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GEOPEKO LIMITED

A Division of North Broken Hill Peko Limited

EL 44/88 BURNS PEAK

ANNUAL REPORT ON EXPLORATION ACTIVITY

JANUARY 1989 - OCTOBER 1989

Report No. T242

A.N. Rosenhain
I.J. Mathison
November 1989

A Report for the Burns Peak Joint Venture
Pasminco
Noranda
Pioneer

89-3059
MINES
File Ref. EL 44/88
29 NOV 1989
Doc. Ref.
Action Officer | Initials
LETTER
29.11.'89
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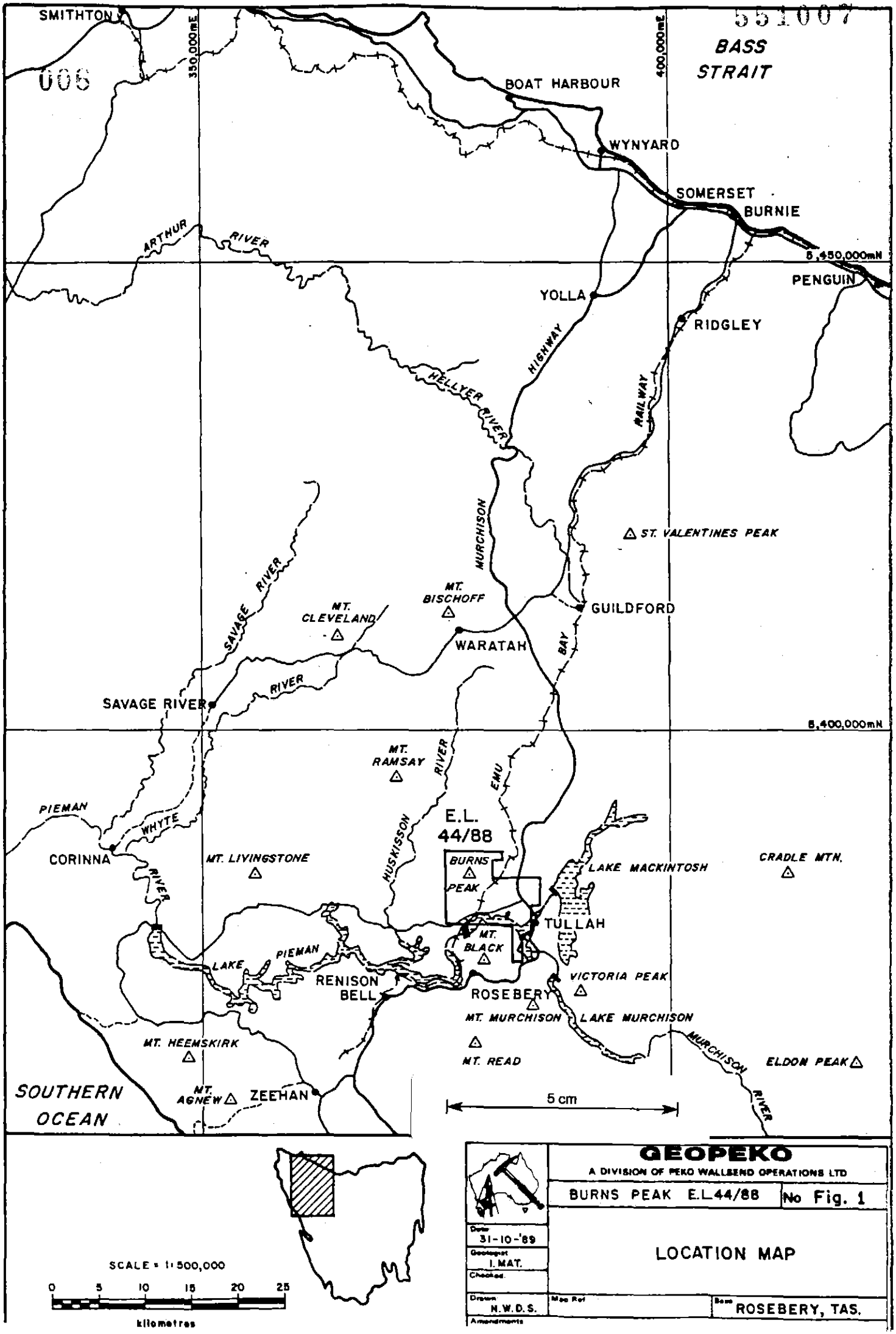
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006
SMITHTON
350,000mE
400,000mE
BASS STRAIT
BOAT HARBOUR
WYNYARD
SOMERSET
BURNIE
ARTHUR RIVER
5,450,000mN
PENGUIN
YOLLA
RIDGLEY
HIGHWAY
RAILWAY
HELLYER RIVER
MURCHISON
ST. VALENTINES PEAK
SAVAGE RIVER
MT. CLEVELAND
MT. BISCHOFF
GUILDFORD
WARATAH
BAY
SAVAGE RIVER
RIVER
5,400,000mN
MT. RAMSAY
RIVER
EMU
PIEMAN
WHYTE
E.L. 44/88
CORINNA
MT. LIVINGSTONE
HUSKISSON
BURNS PEAK
LAKE MACKINTOSH
CRADLE MTN.
RIVER
TULLAH
MT. BLACK
LAKE PIEMAN
RENISON BELL
VICTORIA PEAK
ROSEBERY
MT. MURCHISON
LAKE MURCHISON
MT. HEEMSKIRK
MT. READ
MURCHISON RIVER
ELDON PEAK
SOUTHERN OCEAN
MT. AGNEW
ZEEHAN
5 cm
SCALE = 1:500,000
0 5 10 15 20 25
kilometres
GEOPEKO
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BURNS PEAK E.L.44/88
No Fig. 1
LOCATION MAP
Date 31-10-'89
Geologist I. MAT.
Checked
Drawn N.W.D.S.
Map Ref
Base ROSEBERY, TAS.
Amendments

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E.L.44/88 BURNS PEAK | No Fig. 2

REGIONAL GEOLOGY
(From Map 6 Mt. Read Volcanics Project)

Date:

Geologist:

Checked:

Drawn:

Map Ref:

Base: ROSEBERY, TAS.

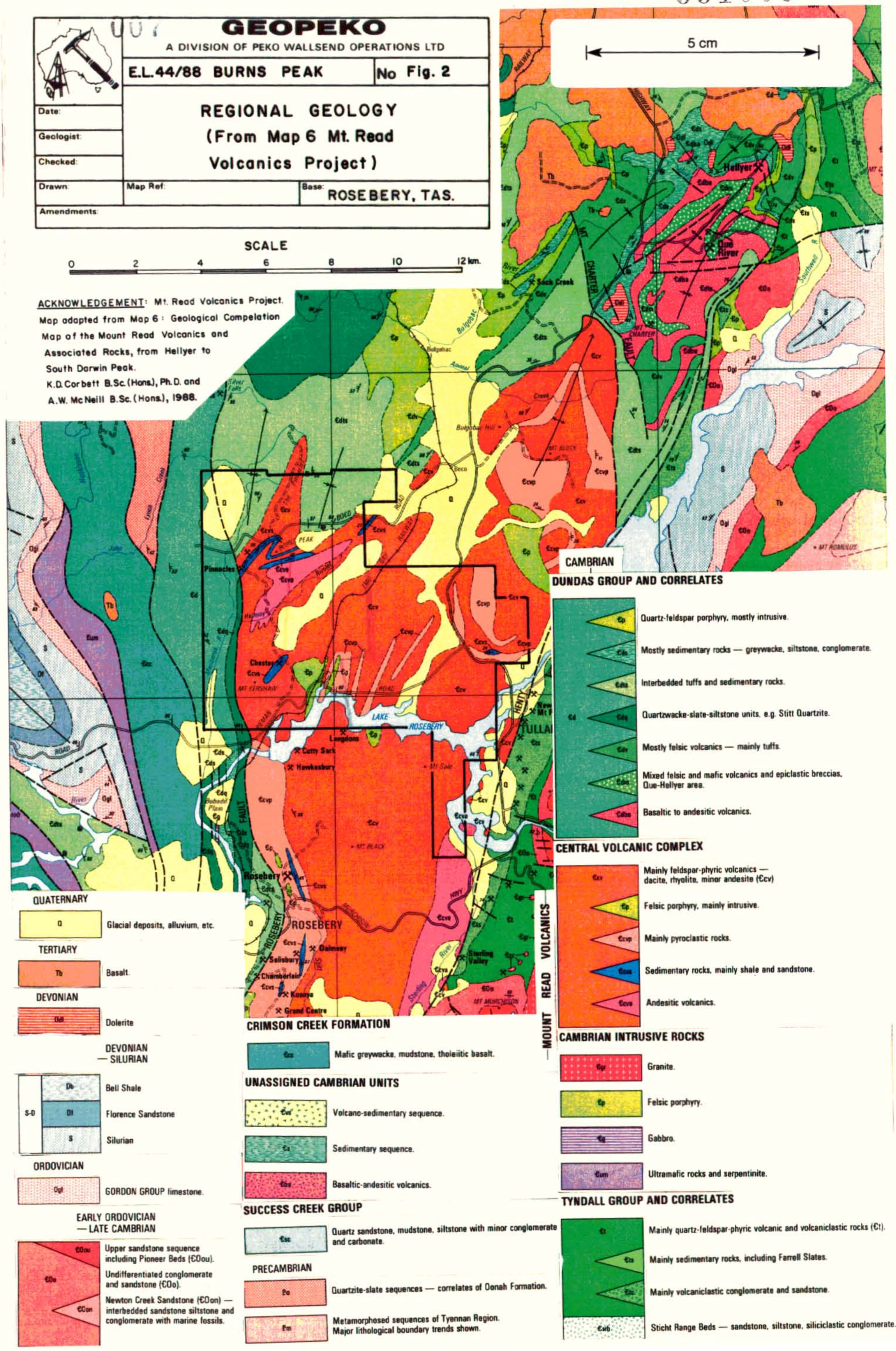
Amendments:

SCALE

0 2 4 6 8 10 12 km.

ACKNOWLEDGEMENT: Mt. Read Volcanics Project.
Map adapted from Map 6: Geological Compelation Map of the Mount Read Volcanics and Associated Rocks, from Hellyer to South Darwin Peak.
K.D. Corbett B.Sc. (Hons.), Ph.D. and A.W. McNeill B.Sc. (Hons.), 1988.

5 cm



QUATERNARY

Q — Glacial deposits, alluvium, etc.

TERTIARY

Tb — Basalt.

DEVONIAN

Ddl — Dolerite

DEVONIAN — SILURIAN

S-D: Db — Bell Shale; Dl — Florence Sandstone; S — Silurian

ORDOVICIAN

Ogl — GORDON GROUP limestone.

EARLY ORDOVICIAN — LATE CAMBRIAN

€Oou — Upper sandstone sequence including Pioneer Beds (€Oou).

€Oo — Undifferentiated conglomerate and sandstone (€Oo).

€Oon — Newton Creek Sandstone (€Oon) — interbedded sandstone siltstone and conglomerate with marine fossils.

CRIMSON CREEK FORMATION

€cs — Mafic greywacke, mudstone, tholeiitic basalt.

UNASSIGNED CAMBRIAN UNITS

€vs — Volcano-sedimentary sequence.

€s — Sedimentary sequence.

€bv — Basaltic-andesitic volcanics.

SUCCESS CREEK GROUP

€sc — Quartz sandstone, mudstone, siltstone with minor conglomerate and carbonate.

PRECAMBRIAN

Pc — Quartzite-slate sequences — correlates of Donah Formation.

Pm — Metamorphosed sequences of Tyennan Region. Major lithological boundary trends shown.

CAMBRIAN

DUNDAS GROUP AND CORRELATES

€p — Quartz-feldspar porphyry, mostly intrusive.

€ds — Mostly sedimentary rocks — greywacke, siltstone, conglomerate.

€dts — Interbedded tuffs and sedimentary rocks.

€dq — Quartzwacke-slate-siltstone units, e.g. Stitt Quartzite.

€dv — Mostly felsic volcanics — mainly tuffs.

€dbv — Mixed felsic and mafic volcanics and epiclastic breccias, Que-Hellyer area.

€dbs — Basaltic to andesitic volcanics.

CENTRAL VOLCANIC COMPLEX

€cv — Mainly feldspar-phyric volcanics — dacite, rhyolite, minor andesite (€cv)

€p — Felsic porphyry, mainly intrusive.

€cvp — Mainly pyroclastic rocks.

€cvs — Sedimentary rocks, mainly shale and sandstone.

€cva — Andesitic volcanics.

MOUNT READ VOLCANICS

CAMBRIAN INTRUSIVE ROCKS

€gr — Granite.

€p — Felsic porphyry.

€g — Gabbro.

€um — Ultramafic rocks and serpentinite.

TYNDALL GROUP AND CORRELATES

€t — Mainly quartz-feldspar-phyric volcanic and volcaniclastic rocks (€t).

€ts — Mainly sedimentary rocks, including Farrell Slates.

€tc — Mainly volcaniclastic conglomerate and sandstone.

€srb — Sticht Range Beds — sandstone, siltstone, siliciclastic conglomerate.

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1.0 INTRODUCTION

1.1 Location and Access (Fig 1 & 2)

EL 44/88 is centred 5km north west of Tullah in Western Tasmania. Tullah is 100km south of Burnie via the Murchison Highway.

The EL covers part of the highly prospective Mt Read Volcanics and lies approximately mid way between major base metal mines at Hellyer and Rosebery. Several old workings and mineral occurrences are known from EL44/88. These are discussed further in later sections of this report.

Access to most portions of EL44/88 is good. Old mineral exploration tracks, logging tracks, the Murchison Highway, the Pieman Road and the Boco Road allow 4WD vehicles to travel to within reasonable walking distance of almost all parts of the EL.

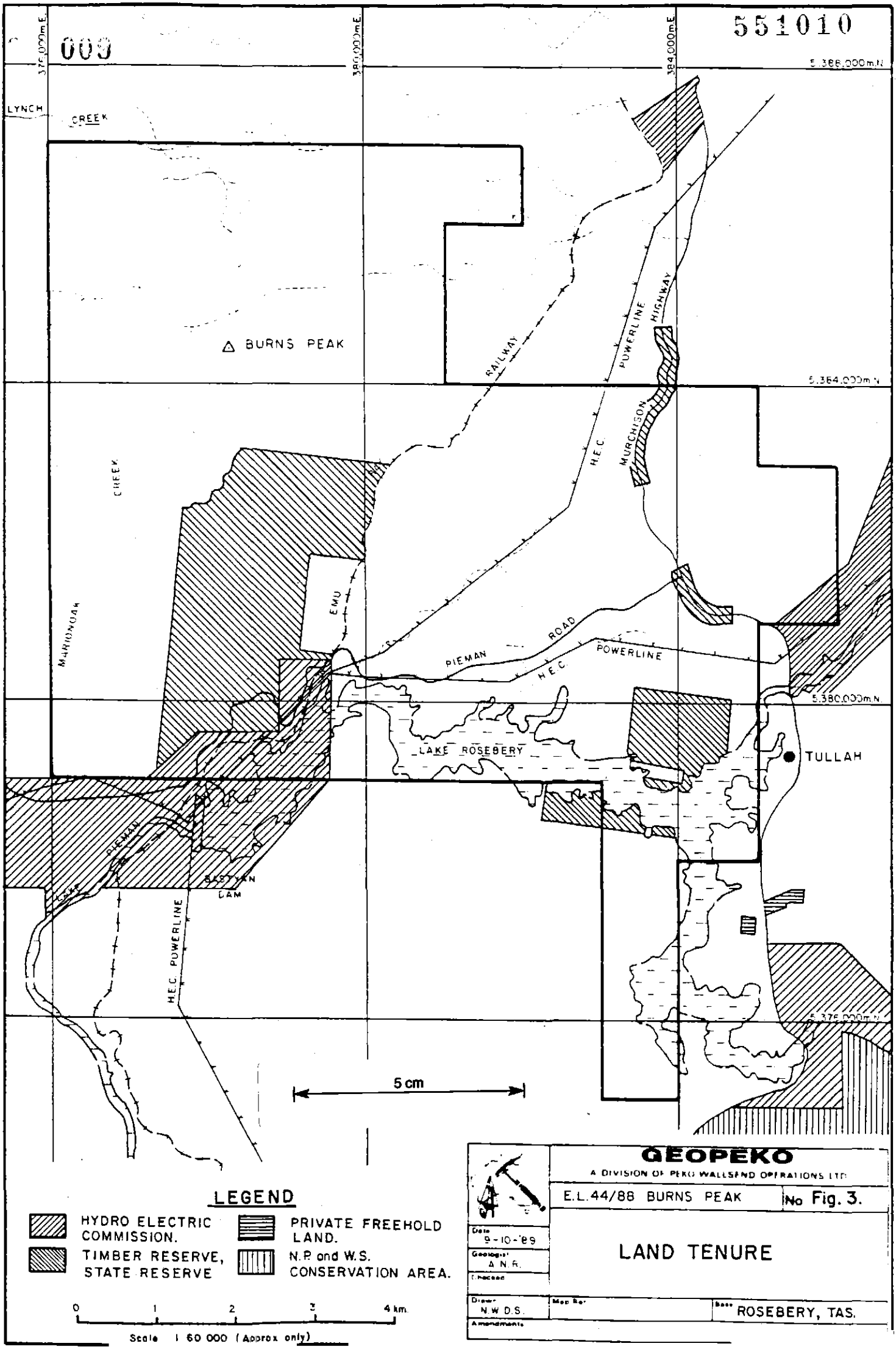
1.2 Tenure and Land Usage (Fig 3 and Appendix 1)

EL44/88 of 63km was granted to Noranda Pty Ltd and Pasminco Limited in December, 1988. The EL is being explored by the Burns Peak Joint Venture comprising Pasminco Ltd, Noranda Ltd and Pioneer Minerals Ltd. Geopeko, a division of North Broken Hill Peko Ltd, is managing exploration in the EL on behalf of Pasminco Ltd.

The EL Schedule detailing boundaries and excluded zones is attached as Appendix 1. Part of the Chester alteration zone occurs within the HEC exclusion zone around Bastyan Dam. All other mineral occurrences, alteration zones and prospect locations occur either within Timber Reserves or Uncommitted Crown Land. A small portion of the EL lying west of Burns Peak has been logged recently and most timbered sections have been logged in the past. Mining and exploration activity have been concentrated on a 2km wide belt extending from south of Mt Kershaw through Burns Peak to North Pinnacles.

1.3 Regional Geology & Mineralization (Fig 2 & Table 1)
(Modified from Corbett & Solomon, 1989)

EL44/88 covers part of the intensely mineralized Mt Read Volcanic belt. In this area, northwest of the Henty Fault, the volcanic belt consists of an earlier sequence of felsic volcanics, the Central Volcanic Complex (CVC), overlain by, and possibly interfingering with, a volcano-sedimentary sequence of tuff, greywacke, siltstone and shale - the Dundas Group.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376,000mE.
380,000mE.
384,000mE.
5,388,000mN.
5,384,000mN.
5,380,000mN.
5,376,000mN.
LYNCH CREEK
△ BURNS PEAK
RAILWAY
POWERLINE
HIGHWAY
MURCHISON
H.E.C.
CREEK
MARIONOAK
EMU
PIEMAN
ROAD
H.E.C.
POWERLINE
LAKE ROSEBERY
TULLAH
PIEMAN
LAKE
BASTYAN
DAM
H.E.C. POWERLINE
5 cm
LEGEND
HYDRO ELECTRIC COMMISSION.
TIMBER RESERVE, STATE RESERVE
PRIVATE FREEHOLD LAND.
N.P. and W.S. CONSERVATION AREA.
0 1 2 3 4 km.
Scale 1 60 000 (Approx only)
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E.L.44/88 BURNS PEAK
No Fig. 3.
LAND TENURE
Date 9-10-'89
Geologist A.N.R.
Checked
Drawn N.W.D.S.
Map Ref.
Base ROSEBERY, TAS.
Amendments

TABLE 1

LOCAL STRATIGRAPHIC SUCCESSION IN MINERALIZED AREAS WITHIN THE MT READ VOLCANIC BELT

ROSEBERY AREA		EL 44/88	QUE-HELLYER AREA	
HERCULES	ROSEBERY	PINNACLES	QUE RIVER	HELLYER
White Spur Fm		Dundas Group		Que River Shale
: Dundas Group	Mt Black Volcanics Feldspar phyric rhyolite lava and pyroclastics. Minor andesitic volcanics	Burns Peak Rhyolite - quartz-feldspar phyric	Dacite Lavas	Pillow Basalts
Epiclastics - quartz-feldspar phyric	Hanging Wall Epiclastics Quartz-feldspar phyric. Some shale, chert & sulphide clasts.	Bedded sandstone and epiclastics.	Hanging Wall Epiclastics - sulphide, dacite & basalt clasts in altered matrix.	Thin Hanging Wall Epiclastics - sulphide & basaltic clasts - matrix altered.
Black slate	Black slate			
Host Rocks - poorly bedded ash tuffs. Massive sulphide lenses.	Host Rocks - Shale, sandstone, tuffs. Massive sulphide lenses.	Host Sequence: cherts, tuffs shales, epiclastic Massive sulphide lenses	Massive sulphides and associated polymict volcaniclastics.	Hellyer massive sulphide
Footwall Pyroclastics Intensely altered feldspar phyric pumiceous pyroclastics.	Footwall Pyroclastics Feldspar phyric pyroclastics - often pumiceous. Alteration zone below ore body.	Acid pumiceous tuffs and rhyolite lavas.	Andesite lava and pyroclastics. Alteration zone below ore body.	Andesite lava and pyroclastics. Alteration "pipe"

NB* HORIZONTAL arrangement was chosen to illustrate the depositional pattern around mineralization. No time or stratigraphic equivalence between the three areas is suggested.

The Rosebery and Hercules mines lie 10km south of EL44/88. These deposits are contained within a volcano-sedimentary unit in the older western part of the CVC.

Within EL44/88, base metal mineralization of Rosebery type is hosted by a complex unit of interbedded shale, sandstone, tuff, mass flow breccia and chert with lenses of pumiceous tuff and felsic lava. This volcano-sedimentary unit occurs within the CVC close to the contact with the overlying Dundas Group.

The Hellyer and Que River mines are 10km north east of EL44/88. These VMS deposits occur within a large lens of andesitic-basaltic volcanics and associated epiclastics near the base of the Dundas Group.

Details of the local stratigraphy for each of these deposits are summarized in Table 1. No stratigraphic or time correlation between the three areas is suggested by the selection of the mineralized horizon as a basis for the table. This arrangement was adopted to emphasize the depositional pattern around mineralization in each of these areas.

1.4 Known Mineral Deposits and Occurrences (Fig 4,5)

Figures 4 and 5 are modified from sections of the Metallic Mineral Deposit Map Series - Rosebery and Tullah sheets. (Green & Bamford 1986a,b) All known mineral deposits within and close to EL 44/88 have been plotted. Locations are shown (Fig 4) and deposits are categorized (Fig 5). Additional data obtained from files held at Rosebery, from site visits and from recent mapping are incorporated in the table below. Several of the smaller deposits within EL44/88 but away from the main area explored during 1989, have not yet been located or visited. Data on these prospects will be upgraded as information becomes available.

1.5 Previous Exploration

The history of exploration within EL44/88 is summarized below. This traces exploration from the early prospecting stage, through initial mining, to modern systematic exploration. Results of recent exploration are summarized in BHP's relinquishment report (Anonymous 1988)

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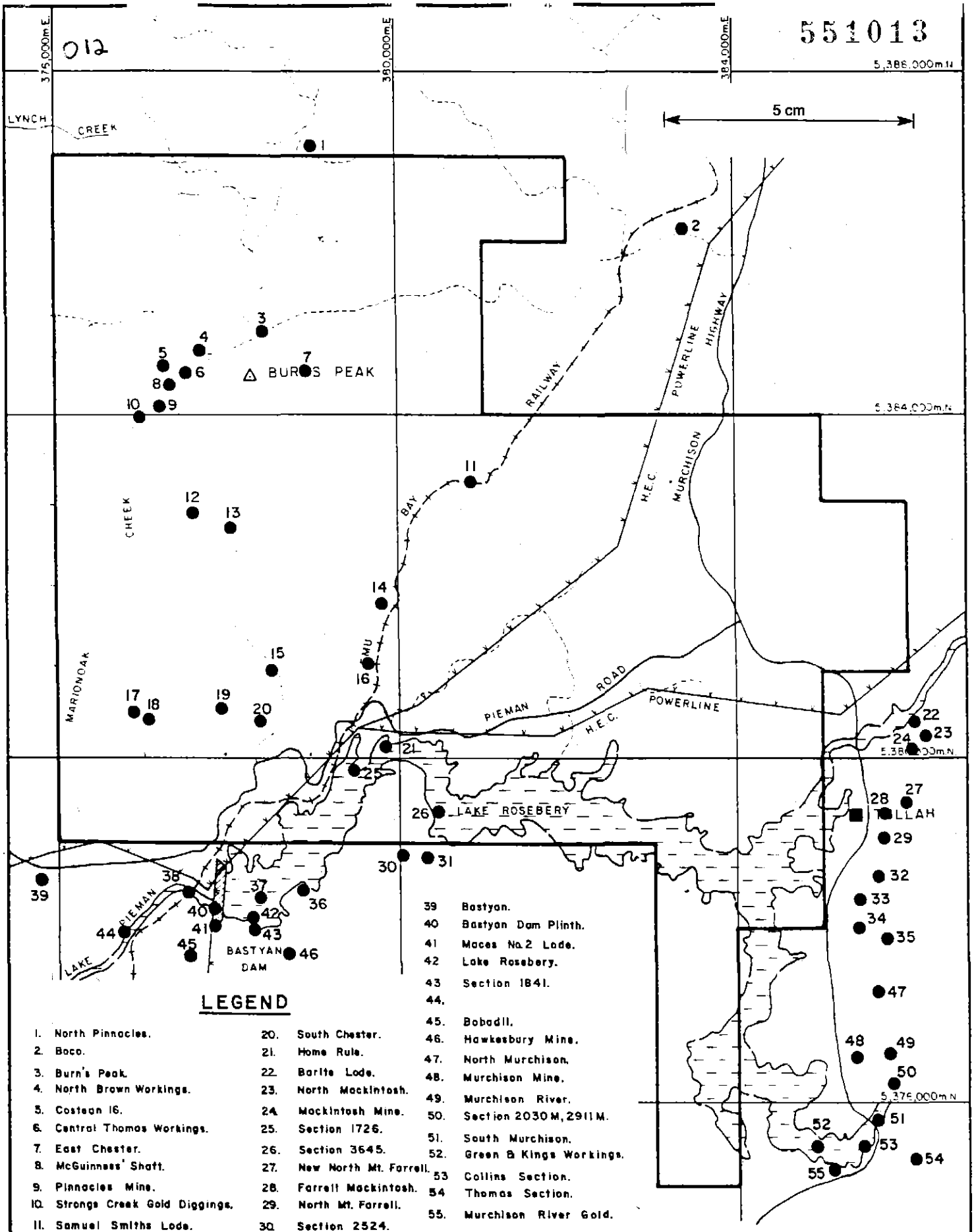

LEGEND

1. North Pinnacles.
2. Boco.
3. Burn's Peak.
4. North Brown Workings.
5. Costeon 16.
6. Central Thomas Workings.
7. East Chester.
8. McGuinness' Shaft.
9. Pinnacles Mine.
10. Strongs Creek Gold Diggings.
11. Samuel Smiths Lode.
12. Section 1893-93M.
13. Section 1894-93M.
14. 63-5 Mile Creek.
15. Chester Mine.
16. Chester Siding.
17. Section 3711, 3712.
18.
19.
20. South Chester.
21. Home Rule.
22. Barite Lode.
23. North Mackintosh.
24. Mackintosh Mine.
25. Section 1726.
26. Section 3645.
27. New North Mt. Farrell.
28. Farrell Mackintosh.
29. North Mt. Farrell.
30. Section 2524.
31. Langdons Mine.
32. Mt. Farrell Mine.
33. South Mt. Farrell.
34. Dutton's Workings.
35. Central Farrell.
36. Cutty Sark.
37. Section 1876.
38.
39. Bastyan.
40. Bastyan Dam Plinth.
41. Maces No.2 Lode.
42. Lake Rosebery.
43. Section 1841.
44.
45. Bobadil.
46. Hawkesbury Mine.
47. North Murchison.
48. Murchison Mine.
49. Murchison River.
50. Section 2030M, 2911M.
51. South Murchison.
52. Green & Kings Workings.
53. Collins Section.
54. Thomas Section.
55. Murchison River Gold.

0 1 2 3 4 km

Scale = 1:60,000 (Approx. only).

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E.L. 44/88 BURNS PEAK

No Fig. 4.

PROSPECT LOCATIONS

Date: 9-10-'89

Geologist: A.N.R.

Checked:

Drawn: N.W.D.S.

Map Ref:

Area: ROSEBERY, TAS.

Amendments:

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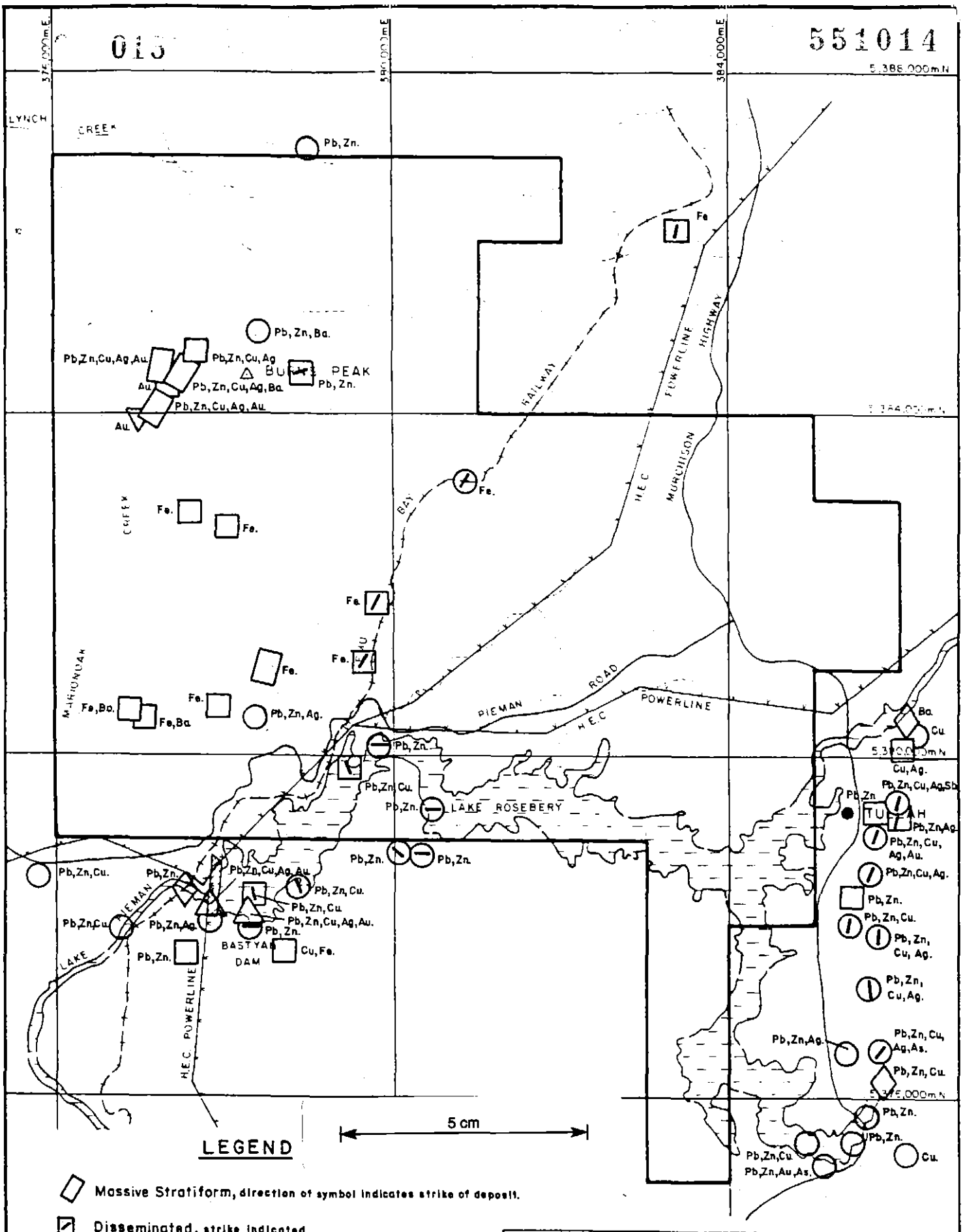

LEGEND

- Massive Stratiform, direction of symbol indicates strike of deposit.
- Disseminated, strike indicated.
- Vein, strike indicated.
- Alluvial/Residual, Quaternary.
- Alluvial/Residual, older than Quaternary.
- Unknown.

0 1 2 3 4km.

Scale - 1:60,000 (Approx. only)

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E.L.44/88 BURNS PEAK — No Fig. 5

MINERAL OCCURENCES

Date: 9-10-'89
Geological: A.N.R.
Checked:
Drawn: N.W.D.S
Map Ref:
Base: ROSEBERY, TAS.
Amendments:

TABLE 2
MINERAL DEPOSITS AND OCCURRENCES

REF NUMBER (Fig 4,5)	NAME	COMMODITIES	COMMENTS
1	North Pinnacles (NPP215)	Zn, Pb, (Au)	Quartz carbonate veinlets with minor sphalerite-galena-pyrite-(gold) mineralization occur in a brecciated rhyolite lava (EZ drill hole NPP215)
2	Boco	Pyrite	Boco alteration zone - extensive pyrite-sericite alteration of acid volcanics - tested by extensive EZ drilling - essentially barren
3	Burns Peak (Leo's Find)	Pb, Ba	Patchy sulphide and sulphate mineralization in altered acid volcanics near the contact of the Burns Peak Porphyry
4	North Brown's Workings (Brown's Tunnel)	Pb, Zn, Cu, Ag	Massive sulphide in cherty sediments
5	Costean 16 (Costean 5000N) (BPD63)	Zn, Pb, Cu, Ag, Au, Ba	Massive sulphide ?vein in altered sericitic sediments
6	Central Thomas's Workings (Thomas's Tunnel)	Pb, Zn, Cu, Ag, Ba	Massive and disseminated sulphides in sheared acid tuffs and chert
7	East Chester (EAB 1)	Pb, Zn	Disseminated sulphide veining in silicified brecciated volcanics
8	McGuiness's Shaft	Au, Cu, (py)	Sulphides in indurated cherty sediments
9	Pinnacles Mine (Southern Trenches)	Zn, Pb, Cu, (Ag, Au, Ba)	Massive sulphides in cherty sediments (?structurally remobilized)
10	Strong's Creek Gold Diggings (Strong's Alluvials)	Au, (Pb,Cu,Cr)	Alluvial gold, sulphide and chromate

11	Samuel Smith's Lode	py	Pyrite vein in acid volcanics
12	Section 1893-93M	py	Pyrite vein in acid volcanics
13	Section 1894-93M (Hollway Pyrite)	py	Pyritized andesite
14	63.5 Mile Creek	Fe	?Limonite vein
15	Chester Mine	py	Massive pyrite
		(Zn,Pb,Ag,Cu,Au)	Traces only
16	Chester Siding	Fe	?Limonite vein
17	Sections 3711, 3712 (Gordon's Show)	Pb, py	Disseminated sulphide on the boundary of sediments and acid volcanics (?Roseberv Fault)
18	Costean 4N	Zn, py	Disseminated sulphide veining in acid volcanics
19	- (Kershaw Trig Road) (South Chester Mine)	py	Massive pyrite in sericitized, pyritized volcanics
20	South Chester (CP3)	Zn, Pb, Ag, Ba	Massive sulphide ?vein in sericitized & pyritized volcanics
21	Home Rule	Cu, Pb	Sulphide vein
25	Section 1726	Cu, Pb	Disseminated sulphide veins in acid volcanics
26	Section 3645	Pb, Zn	Sulphide vein in acid volcanics

Table 3

HISTORY OF EXPLORATION IN EL 44/88

1896	:	Discovery of alluvial gold in Marionoak River by Tom Strong. (Strong's Alluvial Workings)
1896	:	Discovery of Pinnacles Lodes by McGuiness Bros.
1896	:	Discovery of Chester by F. Kershaw and H. Sanderson. (Kershaw's Iron Blow)
1899	:	Brown's Tunnel driven (Brown's Workings) est. production 300t @ 2% Zn, 2 g/t Au, 44 g/t Ag from open cut and adit.
1899	:	Thomas's Tunnel driven (Thomas's Workings) est. production 50t @ 4% Zn, 7% Pb, 1 g/t Au, 240 g/t Ag.
~1899	:	Southern Workings est. production 55t @ +10% Zn, +8% Pb, 8 g/t Au, 38 g/t Ag.
1908	:	Mt Lyell Mining and Railway Co Ltd secured Chester Leases.
1909-1913	:	Intensive exploration and mining development at Chester Production 36,000t @ 37% S.
1918-1920	:	Minor production from Chester by Cuming Smith & Co. Production 700t @ +25% S.
1947-1950	:	Electrolytic Zinc Company created foot and vehicle access to Pinnacles area. 13 small diameter diamond drill holes completed and workings and topography surveyed. Geophysical test surveys at the Pinnacles (SP, ground magnetics and resistivity).

1959-1960 : E.L. 4/59 Rio Tinto Australia (?E.Z. Joint Venture)
Geochemical, geological and geophysical surveys over Pinnacles and Chester. Techniques included Sharpe vertical loop EM, Turam, ground magnetics (vertical field) gravity.

"The significant feature of this coverage is that the Pinnacles Mine mineralization is non-conducting"

1963 : Comstaff acquires E.L. 5/63 which included the Burns Peak area.

1968-1972 : Initial phase of gridding, geochemical sampling, geophysics (IP & EM), mapping and diamond drilling (3 DDH) by Comstaff.

1973-1976 : Second phase of gridding, geochemical sampling, etc. 8 DDH drilled at Pinnacles and 12 DDH at Chester.
(New metric grid, new soil sampling, new IP). Airborne EM.

1976-1979 : Preussag entered into J.V. with Comstaff. Detailed mapping and structural synthesis completed. C horizon soil geochemistry, 2 DDH, trial PEM and IP over Leo's Find.

1980-1983 : Exploration of East Chester area. New grid, grid extensions, C horizon soil geochemistry, ground magnetics, IP, DIGHEM. Four DDH (EAB 1-4) drilled at East Chester (Au).

1984-1985 : New grid at Pinnacles (EAF) mapped, C horizon soil sampling, ground magnetics and UTEM. 15 DDH - discovery of small lenses of massive sulphides and patchy gold mineralization. New geological interpretation.

1986-1988 : BHP entered J.V. Reinterpretation and compilation of exploration results. "Blanket" UTEM and downhole SIROTEM. New geological interpretation. Petrological studies. Wacker sampling.

1.6 Exploration Philosophy

The Burns Peak area became available for application by tender during 1988. Noranda Ltd invited North Broken Hill Peko to participate in a joint approach to exploration in this area. Subsequently, North's share in the project was transferred to Pasminco and Pioneer Minerals joined the Joint Venture. The joint venture draws on the substantial local experience of the North Group and Pasminco; the strong incentive for Pasminco to find ore to feed the soon to be underutilized Rosebery Mill; and Noranda's knowledge and experience in conducting deep sensing surveys in similar volcanic successions in Canada.

When the area became available for application by tender, previous data were reviewed and discussed by I. Mathison (for North/Pasminco) and P. Jones (Noranda). This review suggested that, even though the area had been subjected to intensive systematic exploration including deep sensing geophysical techniques such as UTEM, significant potential for significant base metal and gold mineralization remained. Because of the "blanket" UTEM coverage by BHP and COMSTAFF, most of this potential was seen to be at a depth greater than 100-200m.

A philosophy of working from areas of most information into areas of little information was adopted. Consequently exploration again initially concentrated on the Leo's Find-Southern Trenches area. Because of the high value of the target VMS mineralization, a combined geological, geochemical and geophysical attack using up to date techniques and employing the best local expertise available was selected.

As a first approach, the identified sequence which hosts the mineralization at Brown's Tunnel was to be drill tested at 300-400m intervals at depths 100-200m greater than previously tested. Modern down hole geophysical techniques, the results of alteration studies at Rosebery Mine and geological interpretation could then be used to extend the zone effectively tested by the drill hole. Using these techniques, it was hoped that a zone of influence could extend for up to 100m in all directions from the deep drill holes. In addition, deep sensing surface techniques such as CSAMT, RMIP and detailed gravity were to be evaluated.

2.0 SUMMARY OF WORK COMPLETED

2.1 DIAMOND DRILLING

HQ	282.5m
NQ	1723.0m
TOTAL	2005.5m

2.2 SAMPLING

570 - split core samples from Geopeko (BPD 62-65 holes)
269 - split core samples from Comstaff (PIN & CP) holes and
65 - rock chip samples were sent to Comlabs in South Australia

2.3 GEOPHYSICS

Interpretation of Mines Department Gravity and Magnetic data was completed by David Leaman.

An interpretation and description of UTEM (BHP, 1987), Downhole EM37 (current Program), Downhole SIROTEM (Comstaff, 1985) and CSAMT (current Program) were completed by John Bishop (Mitre Geophysics).

8 drill holes were surveyed, using the EM37 technique.

2.45 line kilometres were surveyed with CSAMT in the Pinnacles area.

4.5 line kilometres of Mise a la Masse readings were taken around EAF3 and BPD63.

2.4 PETROLOGY

69 samples were taken from drill core for petrological examination by Geoff Green.

2.5 GEOLOGY

1:1000 sheets covering the Southern Trenches, Brown's Tunnel and Leo's Find Areas were produced. They show anomalous soil, auger and rock chip samples with outcrop and interpreted geology (Plates 1, 2 & 3). Two 1:5000 sheets showing outcrop and interpreted geology were also drawn (Plates 4 & 5).

All core from Comstaff drilling (ESB, EAF & PIN) in the Southern Trenches and Brown's Tunnel Areas was examined and BHP logs were annotated for correlation purposes, where necessary.

Core from some of Comstaff's Chester holes was examined (CP3, 6, 17, 21, 22 & 23).

5 Cross Sections were constructed through hypothetical drilling targets in the Chester region. (Appendix 6)

EAB4, a hole drilled through the eastern contact of the main andesite body, east of Leo's Find was logged. A cross section was constructed. (Fig. 14)

2.6 GEOCHEMISTRY

6 compilation maps, covering the areas of sheets 1 & 2 (@ 1:5000), were produced (Plates 5 & 7-13). They show rock chip, soil, auger and costean samples. All results with values above selected thresholds are plotted on separate sheets for lead, zinc and copper.

3.0 DRILLING - BPD HOLES

Geopeko has drilled four diamond holes on the E.L. this year. Geopeko holes have the prefix BPD. A number then indicates the order of drilling. BPD62 was the first Geopeko hole, but the 62nd (counting both E.Z. and Comstaff holes) into the E.L. Drilling contractors were Diamond Drilling Tasmania. BPD62 to BPD64 were drilled with a Longyear 44, BPD65 with a Longyear 38 rig.

Core assay and sampling techniques are described in appendix 2.

Assay results and drill logs comprise appendix 3.

The figure and plate numbers of sections and plans pertaining to the drill holes described are listed in Table 4.

3.1 BPD62:

Co-ordinates:	Local	5230E, 5400N
	AMG	378 019.6E 5 384 653.4N
Dip:	55°	Bearing: 270° mag
Final Depth:	658.5m	
Area:	Brown's Tunnel	

TABLE 4

FIGURES AND PLANS RELATING TO BPD DRILL HOLES

INTERPRETED GEOLOGY					Au/Cu ASSAYS	Pb/Zn ASSAYS
DRILL HOLE	1:5000 SECTIONS	1:1000 SECTIONS	1:5000 PLANS	1:1000 PLANS	1:1000 SECTIONS	1:1000 SECTIONS
BPD62	Fig. 7	Plate 62	Plate 4	Plate 2	Plate 63	Plate 64
BPD63	Fig. 8	Plate 39	Plate 4	Plate 2	Plate 40	Plate 41
BPD64	Fig. 9	Plate 24	Plate 4	Plate 3	Plate 25	Plate 26
BPD65	Fig. 6	Plate 65	Plate 4	Plate 1	Not Avail at time of report	Not Avail at time of report

TARGET

North-plunging extensions of Brown's Tunnel ore as well as the host rocks to the mineralization at a depth greater than that previously tested.

RESULT

A sequence of epiclastics interbedded with well sorted shales, cherty sediments and siltstones was intersected from the top of the hole to 107m. This was followed by fine grained, siliceous ?lava to 197.6m and then acid, pumiceous tuff to 248.0m. Petrological samples of the tuff and lava were taken, as recognition of these rock types is difficult. Sericitic patches, which appear to be fiamme, may be alteration features (Allen 1988).

From 248.0m to 459.7m, relatively unaltered quartz-feldspar porphyry was intersected. Minor sericite and pink ?haematite alteration occurs throughout the porphyry, which also contains a high density of white, usually unmineralized, quartz veins (from 329-346m). One of these veins, at 311.5m carried a 10cm patch of chalcopyrite.

Below the porphyry, to 551m, a sequence of bedded shales and siltstones is interbedded with altered, acid, pumiceous tuff. The tuff is identical, in hand specimen, to tuffs in ESB1 and in the upper part of the hole.

This sequence is thought to be equivalent to that which hosts the Brown's Tunnel mineralization. It is along interpreted strike and down dip from the known mineralization, which occurs in a similar sequence of bedded sediments and deformed, acid, pumiceous tuffs. The shales in BPD62 contain carbonate/quartz stringers and patches of alteration, with up to 9600ppm Zn and 2000ppm Pb. The tuffs are intensely sericite, clay and silica - altered, with up to 9300ppm Zn and 3000ppm Pb in alteration patches.

From 556m to 611m, the rock type is acid, pumiceous tuffs, with disseminated pyrite and slightly nodular silicification.

These correlate well with similar rocks at the bottom of EAF14.

At 611m the hole entered rhyolite lavas and was stopped at 658.5m in the same rock type. Sections of clastic ?sediment or breccia occur within this rhyolite. The lavas are characterized by strong chlorite alteration, with carbonate veins and traces of pyrite, sphalerite and galena.

The two sequences of bedded sediments and tuff in this hole, one at the top, the other between the quartz feldspar porphyry and rhyolite lavas, are thought to be stratigraphic equivalents. The hole is interpreted as drilling through an anticline, with porphyry in the core. This interpretation is consistent with downhole facings and with surface field observations.

3.2 BPD63:

Co-ordinates:	Local	4535E,	5000N
	AMG	377 282.6E,	5 384 425.6N
Dip:	60°	Bearing:	100° (mag)
Final Depth:	426.3		
Area:	Thomas's Tunnel		

TARGET

The hole was intended to test for extensions of Thomas's Tunnel mineralization at depth.

RESULT

From the top of the hole to 36.5m, bedded, volcaniclastic sediments were intersected. These correlate well with mineralized rocks in Thomas's Tunnel and EAF 15 & 16. Massive sulphides were found to occur from 28.0 to 28.6m, with higher than background (up to 2.5% Zn & 3600ppm Pb) lead and zinc in the surrounding sediments, as blebs and associated with carbonate stringers.

From 36.5m to 316.1m apparently associated (boundaries are difficult to define) quartz feldspar porphyry and rhyolite lava were intersected. Zones of highly deformed, veined and carbonate-altered black shale occur within this rock and are interpreted as xenoliths.

At 316.1m the Rosebery Fault was intersected. It is a zone of sheared black shale and coarser sediments, strong sericite alteration and brecciated rhyolitic lava and porphyry. Down the hole, beyond the Fault zone, a bedded sedimentary sequence of black shales and conglomerate occurs. The conglomerate contains fine-grained, massive pyrite clasts.

Interpretation along a cross-section through this and other holes on the same northing, suggest the presence of a syncline. The bedded volcaniclastics can be traced around this syncline and correlate well between drill holes.

At depth on the section, the near vertical (at surface) axis of the syncline, is dragged against the Rosebery Fault and has a shallow east dip.

551025

024

Because the mineralized rocks at Thomas's Tunnel are folded into the syncline, BPD63 passed beneath most of them. There is also some indication from this hole that the rhyolite/porphyry takes the place of part of this bedded sequence.

This hole enabled the Rosebery Fault to be accurately located. The rocks on the western side of the fault are a sequence of shales and sandstones, that appear to be relatively unprospective.

The fault cuts out more of the potentially mineralized rocks, in the Thomas's Tunnel area, than was previously thought.

3.2 BPD64:

Co-ordinates:	Local	4785E, 4460N
	AMG	377 395.8E, 5 383 823.6N
Dip:	-82°	Bearing: 273° (mag)
Final Depth:	322.0m	
Area:	Southern Trenches	

TARGET

Extensions of cherty ?exhalative rocks, which host zinc, lead and gold mineralization in the Southern Trenches, an historic mining area.

Extensions were considered likely to occur parallel to the Rosebery Fault.

RESULT

From the hole collar to 213.7m a mixture of predominantly rhyolite lavas and quartz feldspar porphyries, with minor acid pumiceous tuff and siltstone, was intersected. The boundaries between rhyolite lavas and porphyries are, in places, difficult to distinguish.

From 213.7 to 230.0m pumiceous acid tuffs with moderate to intense sericite and nodular siliceous alteration were noted. At 229.2m the alteration is intense and the rock is brecciated and cut by sphalerite, galena and carbonate veining. This breccia passes into another, consisting of grey chert-like fragments in a chloritic matrix. The cherty fragments carry sphalerite, galena and pyrite in carbonate and quartz stringers. This assays up to 1.15% Pb and 1.34% Zn.

551026

025

The breccia horizon was interpreted as the "host rock", but, unlike similar rocks in EAF18, does not contain gold.

Because of the sheared and brecciated nature of this intersection and others like it, in PIN2 and EAF17, this so-called "host rock" may be a zone of shearing parallel to the Rosebery Fault. Alteration about the "Host" rock is symmetrical, which is in keeping with a structural rather than a stratigraphic control on the minor mineralization.

Below the breccia zone to 289.7m, moderately to intensely altered acid pumiceous tuffs contain traces of sphalerite and galena (up to 1.15% Zn) associated with quartz and carbonate stringers.

A zone of brecciated black shale and acid tuff from 289.7m to 304.0m is interpreted as the Rosebery Fault. Below this, to 322.0m, a sequence of bedded black shales and siltstones, thought to belong to the Dundas group, occur.

3.4 BPD65:

Co-ordinates:	Local	5710E,	5715N
	AMG	378 534.9E,	5 384 868.9N
Dip:	62°	Bearing:	270° (mag)
Final Depth:	596.0m		
Area:	Leo's Find		

TARGET

This hole was targeted on down-dip extensions of outcropping rocks which have a lithological and stratigraphic resemblance to those that host mineralization at Brown's Tunnel. They consist of shales and siltstones interbedded with coarse epiclastics and minor acid pumiceous tuffs. They contain traces of pyrite and are thought to be the Brown's Tunnel stratigraphy on the eastern limb of the Pinnacles anticline.

RESULT

The hole was collared in quartz feldspar porphyry. At 198.1m the moderately altered margin of the porphyry was intersected. Beyond this, to 457.9m, a sequence of interbedded coarse epiclastics, cherty and shaley sediments, sandstones, siltstones and acid tuffs was cored.

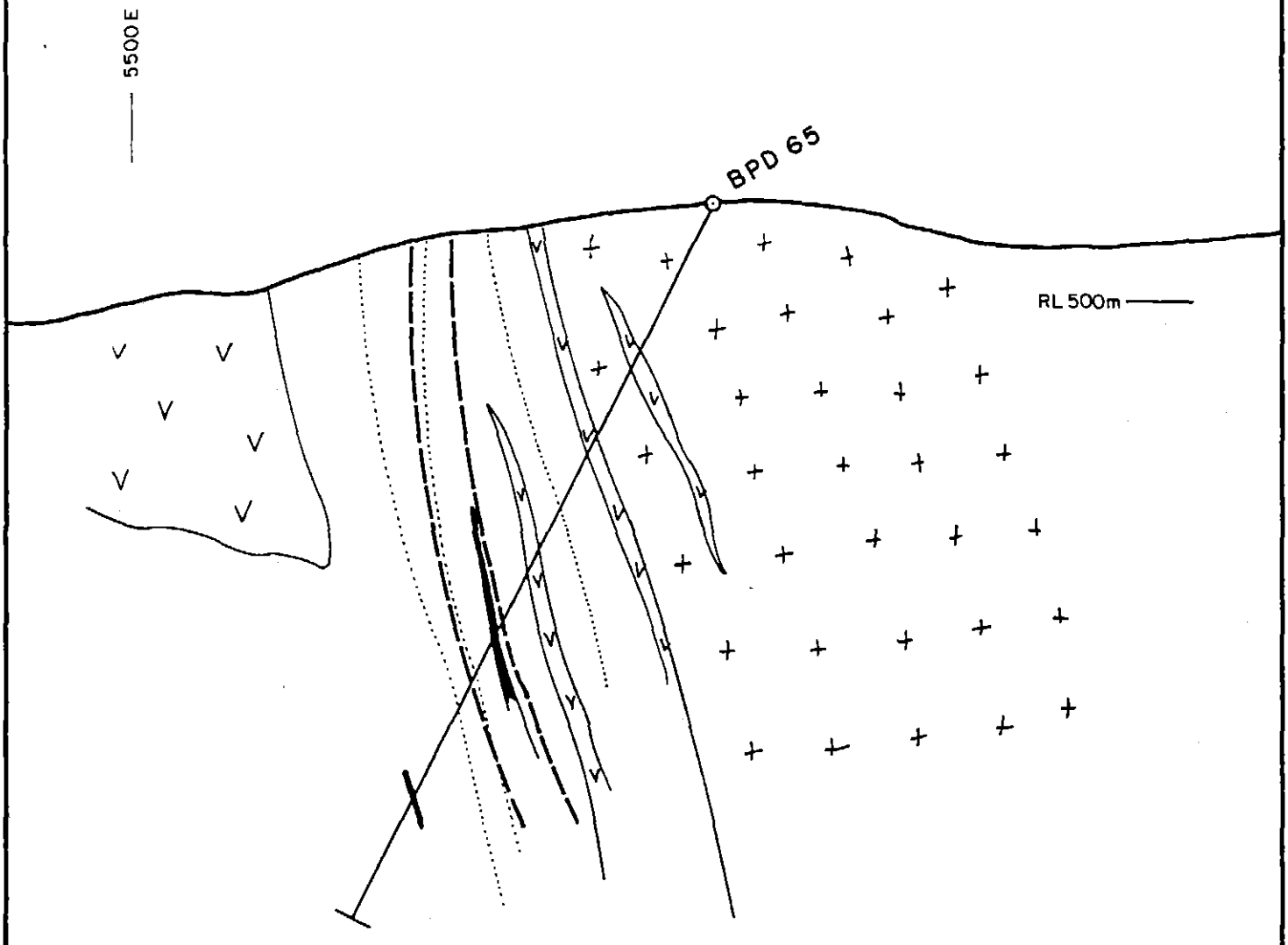
551027

026

The acid tuffs are more altered than most of the sediments, exhibiting intense sericite alteration; cherty, nodular siliceous zones; and spotty carbonate alteration.

At 351.3 to 355.9m bedded arenites, particularly some cherty ones, were observed to contain quartz stringers carrying traces of sphalerite and pyrite. Below this disseminated sphalerite and galena (to 5%) occur in tuffaceous sediments, which pass, down hole, into an altered acid pumiceous tuff. This contains up to 30% combined pyrite, galena and sphalerite in patches from 362.1 to 363.1m. Traces of sphalerite, galena and pyrite are found in stringers, or are disseminated in acid tuffs, siltstones, sandstones and coarse epiclastics, to 457.9m.

From 457.9m to End of Hole at 594.0m, is an intersection of acid pumiceous tuffs. Alteration varies through this. Banded sphalerite, galena, pyrite and chalcopyrite occur from 488.9 to 489.3m. The association of these sulphides with coarse carbonate/quartz veining and the similarity of rocks above and below the intersection indicate that they occur within a vein.



LEGEND

- QUARTZ FELDSPAR PORPHYRY
- RHYOLITE LAVA
- VOLCANICLASTIC SEDIMENTS, Shale and Acid Tuffs
- CORRELATEABLE UNITS
- POSSIBLE HOST ROCK EXTENSIONS
- ROCKS KNOWN TO HOST MINERALISATION

5 cm

1:5000

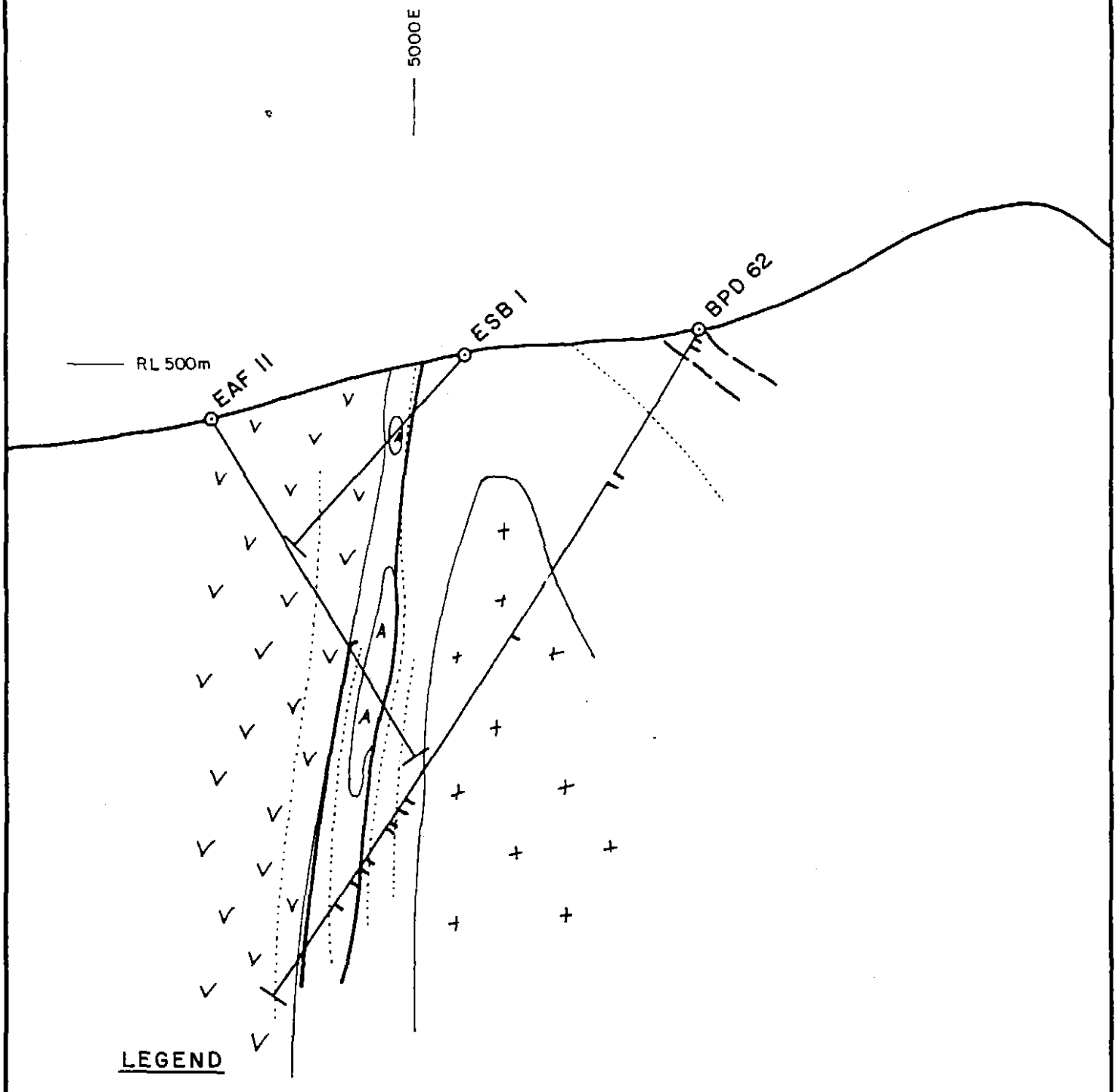
LOOKING NORTH

GEOPEKO
A DIVISION OF PEKO WALLSEND OPERATIONS LTD

EL 44/88 BURNS PEAK | No Fig 6

INTERPRETED GEOLOGY
SECTION ON
5700N

Date: 4-10-'89
Geologist: A.N.R.
Checked:
Drawn: N.W.D.S.
Map Ref:
Base: ROSEBERY, TAS.
Amendments:



LEGEND

- QUARTZ FELDSPAR PORPHYRY
- RHYOLITE LAVA
- ANDESITE LAVA
- VOLCANICLASTIC SEDIMENTS, Shale and Acid Tuffs
- CORRELATEABLE UNITS
- POSSIBLE HOST ROCK EXTENSIONS
- ROCKS KNOWN TO HOST MINERALISATION
- INTERSECTED MINERALISATION

5 cm

1:5000

LOOKING NORTH

GEOPEKO
A DIVISION OF PEKO WALLSEND OPERATIONS LTD

EL 44/88 BURNS PEAK | No FIG 7

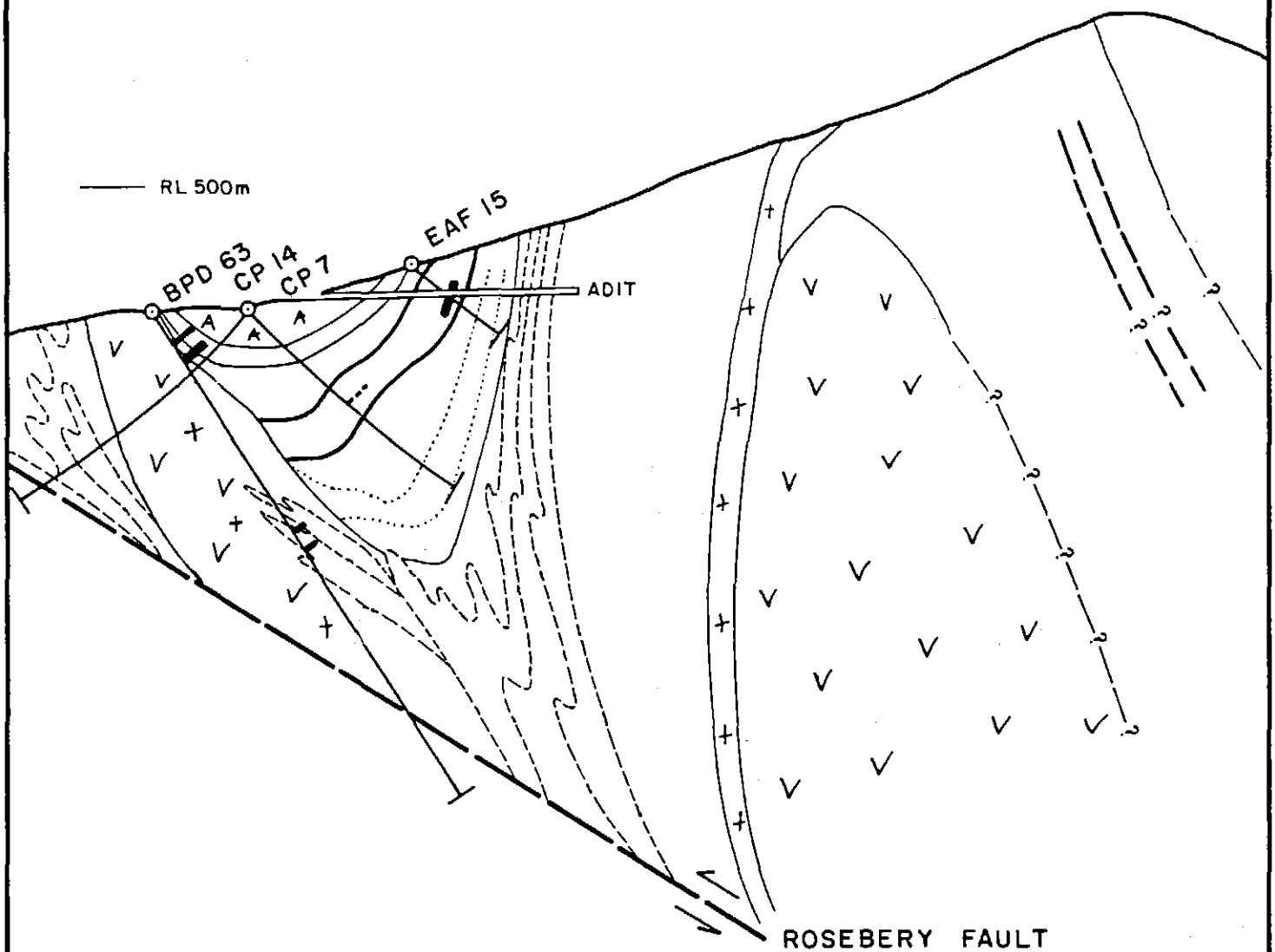
INTERPRETED GEOLOGY
SECTION ON
5400N

Date: 4-10-'89
Geologist: A.N.R.
Checked:
Drawn: N.W.D.S.
Amendments: Aug 12/11/89
Map Ref:
Base: ROSEBERY, TAS.

551030

029

5000 E



LEGEND

- QUARTZ FELDSPAR PORPHYRY
- RHYOLITE LAVA
- ANDESITE LAVA
- VOLCANICLASTIC SEDIMENTS, Shale and Acid Tuffs
- CORRELATEABLE UNITS
- POSSIBLE HOST ROCK EXTENSIONS
- ROCKS KNOWN TO HOST MINERALISATION
- FAULT
- PREDOMINANTLY SHALE
- INTERSECTED MINERALISATION

LOOKING NORTH
1·5000

5 cm

GEOPEKO
A DIVISION OF PEKO WALLSEND OPERATIONS LTD

EL 44/88 BURNS PEAK | No FIG 8

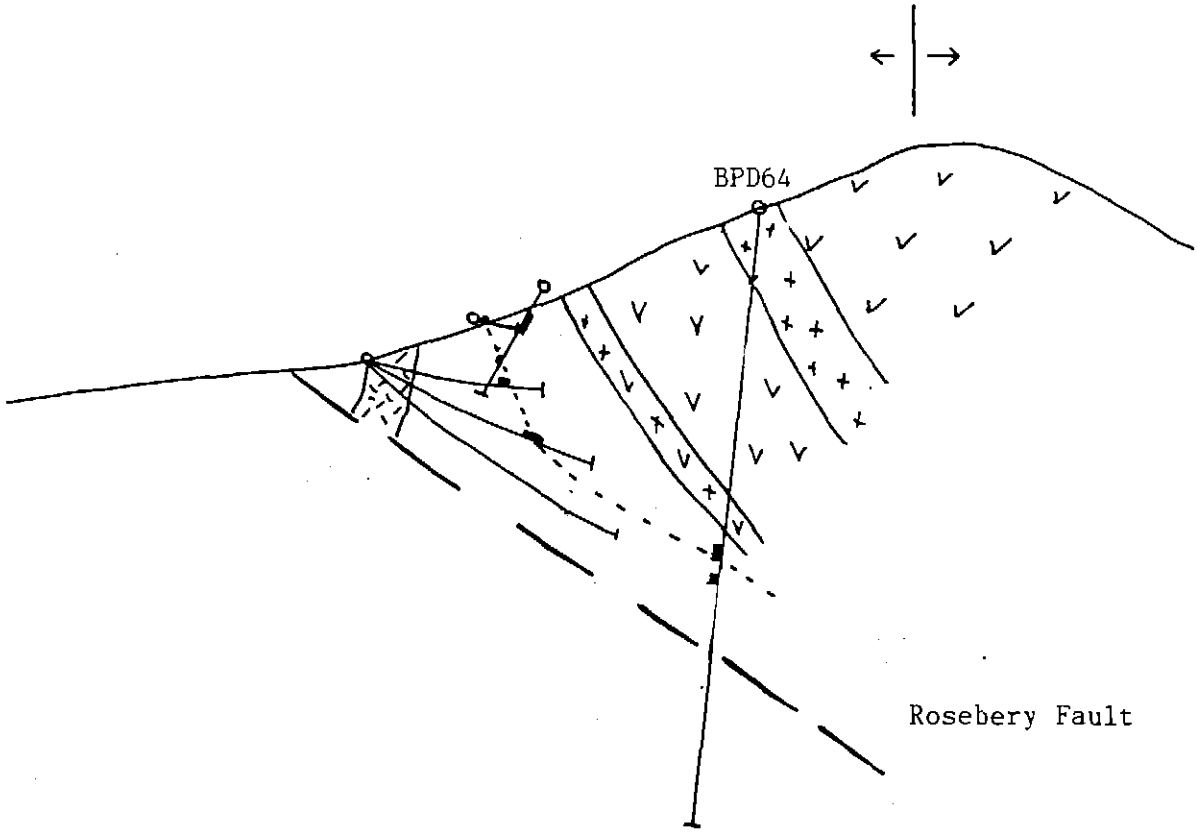
INTERPRETED GEOLOGY
SECTION ON
5000N

Date: 4-10-'89		
Geologist: A.N.R.		
Checked		
Drawn: N.W.D.S.	Map Ref	Base: ROSEBERY, TAS.
Amendments: ANR 31/10/89		

030

551031

5000E



Mineralization

Rhyolite

QF Porphyry

Andesite

Mineralized Horizon

5 cm

0 100 200m

GEOPEKO

PROJECT EL44/88 BURNS PEAK	
BPD64 SECTION 445ON	
Author: D.G. Scale: 1:5000	FIG. 9

4.0 GEOPHYSICS

Geophysical work has been largely of an experimental nature. CSAMT, Downhole EM37 and Mise a la Masse surveys were tested over areas of known mineralization. Petrophysical measurements of rocks were made to determine the conductivity of mineralized and altered rocks.

The "test" surveys were also used, however, to look for extensions to the known mineralization in the vicinity of Brown's and Thomas's Tunnels.

In addition to this work, John Bishop (Mitre Geophysics) was commissioned to evaluate UTEM data available from surveys conducted in 1985-1987 by BHP/Comstaff.

David Leaman (Leaman Geophysics) was employed to review existing gravity and magnetic data covering the area.

The location of all grid lines and holes surveyed by geophysical techniques is shown as plate 14.

A compilation of data from all geophysical surveys of the E.L. area was attempted. Searching out all the data from surveys proved more time consuming than expected and adequate compilation maps are not yet available.

A student, under the supervision of Geopeko geophysicist, D. Webb, has been assigned this task over the summer vacation. D. Webb will interpret the data during compilation.

4.1 Down Hole Geophysics

EM37 was trialled on three holes, EAF14, 11 and 9. This work has been described in detail by John Bishop (Appendix No. 4). The conclusions reached in this report are that EM37 results do not compare with previous SIROTEM down hole surveys, because the surveys were performed on different holes.

This explanation seems unlikely. The original SIROTEM surveys appear to have been performed on the correct holes. End of Hole depths are exactly the same as down hole survey depths.

When the EM37 surveys took place in 1989 some of these holes had become blocked, so depths recorded in the course of this survey do not match those recorded in the SIROTEM work. The depth of open hole was measured prior to the EM37 in all three holes. The depth recorded in the surveys matches that measured (by crow bar) prior to the survey in all three holes. The depth to blockage of some of these holes has been measured since the survey and was again confirmed.

So the failure of EM37 data to correlate with previous SIROTEM data remains unexplained.

Responses, which may relate to intersected mineralization, were noted in the EM37 data for EAF9 and EAF11.

An off-hole response was indicated by EM37 data from EAF14. This is consistent with the existence, above EAF14, of the lens of massive sulphides intersected by EAF3 and EAF4.

A response recorded in the SIROTEM data from EAF11 at 100m has been described as "interesting". The hole did not intersect sulphides until 217m, so the response may be due to an off-hole conductor.

It is unfortunate that EM37 data could not be obtained for loop 2, EAF9. This was because the hole had become blocked. The use of down hole instruments and measuring devices has eroded strips of P.V.C. from the casing and these are blocking the hole. It should be emphasised that the depth of this hole has been checked since the survey and found to match the depth recorded in the EM37, loop 2 survey. The contractors were supervised by Geopeko personnel during this survey. They witnessed the attempts of Geoterrex field crew to get the probe down EAF9.

Additional EM37 surveys on holes BPD62, 63 64 & 65 are proposed. The technique has been used successfully at Rosebery Mine this year and therefore is a valid one in the search for massive sulphide deposits.

4.2 Mise a la Masse

Two Mise a la Masse surveys were performed in the Brown's-Thomas's Tunnel area.

For each survey, two electrodes were used. The remote electrode was placed 1.2km from the first survey points and 1 km from the second. For the first survey the other electrode was placed down EAF3, in the centre of intersected massive sulphides. This was the first survey point. The second was in outcropping sulphides in a costean on 5000N, east of the collar of BPD63.

8 radial lines, each 300m long, were cut from each survey point at 45° intervals.
One porous pot was kept at the survey point, another was taken along the line. Readings were made at 20m intervals.
The purpose of this survey was to determine whether either occurrence of massive sulphides had any continuity. Present preliminary indications are that the sulphides have been seen by this technique, but that they have no lateral extent.

A full report on this survey (including raw data and results) is in preparation.

4.3 CSAMT

The report by J. Bishop contains the details and results of this survey.

The main reason for the choice of this survey was its ability to measure beyond the depth limitation of UTEM. (100-250m).

Resistivity contrasts measured by the survey appear to be due to contacts between rocks of different resistivity rather than the presence of massive sulphides.

One of these contacts was intersected in BPD65. The contact is between quartz feldspar porphyry and sediments and is see at 5610E on 5800N and 5590E on 5600N, on the CSAMT pseudo sections (these are part of J. Bishop's report). (Appendix 4)

4.4 UTEM

The appended report from J. Bishop outlines the results of his work on the BHP data. (Appendix 4)

He has confirmed BHP's opinion that no recorded response
was a drillable target, in its own right.

UTEM responses, however, will be considered in targeting future drill holes, where other reasons for drilling apply. This would be particularly appropriate along the south eastern boundary of the Hollway Andesite body, S.E. of Leo's Find.

It is in this region that J. Bishop has located some UTEM responses that are of most interest.

4.5 Petrophysical Measurements

The results and discussion relating to these measurements made on core from Brown's Tunnel are in J. Bishop's report in appendix 4.

4.6 Regional Magnetic and Gravity Review (Appendix 5)

D. Leaman (Leaman Geophysics) conducted a review of existing public domain magnetic and gravity data. Background information obtained via the regional studies for the Mount Read Volcanics project was incorporated in the study. The licence area was then considered in detail.

Stacked magnetic profiles were assembled to assist in identifying responses indicative of alteration or mineralization. Similarities with previously defined signatures were sought. Gravity information was used to try to confirm any anomalous responses in the magnetics.

A major change in basement relief, along a N-S structure, is thought to exist to the east of the Pinnacles and Chester mines. The ground to the west of this structure is thought to be thrust faulted at depth.

This ground hosts the bulk of the known mineralization in the area.

Two E-W discontinuities were also recognized. These are reflected in magnetic and gravity measurements, though not in surface mapping.

The point of intersection of these features with the basement "step" are thought to be favourable sites for mineralization. Similar features are observed at sites of known mineralization, for instance, Rosebery and Mt. Lyell.

5.0 GEOLOGY

5.1 Brown's Tunnel-Leo's Find BPD 62, 63 AND 65

ROCK TYPES

Rhyolite:

* Appears to occur at all levels in the sequence.
* Sometimes it is difficult to dissociate from neighbouring porphyries. Other times it is distinctly separate.
* It exhibits good flow banding & autobrecciation in places, i.e. top of ESB1 & on Boco Siding road east of quarry (reminiscent of lava onto wet sediments).
* Contacts with other rocks generally passive. i.e. BPD62 & EAF14, however sheared brecciated contacts do occur - in cutting on turn off Boco Rd to EAF holes. Also, in BPD63 Rhyolite/Porphyry has probable xenoliths of very deformed shale.
* Appears to have some sedimentary interbeds.
* Is generally not mineralized, alteration varies, some strong chloritic patches. Usually weak-moderate sericite alteration and pink, siliceous alteration.

Summary:-

Not mineralized
Occurs as lavas and intrusive ?sills throughout the stratigraphy
The youngest and largest flow is later than the Browns Tunnel mineralization

Sequence of rocks Hosting known massive sulphide and some disseminated mineralization
(Brown's Tunnel Sequence)

* Consists of at least 8 discontinuous lithologies. These are:-
  - volcaniclastic siltstone
  - volcaniclastic sandstone
  - chert, cherty shale
  - shale, mass debris flows, coarse epiclastic sediments and pumiceous acid tuff

036

* Sediments, even the better sorted ones, contain abundant large laminated sediment blocks

* Continuity of particular rock types is very poor, though broad trends can be recognized by grouping together certain lithologies. Soft sediment deformation is common

* Massive mineralization occurs in bedded silts & cherts and in pumiceous acid tuff bands. That in Brown's & Thomas's tunnels, most particularly, is associated with very strong shearing and deformation

Summary:-

Disordered sequence of volcaniclastic sediments, includes numerous mass flow deposits and soft sediment deformation. Strongly deformed in places. Hosts massive Pb-Zn mineralization. with Au & Ag.

Andesite:

* Vesicular & chloritic, sometimes feldspar phyric. Can be difficult to distinguish from the rhyolite when it is found weathered on the surface.

* Occurs between the top rhyolite flow and the underlying sediments and tuffs in Brown's Tunnel and Thomas's Tunnel areas. The thickness of sediments between the andesite and the rhyolite varies, appearing to increase to the south

* Is often brecciated and contains sedimentary clasts or matrix. This is considered to be the result of intrusion into or eruption onto wet sediments

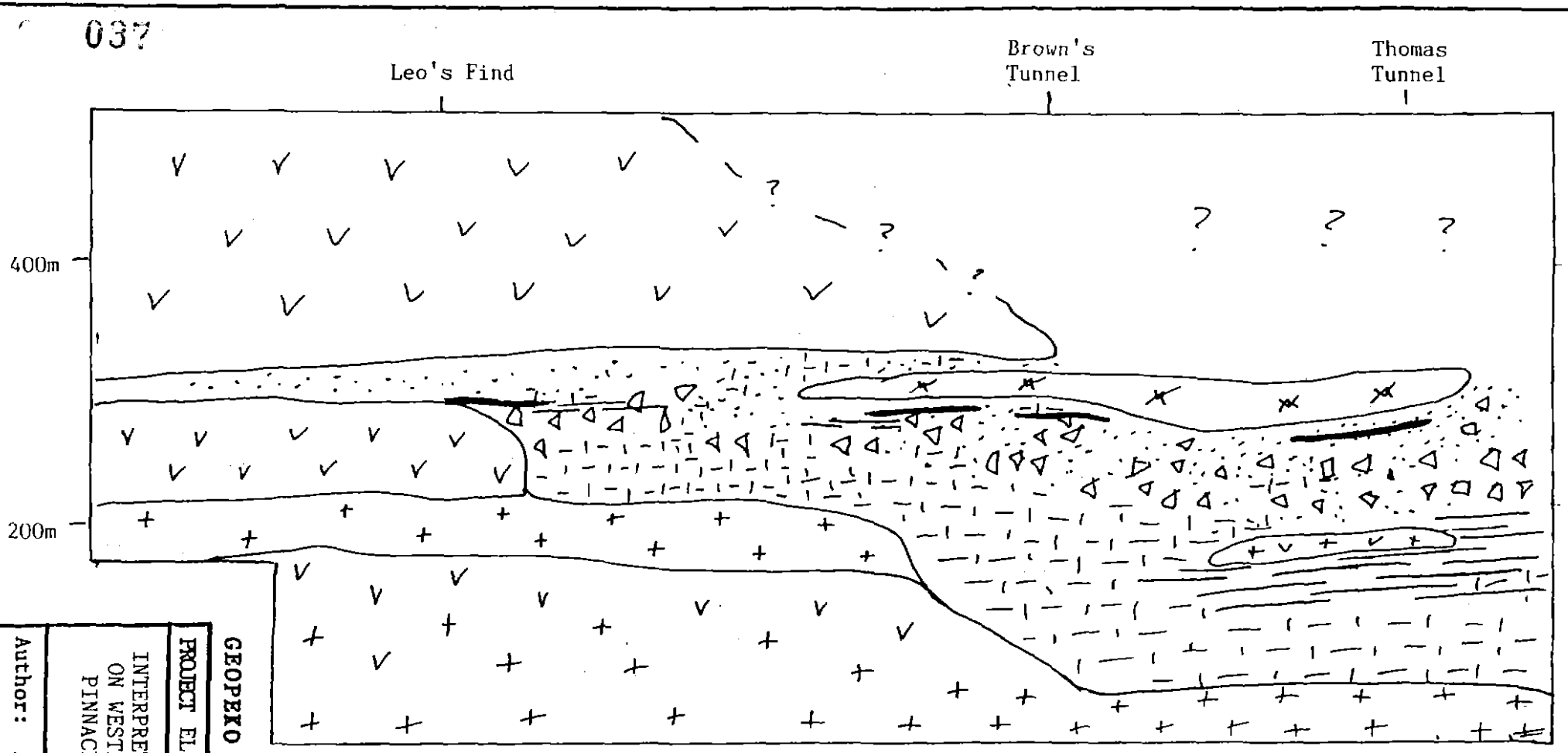
* Often carries disseminated mineralization, with feeder zone characteristics

* Has a strong spatial relationship with the known massive mineralization

Summary:-

Occurs in a mineralized brecciated form in the Brown's Tunnel mineralized sequence. In other places it is relatively unaltered.

037



GEOPEKO

PROJECT EL 44/88 BURNS PEAK

INTERPRETED STRATIGRAPHY ON WESTERN LIMB OF PINNACLES ANTICLINE

Author: ANR

Scale: Approx. 1:5000

FIG. 10

55-1038

Acid Pumiceous Tuffs:

* Underlie the sequence which hosts Brown's and Thomas's mineralization

* Are relatively homogeneous

* No distinct features like bedding are recognizable

* Consist of flattened sericitic patches, interpreted as pumice, in a very fine matrix. Matrix is commonly siliceous, with a nodular texture. Commonly develop a strong cleavage

* Often contain disseminated pyrite, galena and sphalerite i.e. BPD62 - py & gn, two costeans, on 5200 & 5000N, sp & py

* There are lenses of these rocks within the host sequence, and when this occurs, they are invariably mineralized. i.e. Thomas's Tunnel, BPD65, rocks in Brown's Trenches.

Summary:-

Stratigraphically below the Brown's Tunnel sequence with some small lenses within that sequence. Hosts some massive mineralization in the Brown's Tunnel sequence. Hosts spotty, Pb, Zn & py mineralization elsewhere.

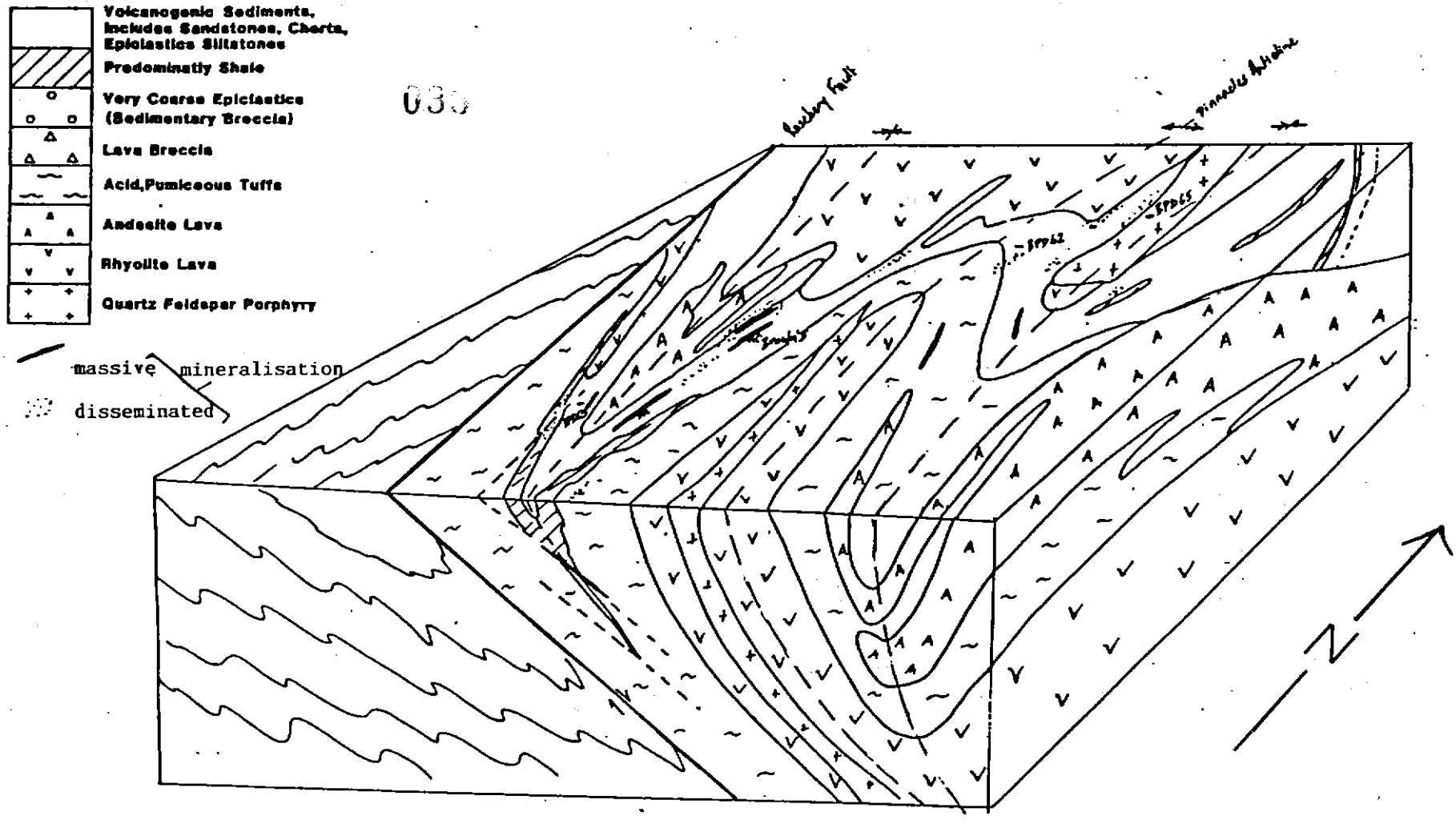
5.1.1 STRUCTURE

* Stratigraphy appears to be folded over a series of sub-parallel, anticlinal and synclinal axes

* The hinges of these structures converge towards the south and against the Rosebery Fault

* All bedding, cleavage and fold axes are rotated to be parallel to the Rosebery Fault on the western side of the licence.

* Along the Rosebery Fault the Pinnacles succession of sediments, lavas and tuffs is thrust in a westerly direction over the sediments of the Dundas Group.
The fault has an easterly dip of 30-40°



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GEOPEKO
A DIVISION OF PEKO WALLSEND OPERATIONS LTD

No FIG.11

INTERPRETED GEOLOGY

PINNACLES AREA

Map Ref:

Area: PARKES NSW

* The rocks in the immediate vicinity of Brown's and Thomas's Tunnels, appear to have been strongly deformed by shearing and folding. Dips on the EAF14 access track demonstrate small scale folding or faulting, or possibly soft sediment slumping. Dips are inconsistent and individual beds cannot be traced far along strike

* There may be a series of shears striking parallel to the Rosebery Fault. Holes that have intersected the fault show evidence of shearing on the eastern side of the main fault intersection (i.e. PIN1 & CP14). Outcropping shale in the costeans north of the Southern Trenches also appears to have been drag folded and sheared along faults.

MINERALIZATION AND ALTERATION

* Most known massive ore occurs within a definable sequence of rocks. The exception is 30cm of sphalerite-galena-pyrite and chalcopyrite intersected in BPD65. It is possibly vein controlled, though it is banded and occurs in acid pumiceous tuffs

* The massive ore appears to occur in discontinuous pods and, in many cases, is deformed i.e. EAF10 & EAF3

* Massive ore occurrences are also associated with zones of shearing and structural deformation

* The facing on ore intersections, most particularly that in EAF9, appears to be inconsistent with the facings determined by lithological logging and mapping i.e. those in BPD62 and on the Boco/Pinnacles access road corner

* Mineralized intersections also appear to have an association with (either occur within, or close to) rare, acid pumiceous tuff lenses, within the so-called host sequence

* All mineralization encountered so far may be footwall type. In which case, the true "Host" horizon, in the Brown's Tunnel area, is truncated by rhyolite lava. There is room for such a horizon to exist, however, to the west and to the north and east of the Brown's Tunnel area

* The Brown's Tunnel massive ore has a plunge to the north and is still not totally fenced off by drilling, to the north (see plate 15)

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041

* Disseminated mineralization is of three main types

  1) Disseminated "clots" of pyrite, sphalerite and galena, in the acid pumiceous tuffs below the Brown's Tunnel sequence

  2) Sphalerite, galena and pyrite in quartz carbonate stringers within all rocks of the Brown's Tunnel sequence, but especially the shales

  3) Disseminated pyrite, galena, chalcopyrite and sphalerite in andesite/sediment breccia on the margin of the Brown's Tunnel Andesite

* The acid pumiceous tuffs exhibit extensive sericitic and nodular siliceous alteration. Zoning of this alteration is not evident in outcrop mapping, though patches of more intense alteration occur throughout

* Alteration becomes very intense surrounding the sites of massive mineralization. This intensity is reflected, mostly, in very strong sericite alteration between totally silicified, nodular zones in volcaniclastic sediments and acid tuffs. Andesites exhibit stronger chlorite alteration close to mineralization

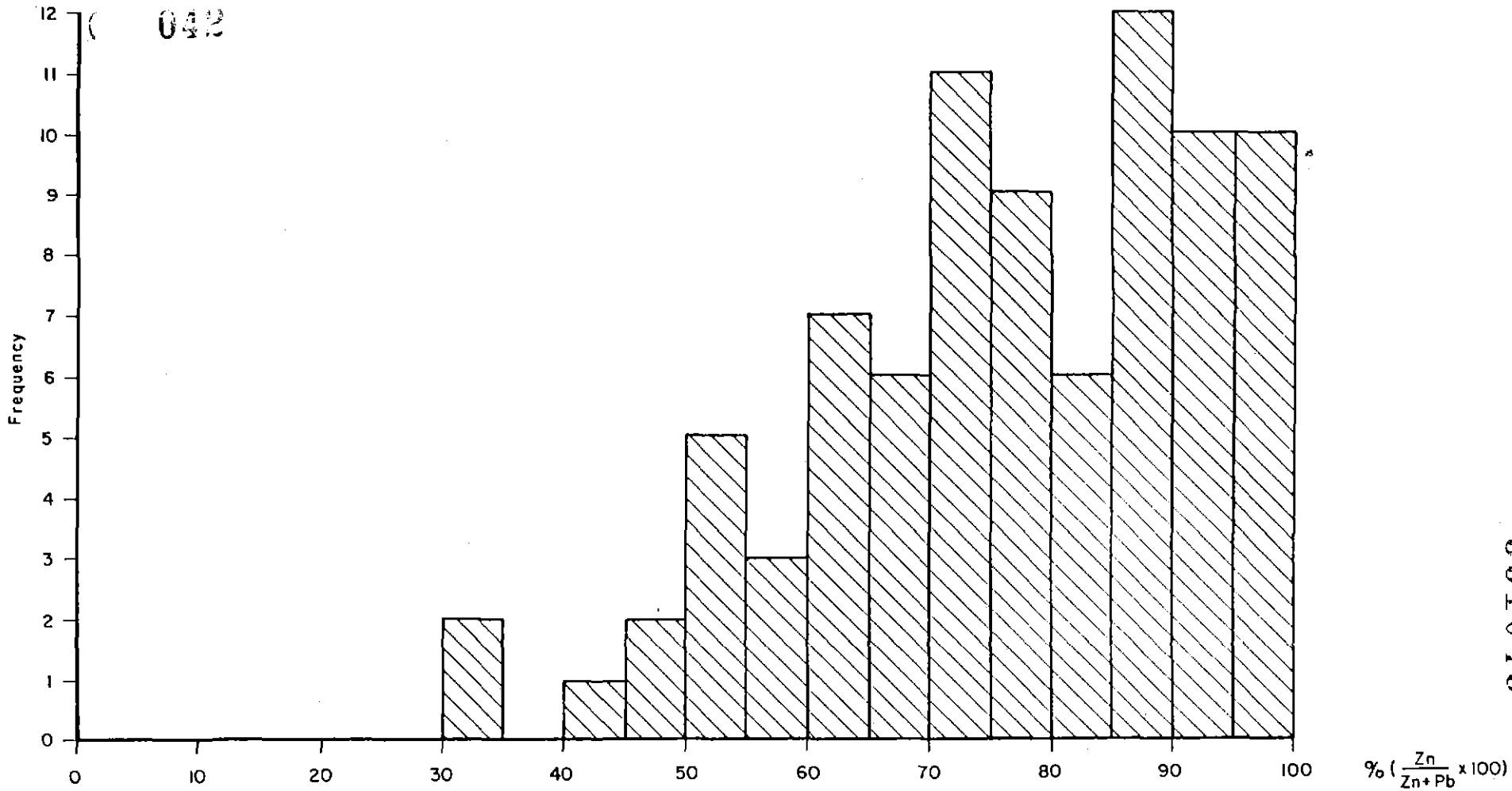
* Disseminated pyrite generally accompanies intense alteration

* Alteration zones do not extend far beyond the mineralized rocks. In one of the wider alteration zones, in Thomas's Tunnel, the intense alteration zone extends 5m either side of mineralization

* Beyond the intense alteration zones, no consistent visible alteration changes, either across or along strike, can be observed

* Zinc ratios fit into the model described by Huston & Large (1987) for Phanerozoic Zn-Pb-Cu massive sulphides, with a mean of 75.69 and standard deviation of 18.3. (see fig. 12) This suggests that Brown's Tunnel mineralization is most likely to be of the volcanogenic massive sulphide type. Although the histogram is negatively skewed compared with the model, the distribution of zinc numbers is closer to the model for VMS-style mineralization than other styles of mineralization in the Mt Read Volcanics. Similar skewness is exhibited in data from the Hercules Mine.

042



Number of Samples = 83
Mean = 75·9
Standard Deviation = 18·3

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BURNS PEAK E.L.44/88 | No FIG 12

BROWNS TUNNEL TO
THOMAS'S TUNNEL
ZINC NUMBERS

Date: 4-11-'89
Geologist: A.N.R.
Checked:
Drawn: N.W.D.S.
Amendments:
Map Ref:
Base: ROSEBERY, TAS.

EL 44/88

551044

043

GEOLOGICAL STORY

The work to date, in the Brown's Tunnel and Thomas's Tunnel belt, has identified the following stratigraphy.

Top
- Rhyolite Lavas
- Volcaniclastic Sandstones
- Siltstones
- Andesite ?Lava
- More volcaniclastic sediments
- Coarse Epiclastics
- Cherty Shale
- Acid Tuff
- Black Shale

- Acid Pumiceous Tuffs
- Rhyolite Lavas and Quartz Feldspar

Bottom
- Porphyry Intrusives

Figure 10 is a long section illustrating this stratigraphy.

Rhyolite lavas, often accompanied by quartz feldspar porphyry, occur at all levels in the stratigraphy. A centre of volcanic activity is envisaged, spilling lava into a sedimentary basin. The porphyries are thought to be high-level intrusions, sometimes occurring at the base of the rhyolite flows and sometimes as sills. The volcanic activity appears to have created a turbulent sedimentary environment with soft sediment deformation, break up of partly consolidated sedimentary units and triggering of mass and debris flows.

The unit of pumiceous acid tuffs, which underlies the Brown's Tunnel sequence, may have been erupted into the basin from a volcano on dry land. The small lenses of similar tuffs within the Brown's tunnel sequence, may be blocks from the same unit transported by later erosion, or could be the products of later eruptions. Massive mineralization at Brown's Tunnel seems to have accumulated during a period of quiescence. It is often associated with laminated cherts and siltstones, which would also have accumulated during such a quiet period. This period probably did not last long, as thicknesses of laminated sediments and massive mineralization do not exceed 5m. Furthermore, rocks hosting the mineralization, exhibit soft sediment deformation and appear to have been broken up, in places, by mass flow sediments i.e. EAF8 access track.

044

There is an association of known mineralization with strong shearing and deformation. It is possible that this is the result of mineralization occurring close to, or within, structures which acted as feeders for mineralizing fluids. Another possible explanation is that later Devonian deformation was more intense in the highly altered, softer rocks surrounding the mineralization.

Rhyolite lavas may have cut-off the access for mineralizing fluids to the basin floor during ore formation. Relatively unaltered lavas abut mineralized andesite/sediment breccias in EAF13. Andesite occurs within the Brown's Tunnel sequence. From its vesicular nature, it is interpreted as a lava, though it does bear a resemblance to andesitic dykes found in the Chester area. Another feature of the andesite is that it is commonly brecciated. Cherty sediment clasts also occur within this breccia, which is thought to be the result of andesite being erupted onto, or intruding, wet sediments. The andesite breccia commonly hosts disseminated mineralization. Perhaps this is the result of the andesite disrupting mineralized sediments, possibly at the time of mineralization. The sediments adjacent to the breccias are often mineralized.

Andesite lavas outcrop over a considerable part of the eastern part of sheet 1. Although they resemble the andesite at Brown's Tunnel, they are thought to be lower in the stratigraphy than the Brown's Tunnel Andesite, probably occurring as lava flows, interbedded with tuffs and sediments in the sedimentary basin.

In this basin scenario, the ideal place for ore formation would be in stratigraphy equivalent to, or possibly above, the Brown's Tunnel sequence, where the ore fluids were given a chance to accumulate, before being disrupted or eroded by tectonic activity or eruption of lavas.

A thickening of the Brown's Tunnel sequence is required. Possible extensions of the sequence to the north, north east and east, give some scope for this. There is also some room to the northwest of BPD63, though the stratigraphy would be severed by the Rosebery Fault.

An interpretation of the geology of the northern part of EL44/88 is shown in Fig. 11 and on Plate 4. Geology and interpretation of the Brown's Tunnel area is shown at 1:1000 scale on Plate 2 and of the Leo's Find area on Plate 1.

5.2 SOUTHERN TRENCHES (BPD64)

Rock Types

Rhyolite:

* has the same properties as Rhyolite to the North

Sequence of rocks Hosting known Mineralization:

* is not as wide as the sequence at Brown's Tunnel, further north.
* The sequence consists of narrow, cherty intervals, generally sheared, with bedded shales towards the north of the Southern Trenches sheet

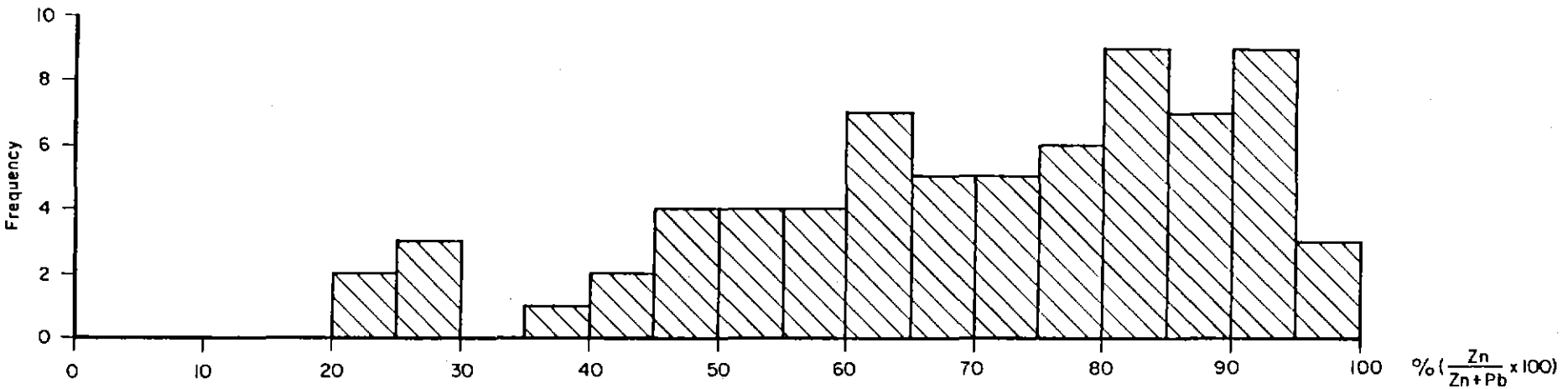
Acid Pumiceous Tuffs:

* These are identical in outcrop and appear to be direct correlates of the rock to the North. They are weakly mineralized in places i.e. at the top of EAF17 where they are also sheared.

