	0.5	0.4	80
29.9	31.5	1.6	0.5	31
31.5	34.5	3.0	0.6	20
34.5	37.5	3.0	1.0	33
37.5	40.5	3.0	0.6	20
40.5	43.5	3.0	0.4	13
43.5	46.5	3.0	0.5	17
46.5	49.5	3.0	0.4	13
48.5	52.5	3.0	0.5	17
52.5	55.5	3.0	0.5	17
55.5	58.5	3.0	0.8	27
58.5	61.5	3.0	1.0	33
61.5	64.5	3.0	2.1	70
64.5	67.5	3.0	1.0	33
67.5	70.5	3.0	0.9	33
70.5	73.5	3.0	1.1	37
73.5	76.5	3.0	0.6	20
76.5	79.8	3.3	0.4	12
79.8	81.7	1.9	1.2	63

FROM	TO	INT	REC	%
133.4	135.3	1.9	1.6	84

ALL OTHER CORE 100% RECOVERY

DESCRIPTIVE LOG

384.3–388.4 Pebble to cobble conglomerate. Sharp contact 45° LCA. Well rounded composed of massive quartz, chloritic fine sandstone in hematitic siliceous matrix. Mainly vein quartz pebbles, lesser quartzite

E.O.H. 388.4m.

025080

ANALABS

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

Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

ANALYTICAL REPORT No. 204.0.08.06700

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

The Shell Company of Australia
Metals Division
P.O. Box 860
Devonport Tasmania 7310

ORDER No	PROJECT
11711	

DATE RECEIVED	RESULTS REQUIRED
01/12/89	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	28/12/89	1	82

STATE OF SAMPLES REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS	REFER TO ANALYSIS SECTION PREPARATION	METHOD
	K172,01/82	DC Prep: 008,010,011,012,013,016							Cu,Pb,Zn,Ag/101		
	K172,01/82	DC							Au,AuChk/309		
	K172,01/82	DC							As,Ba/401		

RESULTS TO:

The Shell Company of Australia
Metals Division
P.O. Box 860
Devonport Tasmania 7310

RESULTS TO:

REMARKS

LD57
BLD 89-3
CORE.

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHODS	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorption	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	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 chemical means	CHEM
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
stream sediment	SS						FLUOR
heavy minerals	HM					inductively coupled plasma	ICP

AUTHORISED OFFICER

025081

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty Ltd

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	204.0.08.06700	28/12/89	11711	1 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	AuCN	As	Ba	
1	17201	25	50	110	<0.5	<0.008	<0.008	10	1200	
2	17202	45	30	100	<0.5	<0.008	-	<2	1400	
3	17203	20	20	70	<0.5	<0.008	-	2	1400	
4	17204	25	15	70	1.0	<0.008	-	<2	1600	
5	17205	25	<5	75	<0.5	<0.008	-	<2	1550	
6	17206	25	25	85	<0.5	<0.008	-	<2	1600	
7	17207	20	25	100	<0.5	<0.008	-	<2	1600	
8	17208	20	30	80	<0.5	<0.008	-	2	1600	
9	17209	20	20	100	<0.5	<0.008	-	<2	1400	
10	17210	25	20	65	<0.5	0.033	0.010	<2	2250	
11	17211	25	10	70	<0.5	<0.008	-	2	1500	
12	17212	15	15	75	<0.5	<0.008	-	<2	1300	
13	17213	15	10	75	<0.5	<0.008	-	<2	1200	
14	17214	20	5	90	1.5	<0.008	-	<2	1200	
15	17215	20	10	80	<0.5	<0.008	-	<2	1100	
16	17216	25	60	120	<0.5	<0.008	-	7	1200	
17	17217	25	55	90	<0.5	<0.008	-	2	1850	
18	17218	20	<5	100	<0.5	<0.008	<0.008	3	1300	
19	17219	25	30	80	<0.5	0.049	-	15	960	
20	17220	25	40	70	<0.5	<0.008	-	15	1000	
21	17221	20	20	90	<0.5	<0.008	-	10	990	
22	17222	20	30	85	<0.5	<0.008	-	9	1050	
23	17223	15	10	120	<0.5	<0.008	-	9	1050	
24	17224	20	50	65	1.5	0.013	0.011	10	1450	
25	17225	25	75	50	<0.5	0.012	-	10	1200	

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

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A Division of Inchcape Inspection and Testing Services Australia Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	204.0.08.06700	28/12/89	11711	2 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au Chk	As	Ba
1	17226	15	20	75	<0.5	0.011	-	7	730
2	17227	20	15	50	<0.5	0.014	-	4	670
3	17228	50	<5	75	<0.5	0.013	-	<2	580
4	17229	40	<5	80	<0.5	<0.008	-	<2	560
5	17230	40	10	75	<0.5	0.009	-	<2	580
6	17231	20	<5	75	<0.5	<0.008	-	<2	500
7	17232	20	<5	65	<0.5	0.017	-	2	520
8	17233	20	<5	80	<0.5	0.017	-	<2	630
9	17234	20	<5	75	1.5	0.011	-	<2	570
10	17235	15	<5	60	<0.5	0.011	-	2	570
11	17236	25	10	80	0.5	0.013	-	4	730
12	17237	60	<5	115	<0.5	0.012	-	2	1200
13	17238	50	<5	70	<0.5	0.013	0.009	<2	1000
14	17239	60	10	80	0.5	0.015	0.010	<2	1350
15	17240	50	<5	75	<0.5	0.012	-	<2	910
16	17241	40	20	120	0.5	0.014	-	7	850
17	17242	40	60	115	<0.5	<0.008	-	5	710
18	17243	100	25	80	0.5	0.014	-	20	760
19	17244	65	30	120	0.5	0.013	-	25	820
20	17245	40	100	255	<0.5	0.013	-	10	1100
21	17246	75	40	280	1.5	0.018	-	15	1100
22	17247	65	10	60	0.5	0.020	-	15	1000
23	17248	35	50	140	<0.5	0.020	-	5	790
24	17249	35	45	170	0.5	0.015	-	10	820
25	17250	35	<5	145	<0.5	0.012	-	6	870

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	204.0.08.06700	28/12/89	11711	3 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	AuChk	As	Ba	
1	17251	30	80	140	<0.5	0.013	-	15	.840	
2	17252	70	20	200	0.5	0.013	-	20	1100	
3	17253	20	10	175	<0.5	<0.008	-	8	740	
4	17254	30	30	200	<0.5	<0.008	-	9	1200	
5	17255	75	30	195	<0.5	0.010	-	7	1400	
6	17256	115	5	235	<0.5	0.010	-	3	1300	
7	17257	130	<5	155	<0.5	<0.008	-	6	1550	
8	17258	135	<5	180	<0.5	0.009	0.012	10	1150	
9	17259	250	15	140	<0.5	0.014	0.011	15	830	
10	17260	175	<5	175	0.5	<0.008	-	20	790	
11	17261	125	<5	135	<0.5	<0.008	-	10	710	
12	17262	100	<5	160	<0.5	<0.008	-	9	890	
13	17263	125	<5	160	<0.5	0.009	-	4	970	
14	17264	195	<5	150	<0.5	0.012	-	2	900	
15	17265	125	<5	130	<0.5	<0.008	-	3	780	
16	17266	150	110	430	<0.5	<0.008	-	10	570	
17	17267	175	20	355	<0.5	<0.008	0.012	5	630	
18	17268	175	<5	235	<0.5	0.009	<0.008	<2	740	
19	17269	185	5	220	<0.5	0.013	-	5	970	
20	17270	130	<5	150	<0.5	0.011	-	2	910	
21	17271	15	<5	160	<0.5	<0.008	-	<2	860	
22	17272	75	<5	130	<0.5	<0.008	-	<2	970	
23	17273	200	<5	180	<0.5	0.015	-	5	800	
24	17274	180	<5	150	<0.5	0.032	-	<2	1500	
25	17275	130	<5	165	<0.5	0.011	-	<2	990	

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

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ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty Ltd

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	204.0.08.06700	28/12/89	11711	4 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Au	Au Chk	As	Ba	
1	17276	185	<5	170	<0.5	0.012	-	<2	1100	
2	17277	160	<5	180	<0.5	0.070	-	<2	1400	
3	17278	265	<5	220	<0.5	0.016	-	<2	1000	
4	17279	175	830	240	<0.5	0.013	-	<2	1000	
5	17280	175	2700	265	<0.5	<0.008	-	5	1550	
6	17281	190	<5	275	<0.5	0.011	-	<2	1150	
7	17282	145	<5	175	<0.5	0.015	0.014	<2	1700	
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.008	0.008	2	10	
24	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
25	METHOD	101	101	101	101	309	309	401	401	

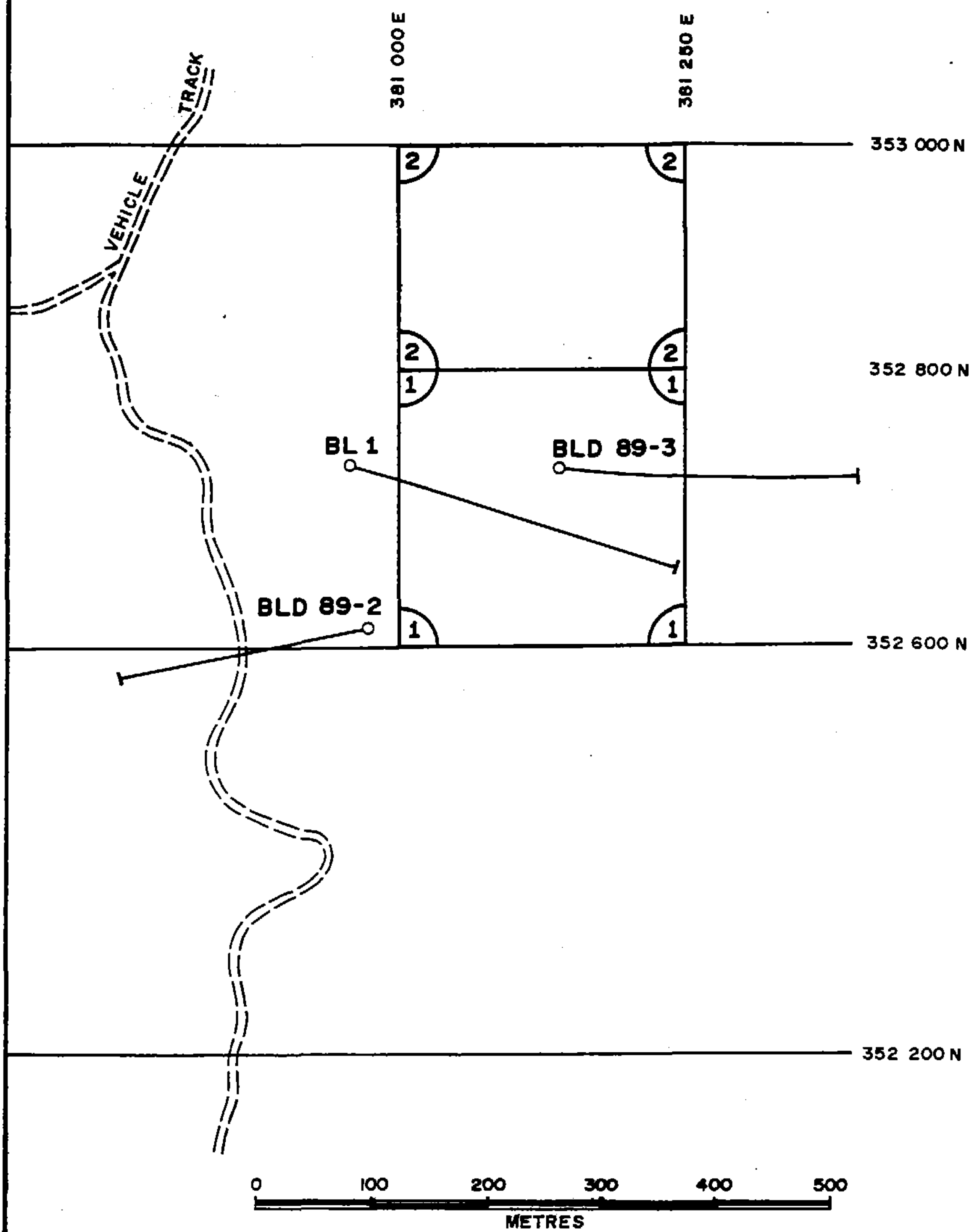
Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

025085

APPENDIX V

025087



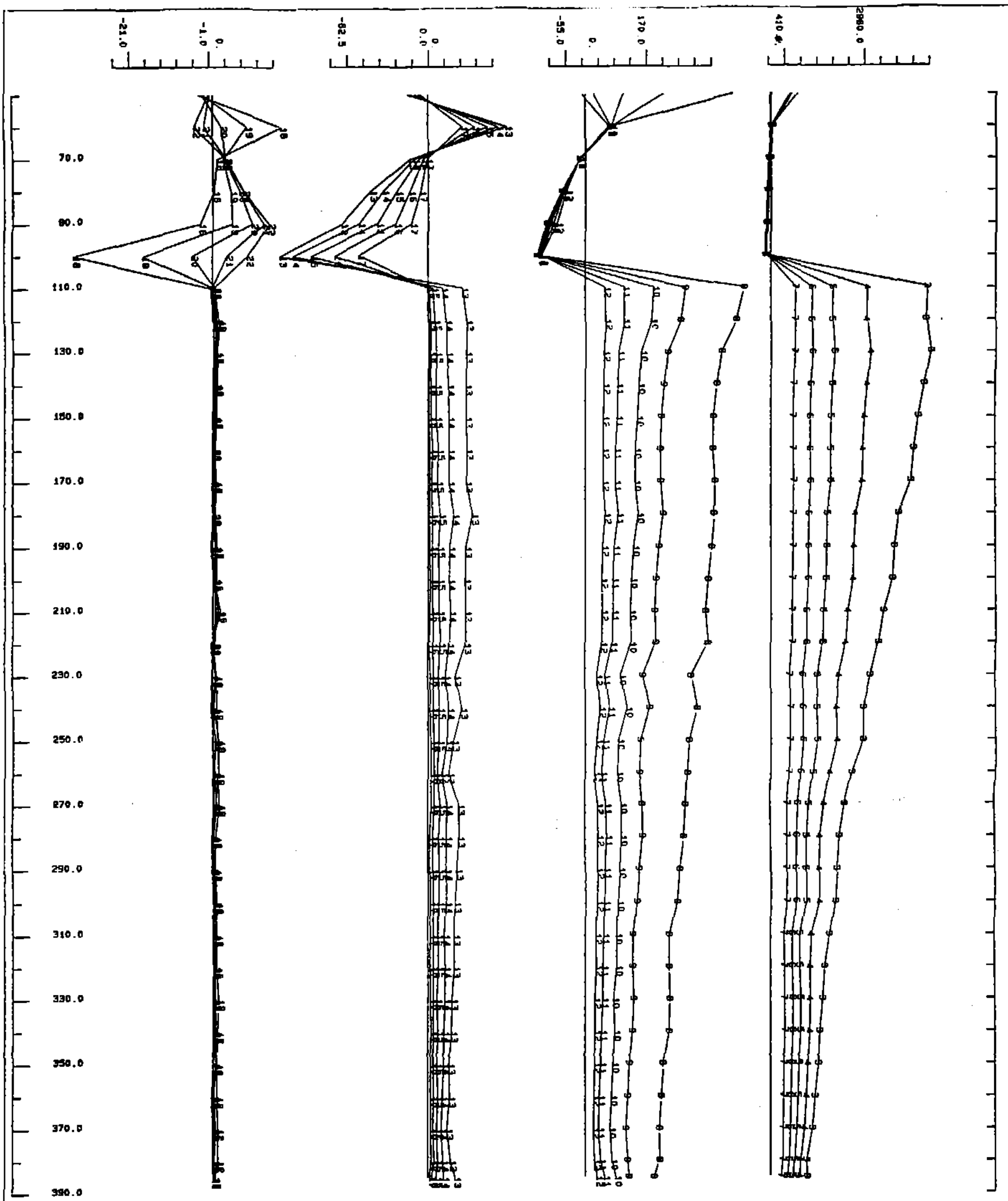
Aberfoyle Resources Limited
EXPLORATION DIVISION

REVISIONS				
Init.	Date	Init.	Date	
Location Code :				

