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EXPLORATION LICENCE 5/63
COMSTAFF J.V., N.W. TASMANIA
REPORT FOR THE YEAR ENDED
30TH JUNE, 1987.

Volume 1

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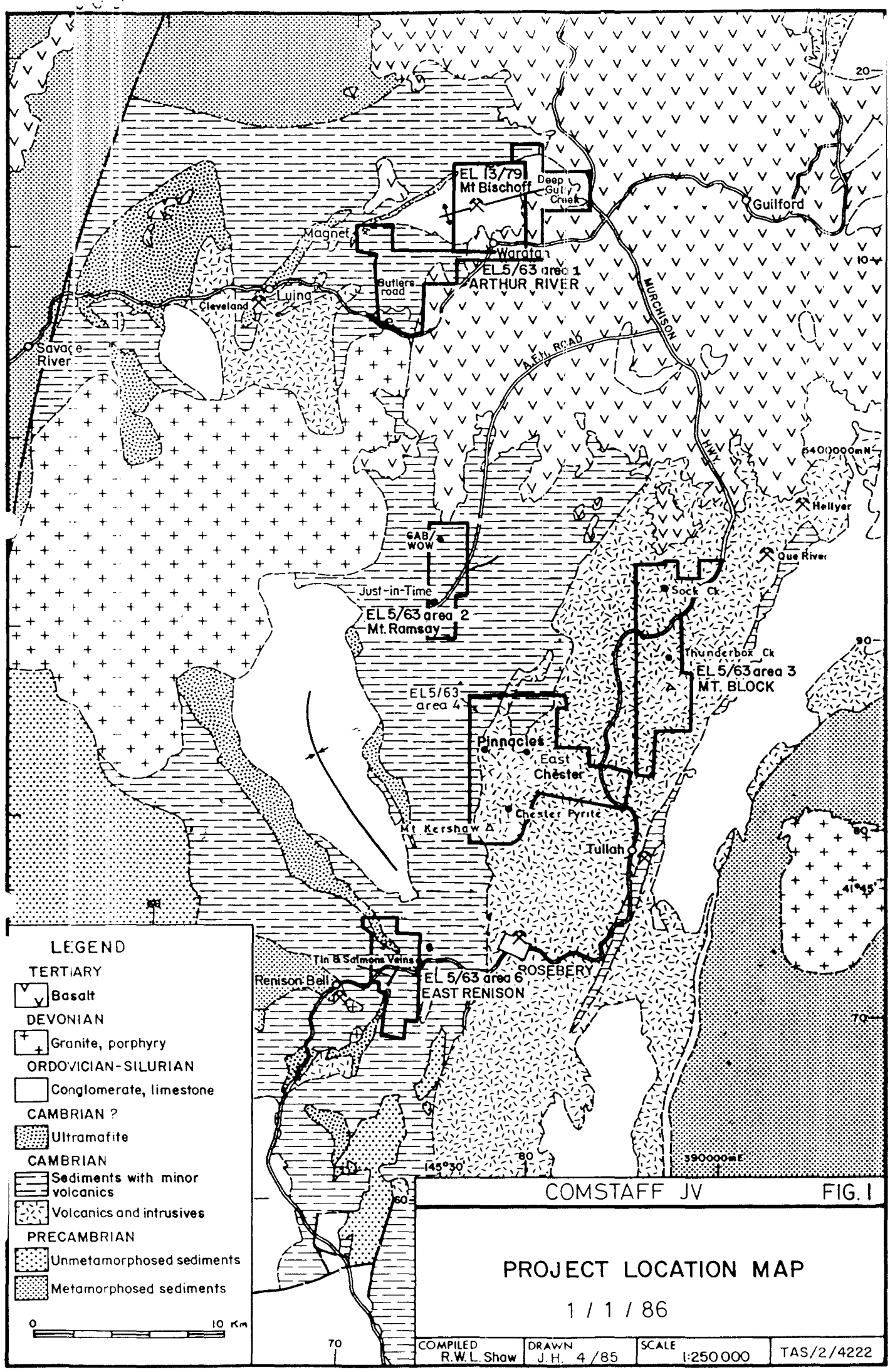
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EL 13/79
Mt Bischoff
Deep Gully Creek
Guilford
Magnet
Waratah
EL5/63 area 1
ARTHUR RIVER
Butlers road
Cleveland
Luina
Savage River
MURCHISON HWY
A.F.M. ROAD
6400000mN
Hellyer
Que River
GAB/WOW
Just-in-Time
EL 5/63 area 2
Mt. Ramsay
Sock Ck
Thunderbox Ck
EL 5/63 area 3
MT. BLOCK
EL5/63 area 4
Pinnacles
East Chester
Chester Pyrite
Mt Kershaw
Tullah
Tin & Salmons Veins
Renison Bell
EL 5/63 area 6
EAST RENISON
ROSEBERY
145°30'
390000mE
LEGEND
TERTIARY
Basalt
DEVONIAN
Granite, porphyry
ORDOVICIAN-SILURIAN
Conglomerate, limestone
CAMBRIAN ?
Ultramafite
CAMBRIAN
Sediments with minor volcanics
Volcanics and intrusives
PRECAMBRIAN
Unmetamorphosed sediments
Metamorphosed sediments
0
10 Km
5 cm
COMSTAFF JV
FIG. 1
PROJECT LOCATION MAP
1 / 1 / 86
COMPILED R.W.L. Shaw
DRAWN J.H. 4/85
SCALE 1:250000
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EXPLORATION LICENCE 5/63
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1. GENERAL

Exploration Licence 5/63 in N.W. Tasmania comprises five parts totalling some 126 square kilometres (Fig. 1). Title is held by Comstaff Pty. Ltd. and the licence has recently been renewed for the twelve month period to 30th June 1988.

Joint Venture discussions led to the signing on 20th December, 1985 of a Memorandum of Understanding between Comstaff Pty. Limited, Preussag Australia Pty. Limited and BHP Minerals Limited, with BHP Minerals as Manager of the exploration programme. The Joint Venture was formally ratified on 14th April, 1986.

The prime target is volcanogenic-style base metal and gold mineralisation within the Mt. Read Volcanics of Cambrian age. The main effort is therefore directed towards Areas 3 and 4. Data review relevant to the other areas has been carried out and a shallow diamond drill hole was completed at Butler's Road in Area 1.

Extensive line cutting and gridding as a preliminary to virtual saturation coverage of Areas 3 and 4 by UTEM, has dominated the exploration programme to date. A UTEM survey was conducted over the Chester, East Chester and North Pinnacles segments of Area 4 during the September-December period. A further major programme over most of Area 3 and remaining segments of Area 4 is planned for the September-December period, 1987.

Detailed geological mapping was carried out over the Pinnacles Prospect with costean and road traverse mapping at Chester, East Chester and Sock Creek. All drill core from Pinnacles, Chester and Sock Creek was relogged. An updated 1:10,000 interpretative geological map of Area 4 has been produced.

Weak UTEM responses and various geological-geochemical targets, including Hollway Pyrite, Chester and West Mount Kershaw, were investigated for bedrock geochemical response by power auger sampling.

Selected samples of vein, disseminated and stratiform sulphide have been submitted for S-isotope analysis. A comparative study will enable vein lead-zinc and "barren" pyrite to be put into a meaningful mineralization content.

Compilation of previous Comstaff geochemistry in Area 4 was carried out to aid exploration decision making.

2. EXPLORATION PHILOSOPHY

Target search is directed towards delineating volcanic-associated lead-zinc deposits with accompanying precious metal credits. Areas 3 and 4 of the Exploration Licence are favourably situated in a highly prospective part of the Central Volcanic Belt of the Mt. Read Volcanics, between the major deposits of Rosebery and Hellyer.

Since the inception of the licence, numerous geological, geochemical, geophysical and drilling programmes have been carried out without locating a major resource. It is likely that all significant outcropping or near surface mineralization is known.

The current joint venture terms and limited time available prior to the relinquishment date in mid-1988 have necessitated a focussed programme of advanced exploration. Our overall rationale is biased towards drill testing of targets generated from ground geophysical surveys of favourable zones.

Deep-sounding TEM has been applied to test for a significant buried sulphide deposit. Various factors influence theoretical depth of detection but it is assumed the method will be reliably diagnostic to at least the 200 metres depth level.

A parallel geological-geochemical approach has also been maintained in an attempt to generate drill targets on more conceptual grounds. This detailed work has confirmed structural complexity within the Central Volcanic Sequence and highlighted the need for an integrated approach to exploration.

3. PREVIOUS WORK

The Electrolytic Zinc Company drill tested the mineralisation in the Pinnacles area in 1949-50 with 13 small-bore holes. One drill hole at Browns Workings, testing for mineralisation beneath the shaft, intersected 4.5m at over 3% zinc.

RTZ also carried out a limited geochemical and geophysical programme over Chester-Pinnacles in 1959-60 under EL 4/59 (Muceniekas and Boniwell, 1959, McCarthy, 1960).

Exploration Licence 5/63 was taken out by Comstaff Pty. Ltd. (formed by Australian Anglo American, Broken Hill South and Mt. Carrington). Work in that portion of the licence covering the Mt. Read Volcanics commenced in 1966 and has been almost continuous, though with some long periods where activity levels were low. Extensive gridding, costeaning, soil geochemistry, geological mapping and ground geophysics were carried out in various areas and results are documented in periodic reports submitted to the Tasmania Mines Department.

Regional stream sediment sampling programmes dominated the early years, with some more detailed work on the Silver Falls-Pinnacles-Chester grid. Between 1973-77 some 28 diamond drill holes were completed at Chester-Pinnacles (Orr and Smith, 1975), with a further 14 holes drilled at Sock Creek in Area 3 (Hall, 1979, Hopwood, 1977). The Comstaff JV was formed in 1977 between Comstaff Pty. Ltd. and Preussag Australia Pty. Ltd. and further geological work and drilling were achieved at Chester and Pinnacles (Perkin, 1977; Krummei, 1977).

From 1978-83 the main activity was at East Chester, (Hall, 1978; Anderson, 1983), but only four boreholes were drilled during this period. A helicopter-borne DIGHEM survey was flown over Area 4 in 1983, as follow-up to a 1975 INPUT survey. Interpreted responses were not thought to be significant.

The most recent phase of intense activity commenced at Pinnacles in 1983. Resampling of old workings demonstrated the presence of significant gold values associated with both massive sulphide mineralisation and cherty host-rocks. In 1984 work focussed on the three mineralised centres in the area - Brown's Workings, Thomas' Tunnel and the Southern Trenches. These were encompassed in a new grid (EAF) which was subjected to geological mapping, ground magnetics, soil geochemical sampling (including gold in the analytical suite) and a UTEM survey. 19 boreholes were drilled in the year from February 1984, with 15 holes at Brown's Workings (Roberts, 1985, Shaw, 1985, Shaw and Roberts, 1985, Mroczek, 1985a). High grade mineralisation was intersected, the best being in EAF 9 with 11.1 metres at 18.92% zinc, 8.01% lead, 93 g/t silver and 4.74 g/t gold. Comstaff's geological interpretation led them to postulate a small resource of 110,000 tonnes at a grade of 25% combined lead-zinc and 4 g/t gold.

Apart from the Sock Creek prospect, exploration in Area 3 has been sporadic, comprising stream sediment sampling and limited work on small grid areas which did not define any drill targets. (Hall, 1979b, Anderson, 1982, Mroczek, 1985b).

During the first half of 1986 work carried out by BHP included a regional geochemical drainage sampling programme for cyanide gold extraction. A down-hole and surface SIROTEM survey was carried out at Pinnacles based on the 1984/85 diamond drilling programme; only minor anomalies were detected. A large programme of grid line cutting commenced in Area 4.

Appraisal of previous work was a major task in the initial months following BHP entry into the Comstaff JV. Geological, geochemical and geophysical compilations were commenced. Detailed geological work was restricted to Area 4, with most effort concentrated at Pinnacles.

4. GEOLOGY

The regional geology of Areas 3 and 4 has recently been reviewed by Corbett (1986), McNeill (1986) and Komyshan (1986) as part of a regional mapping project in the Mt. Read Volcanics.

In broad terms a Central Volcanic Sequence dominated by feldspar-phyric lavas, lesser ignimbrites, local sediment, reworked tuff and andesite is flanked to the west and north west by a volcano-sedimentary succession of siltstone, shale, greywacke, quartz-feldspar-phyric tuff, conglomerate and rarer andesite, basalt and dacite lava of the Dundas Group. In the Chester-Pinnacles area the contact of these two units is a thrust fault, the Rosebery Fault, which dips approximately 40° east. Elsewhere the contact of the two units is assumed as an erosional unconformity. Faulting tends to mask the relationship in Area 3. Fossils from the base of the Dundas Group give ages of Late Middle Cambrian, but the unit ranges in age from middle Middle Cambrian to middle Late Cambrian (Corbett, 1986).

In the following sections the geology of Areas 3 and 4 will be reviewed in the light of detailed studies carried out.

4.1 Pinnacles - East Chester Geology

The geology and mineralization of the Pinnacles area have been summarised previously by Gregory (1986). A detailed interpretative map of the Pinnacles area at 1:1,000 scale is shown as fig. 2 while a simplified 1:10,000 interpretative map of Pinnacles and part of East Chester is shown as fig. 3. The maps were compiled from mapping of all tracks and costeans in combination with relogging and a reinterpretation of all drill holes (including the early series of holes drilled by Electrolytic Zinc Company in 1949). Summary logs of all holes are given in Appendix 1. Interpretative cross sections for drill holes are shown as figs. 4-25. In addition three generalized

cross sections on a regional basis across the Pinnacles-East Chester area are shown in fig. 26. Selected petrographic descriptions of rocks and ore samples are included in appendix 2.

The reinterpretation of drillcore and surface mapping has shown that three major structures, the Burns Peak Syncline, Pinnacles Anticline, (both recognized by Hall, 1978) and Thomas Syncline cause complexity and repetition of rock units (fig. 2 and fig. 3). The oldest unit represented is an andesite lava and volcaniclastic sequence (the East Chester andesite of Hall, 1978). This unit dips and faces to the north west and is overlain by a mixed sequence dominated by reworked feldspar-phyric dacitic tuffs (often bedded and graded) and lapilli tuffs (some pumiceous and possibly of ignimbritic affinity) with shale lenses. A flow banded and autobrecciated rhyolite lava extends from near hole EAB3 to beyond Cone Hill and occupies the axis of the tight Pinnacles Anticline. The rhyolite is suggested to be approximately time equivalent to or to overlie the East Chester Andesite (fig. 26). As shown in fig. 3 the dacitic tuffs and pumiceous units overlie this lava unit.

Some quartz-phyric rhyolite tuffs and lithic tuffs are locally associated with the dacitic tuffs, but the main sequence of quartz-phyric tuffs, ashes, lithic tuffs and breccias overlies the feldspar-phyric dacitic units. Shale lenses are locally associated. Some of the rhyolitic units are of mass flow character and incorporate large rafts of shale. Feldspar-phyric units of possible ignimbritic affinity are included within this rhyolitic suite. Folding of the rhyolite unit by the Burns Peak Syncline and Pinnacles Anticline repeats the unit at Browns Tunnel and Thomas' Tunnel area. Some of the known massive sulphide mineralization is associated with the rhyolitic volcaniclastic unit.

In the Burns Peak area a coarse quartz-feldspar porphyry intrudes the rhyolitic tuff sequence. This porphyry is locally flow banded and has a breccia fabric in places. Hole EAB1 intersected part of this body (fig. 22), but also intersected distinct coarse quartz-feldspar-phyric lithic tuffs to breccias. In addition coarse porphyry fragments are included in the finer grained rhyolitic tuffs and confirm the tuffaceous character of the lower quartz "eye" unit. Rare units of coarse quartz "eye" tuff are known from the rhyolitic unit from Southern Trenches and Brown's Tunnel area.

Details of the rhyolitic tuff and mass flow tuff unit in the Pinnacles Zone (Brown's Tunnel to Southern Trenches) are best considered by reference to fig. 2 and cross sections fig. 4-21. Here the lower dacitic tuff unit is a lapilli tuff probably of ignimbritic affinity. The rhyolitic tuff unit is split by a distinct feldspar ± quartz-phyric dacite lava and lava breccia which can be traced from north of Brown's Tunnel to about 200m south of Thomas' Tunnel as a distinct marker unit. Above this lava is a mixed sequence of quartz-phyric to locally feldspar-phyric tuffs, ashes and pumiceous units with local shale, all of which appear to underlie and locally interfinger with a distinct andesitic lava and andesite volcaniclastic unit. The rhyolitic tuff unit varies from 80-130 m in thickness.

The cross sections shows that this sequence dips and faces to the northwest, but is repeated by folding through Thomas' Syncline. This structure is clearly represented at Thomas' Tunnel (fig. 12) but appears to be more complicated and to attain an apparent W-shape syncline-anticline pair character to the north of Brown's Tunnel (figs. 4-8). There may be local overturning of the east limb of the syncline as suggested on some sections to the south of Brown's Tunnel. Within the overall syncline structure there

are local minor flexures and some slump folding such that there is a local apparent increased thickness to the rhyolitic tuff sequence in particular.

The andesitic unit at Pinnacles is compositionally quite different from the East Chester andesite in trace element Ti, Zr content and should not be confused with the latter (BHP Exploration, 1986). It plunges at about 20° to the north east and is overlain by massive to flow banded and auto brecciated quartz-feldspar-phyric and feldspar-quartz-phyric rhyolite lavas with local intercalated rhyolitic volcaniclastics. These lavas extend to near Brown's Tunnel and form the extensive Pinnacles lava ridge to the north and northeast. Here the lavas are in direct contact with the rhyolite tuff unit that hosts some of the mineralization at Pinnacles. Broad open folding of this lava is suggested.

The Pinnacles andesite unit has been projected to as far as the Rosebery Fault under glacial cover and is probably in part cut off by this fault. The effects of this thrust on the underlying Dundas Group sediments and quartz-phyric tuffs is apparent visually with strong mesoscopic folding within 30m of the fault. Rocks of the Central Volcanic Sequence in the zone some 300m to the north and south of the Southern Trenches show prominent overturning with steep to moderate east dips and west facing (figs. 14-20).

The Rosebery Fault changes its strike in the Southern Trench Zone from north to north west and heads towards Silver Falls (Corbett 1986). Beyond the extent of the rocks forming Thomas' Syncline, it brings Dundas Group rocks against Dundas Group rocks. These rocks which flank the Pinnacles lava ridge to the northwest are bedded, reworked, coarse to medium grained quartz-feldspar rhyolitic tuffs which pass into increasing volumes of shales with thin sandstone interbeds in the Shale Basin area (fig. 3). The latter area is in the axial zone of the Que Syncline.

4.2 Mineralization and Alteration Pinnacles-East Chester

Known mineralization at Pinnacles is concentrated in a zone extending for over 1 km from the Southern Trenches to Thomas' Tunnel and Brown's workings. The mining activity dates to the period 1896-1918 when a total of 453.4 tons was produced. Some 395.5 tons grading 5.8% Fe, 0.4% Cu, 0.8% Pb, 2.0% Zn, 44.3 g/t Ag and 4 g/t Au came from Brown's Tunnel area (Reid, 1918).

Drilling and costeaning by Comstaff has led to a greater understanding of sulphide mineralization and has been successful in locating small massive sulphide pods in a costean west of Thomas' Tunnel, near the collar of hole EAF5 and at depth in holes EAF 3, 4, 6, 9 and 10. Comstaff (Shaw and Roberts, 1985) defined a resource of 110,000 tonnes of 1.26% Cu, 6.58% Pb, 18.83% Zn, 122 ppm Ag and 4.09 ppm Au based on these drill holes. However, our present work suggests that the best intersection of ore grade material, that of EAF9, does not appear to correlate with the mineralized zone represented in the other holes (see figs. 6-10). The pod-like nature of ore grade material observed from surface exposure near EAF5, combined with extreme variation in grade from holes EAF3 and 4 which are within 1 m of one another, suggest the calculation and statement of an ore reserve based on so few holes is very dubious.

Disseminated and vein mineralization occur sporadically in all units overlying the East Chester andesite, but the mineralization is concentrated in the mixed rhyolitic volcaniclastic sequence. Here patchy pyrite dissemination and local sphalerite-pyrite-galena-barite veining and dissemination occur. Prominent veining and dissemination of sulphide in Brown's Tunnel occurs with patchy high gold values associated. The massive sulphide mineralization in hole EAF9 has an underlying narrow fault-bounded

pyrite-chalcopyrite feeder zone in altered andesites, and peripheral more extensive veining and dissemination of sphalerite-galena. The massive sulphides comprise fine to medium grained, massive to banded sphalerite-galena-pyrite-chalcopyrite with accessory tetrahedrite and gold. Gangue minerals include quartz, sericite, chlorite, barite, carbonate. The massive sulphides intersected in holes EAF3, 6 and 10 are banded and tend to be underlain by very narrow pyritic feeder systems with strong silica-sericite alteration.

Alteration of the andesite unit north of Brown's Tunnel involved an early sericite-chlorite-carbonate-pyrite phase overprinted by cherty silicification and cherty veining with pyrite and local chalcopyrite. This is further brecciated and cut by sphalerite-galena-chalcopyrite-pyrite-silica veins. Chlorite may form a local alteration overprint replacing sericite. Rare fuchsite has been observed in the andesite and associated volcaniclastics. Dacitic lapilli tuffs that underlie and/or interfinger with the andesite show extensive sericite alteration with local silicification, carbonate and chlorite alteration, and patchy segregation of sphalerite and galena.

Mineralization at Thomas' Tunnel consists of barite with galena and sphalerite and galena-sphalerite-chalcopyrite-pyrite veining associated with sericite-chlorite altered and locally silicified dacitic tuffs. These tuffs underlie the andesite that is host to massive sulphides near Brown's Tunnel. Banded barite-galena to 1 m thickness was discovered by costeaning west of Thomas' Tunnel. This mineralization appears to relate to that encountered in Thomas' Tunnel and is on the west limb of Thomas' Syncline clearly defined by drill holes CP7 and CP14 (fig.12) in this vicinity.

Mineralization at the Southern Trenches consists of cherty silicification of shales, ash and dacitic lapilli tuffs, with veining by pyrite, chalcopyrite, sphalerite and galena. A small pod of massive sulphide to 0.5 m thickness is developed in the main working. As described above, the sequence here is west facing and overturned with the massive sulphide pod underlain to the east by a zone of pyrite - chalcopyrite and silica alteration in sericitic ash and tuff. Stratigraphically this position is suggested to be below that of massive sulphides at Brown's Tunnel and Thomas' Tunnel areas (fig. 3). Mineralization and alteration at Southern Trenches continue stratigraphically above this horizon and confirm the general stacking of mineralization pulses in the area.

Disseminated pyrite and rare sphalerite-galena-pyrite-barite veining that constitute Leo's Find mineralization occur in rhyolite volcaniclastics equivalent to those that in part host mineralization in holes EAF3, 4, 6 and 10. As indicated above, this sequence is repeated by the Pinnacles Anticline and Burns Peak Syncline. Only weakly disseminated pyrite and lead-zinc mineralisation was encountered by Comstaff drilling in these rocks on the east limb of Burns Peak Syncline (holes EAB1, EAB2, see fig. 22 and 23). The contact between the East Chester Andesite and the overlying dacitic tuff and shale sequence appears a favourable hiatus zone for massive sulphide formation. However the two drill holes through this zone, EAB1 and EAB2, encountered minor sphalerite veining and no pyrite feeder system. The pyritic alteration zone at Hollway Rivulet (see later section) occurs within the andesitic units and suggests that there are potential exhalative positions within the unit. Traces of fuchsite have been observed in the andesites at East Chester.

The rhyolitic lavas that overlie the andesite unit at Brown's Tunnel are generally unmineralized, but do show local sericite alteration and minor local pyrite veinlets. This suggests that the mineralizing system was still active, but very weak after the deposition of the massive sulphides intersected in hole EAF9.

4.3 Hollway Pyrite Zone Geology

The geology of this area, which covers part of the East Chester andesite, is shown in fig. 27 as part of a 1:10,000 scale interpretative map of Area 4. The interpretation is based largely on results of bedrock auger sampling (see geochemical section) with some support from road mapping.

The East Chester andesite unit in this area appears to interfinger with dacite lavas and pumiceous tuffs (possibly ignimbritic) of dacitic affinity. Some quartz-phyric units were encountered in a few places and appear to represent lava, tuff and intrusive. The actual extent of pumiceous units is difficult to gauge because recognition of pumice is often only apparent in fresh bedrock samples.

No facing evidence is available from Hollway Pyrite Zone. The only facing available from the southern side of the East Chester Andesite is from hole EAB4, where sediments flanking the andesite both dip steeply and face to the north west. The very odd splayed and thickened shape to the andesite body between Hollway Rivulet and hole EAB2 at East Chester strongly suggests folding, with perhaps a syncline-anticline pair to produce the observed features. This is also the hinge zone where strike of the sequence extending from the Chester area changes from north to north east.

4.4 Mineralisation and Alteration Hollway Pyrite Zone

Hollway Pyrite Zone is a zone of pyrite (and rare chalcopyrite) dissemination and veining in silicified and sericitized chloritic andesite lavas and volcaniclastics. The pyrite was first recorded by Reid, 1918, in a water race on the southern side of Hollway Rivulet. The pyrite is also visible in outcrop on the track immediately to the north of Hollway Rivulet. The extent of the pyritic alteration zone has been defined by recent power auger sampling and is of the order 700 m x 120 m. The zone of sericitization probably extends beyond these limits.

Details of auger drilling results are given in the geochemistry section.

4.5 Chester and West Mt. Kershaw Areas Geology

Geological interpretation of this area is based on mapping of roads, tracks, costeans and mine workings, a relogging of all Chester core and a bedrock auger sampling programme. These results are summarized in fig. 28 with details as part of fig. 27. Cross sections based on all Chester area diamond drill holes are given in figs. 29-37. Summary drill logs are included in appendix 3.

The main rock type in the area is feldspar ± quartz-phyric dacite lava. However units of water-laid ignimbritic tuff are recorded from the Pieman Road, and the extension of one such unit recorded from CP21 drill hole. Thin ash units may be intercalated locally within the lavas, but two more extensive areas of dacitic crystal tuff, lithic tuff and ash exist to the east of Chester Mine, bordering the collar of CP6 and near the junction of the track to Mt. Kershaw trig station and the track leading to costean 4N (fig. 27, 28). The latter dips at about 40° to the east and the former at 20-50° to the west. No facing data is

evident from these units. However, the bedded pyritic cherts at Chester Mine in general face east with bedding cleavage relations confirming the cherts occupy the eastern limb of an anticline. Minor folds plunge at about 20° to the north. The only other facing evidence comes from hole CP21 where a graded pumiceous (possibly reworked ignimbrite) unit dips steeply and faces east.

Very shallow dips are recorded in ash beds incorporated locally within the dacite lavas seen on the track from hole CP3 collar to Mt. Kershaw trig station. An anticlinal fold axis is interpreted to occur in the zone between hole CP3 collar and Mt. Kershaw trig station, with the axis trending approximately north-south (fig. 28). Variable dips in ash beds and in flow banding attitudes of the lavas on other tracks to the west, towards the Rosebery Fault (West Mt. Kershaw), attest to further folding and may reflect either smaller folds on the western-link of the anticline or other major folds. A strong cleavage is locally evident in hydrothermally altered zones and may produce a schistose fabric.

Andesitic to basaltic dykes which are clearly post mineralization, but possess a cleavage, cut the sequence. Several examples are exposed within the Chester Mine workings.

4.6 Mineralisation and Alteration Chester-West Mt. Kershaw

The Chester Mine contains a body of bedded pyritic chert, part of which was mined by Mt. Lyell for sulphur (Reid, 1918, Collins et. al., 1981). Some 36,800 tons of pyrite averaging 37.25% sulphur were produced in the period 1909-1918 (Reid, 1918). A further 6900 tons of pyrite were mined by Cumming Smith and Company from 1918-1920 (Collins et. al., 1981). Probable remaining ore reserves were estimated by Reid, 1918, as 2.84×10^6 tons of over 20%

sulphur. A gravity survey has suggested a possible resource of 2.29 x 10^6 tons of sulphides approximately 240 m to the west of the mine (Muceniekas and Boniwell, 1959).

The pyritic chert body is underlain by disseminated and vein pyrite mineralization in silica-sericite-chlorite altered dacite lavas. Trace amounts of copper, lead, zinc and silver are associated with the pyrite, usually as sulphide inclusions. Rare barite has been observed.

Mapping of available exposure of the pyritic cherts in the open cut workings (fig. 38) shows that the cherts have been complexly folded into a series of shallowly north plunging anticlines and synclines. Few exposures of footwall dacites occur in the workings. An interpretative cross section through the workings, including hole CP6 drilled by Comstaff (fig. 38), shows the structural picture, with the mineralized body tending to parallel the slope of the hill. This drill hole would appear to have drilled down dip into the footwall. No facing data could be extracted from poor outcrops of the west dipping bedded ash and tuff zone to the east of the collar of CP6, but this may be overturned and correlate with the mineralized horizon. The strong pyritization associated with the dacites near the collar of CP6 would tend to support this idea.

The alteration types defined from surface mapping and drill core logging have been divided into 3 types:

1) Weak to moderate chlorite-sericite ± pyrite (0-1% pyrite) alteration.

2) Moderate sericite-silica-pyrite (1-10% pyrite) alteration.

3) Strong pyrite-silica-sericite (10% pyrite) alteration.

The weak alteration may in part be a deuteric effect within the lavas, but there is probably a low temperature chlorite ± pyrite alteration related to the mineralizing system. This is overprinted locally through fractures or more pervasively by moderate to strong development of sericite-silica and pyrite. The percentage of pyrite is in most cases the best indicator of alteration intensity.

The generalised surface distribution of the three alteration types is inferred in fig. 27 28 Drill hole distributions (figs. 29-37) can show extreme variations often apparently related to strong alteration about crosscutting fracture zones.

The drilling by Comstaff concentrated in a zone south of the Chester Mine along the presumed strike continuation of the mineralized horizon. Some encouragement had been obtained from copper, lead and zinc soil geochemical results in this zone. Values for lead and zinc usually associated with weak to moderate altered areas in the drill core are very patchy but range up to 2000 ppm. Much of this anomalism is in fact associated with quartz and carbonate veins that crosscut chlorite altered areas. The best of these was intersected in hole CP3 and has been described by Collins, 1974, who concluded that the coarse grained sphalerite and galena postdated the alteration of the lavas and was not genetically related to the massive pyrite mineralization.

The broad extent of the alteration envelope is largely due to the anticlinal structure. It seems most likely that erosion has probably removed any up-plunge continuation or repetition of the Chester pyritic chert. The Comstaff drilling has tested the down dip continuation of the mineralized horizon at shallow depths on the eastern limb of the anticline (assuming the moderate to weak alteration transition approximates this horizon). The western limb remains

untested as does the down plunge extension to the north on both limbs of the anticline. However there is no anomalous geochemistry that would suggest a massive lead-zinc pyritic body rather than a barren pyrite body could exist there.

At West Mt. Kershaw some galena was reported in pyritized formation by Reid, 1918. Patchy weak pyrite with traces of sphalerite and galena was observed in outcrops on the track to costean 4N. However, recent auger results indicate that the mineralization is very patchy and of no economic interest.

4.7 Sock Creek Area Geology

Aspects of the regional geology of this area have been discussed by Komyshan (1986). Rocks in the Sock Creek Prospect area have been included in the Dundas Group. Komyshan (1986) defines the Mt. Charter Fault as a major structure separating the andesite, dacite, basalt and sediment sequence of the Que River-Hellyer area from the sediment dominated Sock Creek sequence. He also infers that the relationship of all these rocks (which are included in the Dundas Group) to the Central Volcanic Sequence is a faulted unconformity.

Regional aspects of Sock Creek area geology are shown in fig. 39, while a more detailed map of the Sock Creek Prospect is shown in fig. 40. All 14 holes drilled by Comstaff were relogged with summary logs given as appendix 4. Interpretative cross sections are shown as figs. 41-49.

A mixed sequence of massive greywackes with local shale extends westward from the Mt. Charter Fault and forms the base of the Dundas Group. It is overlain by vitric to spherulitic feldspar-phyric dacite lavas that locally show intercalation of blocky to lithic rhyolitic tuff, shale clasts and finer bedded units, all of probable mass flow origin. Komyshan (1986) has

suggested this dacite may be equivalent to the dacite that forms the hanging wall to the mineralization at Que River Mine. However, the absence of any andesitic rocks at Sock Creek comparable to the extensive footwall andesites at Que River Mine suggests the correlation is very tenuous.

The dacite is overlain by a sequence of rhyolitic tuffs with ash and shale zones. Then follows a sequence of coarse to medium grained quartz eye-feldspar crystal tuffs and lithic crystal tuffs to breccia, with local finer grained rhyolitic crystal tuffs and black shale intercalation. Some of the more homogenous coarse porphyries are probably intrusive, but mapping and drill core studies confirm that many of these rocks are of tuffaceous character. This is shown by the local presence of a gradation from coarse to fine grained crystal components, the incorporation of shale blocks, and the incorporation of coarse debris and crystals of the porphyry within intercalated shale lenses. Evidence from drill core shows that the sequence dips and faces to the west at the Sock Creek Prospect.

Several north-striking fault zones were mapped from costean exposure and the drill core. The drill sections (figs. 45-47) show that faulting in part has a vertical throw with west block down.

4.8 Mineralization and Alteration Sock Creek Prospect

The mineralization discovered by Comstaff at Sock Creek as a result of follow up of stream sediment geochemical anomalism consists of sphalerite-galena associated with quartz-carbonate veining. Not all the quartz-carbonate veining has sphalerite and galena associated. While some of the mineralization occurs in close proximity to mapped fault zones, there is also a wide spread of veining away from any obvious

faults in the drill core (figs. 41-49). The greatest localization of mineralization occurs in the zone between hole SK5 and SK3.

Prominent local silicification is associated with the quartz-carbonate veining. In general the rock sequence shows no extensive alteration that would be indicative of an alteration system related to stratiform massive sulphides formation. Hall (1979) has suggested the mineralization is late stage hydrothermal and related to intrusive porphyry. This is a likely scenario with vein concentration controlled in part by faulting.

5. GEOCHEMISTRY

5.1 Review of Previous Work in Area 4

Extensive gridding has been carried out by Comstaff over the western part of Area 4 since the late 1960's, with several generations of overlapping grids in the most obviously mineralised areas. Pinnacles, for example, was initially covered in 1966/67 with the Chester-Pinnacles-Silver Falls imperial grid; the Pinnacles metric grid (EAA) was cut in 1974/75 (northern extension 1978) and the EAF grid (for UTEM and detailed geological/geochemical work) in 1984.

Accurate location of some of the earlier grids on the new generation of improved base maps is sometimes a problem. Significant positioning errors of sample points are evident in some cases because of inaccuracies in early topographic base maps and the practical difficulties of accurate survey control in heavily vegetated and hilly terrain.

A voluminous geochemical data base exists, based on sampling programmes spread over nearly twenty years, but no recent compilation plans were available that concisely summarized the overall geochemical picture.

It is apparent that any interpretation and compilation necessarily has a strong subjective element because of problems inherent in geochemical sampling in N.W. Tasmania. The soil medium collected frequently varied and there is insufficient control on soil environment, whether residual or transported (glacial, scree, colluvium or alluvium). Extensive areas of glacial cover of very variable thickness occur and scree cover is also a problem locally.

Much early sampling was of the Ao horizon, but this is ineffective where even thin glacials occur. C-horizon soil augering was attempted over many areas but depth penetration was limited and it is very unlikely that all samples were of weathered bedrock. Placosols are clearly developed in some areas. A thin iron oxide layer formed between 20-150 cm below surface; this is almost completely impervious to water and forms an effective barrier to migrating metals. In the strongly acid conditions above the iron oxide layer base metals are leached from the soil and severely depleted or absent in the -80# fraction.

Data presentation problems also include the varying scales of geochemical grid plans, with metrication having taken place during the licence tenure period.

The compilation presented as Fig. 50 is largely an interpretative simplification of the lead soil geochemistry, aimed at picking out highlights and defining general zones of interest. Lead was selected as the most definitive element for the target volcanogenic-style mineralisation; it is relatively immobile and generally reflects mineralisation, being less susceptible than zinc to major variation over different rock types.

The colour scheme on the compilation plot is arbitrary. It is not possible to equate absolute values from grid to grid so the intention is merely to

facilitate visual identification of the anomalous zones. Contour intervals applied to each grid are shown in the boxes - these are sometimes statistically defined (as documented in earlier Comstaff reports) and sometimes arbitrary.

Some gold information is also shown, including areas of interest defined by Comstaff (1984) in the Burns Peak area. Cyanide gold sampling highlights are indicated, including the North Pinnacles area and unexplained anomalies west of Pinnacles.

Faults and dislocations annotated on the plan are largely taken from the interpretation of the 1983 Dighem magnetic data. Finally, sample locations are shown for the 1986/87 soil augering programme, with some interpreted anomalous trends from the first phase of augering (to January 1987). The most recent phase of augering (May 1987) has not been added.

The extent of glacial coverage is a limitation on the overall geochemical interpretation; it is clear that quite large areas occur where geochemical response of the underlying lithologies is partially or totally masked. Glacial cover is not indicated on the compilation plan because of lack of precision as to limits; aerial photo interpretation often differs considerably from data recorded from early Comstaff sampling and geological mapping programmes. Major areas of glacials include a wide belt south of East Chester, trending parallel to strike and extending from the eastern boundary of the EL southwestwards before narrowing and swinging around to the slopes of Mt. Kershaw west of Chester mine. Another broad belt of glacials occur flanking the access road north of East Chester and east of Leo's Find. The area immediately north and west of Pinnacles is also strongly affected by glacial cover.

Local prospect area names are indicated in Fig. 50 and the following brief comments apply to specific areas -

North Pinnacles - On the western side of the North Pinnacles ridge strong linear lead anomalies are evident in Dundas Group sediments and volcaniclastics. Two EZ drillholes have apparently tested part of this zone. The anomalism appears to extend for some 2.5 km to the south-southwest, connecting with an anomalous zone east of the Shale Basin. Further linear anomalies on the eastern side of the ridge lie within rhyolites of the Central Volcanic Sequence. Results from recent cyanide extraction stream sediment sampling indicates spatially related gold anomalism. The area of interest bridges the boundary between two Exploration Licences, so immediate follow-up is difficult.

Shale Basin - Strong geochemical anomalism was recorded in the flat-lying Shale Basin area from early sampling on the Chester-Pinnacles-Silver Falls grid (1965-67); a maximum zinc value of 8.2% was recorded!. Comstaff carried out further work on the prospect in early 1984 and concluded that the anomalies were due partly to high-background values in black shales within the basin, and partly to hydromorphically introduced ions dispersed downslope from the western side of the North Pinnacles ridge. Redistribution of metal values is evident in the locally swampy environment with concentration of lead-zinc values in limonitic material. Some lithological control is confirmed by anomalies following the shape of the broad synclinal structure in the Shale Basin area. Rock chip samples (Appendix 7) demonstrate the high order of background lead-zinc geochemical values.

Pinnacles - This is the only prospect where massive sulphide mineralisation has been located, but the geochemical expression (EAA grid) is relatively subdued compared with, say, East Chester. Response

over the shallow-depth mineralisation at Browns is generally poor and this illustrates the difficulty of using geochemistry in ranking areas and as a direct guide to sub-surface mineralisation. The spotty results at Pinnacles are strongly influenced by variations in the local soil profile and may also reflect inherent patchiness of base-metal mineralisation in bedrock. Complete leaching of bedrock immediately below the humus layer occurs locally and sometimes there is no significant geochemical response in the Ao horizon above mineralisation exposed at one to two metres depth in costeans or old workings.

Burns Peak area - Sporadic gold values in soils occur over a broad northeast trending area. Follow-up work proved disappointing and there appears to be no concentrated zone where a 'gold-only' target can be pursued.

East Chester - A series of discontinuous sub-parallel east-northeast trending anomalous zones occur, with the strongest response present in the area tested by drillhole EAB4. Here a good linear anomaly extends over +700 metres, formationally controlled by the southern contact of a central andesitic lava sequence with pyroclastics and intercalated sedimentary lenses, including black shales. A steep westerly dip and facing is evident. Detailed geological control over the East Chester grid area is poorly understood but there appears to be no significant alteration associated with the anomalous geochemistry.

Hollway Pyrite - This zone lies between major grids at East Chester and Chester/Mt. Kershaw and has received very little exploration attention in recent years. Pyrite alteration was recorded in andesites near the Hollway River bridge, and a parallel zone of anomalous lead-zinc geochemistry is indicated just to the west, based on data from early sampling on the Chester-

Pinnacles-Silver Falls grid. Some 500 metres to the southeast further anomalism was indicated on the old Camp Charlie grid; glacial coverage is extensive and no follow-up had been attempted. The Hollway Pyrite Zone has been the focus of a recent soil augering programme, reported in Section 5.4; this work has provided much new information on the previous 'data gap' between Mt. Kershaw and East Chester.

Chester - Low order and sporadic base metal values occur around the fringes of the Chester pyrite mine and the trend extends southwards to Lake Rosebery. An anomalous zone at West Mt. Kershaw shows local high values associated with manganiferous concentrations; recent augering has failed to upgrade the fairly low-order base metal geochemistry. Most of the Chester-Mt. Kerhsaw grid area has a very subdued geochemical response, though occasional isolated higher-order values occur.

Rosebery Fault - The position of the fault can be approximately mapped out by a varying geological response of the rocks on either side, particularly where shales with high background values occur west of the fault. The fault plane is mineralised to some extent, at least in the southern half of the licence area. Recent augering on the Mt. Kershaw grid showed high lead and arsenic values at the fault sub-outcrop position; gold is not anomalous. Channel sampling of the fault zone exposed on the new Forestry road northwest of Pinnacles did not indicate any geochemical anomalism (Appendix 7).

5.2 Cyanide Gold Stream Sediment Sampling

A comprehensive stream sediment sampling programme for cyanide-gold extraction was carried out early in 1986 and fully reported in the previous Annual Report. A further brief programme was completed in May/June, 1986, to confirm and follow up various anomalous

values, and also to obtain a more detailed coverage over the North Pinnacles area. Sample locations are shown in Fig. 51 and results not previously submitted appear in Appendix 5.

Overall results from the cyanide survey tended to confirm gold anomalism in known areas of mineralisation, but gave few new directions. All values greater than 0.5 ppb have been annotated on Fig. 51. The Pinnacles zone, from Browns Tunnel to the Southern Trenches, was defined by the cyanide sampling, with lower order values also indicating East Chester as a general area of interest. Chester/Mt. Kershaw proved to be barren of gold, despite the extensive pyrite alteration system centred on the Chester Mine. Only sporadic, low-order gold anomalies are recorded from Area 3 and the eastern quadrant of Area 4.

The more recent sampling highlighted a well-defined zone of gold anomalism on the eastern side of the North Pinnacles ridge, extending outside the licence boundary. A poorly defined anomalous area was also indicated to the west of Pinnacles; duplicated positive results were obtained from two streams draining eastwards into the Marionoak River. The source area lies west of the Rosebery Fault in Dundas Group rocks and the origin of the gold is problematical. No mineralisation is known in this area and re-working of glacials may be occurring.

In conjunction with the cyanide gold survey a number of -80 mesh stream sediment samples were collected for base metal analysis. Sample locations and results not previously reported are included in Fig. 51 and Appendix 5.

5.3 Thunderbox Creek (Area 3)

Apart from mineralisation at the Sock Creek prospect previous exploration work in Area 3 has produced little encouragement. One location where further work appeared warranted was Thunderbox Creek, which drains into Animal Creek from the northern slopes of Mt. Block. An unconfirmed historical reference to barite mineralisation was apparently given support by stream sediment results from Comstaff's 1981/82 survey. Samples from two adjacent sites, 200 to 300 metres above the confluence with Animal Creek, were anomalous in barium and lead in the -80 mesh fraction (though not in the -20 + 80 mesh fraction).

Creek	Position	-80# (Cu, Pb, Zn, Ni,	-20# Ba, Ag, Sn, As)
Thunderbox	200m	12, 48, 40, 14	4, 9, 23, 10
		1093, 0.1, x, -	243, 0.2, 4, -
	300m	10, 48, 50, 15	4, 13, 30, 11
		442, 1.0, 3, -	205, x, x, -

1981 - 1982 Geochemical Statistics

Sample Screen Size		Background Values (80% of samples)	Enhanced Values	Highly Enhanced V
-80#	Cu	< 17 ppm	5% > 29 ppm	2% > 58 ppm
	Pb	< 20 ppm	10% > 30 ppm	3% > 46 ppm
	Zn	< 50 ppm	12% > 58 ppm	5% > 80 ppm
-20#	Cu	< 8 ppm	10% > 9 ppm	1% >100 ppm
				4% > 58 ppm
	Pb	< 12 ppm	5% > 20 ppm	4% > 25 ppm
	Zn	< 30 ppm	5% > 46 ppm	3% > 70 ppm

Results and statistics from Shaw, 1984.

In July 1986 a small grid was cut to allow for follow-up soil auger sampling. At the same time an additional 14 -80 mesh stream sediment samples were collected at 50 metre intervals, in an attempt to better delineate the area of interest (Fig. 52). Results from this sampling (included in Appendix 5) failed to confirm the previously reported anomalism and as a result no further work was done on the grid. The reported barite occurrence on Mt. Block thus remain enigmatic. This area will be effectively tested by the planned 1987 UTEM survey and any significant mineralisation is unlikely to remain undetected.

5.4 Soil Augering

Soil augering programmes were carried out in Area 4 at various times between November, 1986 and May, 1987. Work was done under contract by Nick Poltock, using a man-portable lightweight drill with a flow-through sampling system. A small 'core' sample of material is recovered from the base of the hole; in most cases this is C-horizon weathered bedrock but some samples may comprise weathered allochtonous material and on occasion glacial till and scree could not be penetrated.

The auger sampling had a dual purpose objective. Firstly it was intended to follow-up possibly anomalous responses detected by the UTEM survey; early time channel responses are indicative of a shallow source and a strong degree of geochemical anomalism could be expected if the response is due to mineralisation. A second objective was to do further testing of anomalous geochemical zones on old grids that had not been fully evaluated to date, ie. Hollway Pyrite and Camp Charlie grid, Mt. Kershaw West. At a later stage augering was also carried out west of Chester, in conjunction with alteration studies and geological interpretation.

In all 811 auger holes were drilled for a total of 1927.3 metres. At 37 other sites outcrop was visible and rock chip samples were collected for geochemical analysis. Full statistics of the augering are given in Table 1. Work on the Hollway Pyrite Zone and its extensions made up half of the total programme.

With any augering programme of this type there is always a compromise between the coverage possible at reasonable cost and the line and hole spacing. Twenty metre sample spacing was used in most cases, though this was locally closed down to ten metres. Line spacing was usually 200 metres, which is too great a separation to allow for realistic contouring of values. Fig. 53 shows the total auger coverage while Figs. 54 and 59 show 1:5,000 scale coverage of the Hollway Pyrite and Chester/Mt. Kershaw areas. Figures 55-58, 60-63 are provisional plots of metal values. All analyses of the material recovered from the base of the hole (with hole depths) are included in Appendix 6. A working plot showing interpreted rock type from auger chips is presented as Fig. 64.

No geochemical contouring has been attempted as this is rarely meaningful for C-horizon sampling unless very closely spaced sampling has occurred. Anomalous trend directions are frequently recognisable and some of these have been broadly indicated on the compilation plan (Fig. 50). Isolated high values need to be treated with caution as it is not always obvious whether bedrock has been reached. However, they are still of considerable interest as they may be indicative of structural leakage from deeper-level mineralisation. One sample from Line 82100N gave 2.55% combined lead-zinc, but follow-up failed to duplicate this result.

AUGER DRILLING STATISTICS

Area	Sample Nos	Rock Chips	No. Holes	Metreage
UTEM Follow-Up				
East Chester Far North Zone	8901-8914	-	14	54.2
East Chester Railway Zone	8915-8930	-	16	22.6
Line 81900N (Mt. Kershaw Grid)	9062-9076	-	15	19.8
Line 82100N West (Mt. K.)	9129-9147 9241-9254	2	31	66.1
Line 81100N (Mt. K.)	9183-9198	-	16	29.9
Line 79900N (Mt. K.)	9199-9219	-	21	26.9
Line 80300N (Mt. K.)	9220-9240	9	12	38.3
Geochem Follow-Up				
West Mt. Kershaw	8931-9061	1	130	246.3
Camp Charlie Grid	9077-9104	-	28	74.6
Hollway Pyrite Zone (+ N.E. and S. Extensions)	9105-9128 9148-9182 9301-9400* 9501-9747	24	384	1085.4
Chester Extensions	9255-9300 9401-9499	1	144	263.2
		37	811	1927.3

* Sample 9321 is a composite from 3 adjacent sample sites.

At many sites more than one attempt was made to penetrate to weathered bedrock. Only the sampled deepest hole is recorded in the above statistics.

Table 1

A deep-weathering zone is evident over some 500 metres 'strike extent' in a low-lying area south of the Hollway River bridge. Several holes on Line 82100N penetrated to deeper than 20 metres before intersecting possible weathered bedrock. The general trend of this zone is approximately north-south but deep weathering may be influenced on Line 82100N by a major northwest trending dislocation; base metal anomalism is present at this location.

The basic problem in most cases is that negative results from the TEM geophysical surveys largely invalidates further exploration work based on surface geochemistry. Only where really significant alteration is present associated with the anomalous geochemistry is sub-surface testing warranted at deeper levels. The Hollway Pyrite Zone stands out as being an alteration zone with anomalous geochemistry (sporadic at surface) that has not yet been drill tested. Isolated high base-metal values may possibly represent leakage from mineralisation at depth.

6. LINE CUTTING AND GRIDDING

The 1986 line cutting programme continued through to October, overlapping with commencement of the UTEM survey. Fig. 65 shows the location of grid pegs on the new topographic base. A framework of theodolite-surveyed base lines ensured fairly accurate ground location control in generally difficult terrain.

A breakdown of the 1986 line cutting additional to that previously reported is as follows:-

Double width survey base lines	4.61 km
New grid lines and loop lines	39.66
Re-opened grid lines	16.07
Total	60.34 km

The main areas of activity during the second half of 1986 were East Chester and North Pinnacles. Grid adjustments and cutting of loop lines were carried out on the Connection grid and at Chester/Mt. Kershaw; a small grid of 5.45 km was also cut at Thunderbox Creek in Area 3.

Contract line cutting recommenced at the end of January, 1987, in preparation for a second major geophysical programme later in the year. Work to date has been largely concentrated in Area 3, with subsidiary cutting carried out by BHP personnel in the eastern quadrant of Area 4.

Statistics for line cutting to the end of June, 1987, are shown below -

Area	Base lines	Intermediate base/loop lines	Grid lines	Walking tracks	Powerline clearing
Sock Creek	3.90	3.20	61.07	8.68	-
Mt. Block	4.28	10.14	56.63	6.85	4.22
	8.18	13.34	117.70	15.53	4.22

Overall total contract line cutting	158.97 km
BHP line cutting (Area 4)	10.22 km
	169.19

As previously survey work and pegging is done by company employees. Fig. 66 shows anticipated final coverage; as well as the 1986 grid layout.

7. GEOPHYSICS

7.1 UTEM Survey - Area 4

A UTEM III transient EM survey was carried out over the larger part of Area 4 during the period October - December, 1986. The survey was conducted by Lamontagne Geophysics of Sydney.

Approximately 173 line kilometres of data were read on lines 200 m apart with all lines being read at 50 m intervals (with some infill at 25 m). The vertical component was read at all stations and the horizontal component was read on some of the infill lines and adjacent to power and railway lines. The transmitter frequency was 26.230 Hz.

Loops used during the survey were generally rectangular and of the order of 1000 m x 1,500 m; readings were taken both inside and outside the loops. Loop and reading line locations are shown on Fig. 67. (Loops NW of Boco Ck in Chester-Pyrrhotite area

The field plots showing channels 5-10 on the top axis, channels 2-5 on the middle axis and channel 1 on the lower axis are included as appendix 8 and the symbols used are shown on table 2.

Continuously normalised plots have been produced for every line, whilst point normalised plots were produced for only a few lines. No significant conductors were located during the survey and those small anomalies noted on the profiles probably reflect resistivity contrasts at lithological boundaries. The most persistent of these small crossovers occur on the western side of loops 4, 5 and 6 and trace the alignment of the Rosebery fault in this area. This trace agrees well with the geologically inferred position of the fault. The Chester Pyrite Mine was tested by three separate loops and gave a very weak

LEGEND FOR UTEM PLOTS

Symbol	Channel number	Mean Delay Time (milliseconds) f=30Hz	f=26Hz	f=15Hz	f=13Hz
◇	10	0.025	0.029	0.05	0.058
△	9	0.05	0.058	0.1	0.115
✕	8	0.1	0.115	0.2	0.231
⅂	7	0.2	0.231	0.4	0.462
⅄	6	0.4	0.462	0.8	0.923
⅀	5	0.8	0.923	1.6	1.85
□	4	1.6	1.85	3.2	3.69
\	3	3.2	3.69	6.4	7.38
/	2	6.4	7.38	12.8	14.77
|	1	12.8	14.77	25.6	29.54

All channels are plotted as:

$$\frac{\text{Channel - reference}}{\text{base}} \times 100\%$$

For total field normalization: reference = 0

secondary : reference = primary component or Channel 1.

If Ch 1 symbol appears on plot then:

reference = primary for Chan 1
reference = Chan 1 for all other channels.

If no Ch 1 symbol is present then:

reference = primary component for all channels.

Normally base = primary field (total) at reading station.

If symbol ***> appears then base = primary field at reference station marked with symbol.

TABLE 2

response in all cases with the anomaly only persisting to channel 8. The overall shape of the plots for most lines reflects the highly resistive nature of the rocks in this area. In general there appears to be little effect from the limited glacials present, but the small crossovers at 300N on lines 200E and 0E in loop 1 are probably caused by the sediment/glacial contact at this locality.

The best of the anomalies located during the survey have been plotted on Fig. 67. (Chowter + Pennalles)

7.2 Physical Property Measurements

Dr. D.W. Emerson of the University of Sydney carried out various petrophysical measurements on several mineralised core and rock samples from Area 4, EL 5/63. These measurements included inductive conductivity, galvanic complex resistivity, percentage frequency effect (PFE - a measure of the IP response), dry bulk density (DBD), apparent porosity (PA) and magnetic susceptibility. These results are presented in Table 3. The magnetic susceptibilities measured were all virtually zero indicating that magnetic techniques would not detect this type of mineralisation. The dry bulk density and porosity data may be used to give a useful indication of the amount and type of sulphides present. The porosity data also indicates that in most of the samples the pore water would not be a major path for current flow. The inductive conductivity results indicate that the high grade sulphides show moderate to high conductivities. Assuming these sulphides were to lie within the range of investigation of the EM loop it would be expected that they would produce EM anomalies. Similarly the low to moderate grade sulphides have moderate to high PFE responses and would be expected to produce recognisable IP anomalies, assuming once again that the sulphides would lie at depths within the range of investigation of the IP array.

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BHP LOT 87/1 20/2/87

SAMPLE NO.	z m	GALVANIC 4 Electrode ρ @ 0.1 Hz Ωm	GALVANIC 4 electrode ∠ @ 0.1 Hz mrad (-ve)	INDUCTIVE σ @ 2.5 MHz S/m	PFE 0.1 – 1.0 Hz %	DBD g/cc (t/m³)	PA %
COSTEAN	16	60	142	1.9	20	4.34	3.8 (high)
EAF 3	37.20	172	58 (19 @ 1Hz)	2.2	6	3.75	17.0 (v high)
EAF 6	58.75	37	141 (65 @ 1Hz)	0.8	13	3.53	2.5
EAF 7	156.50	1,127	201	0.5	25	3.20	0.1
EAF 9	163.20	1,168	45	0.6	7	2.95	0.4
EAF 9	167.70	23	264 (112 @ 1Hz)	1.5	10	3.98	0.1
EAF 9	170.40	25	183 (52 @ 1Hz)	2.5	14	4.33	0.2
EAF 9	174.90	98	133	1.8	19	3.68	1.1
EAF 10	98.80	27	230 (84 @ 1Hz)	17.1	13	4.20	0.2
EAF 10	99.30	90	213 (80 @ 1Hz)	3.8	18	4.12	0.4
EAF 10	106.50	40	277 (109 @ 1Hz)	0.8	29	3.50	0.3
EAF 10	113.00	37	250 (103 @ 1Hz)	0.7	23	3.64	0.2
EAF 15	25.50	463	3	0.9	3	2.76	3.0
EAF 18	43.60	90	112 (37 @ 1Hz)	→ 0	8	3.45	1.2

COMMENTS : (1) Samples saturated in Sydney tap water $\rho_w = 60\,\Omega m$ T = 28°

(2) 1% PFE ≈ 6 mrad phase lag (approx) ≈ 6ms chargeability

(3) large phase jumps at 1Hz ⇒ rely on PFE data

(4) all magnetic susceptibilities very low [range 10 to 30 × 10^{-6} cgs

TABLE 3

8. BUTLERS ROAD - AREA 1

The Butlers Road prospect is located some 6 km southwest of Waratah. A DIGHEM survey commissioned by Comstaff in 1983 revealed a cluster of anomalies around a northerly projection of the Meredith Granite (see Fig. 68). A grid was cut in 1984 and detailed work comprised geological mapping, soil sampling, ground magnetics and a GENIE EM survey.

The local geological environment involves complexely shaped granitic intrusions into Crimson Creek formation metasediments and basic volcanics, with marginal tourmaline greisen alteration. Mapping revealed that the northern cupola connected to the main body of the Meredith Granite by a bridge of hornfelsed sediments. A strong pattern of geochemical anomalies radiates from the granite, with lead, zinc, tin, arsenic and silver the dominant elements.

The GENIE EM survey was carried out in September 1984 over six east-west grid lines with a 100 metre coil separation and readings at 20 metre intervals. There is good agreement between the ground EM results and the DIGHEM data; all anomalies from the aerial survey were ground located. The best overall response was anomaly 2740G which has a coincident magnetic anomaly. An interpretation of the ground EM by Scintrex stated that 'it is impossible to distinguish between the anomaly being about 70 to 100 metres wide and flat lying, or two near vertical sources close to the surface and about 50 metres apart'. Comstaff interpreted the anomalous response as being 'due to a horizontal conductor ..... less than 10 metres from surface ..... '. No follow up drilling was done. Plans and a discussion of geological, geochemical and geophysical surveys carried out by Comstaff are included in Shaw and Munro, 1984.

In late January, 1987, BHP drilled a 32 metre vertical diamond drill hole to test the coincident EM and magnetic anomaly. This was in part an experimental hole to evaluate

the capability of a man-portable drilling rig constructed and operated by a local contractor, N. Poltock.

Mineralisation was intersected from one metre below surface, consisting of sub-vertical veins of calcite-siderite-quartz with sphalerite, minor galena and cassiterite, and trace chalcopyrite. The host rocks are fine-grained hornfelsed sediments dipping at 30°; moderate pyrrhotite is present throughout both disseminated and in fractures. Vein mineralisation is minimal below 10 metres and because of a depth limitation of the drilling rig the hole was stopped without intersecting granite.

The following analyses were obtained:

	Zn	Pb	Sn	Ag
8.50 m at	1.65 %	0.27%	0.08%	29 g
including				
2.80 m	4.27%	0.71%	0.18%	71 g
and				
0.25 m	4.42%	0.91%	0.17%	74 g
and				
0.40 m	2.89%	0.09%	0.15%	21 g

A drill log is included in Appendix 9, together with analytical results.

A re-examination of the EM and magnetic anomalies indicates that the hole probably intersected the edge of a steep westerly dipping mineralised vein system. Inclined drill holes would be required to give an accurate indication of the width and grade of the system, but given the shallow depth the presence of significant tin makes these initial results encouraging. High tin values are known to occur locally on the granite contact - one selective sample of tourmalinised granite-porphyry collected by Comstaff assayed 7.79% tin.

Surprisingly low base metal values were recorded in auger samples over the area drilled, though tin is anomalous. In contrast Dighem anomalies 2710 B/C and 2690 C are spatially associated with very altered metasediments with strongly anomalous tin geochemistry.

Further work is planned on the Butlers Road prospect during the 1987/88 summer field season. This will include a programme of shallow depth inclined diamond drilling and some costeaning.

9. CONCLUSIONS AND RECOMMENDATIONS

Results of the UTEM survey by BHP over the western section of Area 4, and by Comstaff over the Pinnacles area, have proved disappointing, with no significant anomalies located.

While the Pinnacles area has been shown to contain massive sulphides and local to patchy veining and dissemination of sulphides, geological studies indicate that the massive sulphide mineralisation is pod-like in nature. Lack of continuity of sulphides is also supported by results from downhole Sirotem studies (BHP, 1986). Potential may exist downplunge at the andesite-rhyolite contact in Thomas' Syncline and/or down-dip at stratigraphically lower positions such as defined by the Thomas' Tunnel and Southern Trenches mineralization. The UTEM survey should have adequately tested for the presence of a +5 M tonne conductive sulphide body to at least 200 metres.

The contact of the East Chester andesite and andesitic volcaniclastic unit with overlying mixed sediments and dacitic and rhyolitic volcaniclastics is another zone that has some potential for exhalative activity. However holes EAB1 and EAB2 drilled by Comstaff recorded minor disseminated sulphide only in the overlying mixed suite, with little evidence for significant alteration or mineralization in the andesite. There may be potential down dip towards the axis of the Burns Peak Syncline.

Moderate levels of zinc and lead are present locally within the East Chester andesite. These may be a reflection of elevated background levels due to contained sulphides, but they may in part reflect weak distal mineralization effects related to seafloor venting of oreforming fluids. The structure of the andesite unit is unknown, but it was suggested earlier that a series of tight fold structures may explain the odd shapes of the andesite outcrop pattern at its western edge between Hollway Rivulet and hole EAB2.

The Hollway Pyrite Zone does appear to occur towards the base of the andesite unit but alteration extends for over 100 metres in width across the andesite to a favourable dacite contact to the west. A weak lead-zinc soil geochemical anomaly is slightly displaced from the alteration zone, but appears related to it. The sequence is assumed to be north-west facing at this point though the only evidence for facing is from hole EAB4, 2.3 km to the northeast at approximately the same position. Since most fold structures in the area plunge at about 20° to the north or northeast, the alteration zone at Hollway Pyrite is assumed to do the same. A diamond drill hole may be warranted to test the alteration system at approximately 300 m vertical depth and determine whether there is an increase in the tenor of alteration and mineralisation down plunge. This hole would also provide structural information that would help elucidate any structural complications within the andesite-dacite sequence. Such an understanding may be critical to further exploration drilling within and adjacent to the andesite. Early IP surveys by Comstaff covered the eastern part of the Hollway Pyrite Zone and further IP work may help define the alteration system down plunge and assist with drill targeting.

The Chester area is now suggested to exhibit broad scale folding with a significant anticlinal axis defined west of the mine and extending to the east of Bastyan Dam. This anticline greatly exaggerates the thickness of the altered dacites. The anticline gives some credence to the idea

that the Rosebery Horizon, which is at a stratigraphically lower level, may be present at depth beneath the Chester Sequence. On plunge trends this is probably at depths at 500-1000 metres and is not a valid target unless upfaulted.

The bedrock auger sampling at Chester failed to indicate any significant geochemistry that would guide the siting of a drillhole. Comstaff investigated higher levels of lead-zinc at South Chester and found sphalerite-galena veining that appeared to post-date the pyritic alteration system. This veining may be related to stratigraphically higher mineralization since removed by erosion or be remobilized from a lower stratigraphic level. Comstaff drilling has tested the assumed Chester mineralized horizon at shallow depths to the south of the Chester Mine on the east limb of the anticline. The west limb position is untested, as is the downplunge continuation of the pyritic chert mineralization at Chester Mine. Without some support from UTEM and geochemistry, no definite drill target is apparent. If there is stacking of mineralized systems in the Chester area, then there may be a stratigraphically lower position (even above the Rosebery Horizon) that is of exploration interest and remains untested by the previous shallow drilling. Rationalization of S-isotope data now being processed may help clarify the significance of lead-zinc in the essentially barren Chester mineralising system.

In Area 3 veining of sphalerite-galena at the Sock Creek Prospect is associated with quartz and carbonate and appears to be related to faulting and shearing. The host rocks show no hydrothermal alteration away from the veins and do not appear to offer any potential for hosting a stratiform sulphide deposit.

Results from a shallow diamond drill hole at Butlers Road in Area 1 indicate some near-surface potential for granite-related tin-zinc-lead-silver mineralisation.

10. FUTURE PROGRAMME

Grid line cutting is ongoing, with a further 110 line kilometres scheduled for the period July-September to achieve the overall coverage outlined in Fig. 66.

A second major UTEM survey is planned for the period September-November. Almost total coverage of the volcanics within Areas 3 and 4 will have been achieved at this stage, excepting small areas where coverage is prevented by extreme topographic or cultural features. IP may be warranted over specific zones.

Results from sulphur and lead isotope samples currently being analysed may have a bearing on further work in the Chester and Hollway Pyrite zone.

We anticipate awaiting results from the forthcoming UTEM survey before making firm decisions on the extent and location of diamond drilling required prior to the licence expiry date. Downhole TEM logging will be carried out on all holes drilled.

Further work is planned for the Butlers Road prospect in Area 1. This will include limited costeaning and a programme of shallow-depth inclined diamond drill holes.

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APPENDIX 1

Summary Drill Logs
Pinnacles - East Chester Area

HOLE PP31

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	35.20	No core.	
35.20	44.81	Very poor core recovery (1.22m only) in quartz-phyric rhyolitic crystal tuff and ash.	rct, ash
44.81	74.07	Ignimbritic feldspar ± quartz-phyric dacitic crystal tuff and breccia to lapilli unit, pink to green, moderate sericite and chlorite alteration.	dict
74.07	91.36	Probable feldspar-phyric dacitic lava and lava breccia, rare flow banding.	dc
91.36	93.50	Probable volcaniclastic dacitic lithic tuff to breccia, some chloritic pumice debris.	dlt
93.50	113.39	Feldspar-phyric dacitic breccia, probably a lava.	dc
113.39	128.32	Dominantly shale, cherty shale and sandstone with quartz-phyric lithic tuff zones, particularly 124.76-125.50 and 127.64-128.32. Bedding in sandstone-ash at 123.44 is at 45°.	sh, ss
128.32	186.23	Andesitic lava breccia with cherty veining 128.32-129.16 and some associated sphalerite-galena-pyrite, sericite and chlorite altered. Locally vesicular with carbonate in vesicles and carbonate veining. Note core split from 153.31-167.03 with prominent cherty veining and silicification (core recovery very poor) and strong sericite alteration. Some prominent pyrite veining and dissemination often has chlorite associated and local chalcopyrite. Sphalerite-galena forms segregations and veinlets probably as an overprint, rarely in carbonate veins. 167.03-186.23 is variously sericite-chlorite altered andesite with pink bleaching. The andesite appears to be a lava breccia. Fine grained pyrite to 1% is associated.	and

E.O.H.

SUMMARY DRILL LOGS

HOLE PP34

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	16.76	No core.	
16.76	36.27	Sericite-chlorite altered feldspar andesite? Loss of core and no core blocks makes limits of unit difficult.	and?
36.27	89.79	Prominently sericitized dacitic lapilli tuff, silicified in part with patchy fine grained pyrite dissemination and local segregations and veinlets of sphalerite and galena. Core split 71.32-73.76. Note prominent pyrite veining 82.60-85.75.	dlt
89.79	95.10	Sericitic quartz-phyric rhyolitic crystal tuff with some patchy to prominent sphalerite-galena veining and disseminated pyrite.	rct
95.10	99.36	Sericite and silica altered dacitic lapilli unit? Probably with cherts and some cherty shale 96.01-96.62. Core split 95.10-98.45 with prominent local pyrite, sphalerite and galena veining and segregation.	dlt?, sh
99.36	101.19	Dominantly shale and chert to cherty ash with some sericitic dacitic lapilli tuff. Local strong veining of sphalerite, galena pyrite,chalcopyrite.	sh, chert dlt
101.19	110.64	Sericitic feldspar dacitic lapilli to vitric crystal tuff with patchy pyrite dissemination and veining of sphalerite-galena.	dlt, dvt

E.O.H.

SUMMARY DRILL LOGS

HOLE PP36

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	12.19	No core.	
12.19	30.48	Sericite-chlorite altered feldspar andesite.	and
30.48	38.10	?	
38.10	72.09	Quartz-feldspar-phyric rhyolitic lava breccia?, or volcaniclastic breccia, moderately sericitized, weak pyrite dissemination.	Rb
72.09	107.29	Sericite quartz-phyric? rhyolitic? dacitic lapilli tuff with sericitic pumice clasts, silicified with patchy dissemination and segregation of pyrite, sphalerite, galena and rare chalcopyrite.	dlt
107.29	121.92	Quartz-phyric sericitic and locally silicified rhyolitic crystal tuff and lapilli tuff with prominent pyrite veining and dissemination especially 108.51-115.82. Sphalerite and galena veining and local chalcopyrite more prominent 116.74-121.92.	rct, rlt
121.92	126.80	Predominantly host horizon shale, chert and ash, little or no mineralization.	sh, ash
126.80	135.64	Prominent silicified (white) dacitic lapilli tuff with prominent sphalerite-galena veining.	dlt
135.64	150.88	Dominantly sericitized feldspar ± quartz-phyric dacitic lapilli tuff to crystal tuff, probably some quartz-phyric zones, disseminated pyrite to 1%.	dlt, dct
150.88	154.23	Typical sericitic dacitic lapilli tuff with pumice clasts, disseminated pyrite to 2%.	dlt

E.O.H.

HOLE PP39

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	45.72	Sericitic dacitic lapilli tuff, probably some finer ash zones with weak pyrite dissemination and a few segregations of sphalerite-galena.	dlt
		E.O.H.	

HOLE PP40

0	6.10	Hanging wall dacitic lapilli tuff, sericitic, no significant mineralization.	dlt
6.10	11.89	Main mineralized zone of cherty ashes with veining of pyrite, sphalerite and galena, locally semi-massive to massive, some may be stratiform but most is not.	ash
11.89	24.38	Typical sericitic dacitic lapilli tuff with dissemination and veining of pyrite, spahlerite and galena (moderate to 5%).	dlt
		E.O.H.	

HOLE PP41

0	51.82	Dominantly sericitic dacitic lapilli tuff and ash with ash zone 31.70-32.31, patchy segregation and dissemination of pyritic, sphalerite and galena mainly concentrated 33.22-37.19.	dlt, ash

SUMMARY DRILL LOGS

HOLE PP42

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	36.58	Sericitic and chloritic feldspar-phyric andesite.	and
36.58	60.66	Pink quartz-feldspar rhyolitic volcaniclastic breccia with pink vitric rhyolite fragments in a finer matrix, quite illsorted and suggestive of mass slide deposit.	Rb
60.66	64.16	Predominantly shale mixed with rhyoltic volcaniclastic material and fragments.	sh, rct
64.16	87.78	Rhyolitic volcaniclastic breccia gradational locally to lithic crystal tuff, moderately sericitized. Rare sphalerite-galena veinlets 77.72-78.64.	Rb, rit
87.78	98.45	Dominantly volcaniclastic rhyolitic crystal tuff.	rit
98.45	104.55	Rhyolitic lithic crystal tuff to breccia.	rtl, Rb
104.55	118.87	Dominantly sericite-chlorite altered rhyolitic crystal tuff to crystal lithic tuff.	rit, rclt
		No core seen beyond this depth.	

HOLE PP45

0	18.29	No core recovered.	

SUMMARY DRILL LOGS

HOLE PP46

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	3	No core.	
3	6	Probable sericitic dacitic lapilli tuff.	dlt
6	9	Quartz-phyric sericitic rhyoltic tuff with good cleavage at 50°.	rct
9	13.7	Cleaved sericitic ash to lapilli tuff.	ash, dlt
13.7	20.1	Prominent sericite-silica altered dacitic? lapilli tuff with prominent sphalerite-galena, pyrite and local chalcopyrite veining and segregations.	dlt
20.1	21.2	Fine grained ash (sericitic).	ash
21.2	35.1	Prominently sericitic dacitic lapilli tuff to lithic tuff with foliation at 45° (strong), fine grained pyritic dissemination to 2%.	dlt
35.1	45.72	More massive to weakly foliated sericitized dacitic lapilli tuff, weak pyritic dissemination.	dlt

HOLE PP48

0	16.15	No core.	
16.15	23.16	Mixture of pink quartz-feldspar-phyric rhyolitic crystal tuff and lesser ash to cherty bedded shale (mass flow unit).	rct, ash, sh

HOLE PP50

0	15.24	Weathered feldspar andesite. No core from 7.92-15.24 so cannot be sure of extent.	and
15.24	25.91	Core recovery very poor in weathered rhyolitic crystal tuff.	rct
25.91	36.88	0.46 m of core only recovered, sericitic dacitic lapilli.	dlt

HOLE PP51

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	5.97	No core.	
5.97	23.04	Very poor core recovery in sericite-chlorite altered dacitic lapilli tuff with vague fiamme. Some local pyrite, especially 6.10-12.19.	dlt
23.04	58.09	Quartz-feldspar rhyolitic crystal lithic tuff debris flow to breccia with local large shale clasts and shale mixed with rhyolite lithics. Local gradations to ash with apparent up hole facing. Moderately sericitic.	rclt, Rb
58.09	60.05	Predominantly fine grained ash, locally slumped.	ash
60.05	60.35	Coarse volcaniclastic rhyolitic breccia with admixed rhyolite and shale.	Rb
60.35	60.95	Fine grained volcaniclastic ash to lthic ash.	ash
60.95	68.28	Volcaniclastic rhyolitic breccia and ash mix. Note large vesicular andesite fragment? 66.22-66.40.	Rb, ash
68.28	68.88	Bedded tuffaceous shale with bedding at 45°.	sh
68.88	73.76	Volcaniclastic rhyolitic (quartz-feldspar-phyric) breccia with admixed shale locally and some finer ash. Facing uphole.	Rb, ash, sh
73.76	77.65	Volcaniclastic rhyolitic crystal tuff grading into lithic crystal tuff incorporating shale in matrix locally.	rct, rlct
77.65	79.25	Dominantly ash to lithic ash with some shale fragments.	ash
79.25	81.23	Dominantly volcaniclastic quartz-feldspar rhyolitic crystal tuff. with some lithics.	rct
81.23	92.66	Fine grained bedded rhyolitic ash and shale with a few lithic zones. Bedding at 81.38 is at 50°.	ash, sh
92.66	95.10	Volcaniclastic rhyolitic breccia with large rhyolite fragments in an ash matrix.	Rb
95.10	96.01	Fine grained bedded ash with bedding at 45°.	ash
96.01	114.83	Coarse rhyolitic mass flow breccia with ash matrix, grades to lithic crystal tuff.	Rb, rct
114.83	115.67	Predominantly fine grained ash.	ash
115.67	118.87	Rhyolitic crystal tuff, moderately sericitic.	rct

E.O.H.

SUMMARY DRILL LOGS

HOLE PP52

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	3	No core.	
3	9.1	Weathered sericitic rhyolitic? ash or dacitic? ash. Minimal recovery.	ash
9.1	18.9	Sericitized and silicified dacitic lapilli tuff with rare pyrite dissemination and trace sphalerite-galena.	sltc

HOLE PP59

0	48.62	About 3m of weathered feldspar andesite recovered.	and
48.62	60.35	Sericitic dacitic lapilli tuff, quite cleaved, patchy silicification, local disseminated pyrite and segregation of sphalerite and galena.	dlt
60.35	74.68	Sericite and chlorite altered pumiceous dacitic lapilli tuff.	di, lt
74.68	88.09?	No core.	
88.09?	98.45	Bimodal pink to green rhyolitic breccia with quartz-feldspar-phyric rhyolite and chloritic feldspar dacite lithics set in a finer matrix.	Rb
98.45	98.98	Volcaniclastic quartz-feldspar rhyolitic-breccia with pink vitric rhyolite clasts and some shale clasts in a finer matrix.	Rb, sh
98.98	99.06	Fine grained bedded ash with some lithics. Bedding is at 67°.	ash
99.06	101.35	Pink rhyolitic breccia.	Rb
101.35	106.58	Finer grained vitric rhyolitic ash gradational to crystal lithic tuff.	ash, rct
106.58	118.46	Quartz-feldspar-phyric rhyolitic breccia with pink rhyolite and chloritic rhyolite fragments in a finer matrix. Note large shale fragments 109.42-110.03. Note some disseminated pyrite near 107.29.	Rb
118.46	121.92	Sericite-chlorite altered feldspar ± quartz-phyric dacitic lithic to lapilli tuff with pink vitric dacite and chloritic feldspar dacite lithics in a finer matrix.	dtl, dct

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP1

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	192	*Interbedded shales and sandstones of the Rosebery Group.* Note 187.40–189.90 quite sheared and may be approaching Rosebery Fault.	

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP2 (redrill)

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
35.97	87.00	Sericite-chlorite-feldspar ± quartz dacitic crystal tuff or dacite, 1-2% py from 70-80. Probable fault breccia zone 86.5-87.00.	dc
87.00	90.08	Quartz-feldspar-phyric rhyolite crystal tuff? with medium to coarse ovoid quartz phenocrysts.	rct
90.08	91.74	Fine grained vitric tuff or ash, contact at 80°.	rvt
91.74	93	Rosebery Fault zone in black shales	Sh
93	109.73	Black shales and interbedded sandstones.	Sh-SS

E.O.H.

HOLE CP7

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	6	No core.	
6	64.50	Porphyritic feldspar andesite, sericite and chlorite altered throughout with some local breccia fabric. Vuggy in part with some carbonate and local carbonate and quartz veinlets. Weak dissemination of pyrite (1.5%). Some of vugs may be vesicles.	and
64.50	71.05	Fine grained ash and sericitic lithic tuff with fiamme of probable feldspar-phyric affinity, quite schistose with local pyrite dissemination and segregations of sphalerite and galena.	ash, dilt
71.05	92.70	Prominent sericitic welded ignimbritic lapilli tuff of dacitic affinity with welded sericitic pumice lithics. A pink carbonate alteration as clots is present 71.05-78.0 in particular. Some local chlorite alteration as an overprint. Note unit varies in places to finer ash in character. Pyrite veining and dissemination occur throughout to 3%. Note chlorite alteration patches 84.65-85.10 and 87.70-87.95. Some local segregations of sphalerite-galena.	dilt
92.70	98.60	Fine grained feldspar ± quartz-phyric ash and crystal lithic tuff, sericitized and partially silicified with patchy pyrite dissemination and veining and locally prominent red brown sphalerite, chalcopyrite and galena veining and segregation often in association with carbonate and silica.	ash, dclt
98.60	122.29	Distinctive mass flow deposit of rhyolitic lithic crystal tuff comprising pink vitric fragments, sericite glass shards, quartz-feldspar rhyolite and crystal tuff clasts, quartz and feldspar crystals and local large shale clasts. Matrix is minor. Some grading evident 114.15 suggesting uphole facing. The interval 114.80-115.75 is dominantly shale (probably a large block). Other graded units to 122.29 all indicate an uphole facing. Note a classic breccia unit at 122.29 with quartz-feldspar rhyolite lithics and local but rare vesicular andesite fragments and shale fragments displays a classic uphole fining. Disseminated pyrite to 0.5%.	rlct
122.29	123.32	Mix of fine grained cherty siltstone and sandstone showing slump and microfaulting features.	Sl-SS
123.32	123.57	Coarse mass flow breccia of quartz-feldspar rhyolite, shale, vitric rhyolite and rare andesite fragments in finer grained crystal matrix. Note rare segregations of sphalerite.	Rb
123.57	124.50	Dominantly fine grained sandstone to cherty ash detritus.	SS-ash
124.50	127.90	Coarse breccia mass flow of vitric quartz-feldspar rhyolite fragments, sericitic quartz-feldspar crystal tuff fragments, and shale fragments set in a shaley matrix.	
127.90	130.60	Predominantly shale showing slump features and incorporation of fine grained tuffaceous sandstone zones and lithics.	Sh
130.60	140.00	Coarse mass flow breccia of unsorted quartz-feldspar rhyolite and crystal tuff fragments and shale fragments enclosed in shaley matrix. Some weak pyrite dissemination and rare segregations of sphalerite and galena.	Rb

HOLE CPZ (Cont.)

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
140.00	146.60	Dominantly finer grained ash to crystal tuff and local lithic crystal tuff, the finer distal units of the rhyolitic mass flows. Note bedding at 146.0 is at 50°.	ash, rct
146.60	153.30	Medium grained lithic crystal tuff passing down into coarser breccia unit with dominant quartz-feldspar rhyolite and crystal tuff fragments, some shale fragments in shaley crystal tuff matrix. Facing uphole. Minor pyrite dissemination.	rclt, Rb
153.30	162.00	Dominantly fine grained lithic crystal tuff to ash, the finer distal part of mass flow deposit of rhyolitic affinity. Strong slump features. Bedding at 160.60 is at 5°.	rlct
162.00	197.50	Dominantly shale with intercalation of sandstone derived from the mass flows and a few large rhyolite blocks near 164.00. Note facing 169.0 and 171.0 is uphole. The sandstone is often graded and appears to indicate uphole facing. Slump features and micro faulting are common. Note breccia in shale 189-190 (sedimentary). Bedding at 194 is at approx 45°. Note sphalerite veinlets in shale 194.70-197.50 with sericite associated.	Sh
197.50	200.70	Welded? dacitic ignimbrite, prominently sericitized, but with locally visible feldspars and wispy welded shards and fiamme. Cherty veining is localized with partial to complete replacement of original sericitic fabric. Sphalerite, galena and pyrite veining occur locally and a weak pyrite dissemination. This could be an important alteration system.	dilt

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP9

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	13	No core.	
13	14	Locally silicified and sericite altered shale incorporating lithics of sericitic dacitic fiamme (medium to coarse grained). Disseminated pyrite to 5% and local segregations of sphalerite and galena.	sh, dilt
14	39.20	Black shale, bedding at 18.7 is at 5°, at 20 is at 65°, at 21.0 is subparallel to core axis, at 26 is at 45°, at 31.50 is at 5°, at 34.0 is subparallel to core axis. Locally silicified and sericitized with some pyrite, patchy quartz veinlets, frequently network in character, some sphalerite may be associated or sphalerite forms local agregations. Note some local bedded fine grained syngenetic pyrite. The zone 36.75–38.20 is sheared and crumbly and may be fault zone.	sh
39.20	39.60	Sericitic feldspar dacite or dacitic tuff with quartz veinlets, minor pyrite.	dt
39.60	50.45	Black shale with bedding subparallel to core axis near 40.0 and at 40° near 48.0.	Sh
50.45	53.90	Quartzo-feldspathic reworked tuff, 1% pyrite dissemination, some shale zones, sphalerite-galena-pyrite veinlets.	rct
53.90	57.20	Bedded ash of dominantly feldspar-phyric affinity with bedding at 55.0 at 30°. Note some sericite-silica alteration, pyritization and apparent stratabound pyrite near 56.50 (8% pyrite).	ash
57.20	59.25	Prominently mineralized sericite-silica altered feldspar-phyric dacitic lithic tuff with pyrite veining and dissemination 15%, local moderate sphalerite-galena, minor chalcopyrite.	dtl
59.25	61.85	Bedded sericitic-silica altered ash with pyrite veining and dissemination for 5%. Bedding subparallel to core axis.	ash
61.85	67.94	Feldspar-phyric dacitic crystal tuff to crystal lithic tuff (local cherty lithics), prominently sericitized, local spotty carbonate alteration, pyrite-silica veins and alteration (50% pyrite), local segregations of sphalerite and galena. Note bedding at 61.90 is at 48°. Note prominent sphalerite (red brown) – quartz veinlets near 67.30.	dct, dclt
67.94	71.50	Fine grained dacitic lithic crystal tuff to lithic tuff with sericitic fiamme, vitric fragments, prominently sericitized in part with spotty carbonate, disseminated pyrite to 10%, local veins of sphalerite-galena 66.4–67.60.	dlct, dtl
71.50	78.35	Fine grained vitric ash, locally bedded with bedding at 76.0 at 53°, locally gradational to lithic crystal tuff.	ash

HOLE CP9 (Cont.)

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
78.35	111.05	Dacitic lapilli tuff with welded fiamme lithics (some to breccia size) strongly silicified and sericite altered with veining and segregation of pyrite (5-8%), sphalerite-galena and local chalcopyrite. Note prominent sphalerite vein 79.90. Pyrite decreases to 3% by 90.	dlt
111.05	119.40	Prominently sericitic dacitic crystal tuff to crystal lithic tuff with sericitic fiamme, patchy weak to moderate segregations and veinlets of sphalerite-galena associated with silica.	dct, dclt
119.40	158.40	Dacitic lapilli tuff with fine to coarse fiamme, prominently sericitized and silicified with siliceous nodule alteration locally accompanied by pyrite (1-3%), rare sphalerite-galena apart from galena sometimes associated with carbonate in coarse carbonate veins (some quartz-carbonate) especially 136-141. Foliation defined by fiamme varies from subparallel to core axis to 15° approx.	dilt

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

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HOLE CP10

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	1.5	No core.	
1.5	114.20	Prominently sericitized dacitic lapilli tuff with sericitic to locally chloritic fiamme. Silicification evident 19-63 producing nobly fabric in part. Pyrite weak to trace dissemination, rare local sphalerite-galena veinlets. Some carbonate veins 100 onwards.	dlt
114.20	116.20	Probable quartz-phyric rhyolitic lithic tuff with vitric lithics in a finer sericitic hosts.	dlt
116.20	146.20	Moderately sericitic vitric dacitic lapilli to lithic tuff with vitric and sericitic pumice fragments set in a finer matrix. Patchy pyrtie dissemination and segregations of sphalerite-galena.	dlt
146.20	147.10	Porphyritic feldspar dacite with feldspars completely saussuritized. Contacts at 45° and 30° - probably a dyke.	dc
147.10	149.70	Quartz-phyric rhyolitic lithic crystal tuff.	rlct
149.70	156.20	Feldspar-phyric dacitic crystal lithic tuff with prominent cherty silicification patches and prominent local pyrite, sphalerite and galena veining (pyrite 3%).	dclt
156.20	162.05	Sericitic vitric feldspar-phyric dacitic lapilli tuff with fine grained sericitic fiamme.	dlt
162.05	162.15	Fault zone breccia in broken dacitic lapilli.	dlt
162.15	167.70	Fine grained, locally bedded cherty and sericitic dacitic ash with some local fine lithics. Some local fine grained pyrite veining to 2%.	ash
167.70	195.15	Typical ignimbritic vitric feldspar-phyric dacitic lapilli tuff with sericitic pumice clasts throughout, weak to moderate sericite alteration. Some trace pyrite.	dvilt

E.O.H.

HOLE EAB2 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
78.23	79.25	Fine grained bedded ash, locally lithic with fiamme - probably dacitic. Bedding at 78°	ash, dit
79.25	79.85	Mainly bedded black shale	Sh
79.85	88.55	Fine grained bedded ash, local coarser zones. Bedding at 86.75 is at 70° and at 88.20 is at 43°.	ash
88.55	89.10	Feldspar ± quartz lithic crystal tuff with pink feldspar-phyric clasts and chloritic pumice clasts.	dlct
89.10	89.45	Fine grained bedded ash.	ash
89.45	90.83	Coarse dacitic lapilli unit grading to finer lithic crystal tuff. Uphole facing.	dlt dtl
90.83	94.60	Dominantly fine grained dacitic ash and ash with coarse lithics. Bedding appears slumped.	ash
94.60	98.05	Feldspar-phyric ash passing into coarser lithic crystal tuff. Facing uphole.	ash, dlct
98.05	99.80	Fine grained bedded ash, slumped	ash
99.80	181.05	Distinctive pink feldspar dacitic crystal lithic tuff, sericitized, local dark chloritic lithics?, probably welded in part. Note remarkable homogeneity, coarser lithics 172 onwards, andesitic lithics from 175.40 (scattered).	dclt
181.05	197.65	Prominent vesicular andesite breccia of chlorite glassy to vesicular fragments. Carbonated vesicles. Probable lava breccia at flow front.	and
197.65	229.50	Massive vesicular andesite-basalt, probably pillowed. Note fuchsite near 226. Carbonate veined, carbonate in vesicles, trace sulphides.	and

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAB3

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	3.0	No core	
3.0	10.10	Grey, coarse quartz-feldspar porphyry intrusive, weakly sericite altered, some quartz-chlorite veinlets.	QFP
10.10	16.05	Grey green to pink feldspar ± quartz-phyric dacitic welded? ignimbritic lapilli tuff with abundant sericite-chlorite altered fiamme in flattened wispy shapes set in a finer matrix. Coarse sphalerite, galena and pyrite veinlets. The compacted fiamme define a foliation at 47°.	dilt
16.05	215.00	Pink to green quartz-feldspar-phyric rhyolite lava and lava breccia. A distinct lava breccia 16.05-29.40, more massive and locally flow banded 29.40 - 50 with some autobrecciation. Flow banding at 49.70 is at 22°, at 52.50 is at 40°. Note some prominent cherty silicification and cherty silica veining often with associated pyrite, galena and sphalerite especially 30 - 47. Some sphalerite-galena-quartz veins crossout the earlier silica-pyrite. The rhyolites are quite vitric 47 - 106 with some sericite alteration, alteration of feldspars and patchy fine network silica veining with local concentrations of sphalerite-galena-pyrite. Locally the silicification produces a breccia fabric. Lava breccia 109-125. Flow banding 106.70 is at 43°, at 130 is at 46°. Note 125.2 onwards, dominantly massive to locally flow banded and weakly autobrecciated vitric rhyolite lava with feldspar phenocrysts characteristically sericitized, local silica veinlets, distinctly pink coloured 188-215 with some chlorite alteration Some weak galena-sphalerite associated with quartz veins locally, but minor. Flow banding at 158.20 is at 38°, at 167 is at 25°, at 184.5 is at 40°, at 200.5 is at 43°, at 208.5 is at 44°.	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAB4

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	15	*Micaceous sandstone, siltstone* and shale	SS-sh
15	77.05	Weathered feldspar-phyric dacite becoming fresher from 76.90 m. The unit may contain quartz microphenocrysts locally.	dc
77.05	94.55	Predominantly fine grained sandstone, bedded in part with shaley bands locally. Base of oxidation near 78m. Bedding at 81.00 is at 50°, at 87.30 is at 70°. Facing at 88.89 possibly up hole. Facing at 91.10 uphole (grading). Note 94.55 is base of sandstone unit grading up hole.	
94.55	100.99	Dominantly shale to shaley sandstone, massive to weakly bedded. Possible flame structures in sandstone bed - shale contact at 95.40. Suggest uphole facing.	Sh
100.99	101.73	Sandstone, fine to medium grained, shows slump features appears to fine down hole - possible down hole facing. Contact at 100.99 is at 62°. Contact at 101.73 is at 90°.	SS
101.73	105.50	Shale, generally massive, but bedded at 74° near 105.40	Sh
105.50	107.55	Fine grained sandstone with local shale fragments and slump fabrics	SS
107.55	109.47	Shale showing contact at 90° and grading downhole into medium grained *sandstone* i.e. uphole facing. The graded unit extends 107.55-107.97.	SH
109.47	109.69	Graded unit passing from shale into coarser sandstone i.e. a complex graded turbidite unit. Bedding at 109.69 is at 90°.	Sh-SS
109.69	110.80	Graded unit of sandstone passing to shale, uphole facing. Bedding at 110.15 is at 86°.	Sh-SS
110.80	112.90	Graded unit passing from shale down into sandstone, uphole facing.	Sh-SS
112.90	114.00	Graded unit as above facing uphole.	Sh-SS
114.00	115.88	Graded unit as above, but finer grained, shale base obviously scoured	Sh-SS
115.88	117.50	Graded unit with slump folded fabric involving carbonate rich sandstone bands containing pyrite, possibly sphalerite blobs at 116.37 The shale unit is moderately rich in carbonate.	Sh-SS
117.50	117.70	Shale unit showing fault trunscation at 117.70 as graded unit does not continue into sandstone and core is broken.	Sh
117.70	118.37	Sericitic andesite with relict chloritic patches, carbonate veinlets with some pyrite, disseminated pyrite to 2%. This could be a large block?	and
118.37	119.40	Sandstone unit with local shale fragments, appears sheared and silicified near 118.37 and contact at 119.40 with andesite is broken. Note andesitic detritus incorporated 119.30-119.40 confirms uphole facing with scouring of andesites by this sediment.	SS

HOLE EAB4 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
119.40	121.05	Andesite hyaloclastite breccia with mixture of vesicular chlorite andesite, sericitic andesite and porphyritic feldspar andesite fragments.	and
121.05	122.14	Andesite, more massive fabric with some shale included, minor pyrite dissemination (<1%).	and
122.14	123.79	Andesite hyaloclastite? prominent sericite altered with fine flecks of carbonate (cf EAF 9, EAF 14 footwall), local pyritic impregnation and veinlets to 2% with minor red brown sphalerite.	and
123.79	124.63	Massive fine to medium vesicular andesite, prominently sericite and chlorite altered.	and
124.63	129.06	Andesite hyaloclastite with fine grained sericite altered angular glassy fragments and bleached sericite vesicular fragment, prominent carbonate veining, minor disseminated pyrite (1%).	and
129.06	134.88	Massive andesite, chloritized with variable sericite alteration and bleaching, vesicular in part, local carbonate veins, pyrite veinlets and patchy dissemination to 1%, minor local pink K feldspar? alteration.	
134.88	135.79	Andesite exhibiting partial pink K feldspar – haematite alteration of an original chloritic andesite, local minor pyrite dissemination.	and
135.79	144.90	Pillowed andesite, vesicular with pillow margins marked by altered chilled andesite to several cm width plus a build up of vesicles towards such zones. Prominent carbonate veining in places with breccia fabric of altered andesite fragments included, vesicles tend to be carbonate filled, trace pyrite.	and
144.90	149.25	Distinctive hyaloclastite andesite with wispy sericite producing pseudo fiamme-like fabric, patchy pink K feldspar? bleaching alteration becoming more prominent 146.90- 149.25 but still retaining local less altered kernels of sericitic-chloritic andesite.	and
149.25	153.00	More massive vesicular andesite, some prominent carbonate veining, chlorite veining and sericite, trace pyrite.	and
153.00	154.45	Pink altered andesite with chlorite-sericite replaced by K feldspar and silica, trace pyrite.	and
154.45	156.05	Pillowed vesicular andesite with interpillow hyaloclastite 155.31-155.41, some carbonate-quartz veining, sericite-chlorite altered.	and
156.05	178.00	Pink to green partial to completely K feldspar altered dacitic ignimbrite faulted? contact at 156.05 at 30°. Fiamme-like lithics, sericite-chlorite altered material, veining more prominent towards end of hole, pyrite local dissemination to trace	dilt

EOH

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP12

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	3.96	No core.	
3.96	18.50	Predominantly black shale and some interbedded ash.	Sh, ash
18.50	24.36	Fine grained sericitic ash, some shale clasts locally.	ash
24.36	35.80	Black shale with bedding at 24.40 at 66°, at 34.00 is at 63°.	Sh
35.80	55.00	Typical quartz-feldspar-phyric rhyolitic lapilli tuff with sericitized fiamme in sericitic host, local silicification with vein pyrite and disseminated pyrite to 2%.	rlt
55.00	56.00	Dominantly black shale with some lithic zones.	Sh
56.00	87.16	Quartz-feldspar sericitic rhyolitic ignimbritic lapilli tuff, classic fiamme, local cherty silicification patches with pyrite, sphalerite, galena and chalcopyrite, very patchy. Note prominent sericitization with local schistose fabric. Rock grades to crystal lithic tuff.	rilt
87.16	105.85	Feldspar ± quartz-phyric dacitic lithic crystal tuff with scattered local quartz-feldspar rhyolite lithics. Most fragments are pink vitric dacite, some fiamme. Some finer vitric tuff.	dlct
105.85	128.40	Mixed shale and lithic crystal tuff of dacitic affinity. Note strong quartz and sphalerite-carbonate meshwork veinlets. Bedding at 113.10 is at 55° and facing probably downhole (scour and fill).	Sh, dlct
128.40	133.80	Feldspar ± quartz-phyric vitric dacitic crystal lithic tuff, weakly sericitized.	dclt
133.80	143.55	Quartz-feldsapr-phyric rhyolitic crystal lithic tuff, pink to grey coloured, vitric, silicified + sericite altered in part.	rclt
143.55	143.95	Shale and coarse quartz-feldspar crystal tuff mix.	Sh, rct
143.95	150.80	Coarse to medium grained pink to grey quartz-feldspar lithic crystal tuff, some shale incorporated near 143.95.	rlct

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP13

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	4.0	*No core.*	
4.0	6.00	Black shale with bedding at 18°	Sh
6.00	6.80	Sheared sericitic ash	ash
6.80	32.10	Bedded black shale with variable carbonaceous component, local slump disruption. Bedding at 19.00 is at 5°, at 23.50 is at 22°. Note a few localized pyrite veinlets particularly 28-32.10.	Sh
32.10	37.10	Massive to bedded volcaniclastic dacitic sericitic ash to lithic tuff with vitric and sericitic lithics, some f.g. feldspar crystals. Some prominent pyrite veining 32.10-34.0.	ash, dtl
37.10	40.80	Dominantly bedded shale with intercalated ash layers.	Sh
40.80	47.40	Predominantly fine grained vitric ash, bedded in part with intercalation locally of fine grained lithic tuff. Bedding at 44.0 is at 70°. A few veinlets and segregations of sphalerite-galena.	ash
47.40	51.50	Mixture of sericitic lithic tuff and finer ash material, patchy veining by pyrite and sphalerite.	dtl
51.50	57.40	*Fine grained sericitic ash with rare sphalerite segregations.*	ash
57.40	60.63	Predominantly massive to locally bedded black shale with network sphalerite veins. Core quite broken.	Sh
60.63	67.45	Prominently sericitic dacitic lapilli tuff with sericite pumice lithics	dilt
67.45	70.50	Pink quartz-feldspar-phyric rhyolitic lithic tuff to lithic crystal tuff with vitric rhyolite fragments in a finer matrix.	rtl, rclt
70.50	76.40	Grey feldspar ± quartz-phyric dacitic? lithic crystal tuff with vitric to sericitic fragments in a finer matrix. Sericite alteration moderate with local chlorite, patchy pyrite dissemination to 1%.	dlct
76.40	77.55	Coarse quartz eye rhyolitic crystal lithic tuff.	QEFT
77.55	82.70	Prominently sericitic quartz-phyric rhyolitic lapilli tuff, vitric with sericitic fiamme.	rlt
82.70	96.63	Green grey feldspar-phyric andesite and andesite breccia, sericite and chlorite altered, local cherty silica alteration, breccia fabric probably due to autobrecciation, some quartz-carbonate veining.	and
96.63	117.47	Grey to pink quartz-feldspar rhyolite and rhyolite breccia, probably a lava, vitric with sericite and patchy chlorite alteration.	Rb
117.47	121.10	Predominantly black shale with admixed rhyolitic crystal debris.	Sh
121.10	131.10	Predominantly volcaniclastic rhyolitic crystal lithic tuff with medium to coarse grained quartz phenocrysts and local shale detritus.	rclt

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP13 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
131.10	138.95	Fault zone (Rosebery Fault) in black shales with core extremely shattered, some thin sandstone bands often rhyolitic crystal tuff.	sh
138.95	142.17	Fine grained pumiceous dacitic? rhyolitic lapilli to lithic tuff, quite sericitic.	rlt
142.17	146.20	Black shale with bedding at 146.00 at 33°.	sh
146.20	176.60	Predominantly fine grained quartz-feldspar crystal lithic tuff with local shale zones.	rct
176.60	181.15	Fine grained siliceous shale and ash.	Sh
181.15	183.15	Fine grained sericitic lithic tuff or sandstone.	SS
183.15	189.20	Quartz-phyric, sericitic rhyolitic lithic tuff with intercalated shale zones, slumped in part.	rtl, Sh
189.20	249.30	Predominantly shale with local slump features, slump folds and interlaminated sandstone, bedding 208.60 at 75°, subparallel to core axis 215-218.50, at 223 at 85°, at 231 at 65°. Some quartz veining 240-249.30.	Sh

E.O.H

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SUMMARY DRILL LOGS
PINNACLES AREA

898076

HOLE CP14

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	6.5	No core.	
6.5	52.75	Porphyritic feldspar andesite, sericite and chlorite altered, auto brecciated locally, vesicular in part, weakly pyritic	and
52.75	63.84	Fine grained lithic villic tuff? with some sericitic pumice lithics, prominently sericitized, feldspar suggest dacitic. Rare disseminated pyrite, trace sphalerite - galena	dvtl
63.84	128.05	Coarse quartz - feldspar porphyry showing some internal brecciation, massive character and general homogeneity suggest is intrusive rather than tuff. Weak to moderate sericite - chlorite alteration throughout some quartz veining	Rb
128.05	129.40	Broken crumbly black shale (carbonaceous). Possible fault zone.	Sh
129.40	130.10	Fine grained vitric quartz-feldspar porphyry with incorporated shale.	QFP
130.10	132.45	Fine grained black shale, quite crumbly.	Sh
132.45	136.20	Quartz-feldspar porphyry intrusive	QFP
136.20	158.40	Black shale with local small dykes of quartz - feldspar porphyry	Sh
158.40	161.60	Quartz feldspar porphyry breccia? or crystal lithic tuff	rclt
161.60	164.80	Dominantly black shale	Sh
164.80	169.85	Vitric crystal lithic tuff or quartz - feldspar porphyry	rclt
169.85	171.00	Mainly black shale, but includes small dykelets? of porphyry locally or lithics	Sh
171.00	176.05	Dominantly quartz - feldspar vitric porphyry locally appears as lithic crystal tuff, but may be alteration fabric.	rlct
176.05	176.30	Black shale	
176.30	176.55	Quartz - feldspar porphyry	QFP
176.55	179.40	Mainly shale with some small dykelets of porphyry	Sh
179.40	198.20	Vitric quartz - feldspar porphyry wih some shale 197-197.20. Possible fault zone 197 - 198.20 with core quite broken	rct, Sh
198.20	202.45	Black shale incorporating local rhyoliticcrystal tuff zones with pyrite	Sh
202.45	203.80	Sericitic quartz-rich rhyolitic crystal tuff	rct
203.80	206.35	Predominantly black shale with minor tuff associated	Sh
206.35	209.45	Lithic crystal tuff of quartz-phyric affinity, fragments of vitric rhyolite and shale	rlct
209.45	245.25	Essentially black shale with fine sandstone beds and intervals characteristic of turbidites, folded and slumped locally. Bedding at 237.80 is at 45°	Sh, SS

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE CP15

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	2	No core.	
2	24.60	Sericitic volcaniclastic feldspar-phyric dacitic lapilli tuff with sericitic fiamme enclosed in a finer grained matrix. Weak pyrite dissemination to 0.5%.	dlt
24.60	28.05	Fine grained dacitic crystal tuff (feldspar-phyric)	dct
28.05	36.00	Fine grained feldspar ± quartz-phyric dacitic crystal lithic tuff to fine lapilli tuff, moderately sericitized, patchy sphalerite-galena veinlets, pyrite to 1%	dclt
36.00	36.70	Quartz "eye" - feldspar porphyry or tuff?	
36.70	39.70	Feldspar ± quartz vitric dacitic crystal lithic tuff, moderately sericitized	dclt
39.70	63.53	Rosebery Fault zone in black shales with some sandstone interbeds. Extremely sheared and brecciated	Sh
63.53	64.18	Conglomerate of siliceous pebbles in shaley matrix	Conglom
64.18	65.38	Shale with conglomerate detritus.	Sh
65.38	66.10	Conglomerate with fine grained siliceous pebbles, shaley matrix	Conglom
66.10	66.70	Shale	
66.70	69.50	Quartzo - feldspathic sandstone - greywacke	SS
69.50	91.05	Shale with sandstone - greywacke interbeds. Bedding at 71.00 is at 65°	Sh-SS
91.05	93.86	Feldspar-quartz-phyric tuffaceous sandstone and lithic sandstone with some dark chlorite pumice fragments.	SS-rtl
93.86	95.65	Interbedded shale and sandstones with prominent folds	Sh-SS
95.65	100.95	Feldspar-quartz-phyric lithic sandstone - greywacke with fragments of vitric dacite and rhyolite and pumice	SS-rtl
100.95	103.70	Interbedded shale and fine grained sandstone	Sh-SS
103.70	104.20	Tuffaceous conglomerate and sandstone of rhyolitic parentage	Conglom-SS
104.20	105.30	Fine grained tuffaceous lithic sandstone	SS
105.30	115.70	Conglomerate of siliceous pebbles and rhyolitic and dacitic fragments, some local pyrite veining, gradational to lithic sandstone	Conglom
115.70	120.60	Fine grained sandstone	SS
120.60	151.50	Interbedded shales and fine grained sandstones, local soft sediment features, bedding at 128 is at 48°, at 134 is at 80° at 149.50 is at 55°	Sh-SS

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE PIN1

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	3	No core.	
3	6.50	Coarse quartz-feldspar porphyry, poor core recovery.	QEFP
6.50	91.40	Feldspar-phyric dacitic lapilli tuff, vitric in part, but showing sericite alteration, patchy pyrite dissemination (3%-5%), local silification, rare pyrite chlorite eg 40.50, rare sphalerite-galena as veinlets or segregations eg 29.70. Note pyrite content <1% in zone 55-80. Chlorite alteration of welded lapilli tuff 69.70-70.30 and 73.50-74.20. The zone 71-88.5 shows an increasing degree of silicification with local strong sericite, pyrite 5-8%, locally prominent only sphalerite-galena veinlets.	dlt
91.40	93.00	Fine grained silicified ash with disseminated fine grained pyrite to 5%.	ash
93.00	95.30	Prominently sericitized dacitic lapilli tuff to lithic tuff, weak pyrite dissemination 1-2%, minor sphalerite-galena segregations.	dlt, dtl
95.30	102.30	Bedded cherty ash? and fine grained feldspar-phyric crystal lithic tuff with bedding at 95.50 at 50°. Much of cherty material is a silicification overprint with associated fine grained pyrite and cross cutting sphalerite-galena veinlets. Where not chertified the host is strongly sericitic ash tuff. Pyrite is prominent from 100.4-102.30 in bedded sericitic ash (8%) as veinlets and disseminations associated with silicification. A few local sphalerite-galena segregations.	ash, dclt
102.30	115.50	Typical feldspar-phyric dacitic lapilli tuff with sericitic fiamme showing prominent pink to white silicification overprint locally producing breccia fabric. Disseminated pyrite to 5%, rare chalcopyrite, most prominent sphalerite-galena veinlets 102.30-104.	dlt
115.50	132.20	Feldspar-phyric dacite? andesite with sericite-chlorite alteration of originally vitric host. Locally the alteration may produce a breccia fabric. Some carbonate and quartz-carbonate veins throughout.	dc
132.20	138.80	Quartz-feldspar-phyric rhyolitic lithic tuff to breccia with fine to coarse lithics. Probable mass slide breccia.	rtl, Rb
138.80	139.40	Dominantly shale with admixed rhyolitic lithic tuff.	Sh
139.40	142.00	Quartz-feldspar-phyric rhyolitic breccia with fine to coarse vitric fragments.	Rb
142.00	144.25	Mixed shale and rhyolitic lithic tuff detritus. Note some medium grained carbonate veins.	Sh, rtl
144.25	147.30	Coarse rhyolitic volcaniclastic breccia with vitric fragments and large blocks enclosed in finer matrix locally including shale. Some carbonate veining.	Rb
147.30	148.40	Mixture of rhyolitic volcaniclastic breccia and shale.	Rb, sh

HOLE PIN1 (Cont.)

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
148.40	149.80	Rhyolitic volcaniclastic breccia.	Rb
149.80	152.40	Dominantly shale, but incorporating rhyolitic lithic tuff detritus.	Sh
152.40	159.55	Quartz-feldspar rhyolitic volcaniclastic breccia with coarse pink vitric rhyolite fragments to blocks set in finer grained matrix. Note shale zones 158.05-158.20, 158.50-158.65.	Rb
159.55	160.40	Dominantly black shale with lithics and detritus of rhyolitic tuff incorporated - quite sheared.	Sh
160.40	170.05	Rhyolitic lithic tuff to breccia incorporating shale detritus.	Rb, rlt
170.05	178.00	Rosebery Fault zone in sheared and crumbly black shales and interbeds of quartzo-feldspathic sandstone. The shearing extends at least to 165.50. Prominent isoclinal folds occur in the shales.	Sh-SS

E.O.H.

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SUMMARY DRILL LOGS
PINNACLES AREA

898080

HOLE PIN2

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	3.5	No core.	
3.5	70.60	Feldspar-phyric dacitic vitric crystal lithic-tuff to lithic-tuff and lapilli tuff. Fragments of sericitic pumice of various size ranges form 10-50% of the rock. Sericite alteration is weak to moderate, trace pyrite.	dvct, dtl
70.60	93.30	Quartz-feldspar porphyry dyke with fine to coarse quartz phenocrysts and white feldspars in a finer grained matrix. Note some internal brecciation locally, weak to moderate sericite alteration, local quartz veins.	QFP
93.30	159.00	Ignimbritic dacitic lapilli tuff, probably welded in part, moderate to locally strongly sericitic, local silification ovoids overprinting vitric host. Patchy segregations of sphalerite, galena, weak pyrite <1%. Note silification more prominent 137-151.90 with intense silica 154.50-156.90 probably fault localized. Some moderate sphalerite-galena veining and segregation in this zone. Note small fault breccia at 159.0.	ditl
159.00	162.10	Fine grained ash and lapilli tuff showing local silicification and sericite overprint, patchy sphalerite-galena veining with some chalcopyrite.	ash, dlt
162.10	176.30	Fault zone contact with vitric dacitic lapilli tuff, fine to medium grained sericitic fiamme, moderate sericite alteration, very patchy sphalerite-galena veinlets associated with silicification patches.	ditl
176.30	186.00	Sericite-chlorite altered dacite? andesite, local internal brecciation fabric part due to sericite alteration and probably part autobrecciation. Colour varies pink to green. Some prominent quartz-carbonate veins.	and
186.00	188.30	Coarse quartz-feldspar rhyolite volcaniclastic breccia of vitric rhyolite fragments and finer detritus including local shale. No visible mineralization.	Rb
188.30	188.70	Black shale.	
188.70	190.35	Volcaniclastic rhyolite breccia, pink to fawn coloured.	Rb
190.35	191.20	Shale mixed with rhyolitic tuff detritus.	Sh, rt
191.20	196.50	Predominantly rhyolitic vitric breccia with local shale detritus	Rb, sh
196.50	200.60	Rosebery Fault zone contact in sheared and crumpled shale-sandstone mix.	Sh-ss
200.60	221.50	Extremely folded shale and interbedded sandstone of Rosebery Group	Sh-SS
221.50	231.00	Fine grained vitric lithic tuff of probably dacitic affinity, rare pumice clasts.	dvlt

E.O.H.