Structure

* The stratigraphy at the Southern Trenches appears to have been rotated, until dips parallel the Rosebery Fault
* The cherty horizon that hosts the mineralization has been intersected in 4 holes on 4460N, these intersections appear to show that rather than being cut off by the Rosebery Fault, it is eventually parallel to it
* Shearing located by a number of drill holes (e.g. CP13, 110m)) indicates that zones of shearing, parallel to the Rosebery Fault exist
* The movement of stratigraphy on shear zones parallel to the fault can explain the apparently chaotic outcrop pattern of shales between Thomas's Tunnel and the Southern Trenches
* Mineralization is related to shearing wherever it is found

045



Number of Samples = 72
Mean = 68·8
Standard Deviation = 21·0

	GEOPEKO A DIVISION OF PEKO WALLSEND OPERATIONS LTD	
	BURNS PEAK E.L.44/88	No FIG 13
Date: 4-11-'89 Geologist: A.N.R. Checked:	SOUTHERN TRENCHES ZINC NUMBERS	
Drawn: N.W.D.S. Amendments:	Map Ref:	Base: ROSEBERY, TAS.

5540 E/43

Mineralization and Alteration

* Mineralization is characteristically vein type. High gold values occur in some holes (i.e. EAF18 # g/t) (Intense silicification and sericitization)

* Mineralized intersections are narrow. There is limited potential for a worthwhile tonnage of gold rich mineralization south of S.T. 2 (see plate 15a)

* Alteration is symmetrical about mineralized zones

* Mineralization occurs mostly in cherty layers, in areas of shearing

* Rocks on the western side of the Rosebery Fault are less altered and mineralized than those to the east

* Zinc ratios have a mean of 68.8, which fits into the model for VMS-style mineralization (Huston & Large, 1987). The distribution of ratios and standard deviation, however, (Fig 13) is more akin to Huston & Large's model for Cambrian vein-type deposits.

GEOLOGICAL STORY AND STRATIGRAPHY

The stratigraphy at the Southern Trenches has a smaller sedimentary component than that at Brown's Tunnel.

Acid pumiceous tuffs appear to be overlying rhyolite and quartz/feldspar porphyry lavas/intrusives, which correlate with the footwall units to the north.

Within the acid pumiceous tuffs is a band of bedded shales and cherty sediments. This band diminishes to the south. It is interpreted as part of the sequence that hosts the Brown's Tunnel mineralization squeezed in between sheared acid pumiceous tuffs.

Because mineralization is associated with shear zones and with cherty rocks it is difficult to determine the over-riding control.

Dr. G. Green is currently working on some of these rocks. His work to date suggests that mineralization occurs in late stage veinlets that post date lithification and also, possibly, deformation. (See appendix 7)

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The mineralization may be the result of remobilization of pre-existing, above background mineralization in cherty sediments.

Interpreted and outcrop geology of the Southern Trenches is shown on Plate 3.

5.3 SOUTH EASTERN ANDESITE CONTACT

Preliminary investigations of this area consisted of limited field observations and re-logging of EAB4. Plate 4 shows the location of EAB4 and Fig 12 shows a section through the hole. Anomalous geochemical values and geophysical responses are also shown. An annotated summary of BHP's log of EAB4 is in Appendix 3.

This area attracts attention for a number of reasons.

1) Geochemical anomalies

Wacker sampling has highlighted a zone along the andesite/sediment contact which is anomalous in lead and zinc. This zone is shown in figure 16.

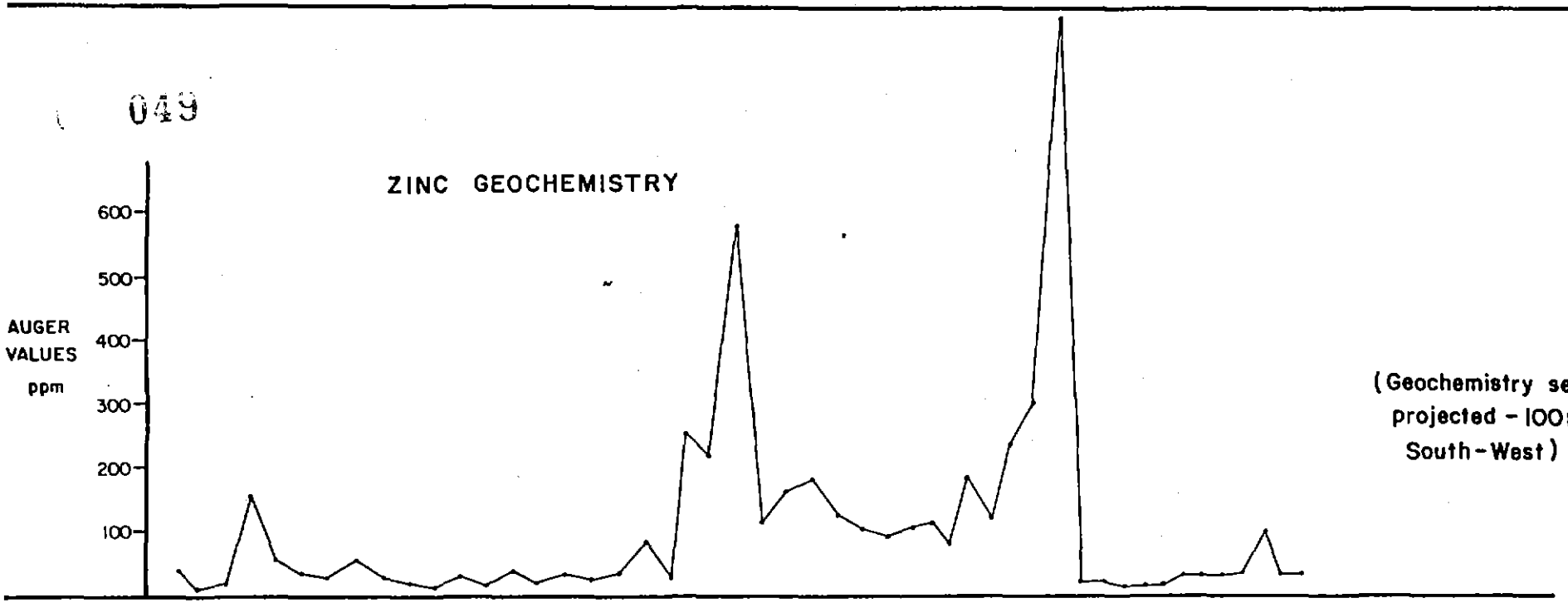
2) Geophysical Responses

A number of UTEM responses were recorded along the contact zone. Whilst these have been attributed to black shale, a sulphide cause is possible. Further drilling in this area should take these responses into account.

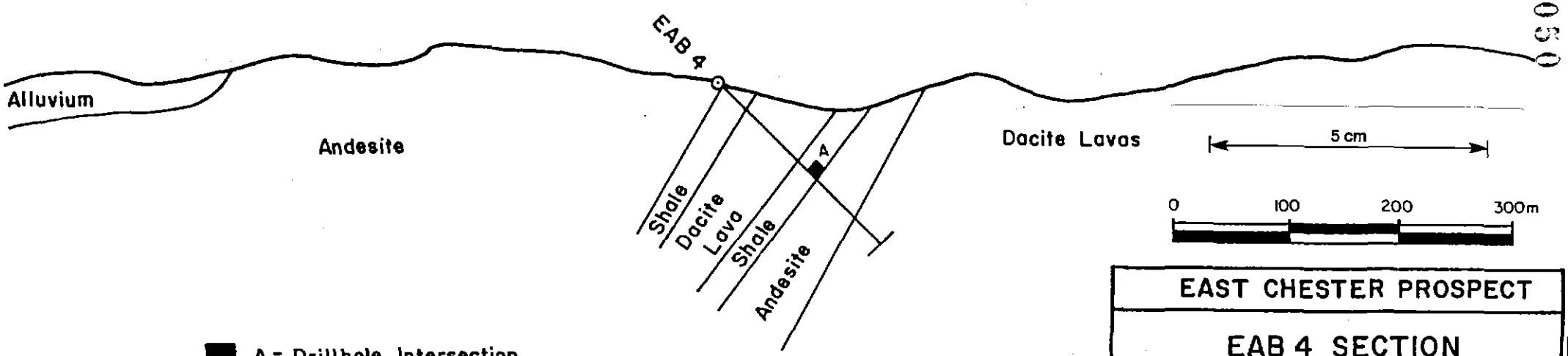
3) Geology

Geophysical and geochemical responses occur in a geological environment favourable for VMS deposits. That is, a contact zone which reflects a change in vulcanism, from acid to intermediate type, with an intervening period of quiescence, marked by bedded shales and sandstones. Figure 15 shows the outcropping geology of the area. Figure 14 shows geology, geochemistry and UTEM in cross-section.

049



5541050



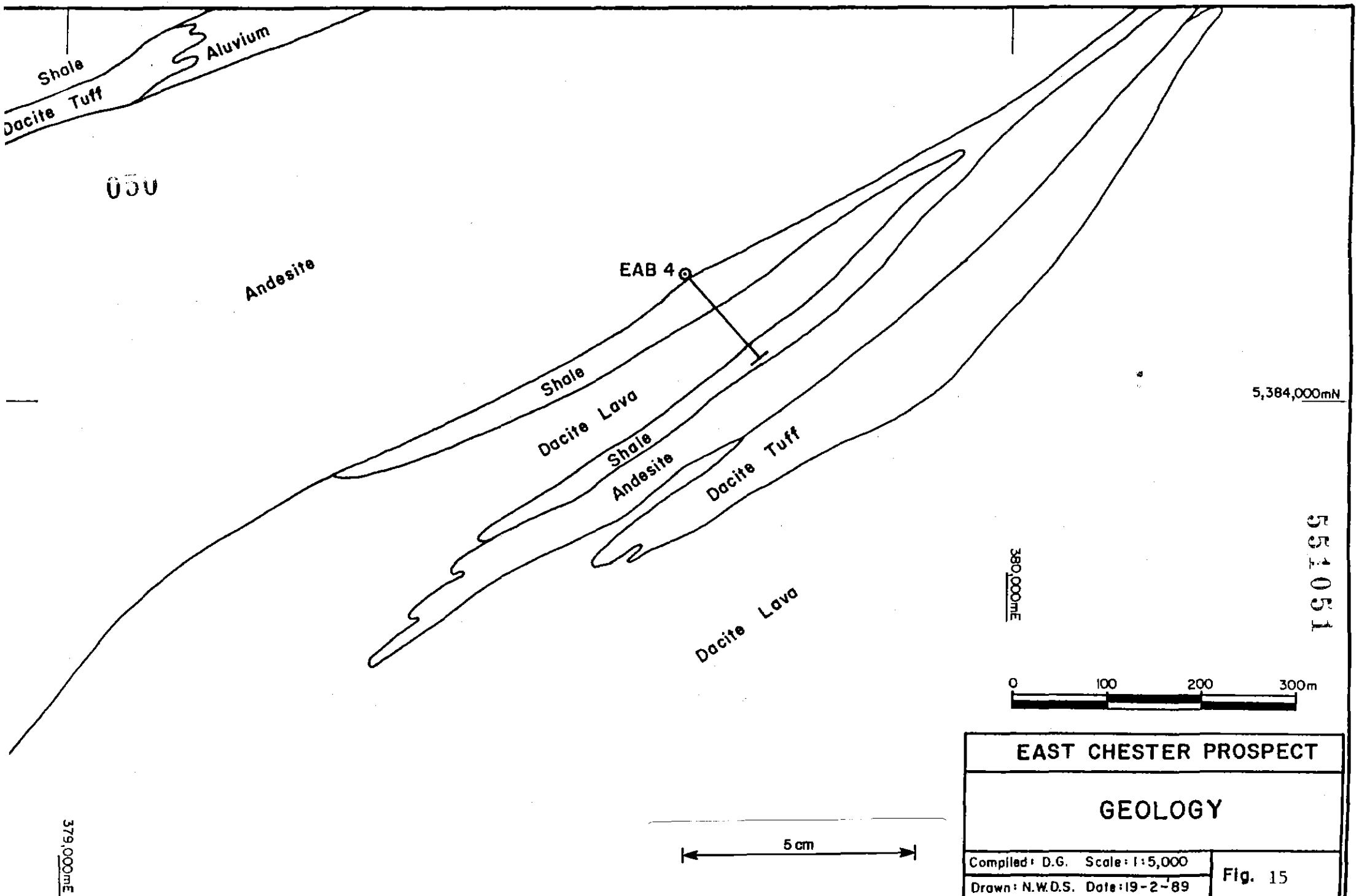
■ A = Drillhole Intersection
8m. at 2050 ppm Zinc

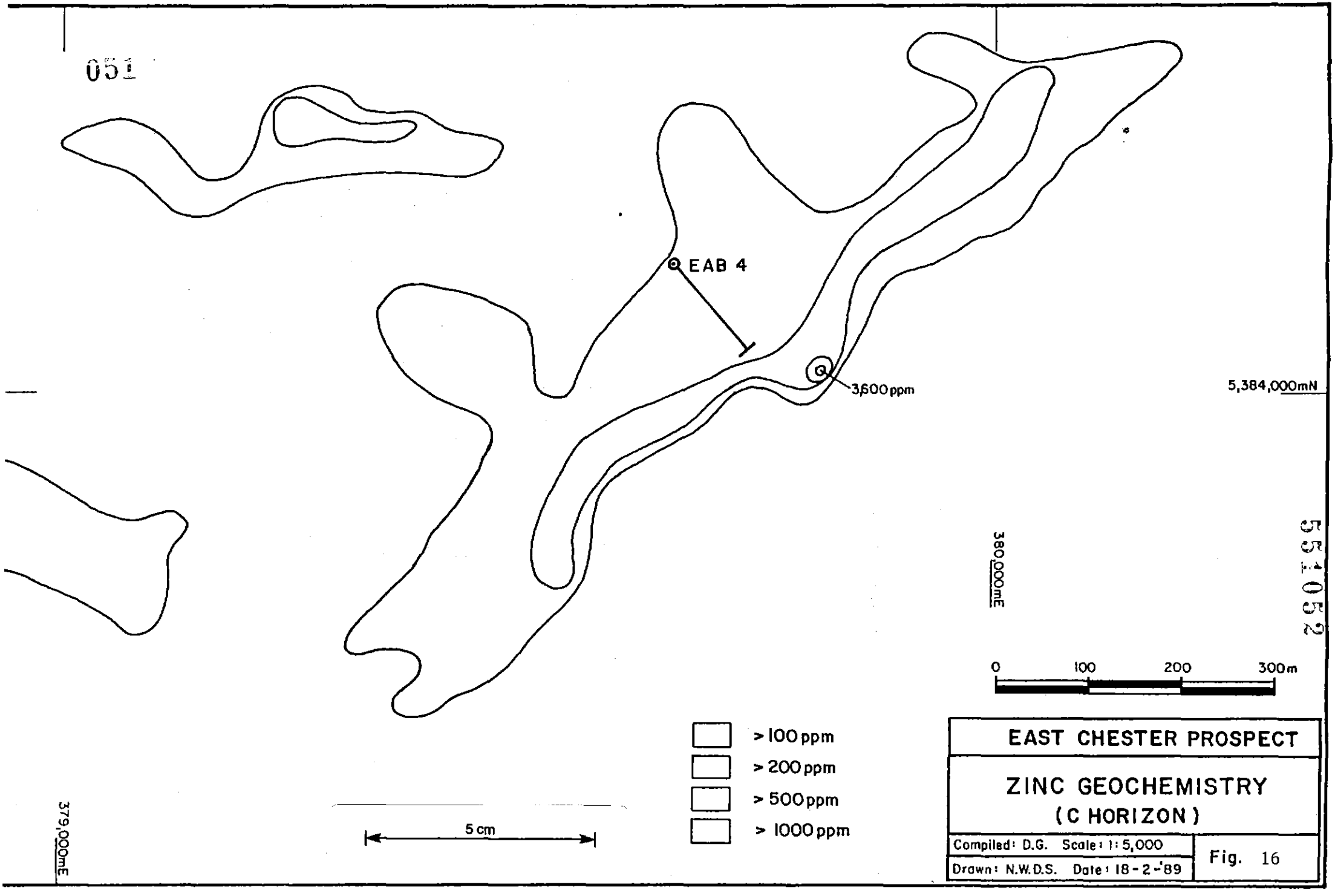
EAST CHESTER PROSPECT

EAB 4 SECTION
(LOOKING NORTH)

Compiled: D.G. Scale: 1:5000
Drawn: N.W.D.S. Date: 19-2-'89

Fig. 14


Shale
Aluvium
Dacite Tuff
050
Andesite
EAB 4
Shale
Dacite Lava
Shale
Andesite
Dacite Tuff
Dacite Lava
5,384,000mN
5541051
380,000mE
379,000mE
0
100
200
300m
5 cm
EAST CHESTER PROSPECT
GEOLOGY
Compiled: D.G. Scale: 1:5,000
Drawn: N.W.D.S. Date: 19-2-89
Fig. 15


051
EAB 4
3,600 ppm
5,384,000mN
380,000mE
379,000mE
5541052
0
100
200
300m
5 cm
> 100 ppm
> 200 ppm
> 500 ppm
> 1000 ppm
EAST CHESTER PROSPECT
ZINC GEOCHEMISTRY
(C HORIZON)
Compiled: D.G. Scale: 1:5,000
Drawn: N.W.D.S. Date: 18-2-'89
Fig. 16

5.4 CHESTER

A brief study of the geology of the Chester areas was undertaken by D. Gardner. (Appendix 6) A review of past work is included in the report.

6 drill holes were proposed in the Chester area. These were designed to test extensions of the Chester stratigraphy to the North East and East, and the Chester alteration zone west of Chester mine.

Other holes were proposed to test previously defined outcropping sulphides on the Pieman Road and at Mt Kershaw, at depth.

An overriding feature of the Chester area is the lack of bedded lithologies, which would enable facing and stratigraphy to be determined.

Alteration masks rock types in many instances and the same rocks have been variously mapped as tuffs, lavas and tuff-lavas!

Re-sampling of core, as recommended by D. Gardner, has been carried out. The results of this sampling are not available at time of reporting.

6.0 REHABILITATION

The sites for drill holes BPD62, 63 and 65 have been covered with topsoil and vegetation that was pushed aside when the site was cleared.

Access for a 4WD vehicle to the drill hole has been kept open to allow down hole surveys by geophysical crews.

Roadways have been left open for the same reason. Drainage-ways have been cut through banks to enable water to run off, rather than down, the drill tracks.

A 1:5000 scale map is currently being prepared. It shows all roadways, costeans, drains etc, constructed by Geopeko and by previous operators. The map covers the western areas of the E.L. (the eastern area has been left almost untouched by exploration). The map will be forwarded to the Mines Department, as requested, on completion.

7.0 RECOMMENDATIONS

7.1 WHAT FUTURE EXPLORATION NEEDS TO ACHIEVE

* Determine whether the mineralization so far located may be footwall to more major mineralization.

* Find strike-length extensions of the Brown's Tunnel stratigraphy. These will be folded around the identified structures, and can be located, to some extent, from outcrop mapping. However, two significant areas are covered by glacials and another may plunge beneath a large area of outcropping rhyolite lava.

* Determine whether Brown's Tunnel massive mineralization can be traced northwards from EAF9.

* Determine whether spatial relationships of massive ore, with acid pumiceous tuff lenses, zones of deformation and Andesite lava/intrusive are important factors in ore formation.

* Establish whether or not shallow mineralization at Southern Trenches extends southwards.

* Develop and test drilling targets on the Southern Andesite contact.

* Determine the facing of alteration and stratigraphy (if possible) in the Chester alteration zone.

* Test extensions of Chester controls.

* Establish the main control (i.e. structural or stratigraphic) of Chester alteration/ mineralization.

7.2 RECOMMENDED METHODS FOR ACHIEVING EXPLORATION OBJECTIVES

* Use of metal or lithochemical zoning and sulphur and/or oxygen isotopes to establish whether mineralization may be footwall to other mineralization and to look for an objective measure of changes in alteration along strike. Any results would be compared with zoning patterns observed at Rosebery or Que River.

* Use of costeans through glacial overburden, to identify and sample underlying lithologies.

* Diamond drilling to fence off Brown's Tunnel mineralization, to the north of 5400N (EAF Grid).

* Close field mapping of Brown's Tunnel sequence, away from the Brown's Tunnel area, to locate zones of strong structural deformation, acid pumiceous tuff lenses and andesitic lava/intrusion contacts in an effort to determine whether any of these are associated with mineralization.

* Application of geophysical method or methods that may identify structural controls on mineralization and would assist in mapping areas covered by glacials and rhyolite, particularly with a view to locating extensions of the Brown's Tunnel stratigraphy.

* Employment of geophysical technique capable of locating ore within the Brown's Tunnel stratigraphy in the Chester Alteration zone and along the Southern Andesite contact. This may only require refinement of existing I.P. and UTEM.

* Shallow drilling south of Southern Trenches.

* Mapping of creek beds in Chester and Hollway Rivulet areas.

* Diamond drilling along Brown's Tunnel stratigraphy, where it can be accurately located, at 400m spacing (Probably 2 or 3 holes).

* Application of downhole geophysical methods to locate ore between drill holes.

* Diamond drilling of targets generated at Chester and on the Southern Andesite contact.

* Target areas for Exploration in 1990 are shown on Plate 66.

CITED REFERENCES

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CORBETT, K.D. MCNEILL, A.W. 1988 — Geological Compilation Map of the Mount Read Volcanics and Associated Rocks Hellyer to South Darwin Peak. Map 6 Mount Read Volcanics Project. Geological Survey of Tasmania.

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GREEN, G.R. BAMFORD, A.L. 1986b — Sheet 8014-IV: Tullah, Metallic Mineral Deposit Map Series. Geological Survey of Tasmania.

HUSTON, D.L. & LARGE, R. — Genetic and Exploration Significance of the Zinc Ratio (100Zn/(Zn & Pb)) in Massive Sulfide systems. Econ. Geol. 82:1521-1539.

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89-3059

MINES
File Ref. EL 44/88
29 NOV 1989
Doc. Ref.
Action Officer | Initials
LETTER
29.11.'89
REFERS
Resubmit to | Date

APPENDIX 1

E.L. SCHEDULE

MICROFILMED

89-3059

OPEN FILE

Appendix 1

SCHEDULE EL 44/88 BURNS PEAK

Commencing at the northwest corner of the area whose grid coordinates are 376 000 metres E. 5 387 000 metres N. thence grid east to 378 000 metres E. grid south to 5 386 878 metres N. easterly to grid coordinates 380 000 metres E. 5 386 900 metres N. grid north to 5 387 000 metres N. aforesaid again grid east to 382 000 metres E. again grid south to 5 386 000 metres N. grid west to 381 000 metres E. again grid south to 5 384 000 metres N. again grid east to 385 000 metres E. again grid south to 5 383 000 metres N. again grid east to 386 000 metres E. again grid south to 5 381 000 metres N. again grid west to 385 000 metres E. aforesaid again grid south to 5 378 000 metres N. again grid west to 384 000 metres E. again grid south to 5 375 000 metres N. again grid west to 383 000 metres E. again grid north to 5 379 000 metres N. again grid west to 376 000 metres E. aforesaid thence again grid north to the point of commencement.

The area excludes (4.3 skm) land vested in the H.E.C. and (0.5 skm) Murchison Highway State Reserve.

Land Tenure: The area comprises: Crown Land; Timber Reserve;Land vested in the H.E.C.

(This land tenure table is a guide only)

EXCLUSIONS

The area embraced by this licence includes State Forests but does not include:

(a) All other public reserves or municipal reserves or roadways.

(b) All forms of mining tenements and water licences including leases, water licences, easement licences, special and exploration licences, prospectors licences, miners rights, permits to enter, owners consents and owners rights which were in lawful possession or marked out prior to the date of marking out of this licence.

(c) Land exempt from the provisions of the Mining Act, 1929.

(d) Land under the National Parks and Wildlife Act, 1970, not subject to the Mining Act, 1929.

(e) All Crown reservations or other land set apart or dedicated for any public purposes.

MINISTER FOR MINES

APPENDIX 2

ASSAY TECHNIQUES

SAMPLE ANALYSIS

Core samples were split at Tullah and sent to Classic Comlabs, South Australia for assay for gold by FA1 and copper, lead and zinc and manganese by AAS1 or AAS2, if insoluble samples were encountered.

Sample preparation was by Comlabs "Mixer-Mill", which pulverises samples in one stage.

Sample size was kept below 5 kg, so that the "Mixer-Mill"could be effectively used.

SAMPLE PREPARATION

Correct sample preparation prior to analysis is vital for obtaining meaningful assays.

We endeavour at all times to obtain a representative sub-sample for analysis from the total sample submitted to the laboratory. On large batches we prepare and code additional samples for analysis as a sample preparation check and for analytical quality control.

The difficulties associated with obtaining even distribution of gold in a prepared sample are recognised, particularly when the material contains "spotty" gold. Precautions are taken to minimise sampling errors as far as possible by using CLASSIC COMLABS designed and manufactured sample preparation equipment like the "MIXERMILL" series of pulverisers. These can reduce, in one stage, samples up to 5kg in weight to minus 75 microns — from which representative splits can be taken for analysis.

AAS

ATOMIC ABSORPTION SPECTROMETRY

Trace metal analysis of rocks, stream sediments, chips, soils and drill core by Atomic Absorption Spectrometry.

MINERALISED CORE samples and samples for ORE RESERVE ESTIMATIONS are best suited to analysis using CODE AAS 4 or XRF 2. We appreciate notification of matrix and mineral types present.

Accuracies quoted refer to values at 100 times detection limit.

AAS 1

Perchloric acid digestion provides "acid soluble" values. Where necessary hydrochloric and/or nitric acid is used in addition to perchloric acid, to assist in digesting high sulphide materials or highly organic samples. Precautions are also taken to ensure the dissolution of Fe and Mn. Some materials are not totally attacked using this method (e.g. chromite, spinels etc.).

NOTE: 1) Values outside the stated range will be re-determined at $3.30 per element.

2) The range for Pb is 4 - 5000 ppm. Pb values greater than 5000 ppm will be re-determined using CODE AAS 4 or XRF 2 as appropriate.

For mineralised samples where concentrations higher than 1% are expected CODE AAS 4 or XRF 2 should be used.

AAS 3

Suitable for analysis of "non-acid-soluble" type mineralisation. In this technique, hydrofluoric acid is used. Evaporation of the HF, followed by conventional perchloric acid dissolution then gives total elemental concentrations: e.g. Ca, Fe, K, Na, Mg, Mn, etc. In clay may be determined as well as the traces in CODE AAS 1. Minerals such as chromites and tourmalines are better suited to analysis by CODE AAS 4.

NOTE: Values greater than 1% will be re-determined by CODE AAS 4.

SCHEME	ELEMENT/DETECTION LIMIT (ppm)	RANGE	ACCURACY
AAS 1	Bi(10), Cd(1), Co(4) Cr(4), Cu(2), Fe(4) Mn(4), Ni(4), Pb(4) Zn(2)	D.L.—1% (Except Pb See note 2)	± 10%
AAS 3	Ag(1), Be(2), Bi(10) Ca(10), Cd(1), Co(4) Cr(4), Cu(2), Fe(4), K(10) Li(4), Mg(10), Mn(4), Mo(2) Na(10), Ni(4), Pb(4) Sc(10), V(10), Zn(2)	D.L.—1%	± 10%

FA

FIRE ASSAY - AAS FINISH

FA 1-2 Gold. Fire assay - AAS measurement.

The sample is fired with litharge and flux. The lead button is cupelled to give a prill which is dissolved in aqua regia and the gold determined by AAS. Total values are obtained. The method is suitable for most types of material. Highly mineralised samples may need pretreatment to obtain suitable fluxing conditions. Pretreatment to overcome interferences may incur extra costs.

CODE	ELEMENT/DETECTION LIMIT (ppb)	SAMPLE WEIGHT (g)	ACCURACY
FA 1	Au (10)	50	Variable

APPENDIX 3

ASSAY RESULTS AND DRILL LOGS

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SUMMARY DRILL LOG

LOCALITY:- BURNS PEAK
LICENCE:- EL 44/88
DRILL HOLE:-BPD62
OBJECTIVE:- To test mineralized horizon 200m deeper than intersection in EAF11
RESULT:- Two zones low grade min. intersected. Min. horizon repeated by folding.

DRILLING DETAILS

Hole drilled by:- Diamond Drilling Ta
Commenced:- 22/5/89
Completed:- 21/6/89
Total Depth:- 658.5m
Logged by:- A. Lorrigan
Annotated by:-
Hole size:- HQ 8 -113.7m, NQ - EOH
Hole condition:- PVC (32mm) to EOH.
(Casing etc in hole)

COLLAR DETAILS

Local grid
5230 EAST
5400 NORTH
AMG Coordinates
378019.6 EAST
5384653.4 NORTH
394.1 R.L.

DOWN HOLE SURVEY DATA

Survey Method:- S.Shot camera

DEPTH	DIP	AZ	DEPTH	DIP	AZ
0.0	55°	270°	480.0	54°	275°
30.0	57°	266°	530.0	53½°	276°
79.0	57°	266°	580.0	53°	278°
130.0	56°	270°	630.0	52°	279°
180.0	55½°	270°			
230.0	54°	271°			
280.0	55°	270°	All bearings mag.		
330.0	54°	275°	For AMG add 12		
380.0	54°	275°			
430.0	54°	275°			

METERAGE FROM	TO	ROCK DESCRIPTION	MINERALIZATION	SAMPLE NO.	FROM	TO	%REC	LNGTH	SIGNIFICANT ASSAYS Cu	Pb	Zn	Ag	Au	Mn	Fe
0.0	17.5	Interbedded Epiclastics, Mass Flows, and Lava Breccia.	14.4-16.5 Blebs sp assoc. with carb. alt.	79110	17.0	18.0	100	1.0	82	3100	4550		<0.01	1.65%	
17.5	107.8	Epiclasts interbedded with well sorted sediments: shales, cherty seds, and siltstones. Probable Host Rock Horizon=(19.4-26.9)	19.4-26.9 gn & sp in qtz stringers. 41-55.2 Spotty alteration. 70.7-72.3 Tr sp in veins.	79113 -115	20.0	23.0	100	3.0	130	940	4390		0.27	200	
			103.3-104.5., 10-20% py, traces of sp & gn.	79170	103.0	104.0	100	1.0	36	140	260		0.18	1150	
107.8	197.6	Epiclasts intercalated with fine-grained siliceous lava.	146.8 Trace sp in veins.												
197.6	248.0	Fine-grained siliceous lava.	203-213 Spotty alteration, similar to Hercules.												
			234.5-247.8 Traces sp & gn.	79220	236.0	238.0	100	2.0	17	155	84		0.11	2100	
248.0	459.7	Quartz-feldspar porphyry	311.5 cp in qz. vn..												
459.7	472.5	Mixture of Qtz Feldspar porphyry and rhyolite breccia.													
472.5	519.7	Interbedded shale & coarser seds. Cherty seds & sericitised ?tuff or lava.	472.5-480.9 sp in carb. stringers. 493.3-498.2 sp	79246 -250	472.0	482.0	95	10.0	19	1090	4500		0.03	890	
			in carb. veins. 513.8-518.8 Trace sp in stringers.	79256 -270	492.0	522.0	98	30.0	25	700	4700		0.01	990	

51064

064

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SUMMARY DRILL LOG

519.7	550.9	Sericitized Rhyolite Tuff foliated. Interbedded with minor black shale.		79277	534.0	536.0	100	2.0	17	3000	9300		<0.01	2450
550.9	611.0	?Dacitic tuffs. Siliceous rock type with fragments & clasts visible. Dissem pyrite throughout.	550.9-554.0 patches sp, gn & py Probable Host Rock Horizon.	79251 -286	542.0	544.0	90	12.0	440	200	6070		0.02	3700
			572.5-576.6 3% f.g dissem. py. 597.6-611.0 3-5% dissem. pyrite.	79296 -298	572.0	578.0	98	6.0	420	1820	5500		0.02	1170
611.0	658.5	Porphyritic rhyolite lava Qtz. and Feldspar phenocryst. Contains zones of chlorite alteration & ?pipe at 640.5-646.5. E.O.H.	640.5-646.5 dissem py, patches sp, gn & cp.	79322	642.0	644.0	100	2.0	370	115	2600		0.03	1380

551063

LOCALITY:- BURNS PEAK DRILL HOLE NUMBER:- BPD62 EL 44/88

METERAGE FROM	TO	SAMPLE NUMBERS	SAMPLE METHOD	PURPOSE	LABORATORY	METHOD	ELEMENTS DETERMINED
8.0	72.0	79101 - 64	½ CORE	ASSAY	COMLABS	AAS1	Cu, Pb, Zn, Mn
90.0	95.0	79165 - 69	½ CORE	ASSAY	COMLABS	FA1	Au
103.0	109.0	79170 - 75	½ CORE	ASSAY	COMLABS		
142.0	196.0	70176 - 202	½ CORE	ASSAY	COMLABS		
202.0	252.0	79203 - 27	½ CORE	ASSAY	COMLABS		
310.0	314.0	79228 - 9	½ CORE	ASSAY	COMLABS		
328.0	346.0	79230 - 8	½ CORE	ASSAY	COMLABS		
458.0	614.0	79239 - 316	½ CORE	ASSAY	COMLABS		
620.0	622.0	79317	½ CORE	ASSAY	COMLABS		
626.0	630.0	79318 - 9	½ CORE	ASSAY	COMLABS		
638.0	656.0	79320 - 8	½ CORE	ASSAY	COMLABS		
112.0		79329	W/CORE	PETROPHYSICS	DR EMERSON		
82.0		79330	W/CORE	PETROPHYSICS	UNI. OF SYD.		
139.0		79331	W/CORE	PETROPHYSICS			
253.0		79332	W/CORE	PETROPHYSICS			
329.0		79333	W/CORE	PETROPHYSICS			
391.0		79334	W/CORE	PETROPHYSICS			
448.5		79335	W/CORE	PETROPHYSICS			
612.8		79336	W/CORE	PETROPHYSICS			
623.7		79337	W/CORE	PETROPHYSICS			
634.2		79338	W/CORE	PETROPHYSICS			
657.0		79339	W/CORE	PETROPHYSICS			
17.0		79340	W/CORE	PETROPHYSICS			
30.0		79341	W/CORE	PETROPHYSICS			
38.1		79342	W/CORE	PETROPHYSICS			
551.7		79343	W/CORE	PETROPHYSICS			
575.6		79344	W/CORE	PETROPHYSICS			
609.8		79345	W/CORE	PETROPHYSICS			
20.5		82001	¼ CORE	PETROLOGY	DR. G. GREEN		
47.9		82002	¼ CORE	PETROLOGY			
70.0		82003	¼ CORE	PETROLOGY			
106.9		82004	¼ CORE	PETROLOGY			
107.5		82005	¼ CORE	PETROLOGY			
148.9		82006	¼ CORE	PETROLOGY			
168.2		82007	¼ CORE	PETROLOGY			
175.2		82008	¼ CORE	PETROLOGY			
198.2		82009	¼ CORE	PETROLOGY			
203.2		82010	¼ CORE	PETROLOGY			
217.3		82011	¼ CORE	PETROLOGY			
222.9		82012	¼ CORE	PETROLOGY			
244.1		82013	¼ CORE	PETROLOGY			
254.4		82014	¼ CORE	PETROLOGY			
325.7		82015	¼ CORE	PETROLOGY			
455.3		82016	¼ CORE	PETROLOGY			
461.8		82017	¼ CORE	PETROLOGY			
489.4		82018	¼ CORE	PETROLOGY			
496.3		82019	¼ CORE	PETROLOGY			

554066

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SAMPLING SUMMARY

METERAGE FROM	TO	SAMPLE NUMBERS	SAMPLE METHOD	PURPOSE	LABORATORY	METHOD	ELEMENTS DETERMINED
517.6		82020	¼ CORE	PETROLOGY			
529.5		82021	¼ CORE	PETROLOGY	DR. G. GREEN		
558.9		82022	¼ CORE	PETROLOGY	DR. G. GREEN		
590.5		82023	¼ CORE	PETROLOGY			
629.4		82024	¼ CORE	PETROLOGY			
655.6		82025	¼ CORE	PETROLOGY			

55406

067

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
0	8	TRICONE													
8	10.5	RHYOLITE LAVA BRECCIA - F'spar-phyric fragments throughout, 30-100mm dia. Siliceous matrix.	Some fragments sil, others ser alt'd. F'spar -> cb	79101	8.00	9.00	100	1.0	13	56	195	440	0.03		
				79102	9.00	10.00	100	1.0	7	44	105	170	0.03		
10.5	13.0	SILICEOUS BRECCIA -Large fine-grained, chl frags. Grey, int sil, matrix. Some cherty frags 10-50mm Chl frags 100-150mm 12.4 cba 50° gd uphole (3	Sil matrix (grey => py). Some frags int chl. Minor cb alt.	79103	10.00	11.00	100	1.0	4	54	95	150	0.02		
				79104	11.00	12.00	100	1.0	8	710	175	1160	0.01		
				79105	12.00	13.00	100	1.0	11	360	680	1960	0.02		
13.0	13.5	?EPICLASTIC - Green/grey Clast supported. Fine grey sil matrix. Small chl & cherty frags, & Porphyritic (f'spar) lava frags.	Sil matrix. Chl alt of some frags. Minor cb & ser alt elsewhr	79106	13.00	14.00	100	1.0	30	340	400	2250	<0.01		
13.5	14.4	AMYGDALOIDAL LAVA - Pale green, f'spar-phyric. Prob flow texture at 13.6 could be a clast?	Mod-int ser alt. Amydales qa & cb filled.												
14.4	16.5	EPICLASTIC - int chl'd frags & porphyritic (f'spar) lava frags in fine-grey sil matrix.	Sil matrix, f'spar-> sid. Wk chl & ser alt, except for some int chl frags. Blebs of sp assoc with cb. stringers.	79107	14.00	15.00	100	1.0	9	32	145	1840	<0.01		
				79108	15.00	16.00	100	1.0	40	230	8500	2850	<0.01		
16.5	17.5	?MASS FLOW BRECCIA - Shale & f.g., ser'd volcanic ?rhyolite frags. Shale frags have very uneven bounds, ?soft dep. 16.6m ?cba 90°	Ser alt of some frag Cb alt of rest of rock. Small blebs of sp.	79109	16.00	17.00	100	1.0	4	370	930	8700	<0.01		
17.5	18.1	SANDSTONE - Dk grey, well sorted sediment with shale & cherty sediment clasts. Most clasts 1-2mm Two large clasts (80mm)	As above	79110	17.00	18.00	100	1.0	82	3100	4550	1.65%	<0.01		
18.1	19.4	FELDSPAR-PHYRIC LAVA BRECCIA. Could be a clast 19 - fol. 50°.	Sericite patches.	79111	18.00	19.00	100	1.0	36	790	1720	4250	<0.01		
				79112	19.00	20.00	100	1.0	42	500	950	2250	<0.01		

55068

060

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
19.4	26.9	SEDIMENTS - Fine gr'd, Cherty->shaley. At 21.8m fac'g on load struct => younging uphole. Soft sed deform at top of fine-bed shale, where coarser bed comes in. 20m gd & s & f uphole (2)	Ser patches, gn & sp in qz vnlts (2-5mm, 21m). 21.7-22.1 & 25.1-25.3 1% diss py cb alt.	79113	20.00	21.00	100	1.0	92	1440	2550	350	0.19		
				79114	21.00	22.00	100	1.0	230	1060	3900	135	0.24		
				79115	22.00	23.00	100	1.0	64	330	6700	105	0.40		
				79116	23.00	24.00	100	1.0	32	100	260	86	0.03		
				79117	24.00	25.00	100	1.0	24	370	540	130	<0.01		
				79118	25.00	26.00	100	1.0	22	160	155	320	<0.01		
				79119	26.00	27.00	100	1.0	3	30	55	470	<0.01		
26.9	27.7	?EPICLASTIC, cherty clast in f'spar-phyric, ser matrix.	Ser & wk silica alt.	79120	27.00	28.00	100	1.0	5	84	160	660	0.01		
27.7	29.2	?EPICLASTIC BRECCIA - 10-100mm frags, most F'spar-phyric lava. Matrix of f.g. dk grey silica.	Clasts partly ser alt, part pk sil alt. Matrix sil with 1-3% f.g. diss py.	79121	28.00	29.00	100	1.0	10	80	260	760	0.02		
29.2	31.2	BEDDED SEDIMENTS. Arenite and very fine, cherty sed. Some large (20mm) lava clasts. Cba 75°.	Clasts ser alt & pk sil alt. Matrix wkly ser with trace py.	79122	29.00	30.00	100	1.0	8	30	78	1160	0.02		
				79123	30.00	31.00	100	1.0	6	10	88	2050	<0.01		
31.2	32.8	COARSE SEDIMENTS with many black shale clasts. Some rhyolite clasts.	Wk ser & cb alt of matrix & clasts. Qz, vughy, vn @31.3-31.4	79124	31.00	32.00	100	1.0	15	8	84	3150	<0.01		
				79125	32.00	33.00	100	1.0	6	30	88	1860	<0.01		
32.8	39.0	FINE GRAINED SEDIMENTS, Bedded, siliceous. Facing on load cast => uphole young'g. Cba 80°. Thin bed of shale @ 36.8m 33 cba 70°, gd uphole (1)	Very wk sericite. Shear @ 32.8-32.9, strong ser & cb alt.	79126	33.00	34.00	100	1.0	26	38	50	1300	<0.01		
				79127	34.00	35.00	100	1.0	34	185	180	1180	<0.01		
				79128	35.00	36.00	100	1.0	5	96	120	320	0.02		
				79129	36.00	37.00	100	1.0	8	125	450	1840	0.01		
				79130	37.00	38.00	100	1.0	3	56	44	1220	0.01		
				79131	38.00	39.00	100	1.0	5	52	90	1420	<0.01		
39.0	41.0	RHYOLITE LAVA	Mod sil & ser alt Blotchy appearance.	79132	39.00	40.00	100	1.0	4	125	370	1800	0.03		
				79133	40.00	41.00	100	1.0	8	56	60	130	0.03		
41.0	55.2	RHYOLITE LAVA - Flow banded F'spar phenos. Fabric at 50° to core.	Spotty alt, cb spots nucleate on f'spar phenos. Ser patches between sil lava.	79134	41.00	42.00	100	1.0	6	24	135	1960	0.01		
				79135	42.00	43.00	100	1.0	15	115	200	2750	<0.01		
				79136	43.00	44.00	100	1.0	11	125	180	1540	<0.01		
				79137	44.00	45.00	100	1.0	11	160	260	1360	<0.01		
				79138	45.00	46.00	100	1.0	18	370	550	1560	<0.01		
				79139	46.00	47.00	100	1.0	98	760	800	1040	0.01		
				79140	47.00	48.00	100	1.0	26	50	70	1900	<0.01		
				79141	48.00	49.00	100	1.0	12	38	52	2350	<0.01		
				79142	49.00	50.00	100	1.0	10	20	46	1860	<0.01		
				79143	50.00	51.00	100	1.0	8	24	45	2500	<0.01		
				79144	51.00	52.00	100	1.0	9	22	45	2400	<0.01		
				79145	52.00	53.00	100	1.0	9	28	42	2350	<0.01		
				79146	53.00	54.00	100	1.0	7	12	30	2150	<0.01		
				79147	54.00	55.00	100	1.0	7	18	26	2100	<0.01		

55,069

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
55.2	58.0	RHYOLITE LAVA - Very f.g. dk green. ?Chilled edge of lava. 57m - foliation 45°.	Int chl alt.	79148	55.00	56.00	100	1.0	9	46	58	2100	<0.01		
				79149	56.00	57.00	100	1.0	9	34	54	1150	<0.01		
				79150	57.00	58.00	100	1.0	14	84	100	1780	0.03		
58.0	62.4	EPICLASTICS. - Alt lava (rhy) clasts, with f.g. Sil sediment clasts. Clast size 2-80mm.	Wk ser & cb alt of clasts.	79151	58.00	59.00	100	1.0	12	22	36	1860	0.02		
				79152	59.00	60.00	100	1.0	9	6	20	2450	0.01		
				79153	60.00	61.00	100	1.0	10	6	24	3450	<0.01		
				79154	61.00	62.00	100	1.0	20	<4	32	3300	<0.01		
				79155	62.00	63.00	100	1.0	14	5	30	2750	0.02		
62.4	63.3	CHERTY SEDIMENTS - F.g. Soft sed deformation.	Wk sid alt.												
63.3	65.9	EPICLASTICS. Mostly porphyritic (f'spar) rhy clasts. Some f.g. sed clasts.	F'spar->cb. Wk chl alt.	79156	63.00	64.00	100	1.0	11	8	48	3150	<0.01		
				79157	64.00	65.00	100	1.0	13	4	35	3200	<0.01		
				79158	65.00	66.00	100	1.0	8	160	240	2900	<0.01		
65.9	66.3	CHERTY SEDIMENTS. Bedded f.g. Healed fractures at right angles to bedding. 66m cba 45°, s & f uphole (3)	Wk chl, mod cb alt.												
66.3	70.7	EPICLASTICS. Cherty sed & porphyritic, rhy lava clast in siliceous matrix	Mod. sil alt.	79159	66.00	67.00	100	1.0	11	4	25	3600	<0.01		
				79160	67.00	68.00	100	1.0	22	8	36	3350	<0.01		
				79161	68.00	69.00	100	1.0	8	18	40	3200	<0.01		
				79162	69.00	70.00	100	1.0	15	10	50	3300	<0.01		
70.7	72.3	EPICLASTICS - Tect. deformed. Clasts are v.f.g. chl seds & sil lava.	Cb & sil vn'g. Trace of sp. Looks like "sweating out". Vns are 3mm wide 750/m.	79163	70.00	71.00	100	1.0	9	44	76	3250	<0.01		
				79164	71.00	72.00	100	1.0	42	510	1120	4100	<0.01		
72.3	92.5	EPICLASTICS - Cherty sed & porphyritic, rhy lava clasts in sil matrix	Mod silic alt	79165	90.00	91.00	100	1.0	2	20	105	1440	<0.01		
				79166	91.00	92.00	100	1.0	6	6	42	1420	<0.01		
92.5	94.0	EPICLASTICS - Colour change. Matrix becomes dk grey. Downhole boundary @ 5°.	Chl through matrix & clasts. Patches of int ser alt. Minor cb vn'g.	79167	92.00	93.00	100	1.0	2	16	140	8000	<0.01		
				79168	93.00	94.00	100	1.0	2	12	185	1.22%	0.02		
94.0	100.7	EPICLASTICS - C.g. porphyritic rhy lava & cherty sed clasts, f.g. sil matrix. Grades to	Clasts sil alt & pk or mod ser alt.	79169	94.00	95.00	100	1.0	2	4	48	2250	<0.01		
100.7	103.3	EPICLASTICS - Finer gr'd better sorted. Of same clastic composition.													

55070

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
103.3	104.5	CHERTY SEDIMENT - Dk grey layered at 5°. Below brecciation downhole from layering. Uphole contact at 40°, Downhole at 45°.	Chl alt up to 10-20% py. Traces sp & gn.	79170	103.00	104.00	100	1.0	36	140	260	1150	0.18		
				79171	104.00	105.00	100	1.0	19	46	420	1460	0.04		
104.5	104.9	EPICLASTICS - Cherty sed & porphyritic rhy lava clasts in sil matrix.	Mod sil alt.												
104.9	106.1	EPICLASTICS - Dk grey Some sulphide clasts. Grades down hole to:	Mod chl & sil alt Trace py.	79172	105.00	106.00	100	1.0	5	52	250	2600	0.01		
106.1	107.1	EPICLASTICS - Cherty sed & porphyritic rhy lava clasts in sil matrix.	Mod sil alt.	79173	106.00	107.00	100	1.0	11	26	80	1480	<0.01		
107.1	107.8	CHERTY SEDIMENT BRECCIA & chl & py. Contacts uphole and downhole are at diff orientations.	Mod-Int chl alt. 1-3% py.	79174	107.00	108.00	100	1.0	28	210	380	870	0.02		
107.8	146.8	EPICLASTICS - Pk & green porphyritic (f'spar) rhy lava & cherty sed clasts	Clasts ser alt or pk sil alt. 126.2 - 128.0 int ser alt.	79175	108.00	109.00	100	1.0	8	60	135	1940	<0.01		
				79176	142.00	144.00	100	2.0	8	78	88	1900	<0.01		
				79177	144.00	146.00	100	2.0	7	8	52	1780	<0.01		
146.8	157.9	?RHYOLITE LAVA - flowband ?spherulites. Diffuse up and down hole boundaries.	Core broken. Trace sp & gn in tension gashes @ 146.8. Sil alt (pk areas) Wk ser & chl alt. Int chl alt @156.5 - 157.9	79178	146.00	148.00	100	2.0	32	470	800	1980	<0.01		
				79179	148.00	150.00	100	2.0	4	<4	50	2250	<0.01		
				79180	150.00	152.00	100	2.0	2	8	48	1640	<0.01		
				79181	152.00	154.00	100	2.0	3	66	70	1720	<0.01		
				79182	154.00	156.00	100	2.0	3	10	95	2300	<0.01		
				79183	156.00	158.00	100	2.0	6	52	135	2700	<0.01		
157.9	162.7	EPICLASTICS - Pk & green Porphyritic (f'spar) rhy lava & cherty sed clasts.	Int ser alt @ 161.3-161.4m 128.0 int ser alt.	79184	158.00	160.00	100	2.0	16	40	100	880	<0.01		
				79185	160.00	162.00	100	2.0	30	88	74	820	<0.01		
162.7	163	?RHYOLITE LAVA.sil f.g.	Wk sil & ser alt.	79186	162.00	164.00	100	2.0	630	22	62	960	<0.01		
163.0	163.2	EPICLASTICS - Pk & green porphyritic (f'spar) rhy lava & cherty sed clasts.													
163.2	168.9	?RHYOLITE LAVA - Faint flow texture @ 30° (168m) Bottom boundary @ 45°.	Wk sil, ser, chl alt Spots of phlogopite.	79187	164.00	166.00	100	2.0	66	10	68	860	<0.01		
				79188	166.00	168.00	100	2.0	88	15	92	1700	<0.01		
				79189	168.00	170.00	100	2.0	6	<4	82	1780	<0.01		
168.9	174.5	?RHYOLITE LAVA - increasingly f.g. 169m foliation 45°.	as above, minor cb, sil veining.	79190	170.00	172.00	100	2.0	5	4	66	1650	<0.01		
				79191	172.00	174.00	100	2.0	10	10	115	4900	<0.01		

55403

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
174.5	183.4	?RHYOLITE LAVA - v.f.g. siliceous.	Some bleached cb & chl patches. Int chl alt @ 180.2-180.4.	79192	174.00	176.00	100	2.0	10	12	72	1980	<0.01		
				79193	176.00	178.00	100	2.0	36	10	45	1700	<0.01		
				79194	178.00	180.00	100	2.0	30	4	35	1660	<0.01		
				79195	180.00	182.00	100	2.0	11	8	58	1560	<0.01		
				79196	182.00	184.00	100	2.0	3	4	42	1260	<0.01		
183.4	188.4	VOLCANICLASTIC SEDIMENTS Uphole boundary is sharp ?Fault - with qz-cb vn. cba 45°. Grades downhole to:	Wk chl alt. Int chl 186.3 - 186.5	79197	184.00	186.00	100	2.0	3	18	68	2900	<0.01		
				79198	186.00	188.00	100	2.0	<2	18	100	3300	<0.01		
188.4	192.6	?RHYOLITE LAVA - finely porphyritic, siliceous.	192.0-192.6 Int ser & chl alt.	79199	188.00	190.00	100	2.0	4	16	75	2150	<0.01		
				79200	190.00	192.00	100	2.0	22	82	250	2400	<0.01		
192.6	192.9	SHEAR ZONE at 45° to core	Int sericite alt.	79201	192.00	194.00	100	2.0	72	330	630	1960	<0.01		
192.9	197.6	?RHYOLITE LAVA - f.g. sil	Alt changes from sil to ser down hole.	79202	194.00	196.00	100	2.0	32	360	940	700	<0.01		
197.6	248.0	?RHYOLITE LAVA - v.f.g. sil. F'spar phenos. Cb infilling of ?vesicles. (?f'spar replacement) 224.2-234.5 numerous ex f'spar phenos visible. 240-247.5 crenulations in ser patches (30°). 244.9-245 ?ash beds 5 - 10mm wide. F.g. sil ash Fractures @ 90° to bdg. cba 40°. 210m foliation & clvg 50° 238m foliation 50°.	197.6-198.4 sil & cb vn'g. Vns to 20mm, 40/m. 198.4-203, white cb spots ?ex f'spar or vesicles. 203-213 increasing ser alt down hole. Chl-cb spots - like spotty ore (Hercules Mine.) 211.3-212.2 wk shear cb vns. 212.8-223.9 cb/chl spots patches int alt & pale grey patches. 223.9-224.2 - white sil alt with patches of ser. 224.2-225.5 - ser patches numerous f'spar->cb. 225.5-234.5 - pink sil patches & zones of dk green, chl alt 234.5-247.8 - mix of ser & sil zones. Some patches of f.g. py spots of chl Traces of sp & gn @246.8. Below 234.5 f'spars gone.	79203	202.00	204.00	90	2.0	3	105	100	3050	0.01		
				79204	204.00	206.00	100	2.0	4	12	26	2300	<0.01		
				79205	206.00	208.00	100	2.0	6	36	52	3450	<0.01		
				79206	208.00	210.00	100	2.0	14	22	54	4000	<0.01		
				79207	210.00	212.00	100	2.0	12	16	38	2050	<0.01		
				79208	212.00	214.00	100	2.0	19	120	85	2050	<0.01		
				79209	214.00	216.00	100	2.0	2	8	18	1580	<0.01		
				79210	216.00	218.00	100	2.0	4	10	28	1820	<0.01		
				79211	218.00	220.00	100	2.0	4	10	20	1920	<0.01		
				79212	220.00	222.00	100	2.0	28	12	34	1320	<0.01		
				79213	222.00	224.00	100	2.0	32	25	12	1340	<0.01		
				79214	224.00	226.00	100	2.0	5	28	60	2350	0.02		
				79215	226.00	228.00	100	2.0	<2	14	66	2650	0.01		
				79216	228.00	230.00	100	2.0	6	12	70	2650	<0.01		
				79217	230.00	232.00	100	2.0	6	10	58	2350	<0.01		
				79218	232.00	234.00	100	2.0	5	12	55	2250	<0.01		
				79219	234.00	236.00	100	2.0	4	16	58	3050	<0.01		
				79220	236.00	238.00	100	2.0	17	155	84	2100	0.11		
				79221	238.00	240.00	100	2.0	7	35	80	2000	<0.01		
				79222	240.00	242.00	100	2.0	4	24	28	1620	<0.01		
				79223	242.00	244.00	100	2.0	3	16	28	1940	<0.01		
				79224	244.00	246.00	100	2.0	18	20	42	2200	<0.01		
				79225	246.00	248.00	100	2.0	52	155	560	1440	<0.01		

53472

072

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
247.8	439.2	QUARTZ-FELDSPAR PORPHYRY F.g ground-mass. Numerous euhedral qz & f'spar (white) phenos. F'spar 1-5mm qz 2-8mm. Uphole contact @25° Foliation @ 35°.	247.8-248.0 int ser alt. F'spar->pink. Lava near contact is also pink. 348.0-304.5 - minor qz & cb vns (1/m) No sulphides. 304.5-305.3 - zone of foln. ser & ?k-f'spar alt. qz & f'spar phenos elongated along foln Broken grnd @305.3-329.5. 311.5 Chalcopyrite in qz vein. 329.5-345.7 - Int qz vns. vns 20-500mm. 75-90°. White and barren. some with narrow py-cb selvage 406.5-407.7 - int pk in f'spars. Brecciat of porphyry. 250mm qz vn with ?calcite replaced by qz - boil'g text - hexagonal crystals Traces of py.	79226	248.00	250.00	100	2.0	46	175	270	165	<0.01		
				79227	250.00	252.00	100	2.0	7	14	44	1080	<0.01		
				79228	310.00	312.00	100	2.0	3600	22	220	690	<0.01		
				79229	312.00	314.00	100	2.0	26	66	120	1360	<0.01		
				79230	328.00	330.00	100	2.0	88	72	50	1580	<0.01		
				79231	330.00	332.00	100	2.0	330	480	290	5600	<0.01		
				79232	332.00	334.00	100	2.0	40	52	74	1140	<0.01		
				79233	334.00	336.00	100	2.0	230	370	1620	3100	<0.01		
				79234	336.00	338.00	100	2.0	34	10	400	660	<0.01		
				79235	338.00	340.00	100	2.0	11	5	26	780	<0.01		
				79236	340.00	342.00	100	2.0	13	14	35	1180	<0.01		
				79237	342.00	344.00	100	2.0	34	38	260	1020	0.02		
				79238	344.00	346.00	100	2.0	15	44	94	1540	0.02		
439.2	440.2	SILICEOUS LAVA BRECCIA ?Xenolith in porphyry.	435-444.2 Broken ground. Brecciation with ser alt. qz vng (white) with trace diss py.												
440.2	459.7	QUARTZ FELDSPAR PORPHYRY		79239	458.00	460.00	100	2.0	82	20	105	1050	0.01		
459.7	462.3	SEDIMENTS - f.m.g. most clasts<2mm. Some larger lava clasts. Contact with porphyry @ 60°. Foliation @35°.	459.7-462.3 Int ser alt on porphyry contact.	79240	460.00	462.00	100	2.0	75	45	130	1050	0.01		
462.3	466.2	RHYOLITE BRECCIA - Pk clasts of sil f'spar-phyr flow-banded rhyolite. ser matrix. Some clasts also ser. Difficult to define clast/matrix boundaries. ?Hyaloclastite.	Ser & Fe cb alt	79241	462.00	464.00	100	2.0	13	14	105	1120	0.01		
				79242	464.00	466.00	100	2.0	9	10	94	750	0.01		

55403

073

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
466.2	472.0	QUARTZ FELDSPAR PORPHYRY contact @60°	Porphyry ser alt F'spar pink, top contact. Sil alt bottom contact.	79243	466.00	468.00	100	2.0	18	22	200	1040	<0.01		
				79244	468.00	470.00	95	2.0	24	22	250	810	0.01		
				79245	470.00	472.00	100	2.0	12	240	490	930	0.01		
472.0	472.5	CHERTY SEDIMENT - sil Contact with porphyry @70°.	Wk cb vng	79246	472.00	474.00	100	2.0	30	1980	7500	1520	0.03		
472.5	473.9	BLACK SHALE - bedded cba 10°-45°	cb stringers with sp 4/m.												
473.9	474.1	SILTSTONE, coarser black sediments.	as above												
474.1	475.8	BRECCIATED ?LAVA with f'spar phenos.	Sil & ser alt zones f.g. py in sil zones	79247	474.00	476.00	100	2.0	24	1150	3700	780	0.03		
475.8	477.9	FINE SEDIMENTS & TUFF Mixture of blk shale, siltstone, cherty seds & sericitized ?tuff. Shale grades to siltstone down hole.	Ser & ?phlogopite f.g. diss py. Traces sp in cb vnlts	79248	476.00	478.00	95	2.0	16	1240	5000	730	0.05		
477.9	480.0	CHERTY SEDIMENT - grey	qz vnlts with traces sp. broken ground	79249	478.00	480.00	85	2.0	13	550	4750	680	0.02		
480.0	485.0	SEDIMENTS - coarsening up hole. Lge shale clasts 480-482. Bedded, lge cb component in seds. 485m cba 25°	?cb alt, ?primary	79250	480.00	482.00	85	2.0	12	530	1380	730	0.01		
				79251	482.00	484.00	95	2.0	11	200	660	900	0.01		
485.0	488.0	BEDDED SEDIMENTS derived from ?felsic lava. Avge clast size 1-2mm. cba 25°	cb vnlets, ser alt of clasts. 486m sulphide clasts	79252	484.00	486.00	95	2.0	10	240	690	940	<0.01		
				79253	486.00	488.00	95	2.0	10	180	420	1160	<0.01		
488.0	491.5	RHYOLITE LAVA ?flowbanded cld be pyroclastic - flow band'g may be foliation. f'spar-phyric. ?reworked top, up hole?? Layering/cba 35°.	Mod-int ser alt minor chl.	79254	488.00	490.00	95	2.0	11	42	175	1360	<0.01		
				79255	490.00	492.00	95	2.0	10	82	1460	1080	<0.01		
491.5	493.3	SEDIMENT OR PYROCLASTIC F.g. pale green, rare shale clasts. f'spar phenocrysts. Uphole contact @75°, downhole @ 40°.	Mod ser & cb alt	79256	492.00	494.00	100	2.0	11	500	4300	690	<0.01		

553074

074

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
493.3	498.2	LAMINATED BLACK SHALE crenulated: cba angle varies, 60,10 & 25°	cb vnlets with sp	79257	494.00	496.00	100	2.0	55	2450	5100	1880	0.02		
				79258	496.00	498.00	100	2.0	28	640	4650	770	0.02		
498.2	501.6	?RHYOLITE LAVA BRECCIA F'spar-phyric. downhole contact @80°. Mixing of lava & underlining seds may occur here, indicates uphole facing.	Int ser alt. feldspar » carb	79259	498.00	500.00	100	2.0	17	470	7800	680	0.01		
				79260	500.00	502.00	100	2.0	55	660	2550	1140	0.01		
501.6	504.2	FINE SED OR PYROCLASTIC Small shale clasts. Rare bdg @ 25°.	Broken ground. Wk ser alt.	79261	502.00	504.00	95	2.0	40	490	1480	1160	<0.01		
504.2	510.6	BLACK SHALE with f.g., pale green interbeds ?lava into wet seds or interbedded pyroclastic. Core orient - 88° dip 020° st (mag) cba 45°.	Wk ser & ?phlogopite in pale green beds.	79262	504.00	506.00	95	2.0	18	410	3400	760	<0.01		
				79263	506.00	508.00	100	2.0	18	870	3400	600	0.01		
				79264	508.00	510.00	95	2.0	22	900	9600	790	0.01		
510.6	513.8	FELDSPAR-PHYRIC ?LAVA on bottom contact very fine grained.	Int ser alt f'spar -> cb	79265	510.00	512.00	95	2.0	16	610	6900	590	0.01		
				79266	512.00	514.00	95	2.0	8	300	5100	630	<0.01		
513.8	518.8	BLACK SHALE, small band of coarser seds @ 516.3 517m cba & foliation 45°.	qz & cb vnlts and traces sp.	79267	514.00	516.00	100	2.0	14	1150	3450	1040	<0.01		
				79268	516.00	518.00	100	2.0	19	540	9200	2150	0.01		
518.8	519.7	VERY FINE EPICLASTICS pale green, foliated, slightly cross cuts shale ?reworked glassy lava.	Int ser alt.	79269	518.00	520.00	100	2.0	26	590	2400	1250	0.01		
519.7	545.0	??RHYOLITE TUFF - starts off looking like a lava, but interbedded with minor shale. Foliation develops downhole. F'spar-phenos can be seen to about 526m, then sporadic. Some of these have foliation wrapped around them. Shale & sil sed clasts throughout, though sporadic.	f'spar -> cb. Ser alt also ?phlog'ite 543-545 Broken grnd, 543-545 Broken grnd, Int ser alt & clay.	79270	520.00	522.00	100	2.0	15	45	1650	760	<0.01		
				79271	522.00	524.00	100	2.0	13	35	400	1020	0.02		
				79272	524.00	526.00	100	2.0	14	18	80	1750	<0.01		
				79273	526.00	528.00	100	2.0	11	12	135	1500	<0.01		
				79274	528.00	530.00	100	2.0	10	18	90	1450	0.01		
				79275	530.00	532.00	100	2.0	11	62	3450	1460	<0.01		
				79276	532.00	534.00	100	2.0	9	18	125	1560	<0.01		
				79277	534.00	536.00	100	2.0	17	3000	9300	2450	<0.01		
				79278	536.00	538.00	100	2.0	9	1150	370	5500	<0.01		
				79279	538.00	540.00	100	2.0	18	56	170	2050	0.02		
				79280	540.00	542.00	95	2.0	48	50	160	1740	<0.01		
				79281	542.00	544.00	80	2.0	380	390	4300	3700	<0.01		
				79282	544.00	546.00	95	2.0	360	330	8300	6200	0.02		
545.0	547.3	SEDIMENTS - Shale, cherty & coarser seds, interbed.	carbonate stringers	79283	546.00	548.00	95	2.0	44	155	1380	2800	0.01		

55405

075

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
547.3	550.9	SHALE & ?ACID TUFF Interbedded, rounded ?spherulites or chalco-zoidites. 549 sole marks uphole? (3). cba 50°.		79284	548.00	550.00	95	2.0	120	160	1060	4800	0.03		
				79285	550.00	552.00	90	2.0	250	82	5800	2600	0.02		
550.9	611.0	ACID VOLCANIC - Uniform rock type. Probably equivalent to Gregorys Dacitic Tuffs. Rock is siliceous, frags visible (though could be alteration), clasts of seds also occur. No phenocrysts. Up hole contact at 50°.	550.9-554 - specs of chl, sil zones with traces py, sp & gn to 3%. 554-557.6 - zones of sil & ser alt. Chl specs. 557.6 - 572.5 ?phlogopite, ser & chl zones. 572.5 - 576.6 Could be rock type change. Int ser zones betwn nodular sil, alt trace - 3% f.g. diss py. 576.6 - 579.8 Broken ground. Int ser alt and zones of sil & chl. Irregular foliation 579.8 - 597.6 Foliated, ser & chl zones. ?phlogopite. 597.6 - 611.0 Sil alt 3-5% py, some zones int ser alt.	79286	552.00	554.00	90	2.0	1460	48	1.56%	2250	0.02		
				79287	554.00	556.00	90	2.0	410	40	300	1560	0.03		
				79288	556.00	558.00	90	2.0	640	44	210	2350	0.01		
				79289	558.00	560.00	100	2.0	40	18	76	1060	<0.01		
				79290	560.00	562.00	100	2.0	58	8	60	1060	<0.01		
				79291	562.00	564.00	100	2.0	17	8	60	1400	0.01		
				79292	564.00	566.00	100	2.0	14	8	44	2200	0.01		
				79293	566.00	568.00	100	2.0	11	24	22	550	0.03		
				79294	568.00	570.00	95	2.0	10	18	18	590	0.02		
				79295	570.00	572.00	95	2.0	10	<4	11	760	<0.01		
				79296	572.00	574.00	95	2.0	58	260	4450	400	0.02		
				79297	574.00	576.00	100	2.0	115	4750	1.03%	460	0.02		
				79298	576.00	578.00	100	2.0	1100	440	1700	2650	0.01		
				79299	578.00	580.00	100	2.0	32	25	115	2800	0.01		
				79300	580.00	582.00	100	2.0	16	10	58	2450	0.02		
				79301	582.00	584.00	100	2.0	16	15	62	2000	0.02		
				79302	584.00	586.00	100	2.0	15	22	14	300	0.02		
				79303	586.00	588.00	100	2.0	16	15	42	1000	0.01		
				79304	588.00	590.00	100	2.0	48	6	78	2450	<0.01		
				79305	590.00	592.00	100	2.0	50	5	32	1320	<0.01		
				79306	592.00	594.00	100	2.0	140	22	60	2550	<0.01		
				79307	594.00	596.00	100	2.0	730	6	94	2800	0.01		
				79308	596.00	598.00	100	2.0	350	12	44	1460	0.01		
				79309	598.00	600.00	100	2.0	2350	26	155	320	0.05		
				79310	600.00	602.00	100	2.0	1020	24	105	195	0.02		
				79311	602.00	604.00	100	2.0	1340	42	190	220	0.02		
				79312	604.00	606.00	100	2.0	950	30	110	220	0.03		
				79313	606.00	608.00	100	2.0	690	38	100	260	0.04		
				79314	608.00	610.00	100	2.0	860	16	105	460	0.05		
611.0	640.5	RHYOLITE LAVA, qz phenos, f'spar phenos, incr down hole. Rare at 611-630m. Clast of Gregorys Dacitic Tuff (as above) @621.1 - 621.4	Zones wk chl alt assoc with traces py 526.3-526.5 chl alt, cherty patch & diss py, minor cpy	79315	610.00	612.00	100	2.0	530	48	92	530	0.04		
				79316	612.00	614.00	100	2.0	250	18	46	2450	0.01		
				79317	620.00	622.00	100	2.0	310	32	50	1440	0.02		
				79318	626.00	628.00	100	2.0	100	48	54	1520	0.02		
				79319	628.00	630.00	100	2.0	30	22	74	1260	0.01		
				79320	638.00	640.00	100	2.0	100	18	44	1320	0.01		
640.5	646.5	?BRECCIA PIPE, andesite & chert clasts.	cb vns, sp & gn	79321	640.00	642.00	100	2.0	155	45	125	2350	0.03		
				79322	642.00	644.00	100	2.0	370	115	2600	1380	0.03		
				79323	644.00	646.00	100	2.0	32	78	125	1550	0.02		
646.5	658.5	RHYOLITE LAVA, qz & fspar phenocrysts. Partial brecciation.	552-552.5 Breccia, cherty clasts, chl, opaline sil. Traces py.	79324	646.00	648.00	100	2.0	17	34	70	970	0.02		
				79325	648.00	650.00	100	2.0	230	42	155	1240	<0.01		
				79326	650.00	652.00	100	2.0	220	110	195	1120	0.05		
				79327	652.00	654.00	100	2.0	710	80	210	1180	0.04		
				79328	654.00	656.00	100	2.0	350	220	46	1500	0.02		
EOH															

55407

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SUMMARY DRILL LOG

075

LOCALITY:- BURNS PEAK
LICENCE:- EL 44/88
DRILL HOLE:-BPD63
OBJECTIVE:-To test for mineralization beneath Thomas Tunnel & in core of *Thomas Syncline.*

RESULT:- Host Rock Horizon intersected (7.7-36.5m).

DRILLING DETAILS

Hole drilled by:- Diamond Drilling T
Commenced:-
Completed:-
Total Depth:- 426.3
Logged by:- A.Rosenhain
Annotated by:-

Hole size:- HQ 0-66.5
NQ 66.5-EOH
Hole condition:- PVC(32mm) to EOH
(Casing etc in hole)

COLLAR DETAILS

Local grid
4535 EAST
5000 NORTH

AMG Coordinates
377282.6 EAST
5384425.6 NORTH
394.1 R.L.

DOWN HOLE SURVEY DATA

Survey Method:- S.Shot camera

DEPTH	DIP	AZ
0.0	60°	090°
50.0	61°	094°
100.0	61°	095°
-	-	-
202.0	60°	098°
250.0	60°	098°
300.0	59°	100°
350.0	59°	100°

DEPTH	DIP	AZ
400.0	59°	100°

All bearings mag.
For AMG add 12.

METERAGE FROM	TO	ROCK DESCRIPTION	MINERALIZATION	SAMPLE NO.	FROM	TO	%REC	LNGTH	SIGNIFICANT ASSAYS Cu	Pb	Zn	Ag	Au	Mn	Fe
0.0	7.7	Andesite breccia.													
7.7	36.5	?HOST ROCK HORIZON.	7.7-13.5 weth'd												
7.7	28.0	Volcanic ash & clastic sediments.	13.5-15.9 Spots py.	79369 -373	27.0	31.0	90	4.0	180	2200	6.4%		0.20	1900	
28.0	28.6	Massive sulphides.	Massive sp & gn.												
28.6	36.5	Volcaniclastic sediments.	28.6-29.9 sp in cb vnlets.	79373 -376	31.0	34.0	95	3.0	19	250	550		0.11	1200	
36.5	41.3	Rhyolite lava.	29.9-36.5 py as clasts & blebs.	79377 -379	34.0	37.0	100	3.0	120	310	5400		0.02	1800	
41.3	70.5	Quartz-feldspar porphyry? Intrusive.	29.9-30.52 Mnr sp & gn.												
70.5	111.4	Rhyolite lava.													
111.4	113.4	Black shale.	Tr sp in cb vnlets												
113.4	117.2	Rhyolite breccia.													
117.2	188.7	Quartz feldspar porphyry ? Intrusive.													
				79395 -400	188.0	200.0	95	12.0	25	280	5300		0.04	2300	
188.7	210.5	Deformed Black shale, with Rhyolite clasts.	Blebs sp,py in sil zones & qz stringrs.												
				79401 -405	200.0	210.0	95	10.0	77	3000	1.34%		0.03	3300	
210.5	274.3	Rhyolite lava or tuff.	Tr. sp,gn,py. in sil zones & qz stringrs.												
				79406 -410	210.0	220.0	95	10.0	45	1000	1100		0.07	4900	
274.3	300.9	Carbonate altered, ?mass flow breccia.	cp in cb vng. Tr sp&gn in chl matrix.												
300.9	316.1	Rhyolite tuff.													

5384425 N
377282 E

316.1	334.1	ROSEBERY FAULT ZONE Brecciated rhyolite in Shaley Matrix.																	
334.1	E.O.H	DUNDAS GROUP....																	
334.1	348.4	Laminated black shale.																	
348.4	426.3	Conglomerate with sedimentary ser'd vole, Chert? pumice, & pyrite clasts. E.O.H. (End of Hole..)	Pyrite clasts.																

55078

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GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SAMPLING SUMMARY

LOCALITY:- BURNS PEAK DRILL HOLE NUMBER:- BPD63 EL 44/88

METERAGE FROM	TO	SAMPLE NUMBERS	SAMPLE METHOD	PURPOSE	LABORATORY	METHOD	ELEMENTS DETERMINED
0.0	11.0	79346-49	½CORE	ASSAY	COMLABS	AAS1	Au,Cu,Pb,Zn,Mn
11.0	16.0	79353-56	½CORE	ASSAY	COMLABS	FA1	Au
16.0	21.0	79358-61	½CORE	ASSAY	COMLABS		
21.0	28.0	79363-9	½CORE	ASSAY	COMLABS	AAS1	Cu,Pb,Zn,Mn
						FA1	Au
28.0	29.0	79370-1	½CORE	ASSAY	COMLABS	AAS1	Au,Cu,Pb,Zn,Mn
29.0	40.0	79372-79382	½CORE	ASSAY	COMLABS	FA1	Au
100.0	120.0	79383-92	½CORE	ASSAY	COMLABS		
184.0	220.0	79393-410	½CORE	ASSAY	COMLABS		
410.0	426.3	79411-8	½CORE	ASSAY	COMLABS		
6.7		82034	¼ CORE	PETROLOGY	DR. G. GREEN		
31.5		82035	¼ CORE	PETROLOGY	DR. G. GREEN		
35.7		82036	¼ CORE	PETROLOGY			
37.2		82037	¼ CORE	PETROLOGY			
42.7		82038A	¼ CORE	PETROLOGY			
43.3		82038B	¼ CORE	PETROLOGY			
55.9		82039	¼ CORE	PETROLOGY			
113.0		82040	¼ CORE	PETROLOGY			
147.7		82041	¼ CORE	PETROLOGY			
187.0		82042	¼ CORE	PETROLOGY			
188.2		82043	¼ CORE	PETROLOGY			
196.5		82044	¼ CORE	PETROLOGY			
197.4		82045	¼ CORE	PETROLOGY			
219.0		82046	¼ CORE	PETROLOGY			
236.2		82047	¼ CORE	PETROLOGY			
260.3		82048	¼ CORE	PETROLOGY			
313.0		82049	¼ CORE	PETROLOGY			

55079

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
0	7.7	?ANDESITE BRECCIA		79346	0.00	5.00	30	5.00	18	24	220	660	<0.01		
		Very weathered lava		79347	5.00	6.00	30	1.00	9	28	360	640	<0.01		
		fragments (dk green) in		79348	6.00	7.00	70	1.00	11	34	470	530	<0.01		
		a finer matrix.													
7.7	13.5	CLASTIC SEDIMENTS.		79349	7.00	11.00	50	4.00	8	80	540	230	0.01		
		Weathered clayey clasts		79353	11.00	12.00	80	1.00	3	16	125	58	0.01		
		in a fine ?ash matrix.		79354	12.00	13.00	80	1.00	4	25	260	680	<0.01		
13.5	15.9	?ASH - Very fine.	Spots py throughout	79355	13.00	14.00	80	1.00	12	120	310	200	0.02		
		Rare clasts of shale.	oriented along fol	79356	14.00	16.00	80	2.00	18	80	5600	1250	0.06		
		Foliation at 26°.													
15.9	28.0	?ASH - Pale green.		79358	16.00	17.00	80	1.00	3	4	145	1760	<0.01		
		Shale and white clayey		79359	17.00	18.00	70	1.00	6	16	145	430	0.02		
		clasts in a fine matrix.		79360	18.00	19.00	70	1.00	5	30	120	820	<0.01		
		Strong cleavage at 26°.		79361	19.00	21.00	70	2.00	6	4	105	240	0.02		
				79363	21.00	22.00	70	1.00	4	52	155	82	0.02		
				79364	22.00	23.00	70	1.00	4	68	450	910	0.02		
				79365	23.00	24.00	90	1.00	11	140	360	2150	0.05		
				79366	24.00	25.00	90	1.00	6	30	230	2250	0.02		
				79367	25.00	26.00	90	1.00	10	690	250	1680	0.02		
				79368	26.00	27.00	80	1.00	11	92	360	1240	0.05		
				79369	27.00	28.00	90	1.00	120	230	1.20%	880	0.04		
28.0	28.6	MASSIVE SULPHIDES.	mass sp & gn	79370	28.00	28.60	85	0.60	590	7300	35.2%	680	1.10		
28.6	29.9	FINE ASH - pale green	sp in cb vnlets.	79371	28.60	29.00	90	0.40	52	290	7500	1120	0.03		
			Carbonate alteration	79372	29.00	30.00	90	1.00	65	420	5900	1940	0.02		
29.9	36.5	VOLCANICLASTIC SEDIMENT	py throughout as	79373	30.00	31.00	90	1.00	145	3600	2.50%	4100	0.07		
		Deformed. Contains	as clasts & as blebs	79374	31.00	32.00	90	1.00	25	270	670	890	0.12		
		cherty, clastic and ashy	in ashy layers, also	79375	32.00	33.00	100	1.00	17	290	670	1400	0.07		
		layers. Clastic beds	assoc with cb vnlets	79376	33.00	34.00	100	1.00	14	185	310	1400	0.15		
		contain banded, cherty,	Sp & gn occur in	79377	34.00	35.00	100	1.00	20	300	1240	2200	0.03		
		shale, pyrite and ash	strongly chl/sil/cb	79378	35.00	36.00	100	1.00	200	300	4800	1820	0.01		
		clasts. Cherty layers	altered layers. Esp	79379	36.00	37.00	100	1.00	130	320	1.02%	1500	0.03		
		discontinuous and	29.9 - 30.2												
		possibly not bedded.	33.6-33.7												
		cba(core to bedding) 25°	Intense ser'n and												
		at 32.5m, clvge 15°.	vughs from wthr'd cb												
36.5	41.1	RHYOLITE LAVA -pink, fine	f'spar -> cb, cb	79380	37.00	38.00	100	1.00	9	18	300	1800	0.01		
		grained, siliceous.	stringers with trace	79381	38.00	39.00	100	1.00	4	74	330	1820	0.01		
		Ghost feldspar phenos.	sp & gn.	79382	39.00	40.00	100	1.00	<2	72	290	1400	<0.01		
41.1	41.3	ZONE OF BRECCIATION	Mod. Chl. alteration												
		Siliceous clasts - cherty													
		and int. chl. ?Andesite													
		clasts.													

55080

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
41.3	70.5	QUARTZ-FELDSPAR PORPHYRY Rock appears clastic in places, with rounded siliceous fragments. - possibly an alt. effect Quartz eyes are large (up to 8mm) some appear round and clear. 66.7m - Reduce to NQ	41.3 - 52.1 predom. dk green, chl. alt spread throughout. Cb. stringers. 52.1 - 60.9 Mostly pink ?Haematite and sil alt. Qz vnlts. Some patches of int. ser. alt. 60.9 - 70.5 as 41-52												
70.5	111.4	PORPHYRITIC RHYOLITE ?Lava poss. related to porphyry. Quartz eyes are rare & smaller than in porphyry.	70.5-73.3 as 52-60.9 73.3 -111.4 predom. dk green, chl. alt. thru grnd mass. F'spars -> cb, sometimes sil. Patches of white sil @ 78 - 79m 81 - 82m 85 - 86m 89 - 89.5m 94 - 96m Cb. stringers thr't.	79383 79384 79385 79386 79387 79388	100.00 102.00 104.00 106.00 108.00 110.00	102.00 104.00 106.00 108.00 110.00 112.00	100 100 100 100 100 98	2.00 2.00 2.00 2.00 2.00 2.00	<2 2 9 5 12 32	16 14 18 14 5 70	34 50 50 50 40 370	880 890 830 860 1020 1080	<0.01 <0.01 <0.01 <0.01 <0.01 0.01		
111.4	113.4	BLACK SHALE - numerous rhyolite fragments. Int. clvge at 30°	Traces sp assoc with cb vnlts & alt.	79389	112.00	114.00	98	2.00	25	145	1480	2300	0.01		
113.4	117.2	RHYOLITE BRECCIA. Clasts of siliceous pk rhyolite in a matrix of chl & ser.	Chl & ser matrix. Si alt in clasts.	79390 79391	114.00 116.00	116.00 118.00	98 98	2.00 2.00	17 12	22 20	94 64	1300 1160	0.01 <0.01		
117.2	188.7	QUARTZ-FELDSPAR, RHYOLITE PORPHYRY, numerous f'spar phenos. Large, clear quartz eyes.	117.2-139.8 predom chl alt esp matrix 139.8-149.5 ser alt of matrix. 149.5-153.5 as 117.2 153.5-188.7 pink to pale green, incr amt of ser. From 180.5 core is broken. Int -mod ser alt, qz vng	79392 79393 79394	118.00 184.00 186.00	120.00 186.00 188.00	98 95 95	2.00 2.00 2.00	24 15 19	10 165 105	88 28 150	700 2650 1840	<0.01 <0.01 0.05		
188.7	192.0	BLACK SHALE & RHYOLITE Rhyolite is brecciated.	sil & ser zones cb vng. Broken ground.	79395 79396	188.00 190.00	190.00 192.00	90 95	2.00 2.00	26 13	540 88	1850 240	1960 1920	0.05 0.05		

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
192.0	210.5	BLACK SHALE. Very deformd Qz & f'spar phenos from rhyolite are scattered thru the shale, i.e. - entirely surrounded by the shale. ?Eroded off rhyolite or rhyolite intruding wet seds or tuff? Bedding all over the place. Clvge 5'.	Masses of cb vnlts, blebs of sp,py,gn assoc with veins. Minor bedded py.	79397	192.00	194.00	95	2.00	30	320	1.05%	1900	0.05		
				79398	194.00	196.00	95	2.00	35	280	8800	2450	0.05		
				79399	196.00	198.00	95	2.00	26	185	5600	3050	<0.01		
				79400	198.00	200.00	95	2.00	22	250	4600	2350	0.02		
				79401	200.00	202.00	95	2.00	56	2150	1.44%	2500	0.05		
				79402	202.00	204.00	95	2.00	48	1300	1.21%	3050	0.05		
				79403	204.00	206.00	100	2.00	68	2450	1.21%	3200	0.03		
				79404	206.00	208.00	90	2.00	135	2350	1.51%	3400	0.01		
				79405	208.00	210.00	90	2.00	155	6700	1.31%	4300	0.03		
210.5	248.4	ALTERED ACID VOLCANIC Appears fragmental, but alt may have caused this. Rare quartz eyes.	210.5 - 219 qz stringers with assoc py, gn, sil & ser alt & ?phlogopite. 219 - 228.5 Sil & ser alt zones. Trace py in sil zones. 228.5 - 242.4 pale green/buff ?ser or sid alt. Qz vnlts with traces sulphide & soft blk mineral ?chalcocite?	79406	210.00	212.00	95	2.00	115	2100	3850	3750	0.06		
				79407	212.00	214.00	98	2.00	20	150	250	2750	0.04		
				79408	214.00	216.00	98	2.00	28	740	390	3650	0.08		
				79409	216.00	218.00	98	2.00	24	1350	185	8500	0.10		
				79410	218.00	220.00	98	2.00	38	760	660	5800	0.05		
248.4	274.3	ACID VOLCANIC - Int alt'd small, rare, shale clasts some with irreg edges ?Soft incorporation.	Sil alt, incr ser down hole, cb alt. Sid & sil vng, trace gn from 258m.												
274.3	300.9	BRECCIA - comprising rhyolite tuff & lava clasts, large volcanic qz eyes, sedimentary clasts. in a blk totally distortd chloritic shaley matrix.	Int cb alt & vng. cp assoc with vng Sp & gn in chl shale Int-mod ser of rhy clasts. Sed clasts are cb alt.												
300.9	316.1	?RHYOLITIC TUFF - green and pink sil fragments, also some cherty frags. Rare f'spar-phenos. ?ROSEBERY FAULT?	Int ser alt zones sil alt.												
316.1	334.1	SEDIMENTARY BRECCIA or Brecciated Sediment!!! Mostly rhyolite fragments (rare qz eye porphyry) in black, shaley matrix. Fragments sub-angular to rounded. Matrix supported Shale is soft & deformed cba near upper boundary 25' (goes against fault theory)	Ser & Int cb alt of rhyolite frags chl.												

554089

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GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
334.1	348.4	LAMINATED BLACK SHALE Core/bdg angles reflect crenulation folding to 344. From there on cba - consistent - 45°. Facings in Shale 346.5 Trunc bdg => fac'g down hole. 348 Flame struct => facing up hole. 348.2 Grading => fac'g down hole.	Cb vng, esp in folded zone.												
348.4	373.3	CONGLOMERATE interbedded with qz arenites. Clasts of cherty seds ser'd? volcanics. Lam shale, siltstone. Rare py clasts	Minor cb vng weak ser alt of some clasts. Cb alt of matrix.												
373.3	394.0	CONGLOMERATE - deformed 'feathery', small (up to 4mm) Ser pumice clasts in black, shaley matrix.	Cb & qz vng. Ser alt of clasts. 388.2 - 388.4 shear with cb, qz & clay filling 15° to core.												
394.0	426.3	CONGLOMERATE - Cherty, siltstone, bedded shale, rare ser ?volcanic clasts Rounded-subrounded 5-50mm From 412m, incr number of fine-grained, py clasts. Source unknown. ?Chester - but py looks too fine grained.	Wk cb alt of conglom Ser alt of some clasts. Py clasts.	79411	410.00	412.00	100	2.00	11	25	36	380	0.02		
				79412	412.00	414.00	100	2.00	13	28	84	350	0.02		
				79413	414.00	416.00	100	2.00	13	22	38	390	0.01		
				79414	416.00	418.00	100	2.00	12	35	82	380	0.04		
				79415	418.00	420.00	100	2.00	15	45	145	380	0.03		
				79416	420.00	422.00	100	2.00	11	32	80	320	0.03		
				79417	422.00	424.00	100	2.00	14	18	38	360	0.02		
				79418	424.00	426.00	100	2.00	12	22	45	430	0.02		
426.3		END OF HOLE													

55083

083

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SUMMARY DRILL LOG

LOCALITY:- BURNS PEAK
LICENCE:- EL 44/88
DRILL HOLE:-BPD64
OBJECTIVE:- To test sequence just east of Rosebery Fault for Southern Trenches style min.
RESULT:- Low grade disseminated min. intersected between Q.F.Porphyry and the Rosebery Fault.

DRILLING DETAILS
Hole drilled by:- D.Drilling (Tas)
Commenced:- 16/7/89
Completed:- 30/7/89
Total Depth:- 322m
Logged by:- Angela Rosenhain
Annotated by:-
Hole size:- HQ 4-69.5M, NQ - EOH
Hole condition:- 9m HW near top
(Casing etc in hole) PVC (32mm) to EOH

COLLAR DETAILS
Local grid
4785 EAST
4460 NORTH
AMG Coordinates
377395.8 EAST
5383823.6 NORTH
598.9 R.L.

DOWN HOLE SURVEY DATA
Survey Method:- S.Shot camera

DEPTH	AZ.	DIP	DEPTH	AZ.	DIP
0.0	84	273	250.0	80	272
37.00	85	273			
62.00	84	275			
80.00	83	274			
100.0	84	271			
150.0	82½	273			
200.0	81½	275			

All bearings mag.
For AMG add 12.

METERAGE FROM	TO	ROCK DESCRIPTION	MINERALIZATION	SAMPLE NO.	FROM	TO	%REC	LNGTH	Cu	SIGNIFICANT ASSAYS Pb	Zn	Mn	Au	Ag
0.0	40.1	Quartz Feldspar Porphyry												
40.1	101.2	Rhyolite Lava and Rhyolite Lava Breccia containing shale and siltstone clasts.												
101.2	104.0	Siltstone												
104.0	181.8	Rhyolitic Lavas & Tuffs		79467	106.00	108.00	90	2.00	82	4850	330	58	<0.01	
183.8	183.8	Quartz Eye Feldspar Porphyry												
183.8	192.0	Rhyolitic Tuff												
192.0	194.0	Quartz Eye Feldspar Porphyry												
194.0	195.3	Rhyolitic Tuff												
195.3	198.5	Quartz Eye Feldspar Porphyry												
198.5	199.4	Rhyolitic Tuff												
199.4	200.0	Quartz Eye Feldspar Porphyry												
200.0	201.2	Rhyolitic Tuff or Lava												
201.2	204.5	Quartz Eye Feldspar Porphyry												

554084

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SUMMARY DRILL LOG

METERAGE FROM	TO	ROCK DESCRIPTION	MINERALIZATION	SAMPLE NO.	FROM	TO	%REC	LNGTH	SIGNIFICANT ASSAYS Cu	Pb	Zn	Mn	Au	Ag
204.6	205.9	Rhyolitic Tuff or Lava Intense sericitic alteration & cherty silicification	Disseminated pyrite											
205.9	212.4	Quartz Eye Feldspar Porphyry												
212.4	213.7	Acid Lavas and Tuffs. Moderate-Intense sericitic alteration	Sphalerite & galena stringers	79494	224.00	226.00	100	2.00	90	1.34%	3550	5500	0.04	
229.2	230.0	Cherty brecciated Sediment or Tuff. ?Host Rock "Chert"	sp & gn in veins and cherty fragments	79419	229.20	230.30	90	1.10	330	1.02%	1.33%	1750	0.06	
230.0	283.7	Acid Tuff	Zones of vein brecciation with qz, cb, & ?k fspar & tr sp & gn	79503	240.00	242.00	100	2.00	670	2700	1.15%	870	<0.01	
283.7	289.7	Brecciated Rhyolitic Tuff												
289.7	297.3	Tectonic Breccia. Andesite, Q.F.Porphyry, and Rhyolite fragments.												
297.3	304.0	ROSEBERY FAULT ZONE. Acid volcanic and siliceous clasts in black, shaley, clayey matrix												
304.0	322.0	DUNDAS GROUP Black shale, siltstone & sandstone												
		END OF HOLE												

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** SAMPLING SUMMARY

LOCALITY:- BURNS PEAK DRILL HOLE NUMBER:- BPD64 EL 44/88

METERAGE FROM	TO	SAMPLE NUMBERS	SAMPLE METHOD	PURPOSE	LABORATORY	METHOD	ELEMENTS DETERMINED
229.2	230.3	79419	½CORE	ASSAY	ANALABS	AAS101	Cu,Pb,Zn,Mn
						FA309	Au
40.1	70.1	79420-49	½CORE	ASSAY	COMLABS	ASS1	Cu,Pb,Zn,Mn
70.1	100.0	79450-64	½CORE	ASSAY	COMLABS	FA1	Au
100.0	101.0	79465	½CORE	ASSAY	COMLABS		
104.0	116.0	79466-71	½CORE	ASSAY	COMLABS		
172.0	206.0	79472-88	½CORE	ASSAY	COMLABS		
214.0	228.0	79489-95	½CORE	ASSAY	COMLABS		
228.0	229.2	79496	½CORE	ASSAY	COMLABS		
230.3	232.0	79497	½CORE	ASSAY	COMLABS		
232.0	238.0	79498-500	½CORE	ASSAY	COMLABS		
238.0	239.0	79501	½CORE	ASSAY	COMLABS		
239.0	240.0	79502	½CORE	ASSAY	COMLABS		
240.0	306.0	79503-35	½CORE	ASSAY	COMLABS		
72.5		82057	¼ CORE	PETROLOGY	DR. G. GREEN		
96.0		82058	¼ CORE	PETROLOGY			
148.1		82059	¼ CORE	PETROLOGY			
163.2		82060	¼ CORE	PETROLOGY			
183.5		82061	¼ CORE	PETROLOGY			
194.8		82062	¼ CORE	PETROLOGY			
208.8		82063	¼ CORE	PETROLOGY			
221.1		82064	¼ CORE	PETROLOGY			
229.6		82065	¼ CORE	PETROLOGY			
235.7		82066	¼ CORE	PETROLOGY			
247.7		82067	¼ CORE	PETROLOGY			
261.7		82068	¼ CORE	PETROLOGY			
289.6		82069	¼ CORE	PETROLOGY			

55086

080

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
0.0	1.0	Non core drilling													
1.0	40.1	QUARTZ-FELDSPAR PORPHYRY	1-31.0 Strongly weathered FeO & Clay. Very broken, poor recovery. 31.0-40.1 Minor chl on fracture surfaces. Minor dissem py. Mod weathering. Broken ground												
40.1	40.3	?FAULT @ 80° to core. Puggy Clay.	Clay												
40.3	44.4	?RHYOLITE LAVA BRECCIA Breccia comprising pink siliceous & some feldspar phyric clasts in sericitic matrix. Clasts 50-150mm	Sil & pink-alt clast Ser of matrix	79420	40.10	41.10	98	1.00	160	400	65	300	0.01		
				79421	41.10	42.10	98	1.00	110	610	40	96	0.03		
				79422	42.10	43.10	98	1.00	155	560	48	84	0.03		
				79423	43.10	44.10	95	1.00	62	640	45	88	0.01		
44.4	44.6	EPICLASTIC SEDIMENT Small, siliceous, pink rounded ?Rhyolite clasts with cherty, pyrite-bearing clasts in a fine matrix. Clasts 2-5mm.	Py in some clasts. Pink & sil alt of other clasts. Ser alt of matrix.	79424	44.10	45.10	95	1.00	78	590	48	70	0.02		
44.6	45.7	?RHYOLITE LAVA BRECCIA as 40.3-44.4. Flow banding @ 45.5.	Sil & pink alt clasts. Ser alt of matrix.	79425	45.10	46.10	95	1.00	24	800	80	170	0.01		
45.7	46.7	ACID TUFF Chloritic ?clasts with py and small, flattened ser patches in a fine fspar-phyric matrix.	Chl/py in some clasts - could be just alt zones. Ser &cb alt (esp fspar phenos)												
46.7	53.6	RHYOLITE LAVA Slightly brecciated, pink & green fspar-phyric. Flow banding @ 52.6 @ 70° to core.	Zones of sil alt, separated by ser & v.minor chl zones.	79426	46.10	47.10	95	1.00	38	1980	76	165	0.01		
				79427	47.10	48.10	95	1.00	72	990	54	175	0.01		
				79428	48.10	49.10	98	1.00	48	530	52	145	<0.01		
				79429	49.10	50.10	98	1.00	44	320	35	155	0.02		
				79430	50.10	51.10	98	1.00	6	240	58	155	0.01		
				79431	51.10	52.10	98	1.00	3	210	66	150	0.01		
				79432	52.10	53.10	97	1.00	<2	135	240	6700	<0.01		

55080

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
53.6	60.0	RHYOLITE LAVA WITH GREY SHALE BLOCKS. The shale blocks are brecciated on some sides, other boundaries are blurry ?soft incorporation.	Strong ser alt of lava. Minor cb alt.	79433	53.10	54.10	97	1.00	28	320	510	2050	0.02		
				79434	54.10	55.10	96	1.00	18	380	125	115	0.01		
				79435	55.10	56.10	95	1.00	90	270	42	90	0.01		
				79436	56.10	57.10	97	1.00	32	730	76	105	0.01		
				79437	57.10	58.10	100	1.00	<2	3450	46	170	0.01		
				79438	58.10	59.10	100	1.00	10	880	195	92	0.02		
				79439	59.10	60.10	100	1.00	35	550	330	92	0.01		
60.0	64.6	RHYOLITE LAVA - distinctly flow banded. Fspar-phyric. Flow banding at varying angles to core. Shale clast with brecciated edges at 63.0.	Fspar=>cb flow banding represented by alternating sil and ser bands.	79440	60.10	61.10	100	1.00	40	250	45	84	0.01		
				79441	61.10	62.10	100	1.00	16	195	40	76	0.01		
				79442	62.10	63.10	98	1.00	34	980	92	240	0.01		
				79443	63.10	64.10	98	1.00	<2	400	105	86	0.02		
64.6	68.4	Gradual transition (Over 100mm) to more homogenous pink, fspar-phyric RHYOLITE LAVA OR TUFF. Some sericitic & siliceous frags. Rare, cherty/shale frags (small one @ 67.7m)	Pink alt throughout. Fspar=>cb. vfg, wispy ser in ground mass & some frags.	79444	64.10	65.10	98	1.00	<2	1420	135	1420	0.02		
				79445	65.10	66.10	100	1.00	280	3450	76	1450	0.01		
				79446	66.10	67.10	100	1.00	125	340	56	98	0.02		
				79447	67.10	68.10	100	1.00	165	1120	100	1340	<0.01		
68.4	83.0	ACID VOLCANIC Fspar-phyric rock with small (1-3mm) zones, flattened sericite 45° to core, but some are irregular.	Cb-alt of fspars. Streaky ser patches.	79448	68.10	69.10	100	1.00	90	420	250	2000	<0.01		
				79449	69.10	70.10	100	1.00	28	140	240	2600	<0.01		
				79450	70.10	72.10	100	2.00	175	70	110	1380	<0.01		
				79451	72.10	74.10	99	2.00	56	12	175	4850	0.03		
				79452	74.10	76.10	99	2.00	72	10	175	5600	<0.01		
				79453	76.10	78.10	100	2.00	15	14	135	2500	<0.01		
				79454	78.10	80.10	97	2.00	12	68	150	1150	0.01		
				79455	80.10	82.10	99	2.00	260	480	78	76	<0.01		
83.0	90.1	ACID VOLCANIC as above, gradual decline in sericite patches down hole. Lineation at 0° to core, formed by weathering out of a soft ?clay or cb mineral.	Mod cb and ser alt	79456	82.10	84.10	100	2.00	180	410	95	74	0.02		
				79457	84.10	86.10	98	2.00	56	280	30	58	<0.01		
				79458	86.10	88.10	98	2.00	7	420	34	65	<0.01		
				79459	88.10	90.10	97	2.00	5	290	28	45	<0.01		
90.1	94.5	BRECCIATED RHYOLITE LAVA Buff coloured matrix with pink siliceous bands & patches. The bands from their resemblance to those at 60.0m, are probably flow banding. The rock contains siltstone clast throughout.	Cb & ser alt of matrix. Sil alt in some zones.	79460	90.10	92.00	95	1.90	110	560	74	68	<0.01		
				79461	92.00	94.00	95	2.00	120	155	30	72	0.01		

57 0088

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
94.5	99.3	RHYOLITE LAVA Pink & green rock. Strongly sericitized zones between pink, siliceous zones. Strong, probably flow bandiong @ 97.8 & 99.0.		79462	94.00	96.00	98	2.00	40	340	74	62	0.01		
				79463	96.00	98.00	98	2.00	16	350	38	86	0.01		
				79464	98.00	100.00	96	2.00	16	400	75	66	0.02		
99.3	100.6	SILTSTONE, uniformly grey	Cb vn'g on up-hole contact.	79465	100.00	101.00	95	1.00	10	300	150	155	0.01		
100.6	101.2	RHYOLITE LAVA OR TUFF Up & down hole contacts are at different angles so this may be a block. Up hole contact @25° & down hole @ 65°.													
101.2	104.0	SILTSTONE Finely laminated silt-stone. Laminations @20° to core. Very broken ground. Too broken for facings.	Wk cb veining.												
104.0	109.4	?RHYOLITE TUFF Siliceous, cherty patches in strongly sericitic. ?pumiceous rock. 15cm block of dk grey. cherty pyritic shale @109.4m	py in chert which is possibly sil alt. Strong ser alt of matrix. mg galena on fracture surfaces	79466	104.00	106.00	94	2.00	17	195	60	50	0.01		
				79467	106.00	108.00	90	2.00	82	4850	330	58	<0.01		
				79468	108.00	110.00	95	2.00	13	100	110	620	0.02		
109.4	167.3	?RHYOLITE LAVA Pink, siliceous, fspar phyric, homogeneous. 109.4-122.8 Brecciated 132.5-135.0 Brecciated 137.0-156.0 vfg. Similar to f.g. rhyolite at 150m in BPD62.	Pink, sil alt with chl patches through-out rock & along fractures. Fspar=>cb. Silica & cb stringers through out (3/m). 127.4-128.4 light green sericite streaks through rock -broken ground. 133.7-134.5 as above (though colour is lighter & slightly pink). 161.8-163.0 Broken ground. Ser & cb alt Lge, round blebs of cb.	79469	110.00	112.00	95	2.00	3	45	200	1260	<0.01		
				79470	112.00	114.00	98	2.00	22	140	200	1040	0.01		
				79471	114.00	116.00	99	2.00	7	35	195	1220	0.02		

089

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
109.4	167.3	(cont...)	163.0-164.0 Rounded merging blebs of cb alt.												
167.3	171.8	ACID VOLCANIC Brecciated, pink fspar-phyric. Some of the pink lavn-like patches are rounded. Rounded cherty clasts also present. Matrix of fine, lt green ser. Down hole contact @15° to core.	Sil, pink alt of clasts. Ser alt of matrix. Some patches of med. grained py, could be clasts, but their blurred edges suggest they are secondary.	79472	172.00	174.00	100	2.00	78	92	175	1250	0.01		
				79473	174.00	176.00	100	2.00	34	1020	390	1280	0.01		
				79474	176.00	178.00	100	2.00	20	120	280	410	0.05		
171.8	178.0	RHYOLITE TUFF This could just be an alt boundary. The rock no longer contains fspar phenocrysts. Siliceous rock with patches of sericite, may be pumice. This rock resembles the rock @600m in BPD62. 174.2-174.5 Back to pink Rhyolite Breccia. Sharp up & down-hole boundaries	Sil patches & dissem med-fine grained py throughout. Small zones of ser (mostly 2-5mm)												
178.0	181.8	A mixture of RHYOLITE TUFF (as above) & pink fspar-phyric, RHYOLITE LAVA. Could be alteration boundaries.	Pink & sil alt of lava. Ser, py in Tuff. 179.8-180.9 Ser patches & zones of cb alt Broken ground	79475	178.00	180.00	100	2.00	10	22	68	1700	<0.01		
				79476	180.00	182.00	100	2.00	8	20	62	2800	<0.01		
181.8	183.8	QUARTZ EYE - FELDSPAR PORPHYRY. Pink Clear-cut up & down hole boundaries. Up hole may be faulted.	Pink, wk ser & med chl & cb alt on down hole boundary	79477	182.00	184.00	100	2.00	6	75	70	1350	<0.01		
183.8	192.0	RHYOLITIC TUFF 191.5-191.6 Altered Quartz Fspar Porphyry	Sil & ser alt & dissem py.	79478	184.00	186.00	100	2.00	11	230	54	210	<0.01		
				79479	186.00	188.00	100	2.00	8	310	55	290	<0.01		
				79480	188.00	190.00	100	2.00	9	320	55	220	<0.01		
				79481	190.00	192.00	100	2.00	10	170	85	320	<0.01		
192.0	194.0	QUARTZ EYE FELDSPAR PORPHYRY	Weak ser. alt.	79482	192.00	194.00	100	2.00	13	70	160	1380	<0.01		

55090

090

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
194.0	195.3	?RHYOLITIC TUFF Feldspar phyric, ?pumiceous Increase in feldspar phenocrysts down hole Most textures obliterated from rock by alteration	Int ser alt, with sil & cb patches. Qz & qz/cb veins with minor sp & gn mineralization.	79483	194.00	196.00	100	2.00	2	6	3	<4	<0.01		
195.3	198.5	QUARTZ FELDSPAR PORPHYRY up hole contact gradational. Down hole contact sharp on a quartz vein ?Fault.	Wk ser pink alt on down hole contact. Sp & gn in quartz vein.	79484	196.00	198.00	100	2.00	7	180	560	1400	<0.01		
198.5	199.4	?RHYOLITIC TUFF	Sil=>Int sil down hole, with ser. Qz/cb stringers through out.	79485	198.00	200.00	100	2.00	8	88	410	1220	<0.01		
199.4	200.0	QUARTZ FELDSPAR PORPHRY	Clear qz/cb vn'g 4/m Mostly @ 80° to core Up hole contact has intense qz vn'g & int ser alt.	79486	200.00	202.00	100	2.00	8	22	88	960	0.01		
200.0	201.2	? RHYOLITIC TUFF Foliation or banding @30° to core.	Ser=> Int ser down hole. Int ser on both contacts.												
201.2	203.5	QUARTZ FELDSPAR PORPHYRY Both contacts sharp.	light pink alt Wk ser alt	79487	202.00	204.00	100	2.00	3	18	64	1220	<0.01		
203.5	203.7	Looks like RHYOLITIC TUFF with fragments of QUARTZ FELDSPAR PORPHRY gradational to													
203.7	204.6	QUARTZ FELDSPAR PORPHYRY	light pink, wk ser	79488	204.00	206.00	100	2.00	5	30	40	1840	<0.01		
204.6	205.9	RHYOLITIC TUFF OR LAVA bedding or banding @ 40° to core. Porphyry frags and large quartz eyes @ 204.7 AND 205.8-205.9 ?contact effect.	Int ser alt, wk diss py. Also cherty sil @ 204.9												
205.9	212.4	QUARTZ FELDSPAR PORPHYRY Last 400m brecciated.	Wk ser alt												
212.4	213.7	Mixture of QUARTZ FELDSPAR PORPHYRY and ACID LAVA & TUFF	pink & sil zones. stringers of chl & cb &qz with traces sp.												