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

Scale : AS SHOWN
Date : MARCH 1992

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



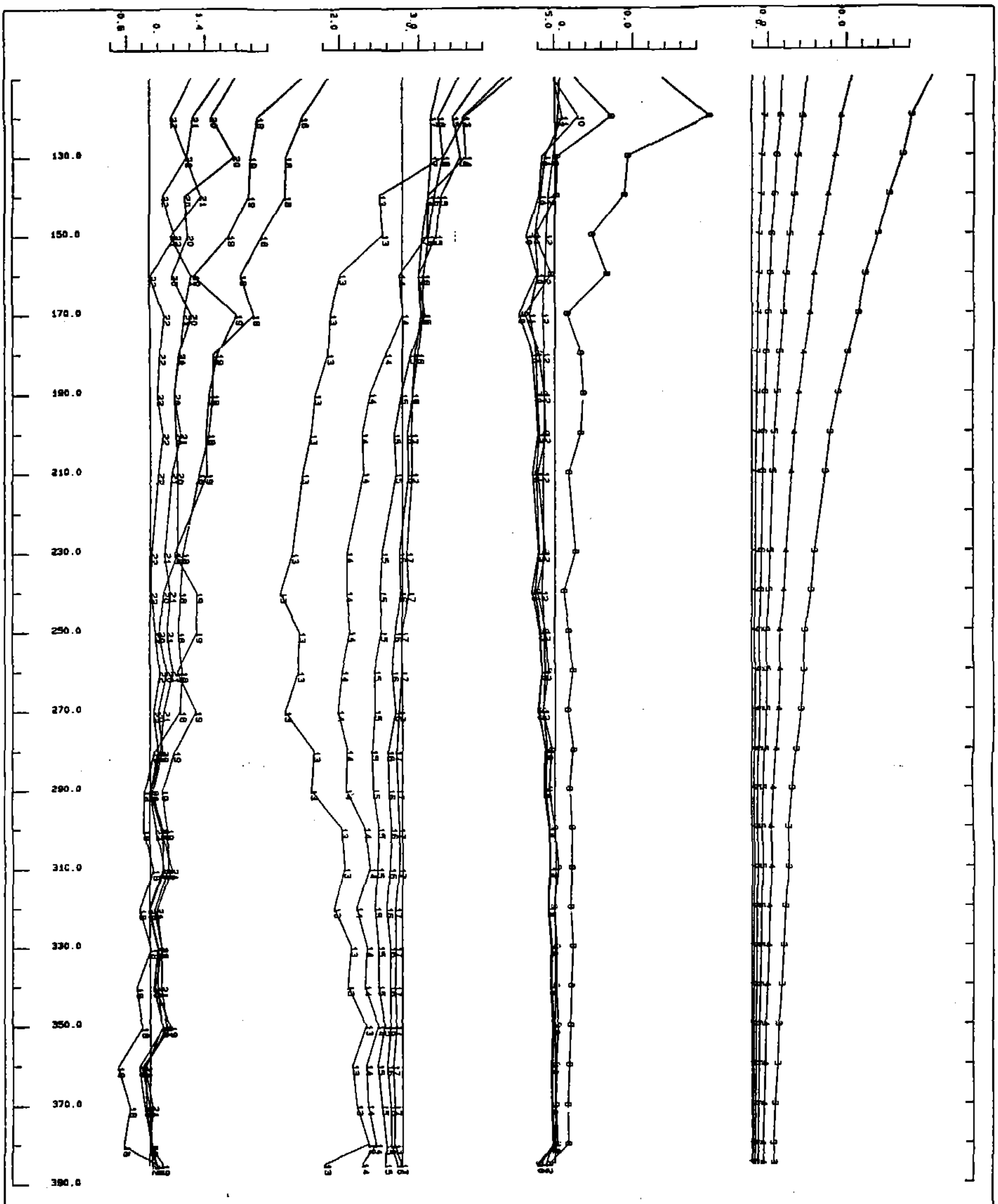
BASIN_LAKE

BL 89_3

DOWN HOLE EM

LOOP 2

025088



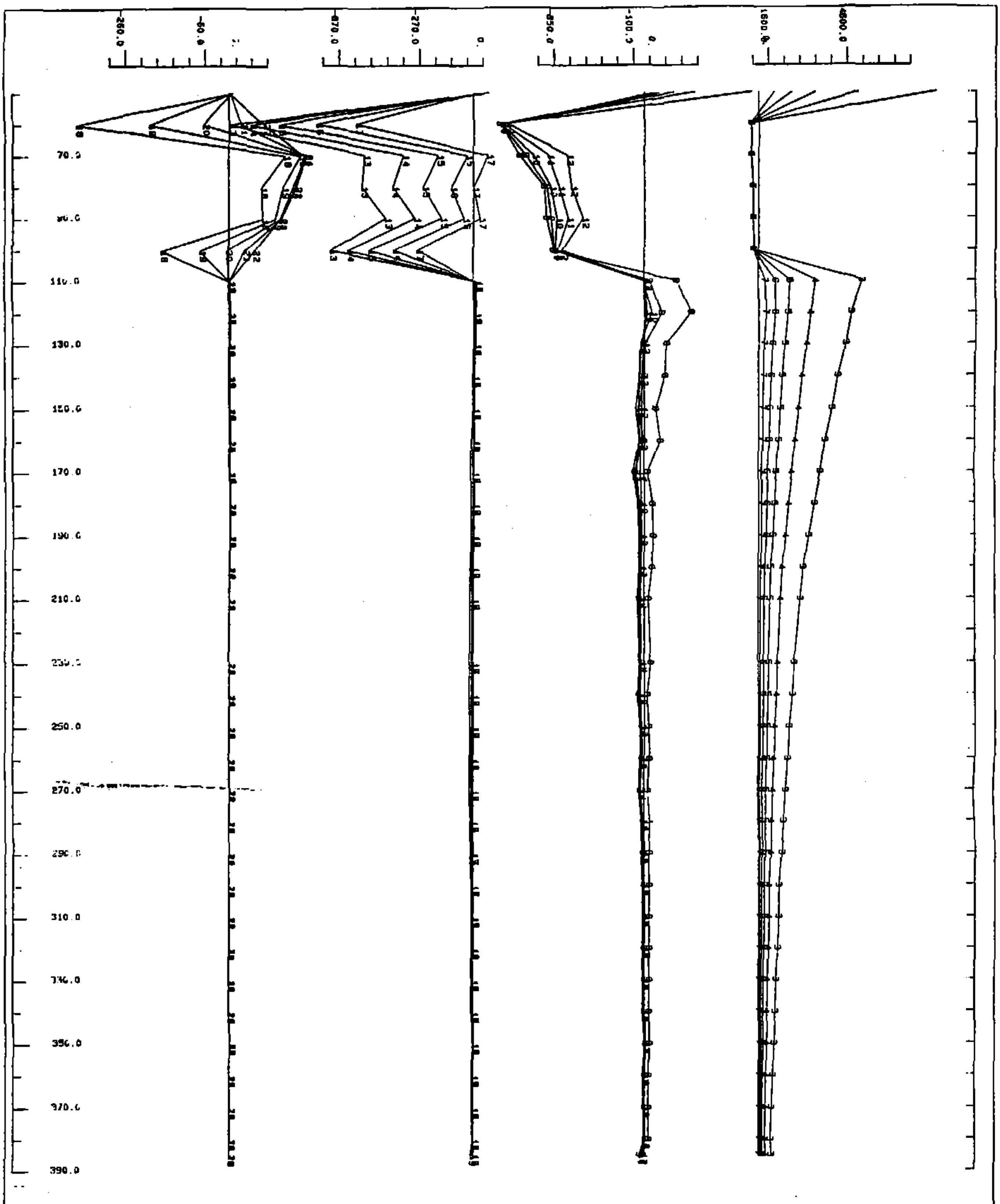
BASIN_LAKE

BL 89_3

DOWN HOLE EM

LOOP 1

Fig 2



BASIN_LAKE

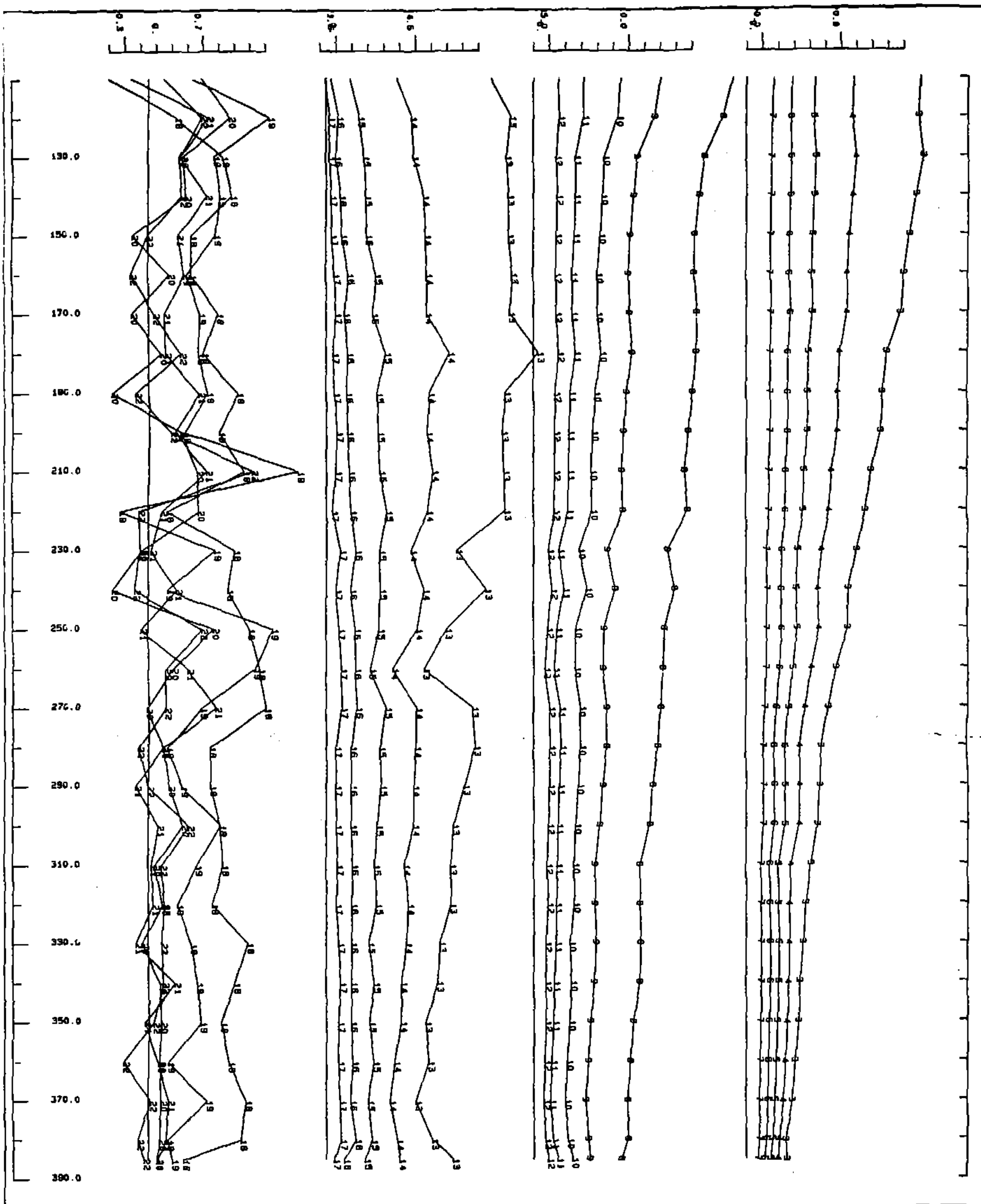
BL 89_3

DOWN HOLE EM

LOOP 1

Fig 2a

025090



BASIN_LAKE

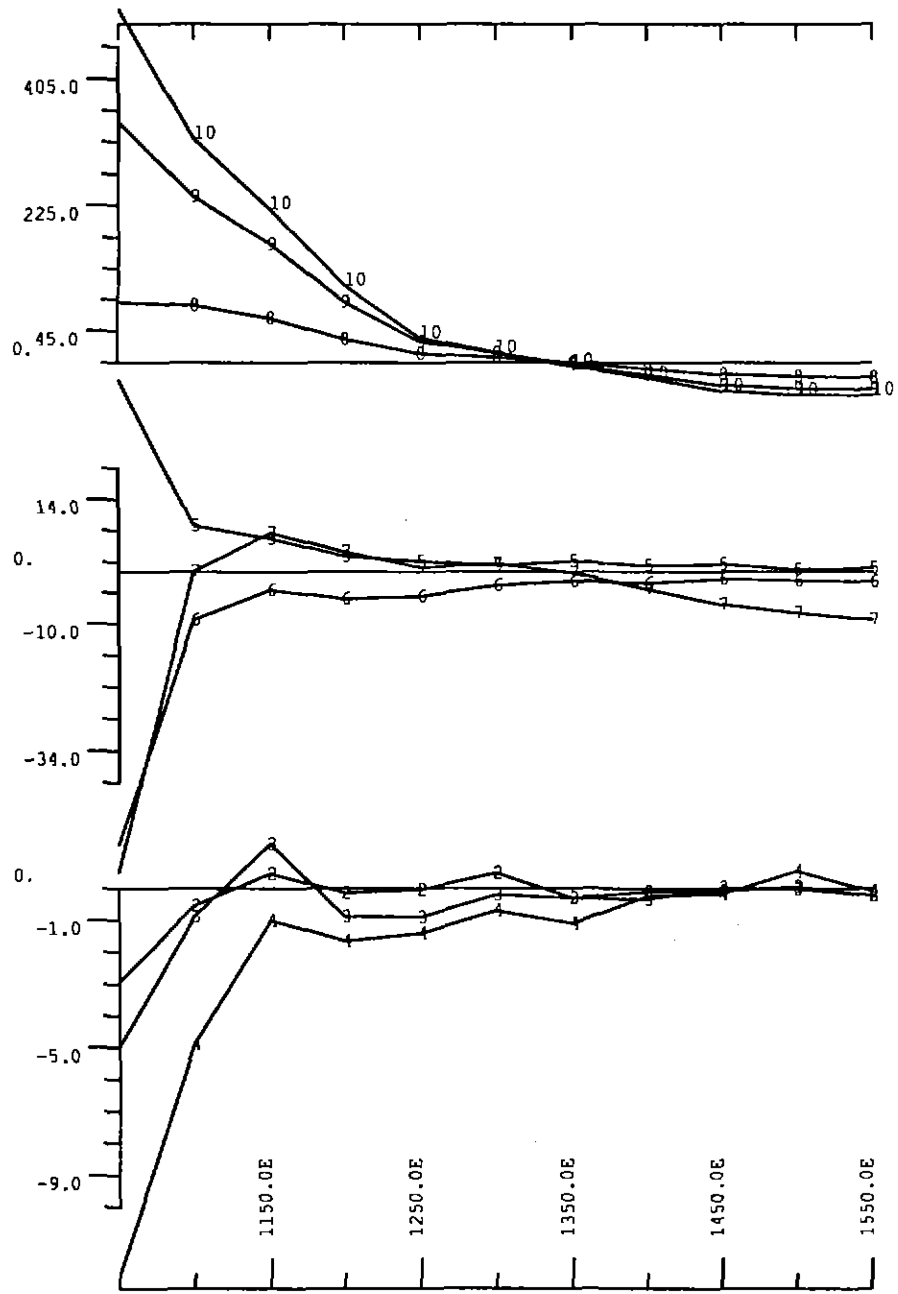
BL 89_3

DOWN HOLE EM

LOOP 2

Fig 3

APPENDIX VI



LINE 4800 N **LOOP 1BE**

****

CHANNEL 1 REDUCED AND

CHANNEL 1 POINT NORMALISED

AT 81400E line 5400 N

****

BASIN LAKE

SURFACE TRAVERSE

UTEM HZ COMPONENT 26.23Hz

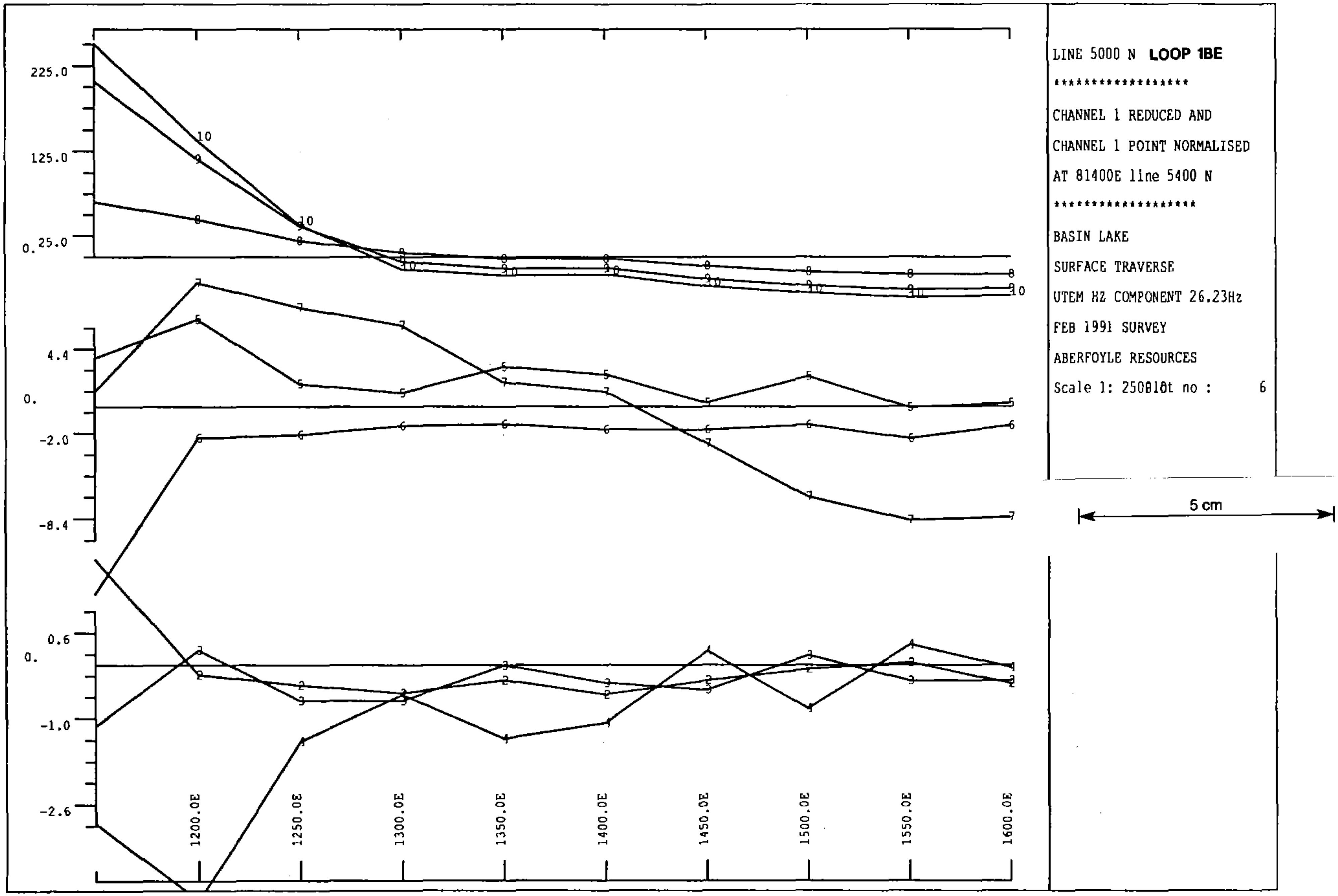
FEB 1991 SURVEY

ABERFOYLE RESOURCES

Scale 1: 5000 Plot no : 5

5 cm

025093



LINE 5000 N **LOOP 1BE**

****

CHANNEL 1 REDUCED AND

CHANNEL 1 POINT NORMALISED

AT 81400E line 5400 N

****

BASIN LAKE

SURFACE TRAVERSE

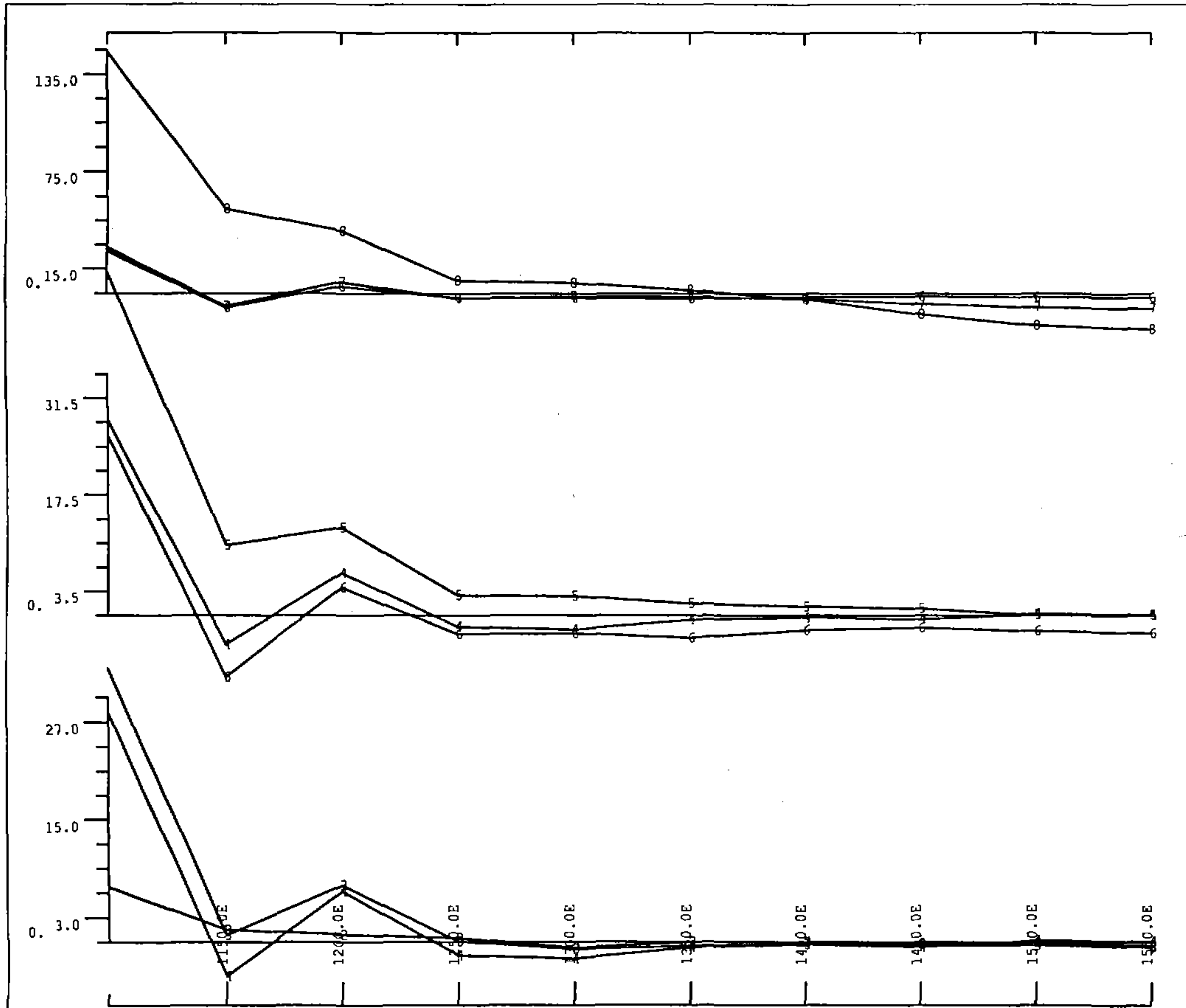
UTEM HZ COMPONENT 26.23Hz

FEB 1991 SURVEY

ABERFOYLE RESOURCES

Scale 1: 250010t no : 6

025094



LINE 5200 N **LOOP 1BE**

****

CHANNEL 1 REDUCED AND

CHANNEL 1 POINT NORMALISED

AT 81400E line 5400 N

****

BASIN LAKE

SURFACE TRAVERSE

UTEM HZ COMPONENT 26.23Hz

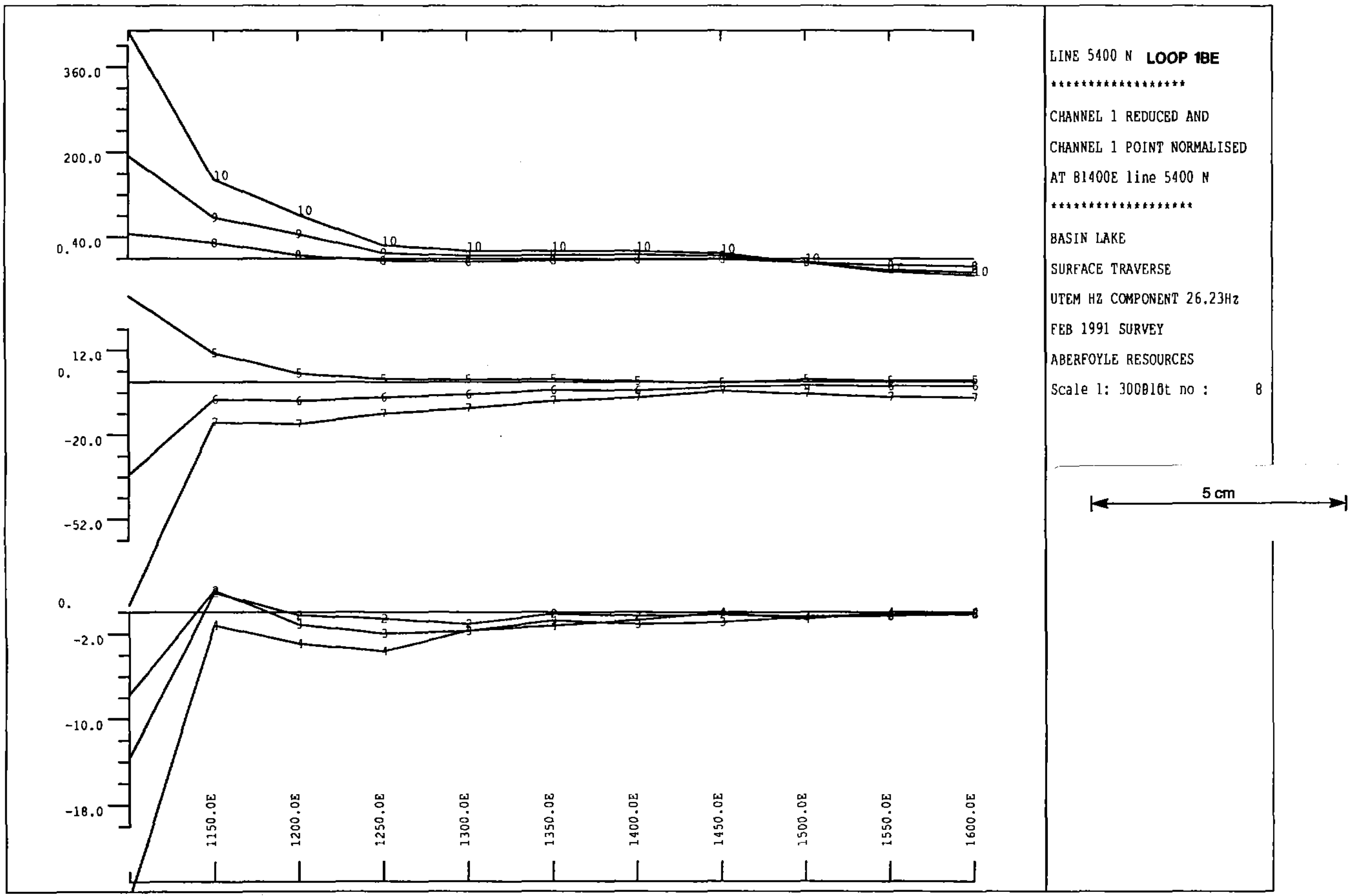
FEB 1991 SURVEY

ABERFOYLE RESOURCES

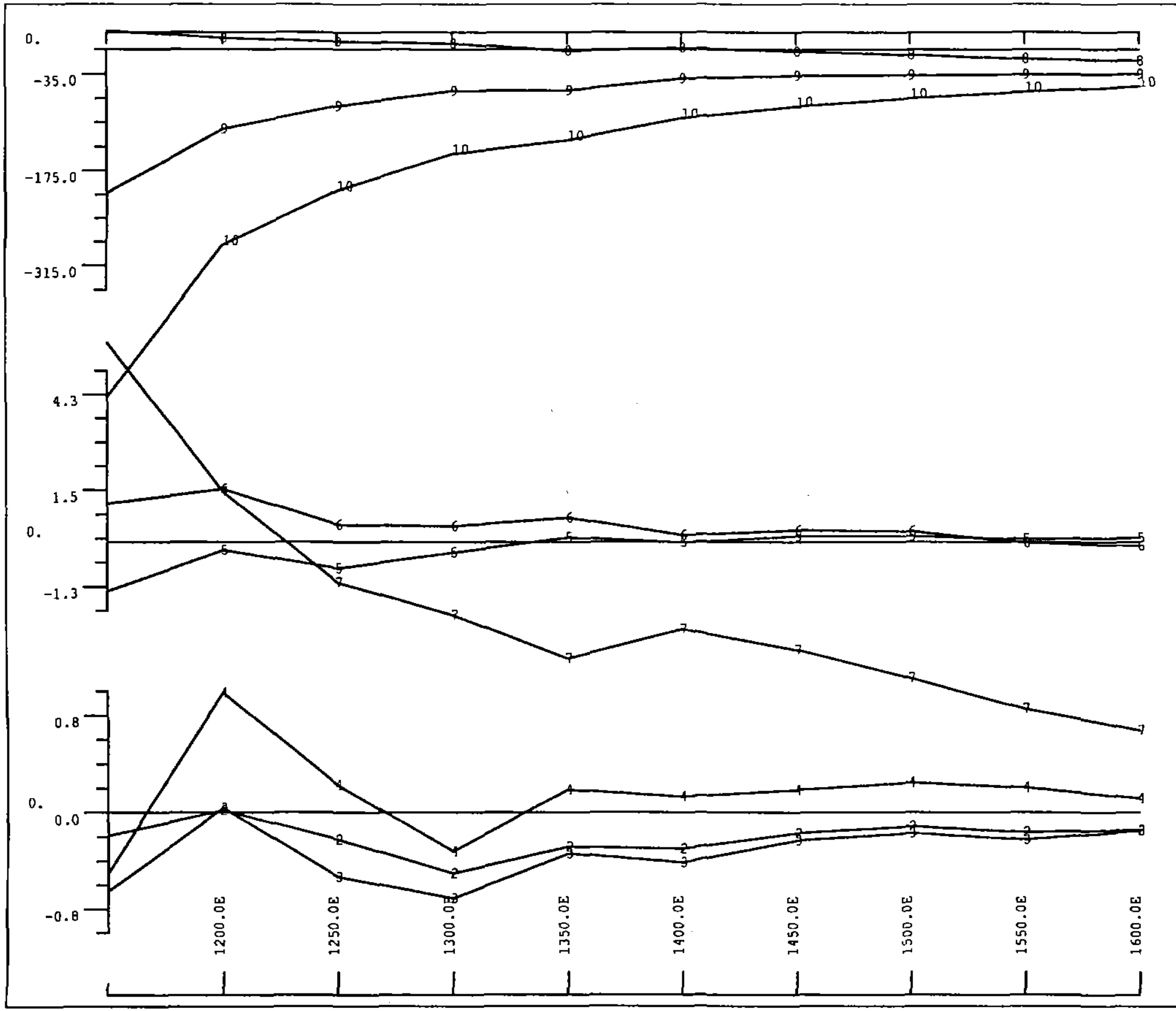
Scale 1: 250010t no : 7

5 cm

025095


LINE 5400 N LOOP 1BE
****
CHANNEL 1 REDUCED AND
CHANNEL 1 POINT NORMALISED
AT 81400E line 5400 N
****
BASIN LAKE
SURFACE TRAVERSE
UTEM HZ COMPONENT 26.23Hz
FEB 1991 SURVEY
ABERFOYLE RESOURCES
Scale 1: 30000 Plot no : 8
5 cm
360.0
200.0
40.0
0.
12.0
-20.0
-52.0
-2.0
-10.0
-18.0
1150.0E
1200.0E
1250.0E
1300.0E
1350.0E
1400.0E
1450.0E
1500.0E
1550.0E
1600.0E

025096



LINE 5600 N **LOOP 1BE**

****

CHANNEL 1 REDUCED AND

CHANNEL 1 POINT NORMALISED

AT 81400E line 5400 N

****

BASIN LAKE

SURFACE TRAVERSE

UTEM HZ COMPONENT 26.23Hz

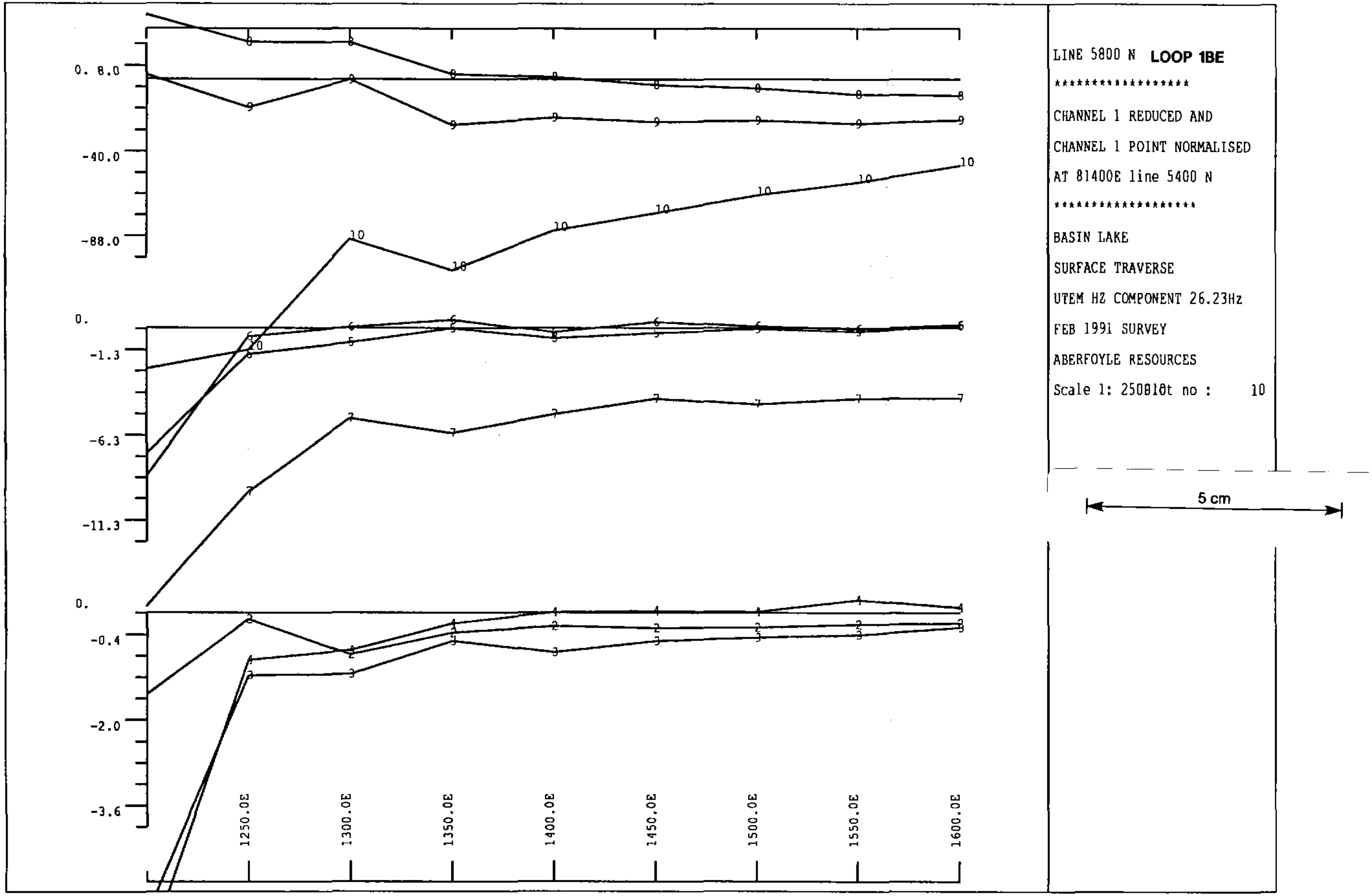
FEB 1991 SURVEY

ABERFOYLE RESOURCES

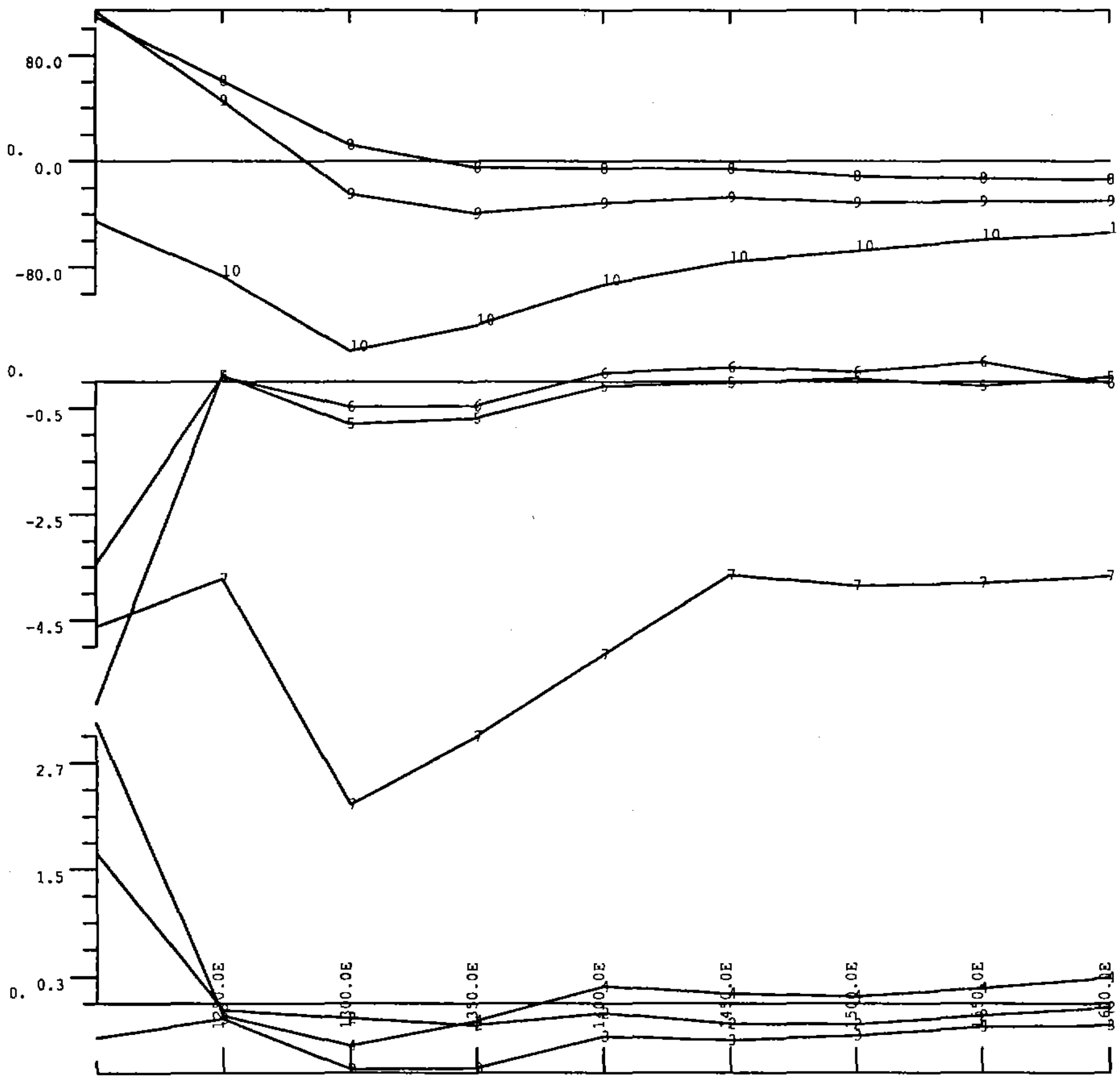
Scale 1: 250010t no : 9

5 cm

025097


0. 8.0
-40.0
-88.0
0.
-1.3
-6.3
-11.3
0.
-0.4
-2.0
-3.6
1250.0E
1300.0E
1350.0E
1400.0E
1450.0E
1500.0E
1550.0E
1600.0E
LINE 5800 N LOOP 1BE
****
CHANNEL 1 REDUCED AND
CHANNEL 1 POINT NORMALISED
AT 81400E line 5400 N
****
BASIN LAKE
SURFACE TRAVERSE
UTEM HZ COMPONENT 26.23Hz
FEB 1991 SURVEY
ABERFOYLE RESOURCES
Scale 1: 250010t no : 10
5 cm

025098



LINE 6000 N **LOOP 1BE**

****

CHANNEL 1 REDUCED AND

CHANNEL 1 POINT NORMALISED

AT 81400E line 5400 N

****

BASIN LAKE

SURFACE TRAVERSE

UTEM HZ COMPONENT 26.23Hz

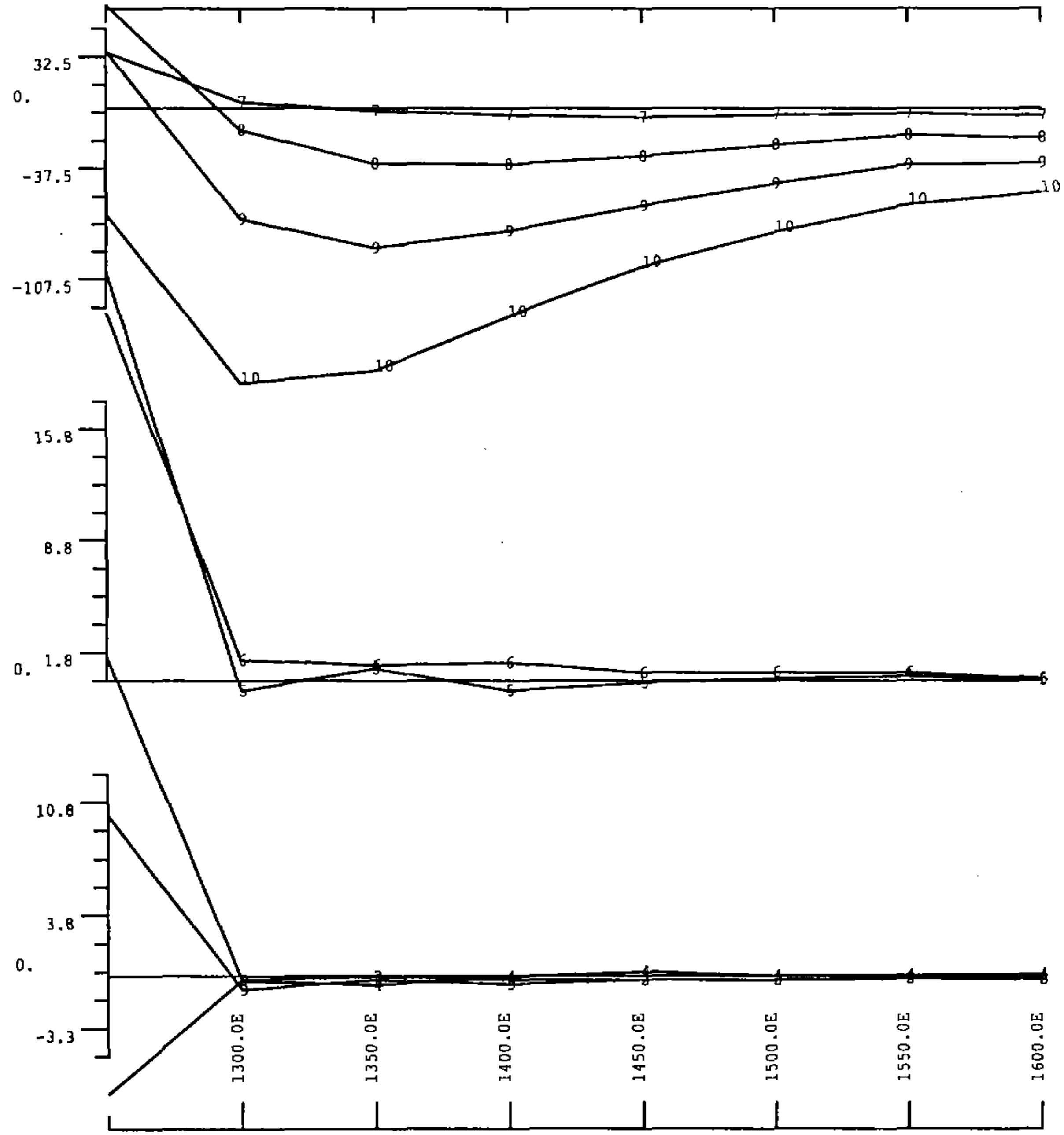
FEB 1991 SURVEY

ABERFOYLE RESOURCES

Scale 1: 2500 Plot no : 11

5 cm

025099



LINE 6200 N **LOOP 1BE**

****

CHANNEL 1 REDUCED AND

CHANNEL 1 POINT NORMALISED

AT 81400E line 5400 N

****

BASIN LAKE

SURFACE TRAVERSE

UTEM HZ COMPONENT 26.23Hz

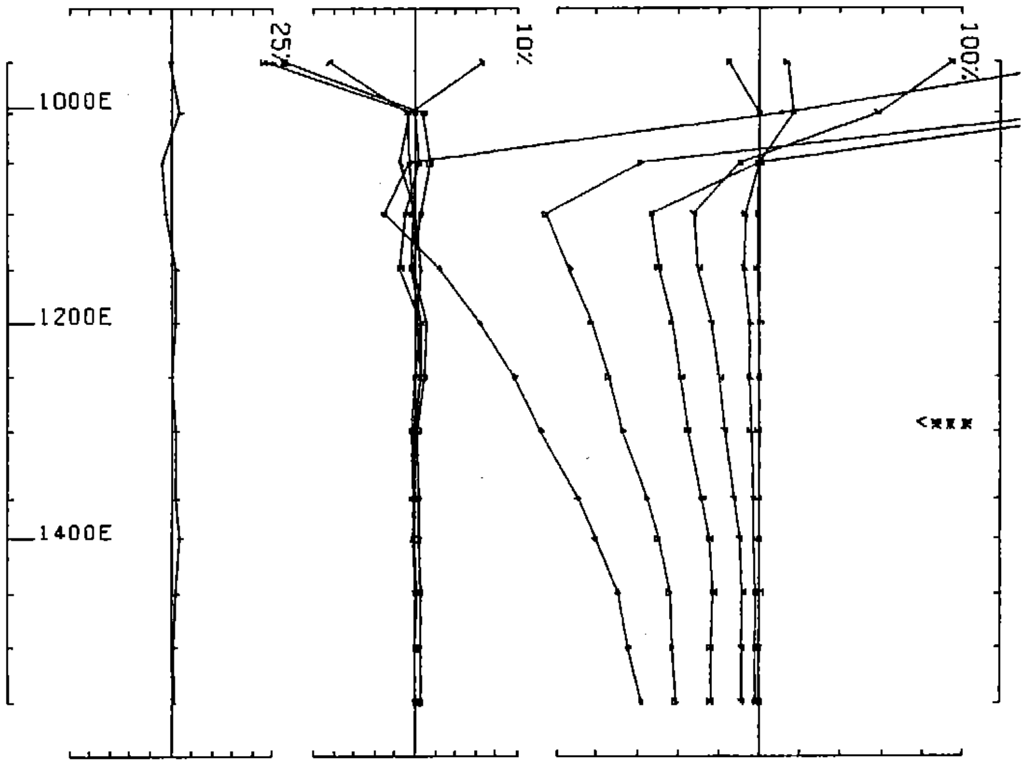
FEB 1991 SURVEY

ABERFOYLE RESOURCES

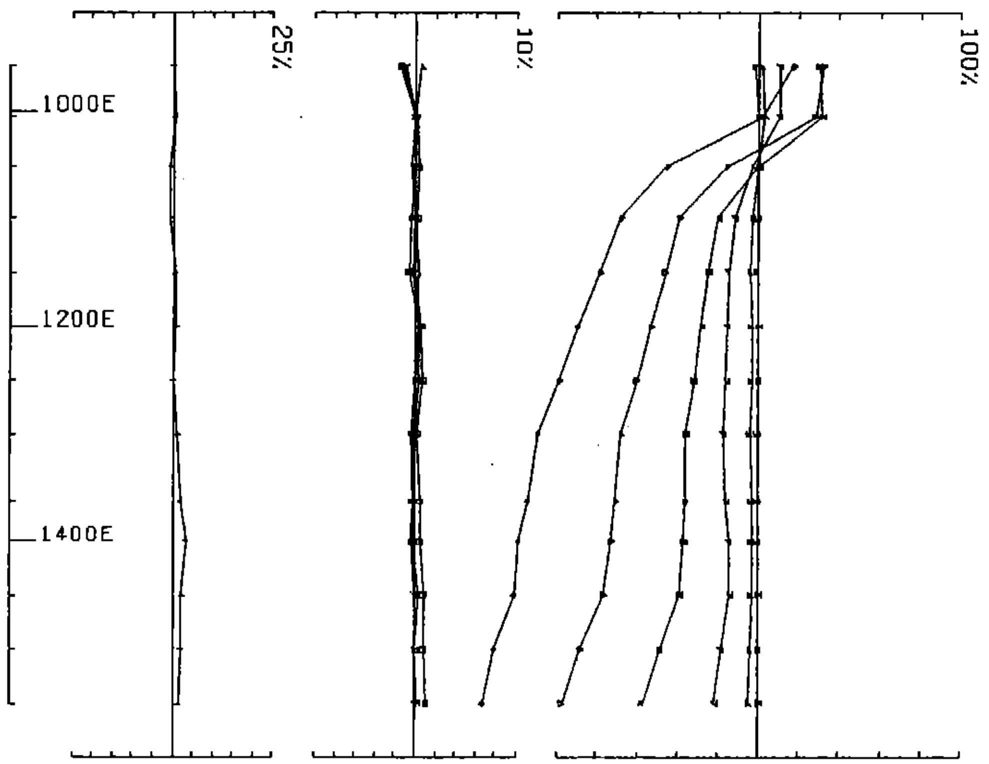
Scale 1: 2500 Plot no : 12

5 cm

025100

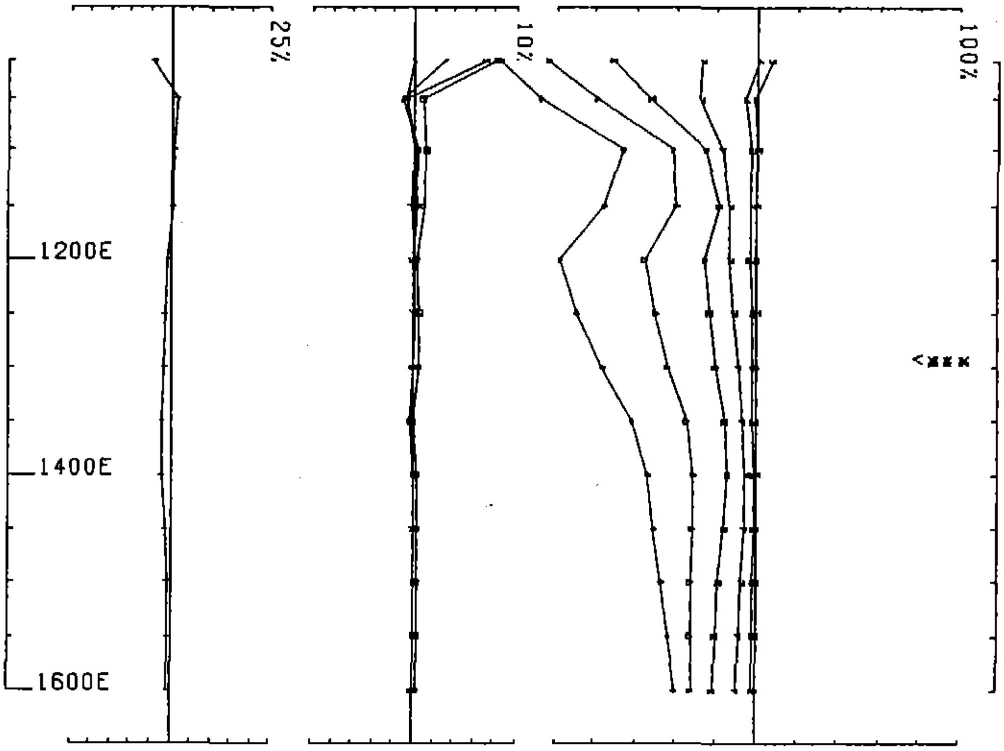


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 3400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.



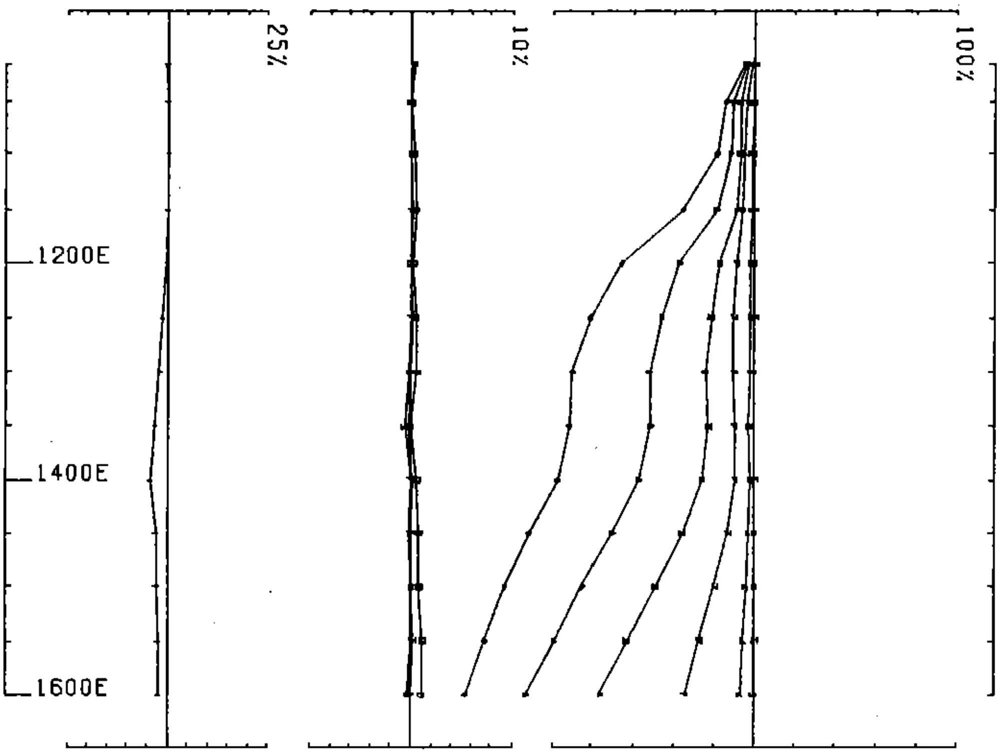
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 28E LINE 3400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025103



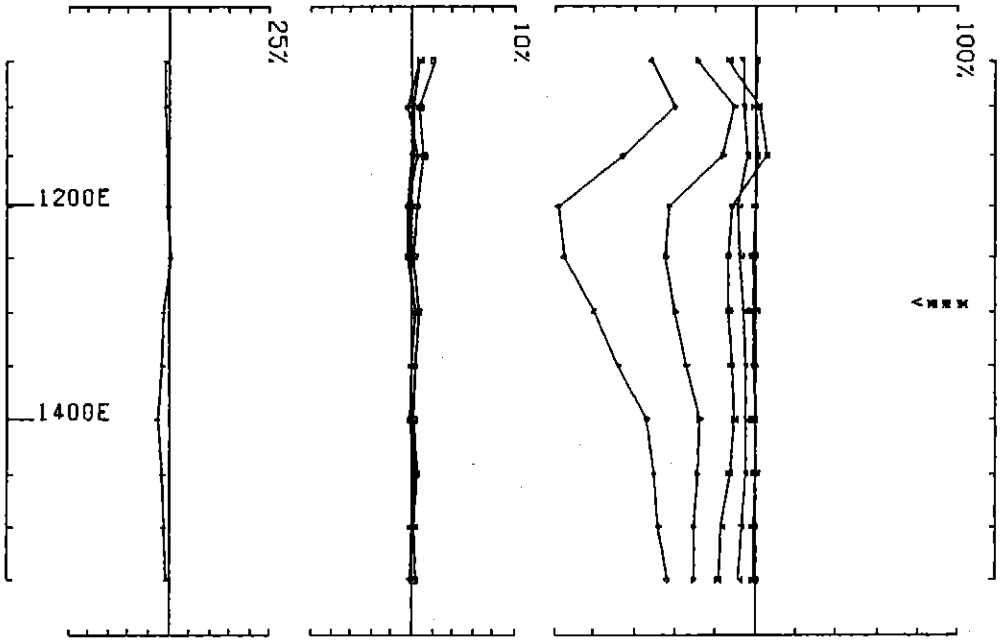
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 28E LINE 3600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025104



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 3600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025105



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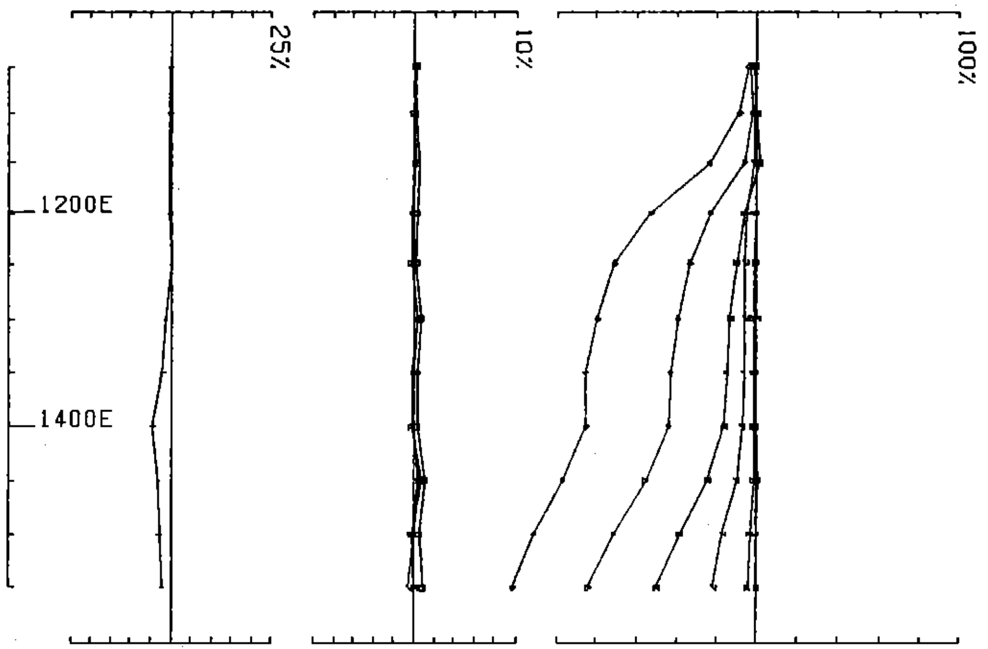
LOOP NO 28E LINE 3800 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025106



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
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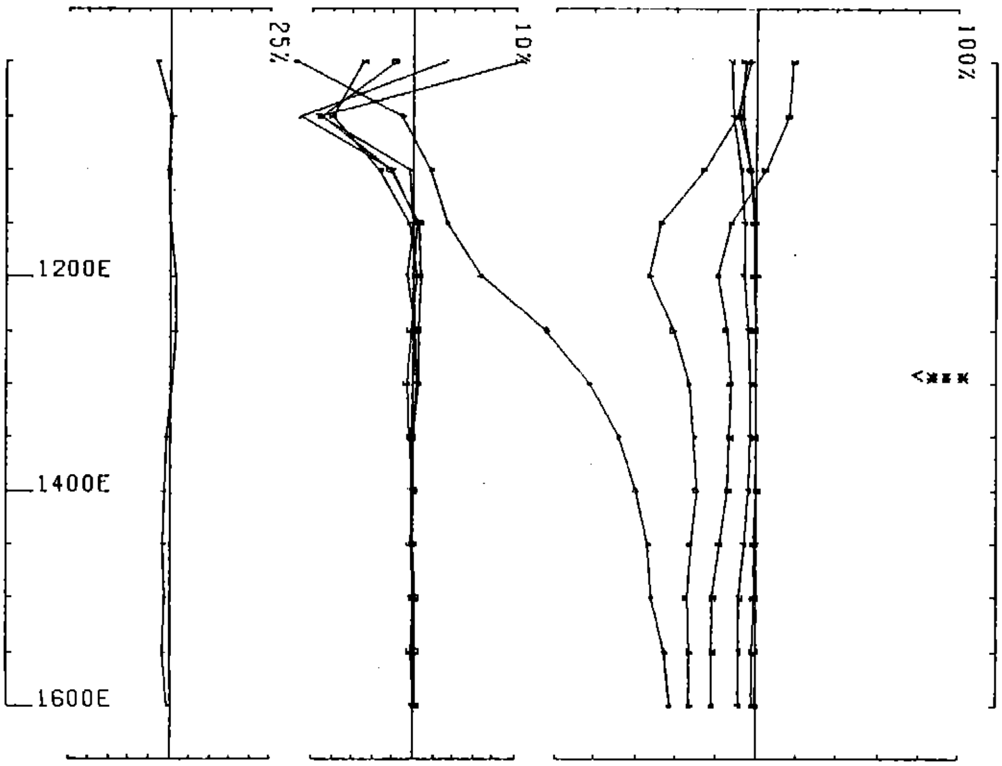
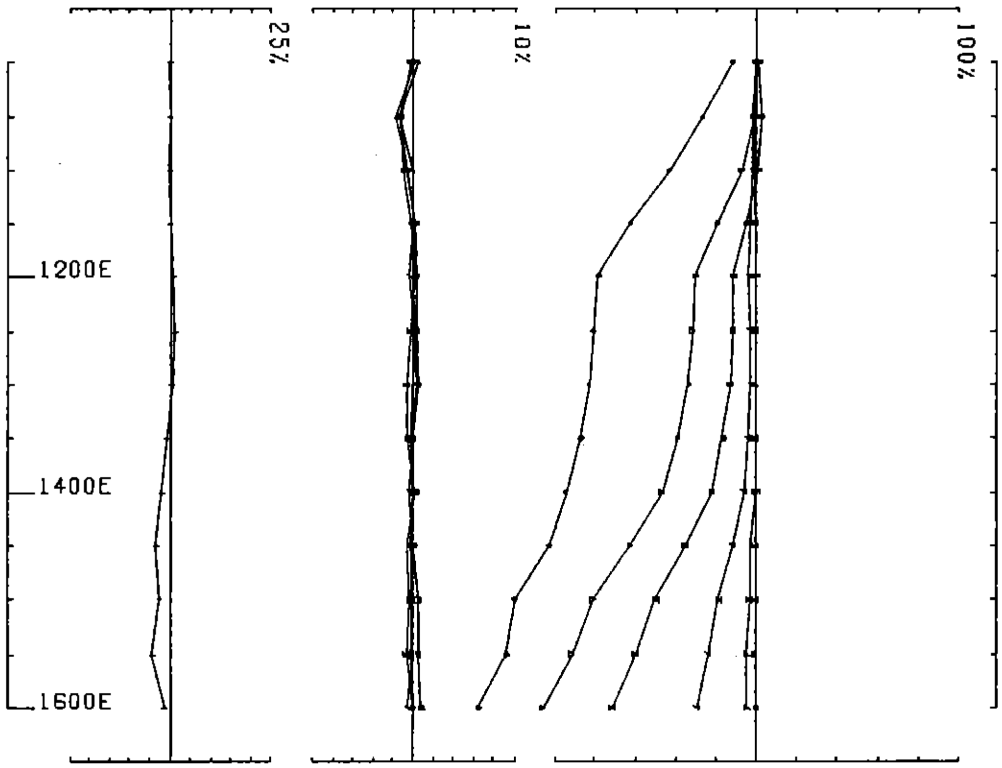
LOOP NO 2BE LINE 3800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025107

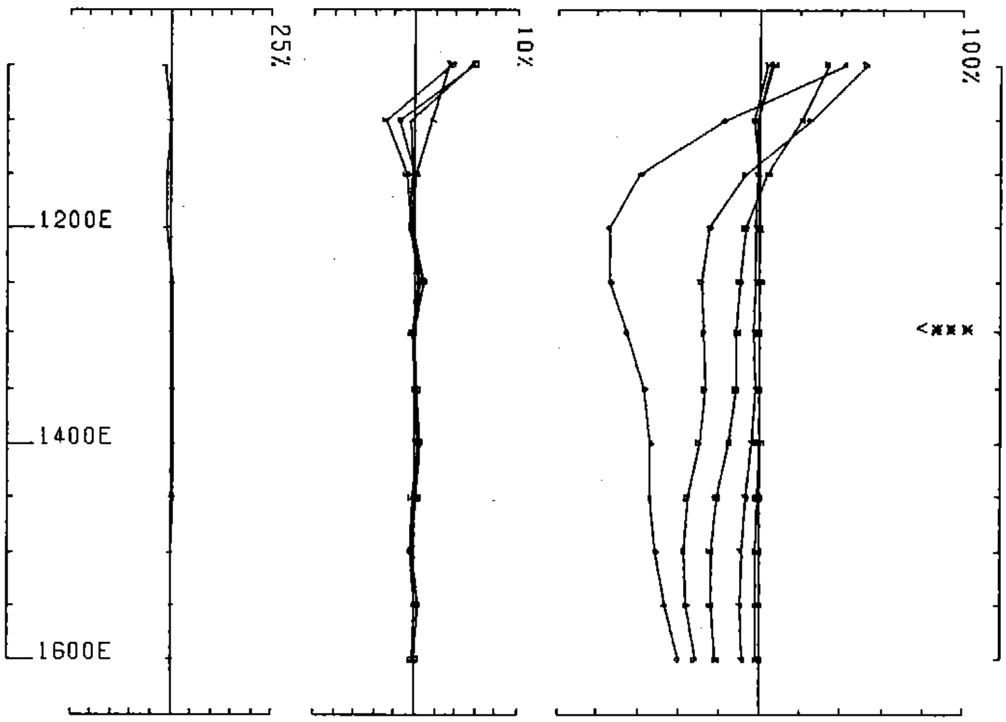


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 4000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.