HOLE EAB1

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	6.0	No core	
6.0	61.90	Coarse quartz "eye"-feldspar porphyry with medium to coarse grained quartz eyes and white tabular feldspars enclosed in a finer grained matrix that shows moderate sericite alteration. Flow banding is present locally e.g. 7.20 at 53°, 23.90 at 60°, 25.90 at 68°, 33.0 at 56°, 41.0 at 58°. The rock is relatively homogeneous and is probably intrusive but could be a flow.	QEFP
61.90	91.75	Approximate contact with quartz "eye" - feldspar porphyry breccia unit containing sericite and locally chlorite altered lithics in a finer matrix. Note some lithics are flow banded. The breccia fabric is not clear past 83.0 where unit is more massive and probably a crystal lithic tuff. The contrasting fabric of the breccia unit compared with the porphyry suggest is probably volcaniclastic.	QEFT
91.75	91.90	Black shale	Sh
91.90	95.45	Quartz "eye" - feldspar rhyolitic crystal lithic tuff. Note broken quartz vein 94-94.40 may be fault zone.	QEFT
95.45	96.35	Medium grained quartz-phyric rhyolite lithic tuff with sericitized lithics in a finer grained matrix containing some shale detritus. Note galena and sphalerite veinlets.	rtl
96.35	96.75	Shale unit with lithics of quartz 'eye' feldspar porphyry and rhyolitic tuff. Contacts at 20°.	Sh
96.75	100.90	Quartz-phyric rhyolite lithic tuff incorporating some shale lithics and detritus. The rhyolitic lithics are sericitic, vitric and locally porphyritic in quartz.	rtl
100.90	102.80	Black shale incorporating rhyolitic lithic detritus.	Sh
102.80	108.10	Feldspar ± quartz-phyric volcaniclastic dacitic breccia gradational to crystal lithic tuff. Some dacitic lithics are flow banded, others sericite and chlorite altered.	dc
108.10	111.95	Black shale containing coarse quartz "eye"-feldspar porphyry lithics and detritus locally.	Sh
111.95	112.50	Quartz "eye"-feldspar lithic crystal tuff	QE
112.50	115.00	Feldspar-phyric dacitic breccia to lithic tuff with feldspar-phyric vitric lithics set in a finer grained matrix.	db, dtl
115.00	121.80	Quartz "eye"-feldspar porphyry showing weak local flow banding and local internal brecciation. Contact at 121.80 at approx 45°.	QEFP
121.80	124.50	Sericitic feldspar-phyric dacitic lithic tuff with vitric rounded to subrounded lithics, probably some flow banded lithics, rare shale lithics	dtl
124.50	124.80	Quartz "eye" feldspar prophyry, intrusive? or crystal tuff	QEFP

HOLE EAB1 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
124.80	176.40	Black shale, generally bedded with bedding at 127.50 at 45°? at 138.30 at 70°, at 160.30 at 75°, and 166.0 at 45°, at 167.50 at 58°, at 171.0 at 85°. A few local slump folds.	Sh
176.40	177.50	Fine grained bedded sandstone-greywacke, bedding at 68°, possible uphole grading at 177.50.	SS
177.50	178.20	Shale	Sh
178.20	211.00	Fine grained bedded sandstone-greywacke, bedding at 186 is at 50°, at 189.70 is at 38°, at 191 is at 28°, at 196 is at 80°. Possible fault breccia 205.90. The sediments appear to be of feldspar-phyric dacitic origin.	SS
211.00	219.90	Lithic greywacke to breccia of dacitic affinity with sericitic to chloritic dacite clasts. Note strong carbonate veining 215-218 as crustiform banded aggregates - possibly fault related.	dct
219.90	222.40	Bedded tuffaceous sandstone of dacitic affinity, bedding at 75°.	dct
222.40	230.35	Volcaniclastic andesitic lithic tuff with fine to medium grained sericitic vitric lithics (locally porphyritic in feldspar) enclosed in a fine grained matrix. There is a general coarsening of lithics downhole, locally bedded veinlets and segregations of galena and red brown sphalerite occur locally. Note a prominent open space filling carbonate vein with crustiform banding 227.50-227.80. Note matrix may in part be chert.	atl
230.35	275.40	Altered palagonized vitric andesite breccia passing down into vesicular chlorite andesite with carbonate alteration. Chert between fragments 230.35-231.70 is probably interpillow material. Prominent carbonate veining and carbonated vesicles are characteristic. Local flow breccia intervals usually over 1-2 metres only.	and
275.40	283.10	Fine to medium grained volcaniclastic andesitic lithic tuff to ash tuff. Note prominent fine grained pyrite veining 275.40-276.70 (10%). Sphalerite veining and segregations associated with carbonate 282.80-283.10.	alt, ash
283.10	284.80	Chloritic vesicular andesite and andesite breccia with carbonate veining.	and
284.80	295.50	Dominently sphaleritic andesite volcaniclastic lithic tuff to breccia with a few graded crystal lithic tuff to ash zones e.g. 286.90-287.0 with uphole facing.	atl

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

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HOLE EAB2

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	4	No core	
4	5.75	Sericitic rhyolitic lithic crystal tuff with abundant quartz eyes, sericitic lithics, some cherty ash lithics, fine grained disseminated pyrite to 3%, trace galena.	rlct
5.75	7.35	Fine grained bedded shale, bedding at 6.80 is at 50°	Sh
7.35	13.75	Coarse rhyolitic lapilli with sericitic pumice and vitric rhyolite enclosed in a fine grained quartz-phyric matrix. Note moderate sericite alteration, 2% pyrite dissemination.	tlt
13.75	15.00	Finely bedded ash with bedding at 48°	ash
15.00	23.60	Coarse to medium grained rhyolitic breccia with fragments of quartz-feldspar rhyolite, ash, sericitic pumice, vitric rhyolite in finer matrix. Note moderate sericite alteration with 1% pyrite.	Rb, ash
23.60	24.25	Fine grained bedded ash, sericitized and partially silicified with 3% fine grained pyrite. Bedding at 24 is at 46°.	ash
24.25	28.15	Mixed fine grained lithic crystal tuff and ash of quartz-phyric affinity.	rlct
28.15	35.55	Dominantly fine grained ash, lithic in part, incorporating shale interbeds in zone 32.25-35.55. Note a few coarse quartz-feldspar rhyolite lithics. Bedding is best defined in shaley units and at 35.0 is at 52°.	ash, sh
35.55	38.95	Illsorted coarse breccia incorporating quartz-rich rhyolite clasts, flow banded quartz - poor rhyolite, sericitic clasts, some shale clasts in finer grained crystal lithic matrix. Weak to moderate sericite.	Rb
38.95	39.50	Bedded black shale with bedding at 66°	Sh
39.50	44.10	Coarse feldspar - phyric fragments and sericite fragments enclosed in a feldspar ± quartz-phyric vitric crystal tuff to ash matrix. Fragments 20% of host.	dvct
44.10	50.30	Predominantly fine feldspar-phyric dacitic ash, locally bedded with a few small zones incorporating feldspar-phyric lithics. Bedding at 49 is at 56°.	ash, dct
50.30	51.35	Lithic crystal tuff of feldspar-phyric affinity, weak to moderate sericite.	dlct
51.35	76.50	Dominantly fine grained, bedded sericitic ash, locally with fine sericitic lithics. Note lithic cyrstal tuff (feldspar-phyric). 71.90-72.40. Note bedding 71.50 is at 74°. Suggested uphole facing based on grading 76.50.	ash
76.50	78.23	Feldspar ± quartz-phyric dacitic lithic crystal tuff with feldspar-phyric clasts and chlorite pumice units.	dlct

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE ESB1

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	7	No core	
7	19.09	Weathered volcaniclastic rhyolite breccia with dominant fine grained pink vitric rhyolite fragments close packed in quartzo-feldspathic matrix. Ash zones are present. 7 - 11.2 (poor core recovery), 12.40 - 14.50. Possible downhole facing? based on grading at 12.40. Bedding illdefined. Base of oxidation near 21 m.	Rb
19.09	41.43	Weathered rhyolite lava breccia or volcaniclastic with pink bleached vitric fragments, sericite and chlorite altered quartz feldspar rhyolite fragments (some flow banded in a sericite-chlorite quartzo-feldspathic matrix. The rock is feldspar-quartz phyric, but appears feldspar-phyric towards end of interval.	rhy1
41.43	41.50	*Rhyolitic feldspar-quartz crystal tuff, medium grained, contact* at 81° approx.	rct
41.50	43.70	Feldspar ± quartz-phyric rhyolite lava breccia, polymict with sericitic quartz-feldspar rhyolite and fine vitric rhyolite, extreme range in fragment size from coarse to fine.	rhy2
43.70	43.85	Crystal rich feldspar-quartz rhyolitic crystal tuff, matrix sericitized. Contact with rhyolite flow at 43.85 as at 55°. Disruption of tuff unit by rhyolite flow at 43.85 suggests downhole facing.	rct
43.85	59.50	Rhyolite? dacitic lava breccia, polymict with vitric pink feldspar-pyric fragments dominant over quartz-feldspar-phyric units and sericitic glassy fragments, complete size range fine to coarse.	rhy
59.50	66.50	Prominently sericitic feldspar-quartz rhyolitic crystal tuff, possibly welded with eutaxitic fabric defined by the sericite. The unit grades to cherty ash and chert at 60.20-60.25, 61.70-63.70, 66.00-66.50 all with downhole facing. Generally weak pyrite dissemination and veining with trace pale sphalerite?	rct
66.50	68.34	Sericitized quartz-feldspar vitric crystal tuff, matrix stil glassy.	rvct
68.34	70.85	*Fine grained rhyolitic ash, probably welded with eutaxitic* fabric, scattered quartz and feldspar phenocryst material, intensely sericitized, patchy pyrite dissemination and pyrite-sphalerite veinlets (2%). Cherty ash unit at 70.85 suggests downhole facing. Contact at 32° with rhyolite.	ash, rct
70.85	107.20	Massive vitric feldspar ± quartz? rhyolite, phenocrysts fine grained and difficult to distinguish from glassy matrix, prominent local flow banding e.g. 35° at 76.10, 45° at 87.50. Note skeletal fabric of preferentially eroded sericitized feldspars near 95m suggests correlation with surface exposure near collar EAF 11. Local brecciation 100-107.20. Flow banding at 100.00 is at 33°.	rhy

SUMMARY DRILL LOGS
PINNACLES AREA

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HOLE ESB1 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
107.20	122.60	Pink and green monomict-rhyolite lava breccia with some flow banded sections e.g. 114.70 60°, fine grained feldspar phenocrysts, quartz less prominent.	rhy
122.60	123.00	Volcaniclastic ash with some chert and shaley material incorporated, no definite facing. Unit is sericitic with disseminated pyrite to 2%.	ash
123.00	145.70	Distinctive quartz phenocryst-rich rhyolite lava breccia, pink to green, sericite and chlorite altered, note local cherty matrix 127.70, 131.50, 132.70, 134.55 may be inter pillow material. Note weak silica-sericite-pyrite alteration (2% pyrite), local segregations of sphalerite and galena and minor silica-carbonate veinlets.	rhy
145.70	151.00	As above, but a lava breccia, rare pyrite.	rhy
151.00	170.35	Dominantly massive rhyolite lava, quartz phenocryst-rich as above more local pyrite segregations and medium grained pale brown sphalerite-galena veins and segregations. Largest vein at 168.01 is 8 cm wide.	rhy
170.35	188.00	Dominantly quartz phenocryst-rich rhyolitic lava breccias with some massive sections, moderately sericitized, pink coloured in part, trace pyrite only. Flow banding at 172.10 is at 70°.	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF1

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	9	No core.	
9	18.60	Very poor core recovery in black shale.	sh
18.60	34.10	Distinctive volcaniclastic breccia to lithic crystal tuff of quartz-feldspar rhyolite affinity incorporating lithic and crystal debris, vitric fragments and large black shale clasts. The unit incorporates ash size material 32.20 - 34.10 and may face downhole - probably a mass slide deposit.	rlct
34.10	84.40	Pink to green grey feldspar ± quartz-phyric dacite breccia. Varies from locally massive lava to more typical breccia with pink and grey alteration bleaching. A few fragments of chert are locally incorporated. The unit is not visibly mineralized. Quartz-carbonate veins and tension gashes present 53-84.40.	dc

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF2

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	6	No core.	
6	20.60	Volcaniclastic to epiclastic reworked rhyolitic crystal lithic tuff with quartz-feldspar-pyrite lithics and detritus, cherty fragments and local shale clasts. Some grading to finer ash material in places, but facing difficult to determine - appears downhole at 8.40.	rclt
20.60	45.45	Feldspar-phyric to locally feldspar quartz-phyric dacite lava and lava breccia, sericite and silica alteration with local pink bleaching, some cherty veins. A few rare quartz veins with chlorite and galena. Note patches of epidote in cavities. The breccia fabric is enhanced locally by cherty silica.	dc
45.45	49.10	Volcaniclastic of lithic crystal tuff and ash of feldspar-phyric and quartz-feldspar-phyric parentage. The texture is overprinted by some prominent cherty silicification with very fine pyrite associated locally. Minor sphalerite-galena veinlets and segregations	dlct, rclt ash
49.10	52.30	Bedded shale with bedding at 49.50 at 0.79°	sh
52.30	54.56	Graded units of lithic crystal tuff to ash with vitric feldspar-phyric fragments, some shale fragments, matrix feldspar and quartz. Facing at 54.56 is uphole while bedding at 54.56 is at 40°.	dlct, ash
54.56	63.00	Dominantly bedded shale and some admixed fine sericitic ash showing local fine grained chertification often accompanied by very fine pyrite. Some prominent fine grained pyritized zones occur particularly 61.30-62.20	sh
63.00	85.70	Porphyritic feldspar andesite prominently sericitic, but showing complete to partial chertification in the zone 63.00-82.00 as an overprint. Fine grained pyrite in varying amounts is associated with the cherty silica. The pyrite may locally form more massive colloform to crustiform veins with some sphalerite segregations, note sphalerite and galena more prominent as veins and segregations 78.40- 53.50.	and
85.70	92.60	Dominantly dacitic ash to lithic fine grained ignimbrite with fiamme and local cherty fragments. This unit shows prominent local cherty silification and patchy sphalerite-galena veinlets and segregations.	dit ash
92.60	107.20	Sericitized and locally chloritic, vesicular feldspar andesite, carbonate filled vesicles, carbonate veining. Some chertification to 98.00, minor sphalerite-galena veinlets.	and
107.20	113.00	Mixed cherty shale and fine grained feldspar-phyric ash	sh, ash
113.00	127.80	Vesicular glassy andesite showing strong sericite alteration with some chlorite and a locally prominent breccia fabric due to cherty silification overprint often with associated fine grained pyrite. Carbonate veining locally throughout.	and

HOLE EAF2 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
127.80	128.60	Dominantly cherty shale and volcaniclastic ash of andesitic affinity. Bedding is at 75°.	sh, ash
128.60	132.40	Feldspar andesite? vesicular, prominent sericite and chlorite altered with local cherty silicification veining producing breccia fabric, local carbonate veining.	and

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF3

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	1	No Core	
1	3.25	Volcaniclastic breccia, strongly sericitic with vitric rounded fragments of probable feldspar phyric affinity in sericitic matrix with some quartz crystals.	Rb
3.25	4.15	Siliceous volcaniclastic breccia with angular to subrounded vitric ash fragments (fragment dominated) in a finer grained matrix. Some sericite veining alteration with pyrite and sphalerite-galena associated (3% pyrite).	Rb
4.15	12.40	Dominantly fine grained vitric lithic ash of feldspar-phyric affinity showing local coarser lithics e.g. 11.67 - 12.40. Patchy moderate sericite alteration. Note fiamme fabrics and possible eutaxitic fabric locally. Pyrite veining and dissemination patchy to 2%. Scattered quartz phenocrysts in matrix.	dt, ash
12.40	15.14	Volcaniclastic conglomerate with rounded cherty ash fragments and sericitic to vitric feldspar-phyric fragments, massive pyrite (replacive) fragments set in a finer grained matrix. Pyrite fragments localized only.	db
15.14	30.50	Fine grained sericitic vitric ash, lithic in part with a few coarser fragments visible locally. A few veinlets of quartz with galena-sphalerite associated changing to anastomosing quartz veinlet mosaic 25.5-29.0. Silicified in part, weak pyrite veinlets 30.00-30.50.	dt, ash
30.50	37.00	Volcaniclastic lithic crystal vitric ash with fine to medium grained lithic tuffs of vitric debris, sericitic ash debris and pyritic fragments (rare) set in a finer grained matrix. Some moderate pyrite (5%) veining with local chalcopyrite and galena-sphalerite veinlets and segregations. Some silicification and sericitization associated. Note quartz may indicate fault 35.7-37.00, poor core recovery. Facing downhole.	dct, ash
37.00	38.45	Massive sulphides, fine to medium grained sphalerite pyrite-galena-chalcopyrite with chlorite gangue, probable stratiform pyrite, but may be slumped from feeder. Layering of bedding at approx. 60° to sub-parallel to core axis. Contact at 38-45 may be faulted (quartz)	MS
38.45	40.50	Sericitic feldspar-phyric lithic crystal vitric tuff with some sections more ash-like.	dlct
40.50	44.40	Strongly sericitic quartz-feldspar volcaniclastic crystal lithic tuff with good cleavage at 35° near 40.00, prominent pyrite-silica veining throughout, (15%) with nodular pink carbonate alteration 41.90-42.15.	rclt
44.40	45.70	Volcaniclastic fine grained sericitic cherty ash, massive.	ash
45.70	75.00	Prominently sericitic to moderately sericitic lapilli tuff of quartz-phyric affinity with sericitic to flow banded vitric fragments in a sericite-silica, fine grained matrix. The texture is probably pseudo-lapilli in part, may be eutaxitic. Pyrite is strong (20%) to 50 m, then weak dissemination to 5% throughout.	rltc

HOLE EAF3 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
75.00	85.00	Dominantly fine grained volcaniclastic ash with some coarser crystal tuff to lithic crystal tuff zones (quartz), patchy weak to moderate pyrite dissemination and veining (3%), some probable eutaxitic fabrics in coarser zones. Local sphalerite but minor.	ash, rlct
85.00	87.60	Probable welded quartz-feldspar-phyric lapilli tuff, eutaxitic fabric in prominently sericitic units, a few vitric fragments. Weak pyrite dissemination to 3%.	
87.60	90.10	Chert-quartz-phyric tuff mix passing into fine grained ash (sericitic)	rct
90.10	95.60	Shale and cherty ash, bedding at 94.00 is at 45-50°. Sericitic with weak fine grained pyrite (1%).	Sh, ash

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF5

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	1.30	No Core	
1.30	9.80	Grey to khaki coloured volcaniclastic rhyolitic lithic crystal tuff, abundant quartz eyes, strongly sericitized with foliation developed. Foliation at 2.3 is subparallel to core axis, while at 5.62 it is at 50° and at 9.5 it is at 60°. (This is anticlinal F_2 fold nose visible on surface). Note some chlorite and silica alteration and associated fine grained pyrite to 2% . Sericite often takes the form of lenses and these may in part be fiamme.	rlct
9.80	15.87	Dominantly fine grained volcaniclastic ash, strongly sericitic and schistose. A few intervals of lithic tuff in the stretched fiamme and vitric fragments. Pyrite veining and leases occur locally while sphalerite-galena segregations are rare. Cherty silica vein like alteration patches often have associated pyrite. (pyrite 5%) Note cleavage at 14.30 is at 25°.	ash
15.87	19.50	Fawn coloured, part weathered feldspar ± quartz dacitic crystal tuff prominently sericitic with abundant secondary quartz as veinlets and in matrix, weakly pyritic only.	dct
19.50	28.10	Fine grained cherty siltstones shale and ashes, locally lithic, sericitic and moderately silicified throughout. A few pyrite veins and segregation lenses to 5%, minor veinlets of sphalerite-galena.	Sh, ash
28.10	32.10	Mixed volcaniclastic quartz-feldspar rhyolitic lithic crystal tuff, finer ash zones and some admixed cherty siltstone especially 31.10-32.10. Prominent sericite alteration, minor quartz veinlets, rare pyrite.	rlct
32.10	37.30	Distinctive pink to green feldspar ± quartz-phyric dacitic lapilli tuff with pink vitric to green sericitic and chlorite lithics and fiamme set in a finer grained matrix. Some secondary silica but not visibly mineralized.	dc
37.30	38.90	Bedded cherty shale with local admixed lithic tuff detritus. Bedding at 37.90 is at 50°.	Sh
38.90	52.10	Pink to grey green feldspar ± quartz dacitic breccia with pink vitric to green sericitic and chloritic fragments possible fiamme set in fine grained vitric matrix. Note some large clasts of shale and chert at scattered intervals throughout. Some quartz-carbonate veining with local minor associated sphalerite-galena.	db

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF6

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	1.3	No Core	
1.3	14.50	Volcaniclastic sericitic quartz-feldspar rhyolitic breccia with rhyolitic fragments and local ribbon shale fragments set in a finer grained matrix, fragments are angular to subrounded.	Rb
14.50	28.80	Volcaniclastic sandstone or lithic sandstone of probable feldspar-phyric dacite affinity, gradational to sericitic ash. Fiamme-type fabric suggests composed of sericitic pumice fragments, glass and crystal debris with gradations to fine ash. Some fine grained chert and cherty siltstone lithics. Note patchy ovoid pyrite altered fragments? and/or segregations.	dtl dit
28.80	42.40	Volcaniclastic pumiceous lapilli to lithic tuff of dacitic affinity possibly welded with eutaxitic fabric, prominently sericitized with local pyrite altered clasts. Note unit appears bedded 28.80-29.70 at 60° approx. Downhole facing at 32 m.	dilt
42.40	44.80	Volcaniclastic sericitic fine grained ash and shale, very broken	ash, sh
44.80	58.40	Coarse volcaniclastic breccia composed of vitric fragments and silicified fragments probably feldspar-phyric, sericite and silica altered with pyrite veining and dissemination and local sphalerite-galena veining. The intensity of pyritization increases towards 54.80, the zone 56.60-58.40 being extremely broken. Note finer lithic intervals occur locally. Pyrite 25%. Note chalcopyrite associated with cherty silicification near 58.20.	db, dtl
58.40	58.90	Massive sulphides and some cherty silicified volcanic and sericitic to cherty lithics. May be slumped stratiform mass or intensely veined volcanic. Fine grained matrix suggests stratiform.	Ms + dt
58.90	59.40	Prominently sericitized lithic crystal tuff of rhyolitic affinity with fine cherty lithics, quartz phenocrysts in sericitic matrix.	rlct
59.40	74.50	Fine grained cherty silicified vitric ash gradational to chert or cherty tuffite, disseminated pyrite and vein pyrite patchy to 10%, locally higher, some locally prominent sphalerite-galena veining. Locally bedded e.g. 63.70 at 43°. Local chalcopyrite only in association with sphalerite-galena veining. Locally bedded e.g. 63.70 at 43°. Local chalcopyrite only in association with sphalerite-galena. The unit is partially sericitized throughout.	ash
74.50	84.20	Feldspar-quartz vitric crystal tuff to lithic tuff? or lava breccia feldspars and local quartz, moderately sericitized with local quartz, moderately sericitized with local cherty pyrite veining alteration. Banding at 77.90 at 45° may be bedding or alternatively flow banding if unit is a brecciated lava. Pyrite 3%.	dvct? dc
84.20	102.40	Quartz-feldspar rhyolite lava breccia, vitric with moderate sericite-silica alteration, some vuggy quartz, not visibly mineralized.	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF7

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	1.50	No Core	
1.50	34.00	Volcaniclastic quartz-feldspar rhyolitic breccia and lithic crystal tuff, locally with large shale rafts and possible shale intervals. Some fine grained bedded ash to crystal tuff 28.90-29.15. Facing possibly downhole?	Rb, rlct, Sh
34.00	44.30	Feldspar ± quartz dacite lava breccia with pink vitric fragments, weak sericite and chlorite alteration.	dc
44.30	67.80	Grey feldspar phyric-flow banded dacite lava with some local autobrecciation. Weak sericite and chlorite alteration of vitric unit Flow banding at 47.00 is at 50°.	dc
67.80	67.90	Quartz-galena vein, probable fault fill (3% Pb)	
67.90	104.40	Grey to pink vitric feldspar phyric dacite lava breccia, dominantly coarse vitric pink to grey fragments, weak sericite, chlorite alteration, finer grained matrix. Note bedded vitric ash fragment at 101.60.	dc
104.40	105.30	Feldspar phyric volcaniclastic breccia of ash to feldspar-phyric ignimbrite and cherty fragments rare rhyolite clasts, dissemination and veinlets of pyrite to 2%, a few segregations and veinlets of sphalerite and galena. Facing uphole.	dib, ash
105.30	115.85	Fine grained siltstone to shale within lithic zones, locally bedded eg. 108.00 at at 45°, fold evident 115.60. Note quartz-feldspar-phyric rhyolite lithics from 115.40, mixed with feldspar-phyric and cherty detritus in shale.	Sh
115.85	117.85	Quartz-feldspar rhyolite-shale lithic volcaniclastic breccia, a mix of fragments, crystal and ash debris. Note two different rhyolite types.	Rb
117.85	122.84	Feldspar ± quartz dacitic volcaniclastic lithic tuff to ash, shows grading to fine ash uphole? (facing), weak to moderate sericite - chlorite alteration.	dtl, ash
122.84	124.40	Volcaniclastic quartz-feldspar breccia to lapilli-tuff with sericitic quartz-feldspar fragments, vitric fragments with chert and shale fragments in finer grained ash matrix.	Rb, rlt
124.40	130.80	Dominantly shale with local quartz-phyric lithic detritus and crystal tuff. Bedding at 129.00 is at 68°. Rare andesitic detritus near 130.50	Sh rct
130.80	142.70	Strongly sericitized feldspar andesite, probably vesicular, exhibits cherty veining 130.80 - 134.40°, carbonate veinlets some sphalerite - galena segregations and veinlets prominent locally, note local cherty veinlets with pyrite and carbonate.	and
142.70	144.12	Volcaniclastic andesitic lapilli tuff to breccia with dominantly chlorite to sericite glassy fragments of andesite, probably a few cherty fragments set in fine grained matrix (fragment supported). Some patchy cherty veining, local disseminated galena, rare pyrite.	alt ab

HOLE EAF7 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
144.12	148.15	Porphyritic quartz rhyolite, pink bleached with sericite alteration, local chlorite, patchy quartz and carbonate veinlets. Note local breccia fabric - probably autobrecciation. Sericite can give pseudo-fiamme fabric locally. Contact at about 75°.	rhy
148.15	150.20	Volcaniclastic rhyolitic crystal lithic tuff with quartz-feldspar-phyric crystals and detritus and rare andesitic fragments set in a finer rhyolitic matrix. Patchy but prominent fine grained pyrite veining and replacement.	rclt
150.20	151.27	Dacitic ignimbrite, prominently schistose with sericitic fiamme, feldspar-phyric fragments and detritus, patchy weak to moderate sphalerite-galena veinlets and segregations.	dilt
151.27	186.90	Altered feldspar-phyric andesite, sericitic and schistose but becomes increasingly silicified with relict sericitic patches. This is a feeder system with prominent pyrite and pyrite-chalcopyrite veining crosscutting finer grained disseminated pyrite. Patchy segregations and veinlets of galena sphalerite often with pyrite and chalcopyrite crosscut these earlier phases. The main silicified zone extends 152.60 - 165.80 (feeder). Note quartz-carbonate veinlets with minor sulphide occur locally. Beyond 165.80 the rock is sericitic and increasingly chloritic. Primary fabric with feldspar, carbonate and quartz filled vesicles, local finer grained rare lithics and possible lava breccia to alteration breccia fabric are seen to the end of the hole. Carbonate veining (collomorphic locally) and quartz veining are prominent with rare associated sulphide. Sphalerite-galena veinlets and segregations are generally weakly developed.	and

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF8

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	2.60	No core	
2.60	26.30	Bleached sericitic-feldspar-quartz rhyolite or dacite breccia, with vitric fragments and grey green sericitic fragments. Core is very broken to 19 m - may be indicative of fault zones especially 9 m, 16 m. Note some fragments show weak flow banding. Note local quartz-feldspar rhyolite fragments. Quartz phenocryst content varies considerably.	db
26.30	28.90	Volcaniclastic tuff and ash. The interval 26.30-26.87 is mixed lithic and crystal detritus of quartz-feldspar rhyolitic and some cherty shale or ash fragments. The interval 26.87-28.90 is sericitic fine grained to cherty ash, locally lithic. Patchy weak pyrite clots. Base of oxidation near 30.00.	ash, rct
28.90	42.00	Predominantly strongly sericite altered feldspar-phyric volcaniclastic? ash, possibly of dacitic affinity. The strong sericite produces fiamme-type fabrics and the rock may be a lithic welded unit. A few zones of nodular sericite-chlorite alteration, trace pyrite.	dlt, ash
42.00	50.35	Dominantly shale and ash with local quartz-feldspathic lithic sandstone beds and lenses. Bedding at 45.20 is at 032°. The interval 49.00-50.35 is fine ash grading to coarse lithic ash including quartz-feldspathic material and cherty material. Zoning is uphole? on this basis. Bedding at 49.20 is at 20°.	sh, ash rit
50.35	52.10	Strongly sericitic volcaniclastic buff and ash possible fiamme uncertain quartz phenocrysts, weak pyritic dissemination and veinlike meshwork 3%. Sugggests rock possibly dacitic affinity.	ash, dt
52.10	53.00	Volcaniclastic fine grained sericitic ash with coarser lithics of sericitic ash.	ash
53.00	57.90	Volcaniclastic ash, massive fine grained moderately to strongly sericitized vitric feldspar-phyric? tuff, possibly dacitic.	ash, dvt
57.90	74.10	Fine grained feldspar-quartz dacite to rhyodacite, dominantly feldspar phyric with scattered quartz, vitric but showing divitrification, bleached pink in part, locally flow banded. Sub-parallel to core axis near 67.30, at 40° near 81.40.	dc, rhy
74.10	78.60	Conglomerate with cherty rounded fragments in fine sericitic, siliceous matrix. Patchy dissemination of pyritic and segregations (2%), local minor sphaleritic-galena veinlets. Some bedded chert occurs locally e.g. at 76.00 is at 50°.	Rb

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF8 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
78.60	87.30	Fine grained chert to cherty volcaniclastic, bedded with extreme variation in core to bedding angle indicative of folding e.g. at 85 m at 05°, 045° at 87.20, 085° at 79.60. Patchy but locally prominent red brown sphalerite-galena-chalcopyrite-silica veining, disseminated pyrite and pyrite veinlets to 57.	ash
87.30	89.90	Conglomerate and chert with rounded cherty fragments and cherty ash fragments in sericitic fine grained matrix, patchy segregation replacement by sphalerite-galena generally minor, local pyrite segregations to 2%.	db
89.90	93.90	Volcaniclastic tuff of sericitic feldspar-phyric material with local cherty lithic zones, some distinct cherty veining 93.00-93.90. Patchy pyrite veining and dissemination (2%), rare segregations of sphalerite.	dt
93.90	106.00	Moderately sericitic quartz-feldspar phyric rhyolite lava breccia grading into massive unit. A few quartz veins locally throughout	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF9

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	3	No Core.	
3	3.40	Flow banded vitric feldspar dacite, probably a boulder as is relatively fresh.	dc
3.40	34.10	Volcaniclastic quartz feldspar rhyolitic crystal tuffs and lithic crystal tuffs, weathered, moderately sericitic, a few shale fragments locally. Core very broken and crumbly.	rct, rlct
34.10	47.40	Distinct quartz-feldspar rhyolitic lithic tuff volcaniclastic with angular to subrounded rhyolite fragments and large black shale fragments in a finer grained matrix, moderately sericitic and moderately weathered. A few local pyrite segregations.	rtl
47.40	54.30	Part weathered massive vitric feldspar ± quartz dacite, weakly sericitic.	dc
54.30	97.25	Feldspar ± quartz dacite lava and lava breccia. Base of oxidation near 61.00. Varies from pink to grey green with vitric to sericite-chlorite altered massive to autobrecciated, a few sections weakly flow banded. No visible mineralization, a few quartz veinlets.	dc
97.25	131.82	Probable volcaniclastic feldspar ± quartz dacite breccia with pink to grey vitric and sericitic fragments usually of lapilli size, but some larger, set in a finer grained matrix. Note large blocks of shale incorporated especially 106.70-118.50. Note the volcanic component appears bimodal with dominant feldspar-phyric lithics, but with some local quartz-feldspar-phyric lithics, a few quartz veins minor carbonate veins carry trace sphalertie. Note finer grained lithic crystal tuff (feldspar-quartz) 131.53-131.82 may be indicative of grading with downhole facing?	dc
131.82	149.00	Dominantly massive to bedded shale exhibiting complex changes in core to bedding angles with some visible mesoscopic folds, a few small zones of quartzo-feldspathic crystal tuff and lithics. Probable uphole facing at 145.00. Bedding at 133.00 is at 35° at 135.80 subparallel to core axis at 140.20 50°, fold at 143.70. Note prominent fault breccia with carbonate-silica matrix subparallel to core axis 145.6-146.27. Patchy pyrite veining and sericite alteration throughout (2%) with local probable chertification, minor sphalerite associated.	Sh
149.00	158.20	Quartz-feldspar rhyolite showing prominent sericite and silica alteration with segregations and veinlets of medium grained sphalerite-galena. The zone 156.80-159.20 is part of fault zone with white quartz. May be intrusive?	rhy
158.20	161.35	Strongly sericitized feldspar-phyric andesite? dacite lapilli unit with quartz fault zone incorporated 158.20-159. A few veins of pyrite, chalcopyrite and sphalerite with 5 cm pyrite-sphalerite-galena vein 158.70.	dlt

HOLE EAF9 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
161.35	163.50	Silicified, sericitized feldspar-phyric dacitic lapilli tuff with veining by mixed sulphides grading into semi massive to massive sulphides. Can only describe as feeder zone replacement unless volcanic detritus incorporated with stratiform sulphides and superimposed veining. Note carbonate segregations and veining locally.	dlt
163.50	165.60	Prominently sericitic feldspar-phyric dacitic lapilli tuff with apparent breccia fabric probably due to the alteration. Minor segregation of sphalerite-galena and veinlets of carbonate with associated sphalerite-galena and chalcopyrite. Note contacts are sharp probably at 45-50° and this unit may have faulted contacts.	dlt
165.60	171.70	Dominantly massive sulphides with sphalerite-galena-pyrite-chalcopyrite, probably replaced silicified andesite over first 0.40 m or volcaniclastic material incorporated within massive sulphides. Another probable volcaniclastic sulphide mix 168.25-169.35 or feeder zone material as is dominated by pyrite. Prominent barite in this zone locally and associated sphalerite-galena. Note sphalerite is usually pale brown coloured, chlorite as visible gangue, chalcopyrite as veining replacement. Some semblance of layering which may be bedding, tendency for sulphides to be realigned into cleavage. Some medium grained galena veining, a few quartz veinlets. Probable bedding 166.25 at 60°, 167.30 at 30°, 171.70 at 20°, some folding suggested.	MS
171.70	212.30	Stockwork zone in sericitized, silicified and locally chlorite altered andesite? with prominent pyrite and pyrite-chalcopyrite and sphalerite-galena-pyrite veining. The zone 171.70-183.40 is dominated by pyrite-chalcopyrite as dissemination and veining to 50% pyrite, chertification most pronounced 171.70-173.70, sericitized throughout with cherty overprint and local crosscutting chlorite overprint. Red brown sphalerite-galena±chalcopyrite veins are common from 183.40 as well as chalcopyrite-pyrite veins and cherty pyritic veins. Intensity of veining falls off past 201.00 though cherty veining and carbonate-galena veining, nodular carbonate alteration in evidence. The main chlorite zone with intense pyrite is 175.6-183.3.	and
212.30	222.35	Foliated sericitized feldspar-phyric andesite? bleached khaki to pink coloured, local breccia fabric due to chertification and cherty silica veining. Some pyrite associated (1%) with local minor sphalerite-galena veinlets.	and
222.35	243.85	Volcaniclastic breccia zone dominated by sericitic feldspar-phyric andesite debris with some cherty lithics incorporated. There are some very large (>20 cm) fragments of andesite. Bedded fine ashes are locally present and matrix to breccias is lithic ash material with scattered quartz phenocrysts. Suggest is series of debris flow units. Bedding at 222.55 is at 45° and facing downhole? (grading). Facing possibly uphole near 226.60. Nodular carbonate alteration of andesite fragments 228.00-234.00, also vesicular fragments, rare fuchsite alteration 232.20. Note some pink carbonate veining, bedded chert blocks to 0.15 m. Trunscation of bedded units at 237.00 may indicate uphole facing. Some of the large andesite fragments display cherty veining, local pyrite and rare sphalerite-galena segregations - may suggest derived from feeder system or interpret as insitu veining of volcaniclastics?	Ab, ash

HOLE EAF9 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
243.85	244.97	Sericitized andesite with vesicles carbonate infilled, carbonate veining, patchy fuchsite. May be dyke, contacts at approx 60° and 45°.	and
244.97	262.00	Massive to locally flow banded, fine grained quartz-feldspar porphyry or rhyolite, may be intrusive, veined by quartz and carbonate, moderately sericite altered. Flow banding at 250.00 is at 50°, at 261.50 is at 45°.	QFP

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

898100

HOLE EAF10

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	63.20	Weathered feldspar ± quartz phyric volcaniclastic? dacite breccia, dominated by pink feldspars, pink vitric fragments and sericite-chlorite altered fragments, a few flow banded fragments e.g. 44.50. Best described as coarse. Base of weathering near 50 m. Matrix content is usually small and suggests may be lava breccia?	dc
63.20	69.30	Volcaniclastic feldspar ± quartz dacite with vitric to feldspar porphyritic and rare quartz phyric fragments, local shale fragments in an ash matrix (40-70%). Facing probably down hole based on grading Note 68.50-69.30 is a distinct sericitic quartz-feldspar crystal tuff.	dt, dct
69.30	78.80	Feldspar-quartz-phyric rhyolite lava breccia, pink to green coloured, vitric with sericite and chlorite alteration.	rhy
78.80	87.55	Volcaniclastic sequence of fine to lithic sandstone and shaley ash of quartz-feldspathic affinity, 78.80-80.20, fine grained sandstone, 80.20-82.80 bedded ribbon siliceous shale with fine ash bands at 80° but slump evidence, 82.80-87.60 quartzo-feldspathic lithic crystal tuff, facing downhole, bedding at 62°.	rct, sh
87.55	98.10	Prominently sericitic, foliated feldspar-phyric and feldspar-quartz phyric volcaniclastic lithic tuff tending to grade downhole to finer ash material, some cherty material locally incorporated. Note some intense isoclinal folding near 96.00, cleavage very strong at 20°. Some local oval shaped boudinaged pyrite-silica vein material? or fragments.	dct
98.10	100.40	Massive sulphide sphalerite-pyrite-galena-chalcopyrite, sericite gangue, barite in zone 99.04-99.11, sulphides show effects of strong deformation with folding and transposition into cleavage. Sharp cut off of massive sulphides at both contacts suggests feeder distal or is slumped mass.	MS
100.40	115.86	Silicified part sericitic volcaniclastic breccia to fine ash, feldspar phyric ± quartz, this is the feeder zone with prominent pyrite, pyrite-chalcopyrite sphalerite-galena-pyrite-chalcopyrite veining, the best sphalerite galena as replacive mass 114.95-115.46, but other prominent zones, disseminated pyrite in some areas, also local replacement by all sulphides of host. The zone 115.46-115.86 is very sericitic with associated silica alteration anastomose pyrite veinlets + local sphalerite-galena segregations. Possible fault near 115.86?	db, ash
115.86	134.00	Volcaniclastic quartz-feldspar-phyric lithic crystal tuff and crystal tuff of rhyolitic parentage, fragments vitric to chert, disseminated pyrite 5%, note fine cherty ash 117.00-117.35 bedded at 50°, intensely sericitized with chert associated 121.30-124.40 and showing crenulation deformation, bedding sub-parallel to core axis. Note 129.90-132.35 mixed cherty ash - crystal tuff, probably a slumped unit.	rct
134.00	136.10	Volcaniclastic cherty ash	ash
136.10	136.30	Volcaniclastic sericitized quartz-feldspar crystal tuff, disseminated pyrite, sphalerite.	rct

HOLE EAF10 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
136.30	147.40	Dominantly siliceous to locally silicified volcaniclastic ash to breccia with sericitic fragments, apparent rhyolite affinity with some quartz phenocrysts, locally bedded eg 141.00at 45°. Patchy pyrite dissemination and veining throughout, sphalerite-galena-pyrite chalcopyrite veins concentrated 137.50-141.70, an intensely veined zone (5-10% pyrite) and part of a feeder system facing indeterminate.	ash, Rb
147.40	188.10	Dominantly autobrecciated to flow banded quartz-feldspar rhyolite and rhyolite breccia with sericitic green to pink quartz-feldspar-phyric fragments, matrix more sericitized rhyolite. Flow banding at 159.90 is at 52, at 167.30 is at 47°, at 177.20 is at 51°, at 182.40 is at 47°. Note 147.40-153 weak fine grained pyrite to 1% as disseminations.	rhy
188.10	188.78	Dominantly bimodal feldspar-quartz and quartz-feldspar volcaniclastic? rhyolite breccia, matrix supported, moderate sericite. Core tray may have been disturbed and core not all in correct position.	rhy, rct
188.78	194.10	Distinctive grey to pink massive feldspar-quartz-phyric rhyolite, locally with breccia fabric. Feldspars show green sericite? alteration (probably gives pitted fabric for surface samples). Moderate sericite alteration, anastomose silica veining locally. Some pyrite veining and dissemination concentrated 193-90-194-10 - may be remobilized.	rhy
194.10	236.70	Feeder system in strongly sericite altered, probably locally vesicular, feldspar andesite? with carbonate alteration spots in sericitic fragments intensely veined by cherty silica showing local growth banding and cut by pyrite, pyrite-chalcopyrite and sphalerite-galena veins. Some sections are moderately sericitic with the sericite producing pseudo-breccia fabric as does the silica. Local less altered zones are pink coloured with green sericitic feldspar, vague quartz phenocrysts or secondary quartz, possible flow banding at 199.50 is at 50°.	and
236.70	247.50	Dominantly massive to weakly flowbanded pink feldspar ± quartz rhyolite, dacite, showing local cherty veining with some associated pyrite. The feldspars are typically green coloured, sericite altered. Local brecciation probably autobrecciation of lava. Probably vesicular in part.	rhy 2, dc
247.50	256.00	Massive to locally flowbanded and autobrecciated rhyolite lava, quartz feldspar-phyric pink bleaching, quartz veining. Flow banding at 252.30 is 27°.	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

898102

HOLE EAF11

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	1.50	No core.	
1.50	38.90	Distinctive fine grained glassy feldspar-phyric massive rhyolite with fabric becoming pitted due to etching out of feldspar from 15.20. Partially weathered to base of oxidation near 15.20. Some large vugs in weathered zone relate to silica veining. Fault gauge near 15.00 is at 40° (significant core loss here). Local flow banding and minor brecciation, banding at 36.50 is at 35°. Core is quite fractured throughout.	rhy2
38.90	83.95	Pink and green quartz-feldspar sericitic rhyolitic lava breccia, becomes quartz phenocryst-rich, some massive sections, but dominant monomict breccia.	rhy1
83.95	85.60	Classic rhyolite hyaloclastic with sericitic glass shards of porphyritic quartz rhyolite of all size ranges set in a cherty to cherty ash matrix. Does this indicate flow top? Suggest facing downhole.	rhy1
85.60	121.90	Distinct change to very fine grained vitric feldspar-phyric rhyolite, massive to prominently flow banded with banding at 88.00 at 60°, 98.60 at 41°, 107.00 at 45°, 112.60 at 53°, 121.60 at 70°.	rhy2
121.90	123.67	Hyaloclastite rhyolite with sericitic quartz-rich fragments and sericitic glassy rhyolite shards in siliceous cherty matrix. Does this indicate up hole facing?	rhy1
123.67	131.25	Medium grained quartz-rich quartz-feldspar rhyolite breccia	rhy1
131.25	149.15	Dominantly quartz phenocryst-rich feldspar rhyolite with local breccia zones, local flow banding at 143.80 at 25°, at 147.50 at 33°.	rhy1
149.15	170.80	Classic quartz-feldspar rhyolite lava breccias, sericitized. The zone 1154.85-157.35 appears hyaloclastitic with pink, green and sericitic glassy rhyolitic fragments in fine ash matrix. The matrix is prominent in this zone, but fragments dominent elsewhere. Local massive sections.	rhy1
170.80	200.84	Massive pink to green sericitic quartz-feldspar rhyolite, local brecciation with silica veining and pink bleaching. Note local haematite alteration, local flow banding at 188.10 is at 49°, at 195.85 is at 52°. Note flow top or base breccia 199.62-200.84 and a few sphalerite-galena veinlets in this interval.	rhy1
200.84	215.50	Volcaniclastic sequence. Coarse reworked rhyolitic fragments and detritus including dismembered chert 200.84-203.28, 203.28-205.85 cherty andesite ash and chert, 205.85-206.65 slightly coarser vitric ash, 206.65-209.20 fine chert, cherty ash, 207.20-210.50 sericitic possibly welded unit passing into coarser lithic vitric tuff of andesitic affinity with variolites, quite sericitic with local segregations of sphalerite-galena and pyrite, 210.50-214.10 distinct andesitic lithic vitric tuff with fine and coarse fragments distinctly glassy, some large chert fragments, 214.10-215.15 mostly chert but some sericitized andesitic glass, veining of sphalerite galena, bedding at 215.00 is at 56°.	at, ash

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF11 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
215.50	218.56	Andesitic volcaniclastic breccia zone (debris slide?) incorporating fragments of massive sulphide sphalerite-galena, some pyrite-chalcopyrite associated in fragments near 218.36 and 218.10 suggests facing uphole (Cu grading to Pb-Zn).	Ab
218.56	219.68	Chert and bedded, graded andesitic ash units, bedding at 62°, facing uphole, minor sphalerite-galena veins.	ash, at
219.68	280.68	Andesite pillow lavas with some interpillow chert and lithic fine volcaniclastic detritus in the zone 219.68-222.60, prominently sericite altered, local sphalerite-galena and quartz carbonate veining to 224, noticeably vesicular from 234, weak flow banding near 273.35 is at 65°. Some sections variably chloritic, strongly sericitic towards contact at 280.68 and originally glassy. Carbonate veining and vesicular fillings.	and
280.68	285.70	Prominently sericitized feldspar-phyric lithic andesitic volcaniclastic tuff with coarser lithics downhole. A silty ash unit 280.68-280.94 may indicate up hole facing? Patchy segregation clots of pyrite, galena-sphalerite.	atl
285.70	293.48	Pink and green rhyolitic volcaniclastic to epiclastic breccia of close packed fine fragments of vitric rhyolite and sericitic rhyolite to 288.60 grading then into coarser fragments of sericitic quartz-feldspar rhyolite and pink vitric rhyolite set in finer matrix. This suggests an uphole facing.	Rb
293.48	297.15	Fine grained epiclastic cherty ash in the main with a few lithics, but with distinct graded units of quartzo-feldspathic material indicating up hole facing. Bedding at 296.20 is at 43°.	ash
297.15	298.40	Siliceous shale locally bedded at 53°.	
298.40	313.60	Coarse quartz feldspar porphyry; probably intrusive, matrix glassy, quartz veined. Contact at 298.40 probably faulted with quartz-carbonate veining at 80°.	QFP

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

898104

HOLE EAF12

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	3.00	No core	
3.00	37.10	Weathered sericitic pitted feldspar ± quartz rhyolite. Core fractured with iron oxides after sulphide veining 21.30-23.60 and 31-38 with quartz often associated. Sericite alteration weak to moderate throughout. Fault zone at 37.10 with pug and brecciation, core loss.	rhy2
37.10	54.30	Sericitic quartz phenocryst-rich rhyolite breccia. Possibly crystal tuff to lithic crystal tuff over first 4 m of the interval. Fragments vary from sericitic to pink glassy to flow banded. Note prominent pyrite stringers in zone 49.60-54.30 with veins to 0.40 m width. Patchy narrow pyrite stringers associated with quartz 54.30-59.20. Brecciation may be partly an alteration effect as fragments fit together in most instances.	rhyl
54.30	77.30	More massive quartz-feldspar rhyolite, flow banded locally. Some quartz veining with iron staining after sulphide vugs. Appears increasingly brecciated towards end of interval.	rhyl
77.30	106.80	Distinctive polymict rhyolite volcaniclastic breccia with sericite quartz-feldspar-phyric feldspar-phyric fragments, pink glassy quartz-feldspar-phyric fragments (glass) in finer grained matrix. The matrix is locally cherty (interpillow?) especially 77.30-78.30. The matrix is usually quartz-feldspar material. The feldspar-phyric fragments are quite distinct and concentrated over certain intervals almost to the exclusion of the quartz-feldspar-phyric fragments, matrix forms 20-40%.	Rb
106.80	121.50	Typical quartz-feldspar-phyric rhyolite lava breccia showing varying degrees of brecciation and locally a massive form, quite glassy with pink alteration colouring.	rhyl
121.50	141.50	As above, but distinctive pink and green colouration due to chlorite alteration which accentuates the flow banding. Some sections show regular flow banding e.g. 132.90 at 70° , but lava breccia for the greater part with various orientations of flow banded fragments.	rhyl
141.50	151.13	Volcaniclastic andesite with large range in size of sericitic and chloritic feldspar andesitic glass enclosed in an ash matrix (20-70% variation). Some matrix is distinctly cherty and may be relict interpillow material. Local veinlets and segregations of sphalerite-galena, pyrite possibly part of fragments before disruption from host.	at
151.13	157.40	Volcaniclastic sericitic quartz-phyric rhyolitic tuff passing into coarser feldspar-quartz rhyolitic tuff and perhaps indicative of uphole facing. Some quartz-carbonate veining with local coarse sphalerite associated - suggest Devonian mobilization. A few andesitic fragments associated towards end of section.	rct
157.40	157.73	Andesitic volcaniclastic of sericitic fragments in finer glassy ash matrix. Secondary coarse carbonate veins with coarse red brown sphalerite associated also local chalcopyrite veinlets and pyrite dissemination, chert fragments rare.	atl

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF12 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
157.73	160.00	Dominantly volcaniclastic rhyolitic detritus with some associated andesitic detritus, best described as sericitic lithic crystal quartz-feldspar tuffs with fine ash zones indicative of debris flow type deposition. Some prominent pyritic veining 158.00-158.30, local chalcopyrite, coarse pink carbonate veins with coarse sphalerite-galena associated.	rct-act
160.00	163.50	Dominantly volcaniclastic andesite dominated by lithics of sericitic andesitic glass with lesser chert and quartz phenocryst material. Matrix is finer grained ash (20-40%). Facing not definite, but probably uphole. Good cleavage developed at 45°.	atl
163.50	164.65	Dominantly quartz-feldspar-phyric rhyolite volcaniclastic, crystal and lithic debris flow.	rct, rtl
164.65	165.80	Volcaniclastic andesite with lithic crystal tuff near 165.80 grading uphole into feldspar-phyric crystal tuffs and ashes, local quartz phenocrysts material but minor in matrix. Facing uphole. A good cleavage developed in sericitic matrix, some chert fragments. Bedding at 45°.	alct
165.80	211.84	Vesicular andesite lava, sericitized with chloritic clots, cleaved in zone 165.80-166.50 with cleavage at 45°, probable local interpillow chert 166.10. Vesicles carbonate filled, prominent carbonate veining. Contact with volcaniclastics at 211.84 is approximately 25°.	and
211.84	214.41	Volcaniclastic of mixed andesitic-rhyolitic affinities, usually ash size material but lithics coarser locally and indicative of uphole facing? Some chert is locally associated. A few localized pyrite veinlets and segregations.	at
214.41	229.60	Coarse grained volcaniclastic andesite to dacitic?, dominantly feldspar-phyric, lithic, prominently sericitized producing pseudo-fiamme and eutaxitic type fabric. Patchy dissemination of pyrite, sphalerite, galena often replacing feldspars. Prominent foliation at 45-50°.	dct, dlt
229.60	230.30	Volcaniclastic cherty ash of possible andesitic affinity.	ash
230.30	232.10	Volcaniclastic dacitic to rhyolitic debris flows grading from lithic crystal to ash, fragments glassy, coarser intervals prominently sericitized, no certain facing. Prominent foliation disrupts primary fabric. Bedding at 231.60 is at 25°.	dct, ash
232.10	235.00	Polymict rhyolitic volcaniclastic breccia with large sericitic quartz-feldspar-phyric green coloured fragments, large pink feldspar-quartz glassy rhyolite and finer glass shard set in an ashy material (35%).	Rb
235.00	244.40	Volcaniclastic feldspar ± quartz dacitic? rhyolitic breccia with sericitic feldspar-phyric fragments, pink glassy feldspar-phyric fragments coarse to fine set in an ashy matrix (50%). Note the zone 235.00-236.25 is dominantly fine ash with a few zones of coarse lithic debris. Scour and fill textures suggest a downhole facing? Bedding at 236 is at 30°. The section 241.70-244.40 is dominated by pink K-feldspar alteration?	Rb, ash

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF12 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
244.40	261.80	Massive pink to grey feldspar ± quartz-phyric dacite or rhyolite lava? intrusive, some local autobrecciation, alteration sericitic to patchy chlorite and pink K-feldspar alteration. Some prominent quartz veins.	rhy2
261.80	266.10	Volcaniclastic quartz-feldspar-phyric rhyolite showing variation from coarse lithic crystal tuff to fine ash indicative of successive debris flows. Facing is probably downhole. Bedding at 263.80 is at 45°.	rhy1
266.10	269.58	Fine grained siliceous siltstone.	S1
269.58	285.00	Coarse quartz-feldspar porphyry, probably intrusive?, contact at 269.58 at approx 45° shows some evidence for feldspar crystals to be incorporated into the disrupted siltstone at the contact - possible mass flow deposit.	QFP

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF13

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	3.00	No core	
3	67.75	Massive to prominently flow banded quartz-feldspar rhyolite or porphyry, part weathered to 34.00 approx. Moderate sericite alteration throughout, a few quartz veins, several small zones of cherty silicification veining with minor sphalerite + galena and pyrite. Flow banding at 35.30 is at 50°, at 40.00 is at 42°, at 58.00 is at 15°, at 64.00 is at 38°. Contact at 67.75 is at 60°.	rhyl
67.75	69.45	Bedded volcaniclastic siltstone with bedding at 45°.	Sl
69.45	135.75	Feldspar-phyric andesite, sericitized throughout, locally vesicular and bleached to pink colouration. The texture 69.45-80.00 approx is a breccia due to chertification and cherty silica veining often with internal layering and locally with pyrite and some sphalerite-galena associated. Massive andesite from 80.00 with patchy sphalerite-galena veining locally prominent. Cherty silica veining again prominent from 94.00-120.00 producing angular breccia fabric, local sphalerite-galena veining is associated, also segregations, pyrite rare. Prominent sphalerite-galena veining 116-119. More massive andesite 110 onwards. Note zones of chlorite alteration and carbonate veining in interval 129.10-135.40. Patchy veinlets of galena-sphalerite to 135.75. Note fault zone with pug zone at 135.75 with contact possibly at 40°. Note minor fuchsite observed in a few places.	and
135.75	143.07	Feeder zone in silicified, sericitic andesite with silicification locally producing breccia fabric. Strong dissemination and veining of pyrite (40%) with some associated chalcopyrite, the intensity of pyritization increasing towards 143.07 and suggesting a downhole facing at this position. The feeder zone is interrupted by a fault at 143.07 at approx 60° with a breccia and pug zone.	and
143.07	145.30	Sericitized quartz-feldspar rhyolite or porphyry, lower contact at 45°	rhy
145.30	152.20	Dominantly grey, fine grained, bedded volcaniclastic cherty siltstone to shale, a few narrow volcaniclastic feldspar crystal tuff zones, no definite facing but truncation of unit at 147.30 at 40° may indicate downhole facing? Bedding at 146.00 is at 55°, at 147.30 at 55°.	Sl-Sh
152.20	162.20	Lithic volcaniclastic unit varying from coarse breccia to fine lithic crystal tuff, a debris flow type sequence dominantly of andesitic detritus and some cherty lithics that may be reworked cherty veining material or chertified andesite. Andesitic fragments are sericitic to vesicular. The interval 159.10-162.20 is coarse andesitic breccia of andesitic fragments and chert fragments. Note a few fragments of sphalerite-rich massive sulphide scattered throughout. Facing probably uphole based on grading. Some carbonate veining.	ab, alct
162.10	178.70	Bleached sericitic, vesicular andesite, prominent alteration with carbonate veining and carbonate in vesicles.	and

SUMMARY DRILL LOGS
PINNACLES AREA

898108

HOLE EAF13 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
178.70	183.30	Volcaniclastic siltstone to lithic crystal sandstone of andesitic affinity, quite fine grained with finest unit near 178.70 possibly indicating uphole facing. Some carbonate veining throughout. A few large andesite fragments near contact at 178.70 probably relate to balling of the siltstone by the andesite flow.	Sl-alct
183.30	183.88	Intensely sericite altered vesicular andesite dyke, carbonate filled vesicles and veining. Contacts at 60° and 45°. Minor fuchsite developed within the dyke probably after feldspar.	and
183.88	184.05	Fine grained volcaniclastic siltstone of andesitic? affinity.	ash
184.05	216.00	Strongly sericitic feldspar-phyric dacitic lapilli unit with wispy sericitic fiamme? perhaps pumiceous, close packed in a fine grained sericitized matrix. Ovoid to spotty carbonate alteration masses and local carbonate veining. Note segregation and veins of sphalerite-galena common throughout with section 211.20-212.80 especially prominent.	dlti
216.00	225.20	Fine to coarse polymict volcaniclastic breccia of probable debris flow origin. Lithics include large chert fragments to 0.20m, quartz-feldspar rhyolite, pink vitric feldspar ± quartz dacite, sericitic feldspar ± quartz dacite. There would appear to be a fining of the unit uphole with siltstone facies near 215.60 i.e uphole facing.	Rb
225.20	240.00	Feldspar ± quartz phyric dacite lava breccia and flow banded lava. The interval 225.20-229.50 is weak to moderately sericitic breccia of pink vitric fragments and green sericitic fragments From 229.50 becomes more massive and grades into massive flow banded grey, feldspar-phyric lava cut by local quartz and carbonate veins. Flow banding at 232.70 is at 42°, at 235.40 is at 48°.	dc

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF14

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	3.00	No core	
3	39.30	Coarse volcaniclastic breccia composed of pink vitric quartz-feldspar rhyolite, flow banded rhyolite, quartz-feldspar crystal tuff and local shale fragments often as large blocks to 0.5m width. No sorting evident and suggest a mass slide. Sericite altered with some chlorite Some prominent quartz veining 27-32.	rhyl
39.30	113.25	Feldspar-phyric ± quartz-phyric rhyolite lava breccia and flow banded lava. Note breccia 39.30-48, flow banded lava 48-69.90, lava breccia 69.90-113.25. Varies pink to grey in colour. Flow banding at 53.30 is at 57°; at 101.00 it is at 55°.	rhy2
113.25	120.70	Dominantly fine grained volcaniclastic ash and lithic crystal tuff of rhyolitic affinity with feldspar-phyric fine lithics and quartz and feldspar crystals, locally bedded at 60°. Some shale and shale clasts locally.	ash
120.70	121.60	Coarse volcaniclastic breccia composed of pink vitric quartz-feldspar rhyolite fragments (the distinctive quartz-rich-feldspar rhyolite, sericitized) set in finer crystal lithic tuff matrix.	Rb
121.60	123.05	Fine grained vitric lithic crystal tuff of rhyolitic affinity.	rlct
123.05	135.12	Complex mixture of tuffaceous shale, vitric ash and fine grained rhyolitic quartz-feldspar crystal lithic tuff, well bedded throughout, note rip up shale clasts in lithic crystal tuff unit 134.57-135.12 showing uphole grading beyond here into finer bedded crystal tuff. Local scour and fill support this facing. Bedding at 126 is at 55° at 134 is at 54°, at 136.5 is at 55°. Note sphalerite-carbonate veinlets 125-129.	Sh, ash
135.12	139.10	Fine grained bedded shale, volcaniclastic andesitic ash rich in feldspar crystals and some fine grained sericitic andesitic lithics, lesser bedded chert with bedded fine grained pyrite. 139.05-139.95. Fine grained pyrite of probable syngenetic character occurs through most of the section. Some of andesitic fragments contain vein and segregation chalcopyrite, pyrite, sphalerite and galena suggestive of derivation from underlying mineralized andesite body. Some probable syngenetic fine grained galena within bedded andesitic volcaniclastic near 137.30.	Sh, ash
139.10	181.70	Massive to locally cleaved vesicular feldspar andesite, intense sericite and chlorite alteration, carbonate veining and carbonate filled vesicles, feldspars completely sericitized. Cleaved 139.10-144. Generally unmineralized except for weak pyrite and some sphalerite, galena 139.10-147.	and
181.70	190.60	Polymodal coarse volcaniclastic breccia with large fragments of feldspar phyric vitric-dacite, dacitic ignimibrite, sericite quartz rhyolite, coarse quartz-feldspar porphyry and sericite-chlorite andesite? set in finer matrix. Many of fragments are mineralized (pre-depositional) with dissemination and segregation of pyrite, sphalerite and galena.	Rb

SUMMARY DRILL LOGS
PINNACLES AREA

898110

HOLE EAF14 (Cont.)

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
190.60	198.20	Finer grained ash to crystal lithic tuff and chert package, showing uphole facing. The coarser lithic zones contain vitric rhyolite, chert mineralized feldspar-phyric dacite, and quartz and feldspar crystals. Bedding in chert at 194.20 is at 77°, some evidence of slumping elsewhere.	ash, rct
198.20	216.40	Probable intensely altered vesicular andesite, completely sericitized with vague carbonate filled vesicles rarely seen, overprinted by strong silica alteration giving breccia fabric. Local overprint by chlorite. Disseminated pyrite occurs throughout the sericitic host while more intense pyritized zones and feeder pyrite-chalcopyrite veins occur in the zone 198.20-207.	and
216.40	222.90	Fine to medium grained lithic vitric tuff, vitric tuff and ash of dacitic affinity, prominently sericitized and locally silicfied with disseminated pyrite to 5%, some local pyrite veins with some associated chalcopyrite. Note vague fiamme locally visible within altered host. This is marginal to main feeder zone.	dvt, ash
222.90	228.53	Prominent sericite altered, silicified and locally chlorite altered pumiceous dacitic lapilli tuff or ignimbrite with vague relict fabric. Cherty silica with local banded character is associated with prominent feeder zone pyrite-chalcopyrite veining and dissemination to 25%. Note chlorite alteration particularly in zone 227-228.53 as an overprint.	dlt
228.53	240.10	Prominent sericite-chlorite altered pumiceous dacitic lapilli with flattened, welded sericitic pumice lithics, patchy pyritic dissemination to 3%.	dlt
240.10	247.50	Prominent, silicified and locally chlorite altered dacitic lapilli tuff with pyrite and chalcopyrite dissemination and veining to 20% - feeder system.	dlt
247.50	272.50	Prominent sericite altered dacitic ignimbritic lapilli tuff with patchy silicification and prominent spotty carbonate alteration locally and local chlorite. Patchy pyrite dissemination of decreasing intensity to 256, some local sphalerite galena and chalcopyrite veinlets. Increasing galena-sphalerite dissemination and fine grained replacement of host rather than coarse veining 256-272.50. Note 268.50-272.50 increasing chertification of sericitized host which may be finer grained.	dilt
272.50	282.60	Volcaniclastic lithic to lapilli tuff of rounded cherty dacitic fragments and sericitic fiamme - may in part be product of chertification. Some patchy segregation of galena-sphalerite.	dlt
282.60	287.60	Fine grained quartz-feldspar porphyry, probably a dyke with contacts paralleling foliation at 30° and 43°. Exhibits sericite alteration and quartz veining.	QFP
287.60	288.40	Volcaniclastic breccia with rounded to angular lithics of chert, sericitic fiamme, vitric dacite in a finer matrix, pyritized in part.	db

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF14 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
288.40	289.25	Quartz-feldspar porphyry or rhyolite, probable dyke.	QFP
289.25	322.55	Volcaniclastic breccia passing into typical coarse dacitic ignimbritic lapilli unit of flattened sericitic pumice fragments. Patchy to locally prominent silicification overprinting sericitization, some local chloritic and spotty carbonate.	db, dib
322.55	330.70	Bedded cherty ash passing down into increasingly coarser lithic tuff past 323.50. There is an obvious uphole facing. The lithic component comprises rounded cherty volcanic fragments and sericitic fiamme. Alteration is sericite with local weak chlorite. Weak local dissemination of sphalerite-galena. Bedding at 322.60 is at 68°. Note rounded lithic zone similar to 287.60-258.40.	ash
330.70	334.50	Fine grained quartz-feldspar rhyolite or porphyry, sericite altered, fractured with some quartz veining.	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

898112

HOLE EAF15

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	4.4	No core	
4.4	23.20	Weathered vesicular sericite-chlorite altered andesite, base of weathering near 18.60. Note weak pyrite dissemination, fine meshwork of secondary quartz veinlets.	and
23.20	43.25	Prominently sericitized and locally silicified dacitic lapilli tuff with flattened, probably welded sericitic fiamme, gradational in places to finer ash. Prominent galena veining with associated pyrite in the interval 23.20 - 33.0. Some pale sphalerite associated spotty carbonate alteration 35.0 - 38.5. Note cherty lithics or ovoid to more massive cherty silica alteration from 40.0. Note finer ash zone 41.00 - 42.40. Some prominent galena veining 38.35 - 39.05 with other local segregations.	dlt
43.25	50.20	Dominantly fine grained vitric ash, bedded in part, local lithic tuff. Bedding at 48.5 is at 50°.	ash
50.20	59.20	Mixture of dacite? lapilli tuff to finer grained lithic tuff and ash prominently sericitized with local chloritization, sericitic fiamme visible locally. Minor veinlets and segregations of sphalerite galena and pyrite.	dlt, dtl
59.20	60.15	Fine grained locally bedded vitric ash with bedding at 45°.	ash
60.15	63.40	Mixture of quartz-phyric lithic crystal tuff and ash, not visibly mineralized.	rlct ash
63.40	65.00	Pink, fine grained lithic crystal tuff of rhyolitic affinity with pink vitric rhyolite, quartz and feldspar crystals in a finer matrix. The unit has mass flow affinities correlates with the large mass flow units in CP7. A few shale fragments are incorporated.	rlct
65.00	71.05	Fine grained lithic crystal tuff composed of pink vitric feldspar ± quartz - phyric fragments, feldspar and quartz crystals and finer matrix.	dlct rlct
71.05	71.30	Fine grained bedded cherty ash with bedding at 85°.	ash
71.30	75.55	Coarse volcaniclastic breccia with pink vitric feldspar - phyric and quartz - feldspar phyric lithics, chloritic feldspar-quartz lithics with minor matrix.	Rb
75.55	85.70	Coarse pink and green grey feldspar-phyric breccia composed of vitric dacite fragments showing patchy sericite-chlorite alteration. May be lava breccia.	dc

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF16

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	23.0	Weathered feldspar andesite with clays to 8.5 passing into less weathered sericite-chlorite altered material, probably vesicular in part with abundant fine grained secondary silica filling cavities, some carbonate veining. Note breccia fabric 21-23 may be flow base or top breccia.	and
23.0	24.80	Fine grained vitric dacitic ignimbrite (lapilli tuff) now showing prominent sericite alteration but with sericitic fiamme visible locally. Pyrite veinlets and dissemination to 3%, some local cherty silica veins minor sphalerite and galena segregations.	di
24.80	27.90	Mixed fine grained vaguely bedded sericitic ash and dacitic lithic tuff with lapilli size fragments of pumice in sericitic hosts, some cherty lithics, good cleavage. Some evidence for uphole facing (grading). Local cherty veining and pyrite veining and segregation (8%) as lenses with minor associated sphalerite-galena.	ash, dtl, dilt
27.90	32.90	Fine grained schistose, sericitic lithic to lapilli tuff of probable dacitic affinity with abundant sericitic to chloritic fiamme and some vitric lithics in a pervasively sericite-chlorite altered matrix. Prominent pyrite, sphalerite and galena occur throughout as veining and ovoid segregations. Ovoid pale sphalerite-galena is particularly prominent 30.4-32.20.	dlt
32.90	37.25	Predominantly fine grained cherty siltstone and ash, locally bedded with bedding at 34.20 at 65°. A few stringers and segregations of pyrite with local sphalerite-galena.	Sl-ash
37.25	38.90	Fine grained schistose lithic to lapilli tuff with abundant flattened sericitic pumice fiamme and cherty lithics in sericitic matrix. Cleavage is at approx 45°, minor pyrite dissemination and veinlets of sphalerite-galena.	dlt
38.90	40.40	Fine grained sericitic ash, local minor galena-sphalerite veinlets.	ash
40.40	42.70	Fine grained volcaniclastic lithic crystal tuff of rhyolite affinity with quartz and feldspar crystals, vitric and sericitic fragments, rare sulphide veinlets.	rlct
42.70	44.90	Fine grained ash.	ash
44.90	47.10	Mixed quarta-feldspar-phyric rhyolitic crystal tuff and ash, quite sericitic, some cherty veins, patchy disseminated fine grained pyrite to 2%, local segregations of sphalerite-galena.	rct, ash
47.10	49.50	Chert? or chertified tuff with moderate veining of pyrite, sphalerite and galena.	dt
49.50	49.78	Massive sulphide sphalerite-galena-pyrite-chalcopyrite with pyrite in minor amounts increasing towards 49.78 where it is up to 20%. Some semblance of layering at 45°.	MS
49.78	51.70	Chert? and cherty tuff, some bedded sections at about 50°, but generally massive fine grained silica with some sericite locally associated. Prominent dissemination and veining of pyrite, sphalerite and galena. The bedded units may be vitric ash rather than chert.	dt

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF16 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
51.70	59.00	Sericitized dacitic? lithic to lapilli tuff or ignimbrite with abundant fine grained sericitic fiamme. The rock is strongly schistose. Disseminated pyrite throughout to 3%.	dlt
59.00	63.00	Moderately to strongly silicified sericitic ignimbrite with textures largely overprinted. Prominent but patchy veining and segregations of pyrite, sphalerite and galena.	dlt
63.00	66.30	Dominantly feldspar-phyric dacitic lithic crystal tuff with pink vitric fragments and local pumice fragments. Grades into finer ash 64.7-65.30 with probable uphole facing.	dlct
66.30	78.40	Vitric feldspar dacite and dacite breccia, may be lava breccia, local fine chlorite veins. Large variation in fragment size, but fragments all of pink vitric dacite.	dc
78.40	81.30	Fine grained, grey coloured vitric dacite, some internal brecciation, local chlorite veinlets and clast that may in part be after mafic phenocrysts. Some local pink bleaching alteration.	dc
81.30	83.20	Coarse bimodal breccia of pink vitric dacite? fragments and chloritic quartz-feldspar rhyolite fragments comprising 70% of the rock enclosed in a finer grained matrix. Contact at 83.20 is at 10°.	Rb
83.20	84.50	Fine grained vitric tuff or ash locally with fine grained chloritic pumice lithics. Some layering at 84.00 is subparallel to core axis.	dtl

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF17

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	6.80	No core.	
6.80	94.00	Prominently sericitized ignimbritic dacitic lapilli tuff with characteristic flattened sericitic pumice fragments, fine to coarse in size, probably vitric in part and locally silicified. Patchy mineralization of disseminated pyrite to 2% throughout with local zones of veining and segregation of sphalerite and galena especially 13-25. Note some of pumice lithics are preferentially pyritized.	dlt
94.00	97.30	Sericitic dacitic lapilli units showing patchy silicification. A few zones of spotty pink carbonate alteration, a few veinlets and segregations of sphalerite and galena and pyrite. Note a fault zone with pug 94.00-94.20.	dlt
97.30	102.40	Prominent sericitic, carbonate and chlorite altered dacitic lapilli tuff with segregations and veinlets of sphalerite and galena, disseminated pyrite to 1%. A few quartz veins with sphalerite and galena. Note chlorite as an overprint.	dlt
102.40	104.30	Dominantly fine grained sericitic ash with some lithic intervals. Some bedding at 73°.	ash
104.30	116.35	Prominent sericitic dacitic lapilli with zones of spotty pink carbonate, chlorite alteration patchy 112-115.50.	dlt
116.35	122.40	Fine grained sericitic dacitic vitric lithic tuff to lapilli tuff with fine pumice lithics.	dvtl
122.40	131.53	Pink volcaniclastic rhyolitic tuffs to breccia with pink quartz-feldspar rhyolite fragments of fine to medium grain size in a finer grained matrix (fragment dominated). Some sericite and chlorite alteration.	rtl, Rb
131.53	143.90	Sericitic and weakly chloritic dacitic lapilli tuff with both sericitic pumice and rounded vitric dacite lithics, local disseminated pyrite and pyrite veinlets to 3%, rarer chalcopyrite often associated with sphalerite and galena veinlets and segregations.	dlt
143.90	146.05	Chlorite-sericite altered, locally feldspar-phyric andesitic lava breccia, some carbonate veining, a few patches of cherty silicification.	and
146.05	147.45	Cherty veined and silicified andesite with some pyrite veinlets. Note carbonate matrix to breccia at 146.05-146.10.	and
147.45	168.47	Chlorite-sericite altered vitric feldspar andesite with local carbonate veining.	
168.47	168.67	Fine grained quartz-phyric rhyolitic breccia to lithic tuff with pink vitric fragments in a finer matrix, moderate sericite alteration, contacts at 70° and irregular.	rhy
168.67	169.50	Chlorite-sericite altered andesite lava breccia with some carbonate veinlets.	and

SUMMARY DRILL LOGS
PINNACLES AREA

HOLE EAF17 (Cont.)

DEPTH From	To	DESCRIPTION	ROCK TYPE
169.50	176.20	Vitric to weakly sericitic quartz-feldspar-phyric rhyolite lava and lava breccia with breccia dominated zones and more massive grey vitric zones. Lithics in breccia zones generally pink. Contact at approx 90°.	rhy

E.O.H.

SUMMARY DRILL LOGS
PINNACLES AREA

898117

HOLE EAF18

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	2.80	No core.	
2.80	43.25	Typical feldspar-phyric ignimbritic dacitic lapilli tuff with abundant flattened pumice clasts, sericitized, locally chlorite altered and silicified. Not sphalerite-galena-pyrite-chalcopyrite veining from 25.00 with prominent replaced zones 39.10-39.70.	dilt
43.25	46.20	Cherty sediments and ashes incorporating dacitic lapilli 44.55-45.20. Note prominent vein of sphalerite-galena with crosscutting later chalcopyrite. 43/50-43.23. Bedding at 43.30 is at 55°.	ash-sl, dlt
46.20	75.00	Sericite-silica altered, dacitic lapilli tuff, one prominent sphalerite-galena vein 50.50-50.60. Note modules of silica alteration 50.90-58 with some associated pyrite, sphalerite and galena. Patchy veining and segregation of sphalerite, galena occur locally to the end of the hole.	dlt

E.O.H.

898118

APPENDIX 2

Petrographic Descriptions

K- 118

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Pontifex & Associates Pty. Ltd.

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E.1 OCT. 1986

MINERALOGICAL REPORT NO.4850

25th September, 1986

TO:	Mr. P. Gregory B.H.P. Minerals Ltd. Exploration Department P.O. Box 559 CAMBERWELL VIC. 3124
COPY TO:	B.H.P Minerals Research Laboratories 245-273, Wellington Road MULGRAVE VIC. 3170 Attention: Kerryn Robinson
YOUR REFERENCE:	Letter dated 3/9/1986 - K. Robinson
MATERIAL:	Drill Core and Rock Samples
IDENTIFICATION:	MRL 20463 to MRL 20476 (Field Nos. 3787Z to 3800Z)
WORK REQUESTED:	Section preparation and some descriptions , variably as specified
SAMPLES & SECTIONS:	Returned to K. Robinson, MRL, with copy of this report

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INTRODUCTION

The samples submitted and their requirements were:

MRL Nos.	Field Nos.	Section Type	Section Only	Section & Description
20463	3787 z	TS	*	
20464	3788 z	PTS	*	
20465	3789 z	PTS	*	
20466	3790 z	PTS	*	
20467	3791 z	TS	*	
20468	3792 z	TS		*
20469	3793 z	TS		*
20470	3794 z	TS	*	
20471	3795 z	TS	*	
20472	3796 z	PTS		*
20473	3797 z	PTS		*
20474	3798 z	PTS	*	
20475	3799 z	PTS	*	
20476	3800 z	PTS		*

In the samples described, your field notes are included in the description and comments are made in reference to them, as appropriate.

With reference to the required identification of sericite v. pyrophyllite, the comment is made that it is virtually impossible to positively distinguish between these two white micas by optics alone. In most of the sections made however, the white mica mostly appears to be sericite (intimately mixed with clay and extremely fine devitrification quartz). The weak yellow staining on the offcuts, treated with sodium-cobaltinitrite, tends to confirm sericite rather than pyrophyllite.

INTRODUCTION cont.

Relatively discrete, slightly coarser single flakes and clusters of white mica do occur in MRL 20473 (3797z), MRL 20474 (3798z), and in MRL 20476 (3800z), and in all cases this mica appears to be muscovite. It is most abundant in MRL 20474 (3798z), of which a description was not requested, and this would be the best sample in the suite to extract the mica for an XRD determination. It will be of interest that this mica, in this sample MRL 20474, forms foliae within an extensive aggregate of oriented barite prisms.

The nature of some clusters of curved, 'distorted', minute flakes of white mica in MRL 20476 does suggest some pyrophyllite, but sericite/muscovite is also present.

In MRL 20475 (3799z), fine, very pale yellow (?silver-rich) gold was seen in pyrite, in close association with galena, chalcopyrite and sphalerite. This section was not required to be described, and was returned, with the other sections and samples, to Kerryn Robinson, M.R.L.

898122

MRL 20468
Field No. 3792 z

Breccia of plagioclase-porphyritic andesite; groundmass with complete pervasive replacement by chlorite, phenocrysts partly replaced by carbonate; fractures veined by:
1) coarse curvi-rhombohedral dolomite ± minor very fine turbid quartz;
2) by later, clearer carbonate ± quartz.

Field Note: EAF7/183.65 m, chloritic feldspar-andesite, carbonate veining, and zeolite veining.

The chaotic aggregate of green breccia fragments, which form about 75 % of this rock, is an extensively altered, plagioclase-porphyritic lava. Original plagioclase phenocrysts (10-15 % of the original rock), up to 2 mm in size, are largely to completely replaced by fine patchy carbonate ± chlorite.

The original groundmass is completely replaced by compact, extremely fine, weakly schistose chlorite, with minor small (0.3 mm) scattered patches of slightly coarser chlorite, and/or of sericite, and/or of extremely fine carbonate, and rare, equally small patches of secondary quartz. The chlorite has replaced a felted mass of microlites of feldspar and probable interstitial mafic glass. The small patches are microphenocrysts and/or minor heterogeneities in the original groundmass. Accessory very small discrete grains of leucoxene are disseminated.

This intensely chloritised andesite has been fairly extensively brecciated and the random fracture network has been invaded by veining:

1) initially by limited micro- to cryptocrystalline quartz ± equally fine turbid carbonate, carrying small breccia fragments of the altered host rock;
2) slightly later than, or more or less contemporaneous with (locally mixed with), extensive coarser turbid carbonate (dolomite), in which individual crystals have distinctly curved crystal faces; also with small fragments of host rock breccia;

MRL 20468 cont.

3) limited later, clearer, microcrystalline carbonate veinlets, with rare minute crystals of opaque oxides, and rare continuities into microcrystalline quartz.

There is no evidence of zeolite veining.

898124

MRL 20469
Field No. 3793 z

Felsic, volcanic breccia, numerous plagioclase phenocrysts, altered to carbonate (siderite), in an extremely fine quartz-sericite-clay groundmass of disrupted, devitrified, altered and welded quartzofeldspathic glass.

Field Note: CP7/78.60 m, dacitic welded lapilli tuff, prominently sericitised spotty pink carbonate alteration.

There are two textural components in this rock:

1) euhedral plagioclase phenocrysts (35 % of the rock), generally about 1 mm size, randomly disposed, but locally loosely clustered;
2) extremly fine, completely altered and disrupted groundmass.

The phenocrysts are stressed, microfractured, and at least one half of each is replaced internally, and rimmed, by carbonate, apparently siderite, commonly iron-stained. There are no quartz phenocrysts (as may be expected in a dacite).

The groundmass consists of fine kaolinite, crowded with random, fairly discrete 'sets' of extremely fine shredded sericite, which locally swirls and kinks around the phenocrysts, and apparently represents original flow, but with localised truncations. Very fine (0.1 mm) microspherulites of quartz are dispersed in subordinate abundance throughout these fine phyllosilicates (this is the same form of fine quartz seen in the groundmass of other lavas in the suite, and appears to be devitrified glass).

There are numerous textural discontinuities, including relict fragmentation preserved in the altered groundmass, and locally phenocrysts are seen to occur in vaguely defined, but separate ghost-like fragments. Compositionally, however, the groundmass, and the contained phenocrysts, are quite homogeneous, and the phenocrysts fairly evenly distributed.

The rock is therefore interpreted as a "volcanic breccia"; the brecciation appears to have been caused by disrupted flow, and welded in-situ, rather than a genuine pyroclastic composed of ejected (mixed) lapilli.

898125

MRL 20472
Field No. 3796 z

Welded tuff of devitrified, clay-sericite-altered, glassy lapilli; in a matrix of the same extremely fine quartz-clay-sericite; virtually no phenocrysts, minor disseminated pyrite, also minor small clusters of pyrite with associated anatase, rarer galena, sphalerite + chalcopyrite.

Field Note: EAF 18/27.50 m, sericitic dacitic lapilli tuff.

This rock consists essentially of a fairly compact mass of clay-sericite and extremely fine quartz (devitrified glass). There are negligible phenocrysts. The identification of the original rock depends largely on the interpretation of relict textures.

These textures are mainly irregular patches and fiamme-like, probable original lapilli, commonly with dimensions of about 1x5 mm, and defined by relatively greater concentrations of extremely fine shredded sericite, than in the generalised matrix. Some of these lapilli are fine cellular/tubular and may have been pumice.

The general matrix consists of dispersed fine microspherulitic to cryptocrystalline quartz (as devitrified glass), within a massive, equally fine clay-sericite matrix.

Accessory very fine pyrite (0.01 to 0.03 mm) is disseminated. Minor slightly coarser pyrite occurs in several small clusters, with associated small anatase crystals and rare fine inclusions of galena, and rarer chalcopyrite. Rare very small grains of sphalerite occur locally.

A single microphenocryst of subrounded and embayed quartz is present.

MRL 20473

Probable tuff, with altered glassy lapilli similar to MRL 20472, but with more abundant irregular lenticular layers of probable secondary fine quartz, abundant associated galena, sphalerite, lesser chalcopyrite; accessory scattered pyrite.

Thomas' Tunnel 3797 Z
Field Note: Prominent sericite, galena, altered dacitic lapilli.

This is a fine-grained, vaguely layered, weakly schistose rock, with widespread fine galena.

About 50 % of the rock consists of a sequence of variably continuous thin lenticular layers of microcrystalline quartz mosaic, incorporating minor shredded foliae of sericite and more discrete very fine single muscovite flakes. This quartz may be metamorphosed detrital material (coarse silt) or, seemingly more likely, it may be secondary hydrothermal alteration.

About 20 % of the rock consists of ragged, shredded, fiamme-like lenses of relatively concentrated sericite, incorporating minor very fine quartz, the exact origin of which would be difficult to resolve objectively, but these do compare with similar "fiamme" interpreted as altered glass lapilli in MRL 20472 (3796 z). This is probably sufficient evidence to classify this rock as a tuff.

Fine irregular grains, lenses and patches of galena (15 %), sphalerite (10 %), and rarer associated chalcopyrite (5 %) occur sporadically, mostly along the layering, more or less intergranular to the quartz-sericite matrix. Galena and much lesser sphalerite and chalcopyrite occur in several slightly coarser and partly crosscutting patches, more or less associated with 'secondary' quartz.

Accessory subhedral crystals of pyrite are scattered, and rarely occur in small clusters, and these commonly contain minute inclusions of galena.

Detailed optical scanning failed to find any gold.

MRL 20476
Field No. 3800 z

Crudely layered, fine granular aggregate of pyrite with intergranular matrix, some lenses and layers of microcrystalline quartz crowded with sericite, fine muscovite, and minor possible pyrophyllite.

Chester Mine
Field Note: Massive pyrite, with silica sericite?/pyrophyllite.

At leastd 60 % of this rock consists of a weakly layered, loose-packed aggregate of fine, irregularly granular pyrite, with a size range of 0.03 mm to 0.5 mm. The matrix intergranular to this pyrite is microcrystalline (cherty-textured) quartz, crowded with, and locally dominated by, extremely fine white mica.

Several irregular lenses and layers, to 15 mm wide, consist largely of the same quartz and mica, but slightly coarser, and occur sporadically within the pyrite aggregate.

Most of the white mica appears to be sericite, with some relatively more discrete, single, coarser flakes of probable fine muscovite. However, in some clusters and small lenses of fine mica aggregate the flakes are partly curved, 'distorted', and subradiating, and may indeed be pyrophyllite.

In the lenses and layers an initial microcrystalline quartz mosaic, crowded with fine pyrite, appears to have been brecciated and filled between by fine cherty quartz, with lesser pyrite. Traces and shreds of relatively concentrated sericite, $\pm$ pyrite, $\pm$ minor pyrophyllite occur in both siliceous domains.

There are no other opaque minerals in the rock.

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898128

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04 SEP. 1986

MINERALOGICAL REPORT NO. 4826

30th August, 1986

TO:	Mr. P. Gregory BHP Minerals Exploration PO Box 559 CAMBERWELL VIC
COPY TO:	Kerryn Robinson BHP Melbourne Research Laboratories 245-273 Wellington Rd MULGRAVE VIC 3170
YOUR REFERENCE:	Job Number B56/PG
MATERIAL:	Mineralised rock samples
IDENTIFICATION:	MRL20124 Field No. 3785Z MRL20125 Field No. 3786
WORK REQUESTED:	Preparation of polished thin section and report.
SAMPLES & SECTIONS:	Returned to Kerryn Robinson with this report.

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898129

MRL20124

JOB B56/PG

FIELD NO. 3785 : irregulsr very fine grained layered sequence of pyrite chalcopyrite galena and sphalerite, rare intergranular quartz, chlorite-muscovite, inclusions of galena and chalcopyrite common in sphalerite; one grain of gold 0.05x0.08mm also in sphalerite, no discrete silver minerals.

Southern Trench 3

Field note; massive pyrite sphalerite chalcopyrite galena.

The polished thin section was cut to represent as much as possible across this very fine layered (and locally patchy-massive) fine crystalline sulphide rock.

Examined first in transmitted light, the rock was seen to contain <10% non opaque minerals, manifest as minor very fine granular quartz, and somewhat more extensive, random-acicular fine flakes of chlorite and rarer muscovite flakes, intergranular to, and locally incorporated within fine sulphide grains.

In reflected light the rock is seen to consist of variably continuous layers, of relatively coarse sphalerite, irregularly alternating with layers of similarly coarse galena and of lesser chalcopyrite; each as a matrix, crowded with abundant small (0.1 to 0.5mm), subhedral to euhedral pyrite crystals.

Very small (0.01 to 0.15mm) inclusions of galena and chalcopyrite are fairly common in sphalerite, and locally these inclusions coalesce to form small highly irregular patches in the sphalerite.

A single subrounded grain of gold, 0.05x0.08mm occurs in sphalerite, in 'line' with several galena inclusions of similar size. (This gold grain is circled on the section). No specific silver minerals were seen.

MRL 20125

JOB B56/PG

FIELD NO. 3786 : layered sequence of microcrystalline barite-sphalerite; minor galena. lesser chalcopyrite, rarer scattered pyrite, and tetrahedrite in same composite galena-sphalerite, no discrete silver-minerals or gold grains.

Costean 16 W of Thomas' Tunnel

FIELD NOTE: massive barite, sphalerite, pyrite, galena.

This polished thin section was also cut to intersect as much as possible of this sequence of very fine layered, fine crystalline, sulphide-barite rock.

In transmitted light, at least 60% of the rock is seen to consist of fairly continuous layers of polygonal micromosaic of barite, with trace extremely fine flakes of muscovite being the only other non-opaque minerals. Some coarser, bent prisms of barite 1x4mm occur in this micromosaic which has an average size of about 0.15mm. Barite forms about 60% of the rock.

Relatively more discontinuous layers, about 1mm thick, of iron-deficient sphalerite (35%) occurs at irregular intervals through this barite sequence, also partly intergranular to it.

The remaining approximate 10% of the rock consists of irregular, grains of galena, generally along the margins of and between grains of sphalerite, locally forming small aggregates with it. Galena is more abundant in some grains than in others.

Accessory small crystals of pyrite are scattered. Rarer, smaller (0.05mm) grains of chalcopyrite occur in some composite, galena-sphalerite grains. Accessory tetrahedrite (possibly 1% of the whole rock) occurs in some of the composite galena-sphalerite grains. It is likely that anomalous silver values occur in this tetrahedrite (?and in the galena), but no discrete silver minerals were seen.

Detailed scanning failed to reveal any gold.

APPENDIX 3

Summary Drill Logs
Chester Area

SUMMARY DRILL LOGS
CHESTER AREA

898132

HOLE CP3

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	47.10	Porphyritic feldspar dacite possibly some quartz phenocrysts locally, moderately sericite - pyrite- silica-carbonate altered (5-8% pyrite), pyrite as dissemination + some local veinlets, some ovoid to lenticular quartz may be filling vesicles. Note local dissemination and segregration clots of sphalerite-galena rare but obvious 28.80-29.10. Some fine grained cherty banding near 41.86 at 35° may be flow banding? or silica veining related to the alteration. The section 45.80 - 46.80 contains prominent secondary quartz and carbonate as ovoid to lenticular masses possibly filling vesicles. A cleavage at 54° is locally evident.	dc
47.10	48.64	Fine grained vesicular andesite dyke, chloritized, some carbonate veining, contacts at 70° and 32° to core	and
48.64	69.49	Porphyritic feldspar dacite, moderate sericite - pyrite - carbonate silica alteration (pyrite 7%) some quartz-carbonate segregations Note 10-15% pyrite in zone 57.50 - 59.70 and locally higher elswhere.	
69.49	71.20	Vesicular chlorite andesite dyke, contacts at 30°.	and
71.20	76.40	Feldspar dacite, moderate sericite - pyrite - carbonate - silica altered (5% pyrite), local autobreccia fabric.	dc
76.40	77.70	Chloritic andesite dyke, lower contact at 35°	and
77.70	80.30	Moderately sericite - pyrite - silica - carbonate altered feldspar (3 - 5% pyrite) dacitic lithic tuff? or dacite auto breccia.	dc
80.30	81.77	Andesite dyke, contacts at 45° and 58°.	and
81.77	126.54	Feldspar dacite autobrecciated and/or alteration breccia giving lithic character, moderate sericitic-silica pyrite (5-8% pyritic), some cherty silica veining, secondary silica in vugs locally.	dc
126.54	133.20	Andesite dyke incorporating local patches of wallrock. Contacts at 50° and 60°.	and
133.20	162.92	Feldspar ± quartz dacite autobrecciated in places, moderate sericite-pyrite - silica - carbonate alteration (5% pyrite), foliation at 60°.	dc
162.92	163.60	Chloritic andesite dyke, contacts at 63°	and
163.60	178.14	More prominently cleaved feldspar dacite with cleavage at 62° moderately sericite-pyrite-silica - carbonate altered (3 - 5% pyrite), note local pyrite veining and coarse pyrite dissemination to 10% 175.00 - 178.14.	dc
178.14	179.10	Andesite dyke with contacts at 70° and 55°	and
179.10	187.35	Feldspar dacite, moderate to prominent cleavage at 60°, moderate sericite - pyrite - silica - carbonate alteration (pyrite to 3%) Chloritic andesite dyke, contacts at 46° and 48°.	dc
187.35	190.50	Chloritic andesite dyke, contacts at 46° and 48°.	

HOLE CP3 Continued

DEPTH From	To	DESCRIPTION	ROCK TYPE
190.50	199.00	Prominently to moderately cleaved feldspar dacite with cleavage at 65°, moderate sericite-pyrite - silica alteration (2% pyrite): note fault zone breccia 198.60 - 199.00.	dc
199.00	200.23	Chloritic andesite dyke, contacts sub-parallel to core axis and at 70°.	and
200.23	211.40	Moderate to prominent sericite - pyrite silica altered dacite with pyrite 7 - 15%, prominent secondary silica, foliation at 72°	dc
211.40	212.00	Chloritic andesite dyke, contacts irregular	and
212.00	233.30	Prominently sericite - pyrite - silica altered dacite, pyrite 5 - 15%, but usually 10 - 15%, strong cleavage development at 72° at 218.60. Fault zone area 233.00, broken and sheared.	dc
233.30	234.60	Moderately altered pyritic dacite.	dc
234.60	236.22	Andesite dyke, contacts at 60° and 70°	and
236.22	268.90	Moderately sericite-pyrite-silica-carbonate altered feldspar ± quartz dacite, 5-10% pyrite as dissemination, rare veinlets, cleavage weak. Note prominent pink carbonate alteration patches 254-260 often with secondary silica associated (may be in vesicles).	dc
268.90	420.00	Distinct change to a weaker chlorite-sericite-pyrite altered feldspar ± quartz dacite (pyrite 1-2%), some quartz-carbonate veining, local abundant secondary quartz and carbonate filling voids and possible vesicles. Chlorite becomes weaker after 375, but to this point may be up to 40%. Local breccia fabric (weak) may be autobreccia or alteration dyke. Pyrite locally absent.	dc
420.00	421.00	Vesicular andesite dyke, contacts broken.	
421.00	516.50	Weakly altered feldspar dacite with weak sericite, patchy chlorite and carbonate, carbonate veins, local pyrite as dissemination to veinlets (0-1%). Note distinct auto breccia fabric throughout most of interval. Note section 512.70-517.5 appears fine grained and is locally sericite-pyrite altered (pyrite 5-3%). Sphalerite-galena-pyrite vein 512.80.	dc
516.50	518.90	Massive to locally semi-massive vein of sphalerite-galena-barite, medium to coarse sulphides.	
518.90	520.60	Khaki coloured weak sericite-pyrite alteration halo (0.5-3% pyrite) in feldspar dacite extending out from the Zn-Pb vein. Minor quartz-galena veining adjacent to the vein. The dacite contains secondary quartz filling probable vesicles.	dc
520.60	602.90	Weakly sericite-pyrite, locally weakly chloritic feldspar dacite, pyrite 0-2% but usually 0-5%, locally vesicular with carbonate-quartz infilling and some quartz-carbonate veining, probable weak local autobrecciation, rare quartz-chlorite veinlets.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

898134

HOLE CP4

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	28.10	Moderately chloritic, weakly sericitic feldspar ± quartz dacite; veining with quartz and chloritic infill locally sometimes with pyrite associated. Some quartz-chlorite veining, generally no pyrite except for veins such as at 16.40.	dc
28.10	28.30	Vesicular andesite dyke, upper contact broken, lower contact at 45°	and
28.30	114.00	Moderate chlorite, weak sericite feldspar ± quartz dacite, vuggy to vesicular zones containing quartz, chloritc and local pyrite and carbonate. Note the silica is chalcedonic and may be banded in the vugs. Cleavage is locally evident and at 80.0 is at 51°. Some patchy weak pyrite to 1%, 46-49 associated with sericite. Note sericite content increases from about here. Pyrite generally 0-0.5%, only locally higher. The zone 94.5-97.80 is moderately sericite-pyrite altered (3-5% pyrite). Increasing sericite-pyrite but still chlorite from 97.80 (pyrite 1-2%). Some carbonate associated quartz in vesicles.	dc
114.00	122.90	Moderately strongly altered sericite-silica-pyrite dacite, abundant secondary quartz in vesicles, pyrite usually 3-5% locally higher, some veining near 122.60.	dc
122.90	126.70	Vesicular andesite dyke, contacts at 80° and 75°.	and
126.70	151.25	Usually strongly to locally moderately sericite-silica-pyrite altered dacite, rare chlorite, alteration intensity and pyritic content increasing downhole, pyrite 5-15%. Note silica as massive cherty replacements from 146.80 to 151.25, but localized with pyrite 5-10%.	dc
151.25	168.25	Prominent zone of intense chertification (50-80%) of host dacite, pyrite 0-2% usually as isolated vienlets, but several pyritic veins to 5cm in zones 165.6-166.4 and 168.0-168.20.	dc
168.25	213.85	Moderate to strongly sericite-silica-pyrite altered dacite with disseminated and vein pyrite 5-15%, vein pyrite 178-186, 193-202, 207-213.85 with stringers usually <0.5cm.	dc
213.85	250.00	Prominent silica-sericite altered zone, but with minimal pyrite (average 0.5%-1%) present as local dissemination and rare veinlet and segregation. The zone 246-250 averages 3% pyrite.	dc
		END OF HOLE.	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP5

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	16.00	Weakly sericitic, locally chloritic feldspar dacite, some carbonate alteration, siderite-silica in vesicles, local quartz siderite veinlets, pyrite (o-1%) as disseminations, rare galena sphalerite segregations.	dc
16.00	20.10	Weak to moderate sericite pyritic-carbonate (0.5-2% pyrite) with pyrite as veinlets and dissemination in feldspar ± quartz dacite with secondary quartz and carbonate.	dc
20.10	67.00	Weak sericite ± chlorite, weak pyrite (0-2%) feldspar dacite prominently vesicular with siderite-quartz infilling 20.00 - 24.00, rare disemination of sphalerite galena, rare chloritic veinlets, extensive secondary silica infilling voids or vesicles, pyrite usually absent.	dc
67.00	68.20	Weakly vesicular microlitic feldspar andesite, contacts at approx. 60° and 52°.	and
68.20	105.50	Weak chlorite-sericite-carbonate feldspar dacite with local secondary quartz, chlorite content often negligible, rare pyrite dissemination but about 0.5% from 100. Note galena-quartz carbonate vein 105.16.	dc
105.50	112.76	Weak to moderate sericite-pyritic (3-5% pyrite) feldspar dacite.	dc
112.76	113.68	Vesicular andesite dyke, contacts at 60° and faulted and sheared lower contact.	and
113.68	124.45	Moderate sericite-pyrite feldspar ± quartz dacite (pyritic 3-7%).	dc
124.45	124.75	Andesite dyke, contacts at 85° and 75°.	and
124.75	130.34	Generally weakly sericite-pyritic altered feldspar ± quartz dacite (pyritic :5-15%), rare chlorite to 129.8, then several percent.	dc
130.34	139.89	Locally vesicular, chloritic andesite dyke, contacts at 85° and 50°, local carbonate veins.	and
139.89	160.33	Weak chlorite-sericite altered feldspar dacite with local quartz and carbonate in voids + vesicles, pyrite dissemination and rare veinlets 0.5-2% probably more concentrated towards end of interval.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP6

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	12.50	Prominent sericite-pyrite-silica altered feldspar dacite, with disseminated to vein pyrite 15-20%. Note pyrite shows a gradual to sharp fall off towards 12.5 where it is 2%.	dc
12.50	22.50	Distinct change to prominent sericite altered feldspar dacite with chlorite in part after feldspar, trace pyrite to 22.50	dc
22.50	55.18	Moderately altered sercite-chlorite-pyrite feldspar dacite, patchy chlorite, 3% pyrite as dissemination, note secondary quartz in probable vesicles near 43.0. Note chlorite associated with pyrite and pyritic veins especially 47-55.18	dc
55.18	56.68	Fine grained andesite dyke, flow banded in part parallel to contact at 40°. Some carbonate filled vesicles and veins.	and
56.68	59.23	Moderately sericite-chlorite altered feldspar decite with weak breccia fabric, weak pyrite dissemination, 1%	dc
59.23	78.11	Andesite dyke with local vesicles and carbonate-chlorite veins. Contact at 59.23 is sheared while that at 78.11 is at 12°.	and
78.11	85.00	Moderately sericite ± chlorite-pyrite-silica altered feldspar dacite to near 85.00 with pyrite 2% and increasing to 10%, some veins of pyrite, silica filled vesicles locally.	dc
85.00	106.00	Prominent silica-sericite-pyrite altered dacite with abundant silica often filling veining. Pyrite usually disseminated 5-15% (average 10%) some pink carbonate alteration.	dc
106.00	108.14	Andesite dyke, contact 85°.	and
108.14	109.24	Moderate sericite-chlorite feldspar dacite, 2% pyrite.	dc
109.24	113.30	Andesite dyke, contacts 47° and 75°.	and
113.30	118.04	Moderate sericite altered feldspar dacite, 3% pyrite dissemination vague breccia fabric due to alteration.	dc
118.04	134.18	Fine to medium grained andesite dyke, contacts 10° and 40°.	and
134.18	145.72	Moderate sericite-silica pyrite carbonate altered dacite with pyrite disseminated to 3%. Note fine grained pink to brown carbonate spotting often associated with pyrite or as discrete blebs.	dc
145.72	146.60	Andesite dyke, contact sheared and at 64°.	and
146.60	147.07	Moderate sericite-silica-pyrite dacite, 2% pyrite, some pyrite veinlets.	dc
147.07	150.82	Andesite dyke, contacts 25° and 68°.	and
150.82	154.66	Moderate-strong sericite-silica pyrite altered dacite with 5-15% pyrite (average 10%) as dissemination and veining	dc

HOLE CP6 continued

DEPTH From	To	DESCRIPTION	ROCK TYPE
154.66	156.51	Andesite dyke contact at 77° and 80°.	and
156.51	164.20	Moderate-strong sericite-silica-pyrite altered dacite, pyrite to 15% some prominent stringers, variable pyrite dissemination throughout.	dc
164.20	171.37	Porphyritic feldspar andesite dyke, chloritized, contacts at 90° and 60°.	and
171.37	188.03	Moderate sericite ± silica-pyrite-carbonate altered dacite, disseminated pyrite 5%, spotty carbonate alteration (weak to moderate) local secondary silica may in part be filling vesicles.	dc
188.03	189.28	Andesite dyke, contacts 60° and 72°.	and
189.28	300.00	Moderate to strong sericite-silica-pyrite dacite, patchy weak to moderate carbonate spotting, pyrite 3-10% (average 5%).	dc

END OF HOLE

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP11

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	71.00	Weak chlorite-sericite-carbonate altered feldspar dacite, with secondary quartz-carbonate in vugs or vesicles locally, local quartz chlorite and siderite veinlets, rare local pyrite. Note 0.60 cm wide coarse carbonate vein at 41.67.	dc
71.00	116.10	Dominantly moderate to strongly sericite-pyrite-silica-carbonate altered feldspar dacite with main pyritic zone 79.60 onwards, note pyrite-sericite silica as local fine grained veining-type alteration 72.40-77.00. Pyrite occurs as dissemination and locally as segregation and veining and varies 5-15%. Note 106.55 a 0.1 m wide pyritic vein. Cleavage moderate and at 111.00 is at 0.45°.	dc
116.10	124.30	Chloritic andesite dyke, contacts both broken	
124.30	127.55	Moderate to strongly sericite-pyrite-silica altered feldspar dacite with some locally prominent pyrite veining (pyritic 7-20%)	dc
127.55	135.16	Moderate sericite-pyrite-silica-carbonate altered feldspar ± quartz dacite (1-8% pyritic)	dc
135.16	136.20	Chloritic andesite dyke, contacts at 33° and 40°	and
136.20	204.90	Moderate sericite-pyrite-silica altered feldspar ± quartz dacite with pyrite 5-10%, locally higher as dissemination and rare veins. A moderate to strong cleavage is developed which at 151.00 is at 43° and at 194.00 is at 52°.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP16

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	200.00	Weak to moderate chlorite-sericite altered feldspar ± quartz dacite quite vuggy to vesicular locally with secondary quartz and carbonate. Fabric with breccia texture locally appears to be alteration related (chlorite 30%). Trace pyrite only. A generally weak foliation in early part of hole (0-50) at 45°. Note andesite dyke 73.5-74.0, contacts at 70° and 15°. END OF HOLE	dc

SUMMARY DRILL LOGS
CHESTER AREA

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HOLE CP17

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	3	Glacial cobble zone.	Qg
3	90.79	Weak to moderate sericite-chlorite altered feldspar ± quartz dacite, autobreccia fabric locally may be in part due to alteration, patchy quartz-carbonate veining and void fillings, some chlorite veins. Pyrite generally trace. Note void to vesicle filling of quartz-carbonate most prominent 3-12, 50.5-78. Note moderate cleavage locally developed at 45°. Alteration strongest at top of hole.	dc
90.79	92.04	Vesicular andesite dyke, contacts at 45° and 46°.	
92.04	150.00	Weak to moderate chlorite-sericite feldspar ± quartz dacite, dacite, generally minor quartz-carbonate veinlets but quartz-carbonate vein and vesicle infills common 100.5-113, 116-121, 124-124, 141-150. Chlorite veining with quartz associated 132-144. The unit is vitric in part and the alteration may be part deuteric. Pyrite is rare as very minor veinlets at several locations.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP18

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	1.8	Glacial boulders	Qg
1.8	146.75	Weak chlorite-sericite altered feldspar dacite with big variation in chlorite content locally, local secondary quartz sometimes filling vesicles, quartz-chlorite veining patchy throughout, siderite as vuggy segregations often associated with quartz. Pyrite dissemination and rare veinlets vary 0-2%. Note quartz-siderite veins as well. A zone of quartz-chlorite-sphalerite and quartz-carbonate-sphalerite veinlets both sub-parallel and obliquely crosscutting core axis 54.90-59.00, near 30.0 and 43.0, 74.10, 108.60. Note secondary void to vesicle quartz 110.60-112, 127-145, 15-18, 26-29. A rare pyrite-quartz-chlorite vein at 31 sub-parallel to core axis, cleavage generally weak to moderate and at 124 is at 45°. END OF HOLE	dc

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP19

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	14.70	Vesicular feldspar dacite lava, moderate to weak chlorite and lesser sericite alteration, vesicles locally infilled with quartz and carbonate. Note chloritic alteration near 11.50 defines a layering sub-parallel to the core axis (probably cleavage).	dc
14.70	15.50	Weak sericite-pyrite altered vesicular dacite, probably as overprint on weakly chloritic zone (pyrite 1%).	dc
15.50	45.30	Weakly chlorite-sericite altered feldspar dacite with chlorite pseudomorphing feldspar. Note core often quite broken locally and suggestive of fault zones, particularly 35.00, 35.90-36.30, 36.90-38.75, 40.35-43.30. Crosscutting local sericite-pyrite zones 28.45-30.80 (1% pyrite), 38.75-40.35 (2% pyrite) 40.75-42.90 (0.5% pyrite). Prominent quartz filled veins and vesicles 48.0-58.0. Note minor andesite dykes 36.0-36.2 and 44.8-45.1. Cleavage 15° at 27.0, 50° at 44.0.	dc
45.30	64.10	Moderate to locally strongly sericite-pyrite-silica altered feldspar dacite with alteration intensity increasing downhole. Pyrite as dissemination and local veinlets (5% but usually higher). Note cleavage weakly developed and at 59.00 is at 65°.	
64.10	67.20	Locally vesicular chloritic andesite dyke with chilled contacts at 55° and 40°.	and
67.20	70.55	Weak to moderate sericite-pyrite-silica altered feldspar dacite (pyrite 2%).	dc
70.55	80.15	Fine grained chloritic feldspar andesite dyke, contacts at 35° and 67°. Note wallrock pyritic dacite 76.25-76.65 included.	and
80.15	81.47	Weak to moderate silica-sericite-pyritic altered feldspar dacite, silica to 30%, pyrite 1%.	dc
81.47	84.05	Andesite dyke, contacts at 68° and 75°.	and
84.05	120.00	Moderately to weakly sericite-pyrite-chlorite altered feldspar dacite, locally vesicular with quartz and carbonate infilling (especially 116-120) pyrite content varies 1-5%. Chlorite local only and may be relict. A few pyritic stringers 116-118. Cleavage at 105 is at 63°.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP20

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	94.50	Weak to moderately chlorite-sericite altered feldspar dacite, vuggy to vesicular, locally with quartz and carbonate infilling and veins. Local lava breccia, but largely disguised by the alteration. Pyrite is rare, but local crosscutting pyrite-sercite zones to 0.05m width present 75-80.	dc
94.50	95.00	Fine grained vesicular andesite dyke, contacts 70° and 21°.	and
95.00	98.96	Moderately chloritic feldspar dacite.	dc
98.96	99.30	Vesicular andesite dyke, contacts at 24° and 33°.	and
99.30	109.55	Weak to moderate chlorite-sericite altered feldspar dacite, quite vesicular with secondary quartz and carbonate.	
109.55	111.35	Vesicular andesite dyke, contacts broken.	and
111.35	133.80	Quartz-feldspar rhyolite porphyry with fine grained phenocrysts in weakly altered vitric host. Secondary quartz and chlorite and veining and vug infills. The unit has a lesser phenocryst content compared with the normal dacite. Contact at 113.80 is at 50°.	rhy, QFP
133.80	140.80	Typical weakly chlorite-sericite altered feldspar ± quartz dacite, secondary quartz and carbonate.	dc
140.80	142.20	Andesite dyke, contacts at 35° and irregular.	and
142.20	164.35	Weak to moderate chlorite-sericite-carbonate altered dacite with carbonate veinlets (some chlorite locally associated) and quartz veinlets, carbonate in vesicles.	dc
164.35	164.85	Chloritic andesite dyke, contacts at 45° and 45°.	
164.85	166.60	Moderate chlorite-sericite-carbonate altered feldspar dacite, quartz carbonate-chlorite veining, carbonate in vesicles.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP21

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	13.05	Moderate sericite-silica-pyrite altered dacite with relict chlorite altered patches, pyrite 3%, but locally higher in crosscutting silica-sericite-pyrite alteration zones, iron stained and part weathered.	dc
13.05	54.50	Moderate chlorite-sericite altered feldspar dacite, prominently vesicular locally with some quartz and carbonate infilling, good foliation developed at 55°. Pyrite usually 0.5% or less, but locally higher eg 35.20 due to crosscutting sericite-pyrite-silica alteration.	dc
54.50	109.50	Ignimbritic lapilli tuff with silicous to vitric clasts and flattened sericite pumice clasts in a finer matrix. The unit exhibits moderate sericite-pyrite-silica alteration (3% pyrite) to 74.35, weak sericite ± pyrite 74.35 - 79.45, weak-moderate sericite-pyrite-silica 79.45 - 90.0 (pyrite 0.5%). From 90.0 the unit is weakly chloritic to 109.00 with minor crosscutting sericite-silica ± pyrite zones. The cleavage defined by sericitic pumice clasts is 69° at 65.00.	dilt
109.50	109.90	Fine to medium grained feldspar-phyric, leucocratic porphyry dyke (dacitic to rhyodacitic), top contact irregular, bottom contact at 80°.	FP
109.90	113.25	Dacitic ignimbritic lapilli tuff, dominantly pumice lithics, a few pink vitric clasts, moderate sericite-pyrite overprint (2% pyrite).	dilt
113.25	121.50	Feldspar dacite lava, contact with ignimbrite at 50°, weak to moderate chlorite-sericite altered, vesicular near contact, note moderate sericite-silica-pyrite alteration overprint 118.20-121.00 (pyrite 4% as veinlets and dissemination).	dc
121.50	129.70	Fine grained vitric quartz-phyric rhyolite dyke cut by quartz veins Quartz may be largely vesicular, some carbonate in vesicles. Suggest is post mineralization as bisects zone of pyritic alteration.	rhy, QP
129.70	146.10	Weakly chloritic-sericitic, fine grained feldspar dacite, locally vesicular, note crosscutting sericite-silica-pyrite zone 130.03-133.70 with contacts at 50° approx. (pyrite 5-8% as dissemination and some veins) Quartz-carbonate locally infills vesicles. Contact with ignimbritic unit at 65°.	dc
146.10	250.00	Ignimbritic feldspar-phyric dacite lapilli tuff with sericite fiamme, becomes pink to grey and vitric by 160, weakly spotted with chlorite alteration throughout. Note crosscutting silca-sericite-pyrite zones 149.40-153.50 (4% pyrite), 157.25-159.20 (5% pyrite). Some quartz-carbonate veinlets and segregations. Note ash zones 187.00-187.10 graded with uphole facing. Other ash 194.60-195.45, bedding at 63°.	dilt
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP22

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	36.20	Part weathered (to 21m) moderate chlorite-(sericite)-pyrite altered feldspar ± quartz dacite. Zone 24.50 - 30.30 is part weathered with moderate sericite-silica overprint. Pyrite dissemination 3%. Broken core 27.10 - 27.40 is probably fault zone.	dc
36.20	76.30	Dominantly moderate sericite-silica-pyrite altered feldspar dacite a few zones of relict chlorite, pyrite 2-5%. Note core intermittently broken 36.20 - 44.75 suggestive of a fault zone. Local zones of pyritic veining near 70 - 76 (8-10% pyrite).	dc
76.30	80.60	Moderate chlorite-sericite altered dacite with pyrite 0-2%.	dc
80.60	103.30	Moderate sericite-silica-pyrite altered feldspar dacite (local chlorite), pyrite to 3%, quartz-carbonate filled vesicles locally. Note major core loss 91.0 - 103.30 (1.5m only recovered!).	dc
103.30	133.40	Moderate chlorite-sericite altered dacite, pyrite with a few crosscutting sericite-pyrite zones.	dc
133.40	134.80	Andesite dyke, contacts at 45° and 10°.	and
134.80	180.15	Weak to moderate sericite-chlorite altered feldspar dacite local quartz - carbonate in vesicles and veinlets. Note minor andesite dyke 171.90-172.05, contacts at 45°.	dc
180.15	181.50	Andesite dyke, contacts at 70° and 50°.	and
181.50	190.20	Moderate chlorite-sericite altered feldspar dacite, some secondary quartz-carbonate in vesicles.	dc
190.20	191.60	Vesicular andesite dyke, contacts at 50°.	and
191.60	200.00	Weak to moderate chlorite-sericite altered dacite.	dc
200.00	207.10	Andesite dyke, contacts at 50°.	and
207.10	218.80	Weakly altered chlorite-sericite dacite with abundant secondary quartz in vesicles, some carbonate.	dc
218.80	219.10	Andesite dyke, contacts at 25° and 20°.	and
219.10	241.10	Moderate chlorite-sericite altered vesicular dacite, trace pyrite, quartz and carbonate in vesicles.	dc
241.10	241.60	Andesite dyke, contacts at 45°	and
241.60	300.00	Moderately to weakly chlorite-sercite-carbonate altered dacite with abundant secondary quartz-carbonate in vesicles, some carbonate-quartz veins. Note dykelets of andesite 257.25-257.35 (contacts at 50°) and 262.05-26.15 (contacts at 40° and 45°).	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CP23

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	82.00	Weakly chlorite-sericite-carbonate altered feldspar ± quartz dacite, weak pyrite (0-2%), local chlorite and quartz veining, quartz-carbonate in vesicles and voids locally especially 39-45, some galena associated at 42-70, rare sphalerite-galena-quartz-carbonate veining eg. 65.30.	dc
82.00	87.70	Moderate sericite-pyrite-silica altered feldspar dacite with pyrite dissemination to 5%	dc
87.70	150.70	Generally weak chlorite-sericite-carbonate altered feldspar dacite with pyrite to 2% falling off past 102. A dominent autobreccia fabric throughout, some local quartz-siderite as void and vesicle infills and as veinlets. Note pyritic vein segregation 142.50. Pyrite probably averages 0.5-1%.	dc
150.70	155.05	Chloritic andesite dyke, top contact sheared, bottom contact at 45°.	and
155.05	163.54	Weakly chlorite-sericite-carbonate altered feldspar dacite, some autobreccia fabric, 0-5-1% pyrite dissemination.	dc
163.54	165.76	Chloritic andesite dyke, contacts at 45° and 48°.	and
165.76	178.00	Weak to moderate sericite-silica-pyrite altered feldspar dacite, pyrite 2-8% as dissemination and local veinlets, rare galena veinlets major fault zone breccia 173.10-173.70 with some brecciation to end of hole. A few quartz-pyrite veins.	dc