53403

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
213.7	217.2	Pink & green ACID ?TUFF Patches of sericite possibly pumice. @216.7 50mm, bleached breccia zone. Foliation @20° to core.	Pink &sil zones & ser zones. Stringers of cb. surface.	79489	214.00	216.00	100	2.00	12	480	940	1600	<0.01		
				79490	216.00	218.00	100	2.00	32	440	150	2900	<0.01		
217.2	220.0	Green foliated ACID ?TUFF with siliceous zones & sericitic frags ?pumice. Could also be a deformed version of the RHYOLITE LAVAS up the hole. Foliation @25° to core.	Int ser alt.	79491	218.00	220.00	100	2.00	9	420	260	3200	<0.01		
220.0	224.5	ACID ?TUFF Sudden appearance of abundant feldspar phenocrysts. Otherwise, rock type the same as above. Foliation @ 25° to core	Int ser fspar->cb Minor gn on fracture surfaces from 223.7m	79492	220.00	222.00	100	2.00	10	630	110	4650	0.02		
				79493	222.00	224.00	100	2.00	7	650	250	5500	0.03		
224.5	229.2	?ALTERED ACID TUFF Alteration masks rock type. Very fine grained green-cream colour. Foliation visible in places. (228.2-229.0) ?clast @ 225.0	Brecciated criss-crossed by sp & gn vn'g & minor cb stringers. Ser/cb 224.5-224.9m sil/ser 224.9-226.6 sil/int ser 226.6-229.2m.	79494	224.00	226.00	100	2.00	90	1.34%	3550	5500	0.04		
				79495	226.00	228.00	100	2.00	18	2300	1020	1080	<0.01		
				79496	228.00	229.20	100	1.20	3	80	36	1220	0.08		
229.2	230.0	BRECCIATED SEDIMENT OR TUFF - ?HOST ROCK Grey, chert-like frags in chloritic matrix. Up hole boundary is a cb/sil vein breccia at 60° to core. Down hole boundary the same, @ 45°.	Wk ser alt. chl alt. sil/cb veins, carrying sp & gn in cherty frags.	79419	229.20	230.30	90	1.10	330	1.02%	1.33%	1750	0.06		
230.0	232.1	ACID TUFF Fine grained slightly siliceous matrix with sericitic zones. Sharp down hole boundary @85° to core. Foliation @ 30°	Ser patches and sil pink matrix. Dissem gn & sp from 230.4-230.8m	79497	230.30	232.00	100	1.70	25	180	1460	540	0.02		

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
232.1	283.7	ACID PUMICEOUS TUFF	ser zones & f.g. ser	79498	232.00	234.00	100	2.00	18	1260	1320	1420	0.02		
		Apparently coarser	thru matrix. Cb	79499	234.00	236.00	100	2.00	95	780	2100	1240	0.02		
		grained lithology. This	stringers throughout	79500	236.00	238.00	100	2.00	40	430	890	1580	<0.01		
		appearance is due to	238.5-239.2 vn	79501	238.00	239.00	100	1.00	30	200	1820	4650	<0.01		
		siliceous zones that have	breccia, single	79502	239.00	240.00	100	1.00	82	110	1350	1960	<0.01		
		a clast-like appearance.	phase angular frags	79503	240.00	242.00	100	2.00	670	2700	1.15%	870	<0.01		
		There are also sericite	of country within	79504	242.00	244.00	100	2.00	55	70	720	1280	<0.01		
		zones which are flattened	qz/cb ?k-fspar	79505	244.00	246.00	100	2.00	18	30	900	2050	<0.01		
		?Pumice matrix is fine	filling	79506	246.00	248.00	100	2.00	30	120	1250	1920	<0.01		
		grained, slightly	248-249.3 cb vns	79507	248.00	250.00	100	2.00	12	15	135	2000	<0.01		
		siliceous.	3/M, 50° to core	79508	250.00	252.00	100	2.00	35	200	1120	1320	<0.01		
			254 & 255m,cb	79509	252.00	254.00	100	2.00	62	290	180	1700	<0.01		
			stringers @ 45°	79510	254.00	256.00	100	2.00	32	210	94	1400	<0.01		
			259.0-260.5 cb vn'g	79511	256.00	258.00	100	2.00	110	230	670	1100	<0.01		
			& angular, jig-saw	79512	258.00	260.00	100	2.00	3	14	36	2850	<0.01		
			brecciation of	79513	260.00	262.00	100	2.00	10	900	430	2850	<0.01		
			country rock.	79514	262.00	264.00	100	2.00	13	145	85	1800	<0.01		
			263.0-263.9m	79515	264.00	266.00	100	2.00	5	380	410	1420	<0.01		
			cb stringer 3/m	79516	266.00	268.00	100	2.00	32	68	1220	1640	<0.01		
			233.6-235.9m	79517	268.00	270.00	100	2.00	22	55	840	1060	<0.01		
			Int chl & py alt	79518	270.00	272.00	100	2.00	145	165	340	1000	<0.01		
			Minor, dissem sp &	79519	272.00	274.00	98	2.00	110	1100	670	880	<0.01		
			gn. Assoc with qz	79520	274.00	276.00	99	2.00	24	28	36	660	<0.01		
			vn'g. Qz stringers	79521	276.00	278.00	100	2.00	46	26	40	1020	<0.01		
			@ 40° to core, carry	79522	278.00	280.00	100	2.00	24	16	45	1000	<0.01		
			gn & sp.	79523	280.00	282.00	100	2.00	5	18	42	1420	0.01		
			240.8-241.0m	79524	282.00	284.00	100	2.00	14	75	250	1460	<0.01		
			2 X *gn, sp vns* @45°												
			to core.												
			239.9-241.9m												
			dissem gn & sp assoc												
			with qz veining												
			241.9-259.1m												
			very minor gn &sp												
			assoc with qz & cb												
			stringers. (1/m)												
			traces of dissem py												
			in patches where ser												
			alt is strong.												
			259.1-260.6m vein												
			type brecciation												
			qz, cb (?Ferrean												
			dolomite) & k-fspar												
			matrix. Jig-saw												
			fracturing of												
			country rock. Single												
			phase brecciation												
			260.6-238.7m												
			ser, pink & sil alt												
			of clasts. Minor sp												
			&gn assoc with												
			stringers of qz												

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GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
232.1	283.7	(cont..) Grades into	274.5 assoc with chl &py alt. Chl fills fractures.												
283.7	289.7	Mixture of coarser grained ?clastic rock & finer grained rock, with fewer or no siliceous patches ?clasts. ? BRECCIATED RHYOLITIC TUFF		79525	284.00	286.00	100	2.00	3	20	25	550	<0.01		
				79526	286.00	288.00	99	2.00	9	24	32	1750	<0.01		
				79527	288.00	290.00	98	2.00	6	20	48	3000	<0.01		
289.7	297.3	ROSEBERY FAULT ZONE sharp irregular boundary at 80° to core. BRECCIA ? Tectonic is composed of Quartz Eye Porphyry clasts, ?Andesite clasts (dark colour, fine ?flow banded matrix) and siliceous, rhyolite lava clasts in very fine matrix.	Chl & ?phlogopite (buff col, wispy) alt of matrix. Silification of some clasts. Minor cb vng	79528	290.00	292.00	100	2.00	3	26	52	3400	<0.01		
				79529	292.00	294.00	100	2.00	8	54	1140	2450	<0.01		
				79530	294.00	296.00	100	2.00	6	100	115	3200	<0.01		
				79531	296.00	298.00	100	2.00	8	450	490	2850	<0.01		
297.3	297.5	ROSEBERY FAULT ZONE Acid lava or tuff frags sub-rounded, in a fine grey, muddy matrix.	Clasts are ser & cb altered.	79532	298.00	300.00	100	2.00	30	800	1580	1500	<0.01		
				79533	300.00	302.00	100	2.00	35	260	630	900	<0.01		
297.5	297.7	ROSEBERY FAULT ZONE Dark grey-black clay-pug zone. Shearing @ 60° to core.	Clay alt.												
297.7	304.0	ROSEBERY FAULT ZONE Siliceous, rhyolite, tuff or lava clasts in black ,shaley matrix. Strong shearing some distorted ,relict bedding Shearing @ 50° to core @ 298.5m & 25° @303.5.	Cb stringers throughout. Fine grained dissem py in some shaley sections.	79534	302.00	304.00	100	2.00	30	180	620	910	<0.01		
304.0	311.1	INTERBEDDED SHALE SANDSTONE AND SILTSTONE Deformed bedding all over the place. DUNDAS GROUP	Cb stringers & cb filled tension gashes.	79535	304.00	306.00	100	2.00	38	78	260	830	<0.01		

55+094

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

FROM	TO	ROCK DESCRIPTION	MINERALIZATION	NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Mn	Au	Ag	S.G.
311.1	322.0	BEDDED BLACK SHALE CBA: 25° @ 314.2m & 35° @ 321.8m DUNDAS GROUP E.O.H													

CONFIDENTIAL

095

551096 Sampling Summary is contained in TCR

GEOPEKO ROSEBERY PRELIMINARY DRILL LOG $ 90-3203

LOCALITY:- BURNS PEAK DRILL HOLE NUMBER: BPD65

METERAGE FROM	TO	ROCK DESCRIPTION	MINERALIZATION
0.0	4.0	TRICONE	
4.0	20.0	QUARTZ FELDSPAR PORPHYRY	4.0-4.2 Fspar pink 4.0-20.0 Weathered, pale coloured, FeO on fracture surfaces
20.0	62.2	QUARTZ FELDSPAR PORPHYRY Reduce to NQ @ 46.5	20.0-45.0 Grey matrix minor FeO on fracture surfaces 45.0-50.7 Matrix bleached, pale buff colour. 50.7-50.8 Int chl alt of matrix 50.8-51.6 Bleached pale matrix. 51.6-62.2 Grey matrix, relatively unaltered.
62.2	120.9	?Autobrecciated QUARTZ FELDSPAR PORPHYRY. ?Flow banding/texture @ 65.5m 5-10% to core	62.2-120.9 Mottled brecciated appearance due to patches of int chl alt between zones of sil pink alt.
120.9	135.0	BRECCIA consisting of rounded to sub angular, very fine grained, grey, sediment clasts, fine grained, pink ?lava clasts and some brecciated quartz-feldspar porphyry. Matrix is fine, green, wispy and bends around clasts in places i.e. 130.9m.	120.9-130.5 Int ser alt. of the matrix and some clasts. Rare chl zones. Other clasts sil, some pink. 130.5-133.3 Int chl alt. Also qz/cb/pink vng (avg 1cm thick,2/m) 132.8-133.0 Broken ground. 133.0-135.0 Int ser alt. Minor puggy clay (grey) patches. Broken grnd
135.0	198.1	QUARTZ FELDSPAR PORPHYRY	135.0-142.5 Grey rel unalt porph. 142.5-156.9 Pink/grn col, mostly from

			ser or pink alt of fspars. Matrix buff col in places. 156.9-169.6 Predom pink col, fspars & matrix pink. Qz/chl vns, avg 1 cm, 2/m 70-80° to core. 4cm qz vns @ 159.9 & minor cb. 168.6-168.9 zone qz/lime grn ser alt. 169.6-198.0 Grey rel unalt porph 172.5 zone qz/chl vns, avg 1cm 65° to core. 198.0-198.1 Pink alt of fspars on porph contact.
198.1	201.6	Angular sericitic and chloritic fragments sparsely distributed in a fine buff matrix. ACID LITHIC TUFF Some "wispy" sericitic fragments, could be pumice.	?phlogopite or FeCO3 alt of matrix. Ser & chl alt of frags.
201.6	213.6	Higher density of clasts, sericitic, chloritic, flattened and angular fragments, also rounded, silicified rhyolite fragments in a fine matrix. VOLCANICLASTIC BRECCIA.	Clasts chl, ser & sil alt. Matrix chl ser & ?phlogopite (buff) alt. Predom chl.
213.6	257.2	EPICLASTICS ?rhyolite Mostly siliceous & sericitic ?pumice clasts. Also pyritic, fine-grained siliceous sediment & strongly chloritized clasts. Fine clastic matrix (coarser than 198.1-213.6) Density of clasts in this rock also higher. Clast sizes from <1mm to 300mm. Crenulations in matrix @ 211.4, Bedding @ 248.9 @ 25° to core. From 253m, chloritic	Int chl alt of some clasts (usually smaller clasts) Very int ser alt of some ?rhy clasts, others are pink & sil. Matrix is lt grey cb alt.. Small patches of red (Fe) cb alt. 225.1 15mm fracture filled with CO3, qz & ser @ 25° to core

		flattened ?pumice fragments.	
257.2	281.1	Light green rock with fine matrix containing predominantly small, sericitic and chloritic fragments, often flattened, interpreted as pumice. Also some rounded, siliceous clasts No rhyolite clasts. A wavy, layered, texture is visible in many places ?ignimbrite. Strong layering @ 60° to core @ 271.6-271.7. ACID PUMICEOUS TUFF	Cb alt throughout of fspars, through matrix and in "splotches" from 273.5-281.1 Matrix is lt gr, prob ser alt with minor cb. Frags, all int chl & ser alt. Some irreg zones of sil thru matrix & rare, small patches of f.g. py.
281.1	282.4	Dark green, homogenous, feldspar-phyric, lava or dyke. ANDESITE LAVA Interpreted as an andesite because of the relatively high chlorite content. Both contacts sharp @ 30 to core.	Mod-int chl alt. Fspars => cb or ser with cb rims.
282.4	283.7	Light & dark green, siliceous, chloritic and sericitic rock with brecciated appearance. Rare quartz phenocrysts, feldspar phenocrysts and ?flow banding near bottom contact which is @ 35° to core. (parallel to contact) RHYOLITE LAVA	Int sil alt. Mod chl & ser.
283.7	286.2	SEDIMENTARY BRECCIA Angular-subrounded, mostly chloritic, but some fine grained sedimentary clasts too. Fine matrix.	Int chl alt of most clasts. Mod ser alt of matrix.
286.2	286.6	Light green, fine, wavy layering @ 25° to core. ?RHYOLITE TUFF	Alt a mix of ser & sil zones. Layering defined by ser clvg
286.6	286.9	Bedded ARENITE. Bedding @ 30° to core. Soft sediment deformation on uphole contact indicates	Int chl alt of some clasts. Rest of rock wk-mod ser alt.

		younging uphole grades downhole into	
286.9	287.4	Sorted TUFFACEOUS SEDIMENT containing ?pumice clasts and then into a poorly sorted ACID VOLCANICLASTIC, with large (up to 70mm) ?flow banded clasts, small sericitic ?pumice fragments and larger, sericitic clasts. The clasts sometimes have poorly defined boundaries and grade into the fine matrix.	Minor f.g. py assoc with some sil alt. Minor cb & mod chl & ser alt of some clasts & matrix. @ 286m, chl/cb/qz/ py - filled fract 25mm @ 40mm° to core
287.4	288.0	Very fine grained ?divitrified RHYOLITE TUFF - some sericite fragments interpreted as pumice.	Int ser alt thr'out
288.0	300.8	Coarsely bedded VOLCANICLASTIC SEDIMENTS angular & wispy, chloritic & sericitic clasts. Sand-size matrix Some large clasts of underlying fine grained siliceous sediments. Good graded bedding indicating uphole facing @ 296.7. cba @ 50°.	Int-mod ser & chl alt of clasts. Cb alt thru matrix.
300.8	306.7	Bedded, fine grained siliceous & tuffaceous ARENITE. Distorted flame structure at 302.5 indicates uphole facing. Cherty sediments from 301.8-302.8. cba @ 55°.	Minor ser alt thru some beds. Sp stringers in cherty beds.
306.7	313.5	Coarse EPICLASTICS consisting mostly of strongly sericitic & chloritic clasts of irregular, slightly flattened, shape, with some siliceous, flow banded rhyolite clasts, in a fine, grey matrix.	Int ser & chl alt of most clasts.

313.5	319.9	Light green ACID ?PUMICEOUS TUFF or SEDIMENT, consists of numerous, totally sericitized fragments ?pumices, with grey, larger, cherty fragments in poorly defined, sericitic matrix. 2 interbeds of sandstone @ 314.6-314.65 &316.0-316.7. Increasing clast size and lithic component downhole.	Int ser alt, esp at top of unit. Sil & traces of py in some clasts.
319.9	322.1	ACID LITHIC TUFF Unusual dark green lithology, consists of counded, siliceous fragments of various sizes (21-30mm), and some flattened, small (1-3mm) sericite pumice fragments in a faintly banded eutaxitic textured matrix.	Chl & ser alt thru matrix. Some clast silicified.
322.1	322.9	Dark green CONGLOMERATE consists of rounded, cherty sediment clasts 1-8mm, in very fine chloritic matrix.	Int-mod chl alt. of matrix.
322.9	334.2	Coarse EPICLASTICS Irregularly shaped, sericite clasts ?pumice siliceous sediments and other clasts, 3-500mm in fine matrix.	Int ser alt of some clasts. Matrix wk-mod ser alt.
334.2	336.7	Bedded SILICEOUS SEDIMENTS. Interbedded grey cherty shale, coarser sericitic units and sandstone. cba = 80°	Traces dissem py mod ser alt of coarser beds. qz vng & chl alt @ 335.5-335.54
336.7	351.3	Coarse SEDIMENTARY BRECCIA. Irregularly shaped ?pumice fragments with other siliceous ?rhyolite & sediment clasts in a fine sericitic matrix, which becomes grey & cherty in places. Down the hole,	Mod ser alt of some clasts & matrix to 345.3m. Then incr ser to int. Rock is also sheared, with a strong fol devel @ 30° to core. Traces of py in cherty areas.

		thin cherty interbeds appear. Most exhibit soft sediment deformation Approx cba = 70°.	349.2-349.6 broken grnd, qz/cb vng & clay alt.
351.3	355.9	Bedded ARENITE green/grey beds, cba 45° @ 351.5 & 25° @ 355.5.	F qz stringers esp in finer, chertier beds. Some carry sp & py. Trace dissem py.
355.9	357.4	Zone of weak shearing Difficult to identify rock type, probably TUFFACEOUS SEDIMENTS. Some rounded cherty sediment clasts. Traces of bedding @ 50° to core	Int ser alt. Mod sil by stringers in places. Dissem py to 5% & sp/gn ?Bedded @ 357.25-357.27.
357.4	369.2	PUMICEOUS TUFF OR SEDIMENT. Very fine, siliceous matrix. Fragments sericite (?pumice) 1-40mm. Banding visible @ 366.2-367.2.	Frags ser matrix, sil esp to 363.3 Flecks of sp,gn & py thr'out. 40mm qz/cb vn. Carries coarse sp & gn @ 359.9 & 360 in a zone of nodular sil & pink alt @ 359.7-360.2 Zone of more int sp/gn min @ 362.1-363.1, up to 30% comb sulphides.
369.2	388.2	Interbedded SILTSTONE, SANDSTONE & CHERTY SEDIMENTS. cba = 30° @ 370.7, 70° @ 377 & 65° @ 383.3. Facing on flame structure and reworked bed @ 380m indicates uphole younging	Stringers of cb/qz thr'out, avg 10/m, some carry traces sp & gn.
388.2	392.8	Transition between very fine grained bedded sediments & coarse epiclastics. PUMICEOUS TUFFACEOUS SEDIMENT. Consists predominantly of tiny sericitic ?pumice fragments in a very fine ?ash matrix. Rare lithic clasts.	1% dissem py thr'out. Also sml patches of sp & gn fuzzy edge therefore thought to be alt, not clasts. Ser alt of fragments & to a lesser extent, matrix. Minor sil alt of matrix.
392.8	408.7	Fine grained TUFFACEOUS SEDIMENT grades downhole	Ser & pink/sil alt of clasts. Wk ser

		into coarser SANDSTONE. Still pumiceous fragments/clasts. Increased lithic fragments. Some pumice fragments have quartz-filled vesicles.	alt of matrix. Sml, discrete patches sp & gn min (≈1% overall).
408.7	410.4	ACID PUMICEOUS TUFF Wispy sericite, rarely vesicular pumice fragments in fine ash matrix.	Int ser alt of frags. 1% py dissem thr'out. Patches of 10% comb sp & gn as discrete small (2-10mm) zones of min
410.4	457.9	Coarse EPICLASTICS Clasts consist of vesicular pumice, sediments & siliceous ?rhyolite in a sandy-cherty matrix.	Sil/pink & ser alt of most clasts. Occas blebs of sp/gn min, assoc with cb & qz stringers. 432.6-433.5 zone of qz vng & int-mod chl alt. Minor shrg. 453.1-453.6 Zone of shrg @ 25° to core Qz/cb vng & alt with chl alt.
457.9	594.0	?ACID PUMICEOUS TUFF consists of wispy, sericitic and chloritic zones, which vary in size from <1mm-200mm. The majority average 30mm long. Some of the larger ones have siliceous spots which may be in-filled vesicles. The rock has a nodular appearance throughout due to irregular siliceous patches. The remainder of the matrix is softer and very fine grained. Some sericitic and angular shapes ?ex-feldspar crystals. From 472.4 number and size of pumice clasts decreases, then gradually increases again downhole. @ 495m. a vague, wispy, layered texture.	457.9-458.0 Int chl alt & py on contact 458-467.4 Int ser alt of frags, matrix mod ser & sil alt pink/lt gr col. 467.4-474.8 Some broad patches of dk chl alt. These may just be frags lying parallel to core. Incr chl alt of all clasts. Otherwise as above. 474.8-486 Ser & ?cb alt of frags. Lt pink, mod sil alt of matrix. 486-489.3 Int chl alt. Qz, cb, coarse vng @ 488.8-488.9.

488.9-489.3 Massive banded, sulph with sp,gn & cpy. Coarse sp & py near vng. Bottom (downhole) contact chl alt, no vng, looks like a sharp sed contact. Sulphide banding consistent at 15°.

489.3-497.5 Mod ser alt of sml frags & matrix. Also sil, nodular alt & pink col of matrix.

497.5-506.6 Dk gr col due to matrix & frags being part ser part chl alt.

597.5-533 Pink col thr'out matrix also mod ser & sil alt of matrix. Mod ser & chl alt of frags.

533.0-564.9 Lt grey col, mod-int chl alt of frags. Wk-mod chl & sil alt of matrix. Spotted appear due to ?cb alt of ?fspars

564.9-567 Pink alt of matrix. Int ser alt in places. Cb/qz (c.g.) vng.

567-586 Mod chl alt of frags & mod chl/sil alt of matrix.
Int chl/ser alt @ 578.1-578.4. Minor cb/qz vng with assoc traces of c.g. py.

586-590.7 Int pink col of matrix ?haematite alt. Int ser & chl alt of frags. Mod sil of

		matrix. Cb/qz vng; avg 25° to core, 2-20mm thick, 4/m. Chl selvedges.
		590.7-594 Mod chl alt of clasts & matrix. Wk pink & mod sil alt in matrix.
	E.O.H.	

GEOPEKO ROSEBERY **DIAMOND DRILL CORE RECORD** DETAILED DRILL LOG

LOCALITY:- BURNS PEAK DRILL HOLE NUMBER:- EAB4

METERAGE FROM	TO	ROCK DESCRIPTION	MINERALIZATION	SAMPLE NO.	FROM	TO	%REC	LNGTH	Cu	Pb	Zn	Ag	Au	Ba
0.0	15.0	Micaceous sandstone, siltstone & shale												
15.0	77.1	Weathered feldspar-phyric acid lava												
77.1	117.7	Interbedded sandstones & shales. CBA at 50° @ 80m and 70° @ 87.30m. Facing @88.89m ?uphole. Grading @ 91.10m uphole facing & @ 94.55m. Flame structures @ 95.4m on shale/sandstone contact indicate uphole facing. Bedding @ 100.9 @ 62°, @ 101.73m @ 90°, 74° @ 105.4m Graded turbidite @ 109.69 @ 90°. Graded, uphole facings @ 112.9, 114, 115.88m Fault at 117.7, broken core.	115.88-117.5m Cb-rich sandstone bands with py, sp. Cb alt of shale also. This may explain soil anomaly.	A1769	77.70	80.20		2.5	130	620	530			260
				A1770	80.20	82.70		2.5	85	1750	930	1.0		310
				A1771	82.70	85.70		3.0	65	360	530			250
				A1772	85.70	89.40		3.7	60	90	445	0.5		270
				A1773	89.40	90.80		1.4	60	30	435			170
				A1774	90.80	93.30		2.5	115	20	475		0.01	150
				A1775	93.30	95.70		2.4	100	50	515			160
				A1776	95.70	97.20		1.5	75	45	615			350
				A1777	97.20	100.00		2.8	55	35	310	0.5		240
				A1778	100.00	103.00		3.0	45	75	165	0.5		220
				A1779	103.00	104.70		1.7	60	85	410			180
				A1780	104.70	107.80		3.1	55	75	310			180
				A1781	107.80	110.90		3.1	50	110	285			200
				A1782	110.90	113.40		2.5	55	125	330			160
				A1783	113.40	116.20		2.8	45	390	640			190
				A1784	116.20	117.70		1.5	35	335	1300		0.01	220
				A1785	117.70	119.40		1.7	70	705	4475			160
				A1786	119.40	121.70		2.3	45	205	1150	0.5		170
				A1787	121.70	124.00		2.3	55	60	1300	0.5	0.01	220
				A1788	124.00	127.00		3.0	30	25	340	0.5		240
				A1789	127.00	130.00		3.0	255		190		0.01	180
117.7	118.4	Andesite ?lava. Possibly a block.	Ser alt, wk chl alt Cb stringers, 2% dissem py.	A1790	130.00	133.00		3.0	410	25	175		0.01	190
				A1791	133.00	136.00		3.0	95	10	190			150
				A1792	136.00	139.00		3.0	85	1800	2400			130
				A1793	139.00	142.00		3.0	70	170	1450		0.01	120
118.4	119.4	Sandstone unit with fragments of andesite and shale	Sheared & sil @ 118.37	A1794	142.00	145.00		3.0	75	85	780	0.5		150
				A1795	145.00	146.90		1.9	120	15	240	0.5		180
				A1796	146.90	150.00		3.1	75	5	160			170
				A1797	150.00	153.10		3.1	125	45	335			170
119.4	156.1	Andesite hyaloclastite to massive vesicular submarine lava. Possible chilled pillow margins @ 135.79-144.90m	122.14-123.79 2% vnlts with py & sp Int ser alt. Looks like EAF9 & 14. 123.79-134.88 Mod-int chl, ser alt Pink ?K or FeO alt in patches. 134.88-135.79 Pink ?K or FeO alt. 135.79-156.05 Ser & chl alt patches, with minor K or FeO	A1798	153.10	156.20		3.1	95	10	170	0.5		170
				A1799	156.20	159.30		3.1	105	10	140			200
				A1800	159.30	162.50		3.2	100	5	120			300
				A1801	162.50	165.60		3.1	80	35	165	0.5		220
				A1802	165.60	168.50		2.9	75	20	130			200
				A1803	168.50	171.50		3.0	135	35	135			190
				A1804	171.50	174.80		3.3	140	130	205	0.5		130
				A1805	174.80	178.00		3.2	100	20	160			150

EXHIBIT

			(pink) zones. Qz-cb vng in places.													
156.1	178.0	Pink to green ?acid lava or possibly altered andesite. Contact is not sharp.	Ser-chl alt & pink K or FeO alt patches Qz-cb vng incr to hole bottom. Grade of alt also appears to incr down hole.													

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APPENDIX 4

INTERPRETATION OF ELECTROMAGNETIC SURVEYS AT BURNS PEAK (E.L. 44/88)

by J. BISHOP, MITRE GEOPHYSICS

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INTERPRETATION OF ELECTROMAGNETIC SURVEYS AT BURNS PEAK (E.L. 44/88)

for

North Broken Hill Peko Ltd

by

Dr J.R. Bishop

NBH/MG89/03
Sept., 1989

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SUMMMARY

Burns Peak (E.L. 44/88) covers an area of Mt Read Volcanics between the Rosebery and Hellyer - Que River mines. Earlier exploration has defined a small massive sulphide deposit at Pinnacles and the old Chester pyrite mine also occurs within the E.L.. Results of petrophysical testing and electromagnetic surveying of the Pinnacles mineralisation indicates that these base metal sulphides are poor conductors. Thus it is suggested that the prospectivity of the tenement, especially for a deep-seated deposit (deeper than 200m), has not been significantly diminished by the negative results from the regional fixed-loop EM survey carried out by the previous lease holders.

A test survey of the controlled source audio-magnetotelluric (CSAMT) technique was carried out over the northern section of the Pinnacles mineralisation. This demonstrated the application of the method, but no significant sulphides were defined. Some down-hole EM (DHEM) surveys were also carried out in this region to compare two different systems (Sirotem and EM37), however the results suggest that different loops were used and/or holes surveyed, and a valid comparison could not be made. From the evaluation of the techniques discussed in this report, CSAMT is recommended for further deep-seated exploration on the lease. However prior to any surveying, a compilation of all previous work is recommended. A summary of the conclusions and recommendations is given in Table 2.

INTRODUCTION

The Burns Peak licence, E.L. 44/88, covers an area of highly prospective Mt Read Volcanics lying between the Rosebery and Hellyer - Que River mines. It contains the sub-economic Pinnacles mineralisation, as well as the Chester pyrite workings (Figure 1). The licence is held by three companies, Pasminco Mining, Noranda and Pioneer Minerals, under a joint venture agreement. North Broken Hill Peko (Geopeko), a major share holder in the recently formed Pasminco, is managing the exploration program under contract to the joint venture partners.

This report evaluates some of the data from a large scale UTEM survey carried out for the previous lease holders (BHP and Comstaff). It also presents the results of a trial CSAMT survey. Lastly, an attempt at evaluating some Sirotem DHEM data by re-surveying three holes with EM37 is discussed.

EXPLORATION TARGETS AND GEOLOGICAL SETTING

The most prospective areas of E.L. 44/88 are considered to lie on the western side of the licence, where mineralisation is known to occur within sediments contained by lavas of the Central Sequence Volcanics. The northern area, broadly referred to as Pinnacles after one of the old workings (at the southern end of the zone -see Figure 1), contains a body of massive sulphides, grading up to 32% Zn and 19% Pb. The zone appears to be truncated to the south by the Rosebery Fault and to the north by a barren rhyolite. Some 3 kms to the south, the Chester mine -a stratiform massive pyrite body -lies within a large zone of pyritised and sericitised volcanics. The rocks in both areas are folded and broad synclines and anticlines have been interpreted through both Pinnacles and Chester.

Geopeko have also identified a number of other prospective zones. These include mineralisation along the Rosebery Fault; ore deposition close to the andesite contact (after Que River); The 'Hollway Zone', which lies between Chester and Pinnacles and is defined by strong alteration and anomalous geochemistry; possible northward plunges of both the Pinnacles and Chester mineralisation and Mt Kershaw which contains some outcropping base metal mineralisation (see Figure 1).

The prime exploration target is for a polymetallic, stratiform, volcanogenic massive sulphide deposit and following the discovery of Hellyer by UTEM, fixed loop EM has been the favoured technique in western Tasmania. However, the Pinnacles mineralisation does not appear to be as conductive as Hellyer or Rosebery. Petrophysical measurements by BHP and Geopeko (see below) have recorded quite low conductivities, to a maximum value of 17 S/m. This compares with values of more than 100 S/m for both Hellyer and Rosebery (Bishop and Lewis, 1988). The lower conductivities from sulphides of comparable grade are ascribed to zinc-rich mineralisation where the sphalerite forms a coating around the galena.

Whilst values from small core samples may not be representative of a deposit as a whole, this data does suggest the possibility of a target which is too poor a conductor to be a reliable EM target. Although still dense and chargeable, such a deposit, if buried to any significant depth, would be hard to find.

Because of this possibility and because of its supposed resolving abilities at depth, a trial CSAMT survey was carried out. Apart from locating any conductors at depth, it was hoped that this technique would differentiate between the different rock types and perhaps some of the structure. Other techniques, such as MIP, are also appropriate for less conductive mineralisation and these are discussed at the end of the report.

PETROPHYSICS

Table 1a lists the results of some petrophysical testing of sulphides undertaken by BHP as well as some measurements made for Geopeko. As was mentioned above, the apparently resistive nature of the Pinnacles mineralisation is of some concern and less persistent EM responses may be more significant here than is generally considered for volcanogenic sulphides. (Gunn and Chisholm (1984) give some interesting examples of non-conductive volcanogenic massive sulphides in Western Australia.) The Pinnacles mineralisation is dense and chargeable, though not as dense or as chargeable as more lead-rich massive sulphides.

The measurements listed in Table 1b were made for Geopeko to determine the physical properties of the host rocks. Of particular interest are the similar (and high) galvanic resistivities of the sediments, epiclastics, rhyolitic lavas and porphyry. The figures obtained - up to nearly 60,000 ohm-m, - do not allow for jointing and fracturing which will much reduce the in situ values. (For example for a rock with fractures or joints in three dimensions and a joint porosity of 5%, the in situ value will be only 40% of the value measured in the laboratory.) Included in the table are the RQD (Rock Quality Designation) values which show that the porphyry is massive, while the sediments have significant jointing and/or fracturing. Nevertheless, all rock values are high, reflecting the widespread silicification which can be observed in the drill core. This suggests that the CSAMT technique, in this area, would have some difficulty in discriminating between the different rock types. In the other parameters, it can be seen that all rock types are effectively non-magnetic. The densities are also very comparable, with the altered volcanics showing a slight increase. The IP effects are low, but somewhat scattered, the altered volcanics again averaging the highest values.

EXPLORATION HISTORY

The Burns Peak - Chester area was first explored (as distinct from prospected) by Rio Tinto in the late 1950's and early 60's,

when they held much of Tasmania's west coast under licence (their Pieman River Project). Rio Tinto regularly used magnetics, gravity and EM during their exploration and undoubtedly these methods were used here. However I have not seen any results from this (presumed) work (see later).

In 1963, the area was pegged as part of E.L. 5/63. This was worked by Comstaff until late 1985 when BHP farmed in and managed the exploration over the remaining areas of the licence before its statutory relinquishment in mid 1988. The BHP relinquishment report (Anon., 1988) summaries the exploration history over 'Area 4' which constitutes most of what is now E.L. 44/88. A table lists the geophysical surveys carried out over each prospect. (This table lists Rio Tinto (?) surveys at Pinnacles, but gives no references for them.)

BHP's program for Area 4 consisted of near blanket coverage of the volcanics with fixed loop TEM (UTEM). No anomalies of potential were recorded, although two responses were followed up with fixed loop Sirotem (using two opposed loops). Some DHEM was also carried out (again with Sirotem), but the results were again disappointing. (No holes were drilled during BHP's management.)

SURVEY DETAILS

UTEM

Four separate UTEM surveys have been carried out over E.L. 44/88. The first, for Comstaff in 1984, consisted of two loops in the north west corner of the lease over the main Pinnacles mineralisation. In 1986, BHP covered most of the western part of the lease and in 1987 the eastern section was surveyed together with some detailing in the west. The fourth survey was carried out for Billiton over an area subsequently added to BHP's 'area 4' to make up E.L. 44/88. The coverage from all surveys is shown in Figure 2a. All surveys were carried out by Lamontagne Geophysics and the results were produced as profiles in their usual fashion.

For this report, only those surveys lying on the western side of the railway line have been evaluated; the Comstaff survey and the majority of the BHP work.

CSAMT

Four lines of CSAMT were surveyed by Zonge in March, 1989. The survey covered the northern end of the Pinnacles mineralisation and the aim was to determine the effectiveness of the technique as a mapping tool and, more importantly, as a direct ore finder in this type of environment. A 1500m transmitting dipole was set up on the Murchison Highway, near the Rosebery golf club, approximately 12kms to the south of the survey area. Because of the trial nature of the survey, more detailed readings than usual were taken: a 20m station interval was used, employing a 20m

dipole for the electric measurements. One (along strike) magnetic measurement was made for each two electric measurements to improve the rate of production.

The data was processed by Zonge in Adelaide and plots of frequency against apparent (Cagniard) resistivity, phase difference and the in-phase ('real') resistivity component were produced. Also produced were pseudosections of real resistivity against 'MT' depth and resistivity derived from phase (against frequency). Some further processing was tried on the line 5200N data to try and reduce the effect on the data of variations in the near-surface resistivity (the so-called statics effect). The results are presented in Figures 3 to 6. The large differences between horizontal and vertical scales should be noted when interpreting the real resistivity - MT depth pseudosections.

DHEM

Many of the holes drilled by the previous licence holders had been surveyed with Sirotem and some of these had shown very large 'self response' (described later). It was decided to verify the Sirotem results by resurveying some of the worst affected holes with EM37 from the same loop positions. A number of holes were chosen, but only DDH's EAF 9; EAF 11 & EAF 14 were resurveyed (most, if not all, of the others were blocked).

These holes had originally been logged by Solo Geophysics from loops numbered 1 & 2, using the early time base option for all surveys. The repeat runs were carried out by Geoterrex in April 1989 using an EM37 at the usual 25Hz repetition rate and the same loop positions were reoccupied. Only one problem was encountered with the resurveying and that was a blockage in EAF 9 at 110m when transmitting from loop 2.

For this report, the two different sets of data from each hole - loop combination have been shown on the one figure. The profiles are at the same depth scale, but the Sirotem has been plotted logarithmically and the EM37, linearly. (On some of the figures, the lower negative Sirotem data has not been included, but all data required for a valid comparison has been presented.) On some figures, there is little if any similarity between the two data sets and this is further discussed below.

INTERPRETATION

UTEM

The 1984 UTEM survey for Comstaff covered the Pinnacles mineralisation. However the lines were spaced 200m apart and did not cross the known massive sulphides which lie between 5200N and 5400N and thus the TEM response of this admittedly rather small deposit was not ascertained. BHP's 1986 survey covered much of the prospective ground on the western side of the Emu Bay Railway

line (loops 1 to 13, plus 201 & 301). Nothing of interest was found in either of these two surveys. In 1987, BHP surveyed on the eastern side of the line, the 'PM' series of loops; plus the three 'CP' loops on the western side. Anomalies 'A' and 'B' on the western side were interpreted as being of interest and these were followed up with fixed loop Sirotem. Anomaly 'A' was recorded on line 7000N (loop CP01). (This is one of a number of profiles which do not appear to have been included in BHP's progress reports (see Figure 2d); however Geopeko now has a copy of all of BHP's UTEM data on disc.) The profile for line 7000N showing anomaly A near 4000E is given in Figure 2b. The anomaly shows a reasonable response down to channel 6 (ie an early-time response) but it is doubtful whether the anomaly extends beyond channel 5. Anomaly 'B' on line 2750W (loop CP03) was moderately well defined and also possibly extends to channel 5. The follow up Sirotem for both anomalies were generally of poor quality and did little to aid the interpretation. There is little information in BHP's reports about their interpretation, but Macnae of Lamontagne did do some evaluation and this is shown in Figure 2c.

As previously stated, for this report I have only re-evaluated the UTEM data on the western side of the railway line. Figure 2d uses a BHP base map showing the positions of the 1986 UTEM survey plus their simplified interpretation (classified into "well defined" and "less well defined" anomalies). To this has been added the Comstaff coverage and the 1987 western side BHP loops; plus all of the responses interpreted from the re-evaluation (separated into three categories, including 'possible'). BHP's conclusion that no really interesting responses were recorded, was confirmed, however, a number of weak responses were recorded in interesting places; eg, along the southern Andesite contact. Figure 2e shows the plan projections of the existing drill holes, the prospective zones as defined by Geopeko's geologists and the 30 'best' UTEM anomalies associated with these zones -with the exception of anomalies 1 to 4 -which are of some interest in their own right.

No quantitative interpretations have been carried out since none of the anomalies can be recommended as a drill target in its own right. Nevertheless when drilling is planned (on some other criteria), then the relevant UTEM data should be utilised and possibly some quantitative interpretations made.

CSAMT

Although described as a trial survey, only two of the lines, 5200N and 5400N, were on drilled sections. The remaining two traverses, on 5600N and 5800N, were sited to try and help interpret the geology beyond the limit of the drilling. As it happened, the very resistive nature of the ground resulted in very little information from the CSAMT for the top few hundred metres, which prevented much direct comparison with the drilling on the southern two lines. Nevertheless, some good agreements were obtained with the interpreted geology and some (hopefully

useful) suggestions have been made about the lithologies at depth. The survey indicates that there is no significant deposit of sulphides between 5200N and 5800N.

Although very resistive conditions were encountered within the survey area, the fortunate occurrence of conductive black shales between the transmitter and the receiver meant that the recorded data is all effectively 'far field' (see appendix) and thus amenable to the use of AMT interpretation techniques (which assume the transmitter is at infinity). The real resistivity depth sections ('d' in Figures 3 to 6) are probably the plots most readily related to the geology and these data were used to produce the final interpretive sections.

To produce a geological interpretation, all data was run through a one dimensional 'inversion' program which produces the best fitting resistivity section to each data station. Although the assumption of horizontal layering used for this procedure is often at odds with the known geology, it often produces useful results (eg, at Renison Bell; see Bishop and Lewis, 1988). Next, the individual layered sections produced for each station were 'hand stitched' together and a simplified resistivity cross-section produced for each line. The results, not shown here, indicated extremely resistive rocks lying between ~500m and 3000m-5000m below the surface, with the western side more resistive. These results are largely confirmed by the petrophysical sampling (Table 1b), which suggests a value of perhaps 10,000 ohm-m for each of the sediments, tuffs and epiclastics (broadly referred to as volcaniclastics in the figures) and perhaps some lavas. The porphyry is more massive (an ROD of 1.0) and has sligthly higher sampled values. In places, the porphyry could have an in situ resistivity of several tens of thousands of ohm-m. At the other end of the scale, the altered volcanics probably go down to several hundred ohm-m. Because of the widespread silicification at Pinnacles, the CSAMT has not been able to discriminate well between the different rock types. Nevertheless, there is some 'character' in the profiles.

The resistivity sections from the one-dimensional interpretation were further simplified and used as models for a two dimensional program. A comparison between the results of this procedure (Figure 7) and the observed data (Figures 3d-6d) shows comparable resistvity values and a comparable, although very much exaggerated structure dividing each section. From these models, the real resistivities and the geologist's (considerable) input, the final interpreted sections were produced.

On line 5200N (Figure 8a), a weak resistivity low coincides with mineralisation intersected by DDH EAF2. The highly resistive western section at depth suggests that the lavas outcroppping to the west of the drill hole dip steeply to the east. On line 5400N (Figure 8b), a weak low again coincides with intersected mineralisation, and another possible zone of alteration is suggested at the western limit of the survey. Again, the western side of the traverse is thought to consist of more resistive lavas and

porphyry; the interpreted contact coinciding with the eastern edge of the porphyry intersected in DDH BPD62. The high resistivities at depth suggest that the host horizon does not extend to depth; although if narrow and steeply dipping, it would have little effect on the results. On line 5600N (Figure 8c), the suggestion of an alteration zone on the western side of the lavas is continued. A small zone of alteration is also suggested near the porphyry contact on the eastern side of the line. This probably continues through to Line 5800N (Figure 8d) where the zone is adjacent to the porphyry and confirmed by recent drilling (BPD65). As on 5200N, the more resistive western section at depth suggests an easterly dip to the lavas mapped at the surface.

DHEM

BHP surveyed some 20 holes in the Pinnacles area with DHEM using the Sirotem system. No significant off-hole conductors were defined, but many high signal levels were recorded. These were recognised as being due to a receiver response directly from the transmitter; ie, currents were induced in the receiver coil by the transmitter and their decay is the so-called 'self-response'. The effect was particularly noticeable when the receiver was in close proximity to the transmitting loop. A sketch of the shape of the self-response curve for each drill-hole and loop is given in Figure 9a.

A series of comparative tests was planned using the EM37 system to see if it was similarly 'afflicted'. If not, it was hoped that the surveys might reveal subtle anomalies which had been obscured by the self-response . Figure 9b shows the positions of the two loops and the plan projection of the 3 holes surveyed.

Figures 9c, 9e, 9g, 9i, 9k & 9m show the comparisons between the Sirotem and EM37 surveys, with the two sets of data from the one hole on one figure. The data shown are as supplied by the contractors, reduced to give the same horizontal scales. A more effective comparison could be made if the same vertical scales had been used, but the differences are quite obvious even with the logarithmic Sirotem and linear EM37 plotted data. Note that 1 uv/A on the Sirotem profile is equivalent to 0.1nv/A-m^2 on the EM37. Thus to convert Sirotem data to EM37 units, the former should be divided by 10 (and the units changed). (This may partly explain why some Sirotem data appears more noisy than EM37 data -it is plotted with a x 10 sensitivity.) All of the Sirotem data was recorded using the early time base, thus the channel numbers

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* A series of comparative tests were also carried out by BHP at their Sock Creek prospect. These apparently included further Sirotem tests by CSIRO using different probes. Analysis of the results revealed that the EM37 also had a self-response, but at about half the level shown by Sirotem (Kerr, pers. comm.).

for the two systems are roughly equivalent#. A description is given below of the comparative data for each hole/loop combination. For each configuration, a model shows the expected shape of the response for an idealised tabular conductor (interpreted from the drill sections) in a resistive host rock. The modelling assumptions have meant that no allowance has been made for current gathering, which can have significant effects (Newman et al, 1989) and the transmitter loops are assumed to lie on a horizontal plane. Proper modelling of the topography should change the amplitude but not the shape or sign of the responses. Sign, or sign trend (ie, positive or negative trends) and shape are probably the most important parameters for interpretation of DHEM data.

EAF 9/1.

The Sirotem profile has high values at the top of the hole, indicative of self-response and all values are positive except for noise in the late time channels (Figure 9c). The EM37 data has a cross-over to negative at 180m in the intermediate channels, despite a positive offset evident in the late time data. Nevertheless, the two sets of data are similar and could perhaps come from the one hole using the same loop.

The weak positive response in the EM37 intermediate channels at 60 to 70m has some similarities with the larger positive response in the model (Figure 9d). The field data shows no response from the bottom end of the conductor, suggesting either the mineralisation extends further -which would produce a larger anomaly -or, more likely, that the observed response is largely due to weak galvanic currents which, unlike induced currents, have no return current across the same section. This phenomena would be expected to occur if the mineralisation was only slightly more conductive than the host rocks.

EAF 9/2.

The EM37 survey could not be completed down EAF 9 for loop 2, owing to the hole becoming blocked. However, the top 100m surveyed has no similarities with the Sirotem data (Figure 9e). The differences could not be merely an error in sign, since the trends are also quite different. These two sets of data do not appear to have come from the same hole using the same loop.

The negative, then positive, character in the Sirotem data is consistent with self-response; ie, the field from the transmitter is negative in the upper part of the hole, then close to zero, then positive towards the end of the hole.

Approximately 25 early time Sirotem channels cover the same time span as the 20 EM37 channels. However channel widths differ.

Figure 9f shows the negative response which would be expected in the absence of self response if the intersected mineralisation had been reasonably conductive (and similar to the model geometry). Thus there is no ready explanation for the positive response from the EM37 data.

EAF 11/1.

The EM37 and Sirotem data sets are broadly similar (excluding the first five Sirotem channels, which are showing an 'on-time' response). Although the late time Sirotem channels are negative from 0 to ~175m, the two sets of data could come from the same hole and same loop (Figure 9g).

The EM37 shows an initial positive, then (weakly) negative going response in the early channels at about 175m, which is not evident in the Sirotem data. Figure 9h shows the response expected from the intersected mineralisation. Changes in size would not effect the sign of the negative response. The discrepancies between the model and field data suggest that the interpreted position of the mineralisation is incorrect, however a reinterpretation has not been attempted because of the underlying doubts about all of this DHEM data. A self-response down this hole would be initially negative, then going to positive towards the bottom of the hole (Figure 9a). Thus although the EM37 and Sirotem are similar, the data do not agree with either the expected response from the mineralisation (possibly due to incorrect location of model conductor) or the self response, which suggests data from a different hole and/or loop.

EAF 11/2.

There are several differences between the Sirotem and EM37 for this hole-loop combination. Firstly, both systems recorded very strong responses at the top of the hole, presumably due to casing: these are of opposite sign (Figure 9i). Polarity is occasionally incorrectly determined in DHEM surveys and although a change of sign in one of the data sets would reduce some of the differences (eg, the 'kick' in both profiles at 130m), others would be exacerbated and new ones produced. On the Sirotem profile, the response at 130m is part of quite a strong negative trending anomaly, centred at around 100m down hole. No such response, negative or positive, can be seen in the EM37 data.

Massive sulphides were intersected at around 235m down EAF 11 and if they occur as modelled in Figure 9j, then a positive response would be expected at around 250m. Small positive bumps can be recognised at this distance in channels 6 to 10 of the EM37 data, but probably only in hindsight. The Sirotem at 100m is far more interesting. If valid, this anomaly also suggests that mineralisation was intersected at about 115m. The shape of the self-response profile for this hole - loop geometry would be entirely

positive (Figure 9a); ie, very similar to the Sirotem profile. The lack of a response at 100m in the EM37 data suggests that different holes were logged. Alternatively, one set of equipment was not working properly. The previously referred to DC offset in the EM37 data also occurs here and this could be a minor symptom of a greater malaise.

EAF 14/1.

The two data sets here are broadly similar (Figure 9k). A strong positive response at 50m in the EM37 intermediate channels is not discernible in the Sirotem data, although linear plotting might reveal a slight response. The EM37 anomaly has some similarities with the model response for a small body of massive sulphides above the hole (Figure 9l), including the cross-over to a negative response; which is certainly not evident in the Sirotem data -linear or logarithmic plot. Neither does the Sirotem show any sort of response at 220m, in contrast to the EM37. The self response for this geometry should be minimal; starting slightly negative, then positive (Figure 9a). One could conclude that the two data sets were from the same hole and loop, but with the Sirotem sensitivity greatly reduced; ie, the opposite to EAF 11/2.

EAF 14/2.

These two data sets are quite different (Figure 9m). At the top of the hole, the large casing responses have different sign; the Sirotem starts strongly negative, then goes strongly positive: the EM37 remains essentially positive for the whole length. And strong responses at 125m and 220m on the EM37 are not at all evident on the Sirotem. The two logs must come from different holes and not just different loops. If one were to try and determine the 'correct' responses, then the Sirotem profile does closely match the expected self-response for EAF 14/2. Neither log matches the modelled response (Figure 9n), although since it has some resemblance to the self-response, it could conceivably be hidden in the Sirotem data.

To summarise the above. The loop 1 data could be the same for all three holes, although neither data set agrees with the expected responses for EAF 11. The loop 2 responses are all quite different, with the Sirotem having the expected results. This would suggest that, at least, different loop '2's were used for the two surveys, with the one used for the EM37 surveys not in the expected position. For EAF 14, different holes are strongly suggested.

CONCLUSIONS AND RECOMMENDATIONS

This report has been of rather limited scope; concentrating as it has on electromagnetic results from one small area of E.L. 44/88

and it would be appropriate to conclude with some thoughts and recommendations on the role of geophysics in general at Burns Peak. Before doing so, the results of the techniques described above are briefly discussed. Firstly, the UTEM. The coverage within E.L. 44/88 is extensive. But no drillable anomalies were recorded and one could perhaps draw the conclusion that most of the E.L. had been effectively searched to a depth of perhaps 250m or even 300m on the long traverses over resistive rocks. However, two provisos can be made: firstly there are definite limitations with fixed loop EM. Although this method is widely used in western Tasmania and Hellyer is justifiably cited as a successful application, it does presuppose a knowledge of the likely position and geometry of the conductor. This is not so for moving loop methods, which are much preferred where access is less of a problem. Secondly, the mineralisation at Pinnacles is much less conductive than the 'typical' volcanogenic massive sulphides exemplified by Rosebery, Hellyer or Que River. I have argued in the past that an economic sized deposit is likely to be more conductive; ie, more typical, but this may be wishful thinking. Presumably there is no reason why a deposit couldn't have Pinnacles' mineralogy, but be bigger. A petrographic study of the massive sulphides is recommended to see why the sulphides are such poor conductors: to determine whether the sphalerite coats the galena or whether the grains are separated by, for example, silica. Such a study might find that sulphides having more than a certain percentage of zinc, were effectively non-conductive.

Although only weakly conductive, the Pinnacles sulphides do have a high resistivity contrast with the silicified country rocks and the CSAMT technique will respond to this. A published example of CSAMT successfully defining a buried poorly conducting body in a resistive host is in the Red Dog, Alaska case history (Van Blaricom and O'Connor, 1989). The orebody, 77 million tonnes of 17% zinc and 5% lead with significant amounts of pyrite, has a resistivity of between 20 and 120 ohm-m and the host rock resistivities are in excess of 1000 ohm-m. However it must be admitted that one of the reasons that CSAMT works so well at Red Dog, is the flat lying attitude of the ore. CSAMT is not well suited for finding narrow, steeply dipping conductors, although the response can be considerably enhanced by placing the transmitter parallel to strike (see Appendix). Further use of CSAMT is recommended at Burns Peak for locating deeply buried mineralisation. The technique should also be able to outline areas of silicification and, in unaltered areas, to differentiate sedimentary horizons from volcanics and intrusives.

Comparisons between Sirotem and EM37 DHEM systems generally give very comparable results over the same time intervals (eg, Bishop et al, 1987). Thus reasons other than the differences in the two systems should be sought to explain the very large dissimilarities between the two sets of DHEM results presented in this report. The problem could be pursued by further surveying, but this is unlikely to be of any immediate economic benefit. Perhaps more pertinently, the exercise serves as a reminder of the importance of properly labelling drill holes and of the need to

thoroughly supervise contractors.

Given the poor conductivity of the target, much better down-hole responses would be expected from down-hole magnetometric resistivity (DHMMR) surveys than from conventional DHEM. As well as responding to sources too resistive for Sirotem or EM37 (eg, BHP's Cadjebut lead-zinc deposit in W.A.; Asten, pers. comm.), this technique also provides results which can lead to a much more certain positioning of the body. The energising source for a DHMMR survey is usually a grounded dipole and a standard IP transmitter. Thus electrodes can be placed down suitably placed drill holes to better concentrate the current through prospective horizons. (The receiver is a modified EM probe and the survey is normally done in the same manner as DHEM; ie, down holes lined with plastic casing.) Testing of the relatively new technique is recommended on the Pinnacles sulphides. Also recommended for testing is the older, if not better established, technique of MIP (magnetic induced polarisation) to see if it better defines the Pinnacles mineralisation than the fixed loop EM. The method is well suited to finding less conductive mineralisation on two points (1) any sulphides, other than sphalerite, should give an IP effect and (2) the injection of current along strike will concentrate in the target 'conductor' provided it is less resistive than the host rocks. I can however, make no comment about the depth penetrating capabilities of MIP, since there has not yet been any thorough independent testing of this patented method.

Prior to carrying out any of these recommended tests, a compilation of all of the previous work is required. Not only does this provide a proper knowledge of what has been done before and where, it also may reveal prospective zones which have been inadequately explored. Also, goals change; an IP survey done some years ago for massive sulphides (with negative results), might now be most useful for defining a volcanic-hosted gold deposit. The compilation should be done using a computer based drafting system to allow replotting of any desired area at a more detailed scale.

Mapping and re-defining of lithologies is still being done at Burns Peak and a good set of aeromagnetic data would assist this task. At present there is no such data set. Neither the 1981 Geoex survey, nor the Dighem magnetics extract the most (or even much) from the area. Re-surveying with a close line spacing and low terrain clearance in recommended. However it is pointed out that although such a survey might be able to distinguish between two weakly magnetic rock types which are close to outcropping, it is unlikely to be able to do so beneath significant thicknesses of glacial till or younger (eg, Dundas) sediments. There is a good regional coverage of gravity which can be used for defining deep seated structure. Infilling would provide more local information.

Radiometrics are usually flown in conjunction with magnetics, but

this method seems to have been ignored in Tasmania; the conventional wisdom being that gamma rays will not penetrate through the soil and vegetation cover. However I would like to see this properly tested. Large crystals flown low and slow, might well provide useful information on alteration and lithologies.

CSAMT is recommended as the technique with the best resolving power for deep-seated, poorly conductive mineralisation. The test surveys covered only a small area and better mapping results would be expected from a broader coverage. If all mineralisaed horizons are silicified, as at Pinnacles, then very prominent anomalies can be expected from massive sulphides of economic tonnage. The system has been improved since the trial and can now read to 8khz, thus providing more near-surface information. The use of transmitting parallel to strike should also be tried, especially where steeply dipping mineralisation is suspected.

Whilst one dislikes continually recommending test surveys, the successful explorer is likely to the one that uses the new, the different, approach and therefore exploration companies must expect a significant part of their budget to be spent trialling methods. Hellyer was cited above as a successful example of the then new technique UTEM. Hellyer's major shareholder, Cominco, spent several hundreds of thousands of dollars developing that system. As was suggested above, test surveys of DHMMR and MIP are recommended at Pinnacles. If the former is successful, it should however be used as a complement rather than as an alternative to DHEM. A summary of the conclusions and recommendations is given in Table 2.

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Sept., 1989

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Table 1a

PETROPHYSICAL MEASUREMENTS

Sample no.	Drill hole	Depth (m)	Galvanic resistivity (ohm-m)	Inductive conductivity (S/m)	Density t/c.m.	Magnetic susceptibility x 10^{-6} cgs	IP effect (PFE) (0.1-10Hz)	Cu/Pb/Zn (Py/Comb. sulph.) (%)*
BHP Lot 87/1								
1	(costean)	16(?)	60.	1.9	4.38	n.m.	20.	-
2	EAF 3	37.2	172.	2.2	3.92	"	6.	2.3/15.7/25.2 (- / >60)
3	EAF 6	58.75	37.	0.8	3.55	"	13.	0.6/ 3.8/ 8. (- / >60)
4	EAF 7	156.5	1127.	0.5	3.20	"	25.	- / 0.1/ 0.1 (25/ -)
5	EAF 9	163.2	1168.	0.6	2.95	"	7.	0.6/ 2.9/20.4 (- / 40)
6	" "	167.7	23.	1.5	3.98	"	10.	1.0/11.0/38. (- / 30)
7	" "	170.4	25.	2.5	4.33	"	14.	0.2/12.2/30.4 (- / 30)
8	" "	174.9	98.	1.8	3.69	"	19.	1.2/ 0.3/ 0.1 (- / >30)
9	EAF 10	98.8	27.	17.1	4.20	"	13.	4.1/ 6.4/35.7 (- / 40)
10	" "	99.3	90.	3.8	4.12	"	18.	2.2/ 8.1/36.8 (- / -)

* Pyrite or combined sulphide percentages are visual estimates made prior to assay. A high combined sulphide estimate and low assay values, suggest high pyrite.

Table 1a (continued)

PETROPHYSICAL MEASUREMENTS

Sample no.	Drill hole	Depth (m)	Galvanic resistivity (ohm-m)	Inductive conductivity (S/m)	Density t/c.m.	Magnetic susceptibility x 10^{-6} cgs	IP effect (PFE) (0.1-10Hz)	Cu/Pb/Zn (Py/Comb. sulph.) (%)*
11	" "	106.5	40.	0.8	3.50	"	29.	0.3/ 0.8/ 6.1 (- / 5)
12	" "	113.0	37.	0.7	3.64	"	23.	1.9/ 0.2/12.4 (10/ -)
13	EAF 15	25.5	463.	0.9	2.76	"	3.	0.1/ 0.1/ 8.3 (-/10-20)
14	EAF 18	43.6	90.	~0	3.46	"	8.	0.7/ 3.6/ 8.3 (3 / -)
Geopeko Lot 36								
1	EAF 9	170.3	n.m.	3.0	n.m.	5.	n.m.	0.2/12.2/30.4 (- / >60)
2	" "	186.1	n.m.	1.0	n.m.	105.	n.m.	3.1/ 0.2/ 0.3 (30-40/-)
3	" "	195.6	n.m.	2.0	n.m.	41.	n.m.	- / - / 2.8 (- / 20)

* Pyrite or combined sulphide percentages are visual estimates made prior to assay. A high combined sulphide estimate and low assay values, suggest high pyrite.

Table 1b

PETROPHYSICAL MEASUREMENTS

PINNACLES (DDH BP62)

Sample no.	Depth (m)	NBH-P ident.	Conduct. (S/m) (at xMhz)	Resist. (ohm-m) (at 1hz)	RQD*	(s.d.)	IP Effect (phase in mr)#	Mag. Susc. (10^{-6} cgs)	Density (t/c.m.)	Lithology
40/01	17.0	79340	~0	34,402	.84	(.11)	12.3	40	2.44	sediment
40/02	30.0	79341	~0	5,779	"	"	5.5	20	2.72	sediment
40/03	38.1	79342	~0	27,519	"	"	6.4	20	2.70	sediment
40/04	82.0	79330	~0	35,414	.93	(.08)	6.6	25	2.70	epiclastic
40/05	112.0	79329	~0	25,648	"	"	7.6	20	2.70	epiclastic
40/06	139.0	79331	~0	1,503	"	"	2.7	25	2.70	epiclastic
40/07	253.0	79332	~0	27,696	1.0	(0)	8.8	15	2.67	porphyry
40/08	326.0	79333	~0	54,169	"	"	14.4	10	2.66	porphyry
40/09	391.0	79334	~0	24,278	"	"	10.0	10	2.66	porphyry
40/10	448.5	79335	~0	59,526	"	"	13.5	50	2.66	porphyry
40/11	551.0	79343	~0	2,395	.89	(.10)	13.0	25	2.82	altered volcs
40/12	575.6	79344	~0	257	"	"	27.9	10	2.78	altered volcs
40/13	608.9	79345	~0	6,404	"	"	24.4	20	2.74	altered volcs
40/14	612.8	79336	~0	3,640	.96	(.05)	2.8	22	2.73	rhyolite lavas
40/15	623.7	79337	~0	11,644	"	"	4.1	15	2.72	rhyolite lavas
40/16	634.2	79338	~0	20,605	"	"	9.5	10	2.72	rhyolite lavas
40/17	657.0	79339	~0	52,135	"	"	8.0	10	2.70	rhyolite lavas

samples measured at University of Sydney (July, 1989).

* Rock Quality Designation is total metres of core recovered in sticks greater than 0.1m long divided by total metres drilled (measured in 3m lots) and is a measure of the jointing and fracturing in the rock. Standard deviation in brackets.

1 milliradian is approx. equivalent to a chargeability of 1ms.

Table 2

Burns Peak (E.L. 44/88) Electromagnetic Surveys

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Conclusions

* The regional coverage of UTEM suggests there is no economic sized deposit lying within 50-100m of the surface.

* Reduced penetration of UTEM because of poorly conducting nature of the Pinnacles mineralisation (assumed to be the 'target type' in this region).

* The test survey of CSAMT was 'successful', but indicated no significant body of sulphide between 5200N and 5800N at Pinnacles.

* The DHEM EM37 surveys carried out to compare results with earlier Sirotem surveys were not successful. Gross dissimilarities suggest different loops and/or holes were used.

Recommendations

* A compilation of all previous geophysical surveys. This should be done using a digital data base to allow detailing of any given area.

* Flying a detailed airborne magnetic/radiometric survey to aid mapping of lithologies and structure.

* A test survey of DHMMR to confirm the better response of this new technique over conventional DHEM for poor conductors.

* Whatever the results of the DHMMR test, a continual use of DHEM down all exploration holes.

* A test survey of MIP over Pinnacles to compare with the fixed loop EM results.

* The use of CSAMT for deep-seated exploration.

APPENDIX 1

Summary Description of the CSAMT Technique

INTRODUCTION

The magnetotelluric (MT) method, using the earth's magnetic and electrical fields, was developed in the 1950's for regional structural and petrophysical analysis. (Vozoff (1972) gives a good collection of papers on the subject.) This led to the audiomagnetotelluric (AMT) method, which, with its higher frequencies, was used to detect smaller conductors at the shallower depths of interest to mineral exploration. To overcome the problems caused by the low and unevenly distributed signal levels of these natural fields, a controlled source audio-frequency magnetotelluric (CSAMT) technique was developed in the 1970's. A comprehensive description of the theory, instrumentation and interpretation of the technique is given by Zonge and Hughes (in prep.).

INSTRUMENTATION AND FIELD PROCEDURE

CSAMT requires a grounded dipole source 1000m to 2000m long which is energised by a variable frequency generator. The receiving station consists of a grounded dipole to measure the electric field and a ferrite coil to measure the magnetic field (Figure A1). These measurements are stacked, averaged and stored for later processing. To approximate the 'plane-wave' nature of natural sources, there must be a large separation between the transmitter and receiver. A distance of three skin depths for the lowest frequency is considered to be a minimum separation. Distances greater than this are referred to as 'far field'. Measurements can be made at closer distances ('near field'), but interpretation is much less reliable. The effect upon the data of different Tx-Rx distances in a homogeneous earth can be seen in Figure A2: the resistivity apparently increases with depth (ie, decreasing frequency) the shorter the Tx-Rx distance. In a non-uniform earth, the picture becomes more complex. Figure A3 shows the results for a two layered earth: for a resistive layer over a less resistive rock (Figure A3(a)), there is little variation with change in distance (the Burns Peak results may be related to

---

* Skin depth is defined as the depth (or distance) at which the source field's amplitude has been reduced to 1/e (ie, by ~37%) of its initial value. In non-magnetic rock, it can be defined as approximately:-

$$\text{Skin Depth} = 500\sqrt{\rho/f}$$

where ρ is resistivity and f the frequency. Thus the lower the resistivity or the higher the frequency, the smaller the skin depth.

this, with the conductive black shales lying between the transmitter and the receiver). But with a resistive basement, there are considerable differences (Figure A3(b)).

Traverses are usually made across strike with a station interval some fraction of the expected size of the target. The effective depth of penetration (the MT depth) is defined as the skin depth divided by $\sqrt{2}$ and is thus a function of both frequency and resistivity. The vertical resolution is ~20% of the depth of penetration "and is subject to the normal conductivity-thickness product ambiguity inherent to any EM measurement" (Zonge and Hughes, in prep.). The lateral resolution is approximately equal to the receiver dipole spacing, which is usually between 10m and 500m (20m for the Burns Peak surveys).

There are several types of CSAMT surveys, depending upon how many components of the EM fields are measured and how many sources are used. The Burns Peak surveys, measuring just one 'E' and one 'H' direction used the most basic type (termed 'scalar' CSAMT). If all components (three H and two E) are measured using two different sources ('tensor' CSAMT), then a better interpretation of two- and three-dimensional conductors can be made, including the direction of geologic strike. It is also possible to make measurements between these two extremes, however multi-component surveys take more time and Zonge and Hughes (in prep.) state that ~90% of surveys conducted so far, have used scalar CSAMT.

PARAMETERS

The basic parameters measured by the receiver are the amplitudes and phases of the electric and magnetic fields. From these are directly calculated the apparent (Cagniard) resistivity and the phase difference for each frequency employed. The expression for the Cagniard resistivity is:-

$$\text{Apparent Resistivity } (\rho_a) = [1/(2\pi f \mu_o)].[E/H]^2$$

Where E and H are the electric and magnetic fields respectively, f is the frequency and μ_o is the magnetic permeability. Thus the resistivity is a function of frequency and the lower the measured frequency, the greater the penetration.

CSAMT is a developing method and various derived parameters are often tried to assist the interpretation. They may include the Offset Phase Difference which has had the far field response subtracted from each data point and the Normalised Phase Difference which subtracts a background phase value (an average of several non-anomalous stations) from the offset phase difference. Resistivity from integrated phase produces a "true non-shifted (ie, no static-offset) resistivity section" (Zonge and Hughes, in prep.) and this parameter has been included in the Burns Peak plots; as has the 'real resistivity which is the in-phase component of the apparent (Cagniard or 'rho from phase') resistivity (see Spies and Eggers, 1986).

INTERPRETATION

There are numerous problems associated with the collection and interpretation of CSAMT data. They include the usual noise sources such as power-lines, plus spurious effects specific to CSAMT such as 'transmitter overprint', 'static off-set' and 'edge effect'. Zonge and Hughes (in prep.) note how these effects can be recognised and suggest ways in which they can be overcome or minimised. For example, since it is theoretically impossible in an ideal horizontally layered earth, to more than double apparent resistivities between two frequencies separated by a factor of 2, any such behaviour can be attributed only to transmitter-receiver separation, or to a significant departure from the assumed horizontally layered earth. A second example concerns the phase: in a homogeneous earth, the phase is n/4 radians (785 milliradians) in the far field and zero in the near field regardless of the resistivity. Thus phase can be helpful in recognising whether data was recorded in the near- or far-field.

A qualitative interpretation can be effected by picking out the areas of low resistivity on the pseudosections. A more quantitative approach includes the fitting of layered earth computer models to the data (ie, by so-called one dimensional inverse modelling). Figure A4 gives an example from line 5200N. A three layered earth gives a reasonable fit to the data. (The steep rise in resistivity with decreasing frequency (ie, with increasing period) seen in this figure illustrates why such a resistive section is indicated in the final interpretation. The figure also suggests a less resistive basement, although this has only been (poorly) defined by one point.) The data from all stations on one traverse can then be averaged to produce a resistivity pseudosection. This was done for the four Burns Peak lines and the sections were used as models for two dimensional (forward) modelling (Figure 7 of the main report). To better enable conductors to be recognised in the apparent resistivity - depth sections, some (two dimensional) modelling of various conductors has been carried out (Figures A5 to A10). They demonstrate that responses can be recognised from conductors at significant depths (500m was used for this exercise) and that these increase quite dramatically when surrounded by a halo of low resistivity disseminated sulphides. Three dimensional programs now exist and as these improve in efficiency (ie, the time taken to run a model), we can expect to see them used more regularly, together with more and different processing, as we seek to overcome the "several challenging interpretational difficulties" which CSAMT presents (Zonge and Hughes, in prep.).

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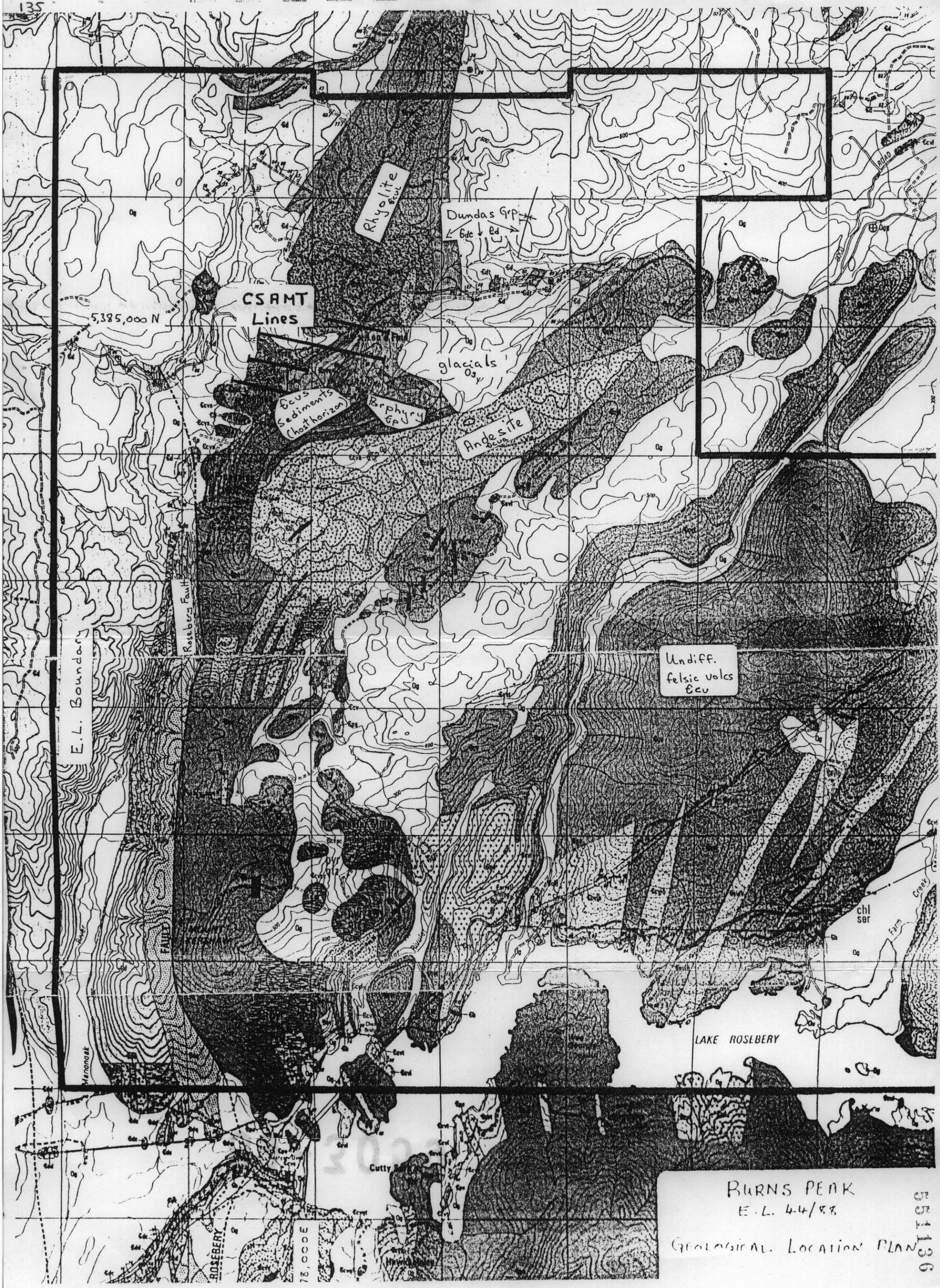
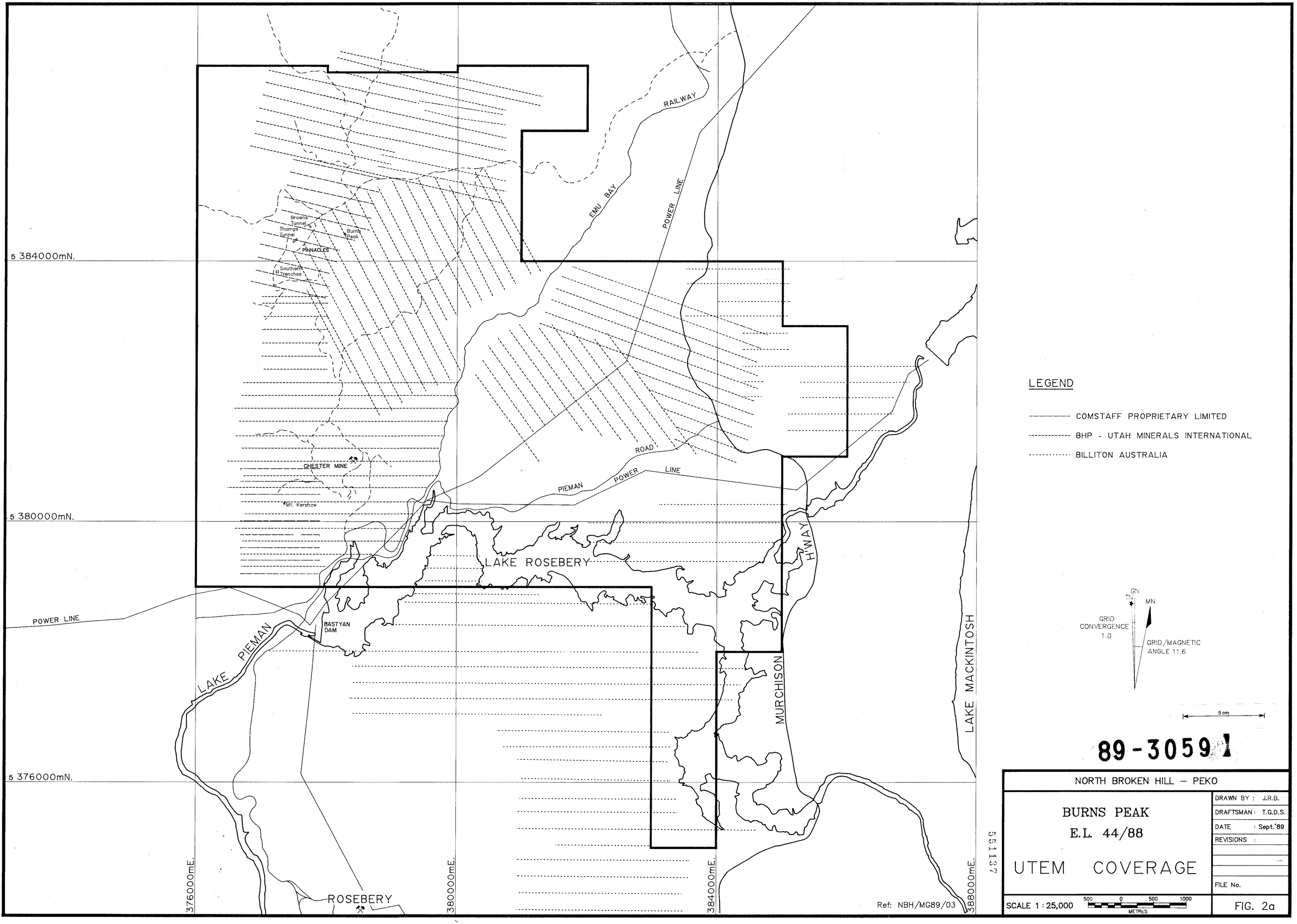


BURNS PEAK
E.L. 44/88

GEOLOGICAL LOCATION PLAN

SE 136



LEGEND

---------- COMSTAFF PROPRIETARY LIMITED

---------- BHP - UTAH MINERALS INTERNATIONAL

---------- BILLITON AUSTRALIA

GN
TN
MN
GRID CONVERGENCE 1.0
GRID/MAGNETIC ANGLE 11.6

5 cm

89-3059 1

NORTH BROKEN HILL – PEKO

BURNS PEAK
E.L. 44/88

UTEM COVERAGE

DRAWN BY : J.R.B.
DRAFTSMAN : T.G.D.S.
DATE : Sept.'89
REVISIONS :
FILE No.

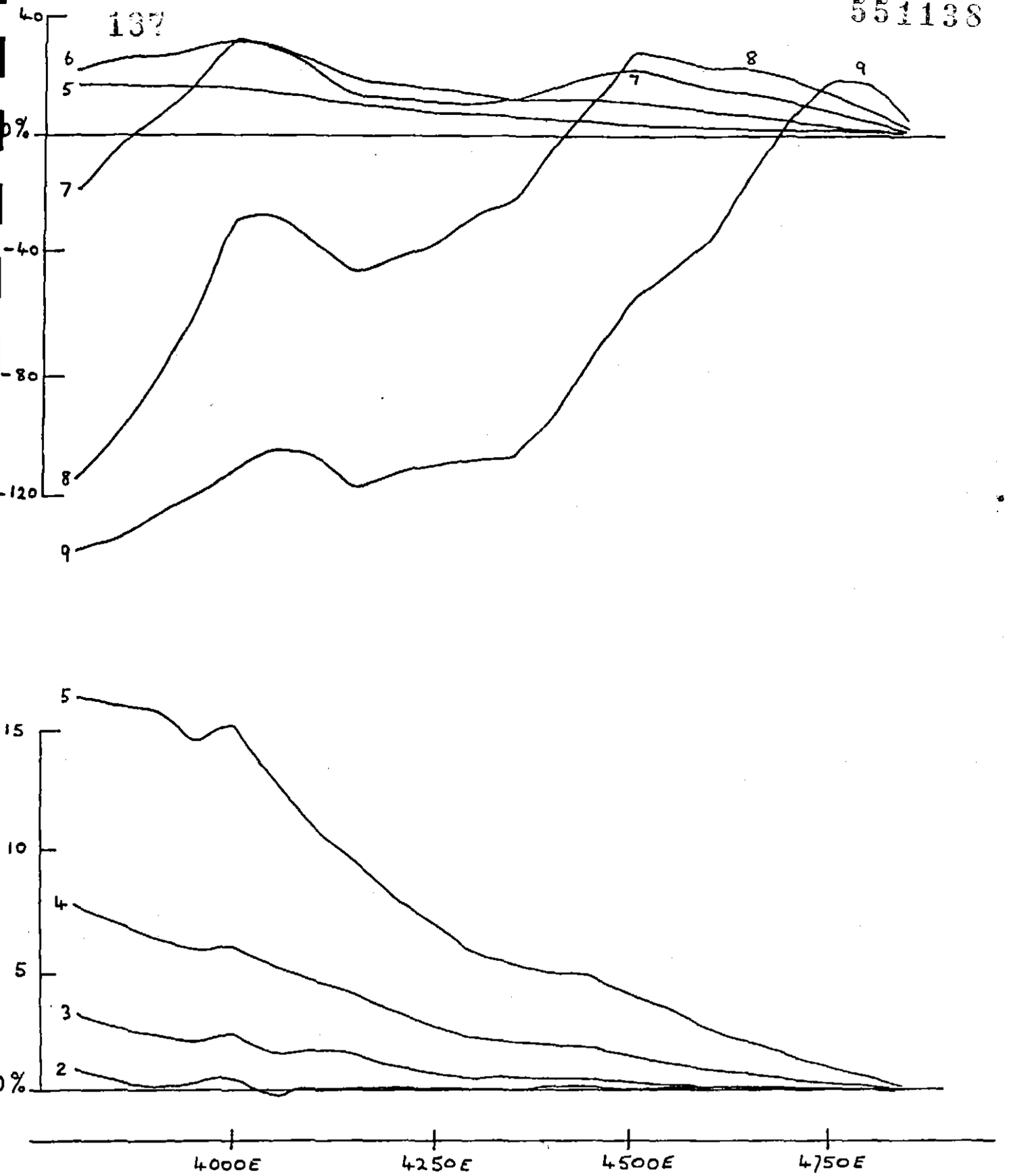
SCALE 1 : 25,000 500 0 500 1000 METRES

FIG. 2a

N.W. Coast Computer Aided Drafting Centre. Phone (004 354315)
Fax. (004 354495)

137

551138



continuous ch.1 normalisation

Burns Peak E.L. 44/88

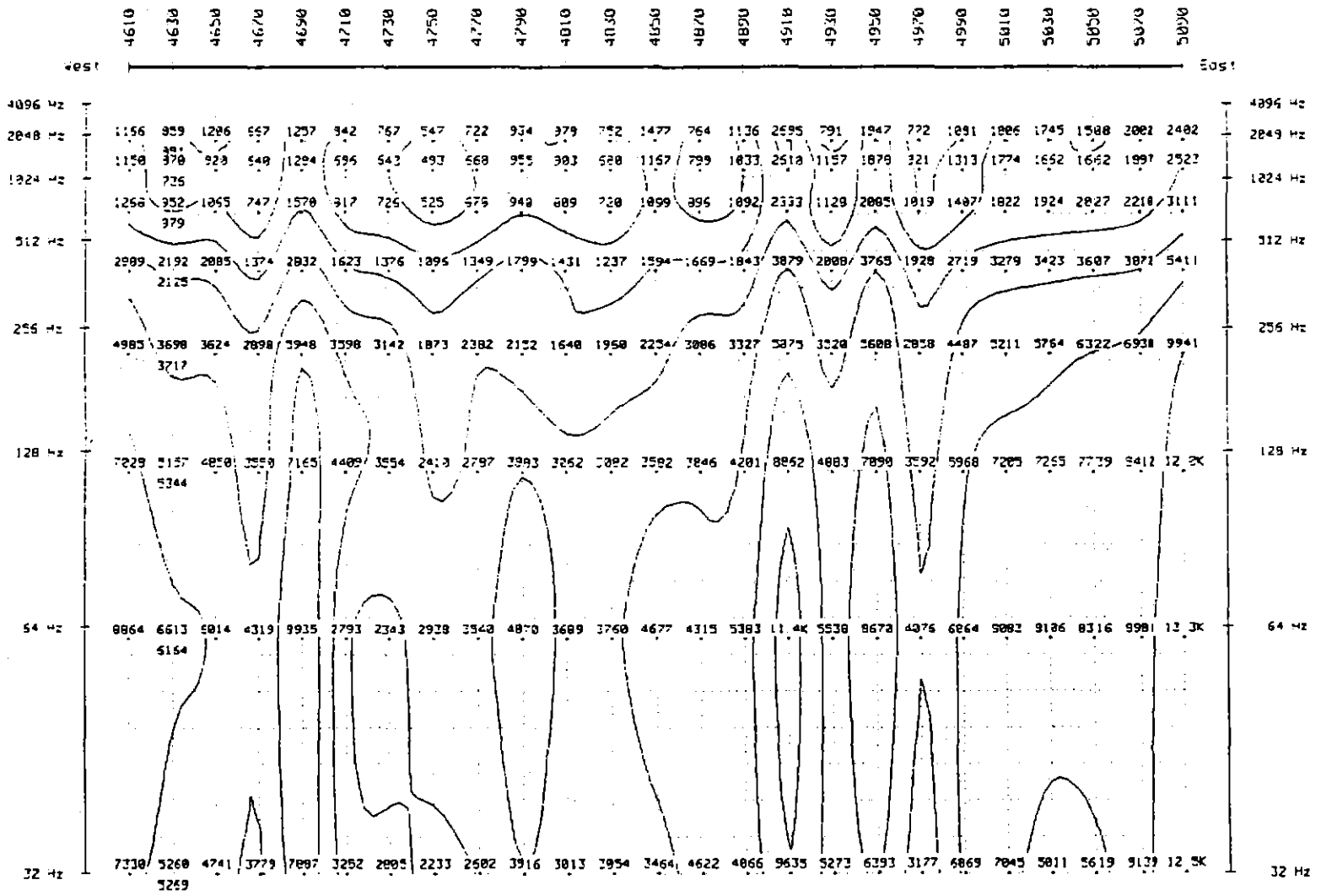
UTEM SURVEY

Line 7000N

Anomaly 'A'

NBH/MG89/03

Fig 21

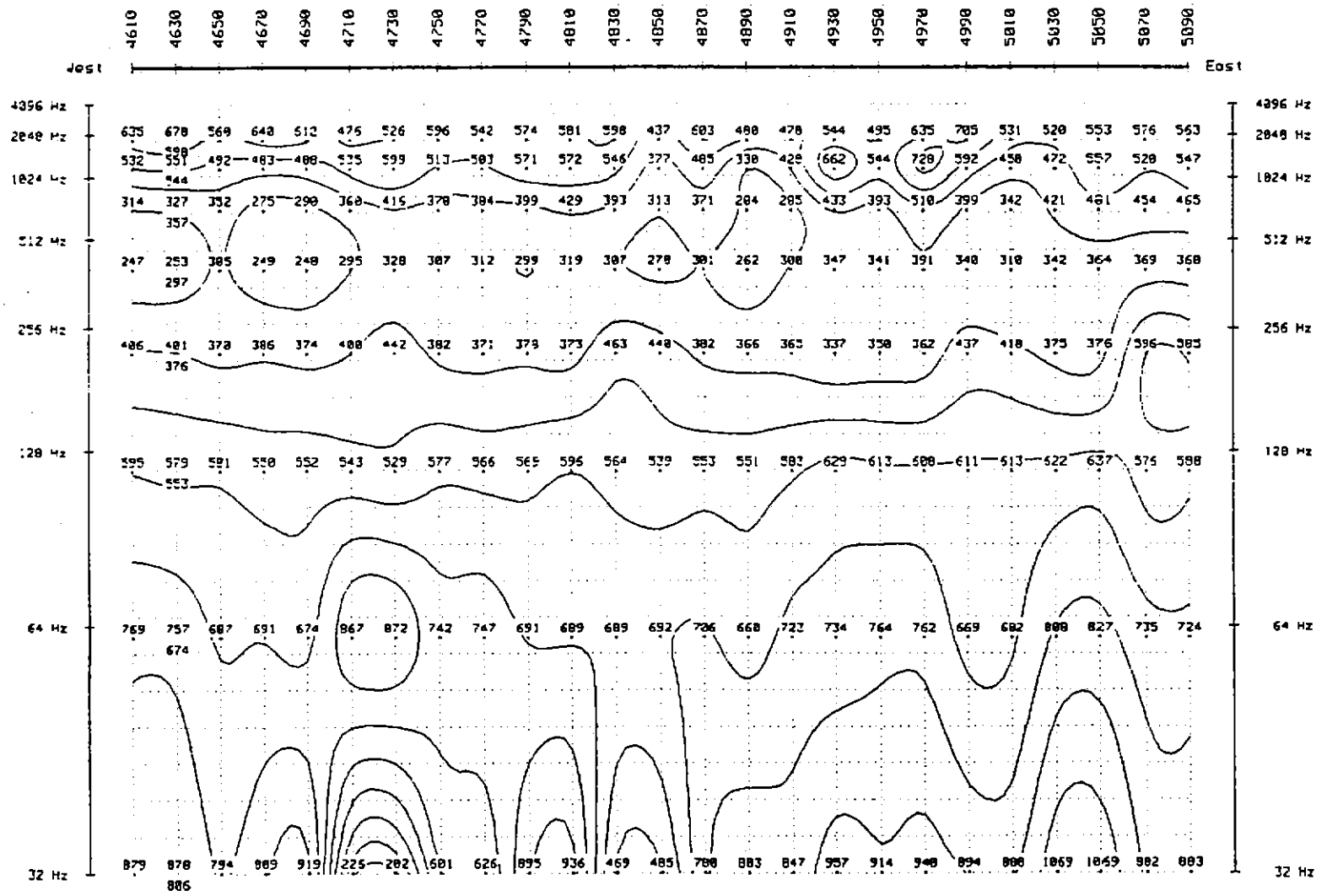


Burns Peak, E.L. 44/88
CSAMT: Cagniard Resistivity
Line 5200N Fig. 3a.

ref: NBH/MG89/03

GSC 136

139



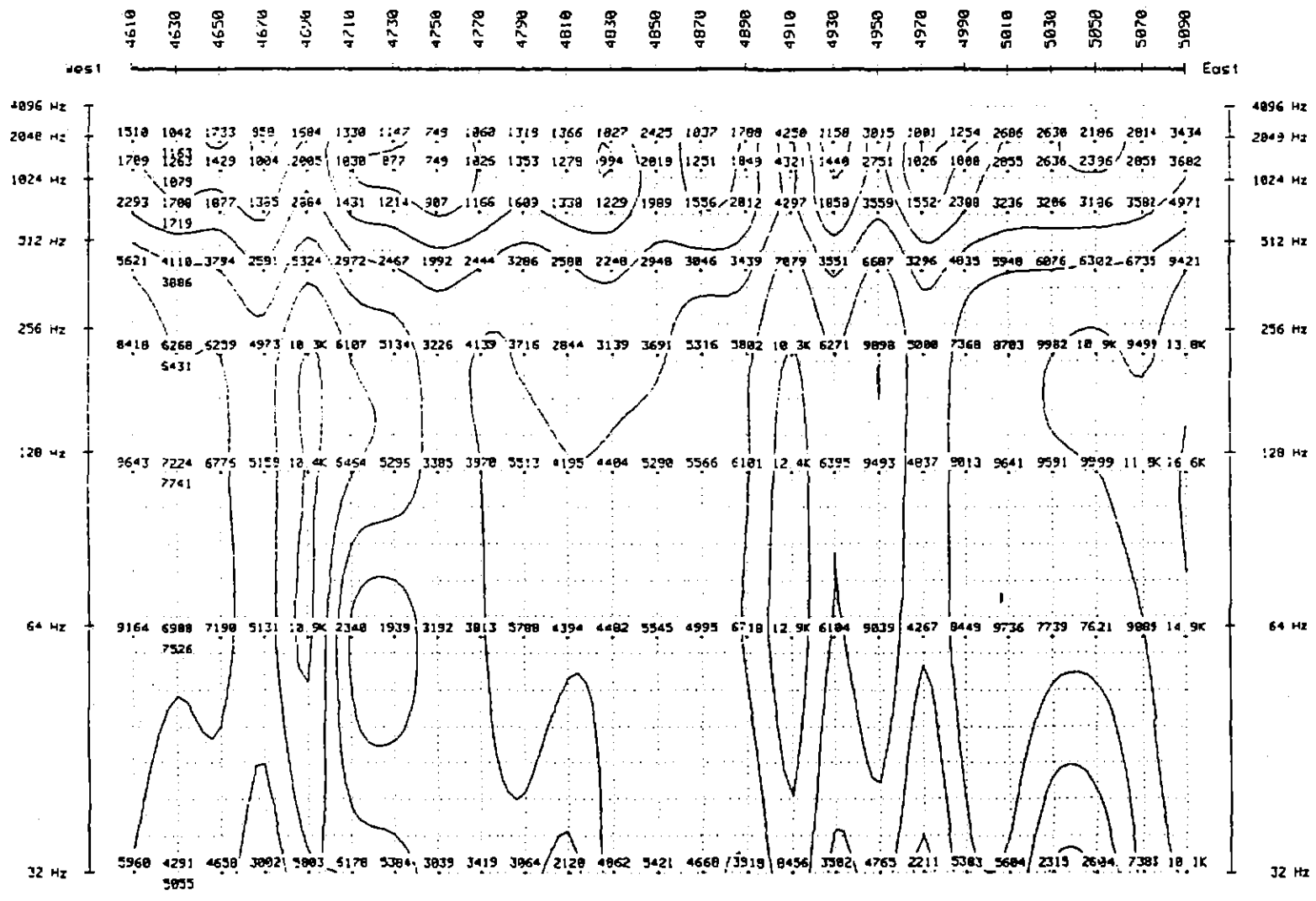
Burns Peak, E.L. 44/88

CSAMT: Phase Difference

Line 5200N Fig. 3b.

ref: NBH/MG89/03

OPEN FILE



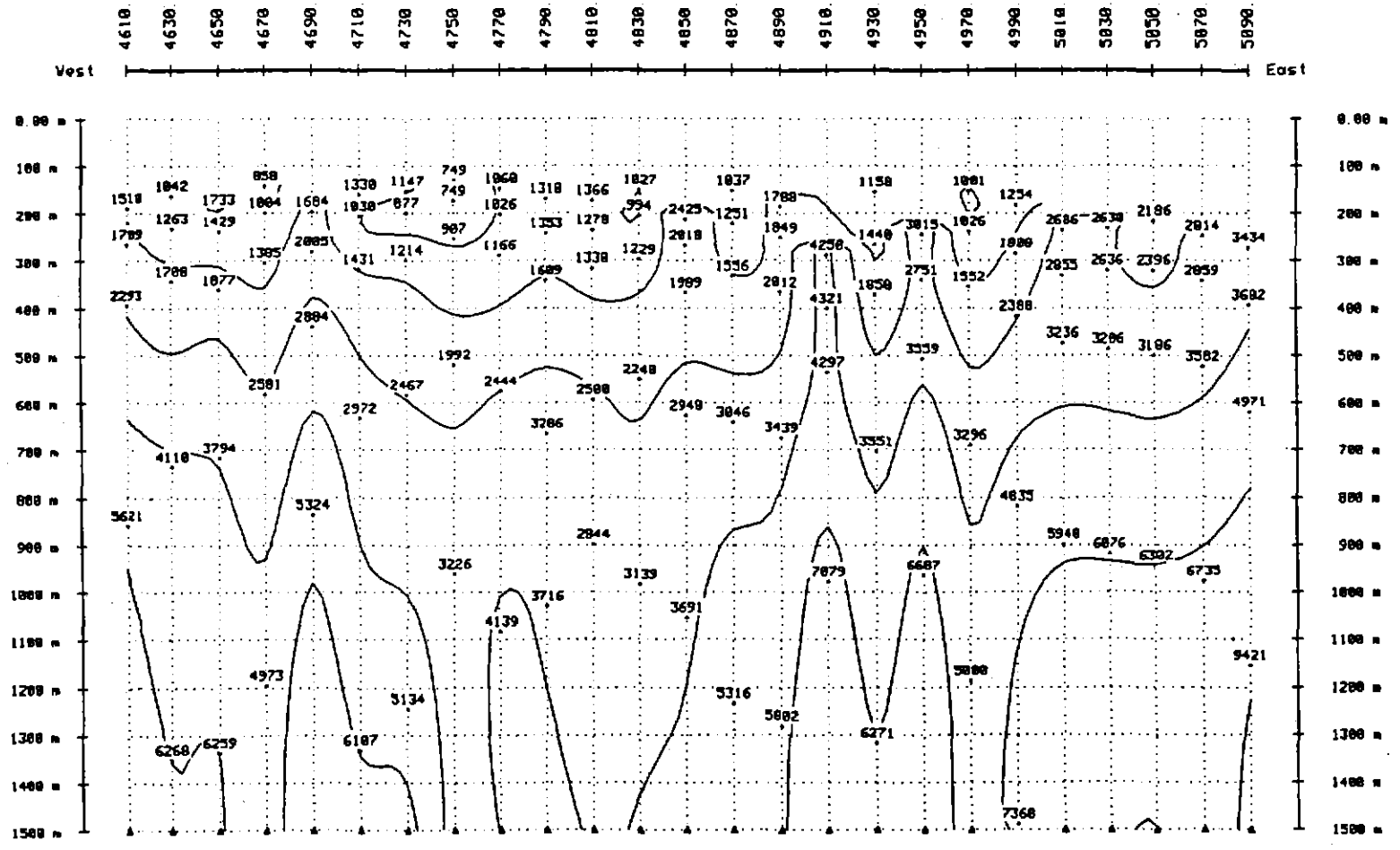
Burns Peak, E.L. 44/88

CSAMT: Real Resistivity

Line 5200N

Fig. 3c.

ref: NBH/MG89/03



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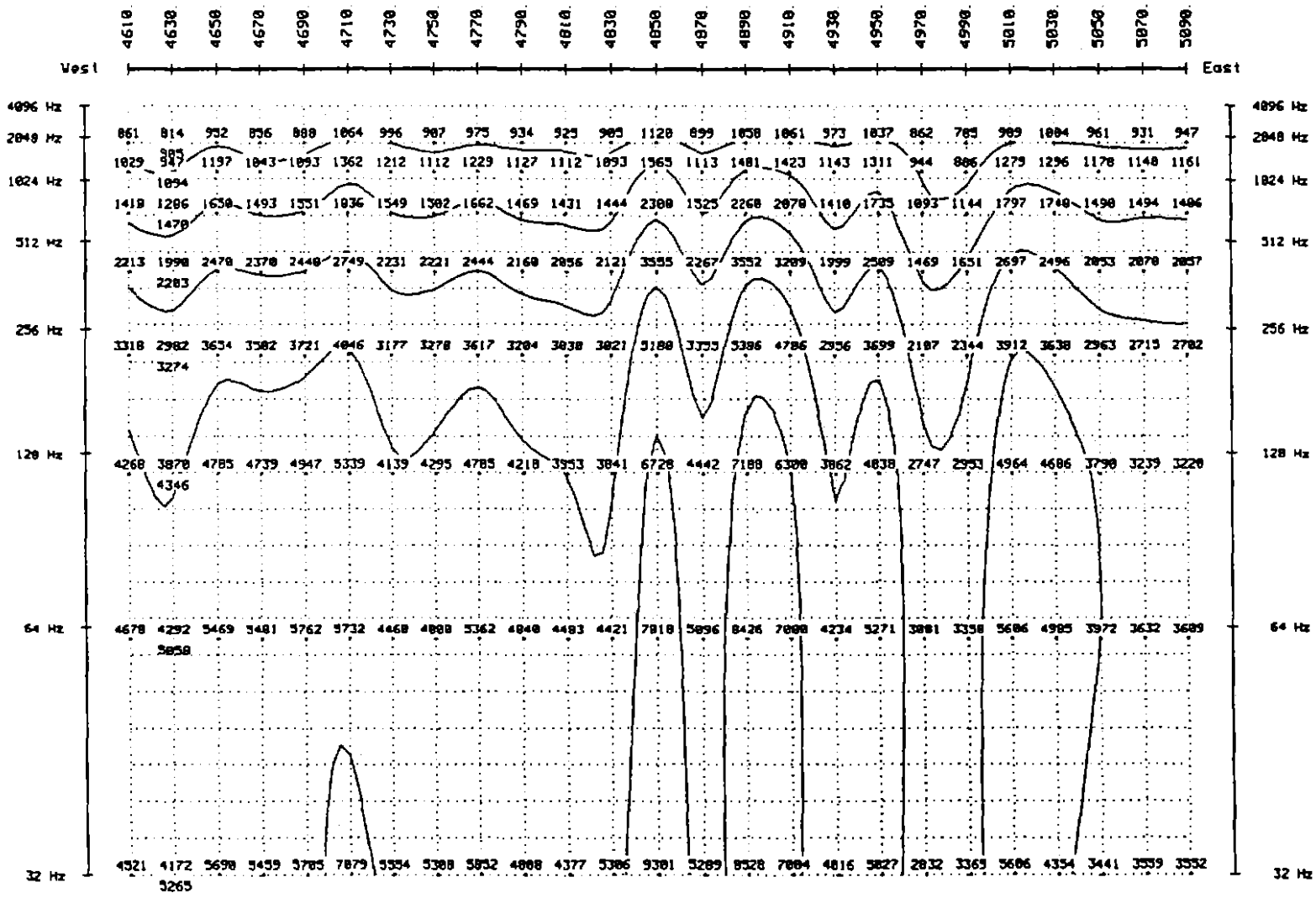
Burns Peak, E.L. 44/88
CSAMT : Real Resistivity - MT Depth
Line 5200N

Fig. 3d.