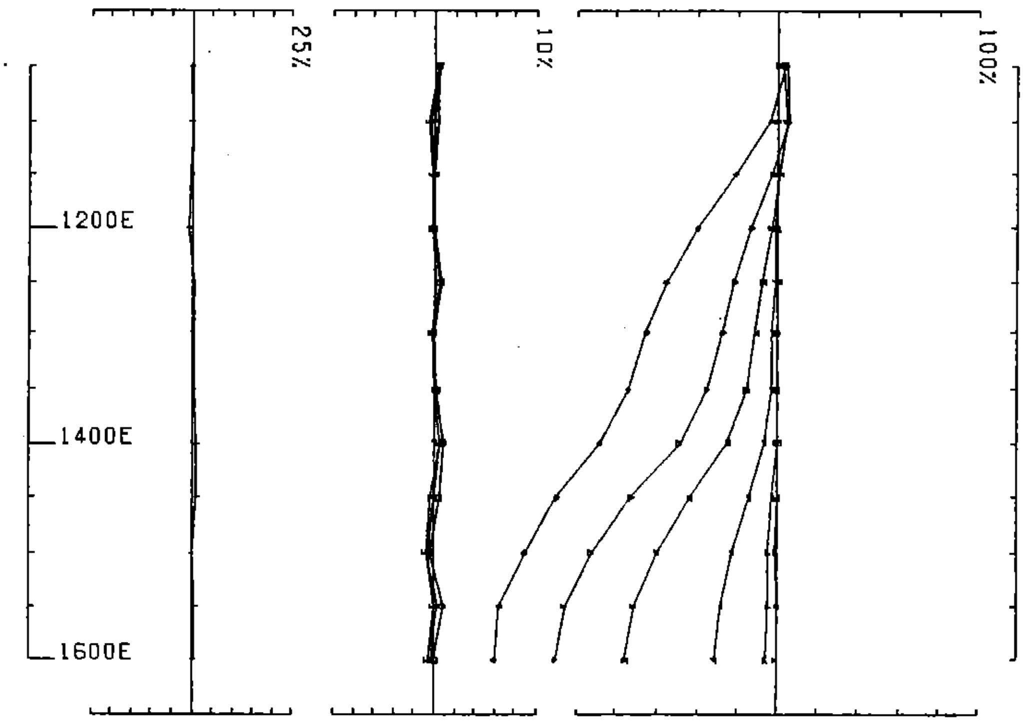
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 4000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025109



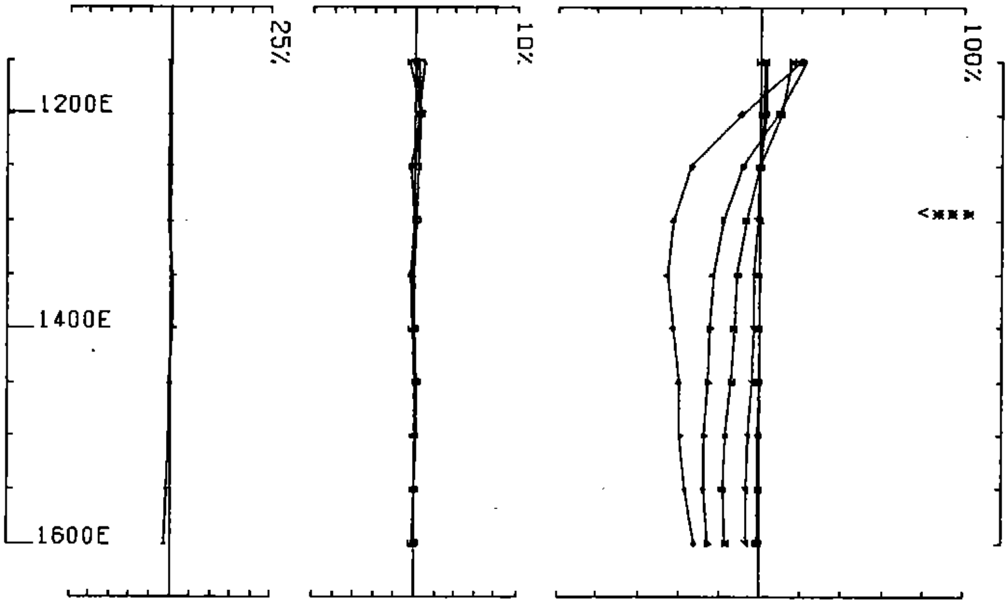
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 28E LINE 4200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025110

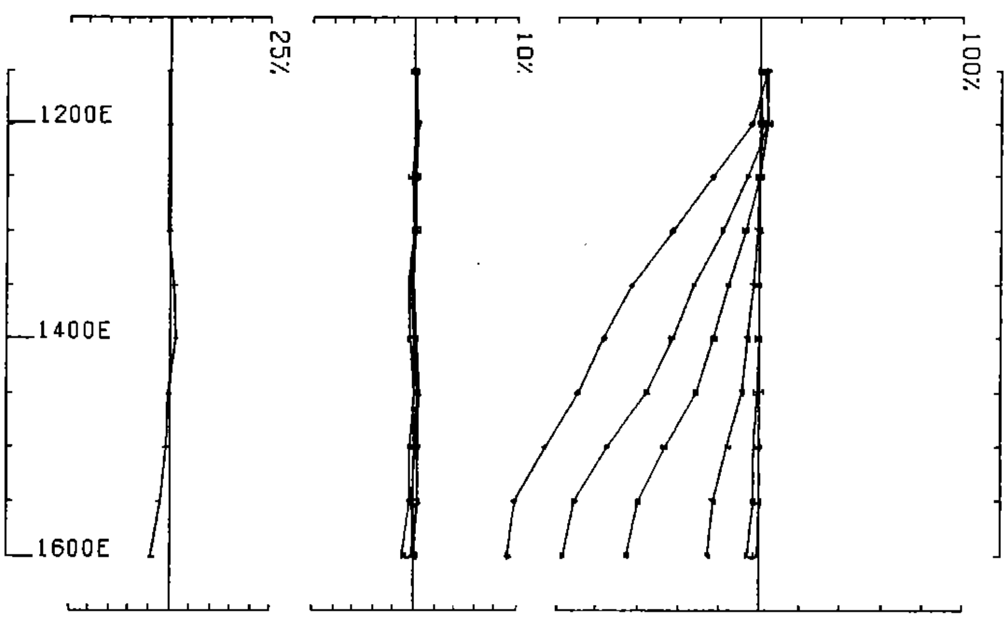


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 4200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025111

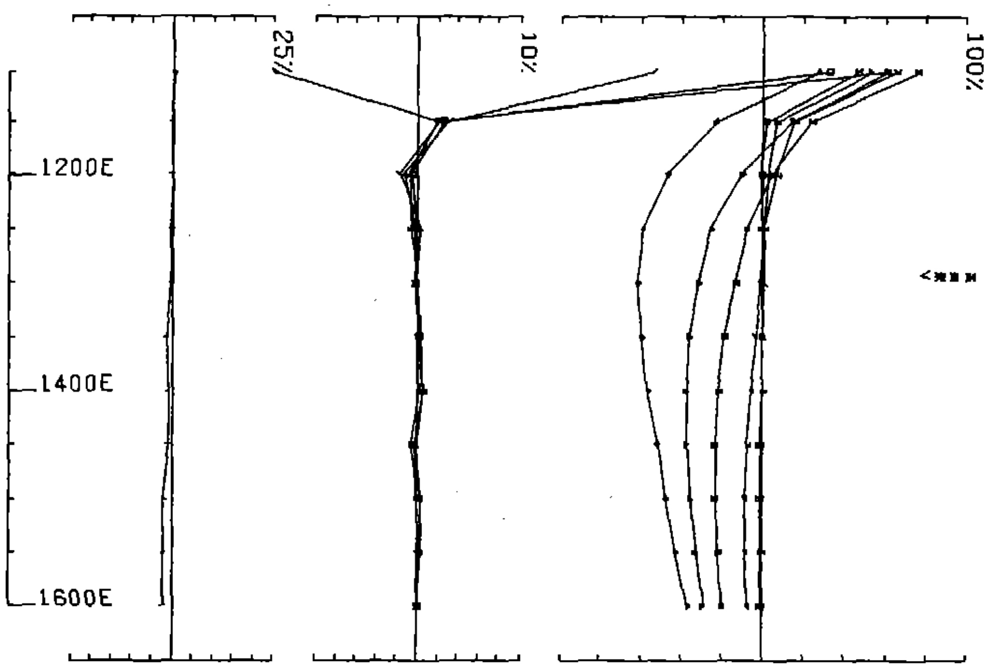


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 28E LINE 4400 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.



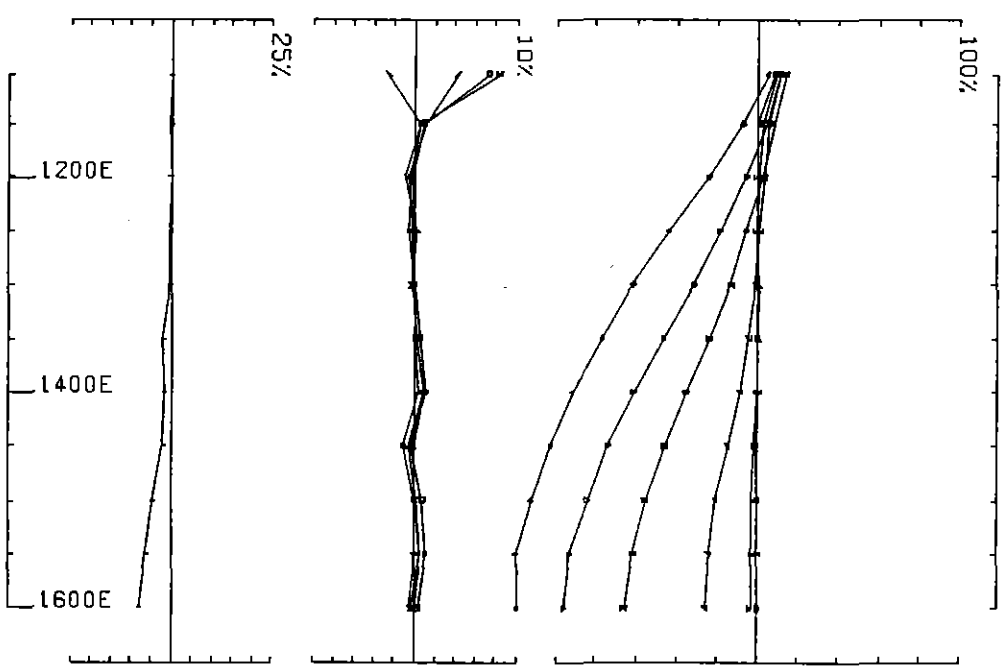
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 2BE LINE 4400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025113



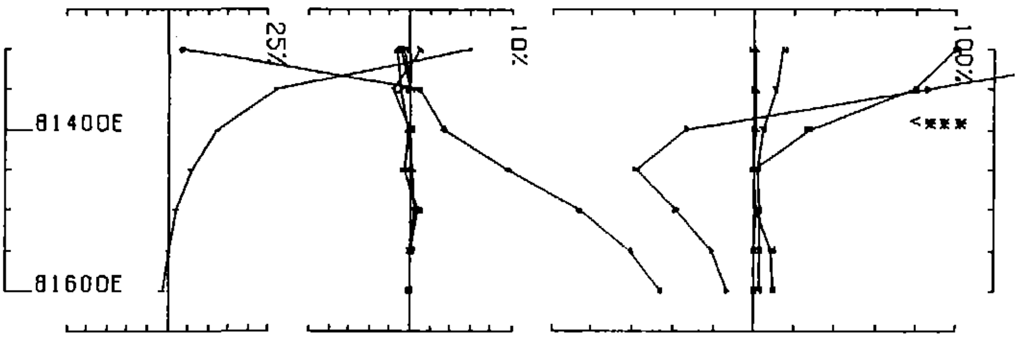
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 4600 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025114



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 2BE LINE 4600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025115



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
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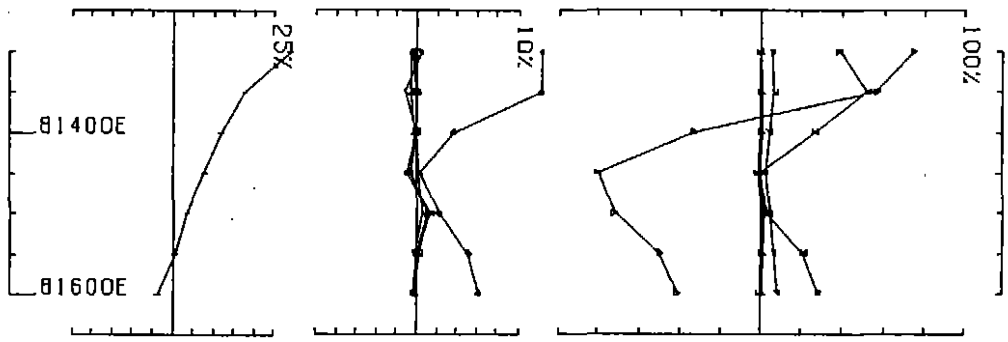
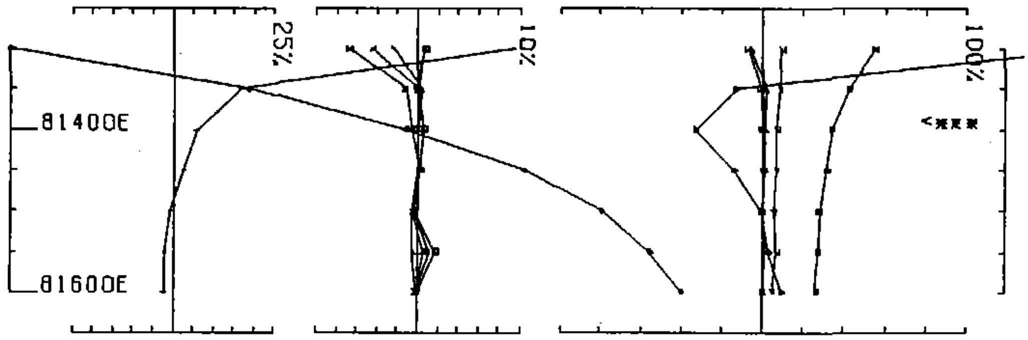
LOOP NO 38E LINE 6400 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.



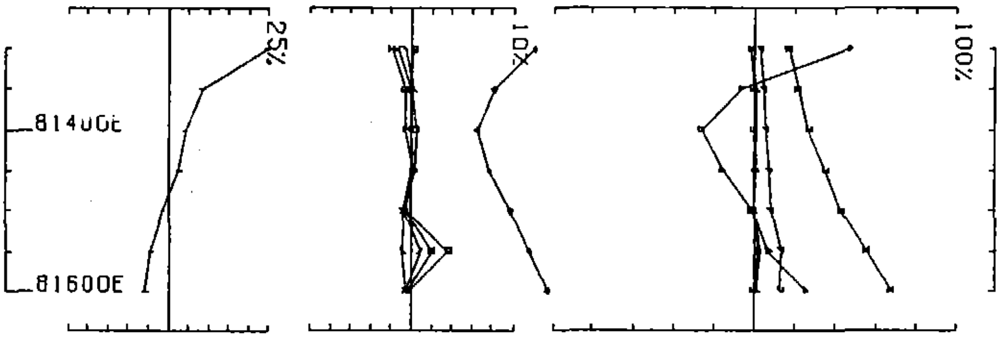
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.25
LOOP NO 38E LINE 6400 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025117

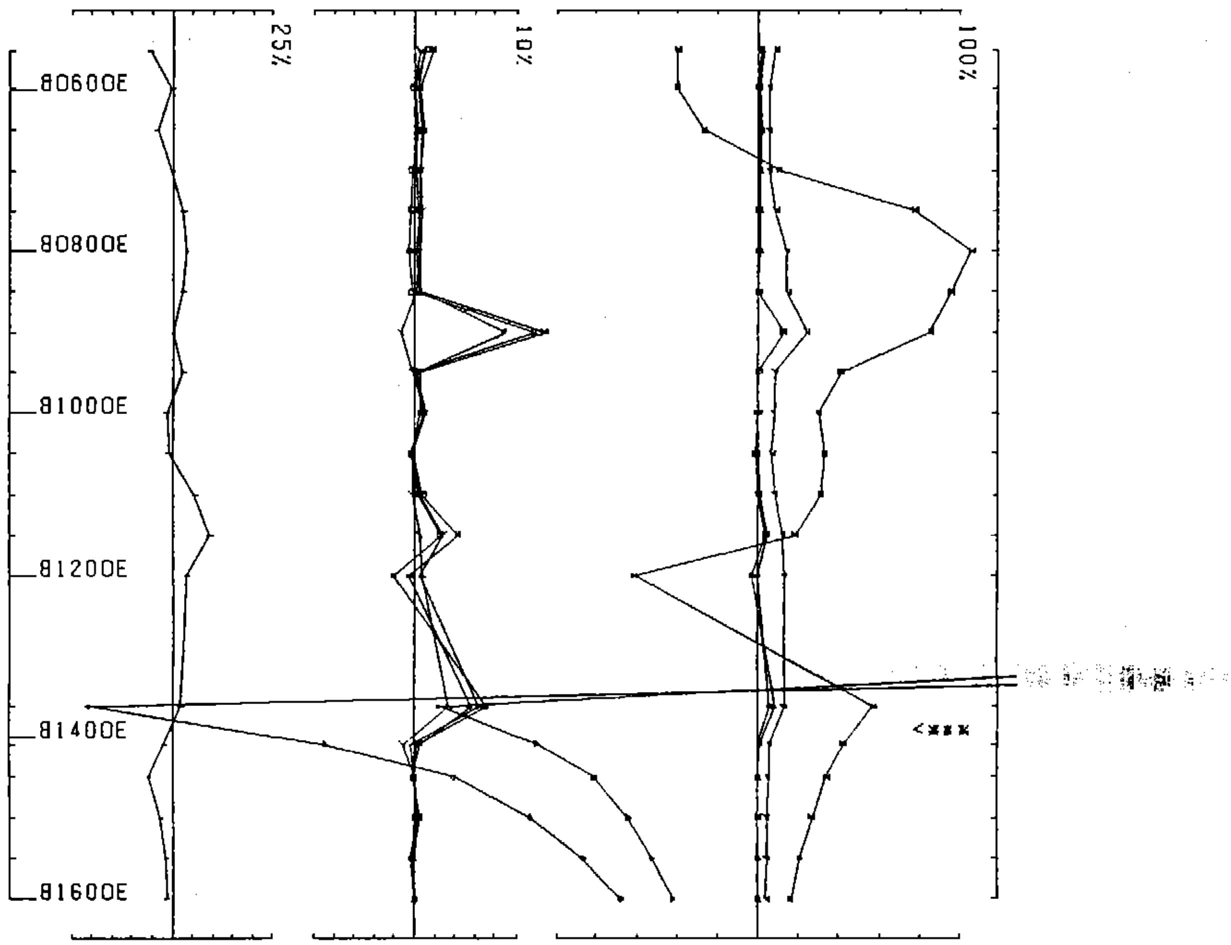


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 3BE LINE 6600 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025118



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.25
LOOP NO 3BE LINE 6600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
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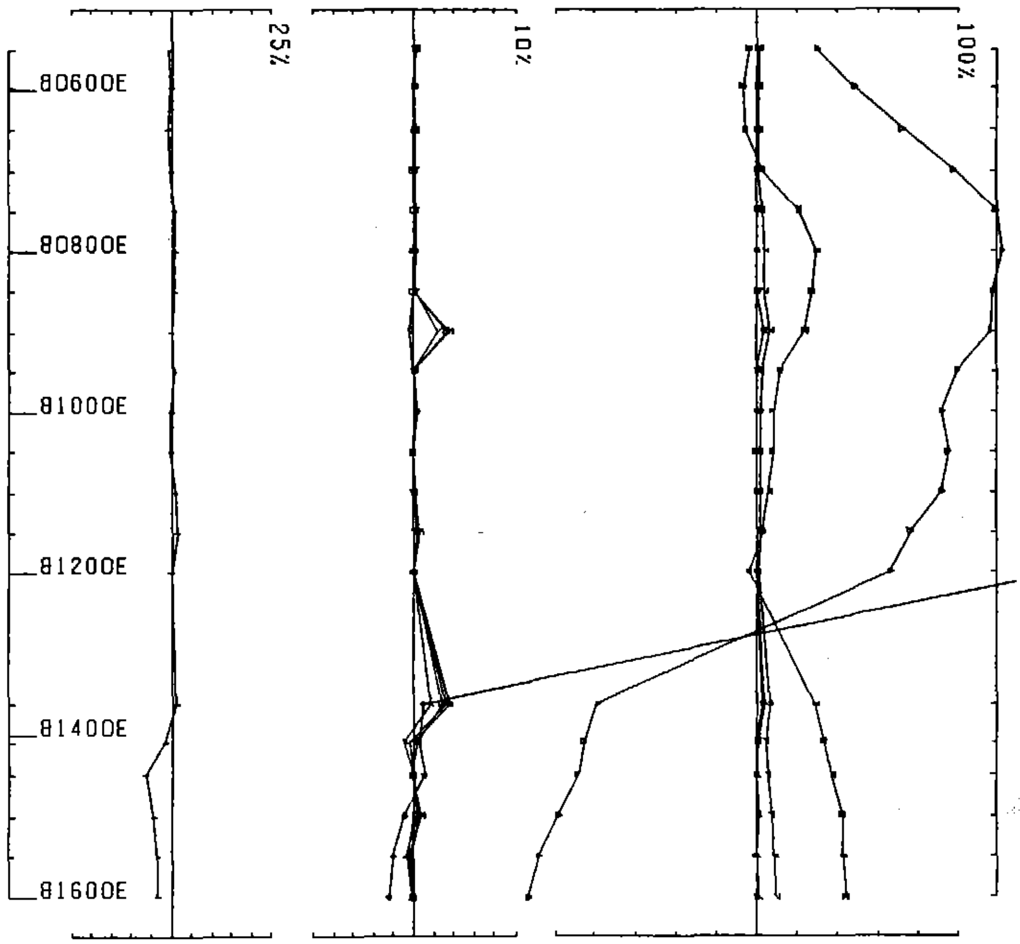
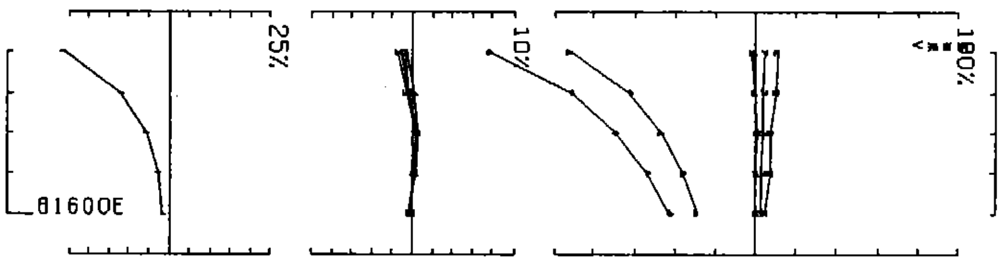
LOOP NO 38E LINE 6800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.



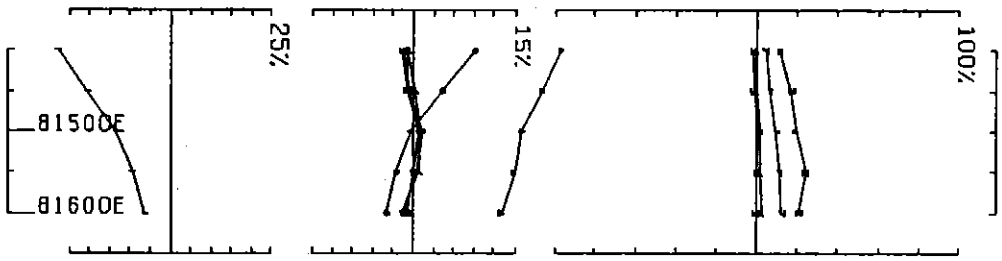
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 3BE LINE 6800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025121



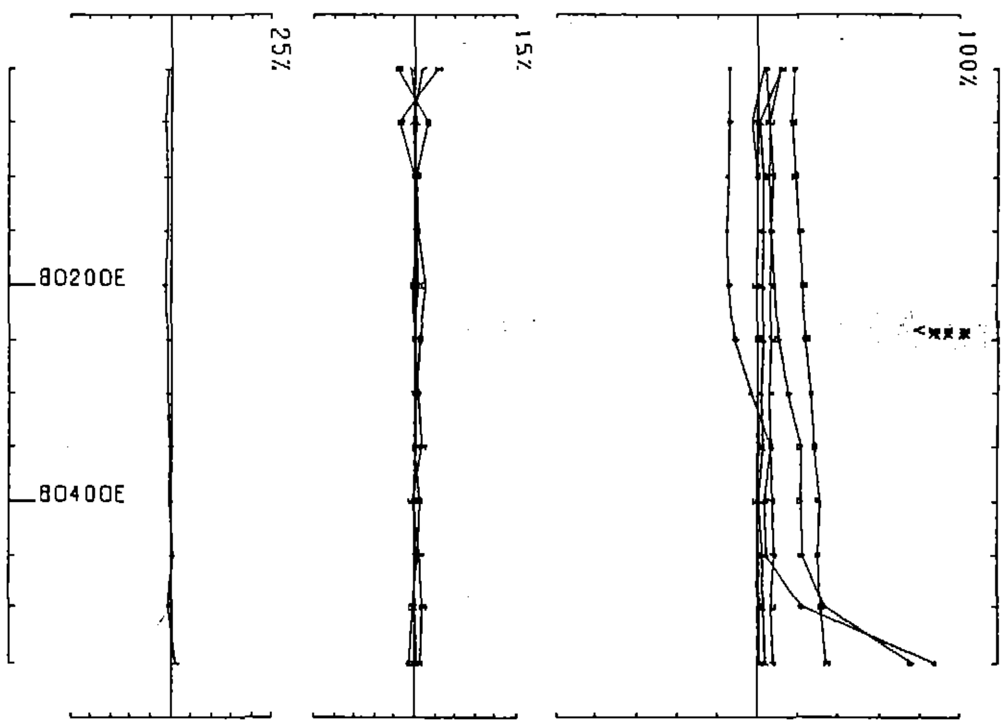
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 38E LINE 7000 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025122



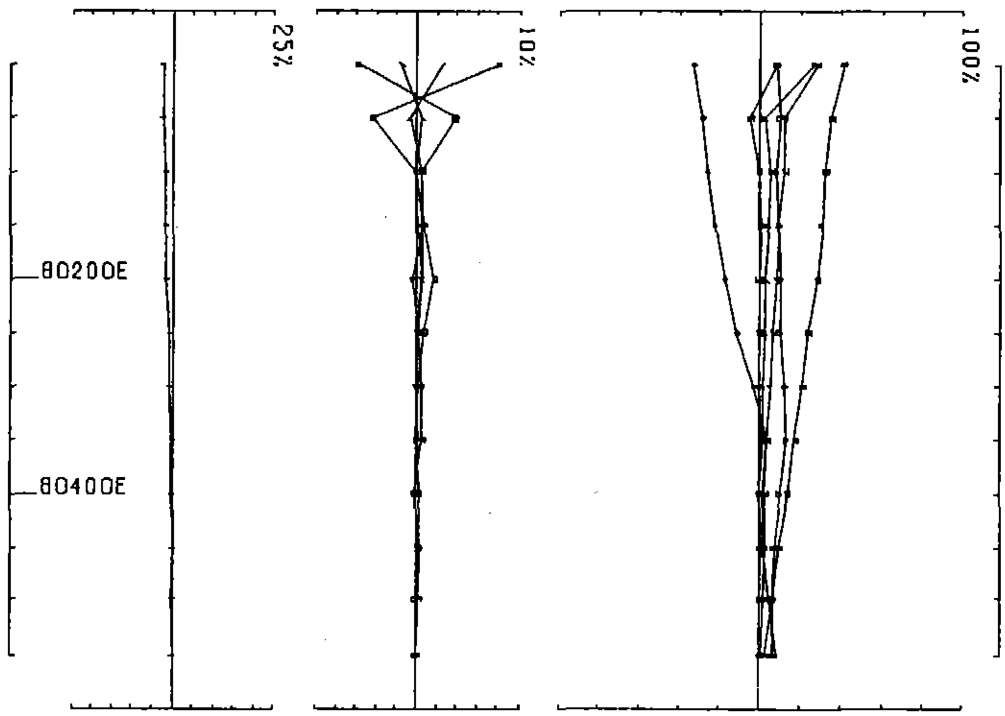
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 3BE LINE 7000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025123



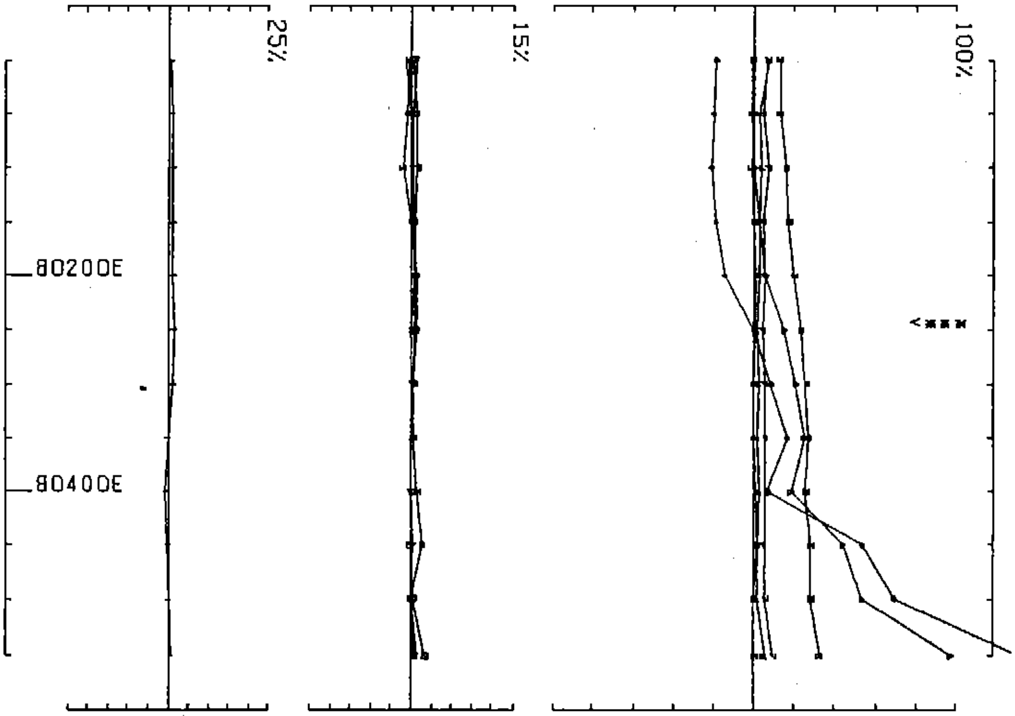
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 1800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025124



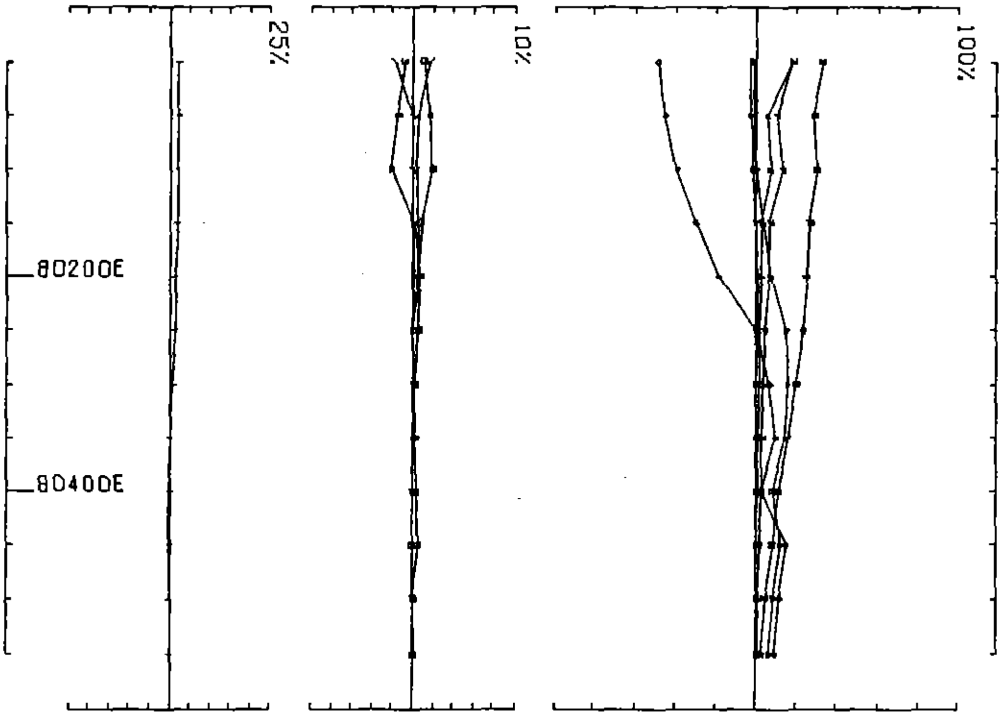
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 1800 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025125



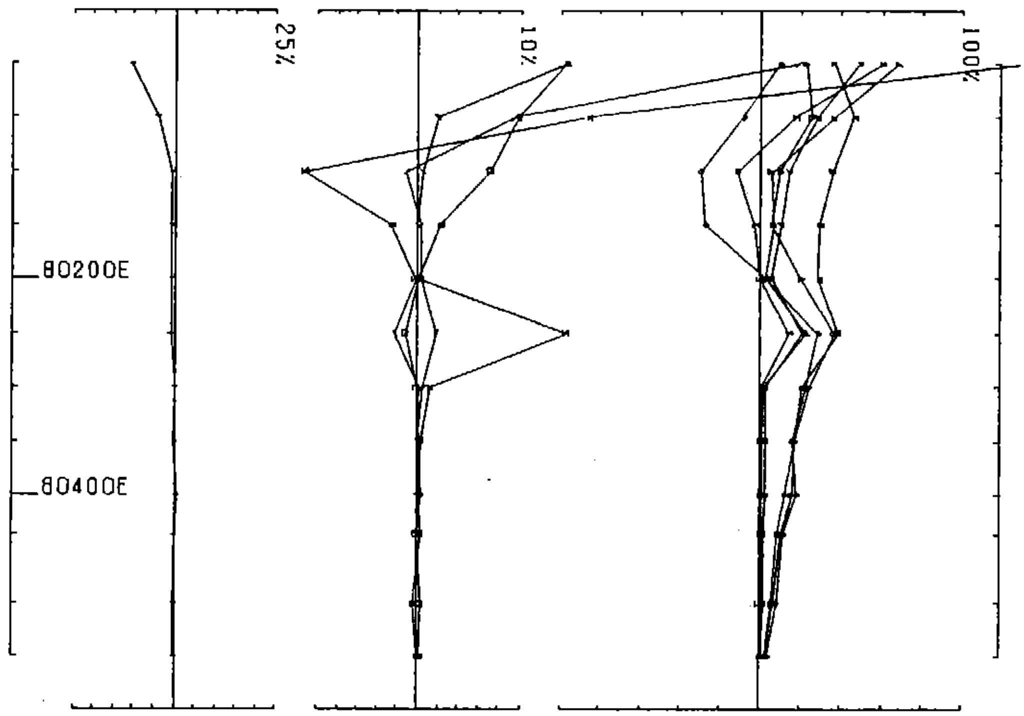
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025126



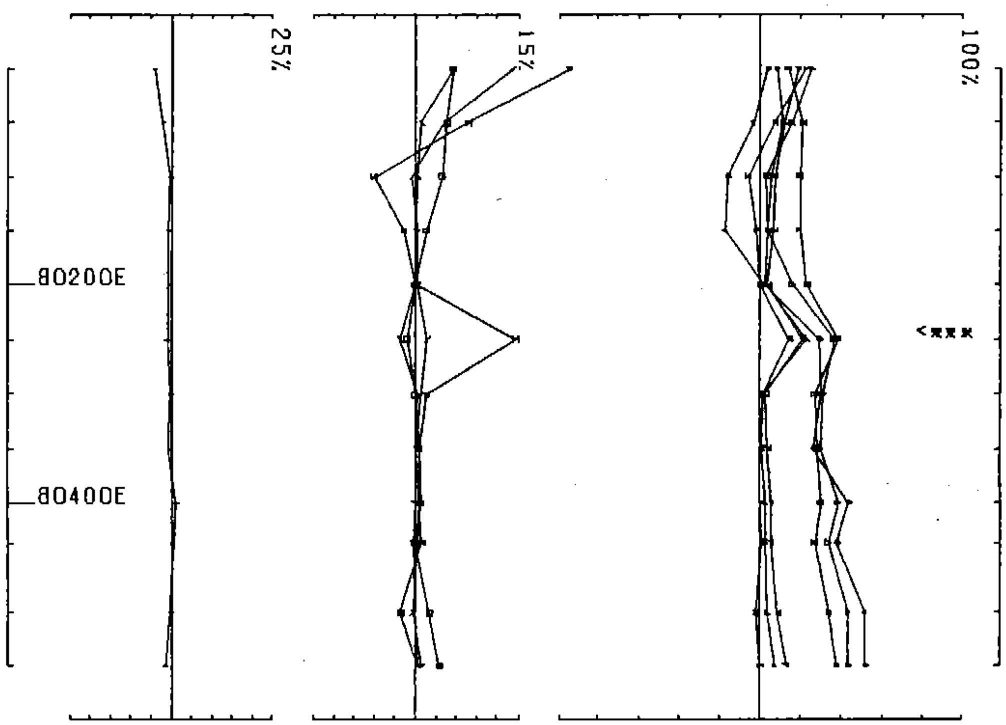
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025127



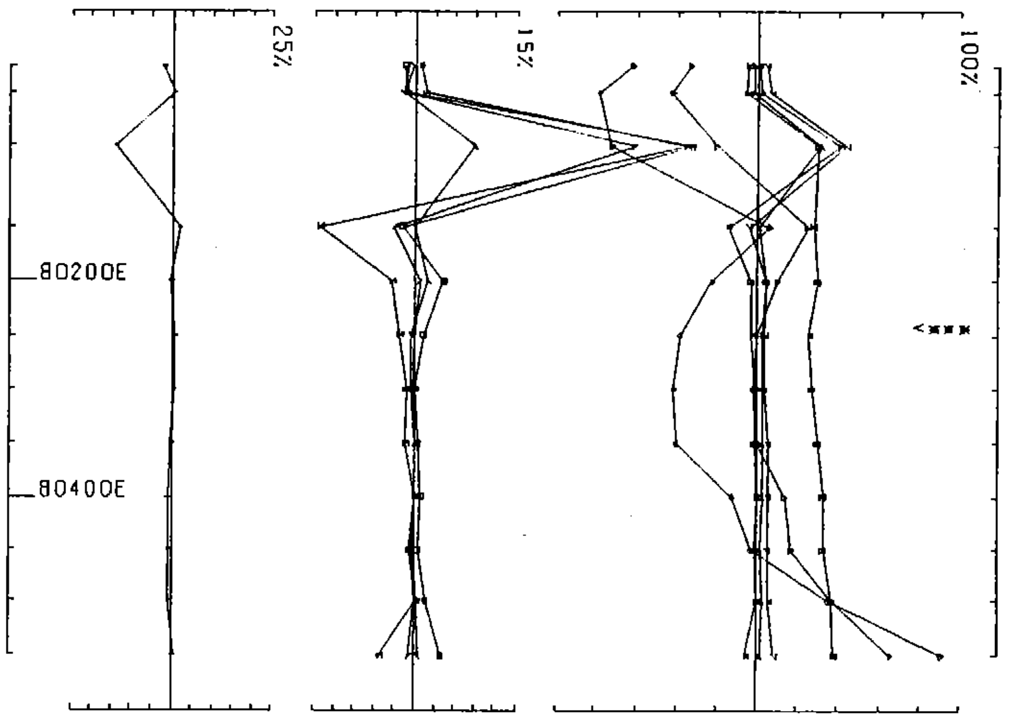
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 48 LINE 2200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025128