END OF HOLE

SUMMARY DRILL LOGS
CHESTER AREA

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HOLE CH1

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	21.0	Weathered moderate sericite-pyrite-silica altered feldspar-phyric dacitic lava? or crystal tuff. Pyrite forms dissemination and sporadic veins and averages 5% with locally higher patches. Some silica associated with the pyrite veins.	dc
21.0	40.80	Feldspar ± quartz dacite lava?, moderate sericite alteration, weak carbonate alteration, moderate pyrite dissemination and local veinlets to 5%. Note possible flow banding (primary layering) at 38.45 and 39.40 is at 20° and 24° respectively.	
40.80	85.50	Distinct change to moderate sericite-chlorite-pyrite altered feldspar ± quartz dacite, pyrite patchy as dissemination and as veinlets associated with quartz and chlorite (average 3%). Note irregular quartz filling possible vesicles locally.	
85.50	86.60	Fine grained chloritic andesite dyke, contacts at 65-70°	and
86.60	89.37	Moderate sericite-chlorite altered feldspar ± quartz dacite with 2-3% pyrite dissemination.	dc
89.37	94.70	Fine grained chloritic andesite dyke, carbonate veins throughout, contacts at 55° and 48°	and
94.70	121.60	Moderate sericite-chlorite-pyrite altered feldspar-phyric dacite, pyrite as dissemination and veinlets to 4%. Some carbonate veins.	dc
121.60	145.97	Change to moderate sericite-silica-pyrite altered feldspar dacite usually homogeneous except for local pseudolithic fabric due to alteration. Pyrite dissemination and rare local veining to 7%. Weak carbonate alteration as fine prisms.	dc
145.97	147.46	Fine grained locally vesicular chloritic andesite dyke, contacts at 67° and 60°.	and
147.46	151.50	Moderate sericite-silica-pyrite altered feldspar dacite, pyrite dissemination and stringers (1-3 per metre) to 5% average (locally higher), some chlorite may be associated with pyrite stringers. Note secondary quartz possibly filling vesicles.	dc
		END OF HOLE	

SUMMARY DRILL LOGS
CHESTER AREA

HOLE CH2

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	16.70	Moderate sericite-chlorite-carbonate altered feldspar ± quartz dacite lava? with abundant secondary quartz filling possible vesicles, some quartz veinlets. Weak pyrite <1%, trace local pale sphalerite. Note carbonate may be associated with quartz in vesicles at margins.	dc
16.70	75.70	As above but distinctly pyritic locally, lots of secondary quartz filling probable vesicles, pyrite 1%, some minor dissemination pale sphalerite and galena locally, possible perlitic fabric, some chlorite-quartz veinlets. Chlorite content may be prominent locally and pyrite occurs to 2% past 28m. Note sphalerite galena veining associated with chlorite-carbonate 54.6-55.0. Note quartz-carbonate filling vesicles 55-72. Local pyrite veining is associated with chlorite and carbonate especially near 70.0. Chlorite content is variable but probably peaks near 43.0 and falls off (but patchy) to 75.70. Pyrite 2% in the zone 43-75.70.	dc
75.70	88.50	Moderate sericite-pyrite-silica altered feldspar ± quartz dacite, 2-3% pyrite dissemination, some pyrite veinlets associated with quartz and some barren quartz veins.	dc
88.50	89.73	Fine grained, locally vesicular, andesite dyke, carbonate veins and carbonate in vesicles, contacts at 70°.	and
89.73	91.90	Moderate sericite-pyrite-silica altered feldspar dacite, some quartz and carbonate veinlets.	dc
91.90	92.25	Fine grained andesite dyke, contacts at approx 50-60°	and
92.25	93.50	Moderate sericite-pyrite-silica altered feldspar dacite, pyrite dissemination to 3%	dc
93.50	94.20	Fine grained andesite dyke, contact at 93.50 is at 25°, other contact is broken.	and
94.20	131.27	Fine grained andesite dyke.	
131.27	134.05	Moderate sericite-pyrite-silica altered dacite, pyrite 5% as dissemination.	dc
134.05	144.55	Fine grained chloritic andesite dyke, contact at 80°.	and
144.55	147.20	Pink coloured moderately sericite-pyrite altered dacite, 2% pyrite.	
147.20	148.50	Fine grained andesite dyke, contact at approx 85°.	and

END OF HOLE

SUMMARY DRILL LOGS
CHESTER AREA

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HOLE CH3

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	122.60	Weakly to moderately chlorite, weak sericite feldspar ± quartz dacite, vesicular locally with some infilling by quartz and carbonate. Some flow banding locally in more vitric units eg 70-82 with banding at 72 at 48°, at 83 at 55°, at 93 at 55°, 117 at 58° parallel to cleavage. Note minor galena associated with carbonate and pyrite at 99.70. Pyrite generally trace to 0.5%, locally higher.	dc
122.60	123.90	Chloritic andesite dyke, contacts at 60° and 70°	and
123.90	136.40	Weakly chlorite-sericite altered feldspar ± quartz dacite, probably some quartz phenocrysts as distinct from vesicle quartz, vitric in part with pink bleaching, trace pyrite. Cleavage and possibly flow banding at 125m is at 70°.	dc
		END OF HOLE	

APPENDIX 4

Summary Drill Logs
Sock Creek Prospect

SUMMARY DRILL LOGS
SOCK CREEK AREA

898151

HOLE SK1

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	19.35	Part weathered epiclastic quartz-feldspar rhyolite crystal lithic, tuff, fine to medium grained, weakly sericitic, locally chloritic.	rct
19.35	27.74	Probable feldspar basalt or andesite dyke, very weathered and broken, poor core recovery.	bas-and
27.74	41.50	Fine grained vitric quartz-feldspar phyric rhyolitic vitric tuff to lithic vitric tuff and lithic crystal tuff.	rvt
41.50	43.50	Black shale, very broken	sh
43.50	111.36	Khaki to pink coarse quartz-feldspar porphyry, may be intrusive in part, but is clearly a lithic ashflow unit from near 70.0 - 74 with local coarse lithics in finer-matrix. Note quartz-carbonate veining throughout, some prominent local sphalerite-galena veining often associated with quartz-carbonate 52.50 - 57.2, 65 - 70, 75 - 76, 81 - 93.	QFP,QEFT
111.36	113.16	Black shale.	Sh
113.16	115.55	Mixed epiclastic of sericite pumice fragments, vitric fragments, shale fragments, rare quartz phenocrysts, some pale sphalerite veining.	
115.55	175.56	Typical coarse quartz-feldspar porphyry, local quartz-carbonate veining, unit homogenous and may be ash flow or intrusive. Contact at 80°. Note pink to grey green coloured with local chlorite, usually quite vitric.	QFP?QEFT

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

898152

HOLE SK2

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	80.17	Black shale with bedding visible through most of interval showing extreme range of orientations. At 10 bedding is at 65°, at 27 is at 38° with cleavage sub-parallel to core axis, at 31.30 at 10°, at 32.80 at 45°, at 37.60 at 50°, at 51.60 at 60° at 71.00 at 45° at 77.45 at 50°. Note quartz - carbonate veining noticeable from 50 with some associated sphalerite-galena locally.	Sh
80.17	89.60	Epiclastic medium grained pink coloured, quartz-feldspar rhyolitic crystal lithic tuff grading into coarser quartz "eye" lithic crystal tuff by 80.80 with lithics of quartz-feldspar porphyry, large shale blocks and crystal detritus. Some sphalerite-carbonate veining 87.50 and disseminated sphalerite near 87.20.	rclt QEFT
89.60	179.00	Typical coarse grained coarse quartz-feldspar porphyry, locally with weak sericite-chlorite alteration, local pink bleaching may be intrusive or ash flow. Prominent quartz-carbonate veining in places through most of section with local associated sphalerite-galena and rare chalcopyritic especially 92.80 - 104.6 116.80 - 120, 125-126.5, 158.50 - 171.20. Note veins at all angles to core axis. Lithic visible near 92.6, some shale fragments suggest epiclastic to ash flow here at least. Distinct shale zones often incorporating quartz-feldspar tuff debris are included 171.20 - 171.60, 174.20 - 178.10.	QFP,QEFT
179.00	185.25	Fault zone, some silicification, shearing, broken core.	
185.25	219.45	Fine grained vitric lithic tuff, possible epiclastic, pink to grey coloured, quartz phyric and rhyolitic. No clear bedding, but suggest - 05° near 192, thickness exaggerated as drilled down dip.	rvlt

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

898153

HOLE SK3

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	62.50	Black shales, locally bedded with bedding at 9.0 at 70°, at 17.0 at 15° at 34.0 at 15°, at 41.0 and 80°. Core quite broken locally.	Sh
62.50	68.58	Mix of medium grained quartz-feldspar rhyolitic crystal tuff detritus and shale with shale dominant.	rct
68.58	91.00	Black shale with network of quartz-carbonate veins containing local sphalerite-galena, bedding at 075-80°.	Sh
91.00	92.20	Fault zone in black shale.	Sh
92.20	97.20	Fine to medium grained quartz-feldspar crystal tuff to crystal lithic tuff showing considerate disruption by quartz-carbonate veining and associated sphalerite-galena.	rct
97.20	125.27	Coarse quartz "eye" - feldspar crystal tuff to lithic crystal tuff locally, pink coloured throughout, rare shale included near 101.50. Patchy quartz and quartz-carbonate veining, locally with associated sphalerite-galena.	QEFT

E.O.H

SUMMARY DRILL LOGS
SOCK CREEK AREA

898154

HOLE SK4

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	9.25	Dominantly epiclastic coarse quartz-feldspar-phyric crystal tuff with local shale lithics and intervals.	QEFT
9.25	19.20	Black shale locally bedded at 40°.	Sh
19.20	30.30	Epiclastic of coarse quartz-feldspar crystal tuff, shale detritus and lithics, poor core recovery.	QEFT
30.30	57.30	Bedded black shale with bedding at 33.25 at 38°, at 44.50 at 41°, at 54.0 at 45°.	Sh
57.30	69.60	Coarse quartz-feldspar crystal tuff locally incorporating shale fragments and/or detritus.	QEFT
69.60	82.40	Black shale with fault zone evident 80.77 - 82.40, bedding usually at 15°-20°, locally steeper.	Sh
82.40	149.04	Coarse quartz-feldspar crystal tuff, reasonably homogenous, lithic locally, may incorporate shale lithics and detritus as at 124.70, 130.50 - 134, 138.60. Prominent quartz and quartz-carbonate veining throughout with some veins to 0.40m thickness, little or no sulphide evident.	QEFT

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

HOLE SK5

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	148.40	Coarse pink to grey quartz eye-feldspar lithic crystal tuff to breccia and crystal tuff, patchy to prominent quartz and quartz-carbonate veining locally throughout with local associated sphalerite galena eg. 39.00, 105.70-106.20, 117.0-118, 121-126.50, 127.0-147 (main zone). Note core broken from 138.10 and probably indicative of fault zone. Some weak sericite.	QEFT
148.40	169.16	Fine grained vitric tuff of rhyolitic affinity to 155, them becoming noticeably more crystal-rich with visible quartz and feldspar and finally lithic with vitric rhyolite fragments in crystal lithic matrix. May be uphole facing if is one graded unit. Weak sericite.	rvt rct

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

898156

HOLE SK6

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	28.30	Coarse quartz eye - feldspar crystal tuff, weathered in part to 11.00.	QEFT
28.30	31.50	Dominantly shale, quite broken with some crystal tuff.	Sh
31.50	44.80	Pink vitric quartz-phyric rhyolitic tuff, some minor sphalerite-galena as segregations.	rvt
44.80	53.00	Chloritic andesite dyke, probable lower contact at 40°, carbonate veining.	and
53.00	58.52	Predominantly quartz-phyric, pink rhyolitic vitric tuff with some fine grained vitric crystal tuff and lithic tuff near end of interval.	rvt rvct
58.52	65.60	Chloritic andesite or basalt dyke, carbonate veining, contact at 70°? May in part be chloritic tuff.	and
65.60	80.20	Predominantly fine grained, pink, vitric (in part) rhyolite tuff with lithic zones and crystal tuff zones, possibly some andesite dyke incorporated.	rvt rvct
80.20	84.45	Chloritic andesite dyke, lower contact at 40°	and
84.45	91.85	Vitric rhyolite lithic tuff to crystal lithic tuff, quartz-feldspar phyric, fault breccia from 91.20.	rtc
91.85	92.50	Fault zone in black shale? on sheared manganese stained tuff.	Sh
92.50	149.96	Silicified in part, coarse quartz-feldspar crystal tuff, locally lithic, weak quartz-carbonate veining, essentially unmineralized.	QEFT

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

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HOLE SK7

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	53.15	Dominantly coarse toe medium grained quartz-feldspar crystal tuff and lithic crystal tuff incorporating some fine ash material 6.86-9.75 and local shale zones and blocks especially 28.50-30.00, 36.20-38.20, 40.35-41.45, 45.40-48.60, 49.40-49.68, weak to moderate carbonate and quartz-carbonate veining.	QEFT & rtl & Sh
53.15	59.45	Black shale, locally bedded at 076°, network veinlets of quartz-carbonate. Note core very broken. 58.40-59.45, possible fault.	Sh
59.45	76.05	Medium to coarse grained quartz-feldspar lithic crystal tuff to quartz eye tuff incorporating local pyritic shale blocks and detritus.	rct QEFT
76.05	86.40	Black shale, broken with some quartz-carbonate veinlets, bedding rarely visible, tends to be massive.	Sh
86.40	87.00	Silicified shale?	
87.00	89.31	Fault zone in black shale, very broken and crumbly.	Sh
89.31	121.40	Dominantly coarse quartz eye-feldspar crystal tuff, silicified in zone 89.31-93.0 and with prominent quartz-carbonate veining throughout.	QEFT
121.40	122.55	Black shale, broken and quartz veined.	Sh
122.55	123.95	Coarse quartz eye-feldspar crystal tuff, veined by quartz-carbonate.	QEFT
123.95	124.65	Mix of shale and coarse quartz-feldspar crystal tuff detritus.	Sh & QEFT
124.65	130.85	Fine grained rhyolitic vitric tuff to crystal tuff with quartz phenocrysts, possible fine lithics locally.	rvt, rct
130.85	138.28	Coarse quartz-feldspar crystal tuff, quartz-carbonate veined.	QEFT
138.28	139.58	Shale with some crystal tuff detritus.	Sh
139.58	142.55	Intensely silica veined and replaced quartz-feldspar crystal tuff	rct
142.55	146.90	Vitric dacite? to local dacitic breccia, pink, weakly porphyritic, possibly vitric tuff. Note rare fuchsite near 142.85, weakly sericitic	dc
146.90	149.20	Weakly vesicular, feldspar porphyritic andesite dyke?	and
149.20	150.00	Fine breccia of vitric dacite? detritus, possibly some quartz, contact at 055°.	dc
150.00	150.26	Fine grained vitric dacite, generally now porphyritic.	dc

SUMMARY DRILL LOGS
SOCK CREEK AREA

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HOLE SK8

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	14.25	Coarse quartz-feldspar phyric ash flow crystal tuff.	QEFT
14.25	15.60	Mix of shale, coarse crystal tuff and ash.	Sh & ash
15.60	65.89	Mix of units of ash (locally bedded), fine to medium grained quartz-feldspar-phyric lithic crystal tuff epiclastics, probably form graded units. Bedding at 20.5 is at 057°. Facing at 65.89 is uphole.	ash, rlct
65.89	70.02	Coarse quartz-feldspar crystal tuff.	QEFT
70.02	70.40	Broken black shale.	Sh
70.40	79.85	Mix of graded epiclastic units of coarse quartz-feldspar crystal lithic tuff and finer lithic crystal tuff to ash, some local quartz-carbonate veining, probable fault zone at 79.85.	QEFT, rct ash
79.85	120.00	Pink coloured coarse quartz-feldspar porphyry, probable ash flow, appears lithic from 28, generally weak quartz-carbonate veining but locally contains sphalerite-galena eg. 104.50-108 with some pyrite associated associated, 111.80-112, 118-120.	QEFT

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

HOLE SK9

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	77.01	Coarse quartz-feldspar porphyry, probable ash flow, locally lithic and finer grained eg. 61.6-77.01 with pink vitric quartz rhyolite lithics enclosed in a medium to coarse quartz-feldspar crystal tuff matrix.	QFP
77.01	79.00	Dominantly broken black shale with some local medium grained quartz-feldspar-phyric crystal tuff.	Sh
79.00	86.20	Fine to medium grained epiclastic quartz-feldspar crystal tuff with local shale blocks and zones eg. 83.40-86.20.	rct & Sh
86.20	146.00	Medium to coarse grained quartz-feldspar phyric crystal tuff to lithic crystal tuff, fine lithic crystal tuff 105-113, then becoming coarse grained crystal tuff, pink to grey coloured. Patchy weak quartz-carbonate veining.	QEFT

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

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HOLE SK10

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	60.37	Black shale, locally finely bedded, bedding at 6.0 is at 45°, at 17.0 at 54°, at 59.0 at 62°.	Sh
60.37	81.10	Fine to medium grained, grey to pink quartz-feldspar-phyric rhyolitic crystal tuff to vitric crystal lithic tuff. The unit is locally bedded, eg. at 73.0 is at 53°. There is a general coarsening of the unit with some coarse crystal tuff detritus and coarser lithics towards 81.10 ie. uphole facing.	rct rlct
81.10	83.50	Bimodal? epiclastic breccia incorporating coarse quartz-feldspar crystal tuff and local finer quartz-phyric rhyolite fragments.	rb
83.50	87.00	Mix of black shale and coarse quartz-feldspar-phyric crystal tuff detritus.	Sh-QEFT
87.00	236.75	Coarse quartz "eye" - feldspar lithic crystal tuff to vitric crystal tuff and breccia, lithic to 144, thin more massive with local identifiable breccia intervals. Quartz-carbonate veining locally prominent with some associated sphalerite-galena especially 108-121 and 144-148.	QEFT
236.75	237.85	Shale blocks? or detritus associated with coarse quartz eye - feldspar tuff detritus.	QEFT
237.85	245.10	Coarse quartz eye - feldspar tuff with rare shale fragments.	QEFT
245.10	248.25	Mix of quartz eye - feldspar tuff detritus and shale.	QEFT-Sh

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

HOLE SK11 redrill

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	57.40	Pink to grey coarse quartz-feldspar crystal tuff and crystal lithic tuff, prominent veining by quartz-carbonate with local replacements to 0.5 m width.	QEFT
57.40	65.80	Epiclastic breccia of mixed vitric rhyolite fragments, coarse quartz-feldspar porphyry fragments locally enclosed in a shale matrix.	rb, QEFT, Sh
65.80	68.70	Dominantly shale, but includes coarse quartz eye-feldspar tuff detritus, core very broken and probably a fault zone.	Sh
68.70	72.90	Medium grained quartz-feldspar rhyolitic crystal tuff grading to coarser quartz "eye" - feldspar crystal tuff ie. uphole facing.	rct QEFT
72.90	101.00	Homogenous coarse quartz-feldspar porphyry may be intrusive or ash flow, some locally prominent quartz-carbonate veining. Sphalerite-galena is associated with quartz-carbonate veining particularly in the zones 72.90 - 77.25, 84.25-87.00 with the latter interval containing a vein sub-parallel to the core axis.	QEFT QFP

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

HOLE SK12

DEPTH From	DEPTH To	DESCRIPTION	ROCK TYPE
0	92.35	Coarse quartz-feldspar porphyry, probably ash-flow tuff, appears relatively homogenous, patchy to prominent quartz-carbonate veining throughout, no obvious sulphide.	QEFT QFT
92.35	99.0	Coarse quartz-feldspar lithic crystal tuff to breccia with local shale fragments 95.40-99.0. Note shale has contact at 30 at 95.50.	
99.0	115.05	Coarse quartz eye-feldspar crystal tuff, relatively homogenous, may be lithic locally.	QEFT
115.05	117.90	Shale and fine grained vitric to crystal rhyolitic tuff.	Sh, rct
117.90	121.30	Quartz eye-feldspar crystal tuff.	QEFT
121.30	125.00	Shale zones mixed with vitric tuff and some quartz "eye" feldspar tuff.	Sh-rvt
125.00	132.15	Fine grained weakly quartz-feldspar-phyric rhyolitic vitric tuff locally grading to crystal tuff and fine lithic tuff, pink coloured.	rvt, rct
132.15	161.00	Fine grained, grey to pink vitric feldspar + quartz dacite, phenocrysts scattered, note fuchsite developed along fracture zones 143-143.20. Some prominent quartz and quartz-carbonate veining. Some sericite alteration with a weak local pyrite dissemination and rare veinlets.	dc

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

HOLE SK13

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	108.15	Coarse quartz "eye" - feldspar porphyry, part-weathered to 15m, appears homogenous and vitric, weak sericite alteration locally. May be ash flow crystal tuff or intrusive? Quartz and quartz-carbonate veining locally, especially prominent 50-69 and 100-108.15. Note some sphalerite segregations in veining near 108.10. The porphyry has a contact at 045° with shale. Quartz-carbonate veining appears truncated by the shale.	QFP QEFT
108.15	118.05	Bedded shale with some evidence of slumping, bedding at 109.00 is at 025°, changes to fine grained sandstone near 117.	Sh
118.05	124.80	Zone of mixed sandstone-shale incorporating debris and lithics of medium grained quartz-feldspar phyric crystal tuff of quartz "eye" affinity - a mass flow unit. Some rare bedding at 118.90 at 17°.	SS-Sh
124.80	137.20	Pink part vitric epiclastic, fine grained sandstone of rhyolitic affinity, local quartz and feldspar phenocryst material only, some internal brecciation of unit.	rvt
137.20	146.70	Medium grained epiclastic lithic crystal tuff to breccia of quartz "eye" affinity, abundant pink vitric lithics, some shale fragments. Note the unit appears to coarsen down hole and suggests uphole facing? Contact at 137.20 is at 45°.	QEFT
146.70	210.50	Vitric dacite, probable rare microphenocrysts of feldspar, homogenous throughout, local autobrecciation, local weak sericite, quartz veinlets and patchy secondary quartz possibly in vesicles.	dc

E.O.H.

SUMMARY DRILL LOGS
SOCK CREEK AREA

HOLE SK14

DEPTH From	To	DESCRIPTION	ROCK TYPE
0	7.60	Black shale, locally bedded at 55°.	Sh
7.60	26.30	Fine grained epiclastic ash tuff to quartz-feldspar rhyolitic tuff passing into lithic crystal tuff from 21.00. Probable uphole facing.	ash rct, rlct
26.30	59.20	Grey, fine grained vitric dacite, essentially non-porphyritic, autobrecciated in part, suggest a lava. Local quartz veining. Prominent brecciation 54.4-59.20 as part of a major fault zone. Some quartz veining here.	dc
59.20	108.85	Part-vitric coarse quartz-feldspar porphyry, may be intrusive or ash flow unit. Fault zone continues in this unit to 60.20 with core loss.	QFP
105.85	121.30	Coarse quartz "eye" feldspar tuff with large shale clasts in zone 108.85 - 115, some prominent quartz veins. Probable contact at 108.85 is at 85°.	QEFT
121.30	147.80	Bimodal epiclastic unit of mixed medium to fine grained quartz-feldspar-phyric detritus and vitric rhyolite and ash (often quite lithic). Fault zone 140.70 - 142.30. Note zone of coarse quartz-feldspar tuff with some pyritic shale clasts 142.40 - 146.60.	rct, ash
147.80	171.00	Homogenous, coarse quartz-feldspar porphyry, matrix is vitric, weak locally quite fractured, patchy quartz veining.	QFP

E.O.H.

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APPENDIX 5

Stream Sediment Surveys - Geochemical Analyses

Cyanide Gold) Area 4 follow up
-80 mesh)

Thunderbox Creek -80 mesh

00 165

ANALABS

881166

A Division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560

ANALYTICAL REPORT No. 14.4.08.03752

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
11156	B56

DATE RECEIVED	RESULTS REQUIRED
11/06/86	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	23/06/86	1	29

PULP NUMBER	REJECT NUMBER	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
		163/170,172/178,183/196 CYANIDE GOLD	RO							TOTwt,%CN/199,Au(1),Au(2),Au(3)/328		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

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

AUTHORISED OFFICER

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ANALABS

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.03752	23/06/86	11156	1 OF 2

TUBE No.	SAMPLE No.	TOTwt	%CN	Au(1)	Au(2)	Au(3)				
1	163	5.1	0.117	0.46	3.5	0.690				
2	164	4.8	0.190	<0.10	<0.5	<0.005				
3	165	4.6	0.228	0.18	1.2	0.263				
4	166	5.0	0.140	<0.10	<0.5	<0.005				
5	167	4.7	0.213	<0.10	<0.5	<0.005				
6	168	4.2	0.137	<0.10	<0.5	<0.005				
7	169	SNR	SNR	SNR	SNR	SNR				
8	170	4.4	0.228	<0.10	<0.5	<0.005				
9	172	4.3	0.239	<0.10	<0.5	<0.005				
10	173	4.8	0.161	<0.10	<0.5	<0.005				
11	174	4.6	0.165	0.67	4.6	1.000				
12	175	4.2	0.228	<0.10	<0.5	<0.005				
13	176	5.2	0.158	<0.10	<0.5	<0.005				
14	177	4.9	0.173	2.63	19.3	3.947				
15	178	4.8	0.154	1.09	7.9	1.638				
16	183	5.1	0.239	0.12	0.9	0.185				
17	184	4.5	0.177	5.28	35.6	7.917				
18	185	5.3	0.161	3.72	29.6	5.577				
19	186	4.8	0.161	1.94	13.9	2.903				
20	187	5.1	0.169	0.68	5.2	1.017				
21	188	5.0	0.144	<0.10	<0.5	<0.005				
22	189	4.3	0.194	<0.10	<0.5	<0.005				
23	190	4.6	0.190	<0.10	<0.5	<0.005				
24	191	5.3	0.137	<0.10	<0.5	<0.005				
25	192	5.3	0.158	<0.10	<0.5	<0.005				

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

AUTHORISED OFFICER

898168

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.03752	23/06/86	11156	2 OF 2

TUBE No.	SAMPLE No.	TOTwt	%CN	Au(1)	Au(2)	Au(3)				
1	193	5.3	0.228	<0.10	<0.5	<0.005				
2	194	5.0	0.165	<0.10	<0.5	<0.005				
3	195	5.1	0.194	<0.10	<0.5	<0.005				
4	196	5.0	0.239	<0.10	<0.5	<0.005				
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19	Dry WT expressed in KGS as calculated from Moisture Determination									
20	Au 1 result expressed in micrograms for Gold per gm of Zinc									
21	Au 2 is the calculated TOTAL GOLD leached from whole samp. in micrograms									
22	Au 3 is the calc. grade of the samp. in ppb that is cyanide extract. Au									
23	DETECTION	0.1	0.001	0.10	0.5	0.005				
24	UNITS	Kgs	%	mcg/g	mcg	ppb				
25	METHOD	199	199	328	328	328				

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

AUTHORISED OFFICER

ANALABS

896169

A division of Mooney Hamilton & Co Pty Ltd

Phone (09) 58 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560

ANALYTICAL REPORT No. 14.4.08.03753

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
11157	B56

DATE RECEIVED	RESULTS REQUIRED
11/06/86	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	13/06/86	1	25

STATE OF SAMPLES (REFER BELOW)	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	353/362,364/365,370/382 — 20#	SS							Cu,Pb,Zn,Fe,Mn/102,Ba/120,As/114		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

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

AUTHORISED OFFICER

169

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.03753	13/06/86	11157	1 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Mn	Ba	As		
1	353	3	18	15	3650	40	40	<1		
2	354	<1	4	4	550	5	30	3		
3	355	1	8	7	1550	10	45	4		
4	356	1	8	5	1150	5	45	1		
5	357	2	50	42	5950	80	90	9		
6	358	1	37	30	3900	40	70	4		
7	359	3	37	27	6150	265	45	11		
8	360	2	32	26	6000	260	50	10		
9	361	4	31	21	1900	15	75	2		
10	362	2	20	17	5950	170	40	6		
11	364	<1	9	11	1200	10	20	1		
12	365	2	17	16	7600	240	55	3		
13	370	4	53	33	7450	480	65	19		
14	371	3	67	39	2850	100	50	35		
15	372	2	52	15	2200	10	45	18		
16	373	2	64	16	4350	25	75	32		
17	374	2	19	12	3000	15	70	4		
18	375	2	19	11	1950	40	80	1		
19	376	2	59	55	8950	480	95	8		
20	377	5	44	16	1750	130	50	3		
21	378	1	15	15	3000	145	75	2		
22	379	<1	30	31	4550	245	80	2		
23	380	1	33	19	3200	65	110	2		
24	381	2	47	56	5550	1000	80	<1		
25	382	<1	17	13	1600	65	65	<1		

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

AUTHORISED OFFICER

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ANALABS

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

ANALYTICAL DATA

893171

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.03753	13/06/86	11157	2 OF 2

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Mn	Ba	As		
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22	DETECTION	1	1	1	50	5	5	1		
23	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM		
24	METHOD	102	102	102	101	101	120	114		
25										

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

AUTHORISED OFFICER

898172

THUNDERBOX CREEK (AREA 3)
-Soff

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106
Phone (09) 458 7999
TLX: AA 59224
Telex AA92560

ANALYTICAL REPORT No. 14.4.08.03814

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
11158	B56

DATE RECEIVED	RESULTS REQUIRED
13/08/86	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	18/08/86	1	14

STATE OF SAMPLES		PRE-TREATMENT							ANALYSIS		
REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	383/396	SS							Cu,Pb,Zn/102,Fe,Mn/101,Ba/120,As/114		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

REMARKS

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

AUTHORISED OFFICER

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ANALABS

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

093173

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.03814	18/08/86	11158	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Fe	Mn	Ba	As		
1	383	5	7	17	4450	30	115	2		
2	384	2	4	10	3650	25	110	<1		
3	385	3	6	18	4550	35	115	<1		
4	386	3	6	12	3400	35	110	<1		
5	387	4	10	24	13500	1150	150	2		
6	388	5	11	21	9800	935	165	3		
7	389	4	10	18	8350	575	140	2		
8	390	5	8	18	13000	2300	300	2		
9	391	4	7	12	4000	40	120	1		
10	392	3	6	12	4400	40	115	1		
11	393	4	7	16	5550	50	120	1		
12	394	3	4	16	5250	60	130	<1		
13	395	3	5	10	4000	35	125	<1		
14	396	5	7	16	9000	620	130	3		
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	1	1	1	50	5	5	1		
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM		
25	METHOD	102	102	102	101	101	120	114		

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

AUTHORISED OFFICER

APPENDIX 6

Soil Auger Geochemical Analyses

ANALABS

A division of Mackay and Hamilton & Co. Pty. Ltd.

Phone (09) 458 7599 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560

P.O. Box 1, Cannington, W.A. 6107

ANALYTICAL REPORT No. 14.4.08.04018

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER NO.	PROJECT
11159	B 56

DATE RECEIVED	RESULTS REQUIRED
27/11/86	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	04/12/86	1	51

DATE OF SAMPLES	PRE-TREATMENT								ANALYSIS		
LEFT BLANK	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS SECTION	PREPARATION	METHOD
	Z 8901/51	SO	Prep: 018						Cu,Pb,Zn,Ag,Fe,Mn/101,Ba/120,As/114		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AA
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XR
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SP
rock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	CC
soil	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CH
pulp	PU	HF mixture	A6	ignition	IG	titration	TT
water	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CI
tissue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	M
stream sediment	SS					fluorescence	FL
heavy mineral	HM					inductively coupled plasma	IC

AUTHORISED OFFICER

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89176

ANALABS [redacted]

A division of MacDonald Hamilton & Company Ltd.

ANALYTICAL DATA

SAMPLE PREFIX [redacted] REPORT NUMBER 14.4.08.04018 REPORT DATE 04/12/86 CLIENT ORDER No. 11159 PAGE 1 OF 3

PAGE 2 OF 3

SAMPLE No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Fe %	Mn ppm	Ba ppm	As ppm	
[redacted]1 3-3	5	5	260	<0.5	31500	750	440	5	3
902 2-8	5	15	260	<0.5	30500	1200	290	6	1
[redacted]3 3-3	10	35	320	<0.5	44000	640	520	3	1
[redacted]4 0-9	10	15	135	<0.5	17500	375	465	2	1
[redacted]5 3-4	5	20	85	<0.5	30500	165	395	5	1
[redacted]6 1-2	5	20	95	<0.5	67500	275	285	10	1
[redacted]07 4-3	5	15	75	<0.5	19000	585	460	4	1
[redacted]8 4-0	40	135	235	<0.5	66500	200	80	12	1
[redacted]09 4-2	40	100	175	<0.5	84500	150	270	54	1
[redacted]10 5-9	30	80	130	<0.5	63500	1300	100	26	1
[redacted]1 6-1	15	20	50	<0.5	9400	65	160	2	1
[redacted]12 5-8	10	130	60	<0.5	13000	70	140	4	1
[redacted]3 7-1	10	55	60	<0.5	12500	120	110	2	1
[redacted]14 1-9	20	35	180	<0.5	20500	190	95	6	1
[redacted]15 1-0	<5	5	20	<0.5	10000	185	160	1	9
[redacted]6 1-0	<5	5	15	<0.5	8450	120	195	1	9
[redacted]17 1-1	<5	<5	25	<0.5	9000	130	185	2	9
[redacted]8 0-6	<5	<5	10	<0.5	8700	65	210	1	9
[redacted]19 1-2	<5	<5	20	<0.5	11000	85	315	<1	9
[redacted]0 1-4	<5	20	120	<0.5	10000	105	260	3	13
[redacted]1 1-6	<5	35	25	<0.5	7350	95	165	3	9
[redacted]22 1-3	<5	10	5	<0.5	4150	45	155	2	7
[redacted]3 1-0	<5	<5	10	<0.5	3300	35	100	2	9
[redacted]24 1-0	<5	5	20	<0.5	6150	55	195	1	<1
[redacted]5 1-1	<5	<5	15	<0.5	6300	45	175	1	

Results in ppm unless otherwise specified
[redacted] = Element present; but concentration too low to measure
< = Element concentration is below detection limit
- = Element not determined

AUTHORISED OFFICER

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ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04018	04/12/86	11159	3 OF 3

LINE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Mn	Ba	As	
1	Z 8951	<5	10	10	<0.5	4800	65	335	<1	
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	50	5	5	1	
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
25	METHOD	101	101	101	101	101	101	120	114	

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

AUTHORISED OFFICER

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ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560
TLX AA 92221

ANALYTICAL REPORT No. 14.4.08.04108

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

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

ORDER No.	PROJECT
11161	B56

DATE RECEIVED	RESULTS REQUIRED
22/12/86	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
24	20/01/87	1	290

STATE OF SAMPLES		PRE-TREATMENT							ANALYSIS		
REPEAT REJECT QC	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	DIRECTION TO ANALYSIS SECTION	PREPARATION	METHOD
	Z8952/9139,Z9139A,Z9140/9240	So	Prep: 4,16						Cu,Pb,Zn,Ag,Fe,Mn/101,Ba/120,As/114		
	Various	PU							Au/309		
	Various	PU							Ba/401		
	~~Z8952/9139,Z9139A,Z9140/9240~~	~~So~~	~~Prep: 4,16~~						~~Ba/401~~		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

REMARKS

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

AUTHORISED OFFICER

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ANALABS

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

898179

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	1 OF 24

TUBE No.	SAMPLE No. (base metre)	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z8952 1.0	15	20	35	<0.5	0.84	85	180	–	2
2	Z8953 0.8	20	10	50	<0.5	1.35	145	210	–	2
3	Z8954 2.3	10	10	80	<0.5	1.80	180	255	–	1
4	Z8955 1.0	5	15	60	<0.5	1.05	145	230	–	1
5	Z8956 1.6	10	20	45	<0.5	0.99	105	270	–	1
6	Z8957 1.3	15	20	25	<0.5	0.45	40	210	–	1
7	Z8958 1.6	10	15	95	<0.5	1.65	240	310	–	<1
8	Z8959 1.4	10	20	95	<0.5	1.20	255	335	–	1
9	Z8960 1.6	10	50	20	1.0	1.15	60	490	–	1
10	Z8961 0.9	<5	20	35	<0.5	0.74	120	400	–	1
11	Z8962 0.4	5	15	65	<0.5	1.45	280	320	–	1
12	Z8963 1.5	20	80	40	<0.5	1.00	30	250	–	3
13	Z8964 3.0	30	85	385	<0.5	8.75	1200	160	–	3
14	Z8965 2.9	70	155	120	<0.5	7.00	65	70	–	7
15	Z8966 3.2	50	120	275	<0.5	8.40	1300	95	–	5
16	Z8967 7.2	10	30	630	<0.5	5.90	1650	250	–	3
17	Z8968 1.4	10	20	20	<0.5	1.25	115	350	–	2
18	Z8969 0.8	<5	20	30	<0.5	0.61	70	400	–	1
19	Z8970 0.6	20	30	165	<0.5	2.15	740	185	–	2
20	Z8971 0.5	20	25	80	<0.5	1.10	2550	265	–	3
21	Z8972 0.9	10	30	80	<0.5	2.15	1050	365	–	7
22	Z8973 1.4	10	45	45	<0.5	0.63	1650	340	–	2
23	Z8974 2.1	25	40	515	0.5	6.05	1350	205	–	2
24	Z8975 1.4	25	25	120	<0.5	0.56	170	260	–	2
25	Z8976 1.5	20	70	105	<0.5	2.75	5850	375	–	5

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

AUTHORISED OFFICER

898180

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	2 OF 24

TUBE No.	SAMPLE No. HOLE DEPTH m.	Cu ppm	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z8977 1.6	20	30	40	<0.5	0.89	270	285	–	
2	Z8978 1.4	15	30	100	<0.5	1.55	170	225	–	
3	Z8979 1.4	5	30	40	<0.5	0.57	35	270	–	
4	Z8980 5.4	5	25	105	<0.5	1.30	55	190	–	
5	Z8981 0.9	40	120	125	0.5	4.45	11000	355	–	1
6	Z8982 1.3	30	30	60	<0.5	1.95	115	230	–	
7	Z8983 0.9	20	25	50	<0.5	0.97	170	205	–	
8	Z8984 1.2	<5	25	190	<0.5	3.90	430	170	–	
9	Z8985 0.7	<5	35	90	<0.5	2.70	120	280	–	
10	Z8986 1.2	5	25	80	<0.5	2.00	435	240	–	
11	Z8987 1.4	5	20	40	<0.5	1.20	60	150	–	
12	Z8988 0.5	30	25	120	<0.5	3.40	910	215	–	
13	Z8989 1.5	55	45	110	1.5	4.45	415	115	–	
14	Z8990 0.8	5	40	165	<0.5	4.00	750	145	–	
15	Z8991 2.7	10	50	150	<0.5	4.40	1600	170	–	
16	Z8992 1.4	50	355	20	0.5	3.75	20	190	–	14
17	Z8993 1.3	20	10	35	<0.5	2.00	40	175	–	5
18	Z8994 1.0	15	<5	20	<0.5	0.55	15	175	–	
19	Z8995 0.8	5	<5	15	<0.5	0.52	20	130	–	
20	Z8996 1.6	30	755	35	<0.5	0.34	30	275	–	
21	Z8997 2.2	30	305	90	<0.5	1.00	110	265	–	2
22	Z8998 ?	25	5	15	<0.5	0.28	15	160	–	
23	Z8999 1.4	5	<5	5	1.0	0.18	10	170	–	
24	Z9000 2.0	25	5	5	<0.5	0.21	10	185	–	
25	Z9001 1.3	<5	<5	5	<0.5	0.24	10	245	–	

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

AUTHORISED OFFICER

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ANALABS

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

898181

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	3 OF 24

TUBE No.	SAMPLE No. HOLE DEPTH m.	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9002 1.0	15	<5	10	<0.5	0.58	30	95	–	3
2	Z9003 1.4	5	<5	20	<0.5	0.76	60	270	–	1
3	Z9004 1.4	45	<5	15	<0.5	0.56	55	285	–	1
4	Z9005 1.0	25	<5	20	<0.5	0.57	60	235	–	<1
5	Z9006 0.8	<5	<5	80	<0.5	2.80	100	135	–	2
6	Z9007 1.0	15	10	110	<0.5	2.45	125	170	–	1
7	Z9008 1.3	20	20	145	0.5	2.90	550	90	–	1
8	Z9009 1.5	10	15	105	<0.5	2.40	105	165	–	3
9	Z9010 6.3	5	<5	300	<0.5	0.59	45	135	–	2
10	Z9011 2.4	25	<5	85	<0.5	1.25	200	145	–	<1
11	Z9012 4.0	20	<5	45	<0.5	0.30	30	145	–	<1
12	Z9013 0.8	15	10	110	<0.5	1.20	270	250	–	2
13	Z9014 0.8	90	15	55	<0.5	2.65	270	230	–	1
14	Z9015 ?	40	10	30	<0.5	2.00	110	255	–	6
15	Z9016 1.0	<5	<5	15	<0.5	0.36	40	280	–	<1
16	Z9017 1.2	30	30	15	<0.5	0.32	65	210	–	<1
17	Z9018 1.4	30	25	35	<0.5	0.39	70	300	–	1
18	Z9019 1.2	10	55	125	<0.5	1.65	450	345	–	2
19	Z9020 2.0	30	175	205	<0.5	1.35	320	205	–	1
20	Z9021 1.6	20	40	65	<0.5	1.05	145	640	–	2
21	Z9022 1.2	20	30	45	<0.5	0.72	115	–	2950	<1
22	Z9023 1.9	10	950	45	<0.5	0.87	100	–	3950	<1
23	Z9024 1.2	10	50	35	<0.5	0.89	95	–	1850	<1
24	Z9025 1.2	5	90	45	<0.5	0.90	115	–	1920	<1
25	Z9026 1.0	5	5	40	<0.5	0.79	45	545	–	<1

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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No. / HOLE DEPTH m	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9027 1.4	5	2050	40	<0.5	0.78	65	680	–	2
2	Z9028 2.0	60	50	30	<0.5	0.57	370	440	–	<1
3	Z9029 2.9	45	80	100	<0.5	0.95	1250	590	–	1
4	Z9030 4.3	50	95	195	<0.5	1.75	665	470	–	3
5	Z9031 2.0	35	60	100	<0.5	0.79	140	770	–	2
6	Z9032 0.8	20	50	75	<0.5	2.00	200	265	–	5
7	Z9033 0.4	5	15	25	<0.5	0.62	80	440	–	1
8	Z9034 0.5	30	45	65	<0.5	1.10	120	300	–	5
9	Z9035 2.0	20	25	225	<0.5	3.55	385	180	–	3
10	Z9036 2.8	35	20	155	<0.5	1.55	200	250	–	3
11	Z9037 2.6	10	60	35	<0.5	0.72	85	505	–	1
12	Z9038 1.9	10	30	50	<0.5	0.95	120	–	2250	1
13	Z9039 2.2	<5	45	45	<0.5	0.73	95	–	3600	1
14	Z9040 1.5	<5	10	35	<0.5	0.85	75	710	2050	1
15	Z9041 1.2	<5	20	25	<0.5	0.74	70	490	–	1
16	Z9042 1.0	<5	<5	25	<0.5	1.40	25	305	–	2
17	Z9043 1.2	<5	<5	20	<0.5	0.55	30	310	–	1
18	Z9044 1.0	<5	5	25	<0.5	0.86	30	320	–	1
19	Z9045 1.4	<5	5	30	<0.5	0.77	65	725	–	1
20	Z9046 1.2	<5	50	25	<0.5	1.35	95	800	–	2
21	Z9047 1.0	<5	5	25	<0.5	0.60	70	485	–	1
22	Z9048 1.0	5	20	40	<0.5	1.10	105	565	–	4
23	Z9049 1.4	<5	10	25	<0.5	0.76	75	550	–	1
24	Z9050 0.4	<5	5	60	<0.5	1.90	160	290	–	1
25	Z9051 rc	10	35	80	<0.5	1.80	565	335	–	2

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No. Hole depth m	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9052 0.7	<5	5	20	<0.5	0.61	35	380	–	1
2	Z9053 0.5	<5	10	45	<0.5	1.60	45	485	–	1
3	Z9054 2.0	10	50	40	<0.5	0.66	3350	365	–	1
4	Z9055 4.4	10	120	80	<0.5	0.63	85	385	–	1
5	Z9056 4.0	25	80	365	<0.5	0.74	130	440	–	4
6	Z9057 5.0	50	90	345	<0.5	1.35	320	570	–	3
7	Z9058 6.4	15	40	120	<0.5	0.66	90	290	–	1
8	Z9059 6.6	55	115	70	<0.5	0.72	55	400	–	3
9	Z9060 4.4	80	175	135	0.5	1.30	210	200	–	3
10	Z9061 1.6	5	15	30	<0.5	1.05	90	640	–	1
11	Z9062 1.4	5	30	25	<0.5	1.40	85	175	–	5
12	Z9063 1.6	10	100	50	<0.5	1.60	60	185	–	5
13	Z9064 2.0	<5	<5	40	<0.5	0.67	50	190	–	1
14	Z9065 2.3	<5	<5	45	<0.5	1.05	165	255	–	1
15	Z9066 1.6	<5	10	30	<0.5	0.92	80	235	–	1
16	Z9067 2.2	<5	<5	5	<0.5	0.21	15	45	–	1
17	Z9068 1.0	<5	10	100	<0.5	2.30	530	125	–	1
18	Z9069 0.8	<5	<5	20	<0.5	0.64	110	110	–	1
19	Z9070 1.6	<5	<5	30	<0.5	0.69	85	205	–	1
20	Z9071 1.0	<5	<5	<5	<0.5	0.16	15	20	–	1
21	Z9072 0.5	<5	10	115	<0.5	6.05	995	130	–	1
22	Z9073 1.0	<5	5	10	<0.5	0.23	30	200	–	<1
23	Z9074 1.0	<5	5	15	<0.5	0.43	65	240	–	1
24	Z9075 1.0	<5	<5	5	<0.5	0.24	25	80	–	<1
25	Z9076 0.8	<5	<5	10	<0.5	0.21	30	90	–	<1

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TUBE No.	SAMPLE No. (Hole depth m)	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9077 2.3	<5	10	45	<0.5	0.56	150	130	–	
2	Z9078 1.6	10	5	40	<0.5	0.70	155	140	–	
3	Z9079 3.3	10	15	110	<0.5	1.35	150	205	–	<
4	Z9080 3.5	5	10	210	<0.5	0.22	30	125	–	
5	Z9081 4.8	5	10	95	<0.5	0.90	280	150	–	<
6	Z9082 5.5	10	20	230	<0.5	1.75	460	115	–	
7	Z9083 1.0	20	65	240	<0.5	4.75	765	30	–	
8	Z9084 1.5	10	80	515	<0.5	6.75	1600	40	–	
9	Z9085 2.6	20	365	505	<0.5	4.90	1250	60	–	
10	Z9086 2.8	30	235	570	<0.5	6.15	1500	55	–	
11	Z9087 1.8	5	245	390	<0.5	6.30	900	30	–	
12	Z9088 3.8	20	90	230	<0.5	6.85	750	60	–	
13	Z9089 1.8	10	120	395	<0.5	4.55	1650	50	–	
14	Z9090 0.7	30	70	155	<0.5	3.70	710	65	–	
15	Z9091 1.0	10	40	105	<0.5	5.50	570	50	–	
16	Z9092 2.2	15	90	370	<0.5	5.00	1200	60	–	
17	Z9093 2.8	15	30	390	<0.5	5.20	1400	130	–	
18	Z9094 4.0	20	160	415	<0.5	5.50	1300	85	–	
19	Z9095 4.2	30	340	400	<0.5	5.15	1650	150	–	
20	Z9096 1.0	30	160	415	<0.5	5.60	1650	80	–	
21	Z9097 0.9	20	30	320	<0.5	5.20	1250	90	–	
22	Z9098 1.0	5	15	20	<0.5	0.32	50	245	–	
23	Z9099 1.2	<5	20	15	<0.5	0.29	40	195	–	
24	Z9100 2.9	10	30	80	<0.5	0.91	210	250	–	
25	Z9101 1.6	20	60	300	<0.5	2.10	250	440	–	

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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No. Hole DEPTH	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9102 m. 2.8	5	35	110	<0.5	0.91	170	160	–	6
2	Z9103 5.8	<5	30	95	<0.5	1.25	305	150	–	3
3	Z9104 6.2	10	65	150	<0.5	1.15	300	190	–	1
4	Z9105 0.6	10	40	200	<0.5	2.50	960	335	–	4
5	Z9106 0.8	5	40	290	<0.5	6.15	1600	210	–	3
6	Z9107 0.8	5	20	30	<0.5	0.65	130	195	–	2
7	Z9108 1.0	<5	15	45	<0.5	0.80	105	225	–	1
8	Z9109 0.5	5	70	290	<0.5	4.15	2450	290	–	3
9	Z9110 0.8	10	20	130	<0.5	3.35	1250	455	–	6
10	Z9111 0.8	20	25	200	<0.5	6.35	1800	450	–	3
11	Z9112 1.0	10	25	115	<0.5	1.55	490	320	–	2
12	Z9113 0.8	10	45	340	<0.5	5.15	1800	315	–	4
13	Z9114 0.5	20	25	130	0.5	2.50	705	320	–	12
14	Z9115 0.8	30	995	340	0.5	5.85	1400	230	–	14
15	Z9116 1.0	15	25	255	<0.5	3.80	1600	260	–	4
16	Z9117 0.8	<5	10	10	<0.5	0.14	15	285	–	<1
17	Z9118 1.0	20	50	85	<0.5	4.15	440	180	–	7
18	Z9119 2.4	25	25	150	<0.5	4.50	1050	270	–	7
19	Z9120 1.2	15	5	70	<0.5	3.85	155	120	–	3
20	Z9121 rc	25	15	140	0.5	3.85	650	175	–	12
21	Z9122 1.8	20	<5	215	<0.5	6.55	2050	200	–	4
22	Z9123 1.0	55	<5	135	<0.5	4.70	1100	205	–	5
23	Z9124 1.2	50	25	340	<0.5	7.10	2250	70	–	5
24	Z9125 1.2	150	275	415	0.5	8.65	3550	135	–	10
25	Z9126 1.2	10	<5	80	<0.5	1.30	310	110	–	2

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TUBE No.	SAMPLE No. Hole - Depth m.	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9127 5·4	20	55	85	<0.5	1.15	190	140	–	2
2	Z9128 5·0	15	25	45	<0.5	0.70	105	210	–	<1
3	Z9129 4·2	20	70	35	<0.5	1.25	35	230	–	83
4	Z9130 1·2	<5	10	10	<0.5	0.18	10	40	–	3
5	Z9131 3·9	<5	10	10	<0.5	0.27	10	90	–	6
6	Z9132 3·3	10	55	65	<0.5	3.20	25	265	–	84
7	Z9133 2·1	5	60	35	<0.5	1.05	385	225	–	19
8	Z9134 2·4	20	75	55	<0.5	1.85	250	280	–	97
9	Z9135 1·0	40	35	100	0.5	4.20	155	240	–	72
10	Z9136 1·0	60	55	95	<0.5	4.75	300	225	–	40
11	Z9137 1·6	55	90	100	<0.5	4.05	65	215	–	93
12	Z9138 2·1	50	80	110	<0.5	5.00	90	210	–	89
13	Z9139 1·6	45	75	170	<0.5	4.30	200	290	–	19
14	Z9139A rc	50	25	100	<0.5	4.05	460	255	–	10
15	Z9140 0·4	30	35	95	<0.5	5.25	155	230	–	10
16	Z9141 1·2	30	40	125	<0.5	5.30	175	230	–	6
17	Z9142 1·6	30	30	80	<0.5	5.05	120	300	–	8
18	Z9143 1·6	35	50	85	0.5	5.50	145	225	–	17
19	Z9144 1·3	40	20	110	0.5	4.70	190	185	–	12
20	Z9145 0·8	55	40	120	<0.5	4.30	820	250	–	15
21	Z9146 rc	45	30	135	<0.5	4.85	210	230	–	5
22	Z9147 rc	40	40	80	0.5	3.50	295	200	–	14
23	Z9148 rc	15	130	350	<0.5	5.85	1850	160	–	7
24	Z9149 rc	20	145	170	<0.5	3.10	1050	170	–	12
25	Z9150 5·8	10	25	305	<0.5	4.65	2500	195	–	2

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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No. Prefix Depth	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9151 M. 1·8	15	65	175	0.5	2.40	1000	275	–	
2	Z9152 2·1	5	150	275	<0.5	1.40	1350	515	–	
3	Z9153 2·2	20	30	230	<0.5	3.25	2050	320	–	
4	Z9154 1·3	<5	5	35	0.5	1.25	150	390	–	
5	Z9155 rc	<5	<5	30	0.5	1.25	120	540	–	
6	Z9156 rc	<5	10	30	<0.5	0.86	235	305	–	
7	Z9157 rc	10	10	140	<0.5	4.25	1750	280	–	
8	Z9158 0·5	5	10	170	<0.5	6.20	1650	180	–	
9	Z9159 1·0	<5	10	165	<0.5	8.55	1000	180	–	
10	Z9160 1·5	<5	<5	15	<0.5	0.49	50	120	–	
11	Z9161 1·9	<5	10	50	<0.5	0.92	60	180	–	
12	Z9162 4·8	10	30	50	<0.5	1.35	165	225	–	
13	Z9163 3·6	<5	5	50	<0.5	1.20	215	250	–	
14	Z9164 12·8	10	55	150	0.5	2.90	720	340	–	
15	Z9165 9·6	10	25	80	<0.5	2.35	505	450	–	
16	Z9166 9·7	10	25	70	0.5	1.60	260	430	–	
17	Z9167 2·9	25	105	115	<0.5	2.60	500	320	–	
18	Z9168 12·7	10	15	110	0.5	2.15	550	305	–	
19	Z9169 11·2	5	10	195	<0.5	3.70	2400	455	–	
20	Z9170 5·5	10	120	75	0.5	0.66	145	320	–	
21	Z9171 1·6	30	80	295	<0.5	6.20	2700	395	–	
22	Z9172 1·2	15	70	160	0.5	3.45	1550	80	–	
23	Z9173 2·3	20	30	145	<0.5	3.80	955	270	–	
24	Z9174 rc	30	10	145	<0.5	3.25	960	335	–	
25	Z9175 1·4	5	15	175	<0.5	4.65	1450	280	–	

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No. HOLE DEPTH M.	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9176 rc	<5	5	40	<0.5	0.94	250	270	–	<1
2	Z9177 0.4	<5	5	15	<0.5	0.49	65	300	–	<1
3	Z9178 rc	<5	15	40	0.5	0.89	190	330	–	<1
4	Z9179 1.5	15	5	340	<0.5	3.70	895	100	–	2
5	Z9180 1.3	<5	30	60	<0.5	0.81	270	415	–	<1
6	Z9181 0.6	35	50	320	<0.5	6.75	1850	155	–	2
7	Z9182 rc	30	35	240	0.5	3.30	1450	115	–	7
8	Z9183 0.8	<5	<5	30	1.0	1.35	70	240	–	<1
9	Z9184 2.4	5	10	25	0.5	0.47	55	150	–	<1
10	Z9185 1.5	<5	5	10	<0.5	0.38	25	185	–	<1
11	Z9186 1.0	<5	10	15	<0.5	0.69	40	325	–	1
12	Z9187 1.0	<5	10	25	<0.5	0.72	30	240	–	2
13	Z9188 0.9	<5	10	45	<0.5	1.30	195	190	–	2
14	Z9189 1.4	<5	10	20	0.5	0.52	40	220	–	<1
15	Z9190 1.0	<5	40	20	0.5	1.20	55	150	–	13
16	Z9191 1.6	<5	<5	10	<0.5	0.38	35	245	–	1
17	Z9192 1.2	<5	<5	30	0.5	0.40	25	210	–	1
18	Z9193 4.6	5	5	25	<0.5	0.58	20	185	–	3
19	Z9194 5.3	5	10	15	<0.5	0.57	25	235	–	2
20	Z9195 3.6	20	165	50	<0.5	1.65	45	280	–	36
21	Z9196 0.8	10	150	35	3.5	0.95	90	360	–	6
22	Z9197 0.8	20	10	30	0.5	0.97	70	380	–	4
23	Z9198 2.0	50	20	155	0.5	6.00	925	135	–	6
24	Z9199 1.6	15	30	20	0.5	0.55	105	500	–	6
25	Z9200 1.2	5	355	10	0.5	0.34	80	255	–	2

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SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
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TUBE No.	SAMPLE No. Hole Depth	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9201 0.8	20	5	20	0.5	0.44	50	300	–	1
2	Z9202 1.2	5	5	25	<0.5	0.46	35	265	–	1
3	Z9203 1.8	20	45	30	<0.5	0.71	50	465	–	1
4	Z9204 0.8	5	15	20	<0.5	0.55	85	525	–	<1
5	Z9205 1.0	20	20	25	0.5	0.64	40	345	–	1
6	Z9206 0.6	5	55	20	<0.5	0.41	35	2454	–	<1
7	Z9207 0.8	65	30	30	<0.5	0.58	35	285	–	1
8	Z9208 1.0	15	30	30	<0.5	0.71	45	425	–	1
9	Z9209 1.4	5	35	35	<0.5	0.62	45	330	–	<1
10	Z9210 1.5	<5	10	30	0.5	0.54	30	295	–	1
11	Z9211 1.6	5	25	30	<0.5	0.55	30	335	–	1
12	Z9212 1.2	5	10	30	<0.5	0.54	30	330	–	1
13	Z9213 2.0	25	120	725	<0.5	3.95	1550	520	–	2
14	Z9214 1.4	55	290	410	<0.5	0.82	95	305	–	4
15	Z9215 1.4	10	50	55	<0.5	0.91	105	110	–	3
16	Z9216 1.6	10	70	60	<0.5	1.70	230	175	–	7
17	Z9217 1.6	5	65	40	<0.5	0.65	40	240	–	1
18	Z9218 1.0	20	20	10	<0.5	0.39	30	220	–	<1
19	Z9219 1.4	60	40	130	<0.5	1.00	810	165	–	5
20	Z9220 rc	10	10	<5	<0.5	2.00	<5	–	3850	5
21	Z9221 2.3	5	5	<5	<0.5	0.12	5	–	10000	2
22	Z9222 rc	15	<5	<5	<0.5	0.14	<5	–	1850	2
23	Z9223 5.4	10	105	115	<0.5	1.45	50	345	–	14
24	Z9224 6.8	25	355	45	<0.5	5.10	30	325	–	16
25	Z9225 1.3	20	40	30	<0.5	2.10	30	325	–	36

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

AUTHORISED OFFICER

ANALABS

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

898190

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	12 OF 24

TUBE No.	SAMPLE No. (Hole depth)	Cu	Pb	Zn	Ag	Fe	Mn	Ba	Ba	As
1	Z9226 (RC 8.6)	35	60	85	<0.5	1.10	35	365	–	12
2	Z9227 (1.6)	20	<5	75	<0.5	1.45	45	380	–	3
3	Z9228 (rc)	10	25	40	<0.5	1.45	30	285	–	4
4	Z9229 (rc)	10	10	50	<0.5	1.95	60	280	–	2
5	Z9230 (2.1)	20	5	10	<0.5	1.15	15	330	–	2
6	Z9231 (rc)	5	5	50	<0.5	1.55	40	135	–	3
7	Z9232 (rc)	5	10	65	<0.5	2.25	405	225	–	2
8	Z9233 (rc)	5	10	50	<0.5	1.85	345	170	–	3
9	Z9234 (rc)	15	10	40	0.5	1.80	80	230	–	17
10	Z9235 (1.4)	5	10	55	<0.5	2.20	190	280	–	3
11	Z9236 (3.1)	<5	25	55	<0.5	1.35	30	195	–	3
12	Z9237 (rc)	5	10	40	<0.5	1.55	450	230	–	2
13	Z9238 (1.4)	5	10	35	<0.5	1.75	75	220	–	2
14	Z9239 (1.8)	10	10	40	<0.5	2.25	490	265	–	1
15	Z9240 (2.3)	5	10	40	<0.5	2.05	105	230	–	4
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.05	5	5	10	1
24	UNITS	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM
25	METHOD	101	101	101	101	101	101	120	401	114

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

rc rock chip

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898191

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	16 OF 24

TUBE No.	SAMPLE No.	Au								
1	Z9027	—								
2	Z9028	—								
3	Z9029	—								
4	Z9030	—								
5	Z9031	—								
6	Z9032	—								
7	Z9033	—								
8	Z9034	—								
9	Z9035	—								
10	Z9036	—								
11	Z9037	—								
12	Z9038	—								
13	Z9039	—								
14	Z9040	—								
15	Z9041	—								
16	Z9042	—								
17	Z9043	—								
18	Z9044	—								
19	Z9045	—								
20	Z9046	—								
21	Z9047	—								
22	Z9048	—								
23	Z9049	—								
24	Z9050	—								
25	Z9051	0.008								

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	19 OF 24

TUBE No.	SAMPLE No.	Au ppm									
1	Z9102	–									
2	Z9103	–									
3	Z9104	–									
4	Z9105	–									
5	Z9106	–									
6	Z9107	–									
7	Z9108	–									
8	Z9109	–									
9	Z9110	–									
10	Z9111	–									
11	Z9112	–									
12	Z9113	–									
13	Z9114	–									
14	Z9115	–									
15	Z9116	–									
16	Z9117	–									
17	Z9118	–									
18	Z9119	–									
19	Z9120	–									
20	Z9121	0.042									
21	Z9122	–									
22	Z9123	–									
23	Z9124	–									
24	Z9125	–									
25	Z9126	–									

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	20 OF 24

TUBE No.	SAMPLE No.	Au								
1	Z9127	–								
2	Z9128	–								
3	Z9129	–								
4	Z9130	–								
5	Z9131	–								
6	Z9132	–								
7	Z9133	–								
8	Z9134	–								
9	Z9135	–								
10	Z9136	–								
11	Z9137	–								
12	Z9138	–								
13	Z9139	–								
14	Z9139A	0.075								
15	Z9140	–								
16	Z9141	–								
17	Z9142	–								
18	Z9143	–								
19	Z9144	–								
20	Z9145	–								
21	Z9146	<0.008								
22	Z9147	0.008								
23	Z9148	<0.008								
24	Z9149	<0.008								
25	Z9150	–								

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

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898194

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	21 OF 24

TUBE No.	SAMPLE No.	Au								
1	Z9151	–								
2	Z9152	–								
3	Z9153	–								
4	Z9154	–								
5	Z9155	0.117								
6	Z9156	0.008								
7	Z9157	0.008								
8	Z9158	–								
9	Z9159	–								
10	Z9160	–								
11	Z9161	–								
12	Z9162	–								
13	Z9163	–								
14	Z9164	–								
15	Z9165	–								
16	Z9166	–								
17	Z9167	–								
18	Z9168	–								
19	Z9169	–								
20	Z9170	–								
21	Z9171	–								
22	Z9172	–								
23	Z9173	–								
24	Z9174	<0.008								
25	Z9175	–								

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

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89195

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.0410B	20/01/87	11161	22 OF 24

TUBE No.	SAMPLE No.	Au								
1	Z9176	0.067								
2	Z9177	–								
3	Z9178	<0.008								
4	Z9179	–								
5	Z9180	–								
6	Z9181	–								
7	Z9182	0.100								
8	Z9183	–								
9	Z9184	–								
10	Z9185	–								
11	Z9186	–								
12	Z9187	–								
13	Z9188	–								
14	Z9189	–								
15	Z9190	–								
16	Z9191	–								
17	Z9192	–								
18	Z9193	–								
19	Z9194	–								
20	Z9195	–								
21	Z9196	–								
22	Z9197	–								
23	Z9198	–								
24	Z9199	–								
25	Z9200	–								

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	23 OF 24

TUBE No.	SAMPLE No.	Au								
1	Z9201	—								
2	Z9202	—								
3	Z9203	—								
4	Z9204	—								
5	Z9205	—								
6	Z9206	—								
7	Z9207	—								
8	Z9208	—								
9	Z9209	—								
10	Z9210	—								
11	Z9211	—								
12	Z9212	—								
13	Z9213	—								
14	Z9214	—								
15	Z9215	—								
16	Z9216	—								
17	Z9217	—								
18	Z9218	—								
19	Z9219	—								
20	Z9220	0.067								
21	Z9221	—								
22	Z9222	—								
23	Z9223	—								
24	Z9224	—								
25	Z9225	—								

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04108	20/01/87	11161	24 OF 24

TUBE No.	SAMPLE No.	Au								
1	Z9226	-								
2	Z9227	-								
3	Z9228	-								
4	Z9229	0.058								
5	Z9230	-								
6	Z9231	<0.008								
7	Z9232	<0.008								
8	Z9233	0.017								
9	Z9234	<0.008								
10	Z9235	-								
11	Z9236	-								
12	Z9237	0.033								
13	Z9238	-								
14	Z9239	-								
15	Z9240	-								
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008								
24	UNITS	PPM								
25	METHOD	309								

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

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ANALABS

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

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

P.O. Box 1224, Cloverdale, W.A. 6105

ANALYTICAL REPORT No. 14.4.08.04197

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
11162	B56

DATE RECEIVED	RESULTS REQUIRED
02/02/88	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	24/02/87	1	14

STATE OF SAMPLES (KEEP BELOW)	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	I,9241/9254	SO							Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		
	I,9241/9254	SO							Ba/120		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

REMARKS

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

AUTHORISED OFFICER

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ANALABS

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

893199

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04197	24/02/87	11162	1 OF 1

TUBE No.	SAMPLE No. Hole depth m.	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	
1	9241 Z 1.5	20	160	25	0.5	0.89	10	75	250	
2	9242 Z 1.0	65	1015	35	0.5	1.25	15	100	210	
3	9243 Z 1.7	25	10	45	<0.5	1.55	70	55	190	
4	9244 Z 2.8	15	300	55	<0.5	2.15	115	13	175	
5	9245 Z 4.3	10	10	50	<0.5	1.85	250	3	200	
6	9246 Z 5.4	10	10	40	<0.5	1.55	45	14	135	
7	9247 Z 1.2	<5	15	30	1.0	1.05	90	4	95	
8	9248 Z 6.8	10	<5	20	0.5	0.69	35	2	130	
9	9249 Z 2.8	5	<5	25	<0.5	0.34	30	1	135	
10	9250 Z 1.4	5	<5	50	1.0	0.44	75	<1	220	
11	9251 Z 1.2	5	<5	35	0.5	0.41	85	1	230	
12	9252 Z 1.6	5	<5	35	<0.5	0.46	100	<1	235	
13	9253 Z 1.5	5	<5	10	<0.5	0.21	40	1	105	
14	9254 Z 1.6	5	<5	15	1.0	0.25	45	<1	95	
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.05	5	1	5	
24	UNITS	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	
25	METHOD	101	101	101	101	101	101	114	120	

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

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Copies 6/T

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An Australian MacDonald Hamilton & Co Pty Ltd Company
Phone: 09 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex: AA92560
TLT: 8R 58224

ANALYTICAL REPORT No: 14.4.08.04221

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

	ORDER No.	PROJECT
The Broken Hill Prop. Co. Ltd. P.O. Box 40 Waratah Tasmania 7321		
	DATE RECEIVED	RESULTS REQUIRED
	11/02/87	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	10/03/87	1	34

	PRE-TREATMENT								ANALYSIS		
	DESCRIPTION	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	DESCRIPTION	PREPARATION	METH
	Various	PU							Au/329		

RESULTS TO
The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

REMARKS

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

AUTHORISED OFFICER

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ANALABS

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

898201

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04221	10/03/87		1 OF 2

TUBE No.	SAMPLE No.	Au									
1	B908	<0.01									
2	B909	<0.01									
3	B910	<0.01									
4	B964	0.01									
5	B965	<0.01									
6	B966	<0.01									
7	B992	<0.01									
8	B993	<0.01									
9	B996	<0.01									
10	B997	<0.01									
11	9023	<0.01									
12	9027	0.02									
13	9085	<0.01									
14	9086	<0.01									
15	9087	<0.01									
16	9094	<0.01									
17	9095	<0.01									
18	9096	<0.01									
19	9125	0.03									
20	9129	<0.01									
21	9132	<0.01									
22	9133	0.02									
23	9134	<0.01									
24	9135	0.01									
25	9136	<0.01									

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

AUTHORISED OFFICER

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ANALABS

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

ANALYTICAL DATA

A0202

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04221	10/03/87		2 OF 2

TUBE No.	SAMPLE No.	Au
1	9137	<0.01
2	9138	<0.01
3	9195	0.01
4	9196	<0.01
5	9213	<0.01
6	9214	0.01
7	9223	<0.01
8	9224	<0.01
9	9225	<0.01
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23	DETECTION	0.01
24	UNITS	PPM
25	METHOD	329

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

AUTHORISED OFFICER

ANALABS

A Division of Roberton Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560

ANALYTICAL REPORT No. 14.4.08.04318

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No. | PROJECT: B 56

DATE RECEIVED: 13/03/87 | RESULTS REQUIRED: ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
6	25/03/87	1	145

STATE OF SAMPLES (SEE BELOW)	LABEL NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULV.	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	Z9255/300,Z9401/99	SO	Prep: 005,009,012,013,017						Cu,Pb,Zn,Ag,Fe,Mn/101,As/114,Ba/120			
	Z9499	RC							Au,AuChk/309			

REMARKS

RESULTS TO:
E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

RESULTS TO:

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

AUTHORISED OFFICER: a. f. Gatt

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898204

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04318	25/03/87		1 OF 6

TUBE No.	SAMPLE No. Max DEPTH	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	Z9255 0.5	<5	25	65	<0.5	2000	15	1	100	–
2	Z9256 0.8	<5	25	40	<0.5	1850	15	<1	80	–
3	Z9257 1.0	<5	<5	25	<0.5	1350	15	1	110	–
4	Z9258 1.2	<5	20	15	<0.5	1450	5	<1	70	–
5	Z9259 1.3	<5	10	20	<0.5	2050	20	<1	320	–
6	Z9260 1.5	<5	15	35	<0.5	5500	160	1	210	–
7	Z9261 1.8	<5	<5	15	<0.5	1750	25	<1	150	–
8	Z9262 1.6	<5	<5	5	<0.5	1450	5	<1	300	–
9	Z9263 0.6	<5	<5	10	<0.5	1050	50	1	370	–
10	Z9264 1.2	<5	<5	10	<0.5	1950	65	<1	620	–
11	Z9265 0.9	<5	<5	5	<0.5	675	35	<1	490	–
12	Z9266 1.7	<5	<5	5	<0.5	965	35	<1	270	–
13	Z9267 1.2	<5	<5	10	<0.5	2000	40	<1	460	–
14	Z9268 1.4	<5	<5	10	<0.5	2350	30	<1	430	–
15	Z9269 1.6	<5	5	40	<0.5	16000	85	2	270	–
16	Z9270 1.0	20	30	65	<0.5	22000	180	2	250	–
17	Z9271 1.7	15	20	35	<0.5	14000	90	3	250	–
18	Z9272 2.6	15	30	55	<0.5	23500	240	6	250	–
19	Z9273 1.4	<5	<5	10	<0.5	1400	65	1	420	–
20	Z9274 1.2	<5	<5	10	<0.5	2100	100	1	500	–
21	Z9275 0.7	<5	<5	15	<0.5	1400	65	1	540	–
22	Z9276 1.2	<5	<5	15	<0.5	2400	55	2	650	–
23	Z9277 2.4	5	50	35	<0.5	7650	95	1	110	–
24	Z9278 2.2	5	<5	40	<0.5	27500	150	4	200	–
25	Z9279 2.5	5	10	45	<0.5	10500	65	2	230	–

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04318	25/03/87		2 OF 6

TUBE No.	SAMPLE No. / DEPTH m.	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	Z9280 4.6	10	90	75	<0.5	26000	130	21	330	–
2	Z9281 1.7	20	75	60	<0.5	38500	25	170	430	–
3	Z9282 3.6	20	90	45	<0.5	29000	<5	18	210	–
4	Z9283 0.8	15	35	30	<0.5	5100	45	3	260	–
5	Z9284 0.7	10	10	50	<0.5	18000	65	5	340	–
6	Z9285 4.8	20	40	410	<0.5	11000	45	41	360	–
7	Z9286 1.4	<5	10	30	<0.5	8550	65	7	230	–
8	Z9287 1.5	<5	10	40	<0.5	12500	125	2	290	–
9	Z9288 0.8	<5	<5	25	<0.5	8300	95	<1	300	–
10	Z9289 1.5	<5	<5	35	<0.5	16000	45	<1	400	–
11	Z9290 3.8	5	50	190	<0.5	15500	175	8	270	–
12	Z9291 5.0	20	25	90	<0.5	16500	210	6	240	–
13	Z9292 1.3	<5	<5	5	<0.5	1800	20	<1	190	–
14	Z9293 1.9	5	20	25	<0.5	7200	65	<1	280	–
15	Z9294 1.4	15	<5	5	<0.5	7750	<5	12	130	–
16	Z9295 1.6	10	40	65	<0.5	14000	110	1	180	–
17	Z9296 1.4	5	55	45	<0.5	10500	110	1	200	–
18	Z9297 2.8	5	50	190	<0.5	28500	690	2	380	–
19	Z9298 2.4	<5	30	125	<0.5	17500	250	1	350	–
20	Z9299 6.3	<5	20	10	<0.5	840	20	<1	170	–
21	Z9300 1.0	<5	<5	40	<0.5	18500	575	2	390	–
22	Z9401 3.6	25	45	140	<0.5	49500	835	2	70	–
23	Z9402 1.9	<5	<5	20	<0.5	2750	20	1	60	–
24	Z9403 2.0	<5	<5	25	<0.5	11500	65	1	80	–
25	Z9404 4.4	<5	<5	20	<0.5	6150	30	1	150	–

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04318	25/03/87		3 OF 6

TUBE No.	SAMPLE No. Hole Depth M	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	Z9405 1.6	<5	<5	25	<0.5	7700	70	1	290	–
2	Z9406 1.4	<5	<5	10	<0.5	1400	10	<1	250	–
3	Z9407 1.6	<5	<5	85	<0.5	5750	30	2	190	–
4	Z9408 2.0	<5	<5	5	<0.5	1450	<5	<1	70	–
5	Z9409 1.9	<5	<5	10	<0.5	1200	<5	1	110	–
6	Z9410 1.8	<5	<5	15	<0.5	1850	5	<1	160	–
7	Z9411 0.8	<5	<5	10	<0.5	1300	5	<1	230	–
8	Z9412 1.3	20	315	1150	<0.5	7100	35	7	590	–
9	Z9413 1.0	<5	130	115	<0.5	8200	5	10	640	–
10	Z9414 1.2	<5	90	190	<0.5	10000	135	1	490	–
11	Z9415 0.8	<5	195	245	<0.5	17000	135	1	300	–
12	Z9416 1.2	<5	40	320	<0.5	22000	160	1	90	–
13	Z9417 1.2	<5	<5	10	<0.5	1550	10	<1	110	–
14	Z9418 1.4	<5	<5	15	<0.5	5000	35	1	80	–
15	Z9419 1.2	<5	30	25	<0.5	2150	10	1	510	–
16	Z9420 0.6	<5	25	430	<0.5	5500	5	16	420	–
17	Z9421 0.8	15	10	685	<0.5	33500	885	3	490	–
18	Z9422 1.0	<5	50	3400	<0.5	6300	15	2	490	–
19	Z9423 0.5	<5	<5	20	<0.5	6100	10	2	430	–
20	Z9424 0.4	<5	<5	15	<0.5	1750	15	2	400	–
21	Z9425 0.5	<5	<5	<5	<0.5	14000	<5	17	530	–
22	Z9426 1.0	<5	<5	<5	<0.5	7300	<5	2	820	–
23	Z9427 1.4	10	50	15	<0.5	10500	5	20	450	–
24	Z9428 1.6	<5	30	115	<0.5	15500	165	4	320	–
25	Z9429 0.9	<5	30	30	<0.5	6500	55	1	230	–

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04318	25/03/87		4 OF 6

TUBE No.	SAMPLE No.	HOLE DEPTH m	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	Z9430	1.2	<5	<5	20	<0.5	6450	45	<1	340	–
2	Z9431	1.4	<5	65	20	<0.5	2650	35	1	210	–
3	Z9432	1.5	<5	<5	45	<0.5	5450	50	1	160	–
4	Z9433	2.3	<5	10	35	<0.5	16000	295	1	250	–
5	Z9434	1.0	<5	5	25	<0.5	3750	40	<1	200	–
6	Z9435	1.0	<5	<5	5	<0.5	2000	10	<1	170	–
7	Z9436	3.8	5	45	185	<0.5	22000	145	3	240	–
8	Z9437	5.9	15	65	265	<0.5	32000	1300	2	380	–
9	Z9438	4.6	15	60	1400	<0.5	12000	55	97	310	–
10	Z9439	1.0	<5	515	135	<0.5	5500	85	3	380	–
11	Z9440	1.0	<5	25	30	<0.5	5800	110	1	400	–
12	Z9441	0.8	<5	<5	45	<0.5	10000	65	2	160	–
13	Z9442	1.0	<5	<5	15	<0.5	2800	35	<1	570	–
14	Z9443	0.8	<5	<5	15	<0.5	2450	35	<1	340	–
15	Z9444	1.3	<5	<5	30	<0.5	11000	95	1	280	–
16	Z9445	1.3	<5	<5	55	<0.5	13500	80	1	300	–
17	Z9446	1.9	<5	<5	65	<0.5	16000	100	1	250	–
18	Z9447	1.4	<5	10	70	<0.5	13500	145	3	320	–
19	Z9448	1.0	<5	5	60	<0.5	15000	80	2	330	–
20	Z9449	1.6	<5	10	45	<0.5	12000	40	1	350	–
21	Z9450	1.4	<5	15	60	<0.5	12500	85	1	330	–
22	Z9451	2.2	<5	20	95	<0.5	28500	355	2	250	–
23	Z9452	4.0	<5	5	65	<0.5	13000	80	2	310	–
24	Z9453	1.2	10	<5	110	<0.5	14500	100	2	360	–
25	Z9454	5.3	<5	<5	65	<0.5	12000	100	1	310	–

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04318	25/03/87		5 OF 6

TUBE No.	SAMPLE No. / HOLE DEPTH m	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	Z9455 1.4	<5	45	35	<0.5	4500	35	1	300	–
2	Z9456 9.3	20	60	520	<0.5	39000	315	1	330	–
3	Z9457 4.0	<5	10	110	<0.5	18500	140	4	380	–
4	Z9458 1.5	-<5	160	30	<0.5	2900	55	1	270	–
5	Z9459 0.8	-<5	<5	15	<0.5	2900	80	<1	570	–
6	Z9460 2.5	-<5	35	115	<0.5	20500	105	5	310	–
7	Z9461 4.0	-<5	50	215	<0.5	13500	110	3	260	–
8	Z9462 2.2	-<5	40	45	<0.5	5650	70	1	290	–
9	Z9463 1.0	105	60	155	<0.5	14000	115	6	220	–
10	Z9464 1.3	<5	50	15	<0.5	2850	15	1	410	–
11	Z9465 0.4	<5	<5	10	<0.5	1850	15	1	260	–
12	Z9466 1.0	<5	<5	20	<0.5	2750	50	<1	700	–
13	Z9467 0.8	<5	60	315	<0.5	34000	475	1	660	–
14	Z9468 1.2	<5	55	50	<0.5	10500	60	3	380	–
15	Z9469 1.0	<5	<5	5	<0.5	440	<5	<1	140	–
16	Z9470 0.8	<5	<5	5	<0.5	3100	<5	2	250	–
17	Z9471 1.2	<5	<5	20	<0.5	2650	25	<1	460	–
18	Z9472 1.6	<5	120	290	<0.5	7600	120	16	450	–
19	Z9473 1.4	<5	75	25	<0.5	18500	245	6	300	–
20	Z9474 1.6	<5	15	55	<0.5	10500	100	1	320	–
21	Z9475 1.5	<5	130	100	<0.5	9950	45	3	330	–
22	Z9476 1.0	<5	<5	30	<0.5	10500	55	<1	400	–
23	Z9477 2.5	<5	10	45	<0.5	9900	245	1	280	–
24	Z9478 1.4	<5	20	60	<0.5	8250	100	1	290	–
25	Z9479 0.8	<5	<5	20	<0.5	8650	40	<1	370	–

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04318	25/03/87		6 OF 6

TUBE No.	SAMPLE No. Hole DEPTH m.	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	Z9480 1.6	<5	45	30	<0.5	6700	90	1	190	–
2	Z9481 1.5	<5	<5	75	<0.5	12000	115	2	240	–
3	Z9482 2.4	<5	25	215	<0.5	13000	305	7	210	–
4	Z9483 3.6	135	10	225	<0.5	20000	705	3	140	–
5	Z9484 2.8	<5	15	175	<0.5	16500	220	2	290	–
6	Z9485 3.9	5	40	185	<0.5	16000	155	2	340	–
7	Z9486 1.4	<5	35	65	<0.5	11500	135	3	260	–
8	Z9487 1.0	<5	<5	10	<0.5	4600	55	1	160	–
9	Z9488 2.6	<5	5	155	<0.5	16500	175	8	210	–
10	Z9489 0.8	25	65	170	<0.5	56000	190	2	340	–
11	Z9490 1.2	<5	<5	5	<0.5	3850	5	<1	160	–
12	Z9491 3.5	<5	<5	45	<0.5	14500	25	4	400	–
13	Z9492 1.0	<5	<5	10	<0.5	1500	10	<1	320	–
14	Z9493 1.2	<5	25	50	<0.5	12500	125	8	480	–
15	Z9494 1.6	<5	<5	<5	<0.5	3100	5	2	250	–
16	Z9495 2.4	<5	5	30	<0.5	14500	15	7	350	–
17	Z9496 4.0	<5	30	85	<0.5	13000	180	21	450	–
18	Z9497 3.3	<5	<5	20	<0.5	3700	15	6	300	–
19	Z9498 0.8	<5	195	55	<0.5	10500	45	3	460	–
20	Z9499 rc	<5	385	25	<0.5	16500	35	5	3500	<0.008
21										
22										
23	DETECTION	5	5	5	0.5	50	5	1	10	0.008
24	UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM
25	METHOD	101	101	101	101	101	101	114	120	309

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
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— = element not determined rc rock chip

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Phone (09) 458 7822 52 Aurora Road, Waterford W.A. 6106 Telex AA92560

ANALYTICAL REPORT No. 14.4.08.04340

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40 .
Waratah
Tasmania 7321

ORDER No. B56

PROJECT

DATE RECEIVED 23/03/87

RESULTS REQUIRED ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
14	30/03/87	1	151

STATE OF SAMPLES (SEE BELOW)	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE (GRIND)	SIEVE	OTHER (SEE REMARKS)	FUSION NO.	ANALYSIS: DIRECT TO ANALYSIS SECTION	PREPARATION	METHOD
	Various	RC	Prep: 006,010,011,012,013,018						Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		
	Various	RC							Au,AuChk/309		
	Various	SO	Prep: 006,016						Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		
	Various	SO	Prep: 006,016						Pb,Zn,/104		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	1 OF 14

TUBE No.	SAMPLE No.	DEPTH M.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
1	4315		45	505	–	130	–	<0.5	1.50	135	20
2	4316		220	<5	–	25	–	<0.5	2.45	15	16
3	4317		10	<5	–	20	–	<0.5	1.60	110	<1
4	4318		10	<5	–	25	–	<0.5	1.25	60	2
5	9365		5	<5	–	45	–	<0.5	0.77	315	<1
6	9366		5	<5	–	240	–	<0.5	3.00	1700	<1
7	9367		5	<5	–	235	–	<0.5	3.50	1700	<1
8	9515		10	<5	–	50	–	<0.5	1.15	215	<1
9	9523	All rock chips	20	<5	–	80	–	<0.5	1.65	755	3
10	9524	↑	10	<5	–	40	–	<0.5	1.10	150	<1
11	9542		<5	<5	–	185	–	<0.5	2.65	950	<1
12	9301	0.7	10	<5	–	55	–	<0.5	0.85	270	<1
13	9302	1.4	15	35	–	75	–	<0.5	0.86	320	<1
14	9303	0.4	10	10	–	300	–	<0.5	4.25	1200	2
15	9304	0.6	10	<5	–	15	–	<0.5	0.29	35	<1
16	9305	1.0	10	20	–	120	–	<0.5	0.99	180	<1
17	9306	1.5	10	15	–	110	–	<0.5	1.30	225	<1
18	9307	0.5	5	<5	–	20	–	<0.5	0.52	55	1
19	9308	1.5	5	30	–	35	–	<0.5	0.68	145	<1
20	9309	1.5	10	<5	–	50	–	<0.5	0.96	130	<1
21	9310	1.0	15	<5	–	50	–	<0.5	1.25	135	1
22	9311	1.8	15	<5	–	80	–	<0.5	0.94	190	<1
23	9312	1.0	10	<5	–	60	–	<0.5	0.68	255	<1
24	9313	1.0	10	<5	–	25	–	<0.5	0.78	75	<1
25	9314	1.0	40	<5	–	160	–	<0.5	4.50	1300	<1

Results in ppm unless otherwise specified
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	2 OF 14

SAMPLE No.	HOLE DEPTH m.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
5	0.6	40	160	-	345	-	<0.5	6.05	1400	2
6	1.0	5	<5	-	90	-	<0.5	0.96	275	<1
7	2.4	10	<5	-	60	-	<0.5	0.40	75	<1
8	2.5	10	<5	-	45	-	<0.5	0.69	160	<1
9	14.9	10	<5	-	70	-	<0.5	1.05	70	<1
0	18.6	15	50	-	695	-	<0.5	1.10	140	2
1	22.6	10	240	-	270	-	<0.5	0.46	275	<1
2	12.6	15	-	2850	2250	-	<0.5	1.55	925	<1
3	1.6	10	15	-	120	-	<0.5	1.60	40	1
4	1.6	10	<5	-	110	-	<0.5	3.35	1400	1
5	0.9	10	<5	-	70	-	<0.5	4.00	1450	<1
6	0.6	10	<5	-	65	-	<0.5	3.75	645	<1
7	1.0	10	15	-	95	-	<0.5	4.45	385	1
8	8.0	10	<5	-	95	-	<0.5	1.85	1700	1
9	8.2	10	35	-	100	-	<0.5	0.60	140	1
0	17.6	5	<5	-	15	-	<0.5	0.99	60	<1
1	3.4	10	115	-	160	-	<0.5	3.35	5650	1
2	9.7	5	<5	-	30	-	<0.5	0.91	60	1
3	3.3	30	-	10600	-	14900	<0.5	0.86	65	1
4	2.7	5	10	-	15	-	<0.5	0.29	20	<1
5	0.6	10	20	-	30	-	<0.5	0.36	25	<1
6	0.6	15	<5	-	115	-	<0.5	4.05	580	<1
7	0.6	85	<5	-	235	-	<0.5	4.30	915	<1
8	1.0	45	10	-	305	-	<0.5	4.45	770	2
9	0.8	5	<5	-	10	-	<0.5	0.44	35	<1

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	3 OF 14

AMPLE No.	HOLE DEPTH m.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
0	1.0	5	<5	–	15	–	<0.5	0.48	45	<1
1	0.7	5	<5	–	10	–	<0.5	0.42	30	<1
2	1.1	10	<5	–	25	–	<0.5	0.27	65	<1
3	0.8	10	<5	–	20	–	<0.5	0.34	50	<1
4	1.2	10	<5	–	25	–	<0.5	0.32	30	<1
5	0.8	10	<5	–	25	–	<0.5	0.65	70	<1
6	1.0	10	<5	–	30	–	<0.5	0.81	80	<1
7	0.8	5	<5	–	20	–	<0.5	0.39	65	2
8	0.6	5	<5	–	10	–	<0.5	0.33	45	1
9	0.8	5	<5	–	25	–	<0.5	0.74	115	1
0	0.6	5	<5	–	15	–	<0.5	0.48	60	1
1	0.6	15	<5	–	20	–	<0.5	0.91	85	1
2	0.7	5	10	–	20	–	<0.5	0.61	100	1
3	0.5	10	<5	–	20	–	<0.5	0.47	85	1
4	?	10	<5	–	15	–	<0.5	0.66	165	1
5	2.2	40	175	–	265	–	<0.5	0.33	50	3
6	1.6	5	<5	–	35	–	<0.5	0.59	145	1
7	2.7	10	<5	–	40	–	<0.5	1.05	360	1
8	0.8	5	<5	–	20	–	<0.5	0.49	90	1
9	2.2	15	45	–	140	–	<0.5	2.45	500	4
0	3.4	15	30	–	195	–	<0.5	1.90	3100	2
1	5.2	20	40	–	285	–	<0.5	5.75	1350	4
2	6.4	20	10	–	.60	–	<0.5	0.55	135	2
3	2.4	55	55	–	680	–	<0.5	4.95	3850	2
4	3.6	20	35	–	100	–	<0.5	2.35	300	3

esults in ppm unless otherwise specified
= element present; but concentration too low to measure
= element concentration is below detection limit
= element not determined

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898213

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	4 OF 14

SAMPLE No.	HOLE DEPTH m.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
3	0.8	10	20	-	140	-	<0.5	2.10	995	3
7	0.7	10	10	-	100	-	<0.5	2.10	1150	2
0	18	15	55	-	25	-	<0.5	0.46	90	2
1	0.8	5	<5	-	10	-	<0.5	0.24	50	1
2	1.0	5	<5	-	<5	-	<0.5	0.14	10	1
3	1.4	30	70	-	395	-	<0.5	3.50	1900	5
4	2.7	15	30	-	205	-	<0.5	2.95	1300	3
5	1.6	35	25	-	410	-	<0.5	5.40	2000	7
6	2.1	5	20	-	50	-	<0.5	1.30	185	3
7	1.2	10	<5	-	60	-	<0.5	1.15	280	1
3	0.7	10	<5	-	45	-	<0.5	0.75	120	1
7	0.4	10	<5	-	30	-	<0.5	0.72	110	1
0	1.4	10	<5	-	15	-	<0.5	0.36	55	1
1	1.2	5	<5	-	30	-	<0.5	0.42	115	1
2	1.4	5	<5	-	15	-	<0.5	0.29	100	1
3	2.1	10	<5	-	75	-	<0.5	1.05	530	1
4	0.6	10	50	-	65	-	<0.5	1.00	455	3
5	1.0	10	60	-	55	-	<0.5	0.87	415	1
6	3.0	45	45	-	385	-	<0.5	1.10	575	10
7	1.9	10	10	-	45	-	<0.5	1.20	200	2
8	0.8	10	25	-	120	-	<0.5	2.75	955	14
9	0.7	15	30	-	65	-	<0.5	2.50	820	22
0	1.6	10	10	-	255	-	<0.5	4.60	1600	5
1	2.9	15	65	-	235	-	<0.5	3.25	1400	10
2	0.6	10	<5	-	50	-	<0.5	1.10	265	2

sults in ppm unless otherwise specified
= element present; but concentration too low to measure
= element concentration is below detection limit
= element not determined

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898214

214

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	5 OF 14

SAMPLE No.	HOLE DEPTH m.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
3	0.5	25	175	–	215	–	<0.5	1.70	795	7
4	0.6	5	<5	–	45	–	<0.5	0.91	165	1
5	3.3	10	10	–	30	–	<0.5	0.68	85	1
6	1.5	5	10	–	25	–	<0.5	0.69	85	<1
7	1.8	10	25	–	75	–	<0.5	1.65	330	1
8	0.7	35	60	–	315	–	<0.5	3.35	1300	1
9	0.6	15	5	–	240	–	<0.5	2.60	1250	1
0	0.8	5	<5	–	30	–	<0.5	1.10	80	<1
1	4.6	65	30	–	430	–	<0.5	3.55	1650	<1
2	3.5	15	35	–	485	–	<0.5	2.80	1550	<1
3	1.6	40	15	–	395	–	<0.5	3.45	1650	<1
4	1.4	30	10	–	395	–	<0.5	4.05	1950	1
5	1.2	25	<5	–	250	–	<0.5	5.10	1900	2
6	1.3	25	5	–	50	–	<0.5	0.71	265	4
7	0.8	10	10	–	270	–	<0.5	3.25	1700	1
8	1.3	10	10	–	180	–	<0.5	2.35	790	2
9	1.6	25	<5	–	50	–	<0.5	0.47	20	3
0	0.9	250	20	–	930	–	<0.5	2.65	3300	2
1	1.2	75	25	–	65	–	<0.5	0.74	55	13
2	4.6	35	70	–	150	–	<0.5	5.30	560	15
3	0.7	5	15	–	20	–	<0.5	0.35	65	<1
4	1.4	10	<5	–	120	–	<0.5	2.30	735	1
6	1.0	70	15	–	230	–	<0.5	3.40	705	2
7	1.8	30	15	–	215	–	<0.5	2.65	1150	2
18	1.2	5	50	–	35	–	<0.5	0.93	190	<1

esults in ppm unless otherwise specified
= element present; but concentration too low to measure
< = element concentration is below detection limit
– = element not determined

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	6 OF 14

SAMPLE No.	HOLE DEPTH m.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
7	2.6	15	60	-	350	-	<0.5	5.20	570	5
0	4.1	25	65	-	460	-	<0.5	6.10	1850	3
1	1.4	15	15	-	70	-	<0.5	1.05	195	1
2	1.3	10	25	-	120	-	<0.5	1.60	790	1
5	2.0	20	120	-	510	-	<0.5	4.45	1050	2
6	0.8	15	50	-	220	-	<0.5	3.35	790	1
7	4.2	20	105	-	235	-	<0.5	3.95	885	2
3	1.8	15	25	-	170	-	<0.5	2.45	1250	1
9	1.6	5	15	-	35	-	<0.5	1.20	115	<1
0	2.0	65	30	-	430	-	<0.5	8.30	875	2
1	4.5	75	35	-	285	-	<0.5	8.20	880	2
2	4.9	15	30	-	55	-	<0.5	1.05	75	1
3	1.5	10	10	-	30	-	<0.5	0.71	120	<1
4	3.1	25	290	-	345	-	<0.5	2.45	1100	5
5	0.8	10	15	-	125	-	<0.5	2.10	920	1
6	1.6	40	25	-	350	-	<0.5	5.50	2750	10
7	1.1	20	15	-	245	-	<0.5	5.25	1500	1
8	0.8	20	20	-	105	-	<0.5	1.50	425	2
9	0.6	5	10	-	10	-	<0.5	0.31	55	<1
0	0.5	<5	<5	-	20	-	<0.5	0.56	75	<1
1	0.6	10	30	-	340	-	<0.5	4.00	1350	1
3	rc	5	15	-	140	-	<0.5	1.35	765	1
4	1.2	15	15	-	140	-	<0.5	2.85	700	1
5	1.6	5	<5	-	40	-	<0.5	1.10	120	<1
6	1.5	25	15	-	220	-	<0.5	2.75	1250	2

esults in ppm unless otherwise specified
= element present; but concentration too low to measure
= element concentration is below detection limit
- = element not determined rc rock chip

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898216

216

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	7 OF 14

SAMPLE No.	HOLE DEPTH	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
7	N. 5.0	10	10	-	35	-	<0.5	0.51	75	<1

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	8 OF 14

AMPLE No.	Au								
5	<0.008								
6	0.010								
7	<0.008								
8	<0.008								
9	<0.008								
0	<0.008								
1	<0.008								
2	<0.008								
3	<0.008								
4	<0.008								
5	<0.008								
6	<0.008								
7	<0.008								
8	<0.008								
9	<0.008								
0	<0.008								
1	<0.008								
2	<0.008								
3	<0.008								
4	<0.008								
5	<0.008								
6	<0.008								
7	<0.008								
8	<0.008								
9	<0.008								
0	<0.008								
1	<0.008								
2	<0.008								
3	<0.008								
4	<0.008								

sults in ppm unless otherwise specified
= element present; but concentration too low to measure
= element concentration is below detection limit
= element not determined

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898218

218

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
9) 458 7999 52 Murray Road, Welshpool, W.A. 6106 Telex AA92560
TLX: AA 59224

ANALYTICAL REPORT No. 14.4.08.04387

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
856	

DATE RECEIVED	RESULTS REQUIRED
07/04/87	ASAP

DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
21/04/87	1	153

SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
0	SO	Prep: 005,013,016						Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		
0	SO	Prep: 005,013,016						Pb/104		

TS The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

TS E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

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

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04387	21/04/87	B56	1 OF 7

SAMPLE No.	HOLE DEPTH m	Cu	Pb	Pb	Zn	Ag	Fe	Mn	As	
548	2.3	<5	<5	-	30	<0.5	0.71	80	1	
549	1.2	5	5	-	65	<0.5	1.40	230	35	
550	1.5	15	50	-	75	<0.5	1.75	340	4	
551	2.0	10	<5	-	60	<0.5	1.80	155	4	
552	5.8	10	<5	-	30	<0.5	1.05	80	<1	
553	1.8	10	25	-	110	<0.5	2.10	395	1	
554	5.7	5	<5	-	35	<0.5	1.05	155	<1	
555	2.1	5	<5	-	30	<0.5	0.50	60	<1	
556	1.4	<5	<5	-	30	<0.5	0.62	35	<1	
557	1.0	10	<5	-	60	<0.5	1.50	195	<1	
558	0.7	5	<5	-	30	<0.5	1.00	145	<1	
559	0.7	<5	<5	-	10	<0.5	0.71	50	1	
560	rc	<5	<5	-	10	<0.5	0.39	35	6	
561	1.4	<5	35	-	70	<0.5	2.40	140	2	
562	3.2	<5	<5	-	95	<0.5	0.61	55	1	
563	1.8	<5	<5	-	30	<0.5	0.91	75	1	
564	2.2	<5	<5	-	40	<0.5	1.40	95	<1	
565	1.8	10	<5	-	125	<0.5	4.90	465	1	
566	0.4	85	<5	-	180	<0.5	5.15	890	<1	
567	1.3	30	10	-	200	<0.5	4.20	2130	<1	
568	7.0	10	<5	-	115	<0.5	8.25	2700	2	
569	10.2	10	<5	-	130	<0.5	7.10	1950	<1	
570	5.8	10	<5	-	60	<0.5	4.75	1700	<1	
571	6.4	5	<5	-	145	<0.5	2.45	305	2	
572	0.6	15	<5	-	130	<0.5	4.40	425	<1	

Results in ppm unless otherwise specified
< = element present; but concentration too low to measure
< = element concentration is below detection limit
- = element not determined rc rock chip

AUTHORISED OFFICER

898220

220

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04387	21/04/87	B56	2 OF 7

SAMPLE No.	HOLE DEPTH m.	Cu	Pb	Pb	Zn	Ag	Fe	Mn	As	
73	1.6	<5	<5	-	25	<0.5	1.45	150	<1	
74	0.6	<5	<5	-	160	<0.5	5.90	1600	<1	
75	2.1	<5	<5	-	155	<0.5	5.45	2000	2	
76	9.8	<5	<5	-	120	<0.5	0.78	120	7	
77	1.6	<5	<5	-	15	<0.5	0.83	90	<1	
78	2.1	<5	<5	-	65	<0.5	0.98	70	2	
79	2.4	5	<5	-	80	<0.5	1.50	105	<1	
80	4.8	10	35	-	230	<0.5	2.95	955	1	
81	1.4	15	35	-	190	<0.5	1.95	245	1	
82	4.6	25	55	-	710	<0.5	9.15	1750	3	
83	1.3	5	<5	-	45	<0.5	0.83	80	<1	
84	0.6	15	35	-	85	<0.5	0.43	50	<1	
85	0.6	10	20	-	45	<0.5	1.95	115	2	
86	3.2	10	55	-	35	<0.5	1.05	120	<1	
87	0.8	<5	<5	-	40	<0.5	0.82	95	<1	
88	1.4	10	85	-	40	<0.5	1.80	125	1	
89	0.8	<5	<5	-	30	<0.5	0.78	105	<1	
90	2.1	<5	<5	-	35	<0.5	0.68	60	<1	
91	2.0	15	85	-	70	<0.5	2.00	140	<1	
92	3.3	35	80	-	235	<0.5	5.30	435	1	
93	3.8	45	80	-	270	<0.5	4.70	1050	<1	
94	1.6	20	35	-	275	<0.5	5.90	625	5	
95	4.6	10	35	-	25	<0.5	1.10	65	2	
96	1.0	20	45	-	70	<0.5	1.80	340	3	
97	2.3	105	70	-	490	<0.5	5.70	475	4	

esults in ppm unless otherwise specified
= element present; but concentration too low to measure
: = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

898221

221

ANALABS

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04387	21/04/87	B56	3 OF 7

SAMPLE No.	HOLE DEPTH	Cu	Pb	Pb	Zn	Ag	Fe	Mn	As	
98	2.8	35	40	–	190	<0.5	7.25	745	3	
99	4.4	20	25	–	155	<0.5	1.65	480	2	
00	0.8	<5	<5	–	55	<0.5	1.05	250	1	
01	2.4	20	<5	–	190	<0.5	6.95	1750	1	
02	1.2	10	<5	–	160	<0.5	6.55	700	3	
03	1.7	40	<5	–	215	<0.5	8.00	25	3	
04	2.8	45	<5	–	220	<0.5	6.45	340	7	
05	4.0	65	<5	–	75	<0.5	1.80	160	2	
06	5.9	40	<5	–	150	<0.5	2.00	270	1	
07	1.0	<5	<5	–	20	<0.5	0.68	75	1	
08	0.8	15	<5	–	40	<0.5	2.15	95	1	
09	3.7	10	25	–	30	<0.5	1.80	110	2	
10	3.2	10	65	–	40	<0.5	0.69	20	1	
11	1.6	35	–	1350	115	<0.5	5.30	165	5	
12	4.3	30	65	–	130	<0.5	3.70	195	6	
13	3.0	10	25	–	55	<0.5	1.00	175	2	
14	1.0	5	<5	–	50	<0.5	0.62	25	1	
15	0.8	<5	30	–	35	<0.5	0.76	90	1	
16	1.0	5	30	–	30	<0.5	0.85	160	1	
17	1.2	<5	<5	–	45	<0.5	0.72	125	1	
18	3.0	<5	<5	–	20	<0.5	0.48	50	1	
19	3.6	5	<5	–	40	<0.5	0.58	75	1	
20	4.7	10	<5	–	20	<0.5	0.56	60	1	
21	1.0	5	<5	–	35	<0.5	1.30	55	1	
22	1.2	<5	<5	–	20	<0.5	0.60	45	1	

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

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898222

222

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ANALYTICAL DATA

SAMPLE PREFIX | REPORT NUMBER | REPORT DATE | CLIENT ORDER No. | PAGE

14.4.08.04387 | 21/04/87 | B56 | 4 OF 7

SAMPLE No. HOLE DEPTH	Cu	Pb	Pb	Zn	Ag	Fe	Mn	As	
23 m. 3.0	10	60	–	70	<0.5	1.50	135	1	
24 6.1	<5	190	–	225	<0.5	1.10	310	1	
25 6.5	5	25	–	15	<0.5	0.44	45	1	
26 3.0	<5	25	–	30	<0.5	0.59	60	1	
27 1.2	<5	35	–	35	<0.5	1.90	75	3	
28 1.4	<5	<5	–	20	<0.5	0.37	30	1	
29 1.2	5	10	–	30	<0.5	0.67	90	1	
30 2.0	10	<5	–	15	<0.5	0.53	35	1	
31 1.2	<5	<5	–	10	<0.5	0.46	15	1	
32 0.6	<5	<5	–	5	<0.5	0.40	15	1	
33 1.0	5	<5	–	15	<0.5	0.72	20	1	
34 0.8	<5	<5	–	15	<0.5	0.54	25	1	
35 1.7	<5	<5	–	10	<0.5	0.42	20	1	
36 2.8	40	375	–	425	<0.5	6.65	1150	8	
37 1.4	20	250	–	245	<0.5	5.70	260	2	
38 0.7	5	60	–	110	<0.5	2.25	280	2	
39 1.3	10	55	–	60	<0.5	1.55	75	2	
40 3.2	50	<5	–	165	<0.5	3.75	490	2	
41 2.8	5	<5	–	65	<0.5	1.40	120	<1	
42 1.4	10	20	–	65	<0.5	3.00	345	2	
43 1.3	15	<5	–	45	<0.5	1.40	200	1	
44 1.9	80	20	–	125	<0.5	7.35	575	3	
45 1.6	20	<5	–	30	<0.5	2.05	110	1	
46 2.0	35	<5	–	110	<0.5	1.75	345	4	
47 1.7	5	<5	–	45	<0.5	1.35	65	2	

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

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898223

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04387	21/04/87	B56	5 OF 7

SAMPLE No.	Hole Depth	Cu	Pb	Pb	Zn	Ag	Fe	Mn	As	
48	3.6	75	45	–	395	<0.5	6.50	3350	3	
49	0.8	10	20	–	15	<0.5	1.45	60	6	
50	?	80	185	–	515	<0.5	8.00	3050	12	
51	1.0	5	<5	–	10	<0.5	0.32	15	2	
52	1.2	<5	<5	–	25	<0.5	0.59	190	1	
53	2.1	<5	<5	–	30	<0.5	1.00	155	2	
54	4.8	10	<5	–	80	<0.5	2.05	500	1	
55	5.7	5	25	–	45	<0.5	1.00	145	1	
56	9.4	<5	<5	–	30	<0.5	0.64	115	<1	
57	5.1	5	<5	–	25	<0.5	0.84	35	<1	
58	4.0	15	60	–	40	<0.5	1.35	80	2	
59	3.8	5	40	–	40	<0.5	1.25	85	2	
60	1.7	<5	<5	–	30	<0.5	0.34	25	<1	
61	3.8	<5	<5	–	25	<0.5	0.51	55	<1	
62	5.9	5	<5	–	20	<0.5	0.44	20	1	
63	1.5	10	40	–	40	<0.5	0.38	30	1	
64	2.9	15	60	–	30	<0.5	0.24	10	<1	
65	0.8	15	55	–	40	<0.5	0.87	60	1	
66	1.7	5	<5	–	30	<0.5	1.00	5	1	
67	2.6	15	<5	–	20	<0.5	0.63	40	<1	
68	1.8	5	<5	–	20	<0.5	0.82	80	<1	
69	0.7	<5	<5	–	<5	<0.5	0.25	20	<1	
70	2.4	5	<5	–	20	<0.5	0.67	50	<1	
71	1.9	<5	<5	–	25	<0.5	0.97	45	1	
72	5.6	<5	<5	–	20	<0.5	0.59	35	<1	

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04387	21/04/87	B56	6 OF 7

SAMPLE No. Hole DEPTH	Cu %	Pb	Pb	Zn	Ag	Fe	Mn	As	
73 0.9	<5	<5	–	25	<0.5	0.38	30	<1	
74 3.5	20	–	1100	225	<0.5	4.30	860	2	
75 5.0	25	175	–	290	<0.5	5.90	1250	2	
76 5.3	30	115	–	290	<0.5	3.00	475	1	
77 0.9	5	<5	–	75	<0.5	1.60	100	2	
78 3.5	15	170	–	180	<0.5	5.25	1500	2	
79 10.3	10	100	–	270	<0.5	2.25	690	2	
80 1.6	20	30	–	130	<0.5	4.20	880	4	
81 2.8	15	25	–	245	<0.5	6.90	1450	6	
82 3.2	15	15	–	270	<0.5	7.00	9050	4	
83 3.7	30	70	–	490	<0.5	10.50	960	9	
84 1.4	20	45	–	420	<0.5	7.40	2250	8	
85 4.2	70	280	–	1500	<0.5	6.50	2500	3	
86 4.0	10	45	–	25	<0.5	0.38	30	2	
87 1.0	15	35	–	35	<0.5	0.72	80	3	
88 1.9	55	100	–	330	<0.5	5.05	1600	2	
89 4.4	20	45	–	80	<0.5	2.00	405	2	
90 4.7	30	20	–	130	<0.5	2.25	450	3	
91 1.2	10	<5	–	20	<0.5	0.35	55	2	
92 3.8	20	25	–	35	<0.5	3.40	45	4	
93 8.0	20	75	–	110	<0.5	2.90	280	2	
94 1.0	5	<5	–	25	<0.5	0.67	80	<1	
95 2.6	15	15	–	55	<0.5	0.80	80	1	
96 1.2	5	<5	–	45	<0.5	1.00	130	1	
97 3.0	<5	<5	–	20	<0.5	0.43	60	<1	

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04387	21/04/87	B56	7 OF 7

SAMPLE No. HOLE DEPTH	Cu	Pb	Pb	Zn	Ag	Fe	Mn	As	
98 1.8	10	<5	-	25	<0.5	0.86	50	1	
99 1.0	5	10	-	40	<0.5	1.30	25	1	
00 1.6	10	25	-	125	<0.5	1.10	150	1	

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Analytical Laboratories Pty Ltd
91 Murray Road, Welshpool, W.A. 6106
Telex: AA 92550

ANALYTICAL REPORT No. 14.4.08.04526

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
B56	

DATE RECEIVED	RESULTS REQUIRED
02/06/87	ASAP

DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
10/06/87	1	47

SAMPLE NUMBERS	PRE-TREATMENT							ANALYSIS		
	DRY				% SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
7	RC Prep: 005,016							Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

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

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04526	10/06/87	B56	1 OF 2

SAMPLE No.	HOLE DEPTH M.	Cu	Pb	Zn	Ag	Fe	Mn	As		
01	0.8	10	35	105	<0.5	3.05	380	9		
02	1.0	5	<5	120	<0.5	8.70	970	2		
03	1.4	<5	<5	35	<0.5	2.65	40	3		
04	1.5	<5	10	35	<0.5	0.79	90	2		
05	1.4	<5	<5	35	<0.5	1.00	95	1		
06	4.3	5	65	115	<0.5	6.15	540	5		
07	1.3	<5	10	155	<0.5	1.35	305	1		
08	1.3	60	25	375	<0.5	4.60	740	4		
09	1.8	<5	<5	40	<0.5	1.45	90	1		
10	8.6	<5	5	140	<0.5	4.05	565	2		
11	8.8	20	10	200	<0.5	4.00	630	2		
12	8.1	5	15	205	<0.5	4.15	125	7		
13	4.0	<5	15	75	<0.5	1.85	220	3		
14	1.6	<5	<5	105	<0.5	5.95	590	2		
15	0.9	<5	<5	20	<0.5	0.81	50	1		
16	1.0	<5	5	175	<0.5	5.05	525	1		
17	0.8	60	10	110	<0.5	7.25	715	1		
18	0.6	<5	<5	25	<0.5	1.10	135	1		
19	1.2	<5	<5	25	<0.5	1.30	155	<1		
20	0.8	<5	<5	15	<0.5	0.73	90	<1		
21	0.7	<5	<5	10	<0.5	0.29	30	<1		
22	1.2	<5	<5	10	<0.5	0.62	35	2		
23	1.0	<5	<5	20	<0.5	0.40	25	1		
24	2.3	<5	<5	20	<0.5	0.27	15	1		
25	1.4	<5	25	70	<0.5	4.15	145	7		

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04526	10/06/87	B56	2 OF 2

SAMPLE No.	HOLE DEPTH	Cu	Pb	Zn	Ag	Fe	Mn	As		
26	1·7	<5	25	85	<0.5	2.25	140	2		
27	rc	<5	<5	30	<0.5	1.00	65	3		
28	rc	<5	<5	15	<0.5	1.10	30	1		
29	rc	5	5	90	<0.5	4.15	450	1		
30	rc	5	20	105	<0.5	1.10	525	3		
31	rc	<5	<5	10	<0.5	0.31	30	<1		
32	1·4	<5	<5	20	<0.5	0.53	30	1		
33	1·6	<5	<5	20	<0.5	0.78	65	2		
34	1·8	<5	<5	10	<0.5	0.69	80	<1		
35	6·2	5	10	30	<0.5	1.00	155	3		
36	4·9	5	20	50	<0.5	1.10	135	2		
37	17·6	5	40	160	<0.5	3.30	540	2		
38	5·4	5	<5	115	<0.5	3.55	1200	2		
39	1·5	5	10	110	<0.5	5.35	1300	5		
40	1·3	5	5	45	<0.5	3.55	400	4		
41	1·6	<5	<5	40	<0.5	2.00	320	1		
42	2·6	<5	<5	40	<0.5	1.20	110	1		
43	26·3	5	15	200	<0.5	2.40	330	1		
44	23·4	<5	<5	225	<0.5	3.85	810	1		
45	19·8	5	10	415	<0.5	1.45	160	8		
46	10·0	5	<5	60	<0.5	1.15	185	1		
47	3·4	<5	<5	40	<0.5	1.85	170	3		
TECTION		5	5	5	0.5	0.05	5	1		
UNITS		PPM	PPM	PPM	PPM	%	PPM	PPM		
METHOD		101	101	101	101	101	101	114		

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

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898230

EXPLORATION LICENCE 5/63
COMSTAFF J.V., N.W. TASMANIA
REPORT FOR THE YEAR ENDED
30TH JUNE, 1987.

Volume 2

MINES
File Ref. EL 5/63
14 AUG 1987
Doc. Ref.
Action Officer | Initials
LETTER
13.8.87
REFERS.
Resubmit to | Date

MICROFILMED

APPENDIX 7

Rock Chip Samples
Descriptions and Geochemical Analysis

ROCK CHIP SAMPLES

Sample No.	Location	Description
4301	Track approximately 100 m N of Hollway Rivulet	Silicified, sericitized andesite with fine grained disseminated pyrite to 10%
4302	As above, but 25 m further south	Silica-sericite-chlorite pyrite andesite (10% pyrite)
4303	As above, but 35 m S of 4302	Silica-sericite-pyrite andesite (5% pyrite)
4304	Track, 25 m N of Hollway Rivulet	Silica-sericite-pyrite andesite (3-10% pyrite)
4307	Rosebery Fault Zone New Forestry Road near Marionoak River	A 1 m channel sample of hanging wall quartz-feldspar crystal tuffs
4308	Rosebery Fault Zone New Forestry Road near Marionoak River	A 1 m channel sample in footwall immediately in contact with fault plane. Rock is crumpled tuffs and sandstone
4309	Rosebery Fault Zone New Forestry Road near Marionoak River	Channel sample to W of fault plane in footwall from 1-6 m along road from fault plane. Rock is crumpled tuff and sandstone.