142

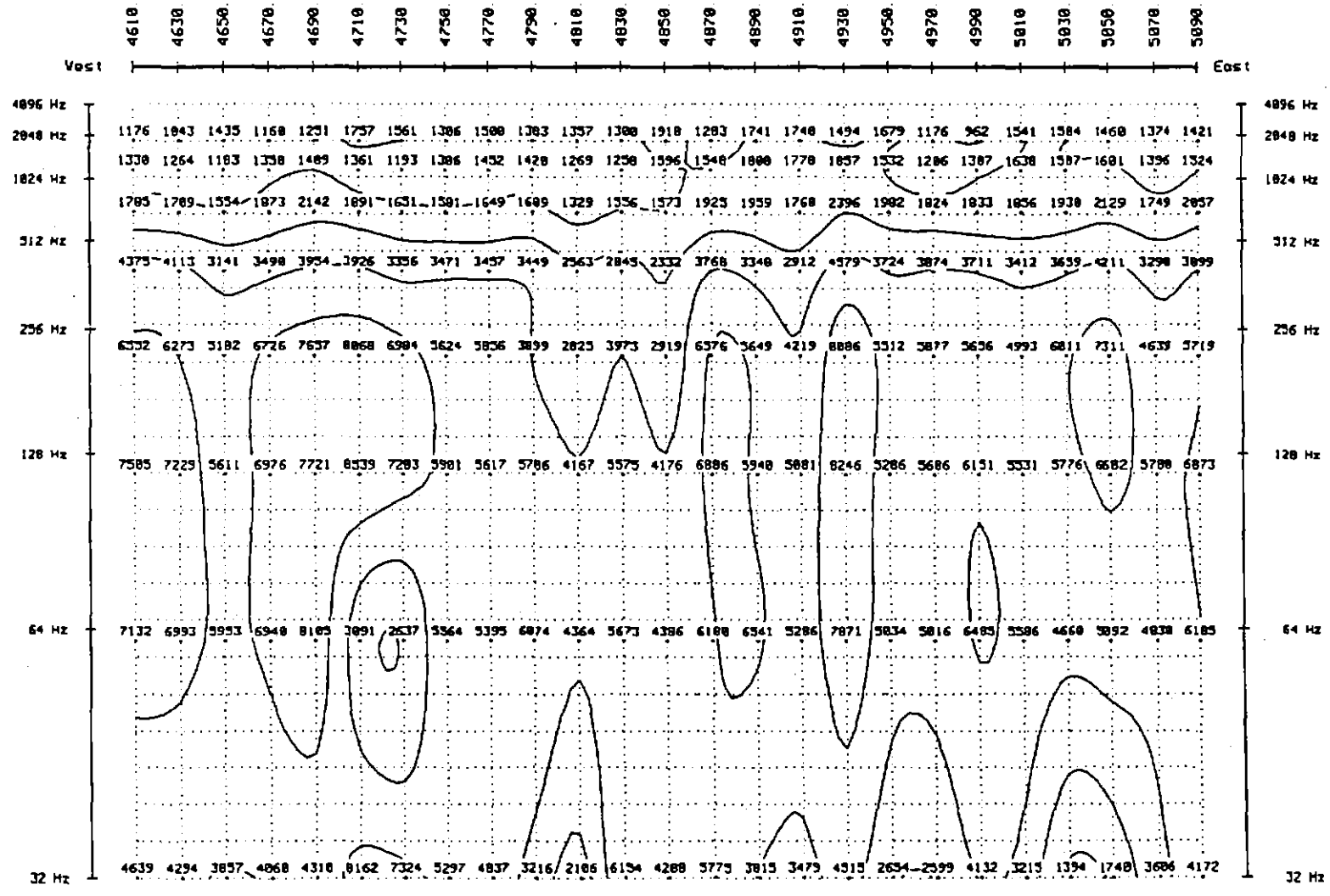


Burns Peak, E.L. 44/88

CSAMT: Resistivity from Phase

Line 5200N Fig. 3e.

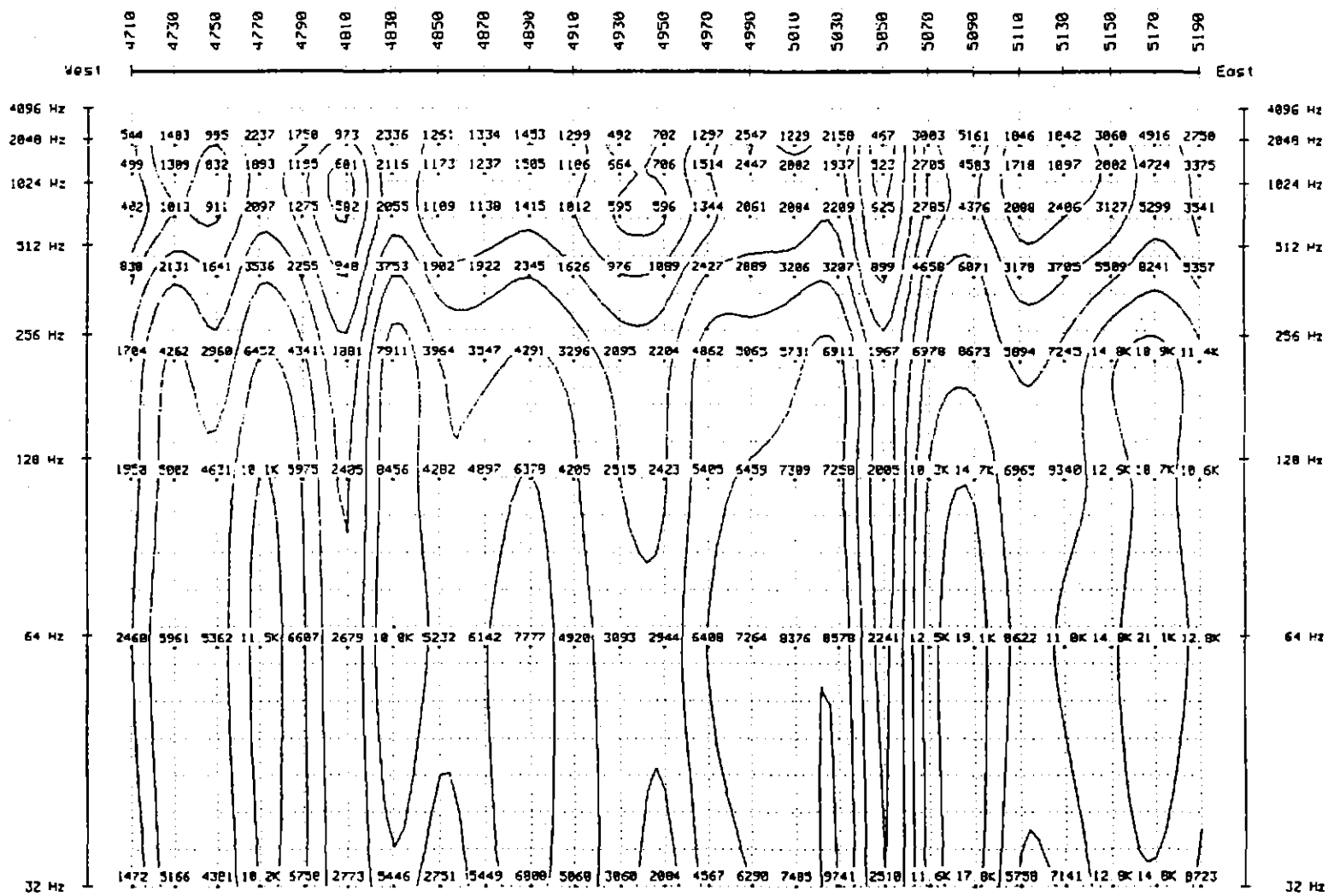
ref: NBH/MG89/03



Burns Peak, E.L. 44/88.
CSAMT: 'Reduced' Resistivities
Line 5200N

ref: NOH/HG89/03

Fig. 3g.



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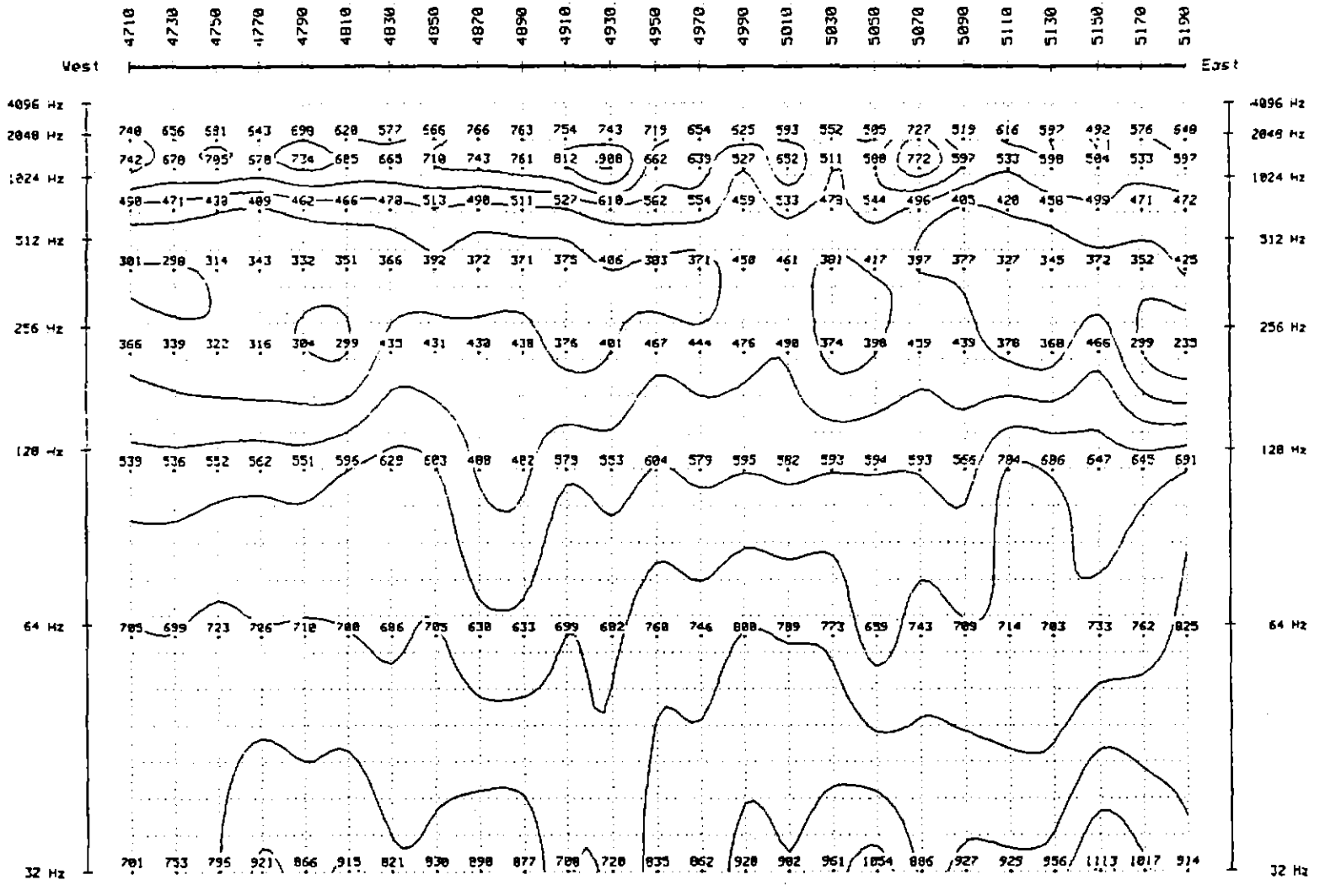
Burns Peak, E.L. 44/88
CSAMT: Cagniard Resistivity
Line 5400N

Fig. 4a.



Burns Peak, E.L. 44/88

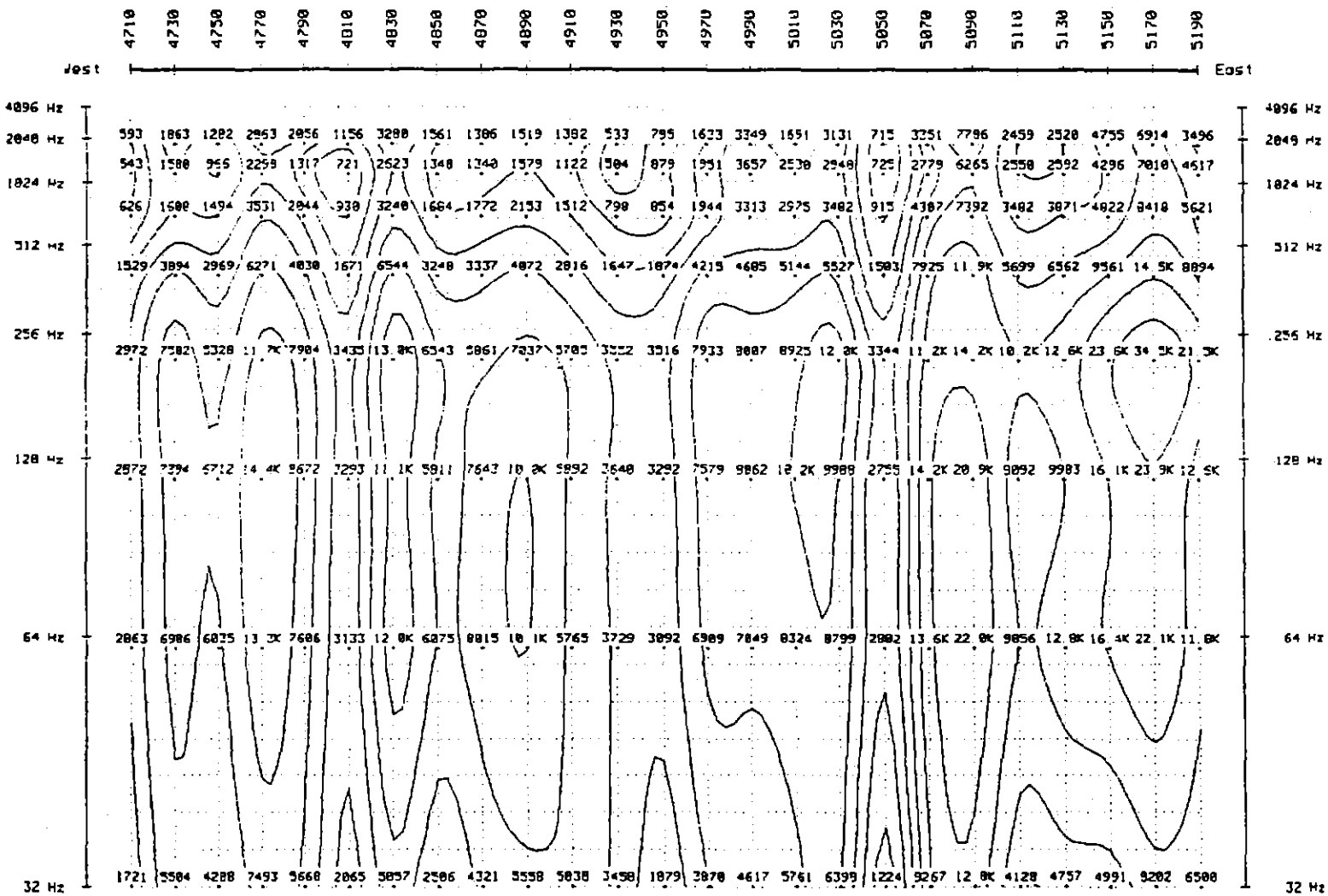
CSAMT: Phase Difference

Line 5400N

Fig. 46.

ref: NBH/MG89/03

OCT 90

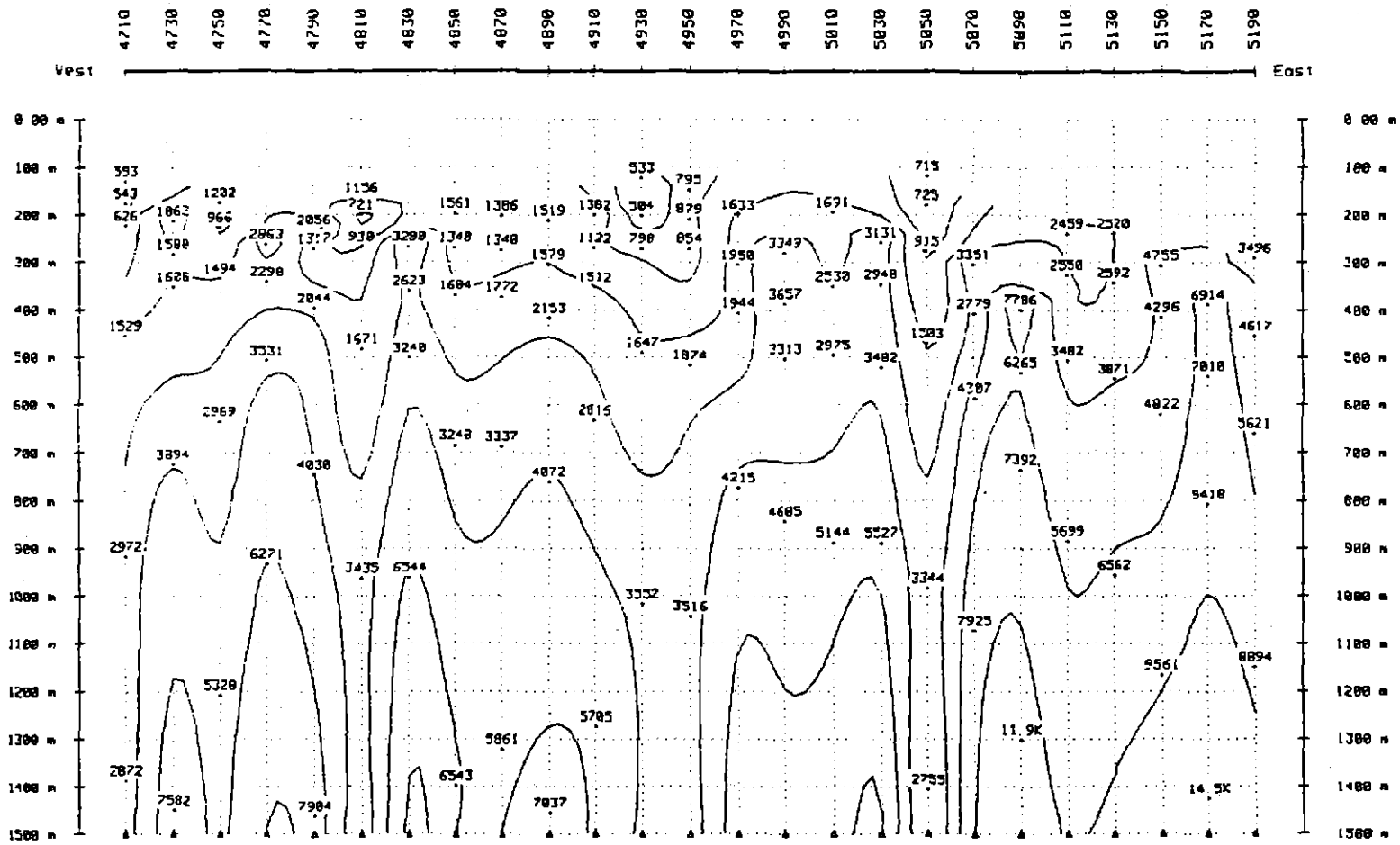


ref: NGH/MG89/03

Burns Peak, E.L. 44/88
CSAMT: Real Resistivity
Line 5400N

Fig. 4c.

55414



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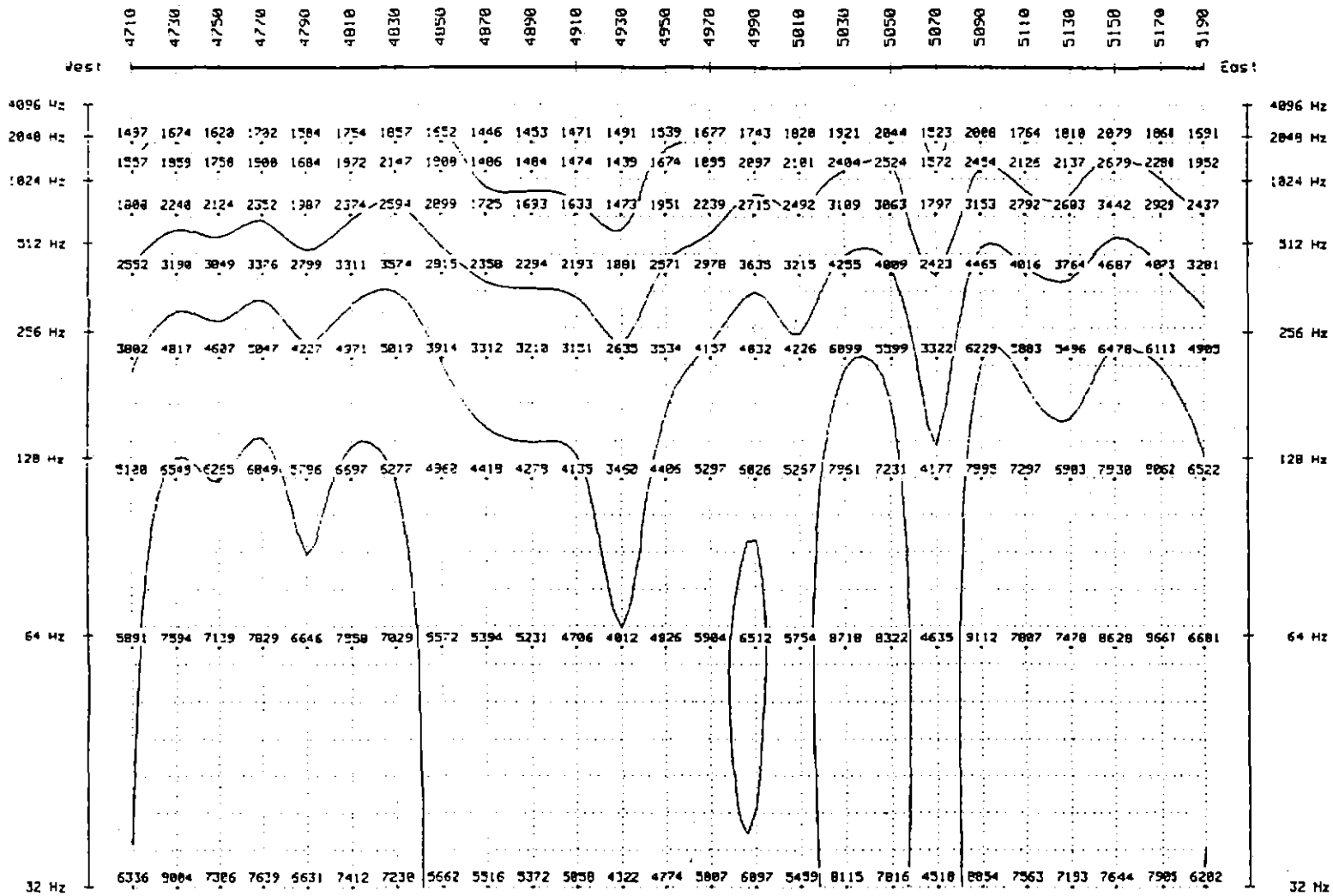
Burns Peak, E.L. 44/88
CSAMT: Real Resistivity - MT Depth
Line 5400N
Fig. 4d.



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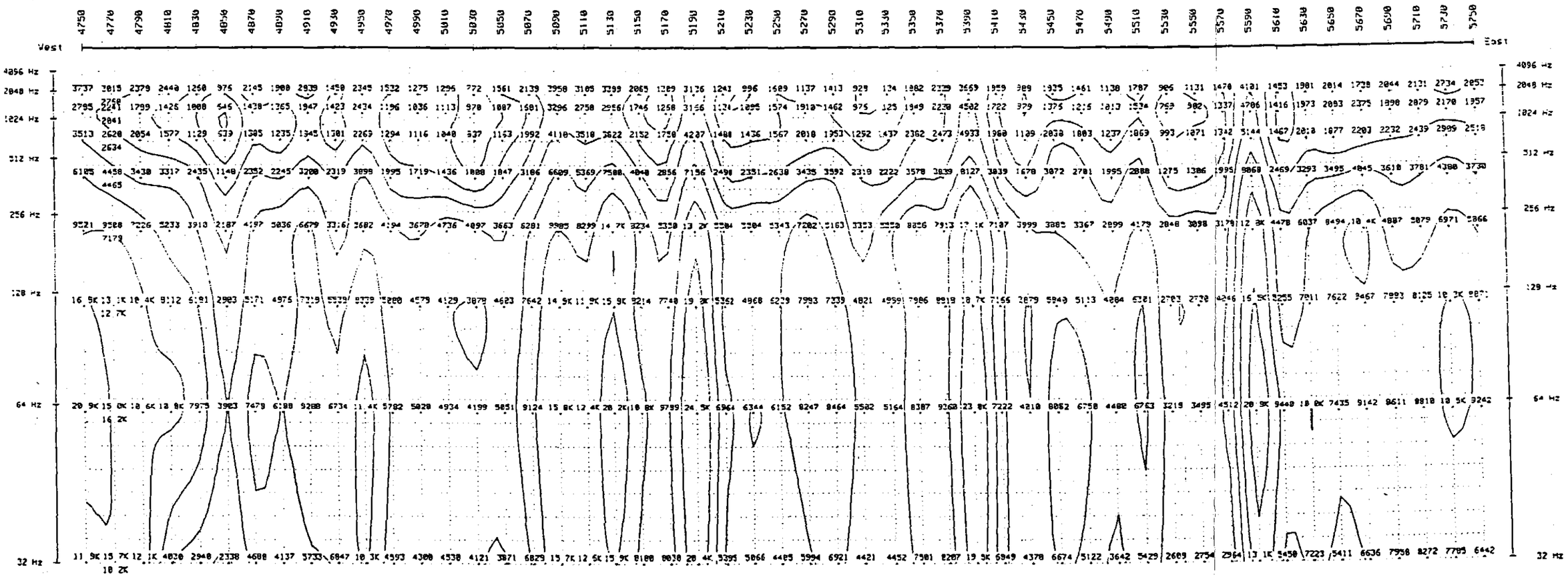
Burns Peak, E.L. 44/88
CSAMT: Resistivity from Phase
Line 5400N
Fig. 4e.

551150



Burns Peak, E.L. 44/88

CSAMT: Cagniard Resistivity

Line 5600N

Fig. 5a.

ref: NBH/MG89/03

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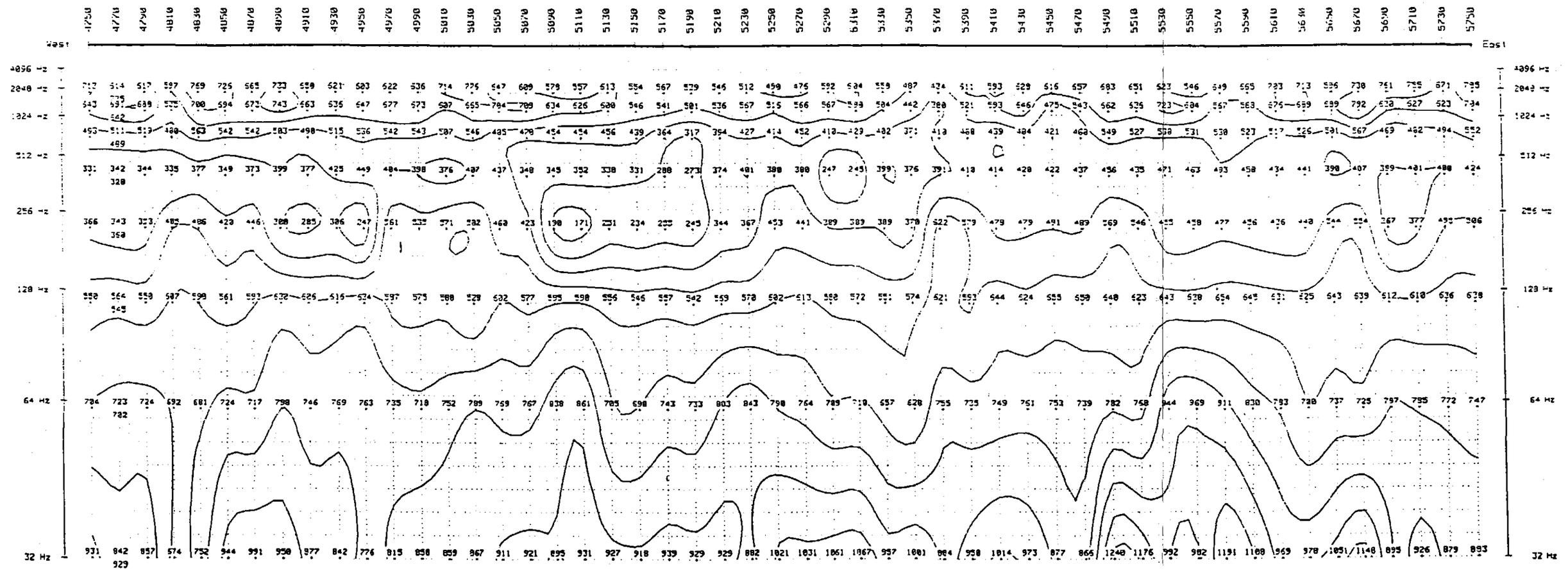


Burns Peak, E.L. 44/88

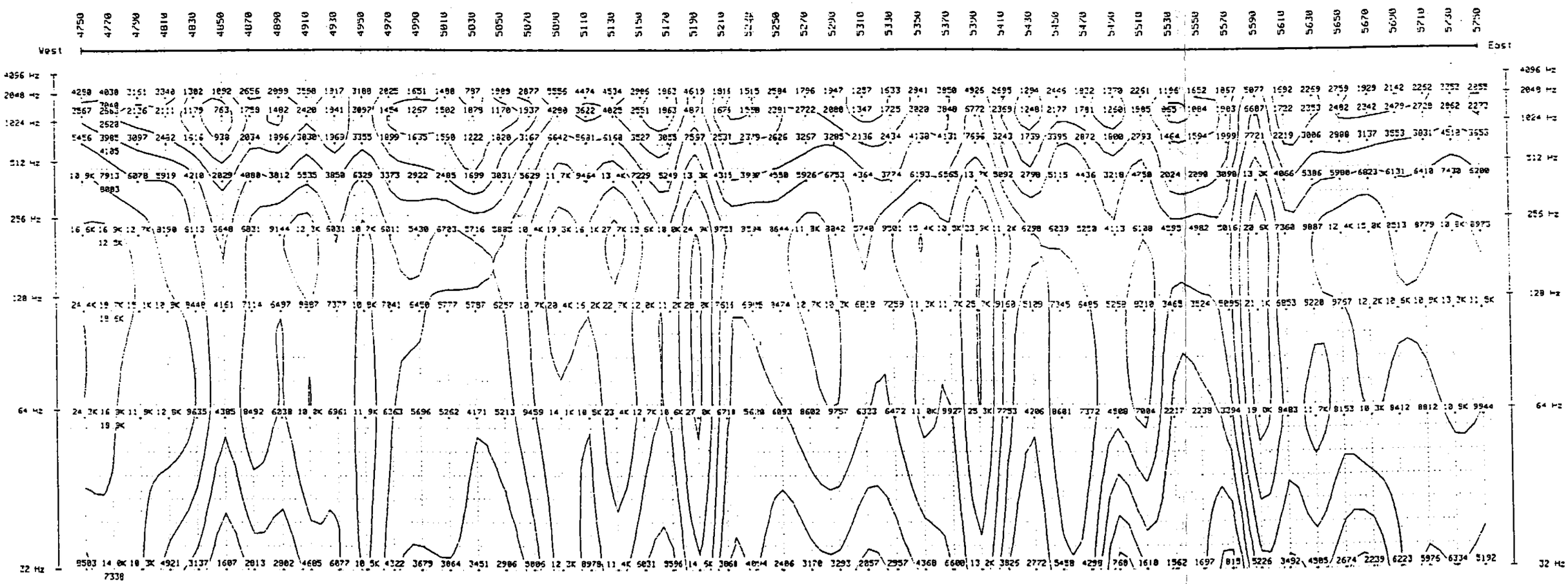
CSAMT: Phase Difference

Line 5600N

Fig. 5b.

ref: NBH/MG89/03

551152



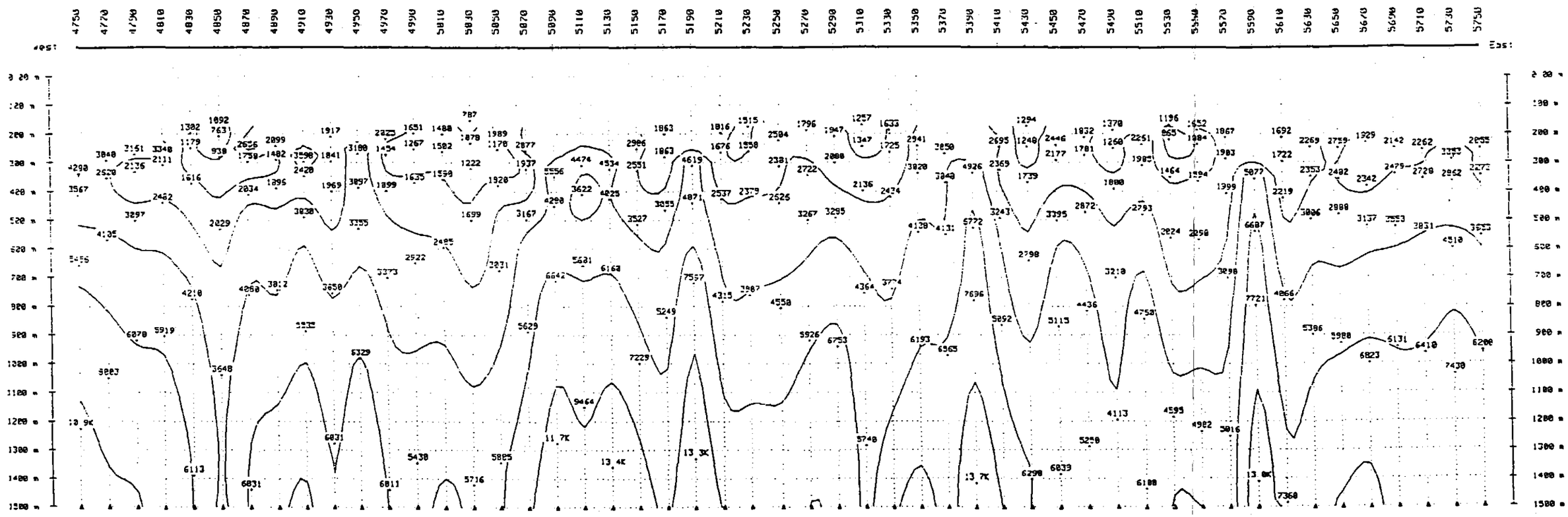
Burns Peak, E.L. 44/88

CSAMT: Real Resistivity

Line 5600N

Fig. 5c.

ref: NBH/HG89/03



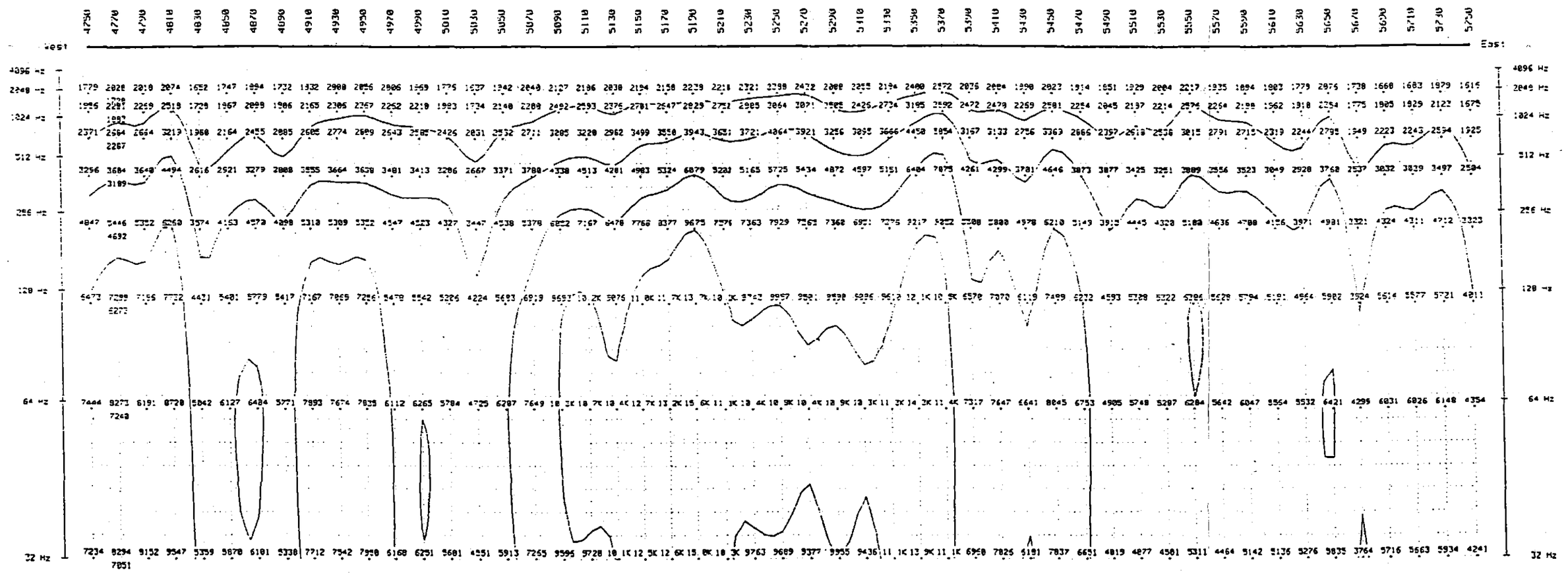
Burns Peak, E.L. 44/88

CSAMT: Real Resistivity - MT Depth

Line 5600N

ref: NBH/MG89/03

Fig. 5d.



Burns Peak, E.L. 44/88.

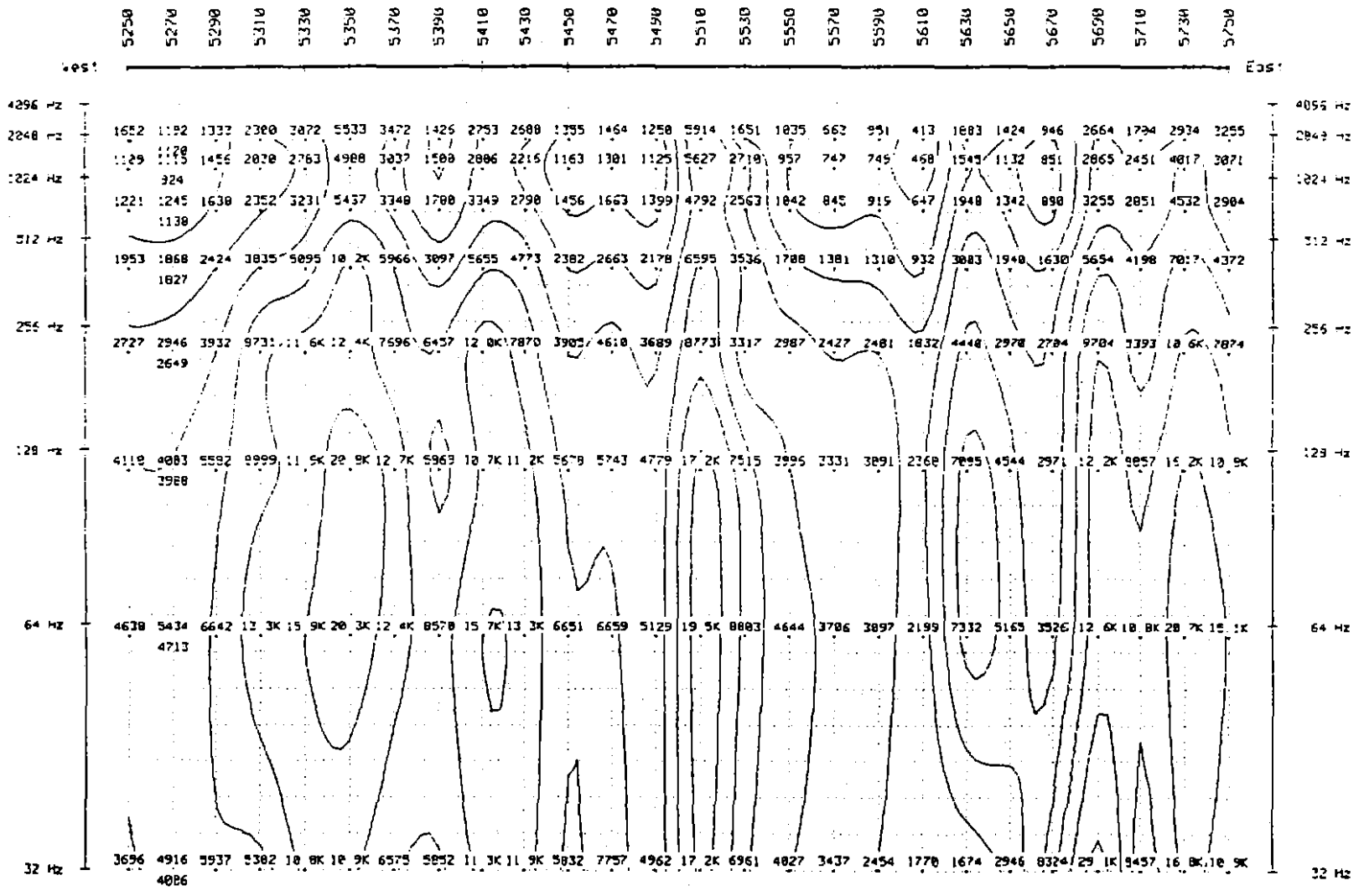
CSAMT: Resistivity from Phase

Line 5600N

ref: NBH/MG89/03

Fig. 5e.

154



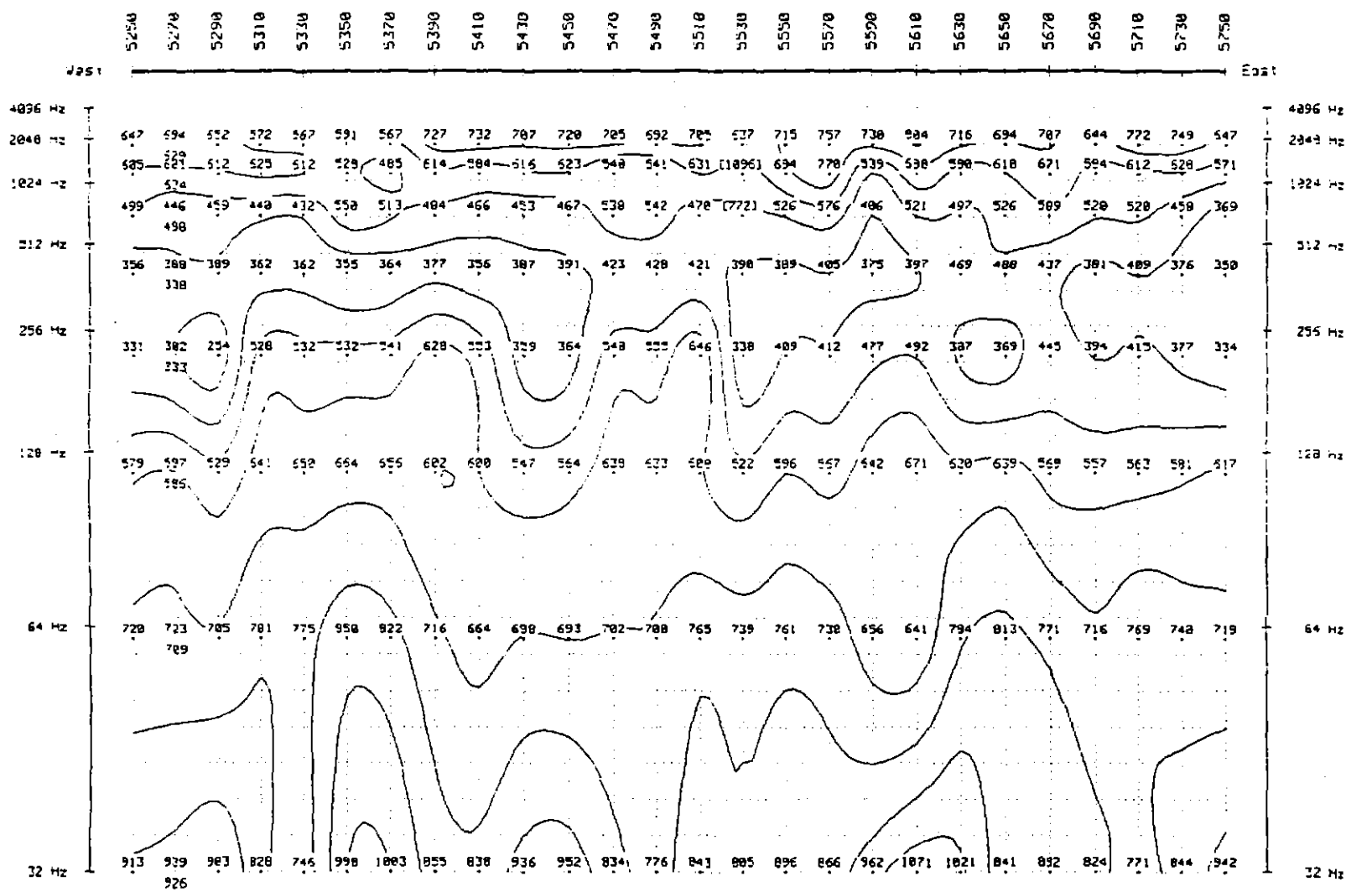
Burns Peak, E.L. 44/88

CSAMT: Cagniard Resistivity

Line 5800N

ref: NBH/MG89/03

Fig. 6a.



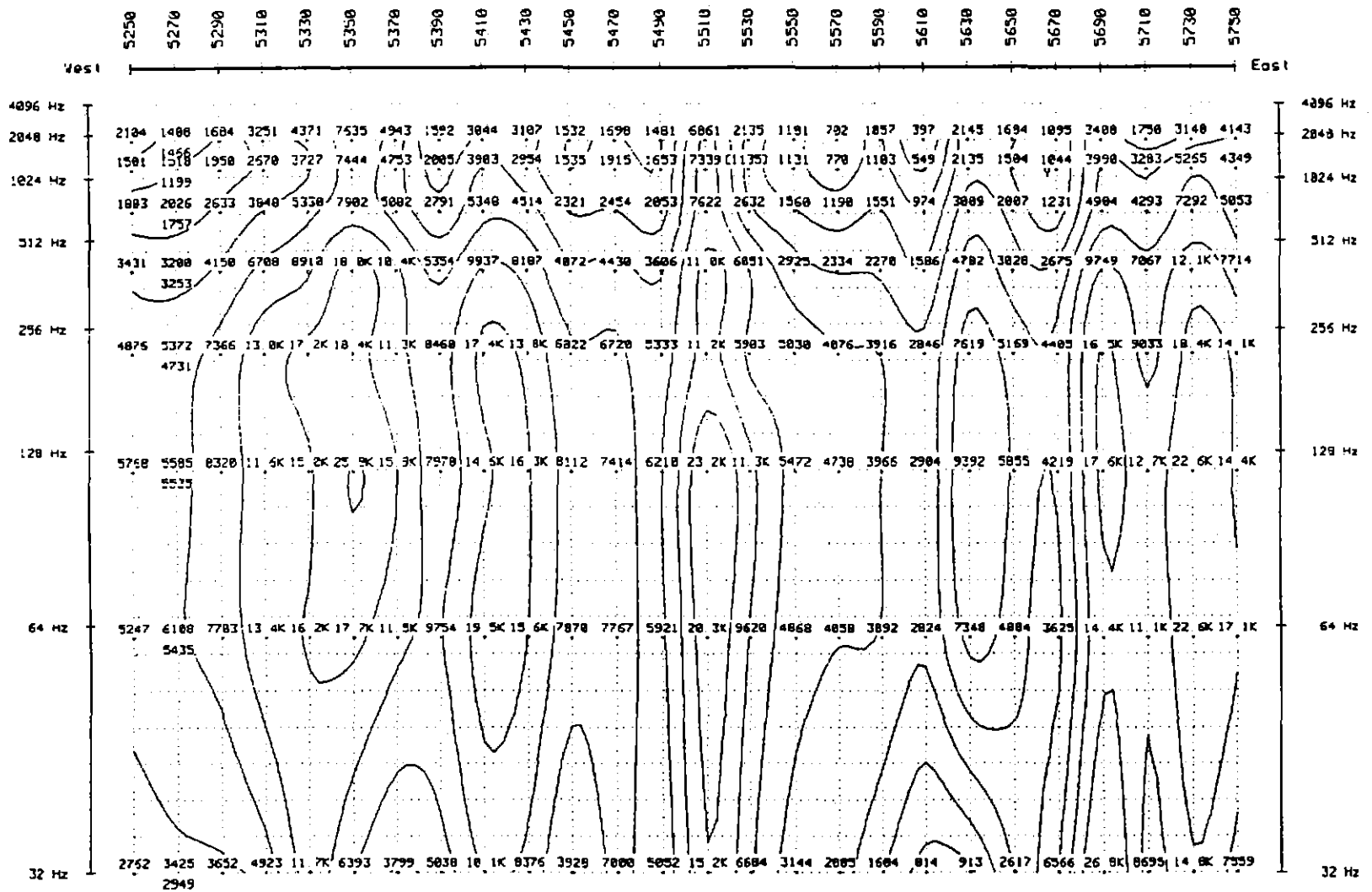
Burns Peak, E.L. 44/88.

CSAMT: Phase Difference.

Line 5800N

ref: NBH/MG89/03

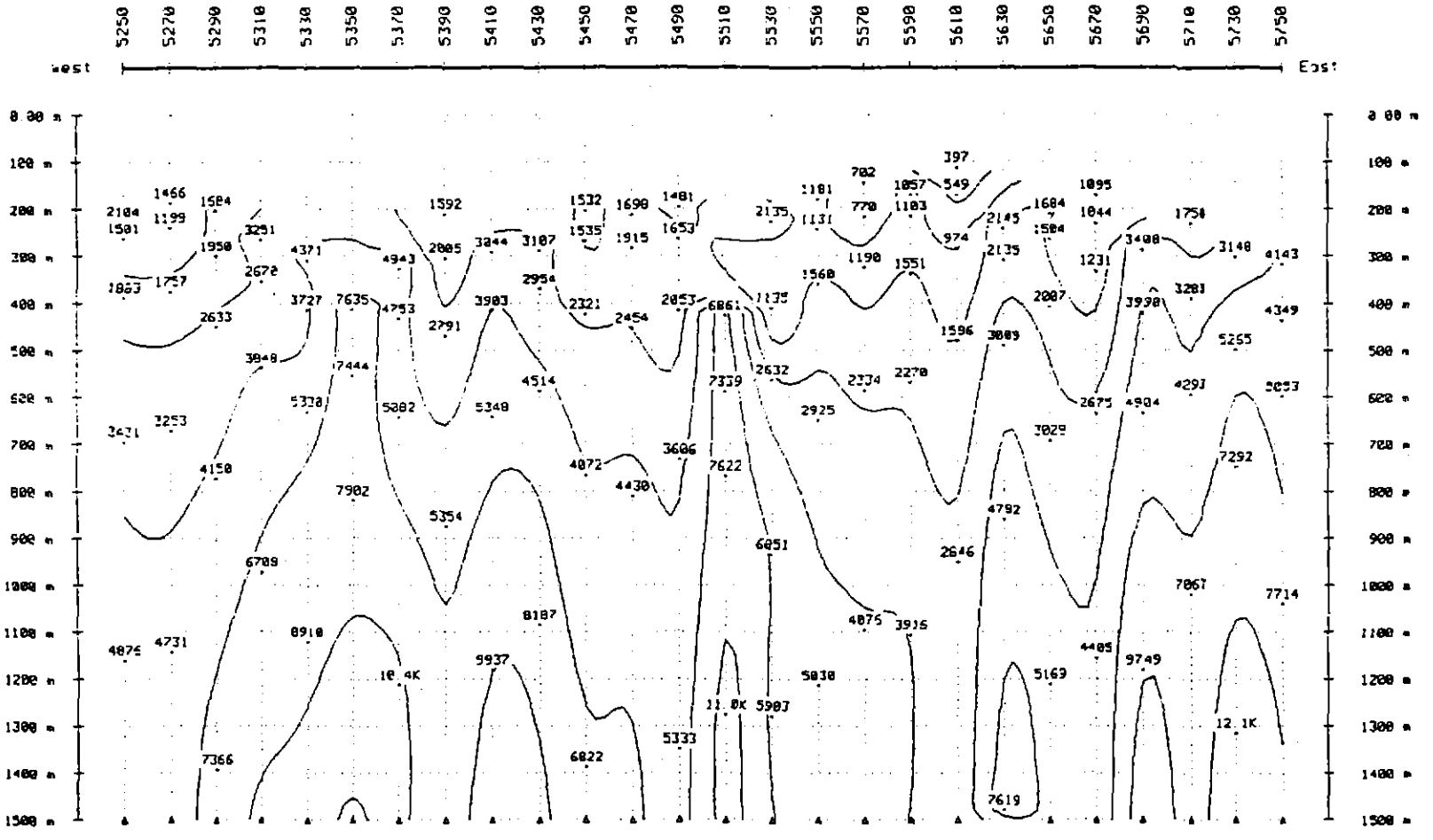
Fig. 6b.



Burns Peak, E.L. 44/88
CSAMT: Real Resistivity
Line 5800N

ref: NBH/MG89/03

Fig. 6c.



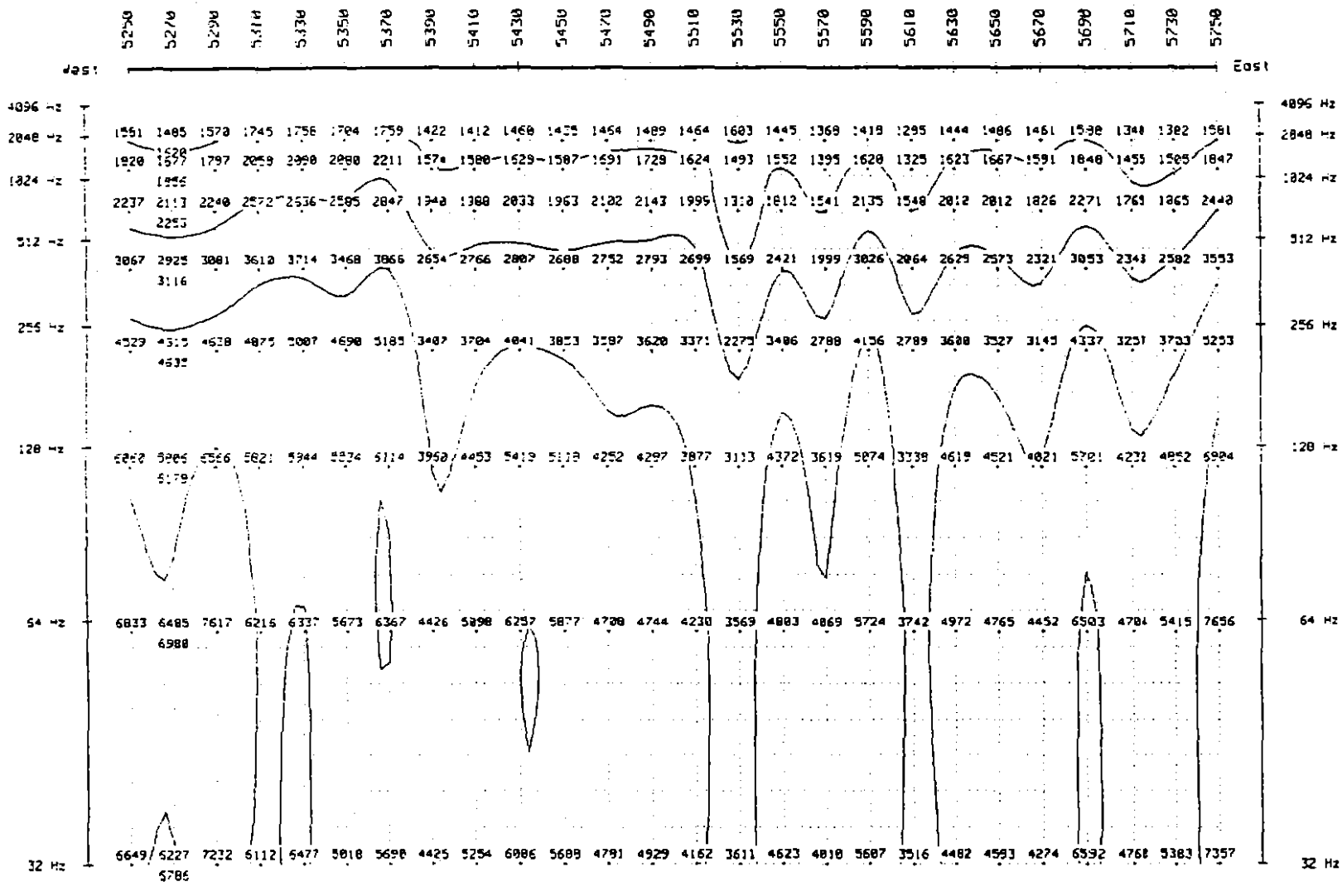
ref: NGH/HG89/03

Burns Peak, E.L. 44/88

CSAMT: Real Resistivity - MT Depth

Line 5800N

Fig. 6d.

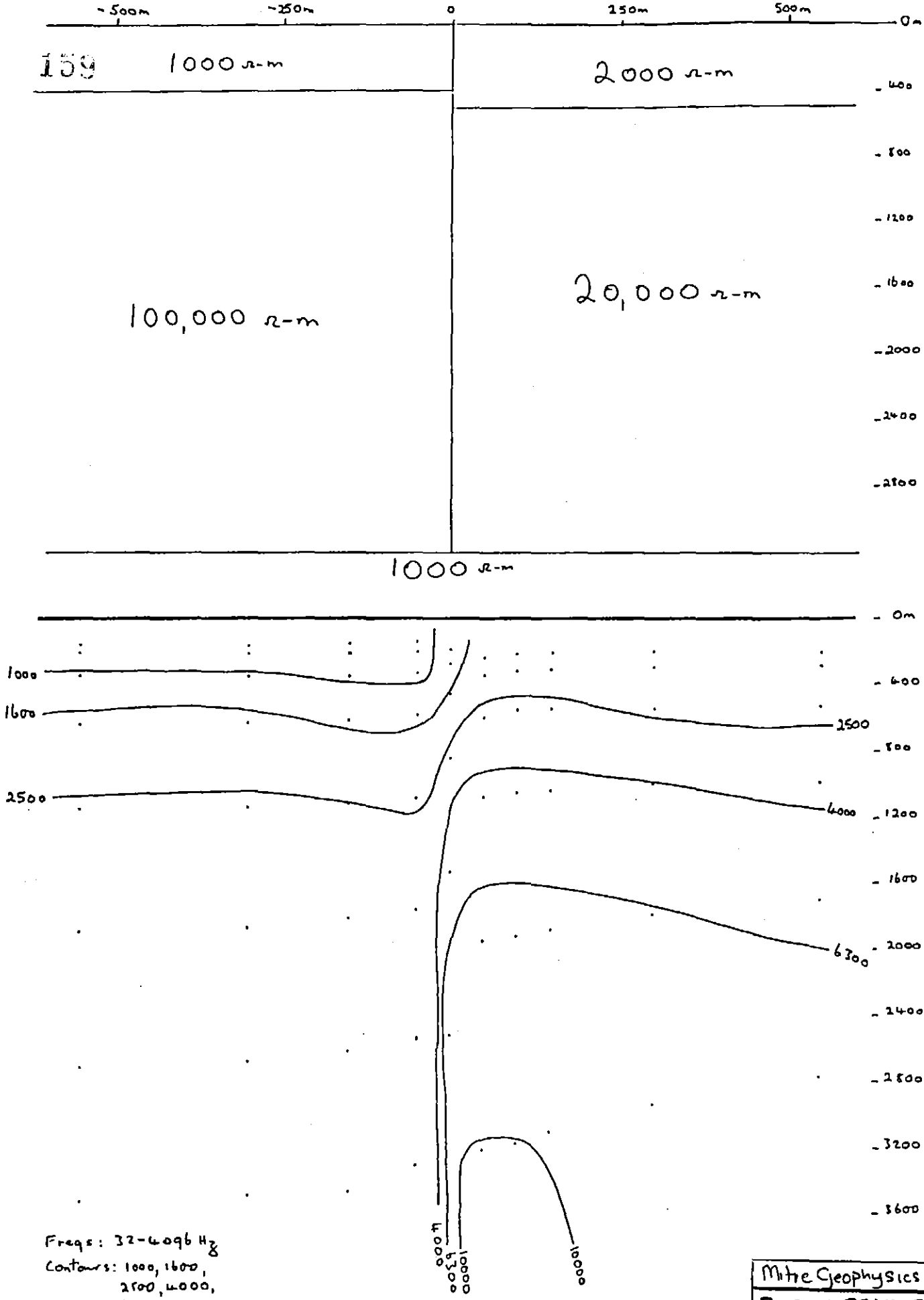


Burns Peak, E.L. 44/88
CSAMT: Resistivity from Phase
Line 5800N

ref: NBH/MG89/03

Fig. 6e.

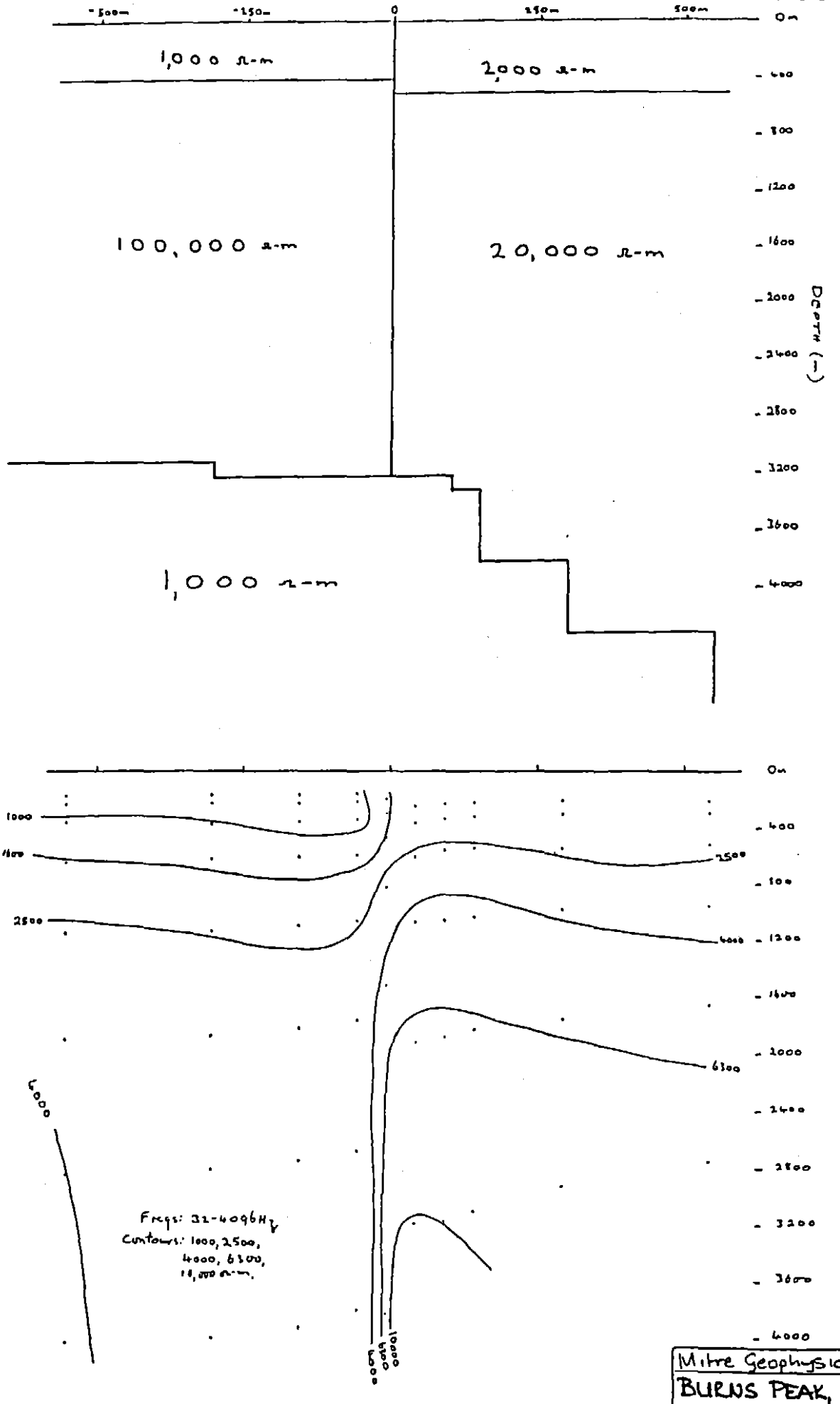
551160



Freqs: 32-4096 Hz
Contours: 1000, 1600, 2500, 4000, 6300, 10000 Ω-m

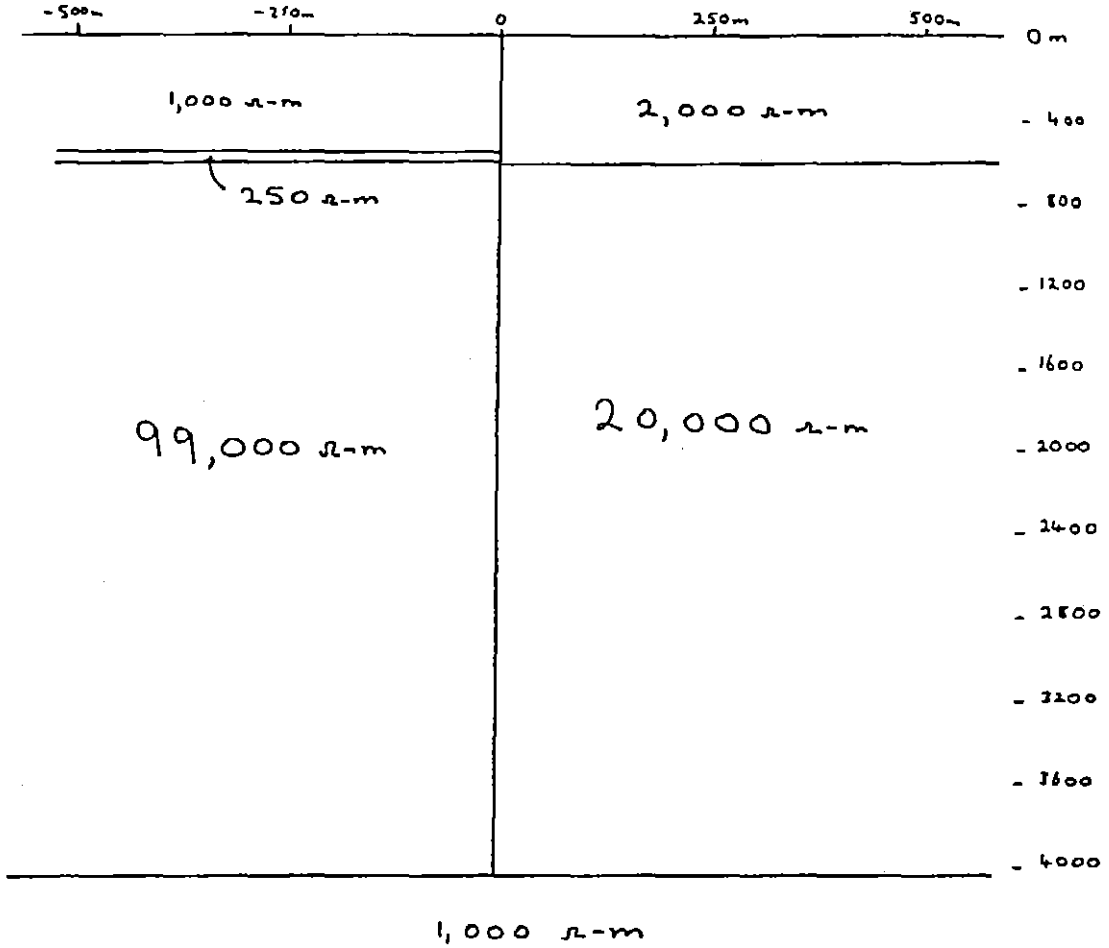
Apparent Resistivity-MT Depth

Mitre Geophysics Pty Ltd
BURNS PEAK, EL 44/8
CSAMT 2-D Modelling
LINE 5200N
FIG. 7a

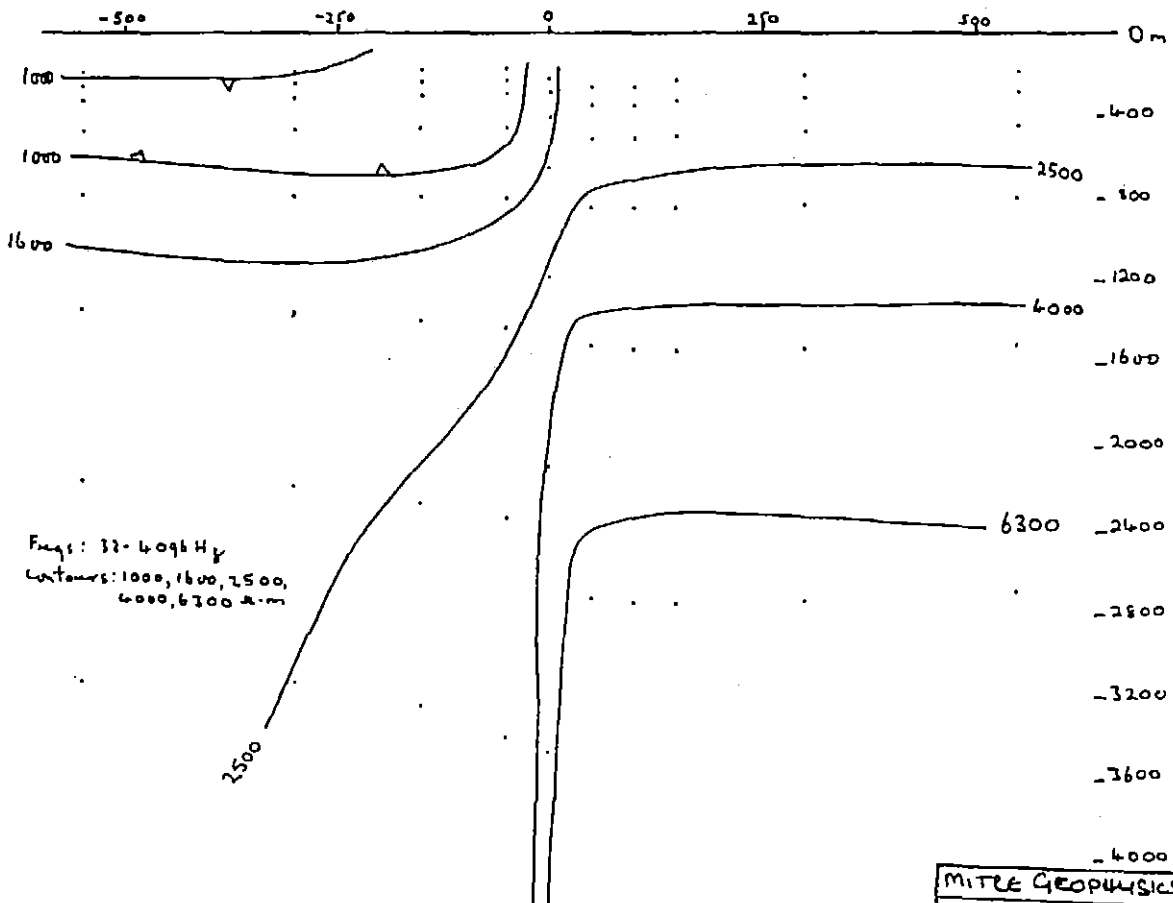


Apparent Resistivity - MT Depth

Mitre Geophysics Pty Ltd
BURNS PEAK, EL 44/8
CSAMT 2-D Modelling
LINE 5400N
Fig. 7b



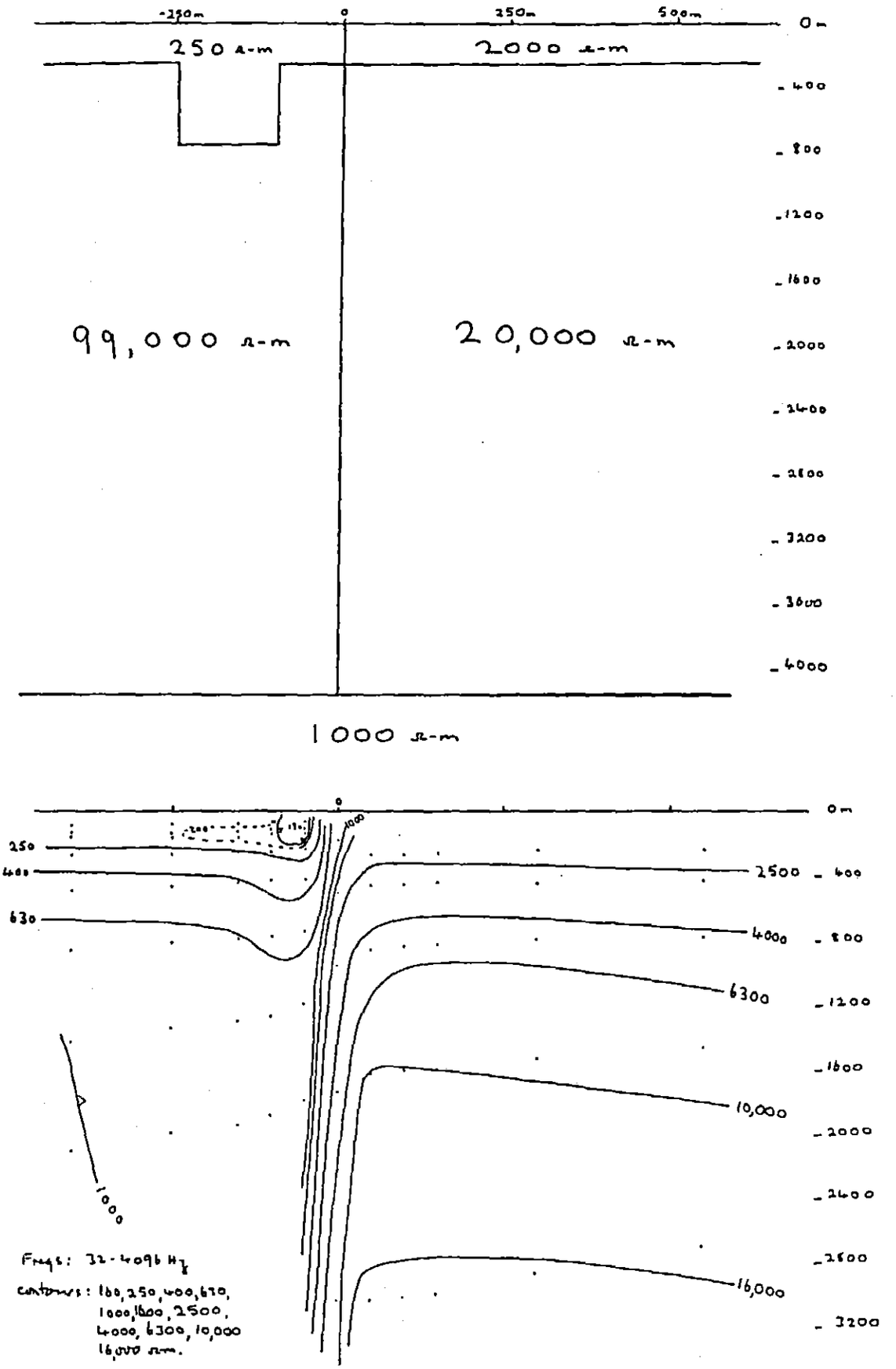
1,000 Ω-m



Apparent Resistivity - MT Depth

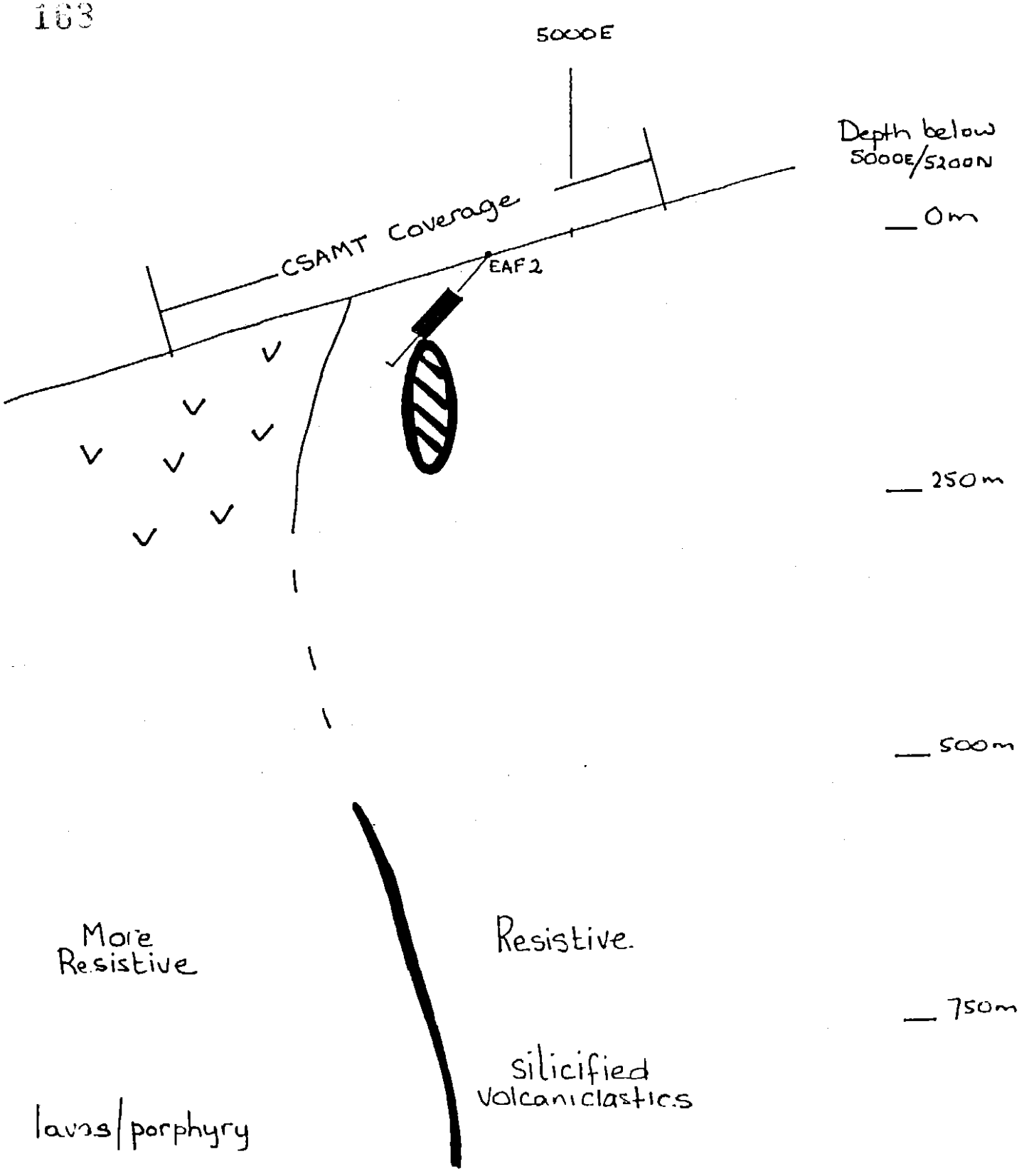
MITTLE GEOPHYSICS PTY LTD

BURUS PEAK EL 44/88
CSAMT 2-D Modelling
LINE 5600N
FIG. 7c



Apparent Resistivity - MT Depth

Mitre Geophysics Pty Ltd
BURNS PEAK EL 44/89
CSAMT 2-D Modelling
LINE 5800N
FIG. 7d
ref NBH/MG 89/03

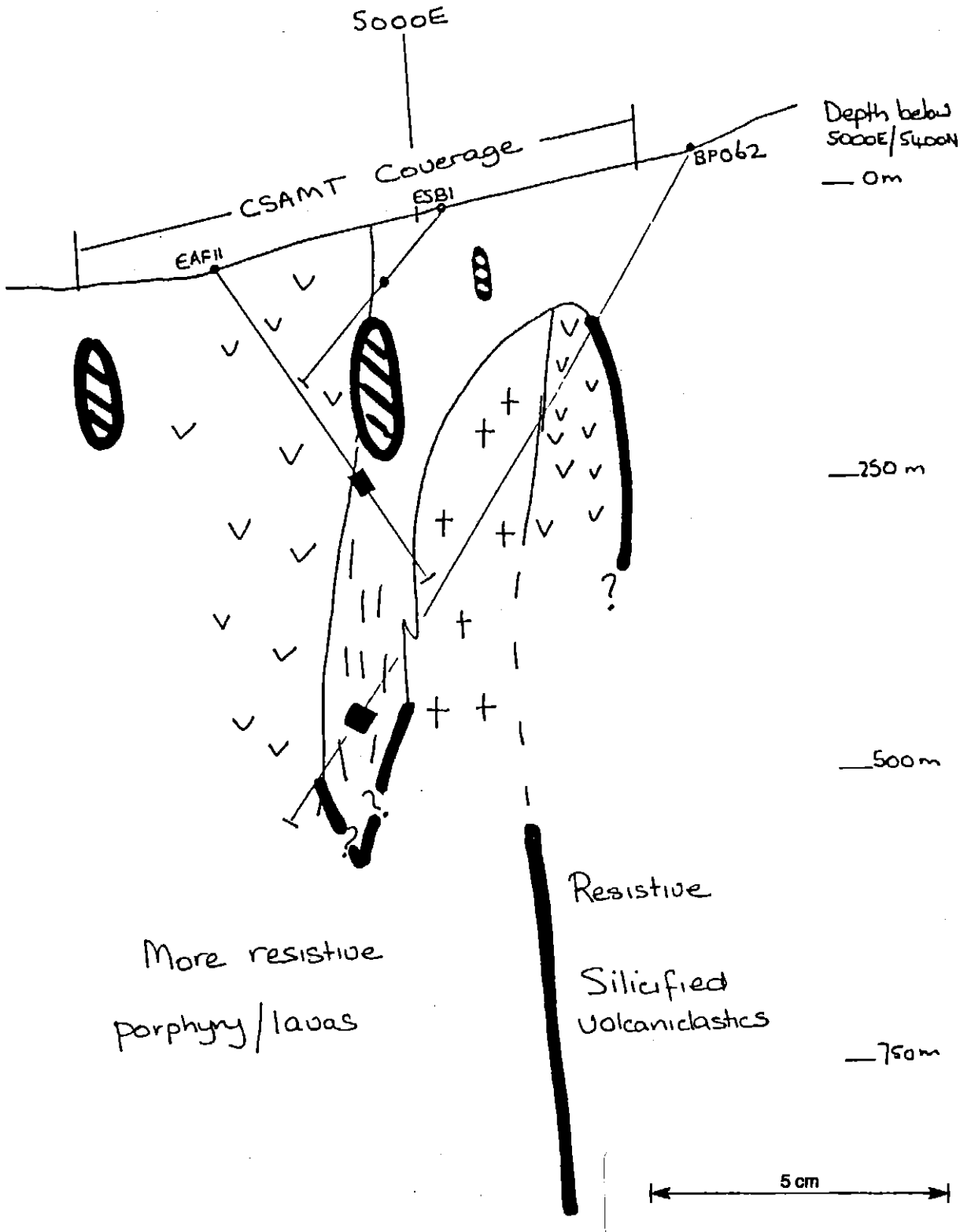


MIPRE GEOPHYSICS PTY. LTD.

BURNS PEAK, E.L. 44/88
CSAMT
Geological Interpretation
Line 5200N

scale 1:5000 Fig. 8a

ref: NBH/MG89/03



Legend

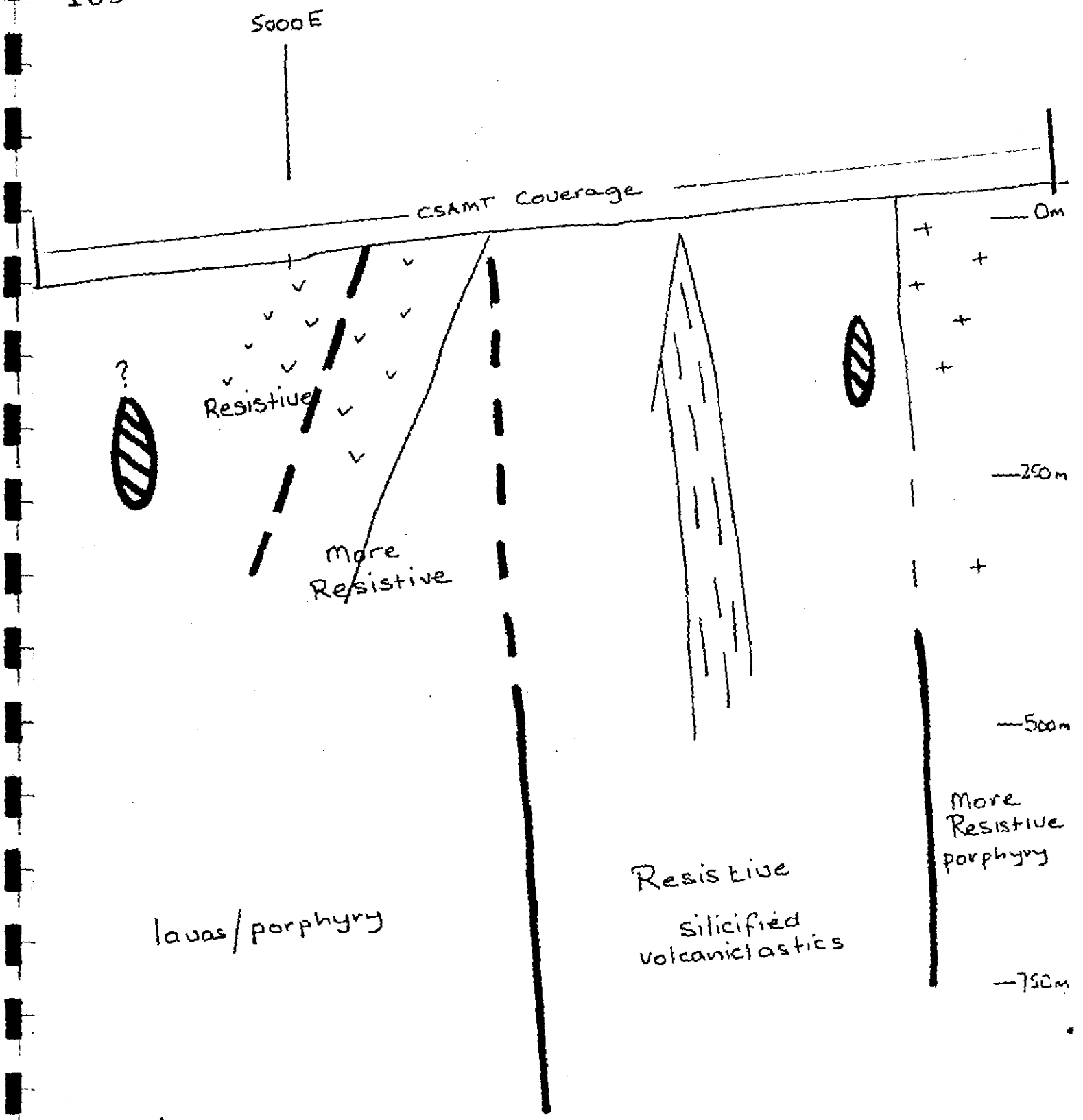
- lavas
- porphyry
- sediments
- volcaniclastics
- mineralisation
- Interpreted alteration/ dissem. sulphides
- Interpreted contact

MITRE Geophysics Pty. Ltd.

BURNS PEAK, E.L. 44/88
CSAMT
Geological Interpretation
LINE 5400N

Scale 1:5000 Fig. 8b

ref: NBH/mg89/03



Legend

- lavas
- porphyry
- Sediments
- volcaniclastics
- Interpreted alteration/ dissem. sulphides
- Interpreted contact

Mitre Geophysics Pty Ltd

BURNS PEAK, E.L. 44/88

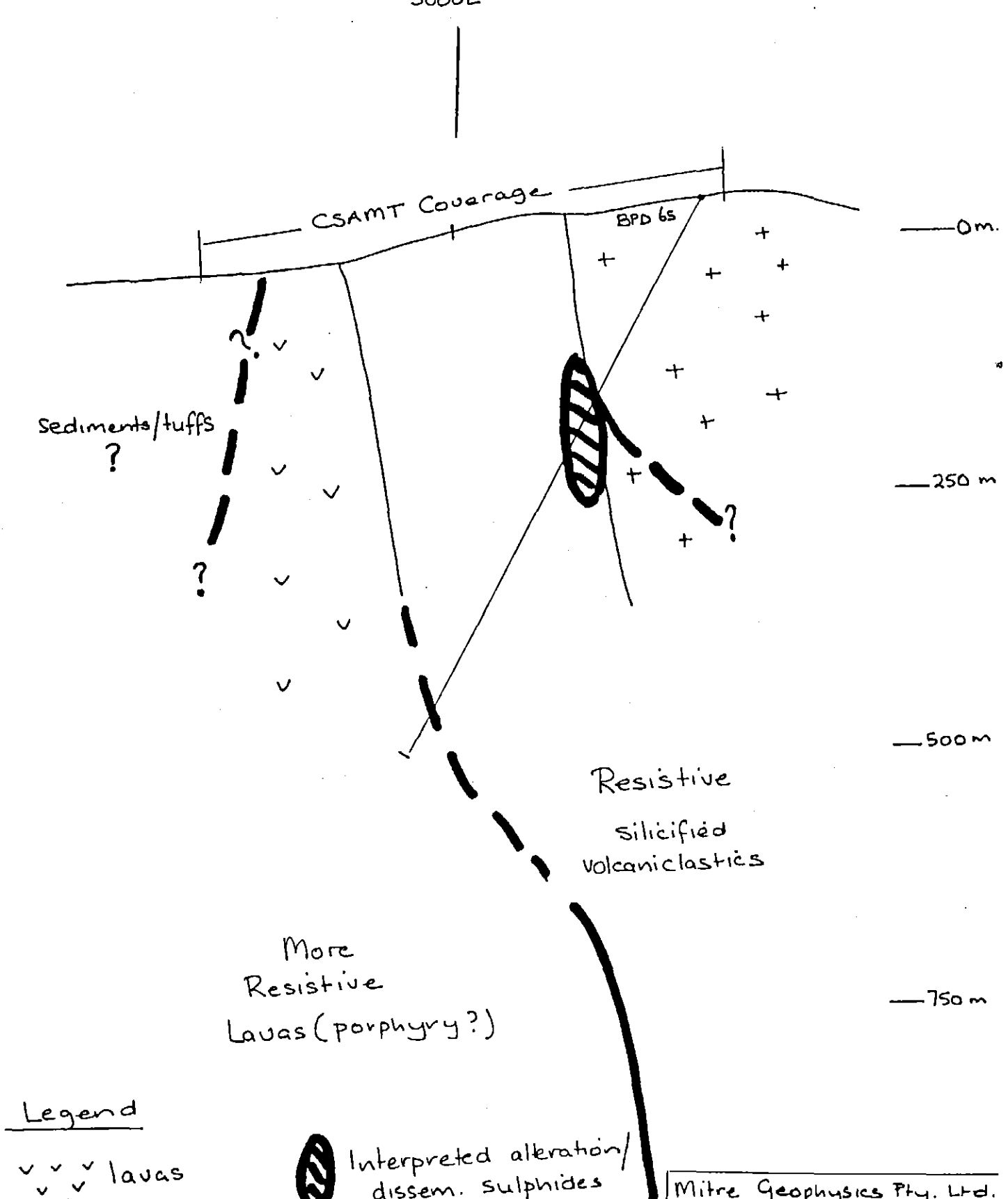
CSAMT

Geological Interpretation

Line 5600N

FIG. 8C

Ref: NBH/MG 89/03



Mitre Geophysics Pty. Ltd.