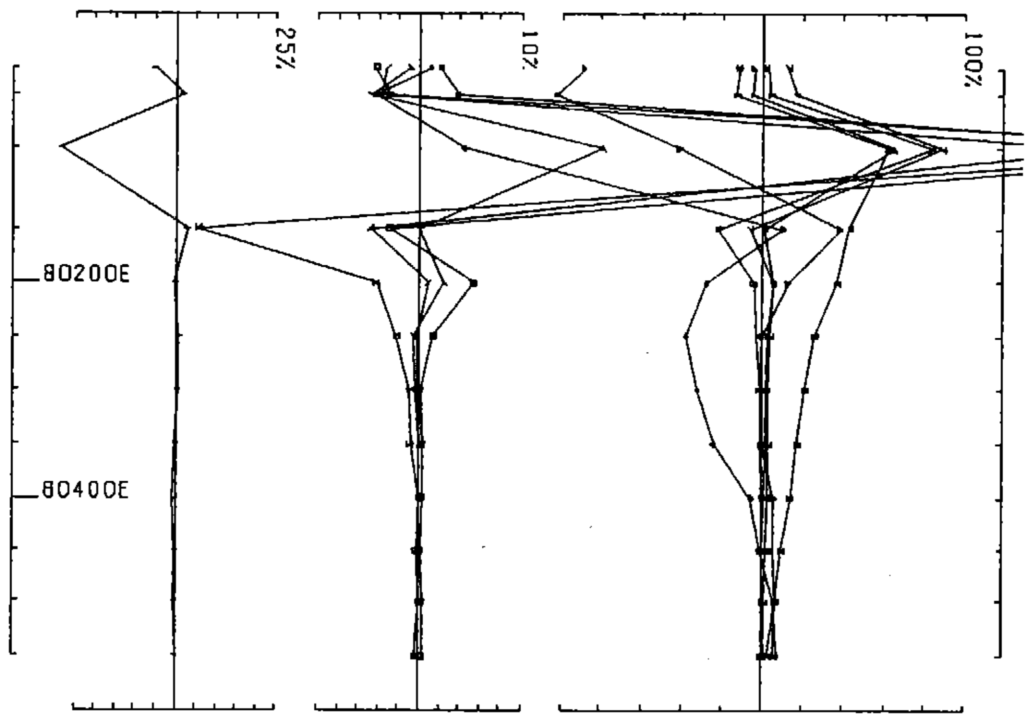
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025129



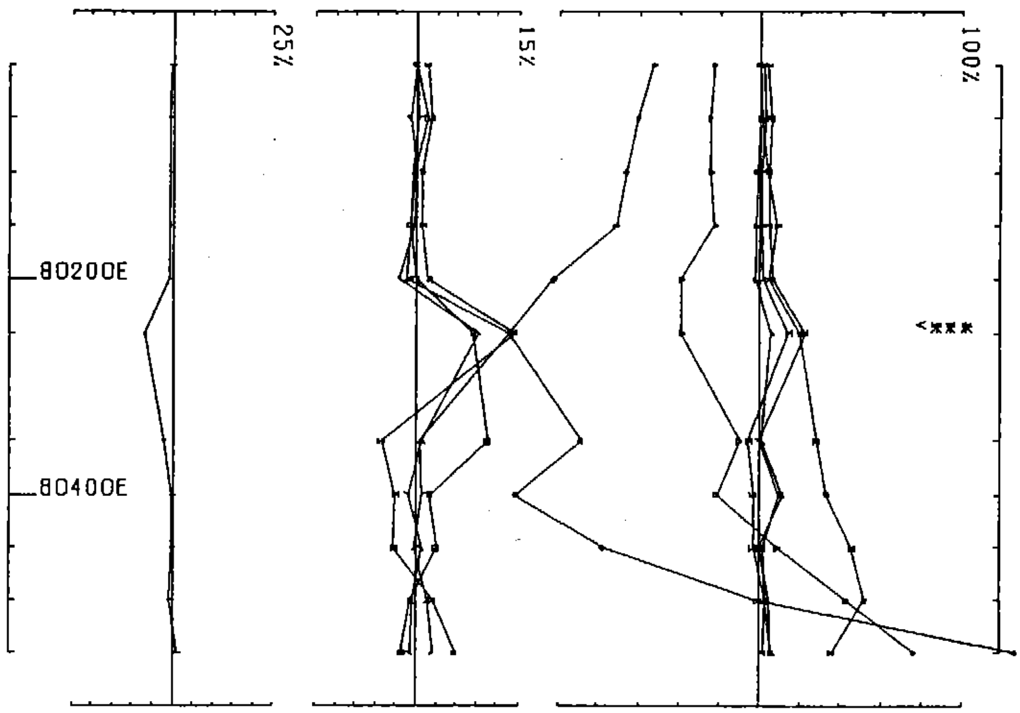
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025130

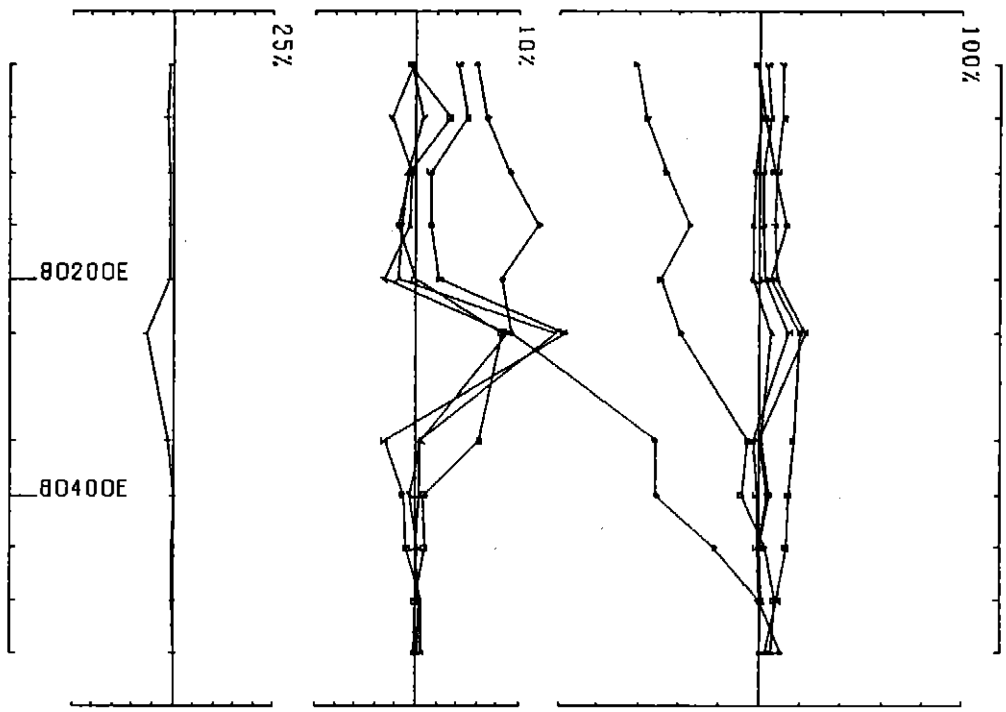


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025131

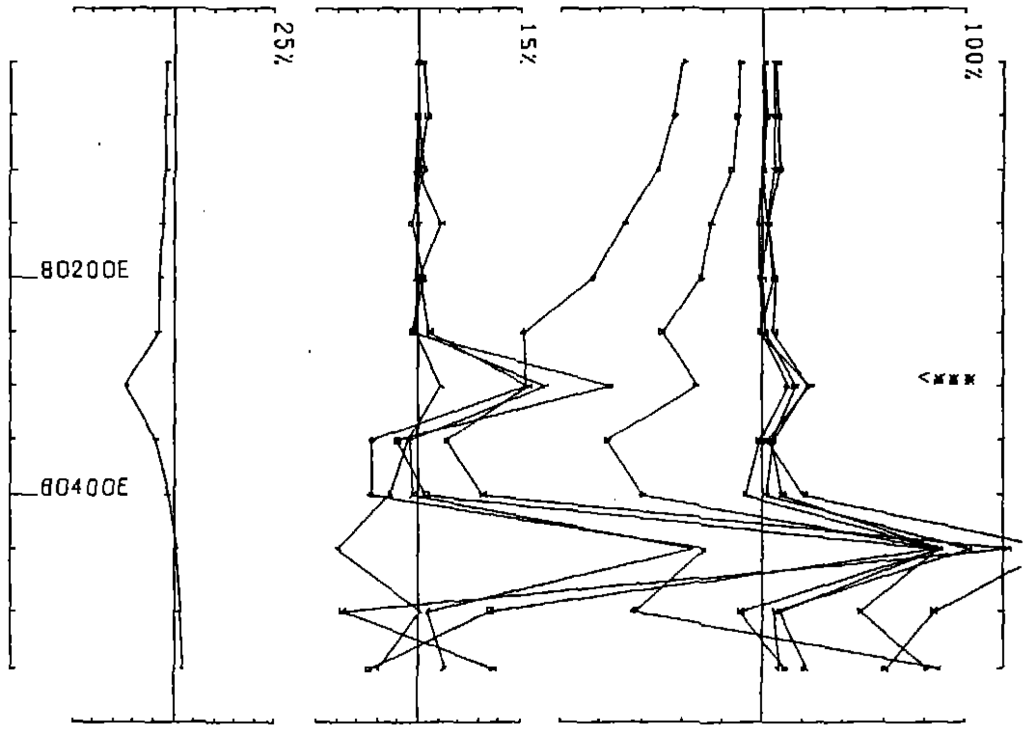


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2600 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.



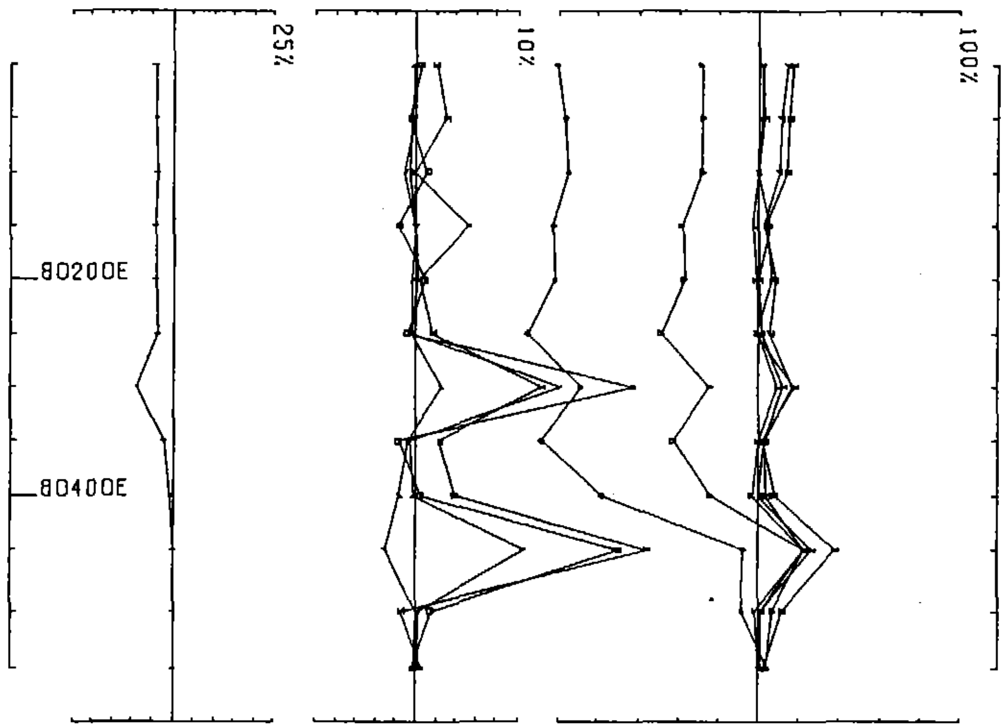
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 4B LINE 2600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025133



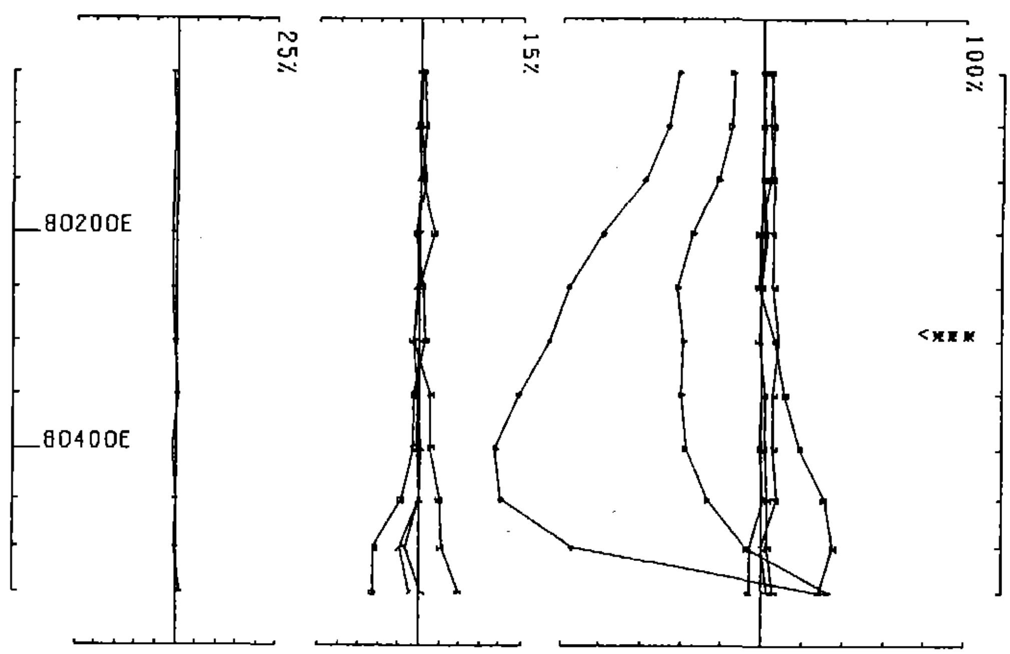
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 2800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025134



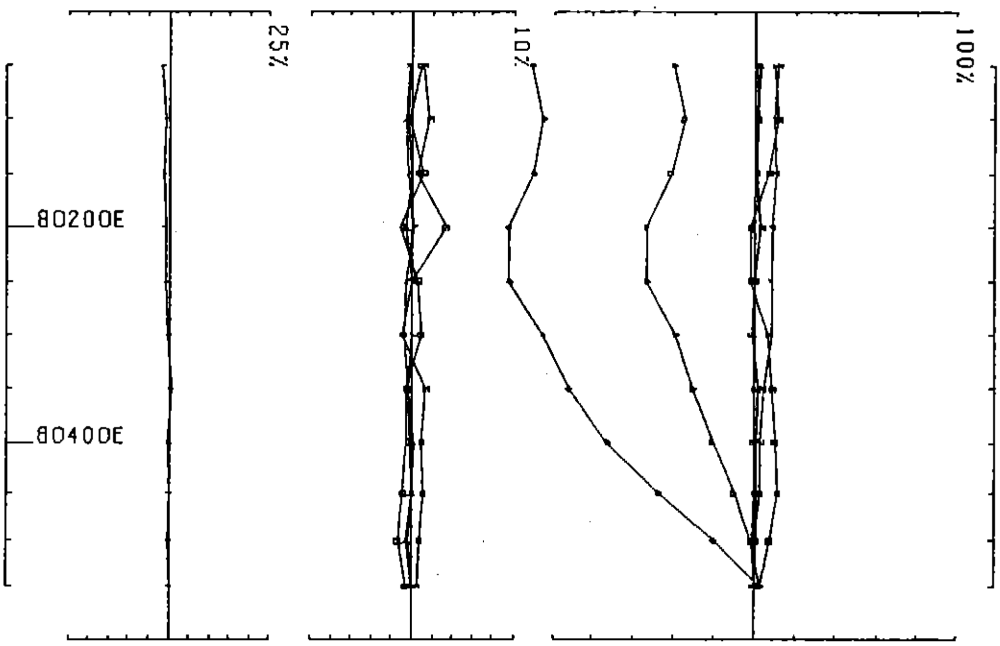
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 48 LINE 2800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025135



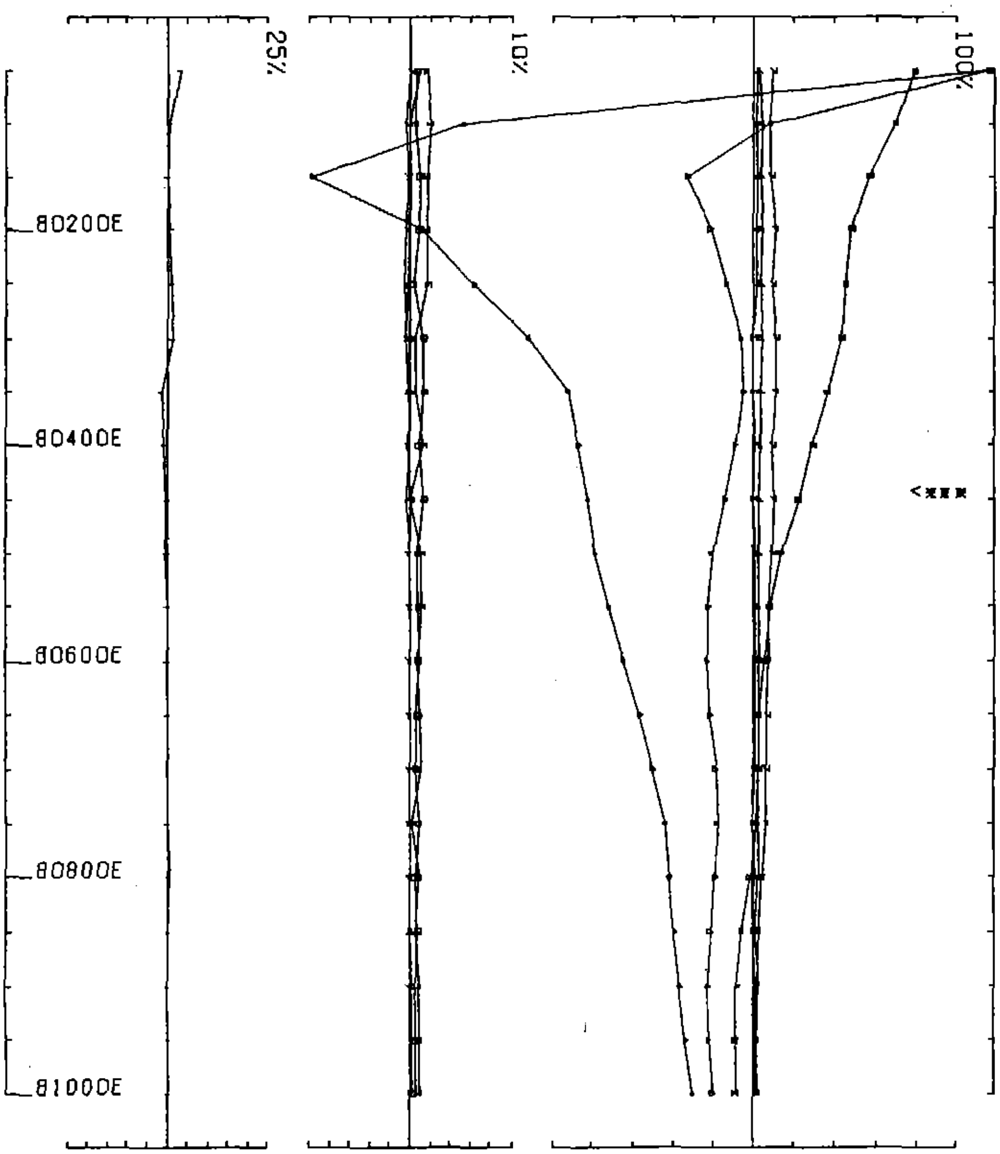
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 3000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM

025136



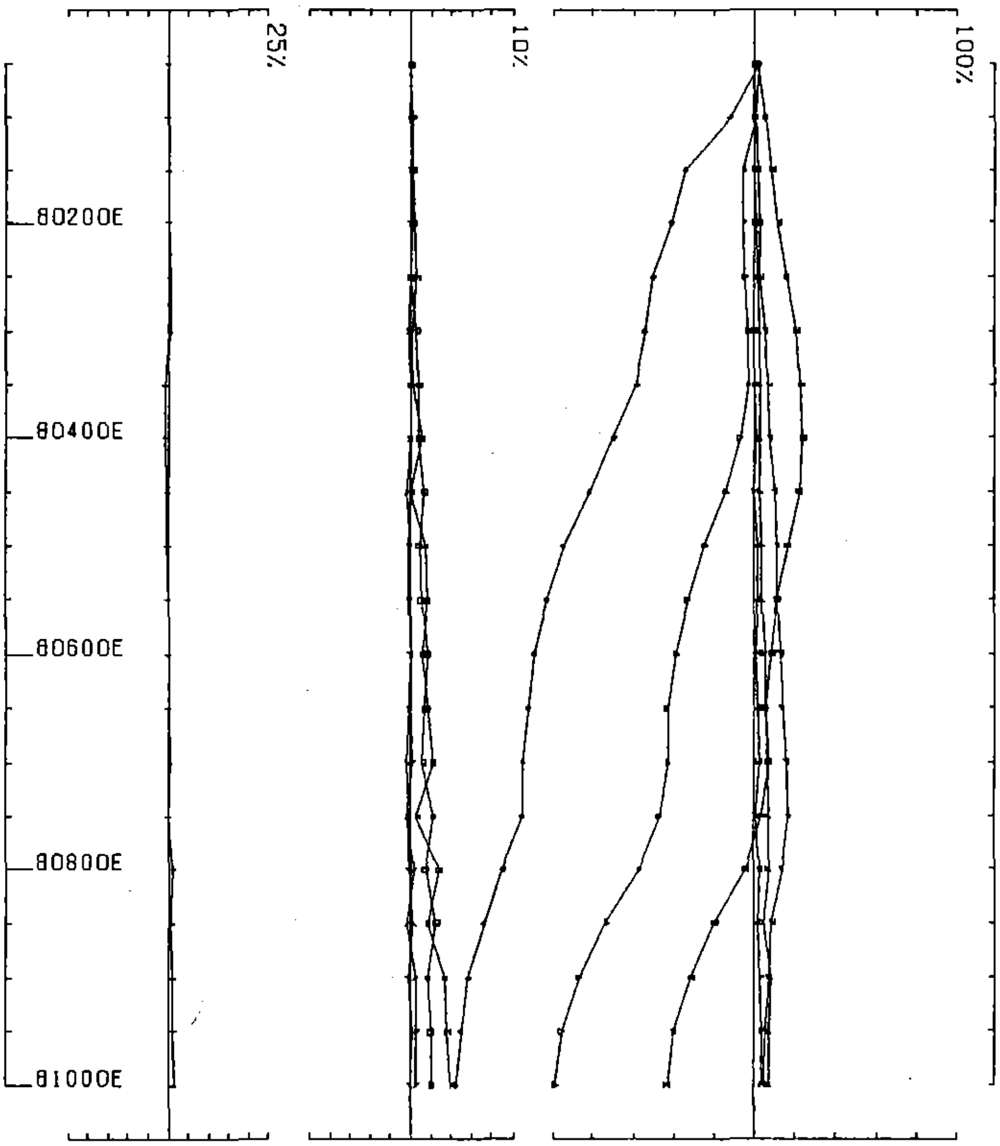
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 4B LINE 3000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025137



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 25.23
LOOP NO 5B LINE 800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025138



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
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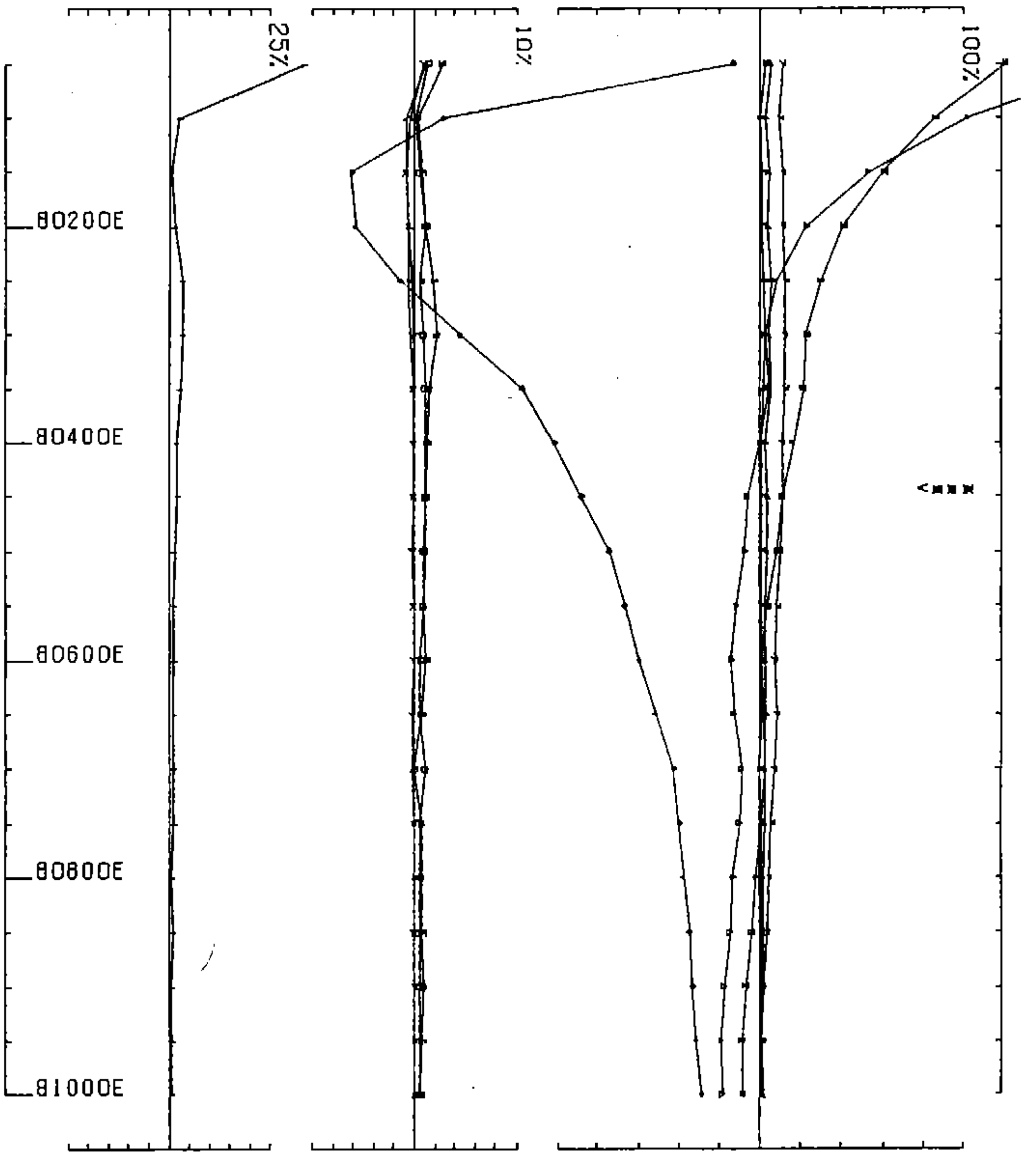
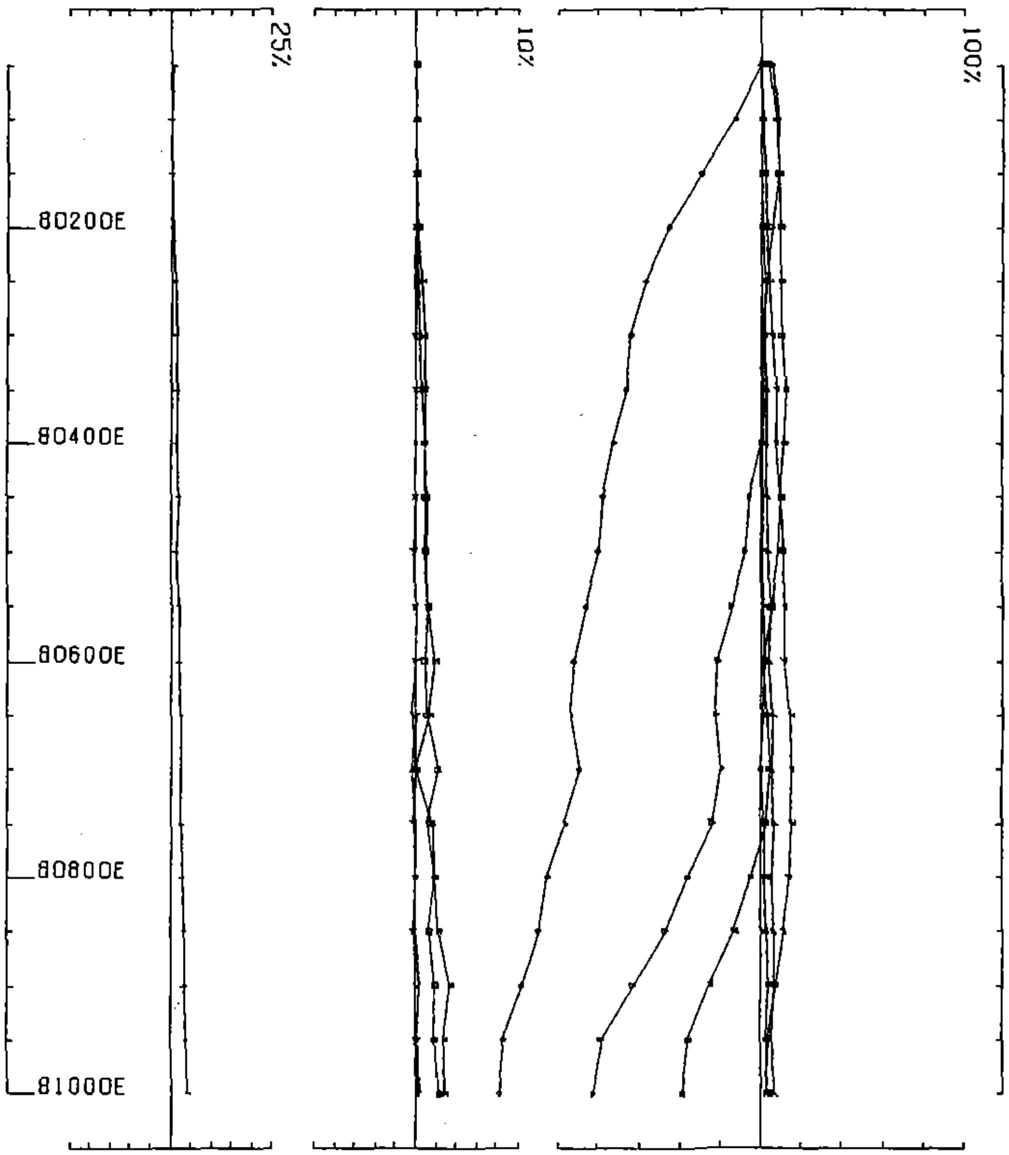
LOOP NO 5B LINE 800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025139



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 1000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025140



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
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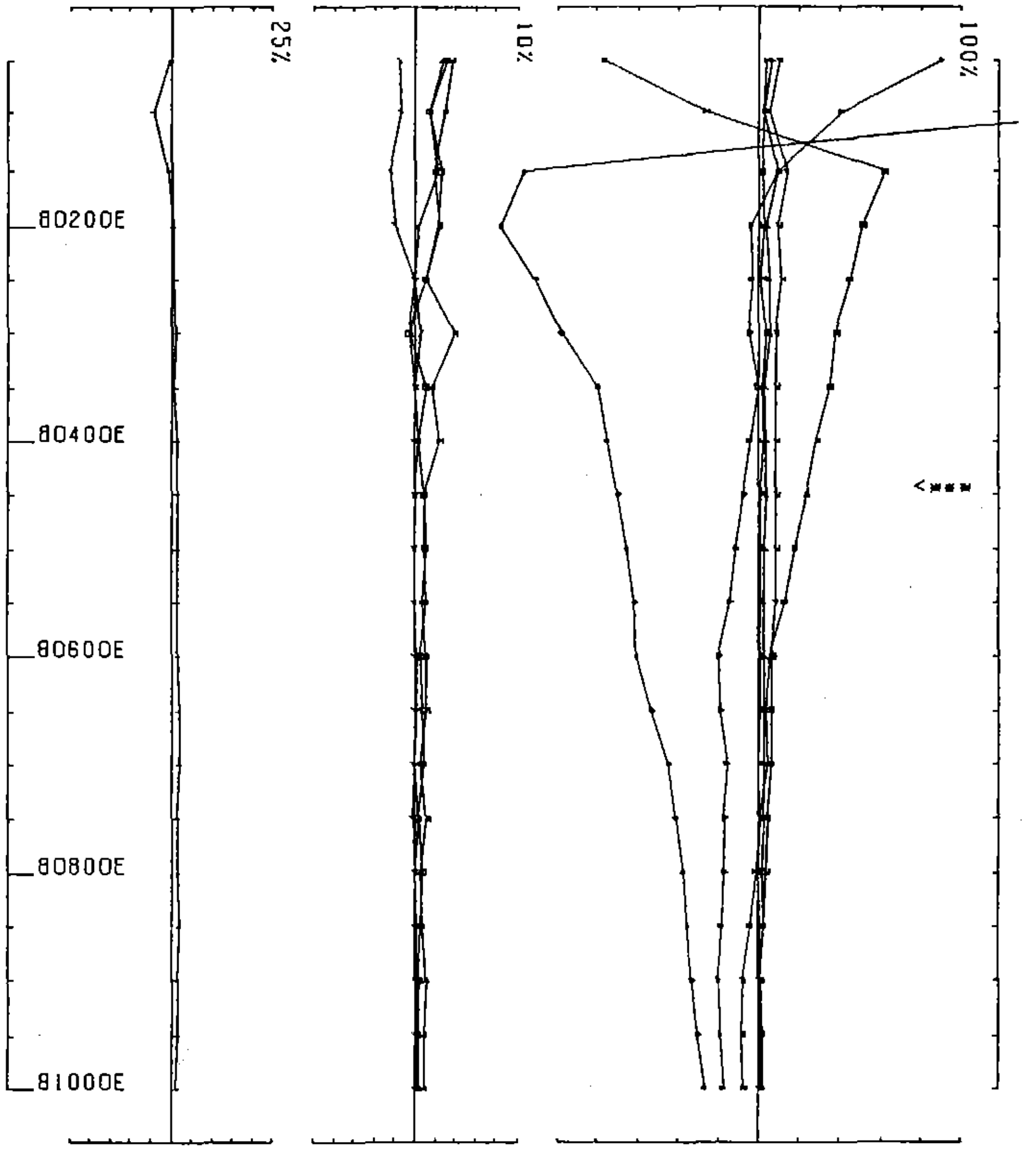
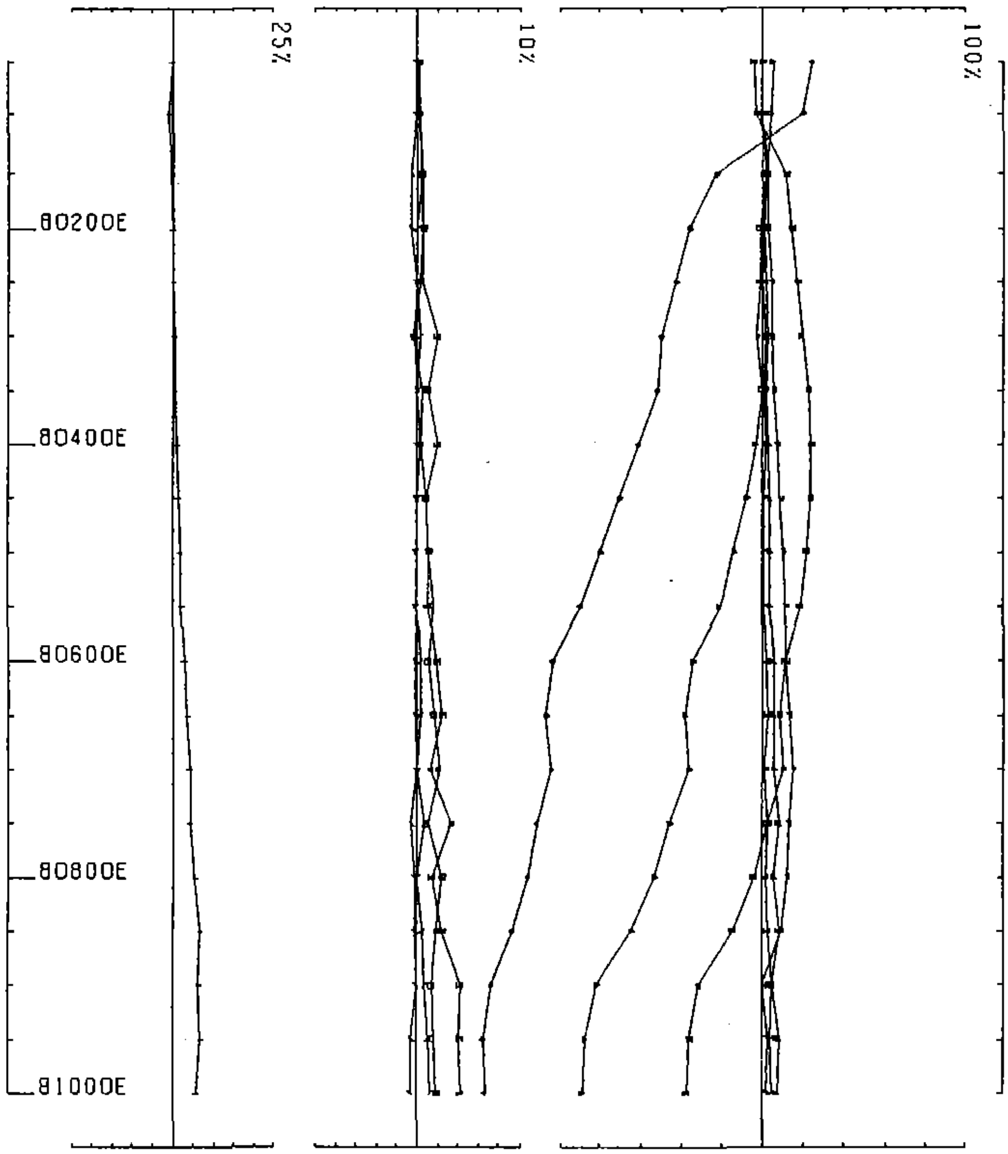
LOOP NO 5B LINE 1000 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