4310	Rosebery Fault Zone New Forestry Road near Marionoak River	Channel sample 6-16 m from fault plane in footwall. Rock is sandstone
4311	Rosebery Fault Zone New Forestry Road near Marionoak River	Channel sample 16-26 m into footwall from fault plane. Rock is shale
4312	Rosebery Fault Zone New Forestry Road near Marionoak River	Channel sample 26-36 m into footwall from fault plane in intensely crumpled slates
4313	Rosebery Fault Zone New Forestry Road near Marionoak River	Channel sample 36-46 m from fault plane, intensely crumpled slates
4314	Rosebery Fault Zone New Forestry Road near Marionoak River	Channel sample 46-56 m in footwall from fault plane in sheared and folded slates
4316	Mt. Kershaw Trig.	Strong silicified sericite-pyrite altered dacite (10-30% pyrite)
4317	700m NNW of spillway of Bastyan Dam	Strong sericite moderate pyrite (5-8%) dacite
4318	Photomarker site 800N of spillway of Bastyan Dam	Strongly sericitic, moderately pyritized (2-8%) dacitic pumiceous tuff

4319	Shale Basin N. end of central costean, junction of old line 25 N.	Bedded shale
4320	As above, line 25 N scrape to W. of N. end central costean	Black shale
4321	As above, small EW costean to E. of central costean, near 6600N, 4650E on BHP grid	Bedded shale, weakly pyritic

ANALABS

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

Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560
TLX: AA 59224

ANALYTICAL REPORT No. 14.4.08.04019

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
11160	B 56

DATE RECEIVED	RESULTS REQUIRED
27/11/86	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	05/12/86	1	6

STATE OF SAMPLES		PRE-TREATMENT							ANALYSIS		
REFER BELOW	SAMPLE NUMBERS	DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	Z 4301/06	RD	Prep: 009,016						Cu,Pb,Zn,Ag,Fe,Mn/101,Ba/120,As/114		
	Z 4301/06	RD							Au/329		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

~~E. Bamstead~~ & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

REMARKS

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

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898235

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04019	05/12/86	11160	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Mn	Ba	As	Au
1	Z 4301	20	40	30	0.5	1.20	45	285	9	0.01
2	Z 4302	25	25	100	<0.5	2.95	600	460	11	<0.01
3	Z 4303	40	25	285	0.5	6.65	2950	260	21	0.01
4	Z 4304	15	35	100	<0.5	2.35	680	275	12	0.01
5	(Z 4305)	205	40	1800	<0.5	11.00	140000	770	9	0.01
6	(Z 4306)	65	45	540	0.5	1.60	430	455	7	0.01
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.05	5	5	1	0.01
24	UNITS	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM
25	METHOD	101	101	101	101	101	101	120	114	329

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

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A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560
TLX: AA 59224

ANALYTICAL REPORT No. 14.4.08.04198

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

20 FEB. 1987

ORDER No.	PROJECT
11163	B56

DATE RECEIVED	RESULTS REQUIRED
02/02/88	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	18/02/87	1	8

STATE OF SAMPLES

REFER BELOW	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	4307/4314	RD							Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		
	4307/4314	RD							Ba/120		
	4307/4314	RD							Au/313		

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

REMARKS

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04198	18/02/87	11163	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Mn	As	Ba	Au
1	4307	25	65	125	0.5	3.15	145	14	195	<0.005
2	4308	30	105	90	<0.5	2.95	50	14	300	<0.005
3	4309	25	90	90	1.0	3.00	60	10	320	<0.005
4	4310	40	85	90	0.5	4.00	80	13	280	<0.005
5	4311	40	75	45	0.5	2.25	55	15	275	0.035
6	4312	40	45	40	1.0	2.20	45	22	220	0.005
7	4313	30	80	70	1.0	2.40	95	11	260	0.005
8	4314	20	95	45	<0.5	1.90	65	9	240	<0.005
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.05	5	1	5	0.005
24	UNITS	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM
25	METHOD	101	101	101	101	101	101	119	120	213

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

AUTHORISED OFFICER

898238

12 Rock chips

ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04340	30/03/87	B56	1 OF 14

TUBE No.	SAMPLE No.	Cu	Pb	Pb	Zn	Zn	Ag	Fe	Mn	As
1	(4315)	45	505	-	130	-	<0.5	1.50	135	20
2	4316	220	<5	-	25	-	<0.5	2.45	15	16
3	4317	10	<5	-	20	-	<0.5	1.60	110	<1
4	4318	10	<5	-	25	-	<0.5	1.25	60	2
5	9365	5	<5	-	45	-	<0.5	0.77	315	<1
6	9366	5	<5	-	240	-	<0.5	3.00	1700	<1
7	9367	5	<5	-	235	-	<0.5	3.50	1700	<1
8	9515	10	<5	-	50	-	<0.5	1.15	215	<1
9	9523	20	<5	-	80	-	<0.5	1.65	755	3
10	9524	10	<5	-	40	-	<0.5	1.10	150	<1
11	9542	<5	<5	-	185	-	<0.5	2.65	950	<1
12	9301	10	<5	-	55	-	<0.5	0.85	270	<1
13	9302	15	35	-	75	-	<0.5	0.86	320	<1
14	9303	10	10	-	300	-	<0.5	4.25	1200	2
15	9304	10	<5	-	15	-	<0.5	0.29	35	<1
16	9305	10	20	-	120	-	<0.5	0.99	180	<1
17	9306	10	15	-	110	-	<0.5	1.30	225	<1
18	9307	5	<5	-	20	-	<0.5	0.52	55	1
19	9308	5	50	-	35	-	<0.5	0.68	145	<1
20	9309	10	<5	-	50	-	<0.5	0.96	130	<1
21	9310	15	<5	-	50	-	<0.5	1.25	135	1
22	9311	15	<5	-	80	-	<0.5	0.94	190	<1
23	9312	10	<5	-	60	-	<0.5	0.68	255	<1
24	9313	10	<5	-	25	-	<0.5	0.78	75	<1
25	9314	40	<5	-	160	-	<0.5	4.50	1300	<1

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

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898239

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
Phone (09) 458 7999 — 52 Murray Road, Welshpool, W.A. 6106 — Telex AA92560
TLX: AA 59224

ANALYTICAL REPORT No. 14.4.08.04453

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

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

ORDER No.	PROJECT
856	

DATE RECEIVED	RESULTS REQUIRED
04/05/87	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
1	11/05/87	1	4

STATE OF SAMPLES

REFER BELOW	SAMPLE NUMBERS	PRE-TREATMENT: DRY	CRUSH	SPLIT	PULVERISE	SIEVE	OTHER SEE REMARKS	NONE	ANALYSIS: REFER TO ANALYSIS SECTION	PREPARATION	METHOD
	74319/22	RC	Prep: 009,012,016						Cu,Pb,Zn,Ag,Fe,Mn/101,As/114		

REMARKS

RESULTS TO

The Broken Hill Prop. Co. Ltd.
P.O. Box 40
Waratah
Tasmania 7321

RESULTS TO

E. Bumstead & A. Clarke
B.H.P.
P.O. Box 559
Camberwell
Victoria 3124

STATE OF SAMPLES		ANALYSIS — PREPARATION				ANALYSIS — METHOD	
whole core	WC	perchloric acid	A1	cold acid	CA	atomic absorbtion	AAS
split core	SC	hydrochloric acid	A2	specific sulphide	SS	x-ray fluorescence	XRF
cutting	CU	nitric acid	A3	other mixed acids	Ma	spectrophotometry	SPEC
ock	Ro	aqua regia	A4	alkaline attack	AA	colorimetry	COL
il	SO	nitric-perchloric	A5	volatilization	VO	chromatography	CHR
lp	PU	HF mixture	A6	ignition	IG	titration	TTN
ter	WA	HF under pressure	A7	pressed powder (XRF)	PP	other chemicals means	CHEM
ue	TI	fusion	A8	glass fusion (XRF)	GF	miscellaneous	MISC
am sediment	SS					fluorescence	FLUOR
y mineral	HM					inductively coupled plasma	ICP

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ANALABS

A Division of Macdonald Hamilton & Co. Pty Ltd.

ANALYTICAL DATA

SAMPLE PREFIX	REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE
	14.4.08.04453	11/05/87	B56	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Mn	As		
1	Z4319	20	310	240	20.0	1.20	100	31		
2	Z4320	10	380	330	1.5	1.50	330	37		
3	Z4321	20	1250	285	3.5	1.80	245	60		
4	Z4322	10	555	235	0.5	1.60	435	43		
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	0.05	5	1		
24	UNITS	PPM	PPM	PPM	PPM	%	PPM	PPM		
25	METHOD	101	101	101	101	101	101	114		

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

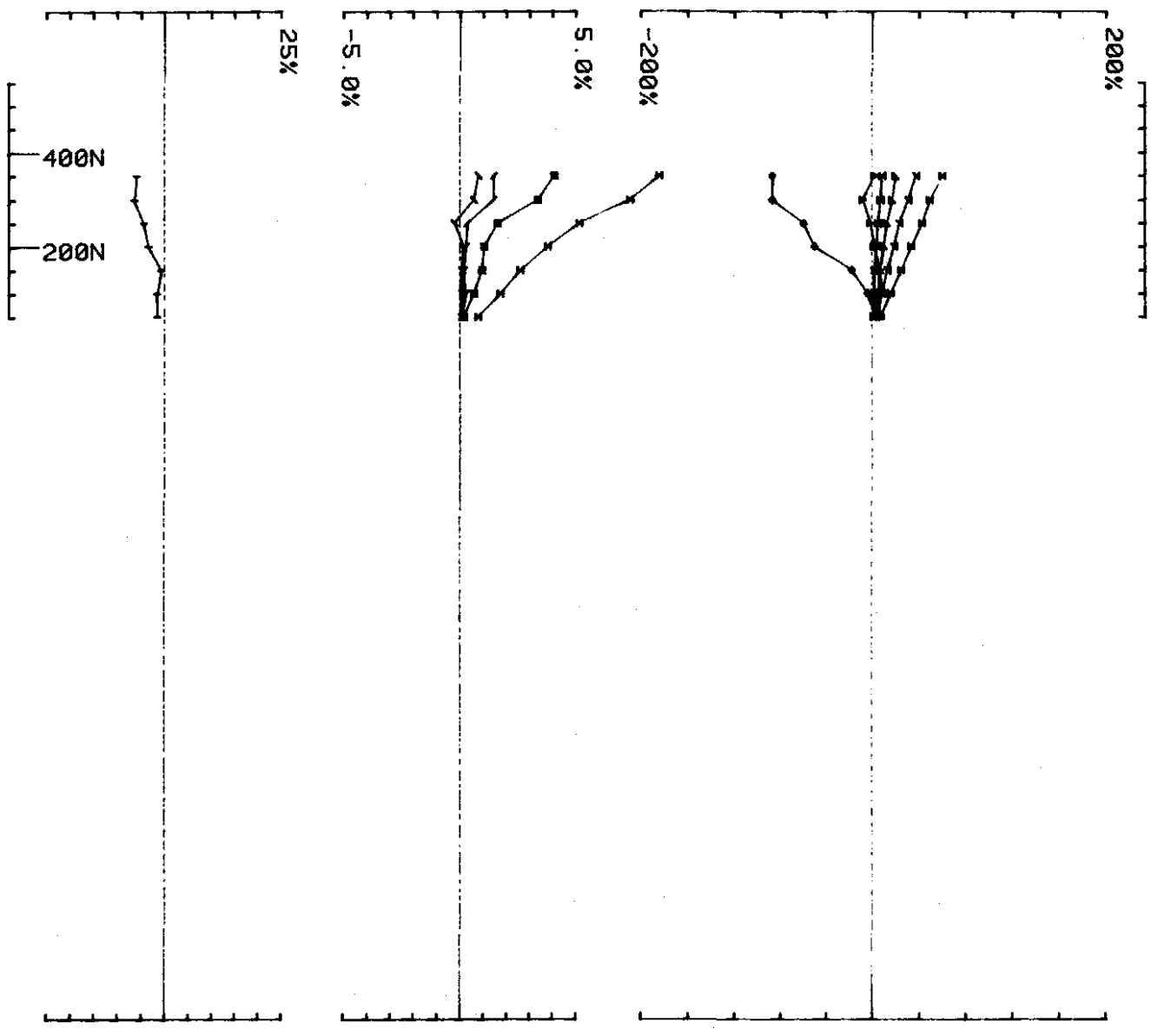
AUTHORISED OFFICER

898241

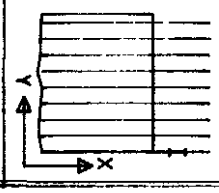
APPENDIX 8

UTEM Plots

898243



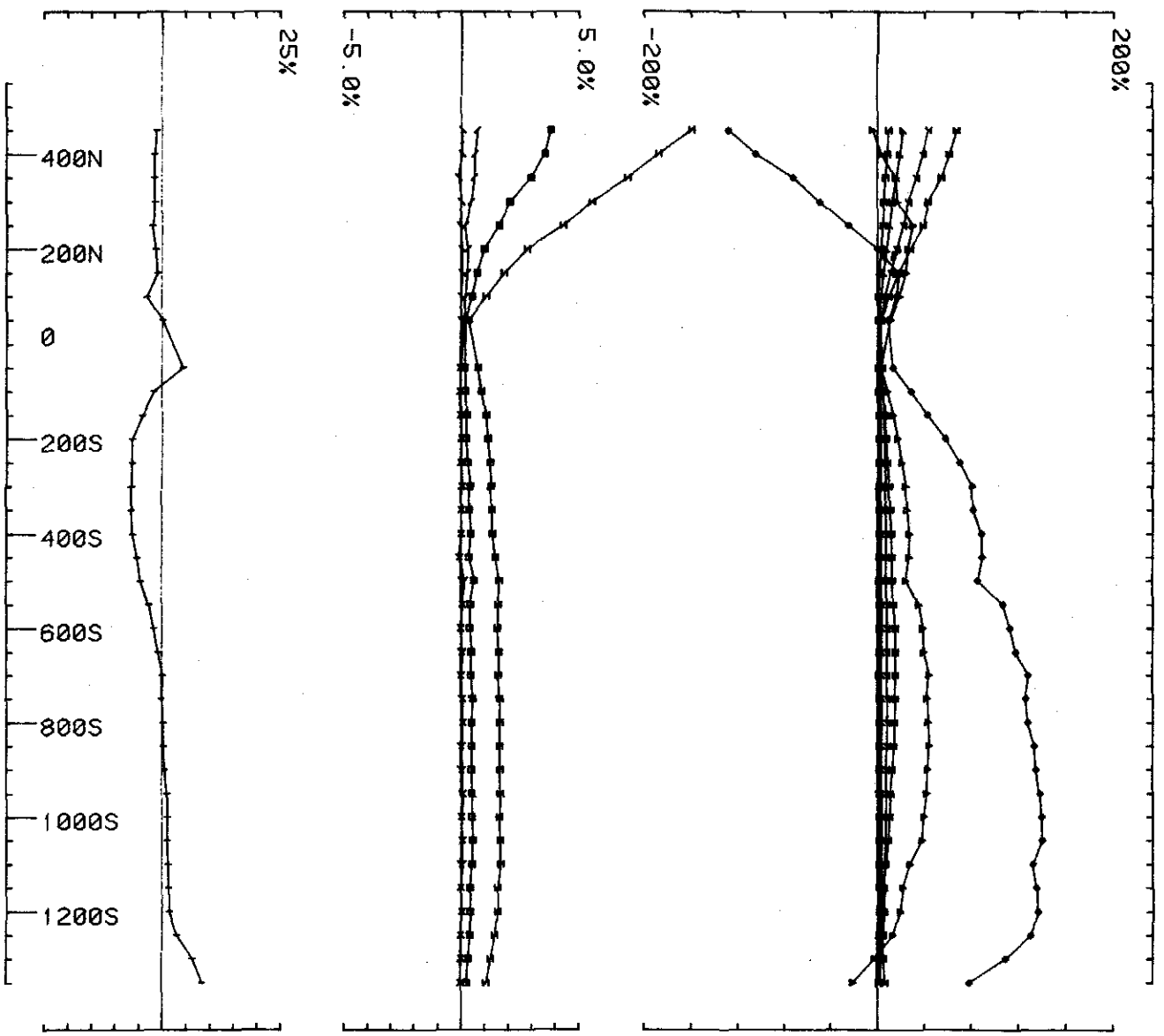
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 1000E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



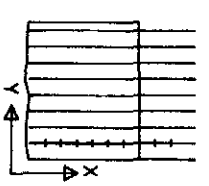
EAST CHESTER
LOOP 8001
LINE 1000
Hz

243

898244

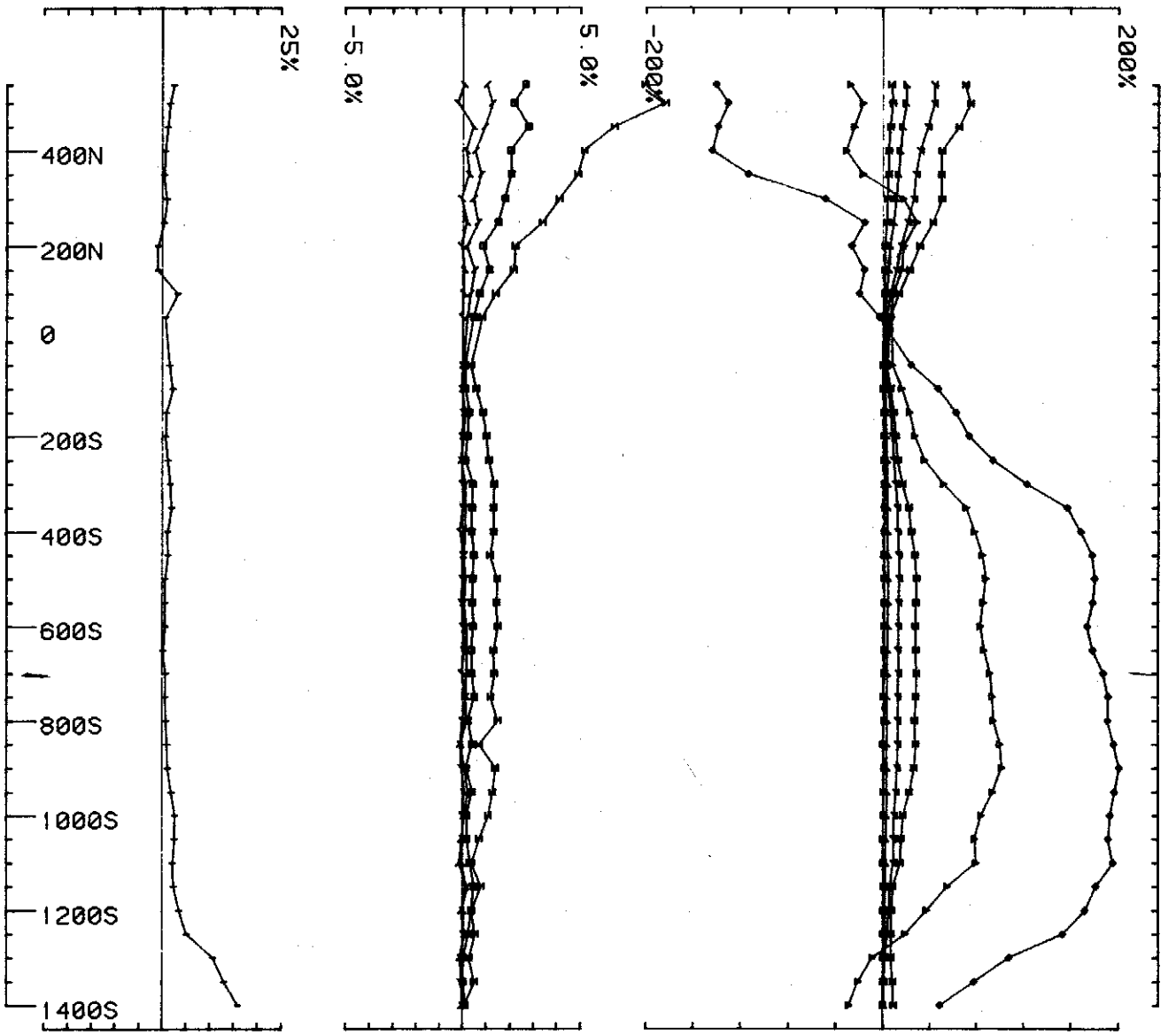


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 800E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

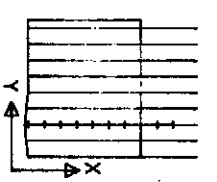


EAST CHESTER
LOOP 800t
LINE 800
Hz

898245



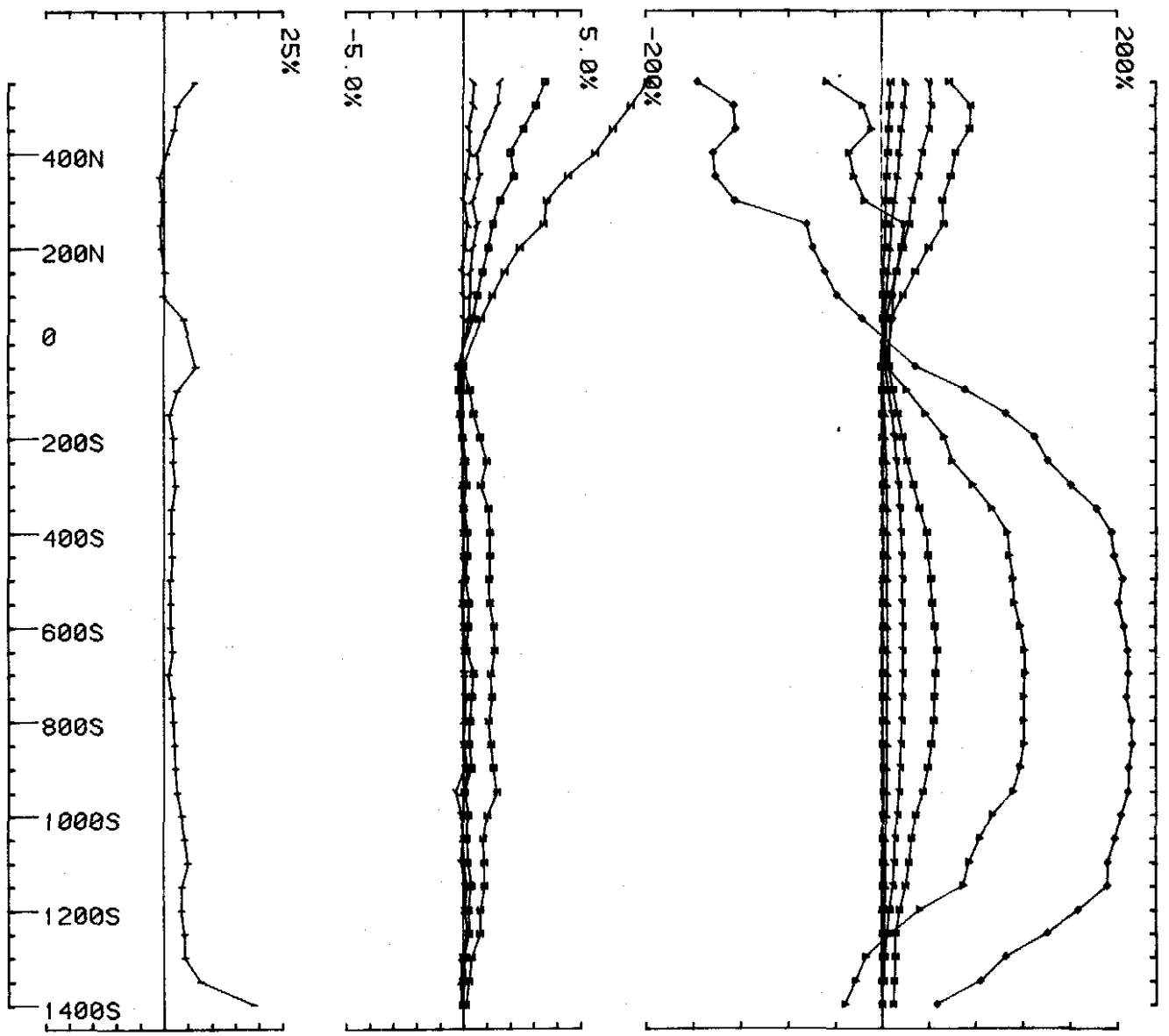
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 600E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



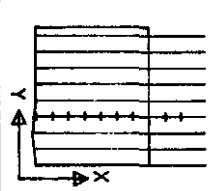
EAST CHESTER
LOOP 0001
LINE 600
Hz

245

898246



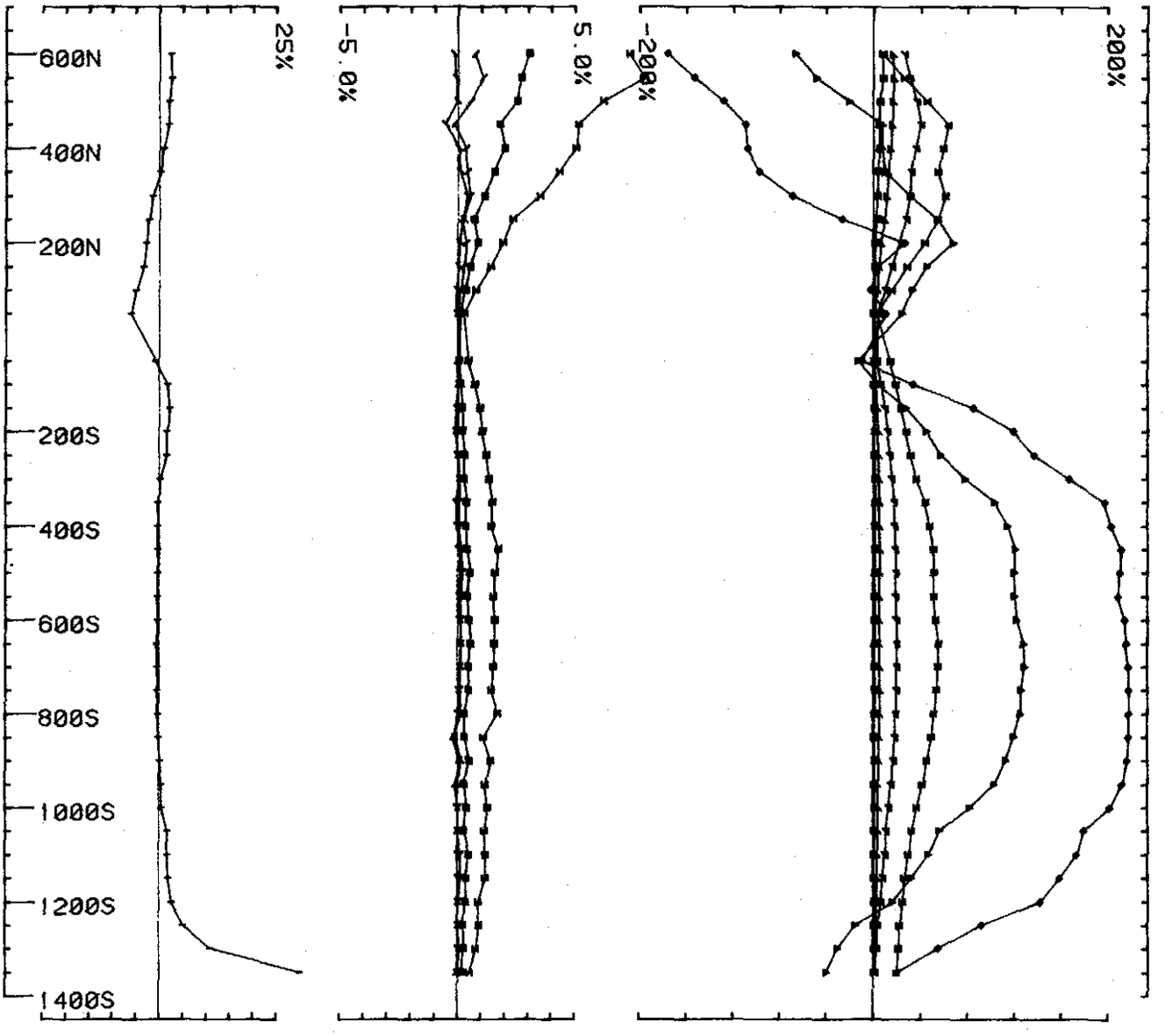
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 400E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



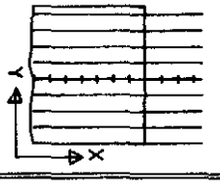
EAST CHESTER
LOOP 0001
LINE 400
Hz

246

898247



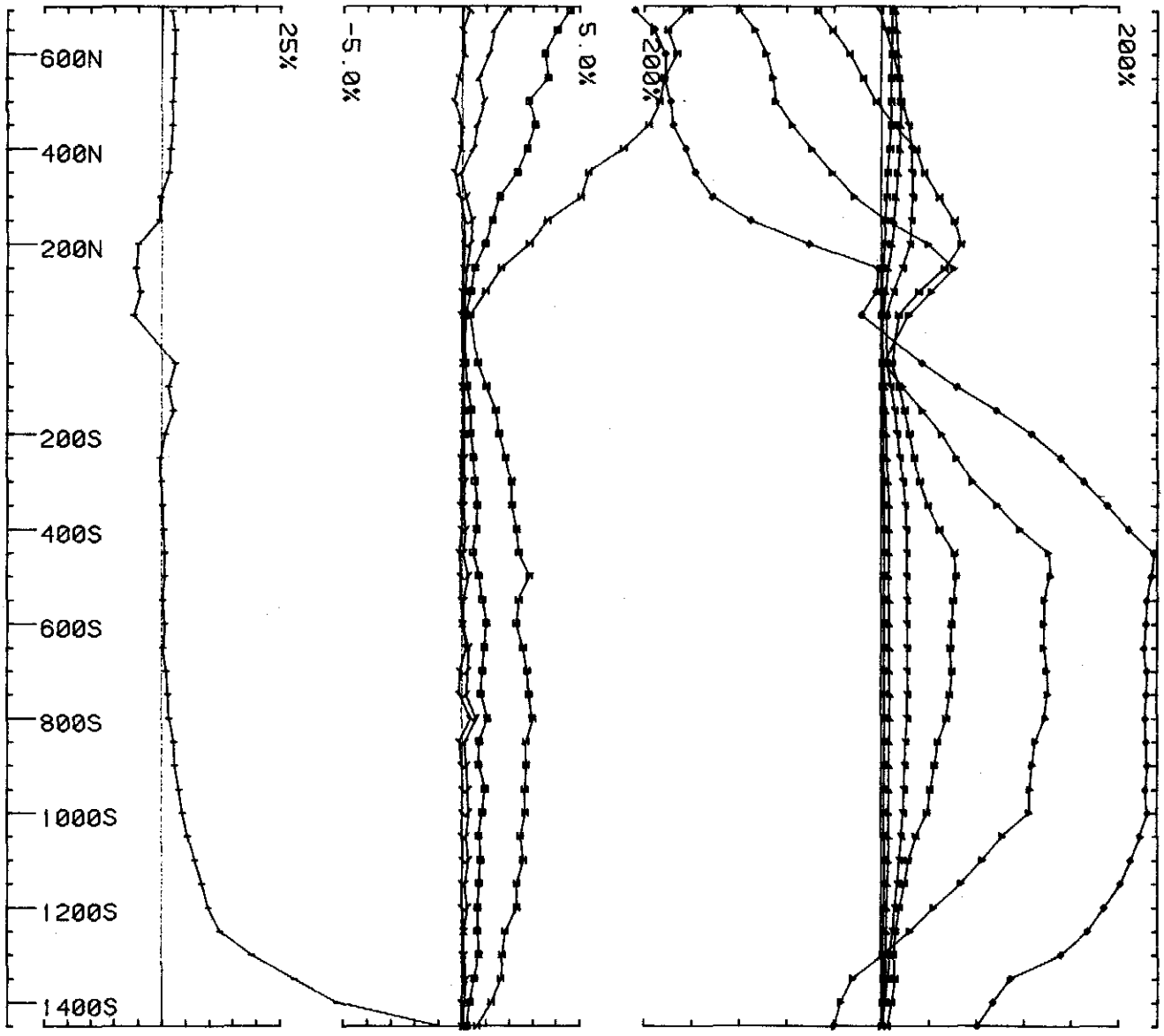
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 200E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



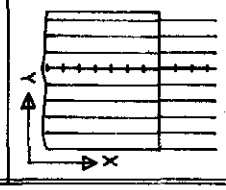
EAST CHESTER
LOOP 8001
LINE 200E
Hz

247

898248



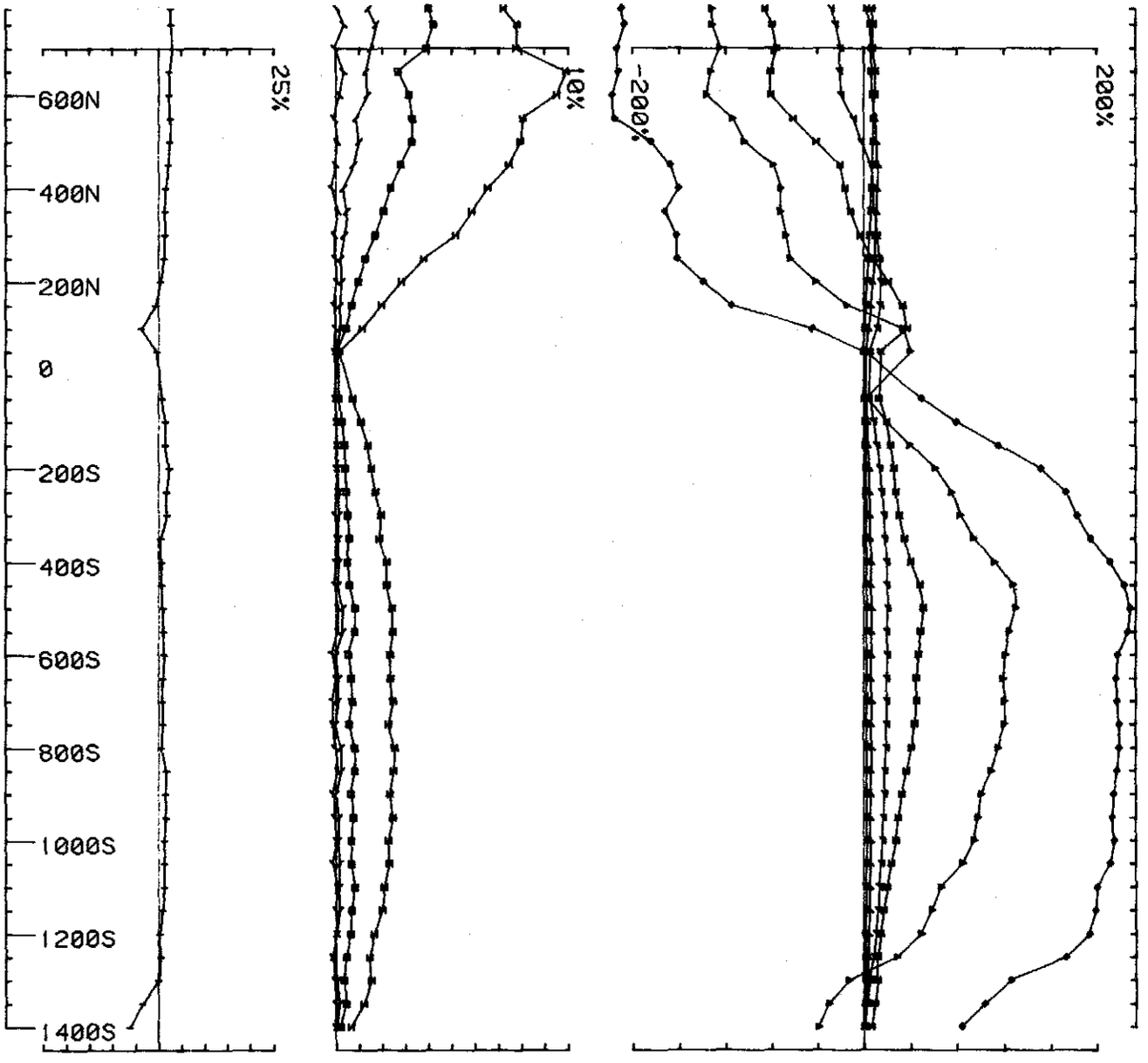
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 0 Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



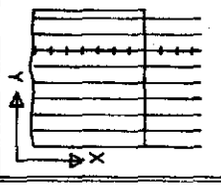
EAST CHESTER
LOOP 0001
LINE 0
Hz

248

898249



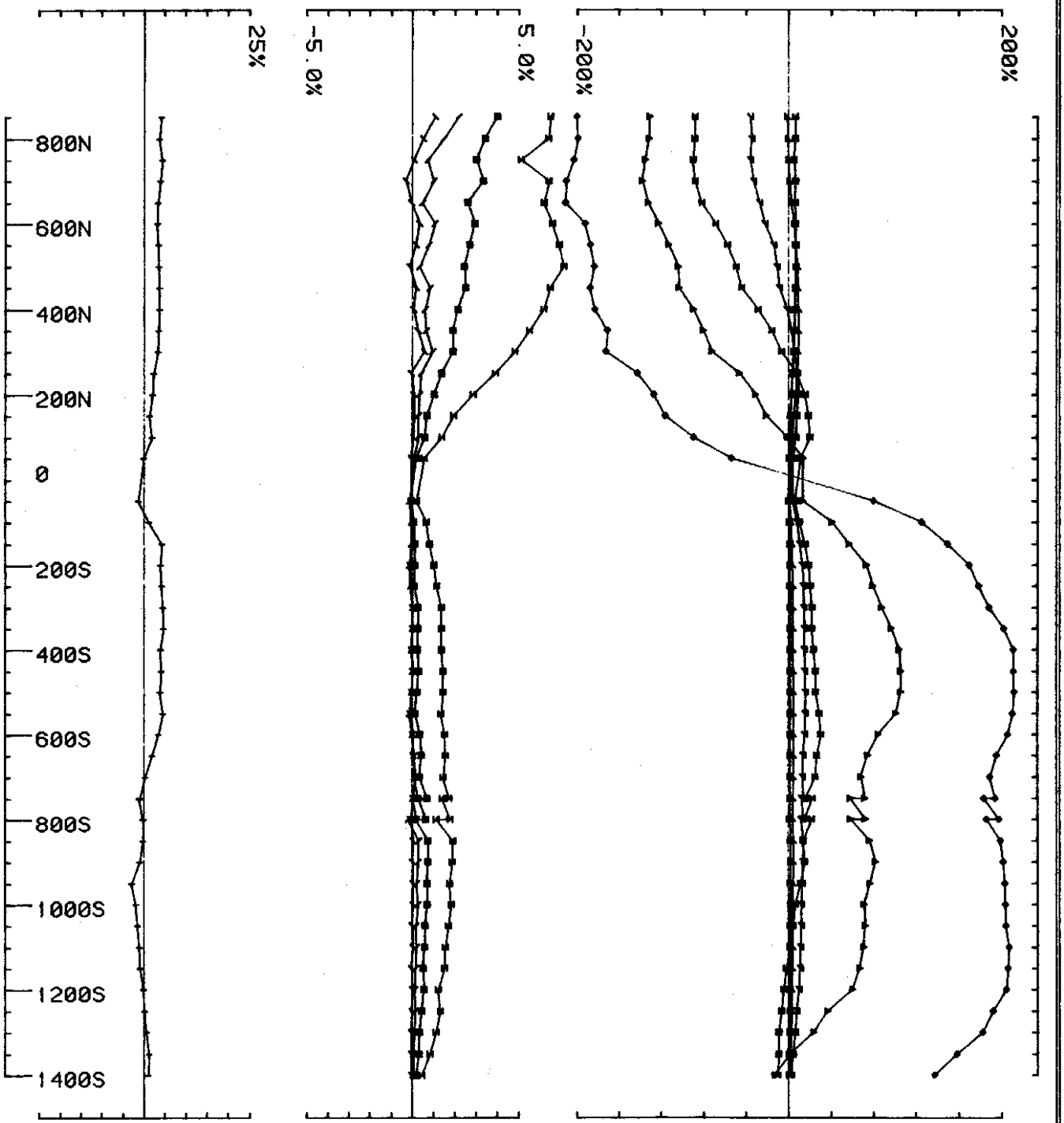
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 200W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



EAST CHESTER
LOOP 8001
LINE 200W
Hz

249

898250



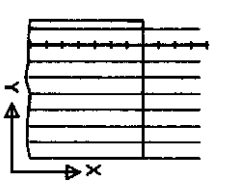
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- EAST CHESTER

CLIENT :- B.H.P. CREW :- PMM HU

Line 1930S Hz COMPONENT BASE FREQ :- 26.230HERTZ

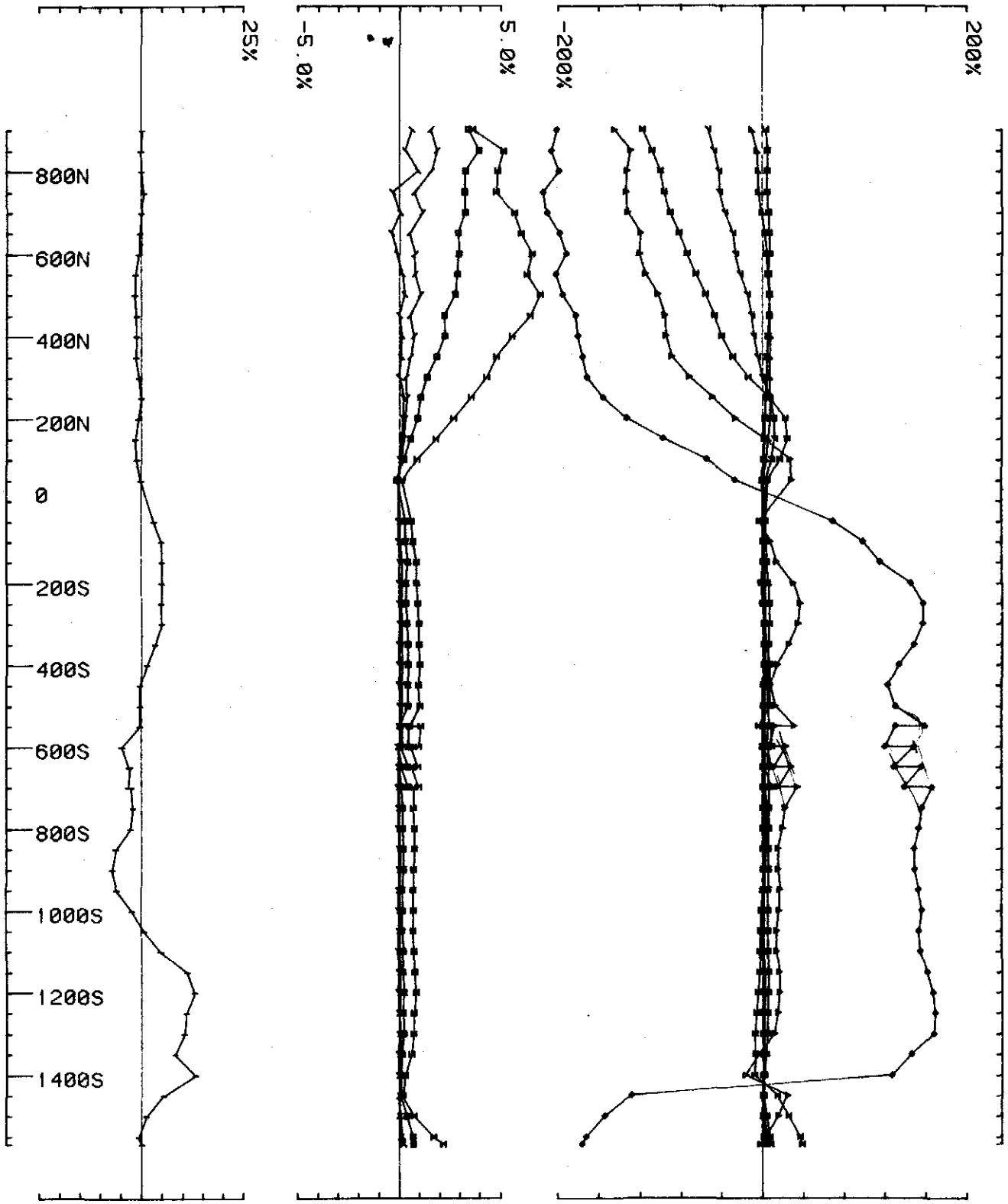
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



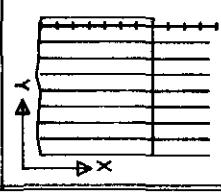
EAST CHESTER
LOOP 0001
LINE 1930S
Hz

25ii

898251

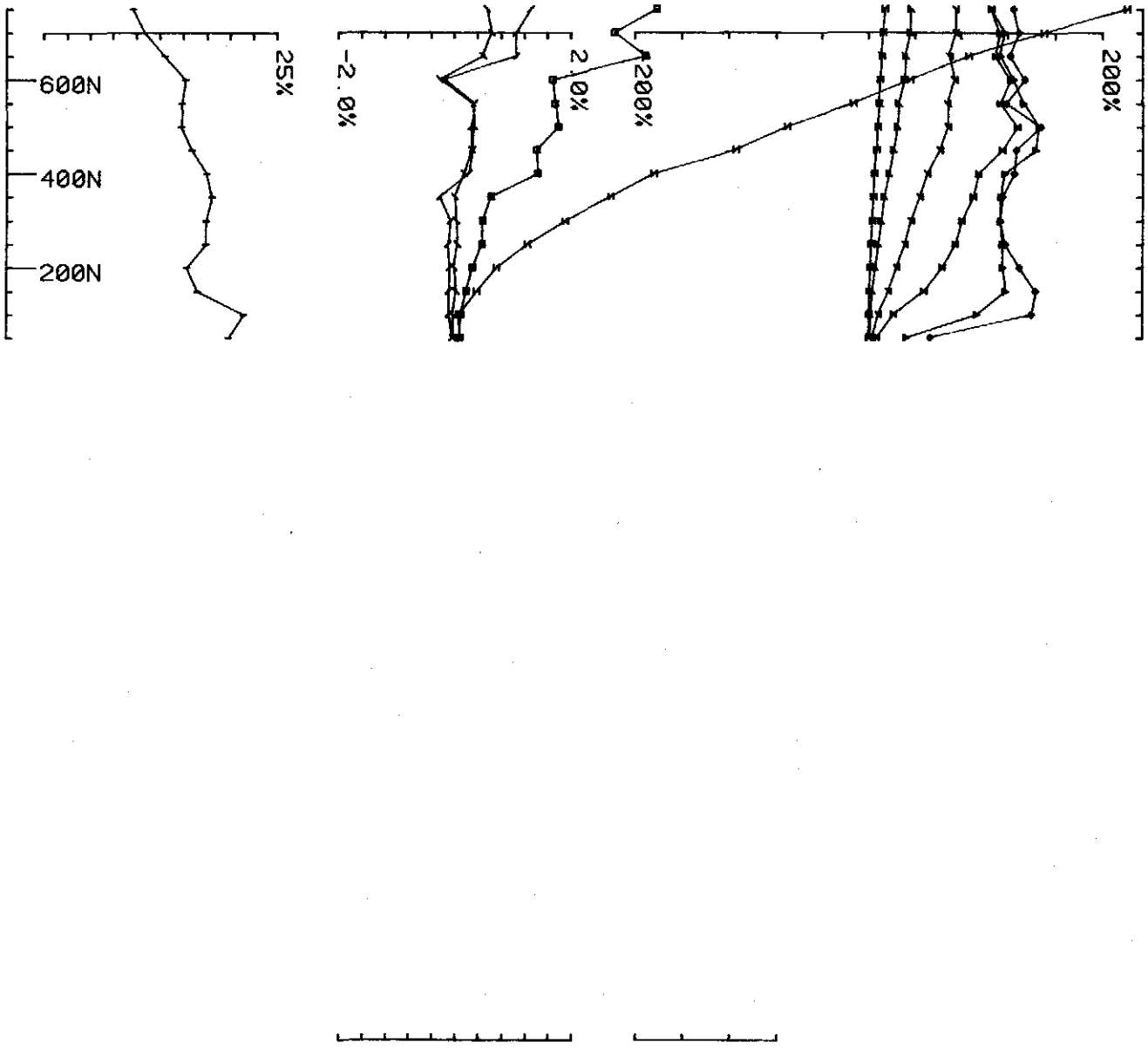


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 2130S Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

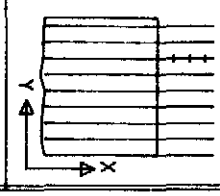


EAST CHESTER
LOOP 0001
LINE 2130S
Hz

898252



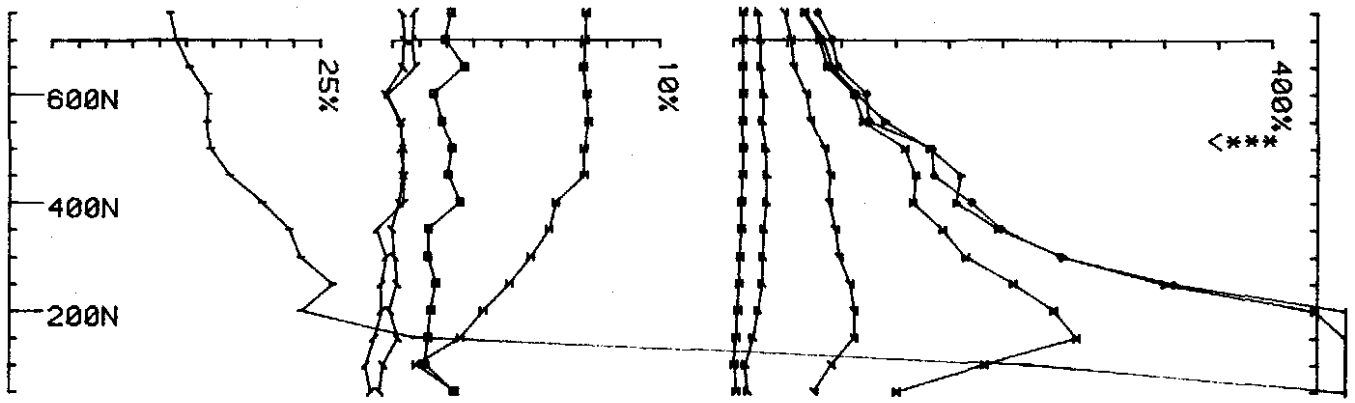
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- HU ART
Line 200W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



EAST CHESTER
LOOP 0001
LINE 200
Hx

252

898253

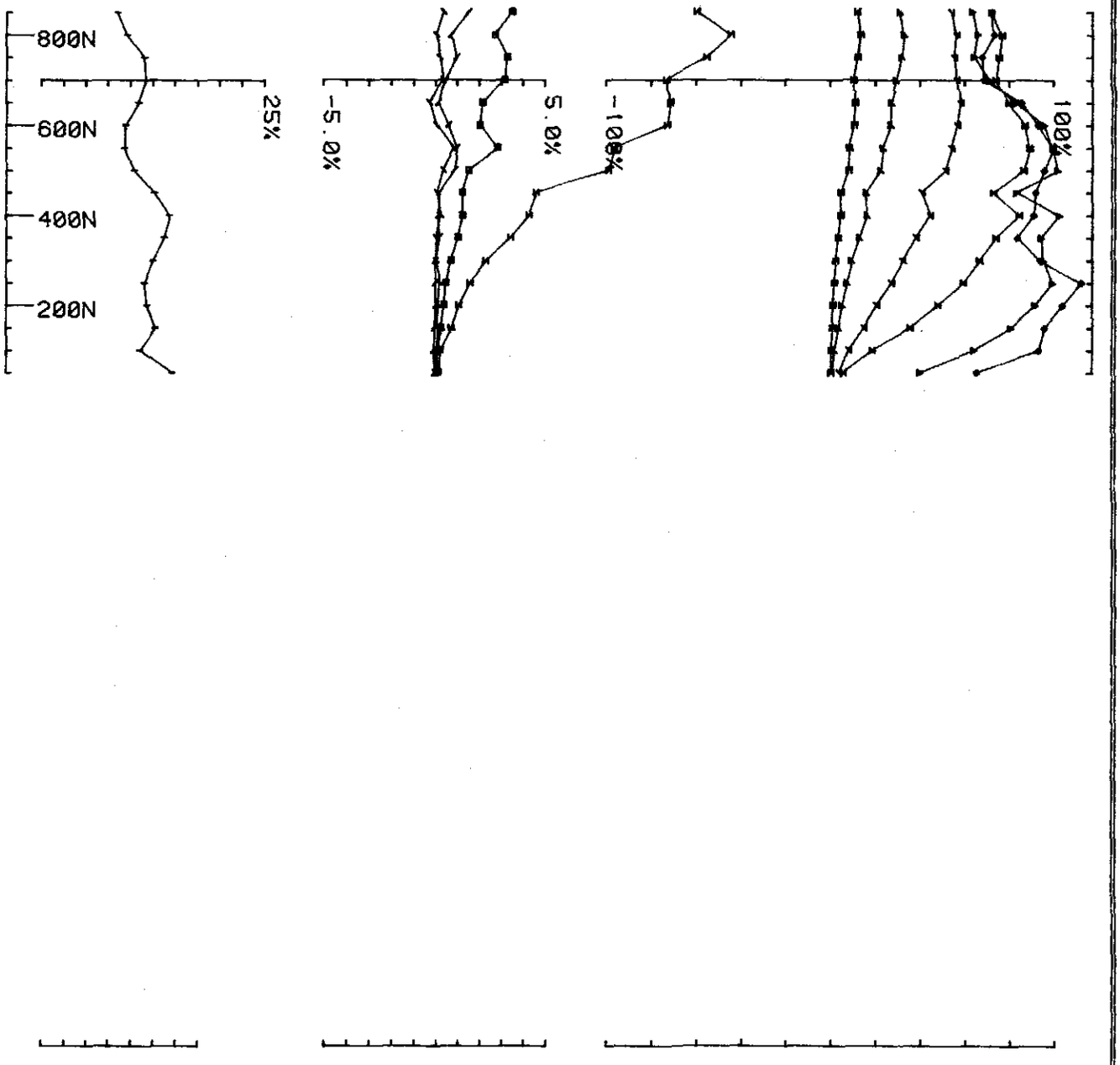


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER

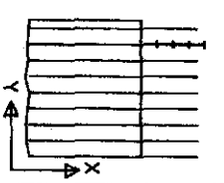
200N 4a

253

898254



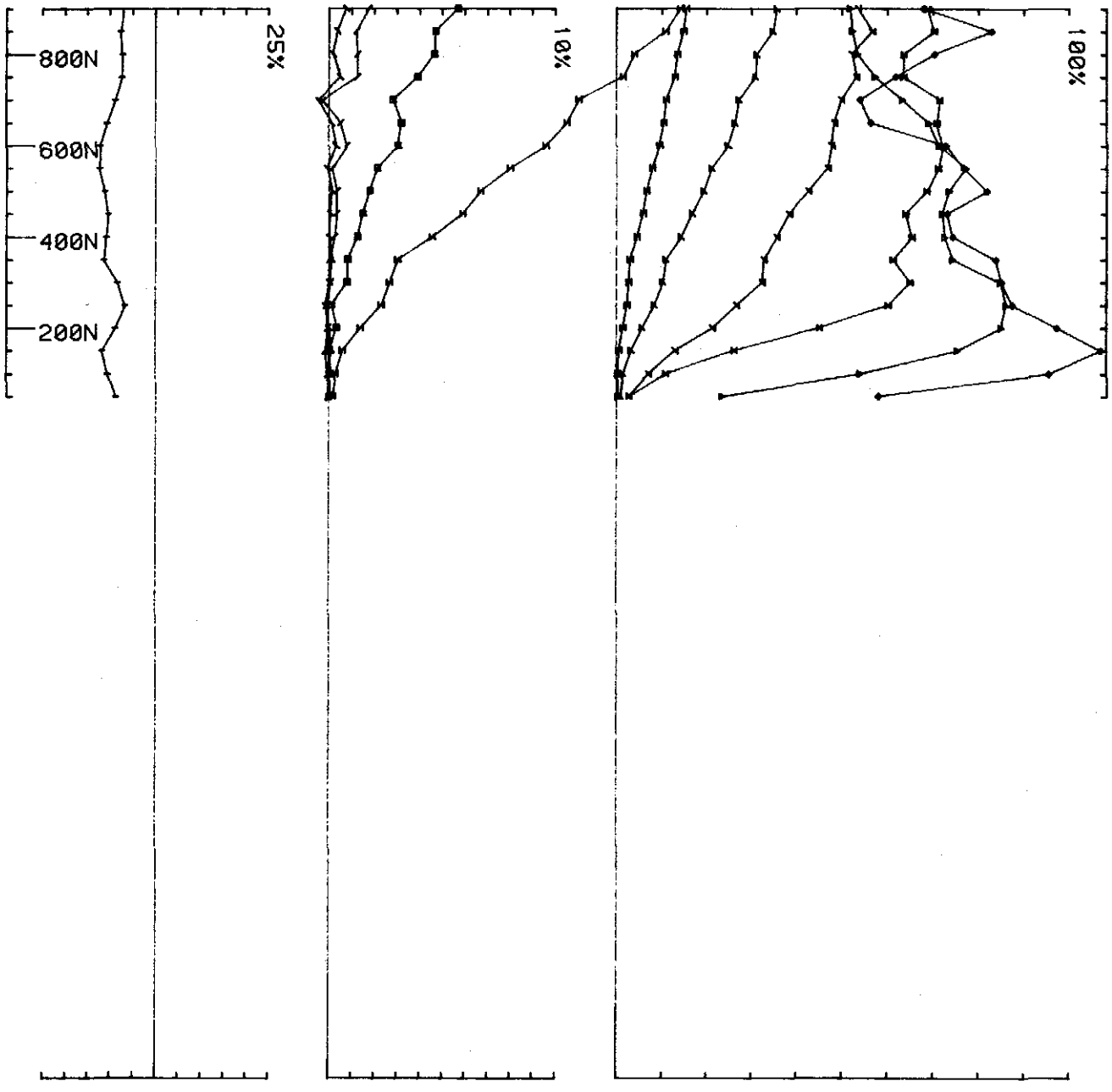
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- HU ART
Line 1930S Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



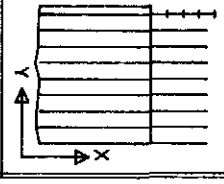
EAST CHESTER
LOOP 0001
LINE 1930S
Hx

254

898255

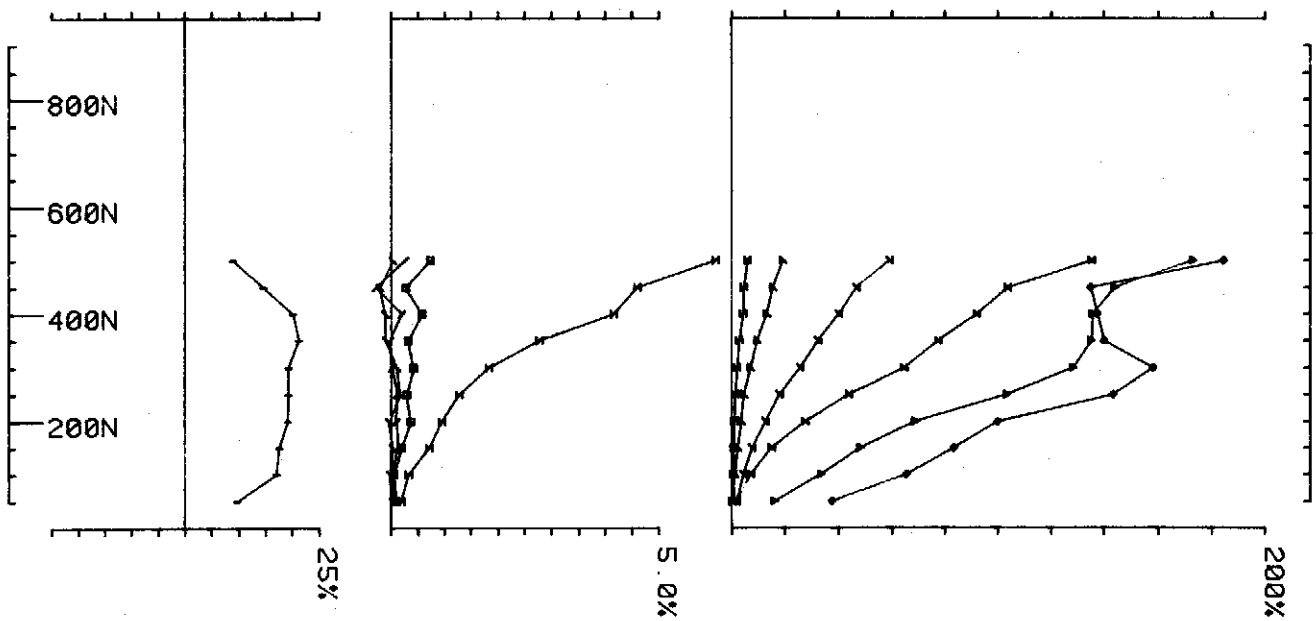


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- HU ART
Line 2130s Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

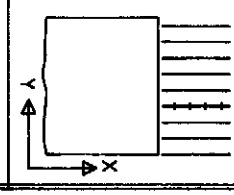


EAST CHESTER
LOOP 0001
LINE 2130s
Hx

898256



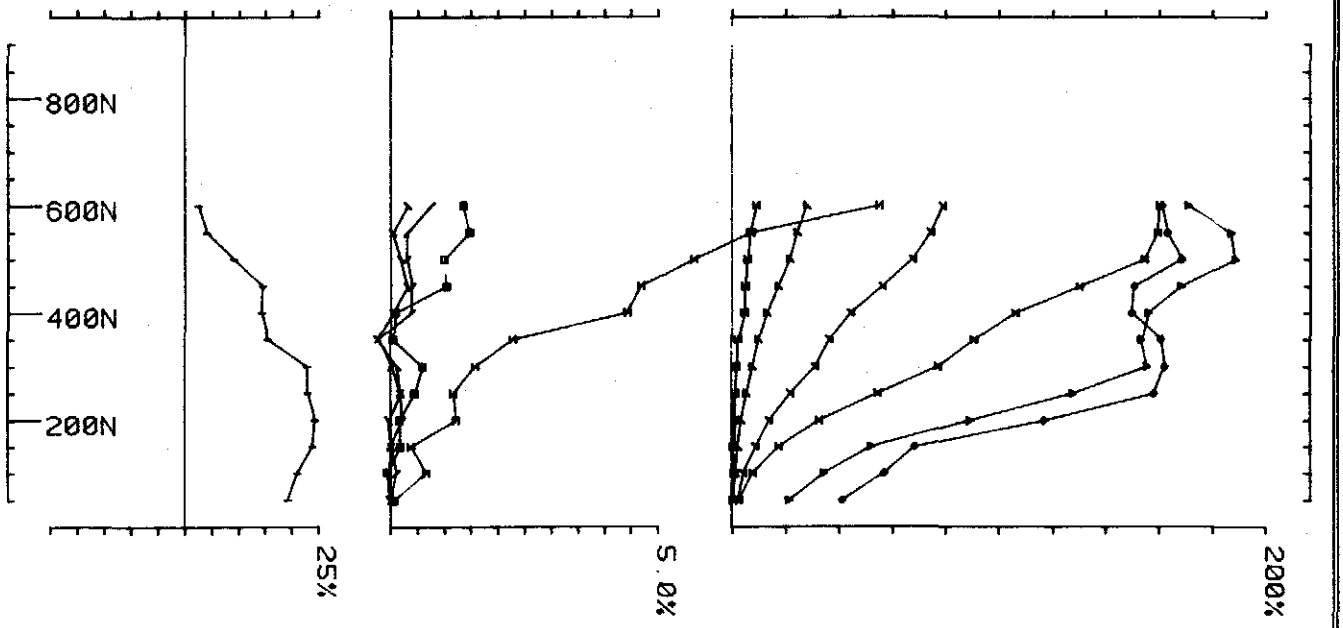
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 400E Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



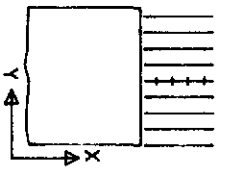
EAST CHESTER
LOOP 0101
LINE 400
Hx

256

898257



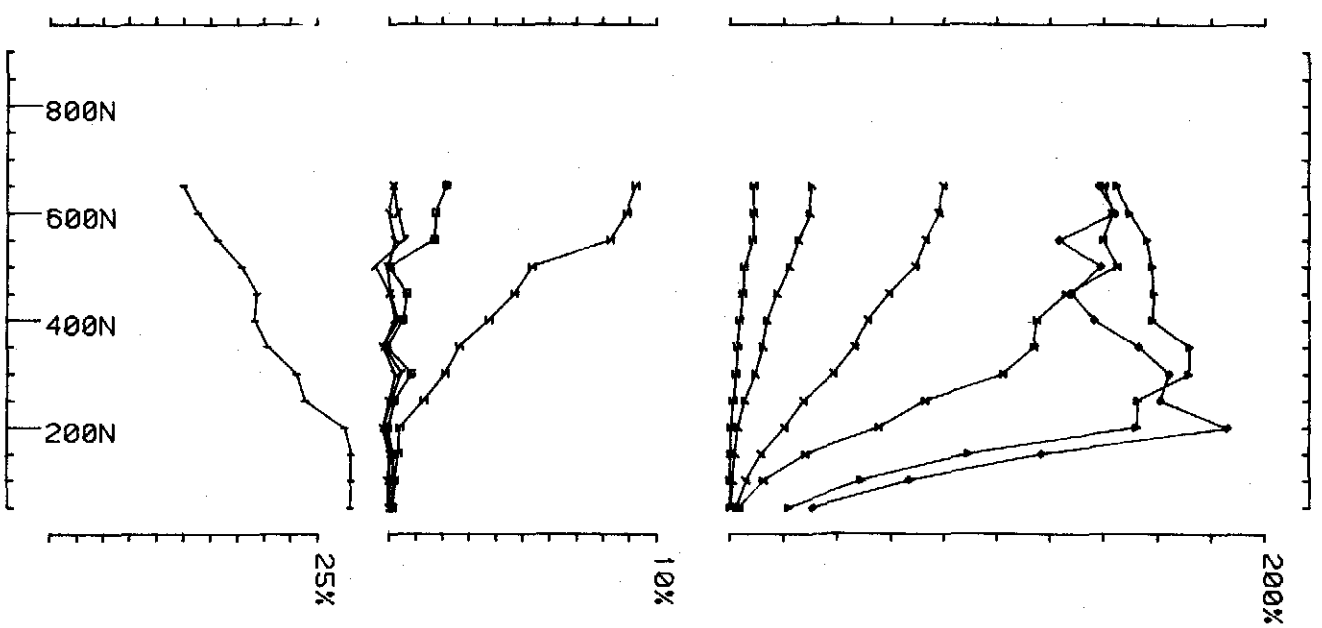
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 200E Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



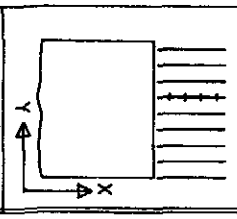
EAST CHESTER
LOOP 0101
LINE 200E
Hx

257

898258



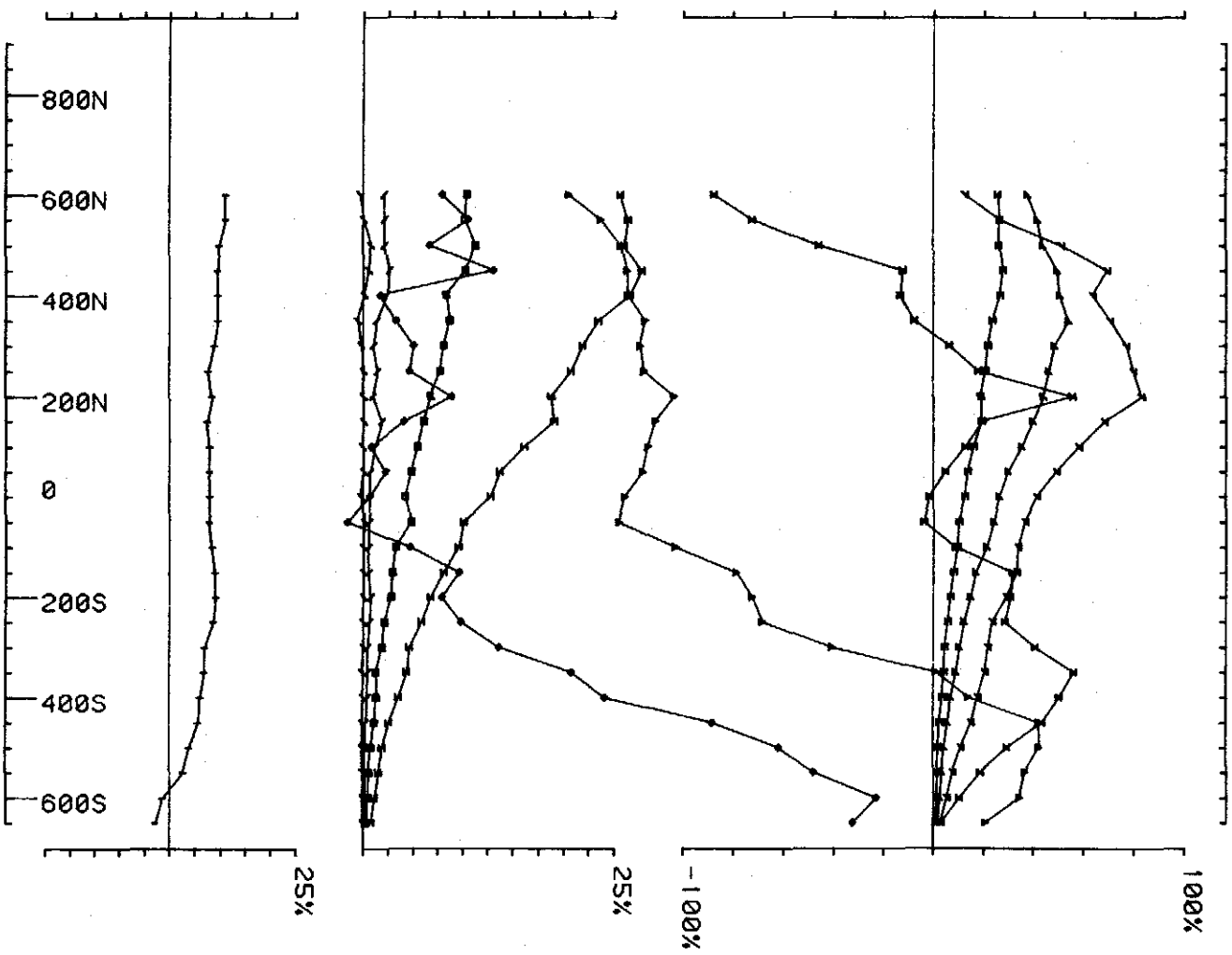
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM HU
Line 0 Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



EAST CHESTER
LOOP 0101
LINE 0
Hx

258

898259



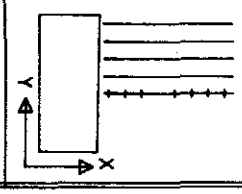
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- East Chester

CLIENT :- B.H.P. Minerals CREW :- ART HU

Line 200E Hz COMPONENT BASE FREQ :- 26.230HERTZ

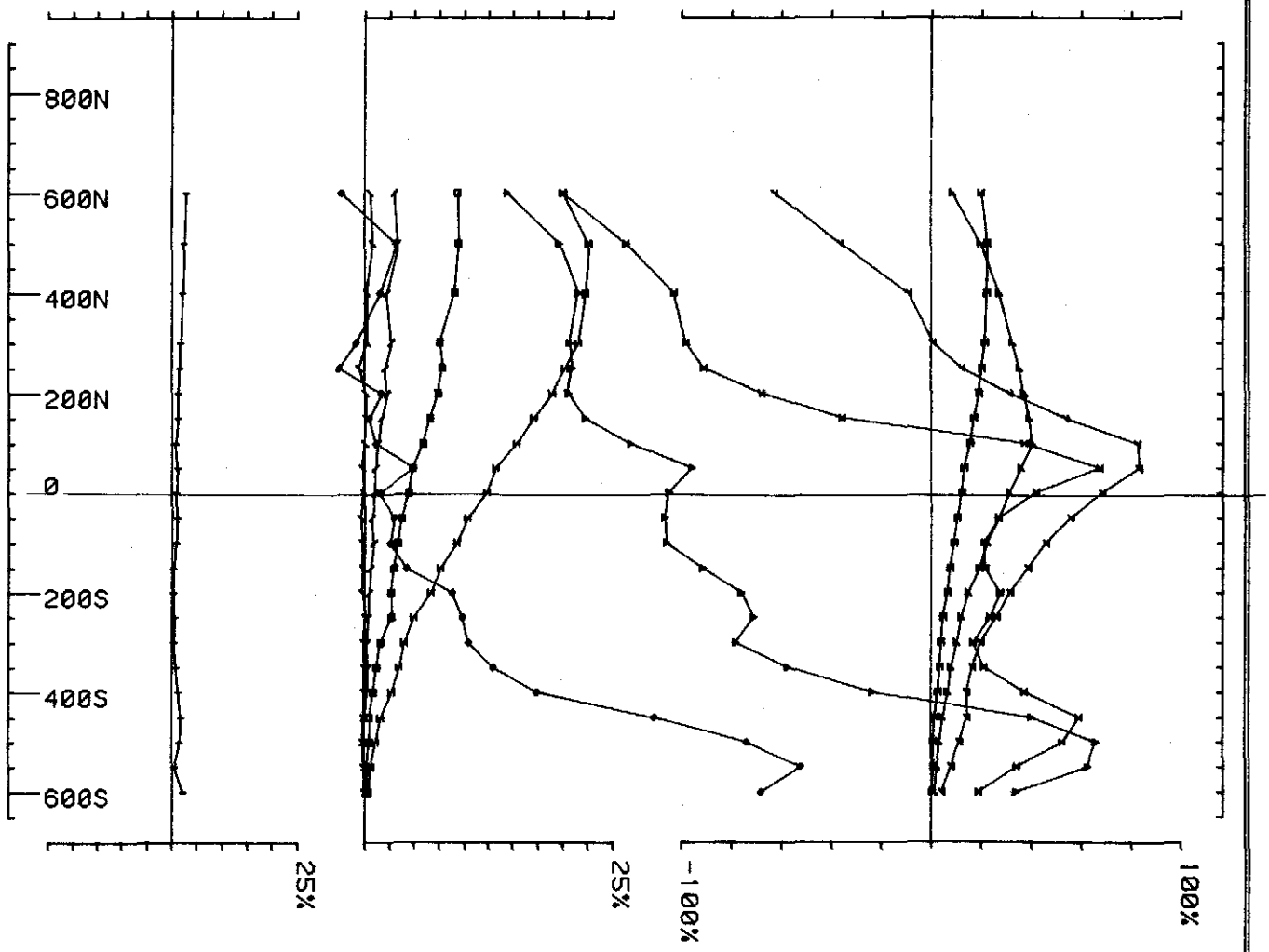
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



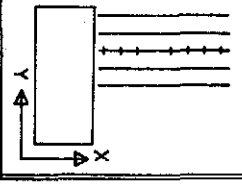
East Chester
LOOP 8201
LINE 200E
Hz

25y

898260



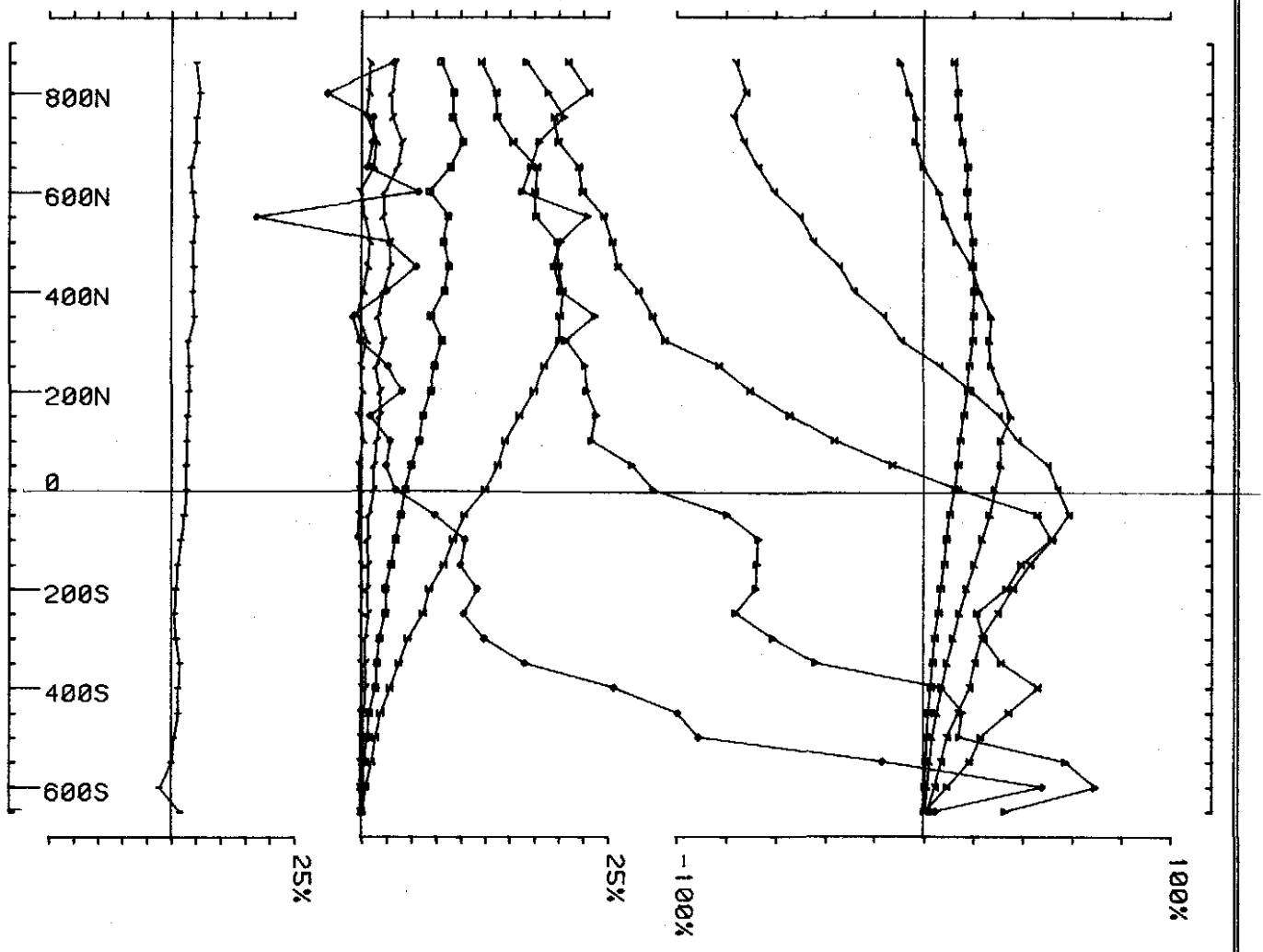
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART HU
Line 1700W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



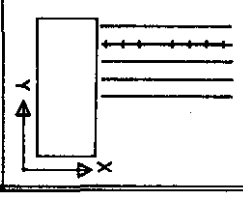
East Chester
LOOP 8201
LINE 1700W
Hz

260

898261



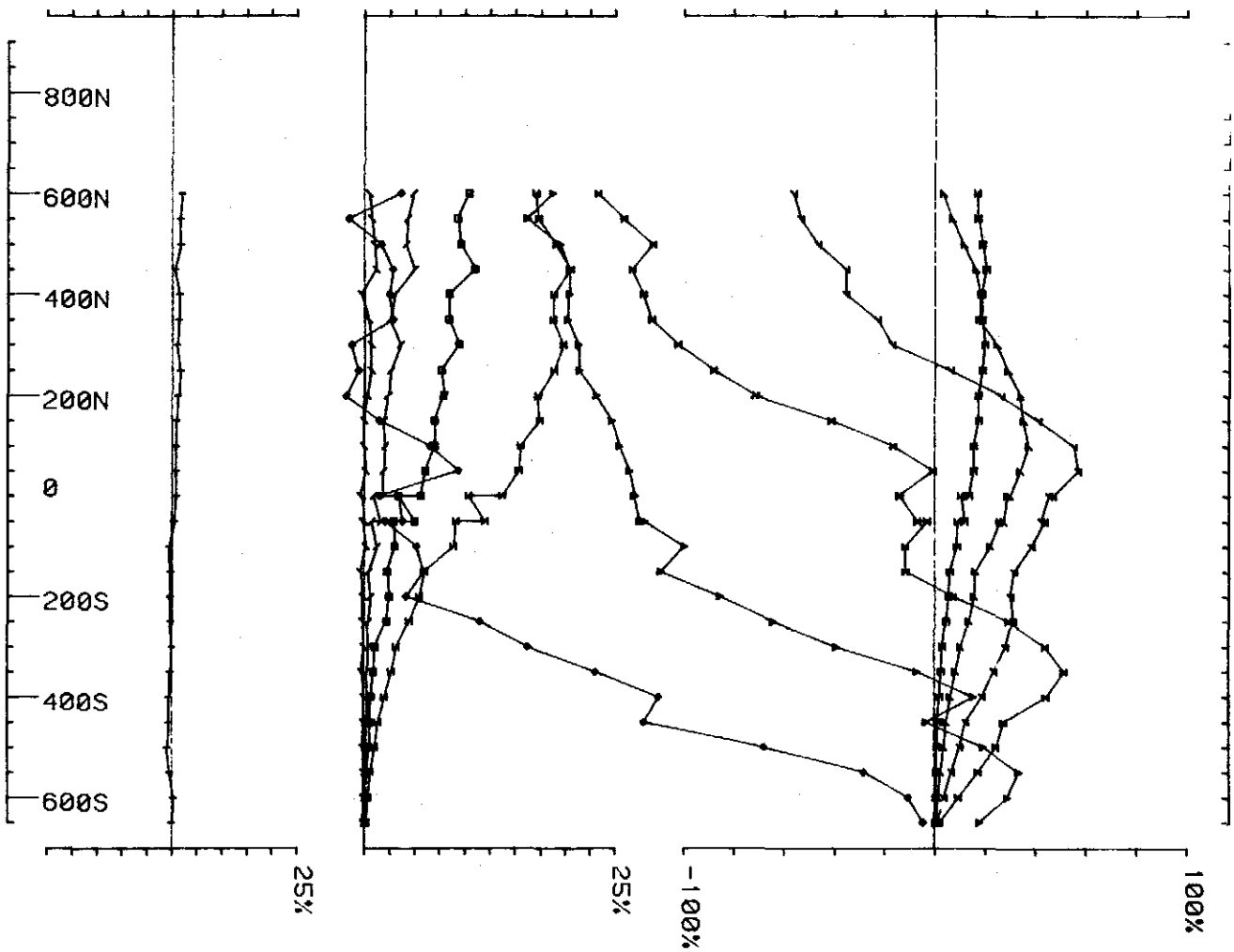
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART HU
Line 1930W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



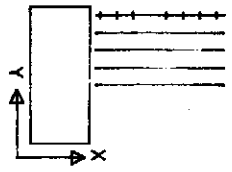
East Chester
LOOP 0201
LINE 1930W
Hz

261

898262



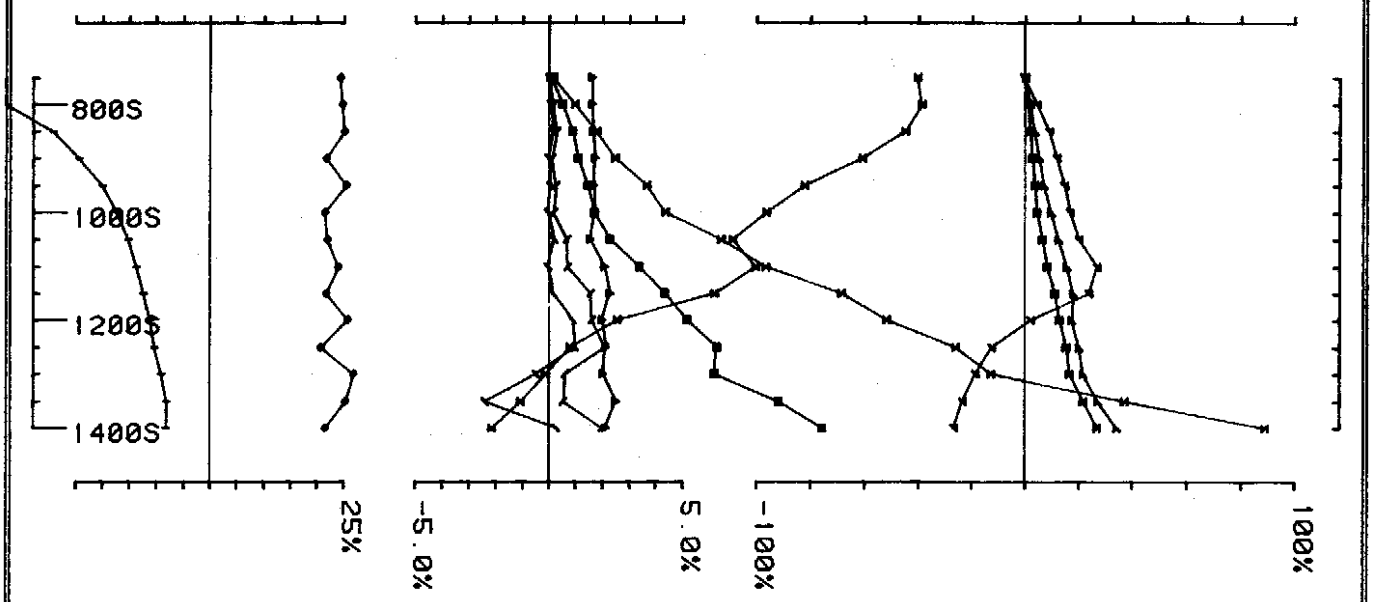
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART HU
Line 2130W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch : NORMALIZATION



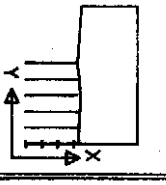
East Chester
LOOP 0201
LINE 2130
Hz

262

898263

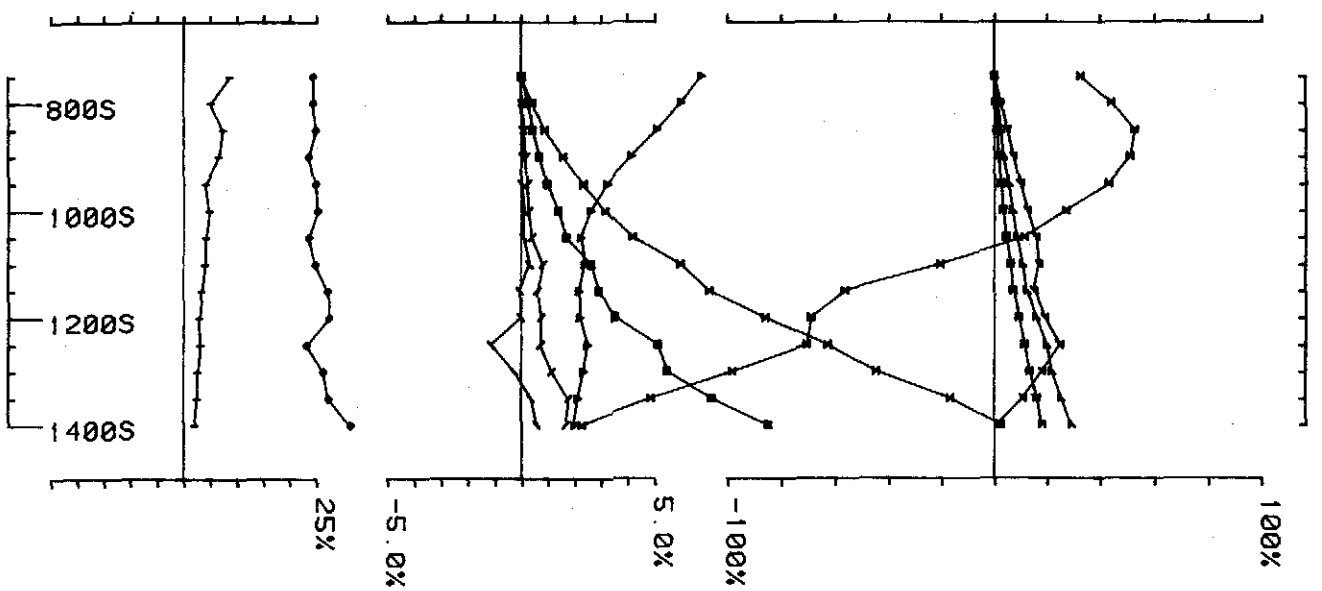


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C8
Line 1000E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

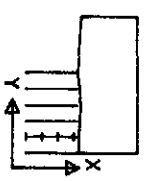


East Chester
LOOP 0301
LINE 1000
Hz

898264

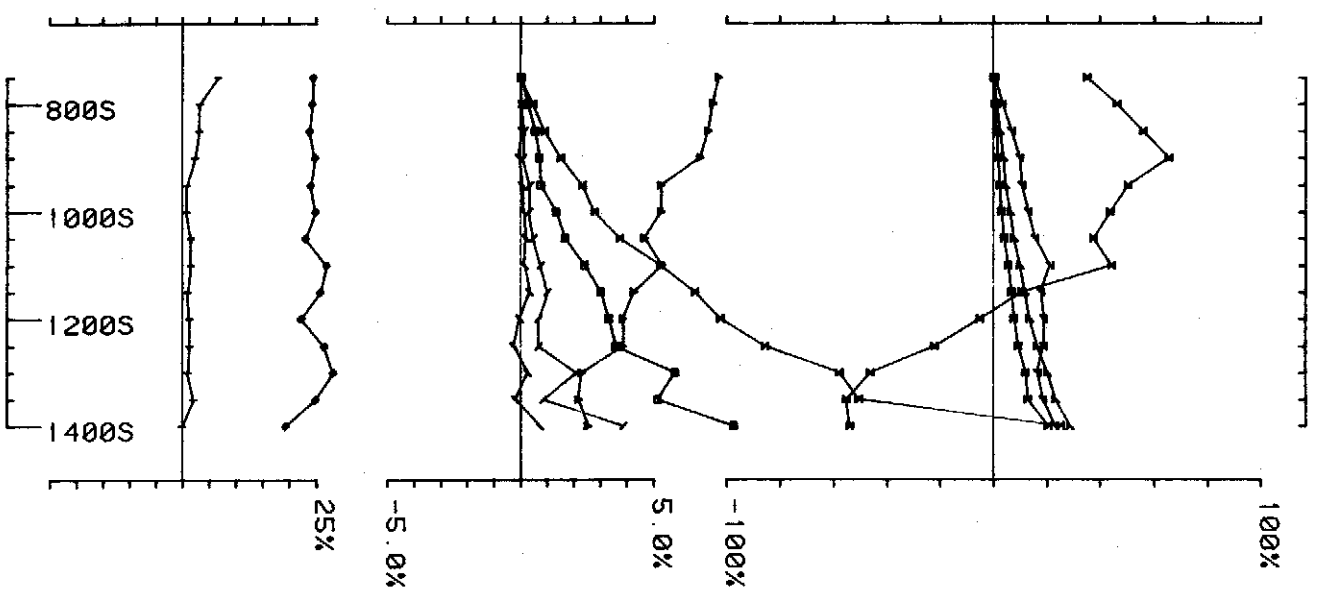


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C8
Line 800E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

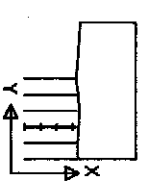


East Chester
LOOP 8301
LINE 800
Hz

898265



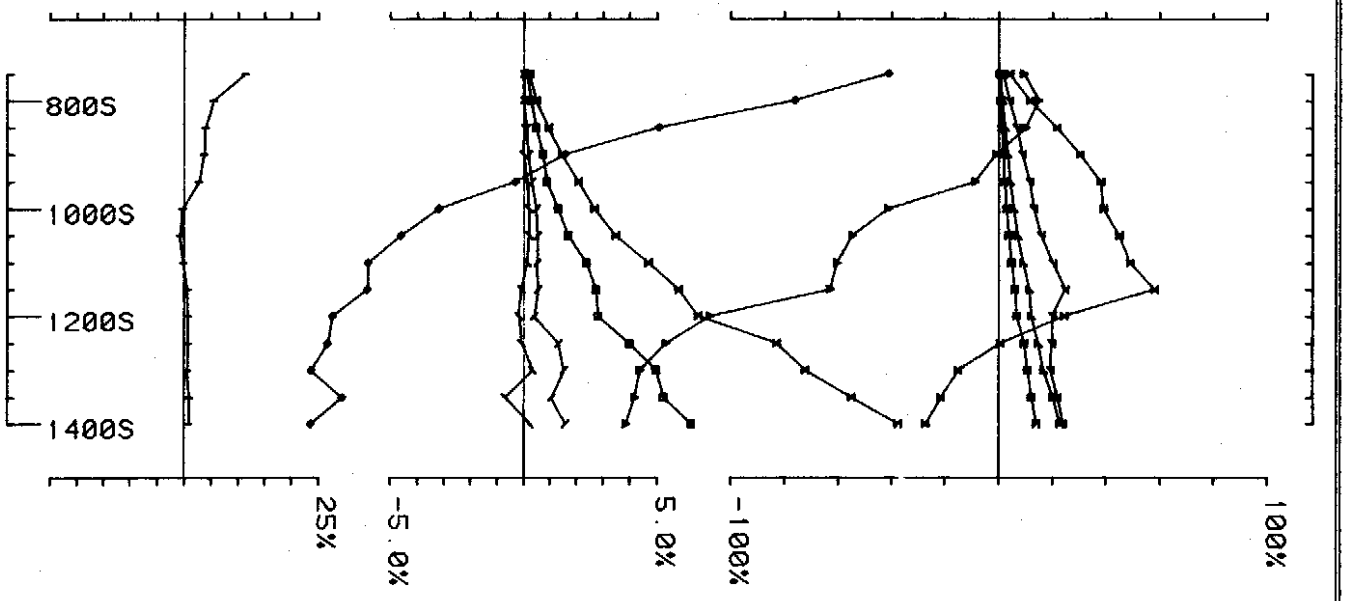
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C8
Line 600E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



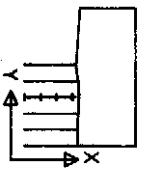
East Chester
LOOP 0301
LINE 600
Hz

265

898266



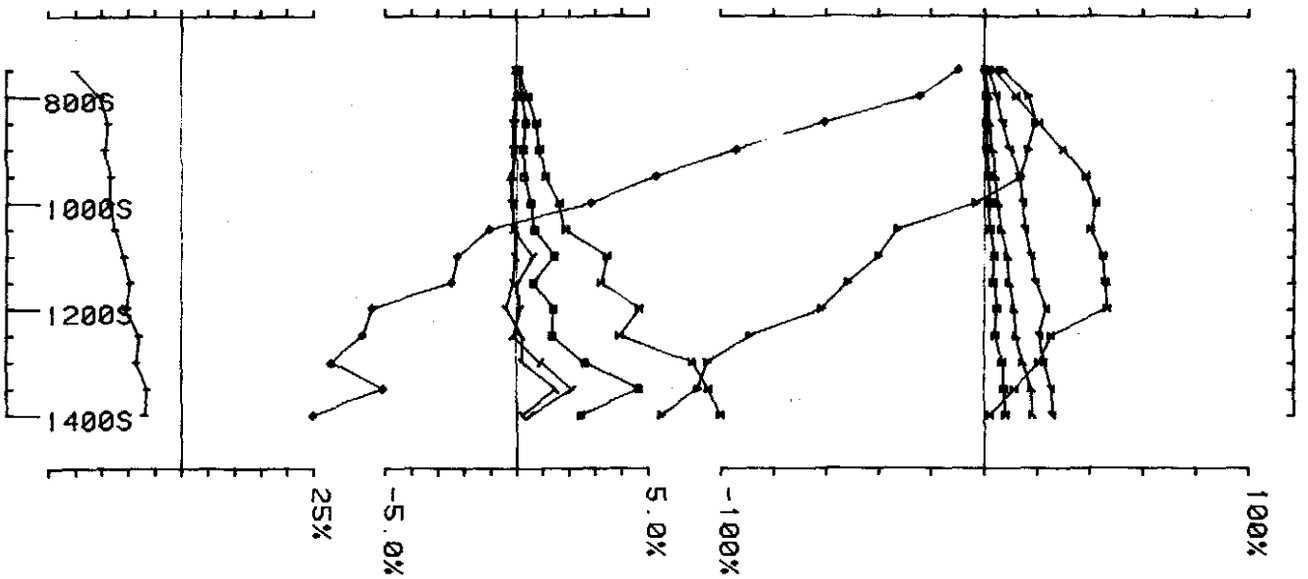
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C8
Line 400E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



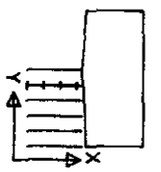
East Chester
LOOP 0301
LINE 400
Hz

266

898267



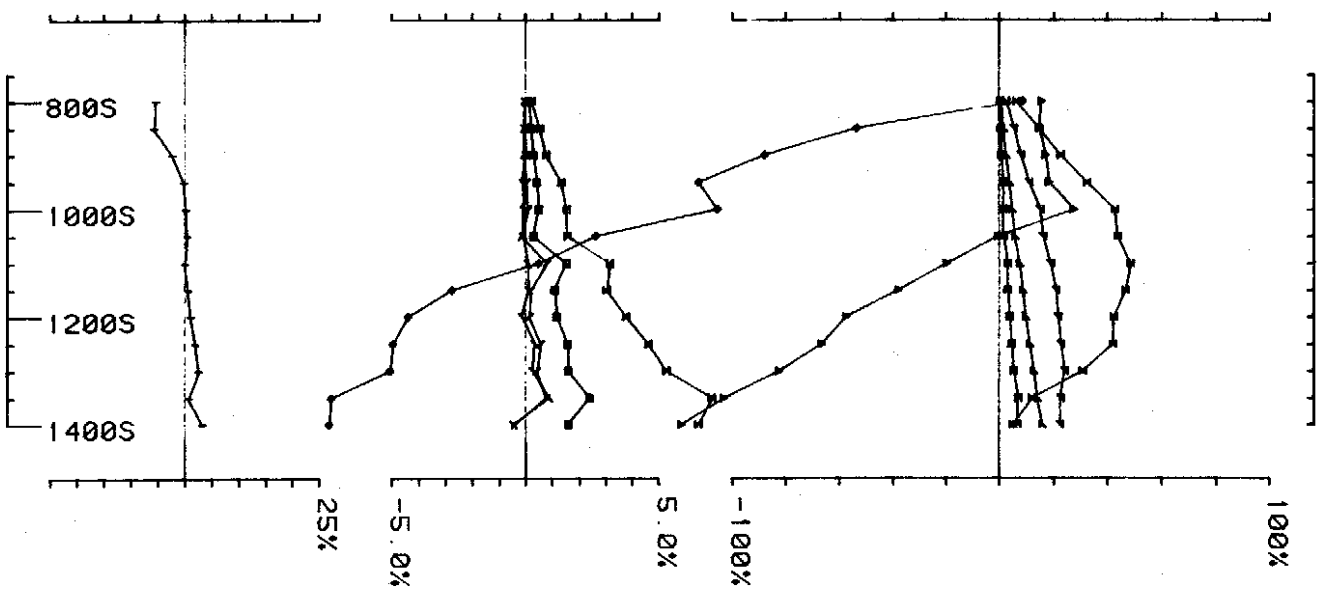
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C8
Line 200E Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



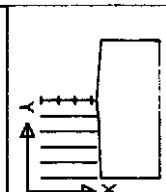
East Chester
LOOP 0301
LINE 200E
Hz

267

898268



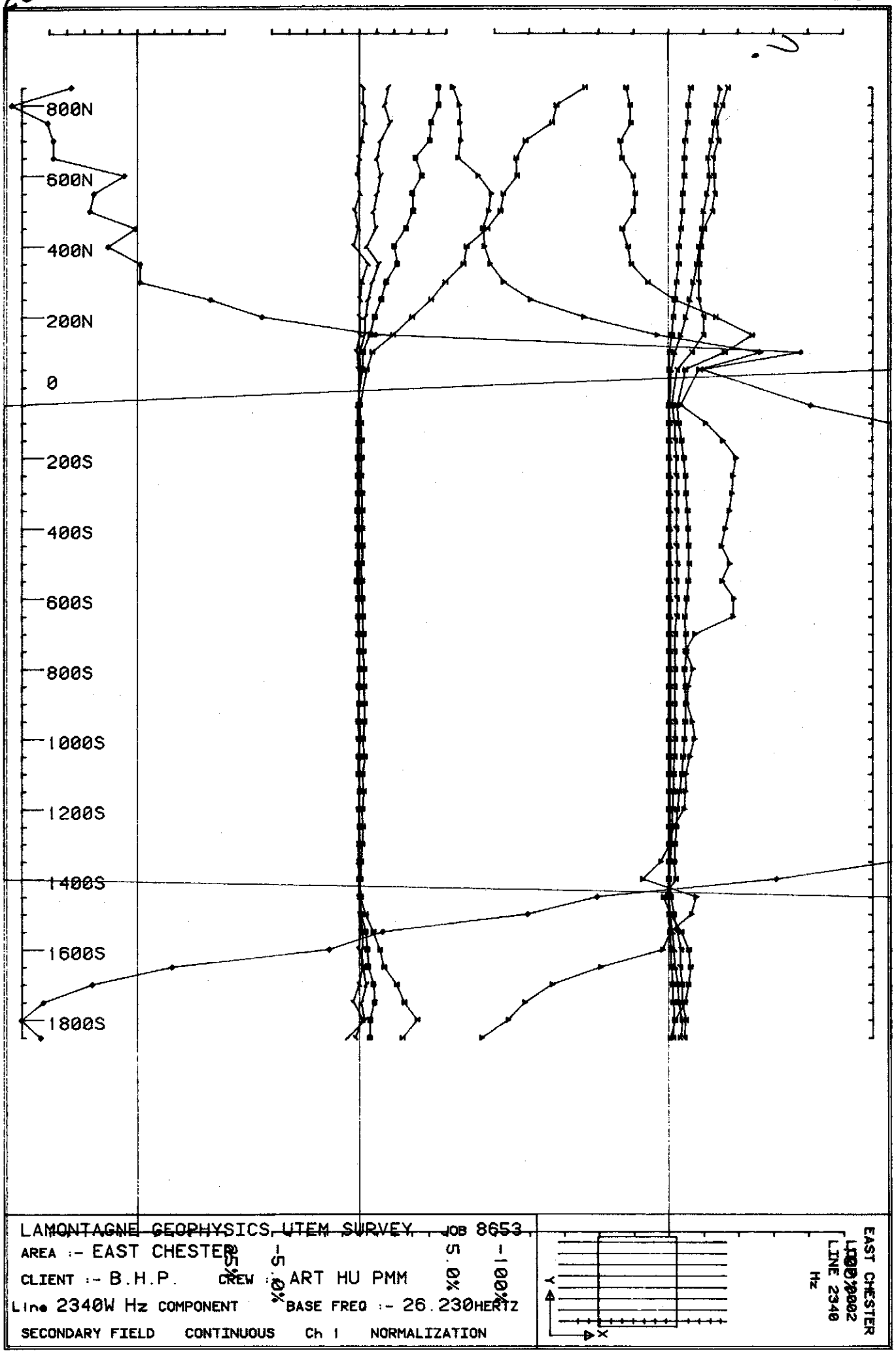
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- East Chester
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C8
Line 0 Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



East Chester
LOOP 0301
LINE 0
Hz

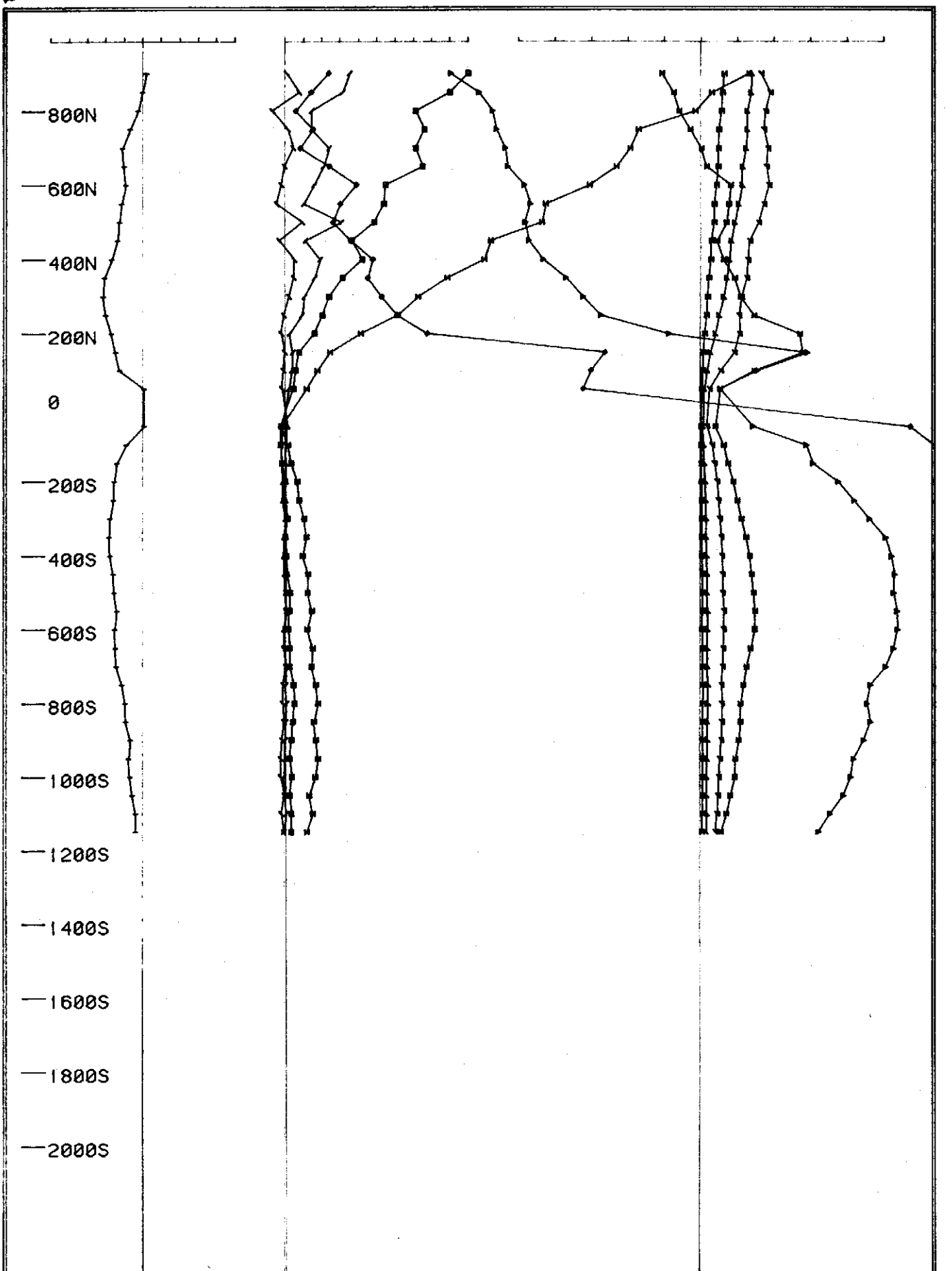
268

898269



Main Sect Loop 2

898270



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8853

AREA :- EAST CHESTER

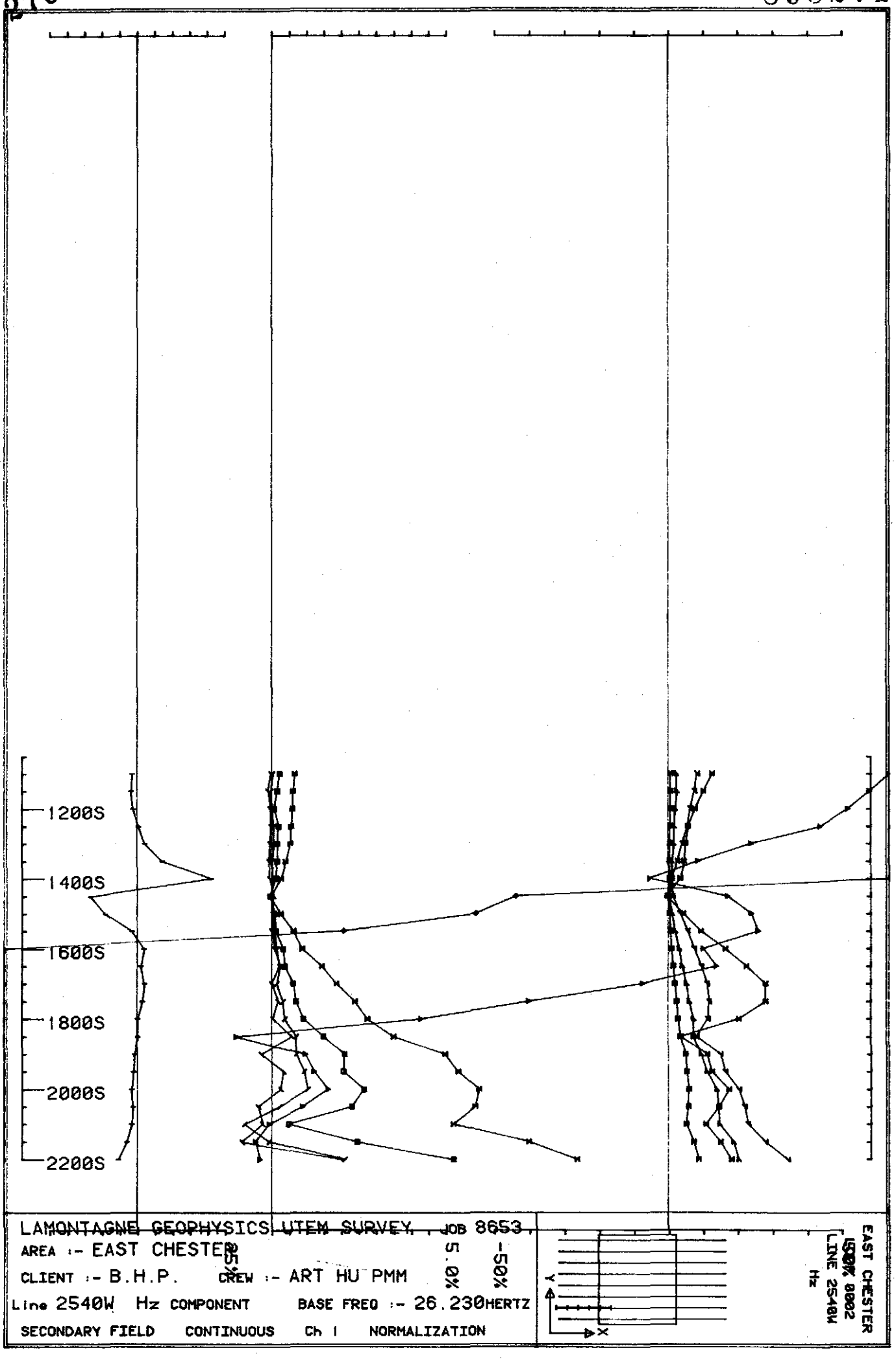
CLIENT :- B.H.P. CREW :- ARV. RMM. HU

Line 2540W Hz COMPONENT BASE FREQ :- 26/30 HERTZ

SECONDARY FIELD CONTINUOUS Ch :- NORMALIZATION

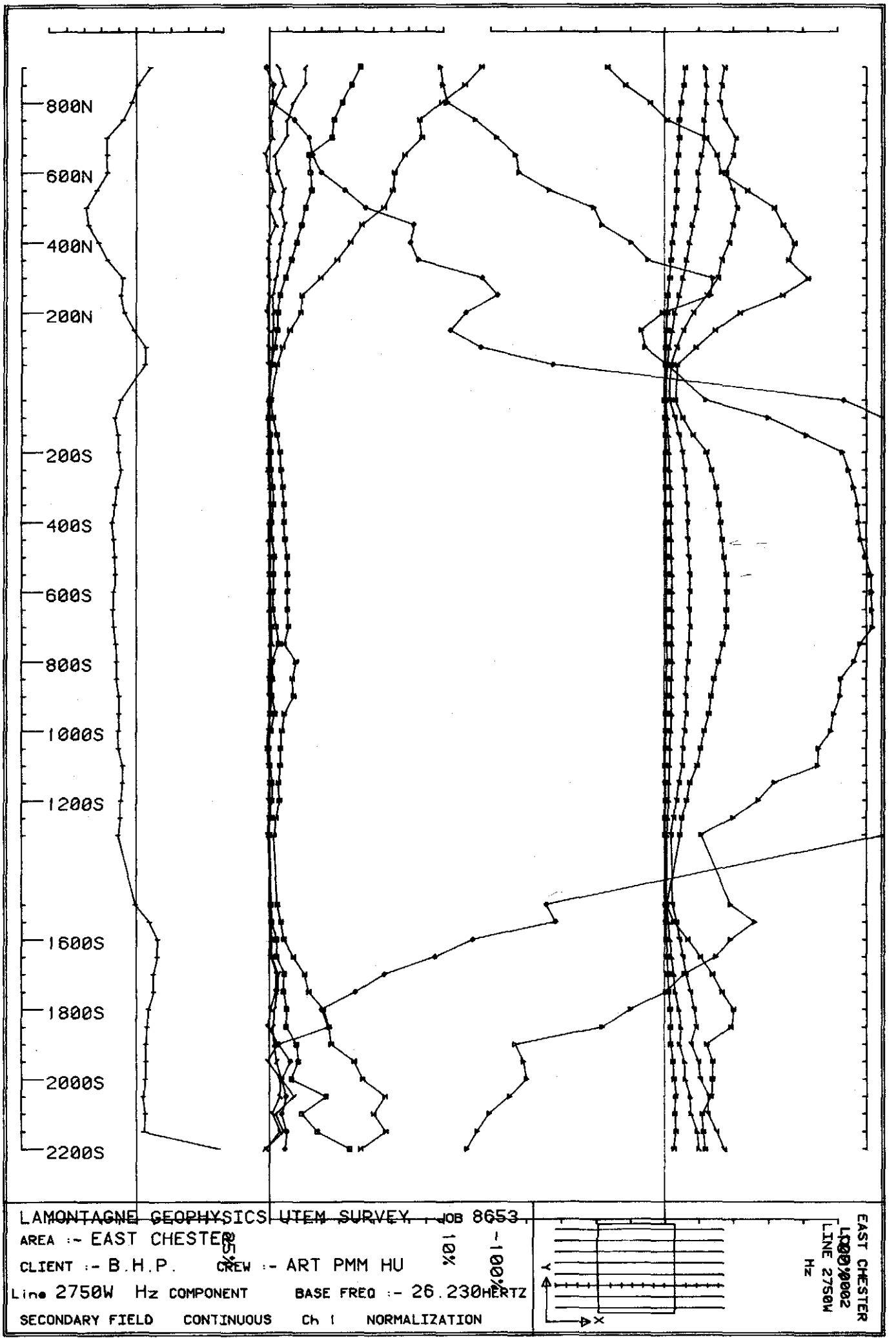
270

898271


1200S
1400S
1600S
1800S
2000S
2200S
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART HU PMM
Line 2540W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
-50%
EAST CHESTER
LINE 2540W
Hz