BURNS PEAK, E.L. 44/88

CSAMT

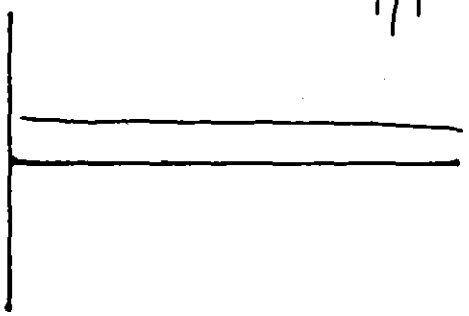
Geological Interpretation

Line 5800N

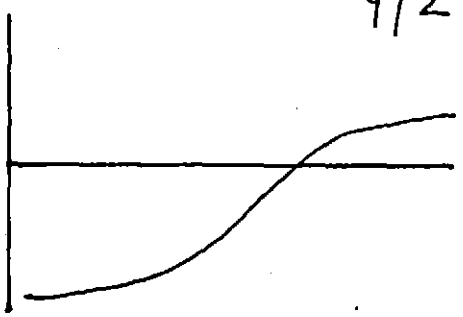
FIG. 8d

ref: NBH/MG89/03

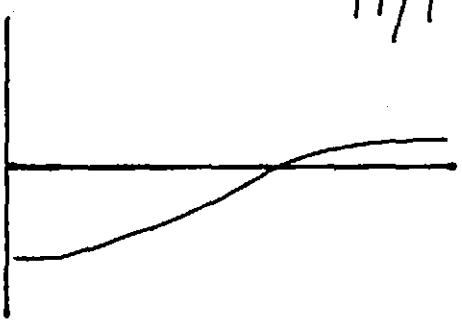
9/1



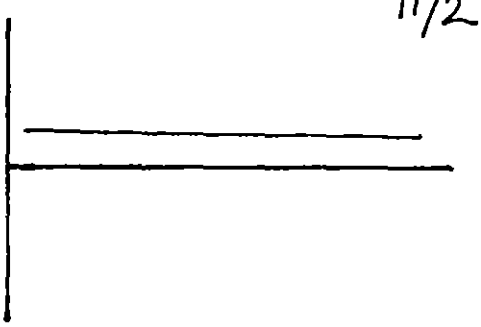
9/2



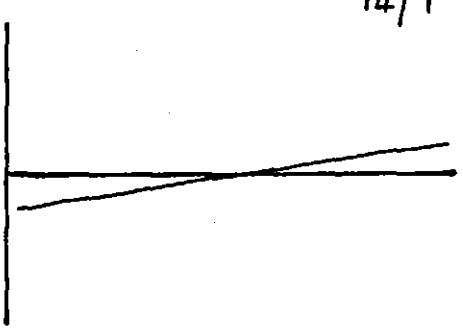
11/1



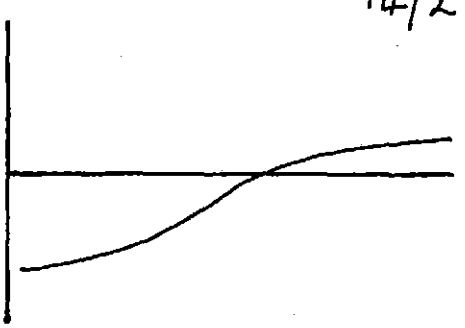
11/2



14/1



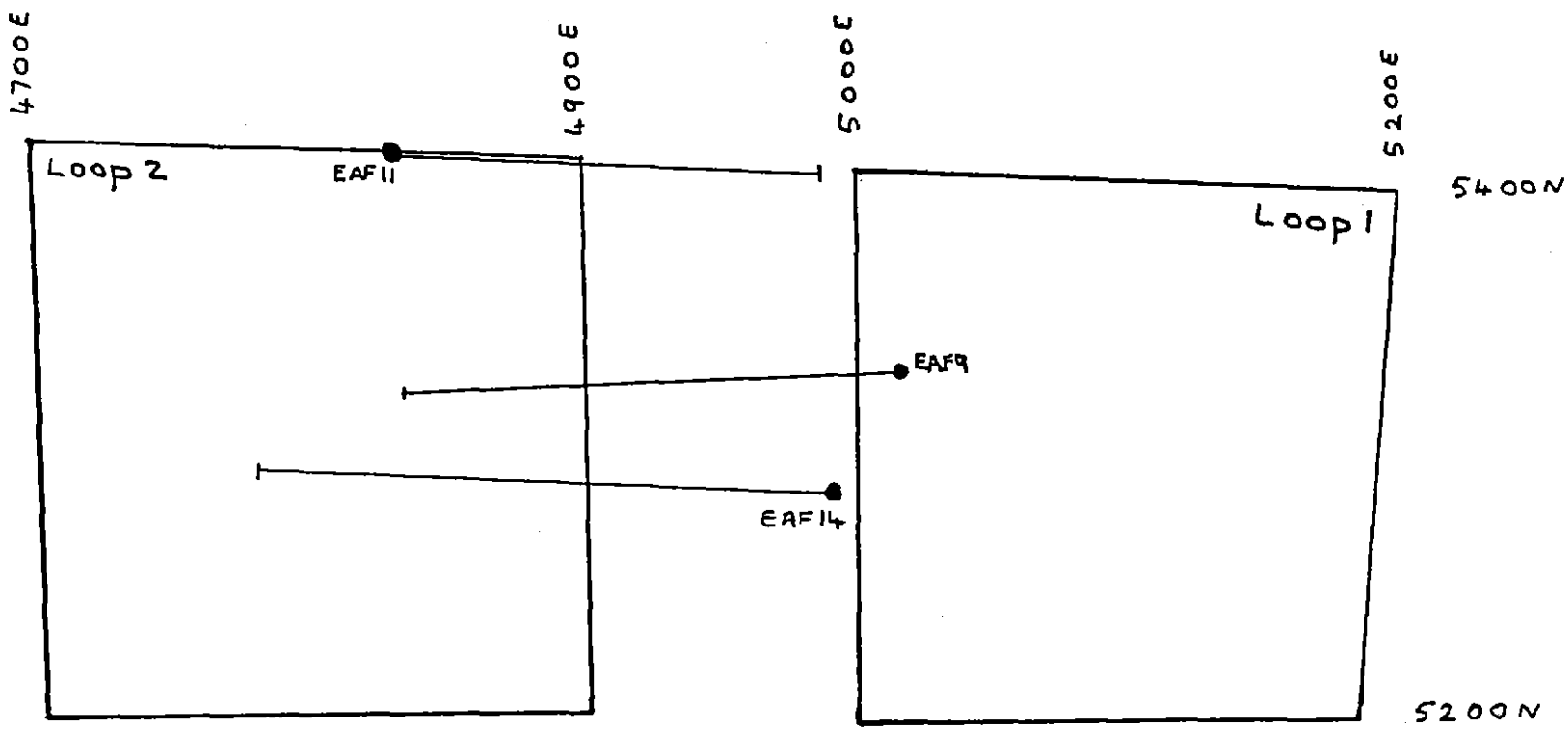
14/2



Burns Peak E.L. 44/88
DHEM SURVEYS
Self Responses

ref: NBH/MG89/03 Fig. 9a.

CST 1989



Pinnacles DHEM Surveys

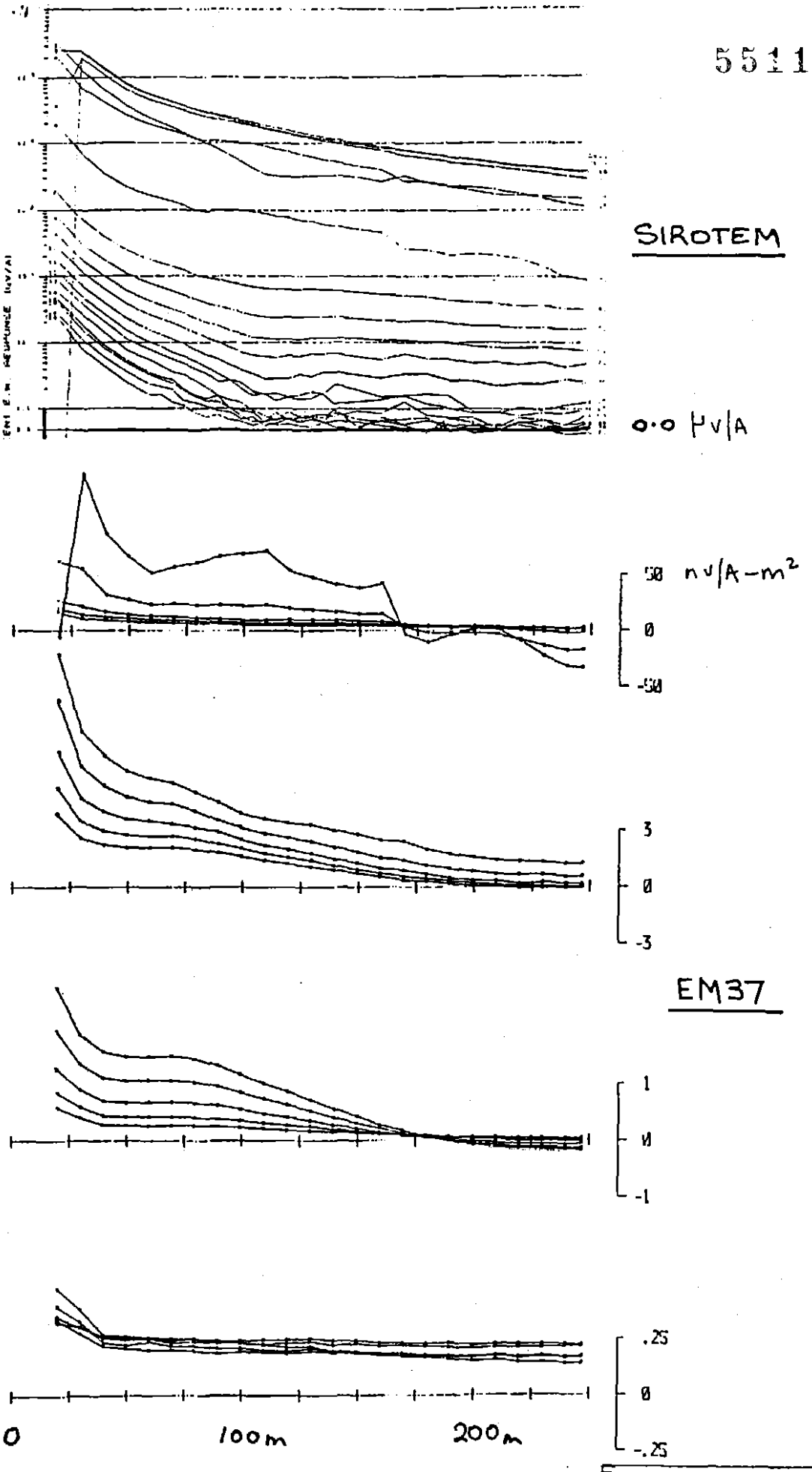
100m

5 cm

BURNS PEAK, EL. 44/88
DHEM Surveys
Loop Locations

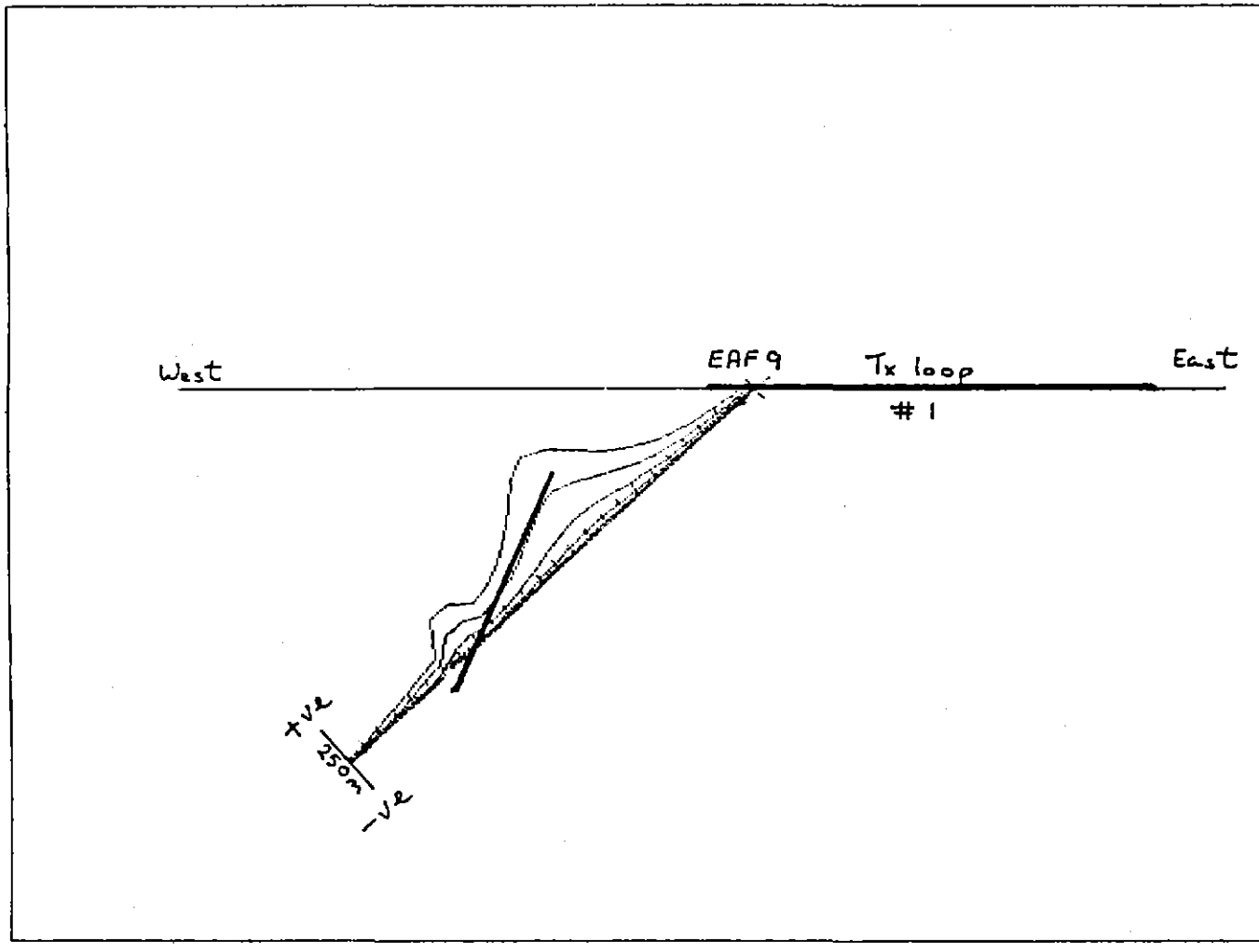
ref: NBH/MG89/03 Fig. 9B

CST 1989



BURNS PEAK, EL. 44/88
DHEM
EAF 9 - Loop 1
FIG 9C

170



EAF 9 EM37

LOOP 1

DIP	65.00
DEPTH	-30.00
DEPTH EXTENT	110.00
STRIKE LENGTH	200.00
CONDUCTANCE	5.00

REGISTERED USER
MITRE GEOPHYSICS

MultiLoop

BURNS PEAK, E.L. 44/88

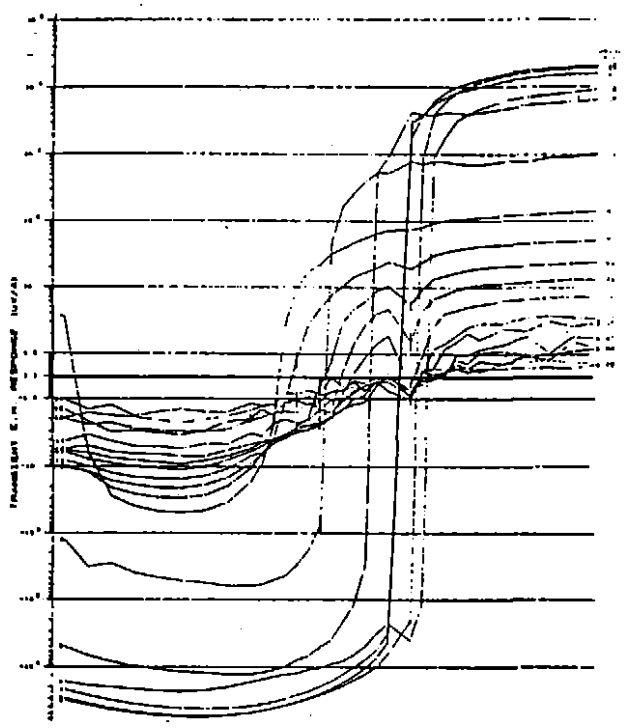
DHEM

modelling: EAF 9 - Loop 1

Ref: NBH/mg89/03

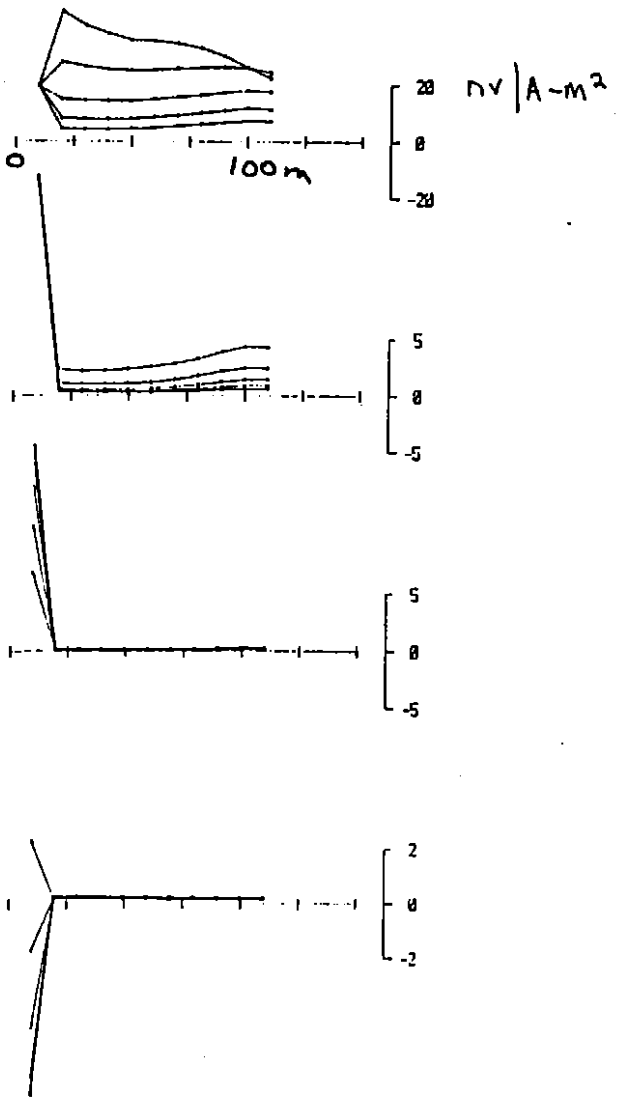
FIG 9d

551172



0.0 μV/A

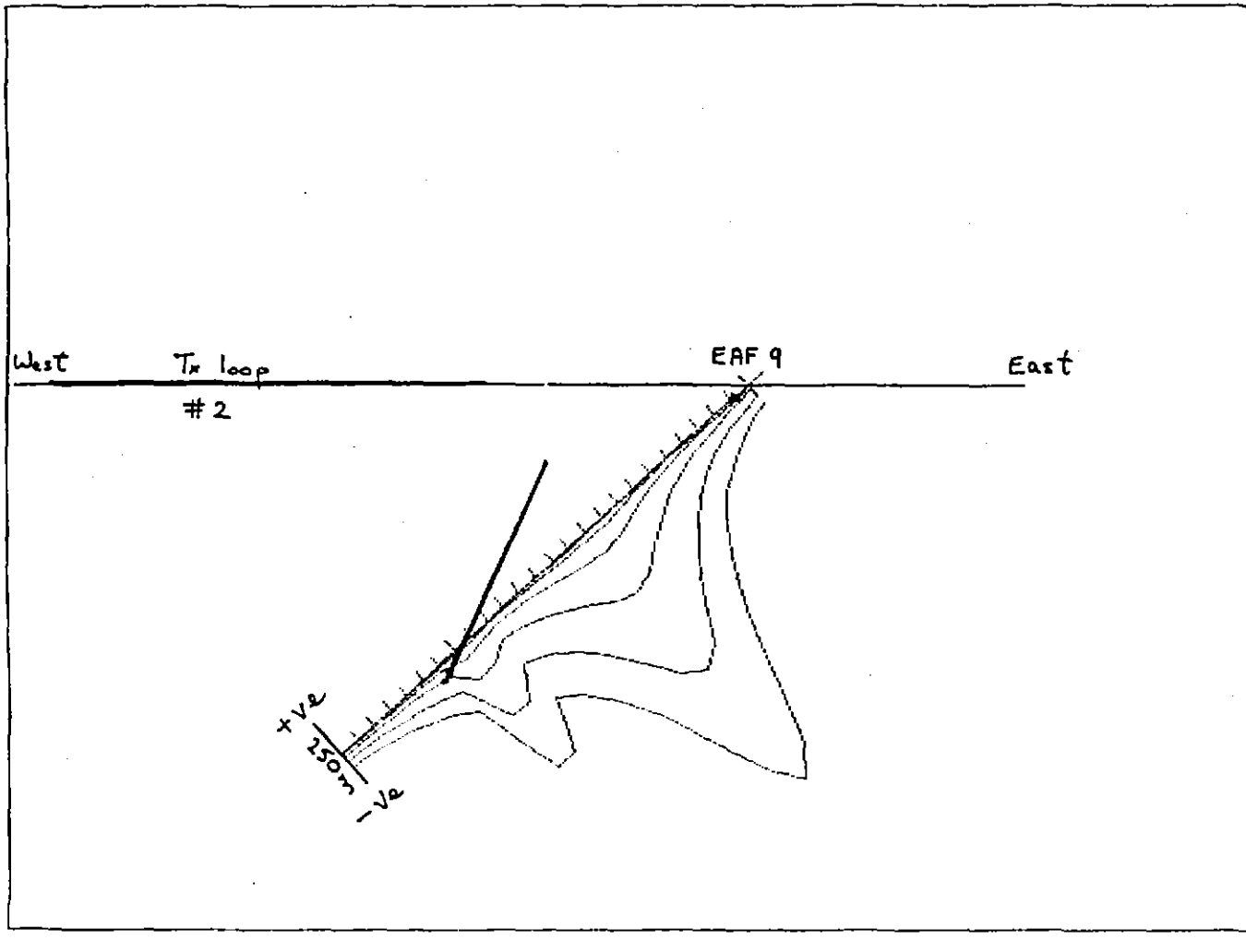
SIROTEM



EM37

BURNS PEAK, EL 44/88
DHEM
EAF 9 - Loop 2

FIG 9e



EAF 9 EM37
LOOP 2

DIP	65.00
DEPTH	-38.00
DEPTH EXTENT	110.00
STRIKE LENGTH	200.00
CONDUCTANCE	5.00

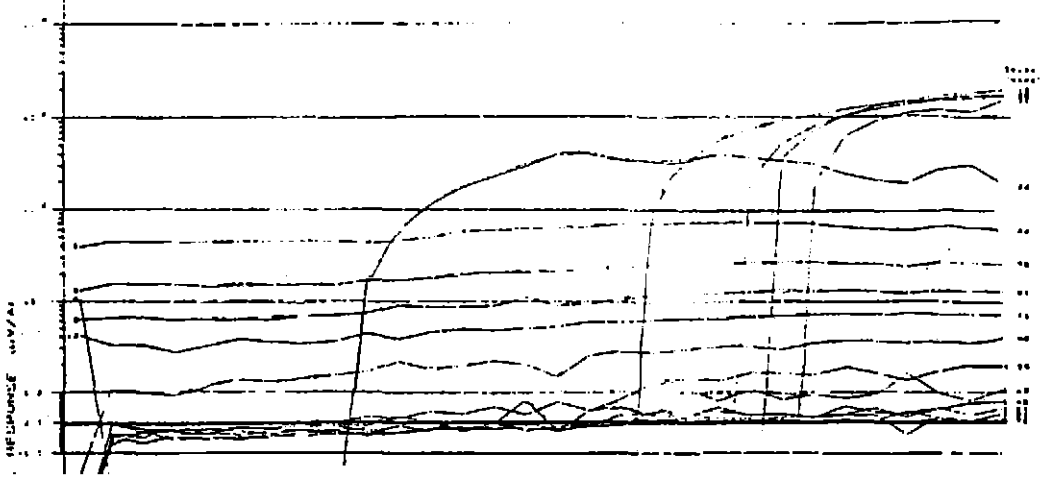
173

REGISTERED USER
MITRE GEOPHYSICS

MultiLoop

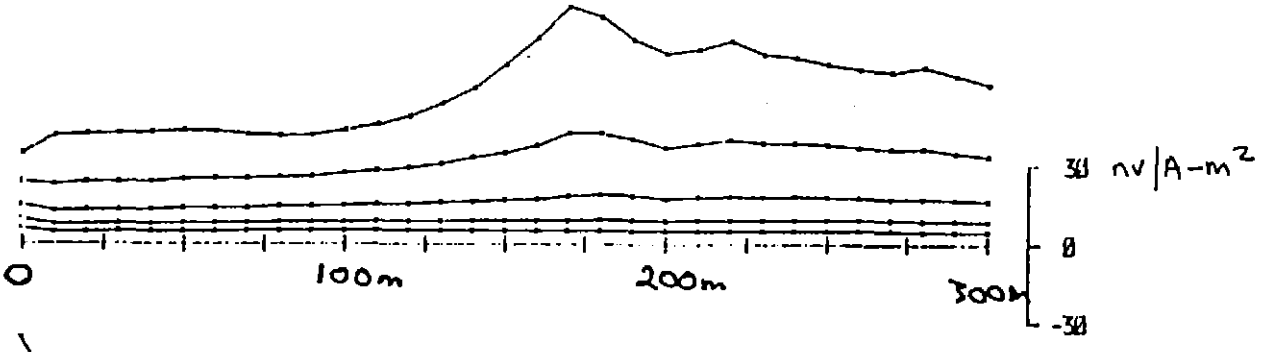
BURNS PEAK, E.L. 44/88
DHEM
Modelling: EAF 9 – Loop 2
FIG 9f

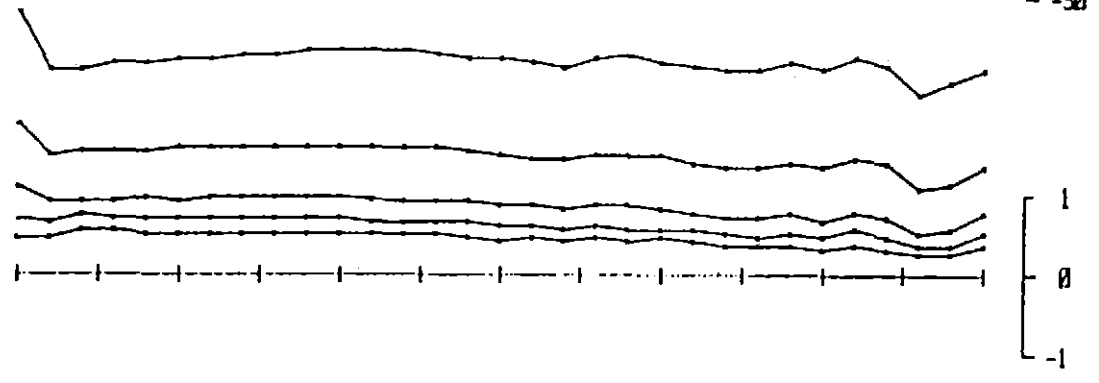
WJ: WBH/WG89/03



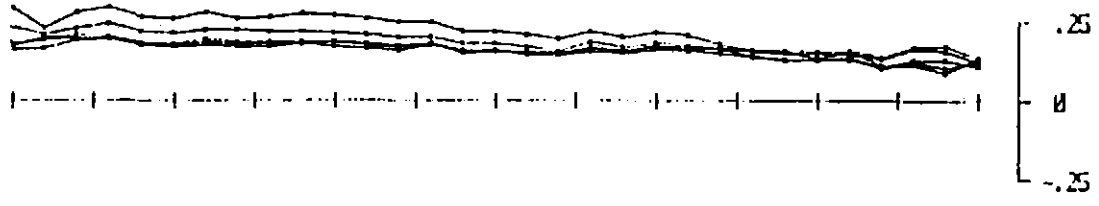
SIROTEM

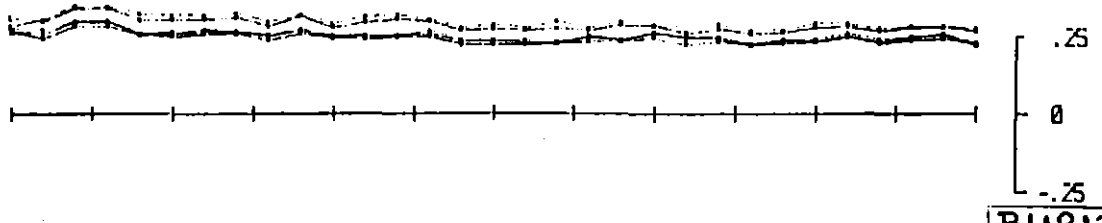
0.0 μv/A





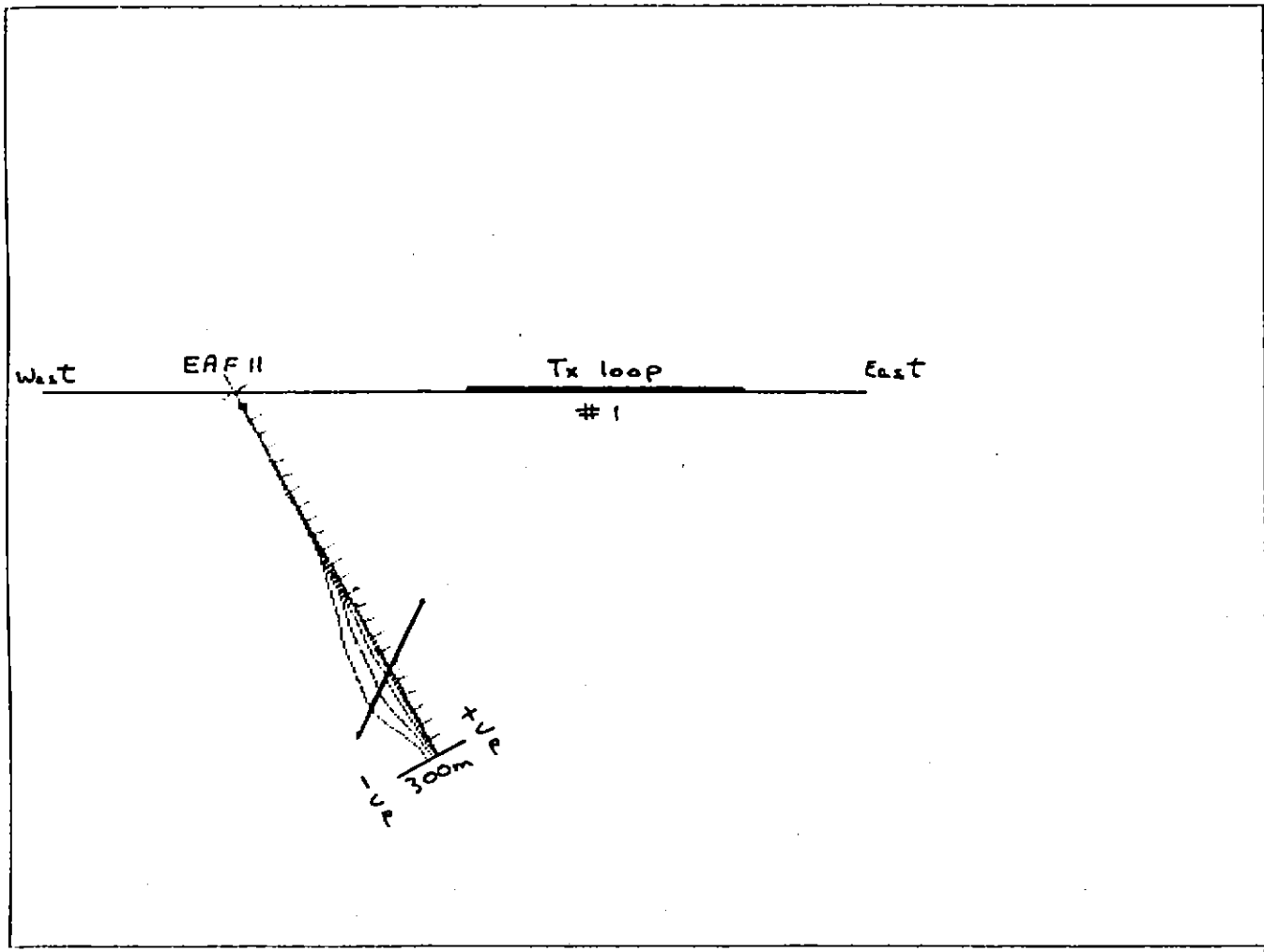
EM37





BURNS PEAK, E.L.44|88
DHEM
EAF 11 – Loop 1

FIG 9a



EAF 11 EM37

LOOP 1

DIP	61.00
DEPTH	-150.00
DEPTH EXTENT	110.00
STRIKE LENGTH	200.00
CONDUCTANCE	5.00

CRONE GEOPHYSICS LTD

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MITRE GEOPHYSICS

MultiLoop

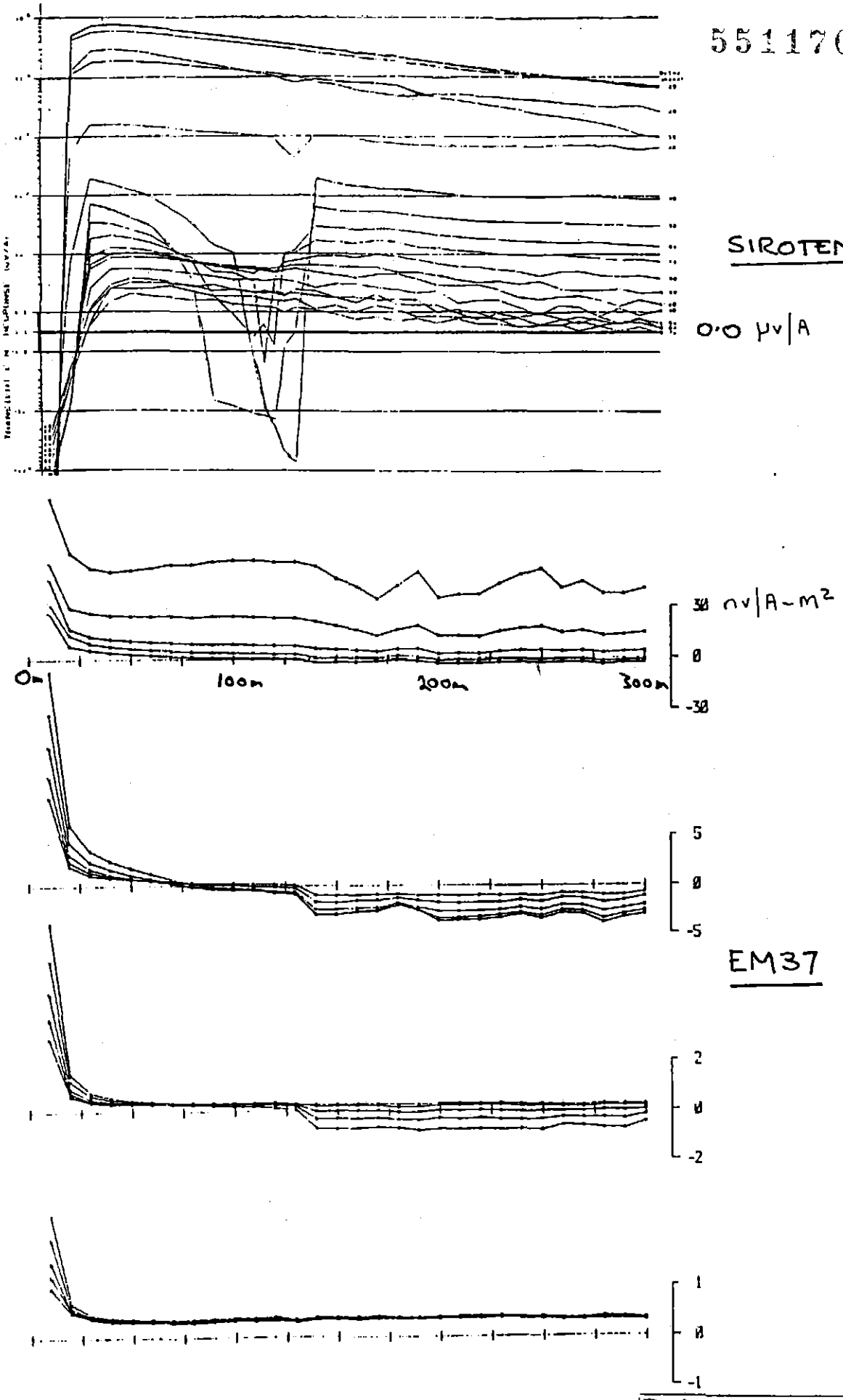
BURNS PEAK, E.L. 44/88

DHEM

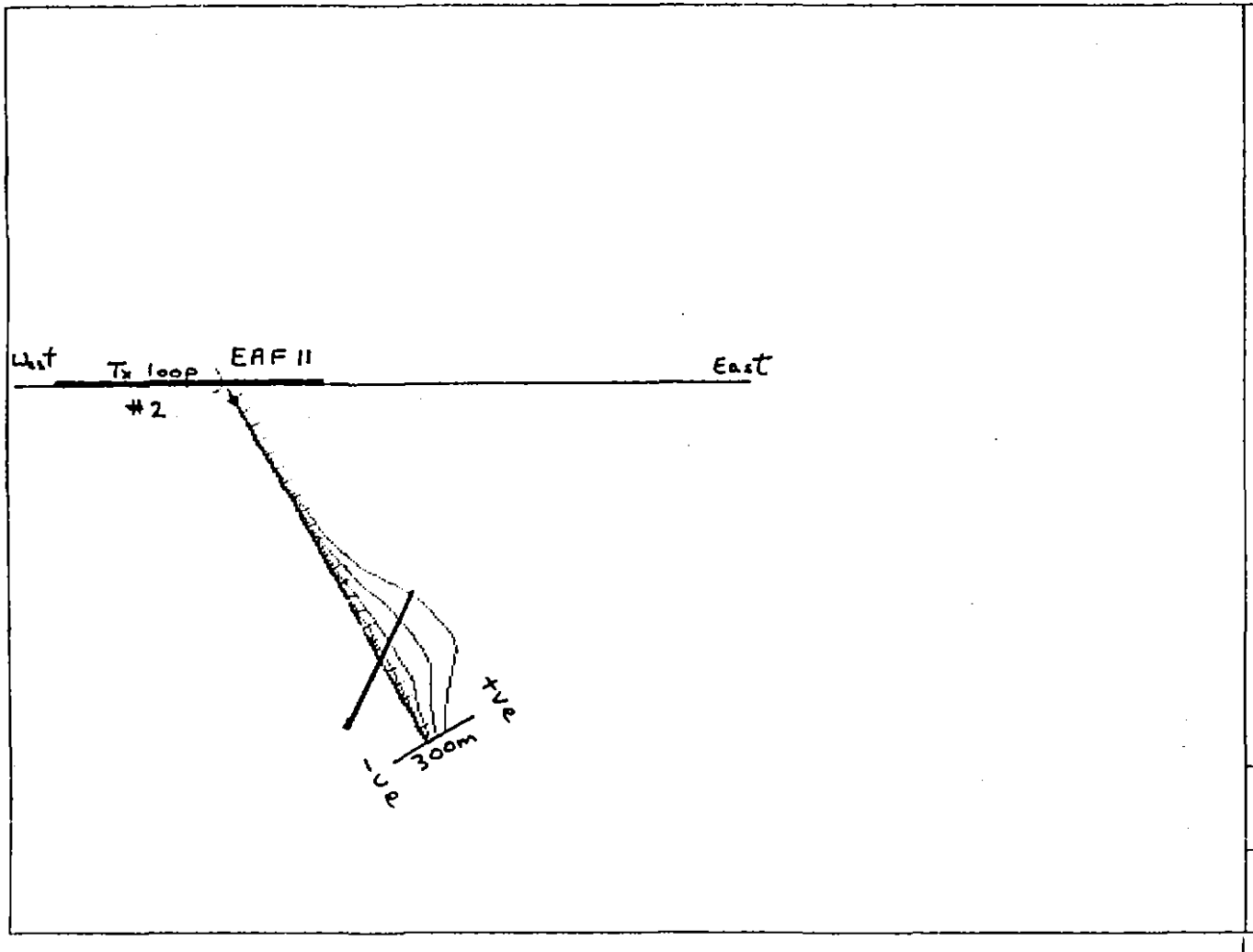
modelling: EAF 11 - Loop 1

FIG. 9h

fol: MRH/mc89h3



BURNS PEAK, E.L. 44/88
DHEM
EAF 11 – Loop 2
FIG 9i



EAF 11 EM37
LOOP 2

DIP	60.00
DEPTH	-150.00
DEPTH EXTENT	110.00
STRIKE LENGTH	200.00
CONDUCTANCE	5.00

GR-1152

REGISTERED USER
MITRE GEOPHYSICS

MultiLoop
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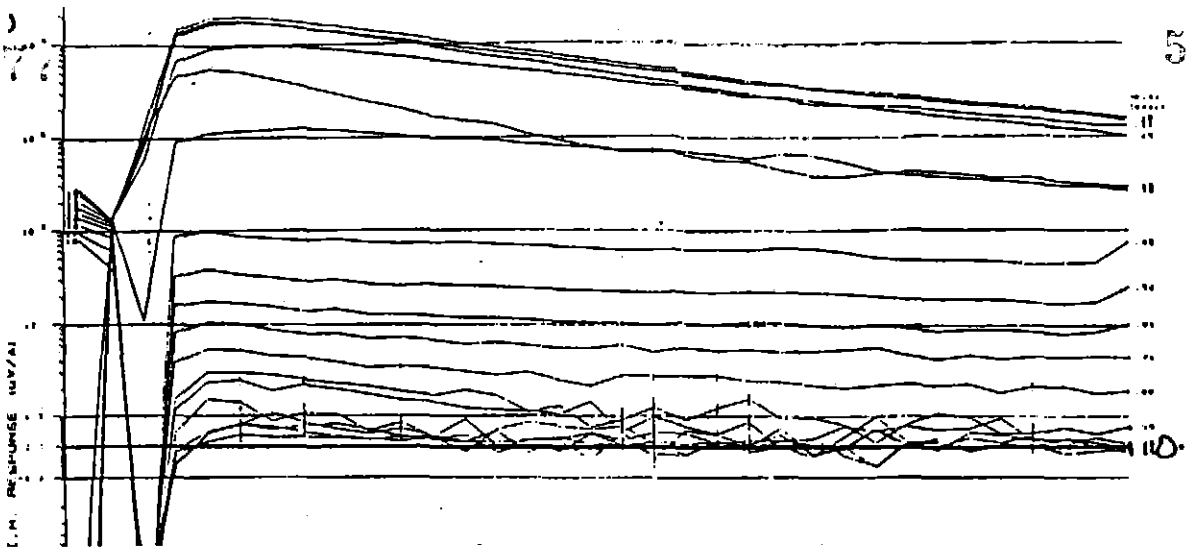
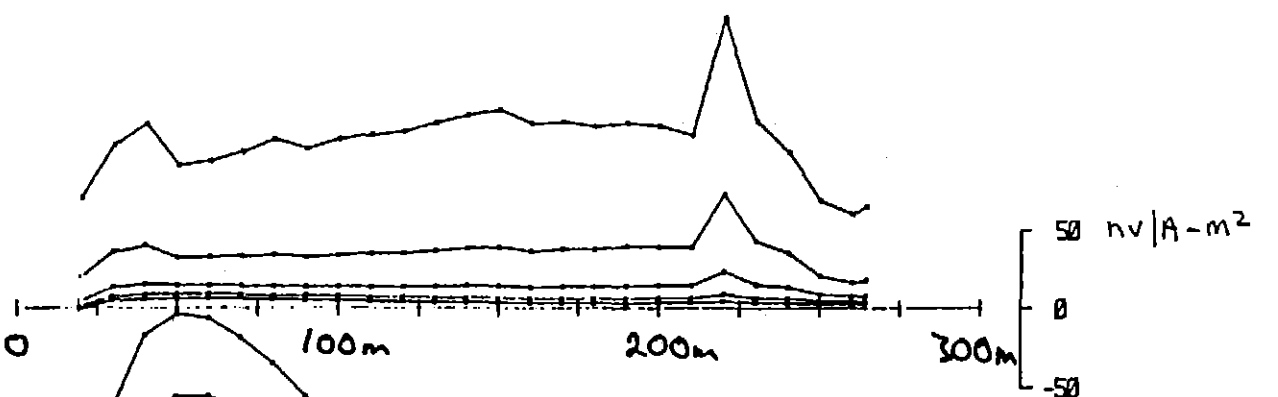
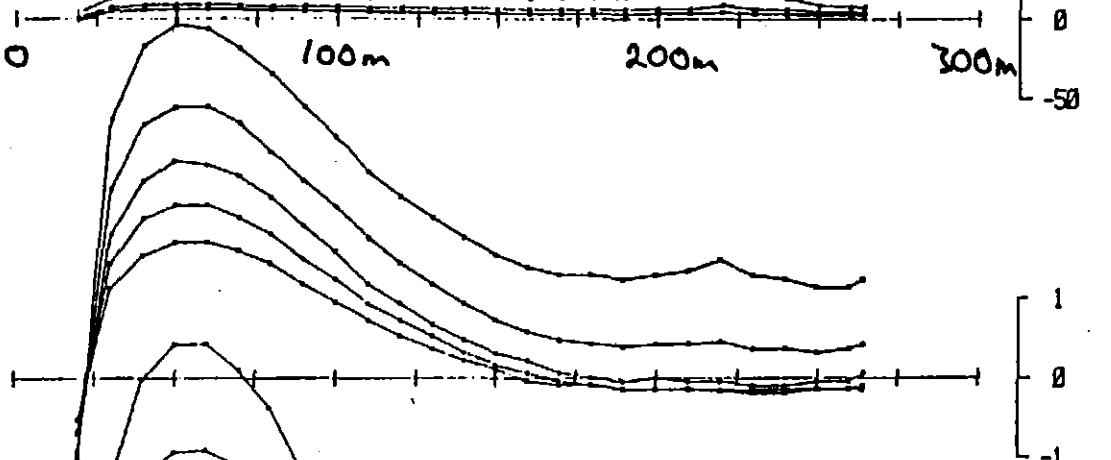
BURNS PEAK, E.L 44/88
DHEM
modelling: EAF 11 - Loop 2

FIG. 9j

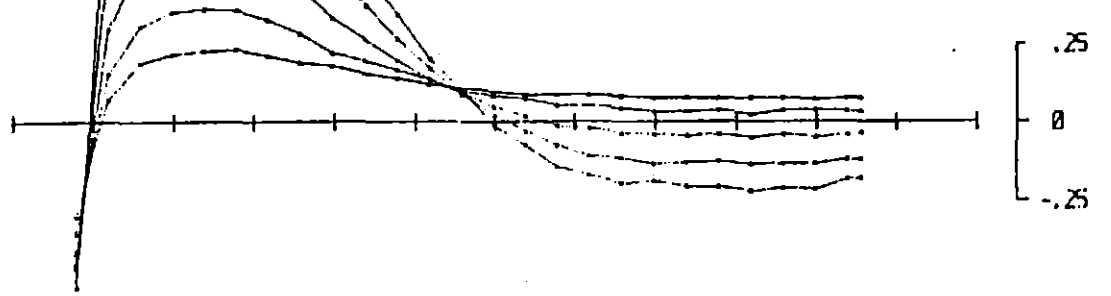
Ref: WBH/mag9103

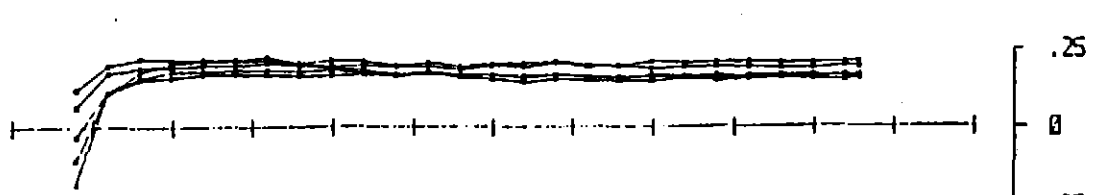






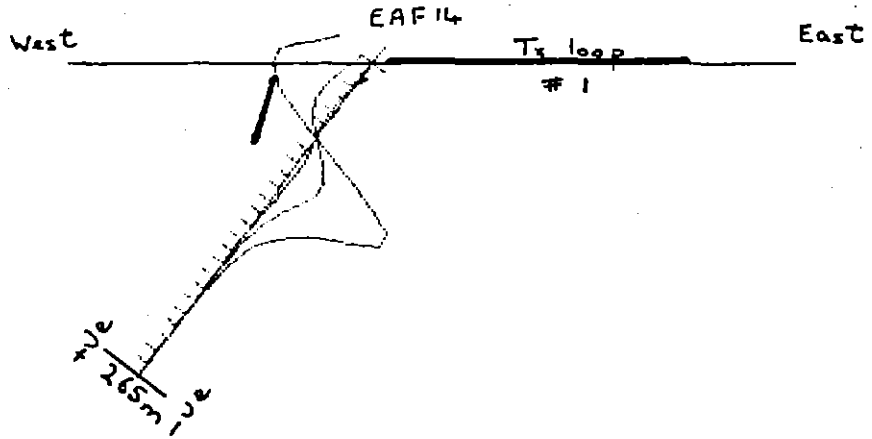
EM 37





BURNS PEAK, E.L. 44/88
EAF 14 – Loop 1

FIG. 9k



EAF 14 EM37

LOOP 1

DIP	72.00
DEPTH	-8.00
DEPTH EXTENT	50.00
STRIKE LENGTH	100.00
CONDUCTANCE	5.00

REGISTERED USER
MITRE GEOPHYSICS

MultiLoop
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BURNS PEAK, E.L 44/88
DHEM
modelling: EAF 14 - Loop 1

FIG. 9L

Ref: NBH/mg89/03

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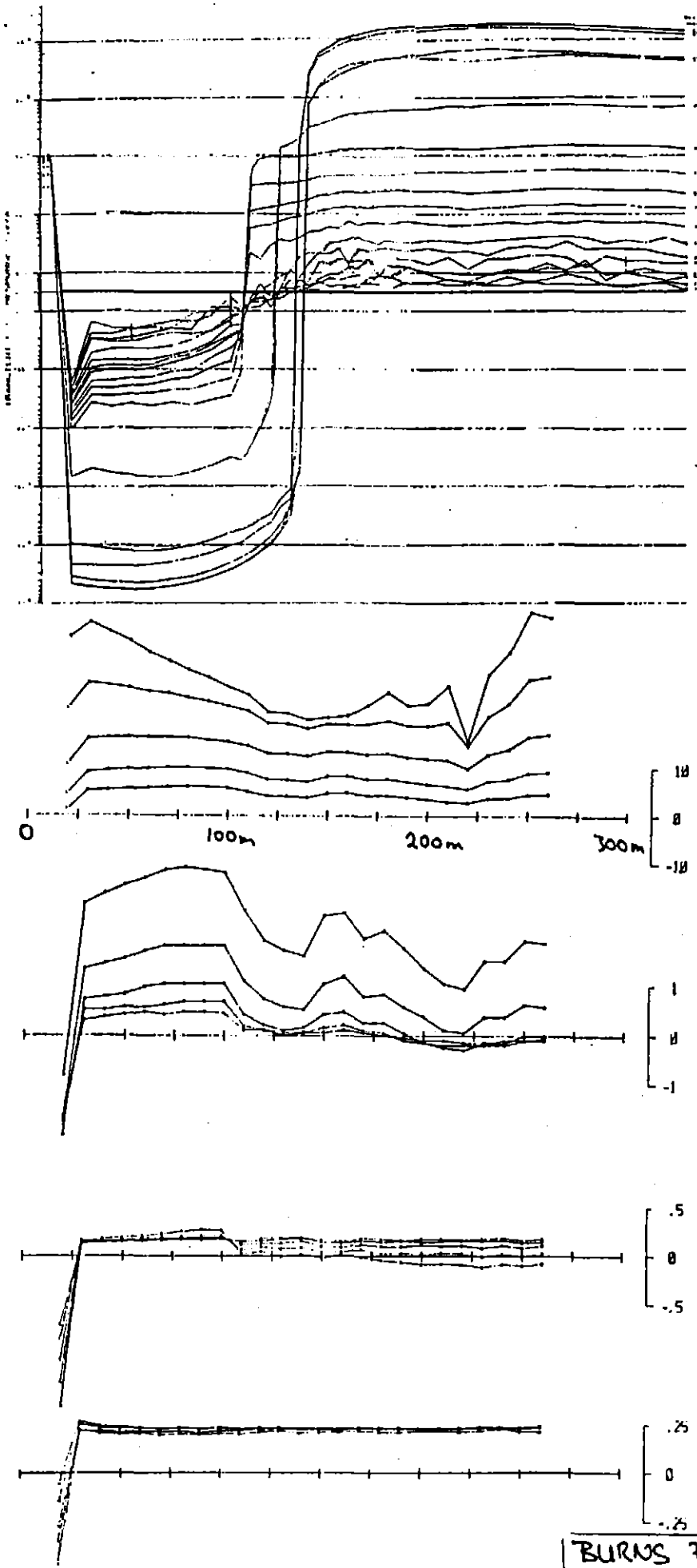
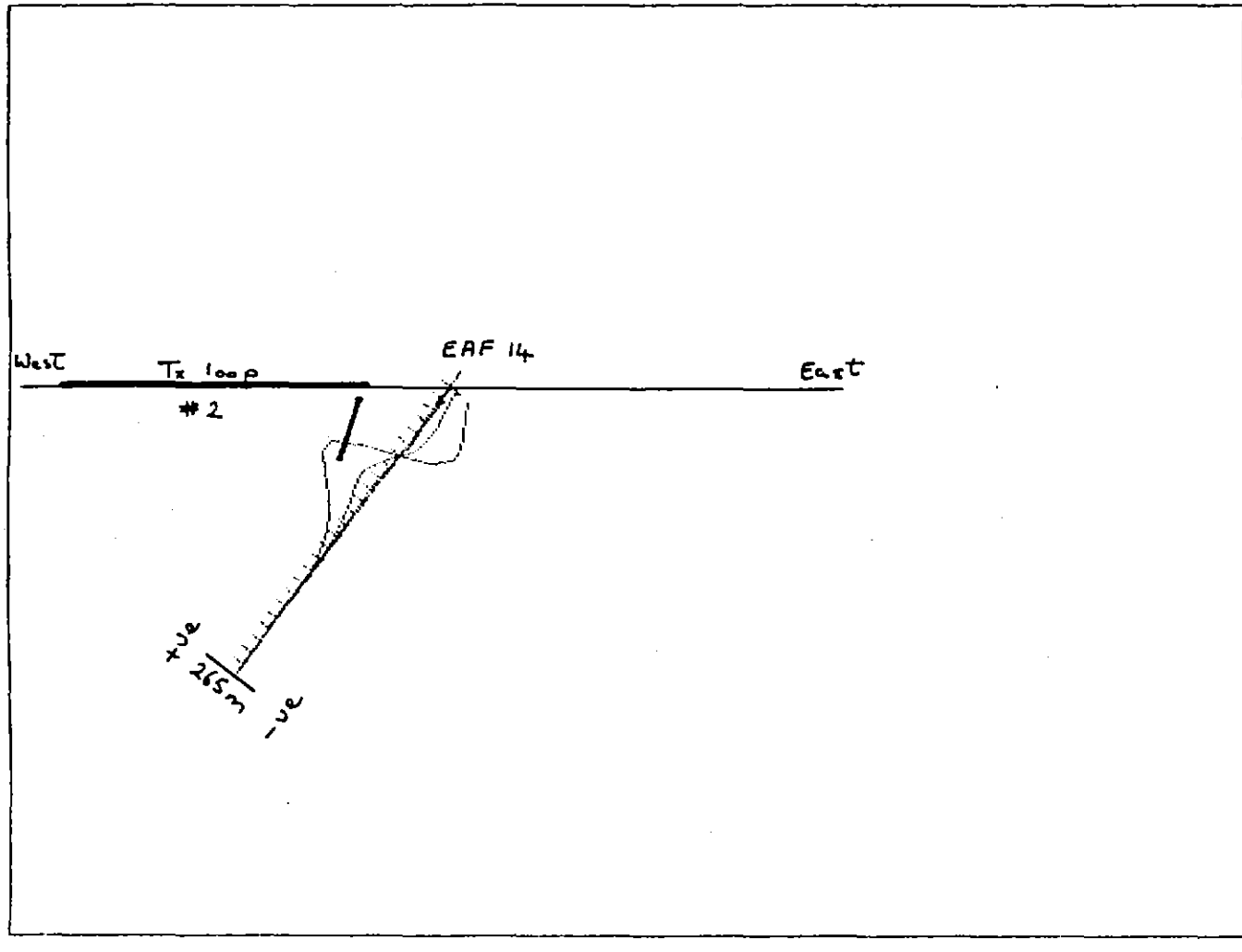
551180



BURNS PEAK, E.L. 44/88
DHEM
EAF 14 – Loop 2

FIG. 9m



EAF 14 EM37

LOOP 2

DIP	72.00
DEPTH	-8.00
DEPTH EXTENT	50.00
STRIKE LENGTH	100.00
CONDUCTANCE	5.00

REGISTERED USER
MITRE GEOPHYSICS

MultiLoop

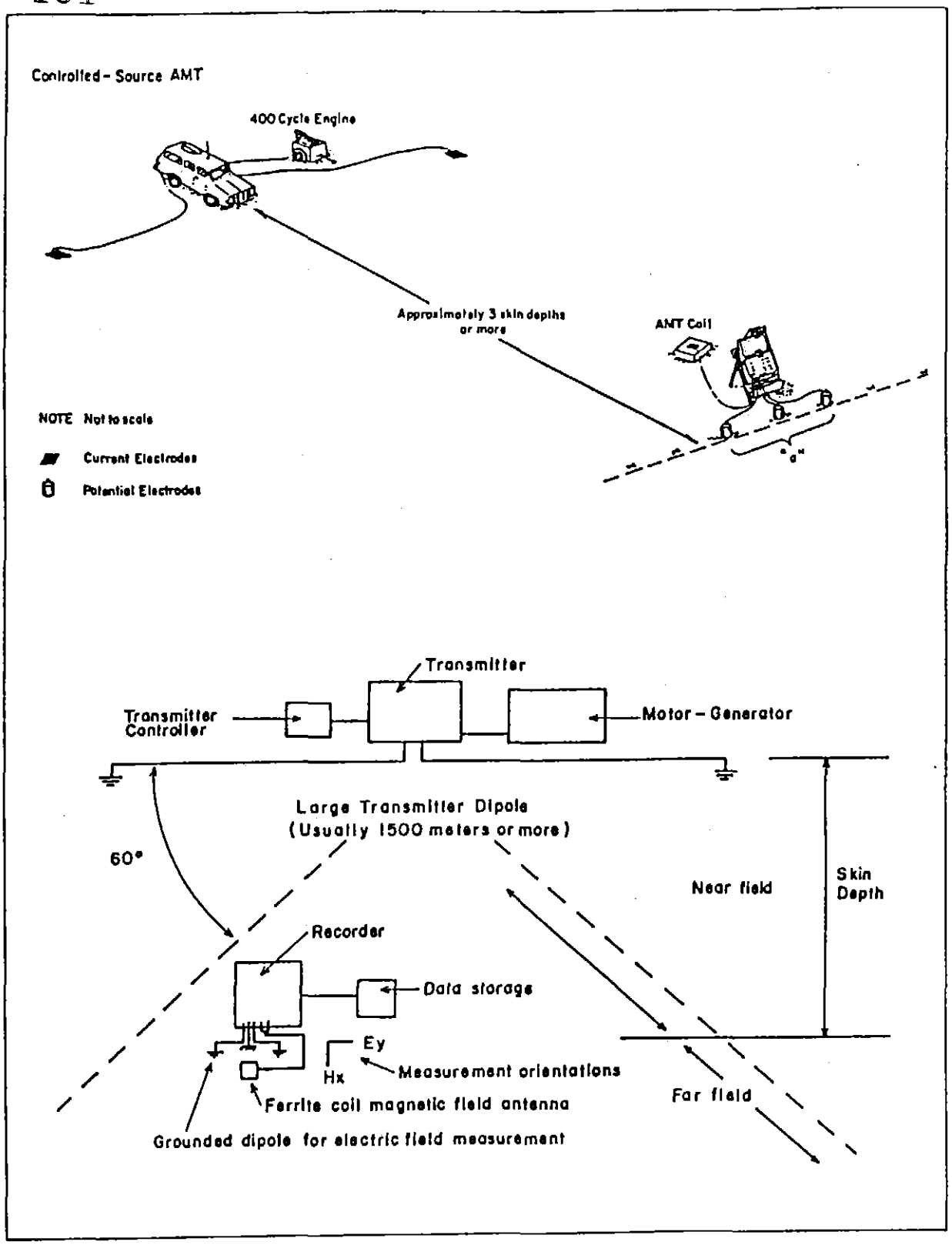
BURNS PEAK, E.L. 44/88

DHEM

Modelling : EAF 14 - Loop 2

FIG. 9n

Ref: NBH/MG89/03



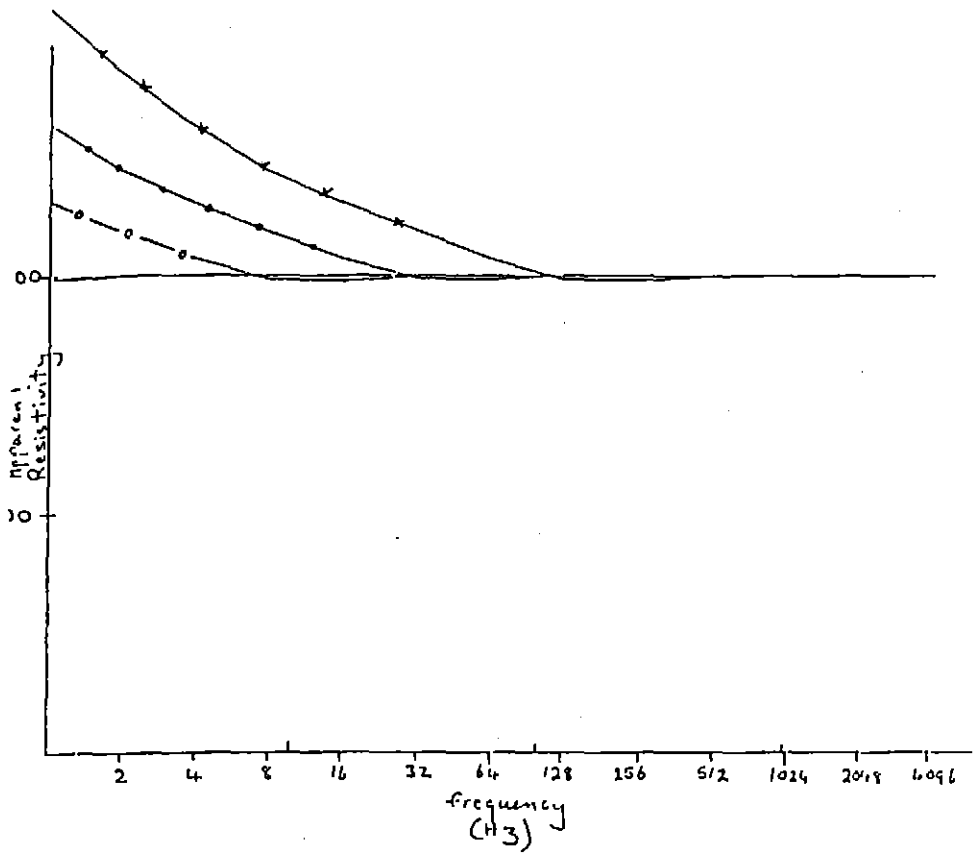
Mitre Geophysics Pty Ltd

BURNS PEAK, EL44/88

CSAMT

Field Procedure

FIG. A1



Tx - Rx dist.

Uniform half space : 1000 ohm-m

x —— x 6 kms.

• —— • 12 kms.

o —— o 24 kms.

—— 100 kms.

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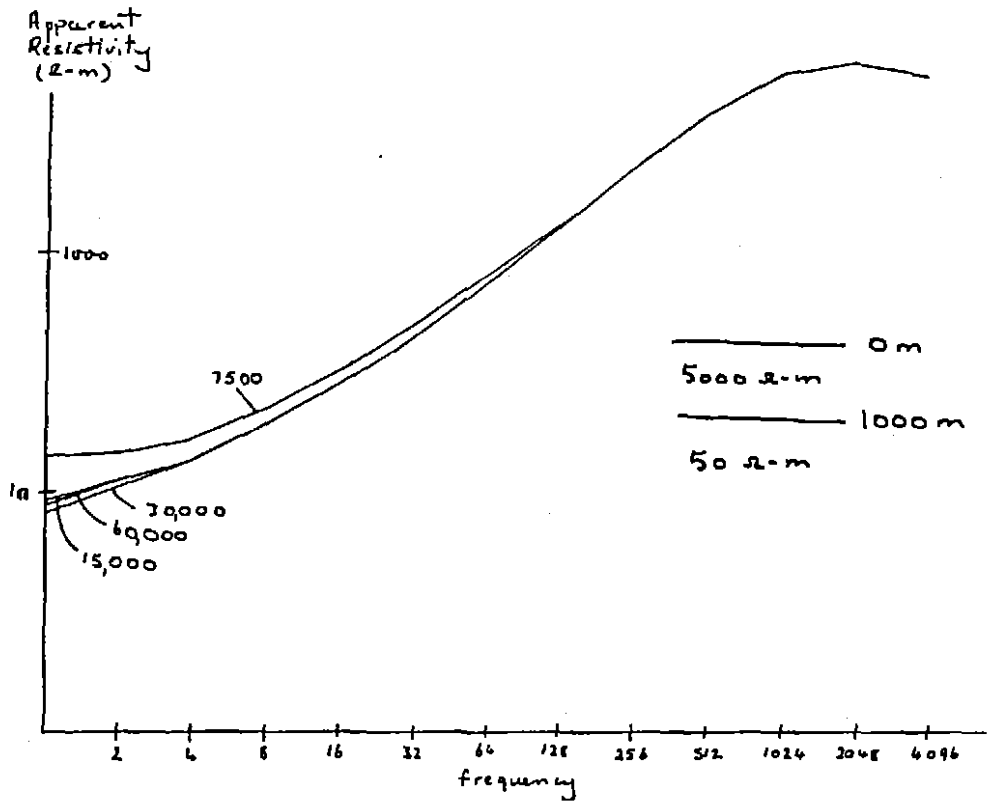
BURNS PEAK, E.L. 44/88

CSAMT

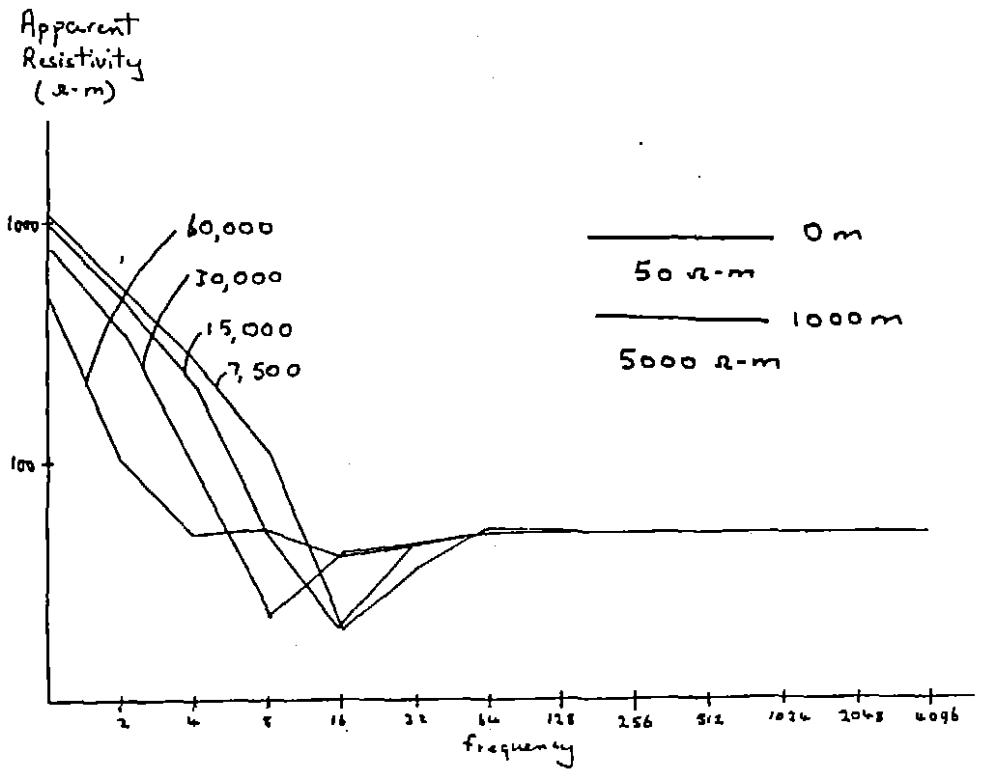
1-D Modelling

Variable Tx-Rx Dist.

FIG. A2



(a) Resistor over conductor

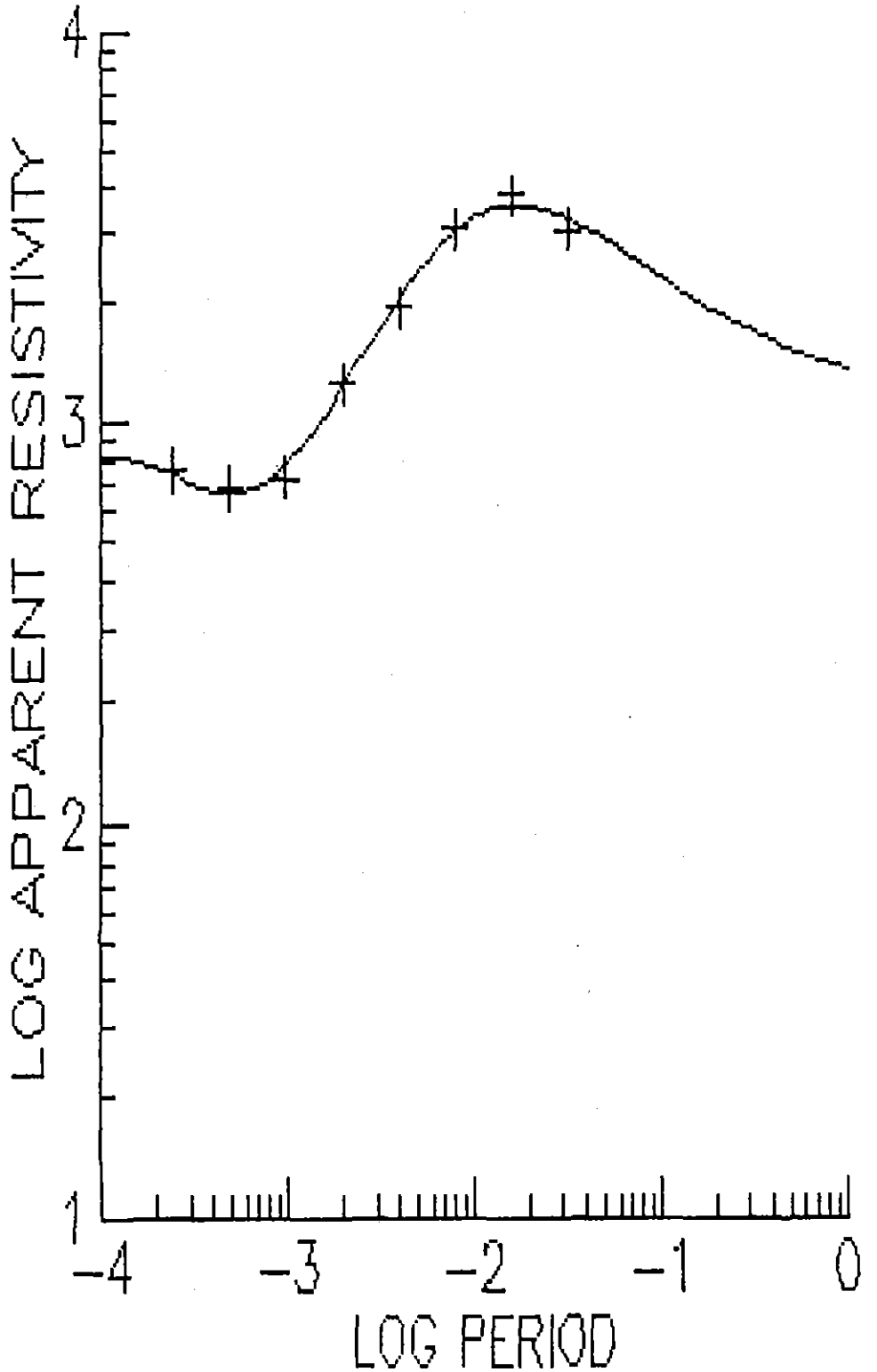


(b) Conductor over resistor

CSAMT
1-D Modelling
Variable Tx - Rx Dist.

ref: NBH/MG89/03

Fig. A3.



SITE: Burns Peak 5200N 4830E

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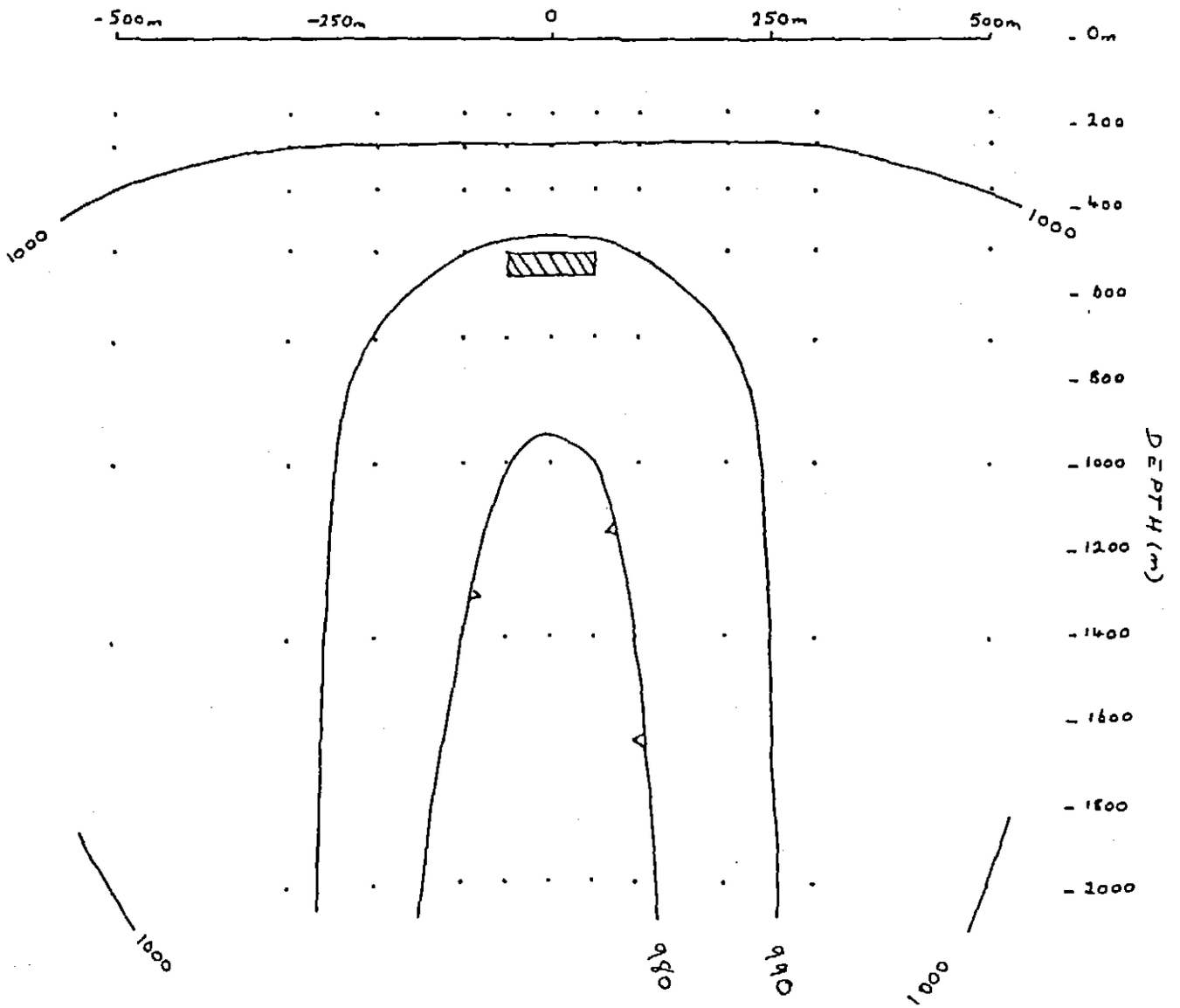
BURNS PEAK, EL 44/82
CSAMT
1-D
Inverse Modelling
FIG A4



Apparent Resistivity - MT Depth
contour interval
10 ohm-m

Model Parameters

	Body	Halo	Host
Depth:	500 m.	—	
Size:	100m. wide × 50m. deep	—	
Resistivity:	1·0 ohm-m	—	1000 ohm-m

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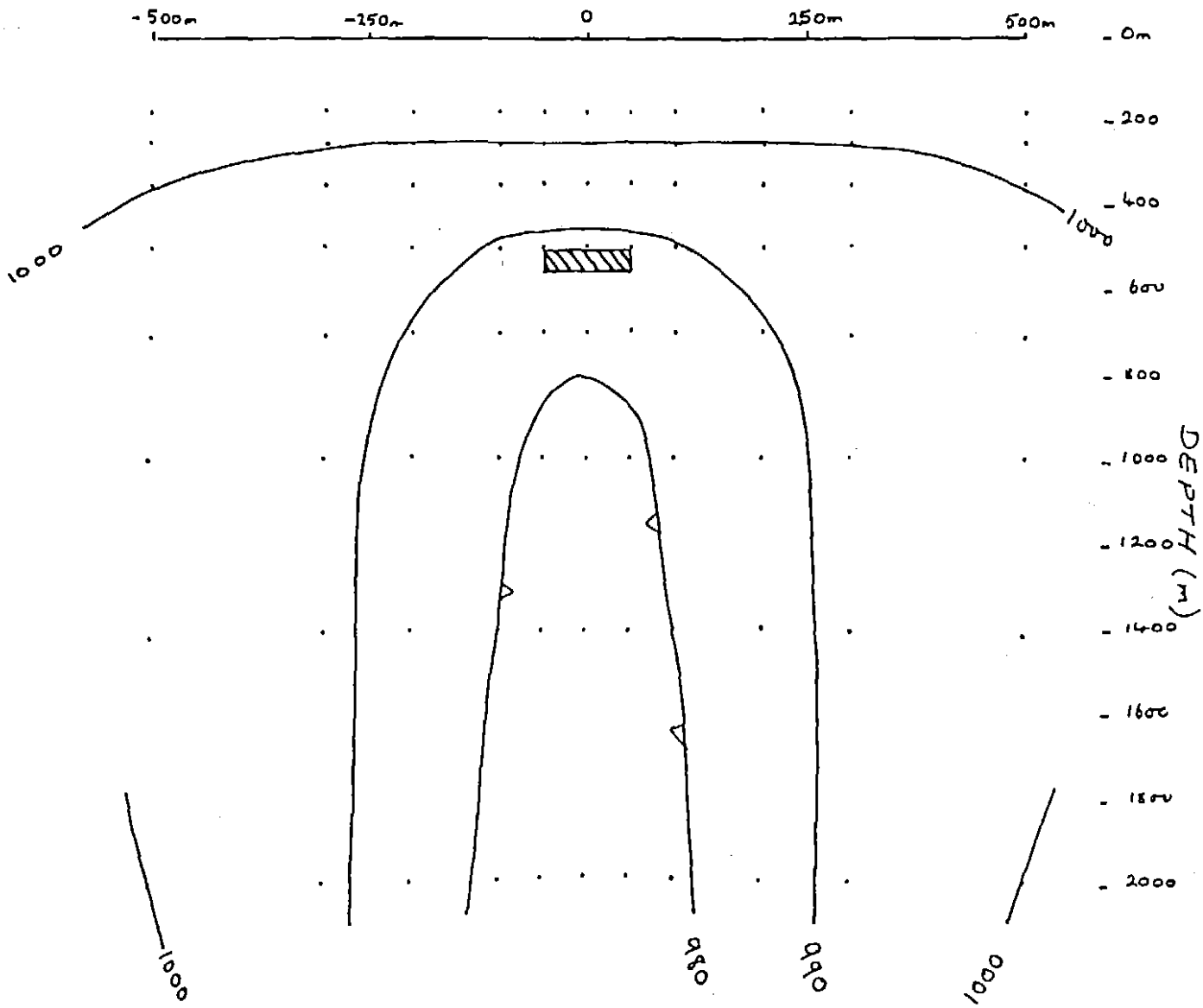
CSAMT
2-D Modelling

FIG. A5

Ref: NBH/MG89/03



Apparent Resistivity - MT Depth
contour interval
10 ohm-m

Model Parameters

	Body	Halo	Host
Depth:	500 m.	—	
Size:	100m. wide × 50m. deep	—	
Resistivity:	0.1 ohm-m	—	1000 ohm-m

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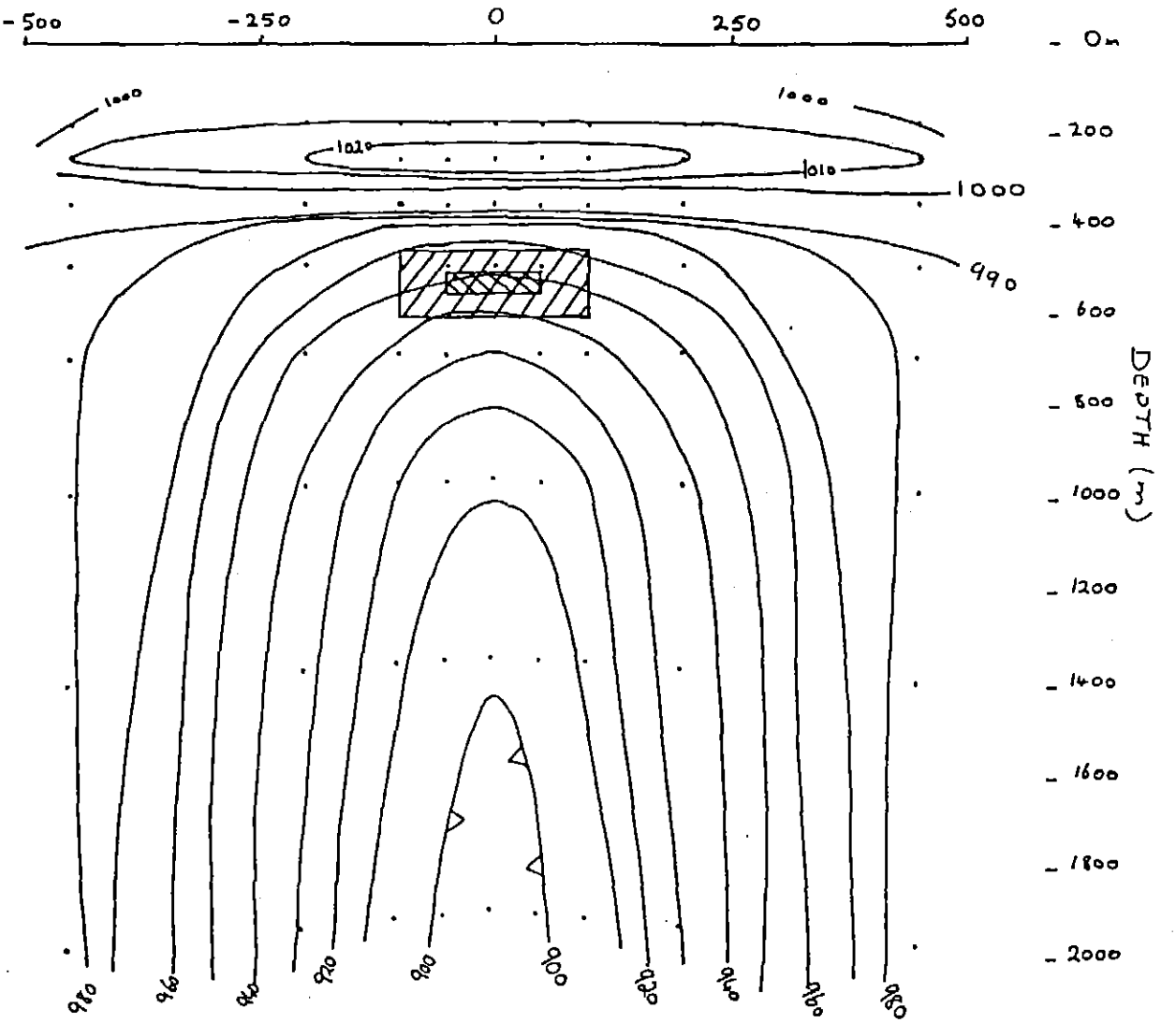
CSAMT
2-D Modelling

FIG. A6

Ref: NBH/MG89/03



Apparent Resistivity - MT Depth
contour interval
10 ohm-m

Model Parameters

	Body	Halo	Host
Depth:	500 m.	450m	
Size:	100m. wide × 50m. deep	200m wide × 150m deep	
Resistivity:	0.1 ohm-m	10 ohm-m	1000 ohm-m

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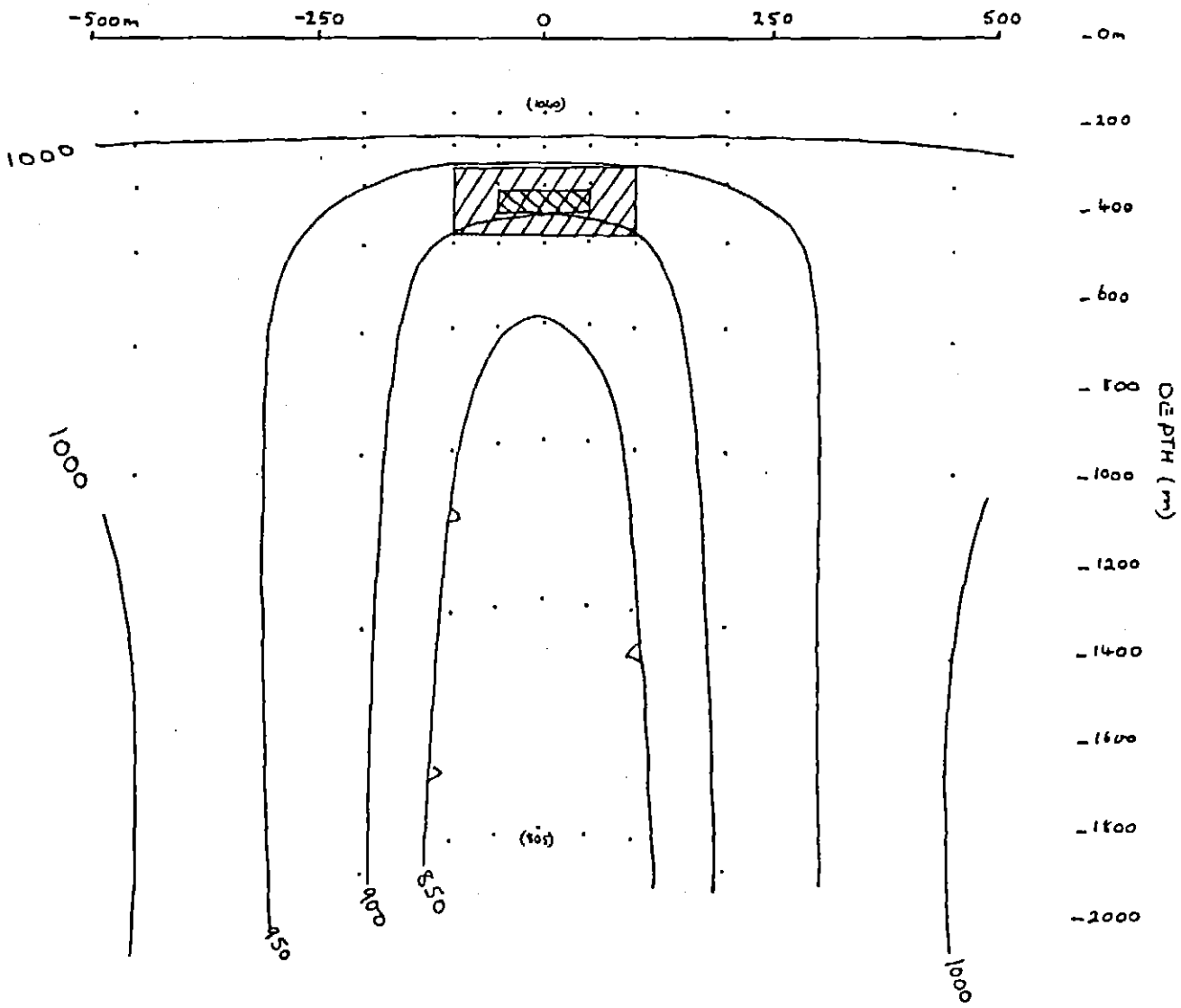
BURNS PEAK, E.L.44/88
CSAMT
2-D Modelling

FIG. A7

Ref: NBH/MG89/03



Apparent Resistivity - MT Depth
contour interval
50 ohm-m

Model Parameters

	Body	Halo	Host
Depth:	350 m.	300 m	
Size:	100m. wide × 50m. deep	200m wide × 150m deep	
Resistivity:	0.1 ohm-m	10 ohm-m	1000 ohm-m

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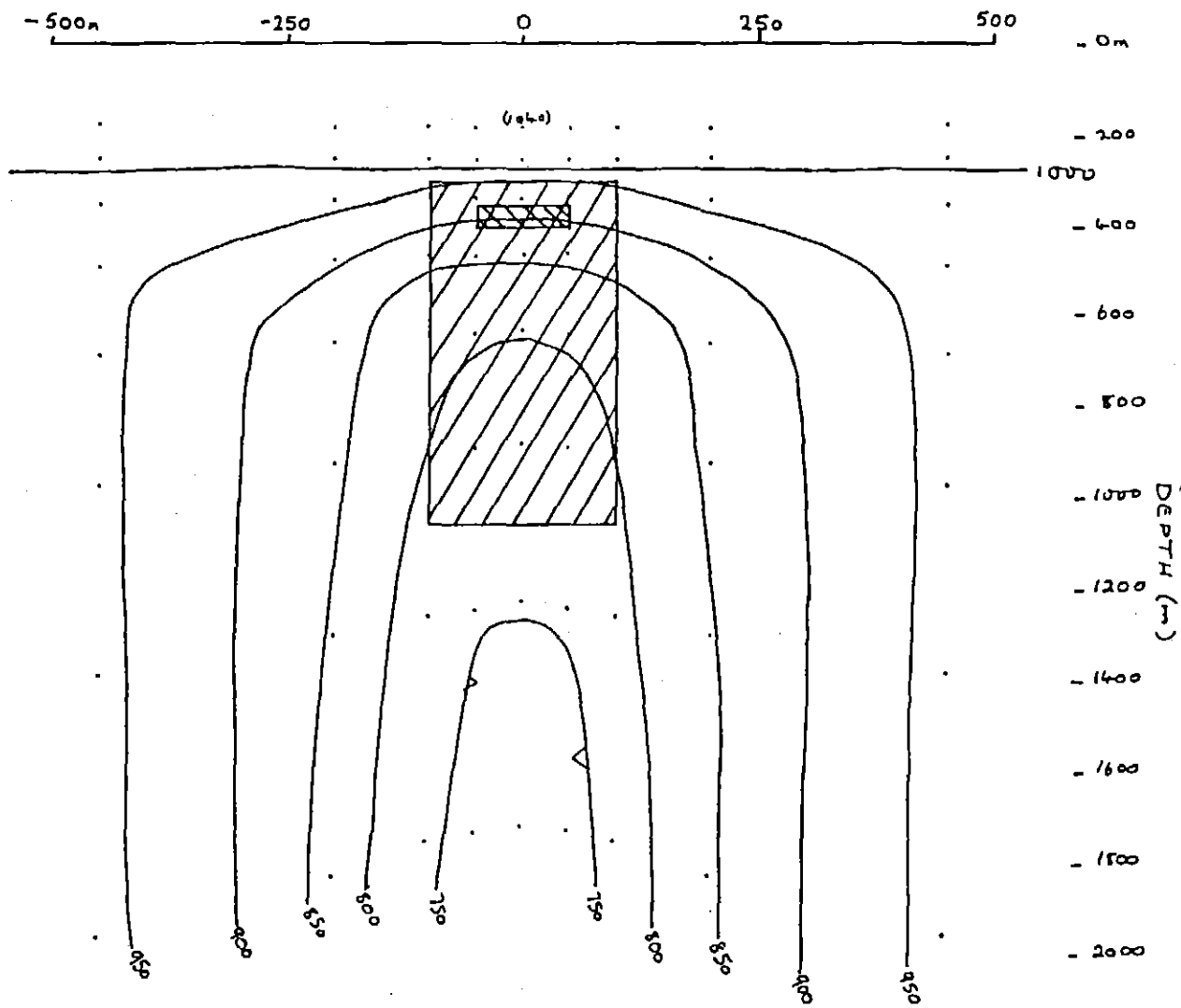
CSAMT
2-D Modelling

FIG. A8

Ref: NBH/MG89/03



Apparent Resistivity - MT Depth
contour interval
50 ohm-m

Model Parameters

	Body	Halo	Host
Depth:	350 m.	300 m	
Size:	100m. wide × 50m. deep	200m wide × 750m deep	
Resistivity:	0·1 ohm-m	100hm-m	1000 ohm-m

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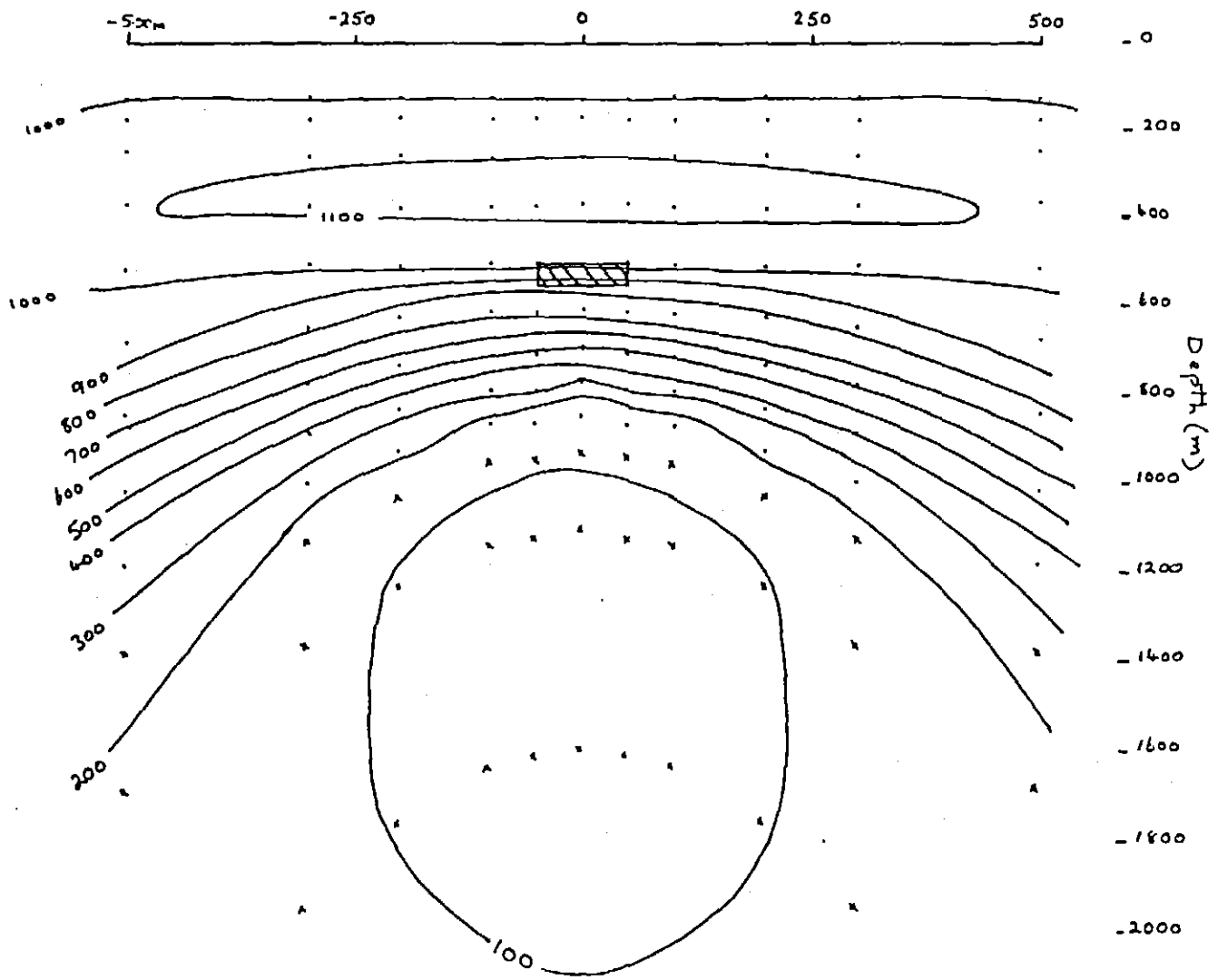
CSAMT
2-D Modelling

FIG. A9

Ref: NBH/mg89/03



Apparent Resistivity - MT Depth
contour interval
100 ohm-m

Model Parameters

	Body	Halo	Host
Depth:	500 m.	—	
Size:	100m. wide ×50m. deep	—	
Resistivity:	0·1 ohm-m	—	1000 ohm-m

Transmitter parallel to strike

Mitre Geophysics Pty. Ltd.

BURNS PEAK, EL.44|88
CSAMT
2-D Modelling

FIG. A10

Ref: NBH/mg89|03

APPENDIX 5

REVIEW, GRAVITY & MAGNETIC DATA
E.L. 44/88

by D. LEAMAN, LEAMAN GEOPHYSICS

192 LEAMAN GEOPHYSICS
Survey Review, Specification, Reduction, Interpretation
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REVIEW
GRAVITY AND MAGNETIC DATA
EL 44/88 BURNS PEAK

for
NORTH BROKEN HILL - PEKO

by
Dr. D.E. Leaman

February 1989

BURNSPK

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12. Detail of profiles 1590, 1613 and 1640
13. Character correlation observed in magnetic data
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15. Bouguer anomalies and interpretation summary

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SUMMARY

Review of existing regional gravity and magnetic data in the Burns Peak region, known as the Chester - Pinnacles area, has suggested that the data sets consistently identify trend orientations that are only partly reflected in surface geological mapping.

There is some variation in orientations across the area and indications that some now-exposed structures or rock units were controlled asymptotically by concealed structures.

Gravity data reveal a major N-S discontinuity extending through Chester and Leo's Find. This is considered to reflect a significant change in basement relief and to be the western limit of shallow Tyennan material. To the east the Mt Read Volcanic pile may rest on basement, to the west Tyennan basement is overlain by late Precambrian Oonah-style rocks, Dundas Group and the western edge of the volcanic pile.

It is likely that the extension of the pile across the underlying basement shelf (?) is due to thrust stacking involving materials near the concealed basement boundary. The curvature of some trends and rock units may approximately locate E-dipping structures in such a stack. Some sub-vertical structures are also present.

Most known mineralisation is concentrated in this zone of complex faulting above or immediately west of the change in character and relief of the basement. Mapped alteration zones also lie above the inferred basement boundary.

The intersection of these fundamental N-S boundaries and sub E-W features are likely to be sites for transmission of fluids and mineralisation. WSW of Chester this zone is marked by a local gravity anomaly. Priority should be given to testing this feature.

While it is possible that some further magnetic survey would clarify and refine the inferences made there can be no doubt that more comprehensive gravity survey will define the precise location and nature of critical structural elements and offsets as well as providing a basic evaluation of the potential of altered or mineralised areas. Some structural analysis may also be justified.

INTRODUCTION

EL 44/88, Burns Peak, is located less than 10 km north of Rosebery in western Tasmania (Figure 1). It includes the Chester and Pinnacles Mines and is generally known as the Chester-Pinnacles area. It has been subject to much exploration over the years (e.g., see summary of geophysics, Leaman (1980)). Previous work has not led to any major new discovery.

As part of a new approach to the area North Broken Hill - Peko, has requested a review of extant public domain magnetic and gravity data based on the experience and techniques developed in recent years. This report provides an assessment of existing data and its implications.

There have been some general, regional studies undertaken using some of the same data as part of the Mines Department Mount Read Volcanics Project between 1985 and 1988. None have been specific to the Chester-Pinnacles area but all provide aspects of a background setting (Leaman, 1986a, b; 1987; 1988 a). The present review has incorporated this information and then considered any detailed inferences which might be drawn from it.

DATA

Mines Department open file data has been used throughout this review. Such data exists in digital form and is available for manipulation. All gravity and magnetic data within EL 44/88 and its immediate surrounds was acquired.

Most of the gravity data was observed as part of early phases of the Mt Read Volcanics Project and little of it was extant when the early regional interpretation (Leaman, 1986 b) was prepared. Consequently much of this data has never been reviewed or interpreted previously. The raw Bouguer values, calculated using a density of 2.67 t/cu m, have not been plotted. These values are heavily biassed by the combined effects of large granite masses and the shape of the mantle interface. Both were assessed by the writer as part of a sub contract for the Mt Read Project. A model was developed for the shape of the mantle interface and titled Mantle88 (Leaman, 1988 a). Although subject to further refinement it does account for all primary features observed in the gravity field across western Tasmania.
Figure 6 presents a regional compilation of residual anomalies calculated after subtraction of the gross crustal effects. The large negative anomalies reflect the large granite plutons. The Chester-Pinnacles area occupies a position in which a general NNE grain has been intersected by sub E-W features related to the Tor-Heemskirk granite system.
Figure 14 shows the location of stations and detail of the residual field within EL 44/88. This Figure shows the influence of the Tor and Meredith Granites in the extreme NW and SE corners of the diagram. Within EL 44/88 the field is complex with a dichotomy of trends a little west of grid line 380 000 mE. The regional grain, inferred to be NNE in Figure 6, is composed of two elements - nearly N-S, and NE-SW.