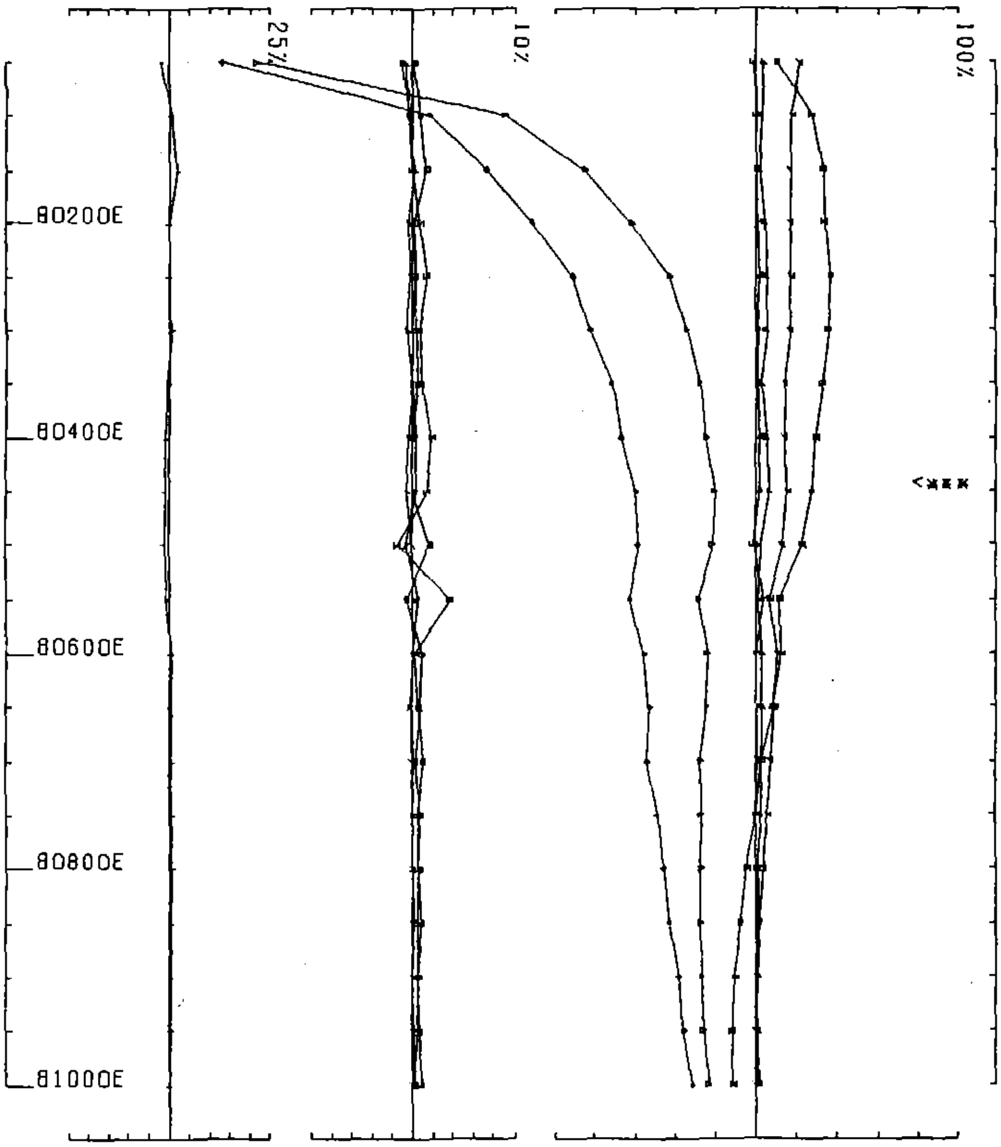


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 58 LINE 1200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025142

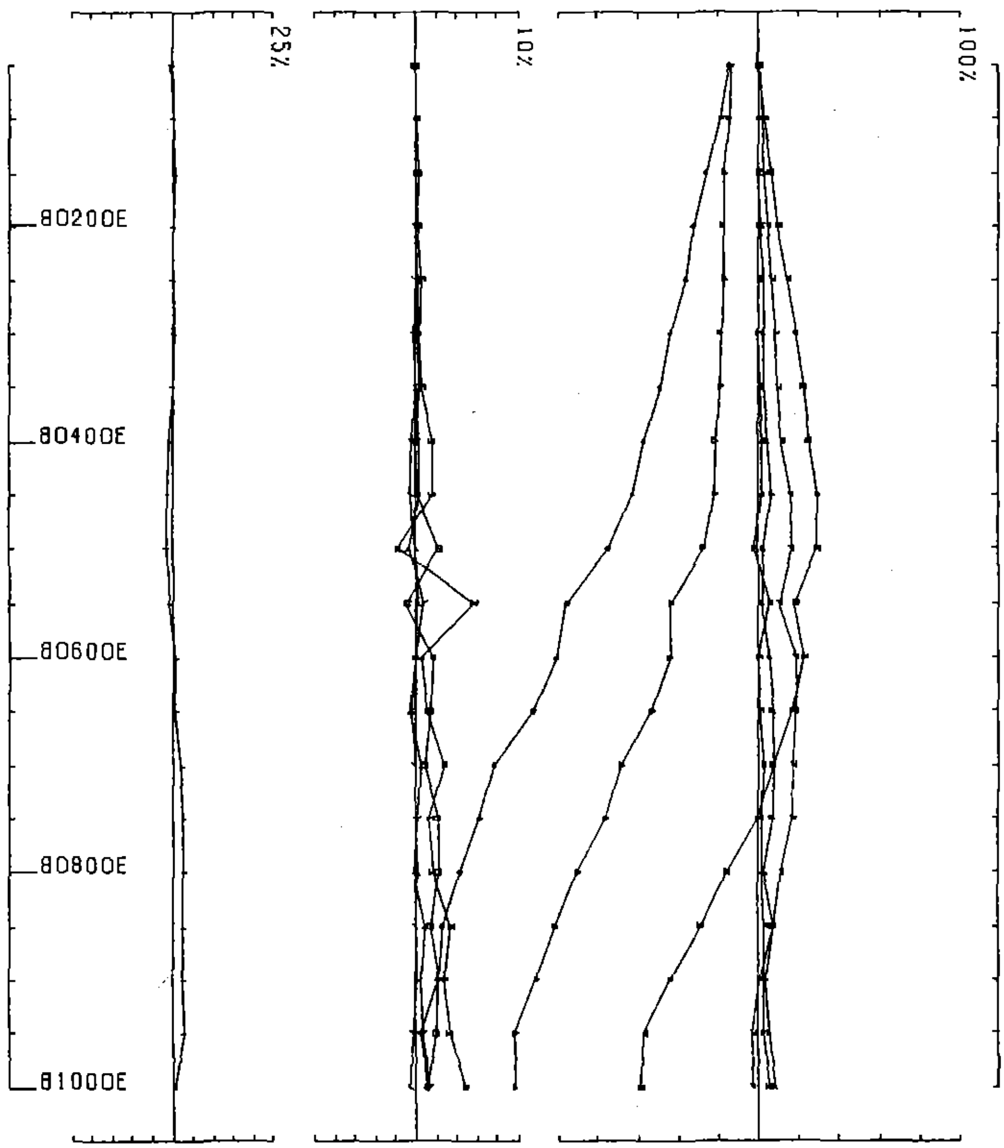


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 1200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



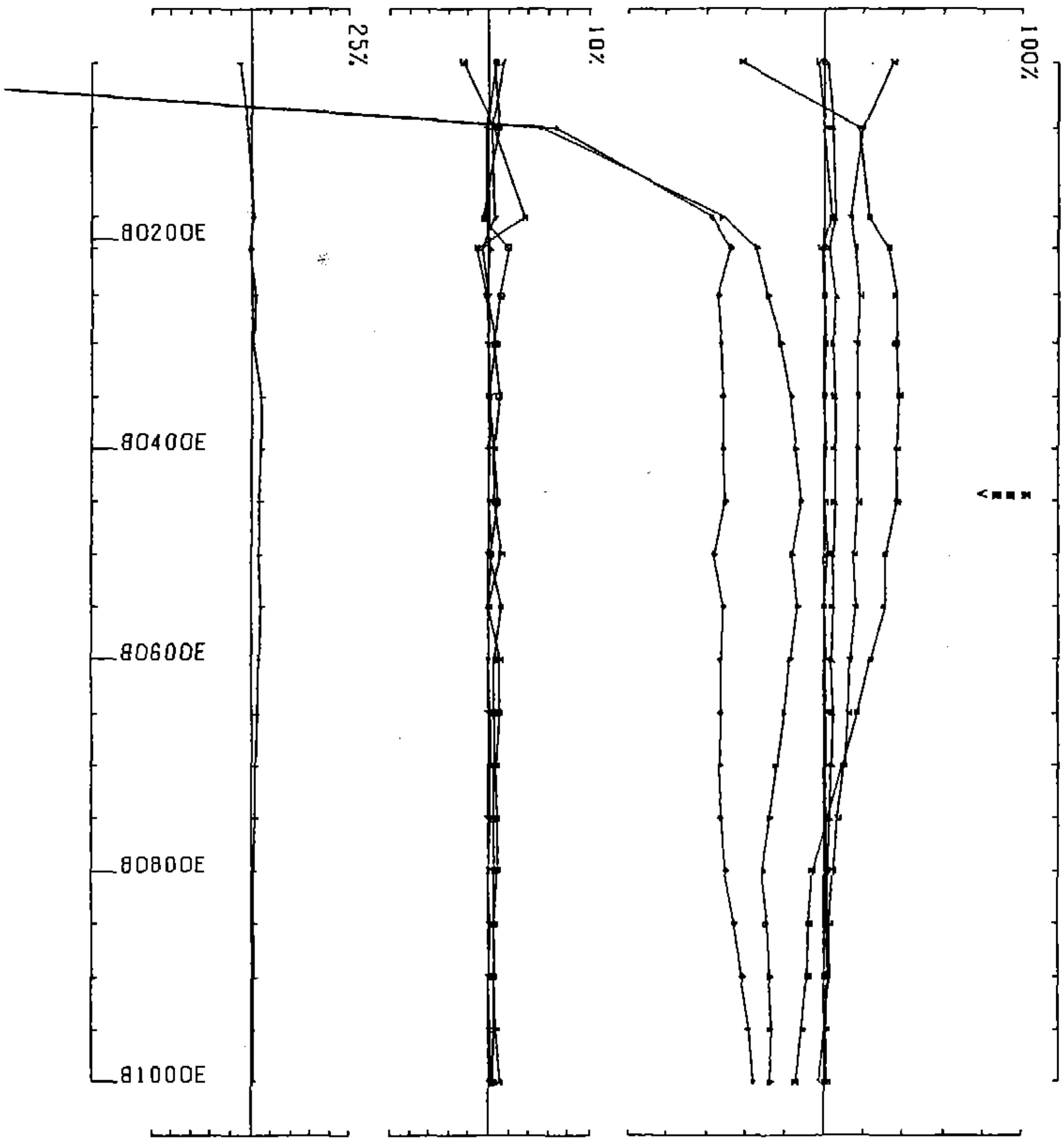
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 58 LINE 1400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM

025144



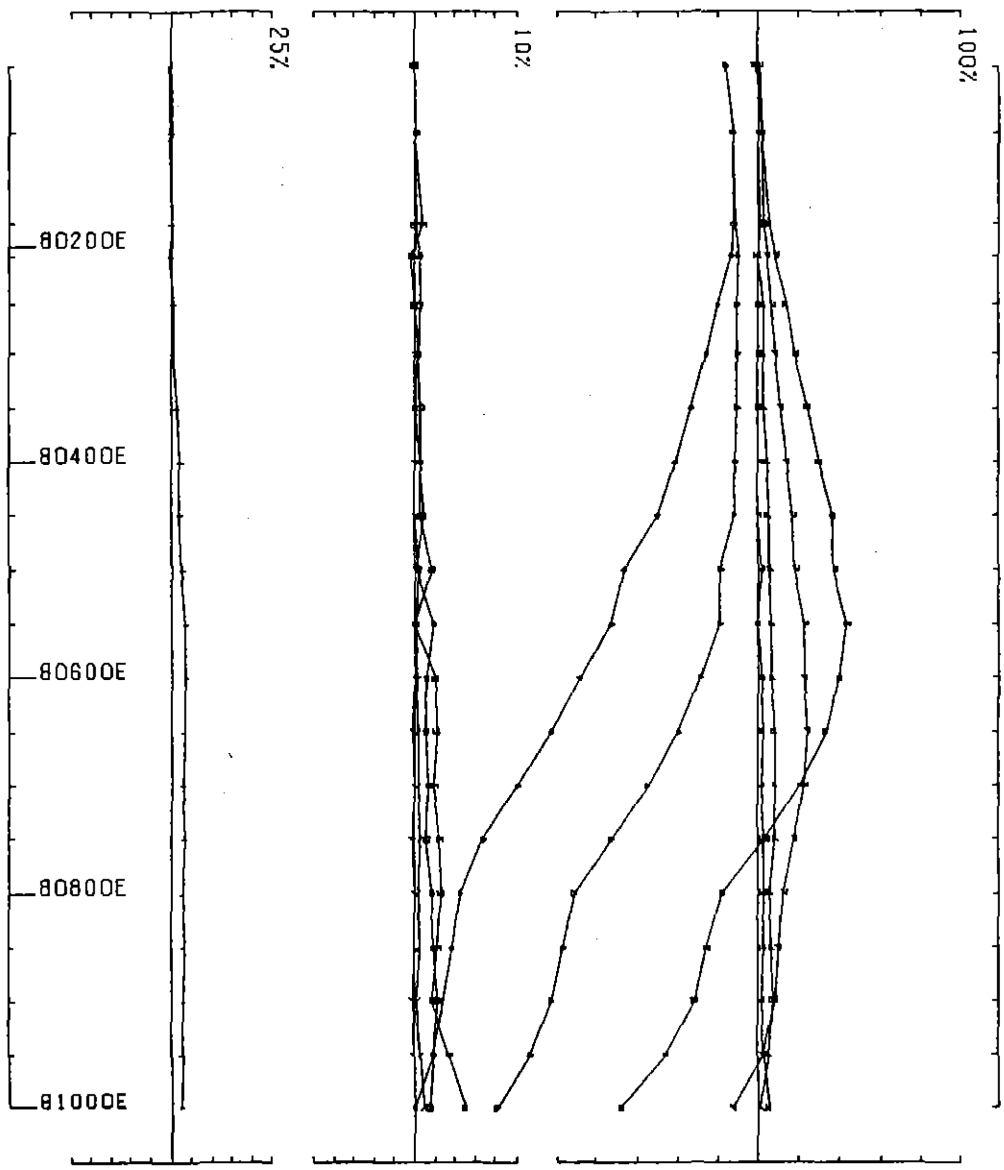
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 1400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025145



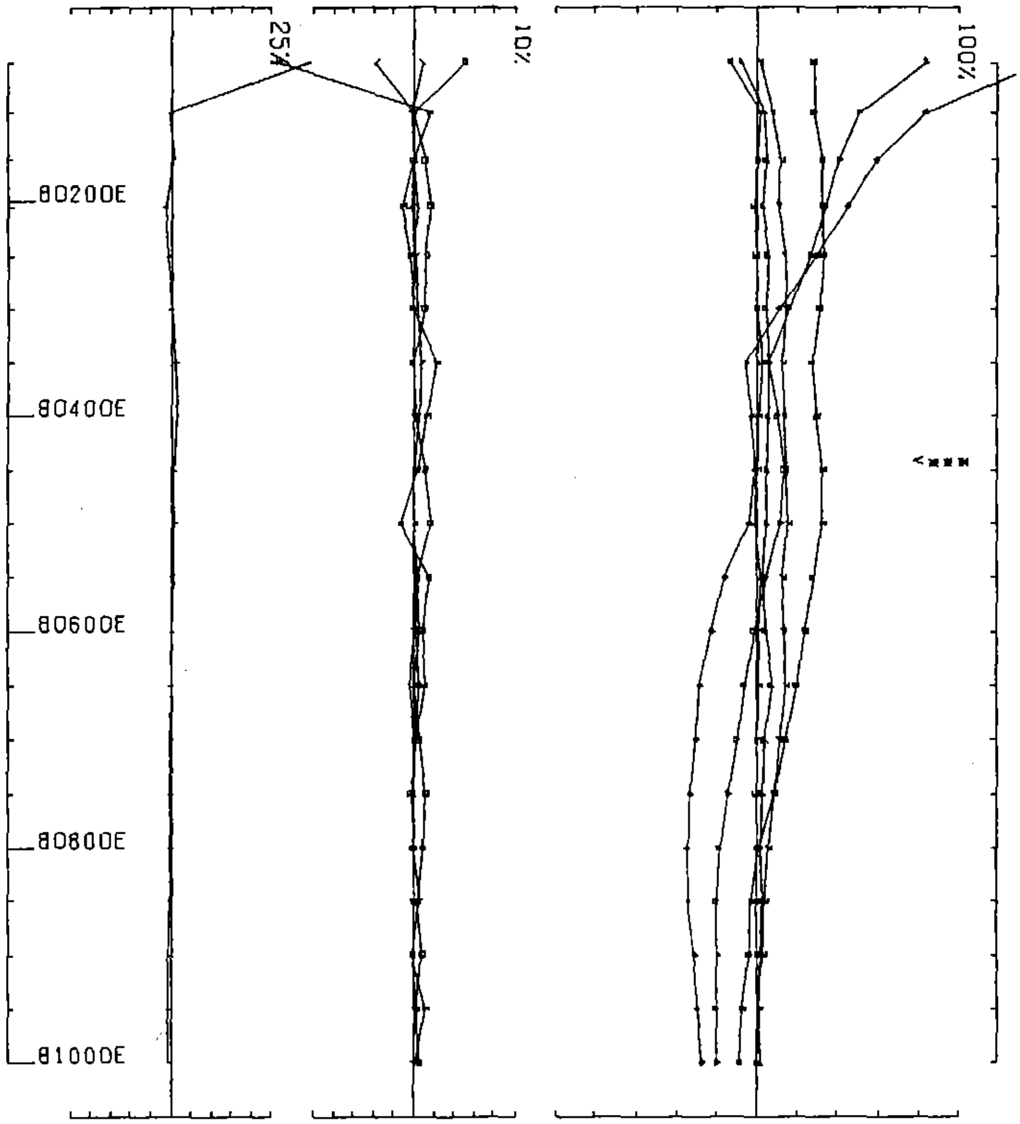
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 1600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025146



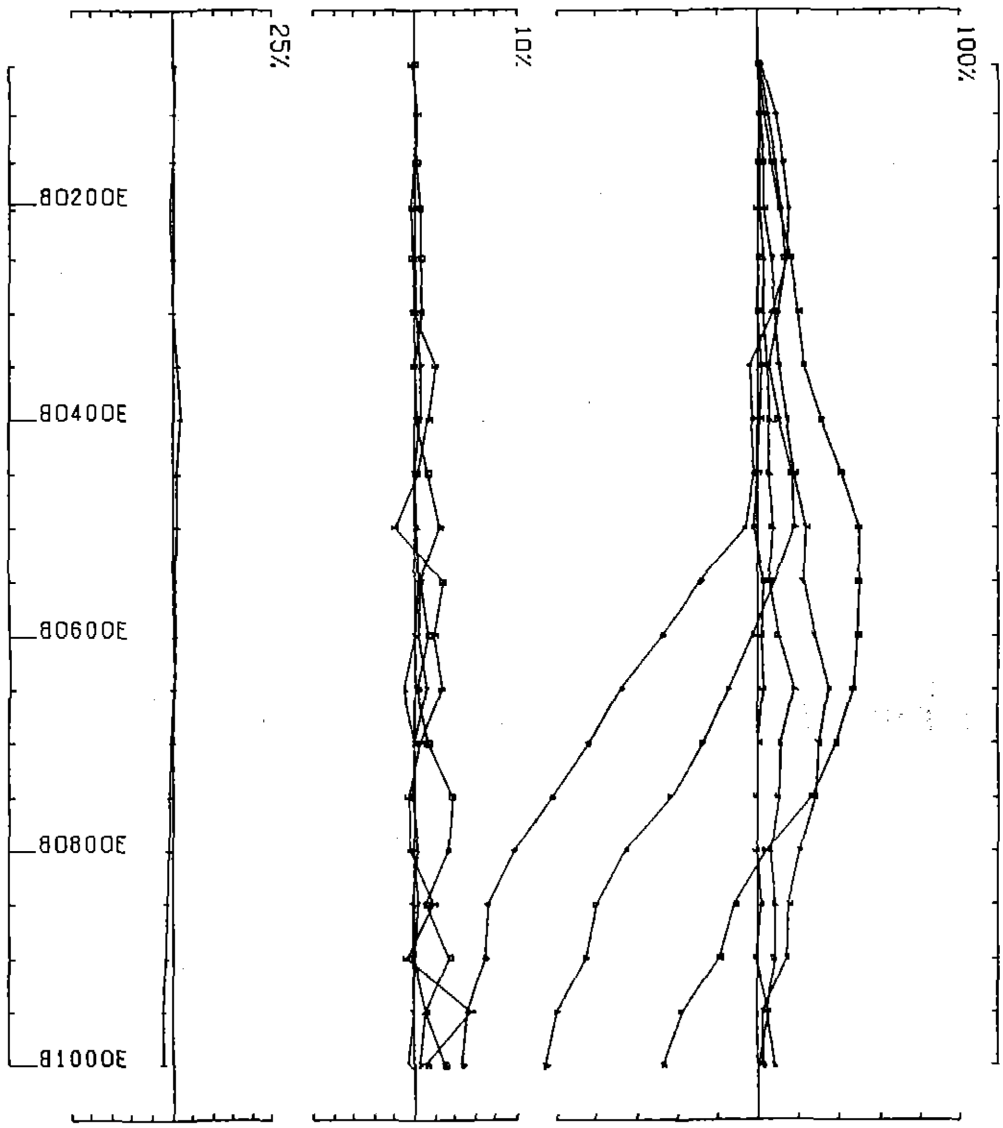
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 1600 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

025147

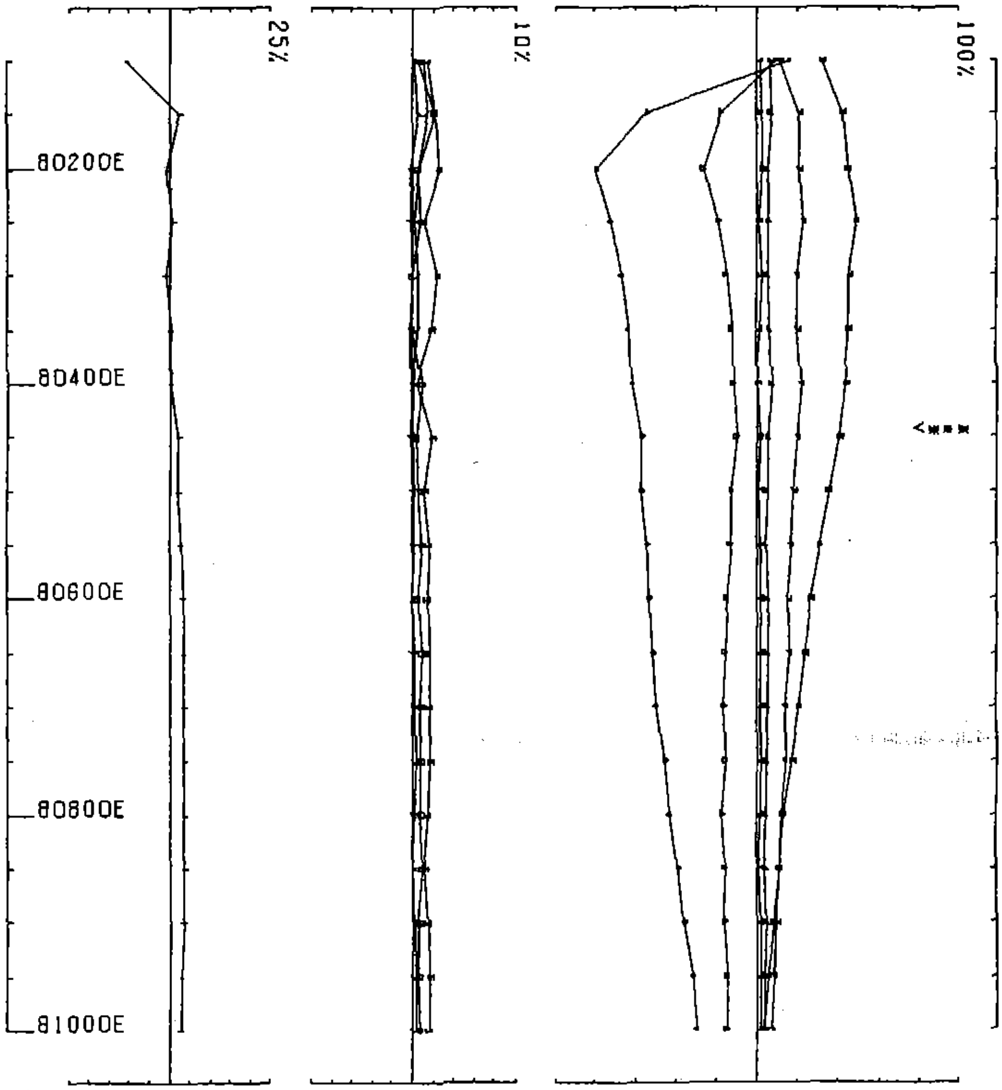


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 58 LINE 1800 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025148

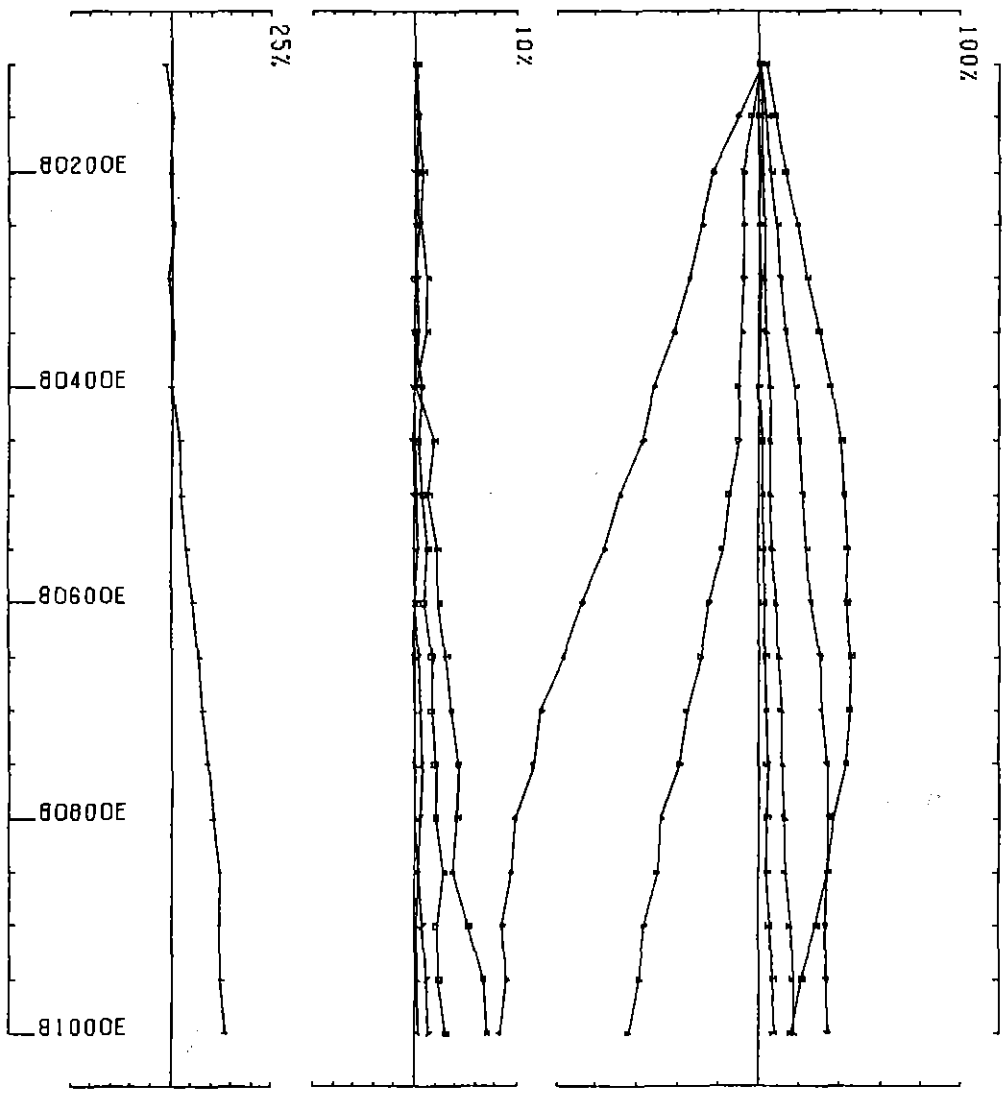


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 1800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



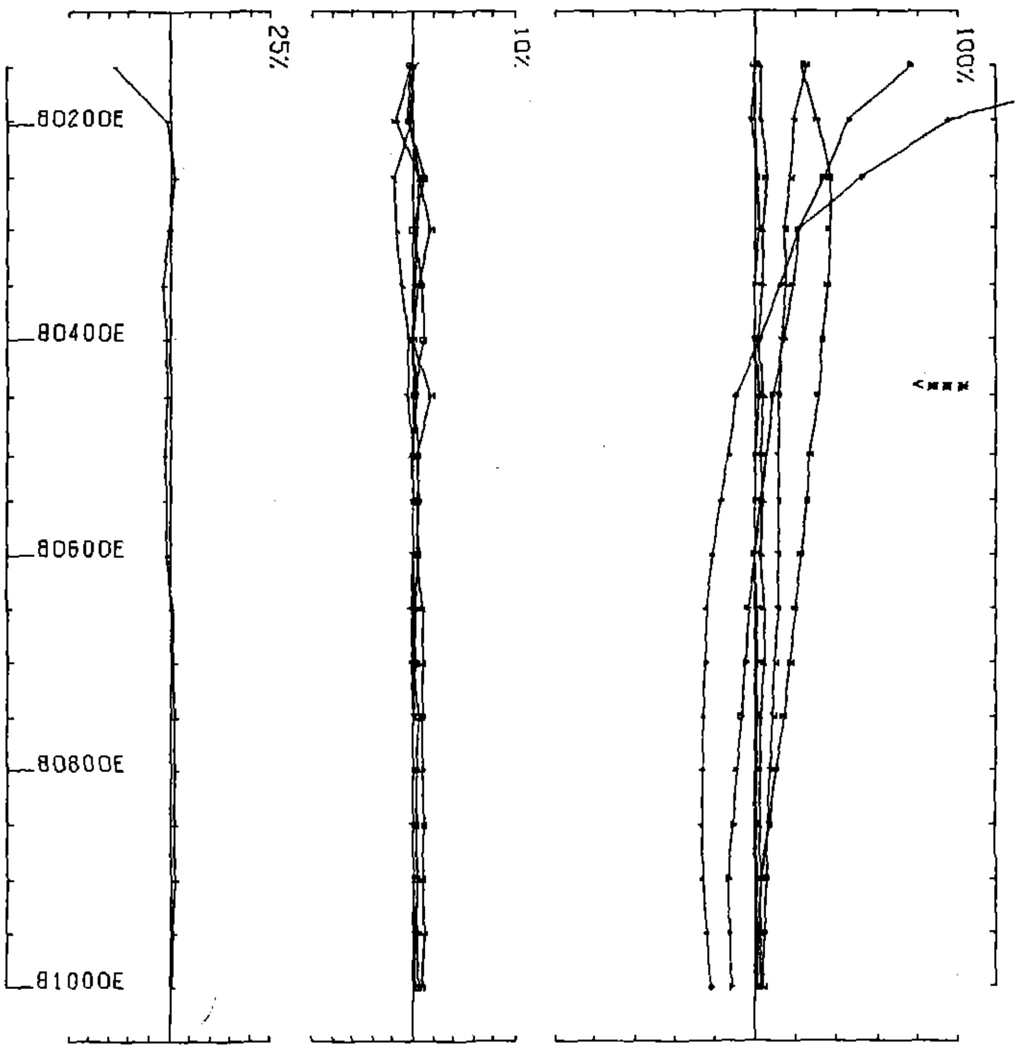
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1891
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 59000 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025150



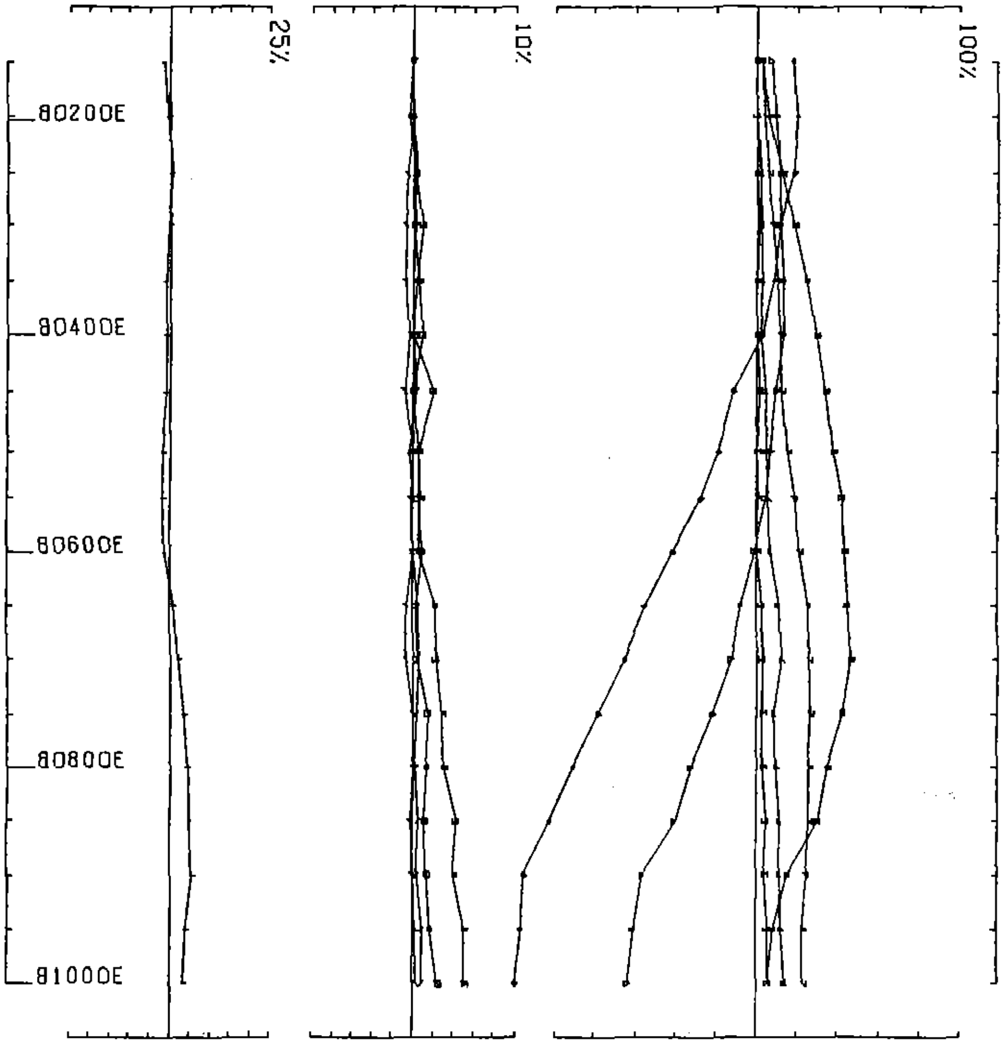
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 59000 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025151

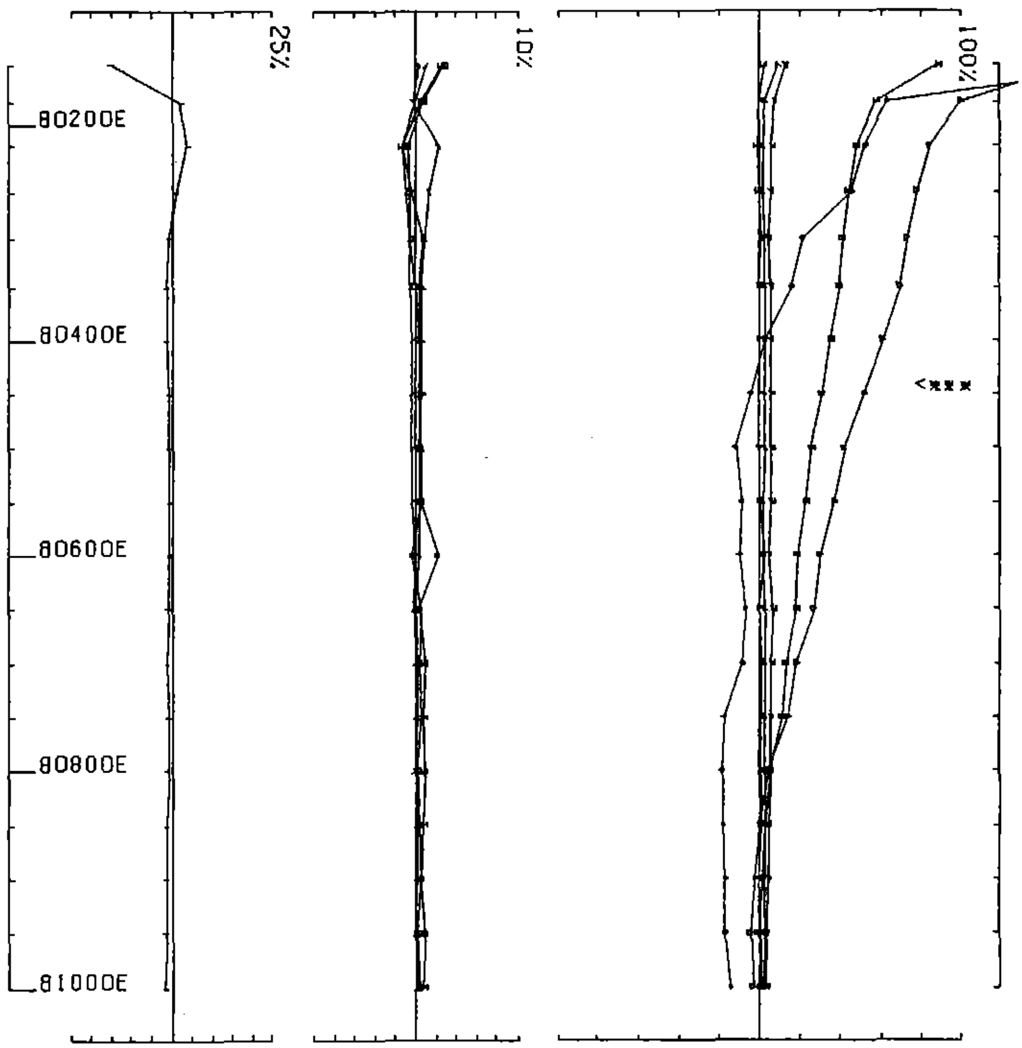


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 58 LINE 59200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