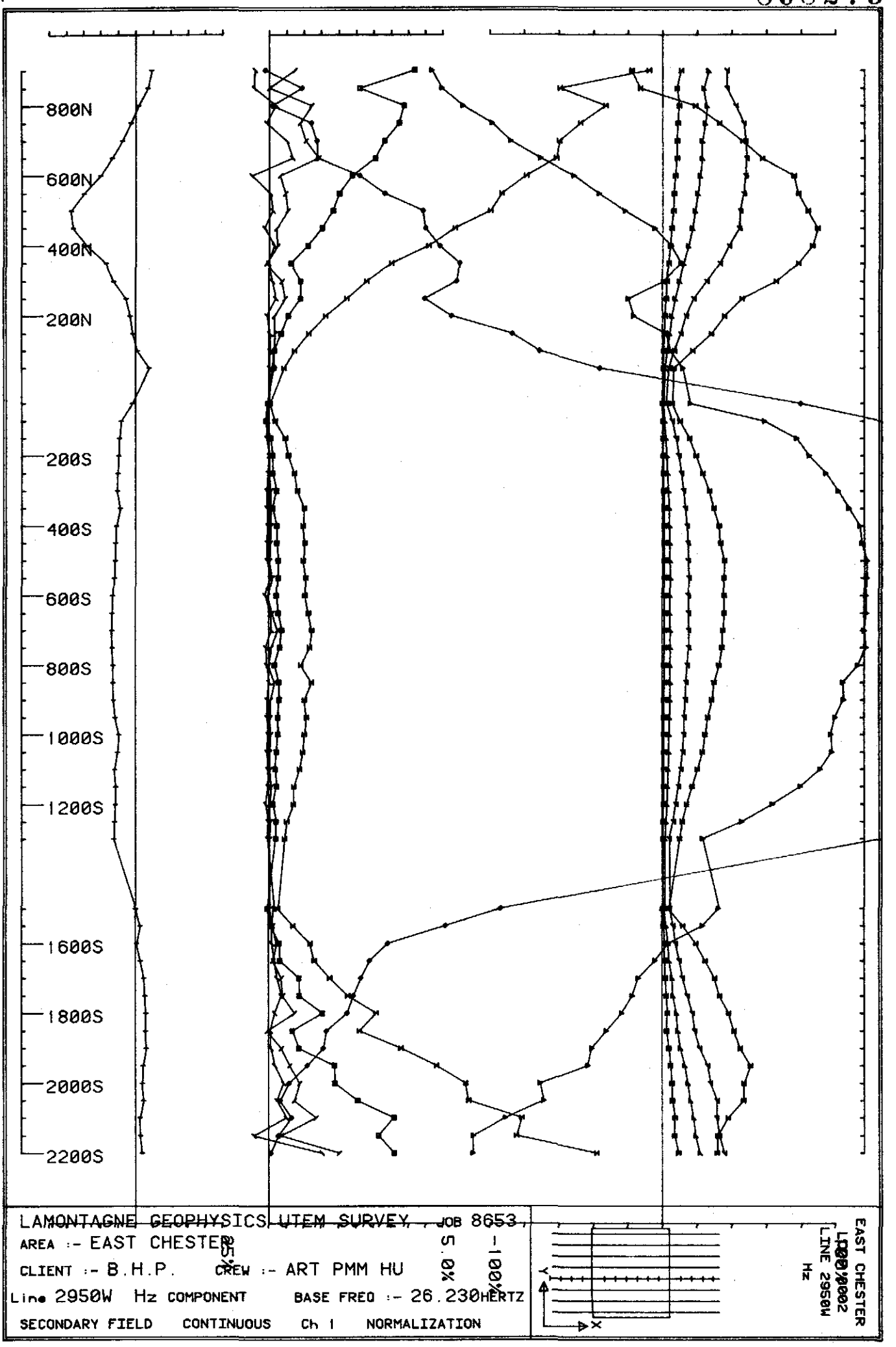
271

898272


800N
600N
400N
200N
200S
400S
600S
800S
1000S
1200S
1600S
1800S
2000S
2200S
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2750W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
95%
10%
-100%
EAST CHESTER
LINE 2750W
Hz

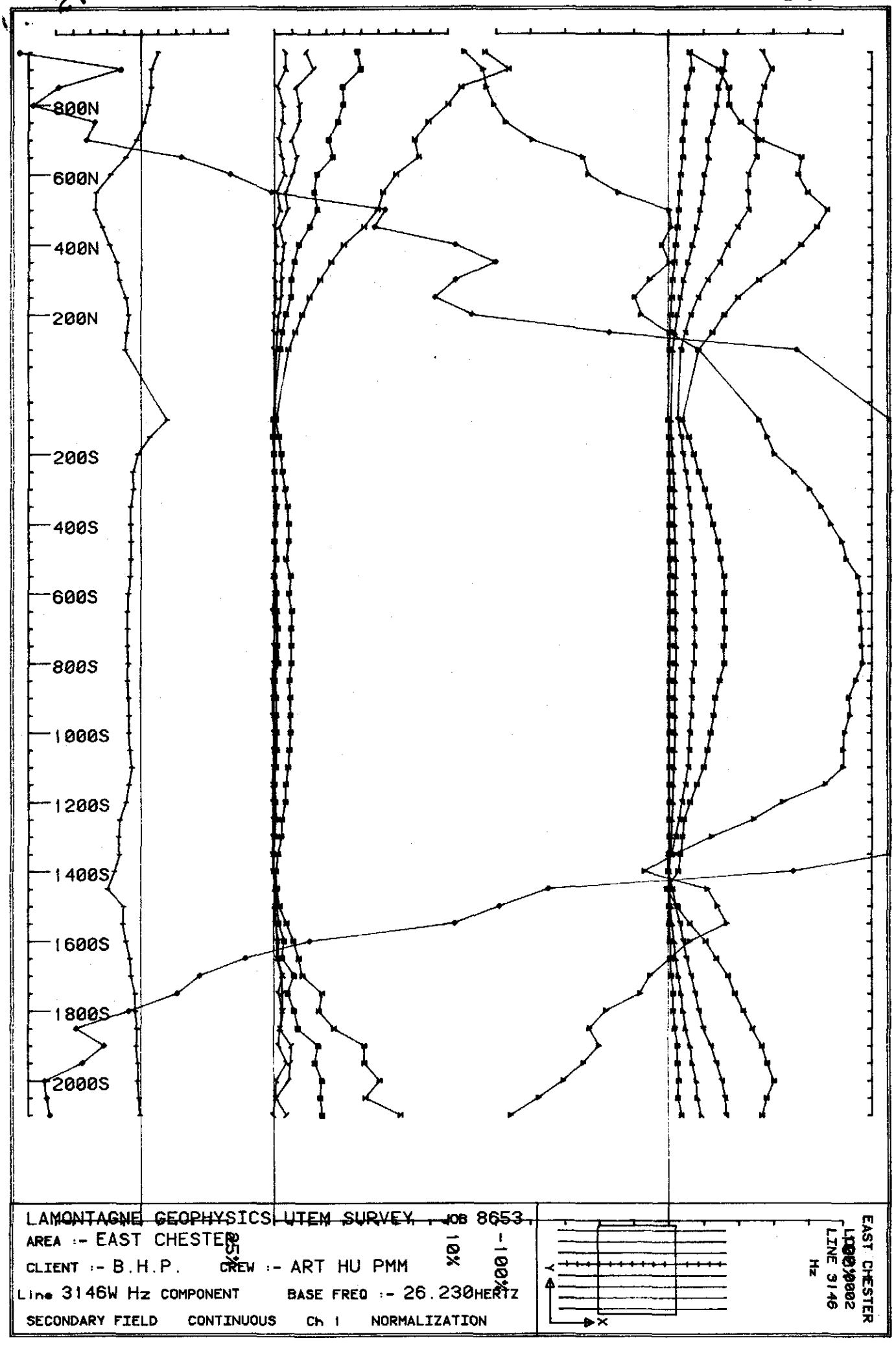
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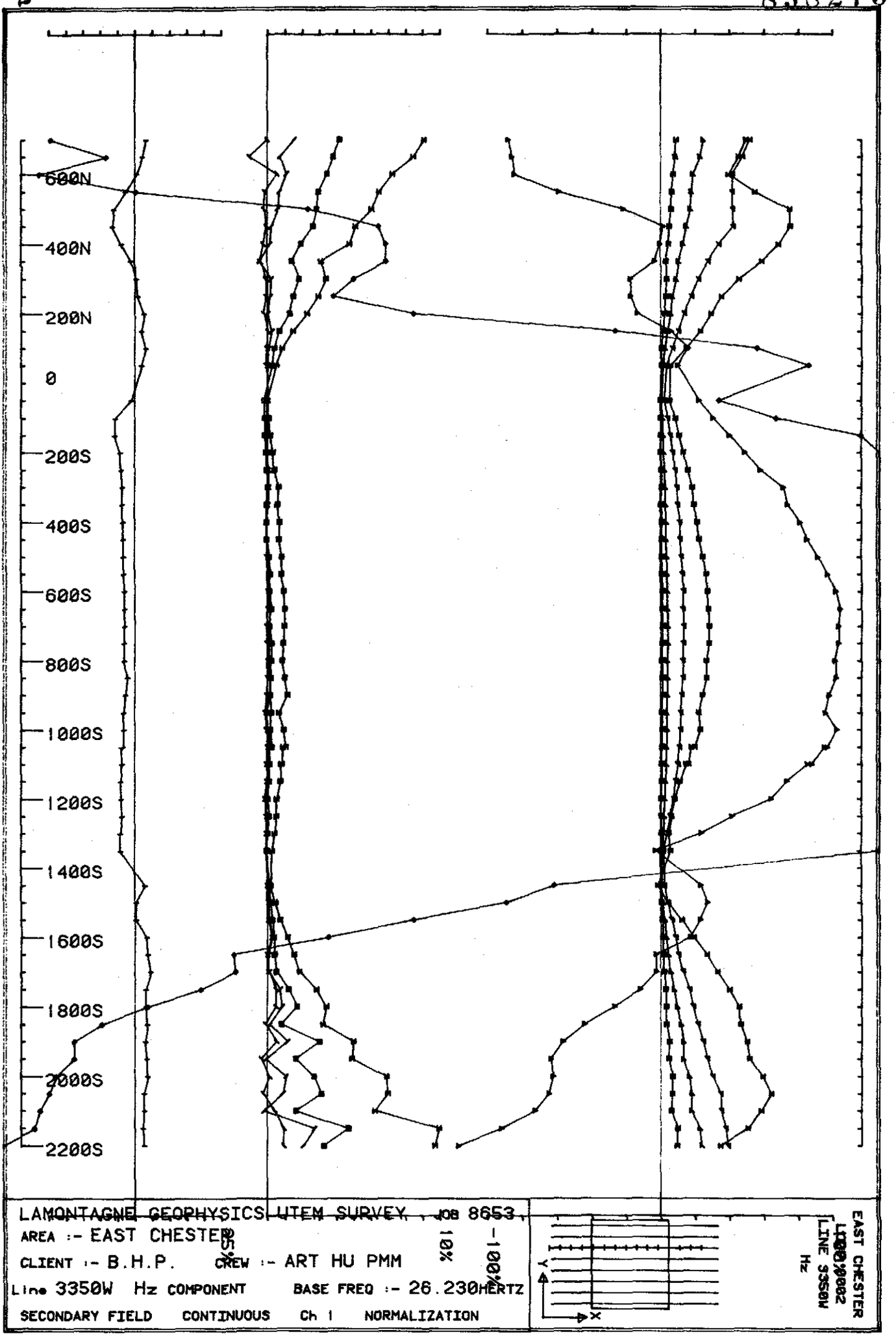
898273


800N
600N
400N
200N
200S
400S
600S
800S
1000S
1200S
1600S
1800S
2000S
2200S
LAMONTAGNE GEOPHYSICS UTEM SURVEY, JOB 8653,
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2950W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
5.0%
-100%
EAST CHESTER
LINE 2950W
Hz

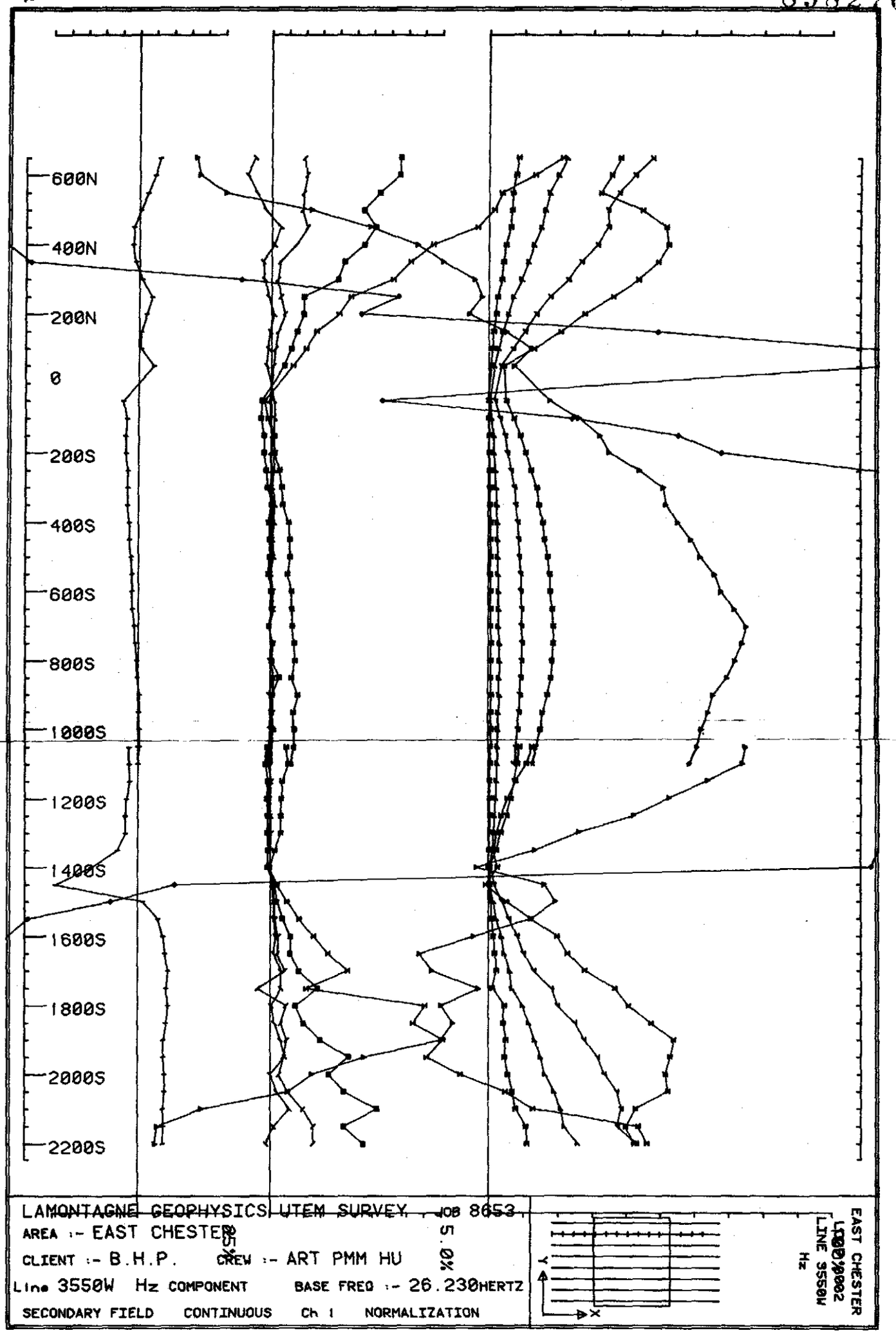
273

898274

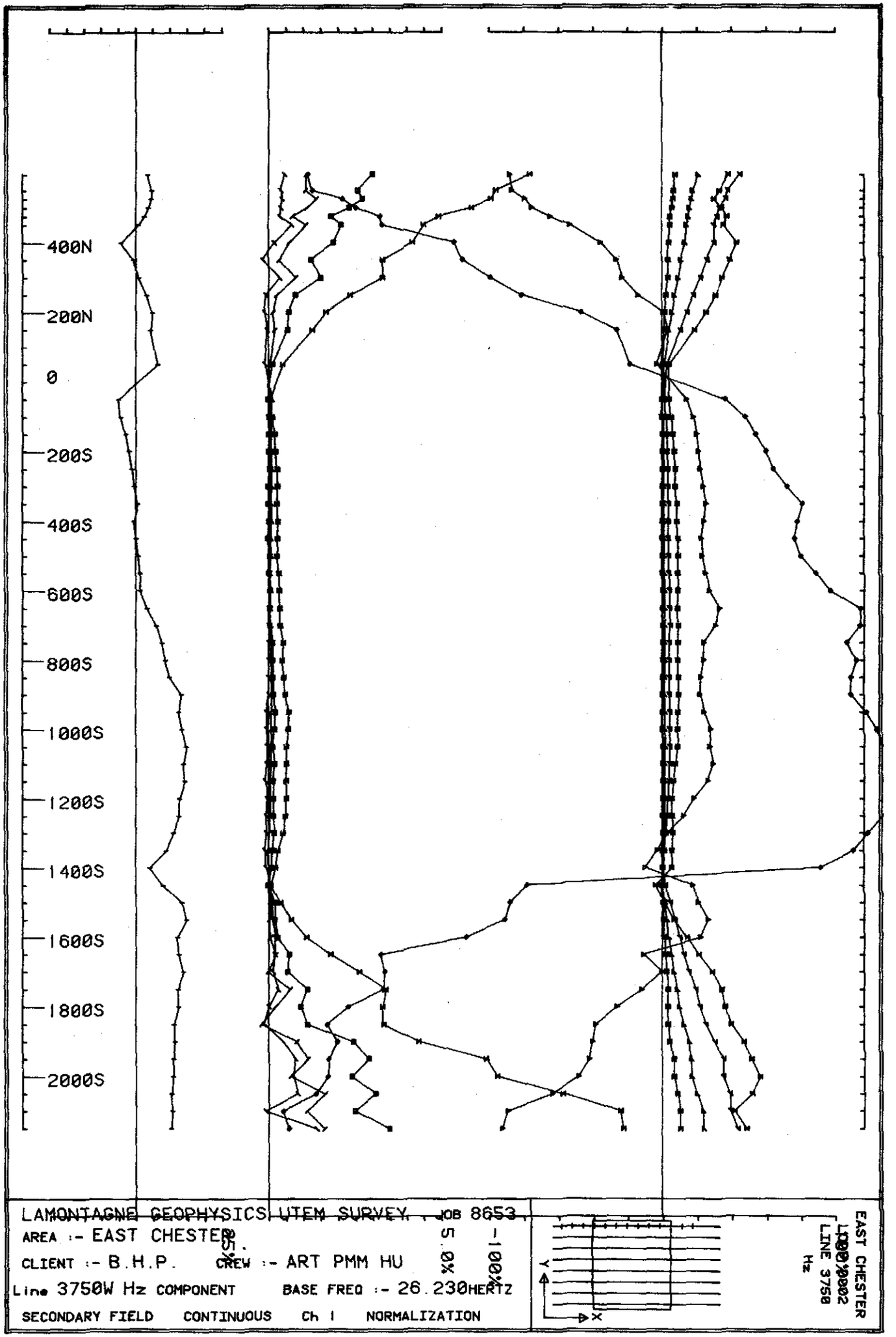

800N
600N
400N
200N
200S
400S
600S
800S
1000S
1200S
1400S
1600S
1800S
2000S
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART HU PMM
Line 3146W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
100%
10%
-100%
EAST CHESTER
LINE 3146
Hz


600N
400N
200N
0
200S
400S
600S
800S
1000S
1200S
1400S
1600S
1800S
2000S
2200S
LAMONTAGNE GEOPHYSICS UTEM SURVEY , JOB 8653,
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART HU PMM
Line 3350W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
25%
10%
-100%
Y
X
EAST CHESTER
LINE 3350W
Hz

898276

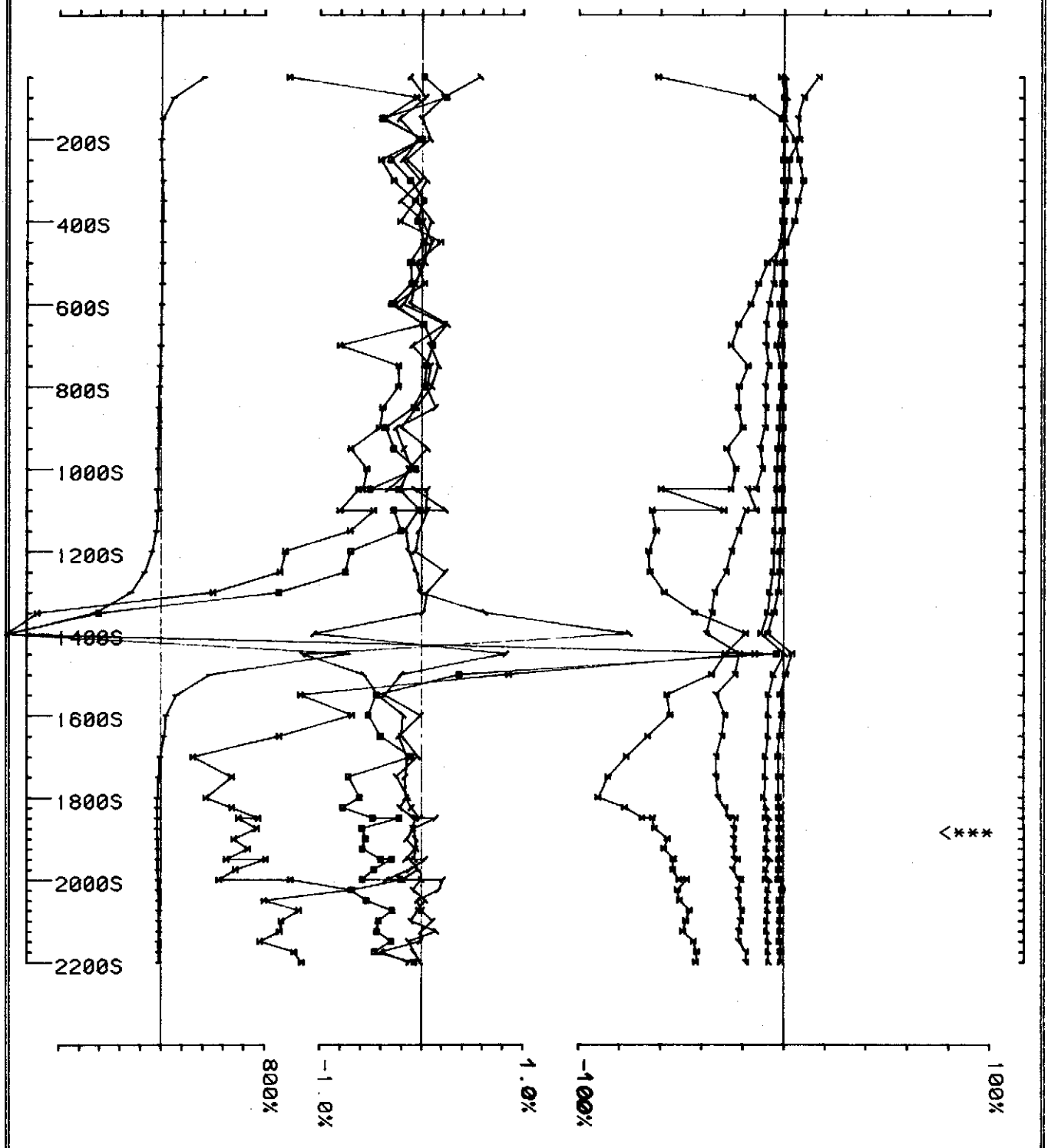

600N
400N
200N
0
200S
400S
600S
800S
1000S
1200S
1400S
1600S
1800S
2000S
2200S
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 3550W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
EAST CHESTER
LINE 3550W
Hz

8K/6

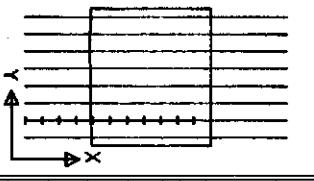

400N
200N
0
200S
400S
600S
800S
1000S
1200S
1400S
1600S
1800S
2000S
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 3750W Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
5.0%
-100%
EAST CHESTER
LINE 3750
Hz
Y
X

277

898278

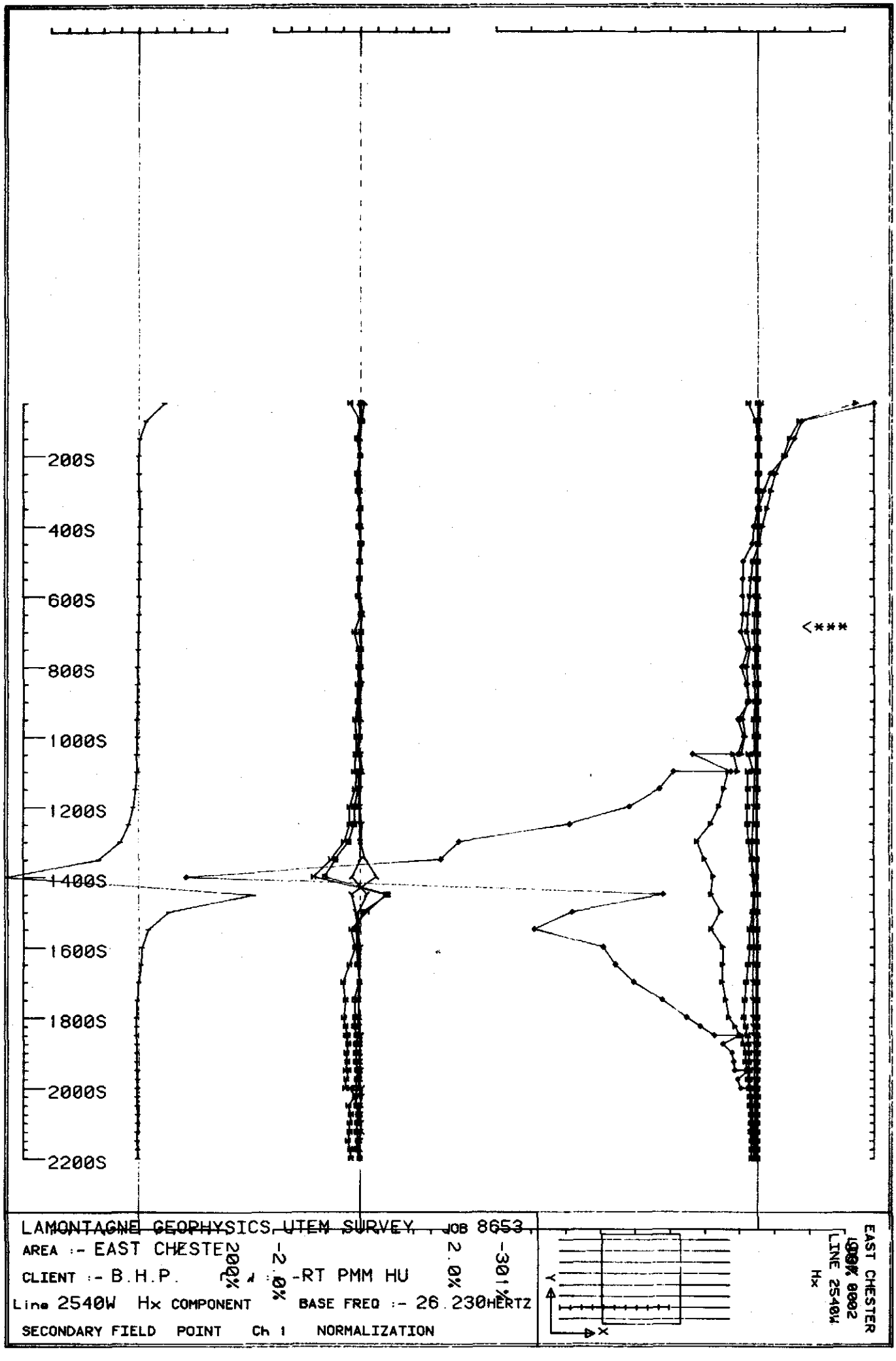


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2540W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



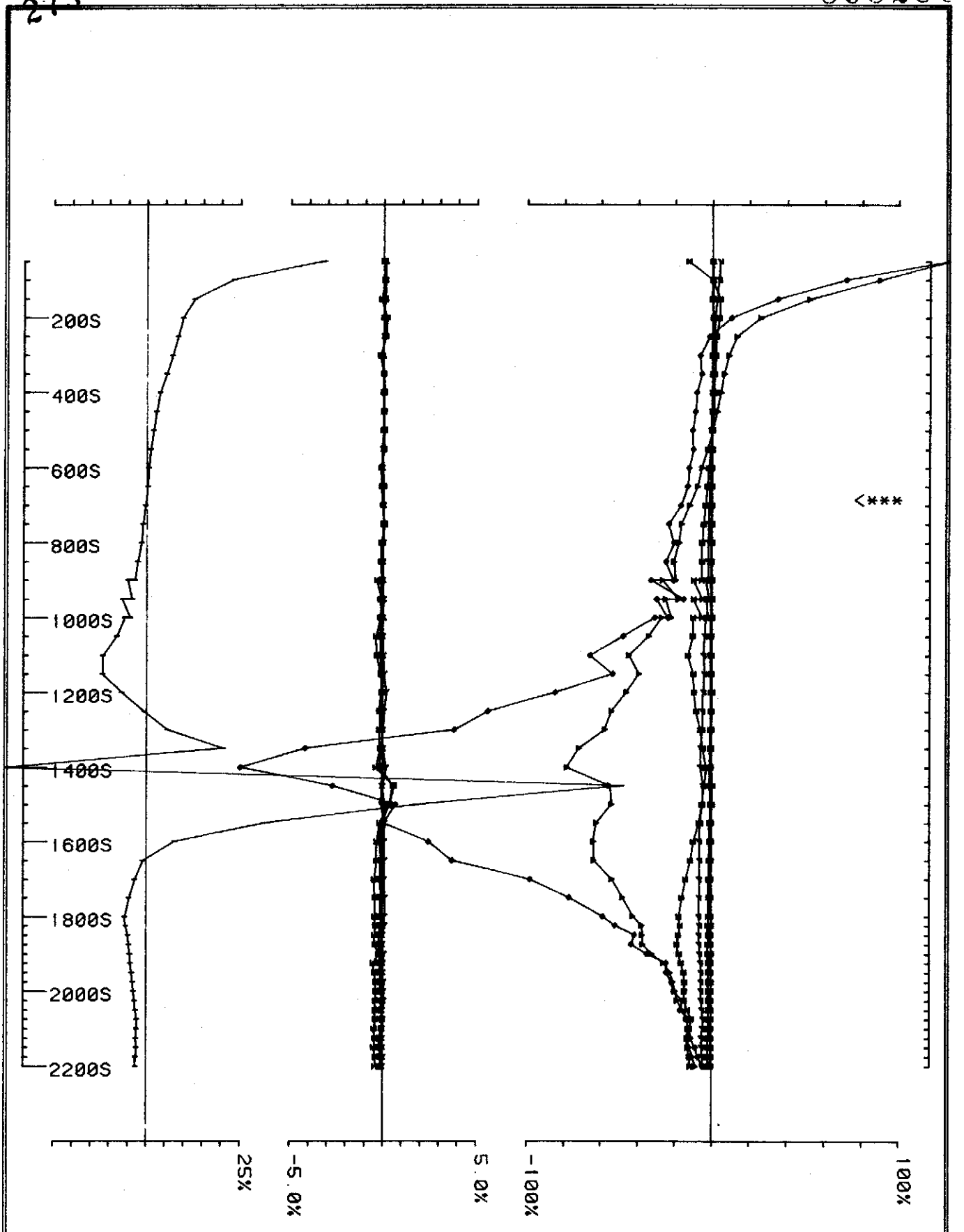
EAST CHESTER
LOOP 8002
LINE 2540W
Hx

Hx / loop 2

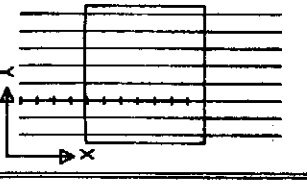

200S
400S
600S
800S
1000S
1200S
1400S
1600S
1800S
2000S
2200S
<***
LAMONTAGNE GEOPHYSICS, UTEM SURVEY, JOB 8653,
AREA :- EAST CHESTE
CLIENT :- B.H.P.
-RT PMM HU
Line 2540W Hx COMPONENT
BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION
200%
-2.0%
2.0%
-30%
Y
X
EAST CHESTER
LINE 2540W
Hx

279

898280



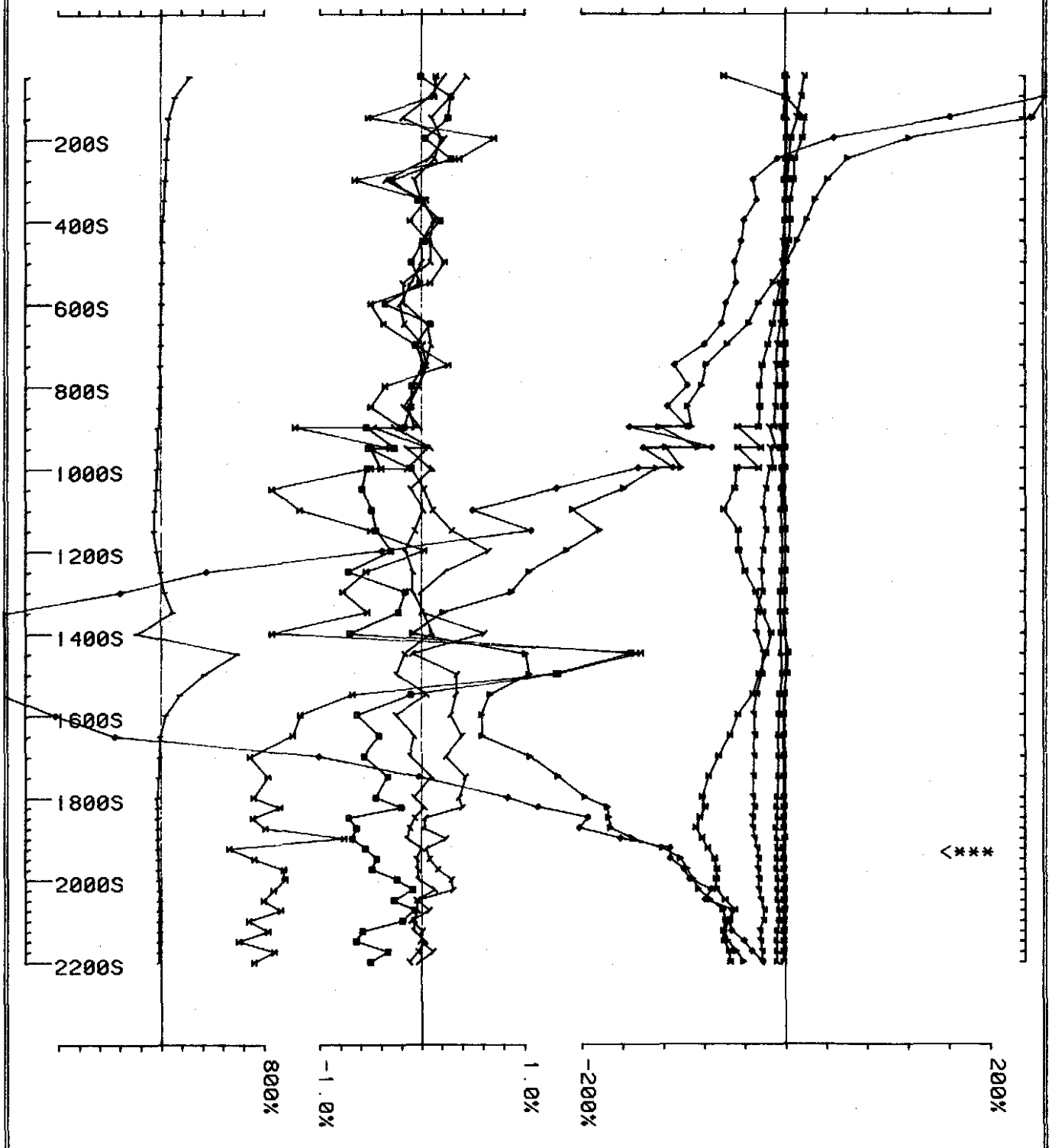
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2743W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



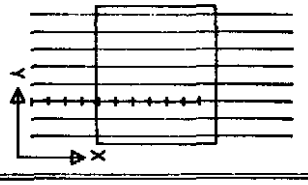
EAST CHESTER
LOOP 0002
LINE 2743
Hx

898281

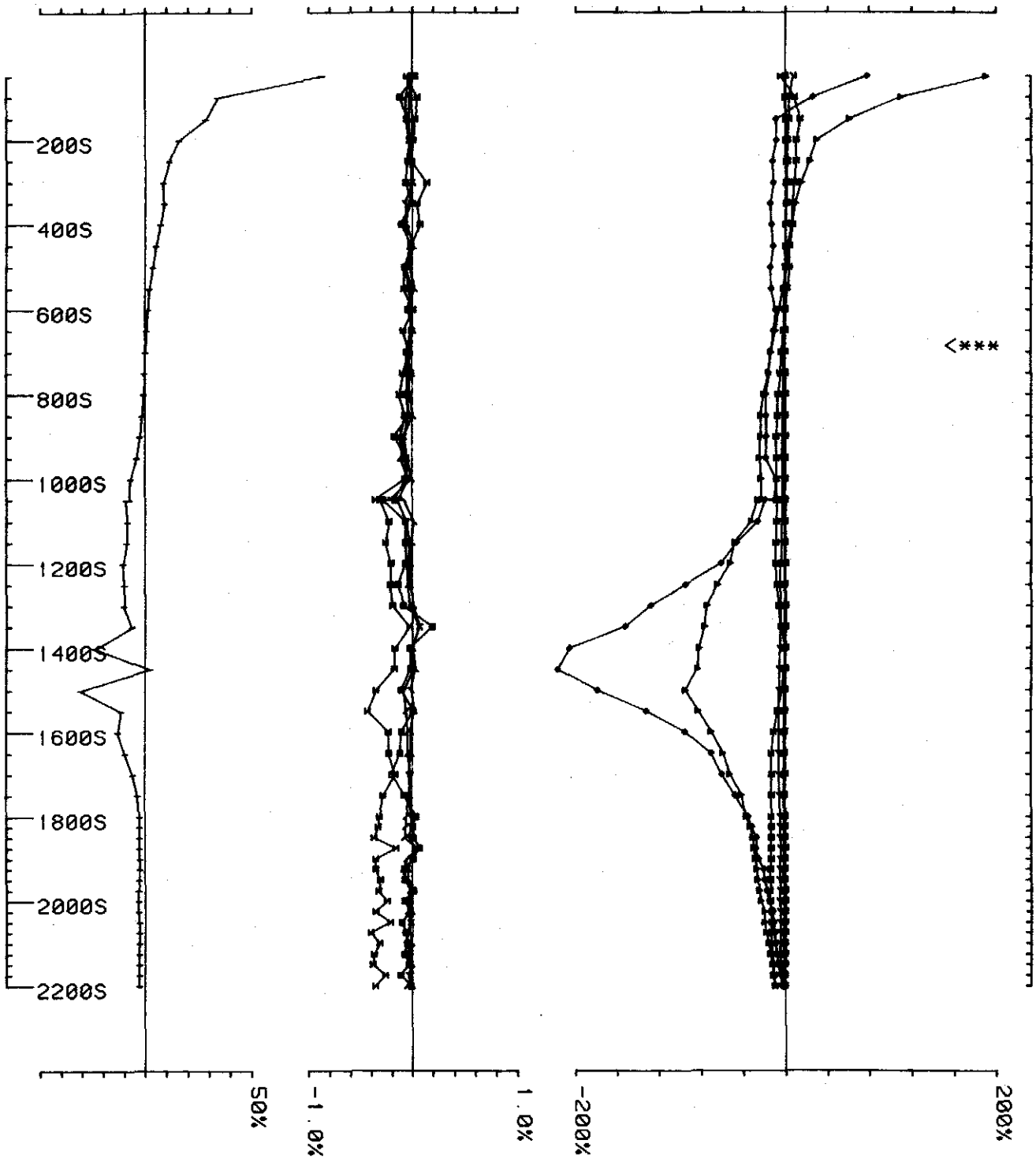
250



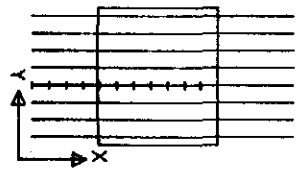
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2750W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



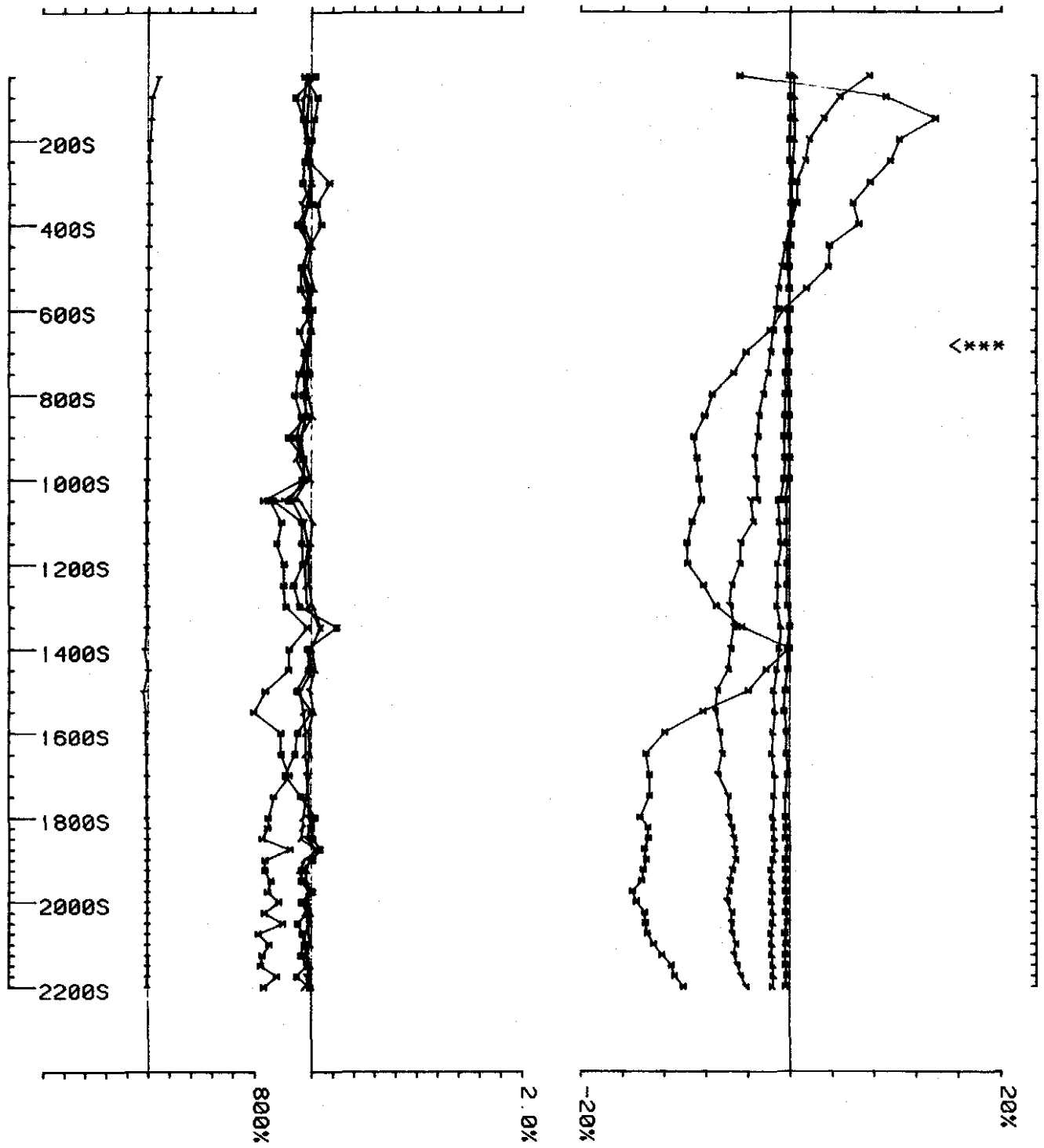
EAST CHESTER
LOOP 8002
LINE 2750W
Hx



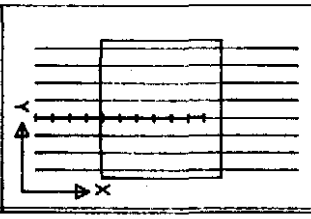
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2950W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



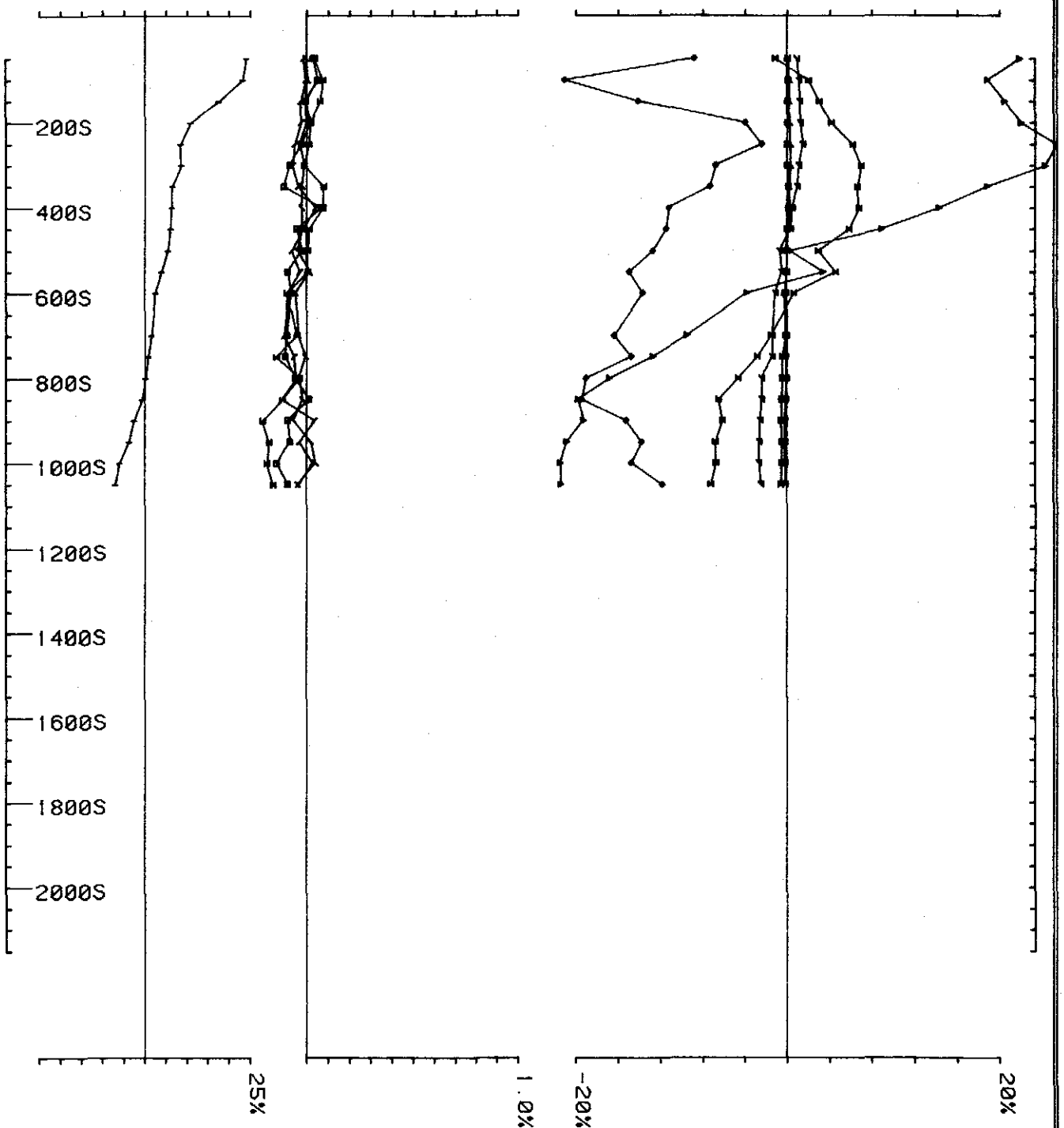
EAST CHESTER
LOOP 8002
LINE 2950W
Hx



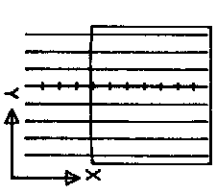
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 2950W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



EAST CHESTER
LOOP 0002
LINE 2950W
Hx



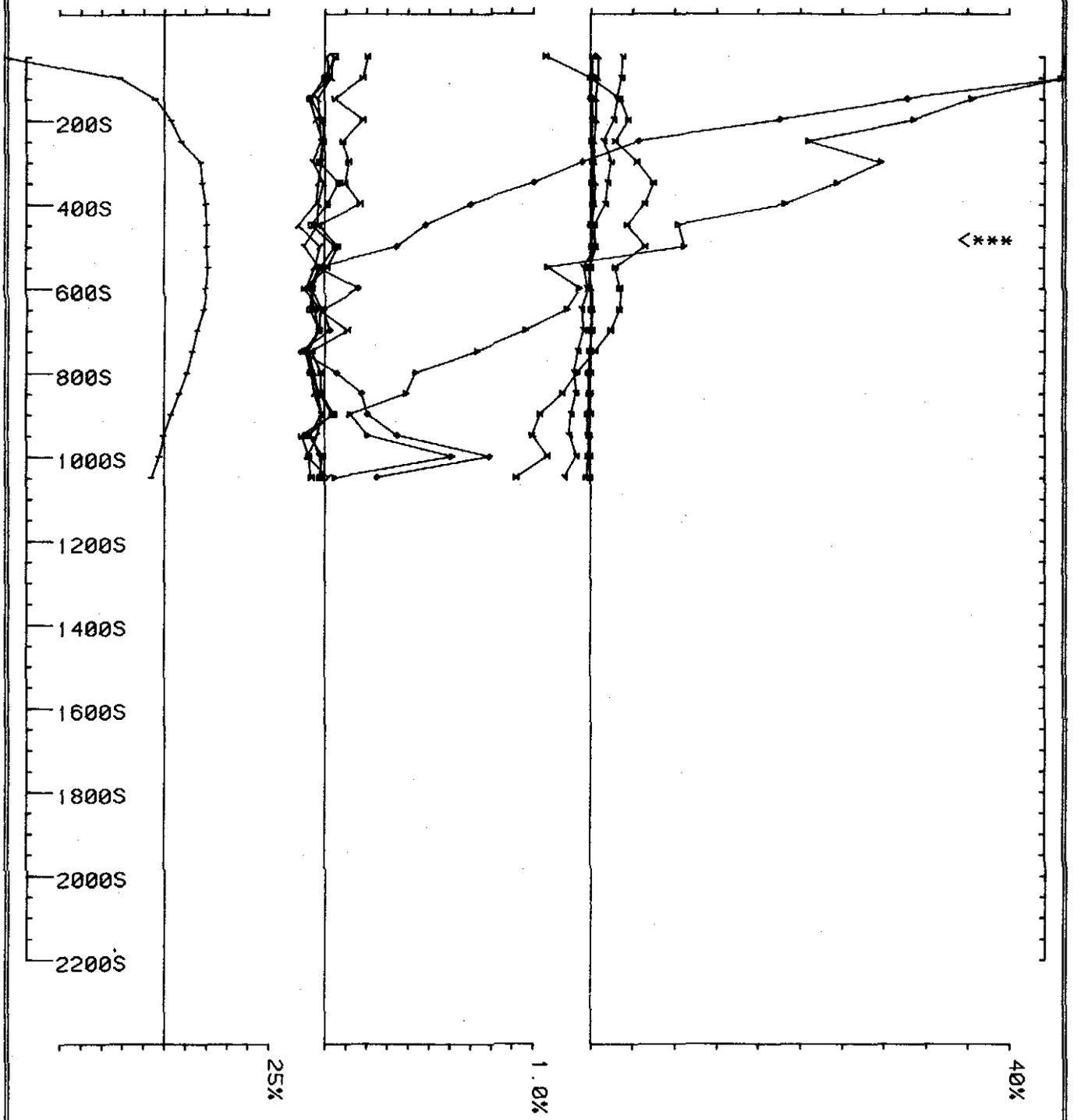
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 3150W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



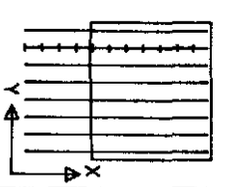
EAST CHESTER
LOOP 8002
LINE 3150W
Hx

284

898285



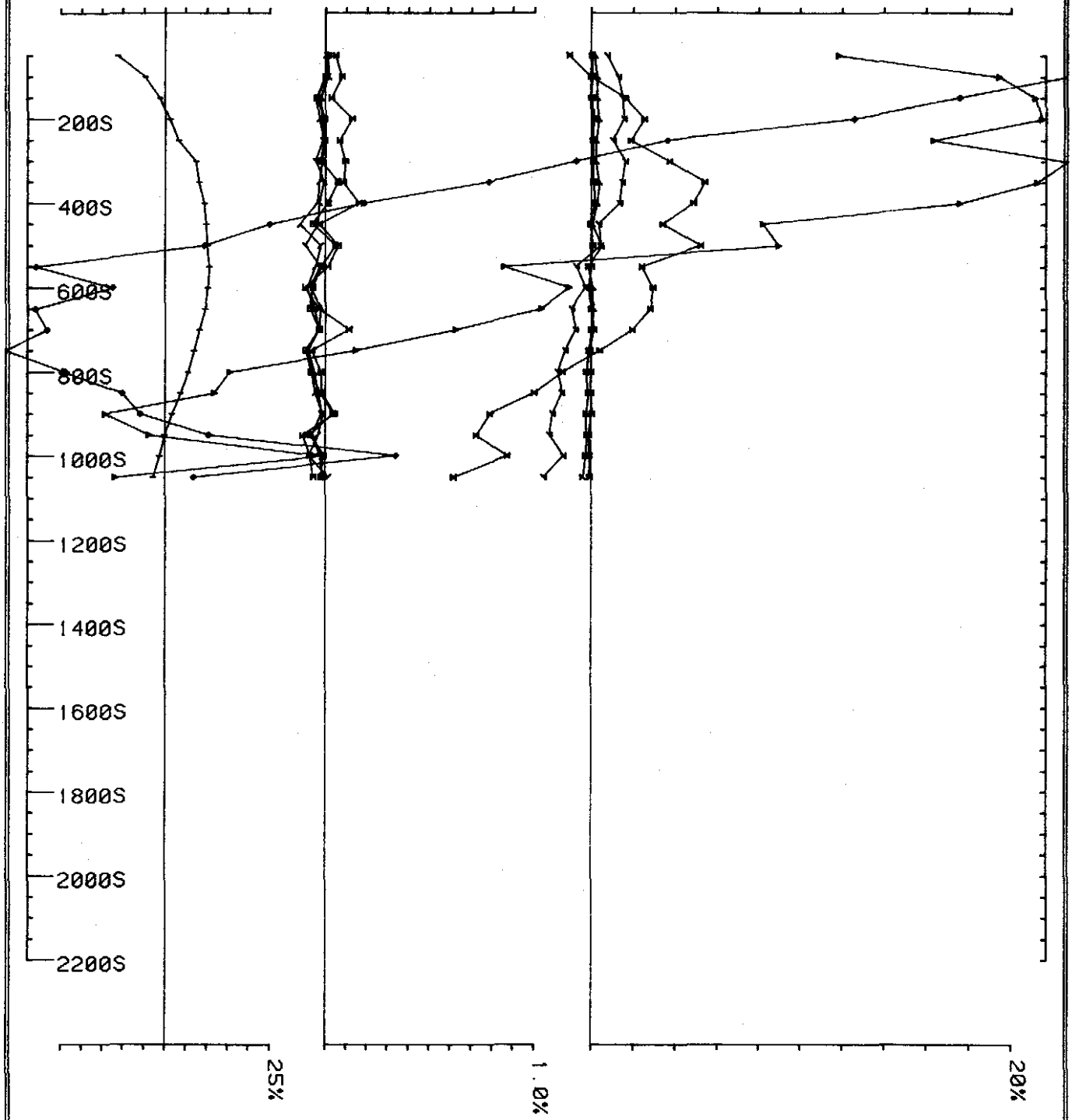
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 3550W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



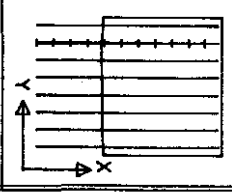
EAST CHESTER
LOOP 8002
LINE 3550W
Hx

235

898286



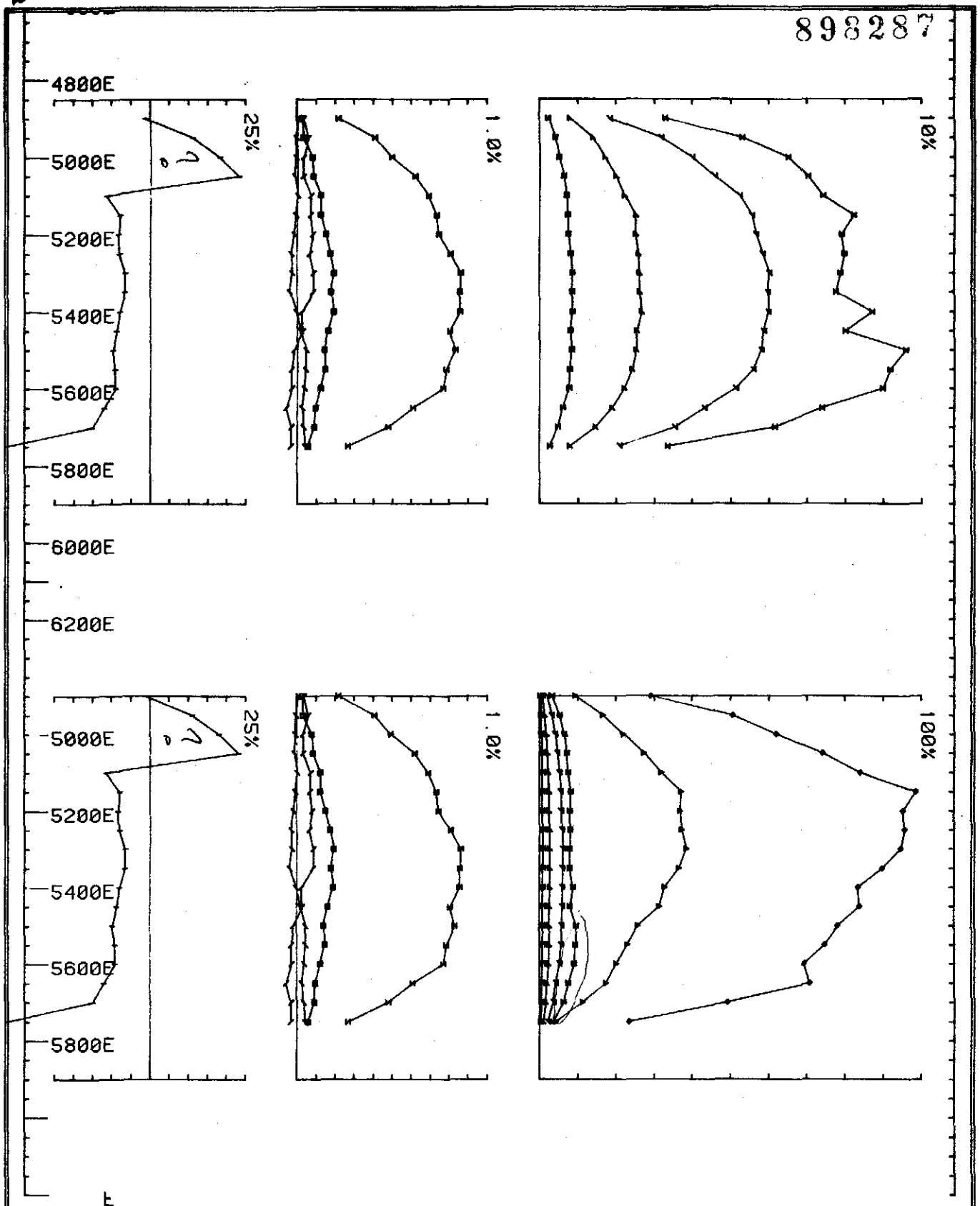
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- ART PMM HU
Line 3550W Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



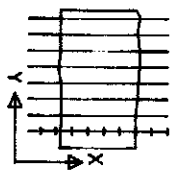
EAST CHESTER
LOOP 0002
LINE 3550W
Hx

286

898287

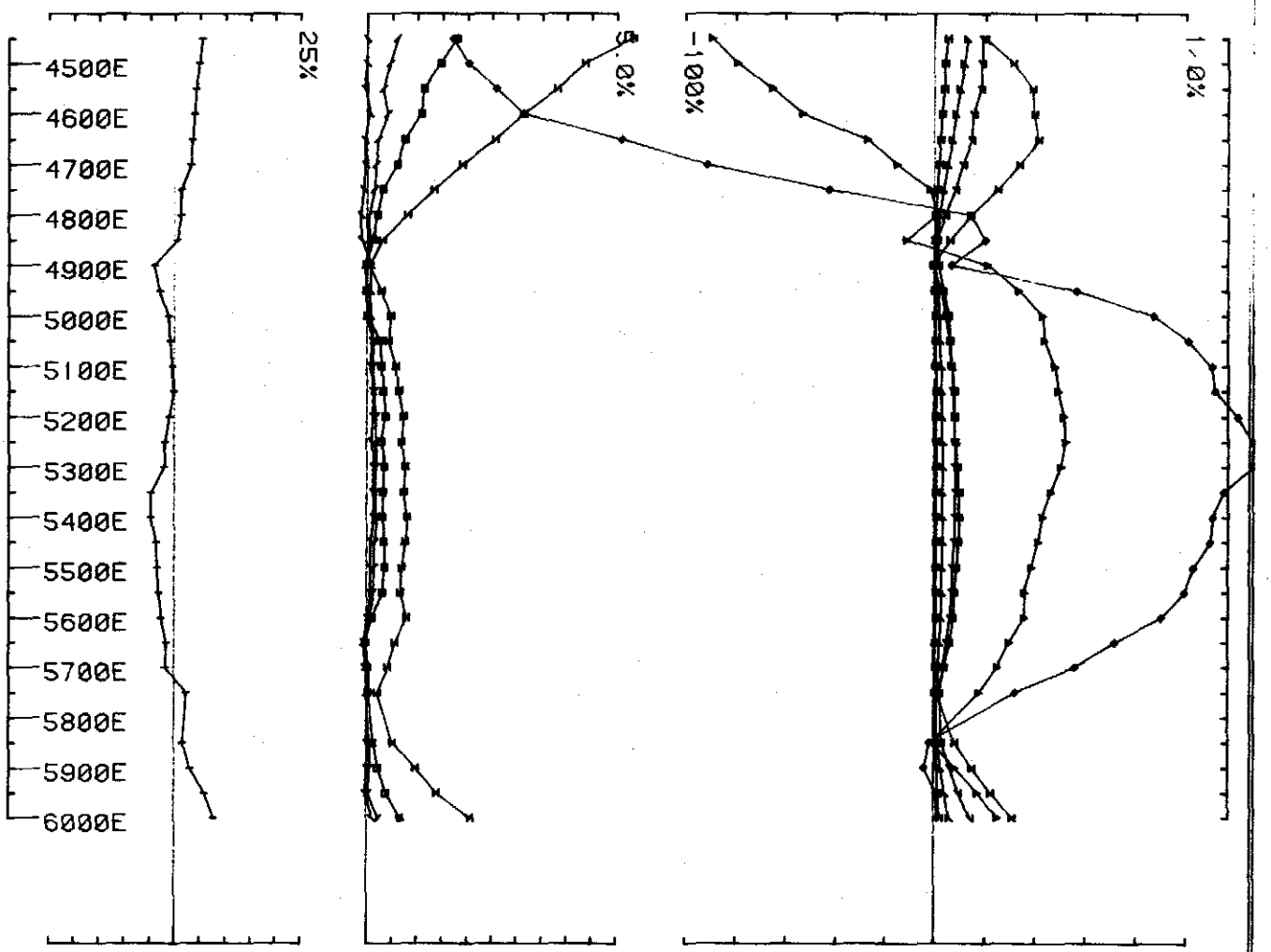


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. Minerals CREW :- ART Rx10 C3
Line 6400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

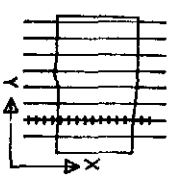


EAST CHESTER
LOOP 0003
LINE 6400
Hz

L 8034

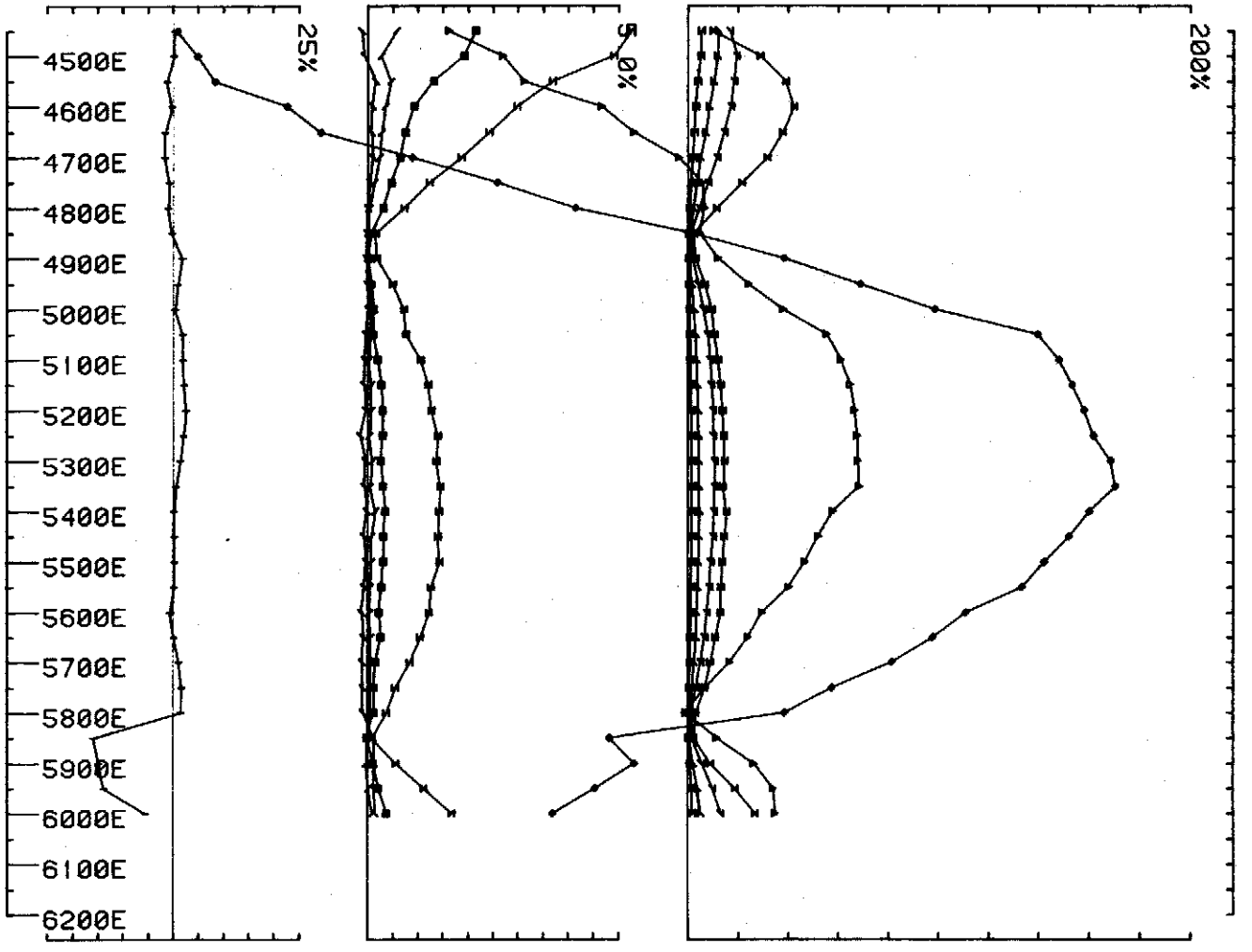


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- N Pinnacles
CLIENT :- B.H.P. CREW :- PMM ART
Line 6600N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

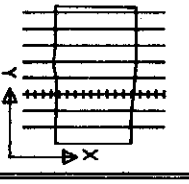


N Pinnacles
LOOP 0003
LINE 6600
Hz

L6810



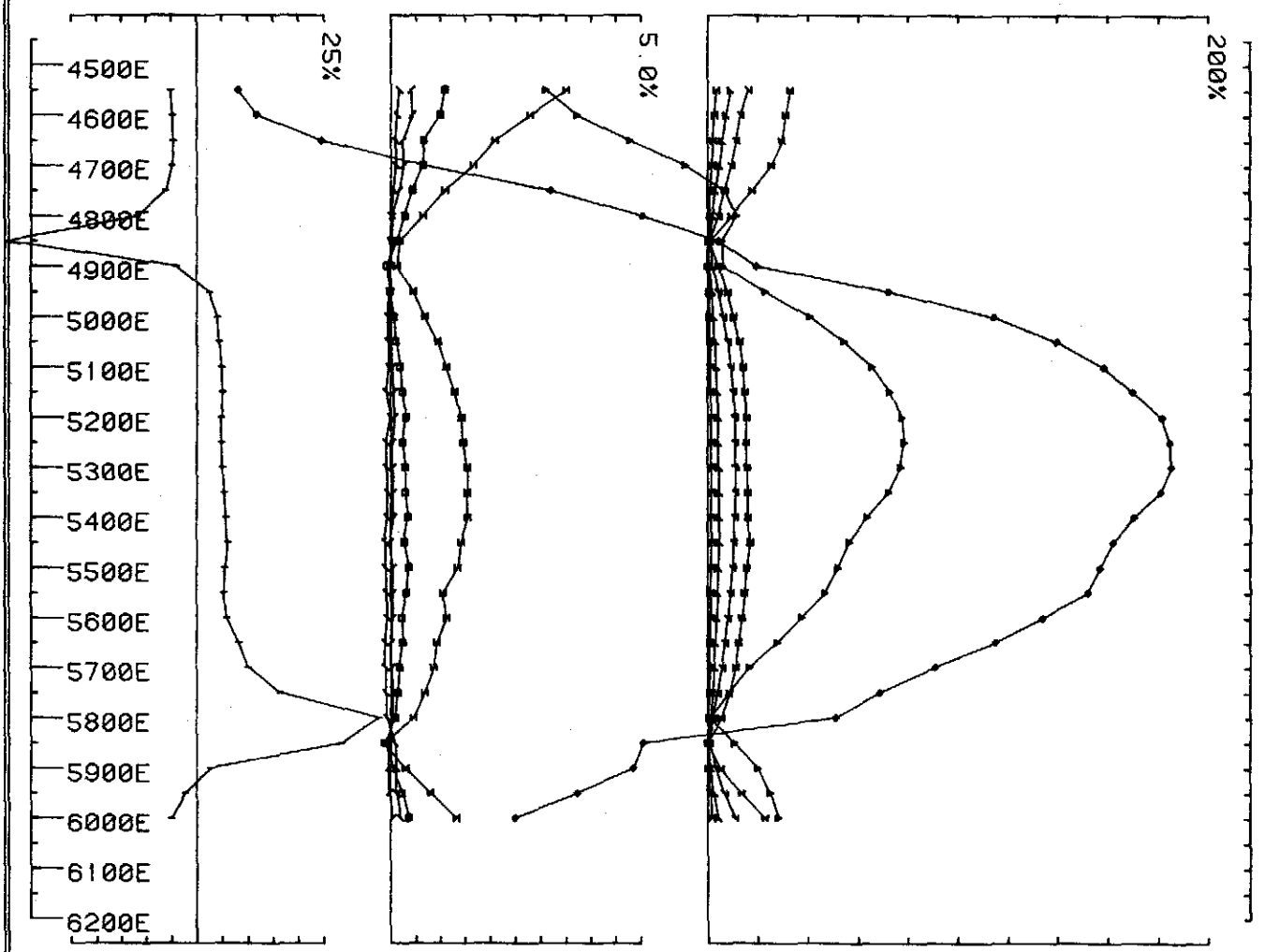
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- N Pinnacles
CLIENT :- B.H.P. Minerals CREW :- ART PMM
Line 6800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



N Pinnacles
LOOP 0003
LINE 6800
Hz

289

898290



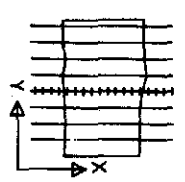
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- N Pinnacles

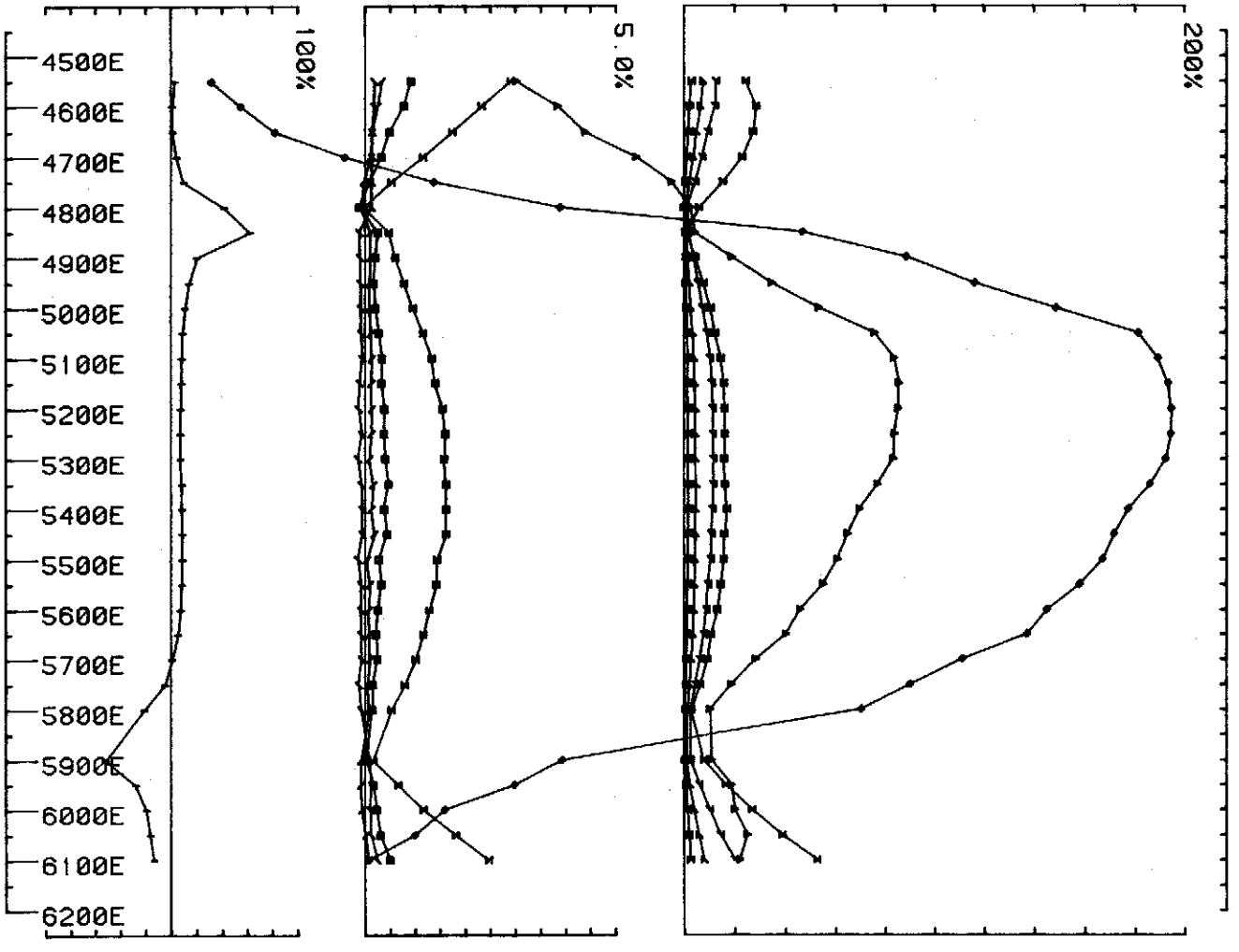
CLIENT :- B.H.P. CREW :- ART

Line 7000N Hz COMPONENT BASE FREQ :- 26.230HERTZ

SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

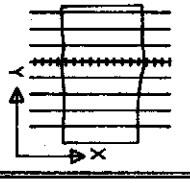


N Pinnacles
LOOP 0003
LINE 7000
Hz



RR 10

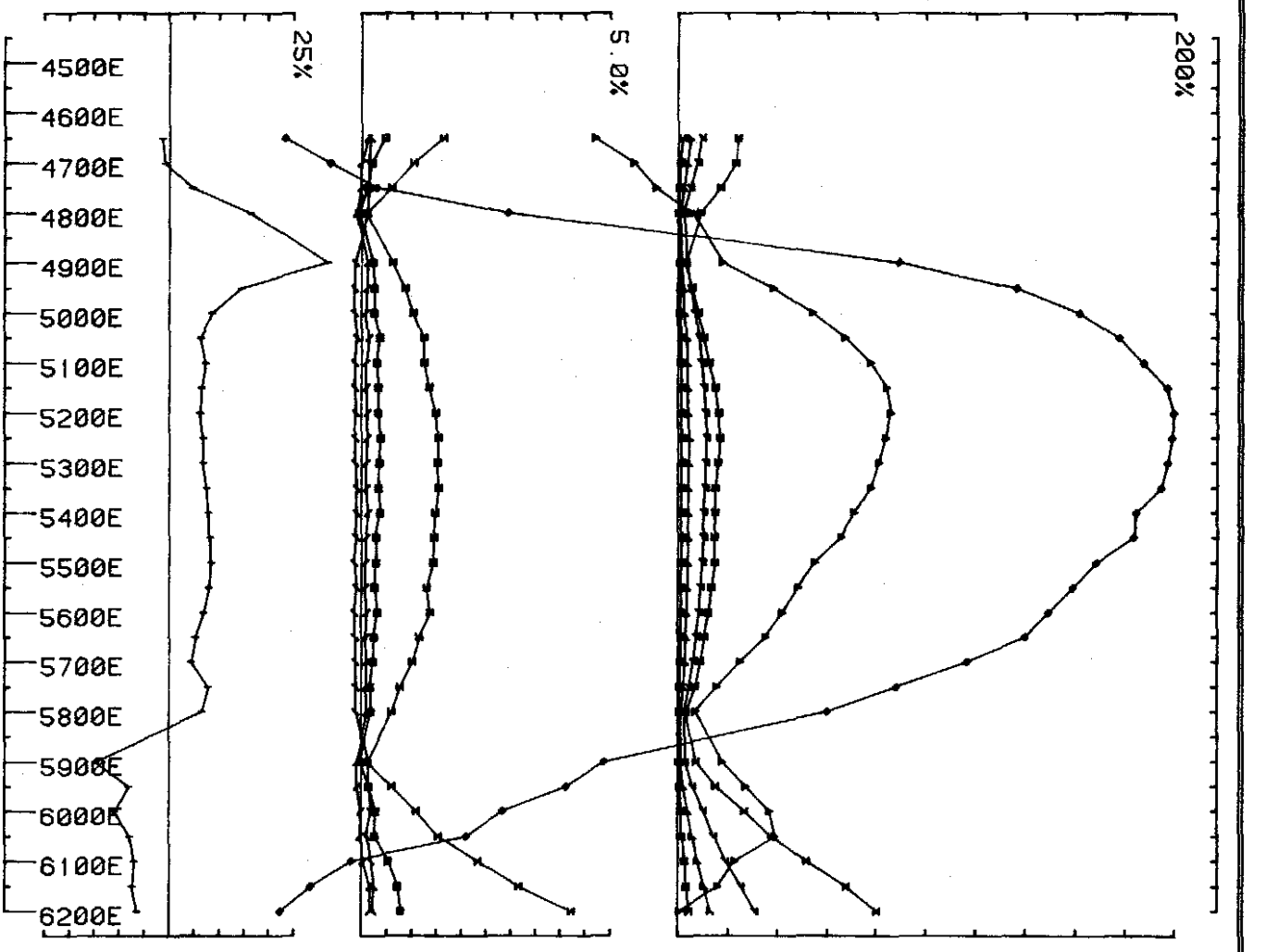
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- N Pinnacles
CLIENT :- B.H.P. CREW :- ART
Line 7200N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



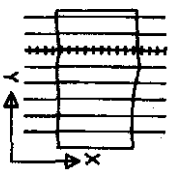
N Pinnacles
LOOP 0003
LINE 7200
Hz

7200 7350

898292



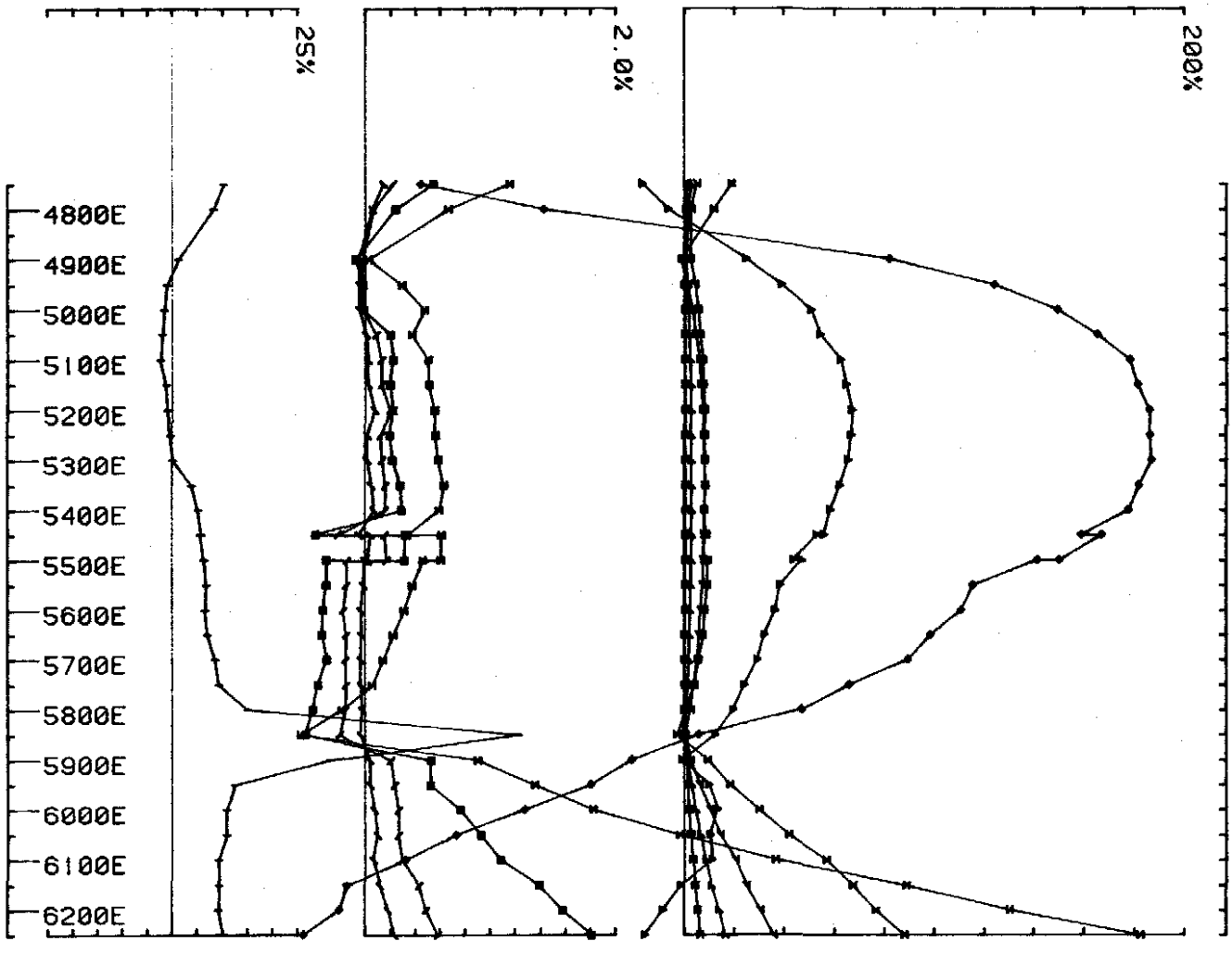
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- N Pinnacles
CLIENT :- B.H.P. CREW :- ART
Line 7400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



N Pinnacles
LOOP 0003
LINE 7400
Hz

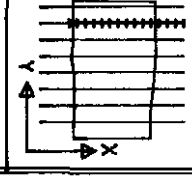
292

898295

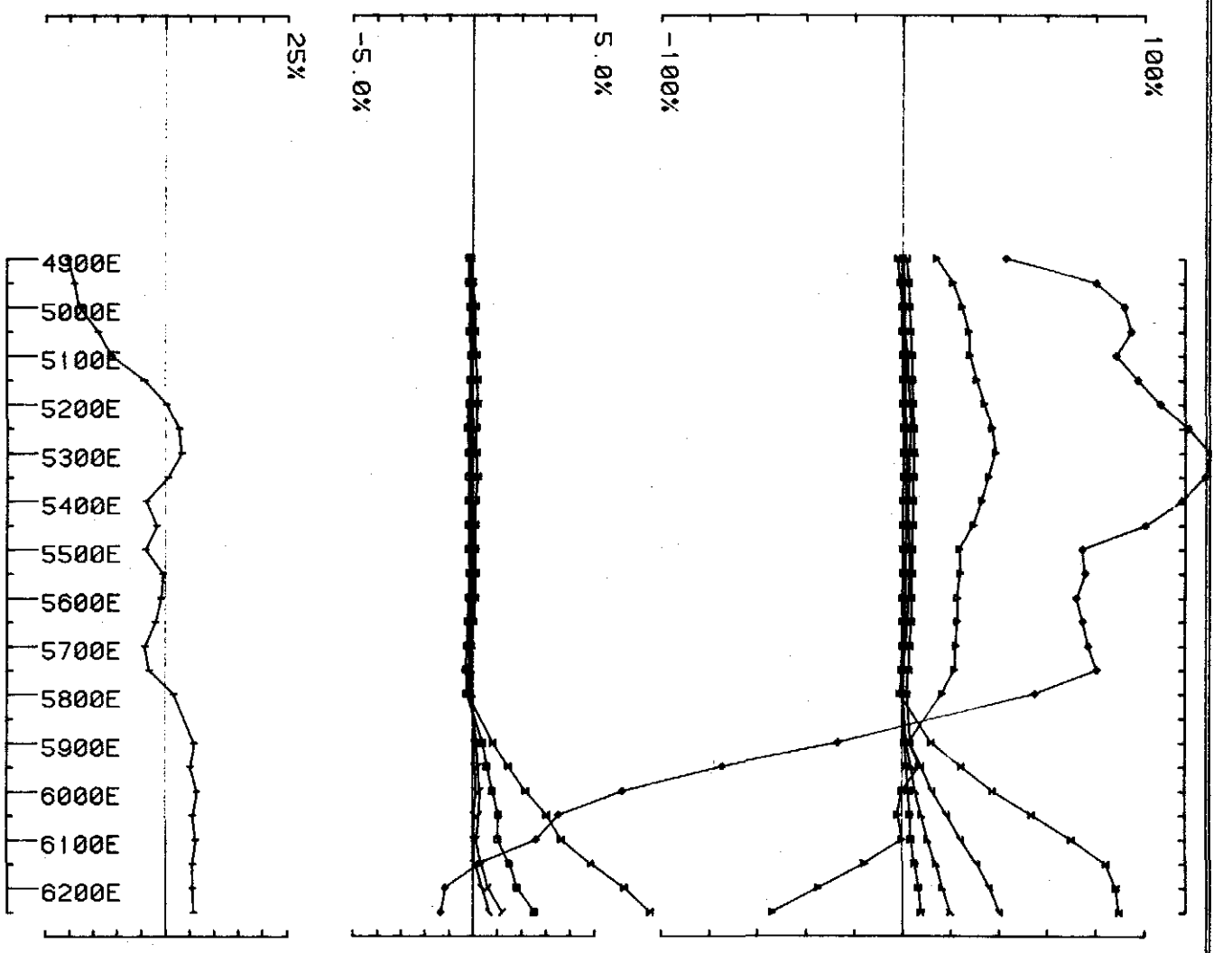


Loop 8

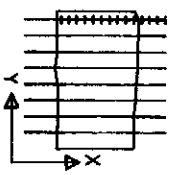
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- N Pinnacles
CLIENT :- B.H.P. CREW :- PMM ART
Line 7600N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



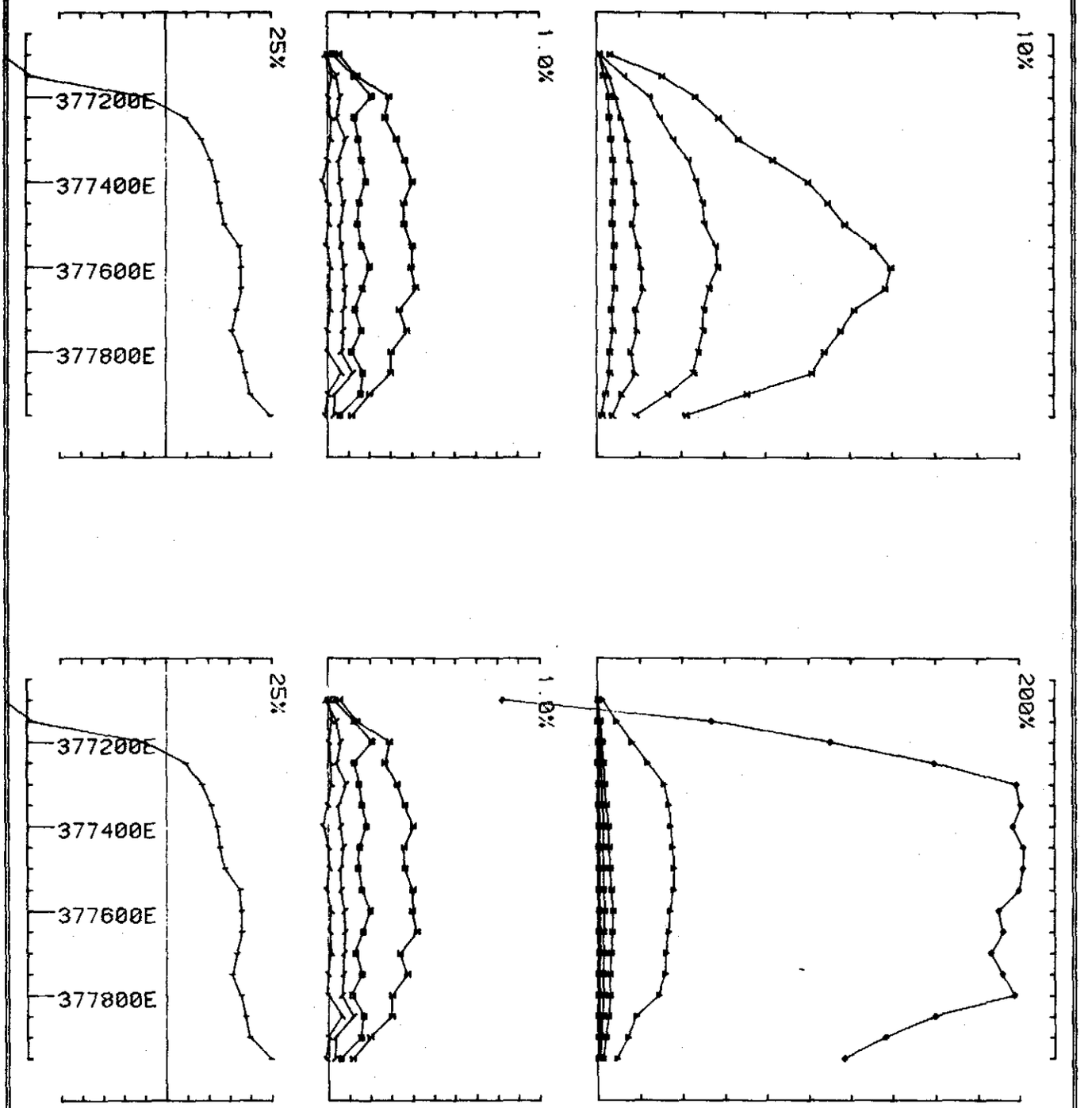
N Pinnacles
LOOP 8003
LINE 7600
Hz



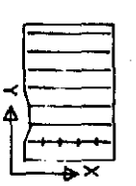
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- EAST CHESTER
CLIENT :- B.H.P. CREW :- PMM ART
Line 7800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



EAST CHESTER
LOOP 0003
LINE 7800
Hz

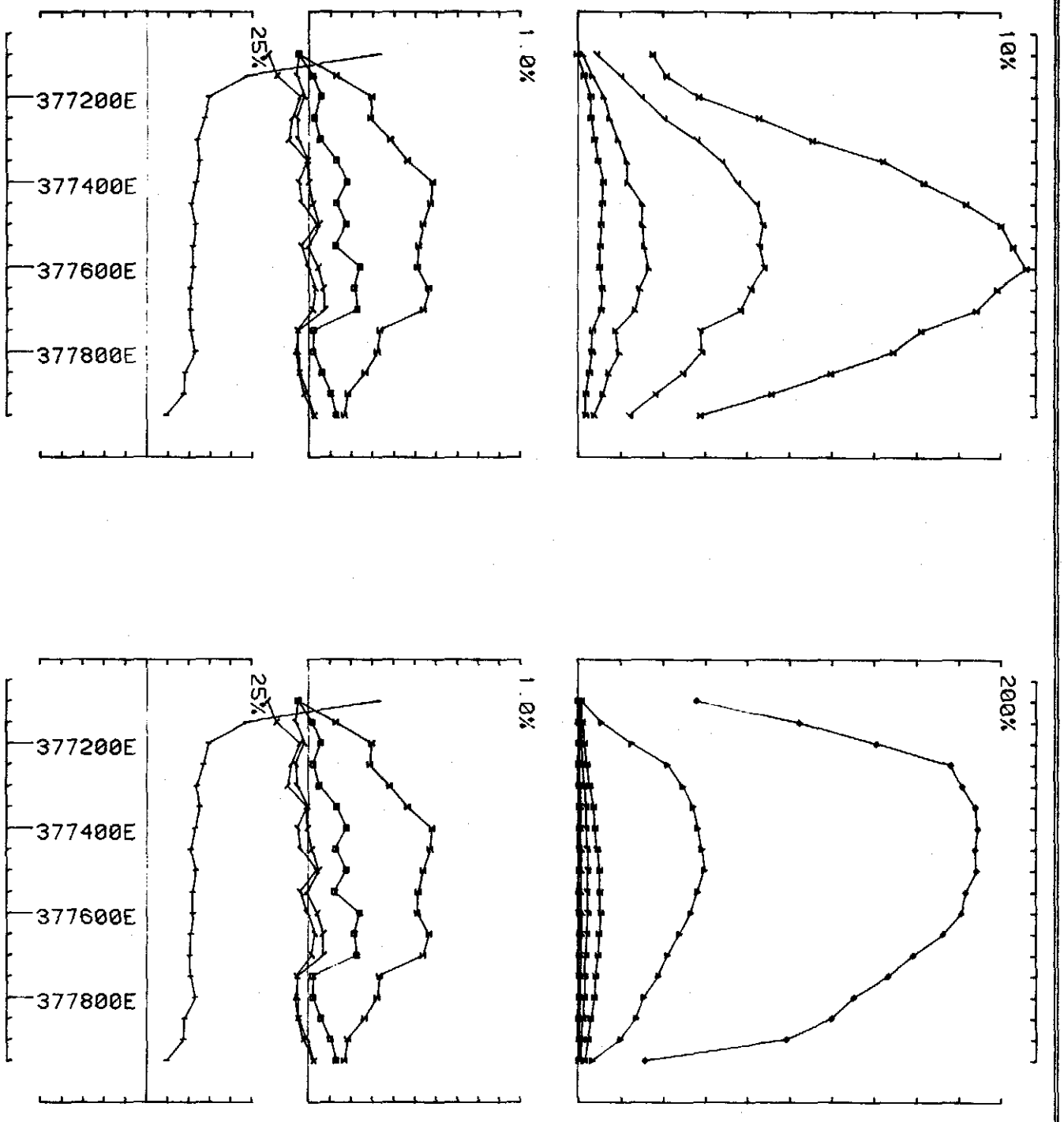


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

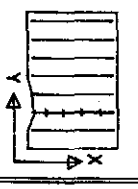


CONNECTOR GRID
LOOP 9004
LINE 82100
Hz

295



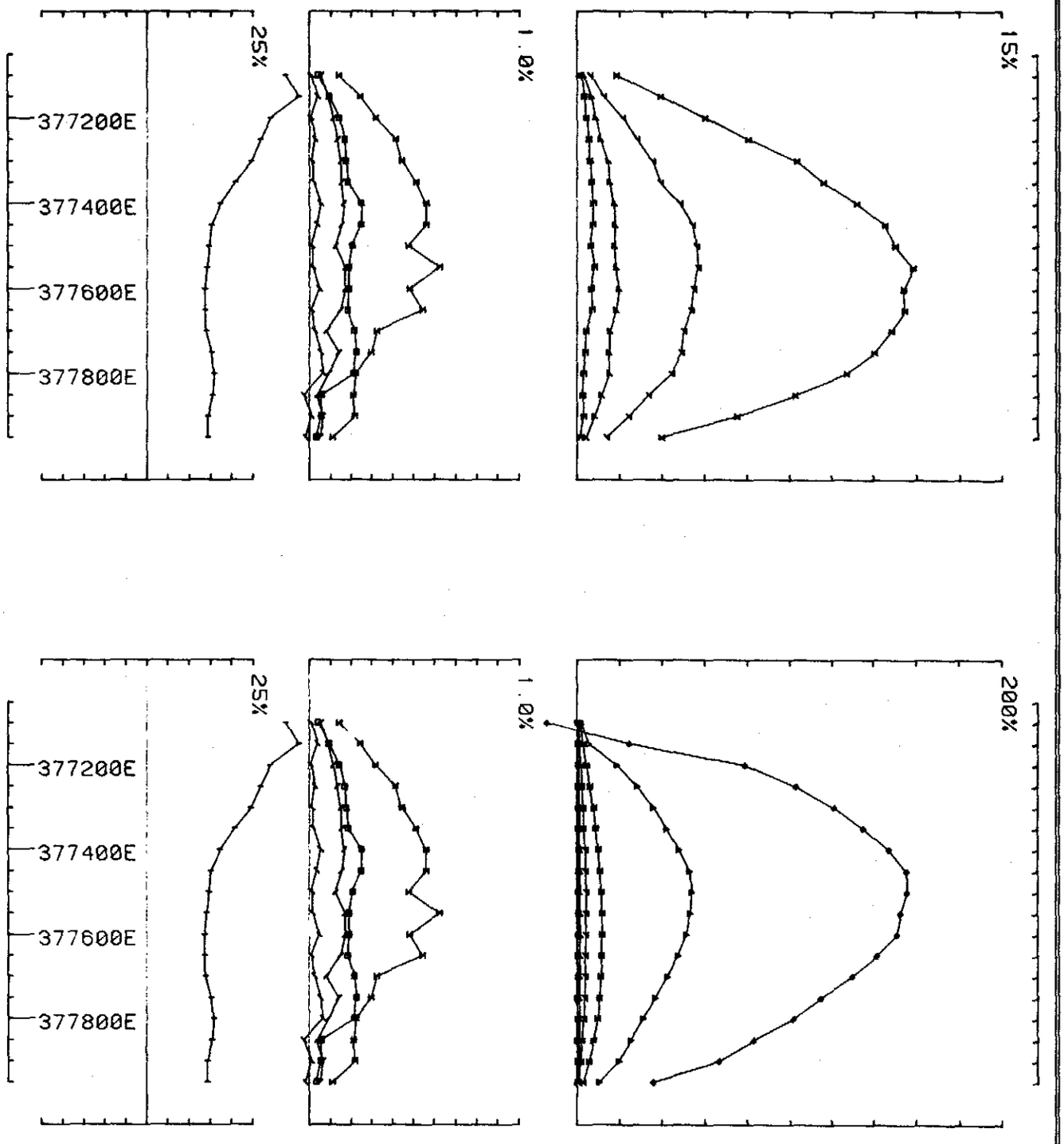
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 82300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



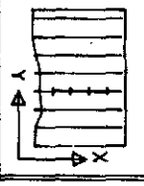
CONNECTOR GRID
LOOP 8004
LINE 82300
Hz

898297

296



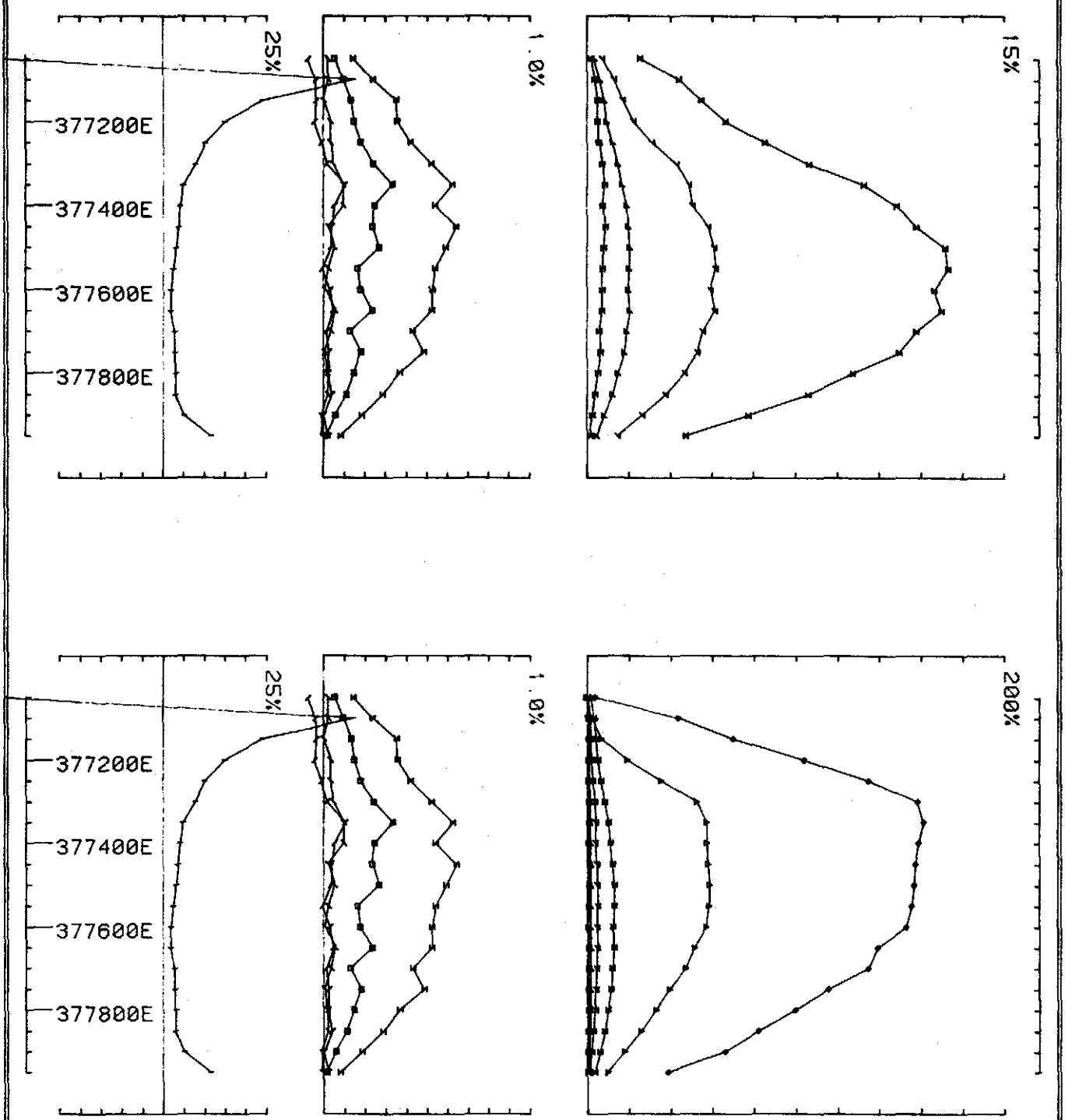
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 82500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



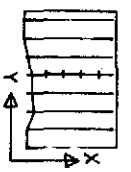
CONNECTOR GRID
LOOP 8004
LINE 82500
Hz

297

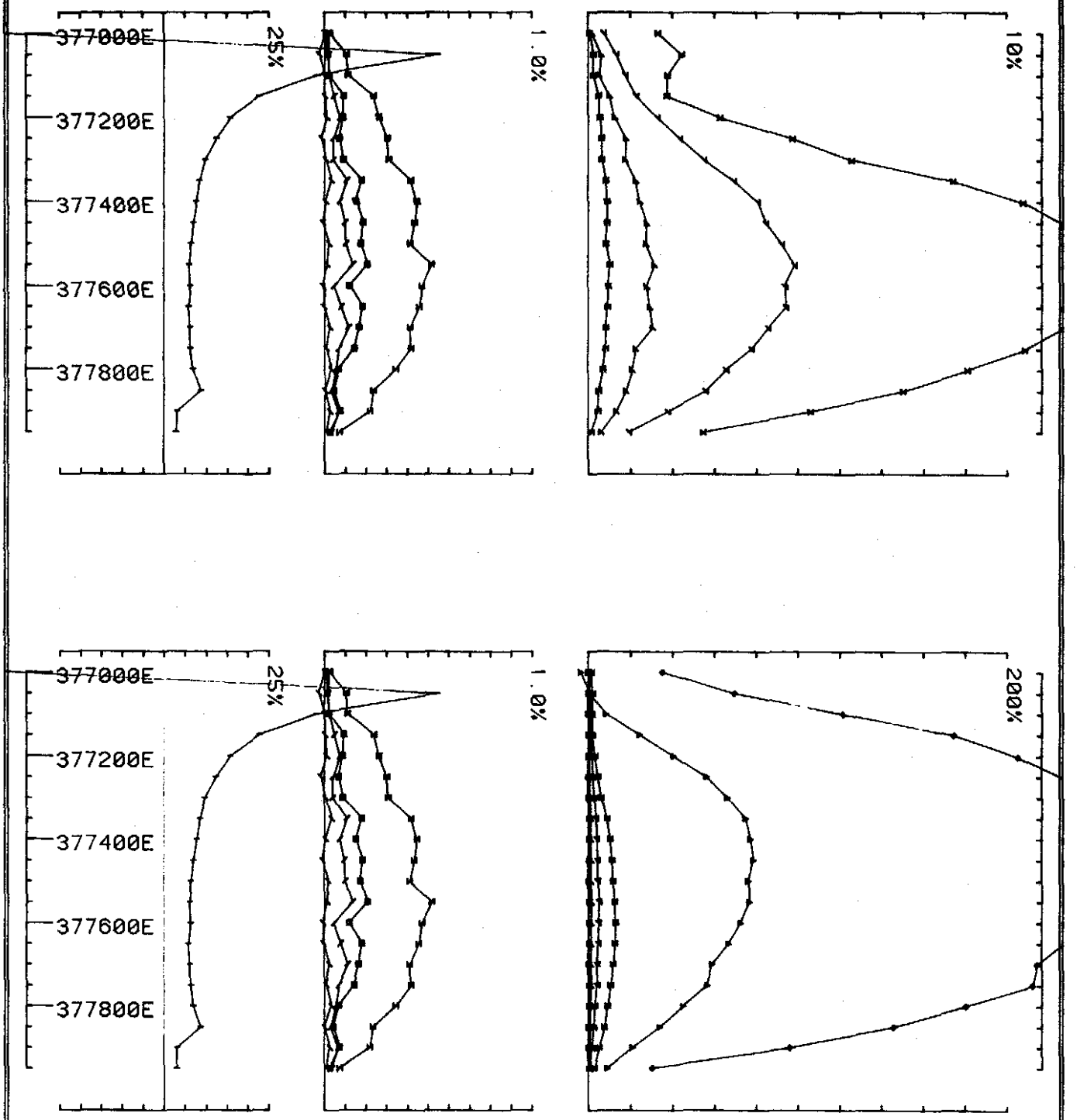
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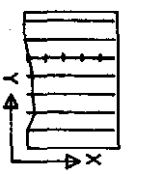
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 82700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



CONNECTOR GRID
LOOP 0004
LINE 82700
Hz

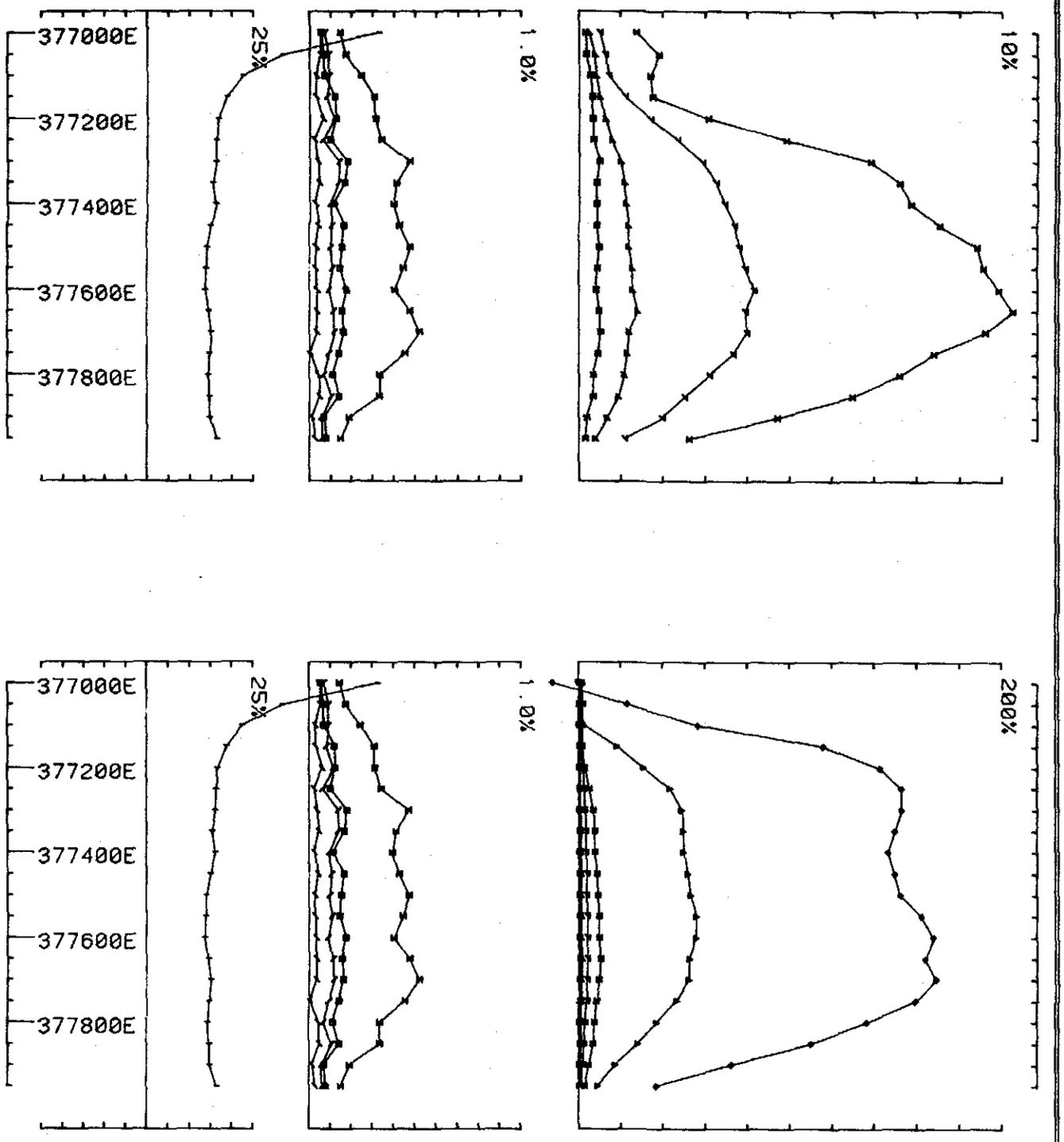


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 82900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