The magnetic data used was acquired in 1981 with E-W lines and nominal 500 m spacing and 40 m sampling (Corbett et al, 1982; Leaman, 1986 a). Other magnetic surveys are available for this area but the data is either less accessible, analog, or of lower resolution. Dighem surveys fall in the latter category. Since it is important to appraise the actual observations, rather than contour presentations of it which might be modified, the most recent digital data has been used. Profiles are presented in Figures 9, 10 and 11 for those lines which extend across the licence area.
A regional contour presentation of the 1981 survey is shown in Figure 2 and profiles are given in Figure 3. Figure 2 locates the general region and character of the field near Chester while Figure 3 provides a perspective about the actual character and relief of the features observed. Responses are relatively subtle in the Chester-Pinnacles area.
The contour amplification offered in Figure 8 must be appraised in this context. NE-SW features generally dominate the Figure but all are terminated by the negative geometric effect of the N-S axis of strongly magnetic rocks to the west. These two trend systems are more clearly reflected in the gravity data.

DISCUSSION

GENERAL

This review has been limited to data sources as defined above. No older or less resolving data has been used. This comment applies principally to magnetic data since no gravity data not part of the departmental data bases has been fully corrected or tied to state datum. Both deficiencies limit the value such data might have. The primary object of the review has been recovery of any suggestions of anomalous character and an indication of whether further survey is a viable exploration option.

The regional lineament study correlated with mineralised sites as presented by Leaman (1987) is shown in Figure 7. This diagram was based on the 1981 magnetic survey, as used for this review, and an earlier compilation of the gravity data base. Even so there are suggestions in the combined data sets that the mineralisation within the Chester-Pinnacles area is not random. Prospect clusters occur on E-W features near the intersection of NE or NW trending features. The presentation has restricted resolution and further regional evaluation is not possible.

MAGNETIC INTERPRETATION

Previous specific interpretation within EL 44/88 is shown in Figure 4. This provides a structural setting for part of the area. It suggests that the ultramafics to the west have been folded into the Huskisson Syncline. These materials dominate the magnetic field. In this model the "Rosebery Fault" (as in Figure 13) marks a major change between the folded sequence to the west and the volcanic pile to the east. The solution requires that many parts of the eastern sequence dip relatively shallowly eastward and that these include, or involve, mafic rocks at depth. Such a model would suggest that the mapped location and form of the Rosebery Fault, as indicated by Corbett and McNeill (1986), represents a boundary limit for a set of interwoven structures. These structures may also involve Upper Precambrian basement, as exposed along the Hatfield River.
This concept may be compared with the structural solution offered 13 km further north (Figure 5). The presence of the Meredith Granite simplifies the interpretation and the same style of solution is required. The form of magnetic units above the east-dipping structures is not uniquely defined but all the features required by the solution for line 1621 are present. Mafic rocks are clearly involved in the structures as the major positive bulge in the magnetic field indicates.

Previous structural analysis, albeit of widely separated profiles, has suggested the presence of sub vertical bounding structures near the location of the mapped position of the Rosebery Fault and at least two interfingering east-dipping structures. These may well be thrusts and the style of solutions

as given in Figures 4 and 5 would suggest this to be feasible. It is possible to interpret the bends and intersecting structures south of Rosebery in a manner which would be consistent with one or two major sub-vertical structures and an intersecting set of low angle structures (see Rosebery Mine Lease study).

This pattern could also be inferred from the rock unit distribution shown in Figure 13. In the vicinity of Pinnacles, for example, units curl eastward in a manner which would be consistent with east-dipping slabs. Such slabs or structures diverge from the "Rosebery Fault" zone.
No further structural analysis has been undertaken for this review since it requires a regional perspective and the data acquired for analysis was restricted to the licence area. This limitation is evident in the profiles displayed in Figures 9 to 11.

Groups of profiles have been presented in a true stacked form in order to allow direct comparisons. Unfortunately the 1981 survey was locally fragmented in this area and the Figures present only those lines which continue across the licence area. The nominal spacing of 500 m is often exceeded locally.
The profiles have been inspected for indications of subtle responses consistent with property alteration or mineralisation based on the signature studies of Leaman (1987).
Most magnetic character is related to magnetic units within the volcanics and few negative excursions may be observed which are not asymptotes to base level or geometric effects. There are, however, very gentle positive effects which may be correlated with altered and mineralised materials in the region of, and south of, Chester.
Figure 12 presents an amplified version of some key profiles. Lines 1590 and 1613 display the Rosebery signature between 377200 and 388500 mE. The low amplitude variations directly west of the strong positive feature whose axis lies near 380000 mE reflect the alteration response. This zone has been mapped with pyrite-sericite alteration. Few similar responses can be found on other profiles but this may reflect the distribution and coverage of the profiles with respect to the known mineralised or altered areas. Line 1640 may contain some of this character but the marked change in magnetic field responses which occur between lines 1613 and 1621 masks any evaluation of continuity.

If Figure 8 may be considered a fair representation of the major elements of the magnetic field then Figure 13 provides an indication of the continuity and location of minor elements. Most of these have amplitudes less than 25 nT. It will be noted that the orientation of the smaller features is not consistent with the orientation of the primary features which is more NE-SW than N-S and not always consistent with mapped units or trends. The "Rosebery Fault" zone is magnetically identifiable using secondary features.
Comparison of the stacked sets of profiles shows, however, some more fundamental character. The change in response pattern

between lines 1613 and 1621 is evident in Figure 9 while a similar change is evident between lines 1700 and 1720 in Figure 11. The differences are evident in all parts of the profiles and are more clearly recognised in profile rather than contour form. The zones in which such character change occurs have been labelled in Figure 13 and are nearly parallel to the flight lines. Since these features can be recognised in gravity data they cannot be ascribed to the survey.
It is perhaps significant that the trend changes mapped by Corbett and McNeill (1986) near Pinnacles are asymptotic to one such character change and that the pattern of alteration changes near Chester can be correlated with the other. In each case known mineralised sites occur within 750 m of the axis of change. Line spacing does not permit finer resolution.
The changes implied reflect fundamental deep-seated sources or structures. The features of Figure 8 are generally more deeply sourced than those of Figure 13.

GRAVITY INTERPRETATION

Although the residual anomalies are based on a station spacing of 1 km all the features suggested by the magnetic data can be confirmed. West of 380 000 mE the field has a generally N-S trend whereas to the east many features trend NE-SW.

Two broad structural-lithological groupings are evident. Units and sequence denser than 2.67 t/cu m are represented by values in excess of 0 mGal while slightly less dense materials occur in the eastern half of the licence area. The large negative anomalies (>-7 mGal) reflect granite at shallow depth.
The dense section is readily explained; most Cambrian units (volcanics and Dundas Group) have bulk average densities of the order of 2.74 t/cu m. The negative anomalies are associated with the main body of the Mt Read Volcanics which have densities in the range 2.69-2.78 t/cu m. Such a sequence should not generate a negative response - unless the materials underlying them is less dense than 2.67. There are several possible explanations for the positive-negative pattern.

i) There is a major density contrast in the basement at no more than 2 km depth. 2.71 vs 2.65, say, for several km.
ii) The granite underlying the Farrell-Tor region shelves westward before plunging steeply.
iii) Siliceous basement underlies the entire area at moderate depth but is ramped, folded or faulted down near Chester and there overlain by a denser Cambrian or Precambrian section such as Dundas Gp or Oonah Fm. The volcanics overlap both materials on either side of the ramp or limit but are mostly piled to the east of it where there may be negligible amounts of the other Formations. A step relief of no more than 2 or 3 km may then generate the effect.

The presence of non Tyennan (siliceous) basement material is indicated by the blocks of infaulted Oonah style rocks to the

north and west and these observations are consistent with (i) and (iii) especially, while not excluding (ii). Option (ii) is less readily sustained regionally since the regional map would require an abnormal shelf development. Comparative gradients near, and distant from, granite are not consistent with (ii); the responses are shallower and must involve major rock units in the sequence.

The presence of Dundas Group and Oonah Formation in the region suggests that (iii) is the simplest option consistent with all observations and the compound basement change, possibly as an onlap or unconformable succession, with Dundas Gp overlying both Precambrian styles is most likely. Only negligible amounts of Dundas or Oonah rocks could be present beneath the volcanic pile although the variations in the gravity field may reflect subtle changes in unit volumes and relationships.

However the change in residual gravity is explained in detail, the broad effect marks the limit of Tyennan basement. Chester overlies this limit, Pinnacles lies to the west of it (Figure 15). Within this framework it is inferred that the shallow Tyennan limit trends is a little east of north in this area but the grain within it, or in materials directly overlying it, is NE or ENE. Parts of the volcanic sequence mirror these latter trends but since only upper units are exposed it is not surprising that the axial pile trend (as a whole) parallels the basement edge and is dominant. Even so, available mapping and magnetic discontinuities reveal internal or controlling variability.

While there are gravity responses which can be associated with the Henty Fault it is difficult to find any pattern or association for the Rosebery Fault as mapped. I take this to indicate that such faulting (or system of faults) disrupts the same rock sequences and is not of primary structural significance in terms of basement offset (laterally or vertically), basin control, or volcanics control and may be be much younger overall. This is not meant to suggest that parts of such faults do not penetrate deeply or have not been used by mineralising fluids but they could not be significant in terms of primary Cambrian mineralisation.

Although the station spacing limits direct evaluation of known mineralised sites or alteration zones a spine of positive anomaly extends WSW from Chester. This is terminated near the inferred limit of shallow siliceous basement and the intersection with either (or both) the structural discontinuity defined by the magnetic survey (Figure 13) or the Rosebery Fault system.
It is possible that other anomalies of this type occur near the southern limit of the licence area at 377500 mE or 1.5 km SE of Leos Find. All sites associated with anomalies recognisable with extant data, or suspected may be, are marked * in Figure 15. All instances lie near the primary gravity gradient considered here to be basement-related but at the western edge of the volcanics.

INTEGRATION

This provisional interpretation has been summarised in Figure 15.

Trends inferred in the various compilations; residual Bouguer anomalies, contoured magnetics, magnetic profile assessments, have been indicated. The interpreted rating of such structures is reflected by weighting or continuity as judged by data control or agreement. No distinction has been made between features inferred from particular data sets.

The Figure also shows a mapped block of andesitic rocks which is shaped in a manner consistent with deep structure. Both data sets, as a result of coarse sampling or line spacing, can only resolve large of deep features or those which extend at least 1 to 2 km in depth.

The two data sets yield a compatible but complementary view of the area. Altered materials are associated with the major gravity gradient which is considered to be related ultimately to changes in basement form and composition. The adjacent regions appear unmineralised and this observation is consistent with the location of primary structure as defined.

The role of sub E-W structuring is uncertain but it may have assisted control of Cambrian mineralisation as well as subseqent emplacement of Devonian granites. There is little doubt that many other structures have been warped toward these trends.

CONCLUSIONS AND RECOMMENDATIONS

Although the available gravity and magnetic data sets are of regional value only and also a little patchy in coverage they do consistently suggest a concept which explains the known location of altered and mineralised sites and suggests which rock volumes justify further examination. It is also clear that gravity and magnetic methods offer a means of target refinement which could reduce overall exploration costs.

1. Most sites which contain economically interesting mineralogy lie on or near an approximately N-S gravity anomaly which is considered to mark the shallow westward extension of Tyennan basement.
   To the west it is overlain by several kilometres of Dundas Group and Oonah Formation.
   The Mt Read Volcanics overlap this section but do not extend far west of the basement limit. The volcanics may directly overlie basement locally east of Chester (compare interpretation of the Mt Owen-Lynchford area - see Leaman, 1988 b).

2. Mapped lithological and structural trends can be observed in gravity and magnetic field character but the potential fields suggest differing emphases. This reflects a more fundamental, penetrative expression in the geophysical data. Rocks now exposed, but 1 to 5 km above basement controls, have been influenced by primary structures which can only be appreciated in geophysical context.

3. Some mapped units suggest curvature in trends or changes in control. Such units are distributed in a manner which is asymptotic to primary structures, trends or discontinuities as indicated by the gravity and magnetic data.

4. At least two major discontinuities are sub E-W. Each has gravity and magnetic expression, locally and regionally. One lies a little south of Chester Mine while the other is near or north of Leo's Find. There is no obvious regional, geological evidence of these features.

5. A poorly defined positive gravity anomaly parallels an E-W feature WSW of Chester. Other comparable features may exist but data definition is unable to resolve them. All suspected sites lie above the inferred basement step or limit.

6. East of the basement step/limit many trends are NE or ENE. Some surface units express such tendencies but it is not dominant in them. This may mean that such trends reflect basement grain, alignments deep in the volcanic pile, or slices of volcanics which dip east at moderate angles. Such structures may be complementary or similar to the structures along or intersecting the Rosebery Fault system near Rosebery itself.

There is evidence that features of this type may also influence the deeper section west of the Rosebery Fault as mapped, i.e., west of Pinnacles, and stacked thrusting dislocated by some sub vertical movements is implied in the region above and west of the basement step/limit.

7. Sites of alteration, as presently mapped, also lie close to the basement step.

8. Current data and present analysis would indicate that possible targets might occur near Leo's Find (a little east and probably north), or WSW of Chester.
Refinement of definition and assessment of other possibilities is dependent upon acquisition of additional data.

9. Although it is clear that magnetic data can identify bulk alteration and primary dislocations not necessarily obvious in surface mapping it is unclear whether infill of the 1981 survey would prove cost effective given other sources of information.
Infill of the gravity survey is certainly recommended. Such a survey would confirm and refine trend and structural inferences, locate any abnormal offsets in such trends, and provide evaluation of possible mineralisation targets and signatures. A nominal spacing of 250 m, locally reduced near chemically-inferred targets, dependent on access or cut lines is advised west of 381 000 mE and perhaps 300 to 500 m spacing east of this easting.

10. There is some potential for bulk structural interpretation of an upgraded data set, either gravity or magnetic, within the regional setting afforded by the surrounding state data base and defined regional elements.

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by

D. Leaman

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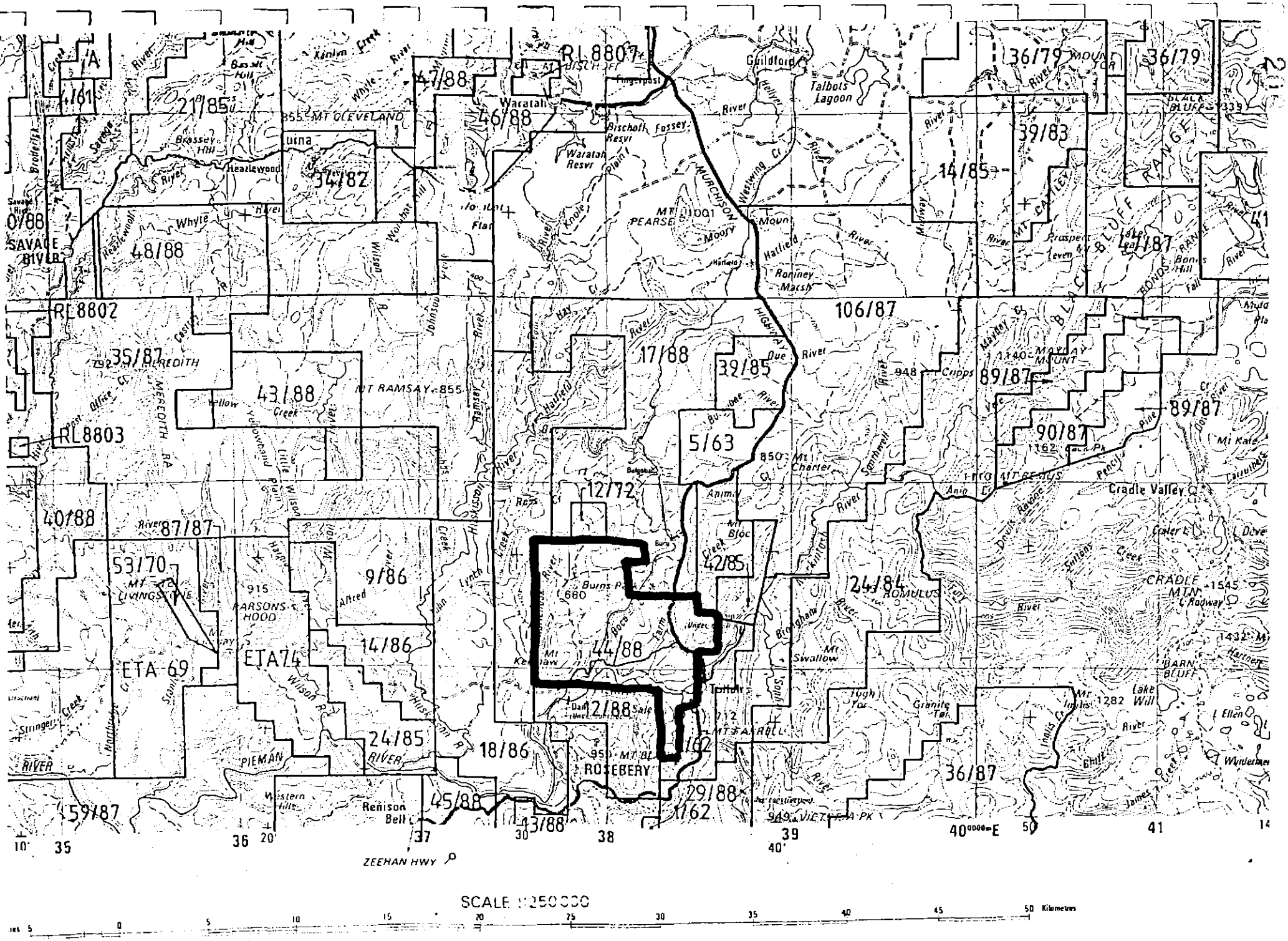
M.Aus.I.M.M., M.M.I.C.A

24-2-89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ZEEHAN HWY
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ROSEBERY
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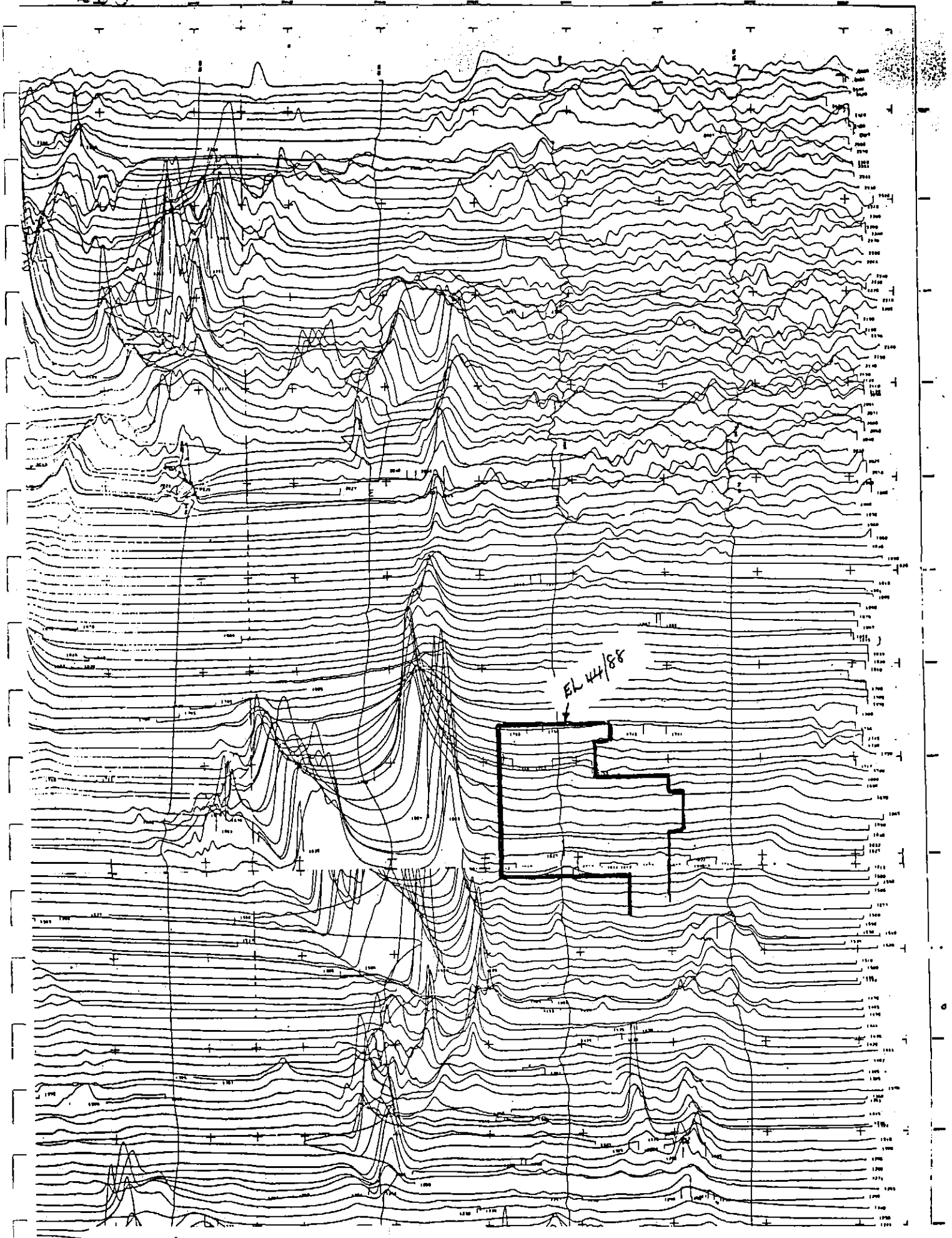
Guildford
Talbots Lagoon
Waratah
Waratah Resvr
Bischoff Fossey Resvr
MURCHISON
PEARSE
MT RAMSAY
MT MEREDITH
MT LIVINGSTYLE
PARSONS HOOD
MT SWALLOW
MT CHARTER
MT ROMULUS
MT SAVAGE
BARN BLUFF
BLACK BLUFF
PANGHT RANGE
Renison Bell
Lake Will
Lake Prosperine
Mt Kate
Mt Inglis
Mt Bischoff
Mt Cleveland
Mt Oakleigh
Mt Darwin
Mt Heemskirk
Mt Zeehan
Mt Owen
Mt Sedgwick
Mt Read
Mt Lyell
Mt Jukes
Mt Huxley
Mt Farrell
Mt Direction
Mt Black
Mt Arrowsmith
Mt Anne
Mt Agamemnon
Mt Afterlus
Mt Ida
Mt Hall
Mt Hamilton
Mt Hartnett
Mt Hayley
Mt Hugh
Mt Hunter
Mt Jupiter
Mt Kelly
Mt Lindsay
Mt Lloyd
Mt Mackenzie
Mt Mary
Mt Maxwell
Mt Murchison
Mt Norfolk
Mt Owen
Mt Pelion
Mt Pelion West
Mt Pencil
Mt Philp
Mt Pillinger
Mt Pleasant
Mt Pyramid
Mt Read
Mt Regent
Mt Rugby
Mt Sedgwick
Mt Selwyn
Mt Sharland
Mt Shelley
Mt Sorell
Mt Stanley
Mt Stewart
Mt Tyndall
Mt Vandyke
Mt Victoria
Mt Wedge
Mt Wellington
Mt Wilson
Mt Zeehan
Mt Zion
Mt Zumbo
Mt Zumbo West
Mt Zumbo East
Mt Zumbo North
Mt Zumbo South

CHESTER
Bulgonia
MT FARRELL
Pb Zn
ROSEBERY
Pb Ag
Renison Bell
ZEEHAN
Pb Ag
Sn
Sn Ag
Pb Ag Sn
Pb Ag Zn
Sn Ag
Pb Ag Zn
Pb Ag
Pb Ag Sn
Pb Ag
Pb Ag
Pb Ag

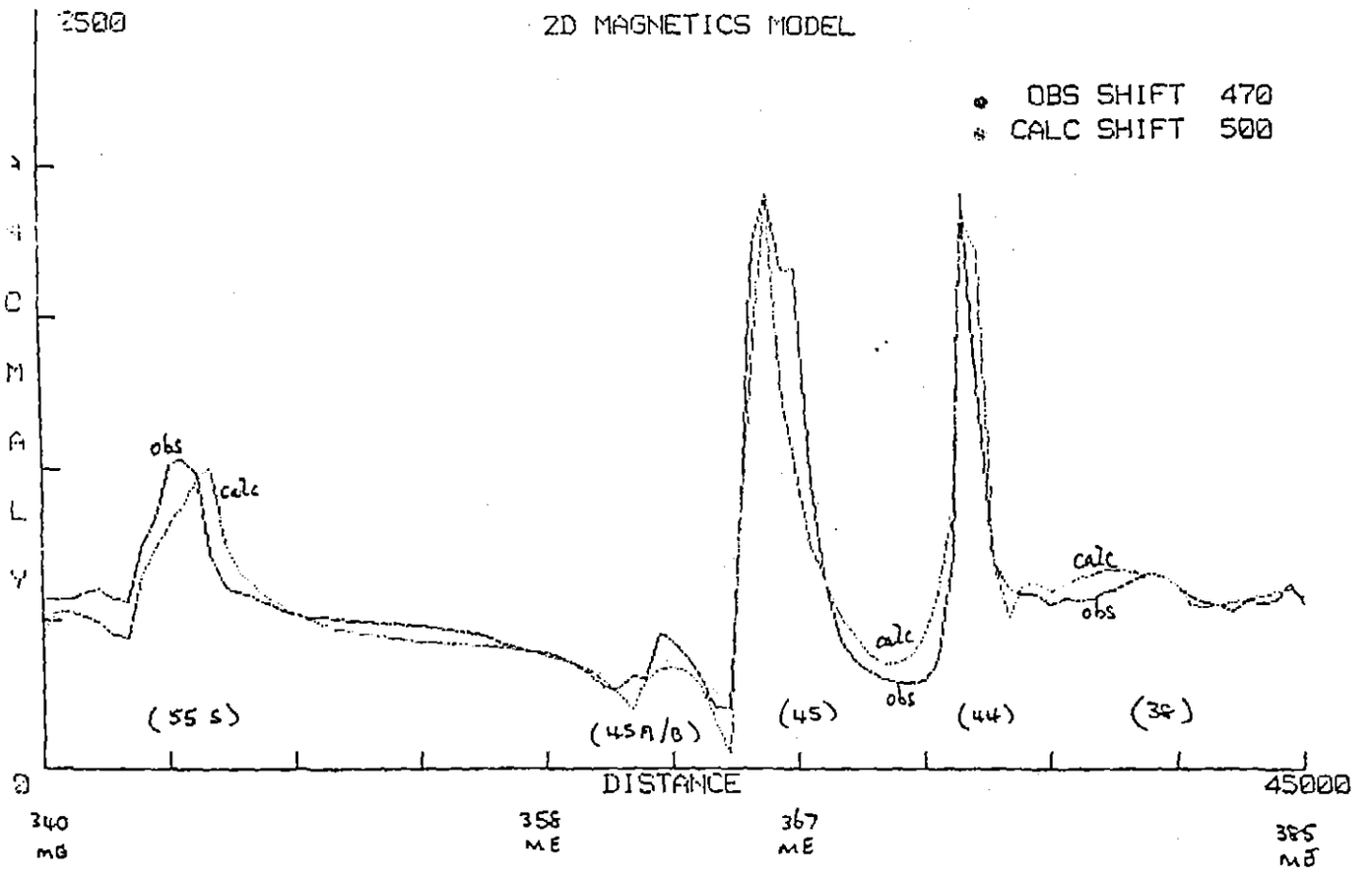


REGIONAL MAGNETIC PROFILE COMPILATION (MINES DEPT 1981 SURVEY)
FIGURE 3

INE PARAMETERS - ORIGIN,LIMIT,INCR : 0 45000 500

551210

95



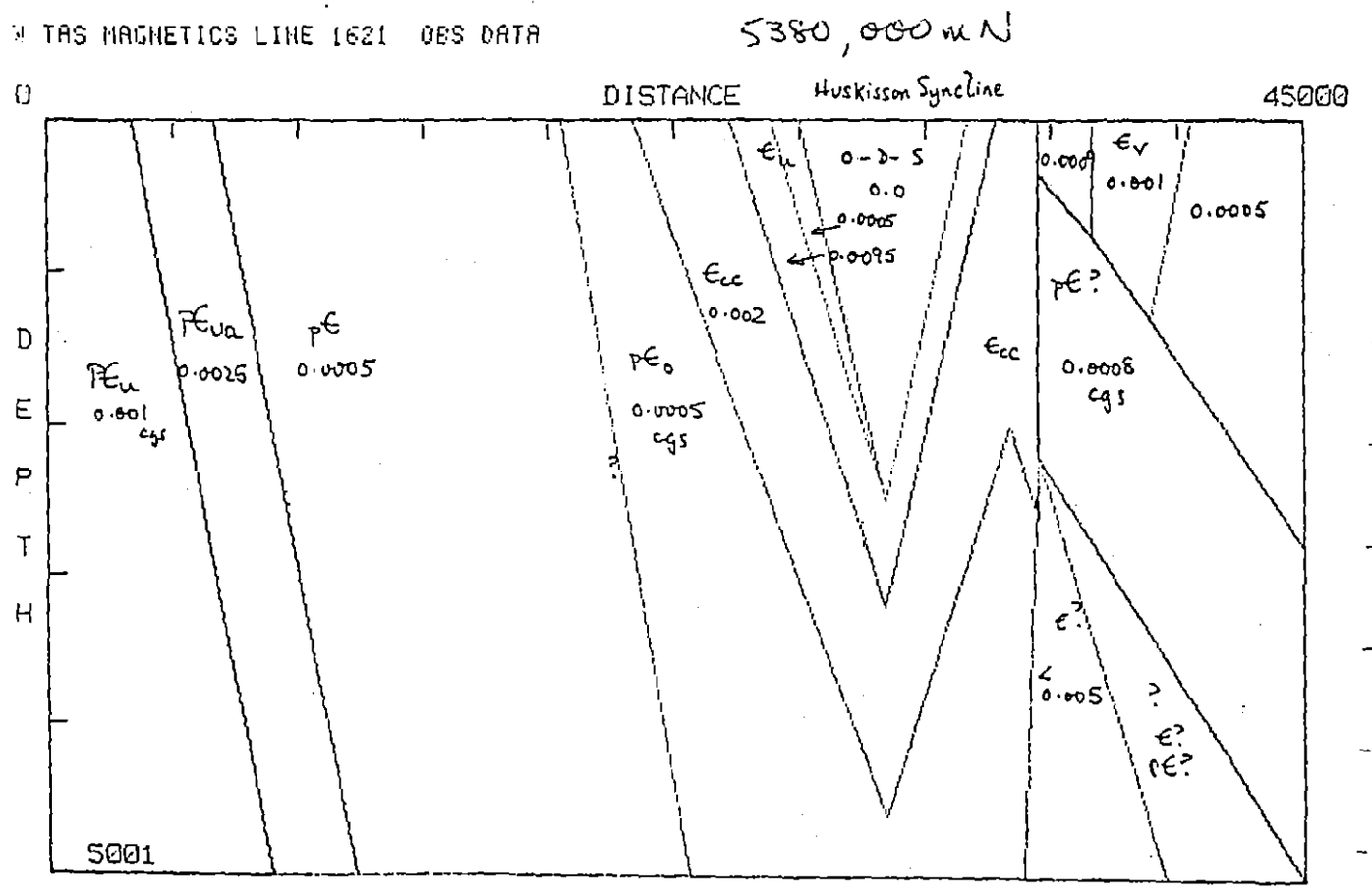


FIGURE 4-F-8

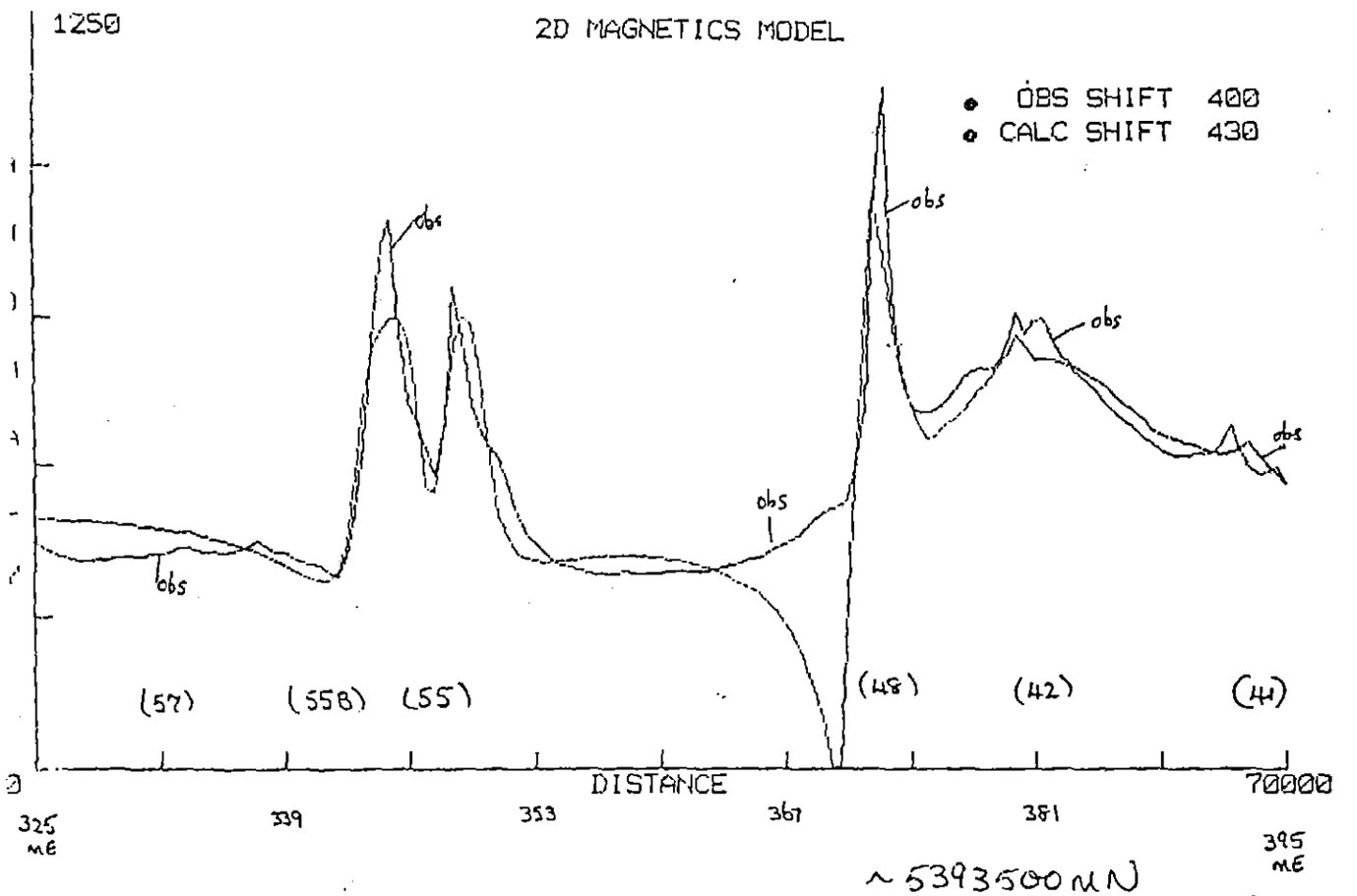
LINE 1621 - 2D RECIONAL INTERPRETATION

LEAMAN GEOPHYSICS
G P O Box 320 D,

(FROM LEAMAN (1986A) FIGURE 4

INE PARAMETERS - ORIGIN,LIMIT,INCR : 0 70000 500 551211

96



~5393500 MN

REGIONAL INTERPRETATION LINE 1890 (FROM 325E - REF 800N)

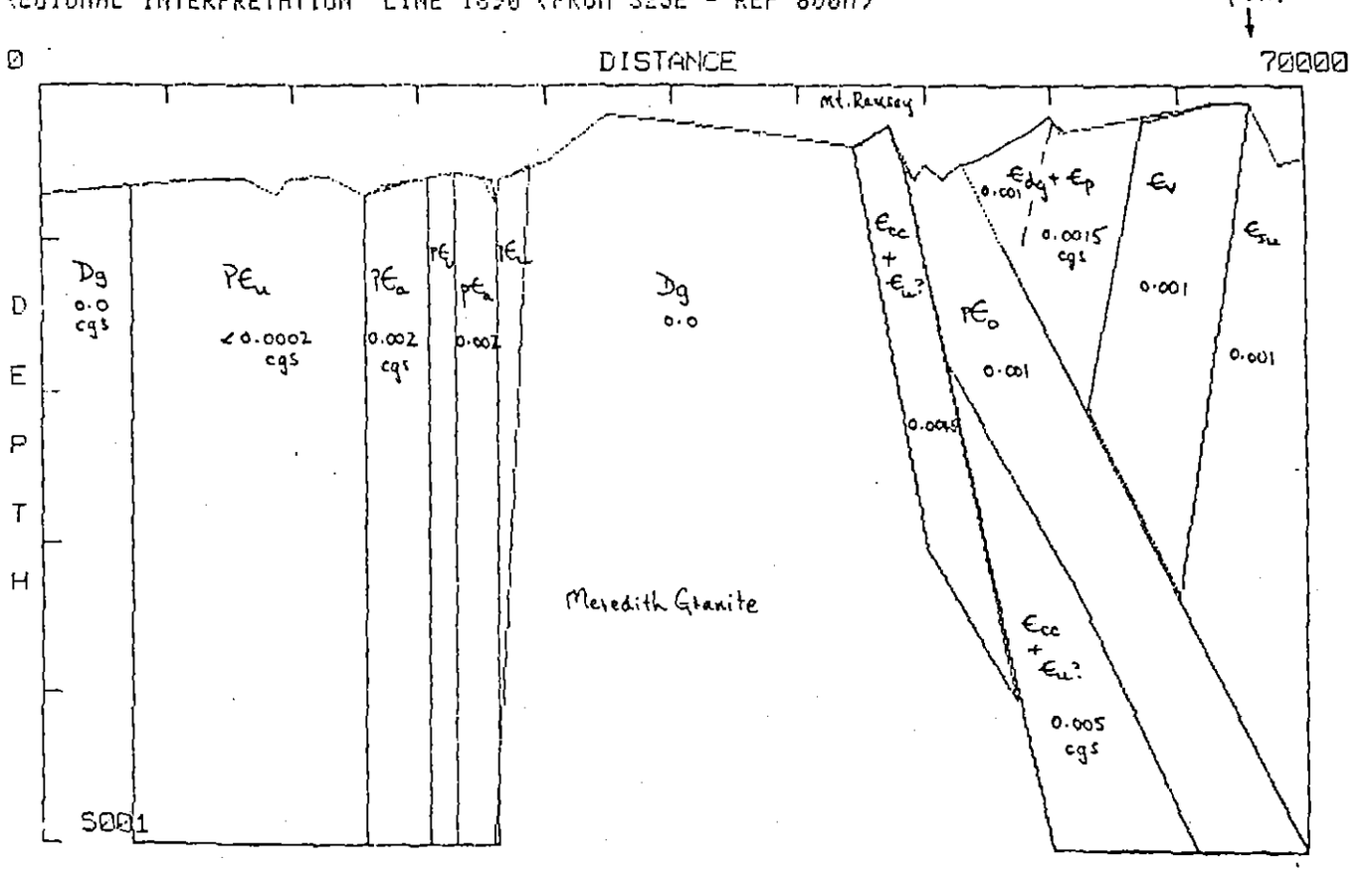


FIGURE 4-F-9

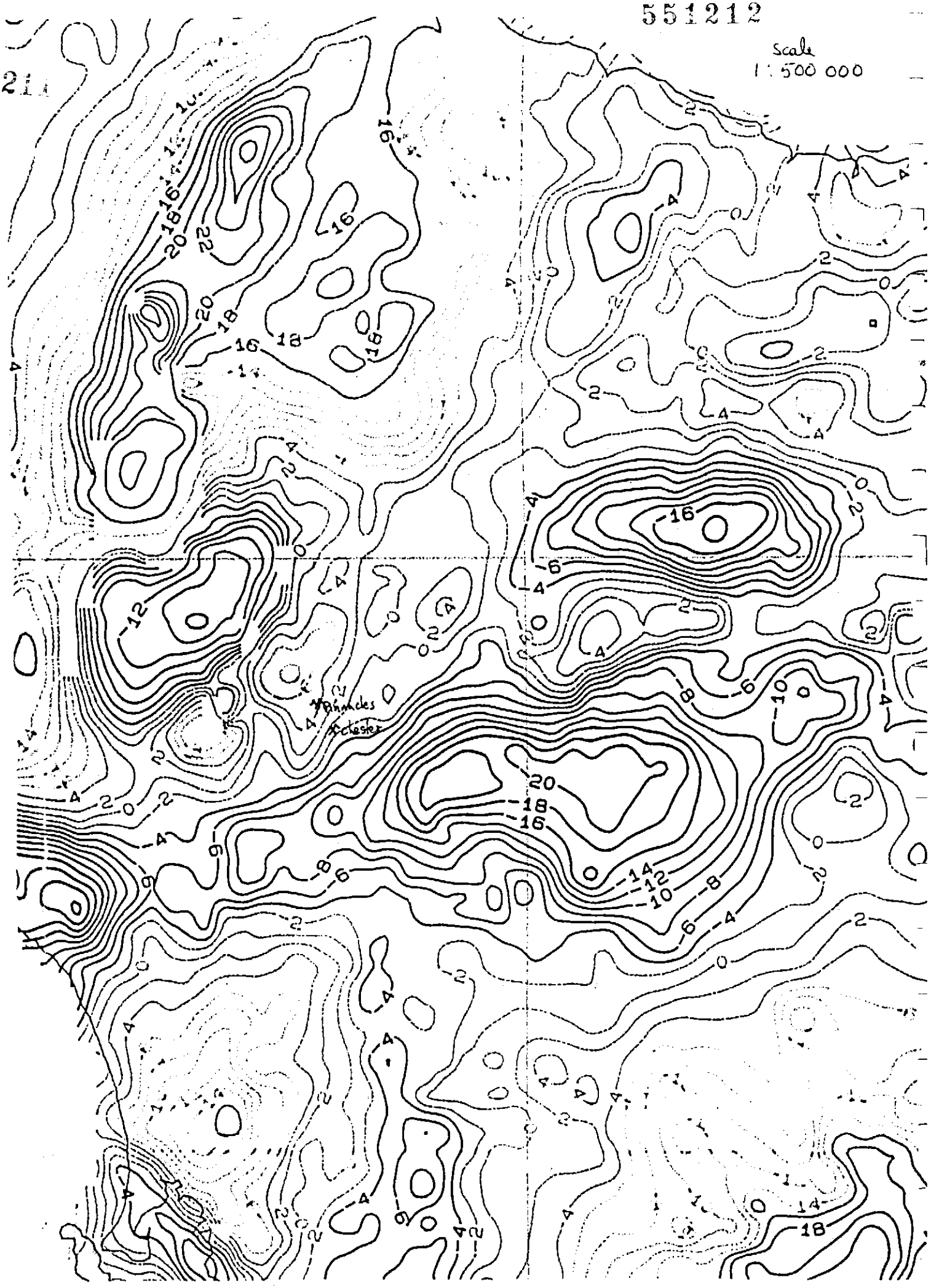
LINE 1890 - 2D REGIONAL INTERPRETATION

LEAMAN GEOPHYSICS
G.P.O. Box 320 D,
Tasmania 7001

(FROM LEAMAN (1986A)

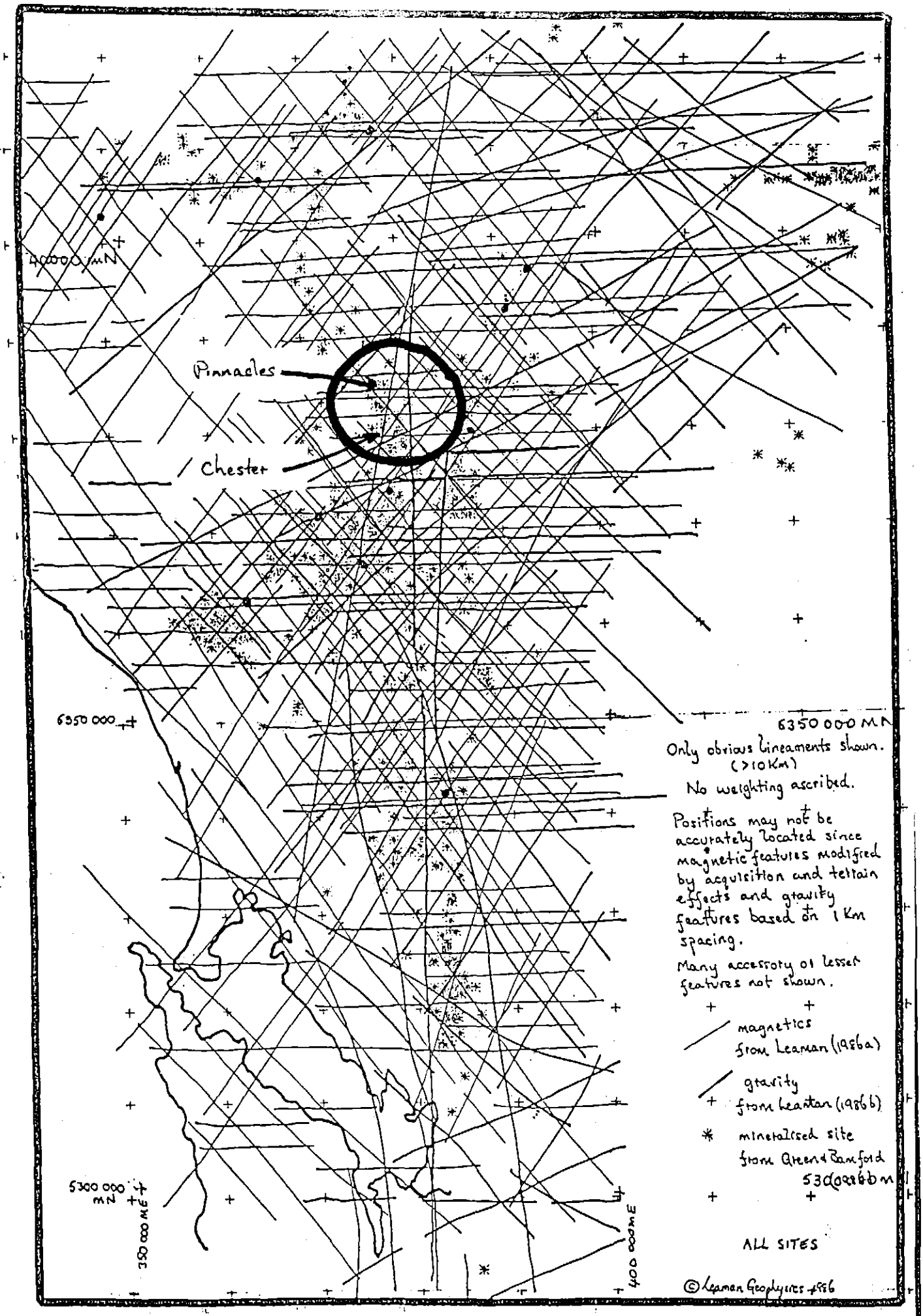
FIGURE 5

551212

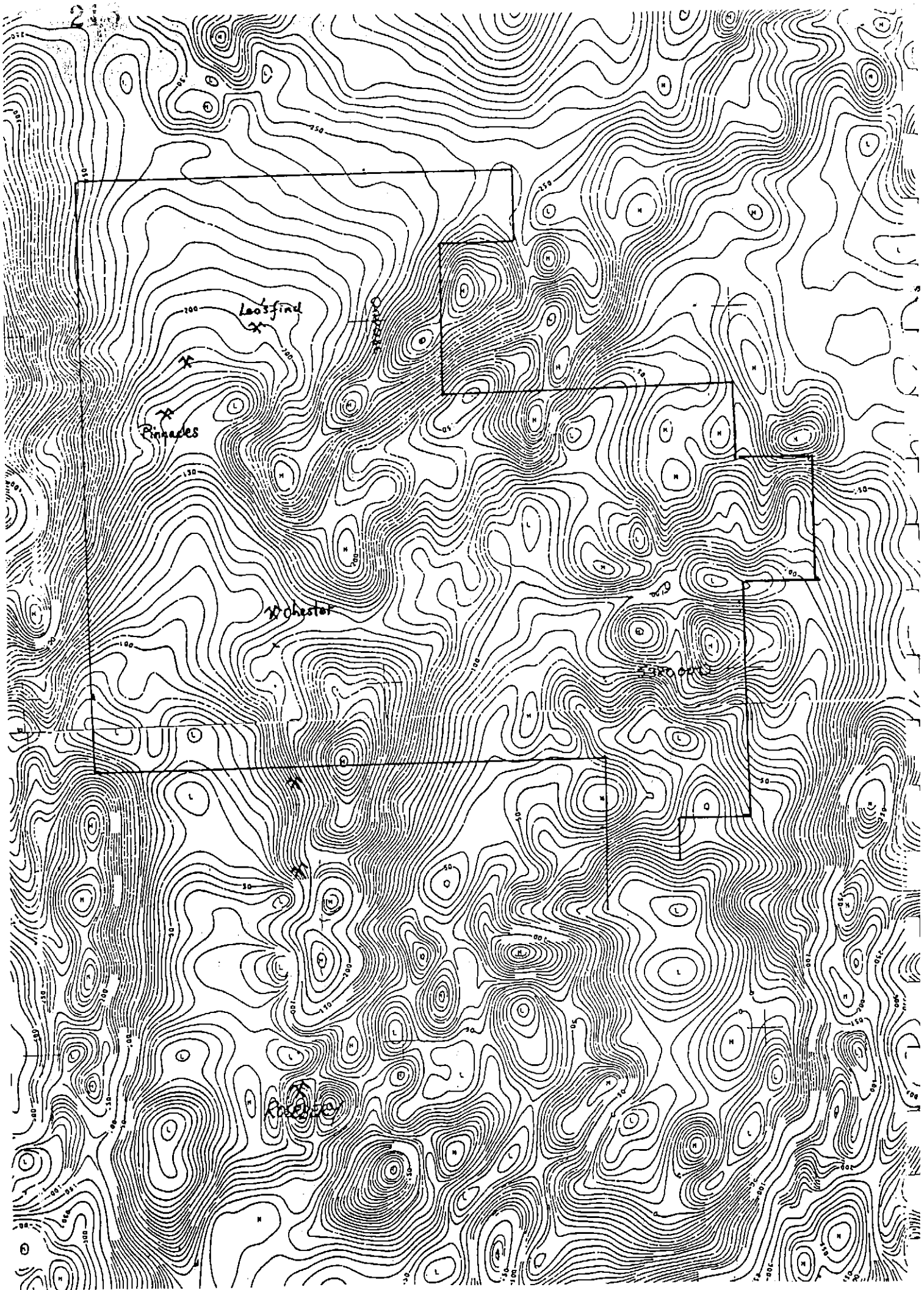


REGIONAL COMPILATION OF RESIDUAL BOUGUER ANOMALIES
(Mines Dept presentation based on crustal model "MANTLE88" -
see Leaman (1988a)

FIGURE 6



REGIONAL TREND INTERPRETATION (after Leaman (1987) FIGURE 7



DETAIL OF MAGNETIC FIELD EL 44/88 FIGURE 8
(Mines Dept 1981 survey)

551214

551215

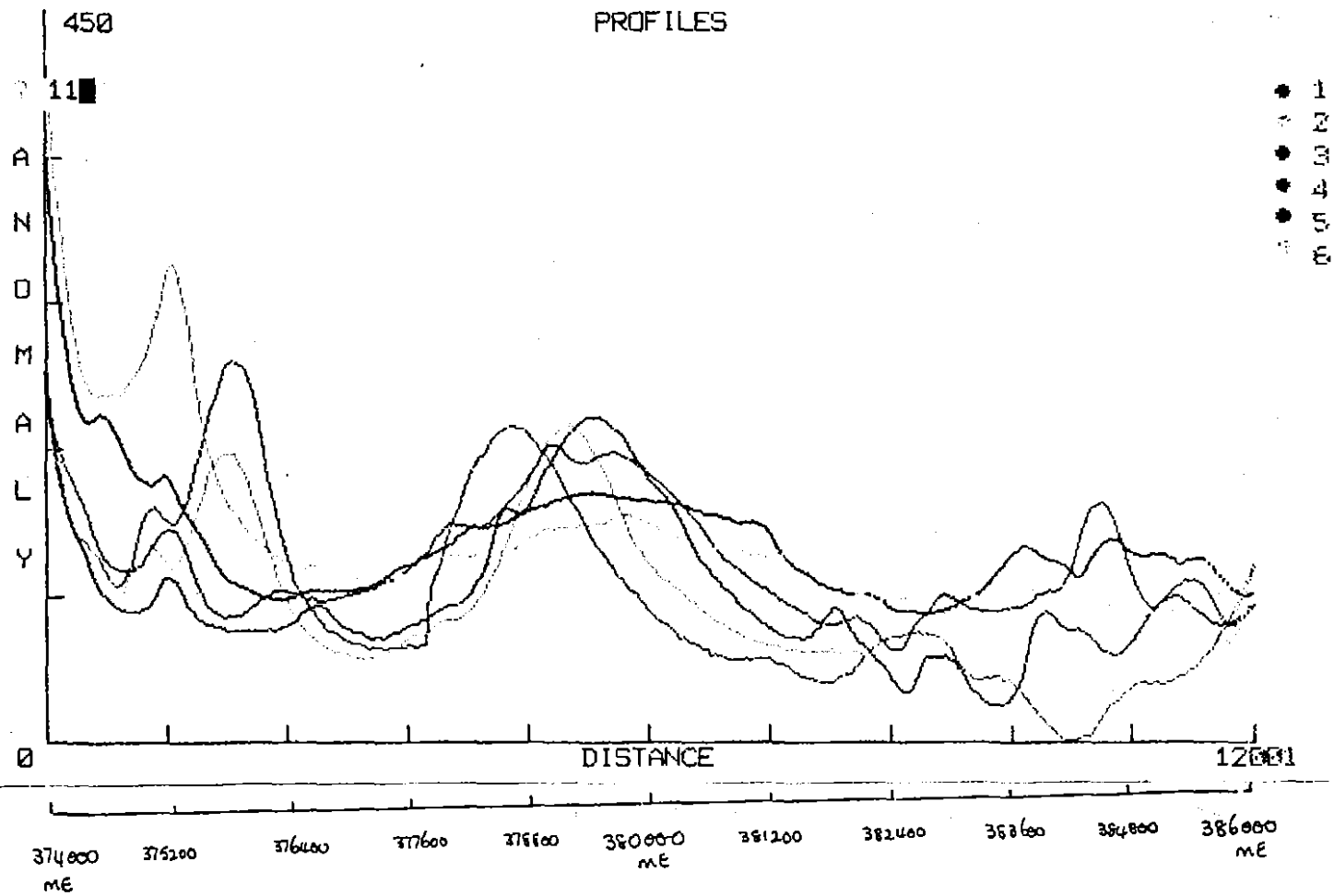
LEAMAN GEOPHYSICS

Survey Review, Specification, Reduction, Interpretation
Wide Experience Most Methods
Specialties:- Gravity, Magnetics, Seismic Methods

Registered Office:
21 Zomay Avenue, DYNNYRNE TAS 7005
All Correspondence to:
G.P.O. BOX 320 D, HOBART, TAS. 7001.
TELEPHONE: (002) 240319

A> 1	B:M1580	BURNS PEAK PROJECT LINE 1580	~ 5378200 mN
2	B:M1590	BURNS PEAK PROJECT LINE 1590	~ 5378 600
3	B:M1613	BURNS PEAK PROJECT LINE 1613	~ 5379 500
4	B:M1621	BURNS PEAK PROJECT LINE 1621	~ 5380 800
5	B:M1632	BURNS PEAK PROJECT LINE 1632	~ 5380500
6	B:M1640	BURNS PEAK PROJECT LINE 1640	~ 5381 100

ZERO SHIFT :-5.1



MAGNETIC PROFILES

FIGURE 9

21.

551216

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Wide Experience Most Methods
Specialties:- Gravity, Magnetics, Seismic Methods

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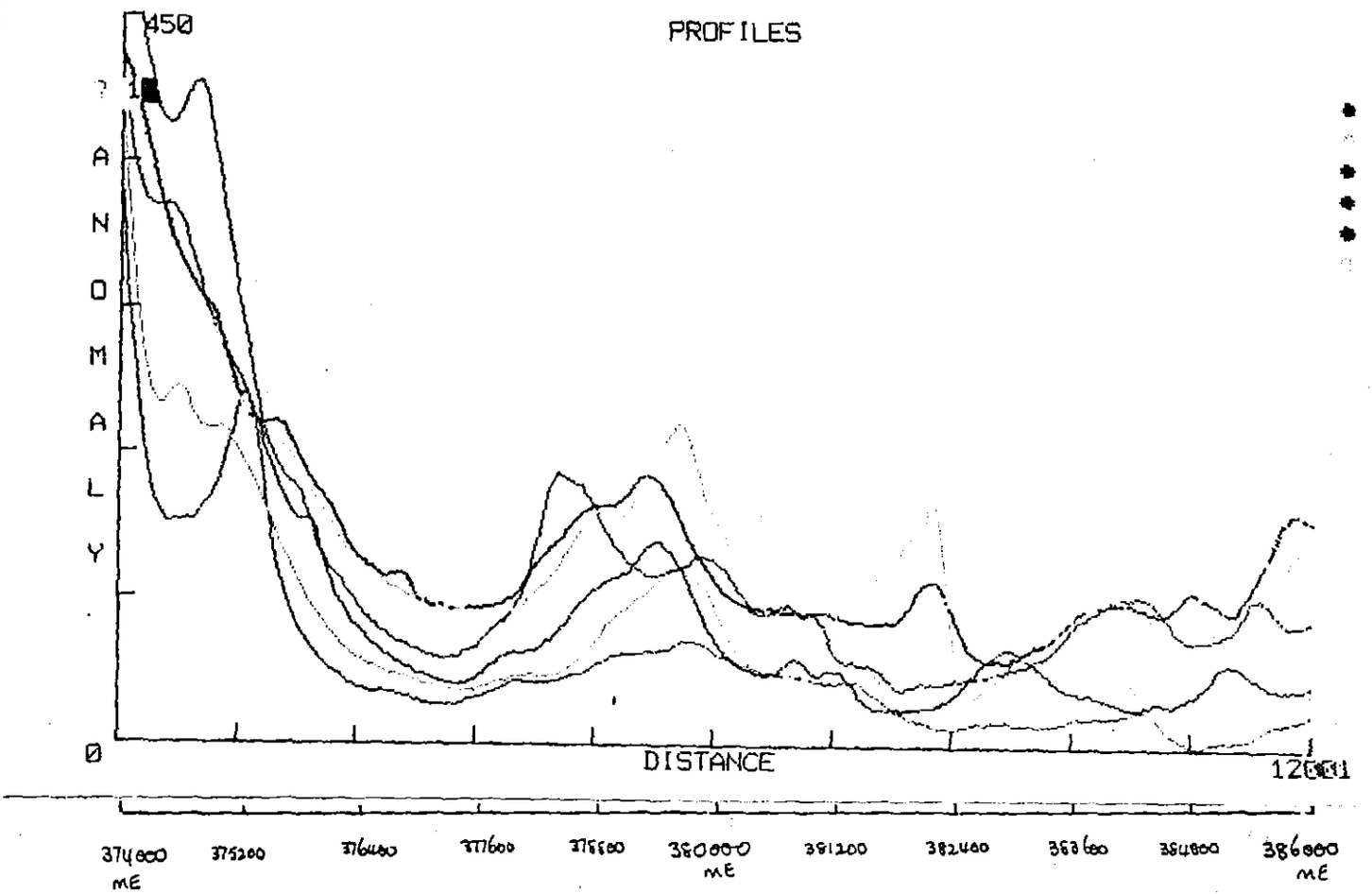
All Correspondence to:
G.P.O. BOX 320 D, HOBART, TAS. 7001.
TELEPHONE: (002) 240319

1	B:M1640	BURNS PEAK PROJECT LINE 1640	~5381 100 mN
2	B:M1650	BURNS PEAK PROJECT LINE 1650	~ 5381 700
3	B:M1667	BURNS PEAK PROJECT LINE 1667	~ 5381 900
4	B:M1670	BURNS PEAK PROJECT LINE 1670	~ 5382 600
5	B:M1680	BURNS PEAK PROJECT LINE 1680	~ 5383 100
6	B:M1690	BURNS PEAK PROJECT LINE 1690	~ 5383 500

ZERO SHIFT :-81.1



MAGNETIC PROFILES

FIGURE 10

218

551217

LEAMAN GEOPHYSICS

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Wide Experience Most Methods
Specialties:- Gravity, Magnetics, Seismic Methods

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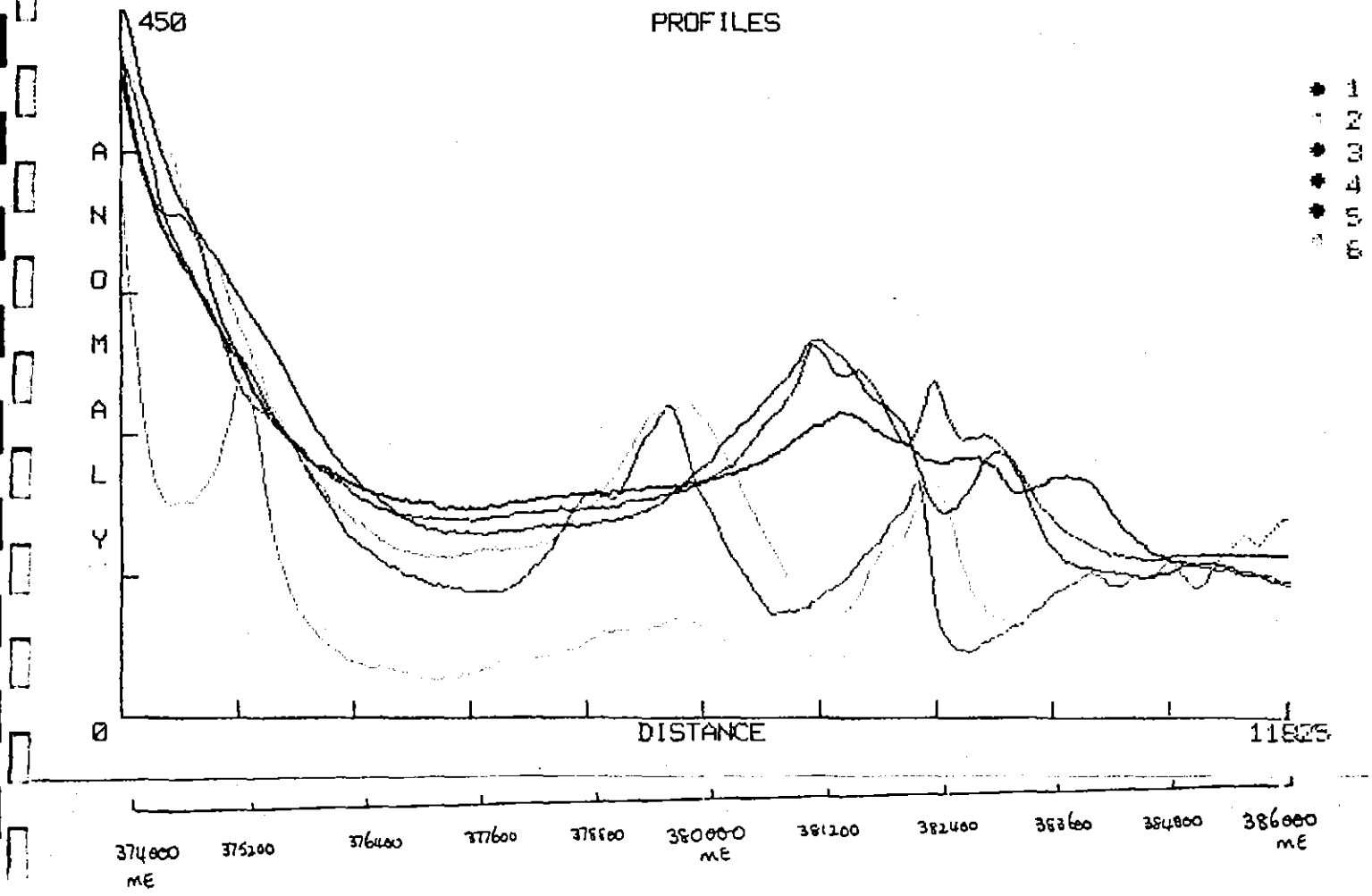
All Correspondence to:
O.P.O. BOX 320 D, HOBART, TAS. 7001.
TELEPHONE: (002) 240319

1	B:M1690	BURNS PEAK PROJECT LINE 1690	~ 5383600 mN
2	B:M1700	BURNS PEAK PROJECT LINE 1700	~ 5384200
3	B:M1720	BURNS PEAK PROJECT LINE 1720	~ 5386000
4	B:M1730	BURNS PEAK PROJECT LINE 1730	~ 5385500
5	B:M1741	BURNS PEAK PROJECT LINE 1741	~ 5386200
6	B:M1640	BURNS PEAK PROJECT LINE 1640	~ 5381100

ZERO SHIFT :-81.1



MAGNETIC PROFILES

FIGURE 11

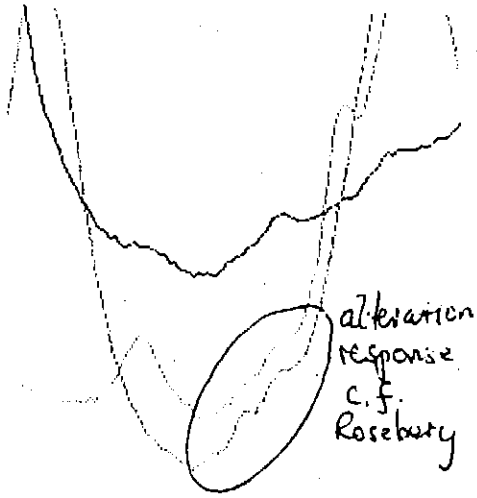
217

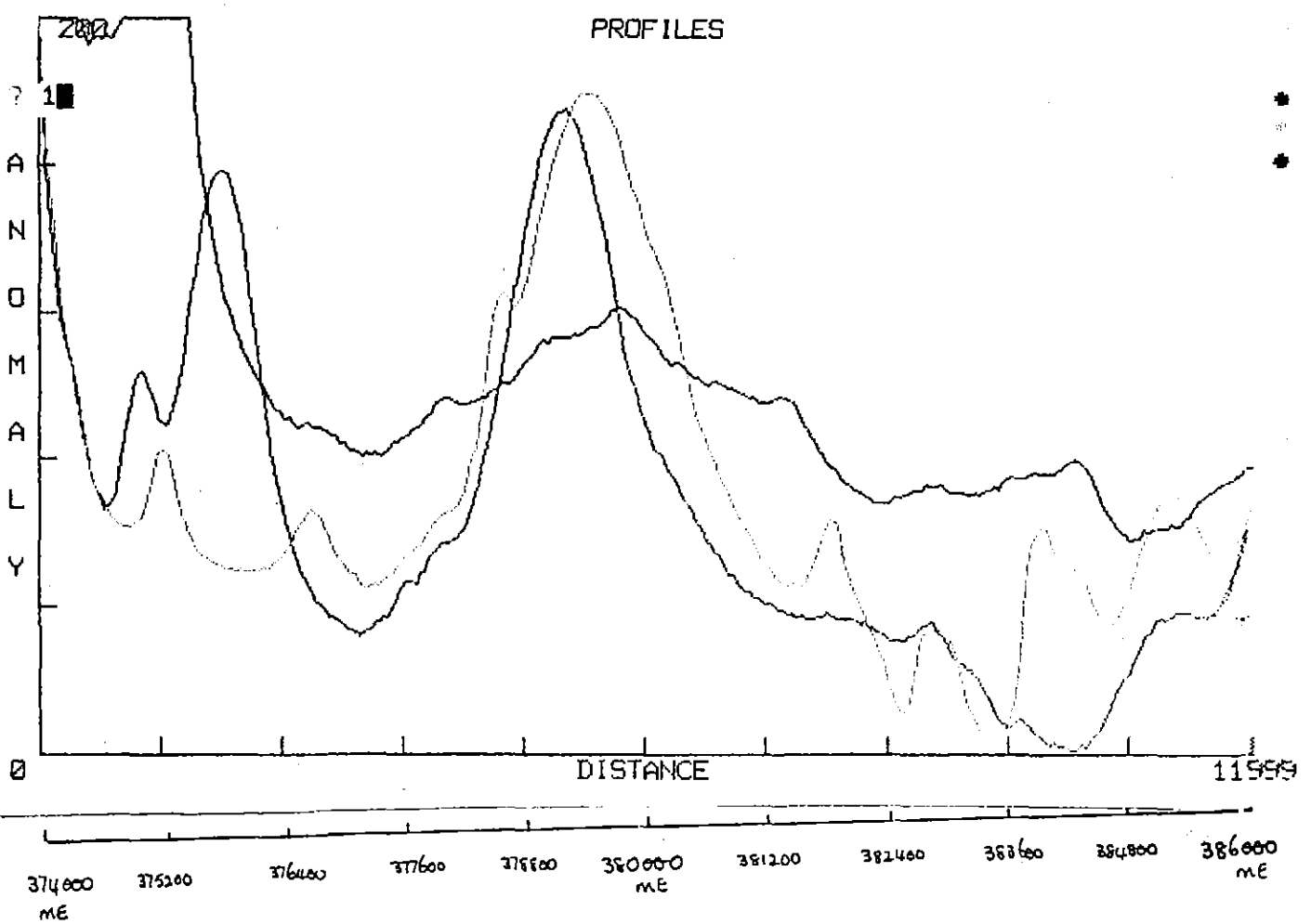
LEAMAN GEOPHYSICS

Survey Review, Specification, Reduction, Interpretation
Wide Experience Most Methods
Specialities:- Gravity, Magnetics, Seismic Methods

Registered Office:
21 Zomay Avenue, DYNNYRNE TAS 7005
All Correspondence to:
G.P.O. BOX 320 D, HOBART, TAS. 7001.
TELEPHONE: (002) 240319

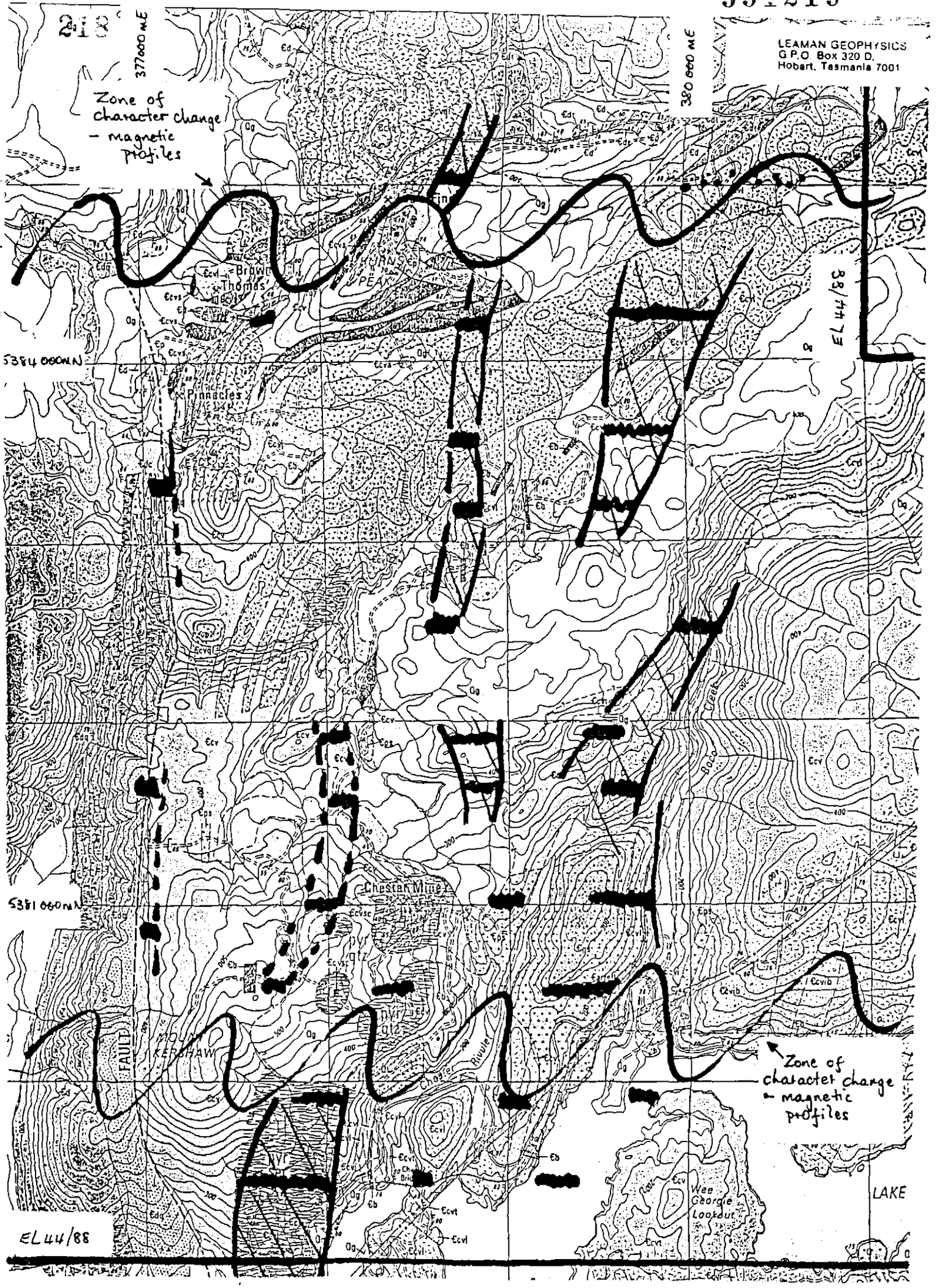
551218



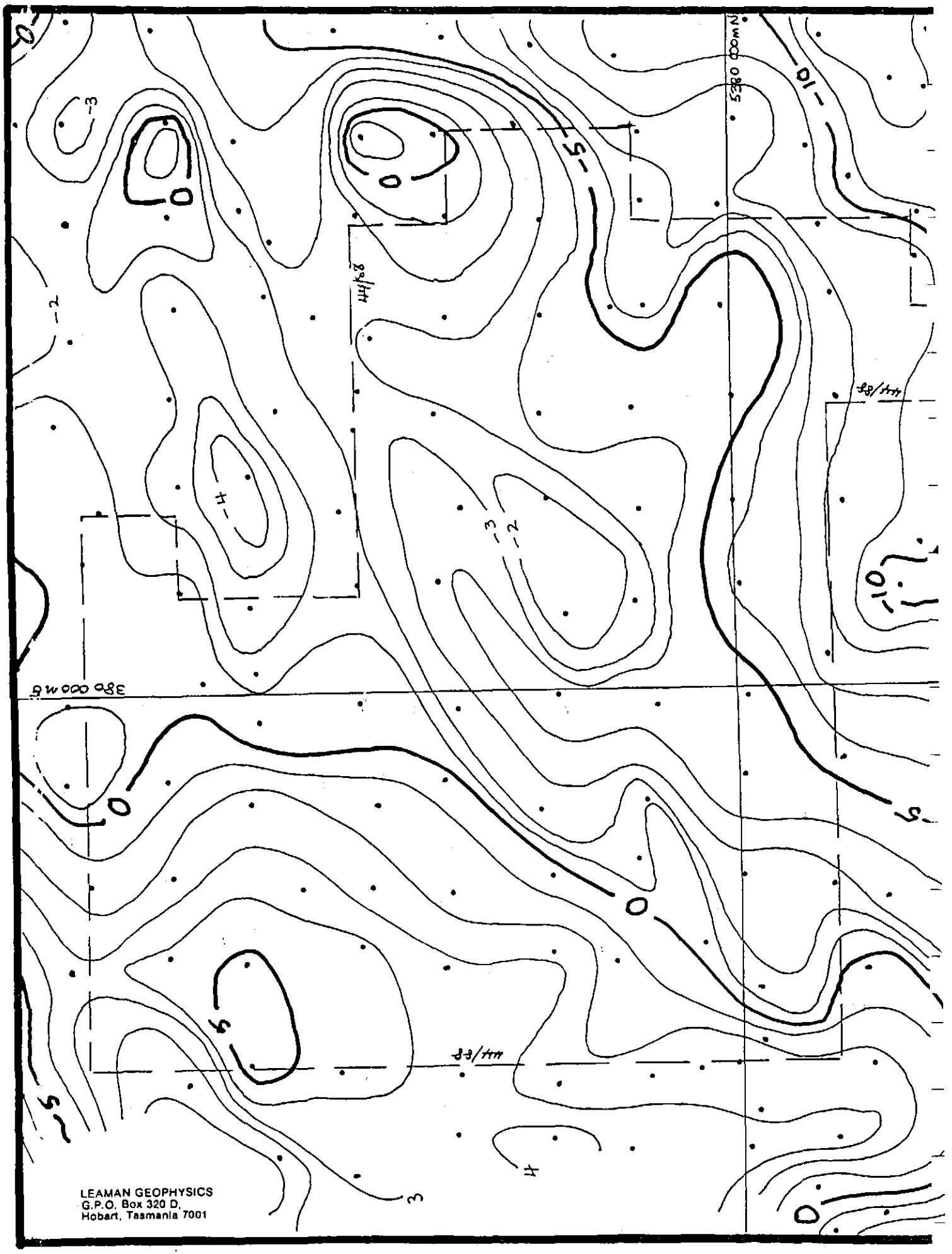


DETAIL OF MAGNETIC PROFILES 1590, 1613 AND 1640 FIGURE 12

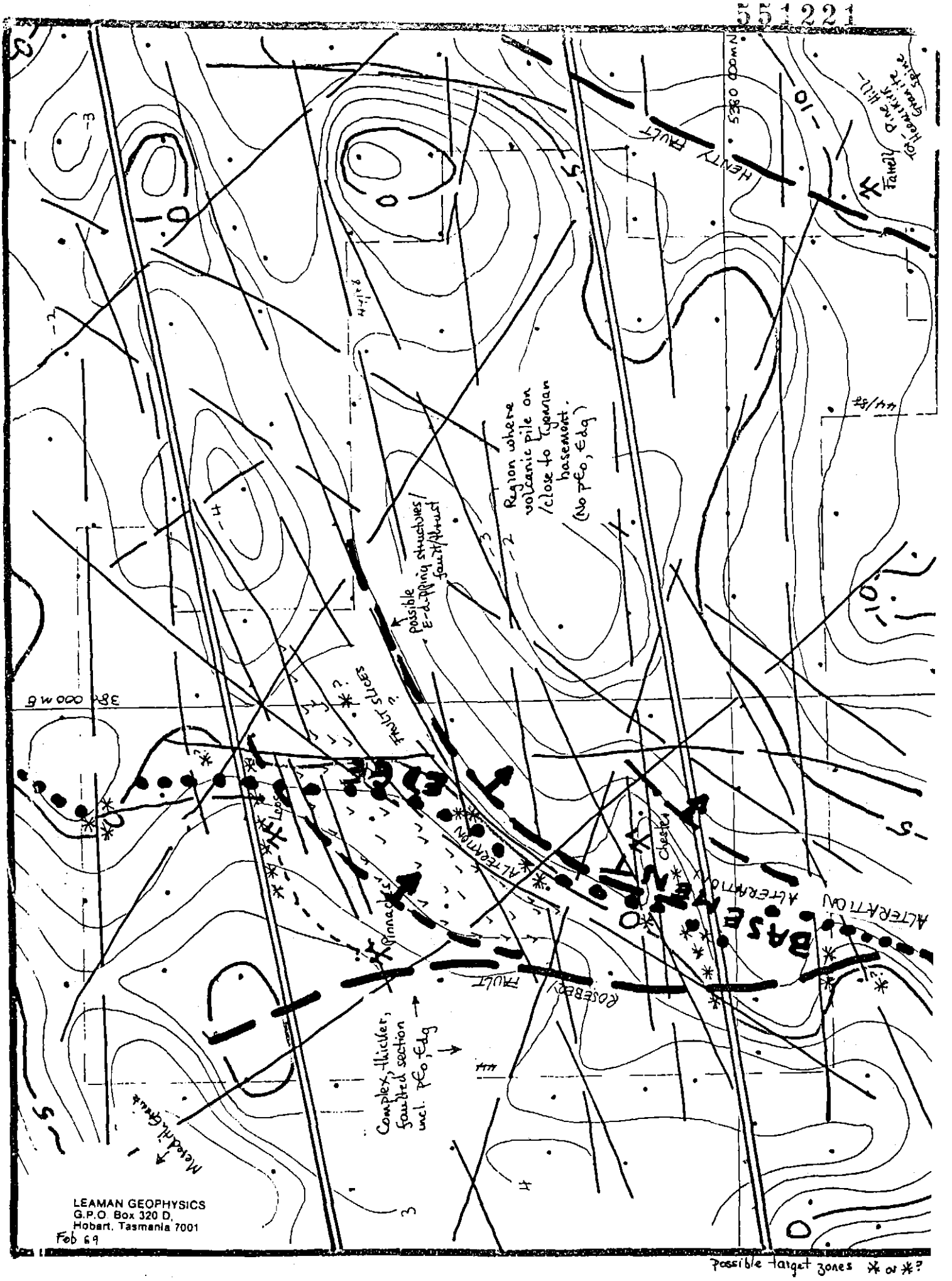
551219



CHARACTER CORRELATION OBSERVED IN MAGNETIC DATA FIGURE 13



DETAIL OF RESIDUAL BOUGUER ANOMALIES EL 44/88 FIGURE 14



RESIDUAL BOUGUER ANOMALIES AND INTERPRETATION SUMMARY
FIGURE 15

APPENDIX 6

CHESTER AREA DRILLING PROPOSAL, JUNE 1989

by D. GARDNER

BURNS PEAK EL 44/88

CHESTER AREA

DRILLING PROPOSAL

JUNE 1989

REPORT NO T236

BY: DAVID GARDNER

1.0 BACKGROUND

GEOLOGY

The Chester Mine and the associated alteration zone dominate the geology of the southern part of EL.44/88 (fig. 1). The Chester Mine is a massive pyrite body showing some bedding and local mesoscopic folding. It was probably partly exhalative in nature, though much of the mineralization is of a vein or stockwork style. Galena, sphalerite and chalcopyrite are rare accessory minerals.

The Chester area has been mapped in detail at least four times during the Comstaff/BHP tenure:- by Smith (1975), Perkins (1977), Hall (1978) and Gregory (1987). Smith and Perkins mapped the area as a sequence of acid tuffs and lavas, Hall considered the area to be an almost entirely tuffaceous sequence, and Gregory (fig. 1) mapped the area as mainly dacite lavas with a few minor tuff lenses. Perkins considered the sequence to consist of six lithological units (corresponding to the Rosebery Mine sequence) striking north and continuous across the whole area. Hall and Smith did not produce interpretations. Smith's map does not indicate any dips recorded, while Hall has mapped a generally east dipping sequence. Gregory (fig. 1) mapped a major north plunging anticline, trending NNE, passing to the west of the mine (though little supportive evidence is given for this).

Keith Corbett (pers. comm.) from the Tasmanian Mines Dept. considers Chester to be exhalative, at least in part. He has mapped the Pieman Road section south of Chester as consisting of acid lavas and ignimbritic tuffs (the latter corresponding roughly in position to Gregory's lenses of dacite tuff, fig.1)

The rare dip indicators (flowbanding and bedding) on this section dip at 60-80° east. Corbett was unable to distinguish lithologies in other parts of the Chester area, except for the cherts at the mine itself. He considers these to be locally folded and not part of a major anticlinal structure.

GEOCHEMISTRY

The entire Chester area has been covered by A° soil geochemistry. The roads and the Mt Kershaw - 4N costean area have had some C horizon and rock geochemistry. Major anomalous areas are shown in fig. 2. The anomalous areas that occur around roads have anomalous geochemistry other than A°. The two anomalies on the Pieman Rd. (SE corner of fig.2) occur where thin bands of galena and sphalerite have been reported to outcrop (Perkins 1977).

The zinc anomaly NW of the Chester Mine occurs in pyritic tuffs, and the Pb, Zn anomaly around the 4N costean covers some old pits (Gordons Show) which have been reported to contain pockets of galena (Perkins 1977).

GEOPHYSICS

The Chester area has been covered by numerous geophysical surveys including I.P., Dighem, UTEM, S.P. and magnetics. None of the surveys have produced anomalies considered worthy of drilling. BHP in 1986 covered the area fairly comprehensively with UTEM. The most well defined anomalies are shown in figure 2. Even these, however, are described as weak and shallow. I.P. conducted in 1974, not surprisingly, picked up the Chester mineralization and surrounding pyrite alteration.

DRILLING

Sixteen diamond holes were drilled at Chester between 1974 and 1977 (fig.2,. These all tested a possible southern extension of the Chester mineralization, ignoring the fact that the mineralization and alteration trend SW. Seven drill holes tested a 2.4m intersection of 22.3% Zn, 5.2% Pb in CP3 (fig.7). This intersection has the appearance of vein or fracture fill mineralization. No extension of this intersection was found in any of the holes drilled.

The Pb, Zn mineralization in CP3 is not near the main alteration zone (fig.7). This major alteration zone (silica, pyrite, sericite) occurs between 60-230m in CP3 and corresponds to similar alteration on the surface on the Mt. Kershaw Trig road (fig. 2). The Chester South mineralization (pyrite, with minor chalcopyrite) is reported to outcrop here too, and this lends weight to NE rather than a N trend for the mineralized zone. Other intense patches of silica- sericite alteration occur in CP6 (fig.6) between 83-106m and 150-179m with some pyrite. This alteration is probably directly associated with Chester Mine alteration but does not have the semi massive to massive pyrite.

An east facing and dip for the area covered by drilling is indicated by the distribution of alteration and anomalous geochemistry (mostly from chip samples) in the holes. In holes such as CP4 the strongest alteration can be correlated with strong alteration on the surface, with this strongly altered zone dipping east. In most holes the zinc values (>200ppm) tend to terminate abruptly to the east while scattered anomalous values continue as for west as any is drilled, supporting an east facing.

Recognizing and correlating structures and lithologies in the old drill holes is made difficult by the small diameter of the core (BQ) and the weathering that has occurred to the core since drilling. Logging of the core by Gregory (1987) and previous Comstaff geologists did not produce any correlations. CP3 intersects the core of Gregory's proposed anticline at 150m.. This is in the middle of the very altered section of the hole, which is cleared/sheared. No evidence, however, is found to suggest that this shearing is an axial plane cleavage to the fold.

Whether Gregory's anticline exists or not, the rocks in the immediate vicinity of the Chester Mine dip generally east and trend NE. If the Chester Mine is an exhalative body then prospective horizons for another (possibly Pb, Zn rich) body, or the slumped Pb, Zn rich top of Chester (?), are along strike and down dip.

A southern strike extension has been covered to some extent by previous drilling. Only CP3, however, tested a SW strike extension (and intersected intense alteration). A down dip extension has been tested by CP6 (drilled directly under the Mine). The lack of mineralization in CP6 indicates that the Chester deposit doesn't continue at depth, the deposit may be a pipe like body with an extension to the west (down through the pile - fig.6).

2.0 PROPOSAL

The most obvious untested possibility for base metal mineralization associated with the Chester Mine is along strike to the NE. A large area of glacial cover here obscures the geology and the only outcrops occur in streams and on roads. The few rocks seen here are thoroughly altered to sericite/clay schists with occasional cherty patches. No sulphides were observed, however.

The projected extension of the Chester Mine 400m along strike, and the proposed drill holes (A and B) are shown in figures 3 and 4. The two holes test the extension assuming a strike of 020°- 030° true and a plunge of 20-30° to the north east. This is consistent with data from the Chester Mine.

In addition to testing the mine position, hole B tests a Zn geochemical anomaly in pyritic tuffs. Drilling two parallel holes will hopefully allow some correlation, helping to elucidate the structure and stratigraphy. Having access to fresh oriented NQ core will be a big improvement on interpreting the old holes. Some information as to whether the anticline exists should be gained.

This proposal is certainly not a 'bullseye target', but it will at least fill an important gap in the drill hole coverage. The present information available does not justify drilling a deep hole at this early stage. If hole A fails to intersect any significantly altered or mineralized rocks, or fails to produce any distinct lithological information, it would probably be unnecessary to drill hole B to consider the area tested.

FUTURE DRILLING

The current knowledge available about the Chester area is limited and there are no strong geological, geochemical or geophysical targets. This means that, unless new techniques can pin point such targets, future drilling will, initially at least, be aimed at producing information about the structure, stratigraphy and alteration that will then lead to targeting potential mineralization.

Four drill holes (each about 500m) are suggested here (figs. 3,5,6,7,8). Each would produce information about an area that we know little about now (i.e. away from intensive Comstaff drilling), but also have definite potential for intersecting significant mineralization. Downhole geophysics on these holes would increase the information gained significantly.

The drill holes test the following targets: (all holes assumed to be 500m long and dip 45° to azimuth 270°).

Hole C (figs. 3,5) tests for mineralization below the 4N Costean (fig. 1) which has strongly anomalous Pb, Zn geochemistry. An old pit working Gordon's Show, with reported Pb, Zn mineralization also occurs here. A UTEM anomaly is coincident with these geochemical anomalies. The hole should be drilled west to intersect the Rosebery Fault. This major structure has anomalous Pb, Zn geochemistry where it reaches the surface.

Hole D (figs. 3,6) tests the hanging wall of the Chester Mine. The surface outcrop east of the mine is still extensively pyrite, silica, sericite altered and CP6 does not completely test possible down dip mineralization associated with Chester.

Hole E (figs. 3,7) tests at depth the intense alteration that outcrops between CP3 and the Chester Mine. CP3 reaches a maximum depth of 60m below the surface as it follows the slope downhill. Some correlation between CP3 and hole E should be possible. To help with this CP3 should be split to give a fresh core surface. Hole E would also give information of the existence of Gregory's anticline or on the possibility of another major structure just west of Chester, as suggested by David Leaman (1989) from gravity and magnetic data.

551228

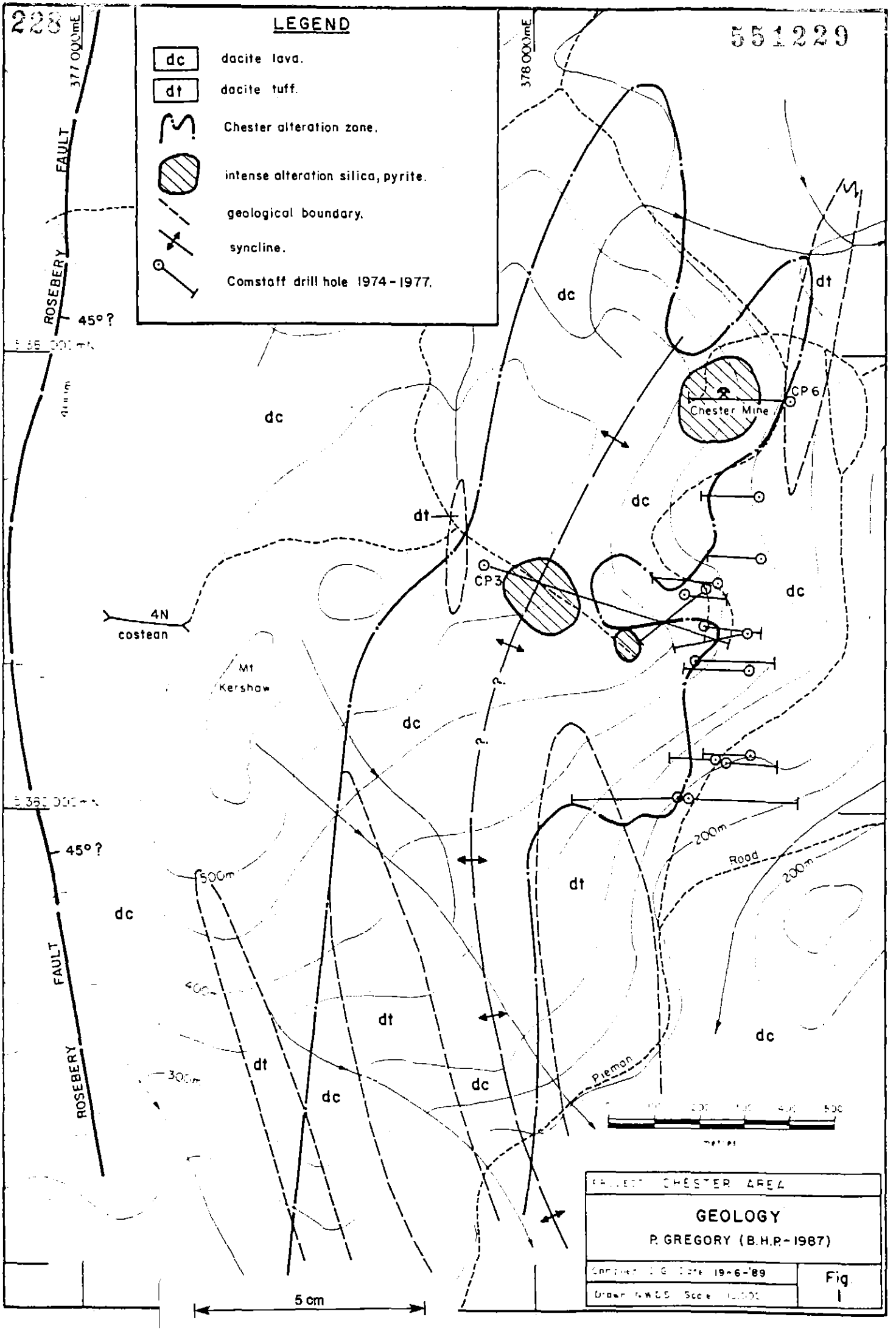
Hole F (figs. 3,8) tests the southern end of the Chester alteration zone. Strong base metal geochemical anomalies occur near the Pieman Road here and thin bands of sphalerite and galena have been reported in outcrop by Perkins (1977) and Hall (1978). Hole F tests this alteration and mineralization. It would allow correlation with the Pieman Road section, and would provide a good section across Gregory's anticline.

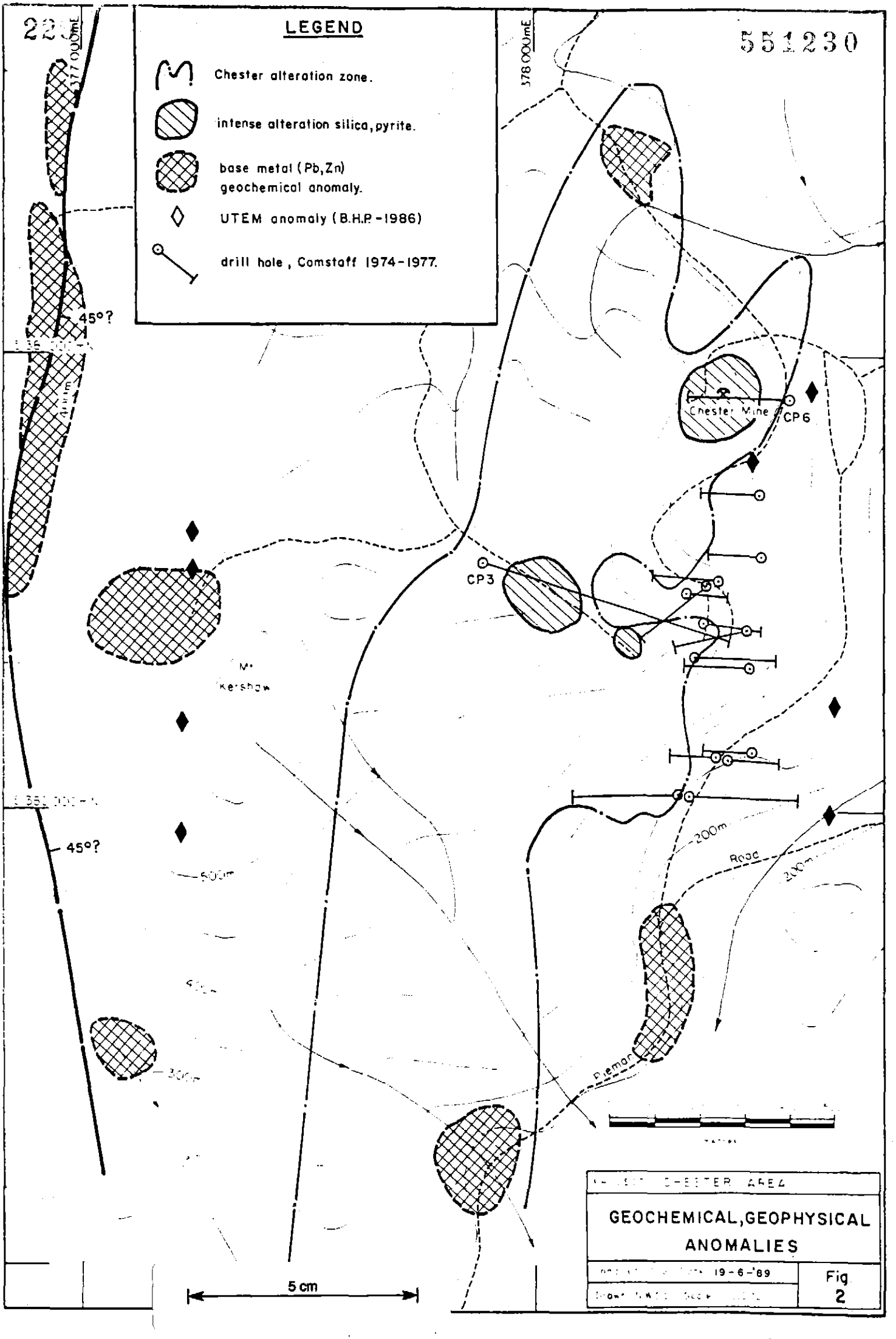
OTHER WORK

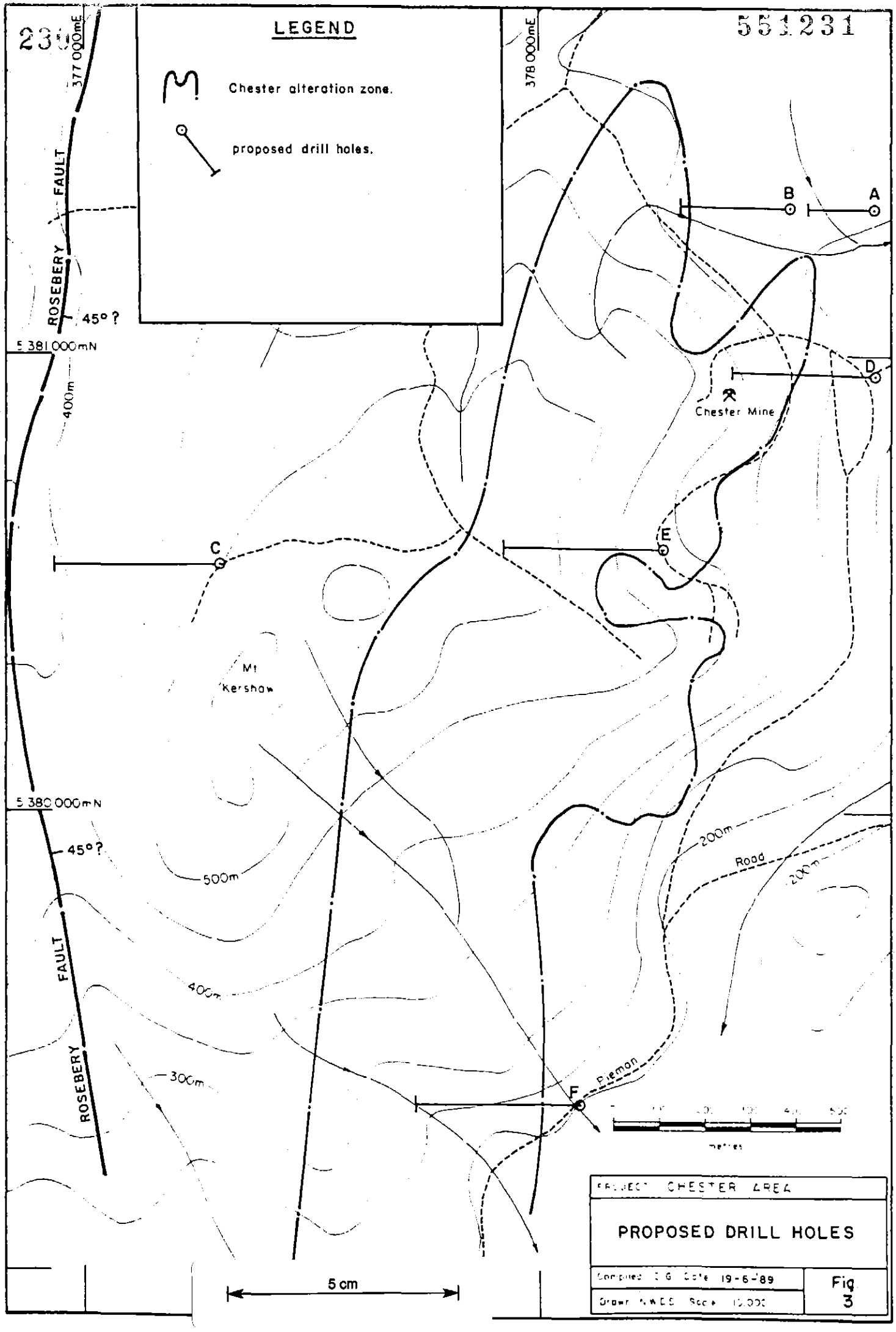
The poor exposure, alteration and lack of marker horizons have hindered attempts at unravelling the stratigraphy and structure at Chester. Laying out complete drill sections has been tried as a way of detecting subtle correlations between holes. The weathered nature of the old core makes this more difficult however, and the splitting of several holes to produce a fresh core surface is suggested. Holes CP3, CP6, CP21, CP22 CP17 and CP23 would be a useful start.