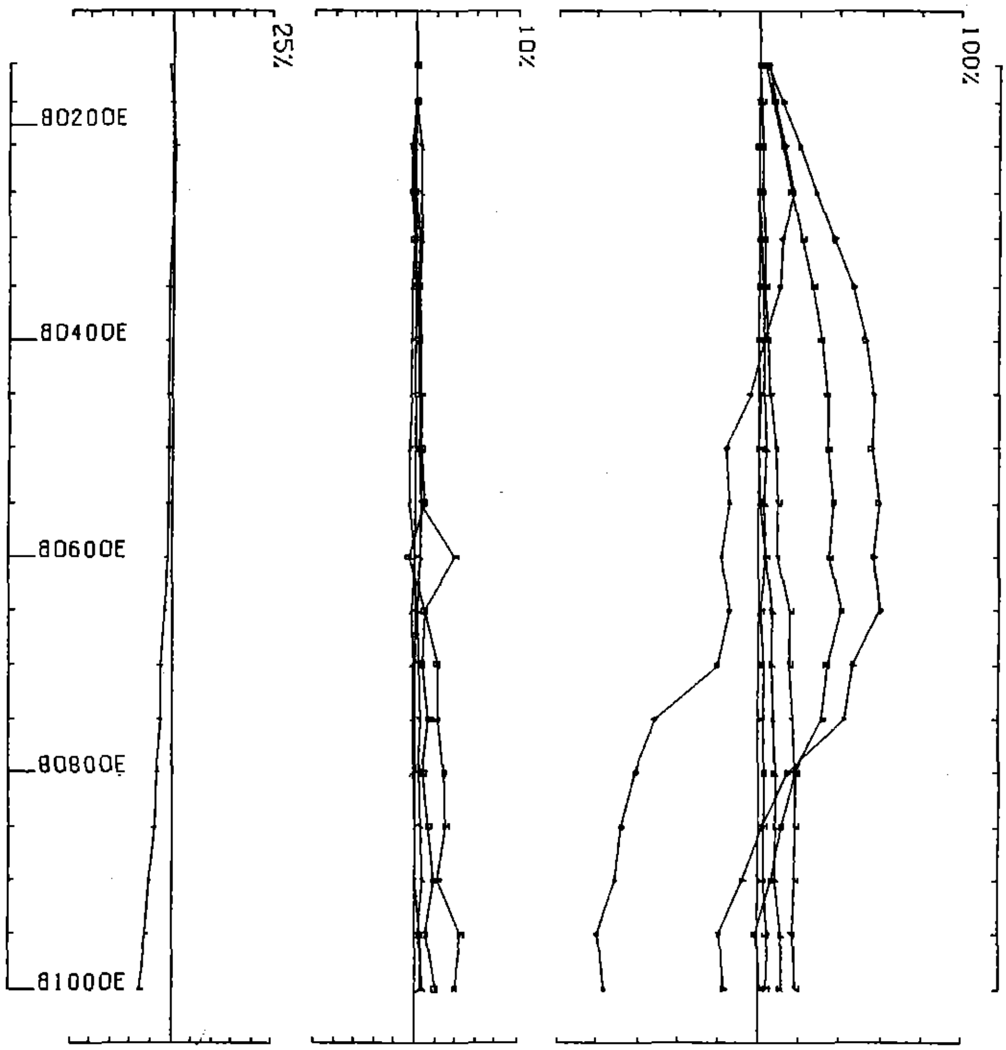
025152



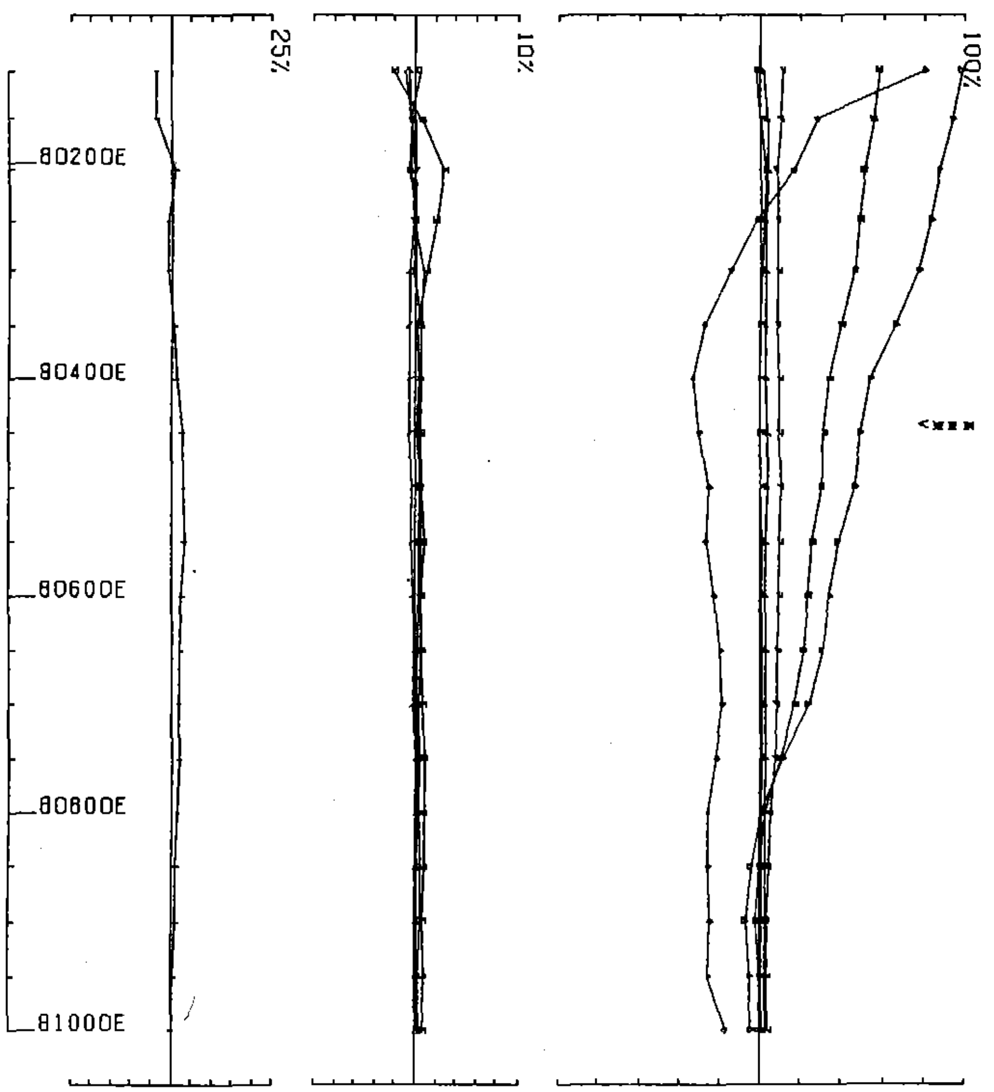
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 59200 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 6B LINE 59400 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

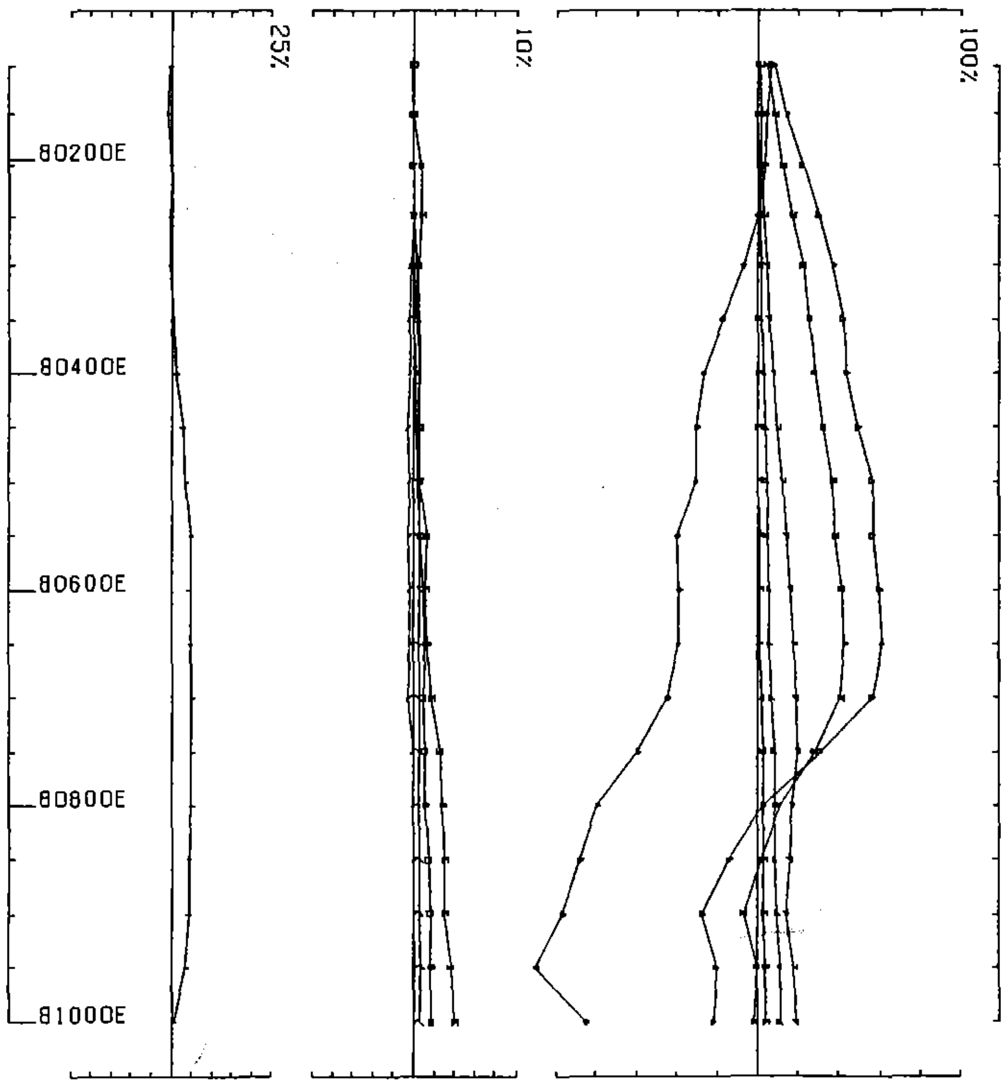


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 59400 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.



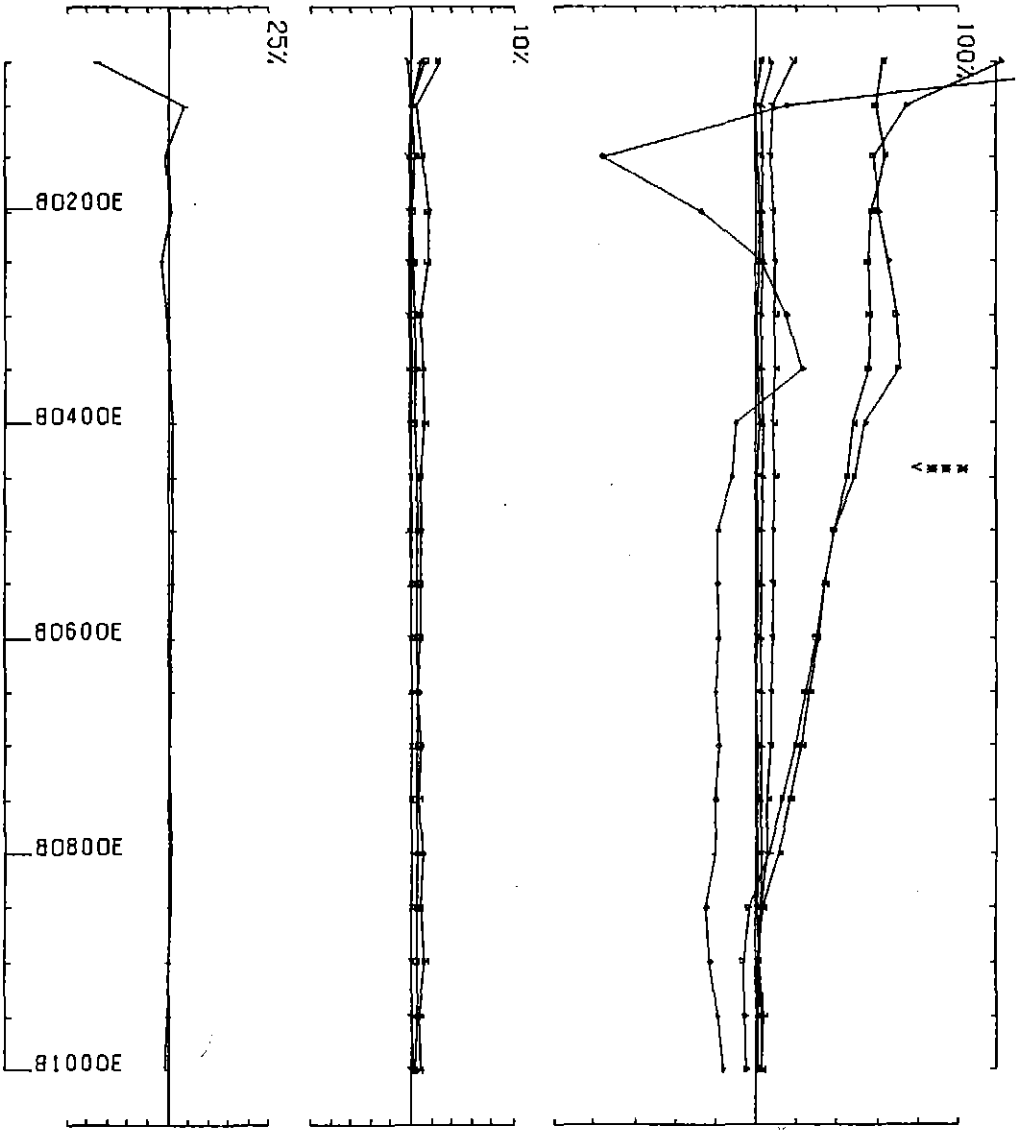
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 59600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025156



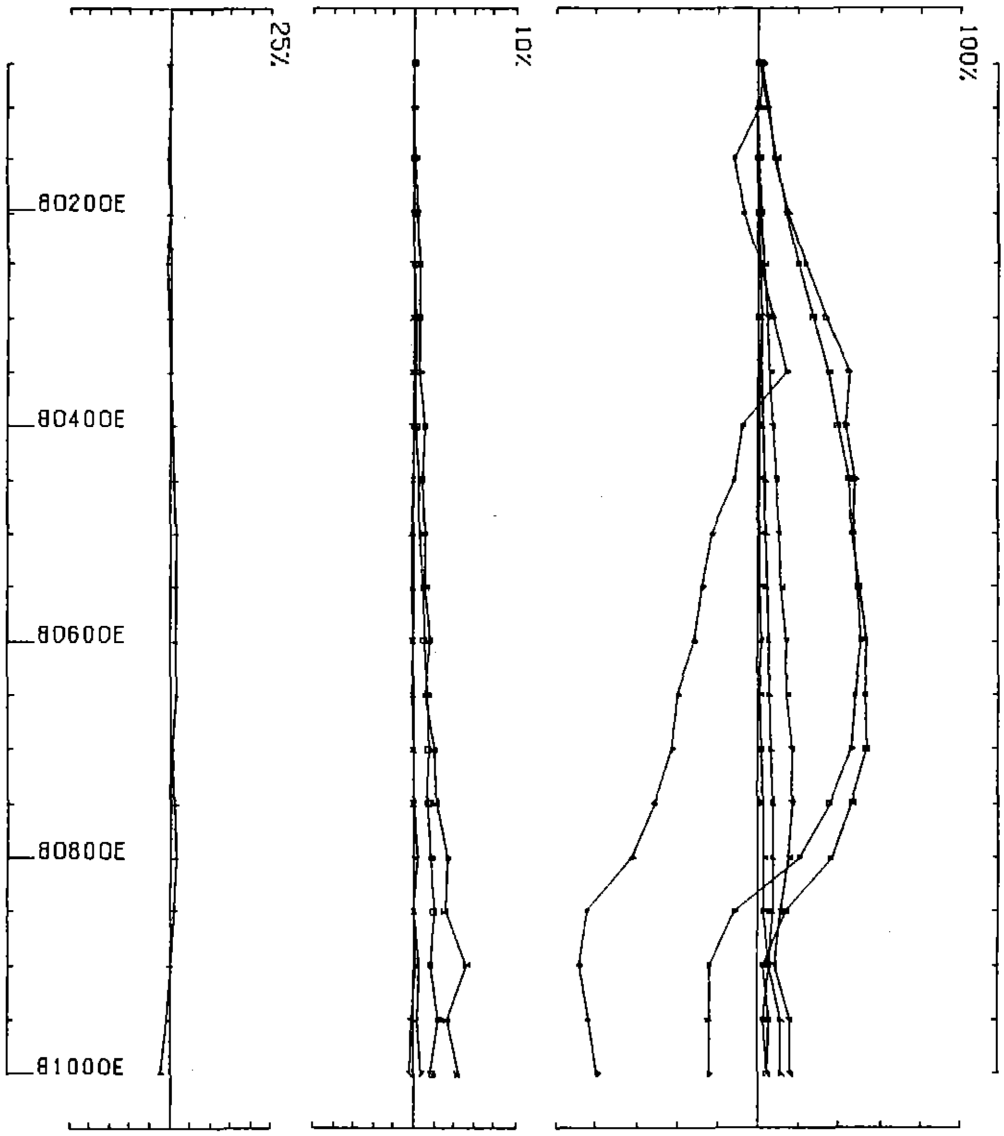
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 59600 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025157

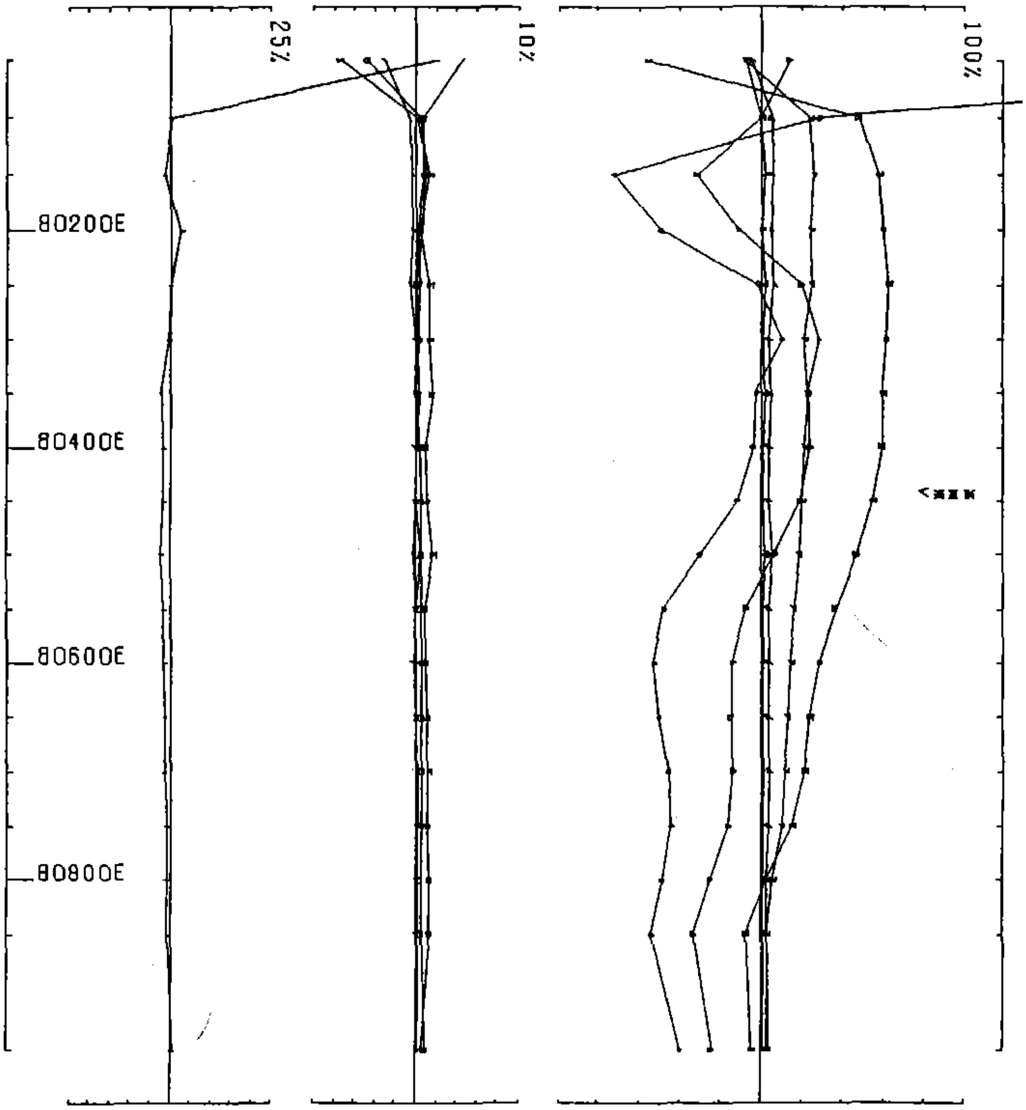


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 59800 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025158

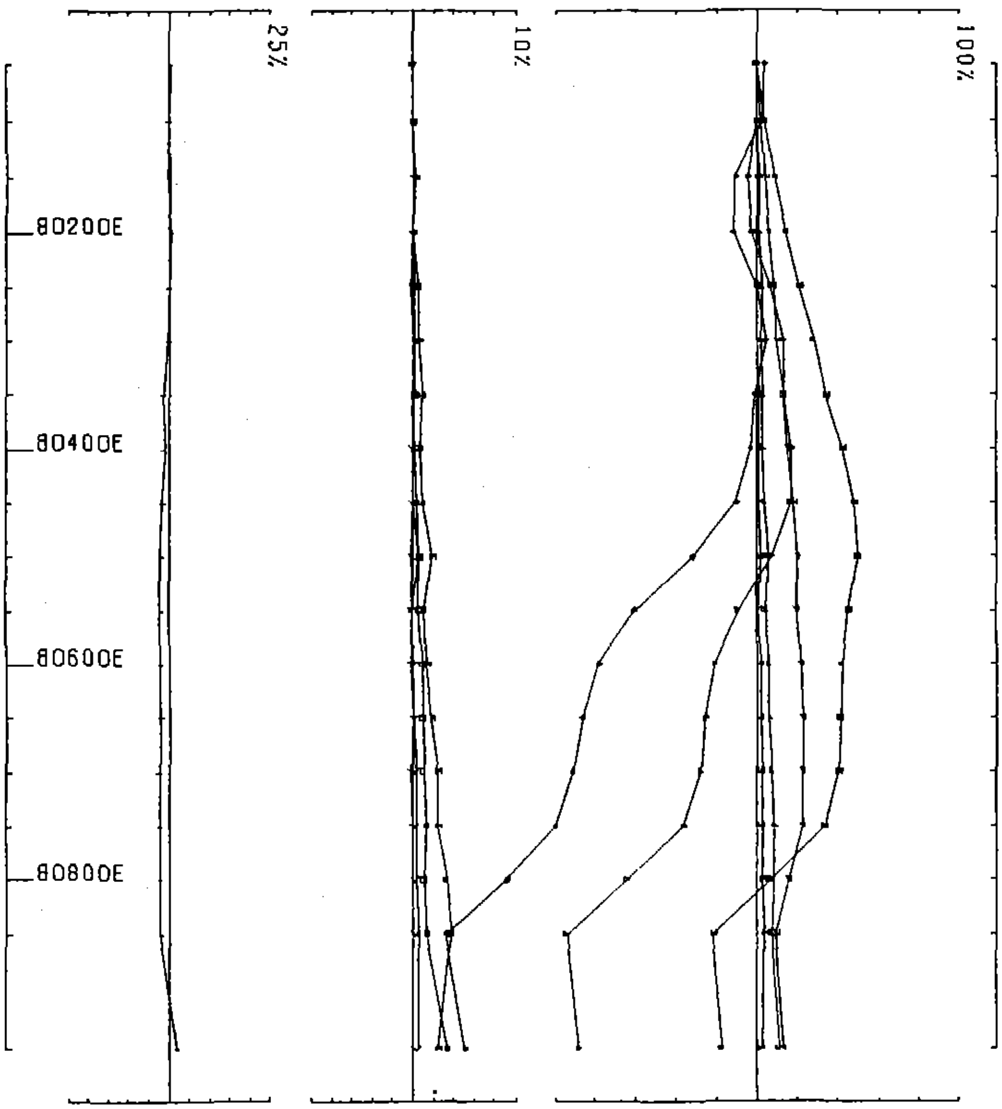


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 5B LINE 59800 N COMPONENT HZ SECONDARY FIELD CH1 CONTIN. NORM.

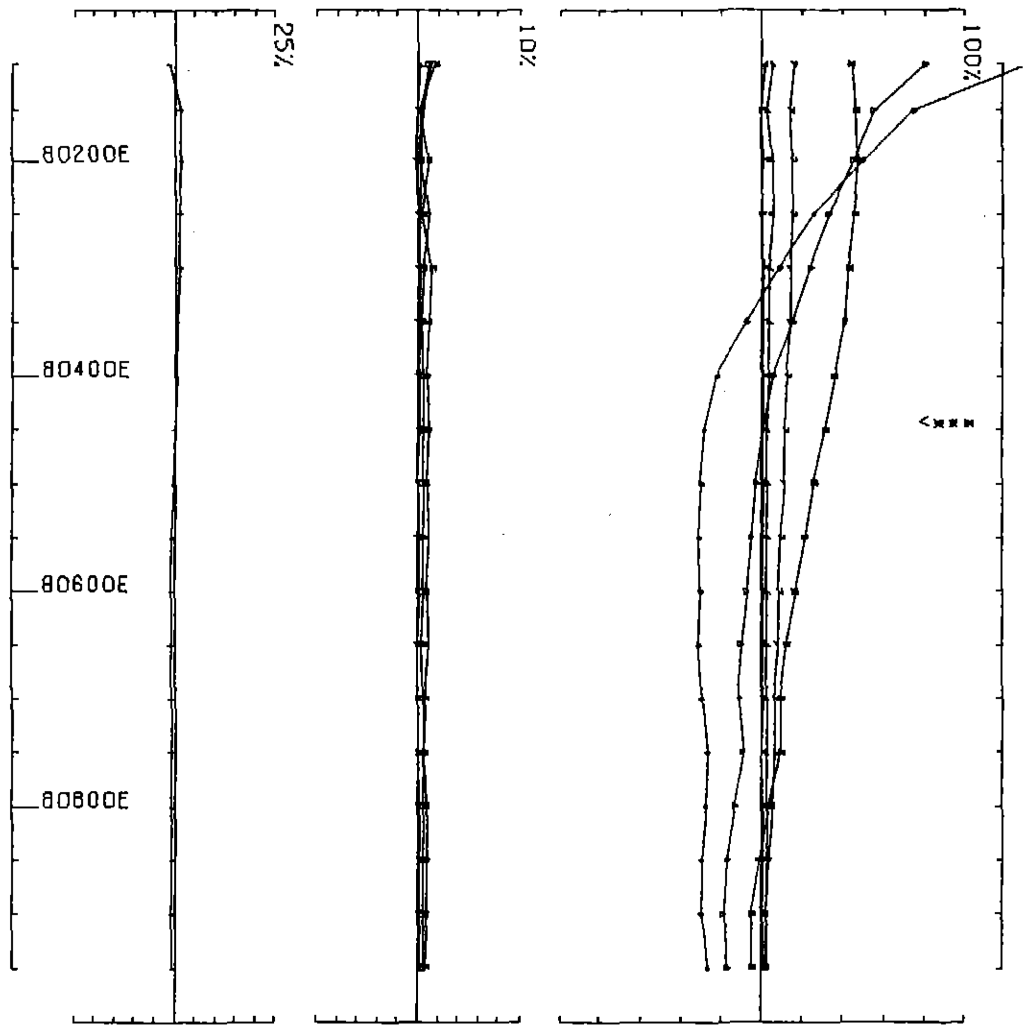


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 50000 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025160

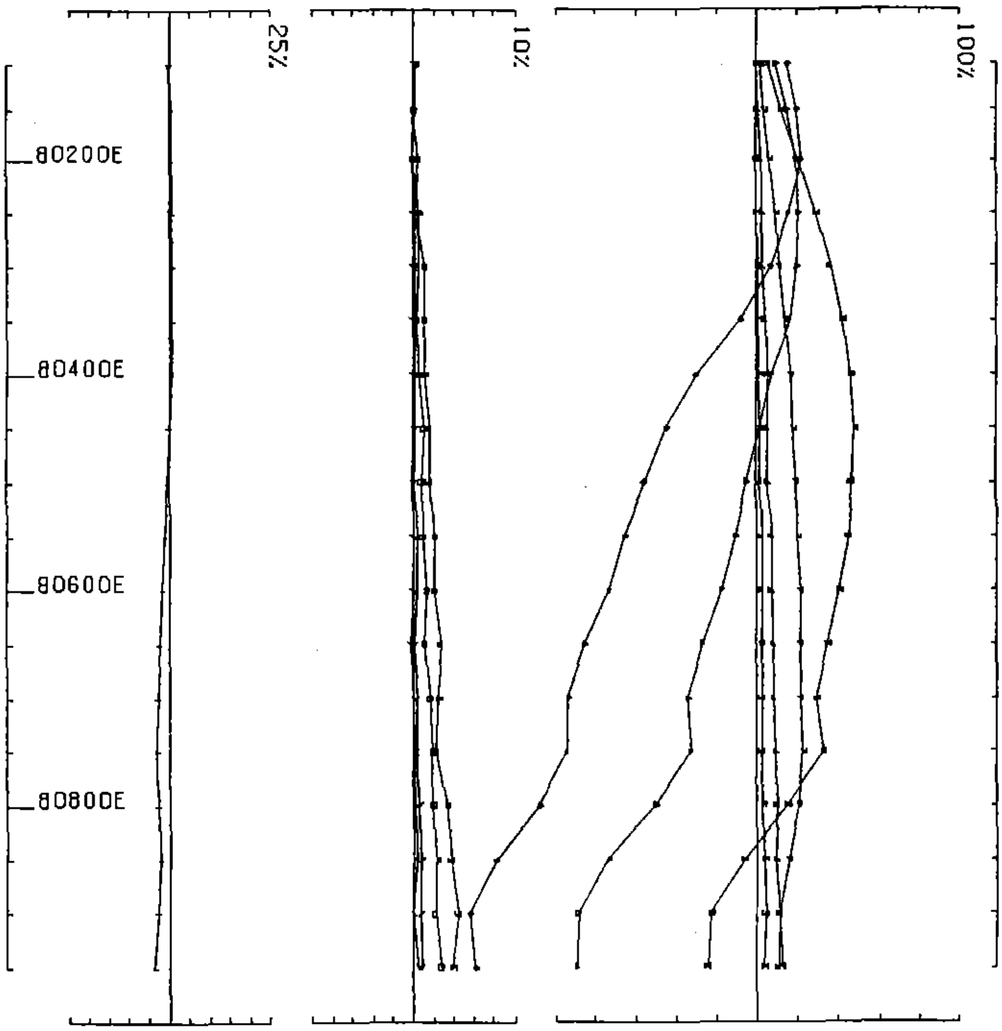


UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 50000 N COMPONENT Hz SECONDARY FIELD CH1 CONTIN. NORM.



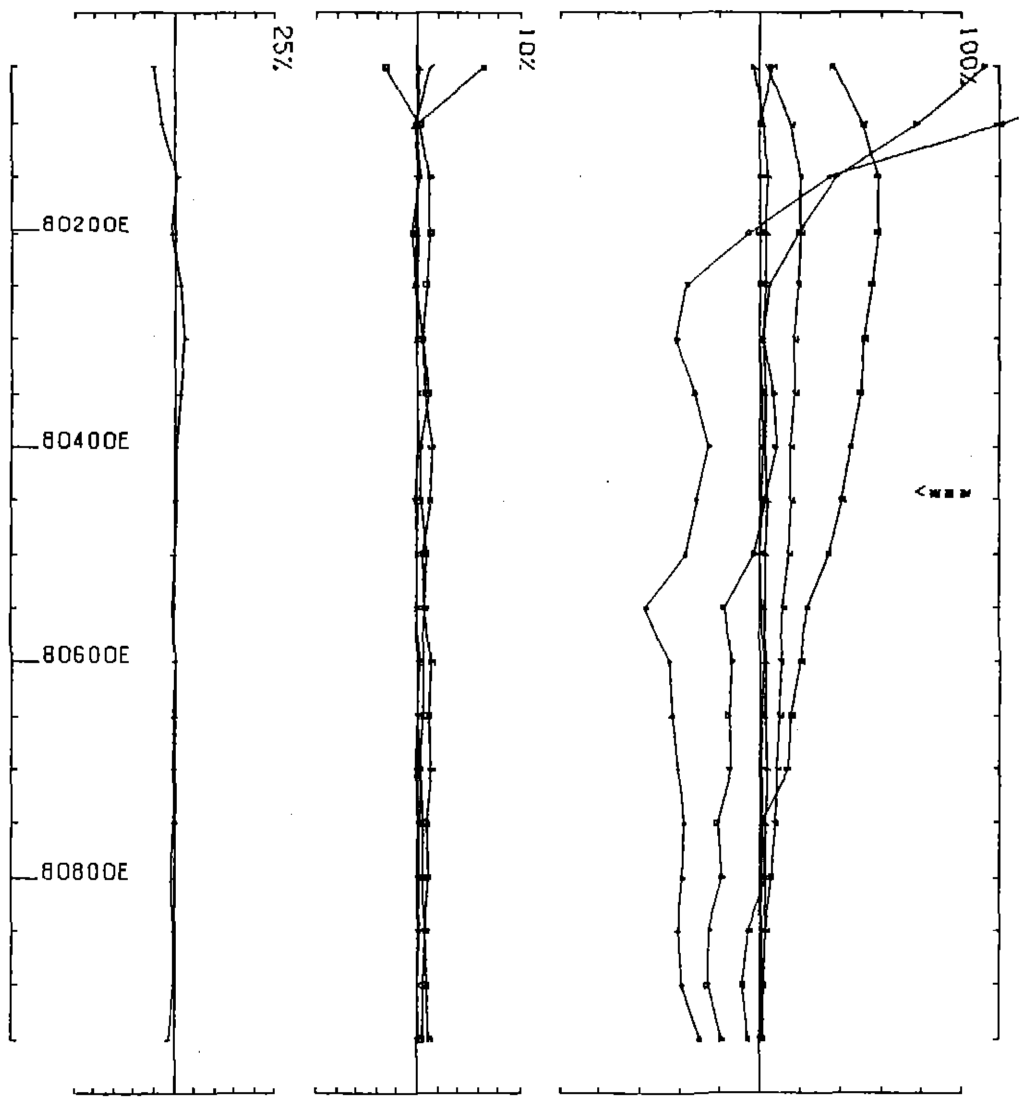
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 6B LINE 50200 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM

025162



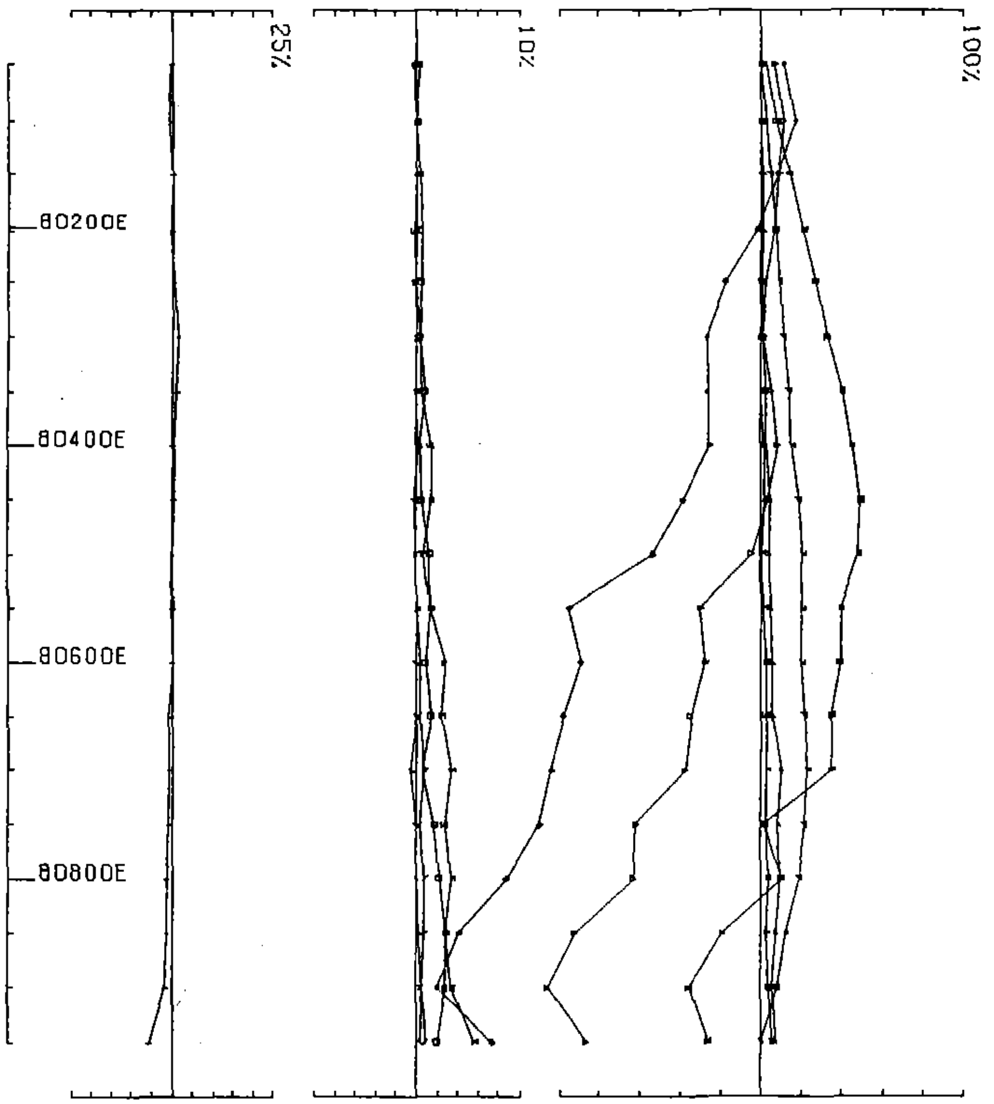
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 6B LINE 50200 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025163



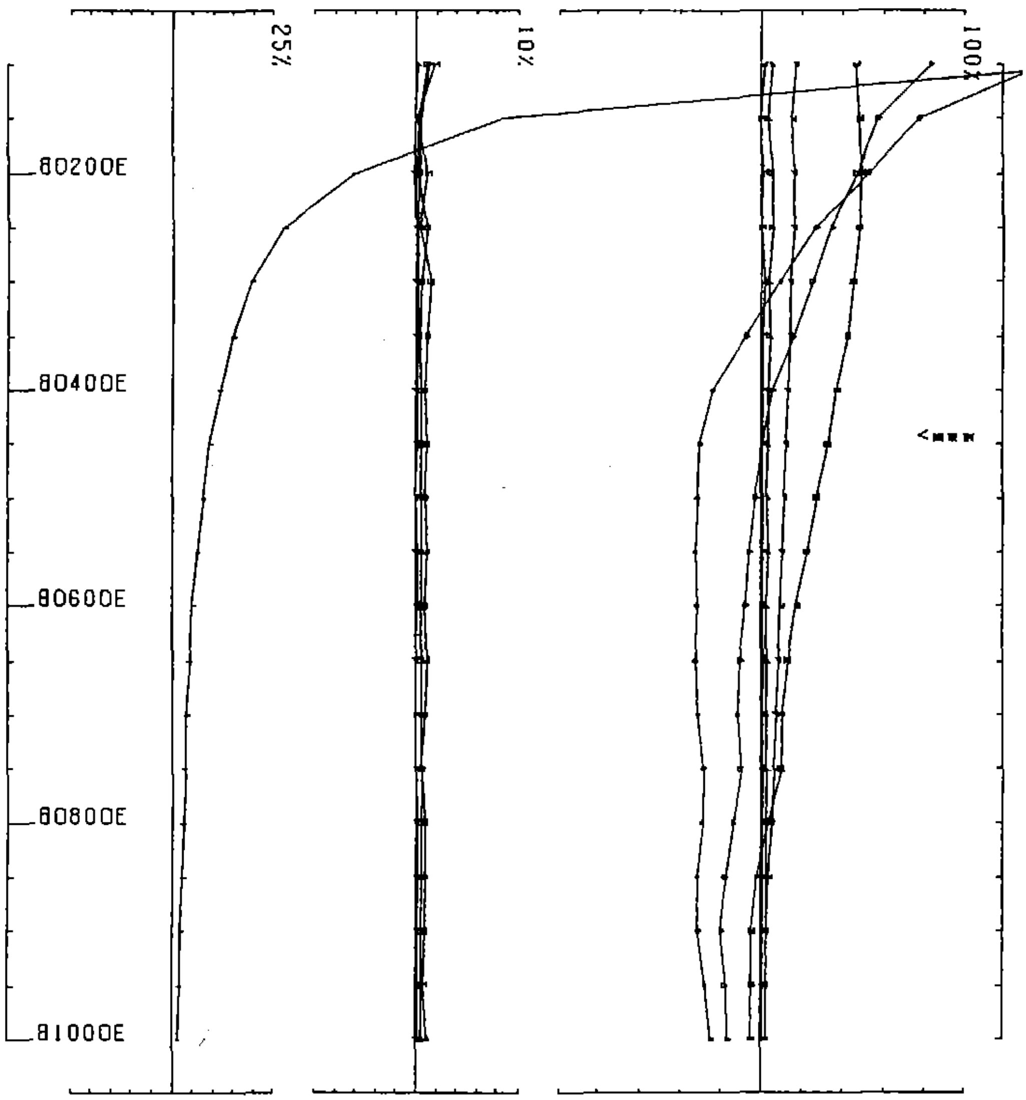
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.25
LOOP NO 6B LINE 50400 N COMPONENT HZ SECONDARY FIELD CHI POINT NORM.