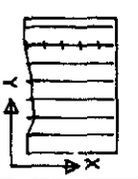


CONNECTOR GRID
LOOP 0004
LINE 82900
Hz

299



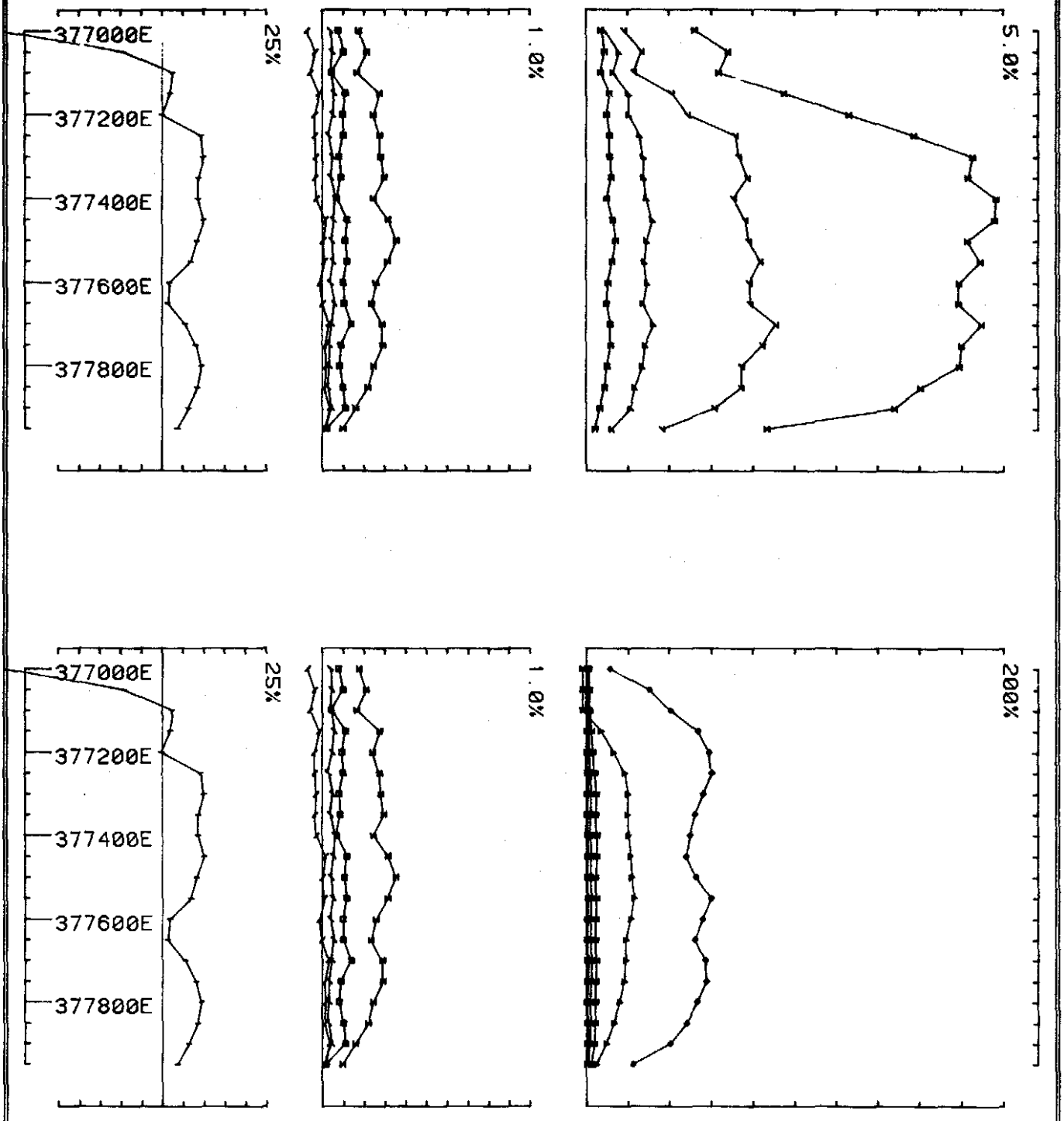
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 83100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



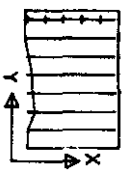
CONNECTOR GRID
LOOP 8004
LINE 83100
Hz

898301

300



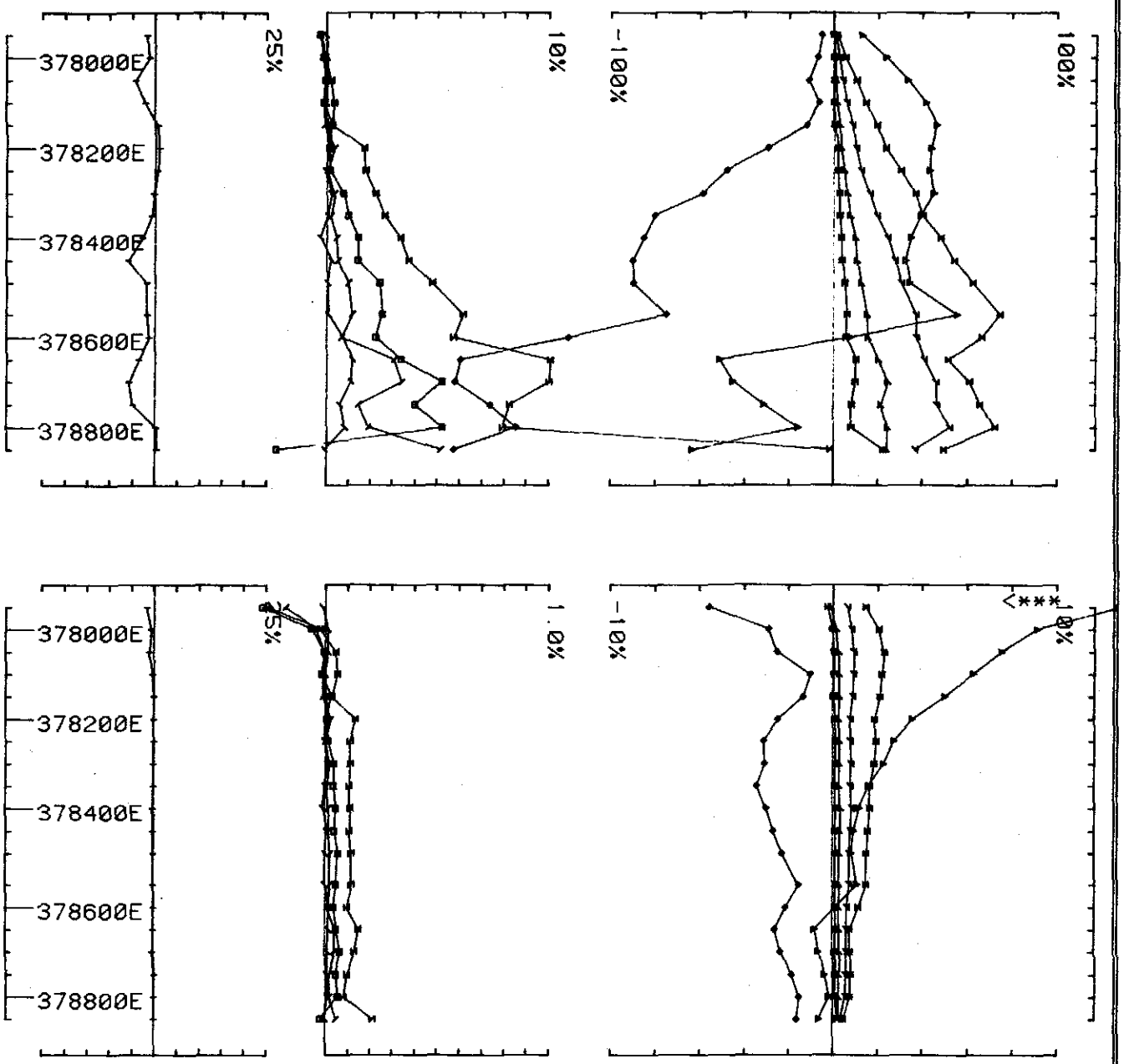
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CONNECTOR GRID
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 83300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



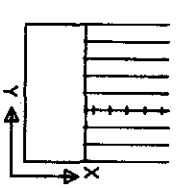
CONNECTOR GRID
LOOP 9004
LINE 83300
Hz

898302

301

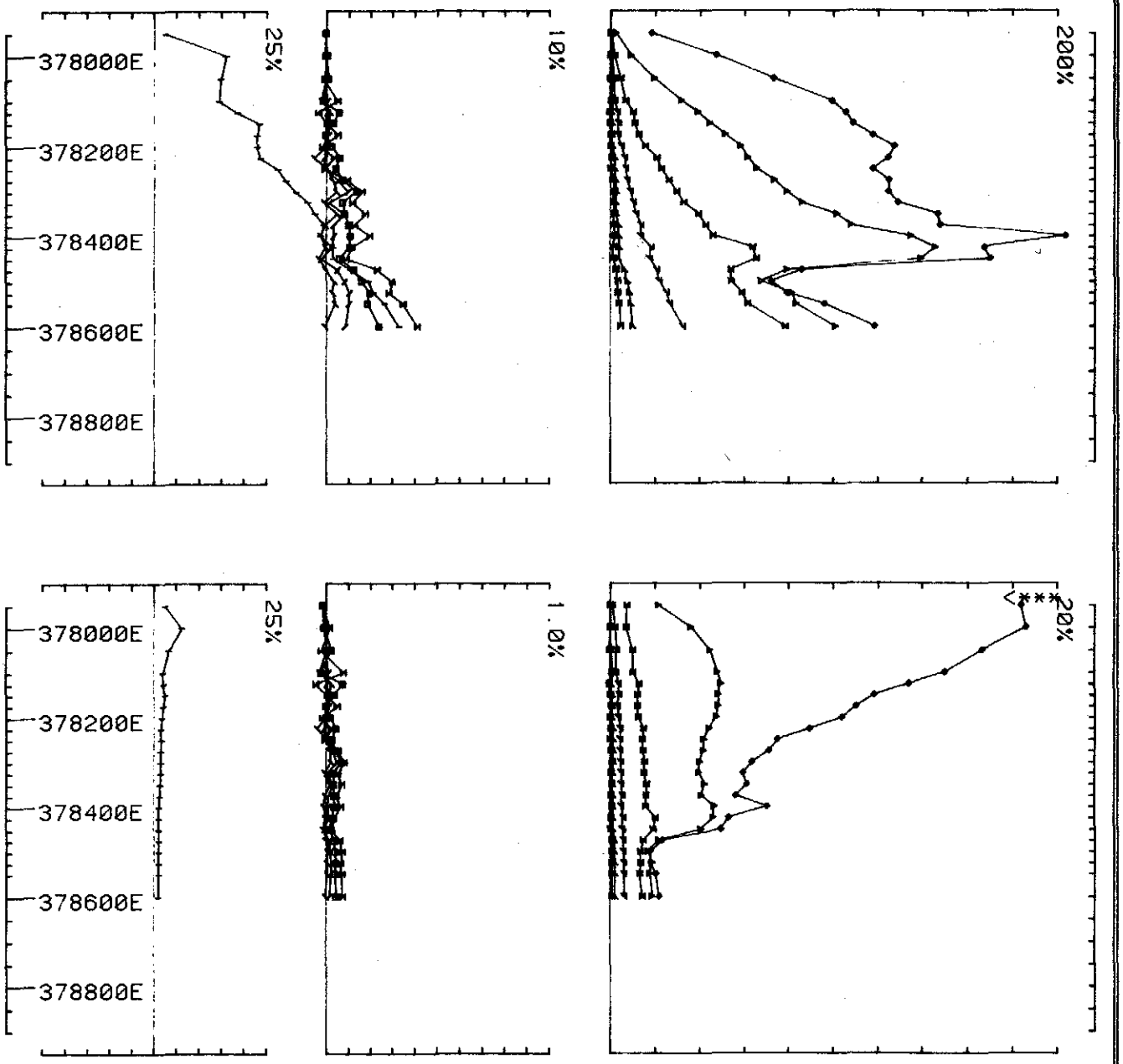


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

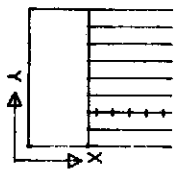


MT. KERSHAW
LOOP 0005
LINE 81100
Hz

302

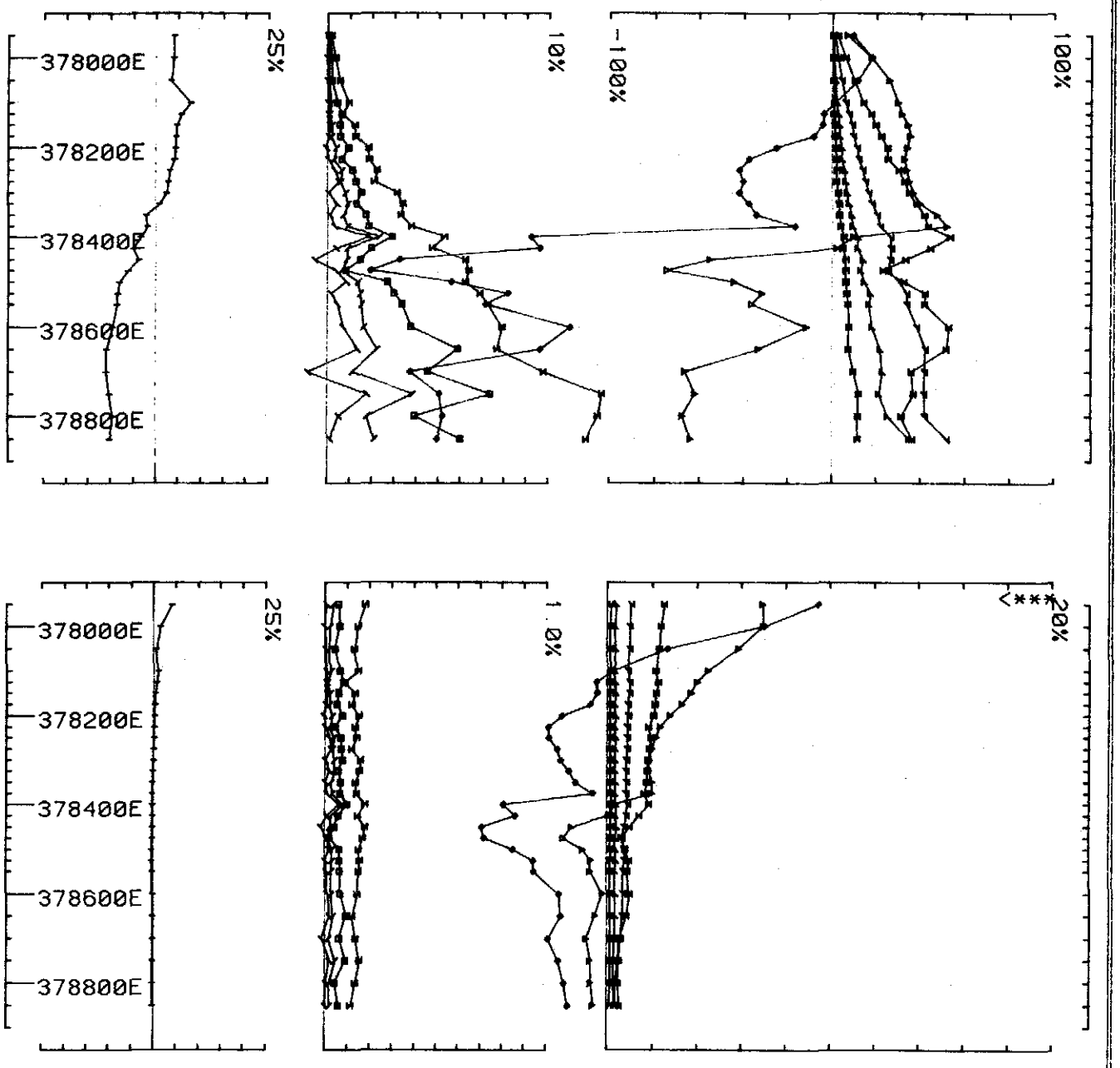


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80900N Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

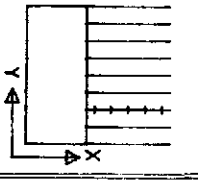


MT. KERSHAW
LOOP 8005
LINE 80900
Hx

303

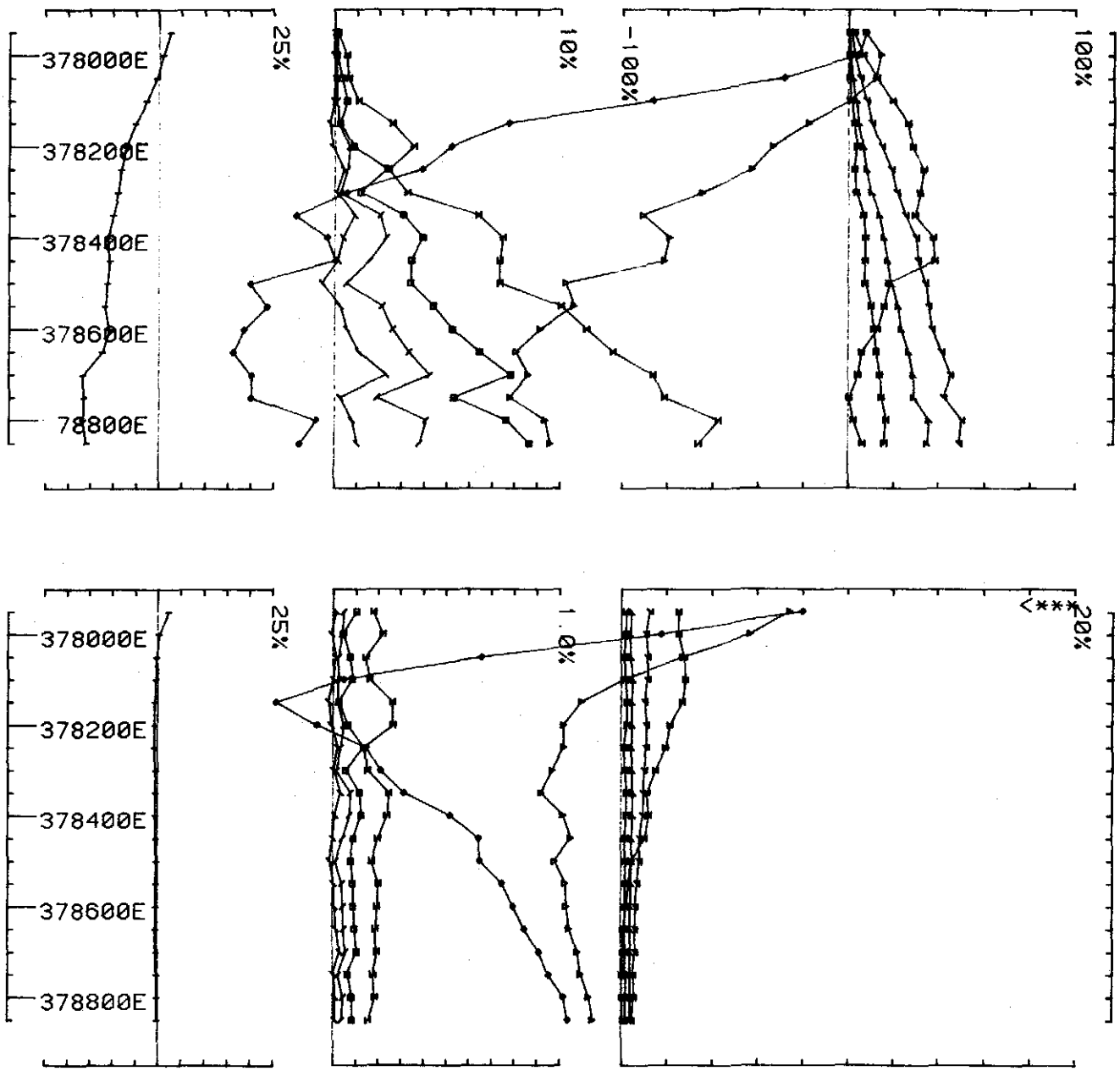


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

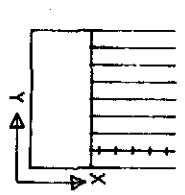


MT. KERSHAW
LOOP 0005
LINE 80900
Hz

304

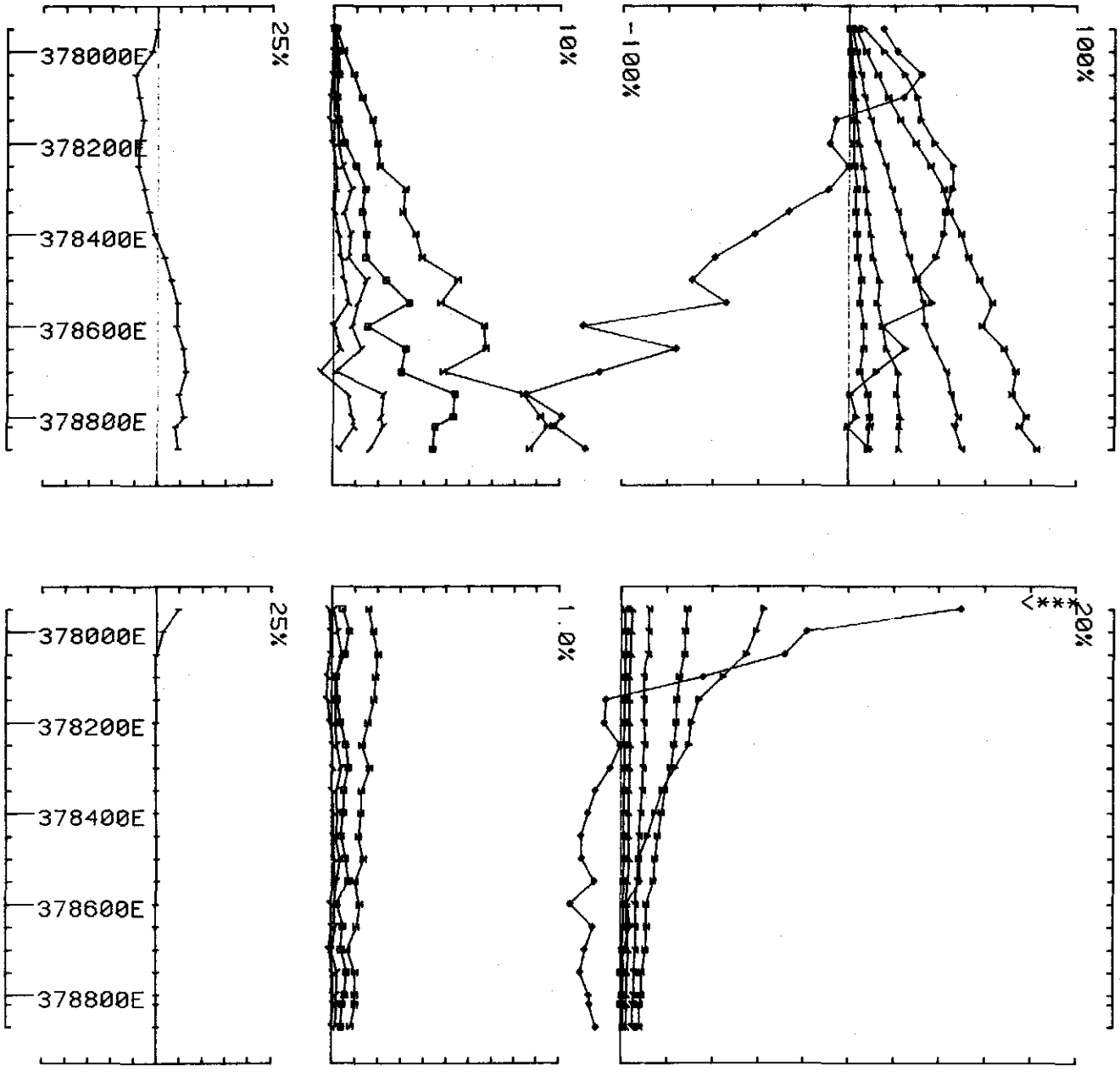


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

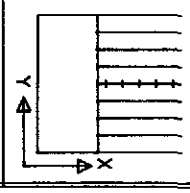


MT. KERSHAW
LOOP 8005
LINE 80700
Hz

305

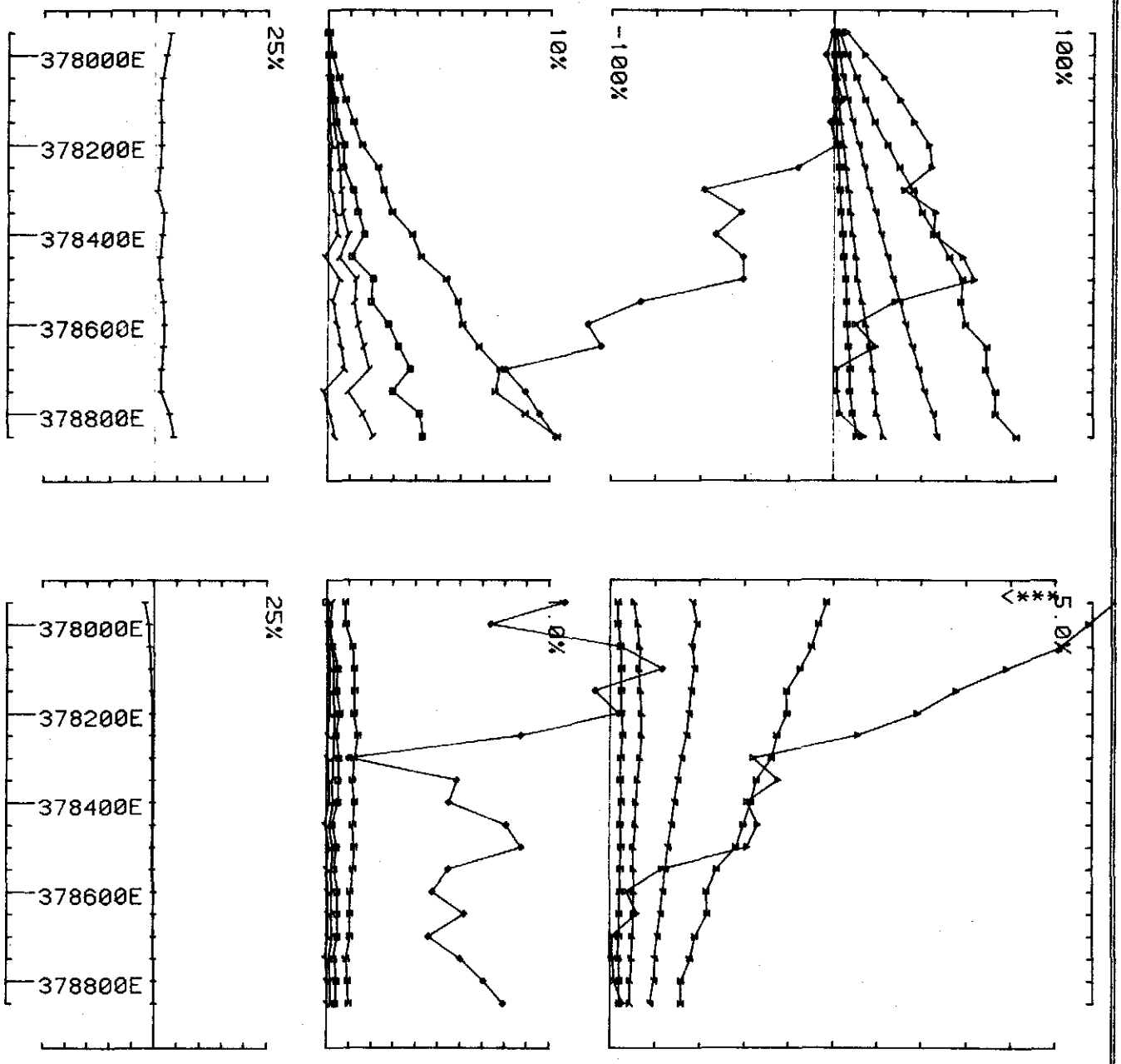


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

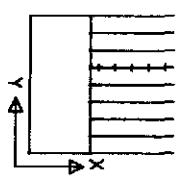


MT. KERSHAW
LOOP 0005
LINE 81300
Hz

306



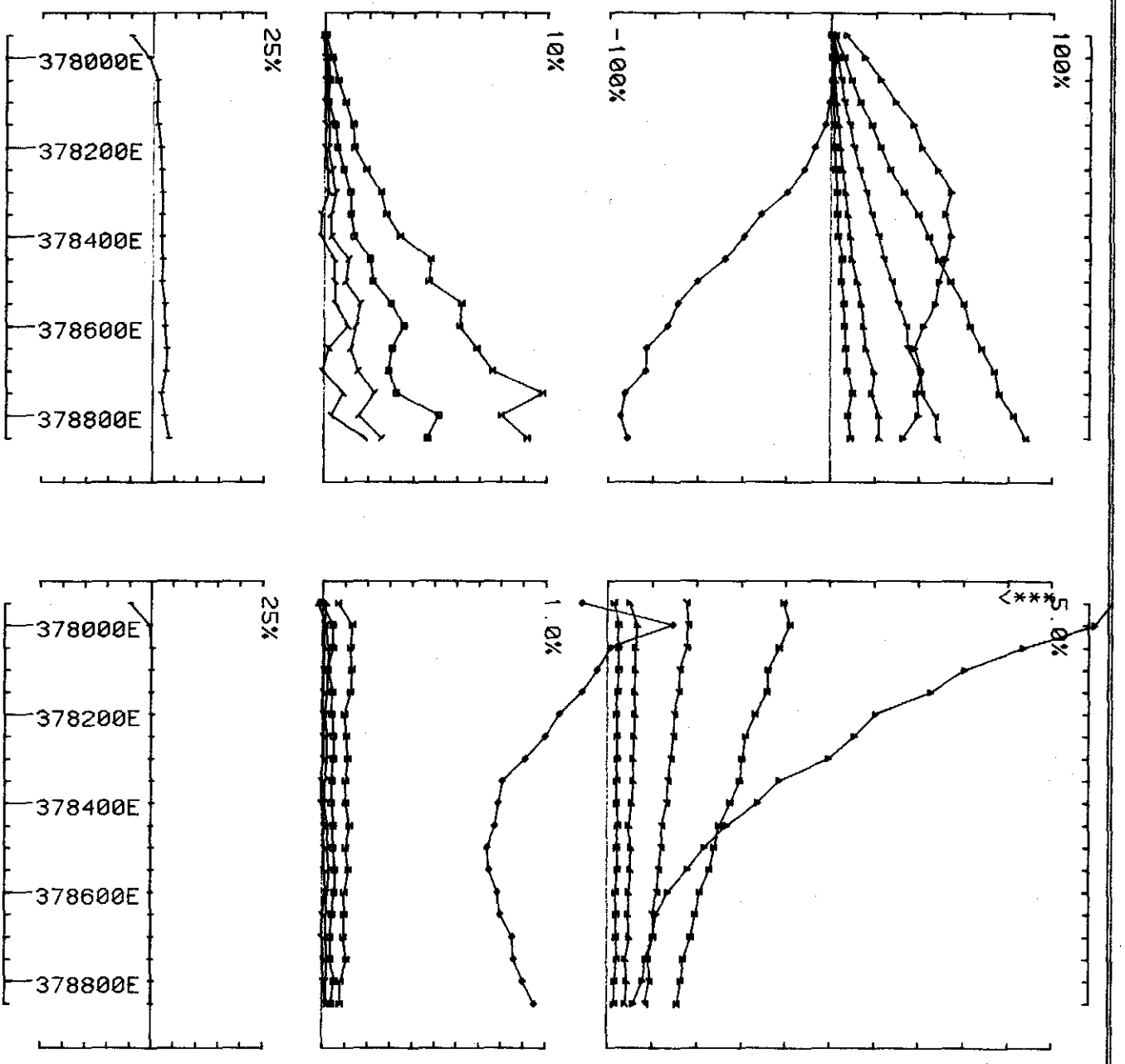
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



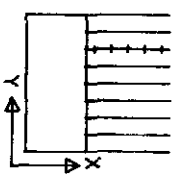
MT. KERSHAW
LOOP 0005
LINE 81500
Hz

898308

307



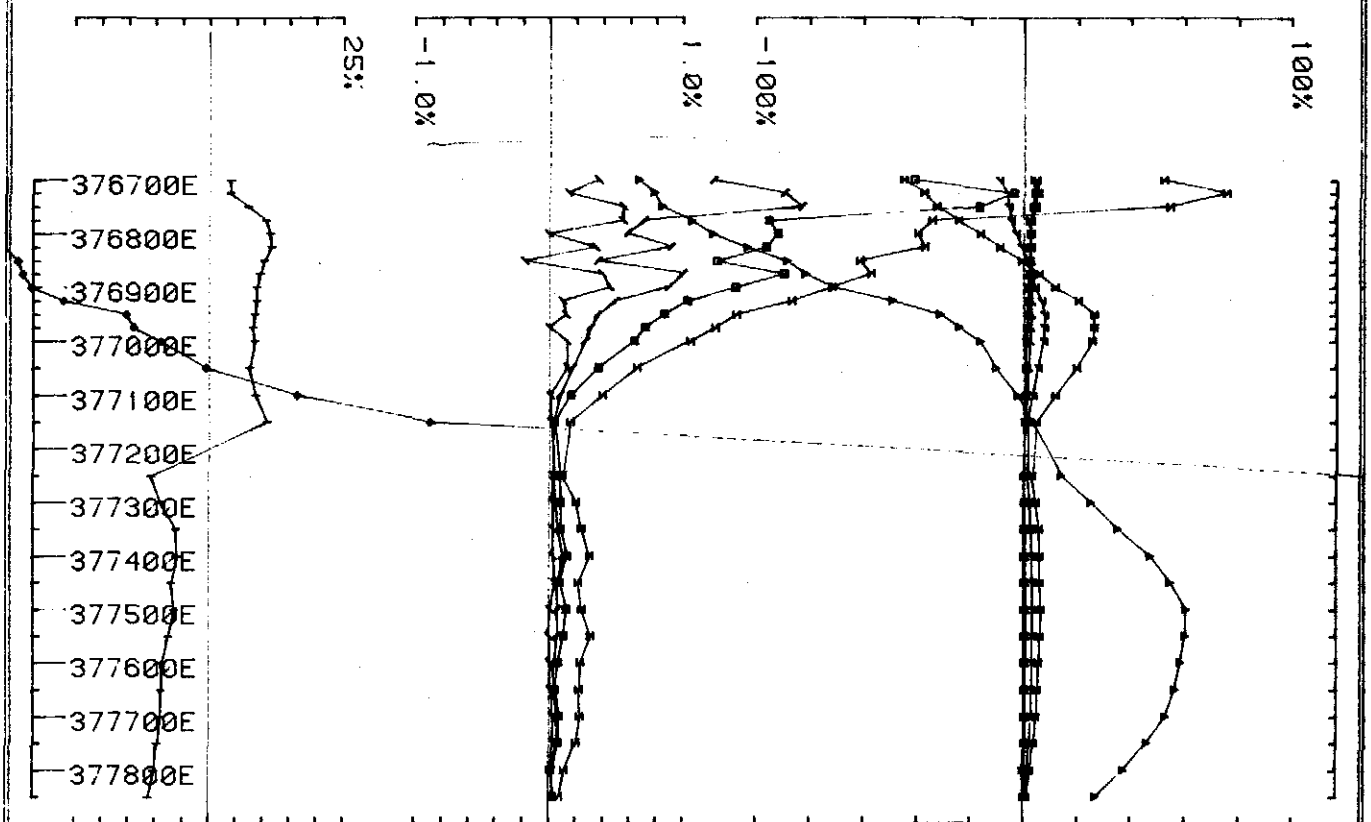
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



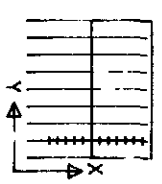
MT. KERSHAW
LOOP 0005
LINE 81700
Hz

898309

308



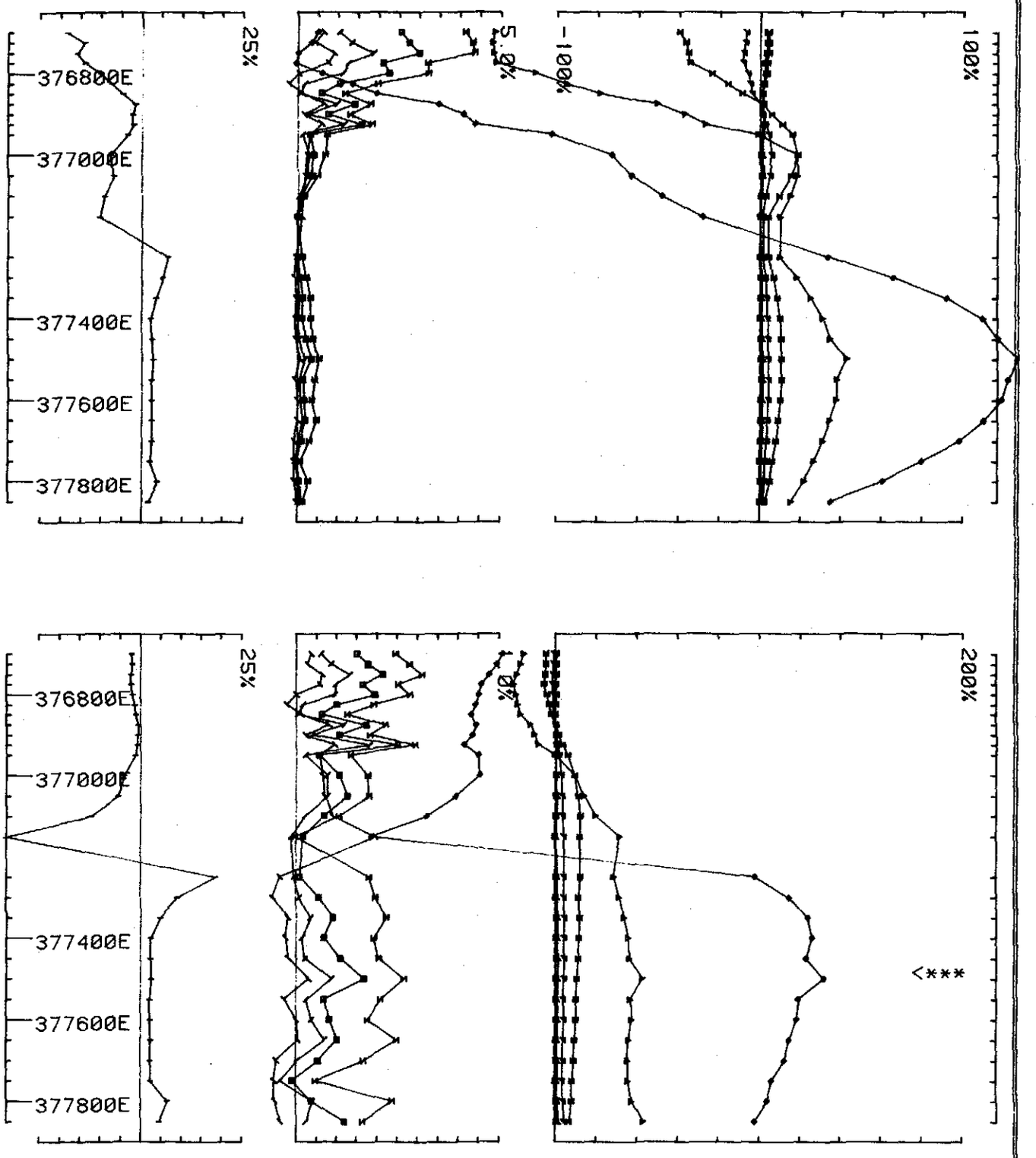
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



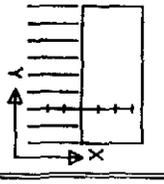
MT. KERSHAW
LOOP 0051
LINE 80700
Hz

898310

309

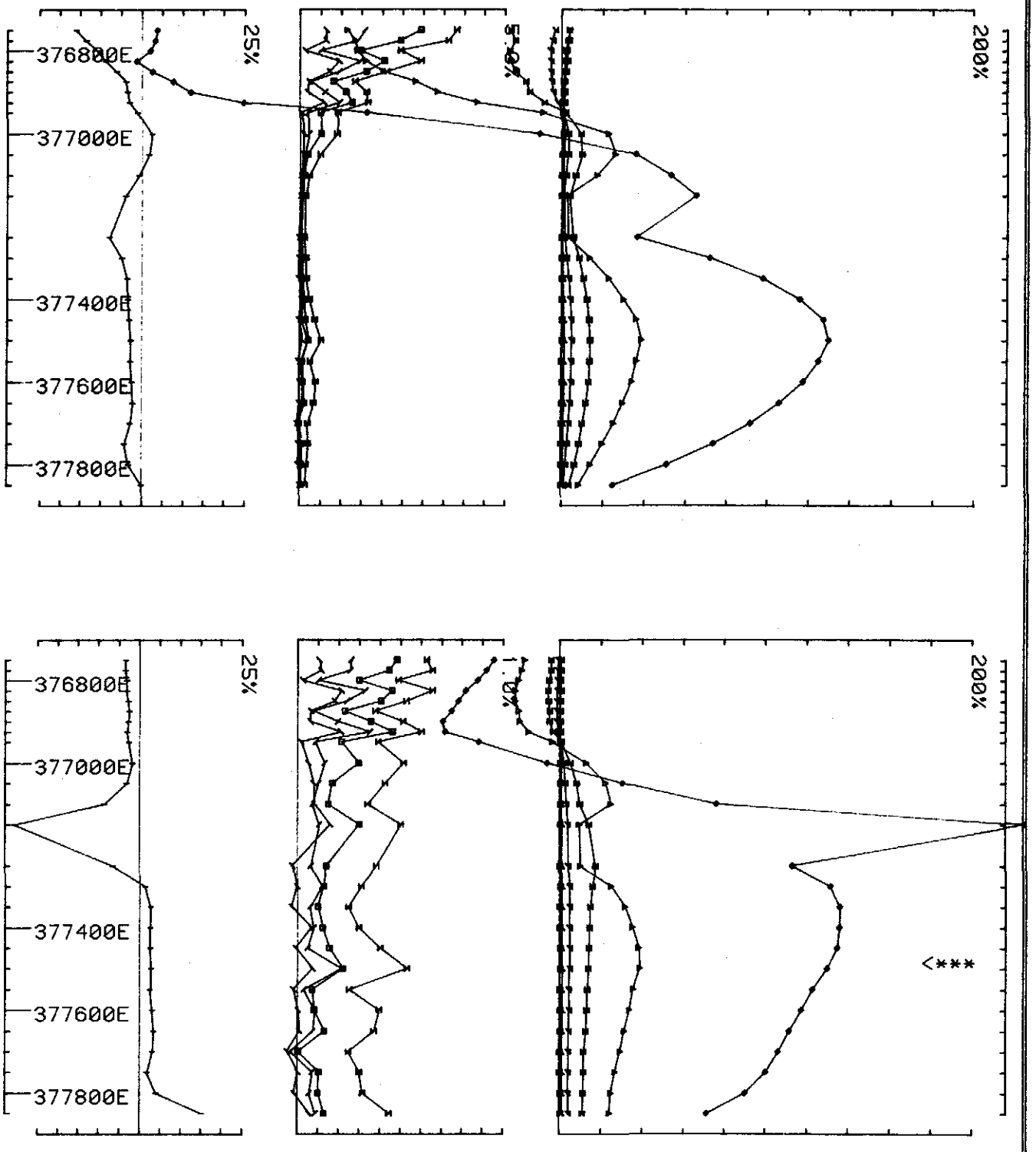


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 80900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

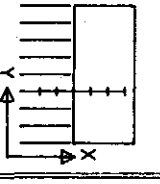


MT. KERSHAW
LOOP 0051
LINE 80900
Hz

310

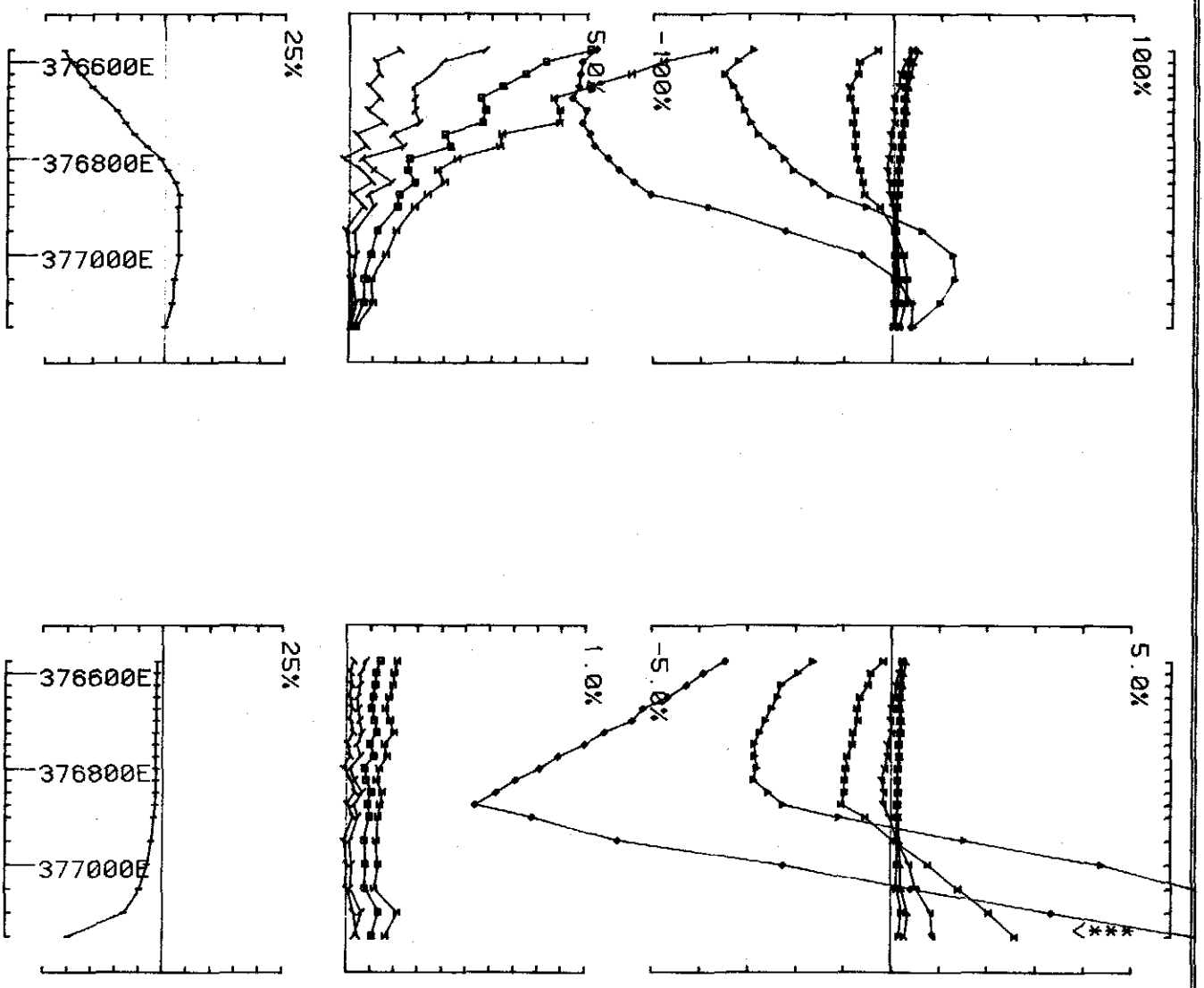


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 81100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

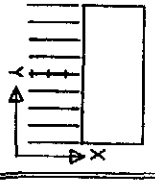


MT. KERSHAW
LOOP 8051
LINE 81100
Hz

311

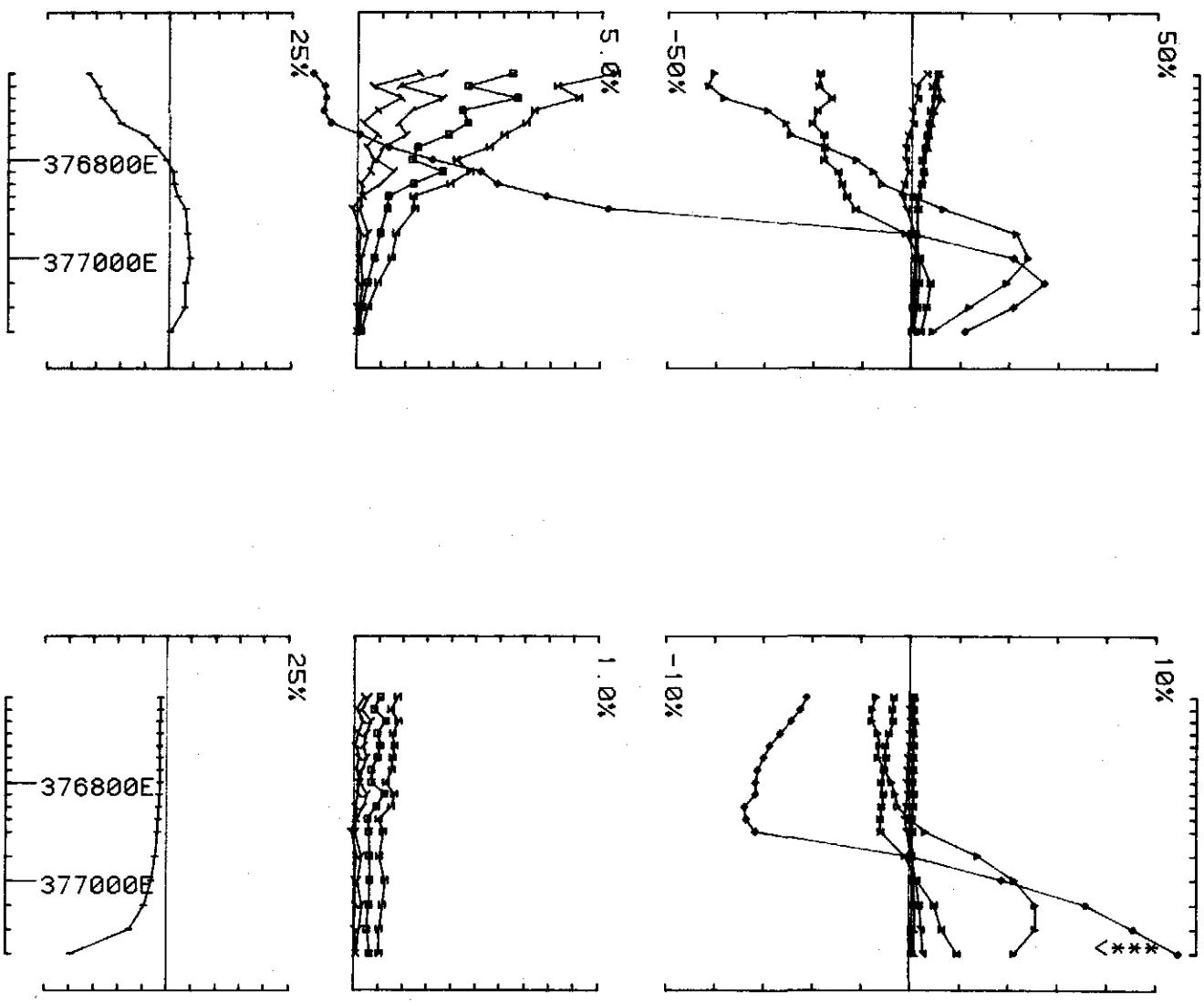


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 81300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

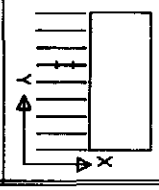


MT. KERSHAW
LOOP 0051
LINE 81300
Hz

898313



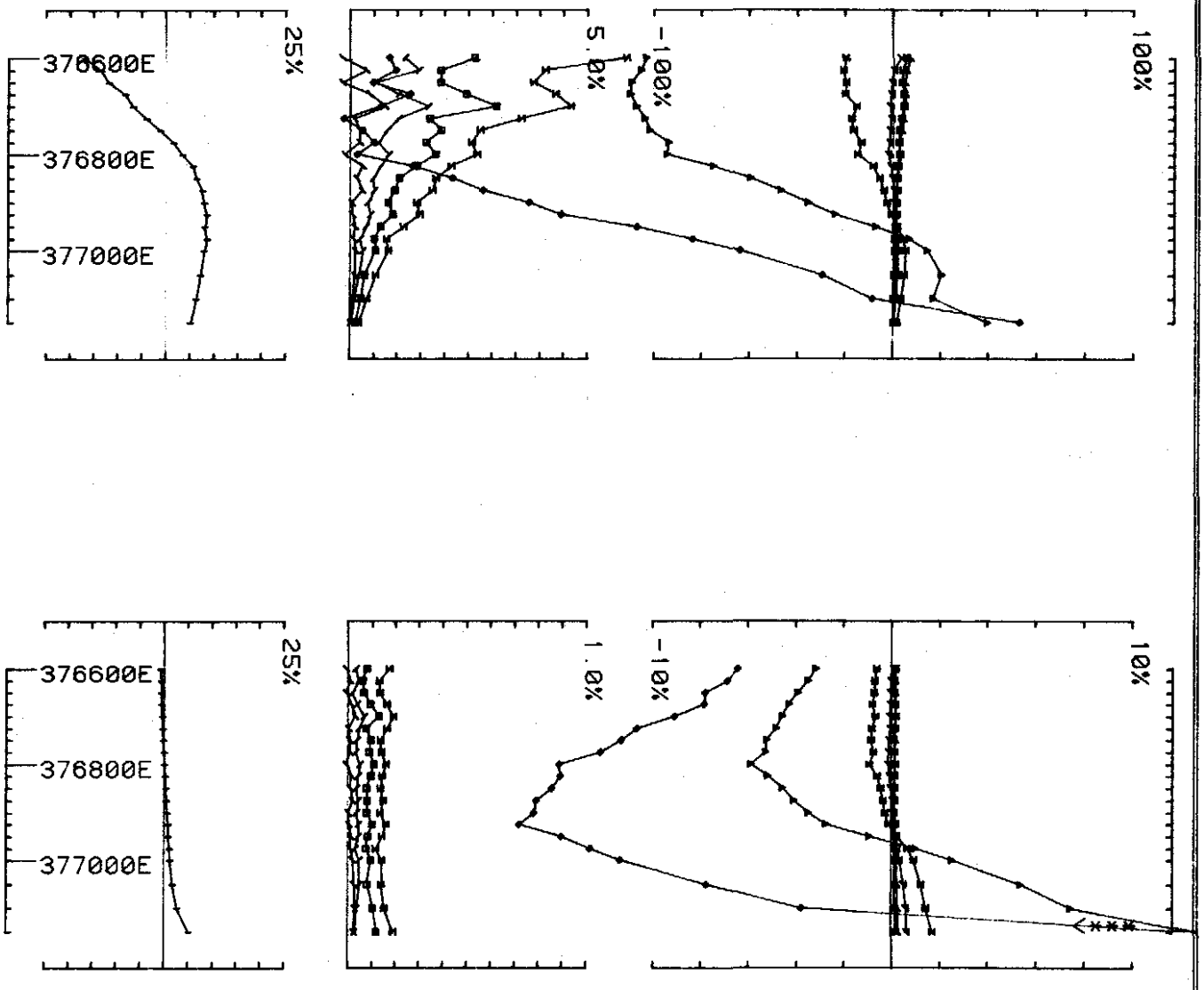
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 81500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0051
LINE 81500
Hz

313

898314



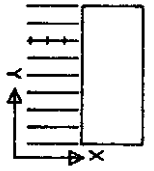
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- BM Rx10

Line 81700N Hz COMPONENT BASE FREQ :- 26.230HERTZ

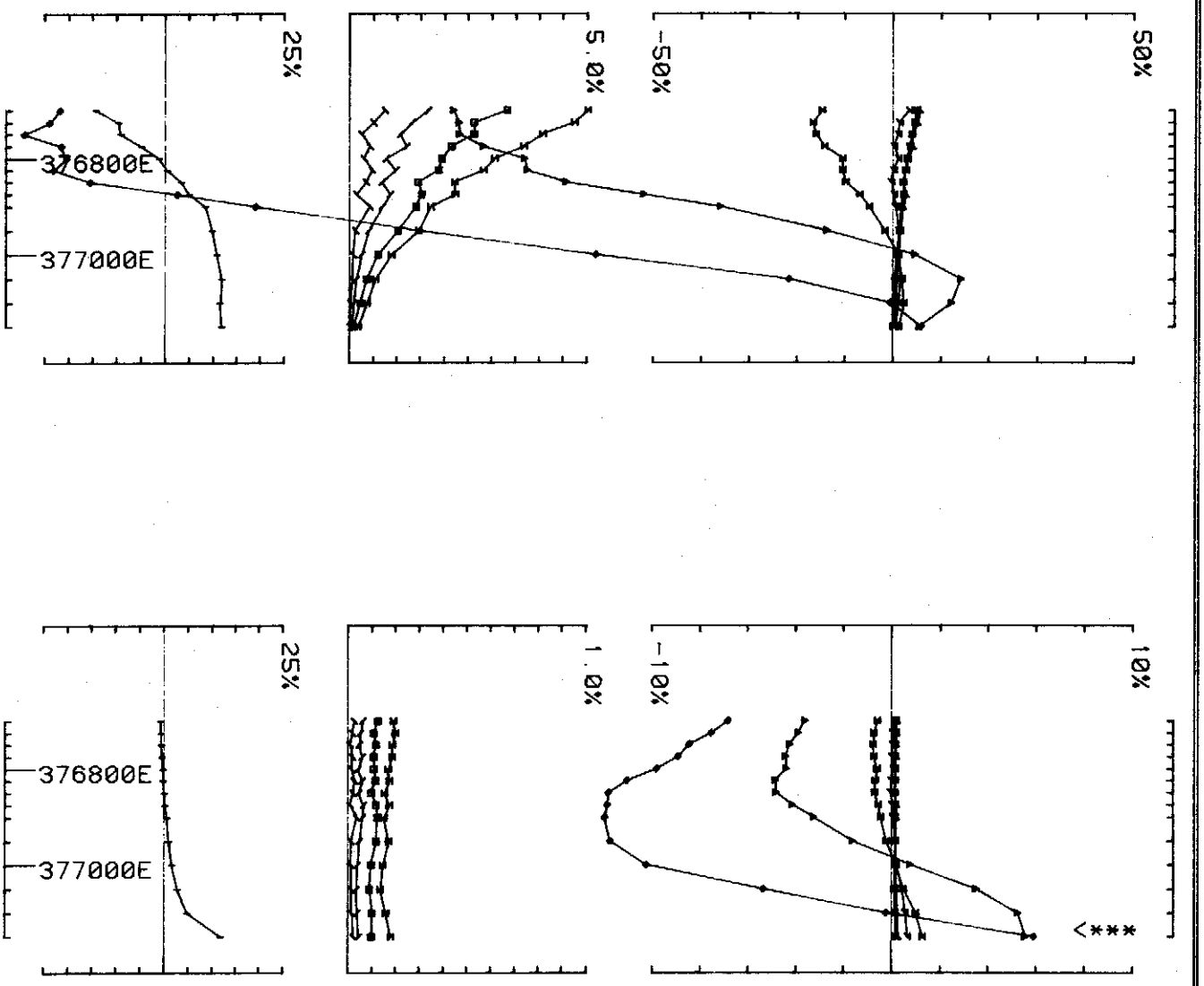
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



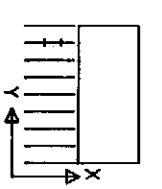
MT. KERSHAW
LOOP 0051
LINE 81700
Hz

314

898315



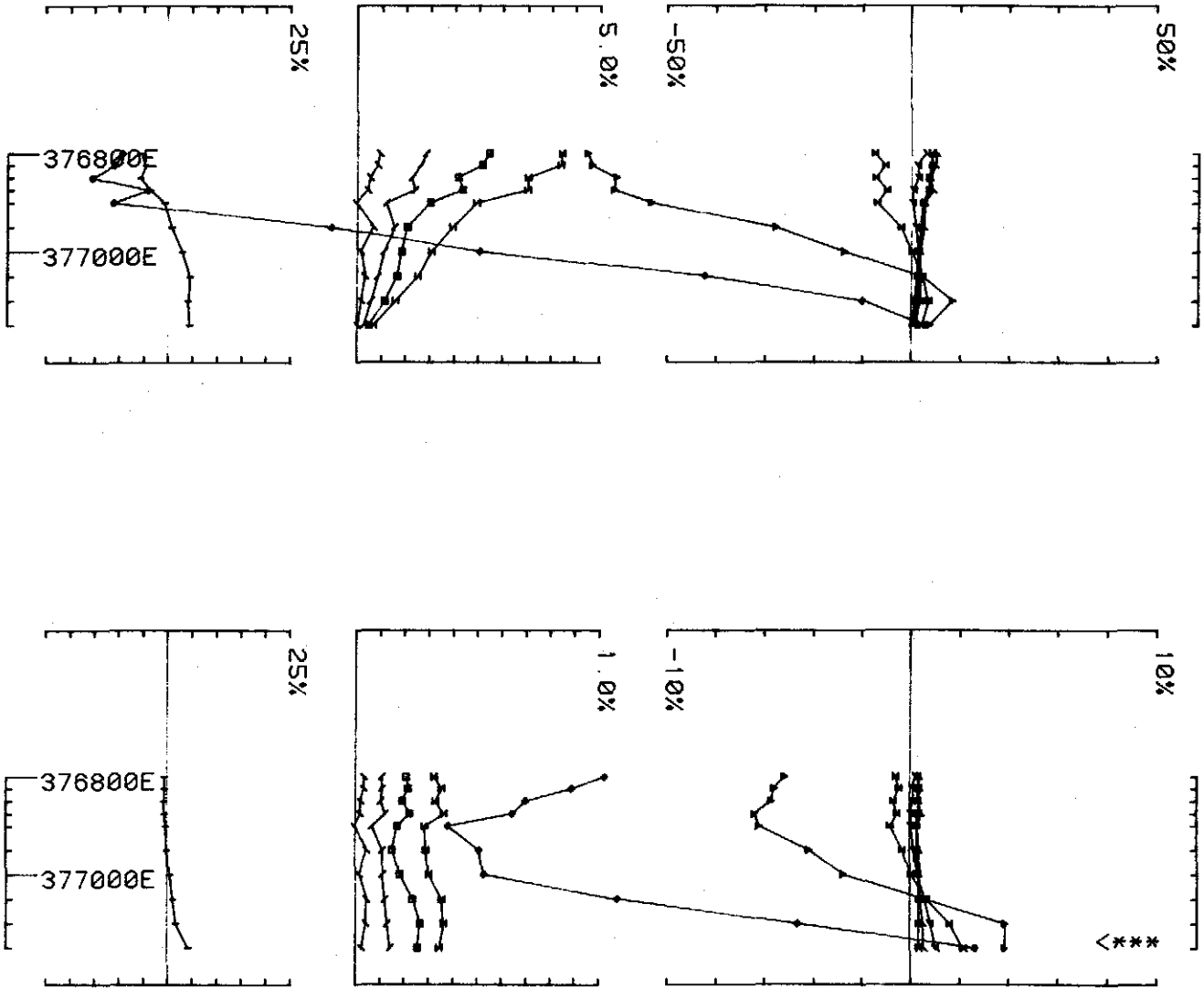
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 81900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



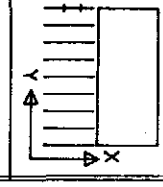
MT. KERSHAW
LOOP 0051
LINE 81900
Hz

315

898316



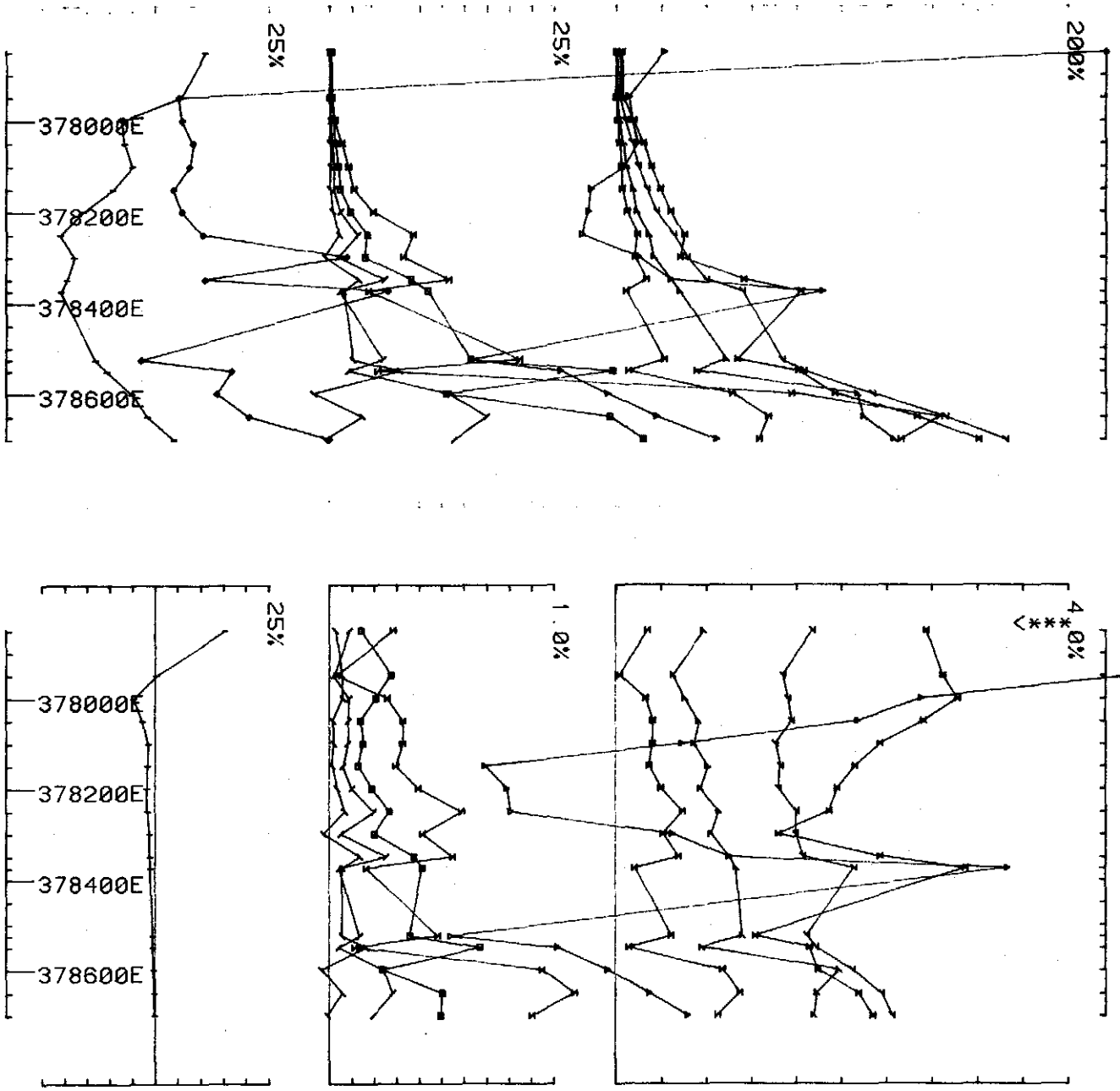
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0051
LINE 82100
Hz

316

898317



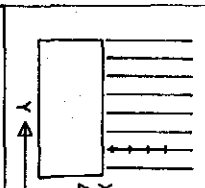
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- Mt. Kershaw

CLIENT :- B.H.P. CREW :- ART Rx10

Line 79500N Hz COMPONENT BASE FREQ :- 26.230HERTZ

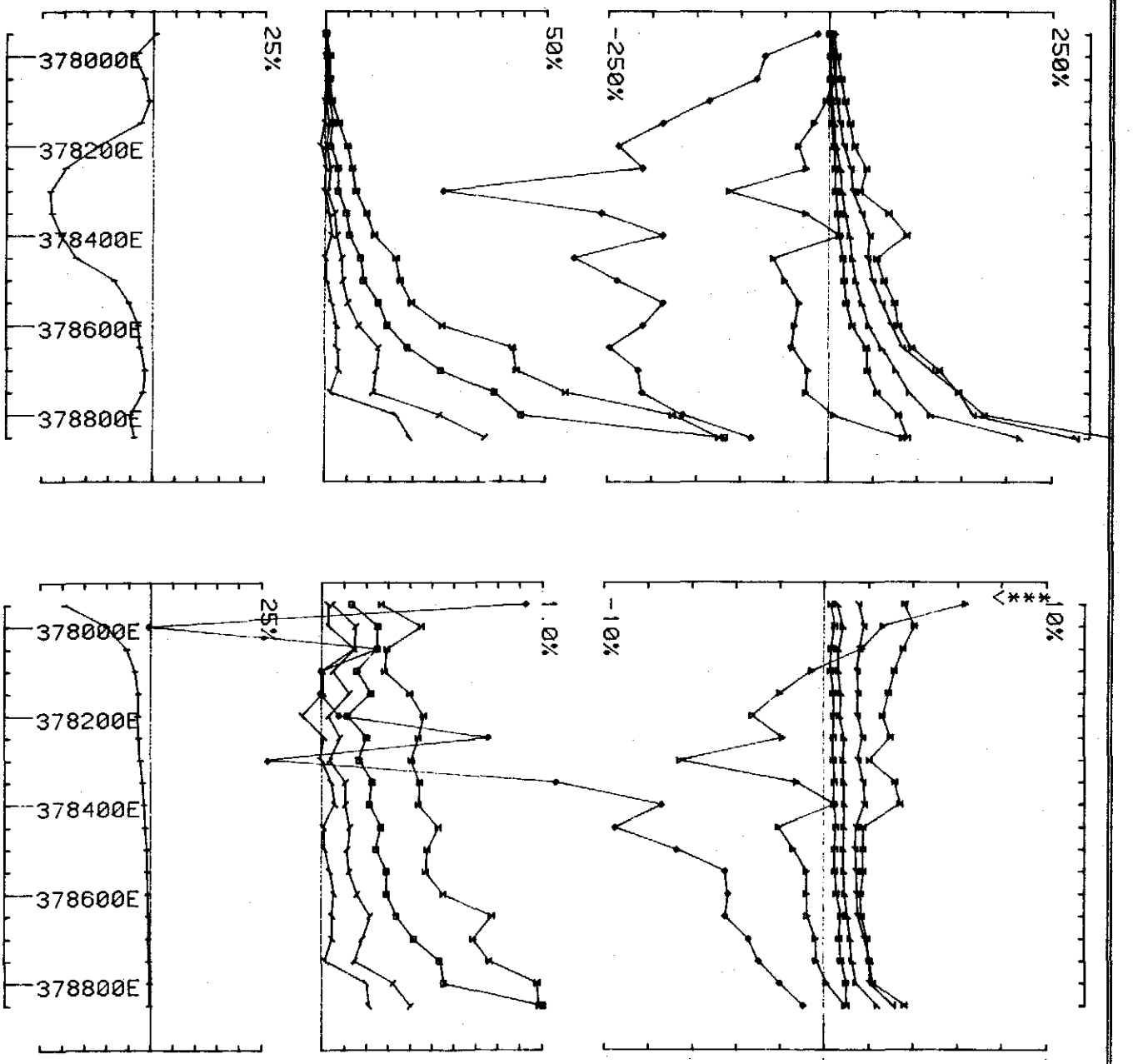
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 0006
LINE 79500
Hz

317

893318



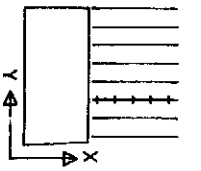
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- Mt. Kershaw

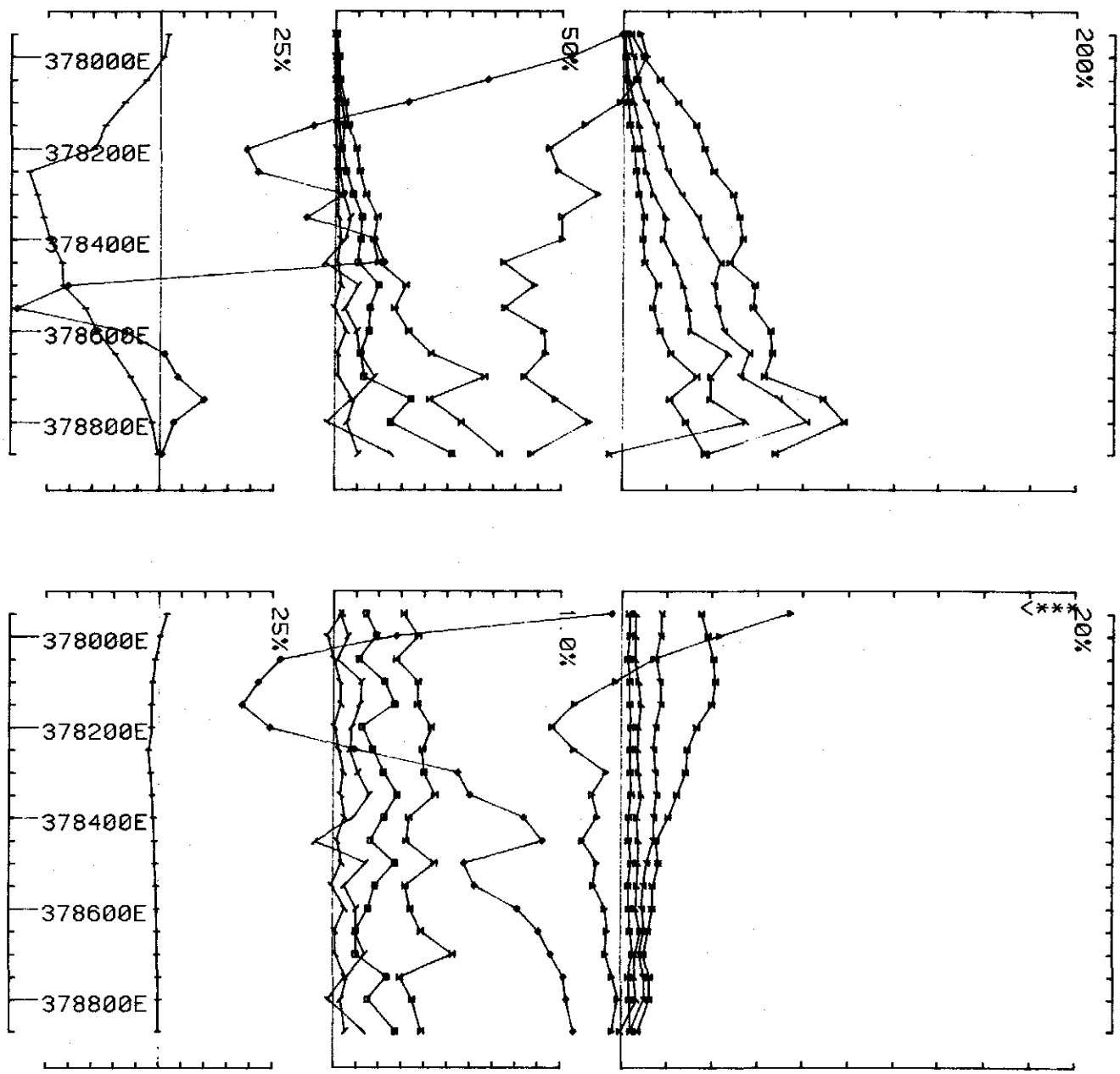
CLIENT :- B.H.P. CREW :- BM Rx10

Line 79700N Hz COMPONENT BASE FREQ :- 26.230HERTZ

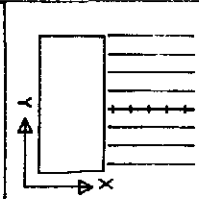
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 8006
LINE 79700
Hz



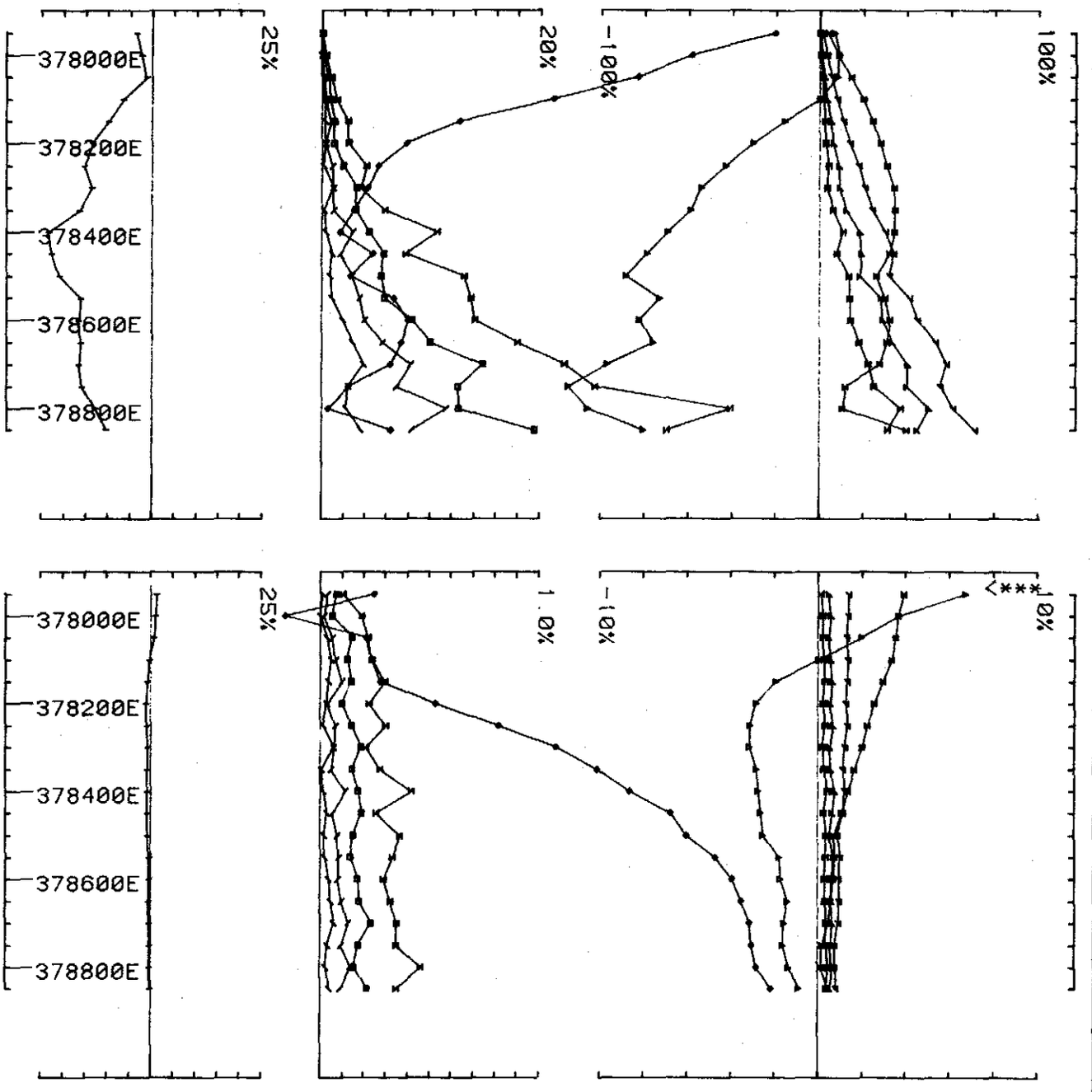
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- BM Rx10
Line 79900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



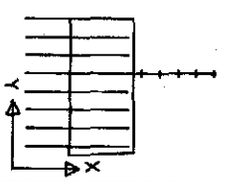
Mt. Kershaw
LOOP 0006
LINE 79900
Hz

319

898320



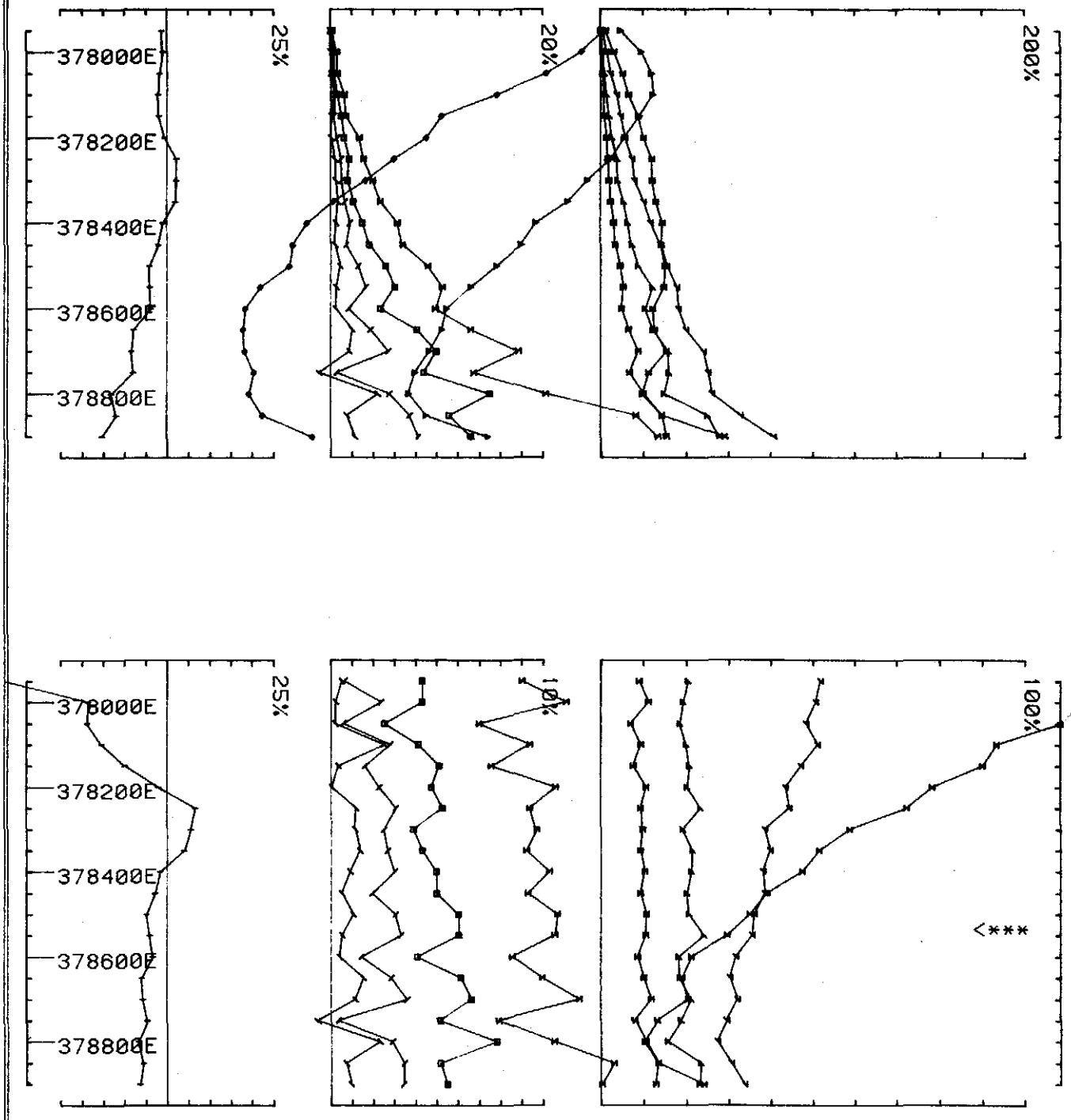
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 0006
LINE 80100
Hz

320

898321



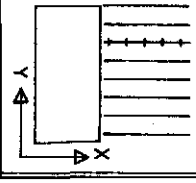
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- Mt. Kershaw

CLIENT :- B.H.P. CREW :- ART Rx10

Line 80300N Hz COMPONENT BASE FREQ :- 26.230HERTZ

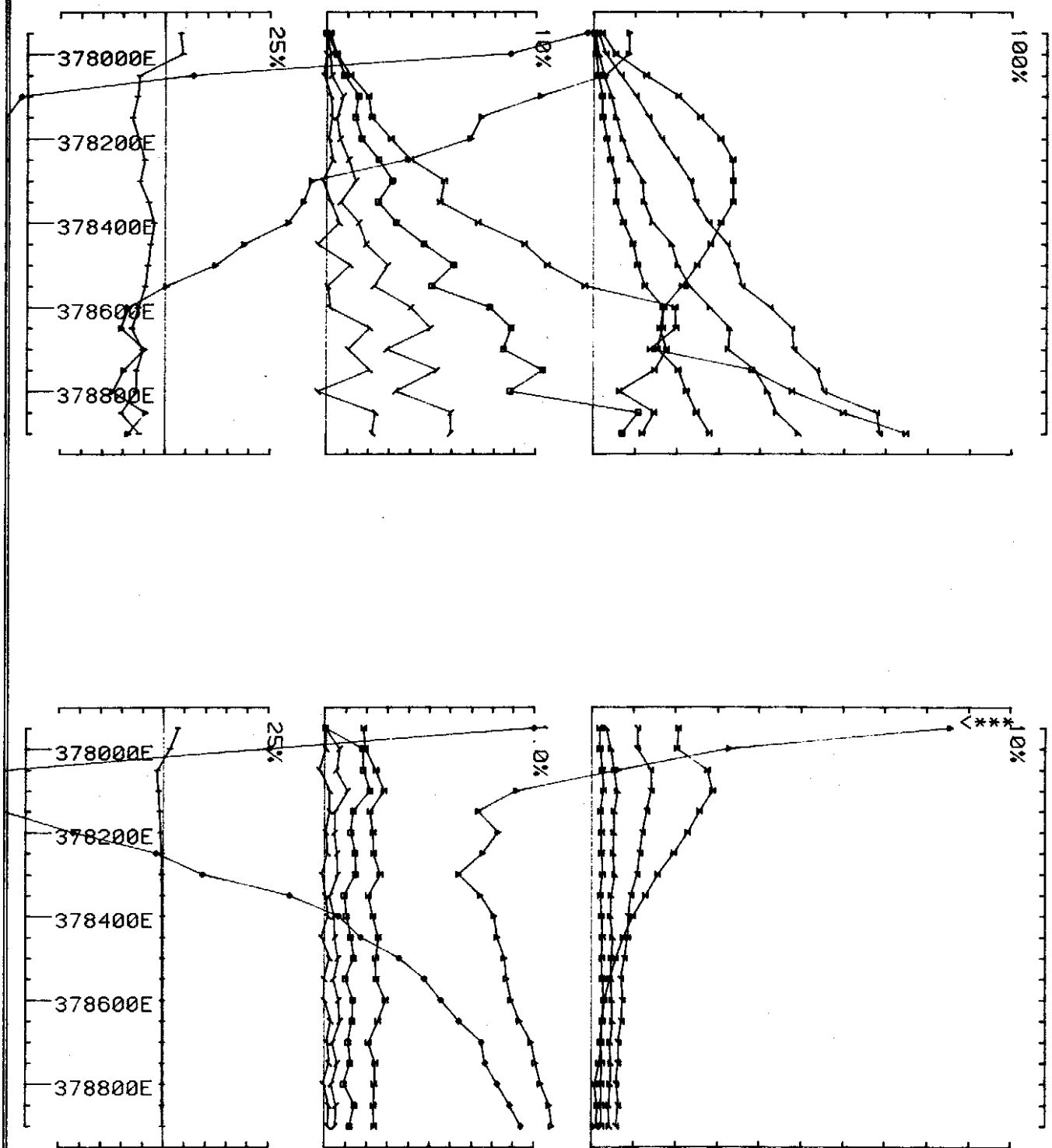
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



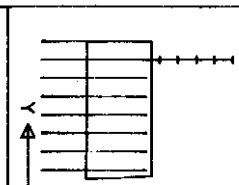
Mt. Kershaw
LOOP 0006
LINE 80300
Hz

321

898322



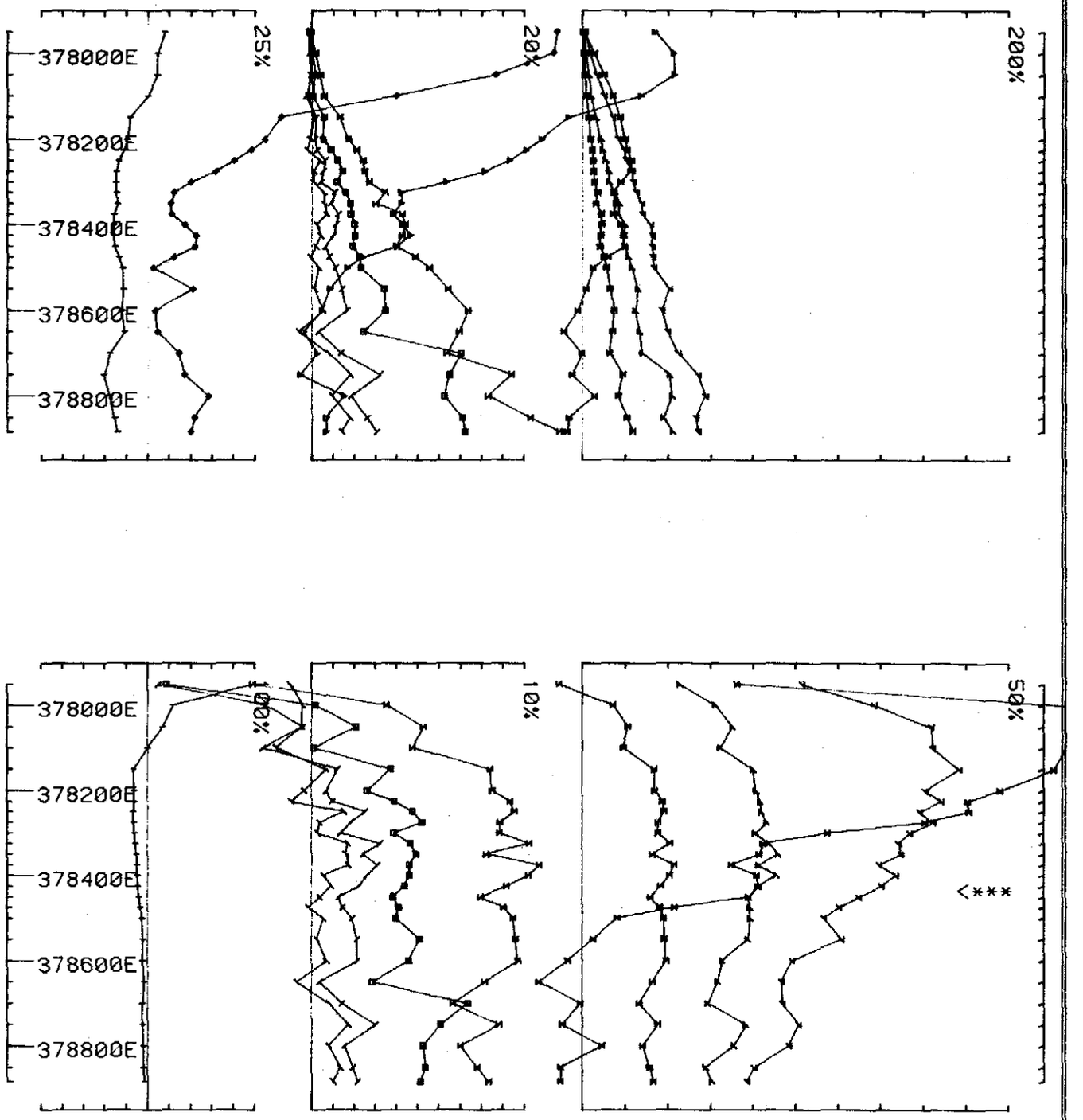
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- ART RH Rx8
Line 80500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 8006
LINE 80500
Hz

322

898323



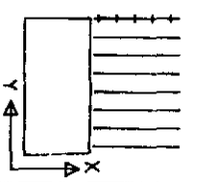
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- Mt. Kershaw

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ

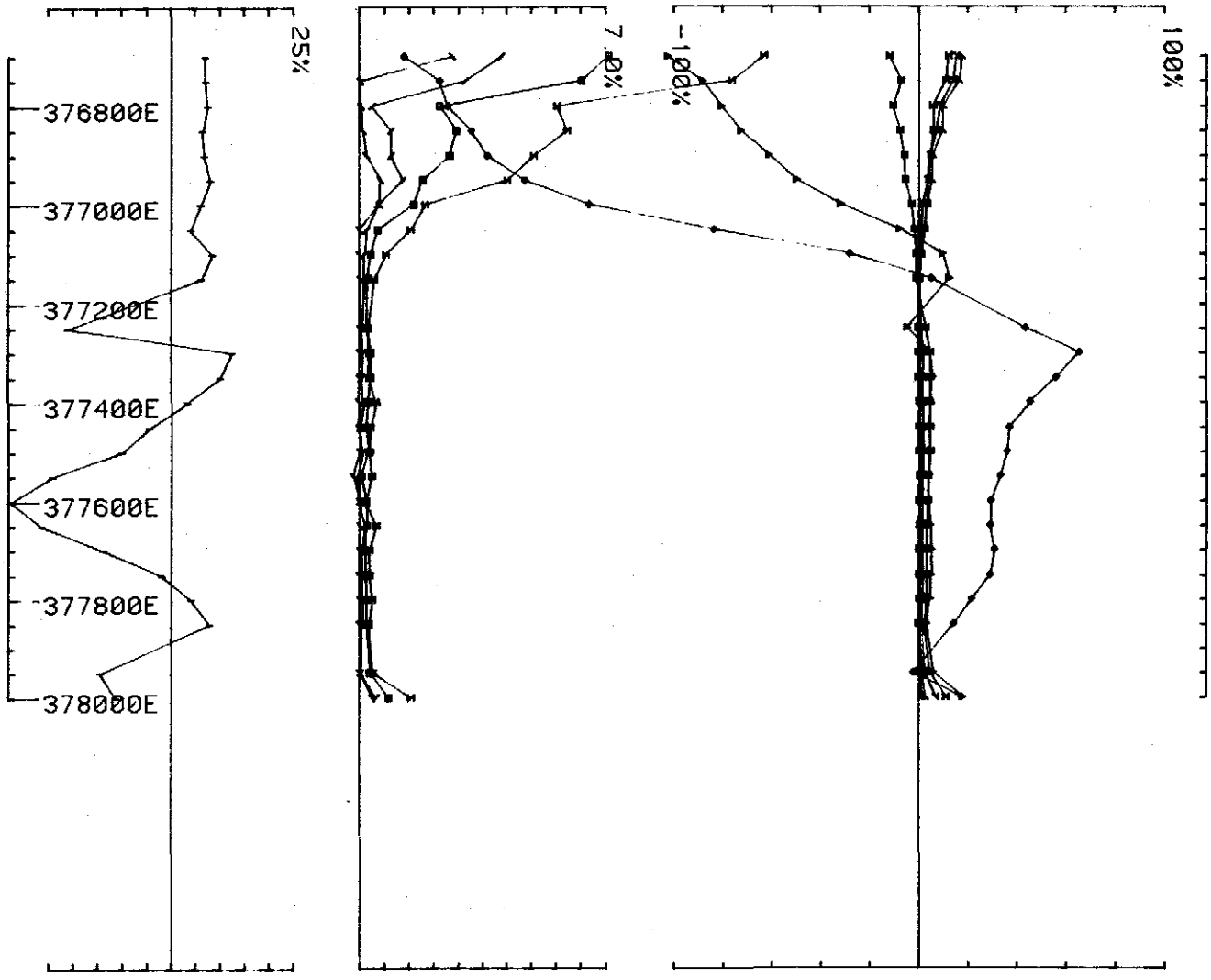
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 0006
LINE 80700
Hz

898324

323

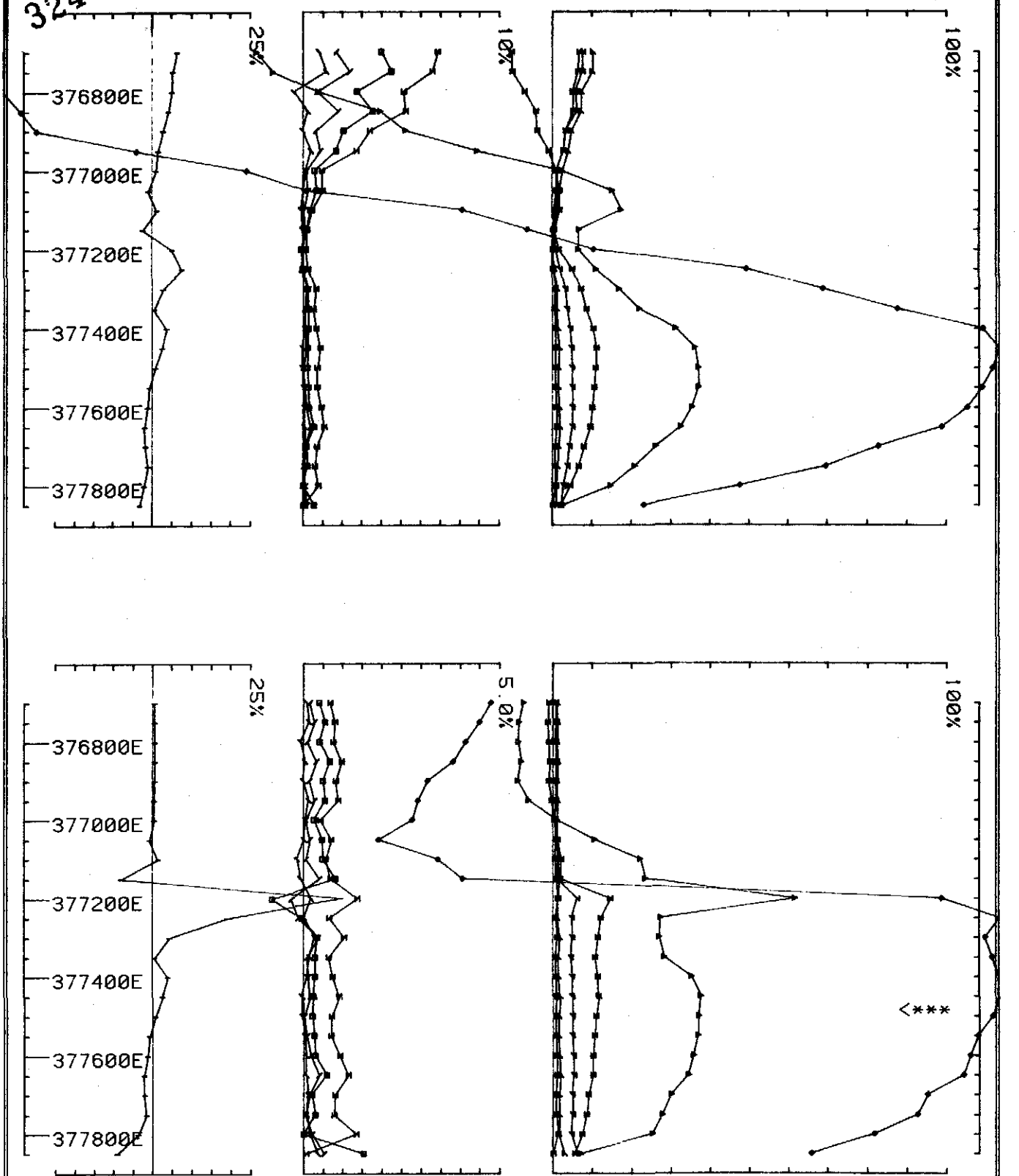


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 79300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

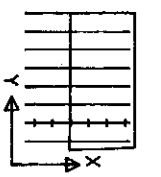
Mt. Kershaw
LOOP 8061
LINE 79300
Hz

898325

324

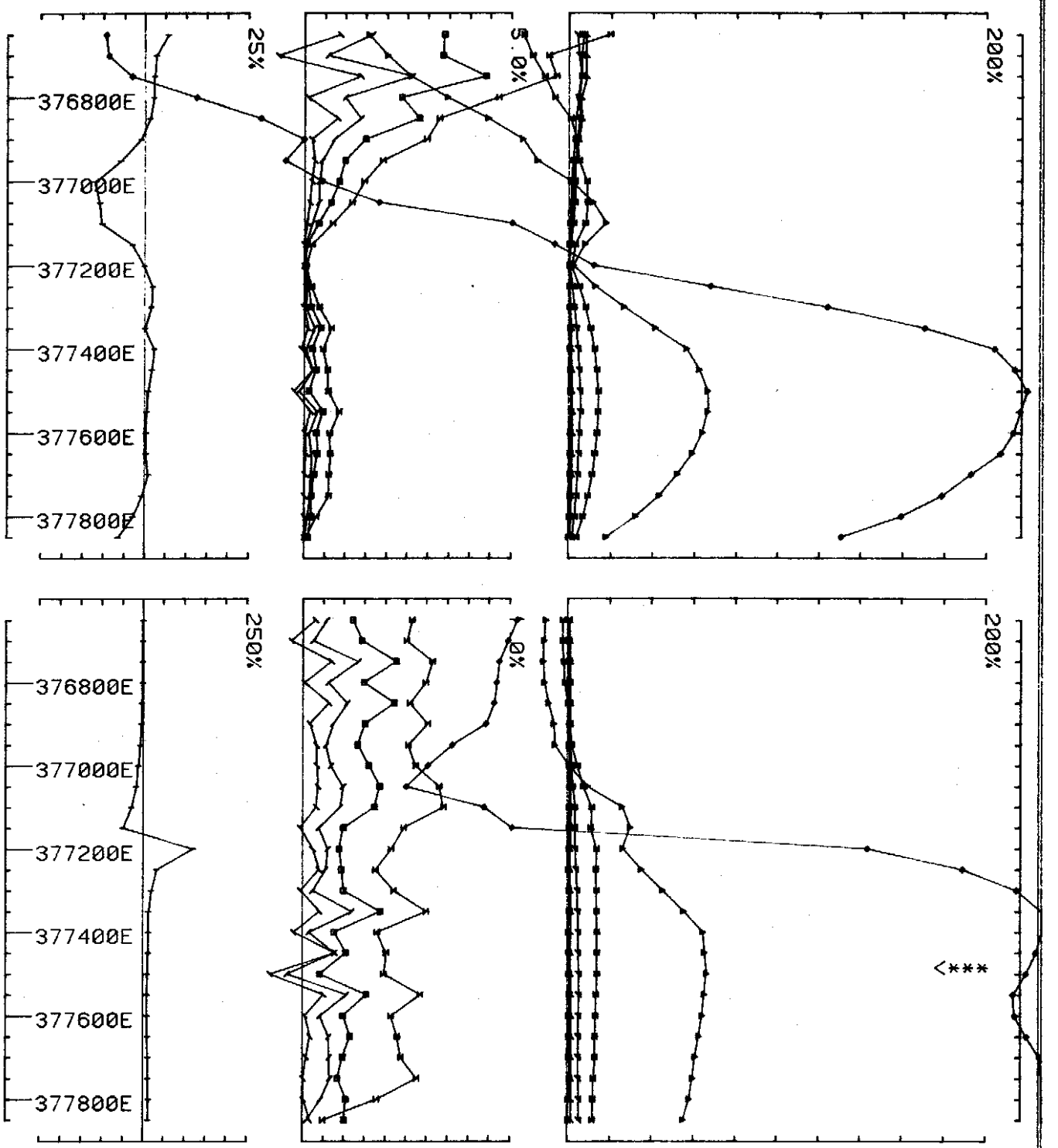


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- ART Rx8
Line 79500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

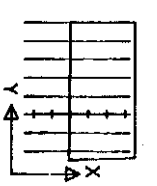


Mt. Kershaw
LOOP 0061
LINE 79500
Hz

325

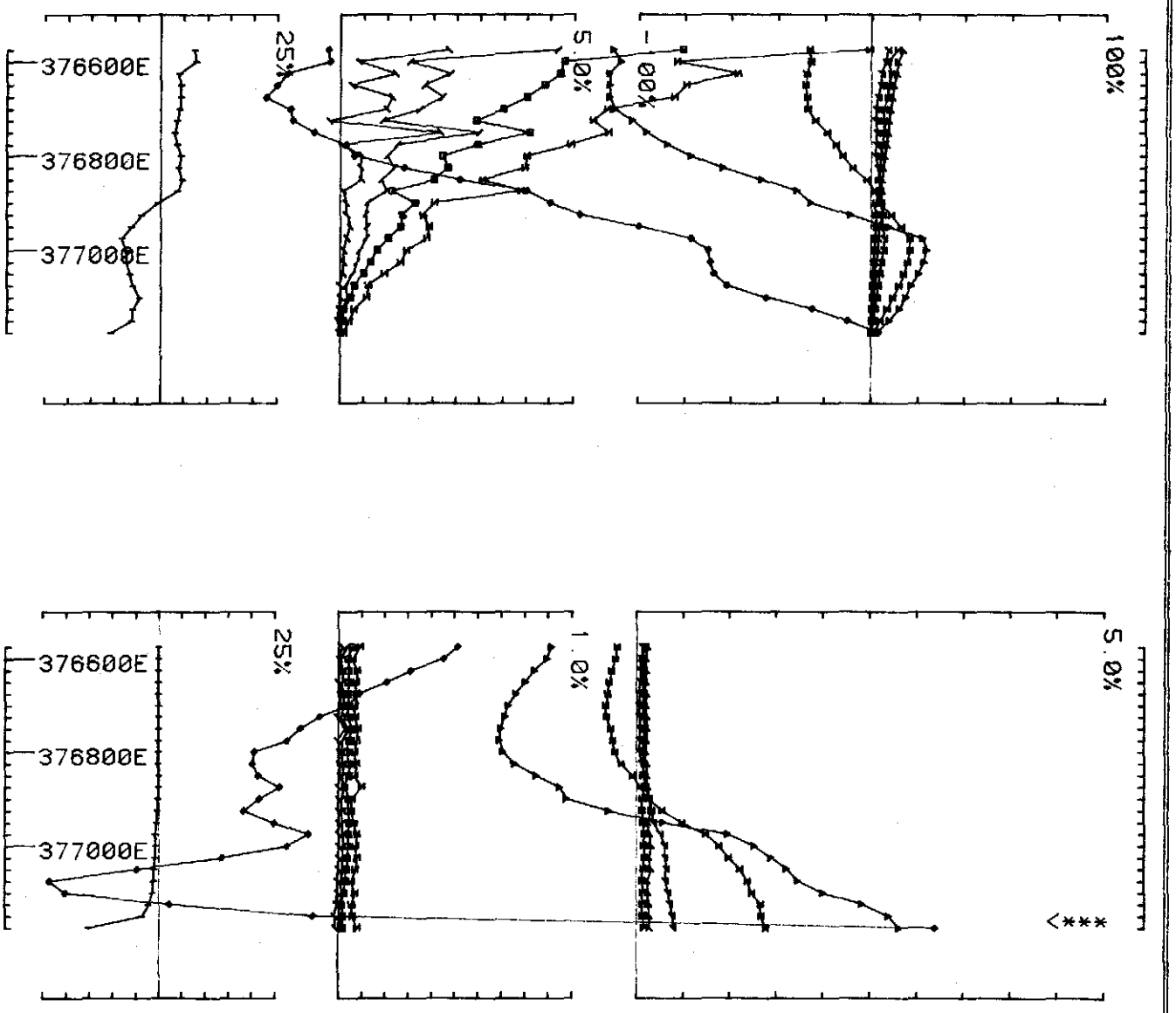


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 79700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 0061
LINE 79700
Hz

320

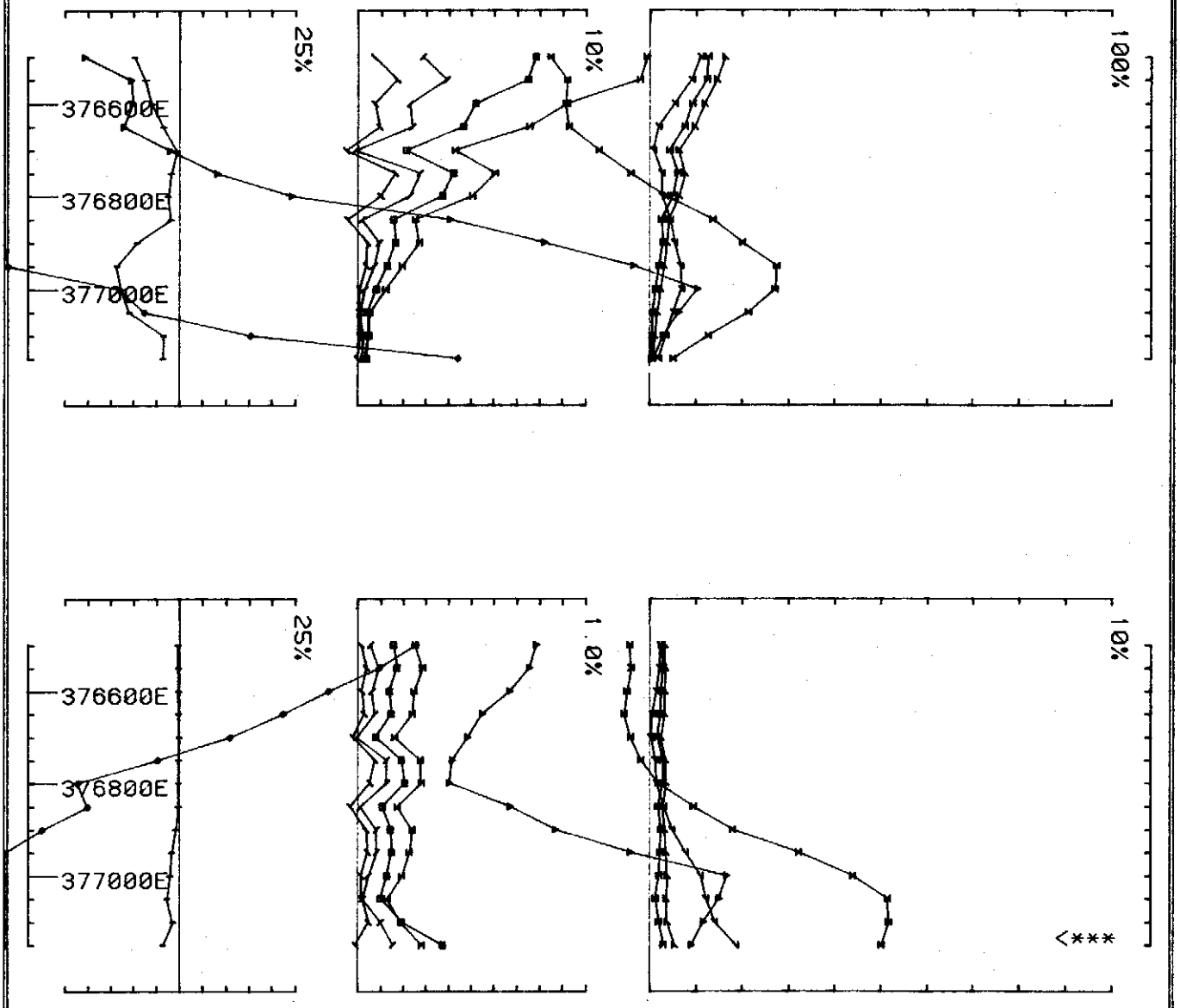


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 79900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

Mt. Kershaw
LOOP 0061
LINE 79900
Hz

898328

327

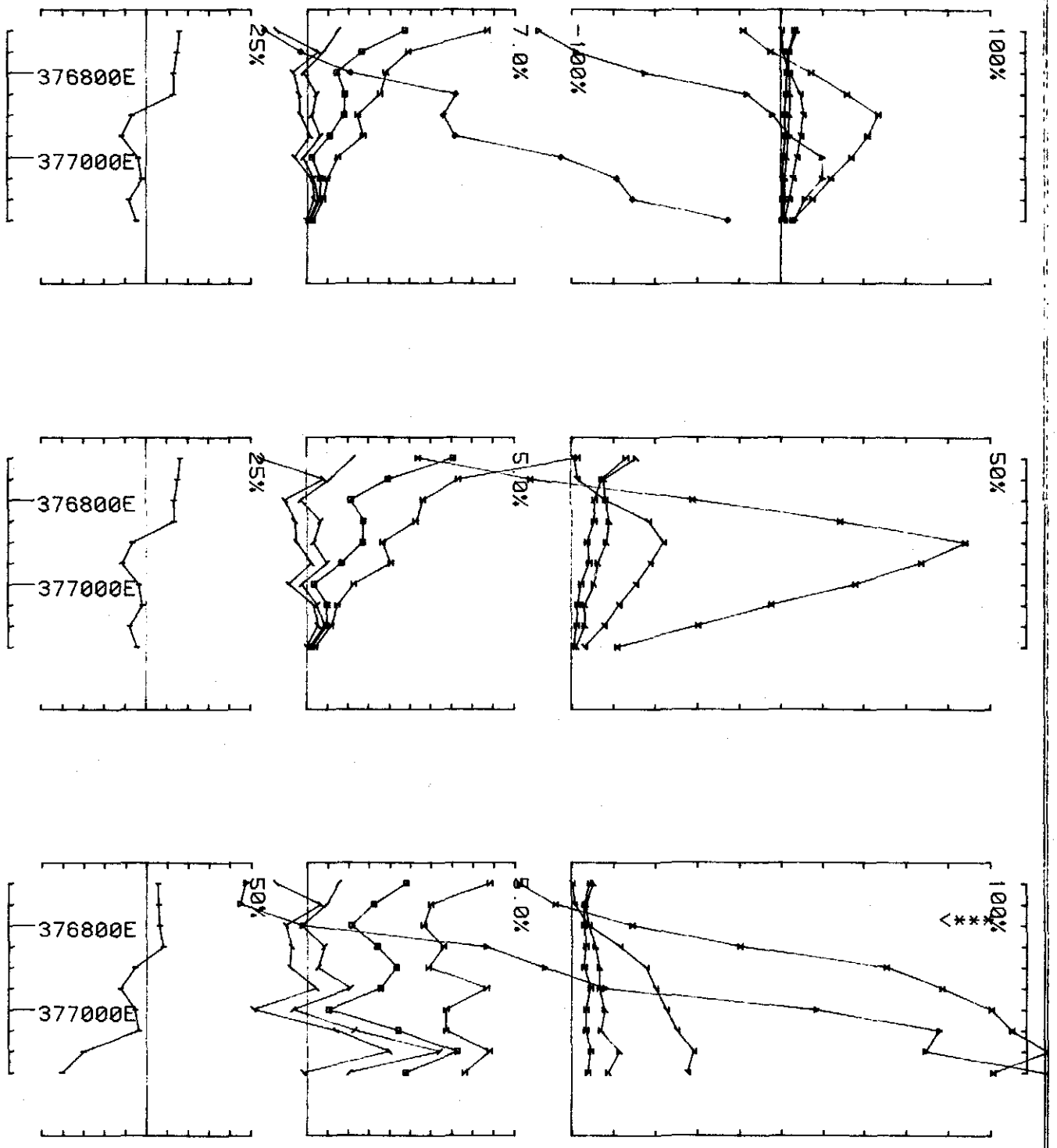


LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- ART RH Rx8
Line 80100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