The gold content of much of the core has not been determined or has only been assayed in chip samples. Two split samples from the Pb, Zn mineralization in CP3 assayed 253.1 and 2.1 g/t Au. (These were not repeatable.) Gerald Purvis (pers. comm.) states that in his opinion the gold content of the Chester ore is not just unanomalous, it is (for such rocks) negatively anomalous. He suggests the mine may be gold depleted, perhaps indicating an enrichment zone elsewhere.

The altered sections of CP3 and CP6 should be split and assayed for gold as a start. Other holes should then be considered for gold assay.


228
551229
LEGEND
dc dacite lava.
dt dacite tuff.
Chester alteration zone.
intense alteration silica, pyrite.
geological boundary.
syncline.
Comstaff drill hole 1974 - 1977.
377 000mE
378 000mE
FAULT
ROSEBERY
45° ?
dc
dt
CP 6
Chester Mine
CP3
4N
costean
Mt
Kershaw
?
500m
400m
300m
200m
Road
Pieman
5 cm
CHESTER AREA
GEOLOGY
P. GREGORY (B.H.P.- 1987)
Fig
1

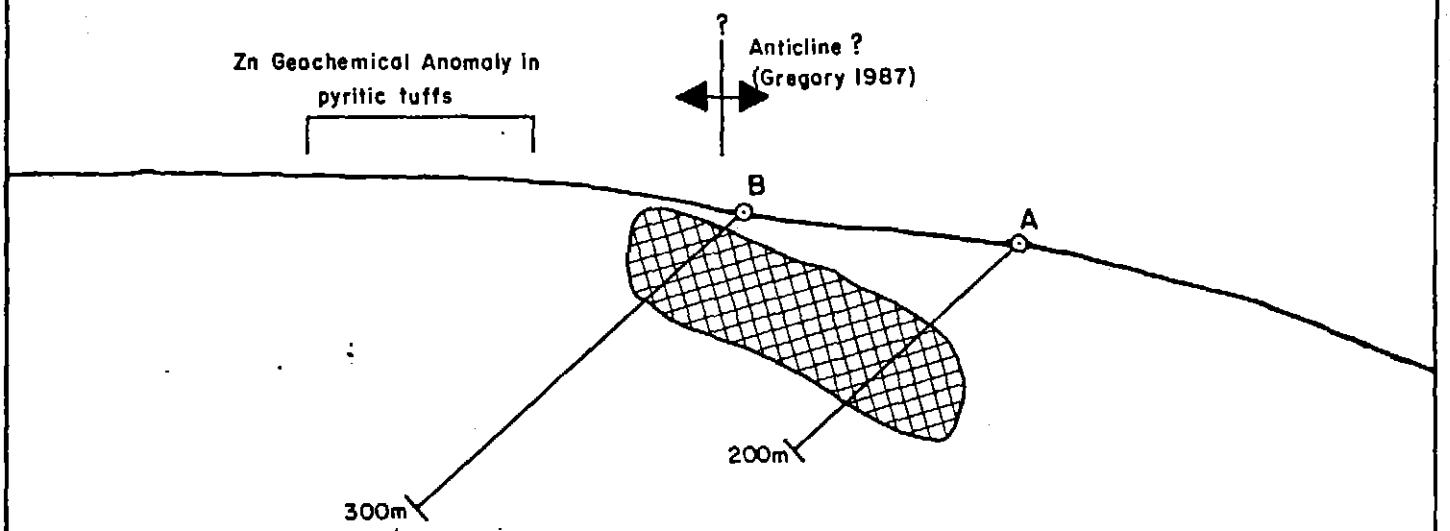

LEGEND
Chester alteration zone.
intense alteration silica, pyrite.
base metal (Pb, Zn) geochemical anomaly.
UTEM anomaly (B.H.P. -1986)
drill hole, Comstaff 1974-1977.
551230
378 000mE
45°?
Chester Mine
CP6
CP3
Mt Kershaw
200m
Road
5 cm
GEOCHEMICAL, GEOPHYSICAL ANOMALIES
19-6-'89
Fig 2


LEGEND
Chester alteration zone.
proposed drill holes.
377 000mE
378 000mE
ROSEBERY FAULT
45° ?
5 381 000mN
400m
A
B
C
D
E
F
Chester Mine
Mt Kershaw
5 380 000mN
45° ?
500m
400m
300m
200m
Road
Piemon
FAULT
ROSEBERY
5 cm
PROJECT CHESTER AREA
PROPOSED DRILL HOLES
Compiled J.G. Date 19-6-'89
Drawn K.W.E.S. Scale 1:5000
Fig 3

23L

378 500mE

551232



A,B proposed drill hole
both holes dip -45°
azimuth 270° A.M.G.

projection of Chester Mine position
(strike 020°-030° A.M.G.)
(plunge 20°-30° N)

5 cm

0 50 100 150 200 250
metres

PROJECT: CHESTER AREA

DRILL HOLE SECTION
5,381,300m. N.

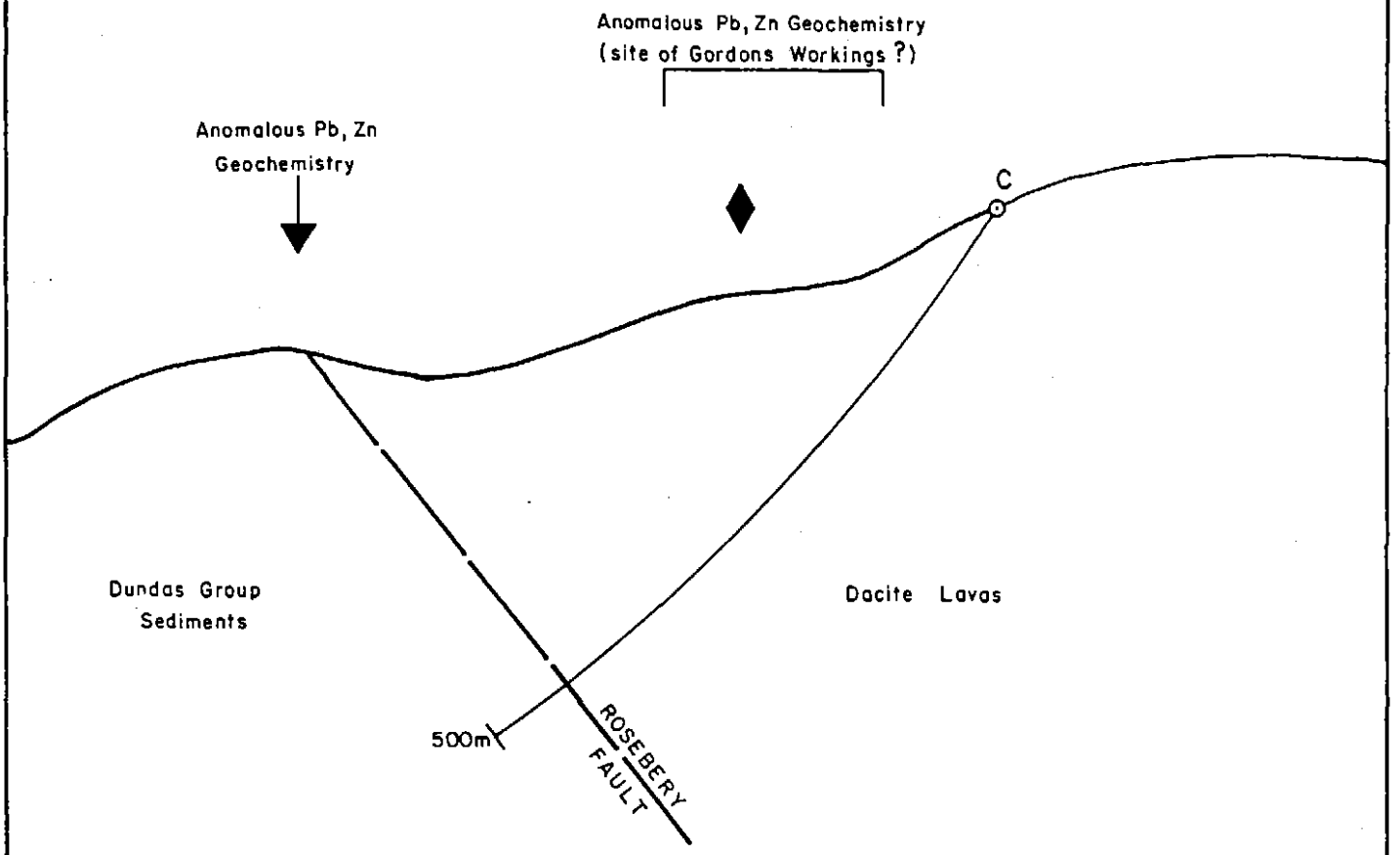
Compiled: D.G. Date: 18-6-'89
Drawn: N.W.D.S. Scale: 1:5,000

Fig. 4

232

377 000mE

551233



Geology from Gregory (B.H.P. 1987)

C

proposed drill hole
dip -45°
azimuth 270° A.M.G.

UTEM anomaly
B.H.P./ Comstaff 1987

5 cm

0 50 100 150 200 250

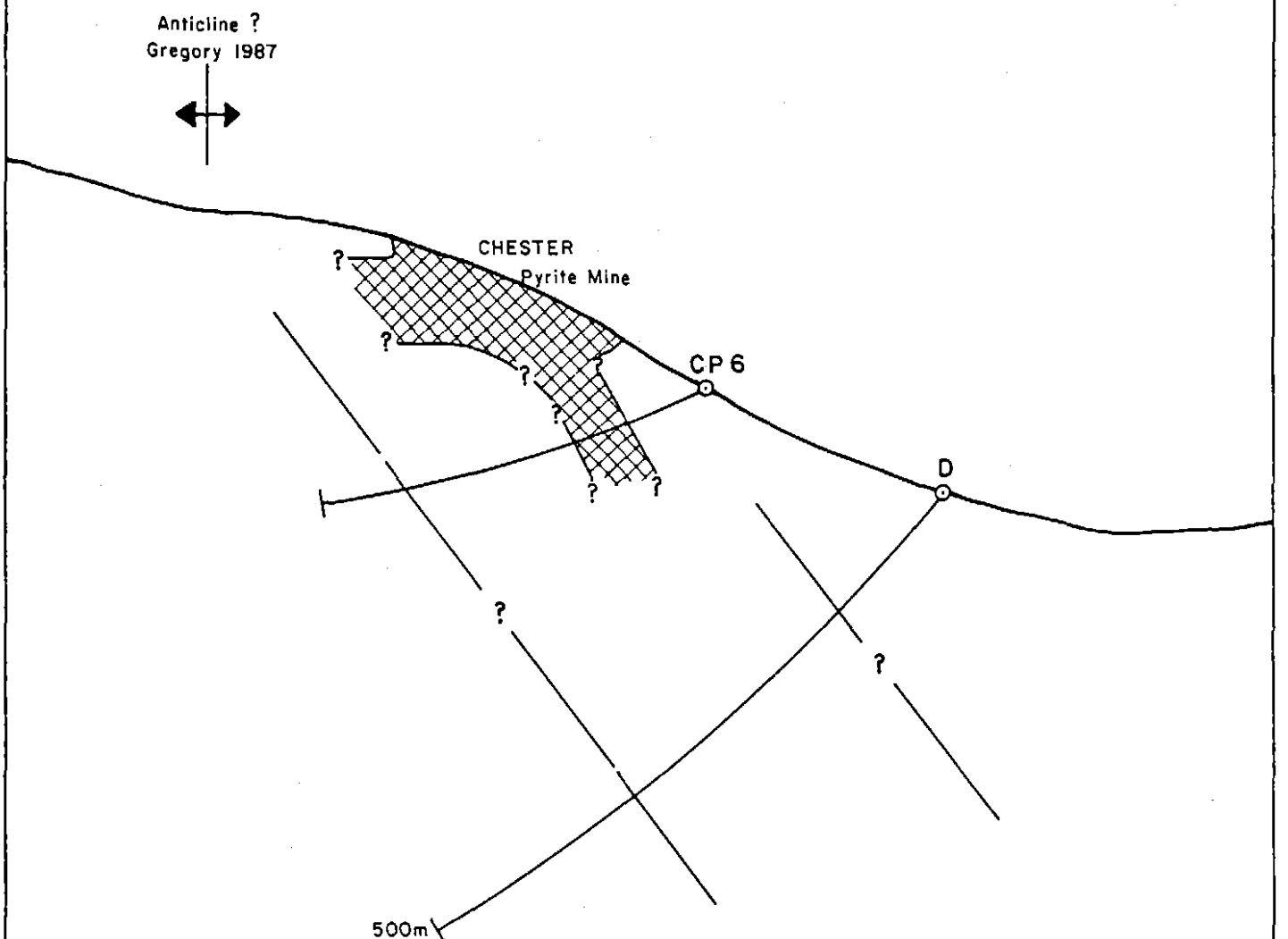
metres

PROJECT: CHESTER AREA	
DRILL HOLE SECTION 5,380,520 m.N.	
Compiled: D.G. Date: 17-6-'89	Fig. 5
Drawn: N.W.D.S. Scale: 1:5,000	

23o

378,500mE

551234



CHESTER Mine
strong pyrite, sericite, silica alteration.

D

proposed drill hole
dip -45°
azimuth 270° A.M.G.

5 cm

0 50 100 150 200 250
metres

PROJECT: CHESTER AREA

DRILL HOLE SECTION
5,380,950 m. N.

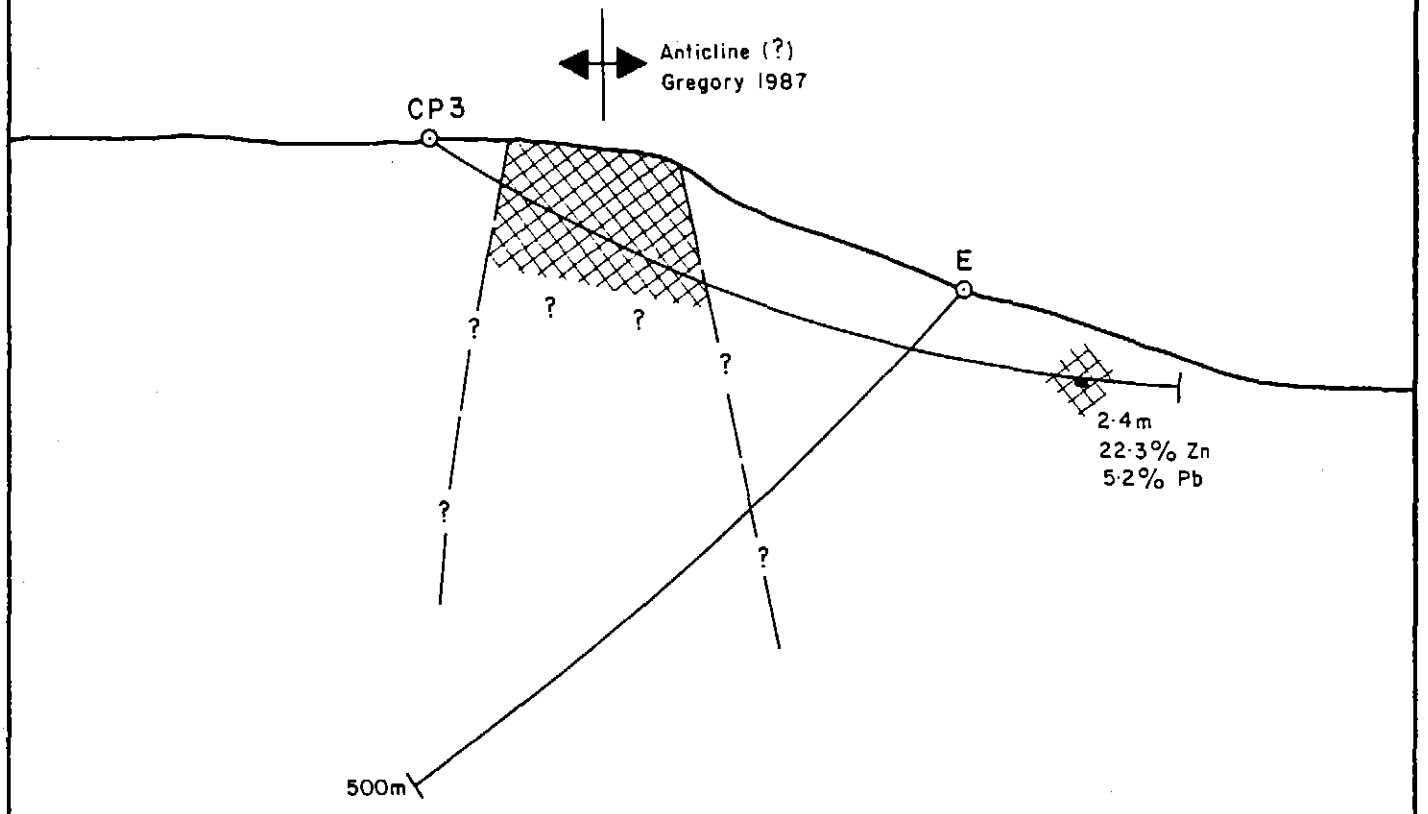
Compiled: D.G. Date: 17-6-'89
Drawn: N.W.D.S. Scale: 1:5,000

Fig. 6

551235

234

378,000mE



E — proposed drill hole
dip -45°
azimuth 270°A.M.G.

strong silica, pyrite, sericite alteration.

5 cm

0 50 100 150 200 250
metres

PROJECT: CHESTER AREA

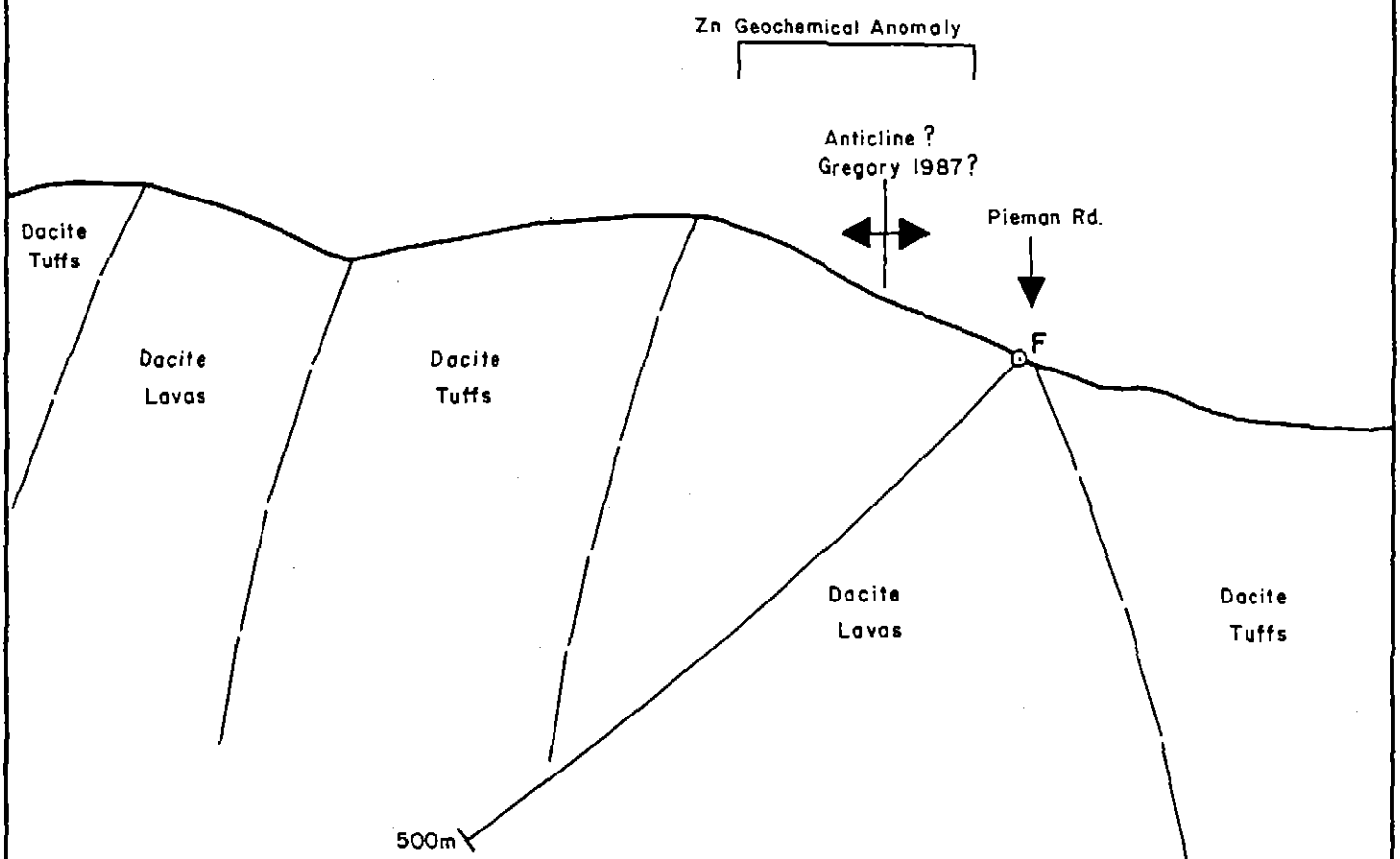
DRILL HOLE SECTION
5,380,550 m.N.

Compiled: D.G. Date: 18-6-'89
Drawn: N.W.D.S. Scale: 1:5,000

Fig. 7

378 000mE

551236



N.B. Geology after Gregory (B.H.P.-1986).

F
proposed drill hole
dip -45°
azimuth 270° A.M.G.

5 cm

0 50 100 150 200 250
metres

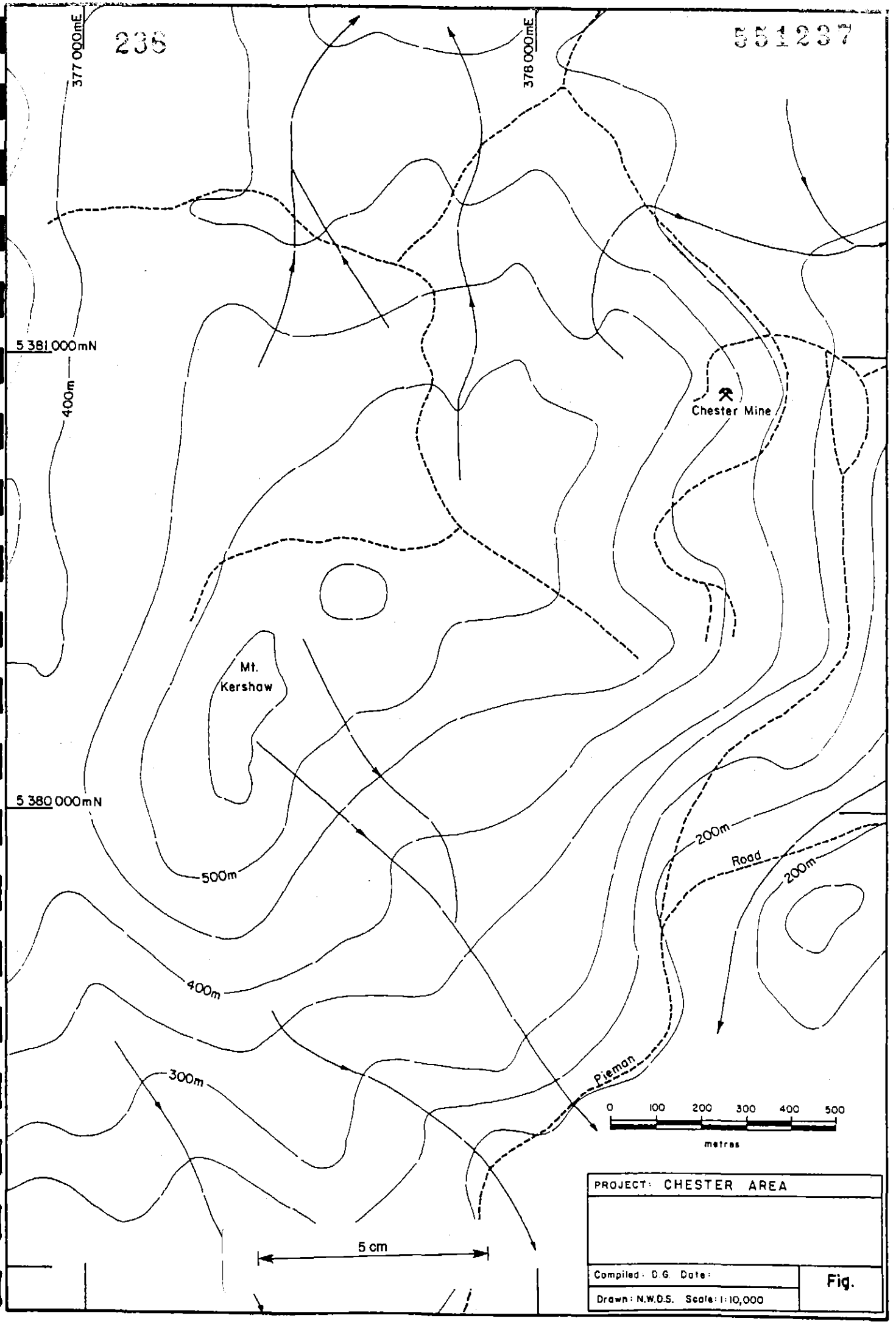
PROJECT: CHESTER AREA

DRILL HOLE SECTION
5,379,350 m.N.

Compiled: D.G. Date: 18-6-'89

Drawn: N.W.D.S. Scale: 1:5,000

Fig. 8


235
551237
377 000mE
378 000mE
5 381 000mN
400m
Chester Mine
Mt.
Kershaw
5 380 000mN
500m
200m
Road
200m
400m
300m
Pieman
0 100 200 300 400 500
metres
5 cm
PROJECT: CHESTER AREA
Compiled: D.G. Date:
Drawn: N.W.D.S. Scale: 1:10,000
Fig.

551238

APPENDIX 7

PRELIMINARY REPORT ON PETROLOGICAL AND GEOCHEMICAL INVESTIGATIONS OF THE PINNACLES AREA

by DR. G. GREEN

PRELIMINARY REPORT ON PETROLOGICAL AND GEOCHEMICAL INVESTIGATIONS OF THE PINNACLES AREA

GEOFFREY R. GREEN

To date, work has involved 3 days examining and sampling drill core, sample preparation, despatching samples for analysis and a start has been made on the petrography.

It is apparent that two end member styles of mineralisation are present:
1. Massive sulphide mineralisation and related alteration, typified by the intersection in drill hole EAF9. Recent and past drilling probably precludes the possibility that a large deposit of this type exists in the area between Brown's Tunnel and the Southern Trenches.
2. Disseminated and veinlet gold and minor base metal mineralisation, possibly including some tectonically disrupted and remobilised Style 1 mineralisation, characteristically associated with zones of silicification. This is the dominant style in the area, and probably represents the prime target for current exploration.

Characteristics of Style 2 mineralisation that appear to set it apart from VMS mineralisation at this early stage of the investigation include the following:
1. Mineralisation is associated with zones of silicification which appear to be symmetrically surrounded by sericitised envelopes(e.g. DDHs EAF18, PIN2, CP64).
2. The silicification post dates lithification of ashey sediments and vitric tuffs; in thin section much of the disseminated base metal mineralisation occurs in late stage drusy quartz veinlets associated with silicification Some of the veinlets appear to be little affected by the cleavage; some may be syn- or even post-cleavage.
3. A variety of rock types are mineralised; in addition to fine grained sediments and vitric tuffs, these include sandy epiclastics. The quartz feldspar porphyry also is weakly altered in BPD63 and BPD64 and therefore might predate this phase of mineralisation.
4. Gold seen to date occurs as relatively coarse grains(to ca. 20 by 20 microns) either in the free state or as compound gold-galena inclusions in pyrite. The pyrite containing the gold shows no evidence(e.g. pressure shadows) of pre-dating deformation.
5. Unpublished Mines Dept. geochemical data collected a few years ago (Table 1) from the old workings show that the zinc ratio of Huston and Large(1987) - 100Zn/(Pb + Zn) shows a wide range from 20 to 98, in contrast to the tightly clustered values of greater than 50 typical of western Tasmanian VMS deposits.
6. Lead and sulphur isotope data collected by BHP showed a preponderence of ratios similar to those of Cambrian VMS deposits, but

occasional 206Pb/204Pb ratios were higher(e.g. EAF9 @ 205.1m) suggesting some contribution from a younger source.

It may be tentatively suggested that gold mineralisation in The Pinnacles area may be the result of a two stage process:
1.A Cambrian VMS-related system, overprinted by
2.Later redistribution and possibly introduction of further gold associated with silicification.
This suggestion carries the implication that gold mineralisation, although broadly stratabound, might be structurally controlled in detail.

Work in the future will involve the following:
1. Petrological characterisation of the silicification, mineralisation and surrounding alteration, combined with geochemical and oxygen isotope definition of the nature and extent of the haloes.
2. Geochemical characterisation of some lithological units in the area (e.g. the andesites in DDHs CP7, CP14 and BDP63.
A report on this work will be forwarded in a month.

APPENDIX 8

ROCK CHIP SAMPLE LEDGER

241

Electrolytic Zinc Co. of A'asia Ltd.
Rosebery, Tas.

ROCK SAMPLE LEDGER

PROJECT: Burn's Peak LOCALITY: Tasmania
COLLECTED BY: DG DATE: May '89

Sample Number	A.M.G. Co-ordinates N	A.M.G. Co-ordinates E	Sample Type	Geological Description	Rock-type (Macroscopic)	Thin or Polished Section: T or P	By	Reference	Rock-type (Microscopic)	Metal Content (p.p.m. unless specified)
79001	5381340	377200E	Slabbed	Clay. Alt Rhyolite.	Alt- lAr			S		
002	5381320	377170E	"	" " "	lAr					
003	5381310	377280	"	" " "	lAr					
004	5381370	377350	"	Alt. vitric ash or Rhyolite lava.	tAr/lAr.					
005	5381350	377400	"	Alt ? Rhyolite	lAr					
006	5381280	377500	"	" "	lAr					
007	5381270	377500	"	" "	lAr					
008	5381230	377540	"	? Dacite lava.	lAd					
009	5381220	377600	"	" "	lAd					
010	5381210	377620	"	" "	lAd					
011	5381200	377650	"	" "	lAd					
012	5380600	379700	"	K. Berman Dam Rd. Fel-phyric sil, ?And. lava py.	lJa					
013	5380325	378500	"	K. Berman Dam Rd. Felsic ignimbritic tuff	tA					
014	5380400	378550	"	" " "	tA					
015	5380300	378400	"	Quartz Feldspar Porphyry.	QFP					
016	5380000	378250	"	Feldspar Porphyry	FP.					
017	5379560	379040	"	Quartz Feldspar Porphyry	QFP					
018	5379640	379100	"	Feld, Quartz-phyric intrusive.	QFP					
019	5379540	379020	"	?Felsic pyroclastic tuff	tA					
020	5379540	379020	"	" " "	tA					
021	5379520	379000	"	Feld-phyric felsic lava.	lA gf					
022	5379560	378900	"	Feld-phyric felsic lava.	lA gf					
023	5378760	377600	"	Quartz Feldspar Porphyry (py, ser)	QFP					
024	5378800	377760	"	Feld-phyric felsic lava.	lA f					
025	"	"	"	" " " "	lA f					
026	5378940	377820	"	" " " "	lA f					
027	5379000	377900	"	Feld, Quartz-phyric intrusive.	QFP					
028	5379160	377880	"	" " " "	QFP					
029	5380630	377840	"	? Felsic Lava, serd.	lA					
030	5380620	377800	"	" " "	lA.					
031	5380600	377600	"	Felsic lava or tuff, very siliceous	tA/lA.					

Smith Print Pty. 641822

EP 12912

242

Electrolytic Zinc Co. of A'asia Ltd.
Rosebery, Tas.

ROCK SAMPLE LEDGER

PROJECT: Burns Peak LOCALITY: Tas.
COLLECTED BY: ANR DATE: Oct '89

Sample Number	A.M.G.Co-ordinates N	A.M.G.Co-ordinates E	Sample Type	Geological Description	Rock-type (Macroscopic)	Thin or Polished Section: T or P	By	Reference	Rock-type (Microscopic)	Metal Content (p.p.m. unless specified)
	CHESTER	RIVULET.								
79701			R/C.	Silicified Andesite (Sheet)	Ia					
79704			R/C	" "	Ia					
79706			R/C	" "	Ia					
79707			R/C.	Py, sil alt in ?tuff (Reef)	tA.					

Smith Print Pty. 441822

55-2243

24

Electrolytic Zinc Co. of A'asia Ltd.
Rosebery, Tas.

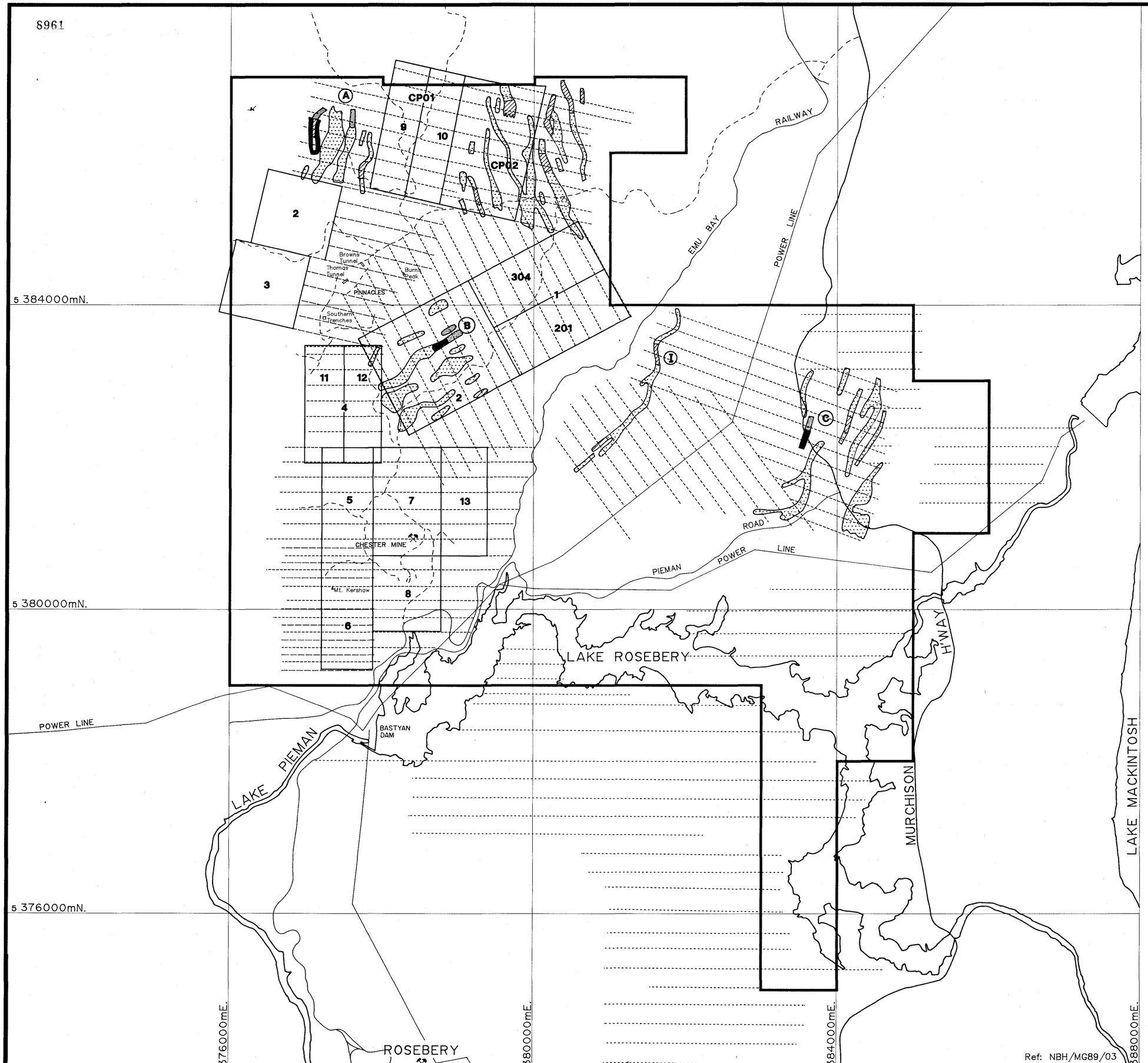
ROCK SAMPLE LEDGER

PROJECT: Burn's Peak · LOCALITY: Tasmania ·
COLLECTED BY: ANR/DG. DATE: ~~Feb~~ May-Oct 86

Sample Number	A.M.G. Co-ordinates N	A.M.G. Co-ordinates E	Sample Type	Geological Description	Rock-type (Macroscopic)	Thin or Polished Section: T or P	By	Reference	Rock-type (Microscopic)	Metal Content (p.p.m. unless specified): Cu	Pb	Zn	Au	Ag	Mn
79032	5380600	377400	Stabbed	?Felsic lava.	lA										
33	5380380	378250	"	V sil ? sediments, pyrite.	VS.										
34	5380420	378150	"	?Felsic lava sil patches	lA										
35	5380550	377930	"	V. sil Cherty Ash Fe staining.	?SV										
36	5380500	378020	"	? Sil. Sedy	VS										
37	5380460	378050	"	Sil Volc. or sediment.	VS										
38	5380550	377900	"	Andesite intrusive or lava.	iIa/lIa										
79040	5380415	377100	"	Sericite schist, relict feldspar.	s'd										
41	5380395	377~~095~~050	"	ser'd felsic ?lava.	lA										
	BROWN'S TUNNEL EAST GRID CO-ORDINATES.														
79045	5200	5195		Cl'd acid pum tuff carb'd ser'd	tA cb s'd					<5	5	30	<0.008		
46	5200	5115		" " " " Si ser'd	tA si s'd					395	2950	8100	0.063		
47	5200	5230		Galena+Pyrite blebs in sil+ser'd Acid Tuff	tA					510	3500	44000	<0.008		
48	5000	5235		Cl'd acid pum tuff si cb nodules	tA si c'b					<5	5	100	<0.008		
49	5200	5255		Blocky ? Rhyolite lava	lAr					<5	75	35	0.016		
50	5367	5105		Very cherty tuff or sed.	tA/Vs chty					85	55	15	0.018		
51	5367	5105		Acid Pum. Tuffs Si.	tA si					5	5	20	0.013		
52	5369	5130		Very cherty tuff or sed.	tA/Vs chty					10	<5	10	<.008		
53	4400	4800		Silicified rhyolite, blocky lava.	lAr					5	5	20	<.008		
	BOCO ROAD														
67089	5385800	378350	R/C	"Host Rock" ser'd tuff c chy fragments.	tA s'd chy					15	350	305	.012	N.A.	610.
67090	5384980	378335	R/C	Ditto.	" "					20	110	230	.045	NA.	285.
	CHESTER														
82210	Chester Tramway.		R/C	Cherty banded, totally alt. ?tuff, py.	tA chy					ANSAC					
82211	"	"	R/C	Float, saccaroidal texture, sil, py.	?tA si py.										
82212	Bench A, chester mine		R/C	K-clay alt sil, tr. py.	?tA si k'd										
82213	Bench A, "	"	R/C	si-alt traces of pyrite ?boiling.	?tA si py.										
82214	"	"	R/C	?tuff si	?tA si (py)										
82215	Fall off from Bench A, Ch'r		R/C	Siliceous nodules	si s'd										
82216	Bench G	Chester M.te	R/C	Pyrite/sil. breccia	Sb Bx py si										

Smuin Print Ph. 411823

8961



LEGEND

- COMSTAFF PROPRIETARY LIMITED
- BHP - UTAH MINERALS INTERNATIONAL
- BILLITON AUSTRALIA

CONDUCTIVITY

- Shallow low σt
- Deep low σt
- Shallow high σt
- Deep high σt
- (A) Anomalous Zone

GN
TN
MN
GRID CONVERGENCE 1.0
GRID/MAGNETIC ANGLE 11.6

5cm

551245 **89-3059**

Ref: NBH/MG89/03

NORTH BROKEN HILL – PEKO

BURNS PEAK E.L. 44/88

LAMONTAGNE / BHP UTEM INTERPRETATION

DRAWN BY : J.R.B.
DRAFTSMAN : T.G.D.S.
DATE : Sept.'89
REVISIONS :
FILE No.

SCALE 1 : 25,000 500 0 500 1000 METRES

FIG. 2c

N.W. Coast Computer Aided Drafting Centre. Phone (004 354315)

8962

9
10
CP 01
CP 02
A
B
2
3
4
5
6
7
8
11
12
13
301
201
1
EAST CHESTER
NORTH PINNACLES
MT KERSHAW
CHESTER MINE
ROSEBERY FAULT
BOUNDARY OF LEASE E.L. 5/63 AREA 4
PIEMAN RIVER
MARIONOAK RIVER
RAILWAY
CREEK

MITRE INTERPRETATION

? — Anomaly grading

Traverses for which there are no results

SCALE 1:10000

0 500 1000 metres

BHP INTERPRETATION

5 — Loop position and number

Prospective zone

Well defined anomaly

Less well defined anomaly
(All anomalies weak and shallow)

TAS/2 2736
TAS/2 2988
TAS/2 2737

TN

NBH/MG89/03

5 cm

8962

NORTH BROKEN HILL - PEKO

BURNS PEAK - E.L. 44/88

LOOP POSITION & SIMPLIFIED INTERPRETATION

COMPILED	T.G.D.S. 28/9/81
DRAWN	GEODRAFT 20/A/78
AMENDED	Sept. 1989
SCALE	1 : 10 000
PLAN No.	FIG. 2d

5312246

8963

378000mE.
380000mE.
382000mE.
5 384000mN.
5 382000mN.
5 379000mN.

PINNACLES
Plunging ?
EAF11
EAF12
EAF13
EAF3,4
EAF5
EAF1
EAF2
ESB1
EAF8
EAF10
WAF6
EAF9
EAF7,14
Browns Tunnel
EAF15
EAF16
CP14,7
PP50
PP49
PP48
PP51
PP52
PP46
PP45
Thomas Tunnel
CP12
EAB3
7a
PINNACLES
7b
7c
CP9
CP13
EAF17
PP39
PIN1
PP34
PP44
EAF18
PP36
PP4
PIN2
Southern Trenches
CP10
CP15
CP1
CP2
Burns Peak
△
EAB 1
EAB 2
1
2
3
4
4a
5?
6?
7?
8
8a?
9?
10?
11?
12?
13
14?
ANDESITE CONTACTS
EAB4
HOLLWAY
15?
16?
17?
18
19
20
Plunging ?
24
CHESTER MINE
25
26
CP6
21
22
23
CH1
CH2
CP11
CP5
CP3
CP18
CP17
CP23
CP4
CP16
CP20
CP19
CH3
CP22
CP21
CHESTER
28
27
Mt. Kershaw
△
MOUNT KERSHAW
29
30
LAKE ROSEBERY
RAILWAY
BAY
EMU
POWER LINE
PIEMAN ROAD
GN
TN
MN
GRID CONVERGENCE 1.0
GRID/MAGNETIC ANGLE 11.6

551247

NORTH BROKEN HILL – PEKO

BURNS PEAK
E.L. 44/88
PROSPECTIVE ZONES AND UTEM ANOMALIES

DRAWN BY : J.R.B.
DRAFTSMAN : T.G.D.S.
DATE : Sept.'89
REVISIONS :
FILE No.

SCALE 1 : 10,000
100 0 200 400
METRES

FIG. 2e

5 cm

N.W. Coast Computer Aided Drafting Centre. Phone (004 354315)
Fax. (004 354495)

8964

85000N

84800N

84600N

7820OE

7840OE

7860OE

Quarry

LAr Fb/brkd (sld)

LAr

?LAr or VS

LAbx or Sbx rny clasts

Vs sed sar/sslt

Ssh, Scl, Sslt Minor Sbrn

Shearing

Sbx, Ssh Blocks

LAr py si

LAr/VS

Sbx shale blocks

Shearing

LAr pm sld py(2%)

Sbx bd shale blocks

LAr, VS, Ssh ?And Clasts

VS + Sar

LAr brkd

VS

LAr Py

QFP

SPD 65

LAr/VS si sld py

LAr/VS si py

LAr/VS si py

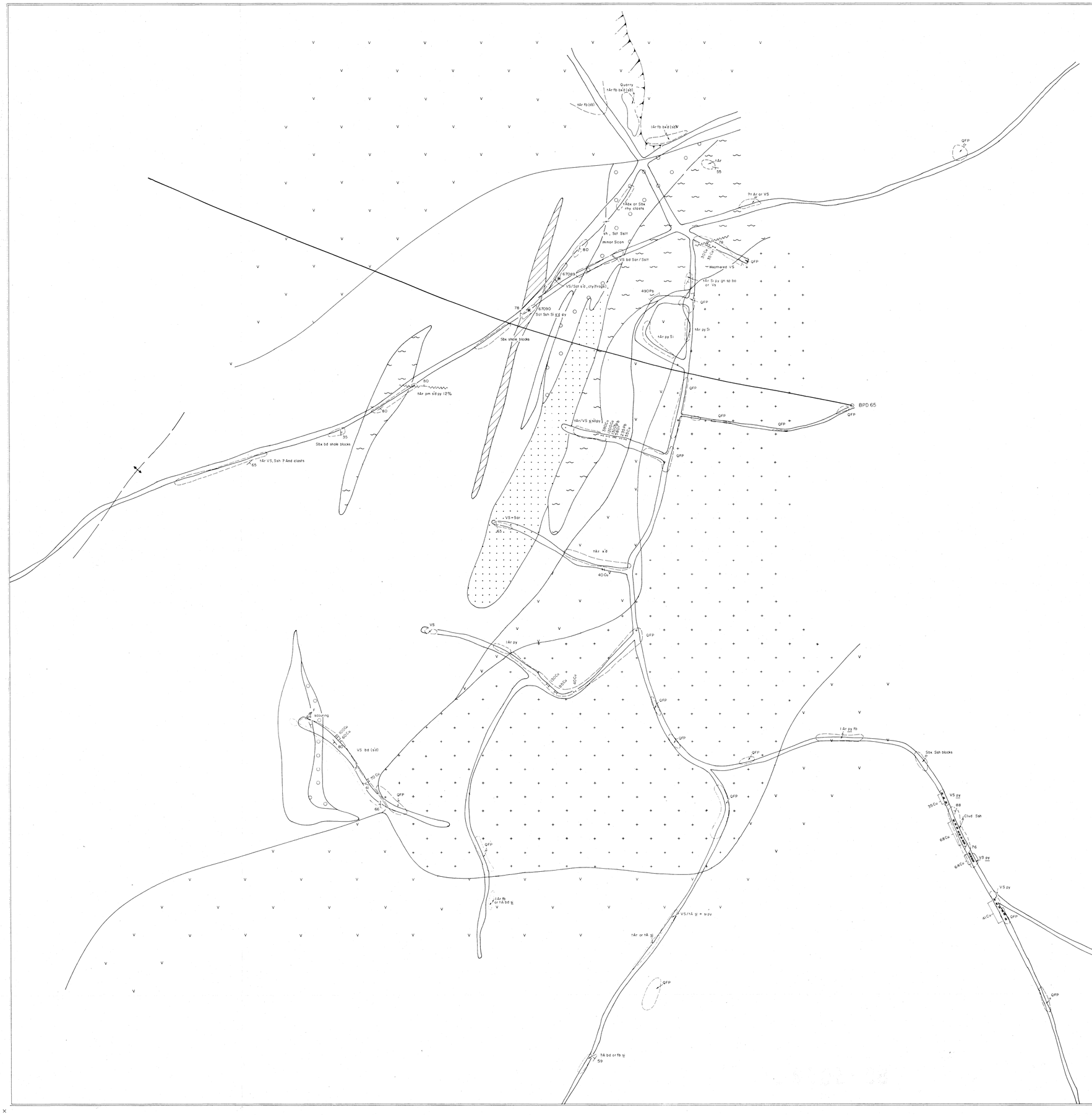
LAr/VS

LAr/VS si py

LAr/VS si py

LAr/VS si py

8965



LEGEND

1.Colour

pl	pale
dk	dark
pk	pink
rd	red
bn	brown
or	orange
yl	yellow
gn	green
bk	black
wh	white
cm	cream
pp	purple

2.Cleavages

w.clvd	(weakly cleaved)
clvd	(moderately cleaved)
s.clvd	(strongly cleaved)

3.Igneous Grain Size

fg	< 1 mm
mg	1–5 mm
cg	5–50mm
vcg	> 50mm

4.Sediment Grain Size

argillites	<0.06 mm	rudites	< 2 mm
arenites – vfg	0.06 - 0.12 mm	gr (granule)	2 - 4 mm
fg	0.12 - 0.25 mm	pb (pebble)	4 - 64 mm
mg	0.25 - 0.50 mm	cob (cobble)	64 - 256 mm
cg	0.50 - 1.00 mm	bld (boulder)	> 256 mm
vcg	1.00 - 2.00 mm		

5.Igneous Rock Classification

	Av	Undifferentiated Acid Volcanic	
10	tA	Acid tuff	rhyolite r
6	lA	Acid Lava	rhyodacite r d
6	iA	Minor Acid Intrusives	dacite d
19	+ + +	Major Acid Intrusives	granite
	GR		quartz feldspar porphyry
	QFP		
	Iv	Undifferentiated Intermediate Volcanic	
51	tI	Intermediate tuffs	trachyte t
47	lI	Intermediate lava	latite l
47	iL	Minor Intermediate Intrusives	andesite a
41	DI	Major Intermediate Intrusives	
60	B	Basic Volcanics	basalt b
54	dB	Minor Basic Intrusives	dolerite d
54	GB	Major Basic Intrusives	Gabbro
64	U	Ultramafic Rocks	

6.Sedimentary Rock Classification

27	VS	Volcaniclastic Seds	Sv	Volcanogenic Seds	
28	Srd	Rudites	Scon	conglomerate	
			Sbx	Breccia (Sedimentary)	
		Sar arenites		Sqtz	orthoquartzite
		<15% matrix		Sqar	quartz arenite
				Sfar	feldspar arenite
33	Ssst	sandstones		Slar	lithic arenite
		Sak arkose		Svar	volcanic arenite
		Swk wackes		sqwk	quartz wacke
		sgwk greywacke		sfwk	feldspathic wacke
		>15% matrix		slwk	lithic wacke
				svwk	volcanic wacke
			Sslt	Siltstone	
23	Ssg	Argillites	Ssh	Shale	
			Sbs	Black shale	
34	Slst	Limestone			
34	Sdol	Dolomite		Sct	Chert
31	Sif	Iron Information	4	Sfgl	Fluvoglacials
31	Sev	Evaporite	4	Sgl	Glacial deposits
			4	Salv	Alluvium

7.SCH Undifferentiated Metamorphic

8.Silicates

q	quartz	bwk	boxwork
kf	K-feldspar	got	gossan
ab	albite	hm	haematite
pf	plagioclase	mag	magnetite
a	amphibole	lim	limonite
px	pyroxene	bn	bornite
b	biotite	cp	chalcopyrite
c	chlorite	sp	sphalerite
s	sericite	gn	galena
e	epidote	py	pyrite
to	tourmaline	po	pyrrhotite
f	feldspar	asp	arsenopyrite
hb	hornblende	Mn	Mn-oxides
t	talc	Fe	Fe-oxides
		tet	tetrahedrite

9.Sulphides,Oxides

10.Carbonate,etc

cb	carbonate		
sid	siderite		
cl	calcite		
dol	dolomite		
rh	rhodochrosite		
ba	barite		
fl	fluorite		
shl	scheelite		
Au	gold		
lx	Leucoxene		

11.Textures

lava		bm	bombs	f	flow brecciated
lt	lithic tuff	pm	pumice	vns	veins
xt	crystal tuff	fm	fiamme	xbd	cross-bedded
vt	vitric tuff		(length cm)	tkbd	thick-bedded
lpt	lapilli tuff	P	porphyritic	tnbd	thin-bedded
ag	agglomerate	a	amygdoloidal	ib	inter-bedded
af	ash flow	ves	vesicular	lam	laminated
ashfll	ash fall	sph	spherulitic	bx'd	brecciated
bx	breccia	wld	welded	stg	staining
qe/aug	quartz eyes/augen	rwk'd	reworked		
bd	bedded	fr	fragments		
schistose		cl	clasts		
		bnd	banded		
		fb	flow banded		

12.Alteration

17	a'b	albitized
35	c'b	carbonated
45	ch'd	chloritized
31	s'd	sericitized
27	k'd	kaolinized
46	ep'd	epidotized
20	si	silicified
	cty	cherty

(+ = weakly — strongly)

13.Structure

- Fault
- Bedding
- Cleavage
- Joint
- Plunge
- Facing & Class
- Unconformity
- Outcrop
- Interpreted boundary
- Shearing

14.Mineralization

diss	() disseminated (%)
str	stringer
mas	massive

15.Topographical Features

- Road
- Track: vehicle, foot
- Railway, tramway
- River, creek
- Waterfall
- Drill Hole
- Old mine, pit
- Sample Location
- Trig, spot height
- Dump or scree

Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones

Predominatly Shale

Very Coarse Epiclastics (Sedimentary Breccia)

Lava Breccia

Predominantly Sandstone

Acid,Pumiceous Tuffs

Andesite Lava

Rhyolite Lava

Quartz Feldspar Porphyry

8965

GEOPEKO

A DIVISION OF PEKO WALLSEND OPERATIONS LTD

No PLATE 1

TASMANIA

Date:	
Compiled:	
Checked:	
Drawn:	
Amendments:	

LEO'S FIND

GEOLOGY

Outcrop, interpretation & anomalous geochem

5cm

Map Ref:

1:1000

551249

5 384 800m.N.
5 384 600m.N.
5 384 400m.N.
5 384 200m.N.
5 384 000m.N.
377 400m.E.
377 600m.E.
377 800m.E.
378 000m.E.
BROWN'S TUNNEL
THOMAS'S TUNNEL
BPD 63
BPD 62
EAF 1
EAF 2
EAF 3
EAF 4
EAF 5
EAF 6
EAF 7
EAF 8
EAF 9
EAF 10
EAF 11
EAF 12
EAF 13
EAF 14
EAF 15
EAF 16
EAB
ESB1
PP31
PP45
PP46
PP48
PP50
PP51
PP52
PP59
CP7
CP12
CP14
Au 5.07 Cu 625
Au 98 Cu 1100
Cu 55
Pb 840
Cu 35
Cu 60 Pb 610 Cu 32
Cu 220 Pb 4000 Zn 500
Cu 190 Pb 1250 Zn 760
Pb 1300 Zn 280
Cu 210 Pb 1200 Zn 1360
[Pb 480]
Au 5.85 Cu 2050 Pb >10.9% Zn 41.5%
Zn 1600
Cu 180 Pb 450
Au 5.11 Cu 1925 Pb 2025 Zn 6000
Au 13 Cu 7174 Pb 6.58% Zn 2.65%
Cu 163 Pb 1995 Zn 6036
Cu 104 Pb 1006 Zn 1036
Au 1.24 Cu 2.12% Pb 19.53% Zn 39.63%
Au 15 Cu 1350 Pb 4300 Zn 1.7%
Pb 3700 Zn 7800
Cu 580 Pb 2300 Zn 5300
Cu 68 Pb 1423 Zn 1457
Au 48 Cu 342 Pb 2400
Au 15 Cu 698 Pb 986 Zn 1036
Au 4.85 Cu 5800 Pb 19.71% Zn 32.49%
Au 2.14 Pb 1600
Cu 500 Pb 10%
Au 13.33
Au 6.44 Cu 1217 Pb 6850 Zn 27.10
Au 39 Cu 468 Pb 2672 Zn 2362
Au 2.7 Pb 5000 Zn 1000
Au 5 Cu 200 Pb 2000 Zn 1500
Pb 2000
Pb 525
Zn 2.0% (proj. 27m. to surface)
massive sulphides
horizontal Ssh
shear zone
v weathered
v weathered ?tA pm
Sv, Sar, Ssh frags
Sar/Sv
Sar cty
Sst/Sar, Ssh clasts
Sct/Sar/Sbx
Sv/Sar/Sbx or tA bx
Sv/Sar Ssh frags
Sar/Sv/Ssh frags
Sbx, Ssh frags
?v weathered ?tA+white clay
v weathered ?tA s.d
v clvd tA s.d si (nodular) py gn
tA s.d si py nodular
clvd tA s.d si py
Zn 920
Sar bd
Ssh bd
SV/Sar bd
SV/Sar/tA s.d
Sbx/SV
Ssh/SV py
SV/Ssh
Ssh/tA
Sct/Ssh/tA
Sct/Ssh
Sv/Sct
Sar/Sct
SV/Sar/Sct
Sv/bd, Sar, Ssh
Sv/bd/Sar/Ssh
Sv/bd, s'd
Sv, c
tAr, qf, s'd
tAr, qf, s/d, bx
v weathered ?Sv/S
tAr, p
tAr (s.d)
tAr, bx, or ?Sbx
tAr
tA s'd
tA si s'd
tA s/d si py, gn
tA si s'd cty
clvd tA cty s'd
clvd tA s'd
clvd tA, si, c'b
clvd, tA, py
clvd, tA, s'd
clvd, tA, si, s'd
clvd tA s'd si
clvd tA/Sct si s'd
clvd tA s'd si py
clvd tA si s'd
clvd tA si
clvd, tA
fg Sar
Sar/Sv
Sar cty
Sst/Sar, Ssh clasts
Sct/Sar/Sbx
Sv si s'd
?Sar or SV
Sar bd
Sv/Sct
Sct, py
Sst/large Ssh frags
Sar/Sv/Ssh frags
?LA/I
I/I/Io
?I/A or SV
v weathered ?I/A or SV
v weathered ?I/A or SV
v weathered
Ssh/tA
Ssh/tA bx
Sbx
Ssh bd
Ssh
Sv/Sar
Sv/Sct
Sv/Sar/Sct
Sv/Sar Ssh frags
Sv/s.d.c.b
Sv/bd/Sar/Ssh
Sv/bd/Sar/Ssh
Sv/bd, Sar, Ssh
Sv/Sar/Ssh
Sv/Sar, Ssh
Sv/Sar
Sv
Sar/Sv
Ssh
tA
tA s'd
tA s'd
tA s'd

8966

8966

PRELIMINARY DRAFT ONLY

551251

GEOPEKO	A DIVISION OF PEKO WALLSEND OPERATIONS LTD
Date: Nov 89	1:1000 — No Plate 2
Geologist: ANR	BROWN'S TUNNEL
Checked:	Interpreted and Outcrop Geology
Drawn:	Anomalous, channel, rock chip samples
Amendments:	Map Ref: — Base: PARKES NSW
	PLATE 2

89-3059

8968

5 384 100mN
377 000mE
377 200mE
377 400mE
377 500mE
5 384 000mN
5 383 800mN
5 383 600mN
5 383 400mN

SOUTHERN CUT
SOUTHERN TRENCH 1
SOUTHERN TRENCH 2
SOUTHERN TRENCH 3
SOUTHERN TRENCH 4
Shearing, parallel to Rosebery Fault
Rosebery Fault
CP9
CP8
CP13
EAF17
PIN1
PP39
PP40
EAF18
PP41
PIN2
BPD64
CP10
CP15
Ssh/tA, bx'd
tA
tA,s'd
tA,s'd fm
Sct,si
QFP
tA,3%py
q-py, ras
tA,s'd c'd
Sct,si,bx'd/Sag
tA,s'd
Ar,q,bx'd
Ar,q,f,bx'd
Ar,s'd
fb
Ar,s'd,si
tA,si,s'd
tA,si,s,bl
si,?QFP
r,FeO
Ar,q,s'd
Ar,bx'd,fb
Iq,ves
Sag,cty,py
bx'd,cty
sv
tA,s'd,si
Ar
tA
f

GEOLOGICAL INTERPRETATION

- Dundas Group, bedded shales, arenites and conglomerates
- Rhyolite lava and lava breccia, semi-intrusive in places
- Discontinuous chert, siltstone, tuffaceous sediments and acid, pumiceous tuffs (undifferentiated)
- Coarse lava breccia (possibly epiclastic)
- Predominantly arenite
- Very coarse epiclastics (sedimentary breccia)
- Predominantly shale
- Andesite ?lava
- Acid, pumiceous tuffs
- Intrusive, quartz, feldspar porphyry
- Mineralisation (Pb, Zn >1%, Au >·1g/t) projected to surface

SEQUENCE WHICH HOSTS BROWN'S TUNNEL MINERALISATION

LEGEND

1. Colour

pl	pale
dk	dark
pk	pink
rd	red
bn	brown
or	orange
yl	yellow
gn	green
bk	black
wh	white
cm	cream
pp	purple

2. Cleavages

w.clvd	(weakly cleaved)
clvd	(moderately cleaved)
clvd	(strongly cleaved)

3. Igneous Grain Size

fg	< 1 mm
mg	1 - 5 mm
cg	5 - 50mm
vcg	> 50mm

4. Sediment Grain Size

argillites	< 0.06mm	rudites	> 2.0 mm
arenites - vfg	0.06 - 0.12mm	gr (granule)	2 - 4 mm
fg	0.12 - 0.25mm	pb (pebble)	4 - 64 mm
mg	0.25 - 0.5 mm	cob (cobble)	64 - 256 mm
cg	0.5 - 1.0 mm	bld (boulder)	> 256 mm
vcg	1.0 - 2.0 mm		

5. Igneous Rock Classification

	Av	Undifferentiated Acid Volcanic	
10	tA	Acid tuff	rhyolite r
6	lA	Acid Lava	rhyodacite r d
6	iA	Minor Acid Intrusives	dacite d
19	+ +	Major Acid Intrusives	GR granite
			QFP quartz feldspar porphyry
	Iv	Undifferentiated Intermediate Volcanic	
51	tI	Intermediate tuffs	trachyte t
47	lI	Intermediate lava	latite l
47	iL	Minor Intermediate Intrusives	andesite a
41	DI	Major Intermediate Intrusives	
60	B	Basic Volcanics	basalt b
54	iB	Minor Basic Intrusives	dolerite d
54	GB	Major Basic Intrusives	Gabbro
64	U	Ultramafic Rocks	

6. Sedimentary Rock Classification

27	VS	Volcaniclastic Seds	Sv	Volcanogenic Seds
28	Srd	Rudites	Scon	conglomerate
			Sbx	Breccia (Sedimentary)
33	Ssst	sandstones	Sar arenites <15% matrix	Sqtz orthoquartzite; Sqar quartz arenite; Sfar feldspar arenite; Slar lithic arenite; Svar volcanic arenite
			Sak arkose	
			Swk wackes	sqwk quartz wacke; sfwk feldspathic wacke; slwk lithic wacke; svwk volcanic wacke
			sgwk greywacke >15% matrix	
			Sslt	Siltstone
23	Sag	Argillites	Ssh	Shale
			Sbs	Black shale
34	Slst	Limestone		
34	Sdol	Dolomite	Sct	Chert
31	Sif	Iron Information	4 Sfgl	Fluvioglacials
31	Sev	Evaporite	4 Sgl	Glacial deposits
			4 Salv	Alluvium

7. SCH Undifferentiated Metamorphic

8. Silicates

q	quartz
kf	K-feldspar
ab	albite
pf	plagioclase
a	amphibole
px	pyroxene
b	biotite
c	chlorite
s	sericite
e	epidote
to	tourmaline
f	feldspar
hb	hornblende
t	talc

9. Sulphides, Oxides

bwk	boxwork
gos	gossan
hm	haematite
mag	magnetite
lim	limonite
bn	bornite
cp	chalcopyrite
sp	sphalerite
gn	galena
py	pyrite
po	pyrrhotite
asp	arsenopyrite
Mn	Mn-oxides
Fe	Fe-oxides
tet	tetrahedrite

10. Carbonate, etc

cb	carbonate
sid	siderite
cl	calcite
dol	dolomite
rh	rhodochrosite
ba	barite
fl	fluorite
shl	scheelite
Au	gold
lx	Leucoxene

11. Textures

lava		bm bombs	f flow brecciated
lt	lithic tuff	pm pumice	
xt	crystal tuff	fm fiamme (length cm)	vns veins
vt	vitric tuff	P porphyritic	xbd cross-bedded
lpt	lapilli tuff	a amygdoloidal	tkbd thick-bedded
ag	agglomerate	ves vesicular	tnbd thin-bedded
af	ash flow	sph spherulitic	ib inter-bedded
ashfll	ash fall	wld welded	lam laminated
bx	breccia	rwk'd reworked	bx'd brecciated
qe/aug	quartz eyes/ augen	fr fragments	stg staining
bd	bedded	cl clasts	
schistose		bnd banded	
		fb flow banded	

12. Alteration

17	a'b	albitized
35	c'b	carbonated
45	c'd	chloritized
31	s'd	sericitized
27	k'd	kaolinized
46	ep'd	epidotized
20	si	silicified
	cty	cherty

( ) = weakly — = strongly

13. Structure

- Fault
- Bedding
- Cleavage
- Joint
- Plunge
- Facing & Class (t-3)
- Unconformity
- Outcrop
- Interpreted boundary
- Shearing

14. Mineralization

diss	()disseminated (%)
str	stringer
mas	massive

15. Topographical Features

- Road
- Track: vehicle, foot (V.T. F.T.)
- Railway, tramway
- River, creek
- Waterfall
- 57R Drill Hole
- Old mine, pit
- Sample Location
- Trig, spot height (△ 443)
- Dump or scree

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT: BURN'S PEAK E.L. 44/88 Tasmania

551252

SOUTHERN TRENCHES GEOLOGY

5 cm

SCALE: 1:1000	SURVEY: A.N.R.	REVISED:
DRAWN: D.W.	DATE: Nov. '89	PLAN N°: PLATE 3

89-3059

8969

5387000N
5386500N
5386000N
5385500N
5385000N
5384500N
5384000N
5383500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E

FAULT

ROSEBERY-TULLAH ROAD

THOMAS TUNNEL

BRONCO TUNNEL

STRONGS ALLUVIAL WORKINGS

TRENCH (RTAE 1959)

ADIT (RTAE pion, 1959)

BPD62

BPD66

PRELIMINARY DRAFT ONLY

1. Colour

pl	pale
dk	dark
pk	pink
rd	red
bn	brown
or	orange
yl	yellow
gn	green
bk	black
wh	white
cm	cream
pp	purple

2. Cleavages

w.clvd	(weakly cleaved)
clvd	(moderately cleaved)
s.clvd	(strongly cleaved)

3. Igneous Grain Size

fg	< 1 mm
mg	1 - 5 mm
cg	5 - 30mm
vcg	> 30mm

4. Sediment Grain Size

argillites	< 0.06mm	rudites	> 2.0 mm
arenites - vfg	0.06 - 0.12mm	gr (granule)	2 - 4 mm
fg	0.12 - 0.25mm	pb (pebble)	4 - 64 mm
mg	0.25 - 0.5 mm	cob (cobble)	64 - 256 mm
cg	0.5 - 1.0 mm	bld (boulder)	> 256 mm
vcg	1.0 - 2.0 mm		

5. Igneous Rock Classification

	Av	Undifferentiated Acid Volcanic		
30	tA	Acid tuff	rhyolite	r
6	lA	Acid lava	rhyodacite	r d
8	iA	Minor Acid intrusives	dacite	d
9	* *	Major Acid intrusives	Gr	granite
			QFP	quartz feldspar porphyry
	Iv	Undifferentiated Intermediate Volcanic		
35	tI	Intermediate tuffs	trachyte	t
47	lI	Intermediate lava	latite	l
			andesite	a
47	iI	Minor Intermediate Intrusives		
4	BI	Major Intermediate Intrusives		
46	B	Basic Volcanics	basalt	b
54	dB	Minor Basic Intrusives	dolerite	d
56	GB	Major Basic Intrusives	Gabbro	
64	U	Ultramafic Rocks		

6. Sedimentary Rock Classification

27	VS	Volcaniclastic Seds		sv	Volcanogenic Seds
28	Sed	Rudites		Scon	conglomerate
				Sbx	Breccia (Sedimentary)
			Sar arenites		Sqtz orthoquartzite
			<15% matrix		Sqar quartz arenite
					Sfar feldspar arenite
33	Swst	sandstones			Slar lithic arenite
			Sak arkose		Scar volcanic arenite
			Sak sockes		sqsk quartz sockе
			sfak arkosic		sfsk feldspathic sockе
			>15 matrix		slsk lithic sockе
					svsk volcanic sockе
				Sslt	Siltstone
37	Smc	Argillites		Ssh	Shale
				Sbs	Black shale
34	Sls	Limestone			
34	Sdol	Dolomite		Scl	Chert
31	Sif	Iron Information		Sfgl	Fluvioglacials
31	Sev	Evaporite		Sgl	Glacial deposits
				Salf	Alluvium

7. MDH Undifferentiated Metamorphic

8. Silicates

q	quartz
kf	K-feldspar
ab	albite
pl	plagioclase
a	amphibole
px	pyroxene
b	biotite
c	chlorite
s	sericite
e	epidote
to	tourmaline
f	feldspar
hb	hornblende
t	talc

9. Sulphides, Oxides

bwk	bornwork
sss	sassaite
hm	hematite
mag	magnetite
lim	limonite
bn	bornite
cp	chalcopyrite
sp	sphalerite
gn	galena
py	pyrite
po	pyrrhotite
asp	arsenopyrite
ox	Oxides
fe	Ferroxides
tet	tetrahedrite

10. Carbonate, etc.

cb	carbonate
sid	siderite
cl	calcite
dol	dolomite
rh	rhodochrosite
ba	barite
fl	fluorite
shl	scheelite
au	gold
ls	lesucrene

11. Textures

	lava	bm	bombs	f	flow
lt	lithic tuff	pm	pumice		breciated
xt	crystal tuff	fm	fiamme	ves	vesicles
vt	vitric tuff		(length cm)	xbd	cross-bedded
lpt	lapilli tuff	P	porphyritic		
ag	agglomerate	a	amygdaloidal	tkbd	thick-bedded
at	ash flow	ves	vesicular	tnbd	thin-bedded
ashf	ash fall	sph	spherulitic	ib	inter-bedded
br	breccia	sold	welded	lam	laminated
qpcrag	quartz crystal vitric tuff	rsk'd	resorbed	bx'd	brecciated
		fr	fragments	stks	stacking
bd	bedded	cl	clasts		
schistose		bnd	banded		
		fb	fine banded		

12. Alteration

	a'l	albitised	
35	c'b	carbonated	
45	c'l	chloritised	Intensity
31	s'd	sericitised	
27	k'd	kaolinised	
46	ep'd	epidotised	
20	si	silicified	
	ch	cherty	

13. Structure

	Fault
	Bedding
	Cleavage
	Joint
	Plunge
	Facing & Closure
	Unconformity
	Outcrop
	Interpreted boundary
	Shearing

14. Mineralisation

diss	Disseminated
str	stringer
mas	massive

15. Topographical Features

	Road
	Track, vehicle, foot
	Railway, tramway
	River, creek
	Watertail
5780	Drill hole
	Old mine, pit
	Sample location
345	Trig. sta. height
	Dump or scree

Lease boundary
Watercourse
Road
CP 9 Drill hole

8969

NORTH

89-3059

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

Plate 4a.

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

SHEET 1

551253

Geology

5cm

Scale: 1:5000	Survey:	Revised:
Drawn: TGF	Date: 3/8/89	Checked:

8970

5387000N
5386500N
5386000N
5385500N
5385000N
5384500N
5384000N
5383500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E

5800N
5600N
5400N
5200N

Lea's Find
BPD 65
BPD 62
EAB 5
Brown's
Burns Peak
EAB 1
BPD 63
Thomas's
EAB 3
EAB 2
EAB 4
Strong's Alluvial Workings
BPD 64

Dundas Group Sediments

Predominantly Rhyolite Lavas, Some Quartz-Feld Porphyry

Sequence that hosts known mineralisation:-
Volcaniclastic,bedded sediments.
Chert
Mass Flows
Acid Pumiceous Tuff
Shale
Andesite?Lava.

Predominantly Shale

Andesite Lava

Acid,Pumiceous Tuff

Rhyolite Intrusives & Lavas & Quartz,Feldspar Porphyry Intrusives

Lease boundary

Watercourse

Road

CP 9 Drill hole

8970

89-3059

NORTH

PLATE 4b

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION 551254

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

SHEET 1

INTERPRETED GEOLOGY

5cm

Scale: 1:5000	Survey:	Revised:
Drawn: TGF	Date: 3/8/89	Checked:

8971

5383000N
5382500N
5382000N
5381500N
5381000N
5380500N
5380000N
5379500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E
3810000E

ROSEBERY FAULT

Chester Alteration Zone (after Gregory 1987)

Outcrop

8971

LEGEND

1.Colour

pl	pale
dk	dark
pk	pink
rd	red
bn	brown
or	orange
yl	yellow
gn	green
bk	black
wh	white
cm	cream
pp	purple

2.Cleavages

w.clvd	(weakly cleaved)
clvd	(moderately cleaved)
s.clvd	(strongly cleaved)

3.Igneous Grain Size

fg	< 1 mm
mg	1-5 mm
cg	5-50mm
vcg	> 50mm

4.Sediment Grain Size

argillites	< 0.06 mm	rudites	< - 2 mm
arenites - vfg	0.06 - 0.12 mm	gr (granule)	2 - 4 mm
fg	0.12 - 0.25 mm	pb (pebble)	4 - 64 mm
mg	0.25 - 0.50 mm	cob (cobble)	64 - 256 mm
cg	0.50 - 1.00 mm	bld (boulder)	> - 256 mm
vcg	1.00 - 2.00 mm		

5.Igneous Rock Classification

	Av	Undifferentiated Acid Volcanic	
10	tA	Acid tuff	rhyolite r
6	lA	Acid Lava	rhyodacite r d
6	IA	Minor Acid Intrusives	dacite d
19	+ + +	Major Acid Intrusives	GR granite
			QFP quartz feldspar porphyry
	Iv	Undifferentiated Intermediate Volcanic	
51	tI	Intermediate tuffs	trachyte t
47	lI	Intermediate lava	latite l
47	IL	Minor Intermediate Intrusives	andesite a
41	DI	Major Intermediate Intrusives	
60	B	Basic Volcanics	basalt b
54	tB	Minor Basic Intrusives	dolerite d
54	GB	Major Basic Intrusives	Gabbro
64	U	Ultramafic Rocks	

6.Sedimentary Rock Classification

27	VS	Volcaniclastic Seds	Sv	Volcanogenic Seds	
28	Srd	Rudites	Scon	conglomerate	
			Sbx	Breccia (Sedimentary)	
		Sar arenites <15% matrix	Sqtz	orthoquartzite	
			Sqar	quartz arenite	
			Sfar	feldspar arenite	
33	Sst	sandstones	Slar	lithic arenite	
		Sak arkose	Svar	volcanic arenite	
		Swk wackes	sqwk	quartz wacke	
		sgwk greywacke	sfwk	feldspathic wacke	
		>15% matrix	slwk	lithic wacke	
			svwk	volcanic wacke	
			Slst	Siltstone	
23	Sag	Argillites	Ssh	Shale	
			Sbs	Black shale	
34	Slst	Limestone			
34	Sdol	Dolomite	Sct	Chert	
31	Sif	Iron Information	4 Sfgl	Fluvoglacials	
31	Sev	Evaporite	4 Sgl	Glacial deposits	
			4 Salv	Alluvium	

7.SCH Undifferentiated Metamorphic

8.Silicates

q	quartz	bwk	boxwork
kf	K-feldspar	gos	gossan
ab	albite	hm	haematite
pf	plagioclase	mag	magnetite
a	amphibole	lim	limonite
px	pyroxene	bn	bornite
b	biotite	cp	chalcopyrite
c	chlorite	sp	sphalerite
s	sericite	gn	galena
e	epidote	py	pyrite
to	tourmaline	po	pyrrhotite
f	feldspar	asp	arsenopyrite
hb	hornblende	Mn	Mn-oxides
t	talc	Fe	Fe-oxides
		tet	tetrahedrite

9.Sulphides,Oxides

10.Carbonate,etc

cb	carbonate		
sid	siderite		
cl	calcite		
dol	dolomite		
rh	rhodochrosite		
ba	barite		
fl	fluorite		
shl	scheelite		
Au	gold		
lx	Leucoxene		

11.Textures

lava		bm	bombs	f	flow brecciated
lt	lithic tuff	pm	pumice	vns	veins
xt	crystal tuff	fm	fiamme	xbd	cross-bedded
vt	vitric tuff		(length cm)	tkbd	thick-bedded
lpt	lapilli tuff	P	porphyritic	tnbd	thin-bedded
ag	agglomerate	a	amygdaloidal	ib	inter-bedded
af	ash flow	ves	vesicular	lam	laminated
ashfl	ash fall	sph	spherulitic	bx'd	brecciated
bx	breccia	wld	welded	stg	staining
qe/aug	quartz eyes/augen	rwk'd	reworked		
bd	bedded schistose	fr	fragments		
		cl	clasts		
		bnd	banded		
		fb	flow banded		

12.Alteration

17	a'b	albitized
35	c'b	carbonated
45	c'd	chloritized
31	s'd	sericitized
27	k'd	kaolinized
46	ep'd	epidotized
20	si	silicified
	cty	cherty

( ) = weakly — strongly

13.Structure

- Fault
- Bedding
- Cleavage
- Joint
- Plunge
- Facing & Class
- Unconformity
- Outcrop
- Interpreted boundary
- Shearing

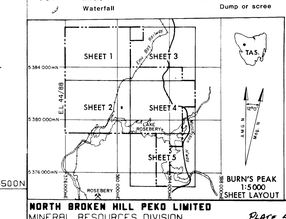
14.Mineralization

diss	() disseminated (%)
str	stringer
mas	massive

5cm

15.Topographical Features

- Road
- Track: vehicle, foot
- Railway, tramway
- River, creek
- Waterfall
- Drill Hole
- Old mine, pit
- Sample Location
- Trig, spot height
- Dump or scree



NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION
PLATE 5

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

551255

Geology

Outcrop Geology Compilation from Gregory (1987), Hall (1978,79)

Scale : 1:5000	Survey :		Revised :
Drawn : TGF	Date : 1/8/89		Checked :

8972

5387000N
5386500N
5386000N
5385500N
5385000N
5384500N
5384000N
5383500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E

LEGEND

- ROCKCHIP
- x A° SOIL SAMPLE
- o AUGER SAMPLE
- [COSTEAN / TRENCH SAMPLE
- •
- COSTEAN SAMPLING 1969.
- GRID COVERED BY AUGER SAMPLING. 1968. Tas/2/1333
- Lease boundary
- Watercourse
- Road
- CP 9 Drill hole

NOTE:

REFER TO MAP TBP-001 FOR GRID NAMES AND SURVEY DETAILS.

THRESHOLD 60/ppm Pb.

8972

551256

NORTH

PLATE 6

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

SHEET 1

GEOCHEMICAL COMPILATION.

GEOCHEM., Pb.

5 cm

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F	Date: 1-10-'89.	Checked:

8973

OLD GRID - CPSF.
EAB A° AUGER
EAB C AUGER
NEW EAA A°
EAA

THRESHOLD 100/ppm Zn.

LEGEND

- ROCKCHIP
- X A° SOIL SAMPLE
- O AUGER SAMPLE
- [COSTEAN / TRENCH SAMPLE
- GRID COVERED BY AUGER SAMPLING. 1968 Tas/2/1334 Tas/2/1237
- COSTEAN SAMPLING 1969.
- Lease boundary
- Watercourse
- Road
- CP 9 Drill hole

8973

89-30591

NORTH

PLATE 7

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

SHEET 1

GEOCHEMICAL COMPILATION

GEOCHEMISTRY Zn.

5 cm

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F.	Date: 15-10-'89	Checked:

5512257

8974

5387000N
5386500N
5386000N
5385500N
5385000N
5384500N
5384000N
5383500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E

'EAA NEW GRID'
A° GEOCHEMICAL SAMPLING PROGRAM
1979

x Cu outcropping

LEGEND

- Rockchip.
- O Auger Sample.
- [Costean.
- X A° Soil Sample.
- •

GRID COVERED BY AUGER SAMPLING 1968
Tas/2/1332
Tas/2/1337

COSTEAN SAMPLING 1969

- Lease boundary
- Watercourse
- Road
- CP 9 Drill hole

THRESHOLD 30/ppm Cu.

8974

551258
89-30597

PLATE 8

NORTH

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

SHEET 1

GEOCHEMICAL COMPILATION

GEOCHEMISTRY, Cu.

5cm

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F.	Date: 7/10/'89.	Checked:

8975

5383000N
5382500N
5382000N
5381500N
5381000N
5380500N
5380000N
5379500N

376500E
377000E
377500E
378000E
378500E
379000E
379500E
380000E
380500E
381000E

Chester Dam

LAKE ROSEBERY

LAKE ROSEBERY

Power lines

LEGEND:

- Rockchip.
- A° Soil Sample.
- O Auger Sample.
- Costean.

THRESHOLD > 50/ppm Pb.

- Power transmission line
- Watercourse
- Road
- Railway
- Drill hole
- Outcrop
- Lease boundary

8975

89-3059

PLATE 9

NORTH

551259

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT BURN'S PEAK E.L. 44/88, TAS.

GEOCHEMICAL COMPILATIONS.

GEOCHEMISTRY, Pb.

5cm

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F.	Date: 7/11/'89	Checked:

8976

5383000N
5382500N
5382000N
5381500N
5381000N
5380500N
5380000N
5379500N

376500E
377000E
377500E
378000E
378500E
379000E
379500E
380000E
380500E
381000E

Chester Dam

LAKE ROSEBERY

LAKE ROSEBERY

Power lines

COSTEAN

EAD A°
EAD C Horizon
EAD Rocks and Costean (some)
EAB A°
EAB C
Camp Charlie A°
Old Grid C

PLANS

Tas / 2 / 1390
1463 (A1-230)

LEGEND

- Rockchip
- X A° Soil Sample
- O Auger Sample
- [Costean
- •

THRESHOLD > 100/ppm

- Power transmission line
- Watercourse
- Road
- Railway
- Drill hole
- Outcrop
- Lease boundary

8976

89-3059

NORTH

PLATE 10

551260

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT BURN'S PEAK E.L. 44/88, TAS.

GEOCHEMICAL COMPILATIONS

GEOCHEMISTRY, Zn.

5cm

Scale 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F.	Date: 13/11/'89	Checked:

8977

5383000N
5382500N
5382000N
5381500N
5381000N
5380500N
5380000N
5379500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E
3810000E

Chester Dam

LAKE ROSEBERY

LAKE ROSEBERY

Power lines

LEGEND.

- Rockchip
- X A° Soil Sample.
- O Auger Sample.
- [Costean.
- •

THRESHOLD 30/ppm Cu.

- Power transmission line
- Watercourse
- Road
- Railway
- Drill hole
- Outcrop
- Lease boundary

8977

89-3059

PLATE 11

NORTH

551261

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

GEOCHEMICAL COMPILATION

GEOCHEMISTRY, Cu.

5 cm

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F.	Date: 30/10/'89	Checked:

8978

EAA NEW GRID

EAF GRID

EAA GRID

EAB EXTENDED GRID

RTAE GRID

1968 AUGER SAMP.

ORIGINAL EAST CHESTER GRID

EAD GRID

5387000N
5386500N
5386000N
5385500N
5385000N
5384500N
5384000N
5383500N

3765000E
3770000E
3775000E
3780000E
3785000E
3790000E
3795000E
3800000E
3805000E

ORIGINAL EAST CHESTER GRID.

A° SOIL SAMPLING.
ZN, Pb, Cu,
MAP No. Tas/2/1701
Tas/2/1702
Tas/2/1700

EAA GRID.

A° SOIL SAMPLING.
Pb, Cu, ZN, Ni, BA
MAP No. Tas/2/1786
Tas/2/1785
Tas/2/1787
Tas/2/1788
Tas/2/1789

EAB EXTENDED GRID.

A° SOIL SAMPLING. 15-1-'79
BA, Pb, ZN, MN, Cu
MAP NO. Tas/2/1700
Tas/2/1701
Tas/2/1702
Tas/2/1703
Tas/2/1704

AUGER SAMPLING. 3-2-'82
Cu, Pb, ZN, MN, Ba
MAP NO. Tas/2/3129
Tas/2/3130
Tas/2/3131
Tas/2/3132
Tas/2/3133

EAD GRID - (MT. KERSHAW)

Pb, ZN, Cu
MAP NO. EAD; BH1
EAD; BH2
EAD; BH3

Ag, Au, As
MAP NO. EAD, B6

RTAE GRID.

1954 SOIL SAMPLING.

1968 AUGER SAMPLING.

Pb, ZN, Cu
MAP NO. Tas/2/1333

EAF GRID.

AUGER SAMPLING
Cu, Pb, Zn, Au
MAP NO. Tas/2/4062
Tas/2/4063

1969 COSTEAN SAMPLING.

Pb, Zn, Cu

EAA NEW GRID.

Lease boundary
Watercourse
Road
CP 9 Drill hole

8978

MAP NO. Tas/2/1333
COMSTAFF NUMBER. 551262

5cm

89-3059

NORTH

PLATE 12

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT : BURN'S PEAK E.L. 44/88, TAS.

SHEET 1

GEOCHEMICAL COMPILATION

GRID LOCATIONS

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.F.	Date: 20/9/89.	Checked:

8979

EAD GRID (Mt. KERSHAW)

EAB EXTENDED GRID

CAMPCHARLIE

EAD GRID

Chester Dam

Power lines

LAKE ROSEBERY

LAKE ROSEBERY

EAD GRID

EAD GRID

A° Soil Sampling.
Comstaff September, 1977.
Cu, Pb, MA, Ba, Zn.
Map Number; A 1461
A 1462
A 1463
A 1464

EAD GRID (Mt. KERSHAW)

BHP EAD GRID
Soil Augering.
Pb, Zn, Cu.
Map Number; EAD; BH1
EAD; BH2
EAD; BH3

BHP EAD GRID
Soil Augering.
Ag, Au, As.
Map Number; EAD; BH6

EAB EXTENDED GRID

Comstaff
A° Soil Sampling.
BA, Pb, Zn, MN, Cu.
Map Number; Tas/2/1700
Tas/2/1701
Tas/2/1702
Tas/2/1703
Tas/2/1704

Comstaff
Augering Sample.
Cu, Pb, Zn, MN, Ba.
Map Number; Tas/2/3129
Tas/2/3130
Tas/2/3131
Tas/2/3132
Tas/2/3134

CAMPCHARLIE

Power transmission line
Watercourse
Road
Railway
Drill hole
Outcrop
Lease boundary

6979

89-3059

NORTH

PLATE 13

551263

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT: BURN'S PEAK E.L. 44/88, TAS.

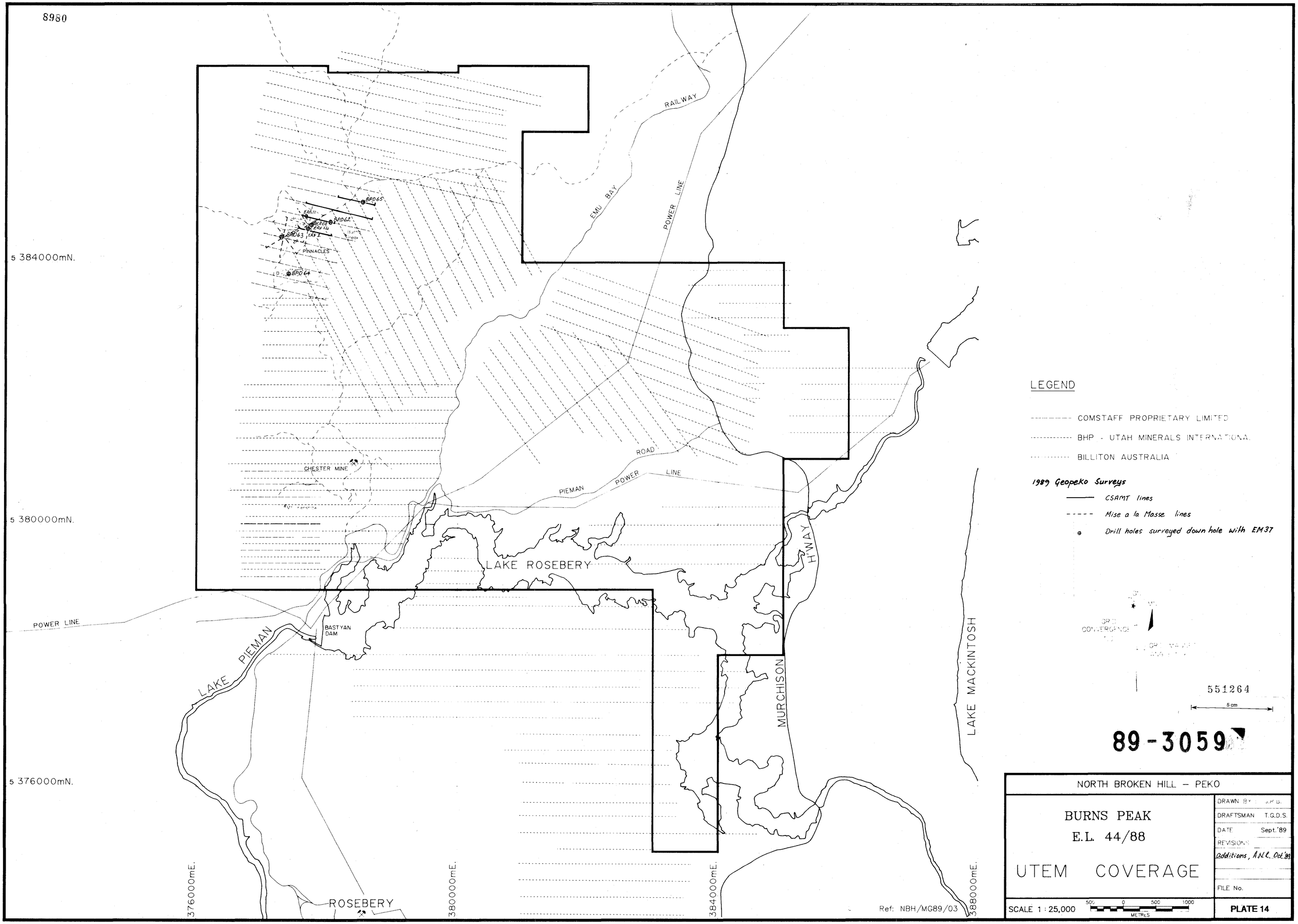
GEOCHEMICAL COMPILATIONS.

GRID LOCATIONS.

5cm

Scale: 1:5000	Survey: A.N.R.	Revised:
Drawn: S.Fenton.	Date: 22-10-'89.	Checked:

8980



LEGEND

- COMSTAFF PROPRIETARY LIMITED
- BHP - UTAH MINERALS INTERNATIONAL
- BILLITON AUSTRALIA

1989 Geopeko Surveys

- *CSAMT lines*
- *Mise a la Masse lines*
- *Drill holes surveyed down hole with EM37*

GRID CONVERGENCE

551264

5 cm

89-3059

NORTH BROKEN HILL – PEKO

BURNS PEAK
E.L. 44/88

UTEM COVERAGE

DRAWN BY J.M.B.
DRAFTSMAN T.G.D.S.
DATE Sept.'89
REVISIONS
Additions, A.N.C. Oct'89
FILE No.

SCALE 1 : 25,000 500 0 500 1000 METRES

PLATE 14

8981

84203·0N
77317·5E (AMG)

84713·5N
77777·5E (AMG)

600mRL

500mRL

400mRL

300mRL

200mRL

100mRL

14·33 % Zn
8·3 % Pb
0·4 % Cu
46·2 g/t Au

0·6 % Zn
0·2 % Pb
0·2 % Cu
5·71g/t Au

McGUINES'S SHAFT

Samples from spoils heaps(projected from 14mW)

PP46 (projected from 14mW) [4m@ 7·1 % Zn
1·9 % Pb
0·74 % Cu
0·9g/t Au

EAF 15
15m @ 3·1 % Zn
0·15 % Pb
0·01 % Cu
0·02 g/t Au

EAF 16
[2·2m @ 7·9% Zn
0·72%Pb
0·18%Cu
0·28g/tAu

THOMAS' TUNNEL
6·7 m @ 1·8 % Zn
5·0 % Pb
0·04% Cu
0·1 g/t Au

Rock Chip Sample
1m @ 0·06% Zn
0·03% Pb
0·06% Cu
5·07g/t Au

Rock Chip Sample
1m @ 19·44 % Zn
5·17 % Pb
0·78 % Cu
2·99 g/t Au

EAF 5

BROWN'S TUNNEL
8m @ 0·24% Zn
0·44% Pb
0·05 % Cu
2·7 g/t Au

EAF 3
1·2m @ 26·6 % Zn
15·9 % Pb
2·5 % Cu
1·52g/t Au

EAF 4
a) 2m @ 3·10% Zn
1·68% Pb
0·50% Cu
6·5 g/t Au
b) 0·8m @ 25·8 % Zn
9·4 % Pb
0·67% Cu

EAF 2

EAF 1

EAF 6
[5·5m @ 9·9 % Zn
2·8 % Pb
0·6 % Cu
0·28g/t Au

EAF 8

ESB 1

EAF 10
6m @ 8·6 % Zn
1·4 % Pb
0·9 % Cu
0·6 g/t Au

EAF 10
2m @ 7·3% Zn
0·3% Pb
0·4% Cu
0·14 g/tAu

EAF 9
10·5m @ 9·3 % Zn
3·8 % Pb
0·4 % Cu
2·5 g/t Au

PP51

CP12

CP7

BPD63

PP31
[2m @ 4·5% Zn

PP31
[2·5m @ 3·3% Zn

EAF 11
[3m @ 3·1 % Zn
2·9 % Pb
0·2 % Cu
0·04g/tAu

EAF 12

EAF 13

EAF 14
[1m @ 3·3% Zn
0·46% Pb
0·17% Cu
— Au

551265

BPD 62

5cm

89-3059

NOTE:

All intersections are interpreted true width, projected onto a vertical plane.
Cut offs used:– 3% Zn, 2% Pb, 5% Cu, 5g/t Au.

SCALE 1:1000 metres.

GEOPEKO
A DIVISION OF PEKO WALLSEND OPERATIONS LTD

PLATE 15 | No

THOMAS'S TUNNEL – BROWN'S TUNNEL.

LONG SECTION THROUGH 84203·0N, 77317·5E and 84713·5N, 77777·5E. (AMG). FACING WEST.

Date: November,'89.
Geologist: A.N.R.
Checked: ——
Drawn: ——
Amendments:
Map Ref:
Base: ROSEBERY, TASMANIA.