025164



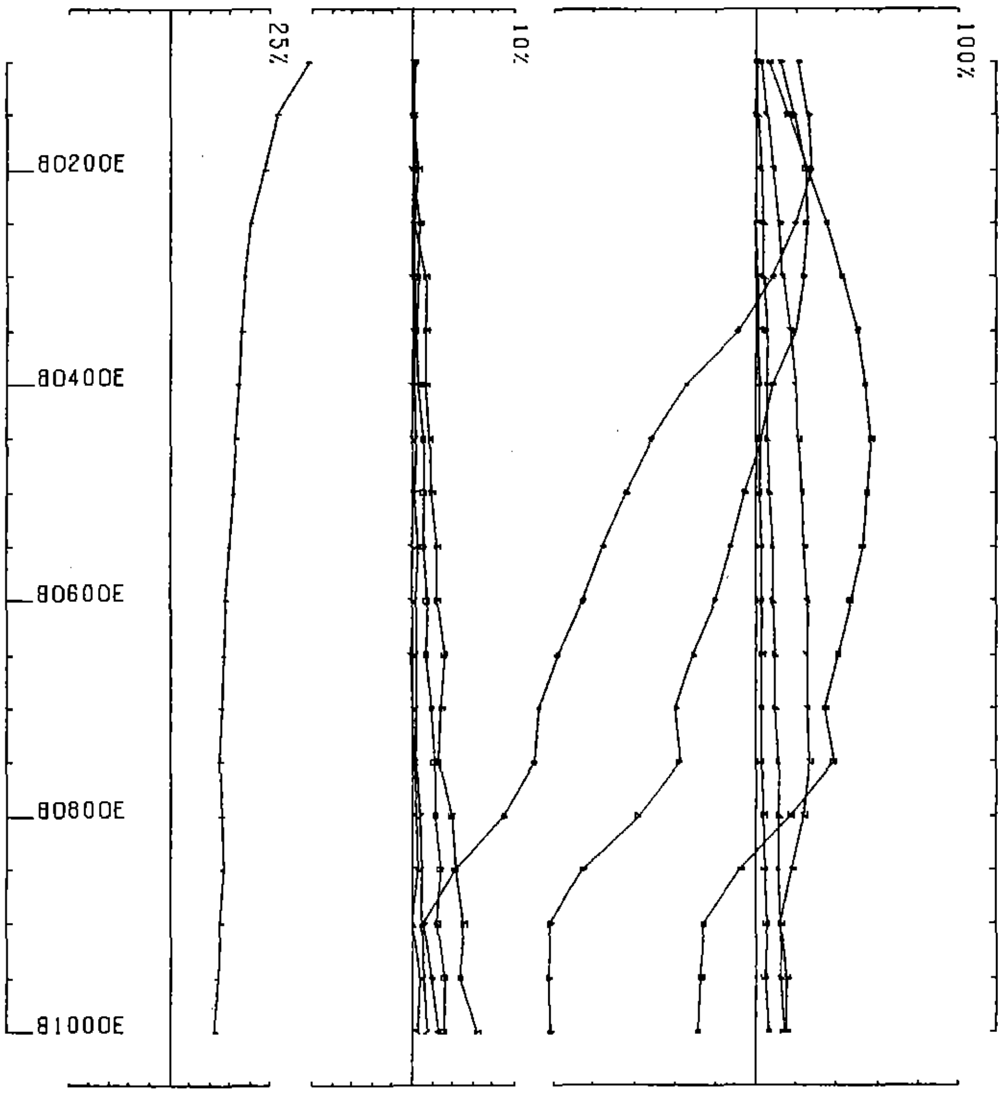
UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.29
LOOP NO 6B LINE 50400 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025165



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 50600 N COMPONENT HZ SECONDARY FIELD CH1 POINT NORM.

025166



UTEM SURVEY AT BASIN LAKE FOR ABERFOYLE RESOURCES FEBRUARY 1991
CONDUCTED BY LAMONTAGNE GEOPHYSICS LTD JOB 9102 BASE FREQ (HZ) 26.23
LOOP NO 6B LINE 50600 N COMPONENT HZ SECONDARY FIELD CHI CONTIN. NORM.

025167

Aberfoyle Resources Limited

EXPLORATION DIVISION

EXPLORATION LICENCE 103/87

BASIN LAKE

PARTIAL RELINQUISHMENT REPORT

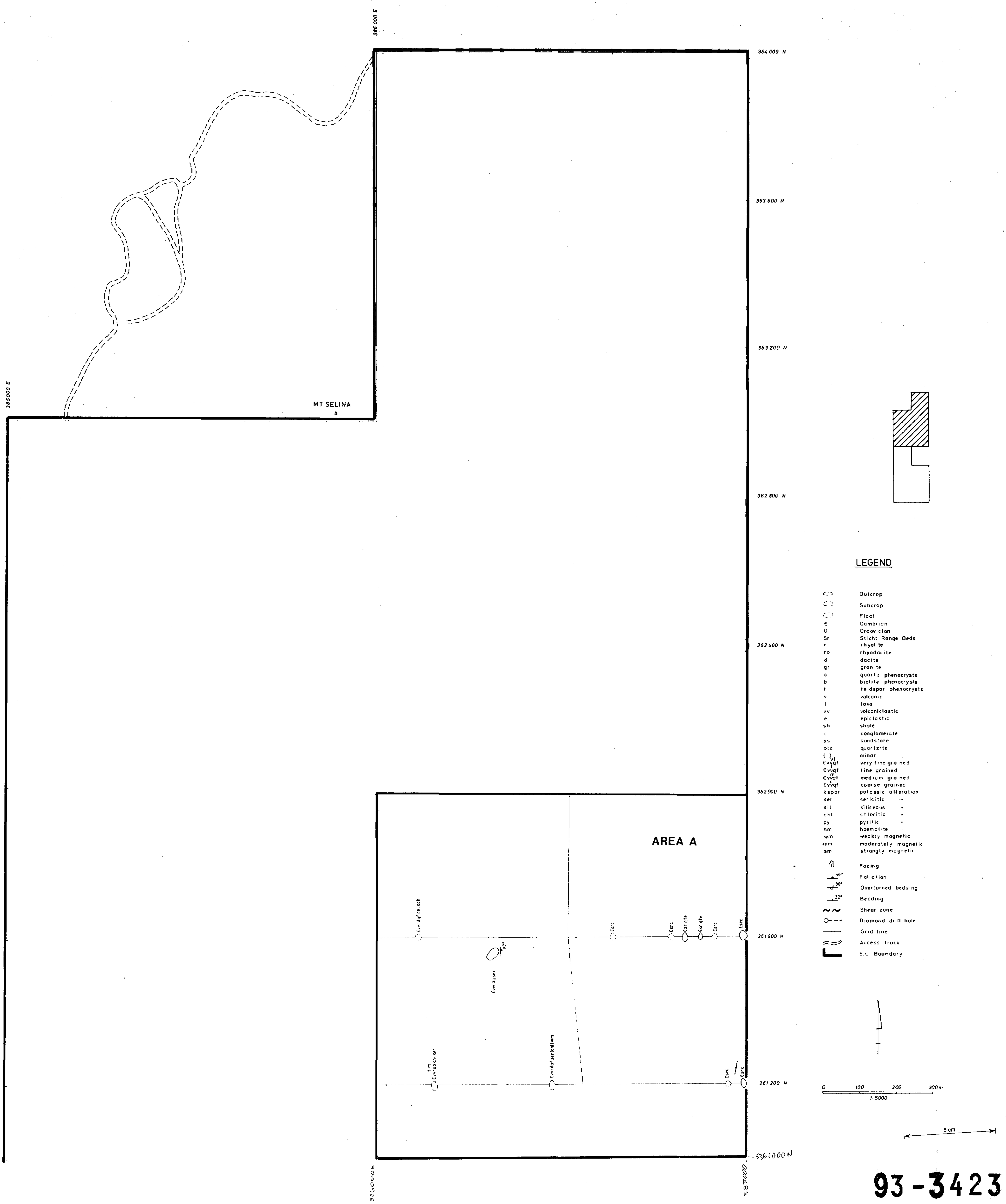
ON EXPLORATION TO APRIL, 1993

VOLUME 2 OF 2

PLATES

Distribution

Aberfoyle - Burnie (1/4)
Aberfoyle - Hawthorn (2/4)
Billiton Australia (3/4)
Department of Mines (4/4)



93-3423.

025177

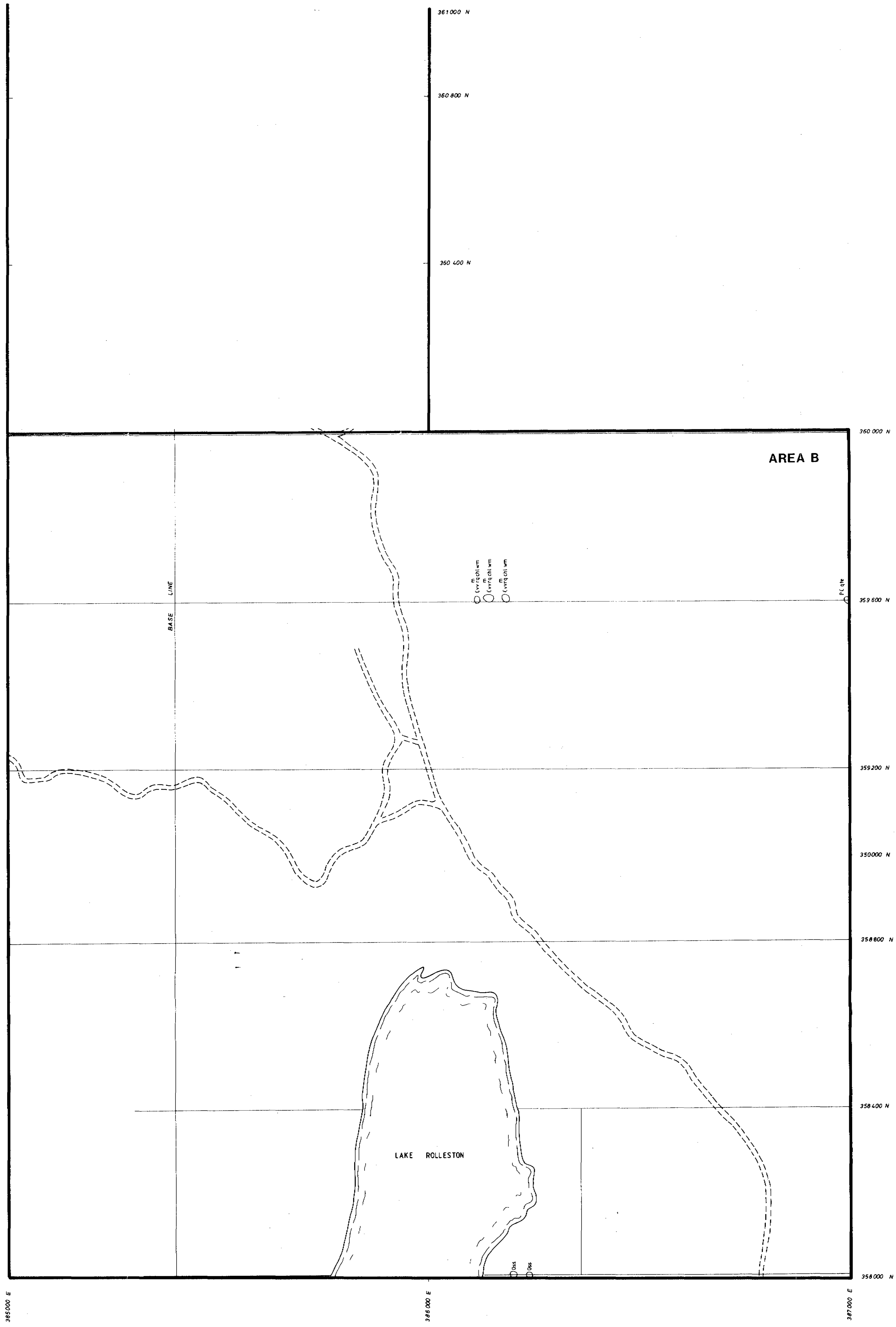
Billiton Australia
The Metals Division of the Shell Company of Australia Limited

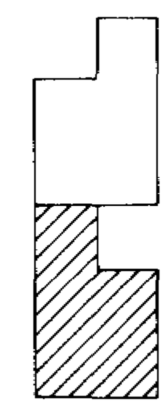
Project: LAKE SELINA

Title: GEOLOGY
GRID LINE FACT MAP

SHEET 1

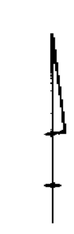
Author C J C	Dept. TAS	Scale	1:5000
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG 6		Drawing No. D/LD 56/038	





LEGEND

	Outcrop
	Subcrop
	Float
Є	Cambrian
O	Ordovician
Sr	Sticht Range Beds
r	rhyolite
rd	rhyodacite
d	dacite
gr	granite
q	quartz phenocrysts
b	biotite phenocrysts
f	feldspar phenocrysts
v	volcanic
l	lava
vv	volcaniclastic
e	epiclastic
sh	shale
c	conglomerate
ss	sandstone
qtz	quartzite
( )	minor
Єvvqf (vf)	very fine grained
Єvvqf (f)	fine grained
Єvvqf (m)	medium grained
Єvvqf (c)	coarse grained
kspar	potassic alteration
ser	sericitic "
sil	siliceous "
chl	chloritic "
py	pyritic "
hm	haematite "
wm	weakly magnetic
mm	moderately magnetic
sm	strongly magnetic
	Facing
50°	Foliation
30°	Overturned bedding
22°	Bedding
	Shear zone
	Diamond drill hole
	Grid line
	Access track
	E.L. Boundary



0 100 200 300m
1:5000

025174

5 cm

93-3423.

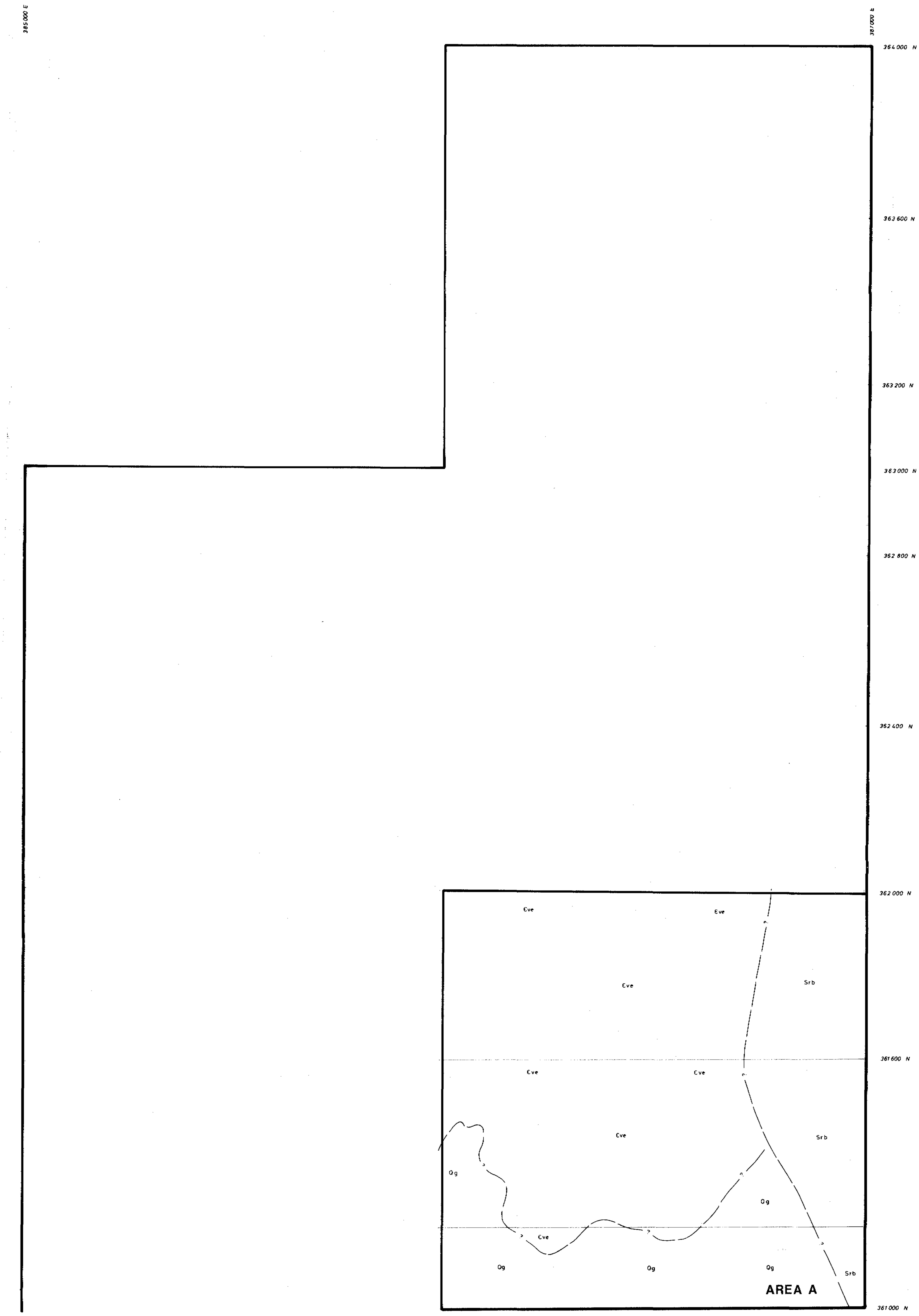
Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: LAKE SELINA

Title: GEOLOGY
GRID LINE FACT MAP

SHEET 2

Author C J C	Dept. TAS	Scale 1:5000	
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG 7		Drawing No. D/LD 56/039	



Og	Quaternary glacial sediments
Oc	Ordovician Owen Conglomerate
Dc	Cambrian Dora Conglomerate
Єrl	Cambrian rhyolitic lava
Єvvf	Cambrian very fine grained laminated volcaniclastics and sandstones
Єvf	Cambrian fine grained volcaniclastics
Єve	Cambrian fine to coarse grained dacitic to rhyolitic volcaniclastics, epiclastics and minor lavas
Єsh	Cambrian shales
Srb	Cambrian Sticht Range Beds
	Cambrian granite
	Chloritic - pyritic alteration
	Sericite - silica - pyrite alteration
	Access track
	E.L. Boundary
	Geological boundary
	Inferred fault
	Shear zone

0 100 200 300 m

1:5000

5 cm

93-3423.

025175

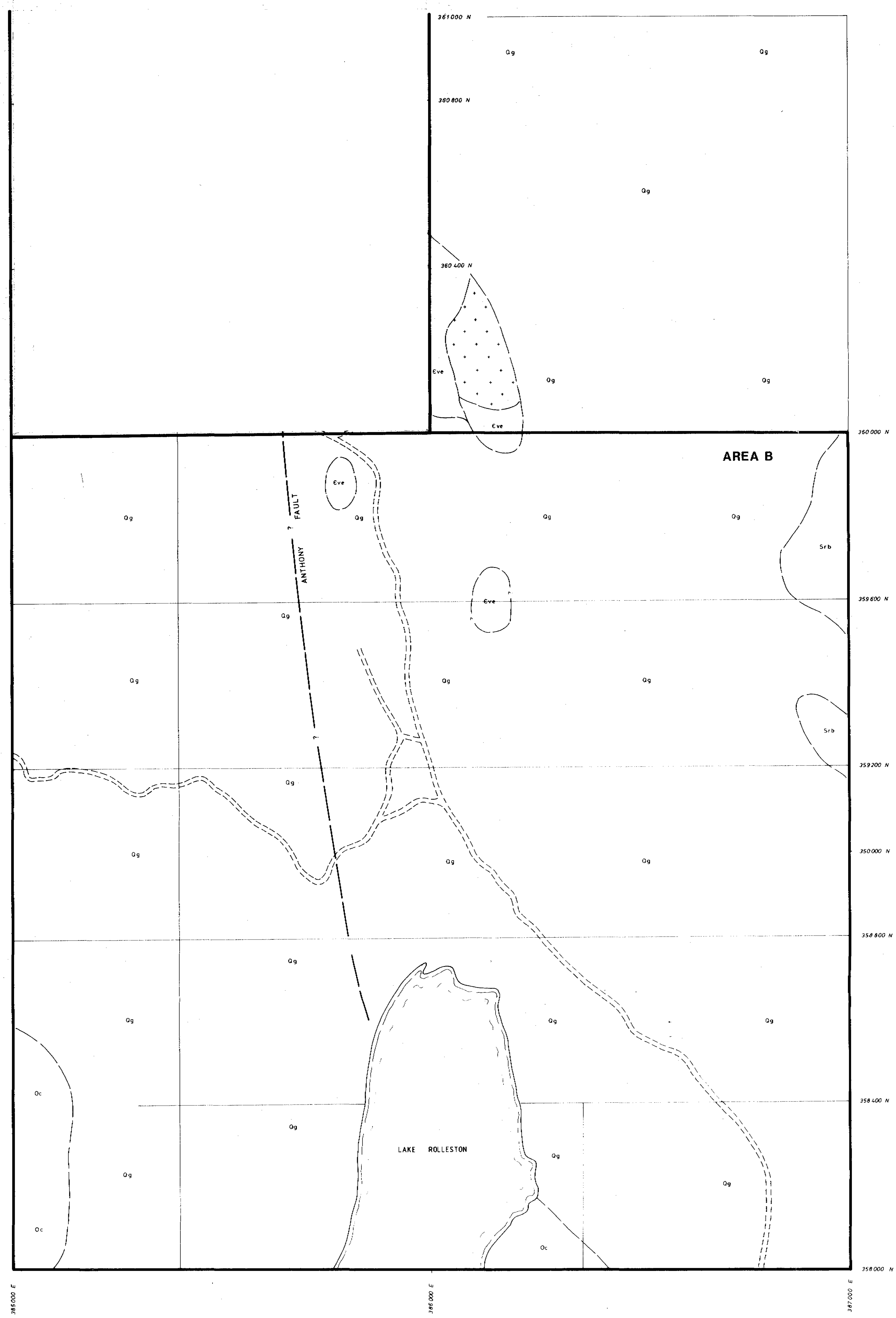
Billiton Australia
The Metals Division of the Shell Company of Australia Limited

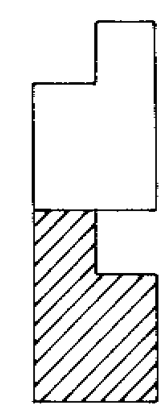
Project: LAKE SELINA

Title: GEOLOGICAL INTERPRETATION

SHEET 1

Author C J C	Dept. TAS	Scale 1:5000	
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG 8		Drawing No. D/LD 56/036	





LEGEND

Qg	Quaternary glacial sediments and alluvials
Oc	Ordovician Owen Conglomerate
Dc	Cambrian Dora Conglomerate
Єrl	Cambrian rhyolitic lava
Єvvf	Cambrian very fine grained laminated volcaniclastics and sandstones
Єvf	Cambrian fine grained volcaniclastics
Єve	Cambrian fine to coarse grained dacitic to rhyolitic volcaniclastics, epiclastics and minor lavas
Єsh	Cambrian shales
Srb	Cambrian Sticht Range Beds
+ +	Cambrian granite
	Access track
	E.L. Boundary
	Geological boundary
— ? —	Inferred fault
~~	Shear zone

0 100 200 300 m
1 : 5000

5 cm

93-3423

025178

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: LAKE SELINA

Title: GEOLOGICAL INTERPRETATION

SHEET 2

Author C.J.C.	Dept. TAS	Scale 1:5000	
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG. 9		Drawing No. D/LD 56/037	

93_3/23

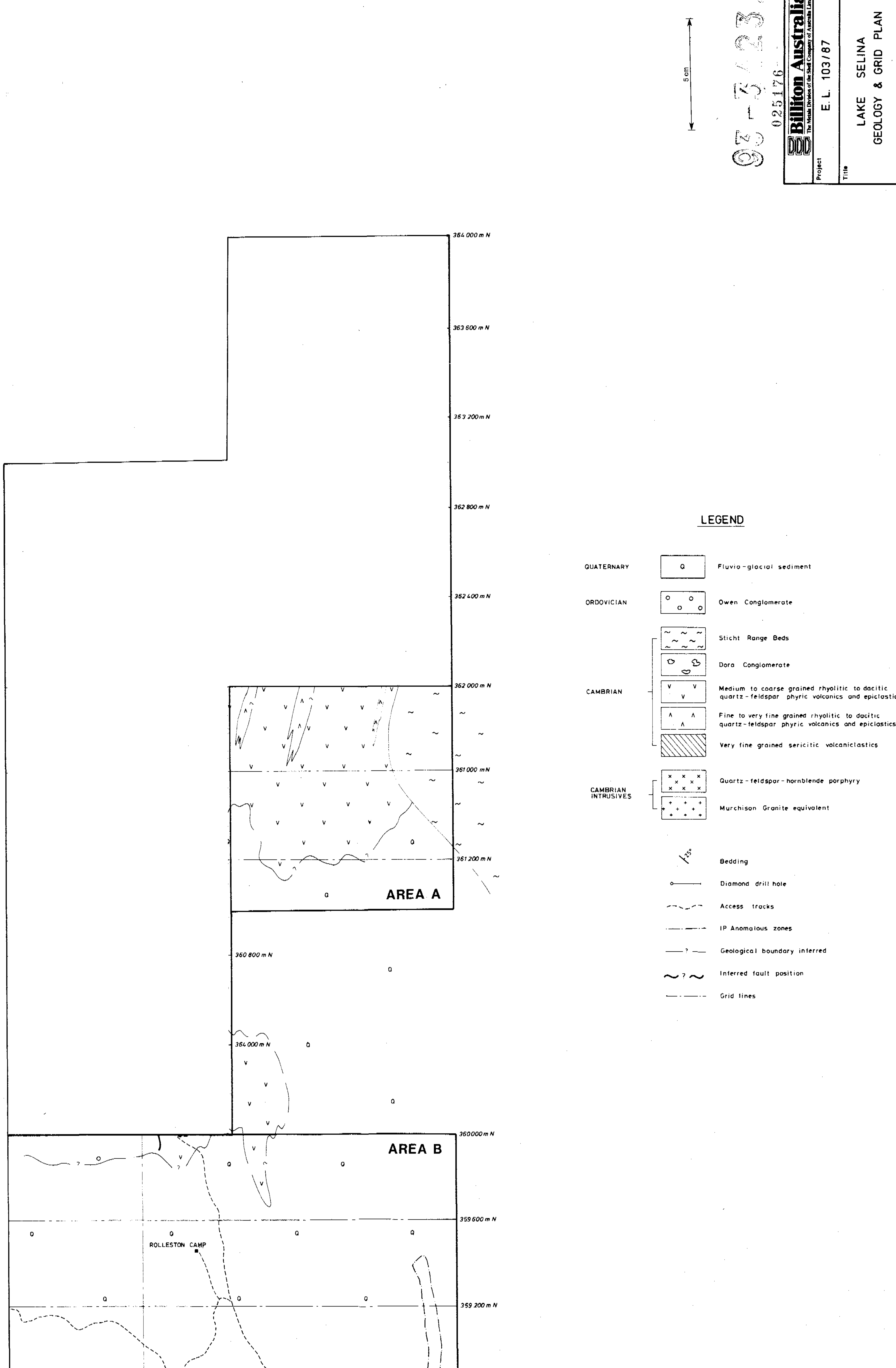
025176

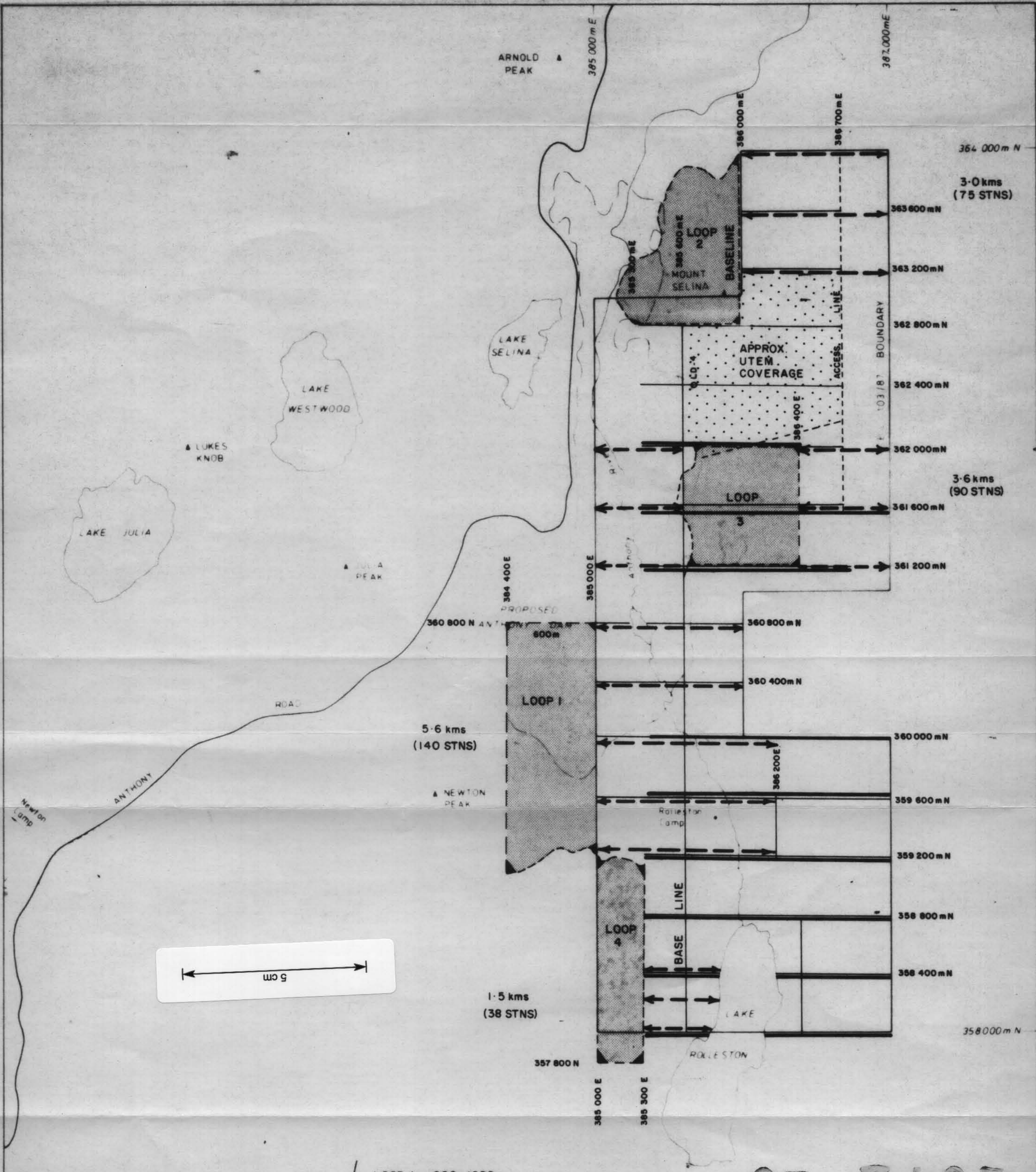
Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: E.L. 103/87

Title: LAKE SELINA GEOLOGY & GRID PLAN

Author C J C	Dept. TAS	Scale 1:10,000	
Drawn OH	Date 3/89	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG No. 2		Drawing No. D / LD 56 / 007	





93-3423

025183

CSAMT coverage (80 m stations)

TEM coverage Hz component (40 m stations)

LOOP 1 : ~600 x 1600 m

LOOP 2 : ~500 x 1000 m (west side along road)

LOOP 3 : ~800 x 800 m (west side along road)

LOOP 4 : ~300 x 1400 m (north side along road)

FEB. 1989
EM 37

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: LAKE SELINA

Title: LOCATION PLAN

GEOPHYSICAL SURVEYS 1989

Author N.H.	Date 12/89	Scale 1:25 000	
Drawn A.M.	Office AHO	Revised	Date
Drawing No LD56/1025			FIG. 12

SHELL COMPANY OF AUSTRALIA

METALS DIVISION

R.O.C.S. - PROTEM

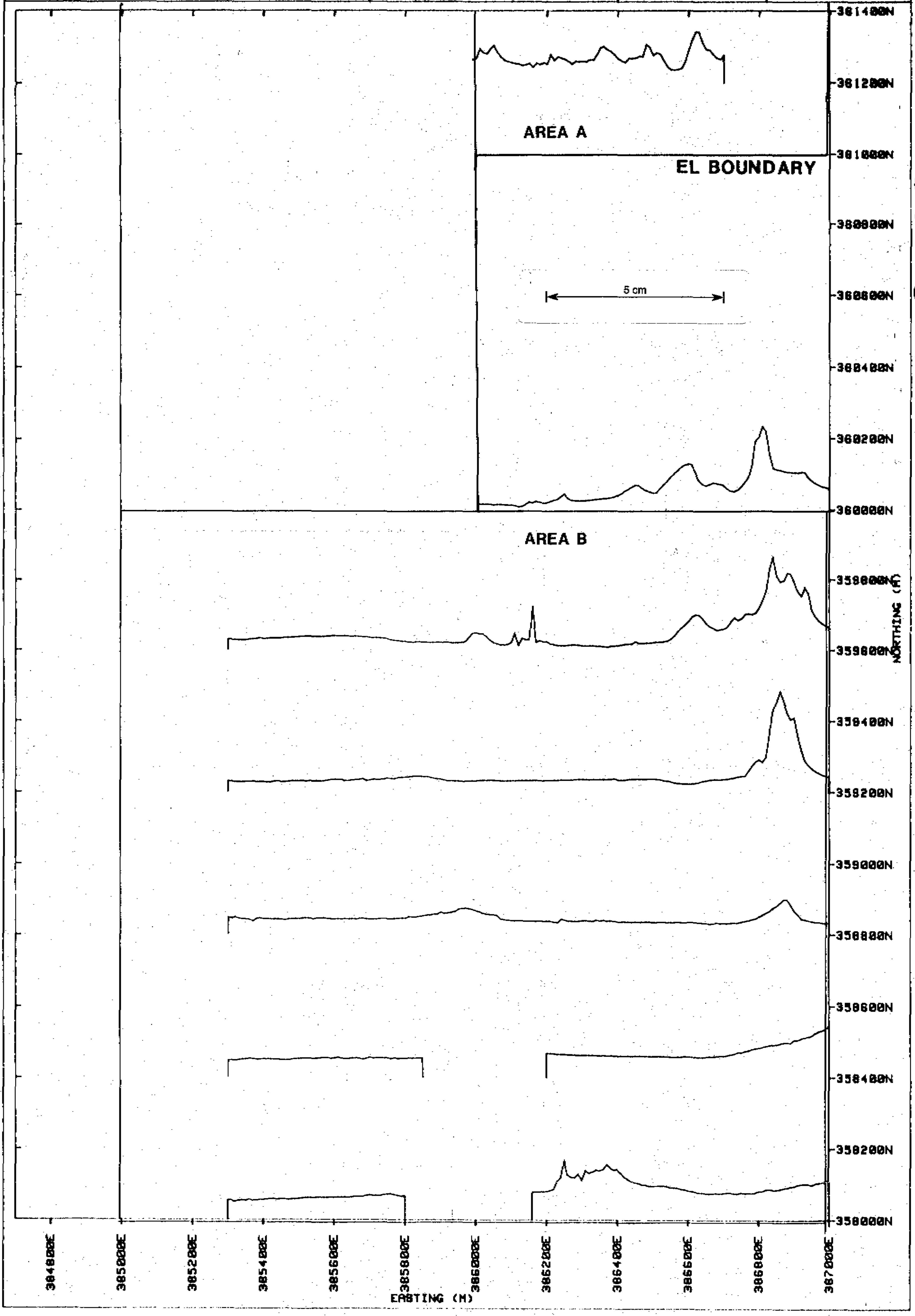
LAKE SELINA
GROUND MAG

BASE LEV. 62200nT

500nT/cm

SCALE 1 : 10000

FIG No : 4	LEGEND	
DATE : SEPT. 1988	2X G856	
AUTHOR : N Hungerford		
OFFICE : MELB.		
Drwg No : L056/1019		



025181

93-3423.