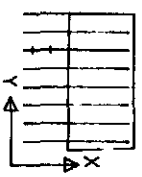
Mt. Kershaw
LOOP 0061
LINE 80100
Hz

328

898329



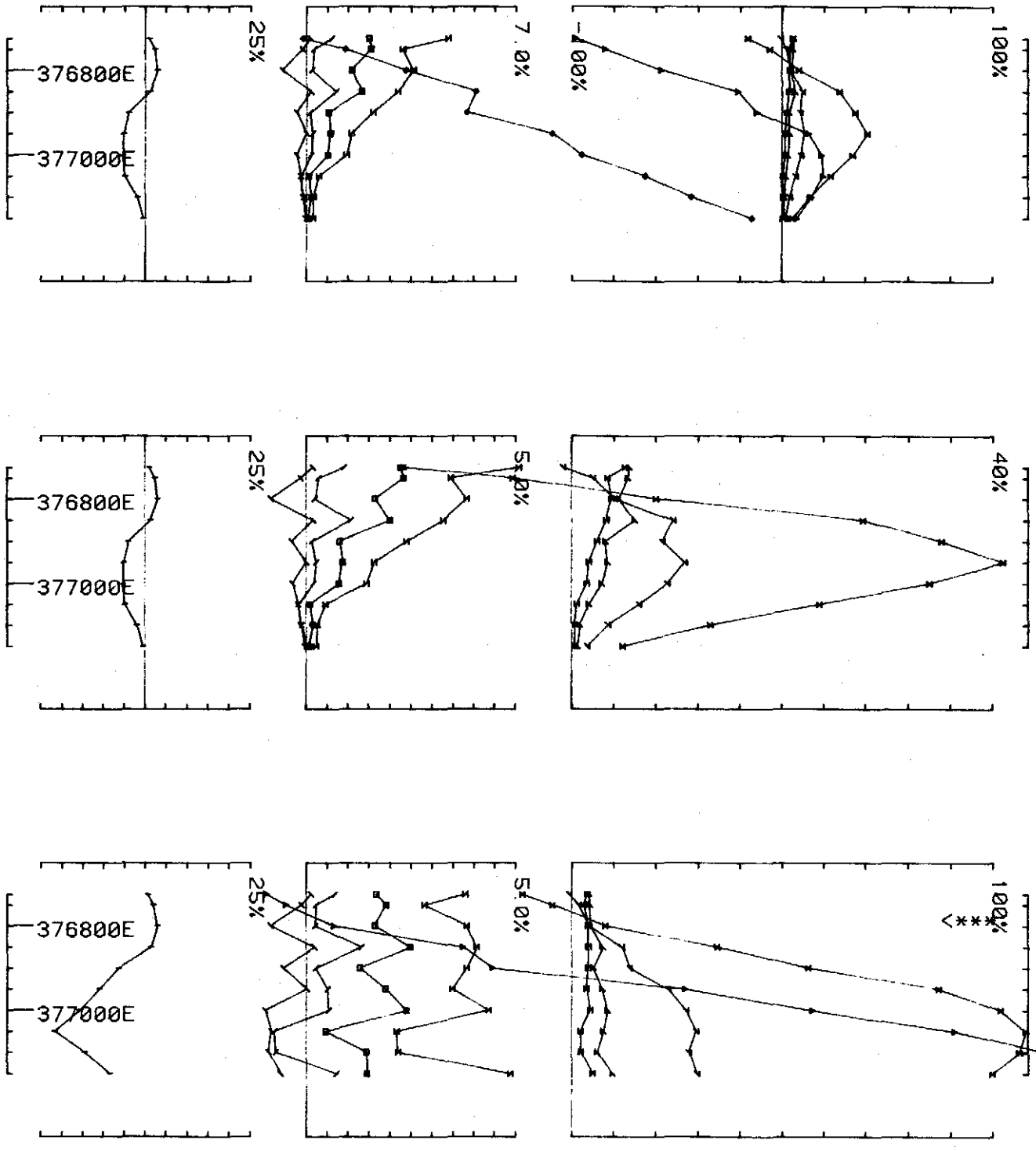
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



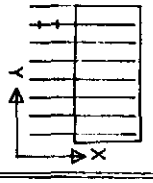
Mt. Kershaw
LOOP 0061
LINE 80300
Hz

329

898330



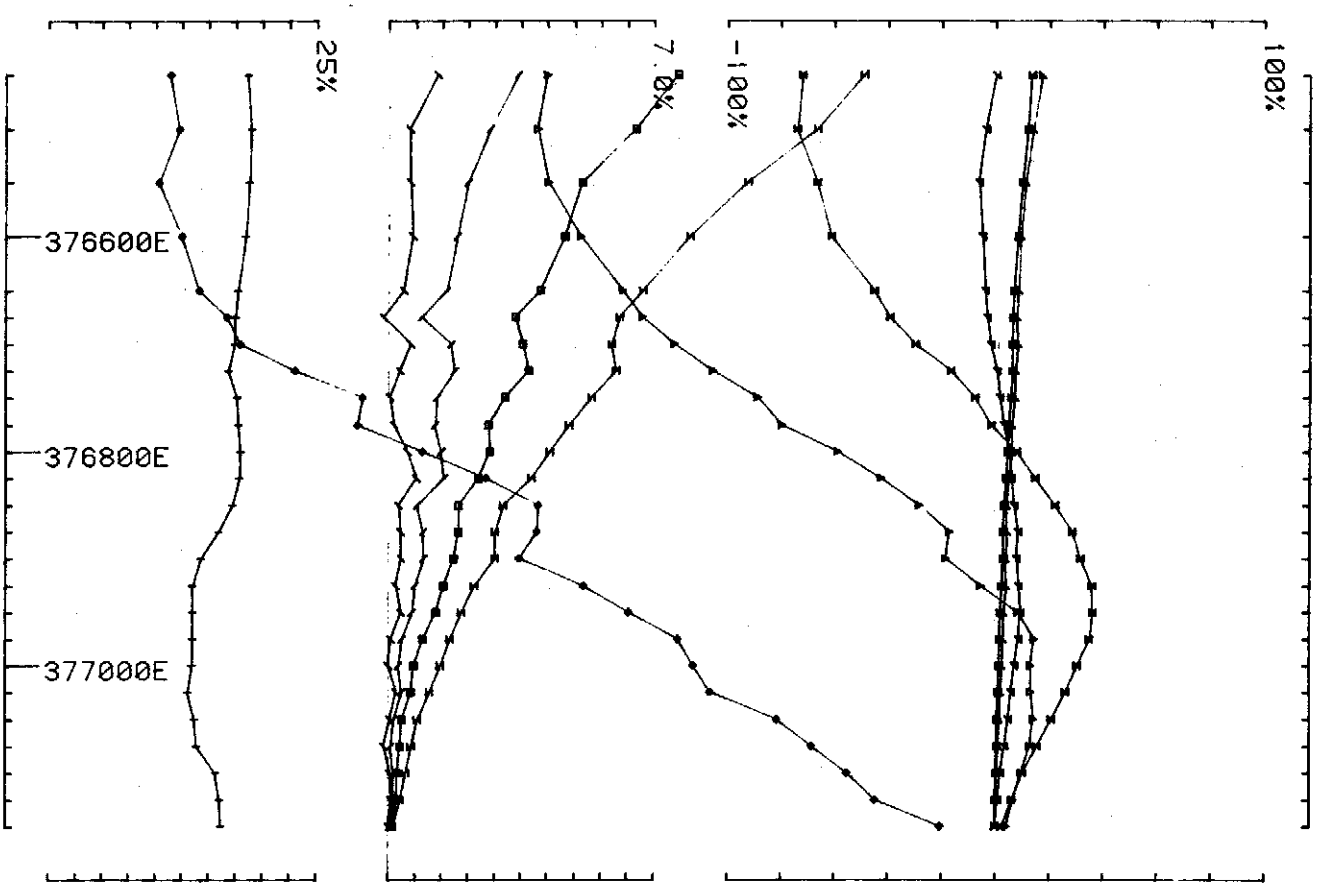
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



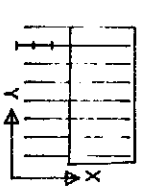
Mt. Kershaw
LOOP 0061
LINE 80500
Hz

330

898331



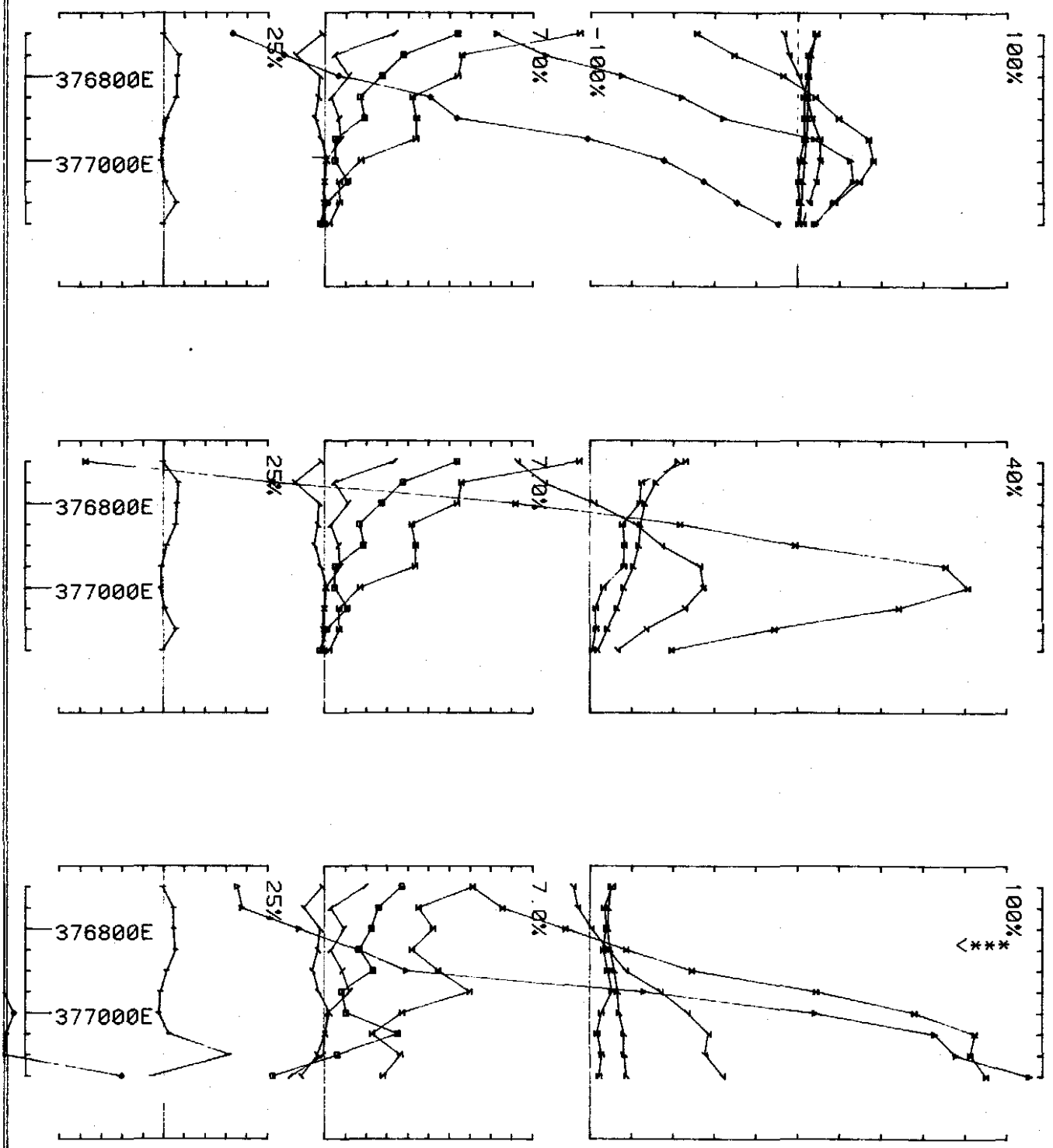
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 0061
LINE 80500
Hz

331

898332



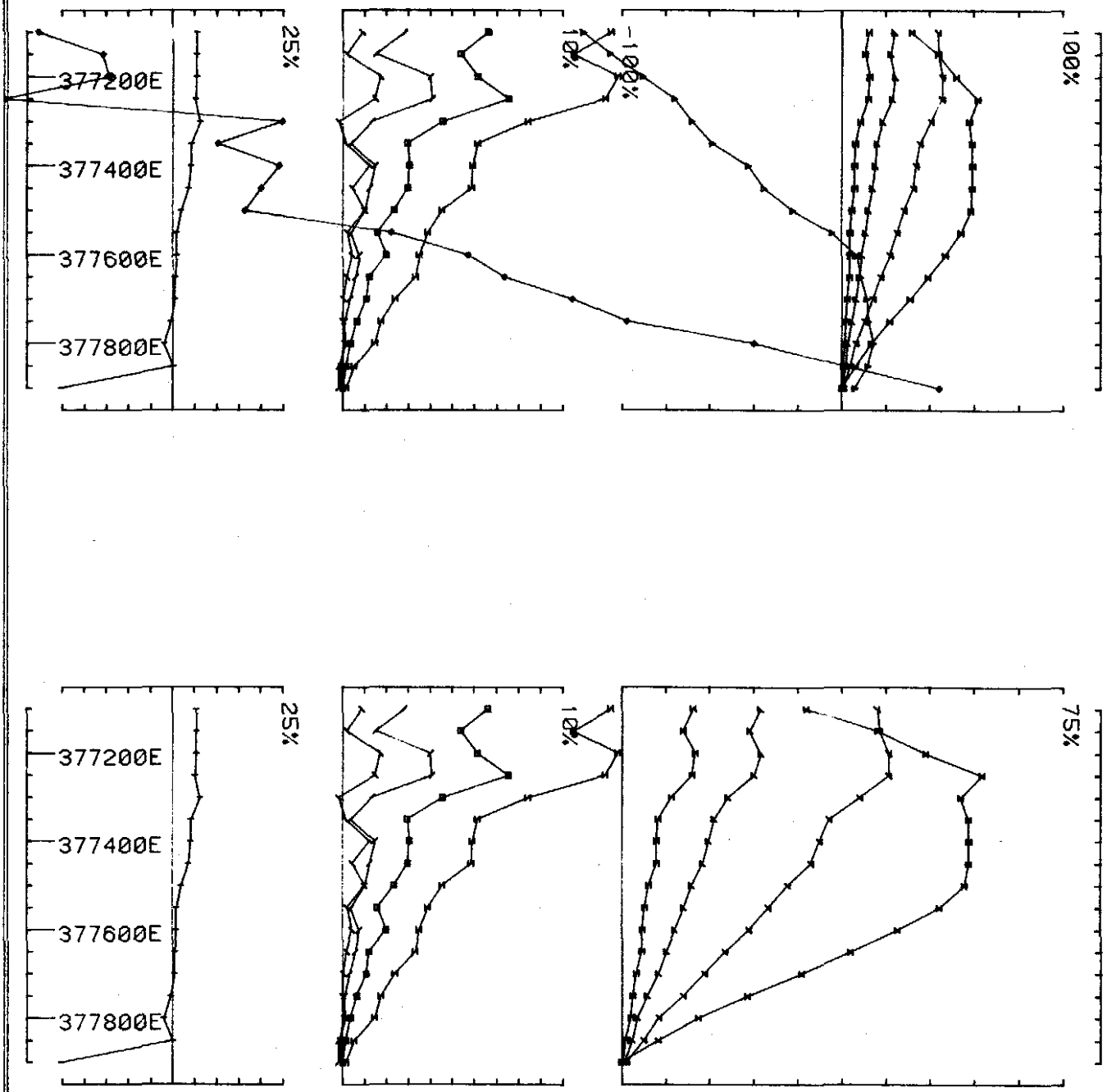
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

Y
X

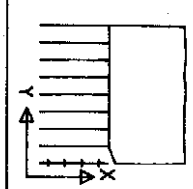
Mt. Kershaw
LOOP 0061
LINE 80700
Hz

332

898333



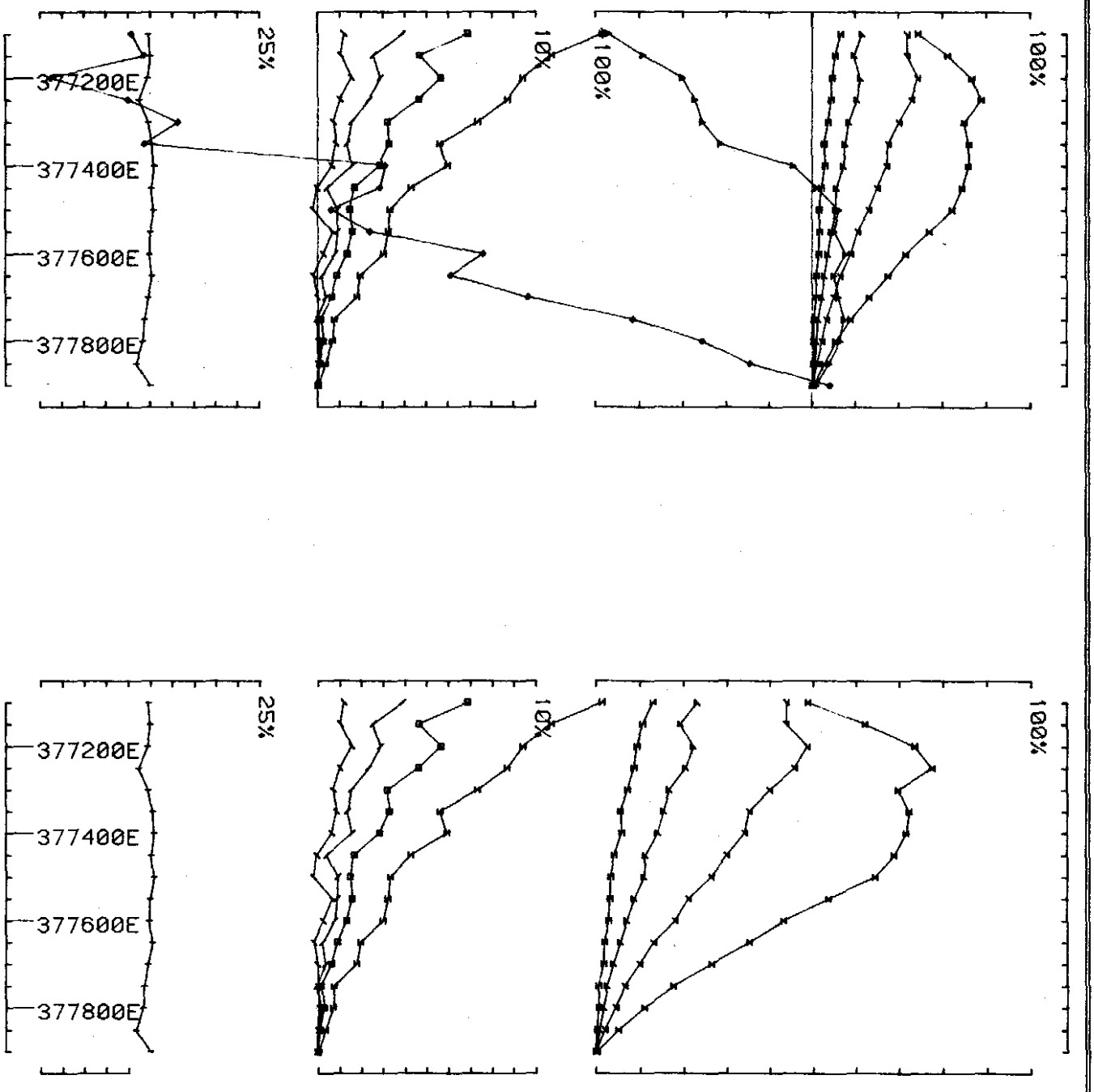
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



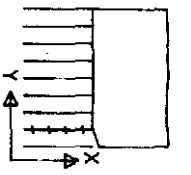
MT. KERSHAW
LOOP 8071
LINE 80500
Hz

898334

333



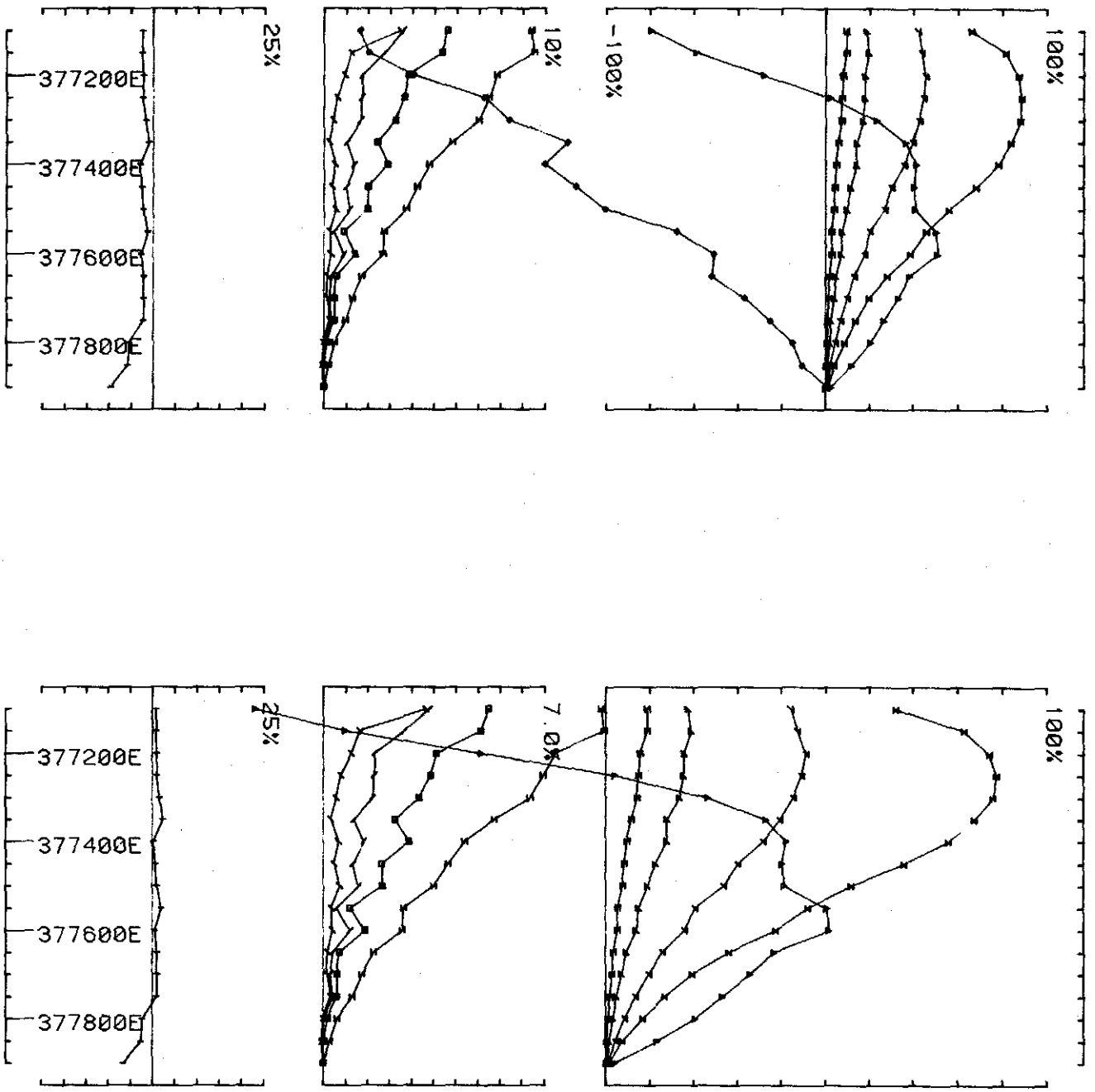
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



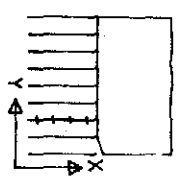
MT. KERSHAW
LOOP 8071
LINE 80700
Hz

334

898335



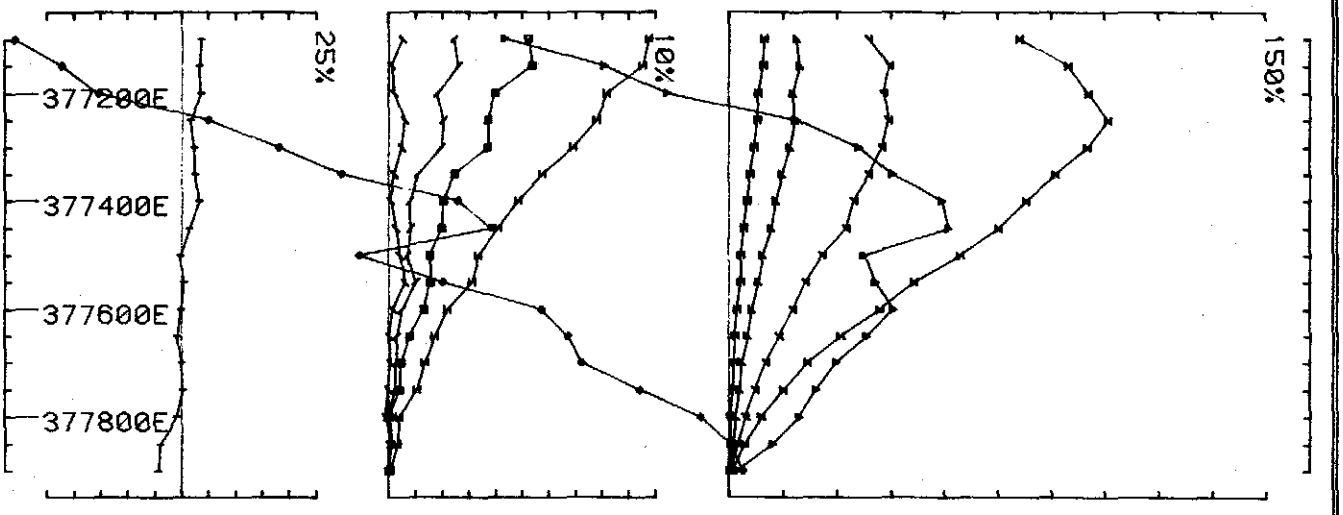
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 80900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

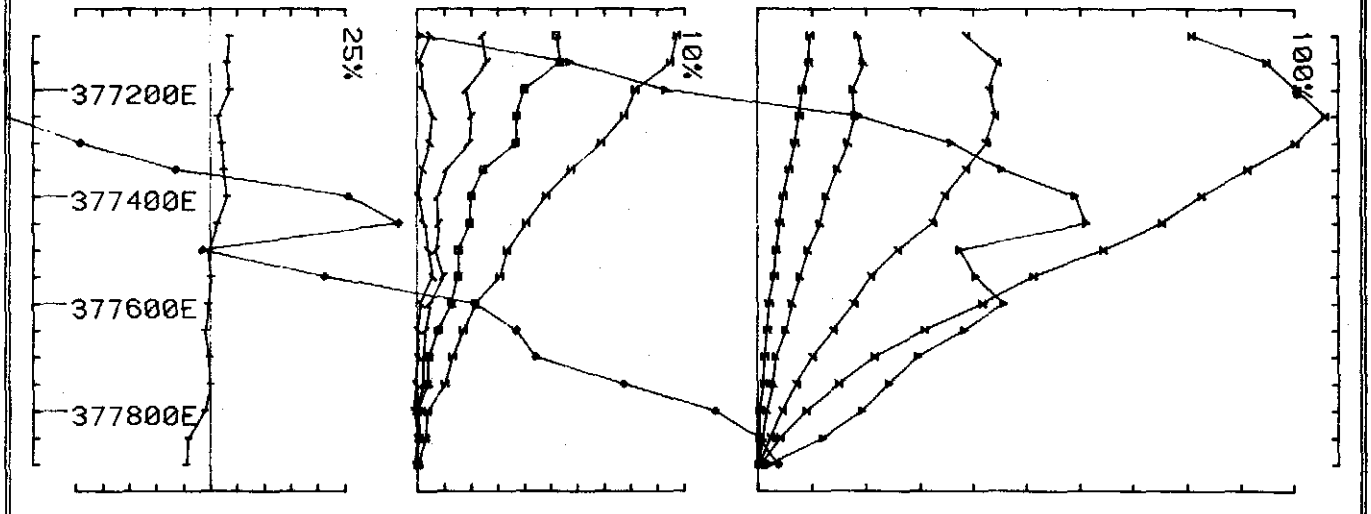


MT. KERSHAW
LOOP 0071
LINE 80900
Hz

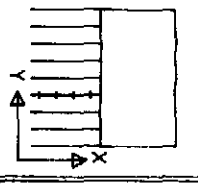
335

898336





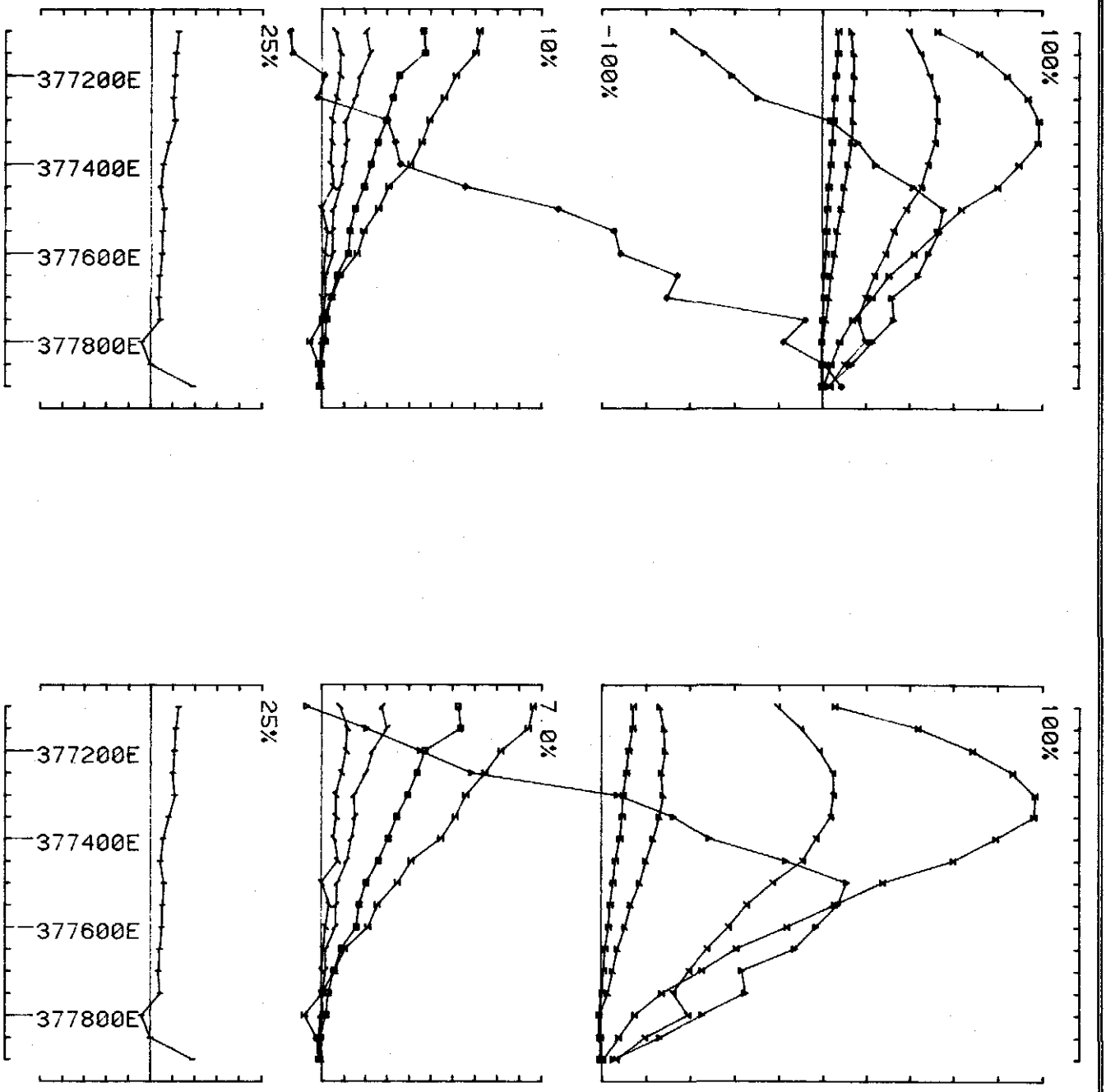
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART Rx8
Line 81100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0071
LINE 81100
Hz

336

898337



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- ART Rx8

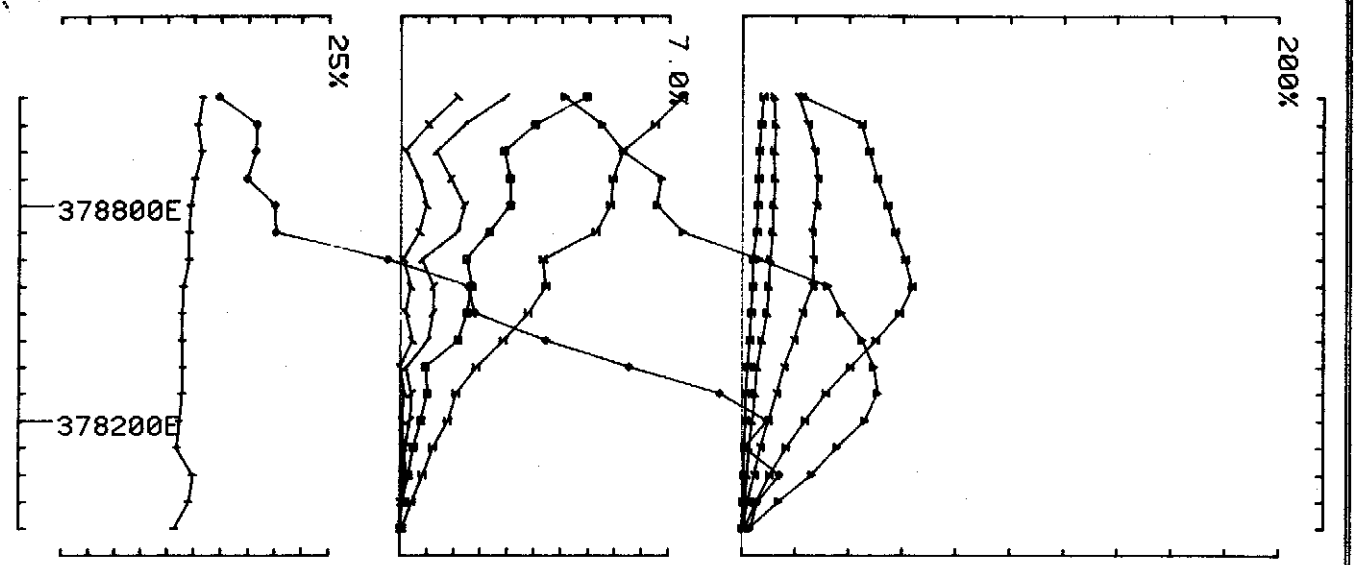
Line 81300N Hz COMPONENT BASE FREQ :- 26.230HERTZ

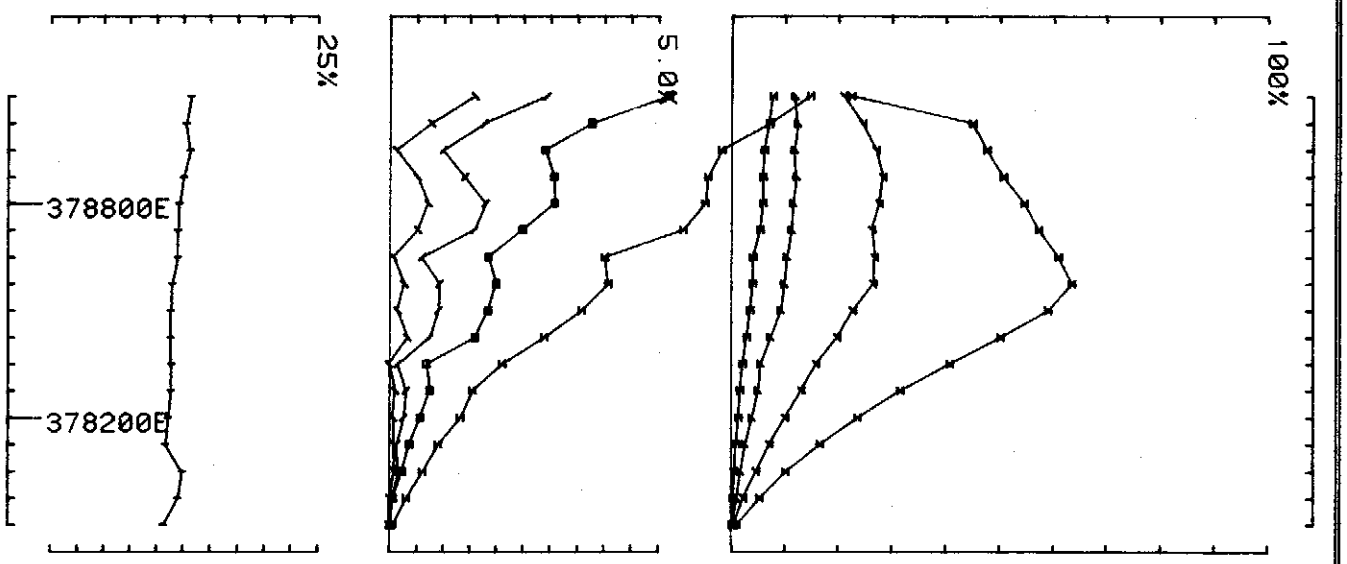
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

MT. KERSHAW
LOOP 8071
LINE 81300
Hz

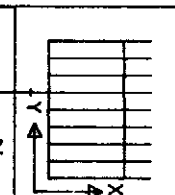
337

898338





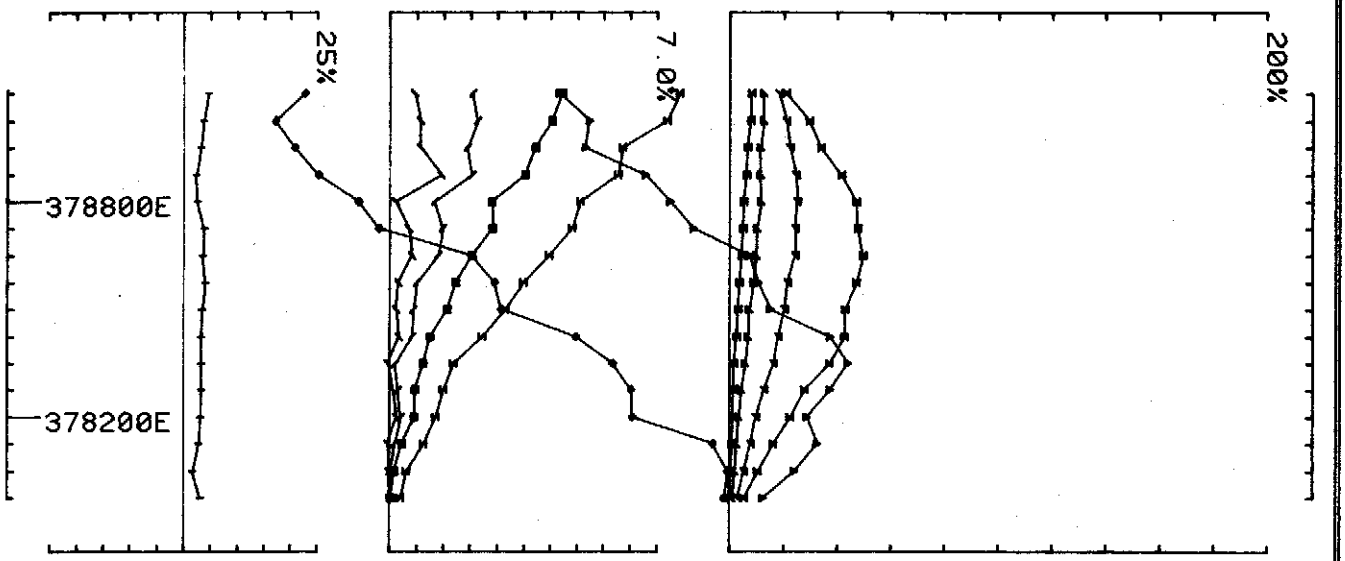
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

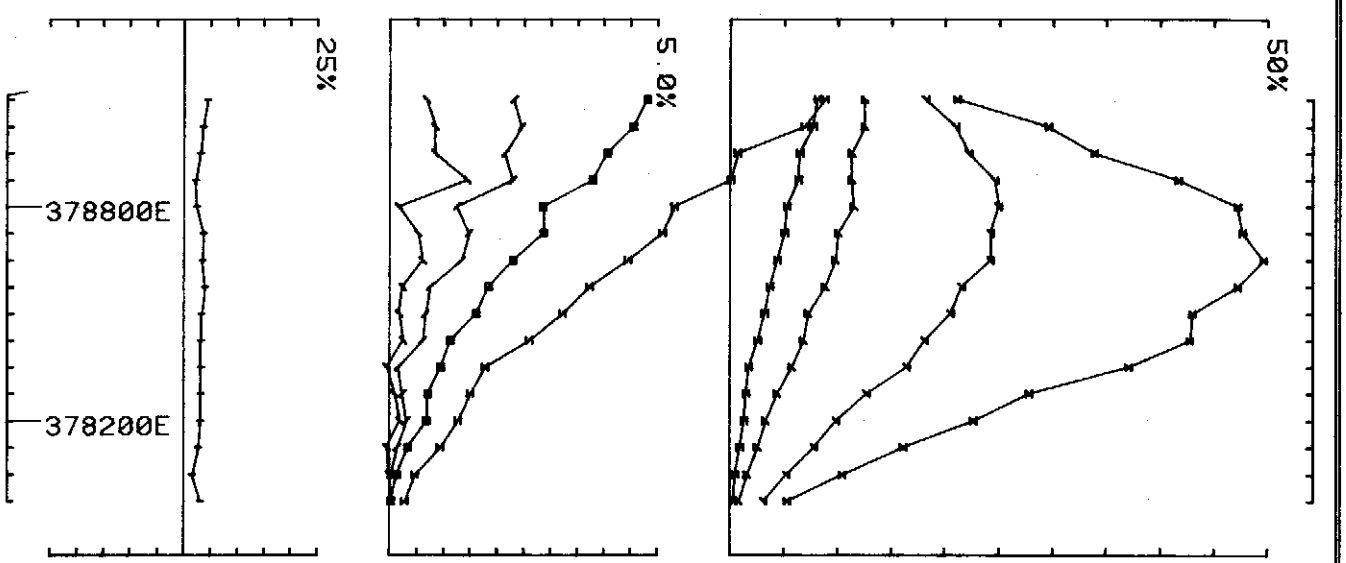


MT. KERSHAW
LOOP 8071
LINE 81500
Hz

338

898339





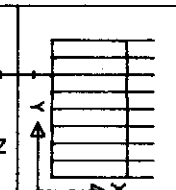
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 81700N Hz COMPONENT BASE FREQ :- 26.230HERTZ

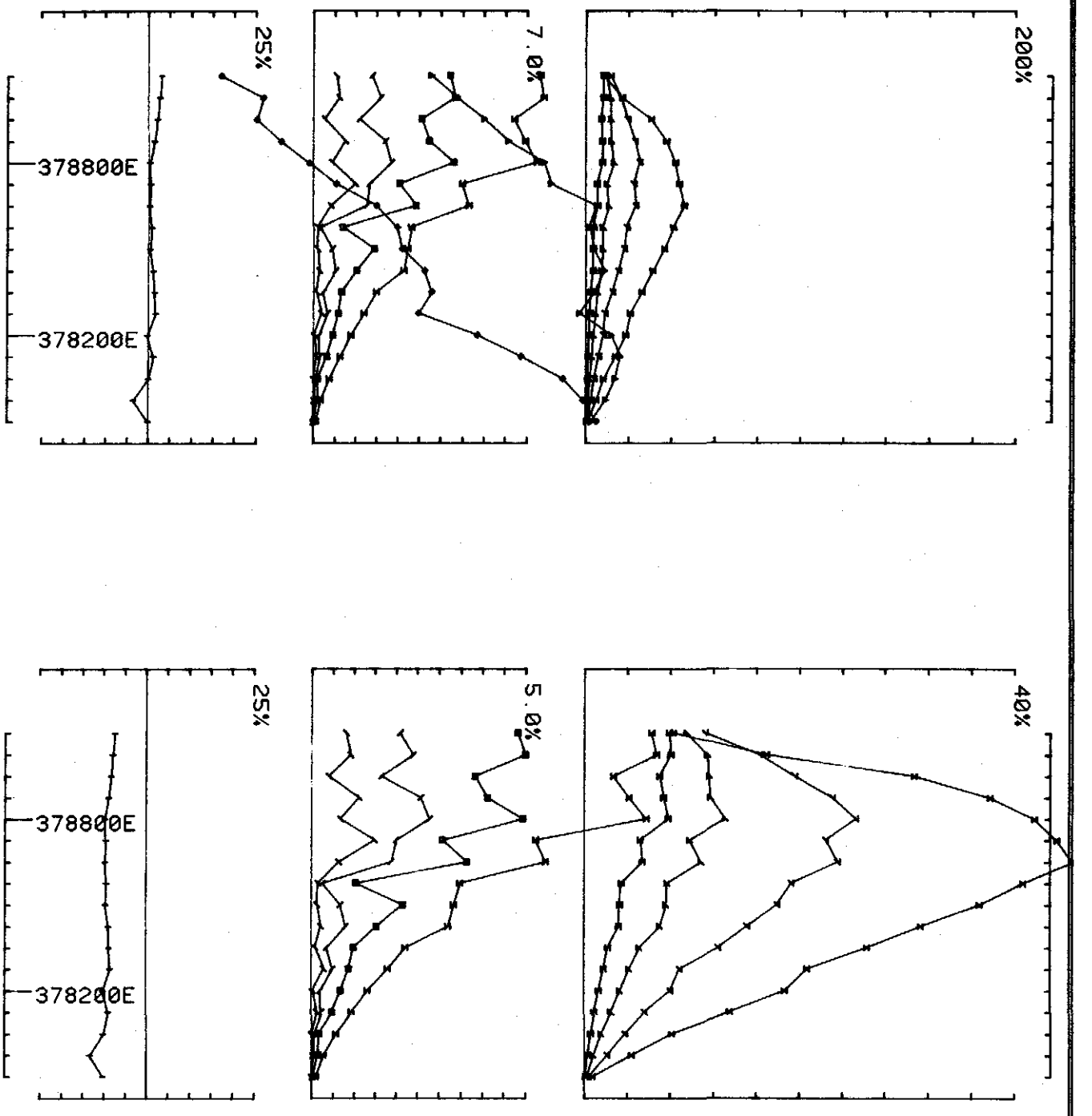
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0071
LINE 81700
Hz

339

898340



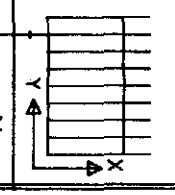
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 81900N Hz COMPONENT BASE FREQ :- 26.230HERTZ

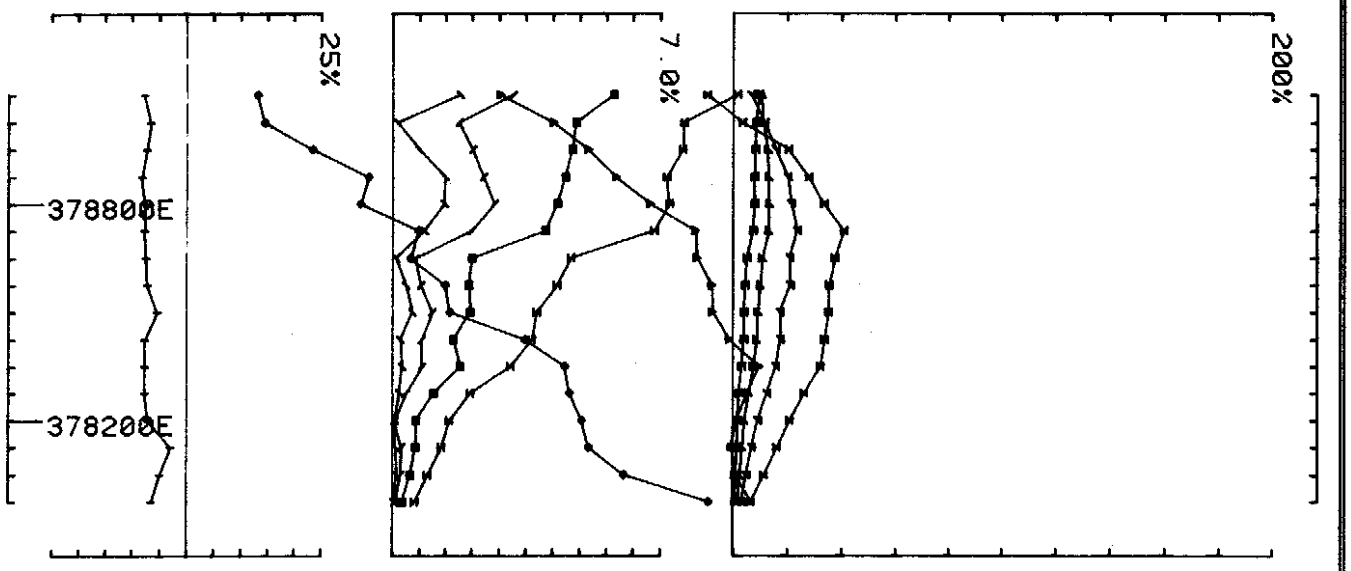
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

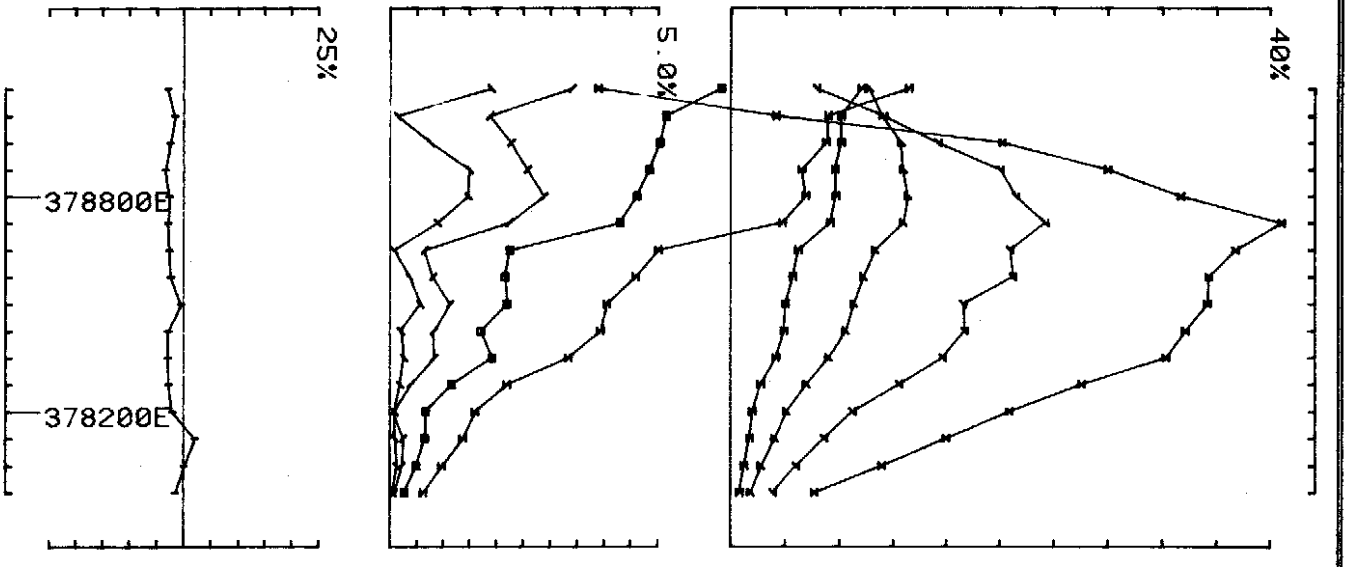


MT. KERSHAW
LOOP 0071
LINE 81900
Hz

898341

340





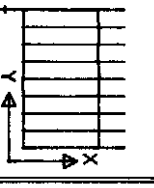
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ

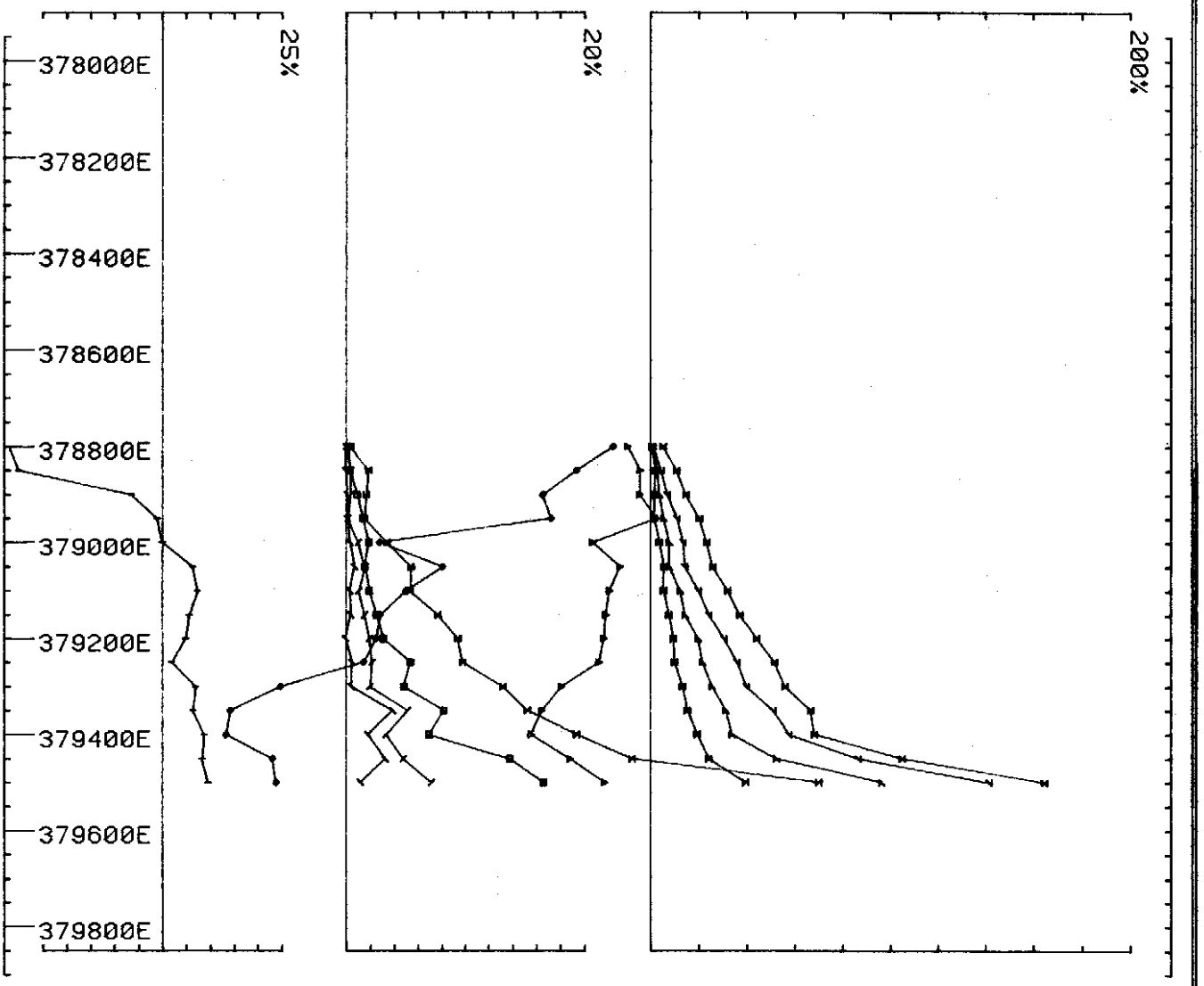
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 8071
LINE 82100
Hz

341

898342



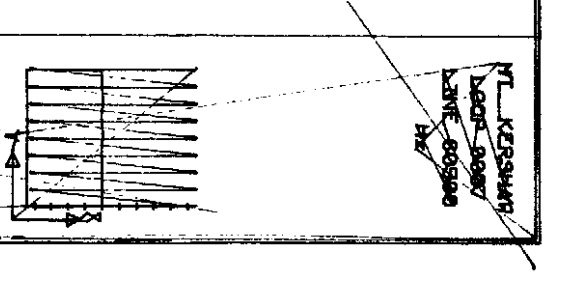
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- ART Rx8

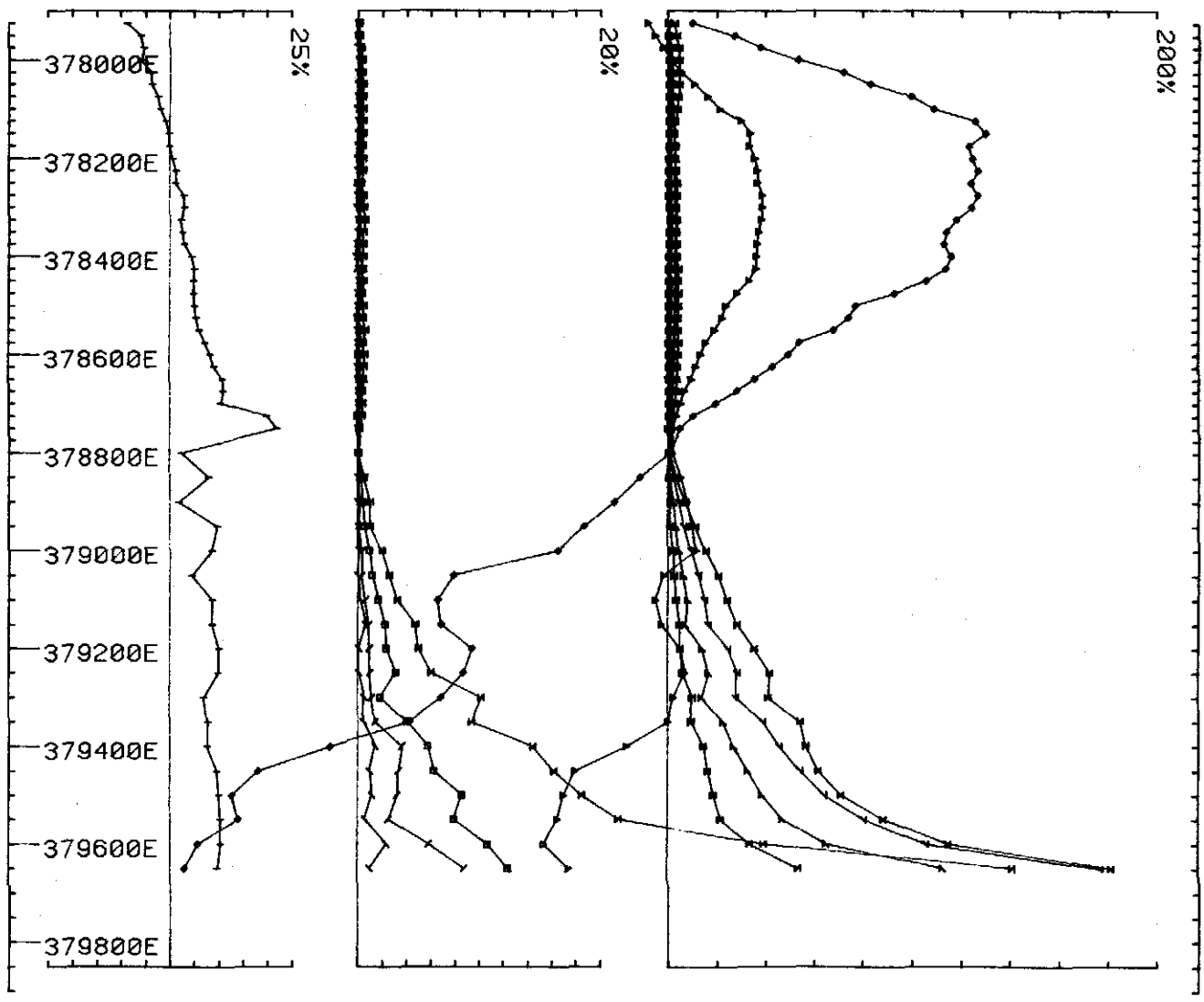
Line 80500N Hz COMPONENT BASE FREQ :- 26 ~~/ 30 HERTZ~~

SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

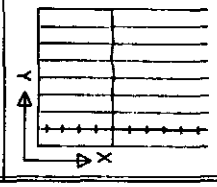


342

898343



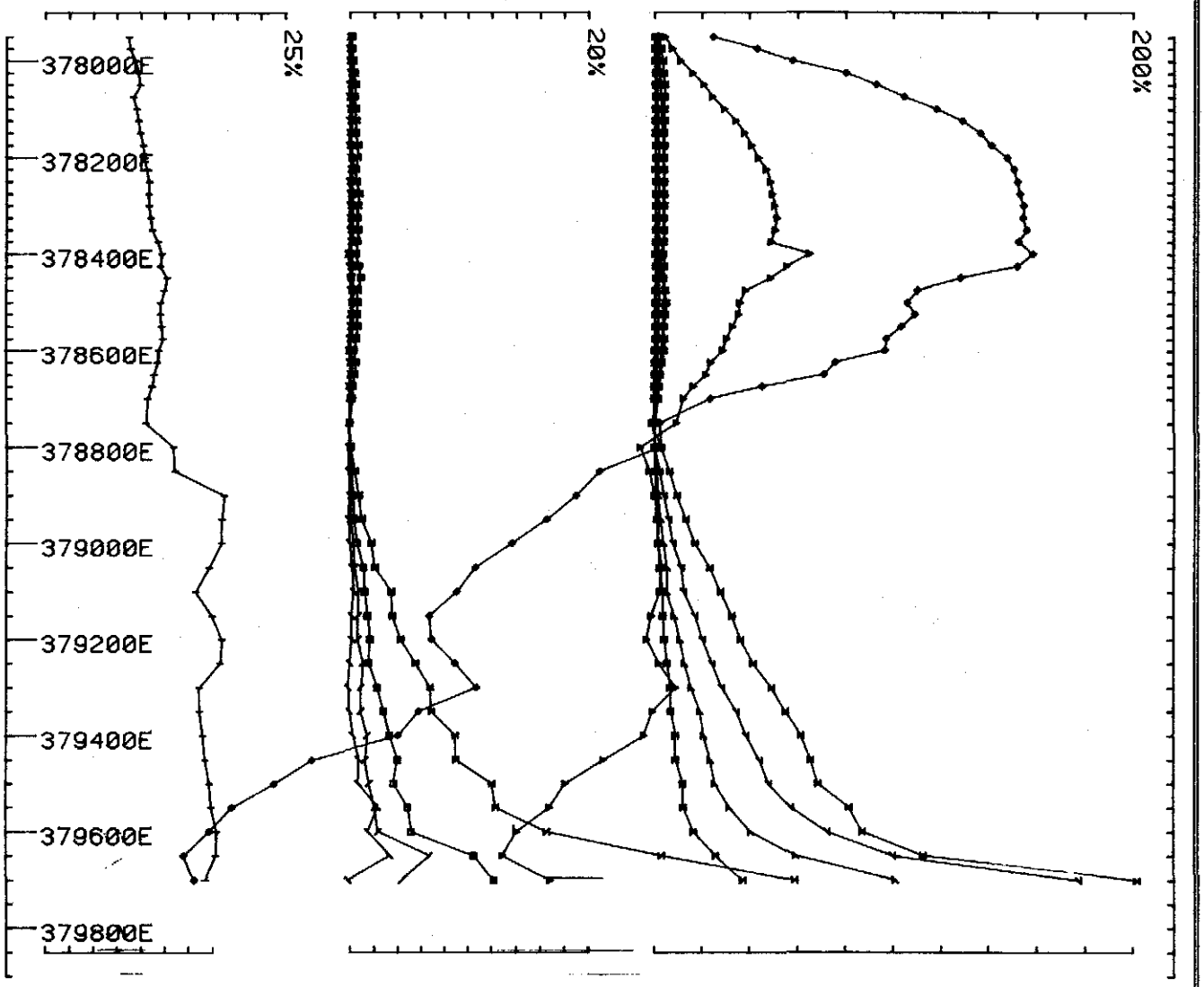
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART Rx8
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0007
LINE 80700
Hz

343

898344



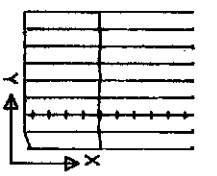
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 80900N Hz COMPONENT BASE FREQ :- 26/30 HERTZ

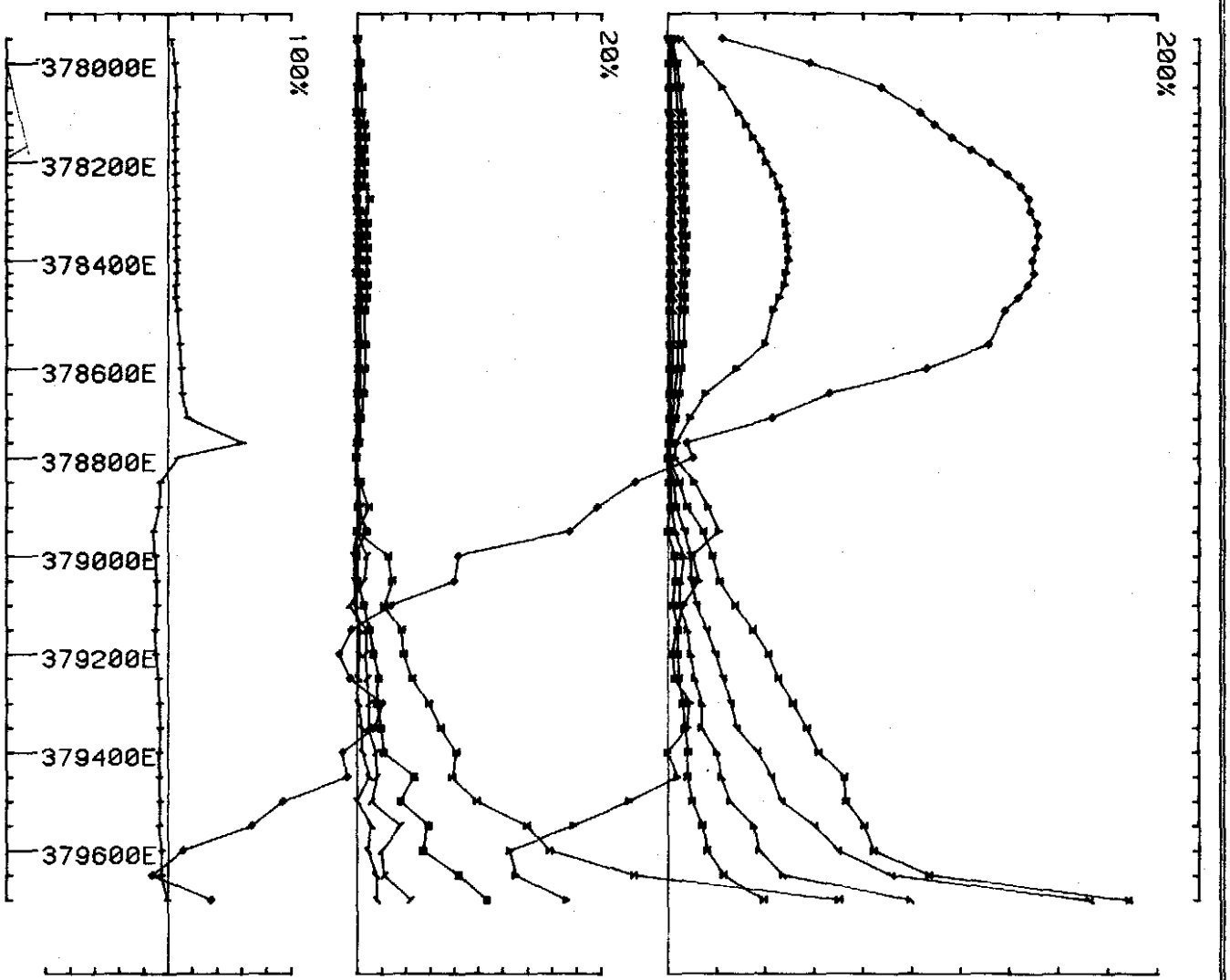
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0007
LINE 80900
Hz

344

898345



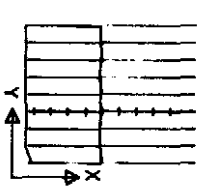
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 81100N Hz COMPONENT BASE FREQ :- 26.230HERTZ

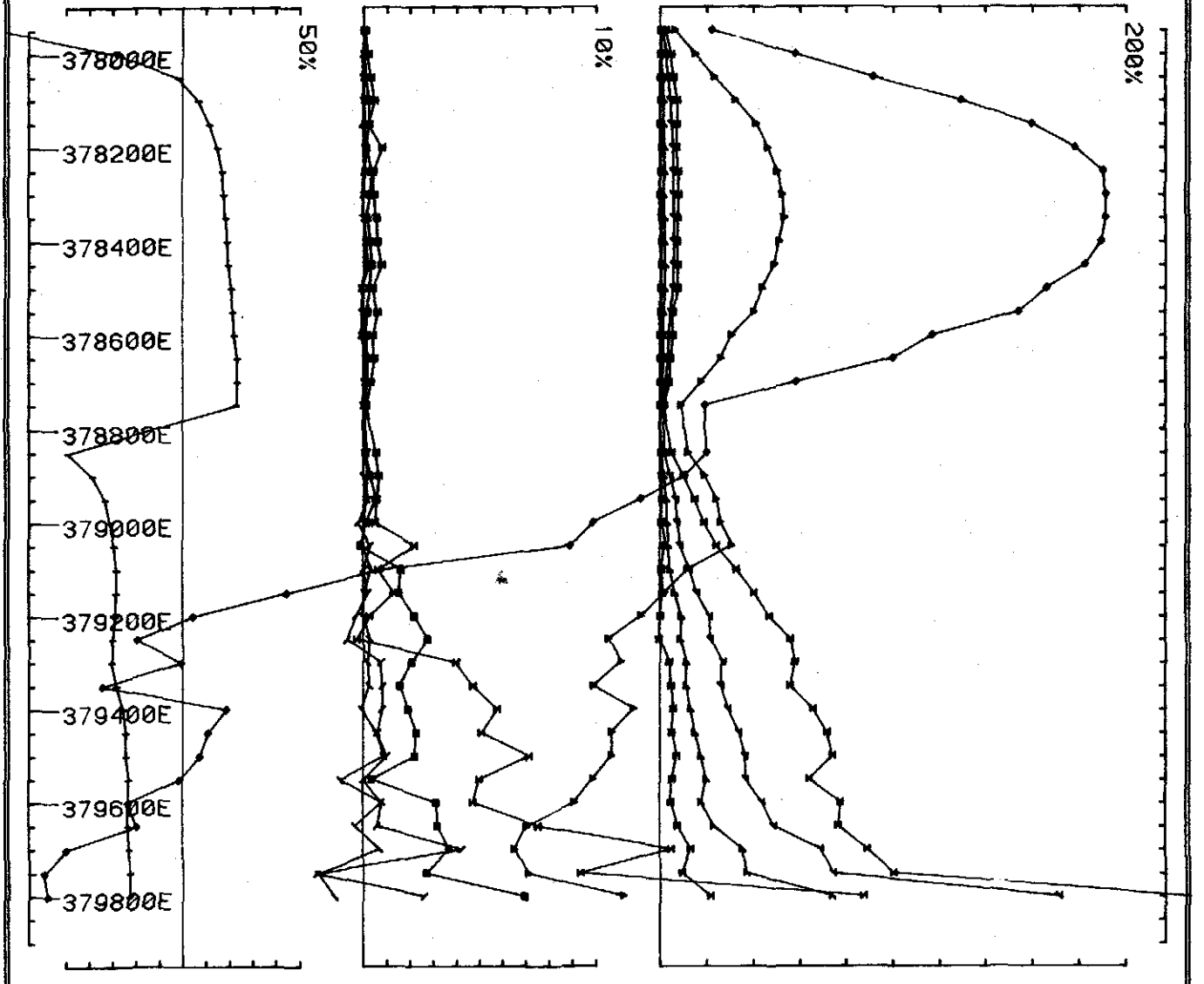
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0007
LINE 81100
Hz

345

898346



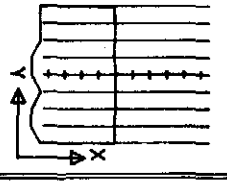
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- ART Rx10

Line 81300N Hz COMPONENT BASE FREQ :- 26.230HERTZ

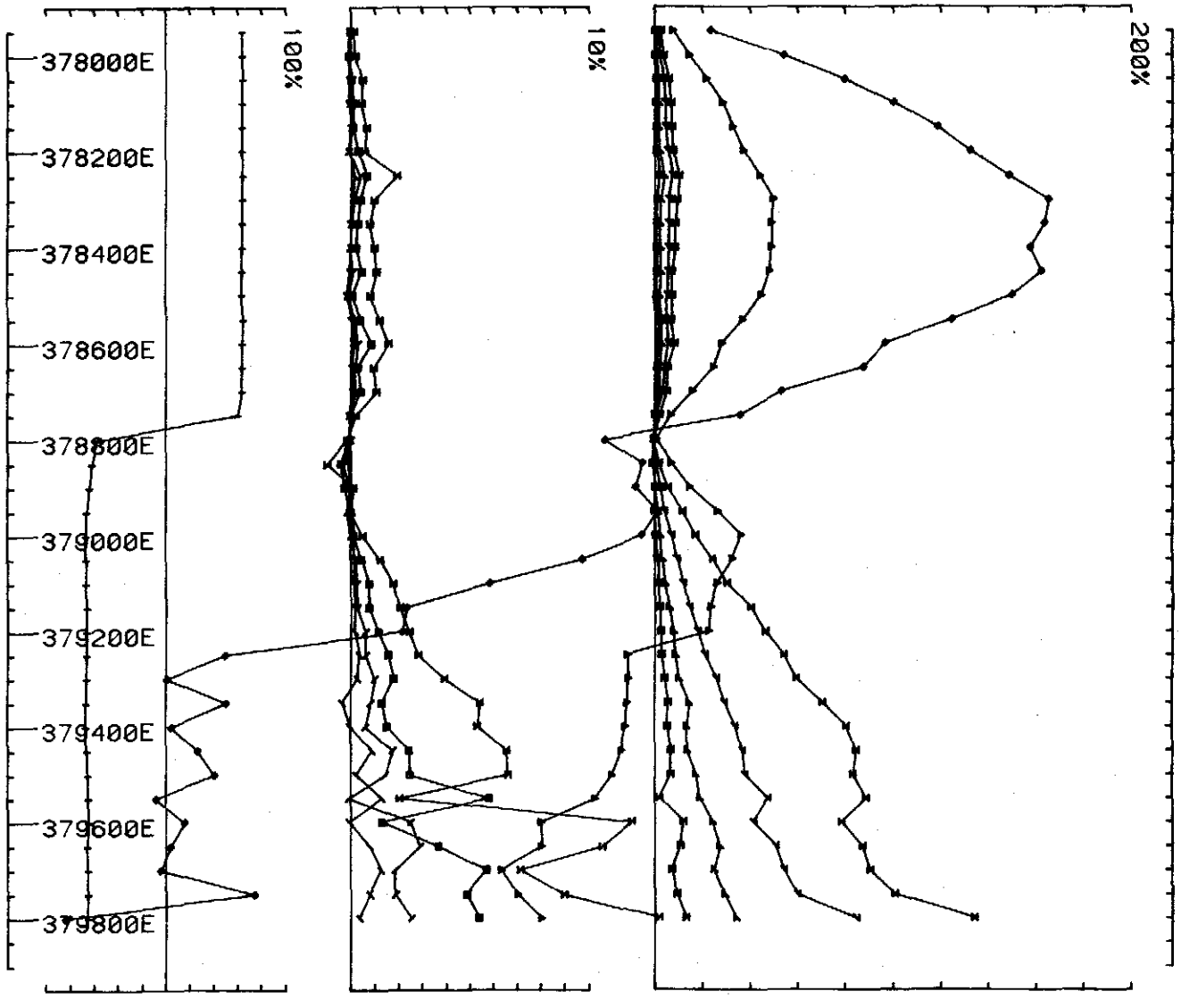
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



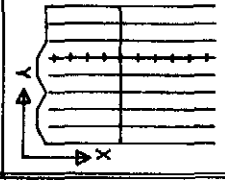
MT. KERSHAW
LOOP 8007
LINE 81300
Hz

346

898347



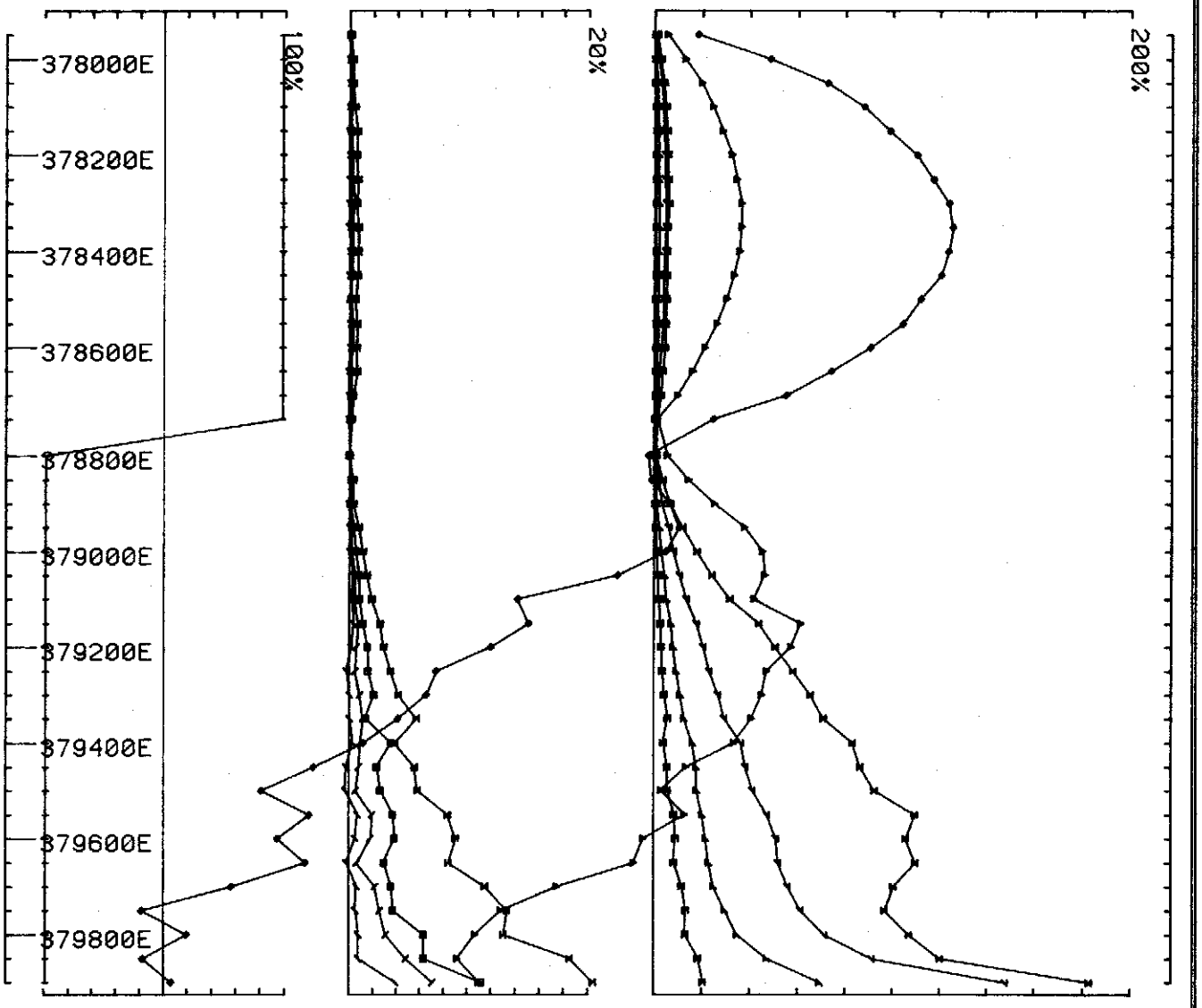
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART Rx10
Line 81500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



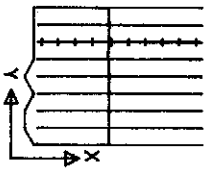
MT. KERSHAW
LOOP 0007
LINE 81500
Hz

347

898348



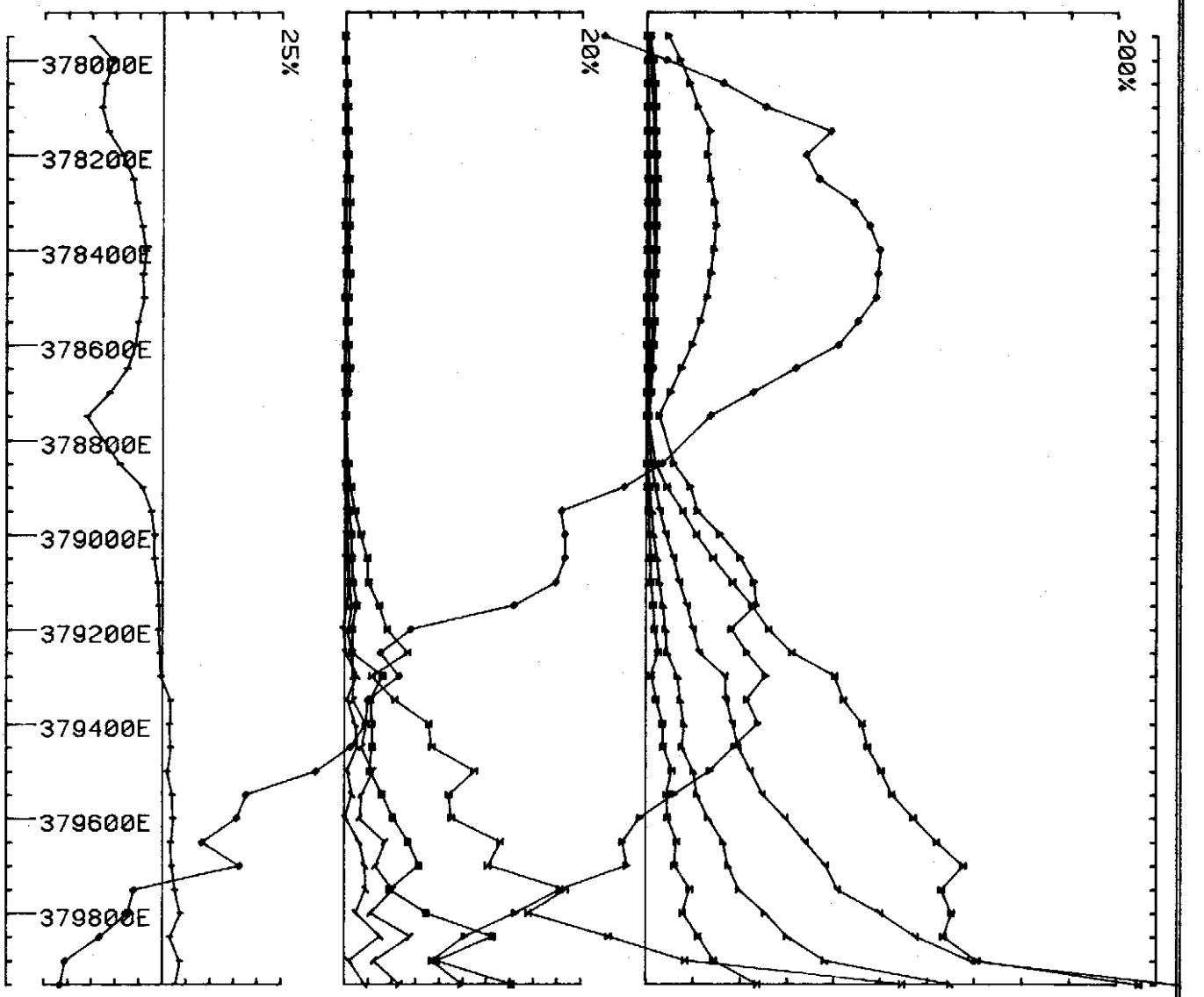
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



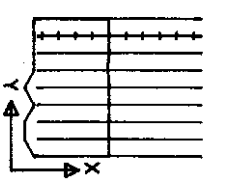
MT. KERSHAW
LOOP 0007
LINE 81700
Hz

348

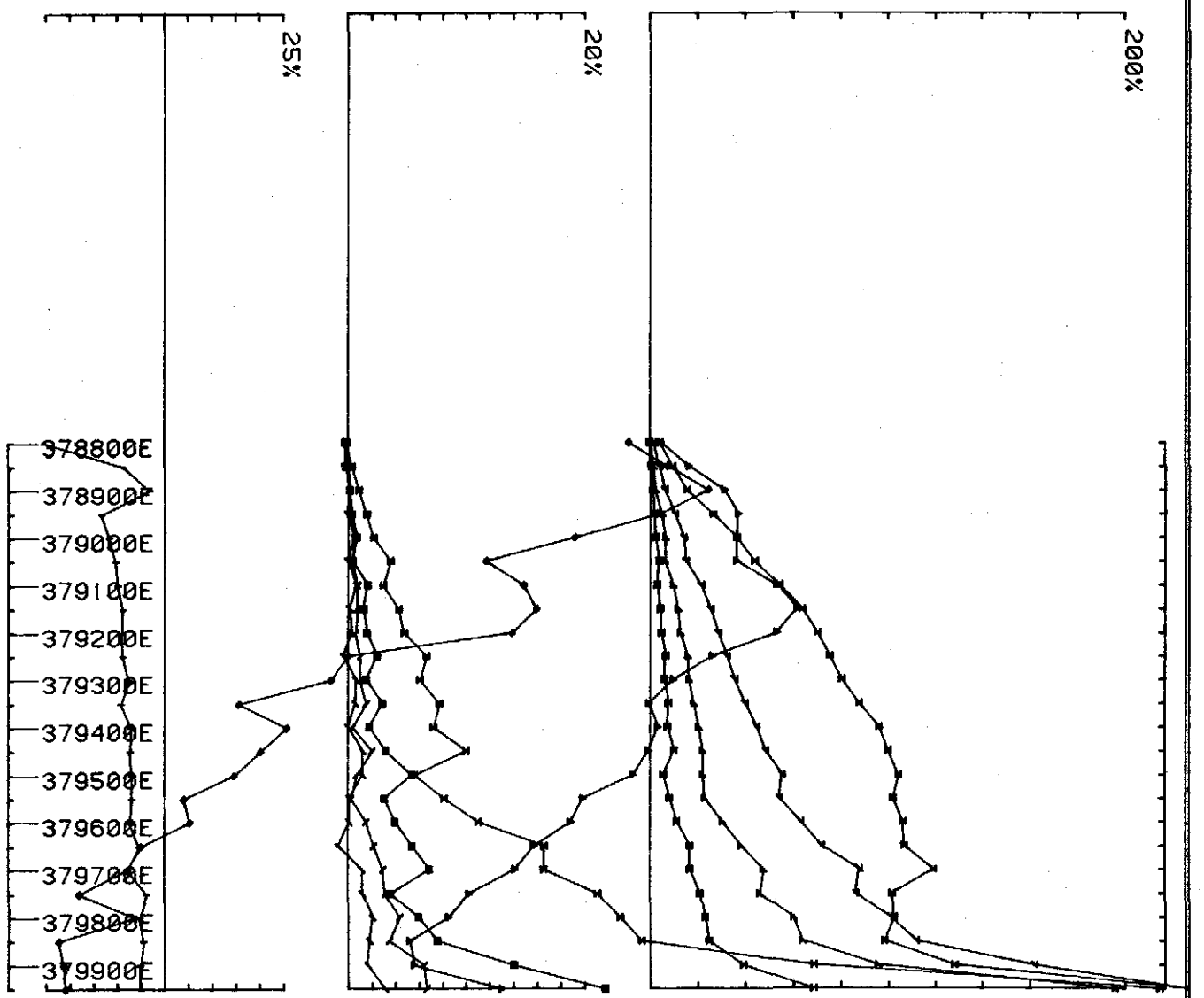
896349



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 81900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0007
LINE 81900
Hz



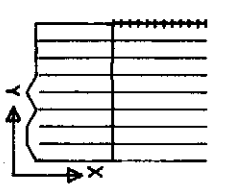
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ

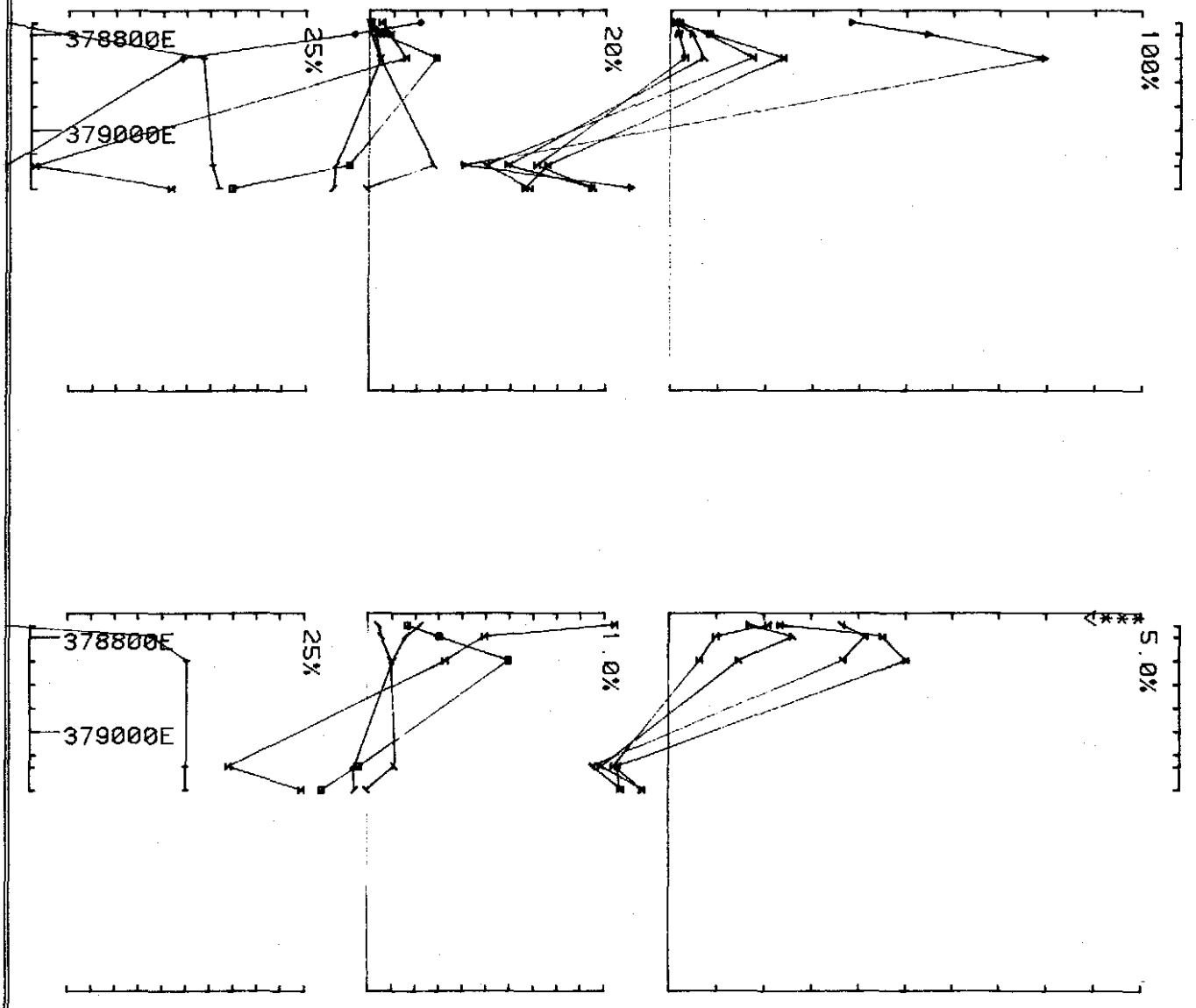
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0007
LINE 82100
Hz

898351

350



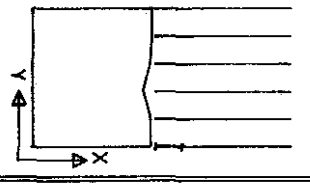
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM RX8

Line 79700N Hz COMPONENT BASE FREQ :- 26.230HERTZ

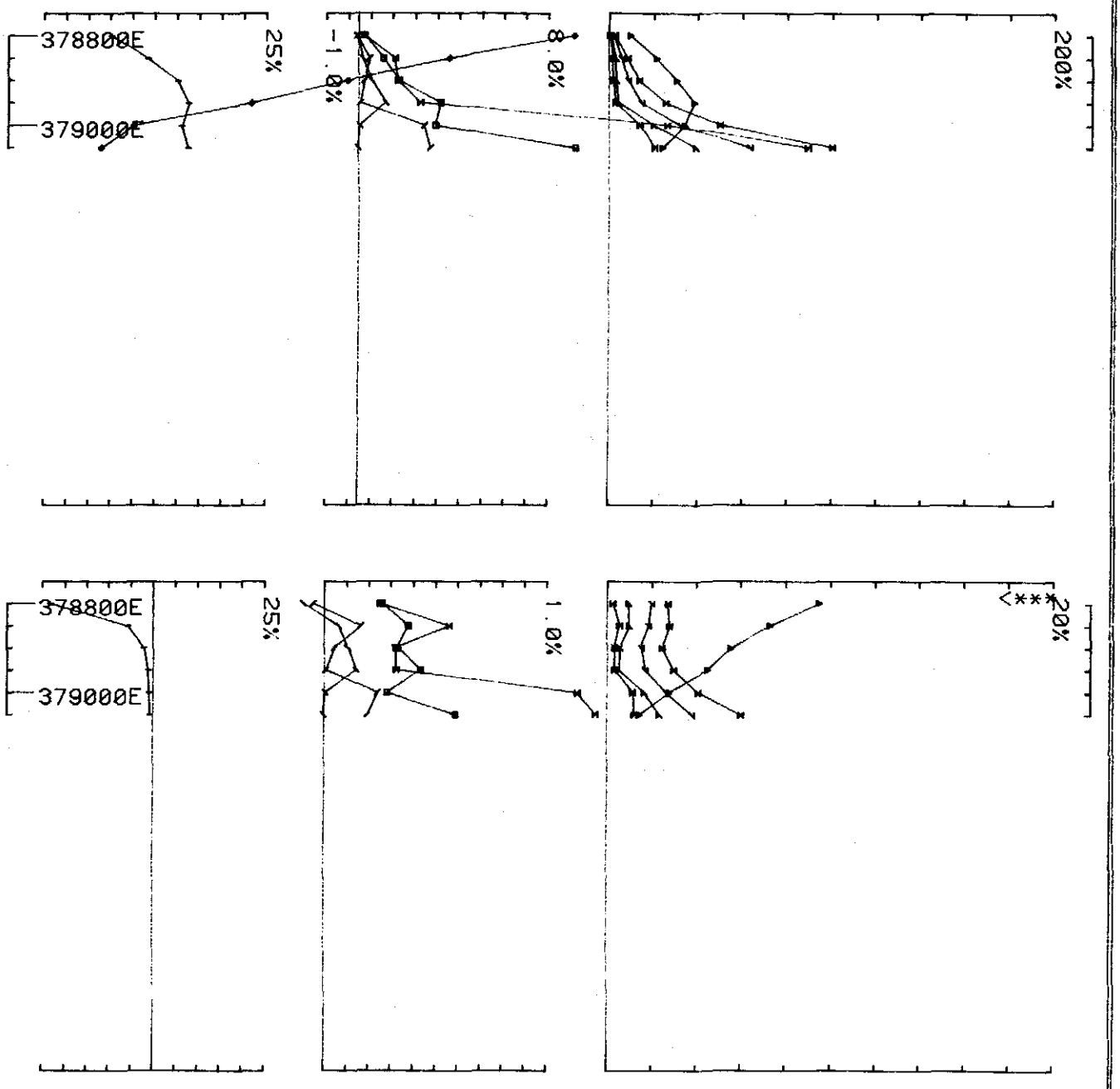
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



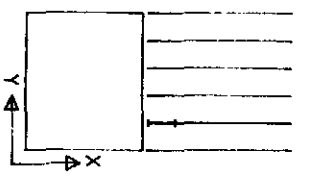
MT. KERSHAW
LOOP 0008
LINE 79700
Hz

351

898352



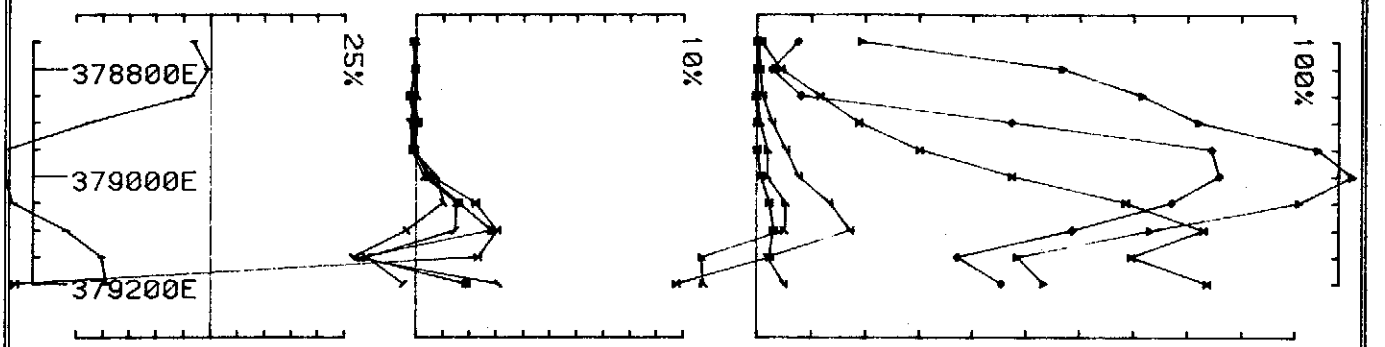
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM RX10
79900N Hz COMPONENT BASE FREQ 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

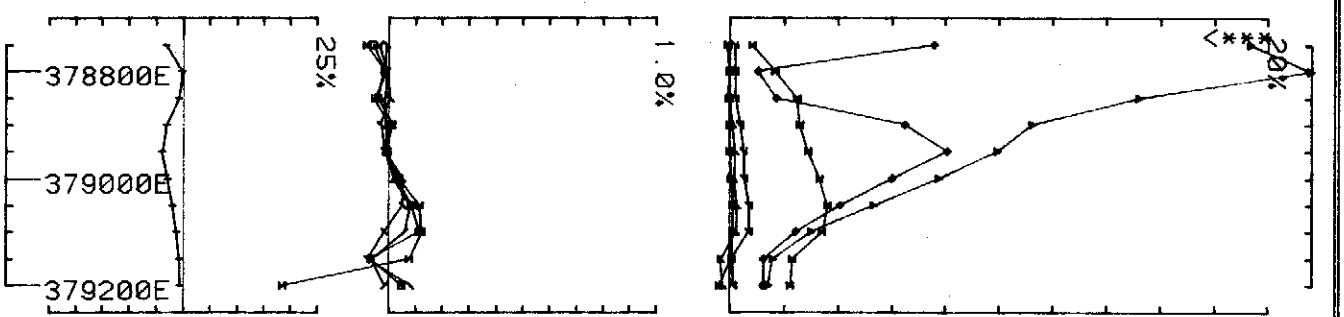


MT. KERSHAW
LOOP 0006
LINE 79900
Hz

352

898353





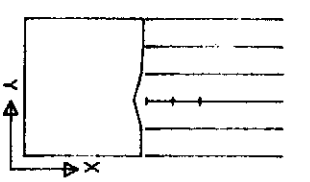
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM RX8

Line 80100N Hx COMPONENT BASE FREQ :- 26.230HERTZ

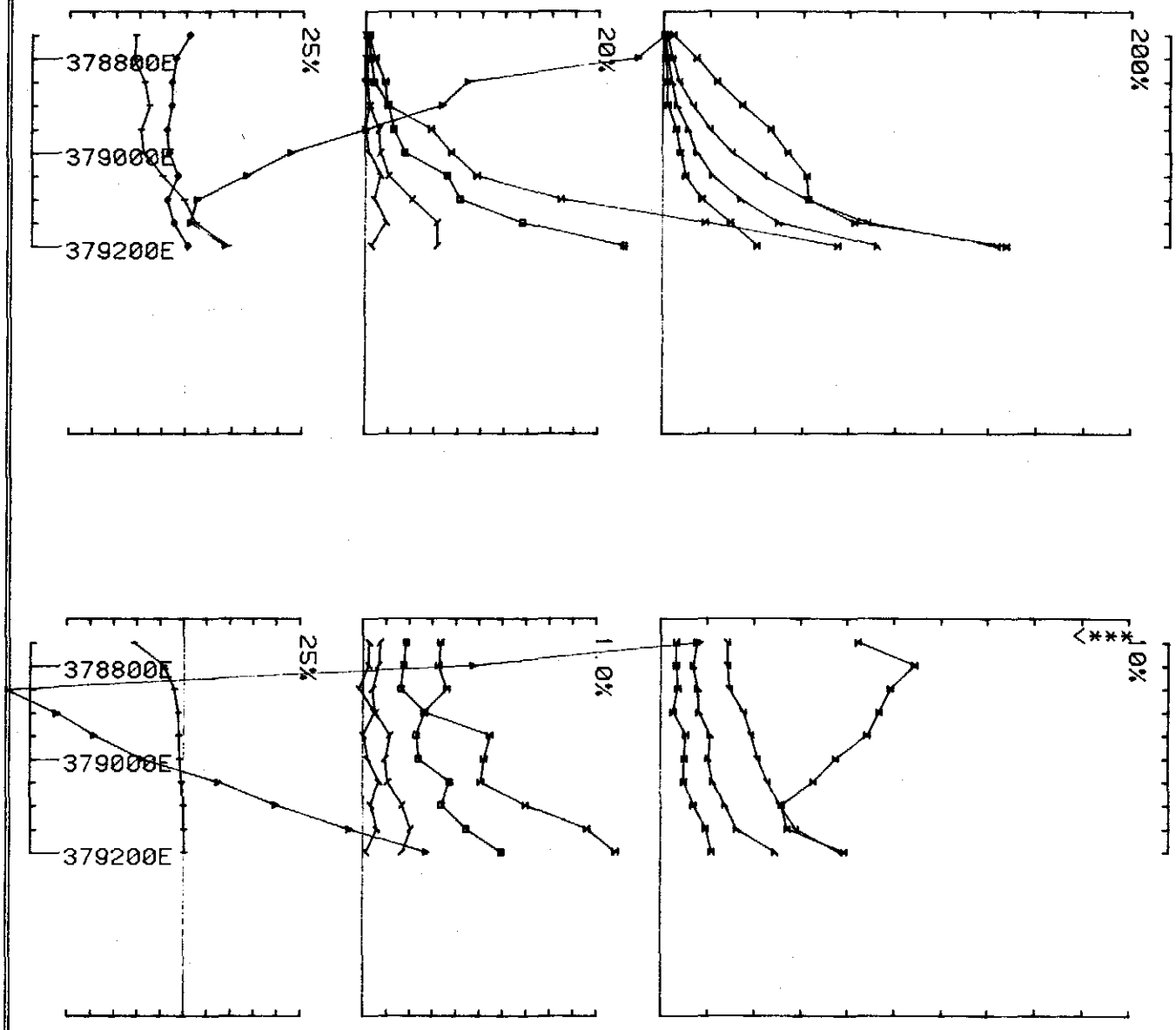
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



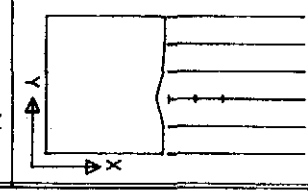
MT. KERSHAW
LOOP 8000
LINE 80100
Hx

353

896354



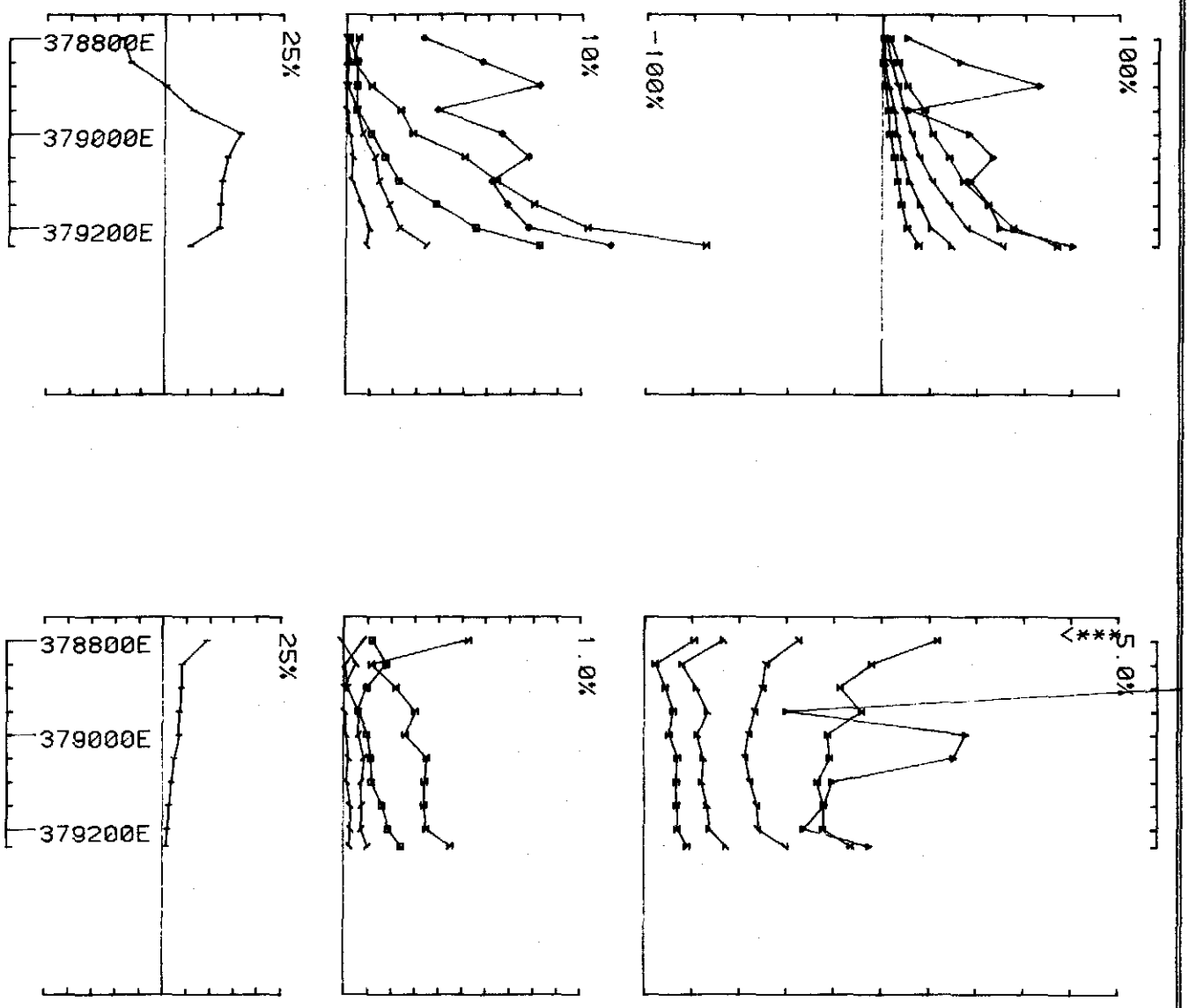
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



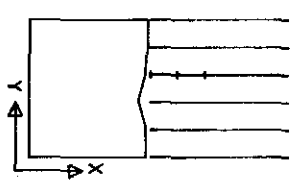
MT. KERSHAW
LOOP 0008
LINE 80100
Hz

354

898355



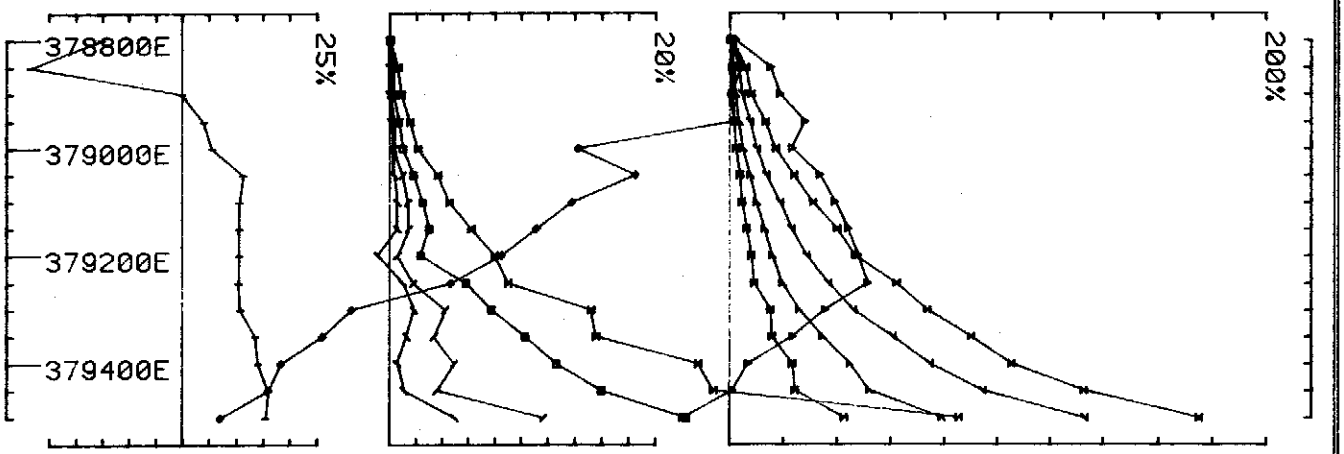
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

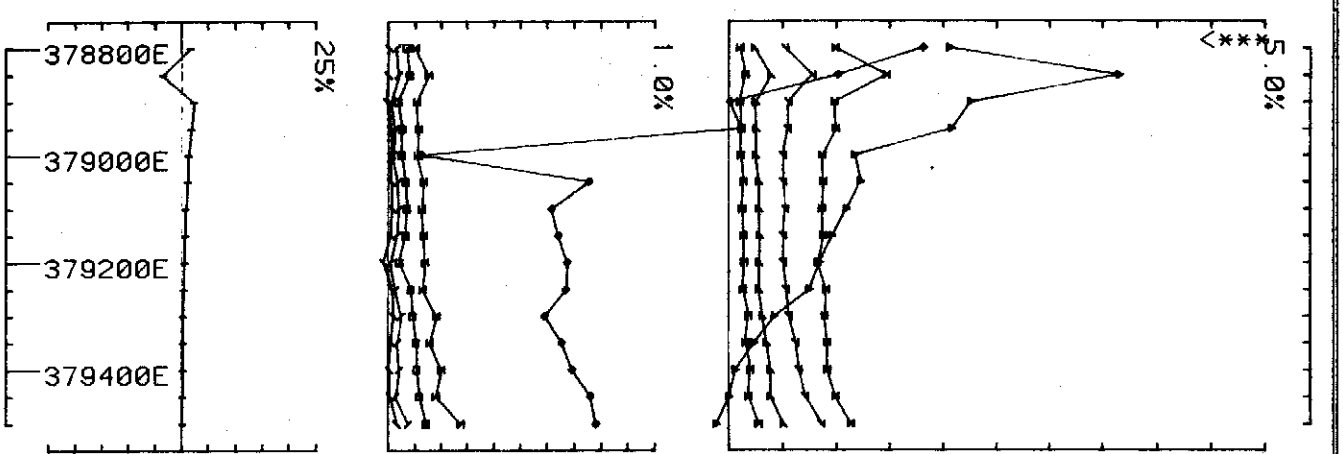


MT. KERSHAW
LOOP 8008
LINE 80300
Hz

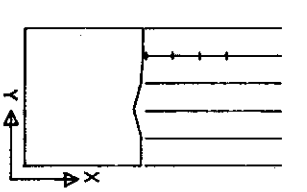
355

898356





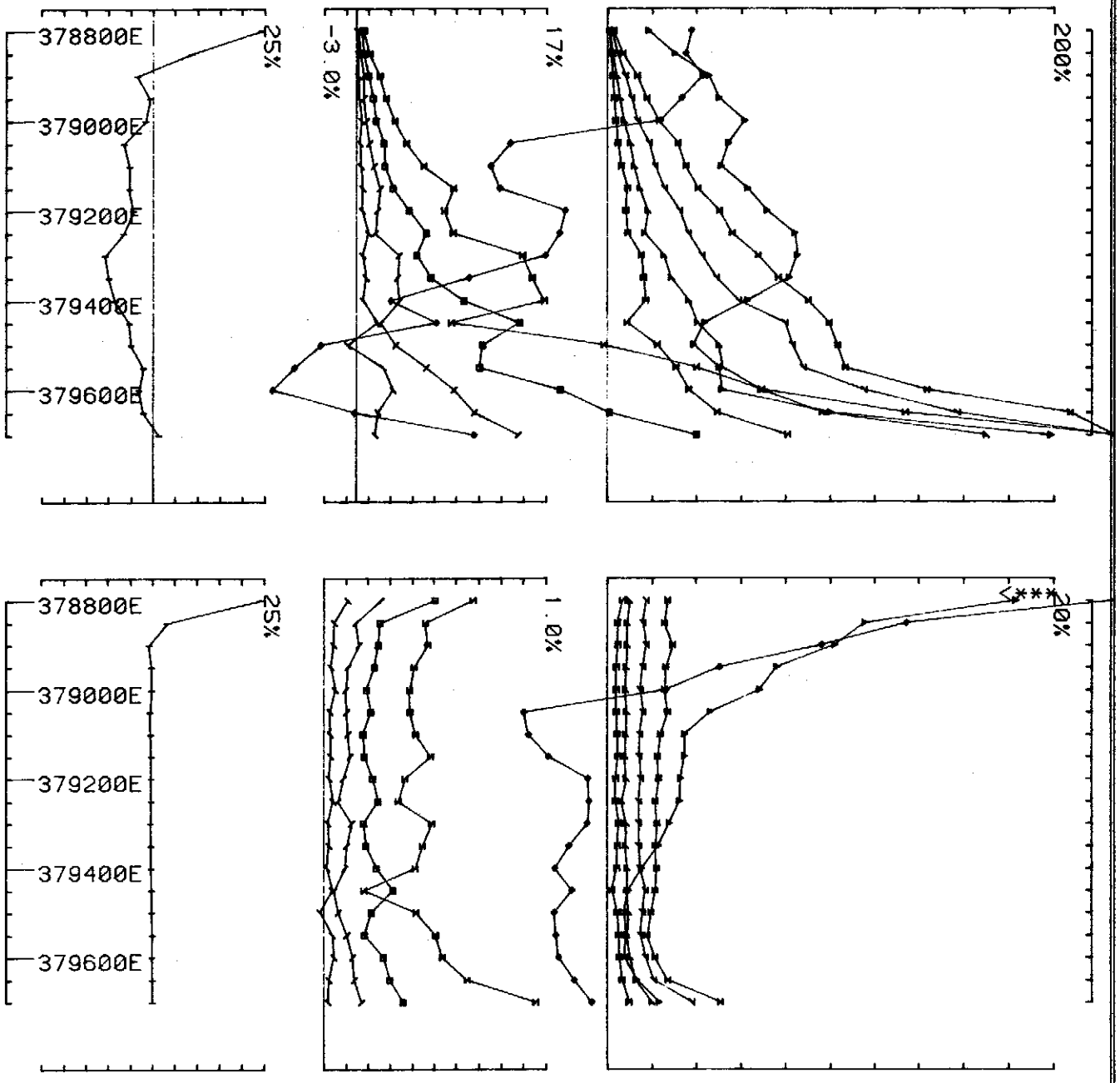
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0008
LINE 80500
Hz