8982

ST2
20 0
I PP40
10 0
PP39
4 3
S1h Cut
0 63
400m A.S.L.(approx)

I EAF 18
26 6
I PP41
1 5
I CP13
0 10
I PP34
1 2
I PIN 1
x
I PP36
x
I CP 9
0·13
I EAF 17
x
I CP10
0 1
I PIN 2
x

383 600N
383 700N
383 800N
BPD 64
383 900N
384 000N(AMG)

5 cm

551266

PLATE 15a

LEGEND

PP41	Hole name
Trench	True thickness of intersection
DDH	
4 3	Au in g/t
x	Nil Au

NORTH BROKEN HILL PEKO LIMITED
MINERAL RESOURCES DIVISION

PROJECT: BURNS PEAK E.L. 44/88 Tasmania

LONG SECTION THROUGH SOUTHERN TRENCHES

LOOKING WEST

DRILLING INTERSECTIONS ARE PROJECTED ONTO CHERT HORIZON
(AVERAGE DIP 60°)

SCALE: 1:1000	SURVEY:	REVISED:
DRAWN: D. Williams	DATE: 3-10-89	CHECKED:

8983

(approx) 5000E

500mRL

400mRL

300mRL

200mRL

100mRL

EOH 114.9

5 cm

551267

89-3059

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

PARKES

Geo	EL44/88 BURNS PEAK
Drawn	GOLD/COPPER
Checked	3720N
Date 4-OCT-89	All values in ppm — Dwg No. **PLATE 16**

SURPAC - SURPAC MINING SYSTEMS PERTH WA (09) 4784411

8984

(approx) 5000E

500mRL

400mRL

300mRL

200mRL

100mRL

CP2

114.8

5 cm

551268

89-3059

PARKES

GEOPEKO

A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo

Drawn

Checked

Date 4-OCT-89

EL44/88 BURNS PEAK
LEAD/ZINC
3720N

All values in ppm

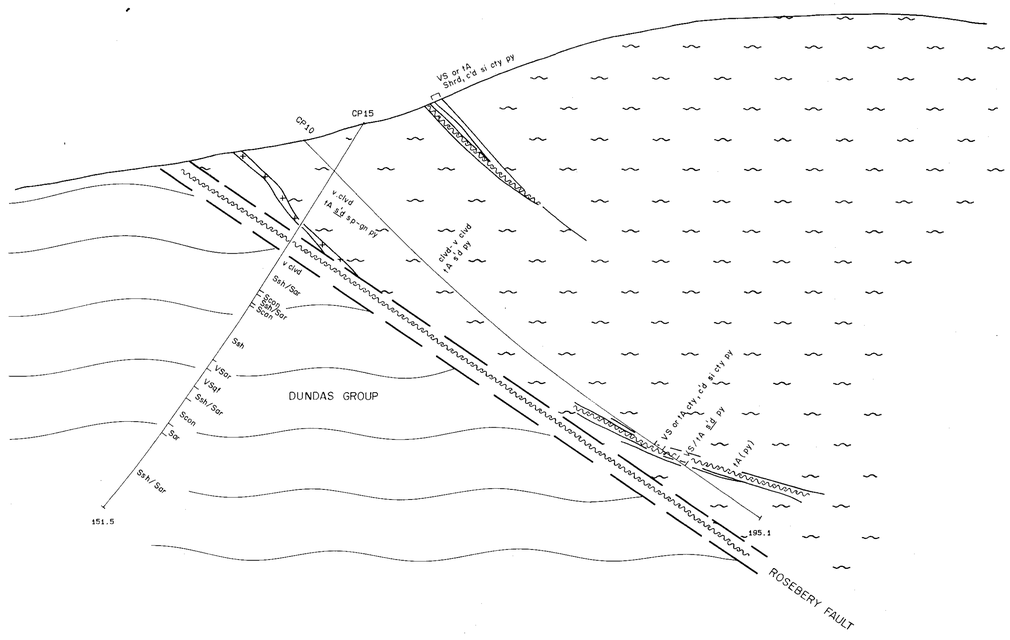
Dwg No. **PLATE 17**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8985

100E | 0E | 100E | 200E | 300E | 400E | 500E | 600E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



551269

- Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones
- Predominatly Shale
- Very Coarse Epiclastics (Sedimentary Breccia)
- Lava Breccia
- Predominantly Sandstone
- Acid,Pumiceous Tuffs
- Andesite Lava
- Rhyolite Lava
- Quartz Feldspar Porphyry

5cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	HOLE TRACE
Checked	4200N
Date 28-SEP-89	Dwg No. **PLATE 18**

8986

(approx) 5000E

500mRL

400mRL

300mRL

200mRL

100mRL

CP10

CP15

EOH 151.5

151.5

EOH 195.1

89-3059

551270

5 cm

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.	
	Scale 1: 1000	
Geo	EL44/88 BURNS PEAK GOLD/COPPER 4200N	
Drawn		
Checked		
Date 4-OCT-89	All values in ppm	Dwg No. PLATE 19

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8987

(approx) 5000E

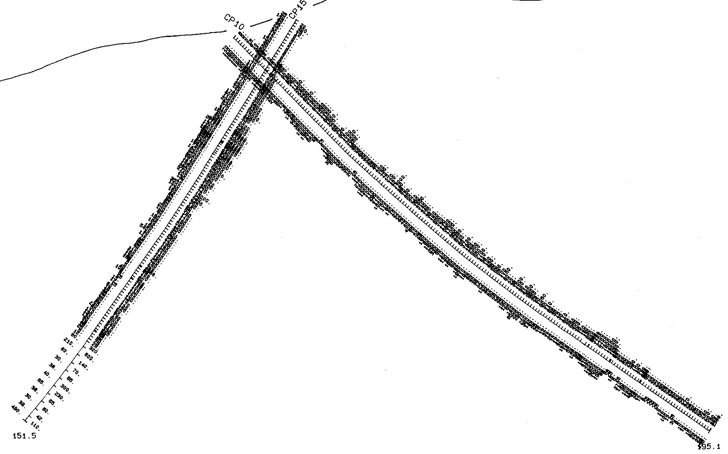
500mRL

400mRL

300mRL

200mRL

100mRL



551271

89-3059

5 cm

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

PARKES

Scale 1: 1000

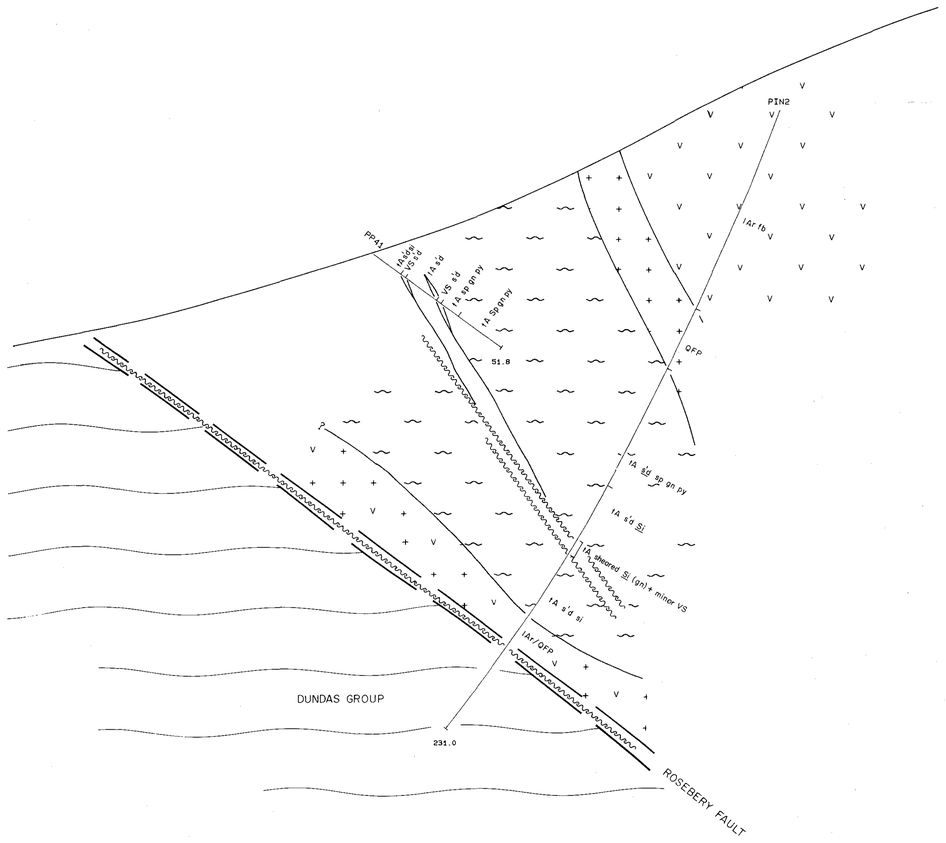
Geo	EL44/88 BURNS PEAK
Drawn	LEAD/ZINC
Checked	4200N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 20

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8883

100E 0E 100E 200E 300E 400E 500E 600E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



551272

- Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones
- Predominatly Shale
- Very Coarse Epiclastics (Sedimentary Breccia)
- Lava Breccia
- Predominantly Sandstone
- Acid,Pumiceous Tuffs
- Andesite Lava
- Rhyolite Lava
- Quartz Feldspar Porphyry

89-3059

5cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

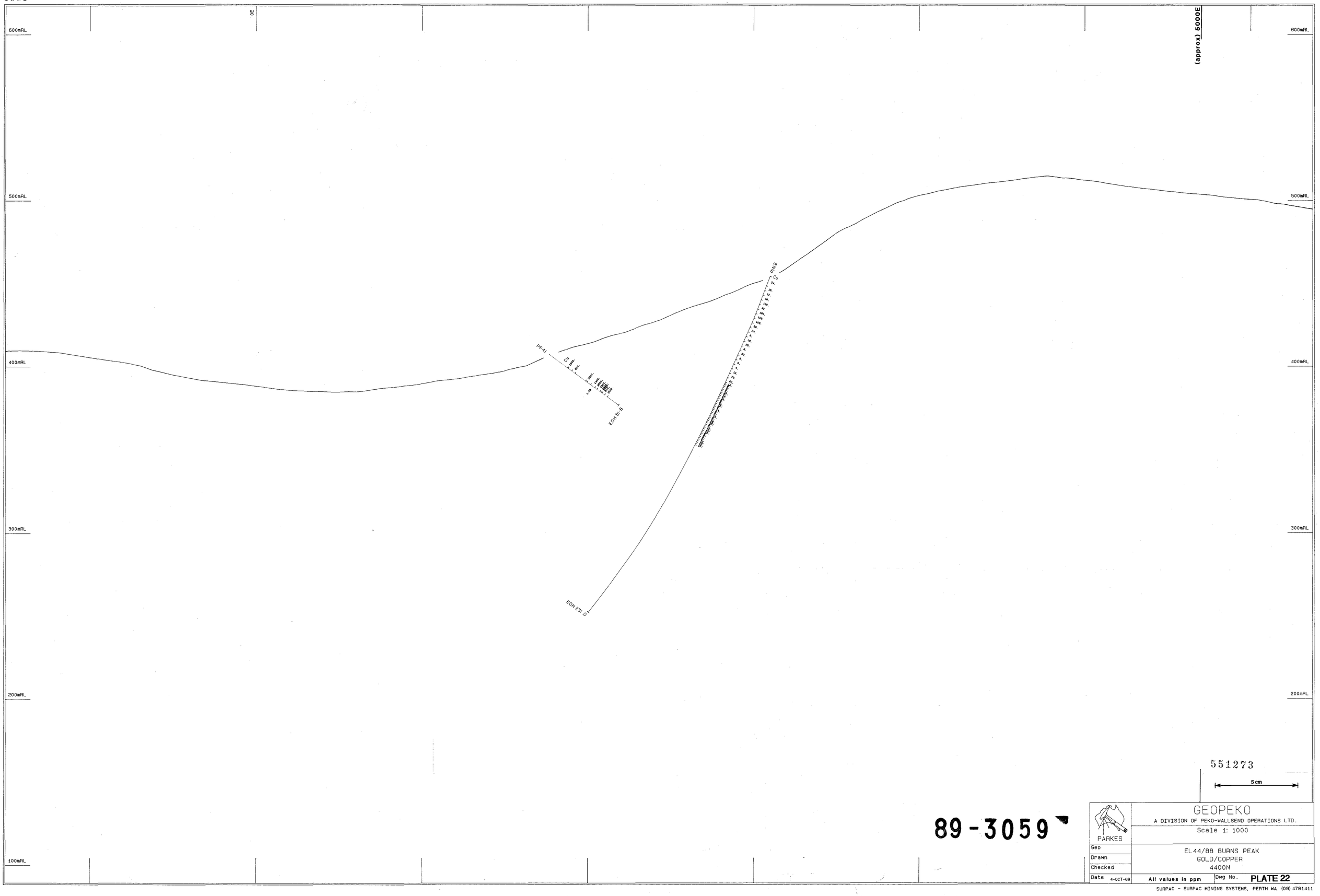
Scale 1: 1000

Geo
Drawn
Checked
Date 28-SEP-89

EL44/88 BURNS PEAK
HOLE TRACE
4400N

Dwg No. PLATE 21

8989



551273

5 cm

89-3059

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	GOLD/COPPER
Checked	4400N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 22

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8990

600mRL

500mRL

400mRL

300mRL

200mRL

100mRL

(approx) 5000E

89-3059

5 cm

551274

PARKES

GEOPEKO

A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

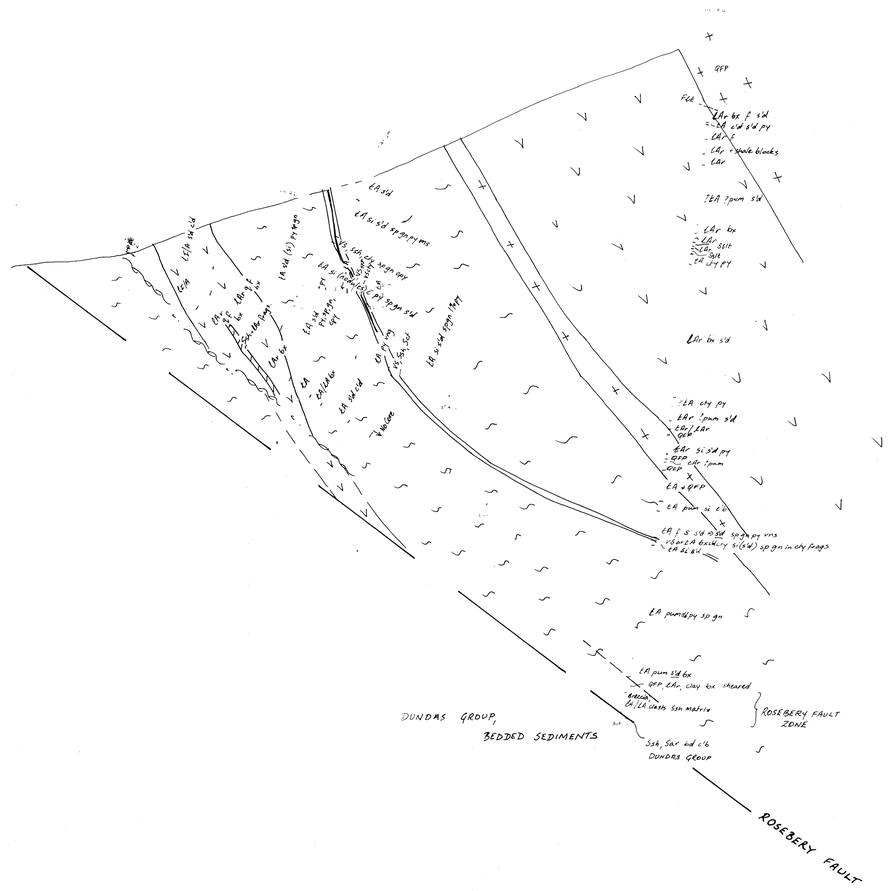
Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	LEAD/ZINC
Checked	4400N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 23

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8991

PRELIMINARY DRAFT ONLY



8991

Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones
Predominatly Shale
Very Coarse Epiclastics (Sedimentary Breccia)
Lava Breccia
Predominantly Sandstone
Acid,Pumiceous Tuffs
Andesite Lava
Rhyolite Lava
Quartz Feldspar Porphyry

5cm

551275

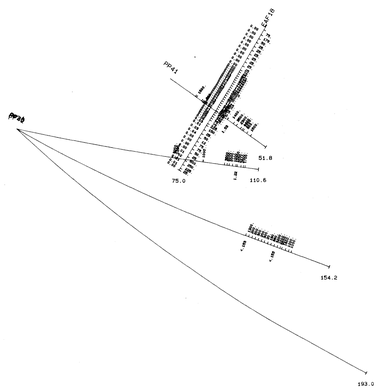
89-3059

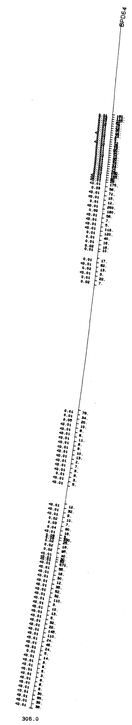
A DIVISION OF PEKO MALLENEE OPERATIONS LTD.
SCALE 1: 1000
FAHEY
FLAGTHEAD HAND PEAK
MOLE THALE
4480N
Drawn
Checked
Date 26-OCT-89
Dwg NO. PLATE 24
DIMPAL - DIMPAC MINING SYSTEMS, PERTH WA (09) 4781411

8992

10SE 0E 10OE 20OE 30OE 40OE 50OE 60OE 70OE 80OE 90OE

700mRL
600mRL
500mRL
400mRL
300mRL
200mRL
100mRL
0mRL





8992

551276

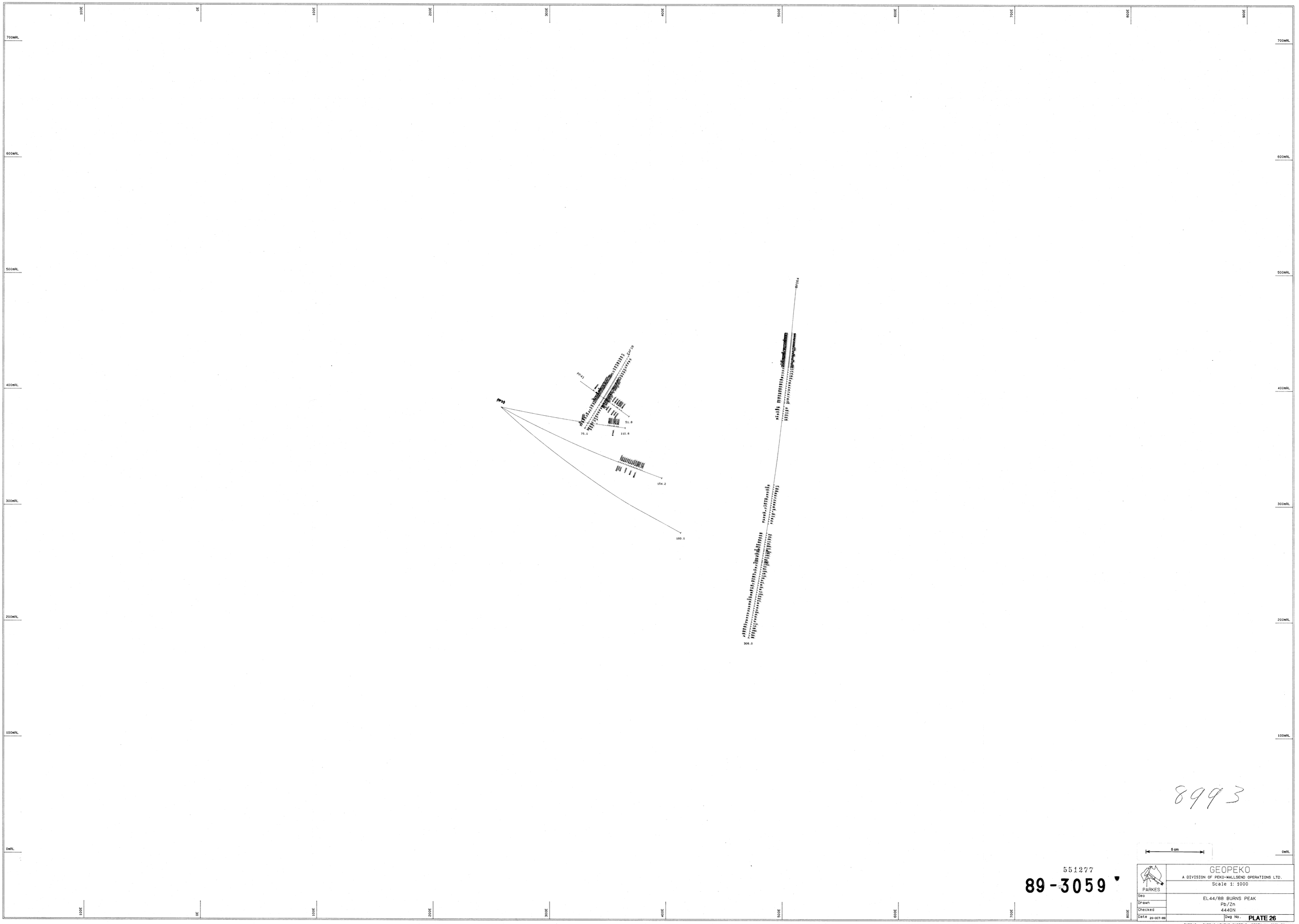
5 cm

89-3059

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
Geo	Scale 1: 1000
Drawn	EL44/88 BURNS PEAK Au/Cu
Checked	4440N
Date 20-OCT-89	Dwg No. **PLATE 25**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8993



8993

551277

89-3059

6 cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

EL44/88 BURNS PEAK
Pb/Zn
4440N

Geo
Drawn
Checked
Date 20-OCT-89

Dwg No. **PLATE 26**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8994

0E

(approx) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

PP39

EOH 45.7

551278

5 cm

89-3059

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK
Drawn	GOLD/COPPER
Checked	4480N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 27

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8995

(approx) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

PP39

45.7

551279

5 cm

89-3059

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK LEAD/ZINC 4480N
Drawn	
Checked	
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 28

8996

600mRL

500mRL

400mRL

300mRL

200mRL

100mRL

(approx) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

PIN 1

EDH 179.0

5 cm

551280

89-3059

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

PARKES

Scale 1: 1000

EL44/88 BURNS PEAK
GOLD/COPPER
4520N

Geo			
Drawn			
Checked			
Date	4-OCT-89	All values in ppm	Dwg No. PLATE 29

8997

89-3059

5cm

551281

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

EL44/88 BURNS PEAK
LEAD/ZINC
4520N

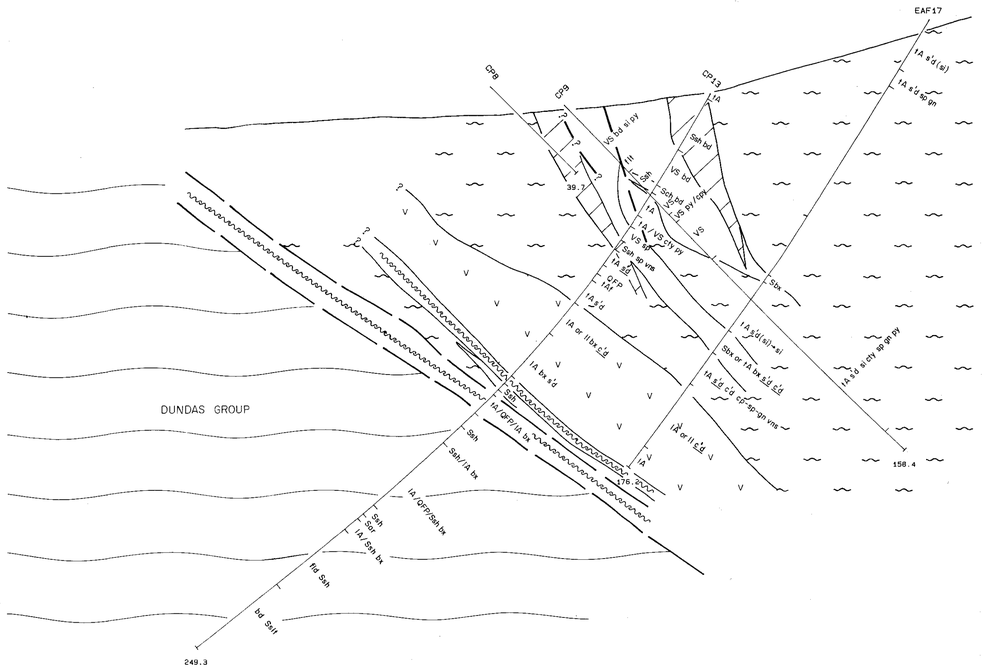
Geo	
Drawn	
Checked	
Date 4-OCT-89	All values in ppm

Dwg No. **PLATE 30**

8998

200E 100E 0E 100E 200E 300E 400E 500E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones

Predominatly Shale

Very Coarse Epiclastics (Sedimentary Breccia)

Lava Breccia

Predominantly Sandstone

Acid,Pumiceous Tuffs

Andesite Lava

Rhyolite Lava

Quartz Feldspar Porphyry

5 cm

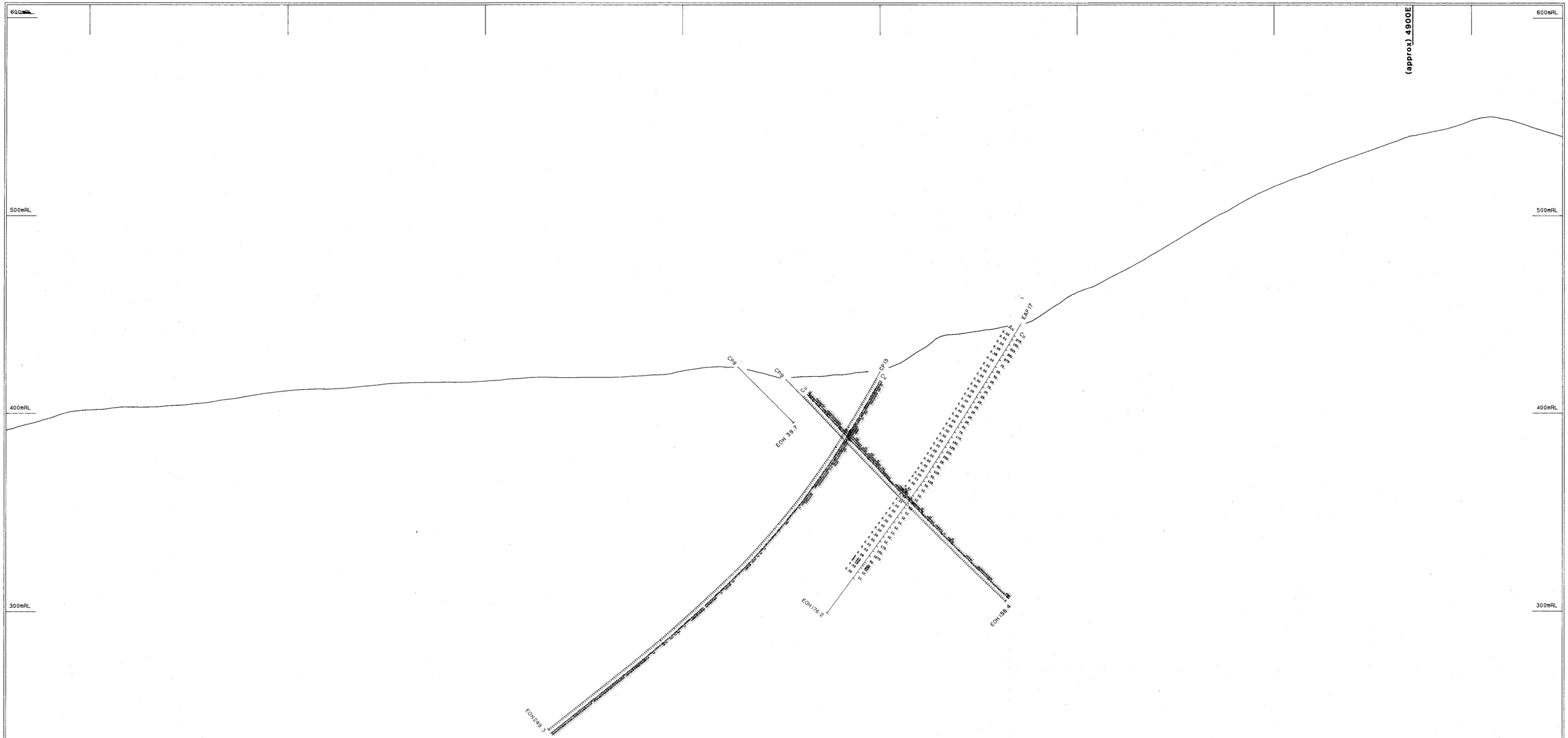
551282

89-3059

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK
Drawn	HOLE TRACE
Checked	4600N
Date 28-SEP-89	Dwg No. **PLATE 31**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

8999



551283

5 cm

89-3059

PARKES

GEOPEKO

A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

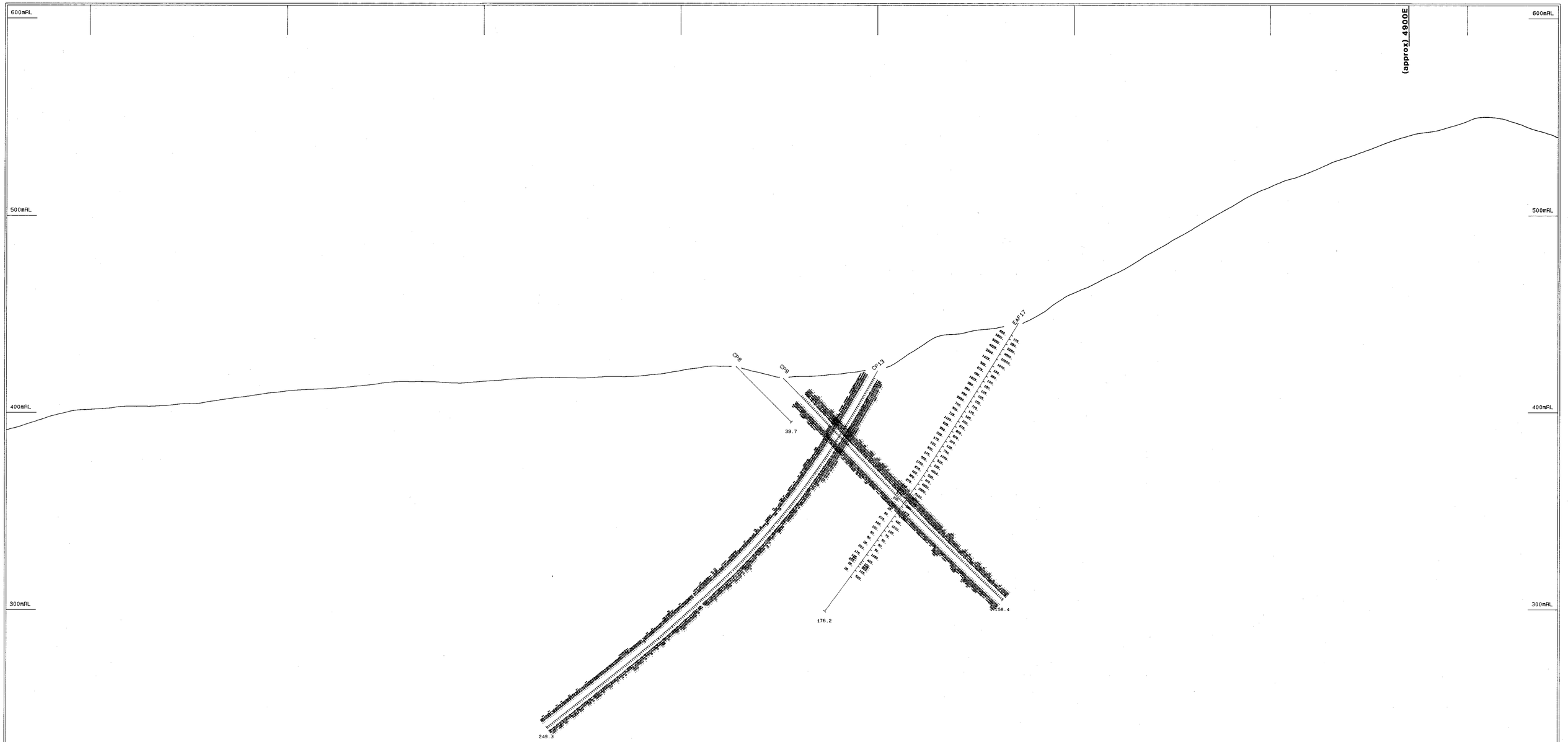
Scale 1: 1000

EL44/88 BURNS PEAK
GOLD/COPPER
4600N

Geo			
Drawn			
Checked			
Date	4-OCT-89	All values in ppm	Dwg No. PLATE 32

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9000



551284

5 cm

89-3059

PARKES

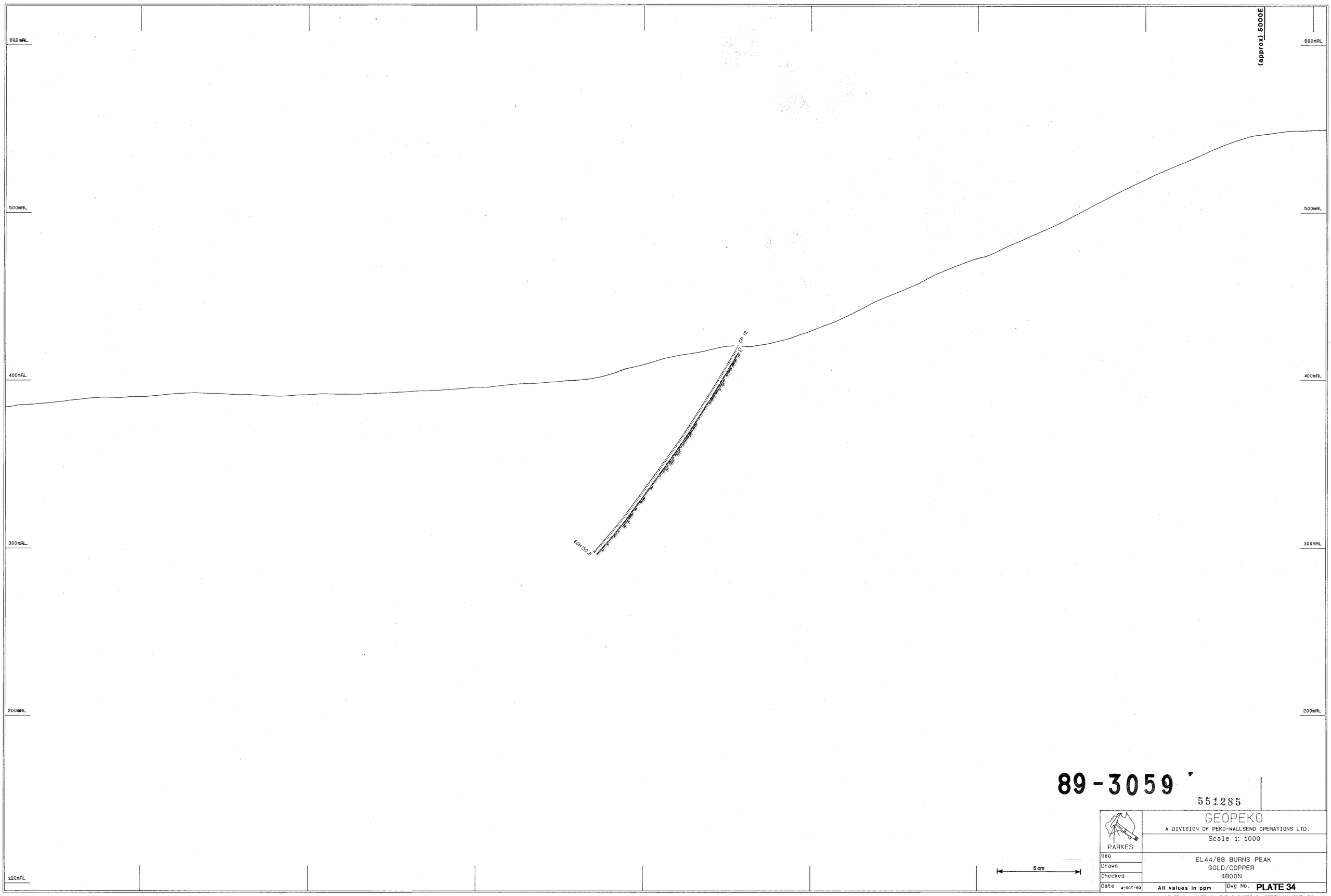
GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	LEAD/ZINC
Checked	4600N
Date 4-OCT-89	All values in ppm — Dwg No. **PLATE 33**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9001



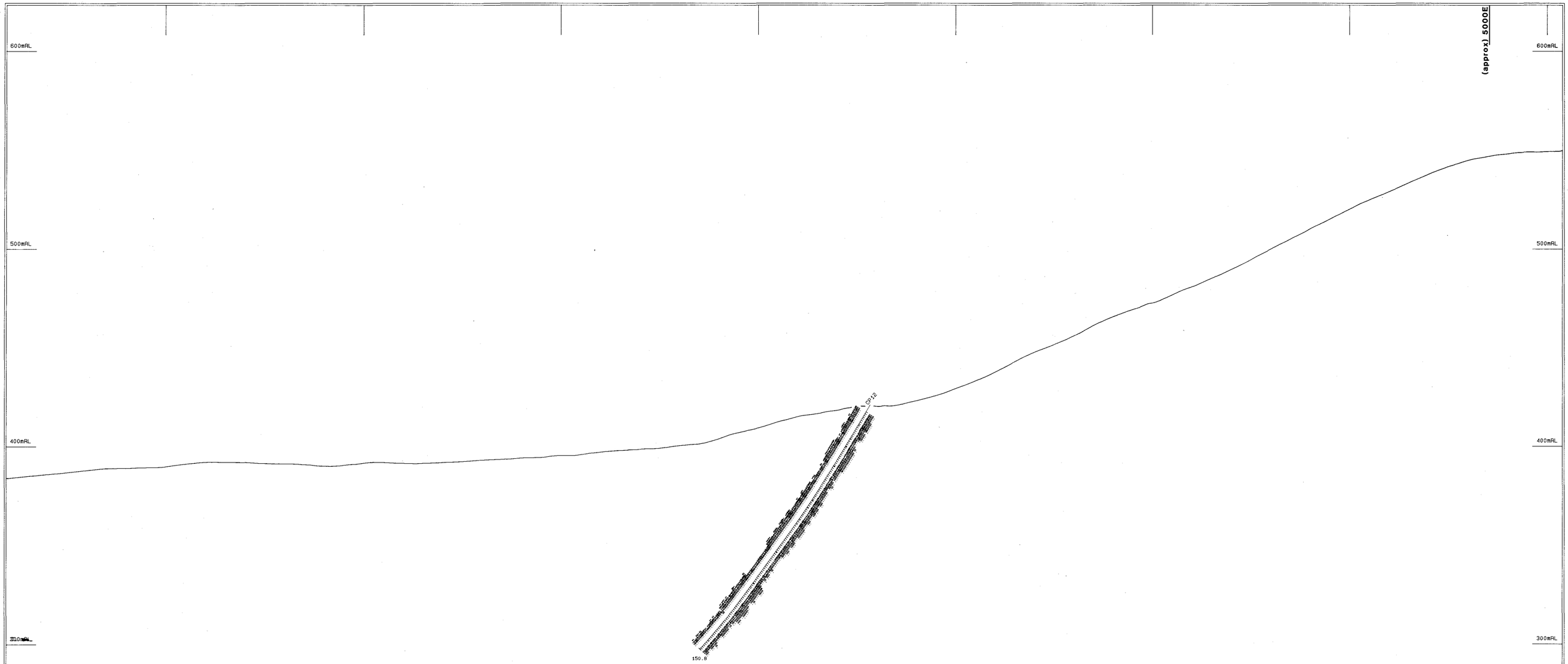
89-3059

551285

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK
Drawn	GOLD/COPPER
Checked	4800N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 34

5cm

9002



551286

5 cm

89-3059

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

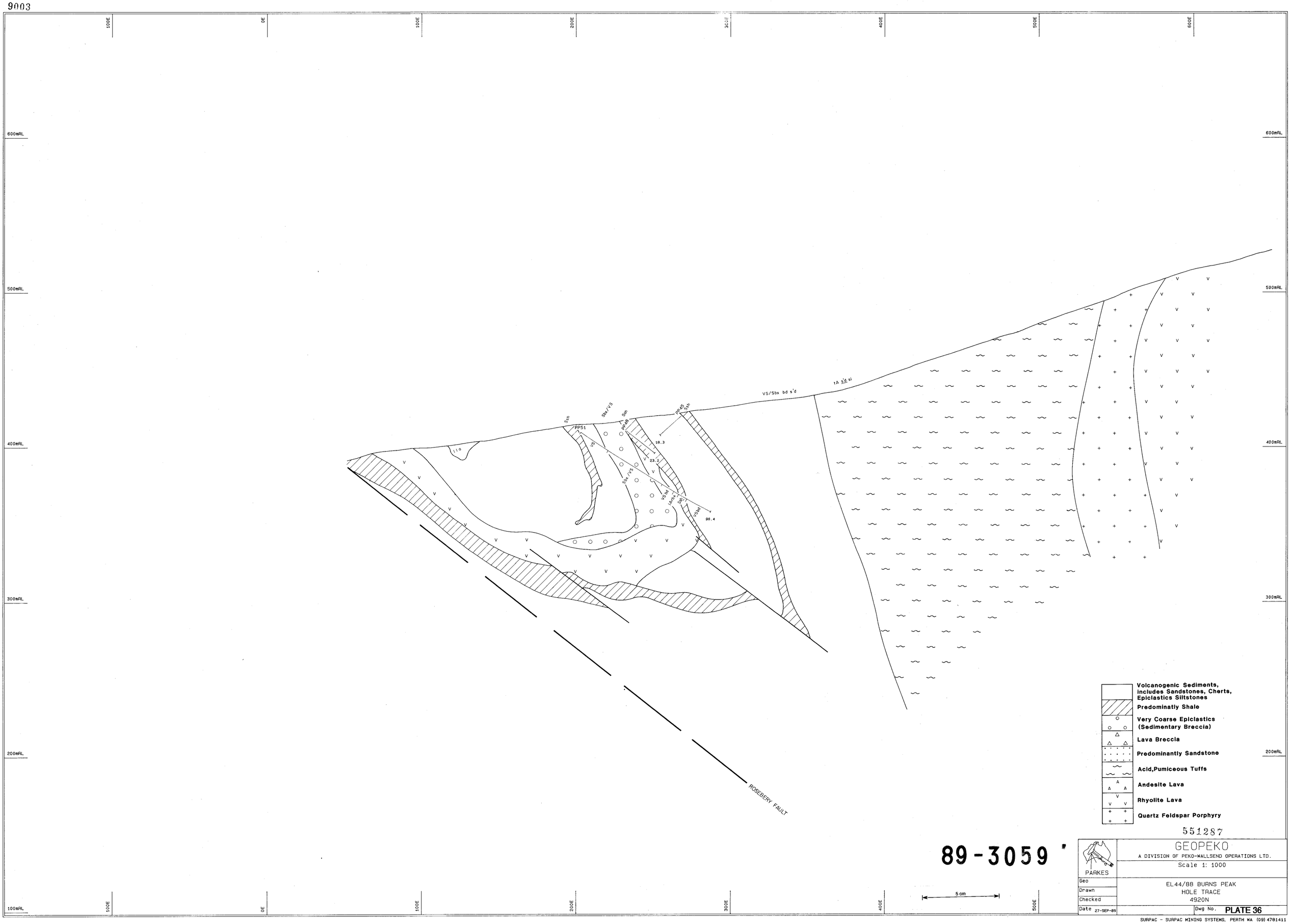
Scale 1: 1000

EL44/88 BURNS PEAK
LEAD/ZINC
4800N

Geo	
Drawn	
Checked	
Date 4-OCT-89	All values in ppm
Dwg No.	PLATE 35

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9003



551287

89-3059

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
Scale 1: 1000

PARKES

Geo	
Drawn	
Checked	
Date	27-SEP-89

EL44/88 BURNS PEAK
HOLE TRACE
4920N

Dwg No. **PLATE 36**

9004

(approx) 5000E

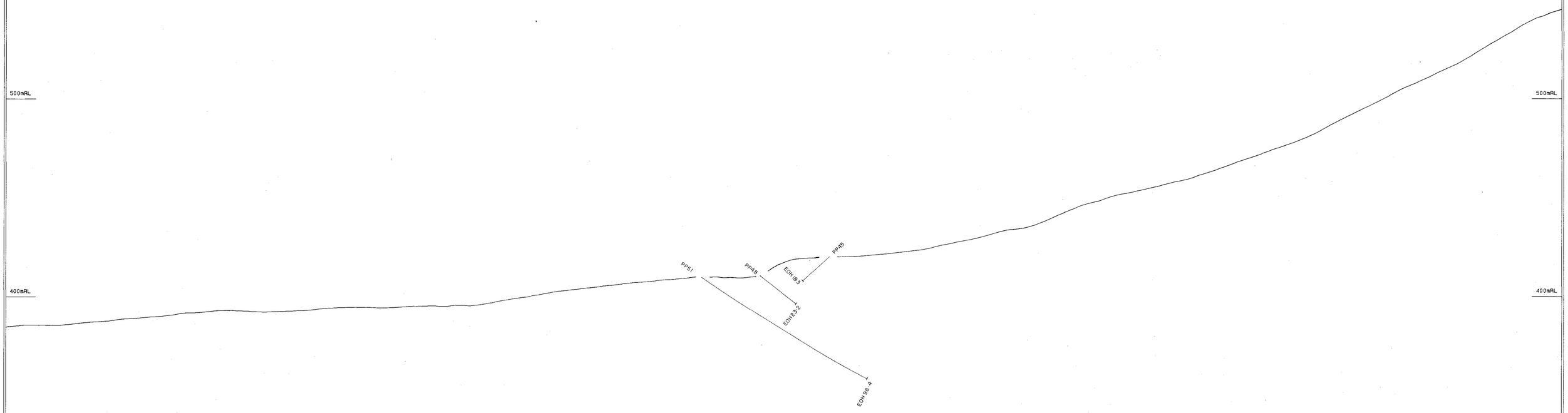
600mRL

500mRL

400mRL

300mRL

200mRL



89-3059

5cm

551288

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

PARKES

Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	GOLD/COPPER
Checked	4920N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 37

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9005

(approx.) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

PP51

PP48

PP45

18.3

23.2

98.4

89-3059

5cm

551289

PARKES

GEOPEKO

A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo

Drawn

Checked

Date 4-OCT-89

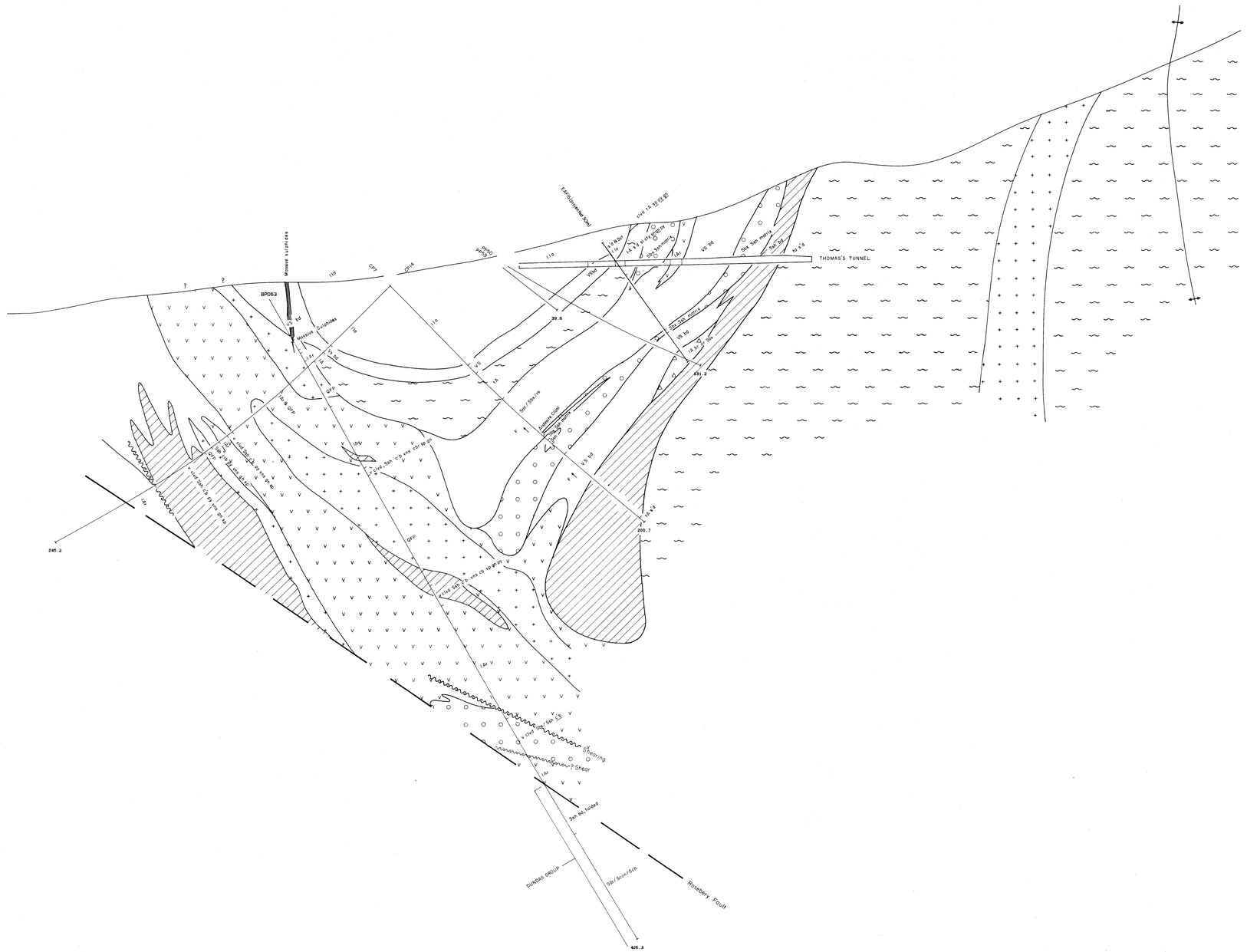
EL44/88 BURNS PEAK
LEAD/ZINC
4920N

All values in ppm

Dwg No. **PLATE 38**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9006



- Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones
- Predominatly Shale
- Very Coarse Epiclastics (Sedimentary Breccia)
- Lava Breccia
- Predominantly Sandstone
- Acid,Pumiceous Tuffs
- Andesite Lava
- Rhyolite Lava
- Quartz Feldspar Porphyry

5cm

551290 9006

89-3059

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

EL44/88 BURNS PEAK
HOLE TRACE
5000N

Geo
Drawn
Checked
Date 27-SEP-89

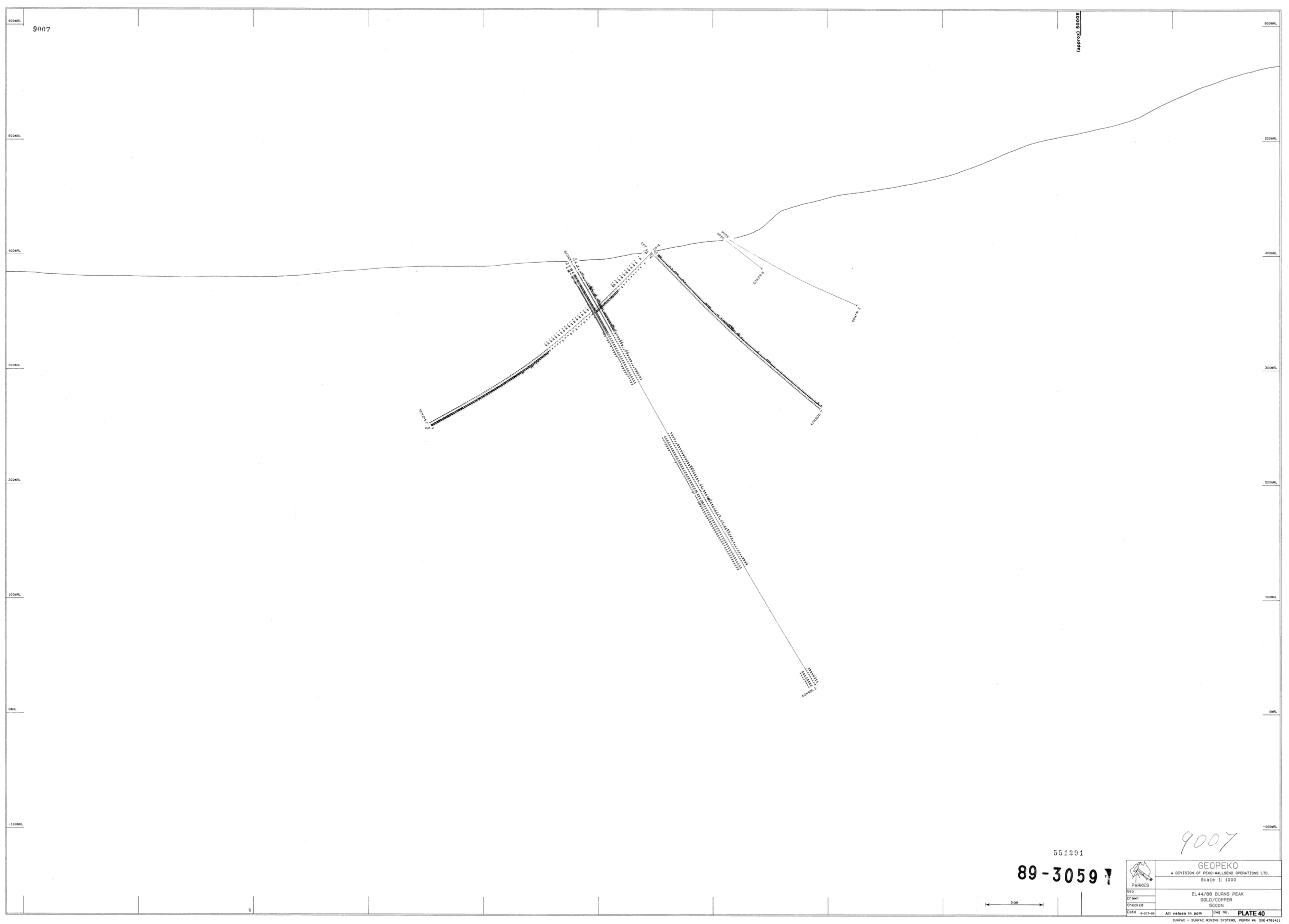
Dwg No. PLATE 39

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9007

5005E (grade)

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL
0mRL
-100mRL



551291

89-3059

9007

5cm

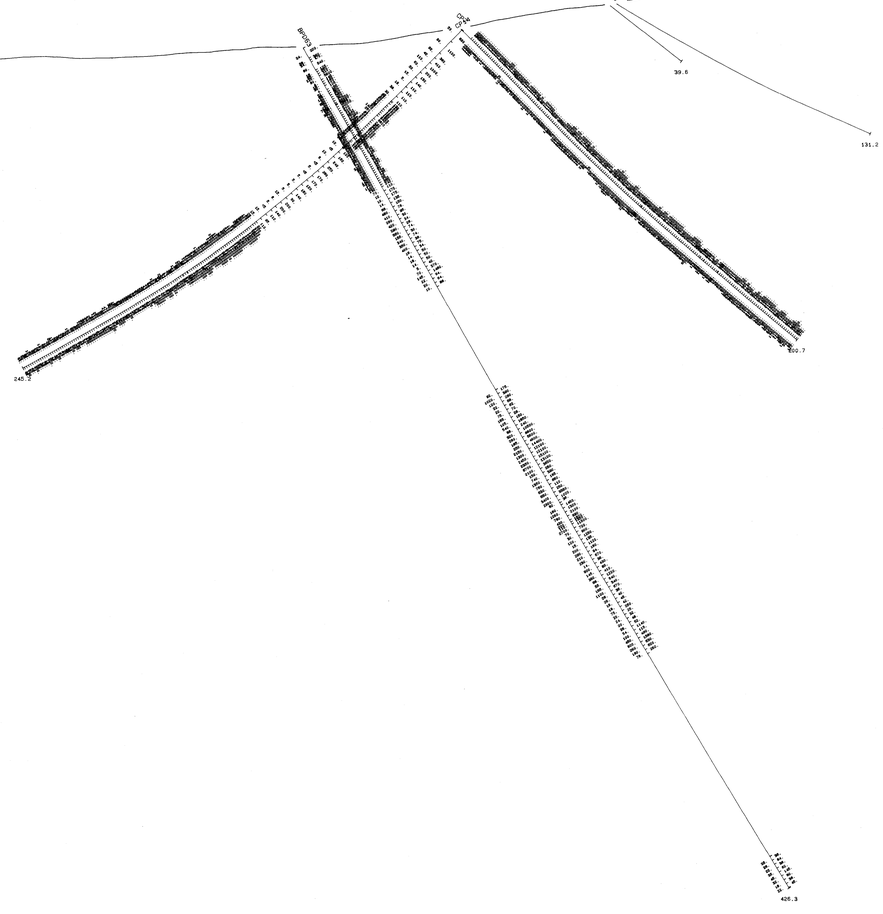
PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK
Drawn	GOLD/COPPER
Checked	5000N
Date 6-OCT-89	All values in ppm Dwg No. PLATE 40

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9008

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL
0mRL
-100mRL

5000E (approx)



5cm

551292

89-3059

9008

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	LEAD/ZINC
Checked	5000N
Date 6-OCT-89	All values in ppm — Dwg No. PLATE 41

9009

(approx) 5000E

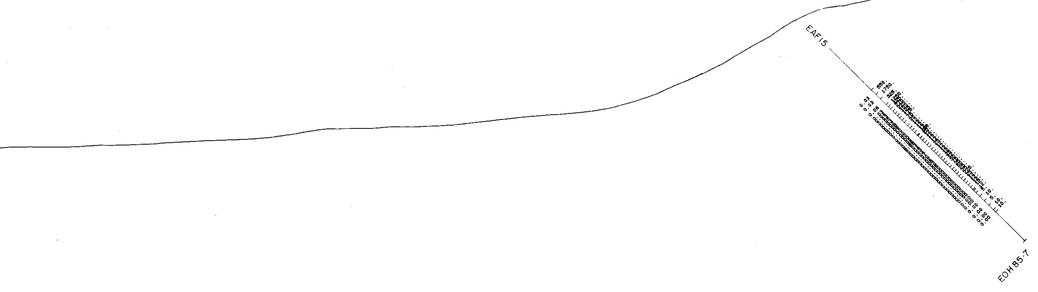
600mRL

500mRL

400mRL

300mRL

200mRL



551293

89-3059

5 cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

EL44/88 BURNS PEAK
GOLD/COPPER
5040N

Geo	
Drawn	
Checked	
Date 4-OCT-89	All values in ppm

Dwg No. **PLATE 42**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9010

30

(approx) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

EXP-15

85.7

551294

89-3059

5cm

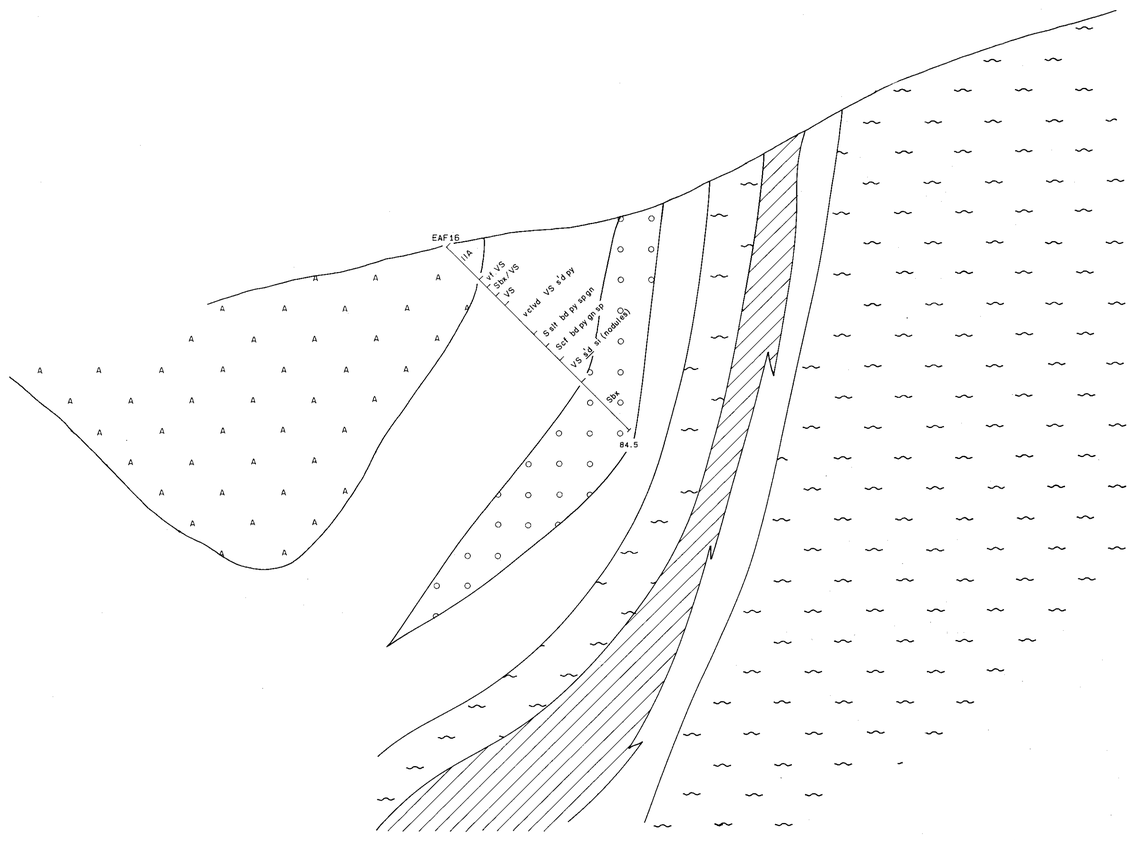
PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK LEAD/ZINC 5040N
Drawn	
Checked	
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 43

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9011

0E 100E 200E 300E 400E 500E 600E 700E

600mRL 500mRL 400mRL 300mRL 200mRL



- Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones
- Predominatly Shale
- Very Coarse Epiclastics (Sedimentary Breccia)
- Lava Breccia
- Predominantly Sandstone
- Acid,Pumiceous Tuffs
- Andesite Lava
- Rhyolite Lava
- Quartz Feldspar Porphyry

5 cm

551295

89-3059

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
Scale 1: 1000

Geo	EL44/88 BURNS PEAK
Drawn	HOLE TRACE
Checked	5080N
Date 27-SEP-89	Dwg No. **PLATE 44**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9012

0E

(approx) 5000E

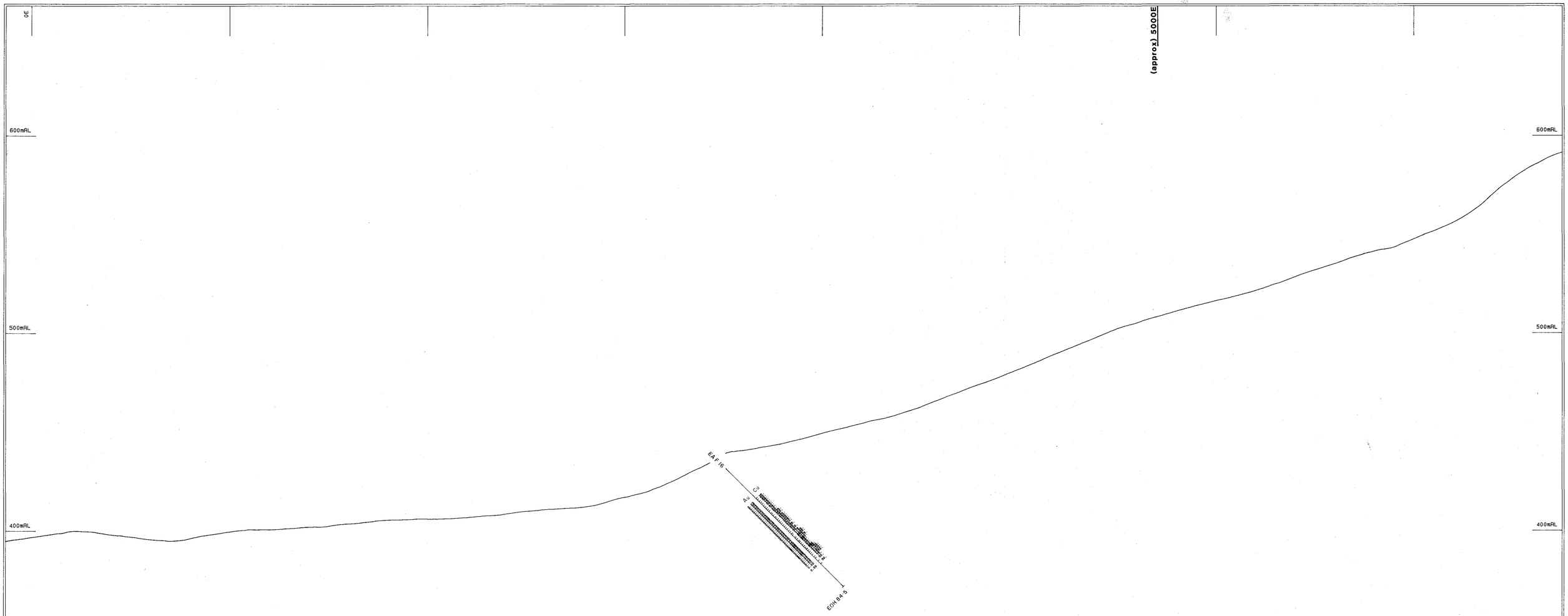
600mRL

500mRL

400mRL

300mRL

200mRL



89-3059

5 cm

551296

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo

Drawn

Checked

Date 4-OCT-89

EL44/88 BURNS PEAK
GOLD/COPPER
5080N

All values in ppm

Dwg No. **PLATE 45**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9013

30E

(approx) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

EAF16

84.5

551297

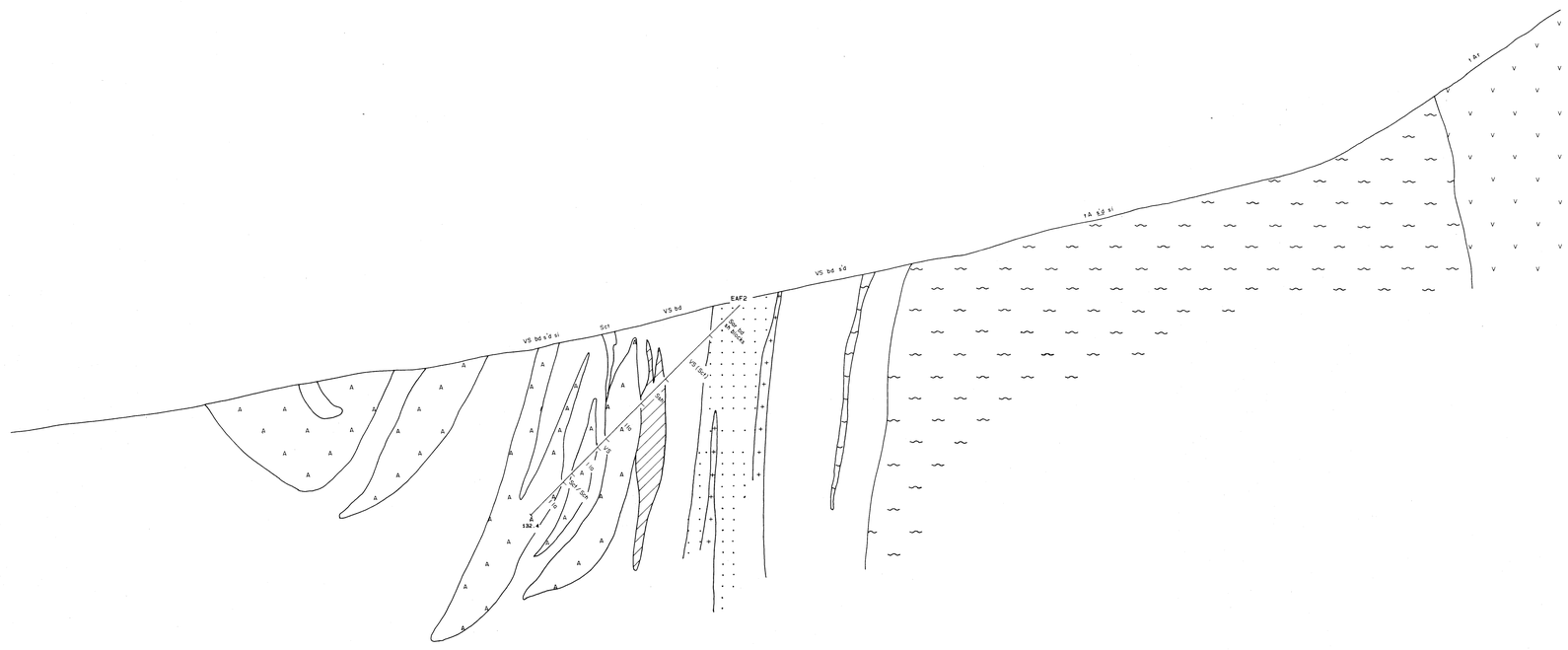
89-3059

5cm

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK LEAD/ZINC 5080N
Drawn	
Checked	
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 46

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9014


1A1
1A 5.0 sl
VS bd x 0
EAF2
VS bd
VS bd x 0 sl
Sct
VS bd x 0 sl
VS (Sct)
Sct
Sct
Sct

9015

800mRL
700mRL
600mRL
500mRL
400mRL
300mRL
200mRL
100mRL

5000E (approx)

EAP2

EOH 130.4 m

9015

551299

89-3059

5cm

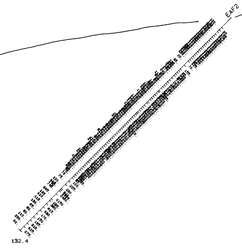
PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.	
	Scale 1: 1000	
Geo	EL44/88 BURNS PEAK GOLD/COPPER S200N	
Drawn		
Checked		
Date 4-OCT-89	All values in ppm	Dwg No. PLATE 48

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9016

(approx) 5000E

800mRL
700mRL
600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



9016

551300

89-3059

5cm

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

PARKES

Geo	EL44/88 BURNS PEAK
Drawn	LEAD/ZINC
Checked	5200N
Date 4-OCT-89	All values in ppm

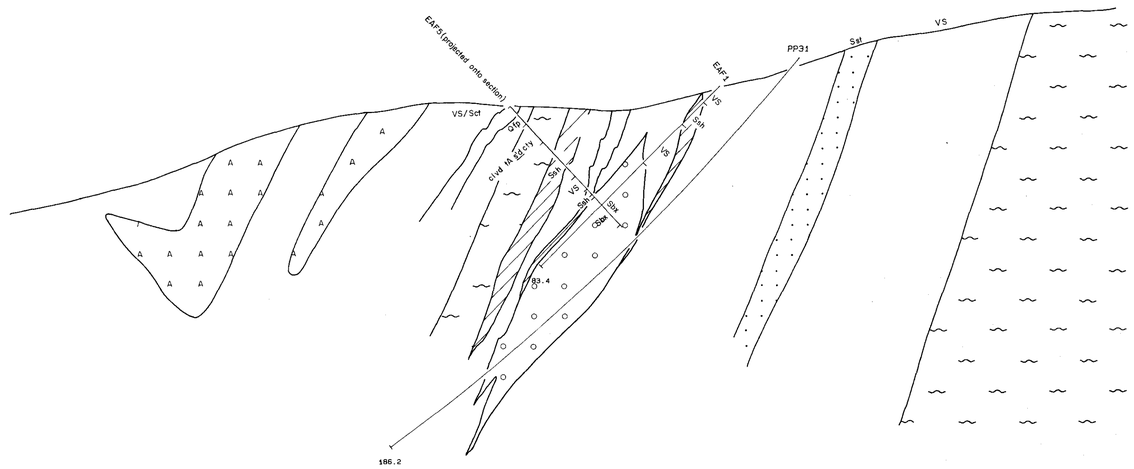
Dwg No. **PLATE 49**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9A17

100E 200E 300E 400E 500E 600E 700E 800E

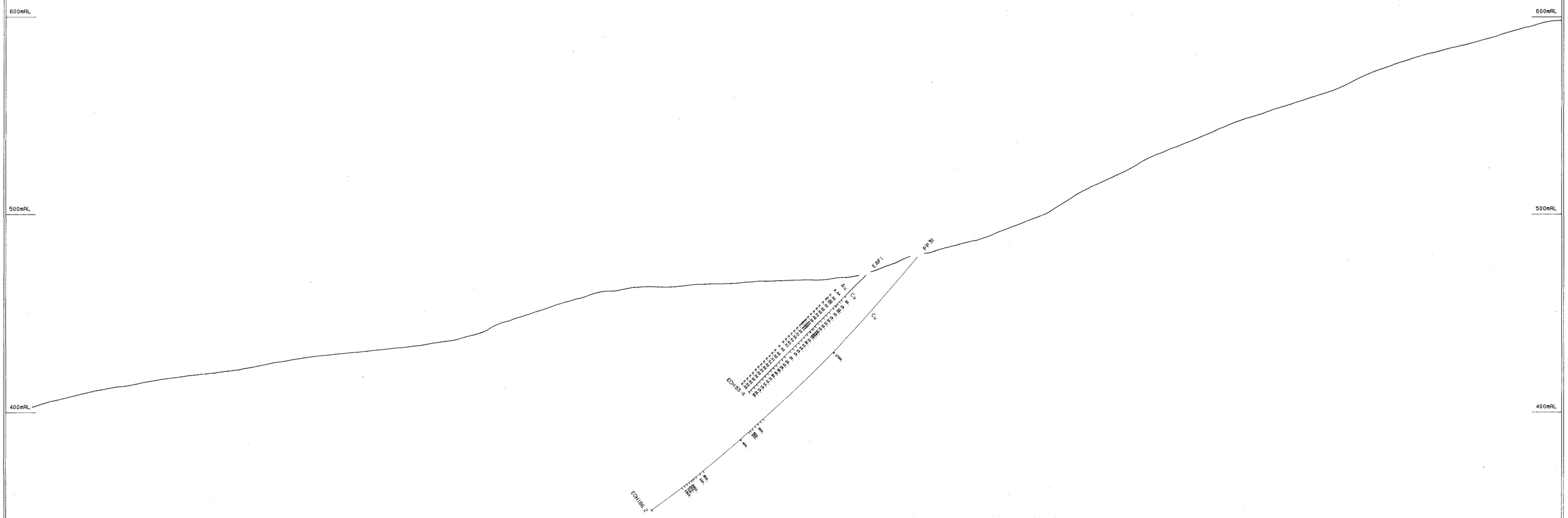
700mRL
600mRL
500mRL
400mRL
300mRL
200mRL


EAF5 (projected onto section)
VS/Sst
Qtz
Qtz
Sst
VS
Sst
Sst
Qtz
Sst
Qtz
Sst
Sst
Qtz
Sst
Sst
Qtz
Sst

9018

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL



551302

89-3059

5 cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo	
Drawn	
Checked	
Date 4-OCT-89	All values in ppm

EL44/88 BURNS PEAK
GOLD/COPPER
5240N

Dwg No. **PLATE 51**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9019

100E

(approx) 5000E

600mRL

500mRL

400mRL

300mRL

200mRL

E4F1

FP31

83.4

186.2

551303

89-3059

5cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

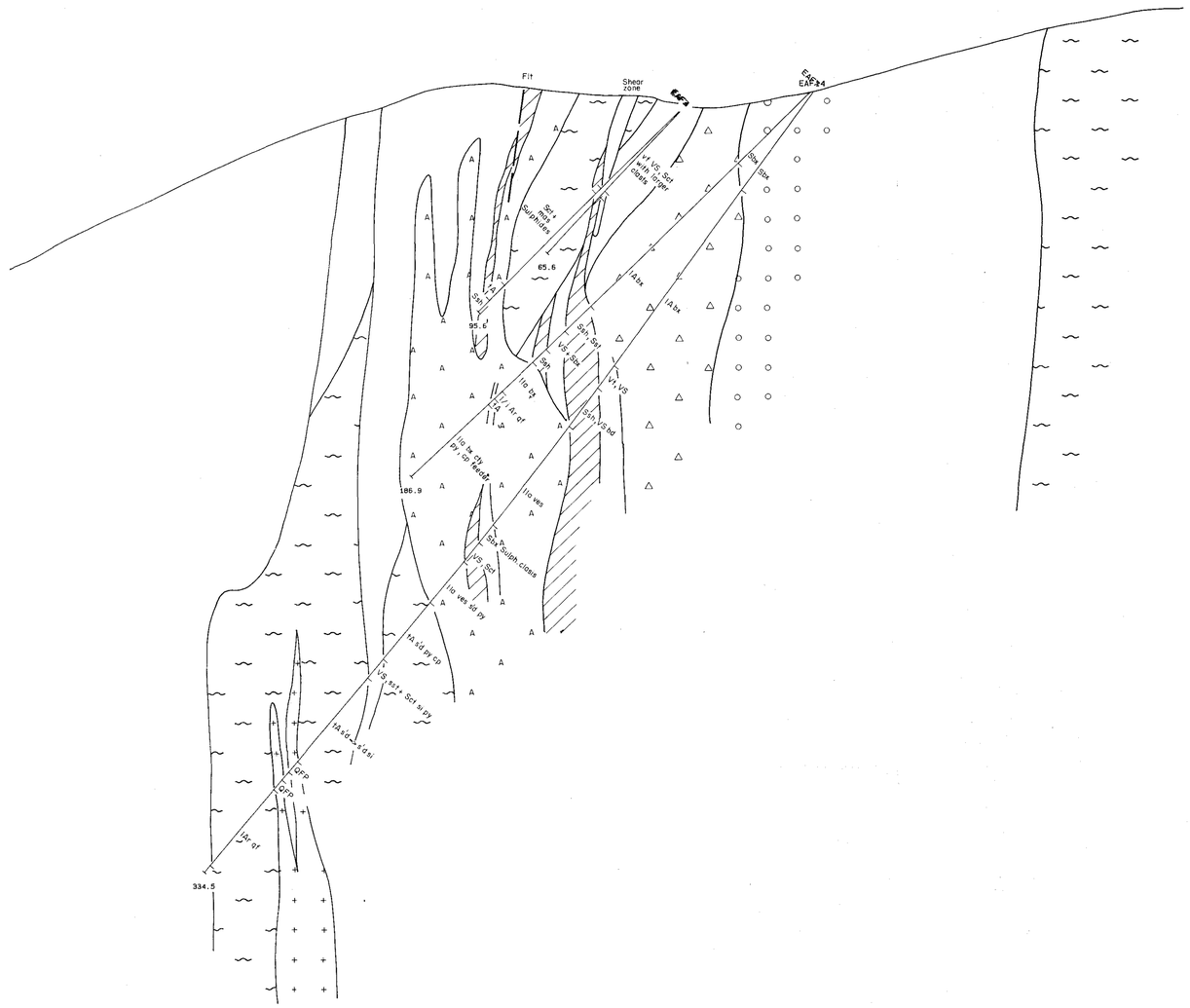
Geo	EL44/88 BURNS PEAK
Drawn	LEAD/ZINC
Checked	5240N
Date 4-OCT-89	All values in ppm — Dwg No. PLATE 52

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

0206

100E 200E 300E 400E 500E 600E 700E 800E

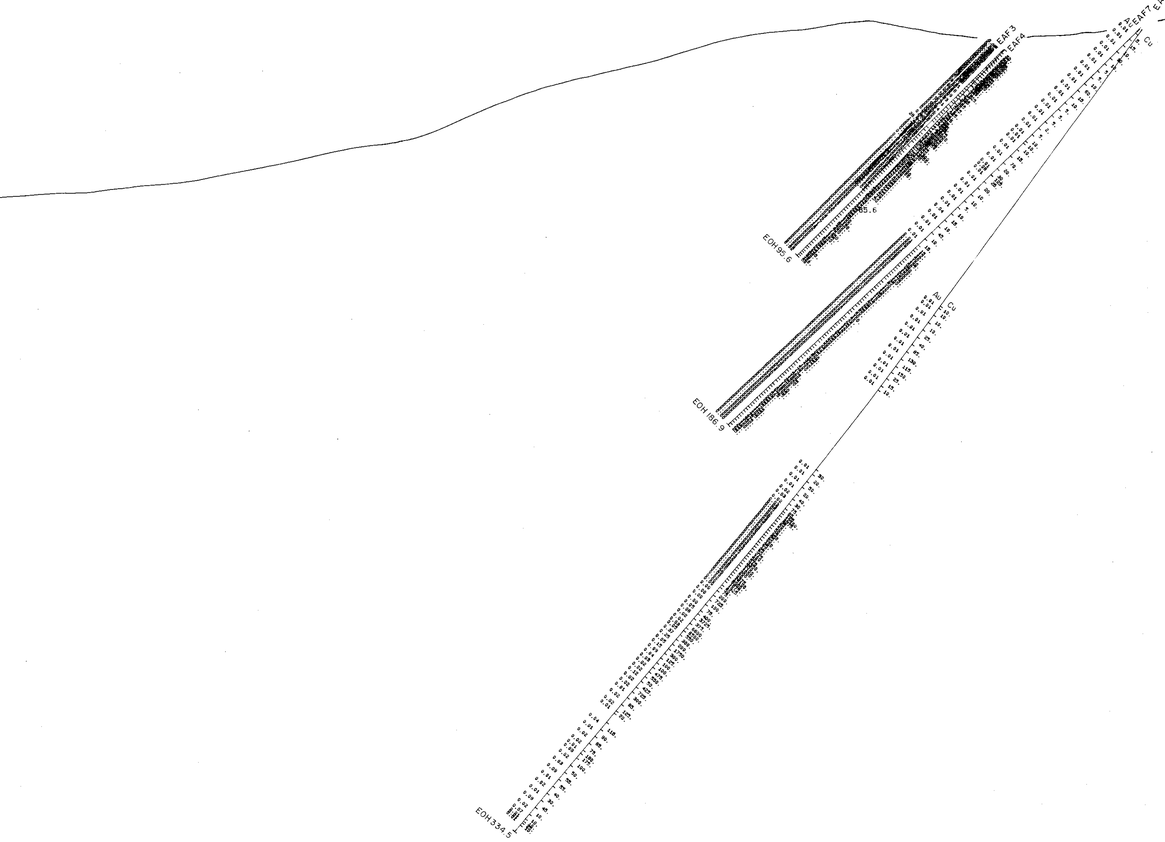
600mRL 500mRL 400mRL 300mRL 200mRL 100mRL


Fit
Shear zone
EAE 34
65.6
95.6
186.9
334.5
Sch
Sch, Sct
Sch, Sct
Sch, Sct

9021

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



5cm

551305

89-30597

PARKES	GEOPEKO A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
	Scale 1: 1000
Geo	EL44/88 BURNS PEAK GOLD/COPPER 5280N
Drawn	
Checked	
Date 3-OCT-89	All values in ppm — Dwg No. **PLATE 54**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9022

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL

95.6

186.9

334.5

551306

89-3059

5 cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo
Drawn
Checked
Date 3-OCT-89

EL44/88 BURNS PEAK
LEAD/ZINC
5280N

All values in ppm

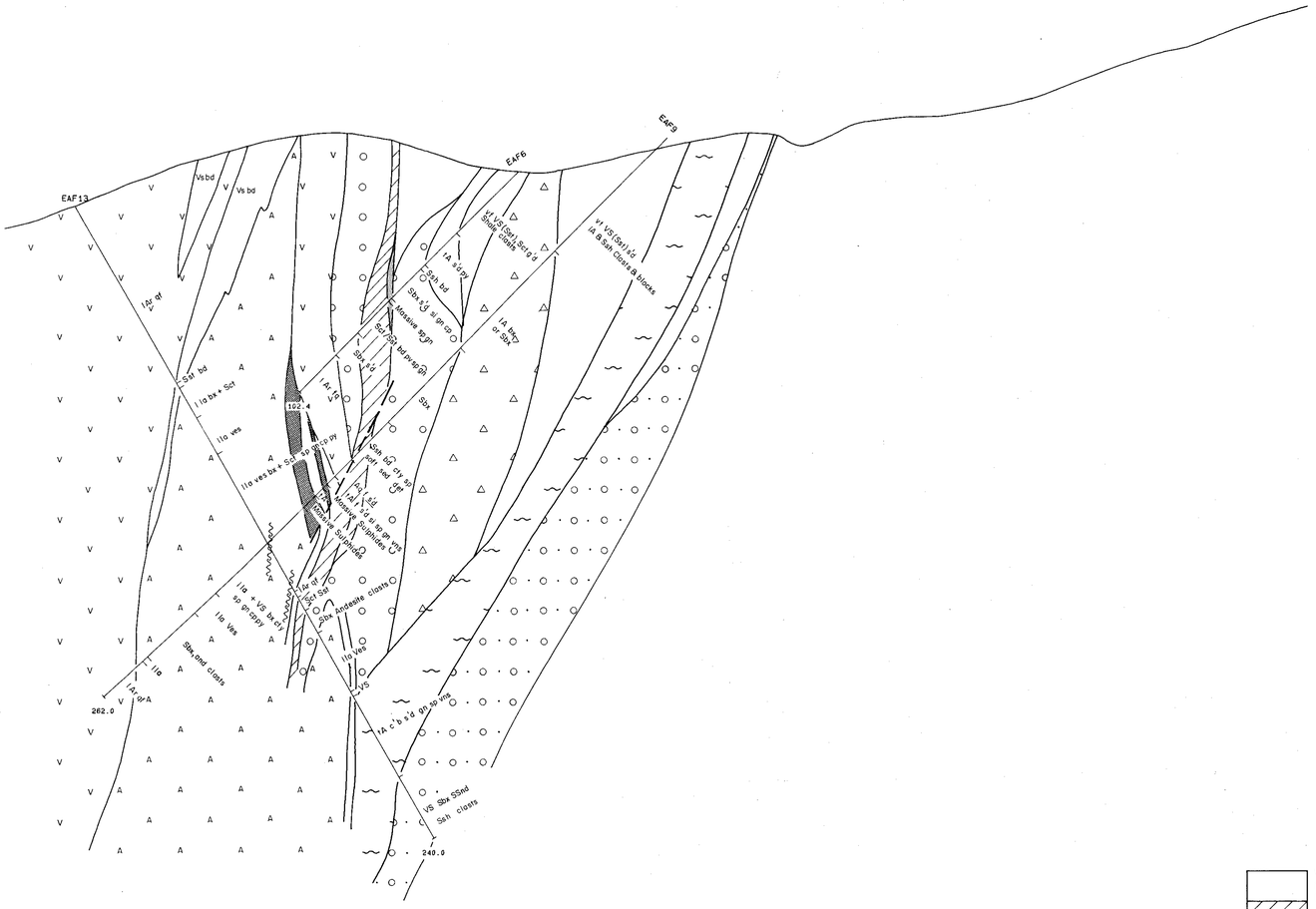
Dwg No. **PLATE 55**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9023

100E 200E 300E 400E 500E 600E 700E 800E 900E

600mRL 500mRL 400mRL 300mRL 200mRL 100mRL


EAF13
EAF6
EAF9
Vs bd
Vs bd
12r gr
Sstf bd
11a bx + Sst
11a ves
11a ves bx + Sst sp gr grpy
11a ves
11a
1Ar gr
262.0
Sbx,sand clasts
1Ar Sst
102.4
Sbx andesite clasts
11a ves
11a bx + VS bx sp gr grpy
11a ves
VS
1A c b r d gr sp ves
VS Sbx SSnd
Sstn clasts
240.0
12r sstf
Sbh bd
Sstx sl gn cm
Monzonite dyke
Sstf fmgn bd pr sp gn
Sbh sd
Sbx
12r sstf
Sstx
Sbh sd gn cm
Sbh bd gn cm
Sstf bd
Sbh bd gn cm
Sbh sd gn cm
Sbx
Sbh sd gn cm
Sbx
Sbh sd gn cm
Sbx

9024

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL

EAF13
EAF6
EAF9
EOH100.0
EOH160.0
EOH240.0

551308

89-3059

5 cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

EL44/88 BURNS PEAK
GOLD/COPPER
5320N

Geo			
Drawn			
Checked			
Date	3-OCT-89	All values in ppm	Dwg No. PLATE 57

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9025

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL

551309

89-3059

5cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.
Scale 1: 1000

Geo
Drawn
Checked
Date 3-OCT-89

EL44/88 BURNS PEAK
LEAD/ZINC
5320N

All values in ppm

Dwg No. **PLATE 58**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9026

100E 200E 300E 400E 500E 600E 700E 800E 900E

600mRL 500mRL 400mRL 300mRL 200mRL 100mRL

Volcanogenic Sediments, includes Sandstones, Cherts, Epiclastics Siltstones

Predominatly Shale

Very Coarse Epiclastics (Sedimentary Breccia)

Lava Breccia

Predominantly Sandstone

Acid,Pumiceous Tuffs

Andesite Lava

Rhyolite Lava

Quartz Feldspar Porphyry

551310

5 cm

89-3059

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

PARKES

Geo

Drawn

Checked

Date 27-SEP-89

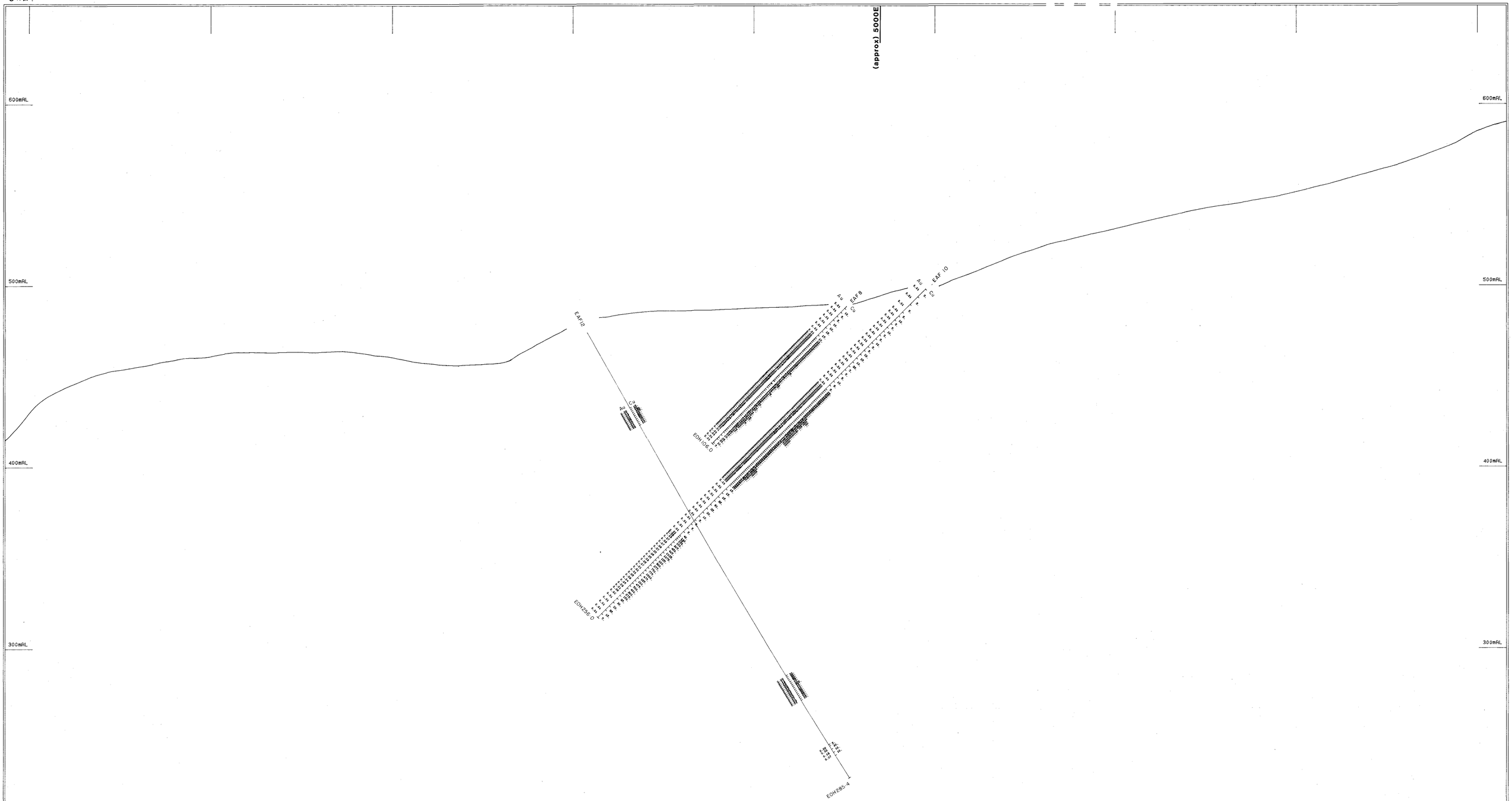
EL44/88 BURNS PEAK
HOLE TRACE
5360N

Dwg No. **PLATE 59**

9027

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



100E

551311
89-3059

5 cm

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

Geo
Drawn
Checked
Date 3-OCT-89

EL44/88 BURNS PEAK
GOLD/COPPER
5360N

All values in ppm

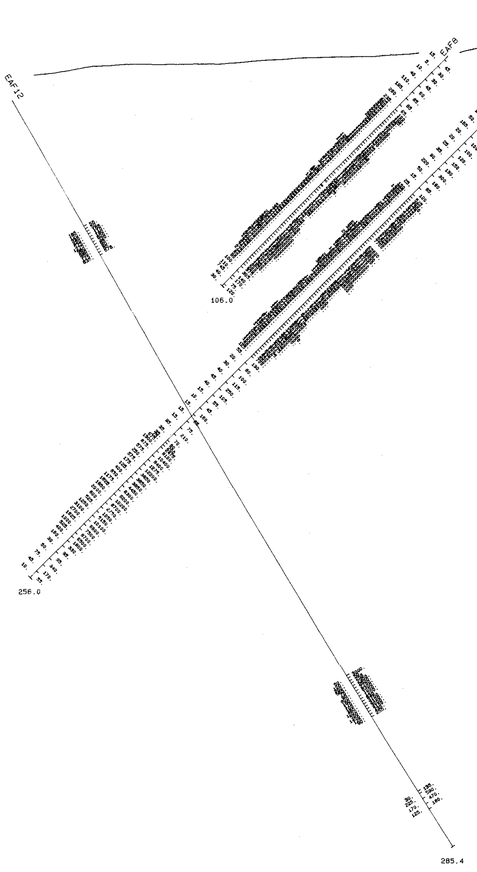
Dwg No. **PLATE 60**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9028

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL



89-3059

5cm

551312

PARKES

GEOPEKO
A DIVISION OF PEKO-WALLSEND OPERATIONS LTD.

Scale 1: 1000

EL44/88 BURNS PEAK
LEAD/ZINC
5360N

Geo	
Drawn	
Checked	
Date 3-OCT-89	All values in ppm

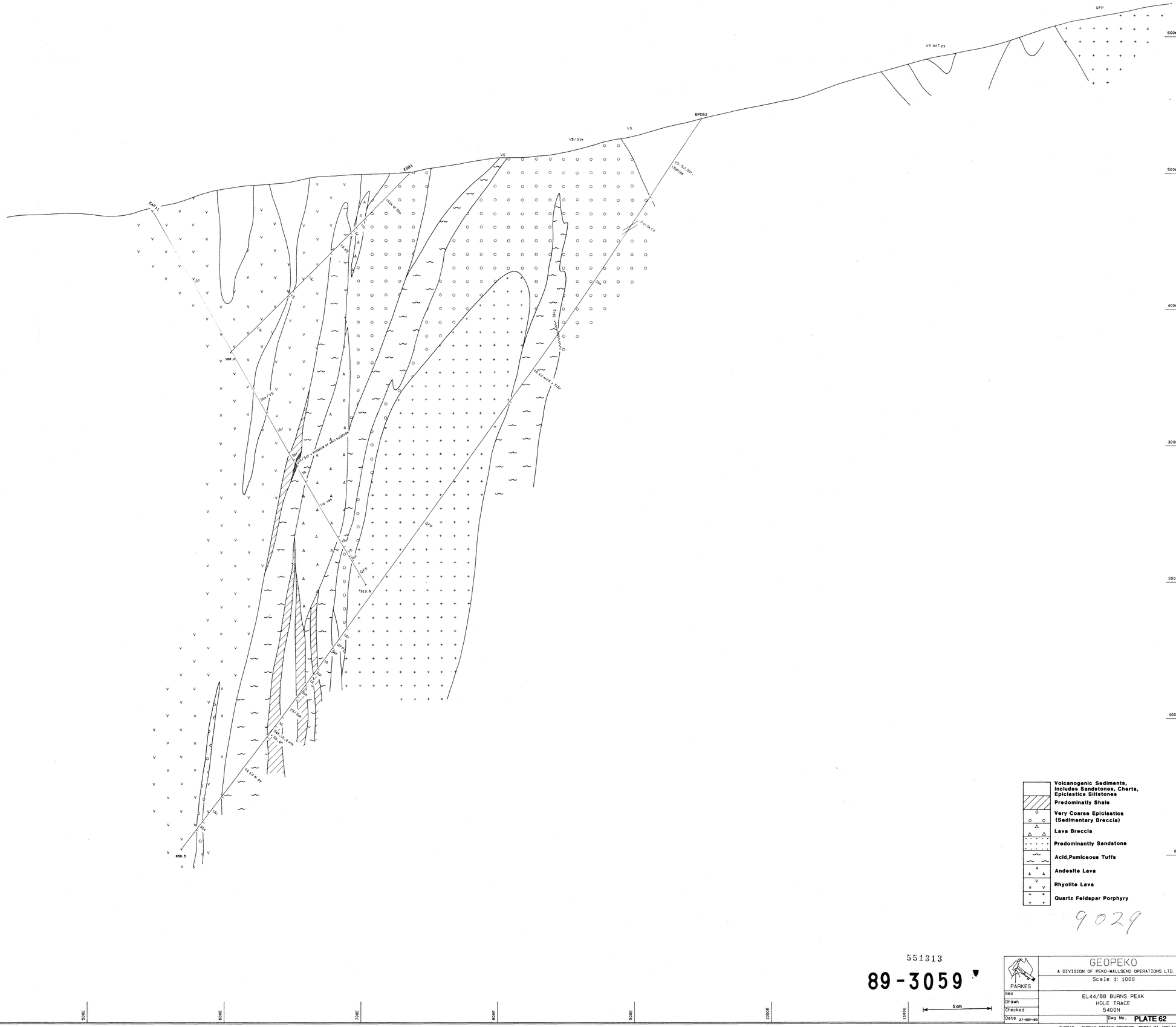
Dwg No. **PLATE 61**

SURPAC - SURPAC MINING SYSTEMS, PERTH WA (09) 4781411

9029

300E 400E 500E 600E 700E 800E 900E 1000E 1100E 1200E 1300E

600mRL 500mRL 400mRL 300mRL 200mRL 100mRL 0mRL -100mRL


QFP
VS bd ? py
BPD62
VS
VS / Sbx
VS
EDB1
EAB12
Sbx or Sbx
Sbx / VS
VS / Sbx + mainly or ser sulphide
QFP
313.6
658.5
VS Sct Sbx ?
QFP/VS
? m ra Co
Sbx
Sbx
Sbx

9030

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL
0mRL
-100mRL

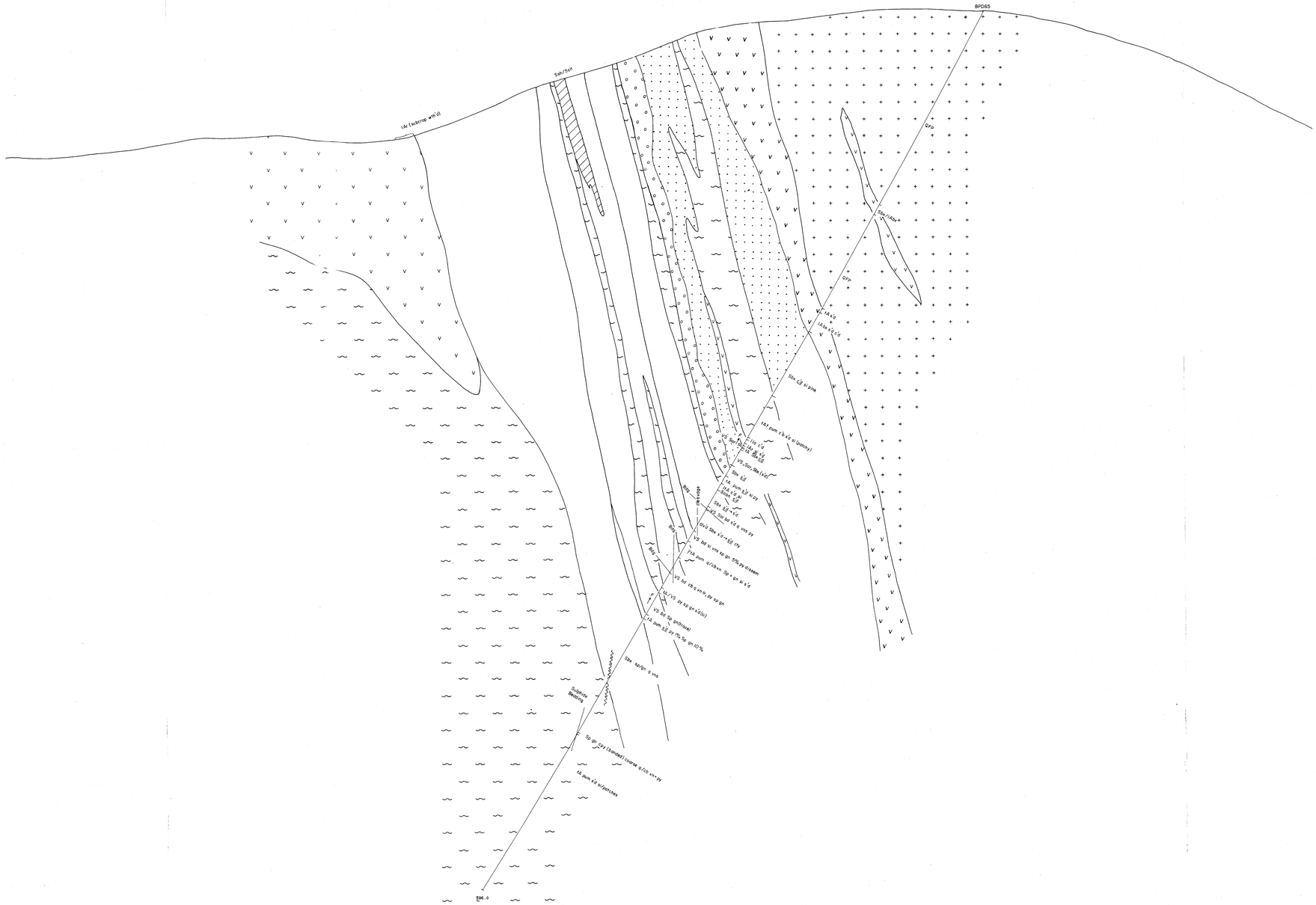
BM5.60
E5451
E5451
E5451

9031

(approx) 5000E

600mRL
500mRL
400mRL
300mRL
200mRL
100mRL
0mRL
-100mRL

9032


BPD65
Soil/Sub
(Air Inducing void)
QFP
Sltst/Mdst
Sltst x/b
Sltst x/b si pink
1A/1 pum c'b x/b si (pumice)
Sltst x/b
1A pum x/b si py
Sltst x/b si py vns py
Sltst x/b si py vns py disseam
1A/1 pum c/cb vn py sp gn si x/b
1A/1 pum x/b si py vns py
Sltst x/b si py vns py sp gn 5% py disseam
1A/1 pum x/b si py sp gn 5% py
1A/1 pum x/b si py sp gn 10%
Sltst x/b/gn c vns
Sltst x/b si py (bedded) coarse c/1/2 vn+py
1A pum x/b si/patches
Siltstone Bedding
Sltst x/b
Sltst x/b si py
Sltst x/b si py
Sltst x/b si py

9033

BROWN'S TUNNEL HOST ROCK EXTENSIONS

STRIKE EXTENSIONS OF EAF 9 MINERALIZATION

BROWN'S TUNNEL HOST ROCK EXTENSIONS

ROSEBERY FAULT

Plunging

Leo's Find

HOST ROCK EXTENSIONS

PINNACLES

Browns Tunnel

Thomas Tunnel

Burns Peak

PINNACLES

ANDESITE CONTACTS

SHALLOW GOLD

Southern Trenches

SOUTHERN ANDESITE CONTACT

HOLLWAY

RAILWAY

BAY

EMU

EXTENSIONS OF CHESTER STRUCTURE, AND/OR STRATIGRAPHY

MOUNT KERSHAW

Mt. Kershaw

CHESTER MINE

CHESTER

Plunging ?

POWER LINE

PIEMAN ROAD

LAKE ROSEBERY

378000mE. 380000mE. 382000mE.

5 384000mN.

5 382000mN.

5 380000mN.

5 379000mN.

5 cm

GN TN MN

GRID CONVERGENCE 1.0

GRID/MAGNETIC ANGLE 11.6

LEGEND

- TARGETS
- SIL-PY ALTERATION ZONES (AFTER GREGORY 1987)
- ROCKS THAT HOST BROWN'S TUNNEL MINERALIZATION & POSSIBLE EXTENSIONS
- PROSPECTIVE ZONES

NORTH BROKEN HILL – PEKO

BURNS PEAK
E.L. 44/88
PROSPECTIVE ZONES AND TARGET AREAS

DRAWN BY : A.R.
DRAFTSMAN : T.G.D.S.
DATE : Nov '89
REVISIONS :
FILE No.

SCALE 1 : 10,000 (100 0 200 400 METRES)

PLATE 66

551317

N.W. Coast Computer Aided Drafting Centre. Phone (004 354315) Fax. (004 354495)