SHELL COMPANY OF AUSTRALIA

METALS DIVISION

R.O.C.B. - PROTEM

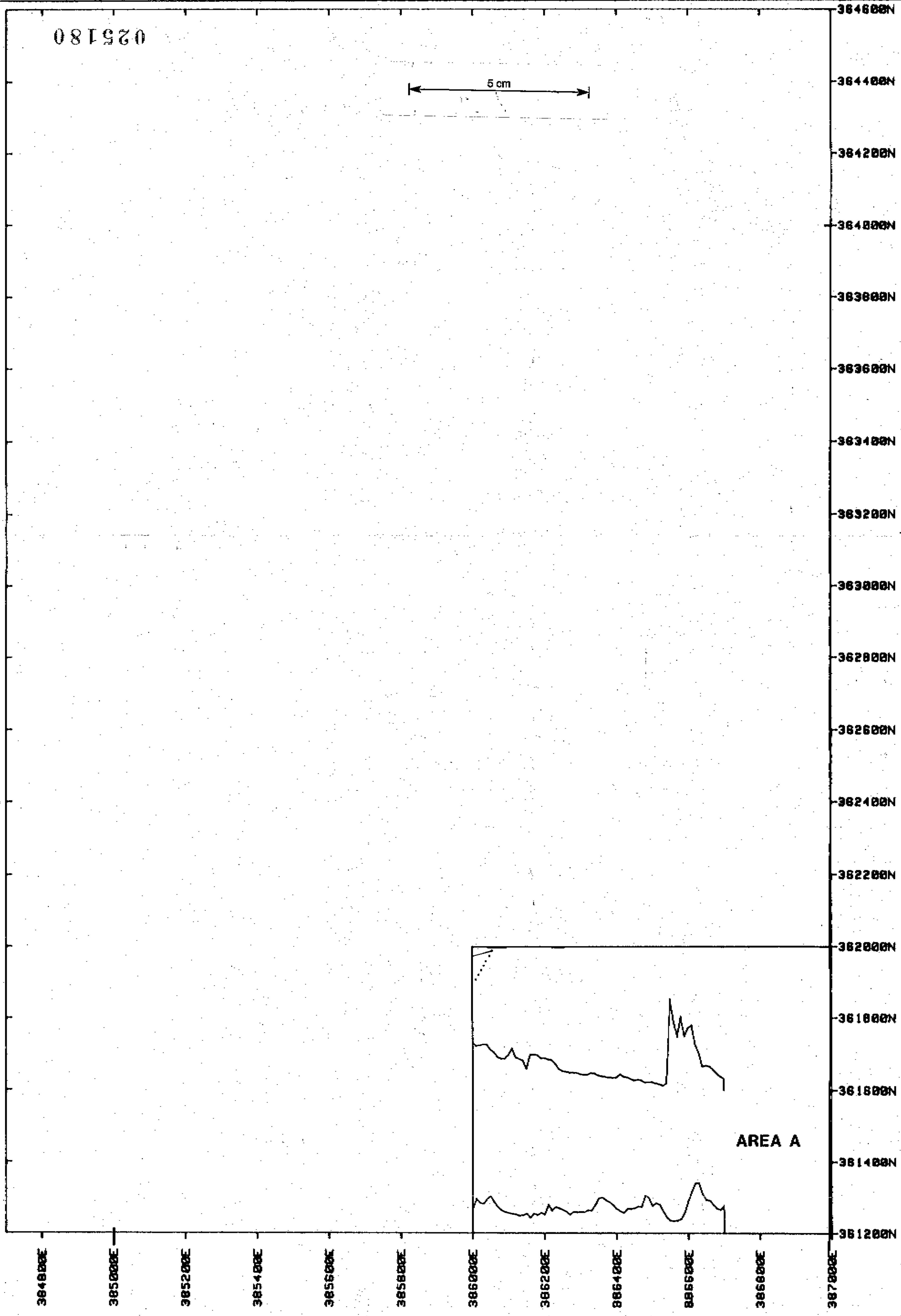
LAKE SELINA
GROUND MAG
BASE LEV. 62200nT
500nT/cm

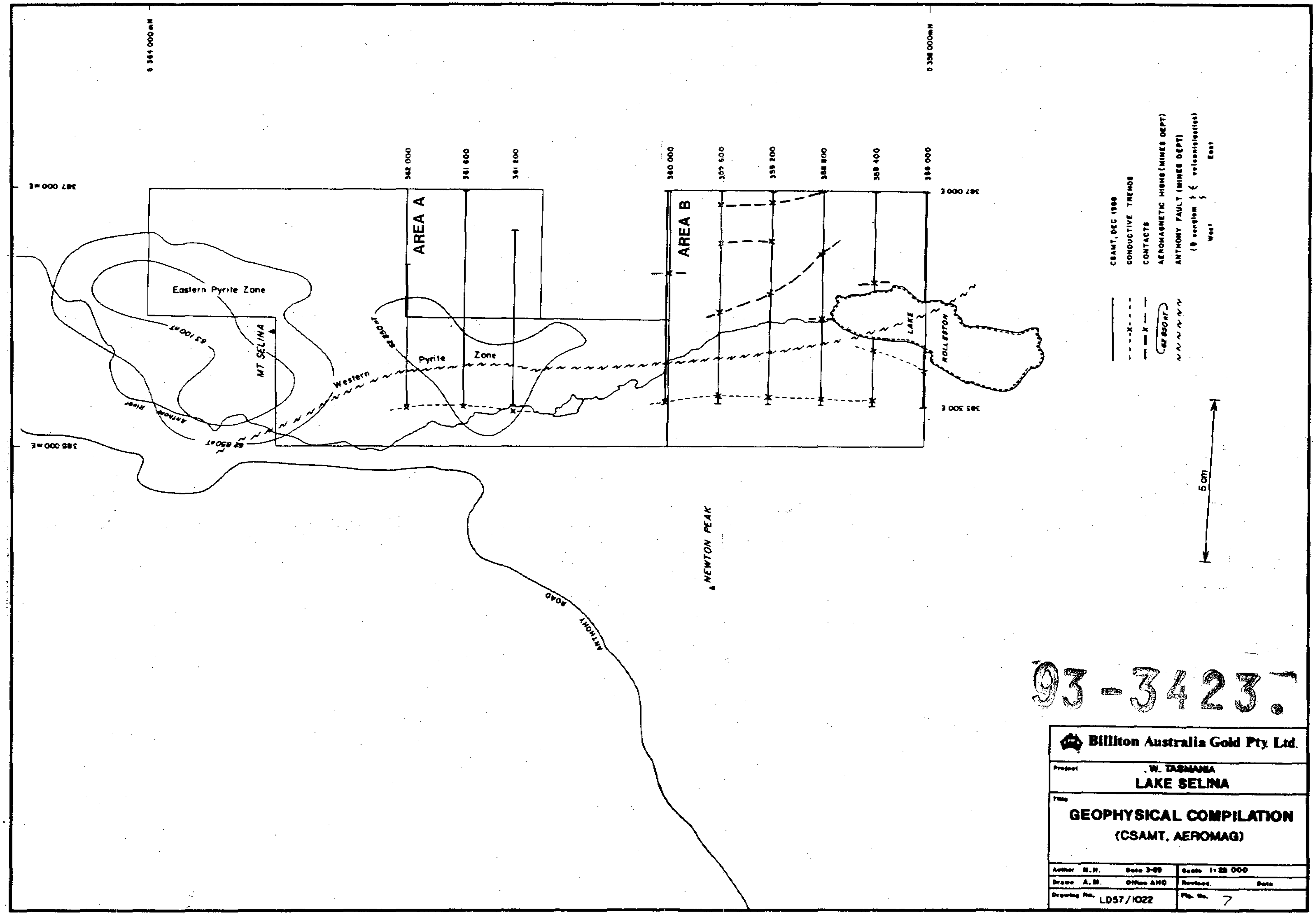
SCALE 1 : 10000

FIG No :	5
DATE :	SEPT 1988
AUTHOR :	N.Hungerford
OFFICE :	MELB.
Drwg. No :	L056/1020

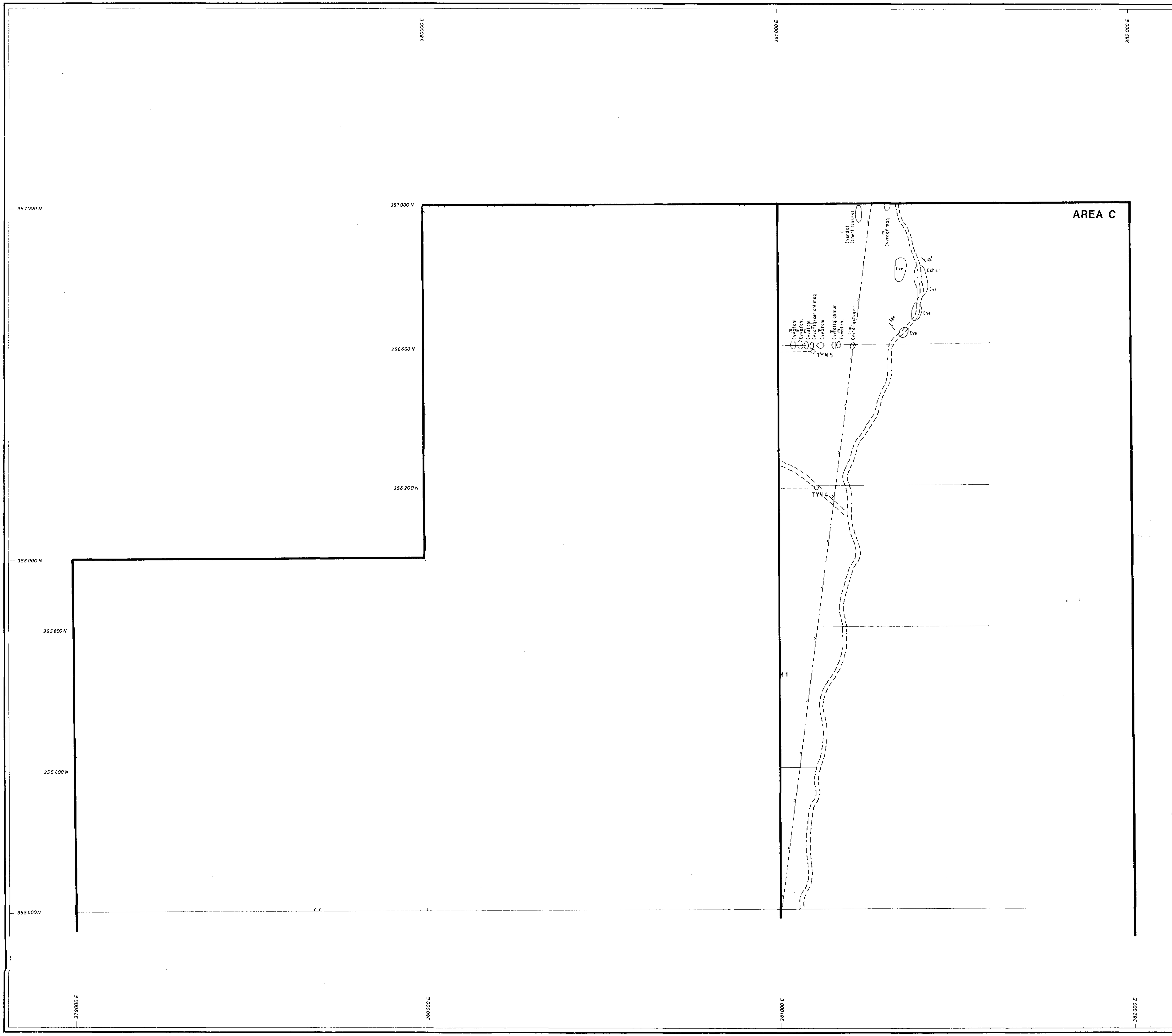
LEGEND
2X G856

93-3423.




AREA A
AREA B
Eastern Pyrite Zone
Western Pyrite Zone
MT SELINA
NEWTON PEAK
LAKE ROLLESTON
ANTHONY ROAD
Anthony River
63 100 nT
62 850 nT
5cm
CSAMT, DEC 1988
CONDUCTIVE TRENDS
CONTACTS
AEROMAGNETIC HIGHS (MINES DEPT)
ANTHONY FAULT (MINES DEPT)
West
East
93-3423
Billiton Australia Gold Pty. Ltd.
Project W. TASMANIA
LAKE SELINA
Title GEOPHYSICAL COMPILATION
(CSAMT, AEROMAG)
Author N.H.
Scale 1:25 000
Drawn A.M.
Office AHO
Drawing No. LD57/1022
Fig. No. 7

0251182



LEGEND

Є	Cambrian
r	rhyolite
rd	rhyodacite
d	dacite
a	andesite
o	diorite
qvn	quartz vein
car	carbonate alteration
py	disseminated pyrite
sil	silification
ser	sericite alteration
chl	chlorite alteration
mag	magnetic
fl	fluorite
( )	minor/trace
st	siltstone
ss	sandstone
sh	shale
i	intrusive
e	epiclastic
l	lava
v	volcanic
vv	volcaniclastic
Єvvf (vf)	very fine grained
Єvvf (f)	fine grained
Єvvf (m)	medium grained
Єvvf (c)	coarse grained
16734	sample no.
	Outcrop
	Subcrop
	float
	Dip and strike of foliation
	facing
	Dip and strike of stratigraphy
TYN1	Diamond drill hole
	Access track
	Transmission line
	BAUS grid line
F	Fault inferred position
	EL boundary

025172

0 200 400m
1:5000

5 cm

93-3423.

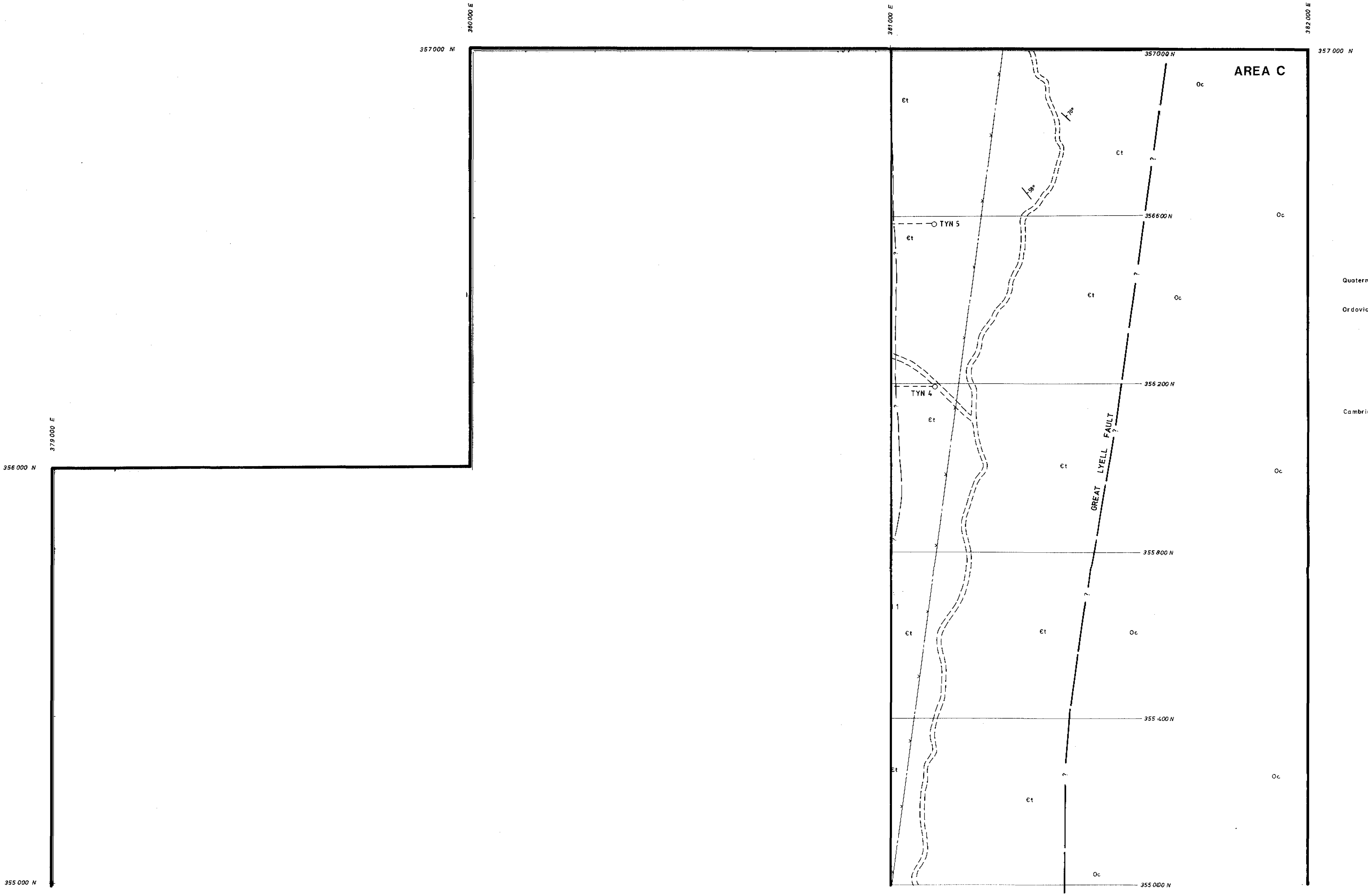
Billiton Australia
The Metals Division of the Shell Company of Australia Limited

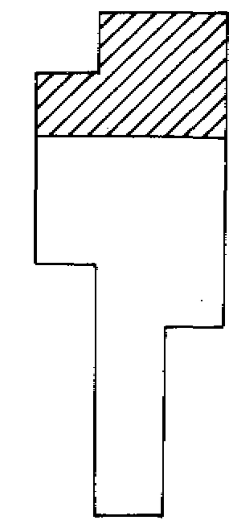
Project: BASIN LAKE

Title: GEOLOGY FACT MAP

SHEET 1

Author CJC	Dept. TAS	Scale 1:5000	
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG. 8		Drawing No. D/LD 57/024	





LEGEND

Quaternary	Qg	Glacial sediments and alluvials
Ordovician	Oc	Owen Conglomerate
Cambrian	€t	Tyndall Group. Predominantly felsic volcaniclastics, epiclastics and lavas. Base marked by mixed intermediate and felsic volcanics. Includes Comstock Tuff.
	€i	Dacitic-andesitic shallow level intrusives. Autobrecciated along margins. Majority possibly sills. Lavas increasing towards east. Pyritic towards margins.
	€csh	Interbedded sandstones, siltstones and black shales (partly graphitic)
	€csu	Central Volcanic Sequence upper. Includes Basin Lake sulphide zone. Predominantly intermediate volcanics with felsic content increasing towards the east. Abundant disseminated pyrite in parts. Minor stratiform pyrite lenses.
	€csl	Central Volcanic Sequence lower. Predominantly intermediate volcanics with minor felsic volcanic lenses incorporated. Disseminated pyrite common.
	€ws	Western Volcanosedimentary Sequence. Mixed felsic-intermediate volcaniclastic sequence.

- Access track
- Power line
- Grid line
- Geological boundary inferred
- Fault inferred location
- Diamond drill hole
- E.L. boundary
- Bedding
- Facing

NOTE: OUTCROP WITHIN THE E.L. BOUNDARY IS SPARCE. THE MAJORITY OF THE LICENCE IS COVERED BY QUATERNARY GLACIALS, SEDIMENTS.

5 cm

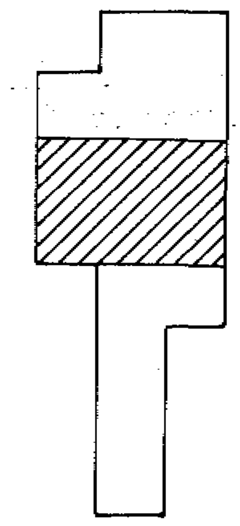
0 100 200 300m
1:5000

93 3 23

025179

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: BASIN LAKE	
Title: GEOLOGICAL INTERPRETATION — SHEET 1	
Author CJC Dept. TAS	Scale 1:5000
Drawn OH Date 2/90	Revised Date
Checked Date	S'ceded Date
Sheet No FIG 10	Drawing No. D/LD 57/030



LEGEND

Quaternary	Qg	Glacial sediments and alluvials
Ordovician	Oc	Owen Conglomerate
Cambrian	€t	Tyndall Group. Predominantly felsic volcaniclastics, epiclastics and lavas. Base marked by mixed intermediate and felsic volcanics. Includes Comstock Tuff.
	€i	Dacitic-andesitic shallow level intrusives. Autobrecciated along margins. Majority possibly sills. Lavas increasing towards east. Pyritic towards margins.
	€csh	Interbedded sandstones, siltstones and black shales (partly graphitic)
	€csu	Central Volcanic Sequence upper. Includes Basin Lake sulphide zone. Predominantly intermediate volcanics with felsic content increasing towards the east. Abundant disseminated pyrite in parts. Minor stratiform pyrite lenses.
	€csl	Central Volcanic Sequence lower. Predominantly intermediate volcanics with minor felsic volcanic lenses incorporated. Disseminated pyrite common.
	€ws	Western Volcanosedimentary Sequence. Mixed felsic-intermediate volcaniclastic sequence.

Access track
Power line
Grid line
Geological boundary inferred
Fault inferred location
Diamond drill hole
E.L. boundary
Bedding
Facing

NOTE OUTCROP WITHIN THE E.L. BOUNDARY IS SPARCE. THE MAJORITY OF THE LICENCE IS COVERED BY QUATERNARY GLACIALS, SEDIMENTS.

5 cm

0 100 200 300m
1:5000

93-3423.

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

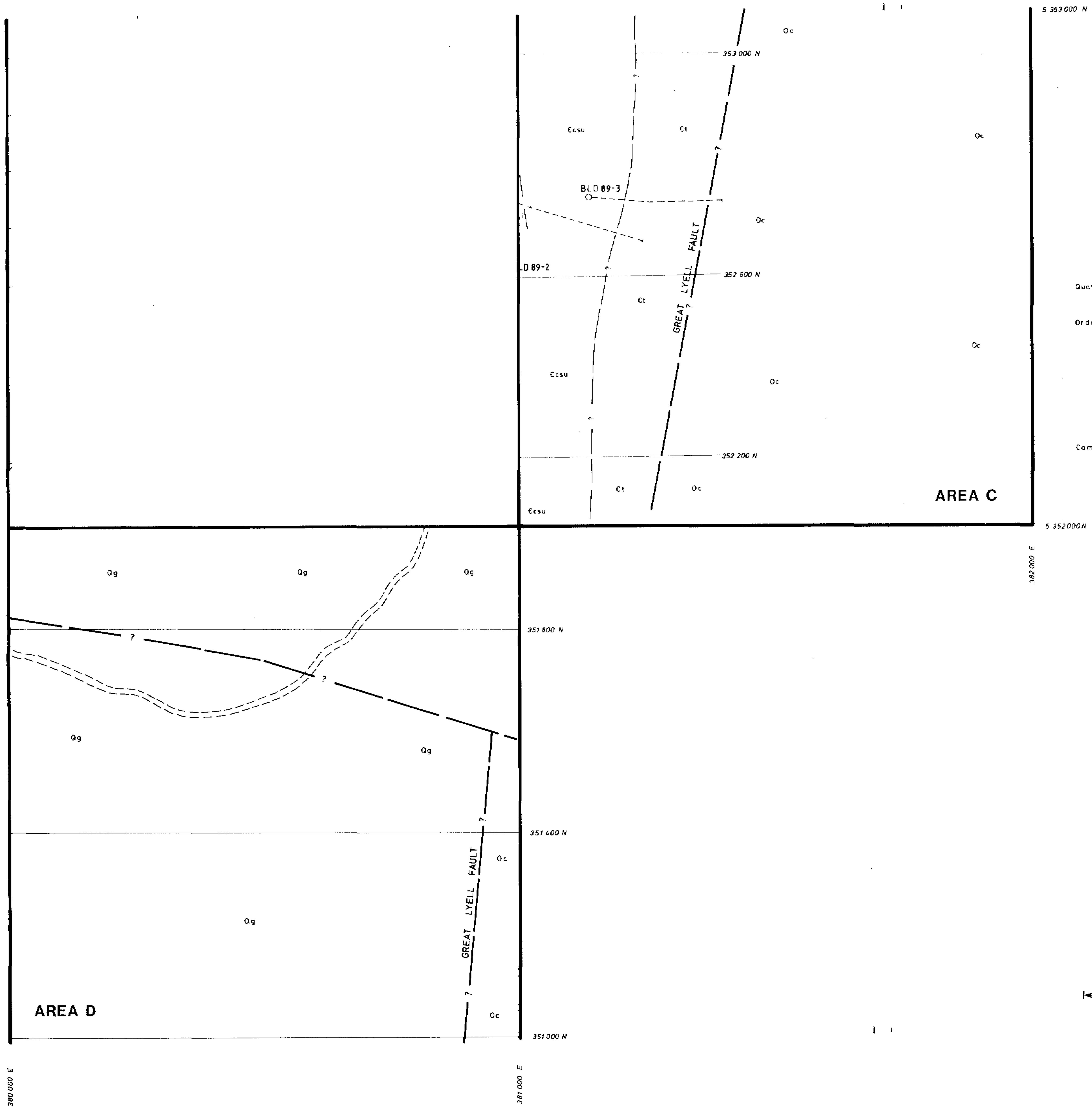
Project: BASIN LAKE

Title: GEOLOGICAL INTERPRETATION

SHEET 2

Author CJC	Dept. TAS	Scale 1:5000	
Drawn OH	Date 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG II		Drawing No. O/LD 57/031	

025184



LEGEND

Quaternary	Qg	Glacial sediments and alluvials
Ordovician	Oc	Owen Conglomerate
Cambrian	Ct	Tyndall Group. Predominantly felsic volcaniclastics, epiclastics and lavas. Base marked by mixed intermediate and felsic volcanics. Includes Comstock Tuff.
	Ci	Dacitic-andesitic shallow level intrusives. Autobrecciated along margins. Majority possibly sills. Lavas increasing towards east. Pyritic towards margins.
	Ccsh	Interbedded sandstones, siltstones and black shales (partly graphitic)
	Ccsu	Central Volcanic Sequence upper. Includes Basin Lake sulphide zone. Predominantly intermediate volcanics with felsic content increasing towards the east. Abundant disseminated pyrite in parts. Minor stratiform pyrite lenses.
	Ccsl	Central Volcanic Sequence lower. Predominantly intermediate volcanics with minor felsic volcanic lenses incorporated. Disseminated pyrite common.
	Cws	Western Volcanosedimentary Sequence. Mixed felsic-intermediate volcaniclastic sequence

- Access track
- Power line
- Grid line
- Geological boundary inferred
- Fault inferred location
- Diamond drill hole
- E.L. boundary
- Bedding
- Facing

NOTE: OUTCROP WITHIN THE E.L. BOUNDARY IS SPARCE. THE MAJORITY OF THE LICENCE IS COVERED BY QUATERNARY GLACIALS, SEDIMENTS

5 cm

0 100 200 300m
1:5000

93-3423.1

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

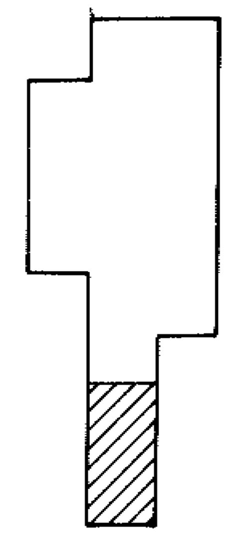
Project: BASIN LAKE

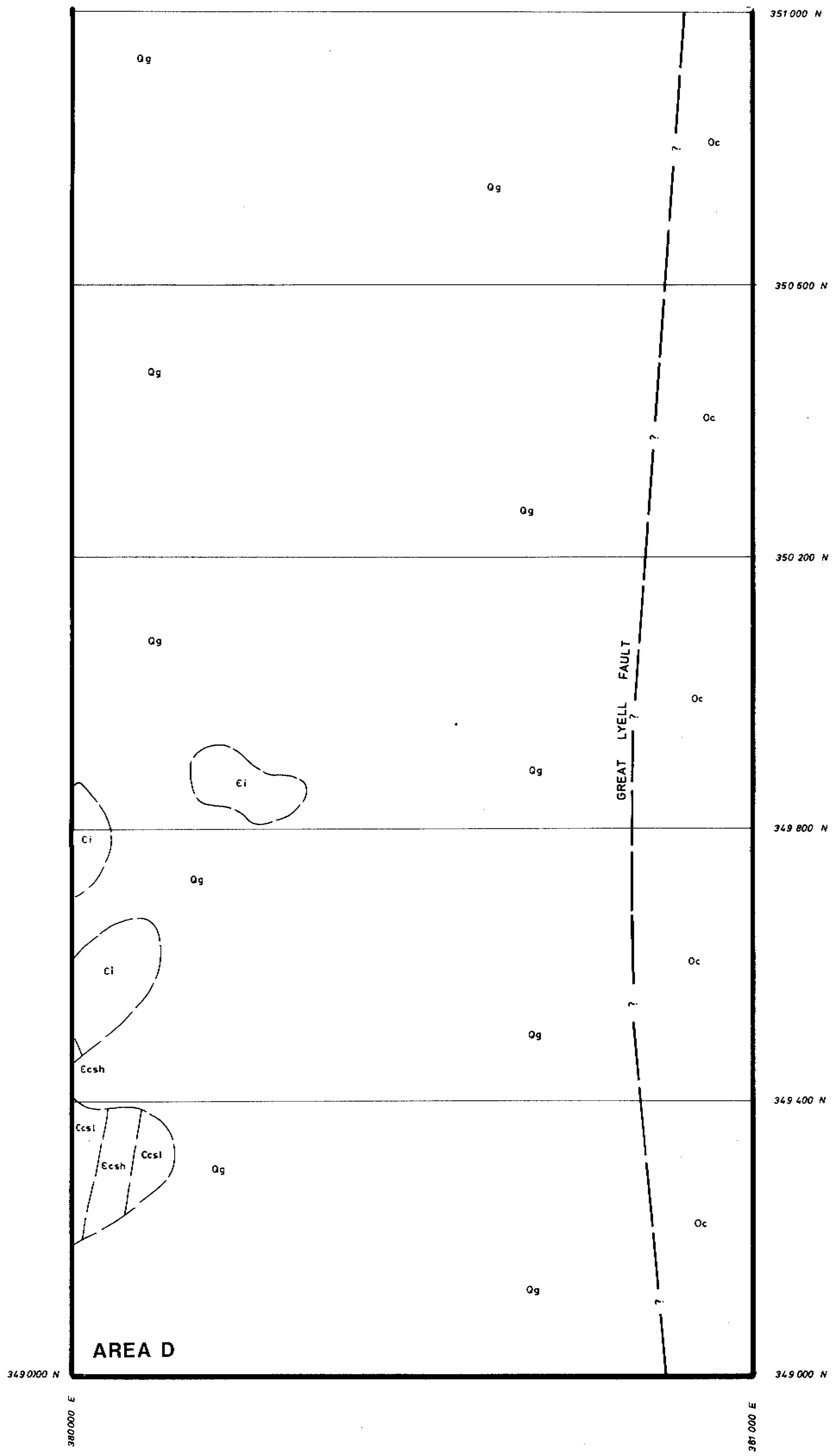
Title: GEOLOGICAL INTERPRETATION

SHEET 3

Author: CJC	Dept. TAS	Scale: 1:5000	
Drawn: OH	Date: 2/90	Revised	Date
Checked	Date	S'ceded	Date
Sheet No.: FIG 12		Drawing No.: D/LD 57/032	

025185





LEGEND

Quaternary	Qg	Glacial sediments and alluvials
Ordovician	Oc	Owen Conglomerate
Cambrian	Ɛt	Tyndall Group. Predominantly felsic volcaniclastics, epiclastics and lavas. Base marked by mixed intermediate and felsic volcanics. Includes Comstock Tuff.
	Ɛi	Dacitic-andesitic shallow level intrusives. Autobrecciated along margins. Majority possibly sills. Lavas increasing towards east. Pyritic towards margins.
	Ɛcsh	Interbedded sandstones, siltstones and black shales (partly graphitic)
	Ɛcsu	Central Volcanic Sequence upper. Includes Basin Lake sulphide zone. Predominantly intermediate volcanics with felsic content increasing towards the east. Abundant disseminated pyrite in parts. Minor stratiform pyrite lenses.
	Ɛcsl	Central Volcanic Sequence lower. Predominantly intermediate volcanics with minor felsic volcanic lenses incorporated. Disseminated pyrite common.
	Ɛws	Western Volcanosedimentary Sequence. Mixed felsic-intermediate volcaniclastic sequence.

Access track
Power line
Grid line
Geological boundary inferred
Fault inferred location
Diamond drill hole
E.L. boundary
Bedding
Facing

NOTE: OUTCROP WITHIN THE E.L. BOUNDARY IS SPARCE. THE MAJORITY OF THE LICENCE IS COVERED BY QUATERNARY GLACIALS, SEDIMENTS.

025186

5 cm

0 100 200 300m
1:5000

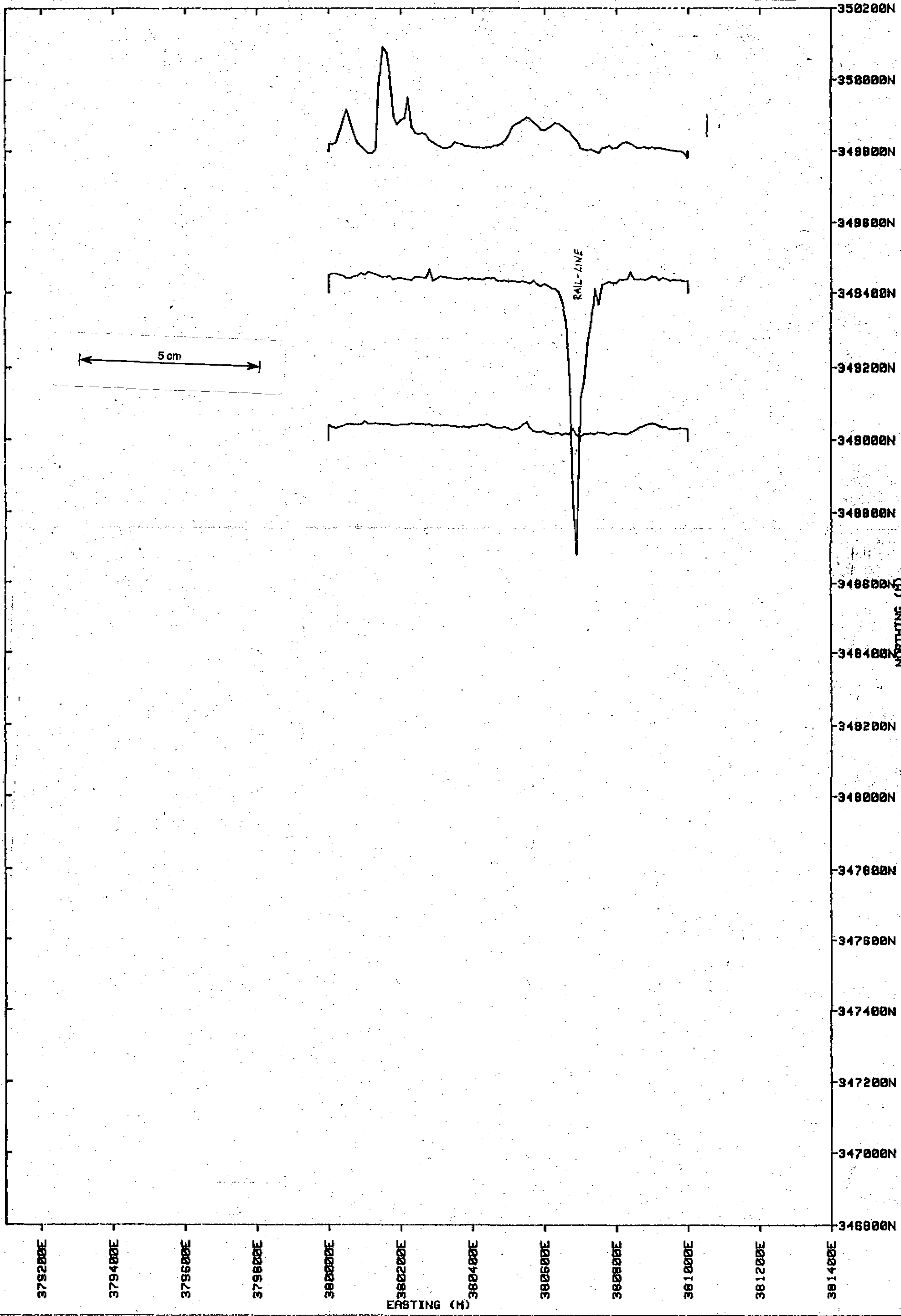
93-3423

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project	BASIN LAKE
Title	GEOLOGICAL INTERPRETATION
	SHEET 4
Author CJC Dept. TAS	Scale 1:5000
Drawn OH Date 2/90	Revised Date
Checked Date	S'ceded Date
Sheet No. FIG 13	Drawing No. D/LD 57/033

025170

SHELL COMPANY OF AUSTRALIA	BASIN LAKE GROUND MAG	FIG No : 6	LEGEND
METALS DIVISION	BASE LEV. 62300nT	DATE : 7/88	2 × G 856
R.O.C.S. - PROTEM	100nT/cm	AUTHOR :	XBL 33
	SCALE 1 : 10000	OFFICE :	
		DRAWN :	

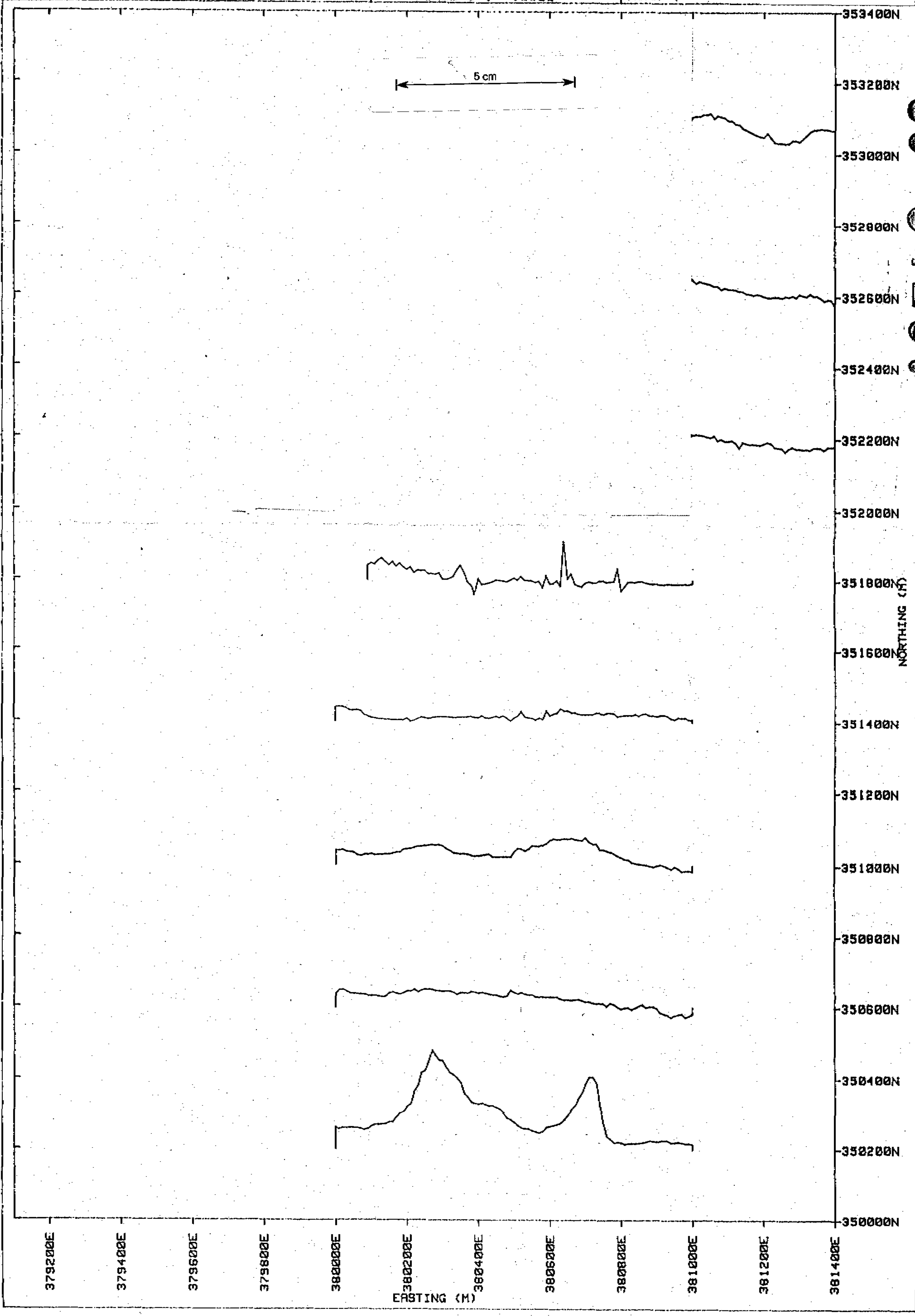


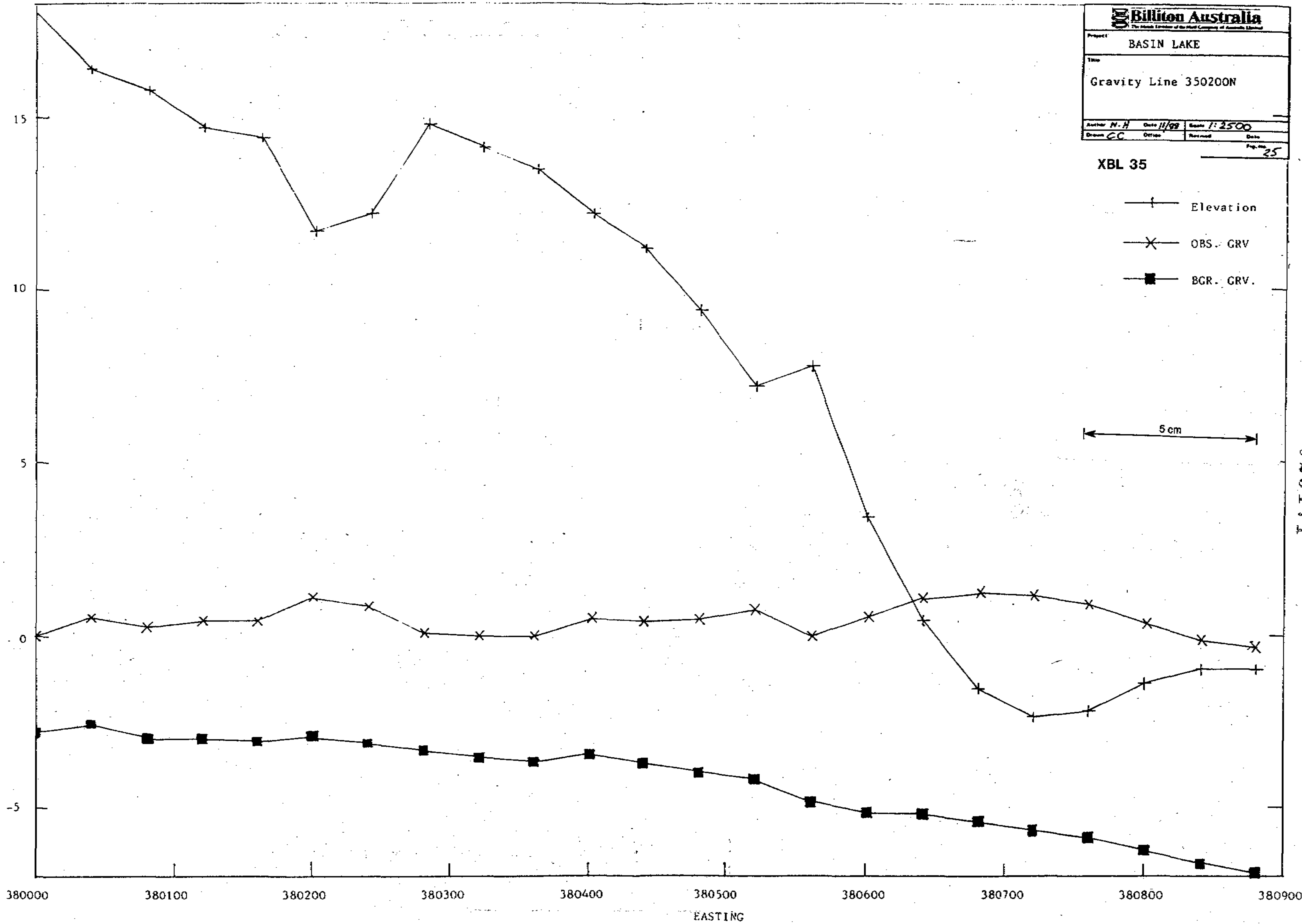
025173

SHELL COMPANY OF AUSTRALIA METALS DIVISION R.O.C.S. - PROTEM	BASIN LAKE GROUND MAG BASE LEV. 62300nT 100nT/cm SCALE 1 : 10000	FIG No : 5 DATE : 7/88 AUTHOR : OFFICE : DRAWN :	LEGEND 2x G856 XBL 34

Fig

93-3723





92-3423
025171

Billiton Australia
The Metals Division of the Shell Company of Australia Limited

Project: BASIN LAKE

Title: DIAMOND DRILL SECTION BLD 89-3, BL 1

Author JPR	Dept. TAS	Scale 1:1000	
Drawn OH	Date 12/89	Revised	Date
Checked	Date	S'ceded	Date
Sheet No. FIG 16		Drawing No. D/LD 57/012	

025168

Aberfoyle Resources Limited

EXPLORATION DIVISION

NORTH WEST TASMANIA

BASIN LAKE EL 103/87

UTEM LOCATION PLAN 1991 SURVEY

REVISIONS			
Init.	Date	Init.	Date

Location Code :

Scale : 1:10 000

Date : May 1991

Compiled : MAG

Drawn : MAG

Traced : MAR

Checked :

Plate No : BL5