898357

356



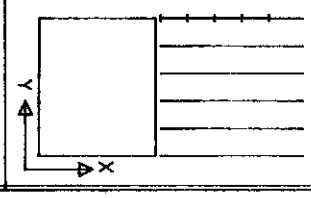
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- BM RX10

Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ

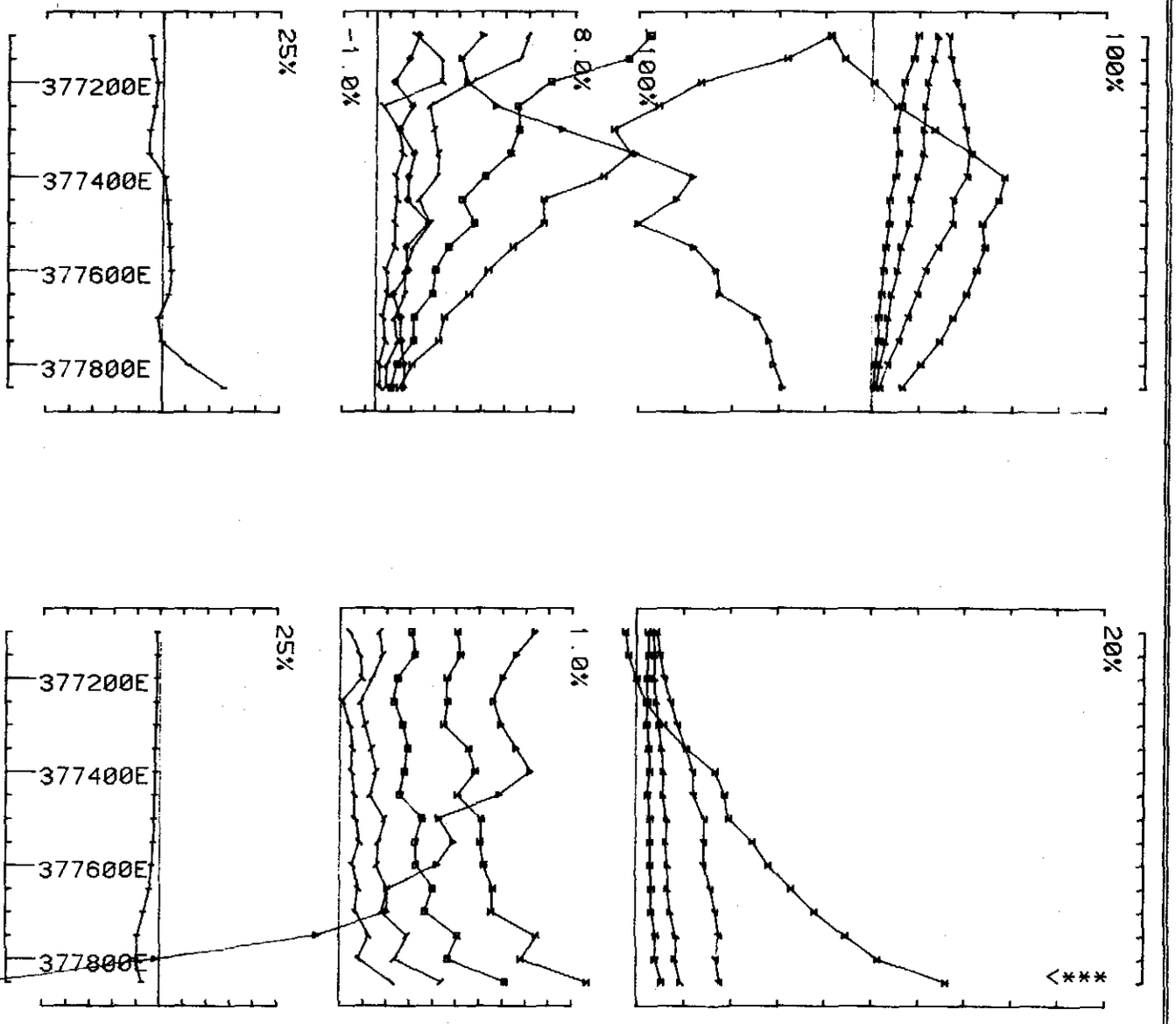
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



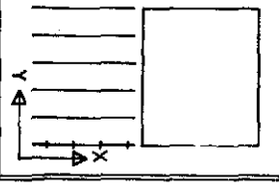
MT. KERSHAW
LOOP 8008
LINE 80700
Hz

357

898358



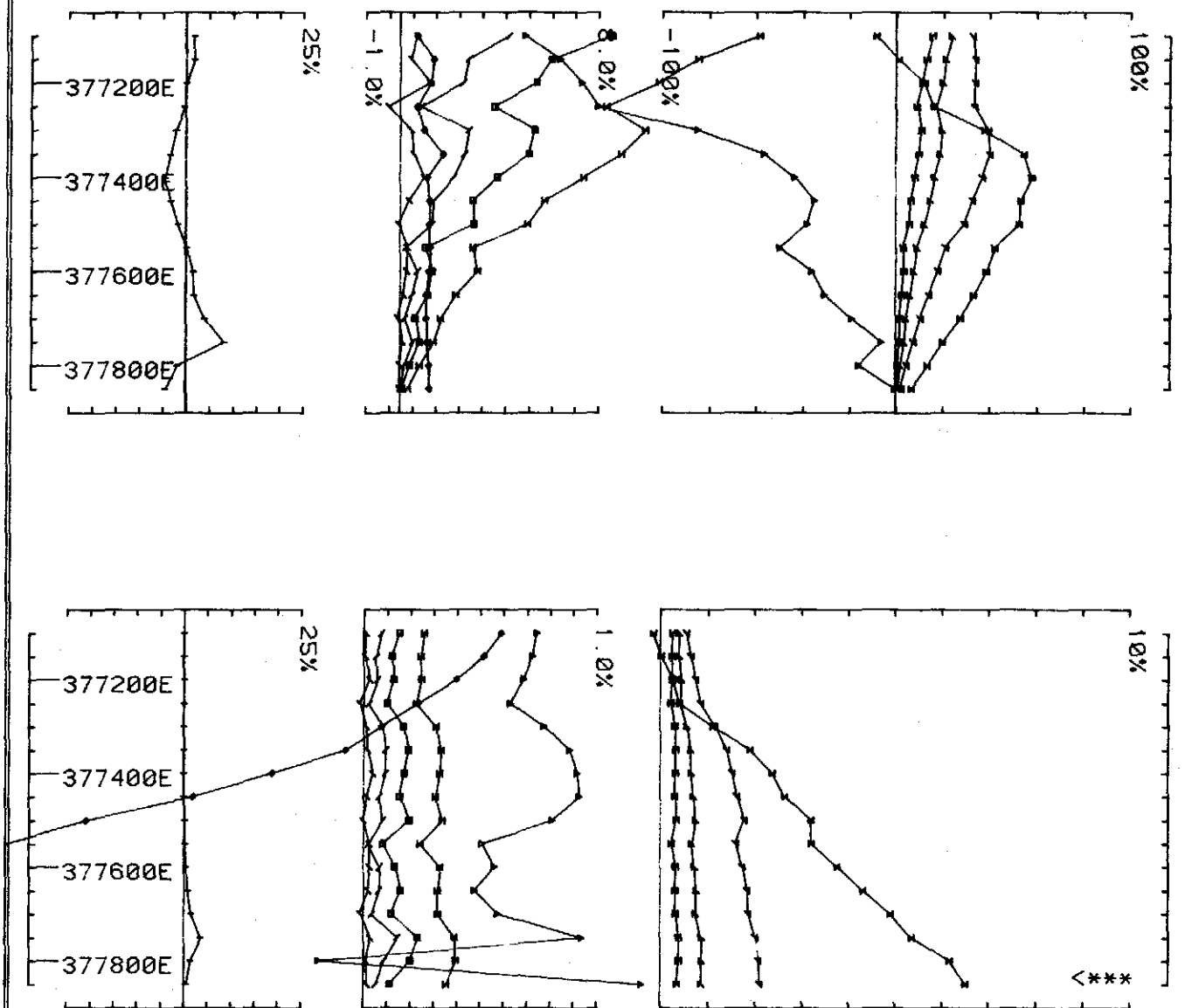
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 79700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



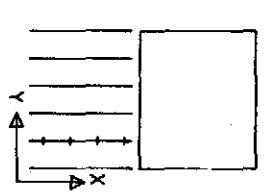
MT. KERSHAW
LOOP 0081
LINE 79700
Hz

358

898359



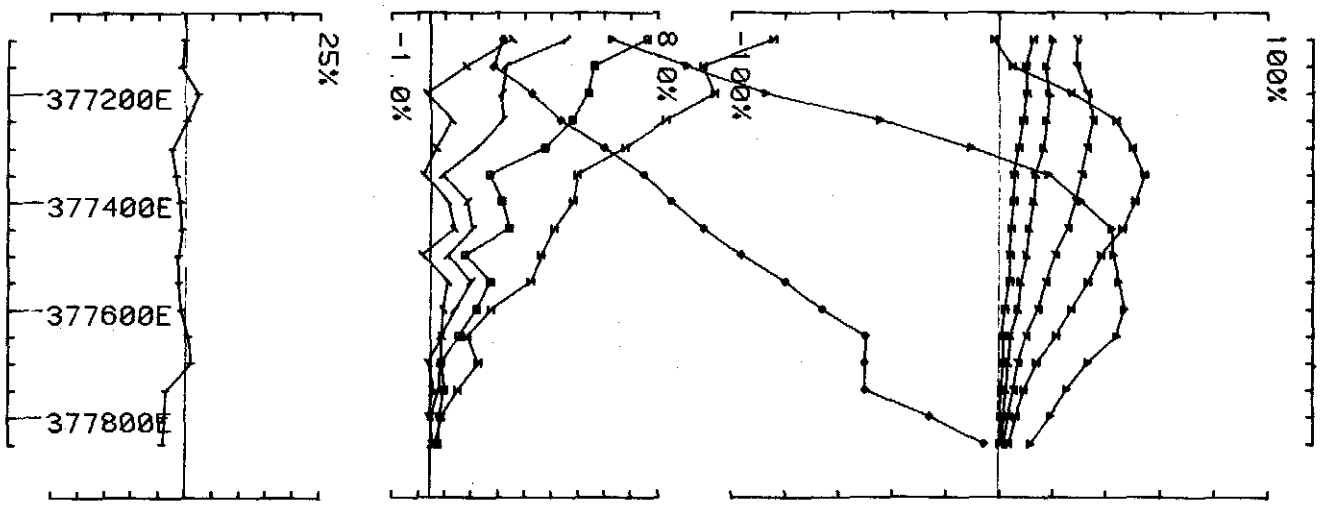
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 79900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

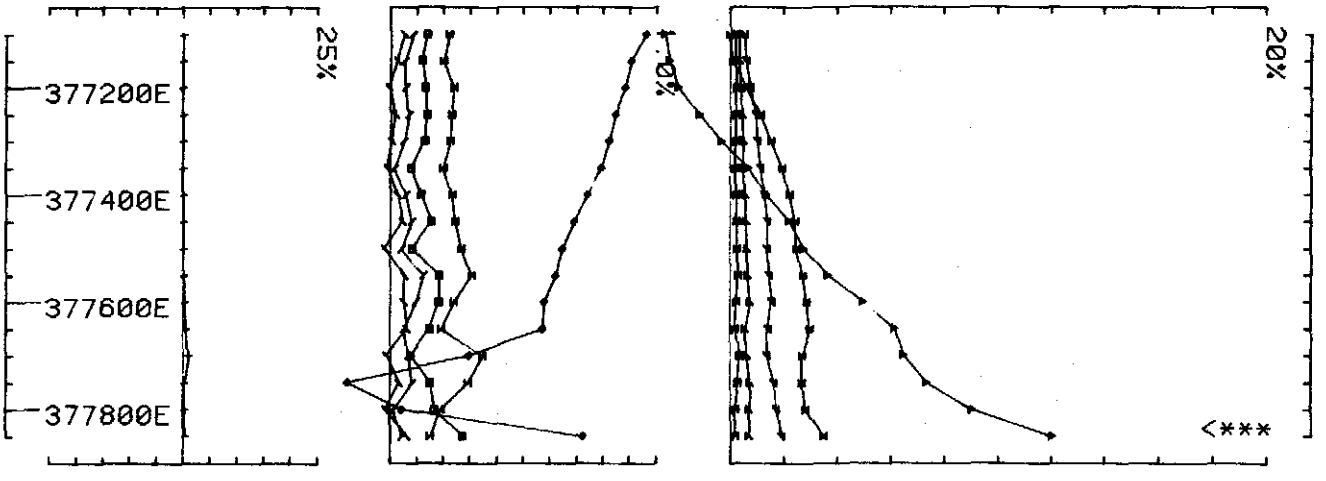


MT. KERSHAW
LOOP 8081
LINE 79900
Hz

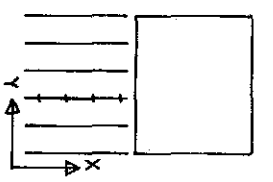
359

898360





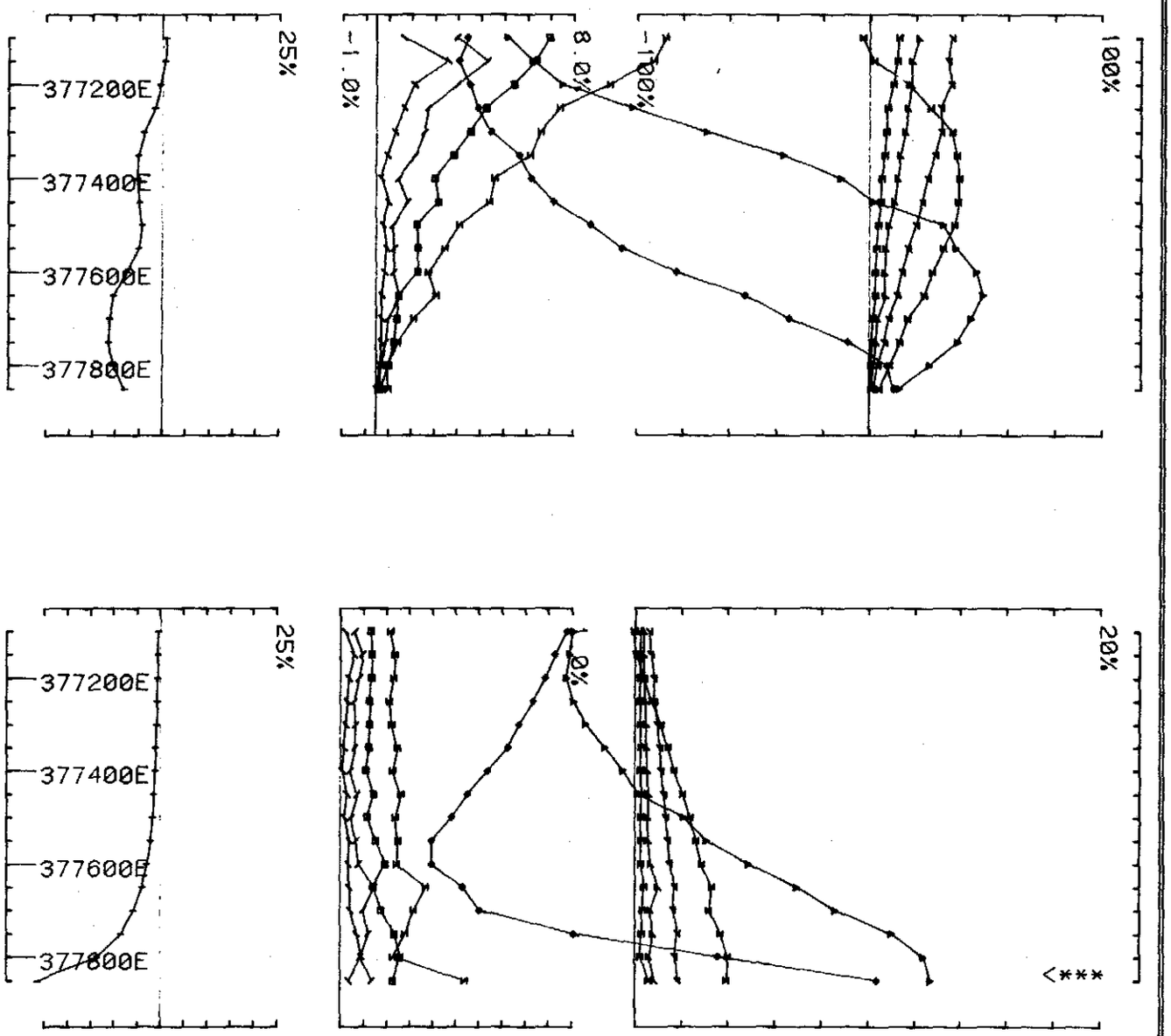
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



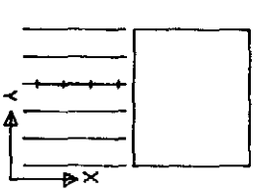
MT. KERSHAW
LOOP 0081
LINE 80100
Hz

360

898361



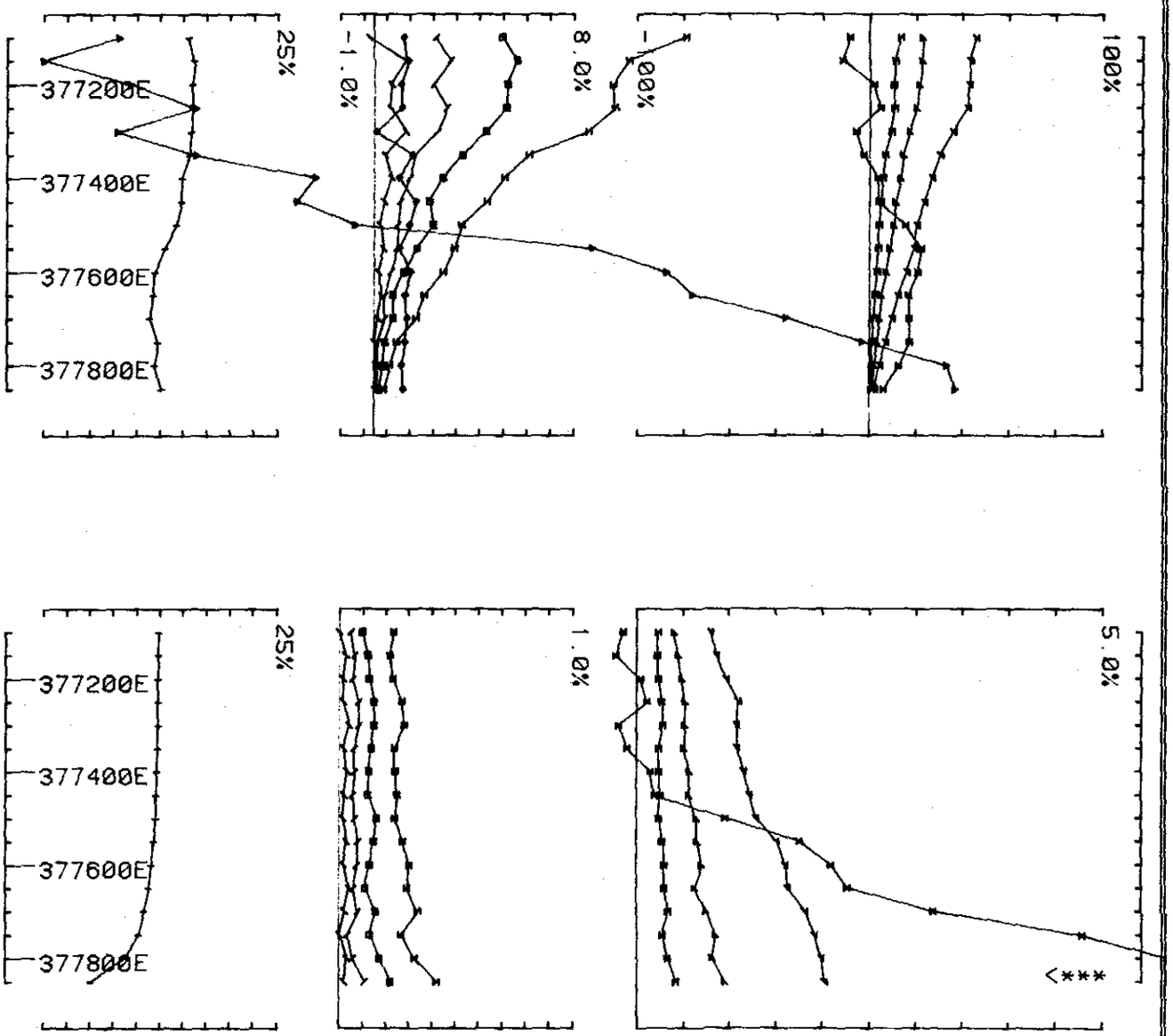
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM RX10
Line 80300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



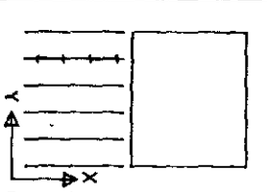
MT. KERSHAW
LOOP 8081
LINE 80300
Hz

361

898362



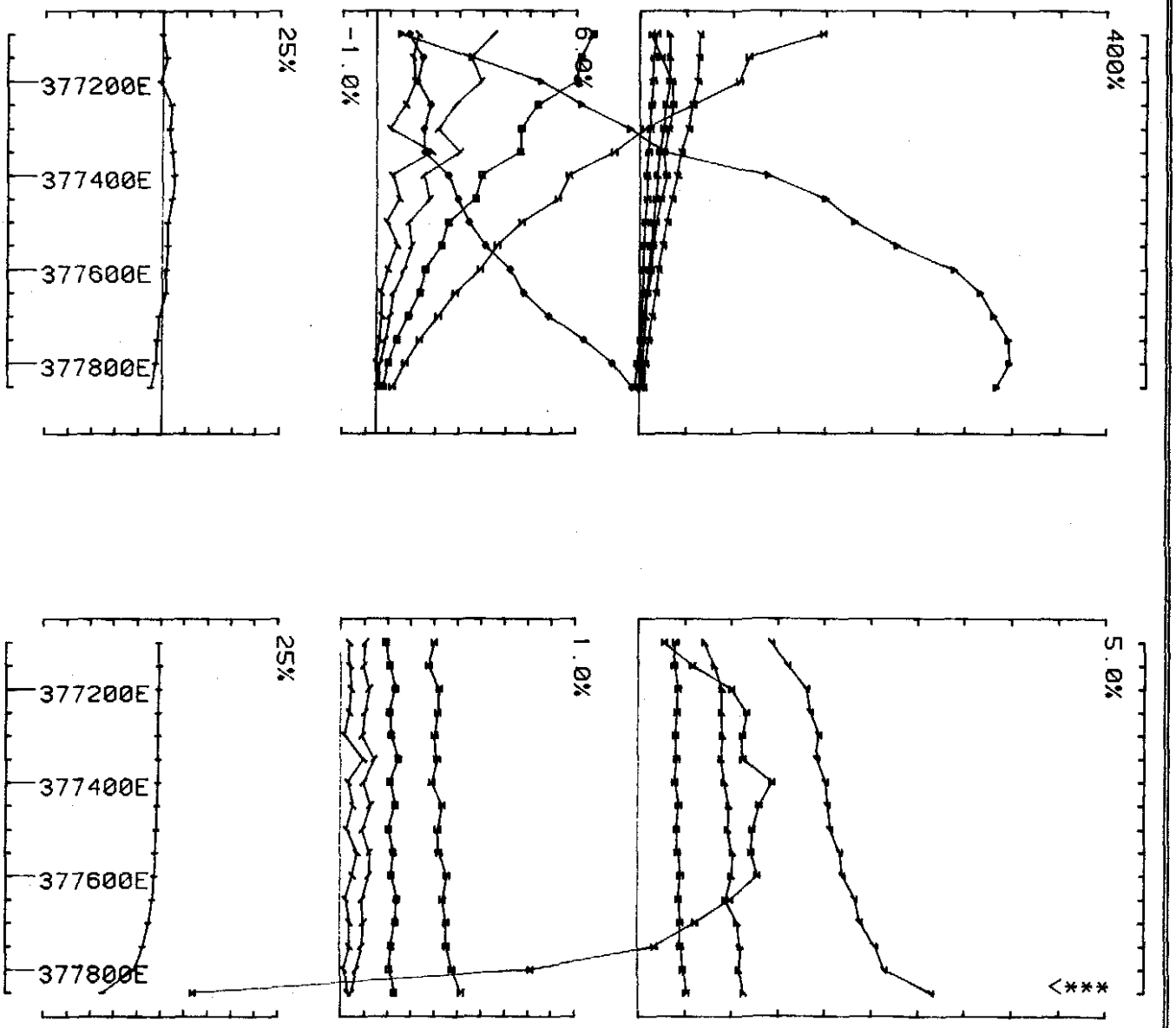
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM RX10
Line 80500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



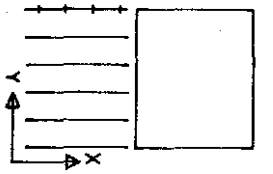
MT. KERSHAW
LOOP 0081
LINE 80500
Hz

362

898363



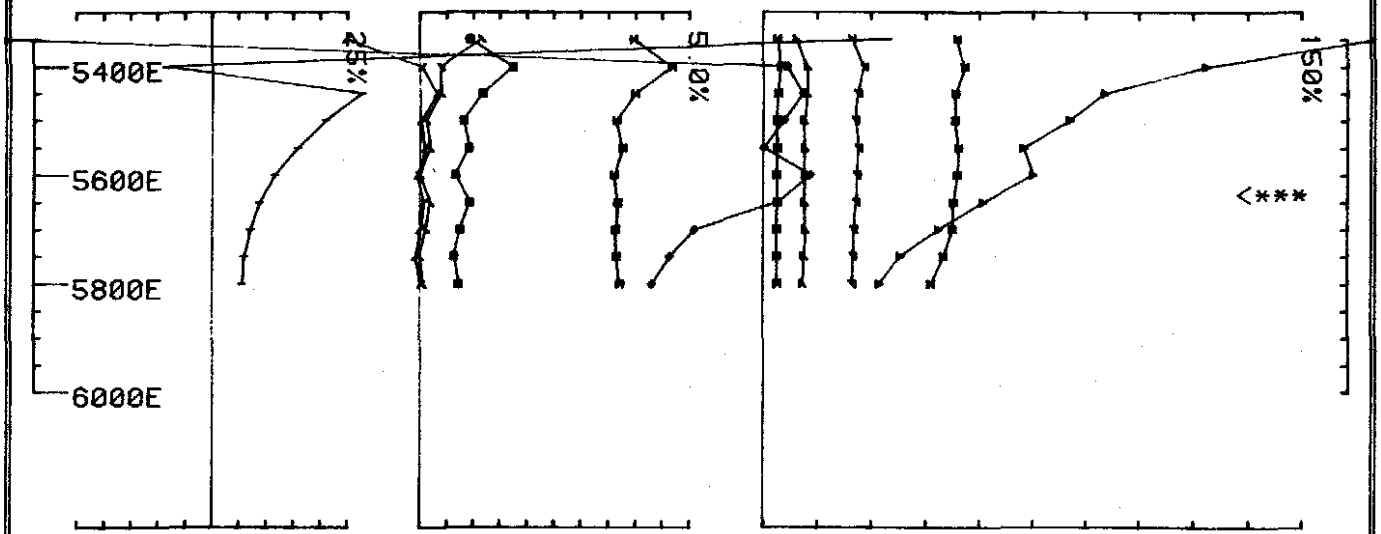
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM RX10
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

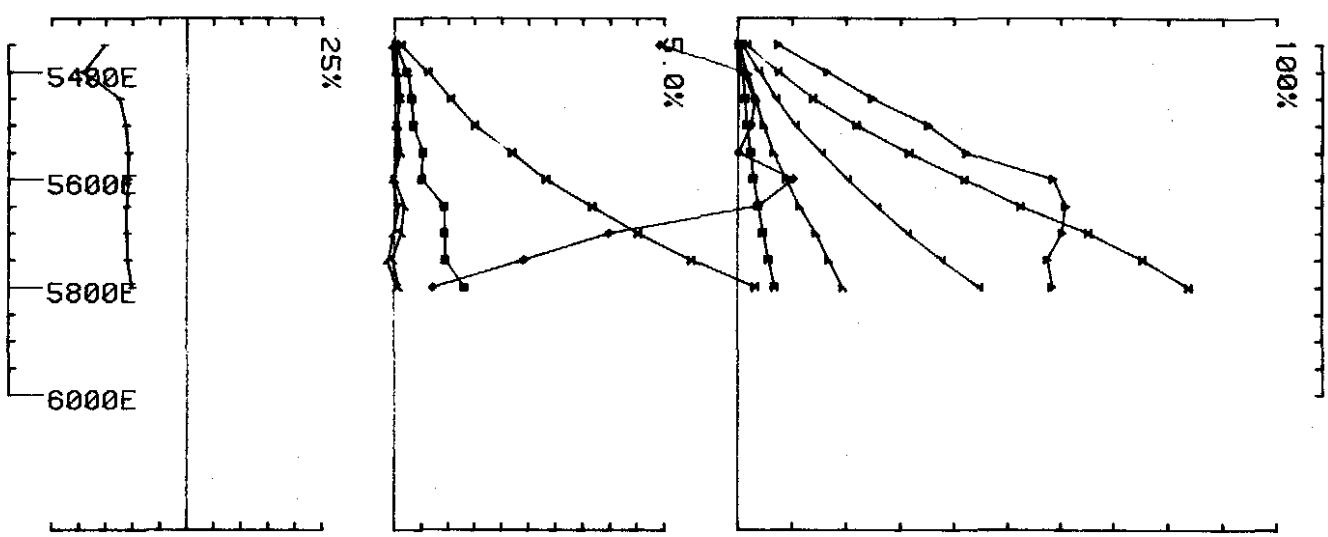


MT. KERSHAW
LOOP 0081
LINE 80700
Hz

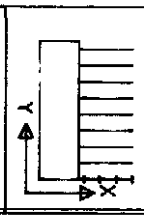
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898364





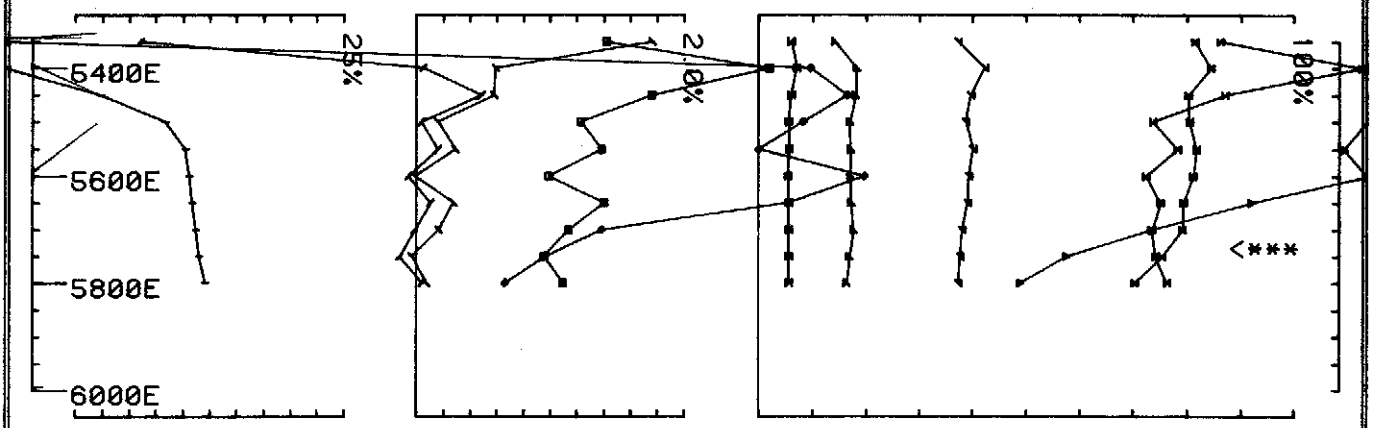
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 6200N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



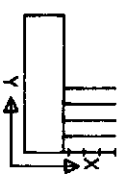
NORTH PINNACLES
LOOP 8000
LINE 6200
Hz

364

898365



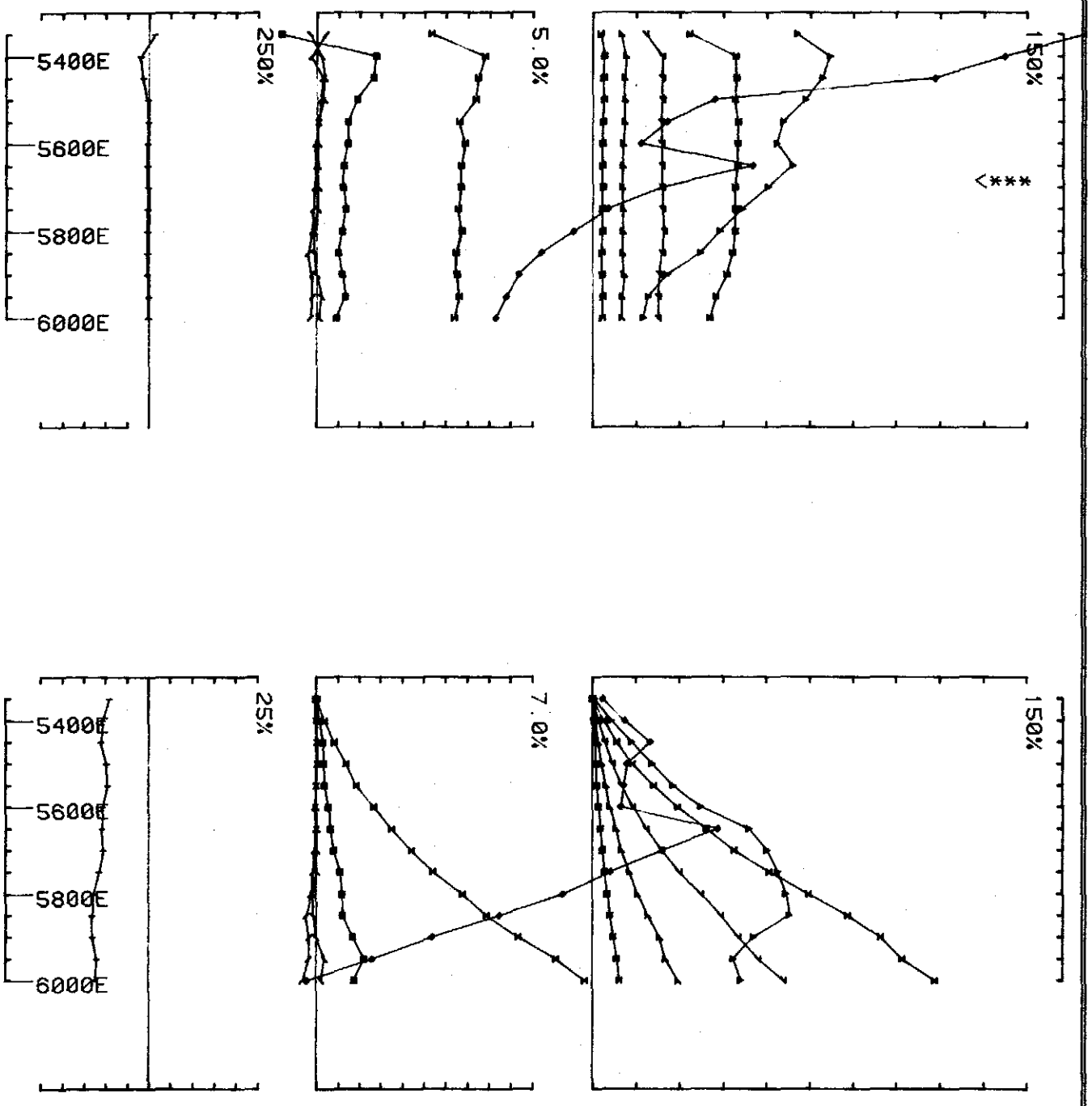
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 6200N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



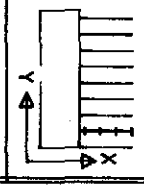
NORTH PINNACLES
LOOP 8031
LINE 6200
Hz

365

898366



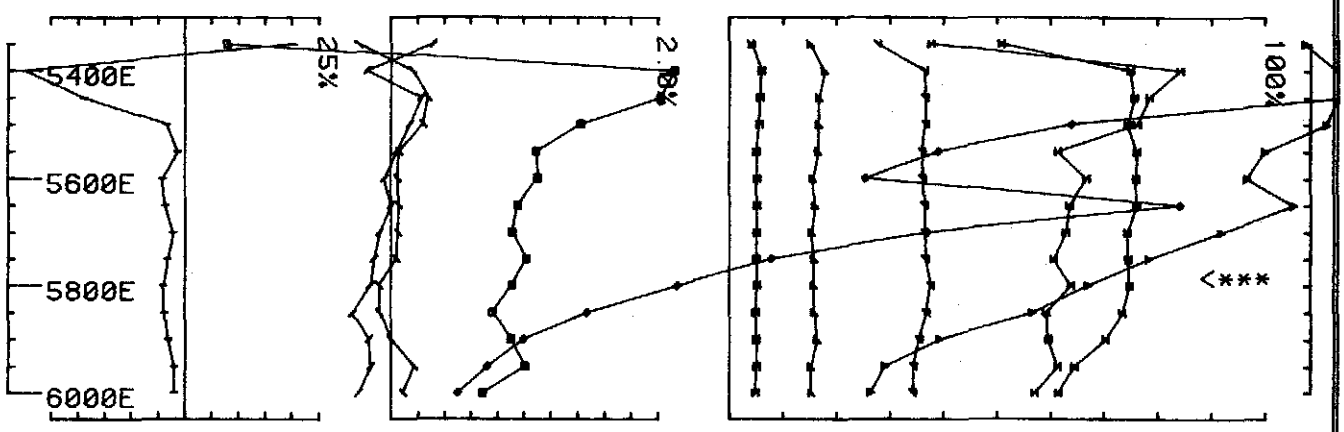
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 6400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



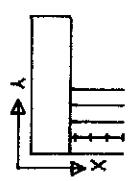
NORTH PINNACLES
LOOP 8000
LINE 6400
Hz

366

898367



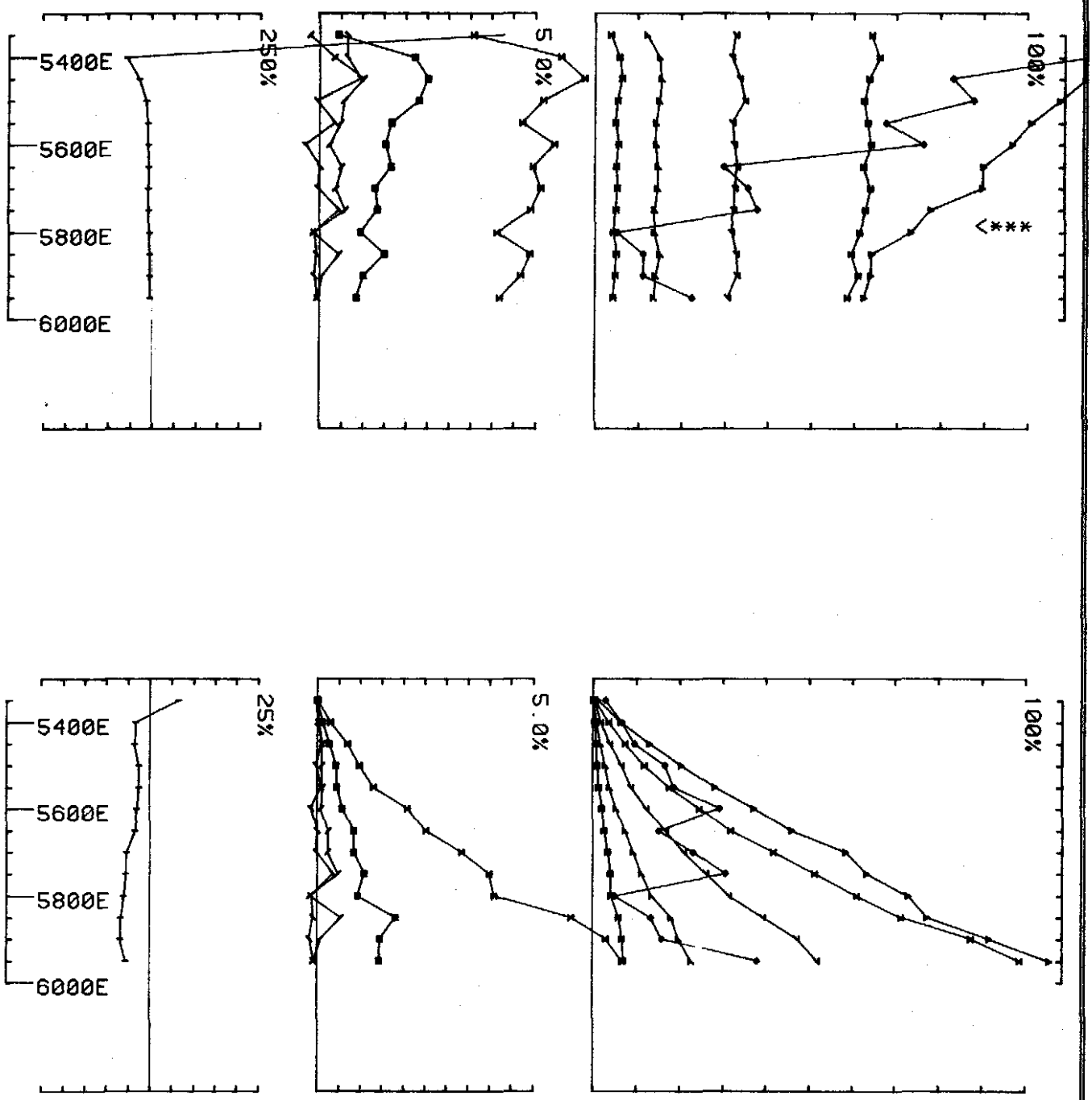
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 6400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



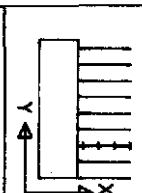
NORTH PINNACLES
LOOP 8031
LINE 6400
Hz

367

898368



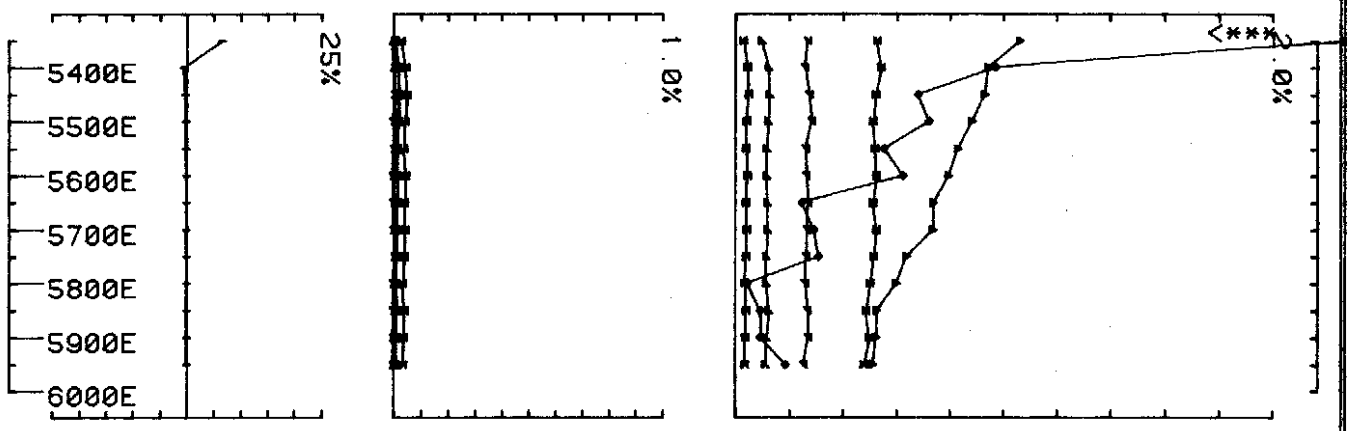
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 6600N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



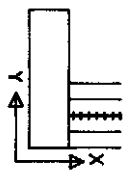
NORTH PINNACLES
LOOP 8031
LINE 6600
Hz

368

898369



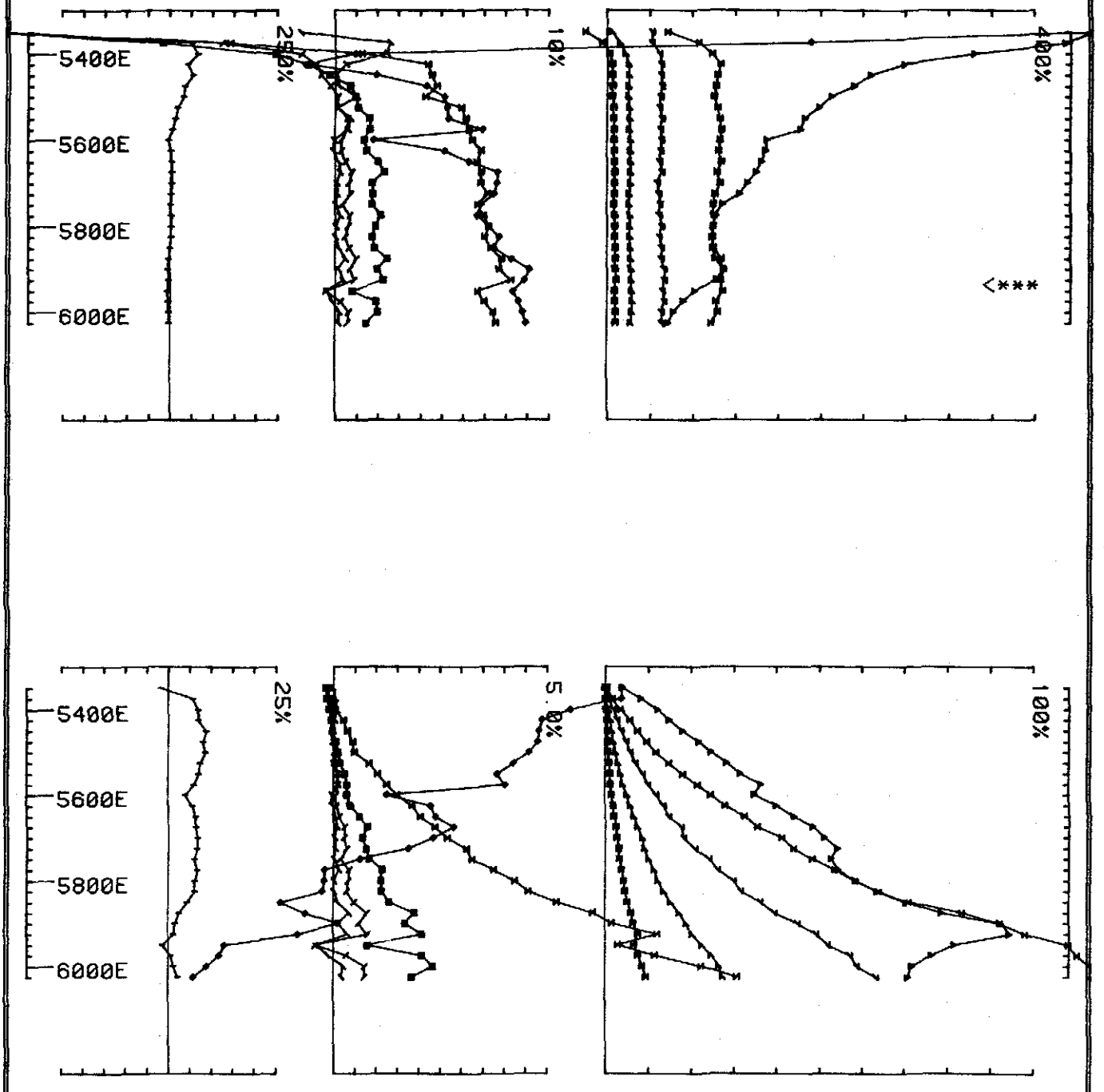
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM
Line 6600N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



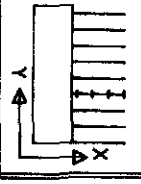
NORTH PINNACLES
LOOP 8031
LINE 6600
Hz

369

898370



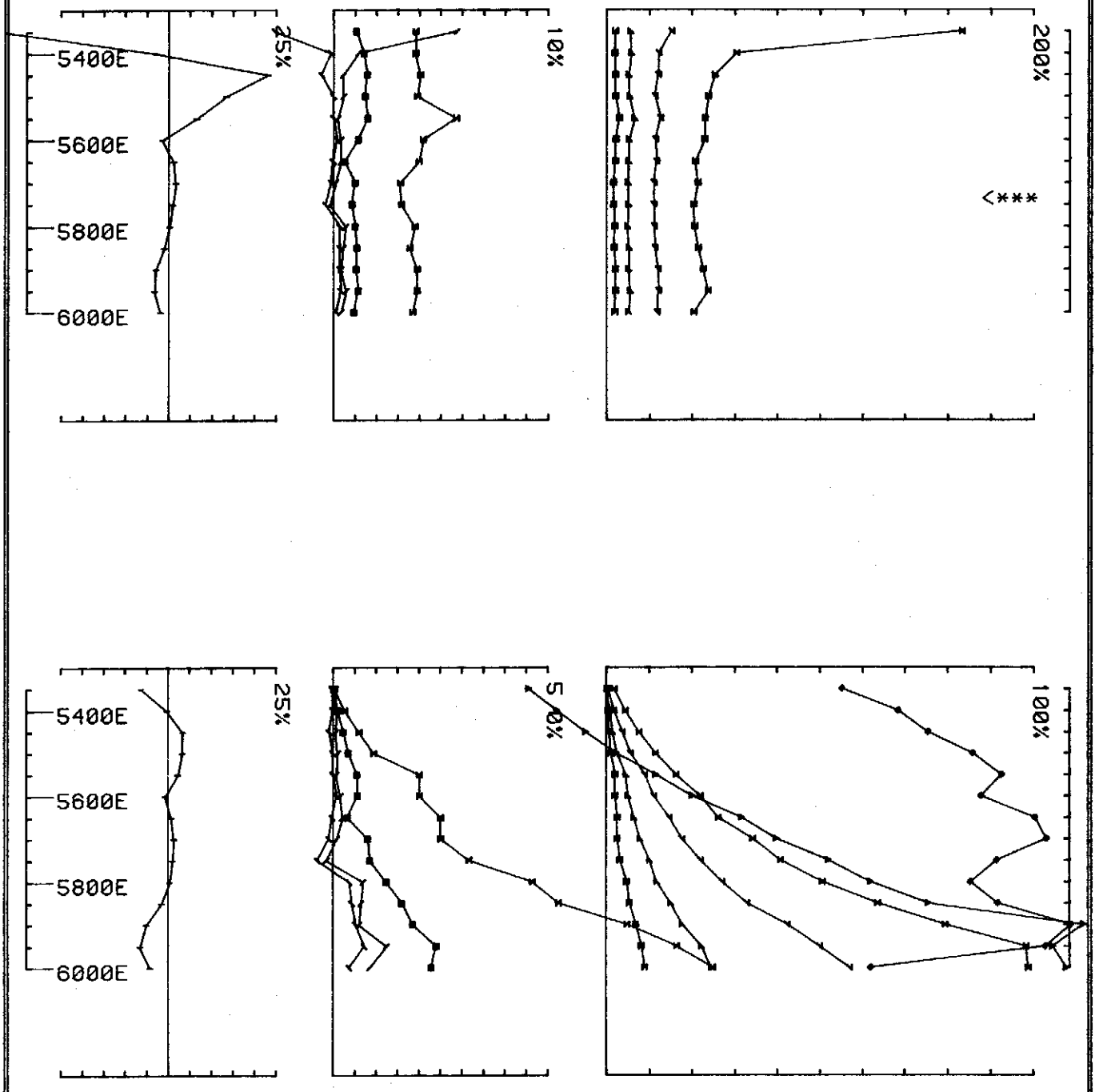
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8 C8
Line 6800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



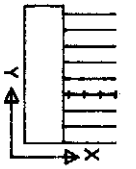
NORTH PINNACLES
LOOP 8000
LINE 6800
Hz

370

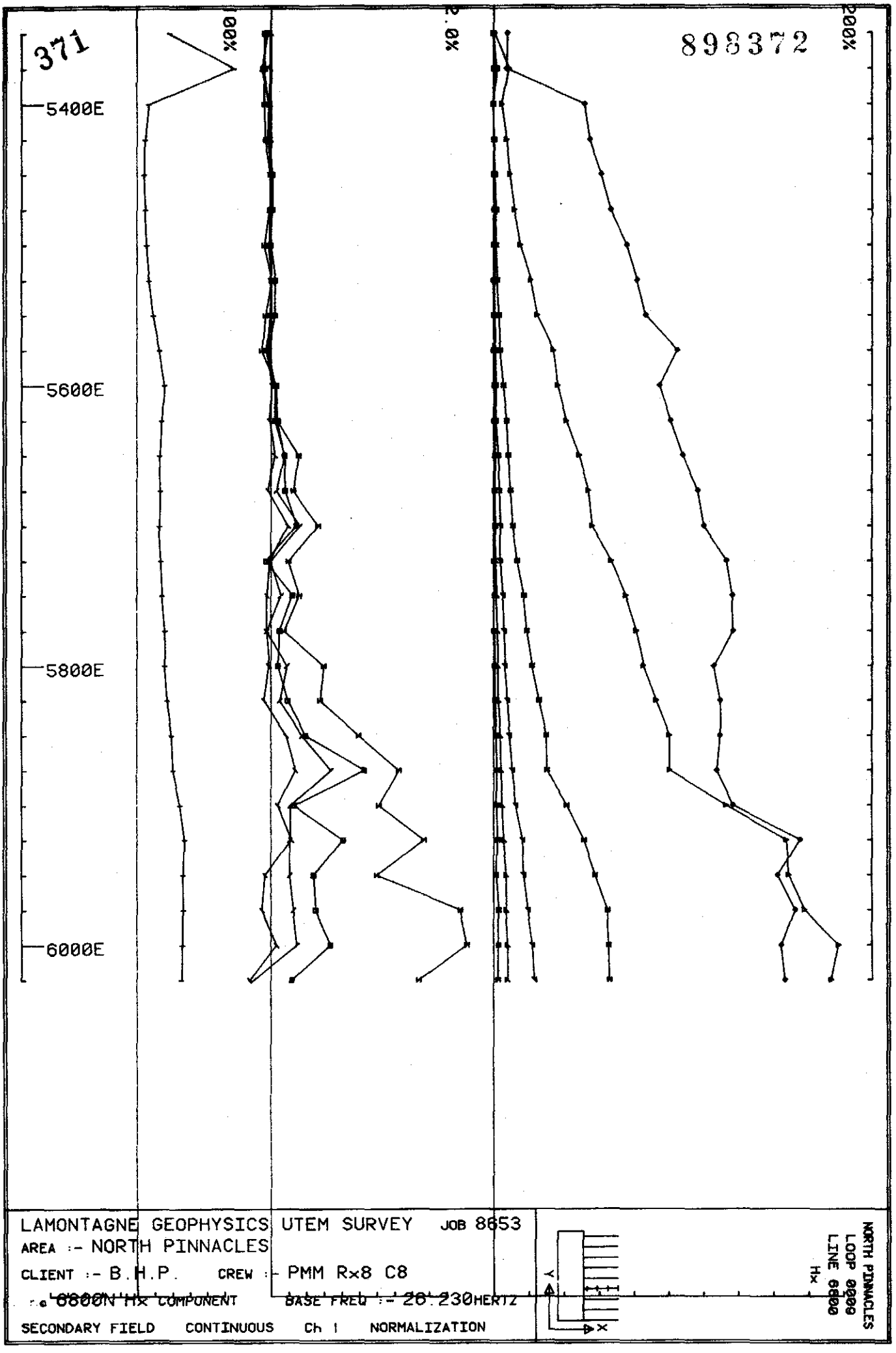
898371



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 6800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

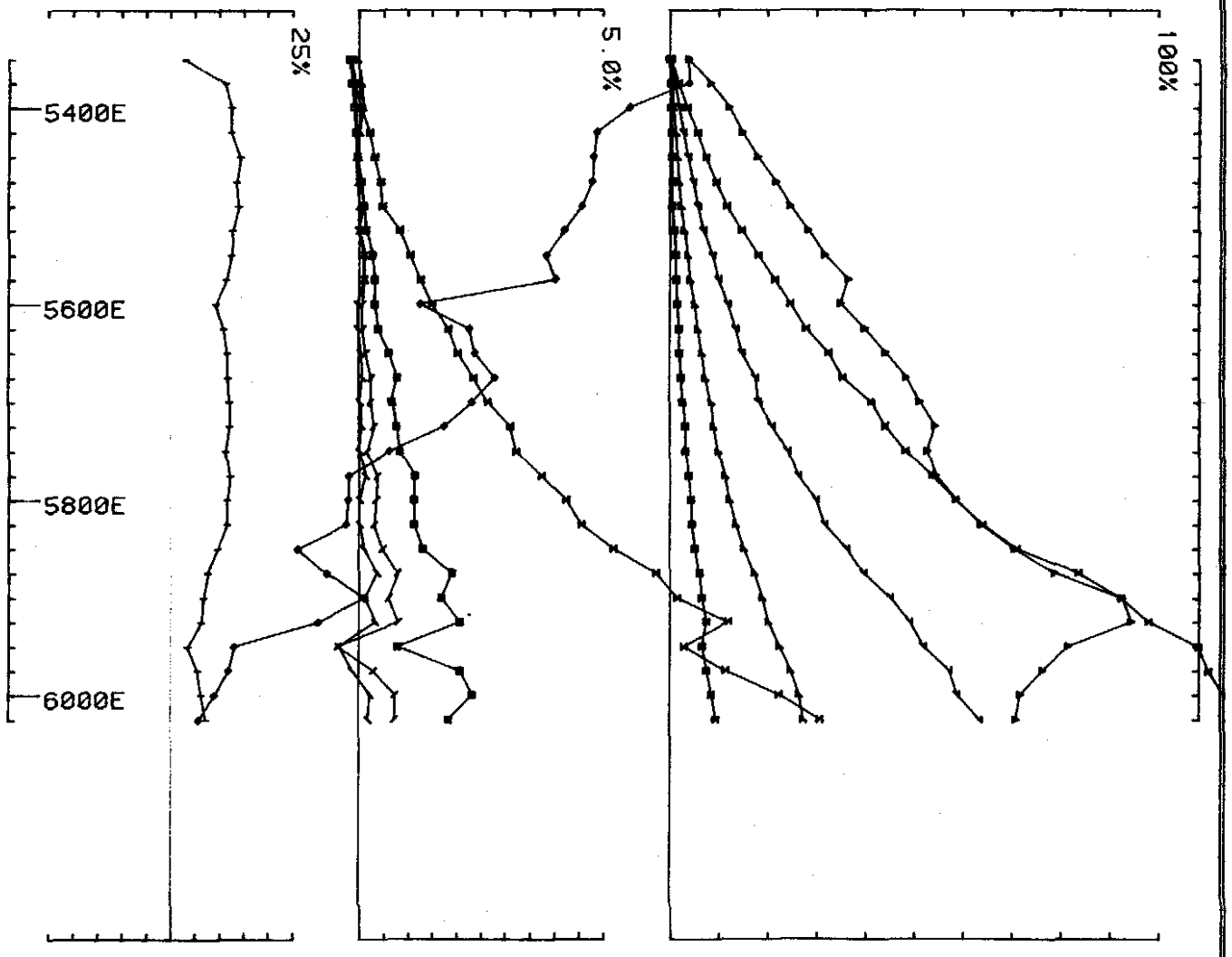


NORTH PINNACLES
LOOP 8031
LINE 6800
Hz

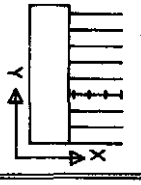

371
898372
5400E
5600E
5800E
6000E
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8 C8
6800N Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION
NORTH PINNACLES
LOOP 8000
LINE 6800
Hx

372

898373



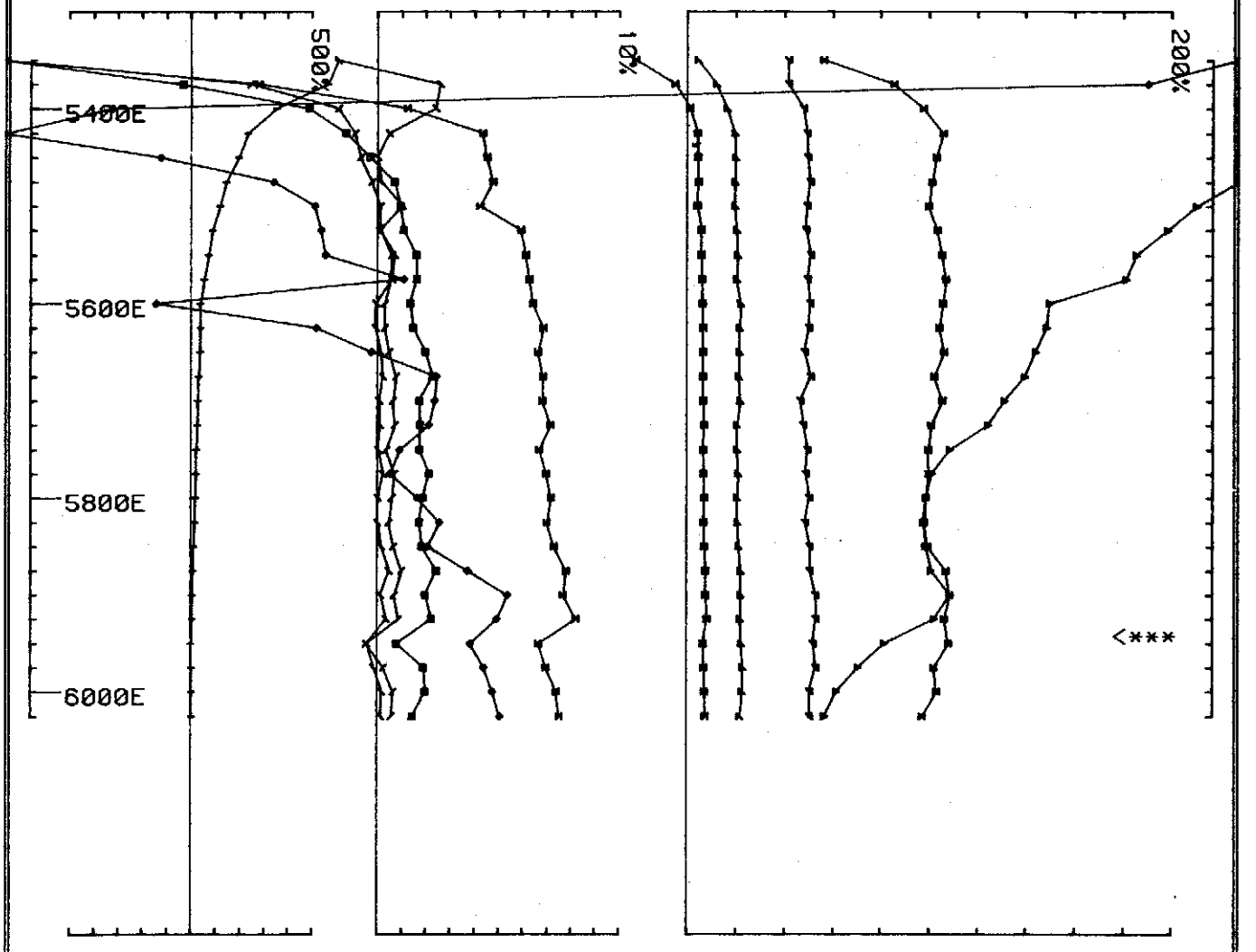
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8 C8
Line 6800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



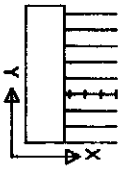
NORTH PINNACLES
LOOP 8000
LINE 6800
Hz

373

898374



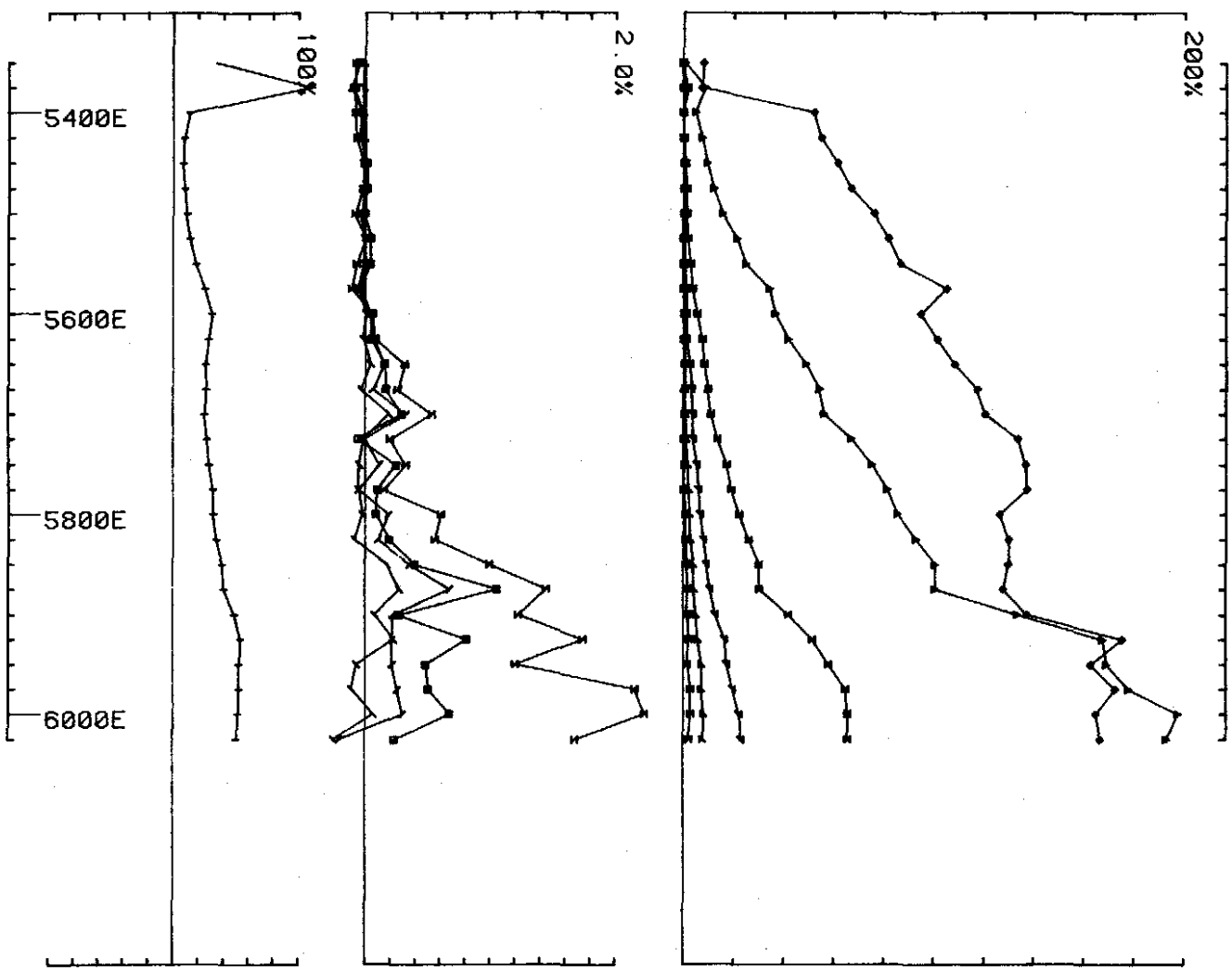
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8 C8
Line 6800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD POINT Ch 1 NORMALIZATION



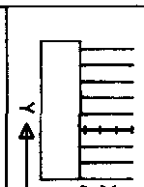
NORTH PINNACLES
LOOP 6000
LINE 6800
Hz

374

898375



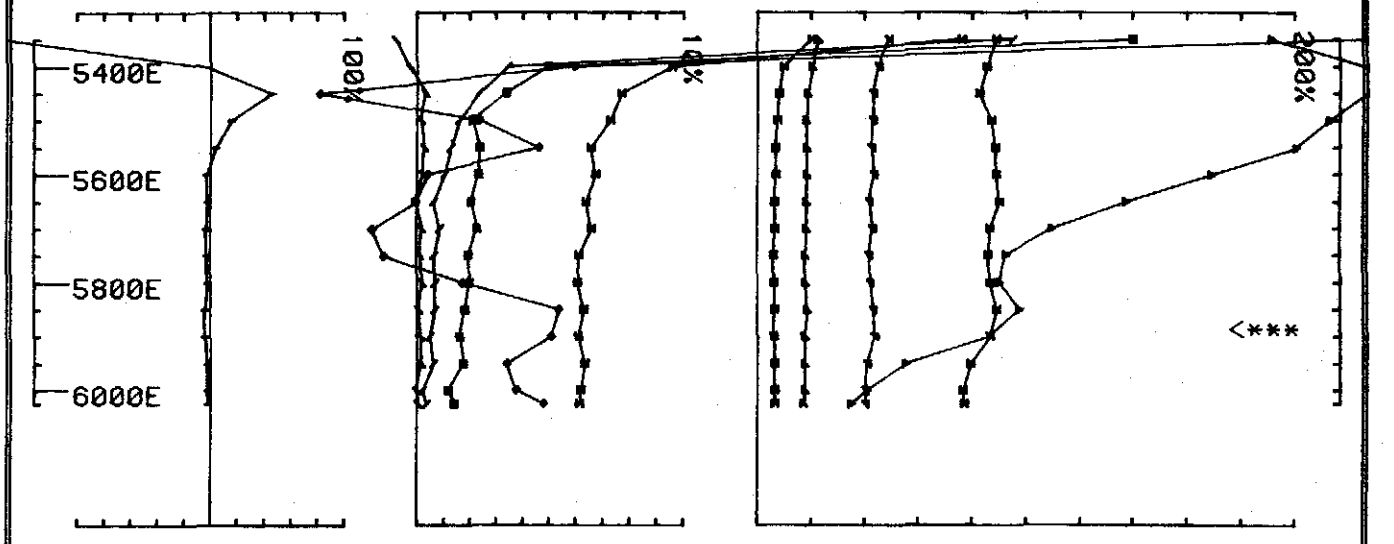
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8 C8
Line 6800N Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

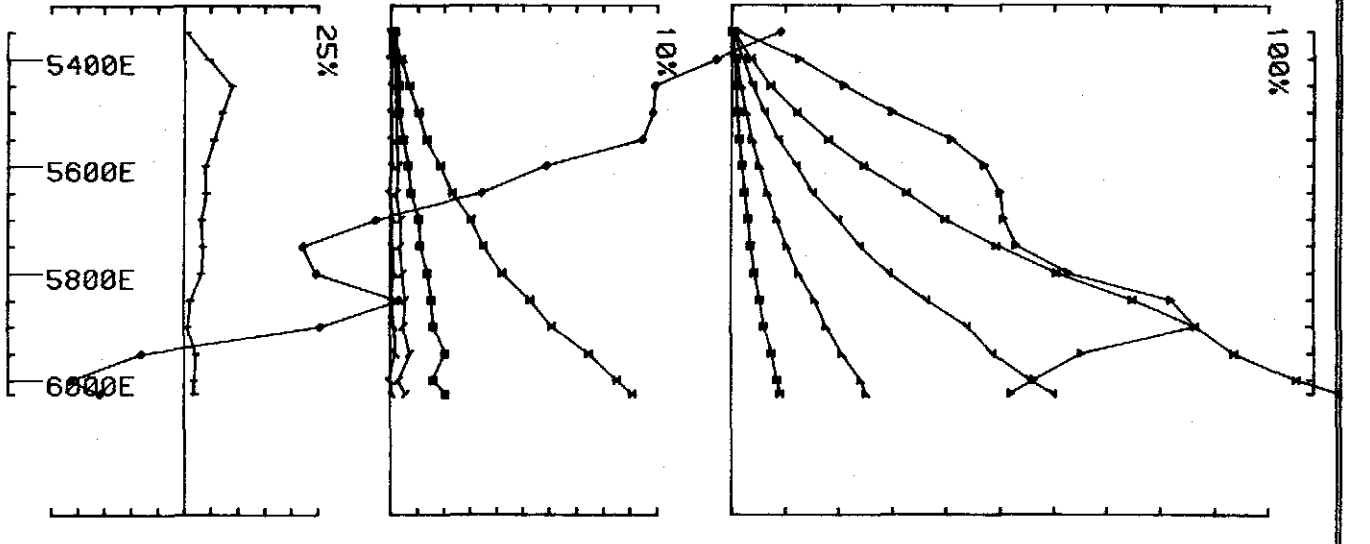


NORTH PINNACLES
LOOP 8000
LINE 6800
Hx

375

898376





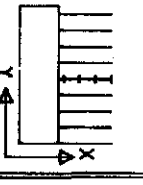
KAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- NORTH PINNACLES

CLIENT :- B.H.P. CREW :- PMM Rx8 C8

Line 7000N Hz COMPONENT BASE FREQ :- 26.230HERTZ

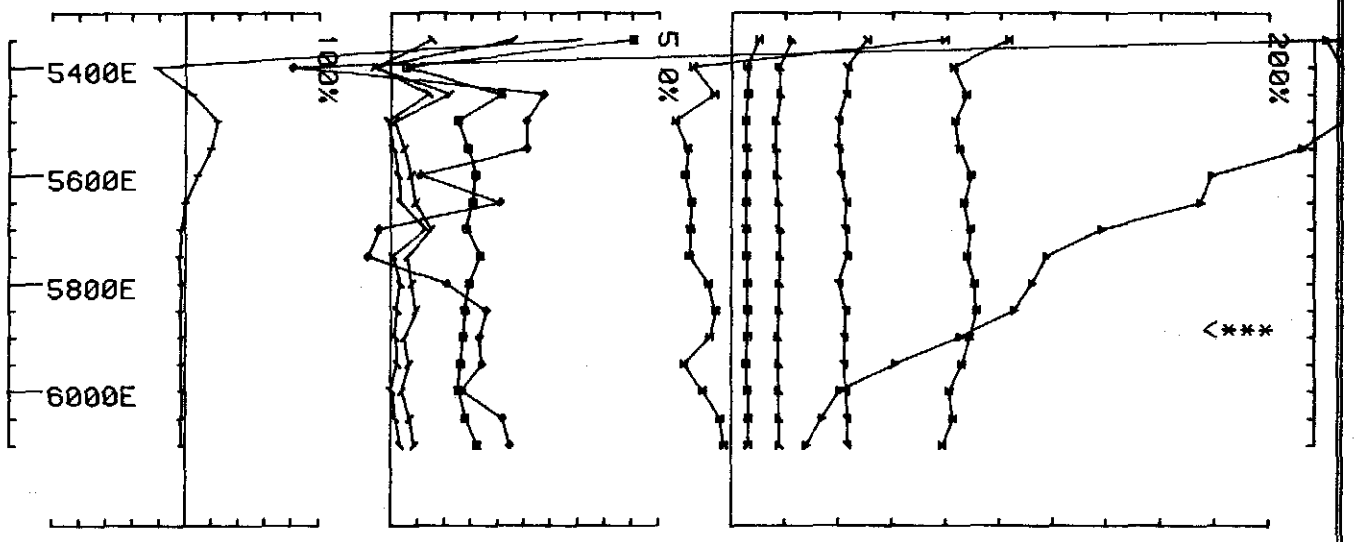
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

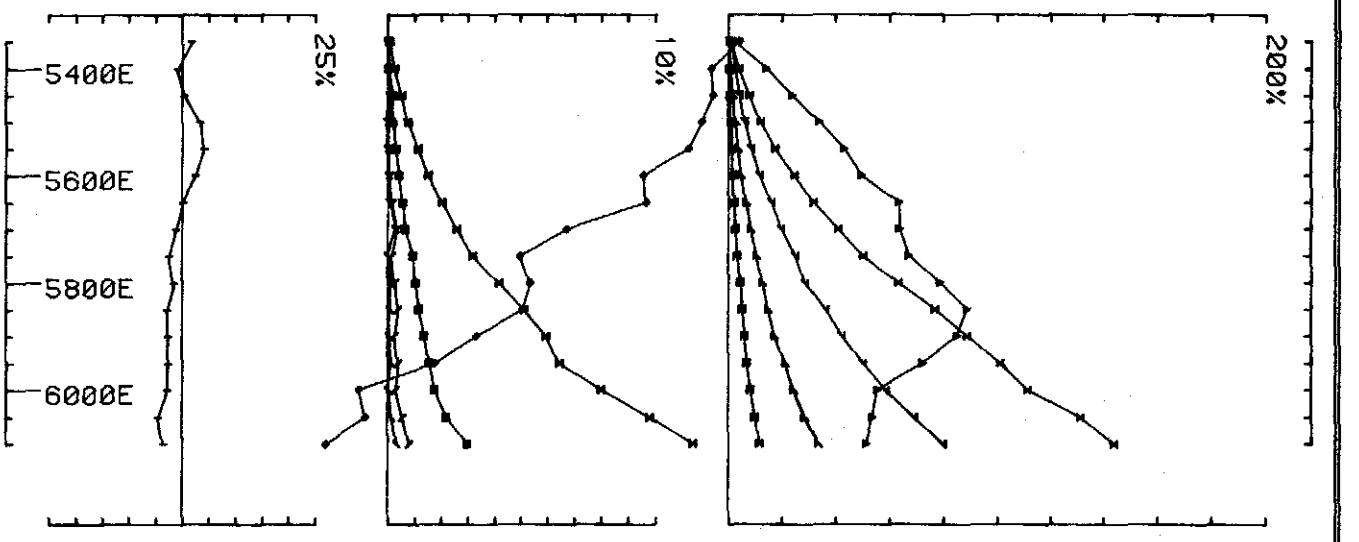


NORTH PINNACLES
LOOP 8000
LINE 7000
Hz

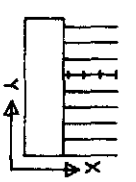
376

898377





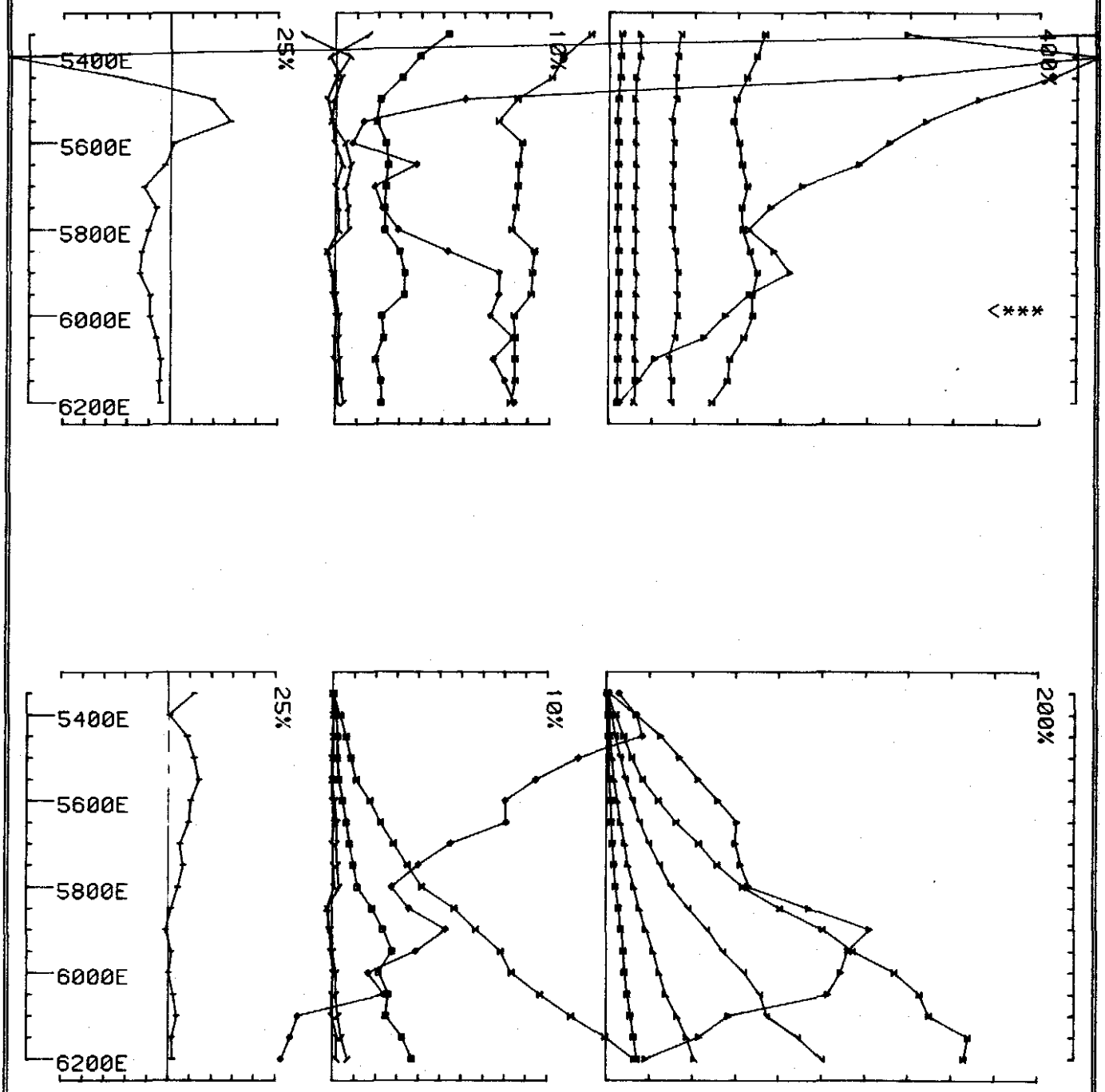
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8 C8
Line 7200N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



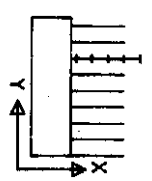
NORTH PINNACLES
LOOP 8000
LINE 7200
Hz

377

898378



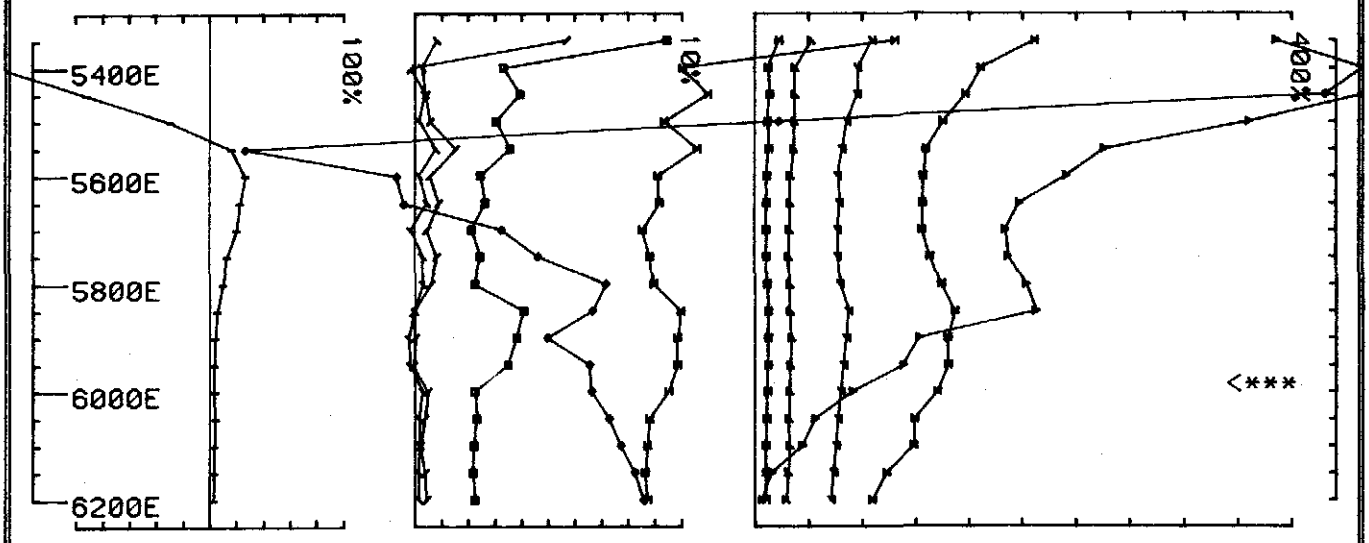
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

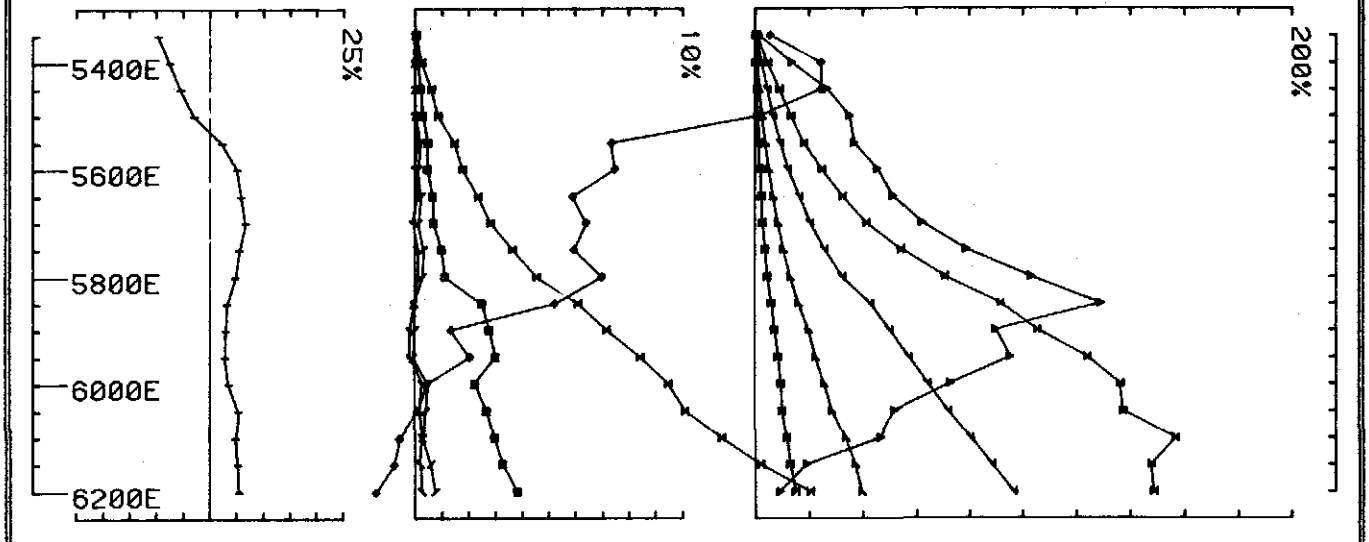


NORTH PINNACLES
LOOP 8031
LINE 7400
Hz

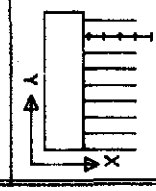
378

898379





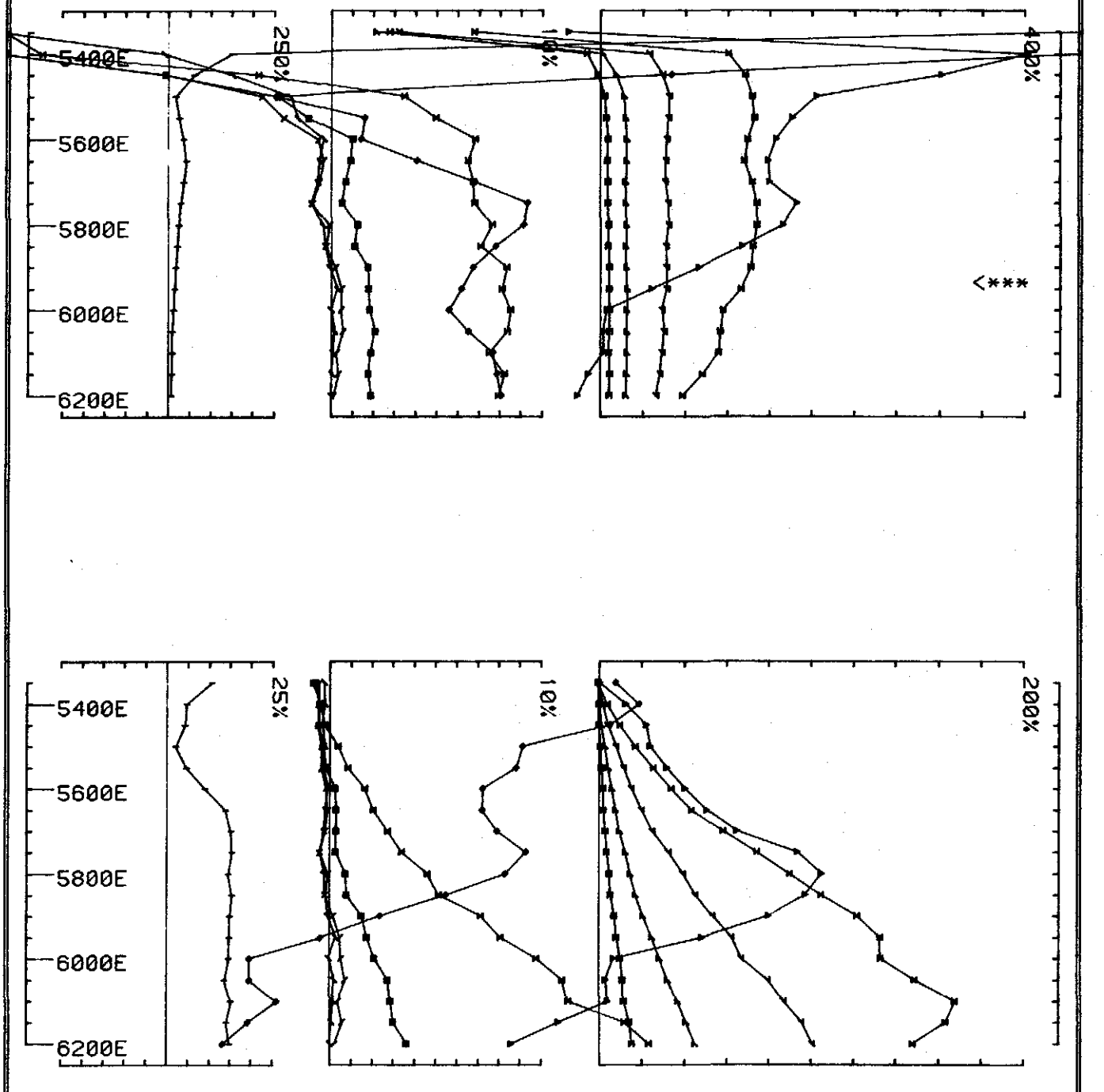
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7600N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



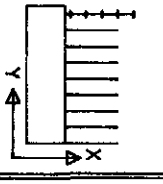
NORTH PINNACLES
LOOP 8031
LINE 7600
Hz

379

898380



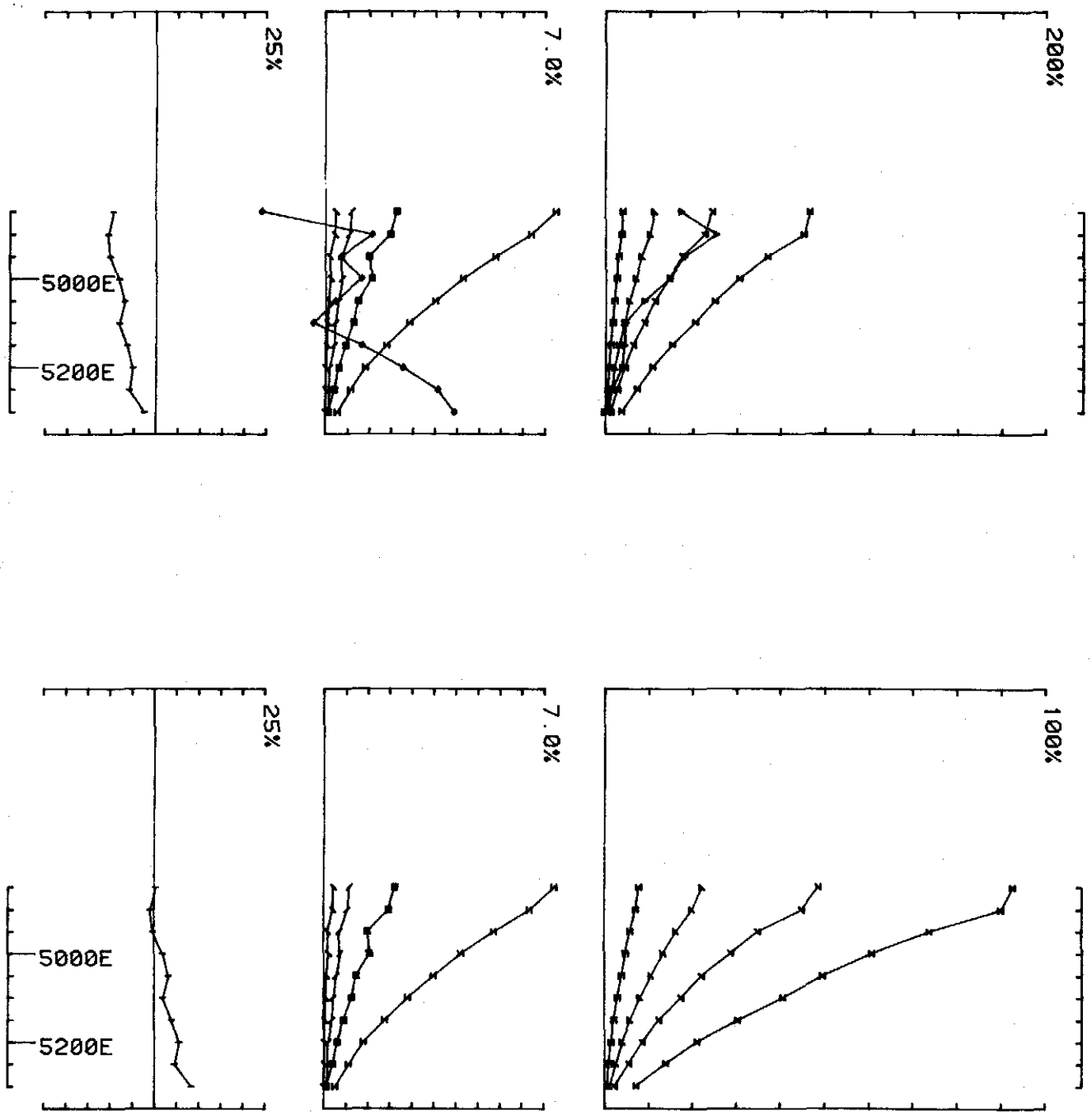
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



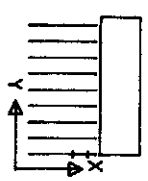
NORTH PINNACLES
LOOP 8031
LINE 7800
Hz

896381

380



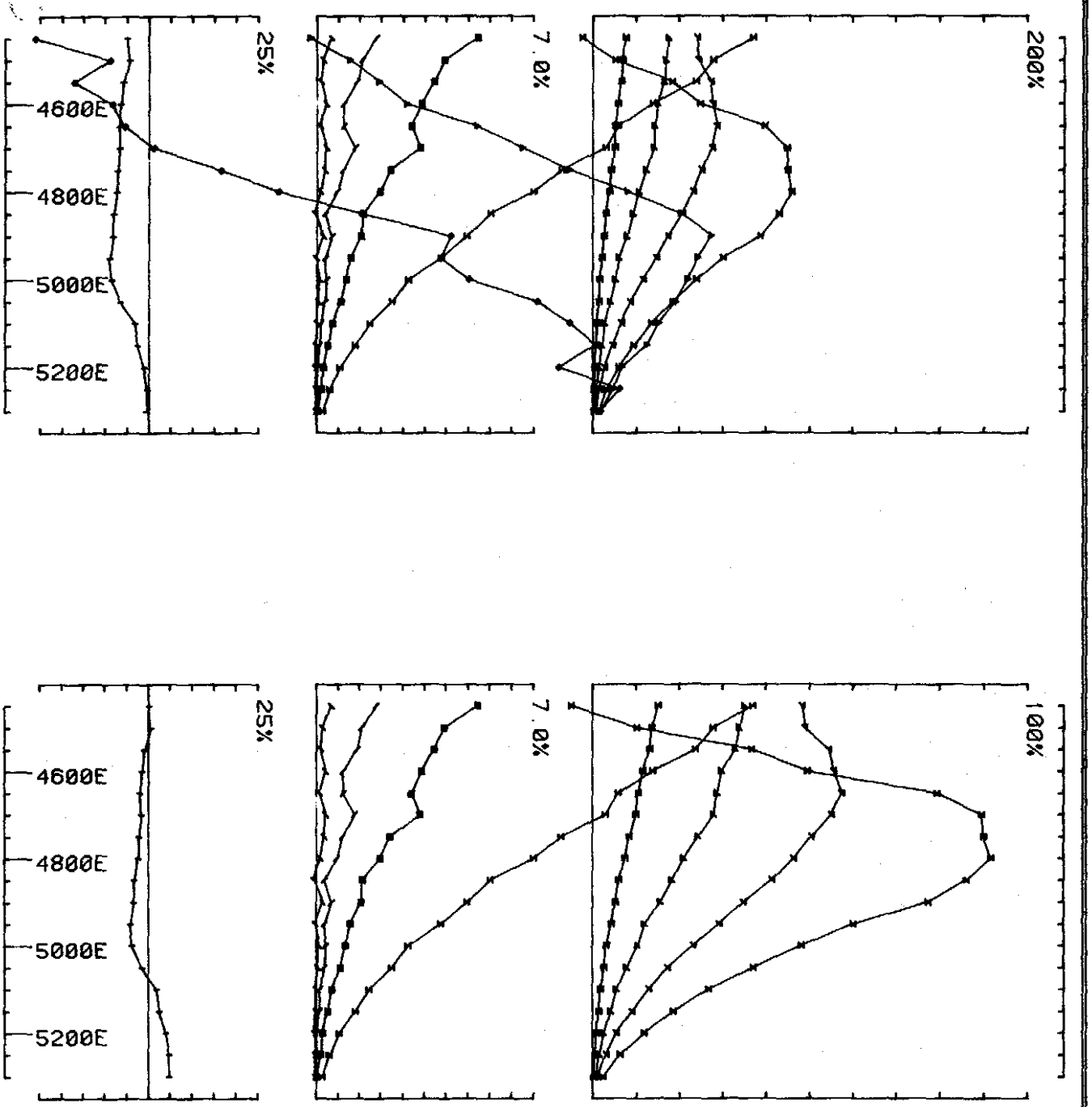
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 6200N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



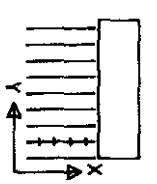
NORTH PINNACLES
LOOP 0010
LINE 6200
Hz

381

898382



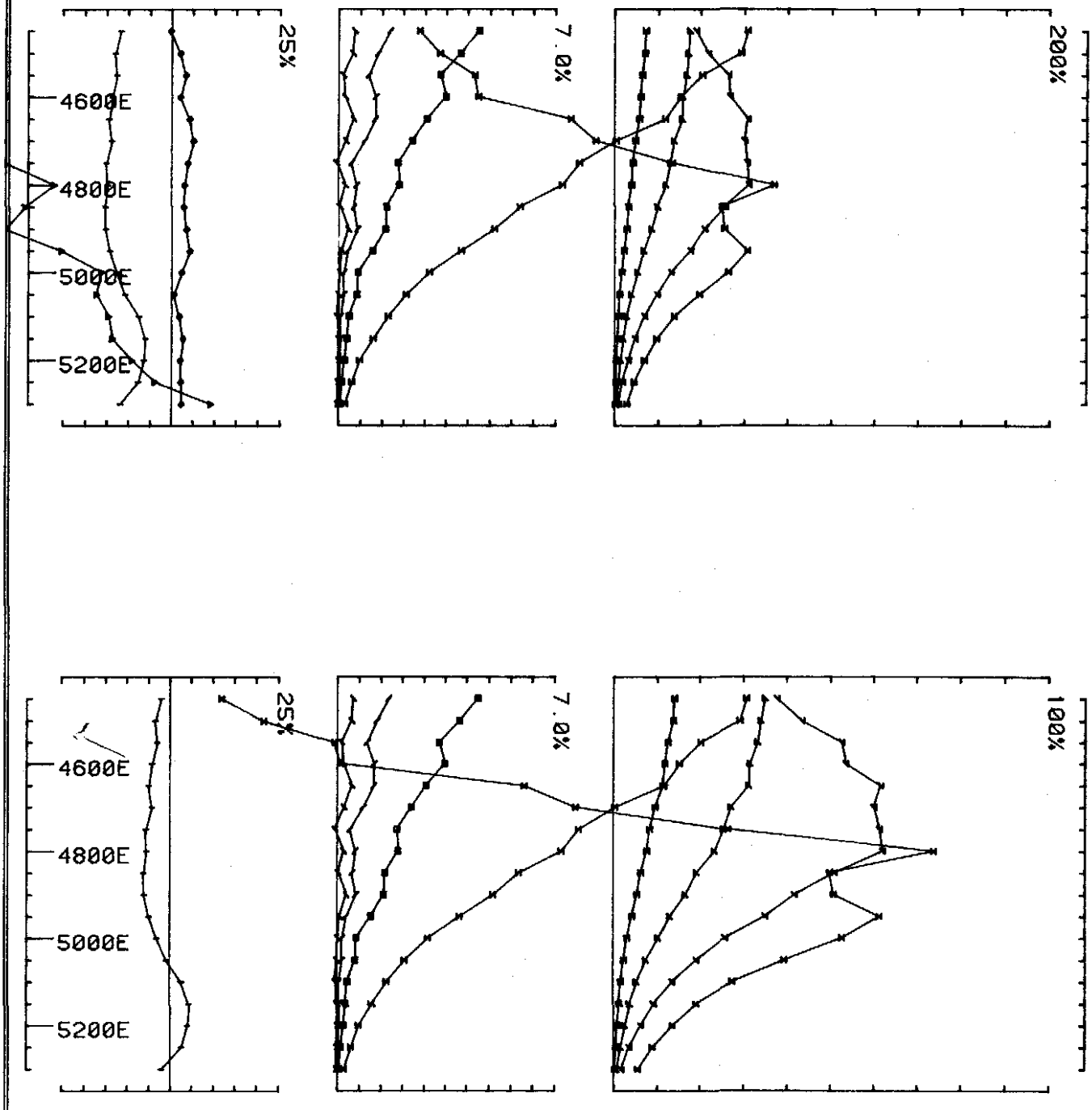
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 6400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



NORTH PINNACLES
LOOP 8818
LINE 6400
Hz

382

898383



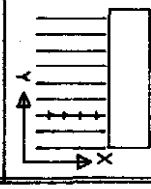
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- NORTH PINNACLES

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 6600N Hz COMPONENT BASE FREQ :- 26.230HERTZ

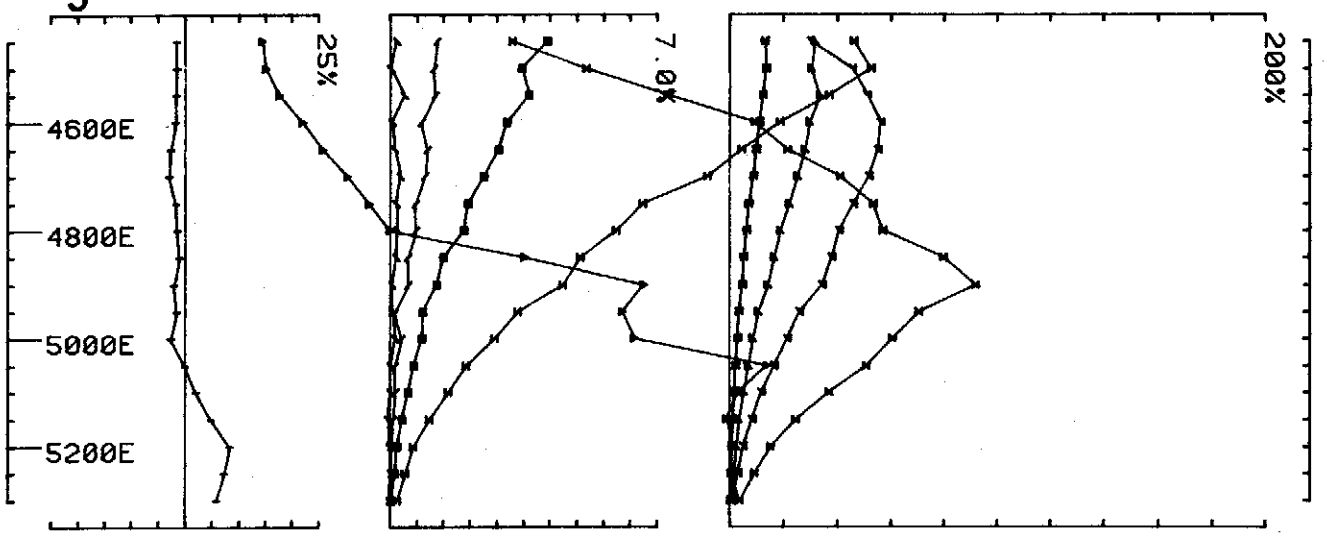
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

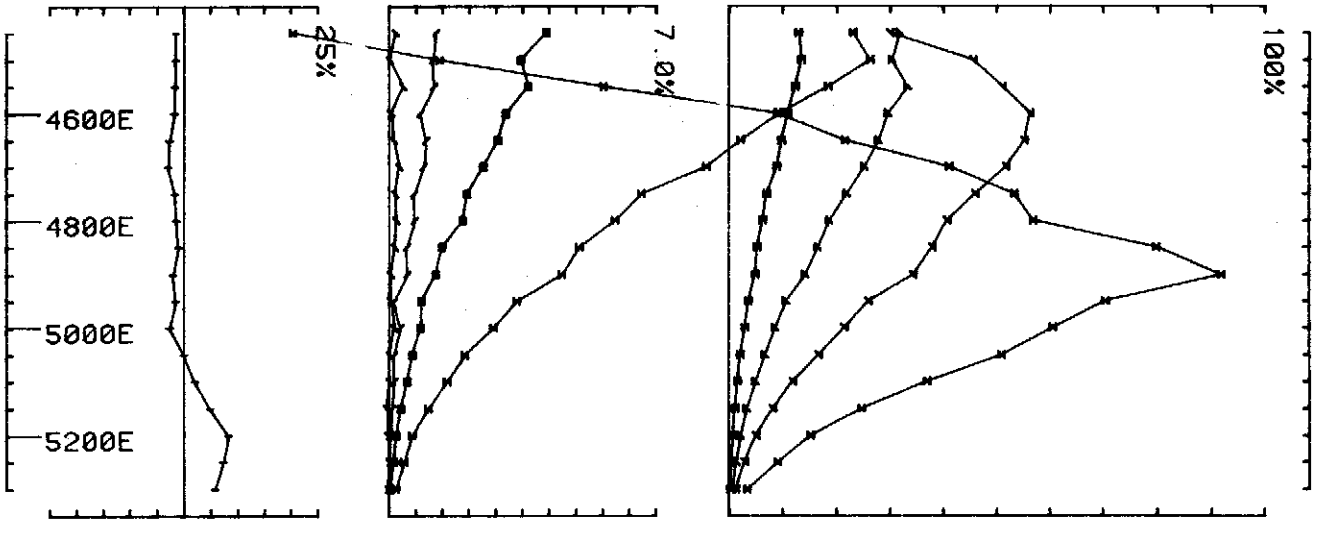


NORTH PINNACLES
LOOP 0010
LINE 6600
Hz

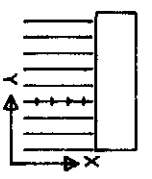
898384

383





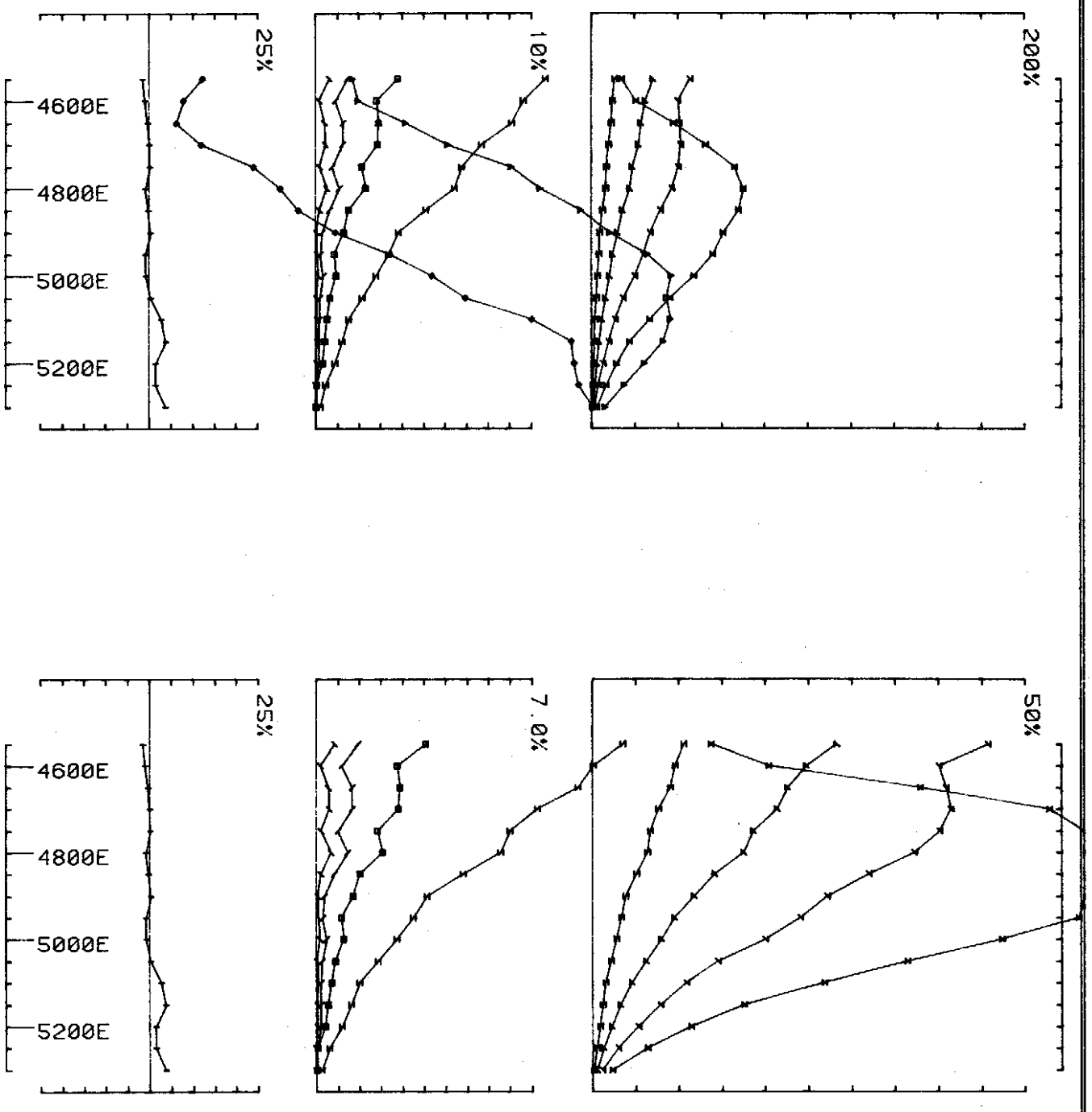
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 6800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



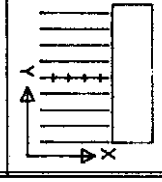
NORTH PINNACLES
LOOP 0010
LINE 6800
Hz

384

898385



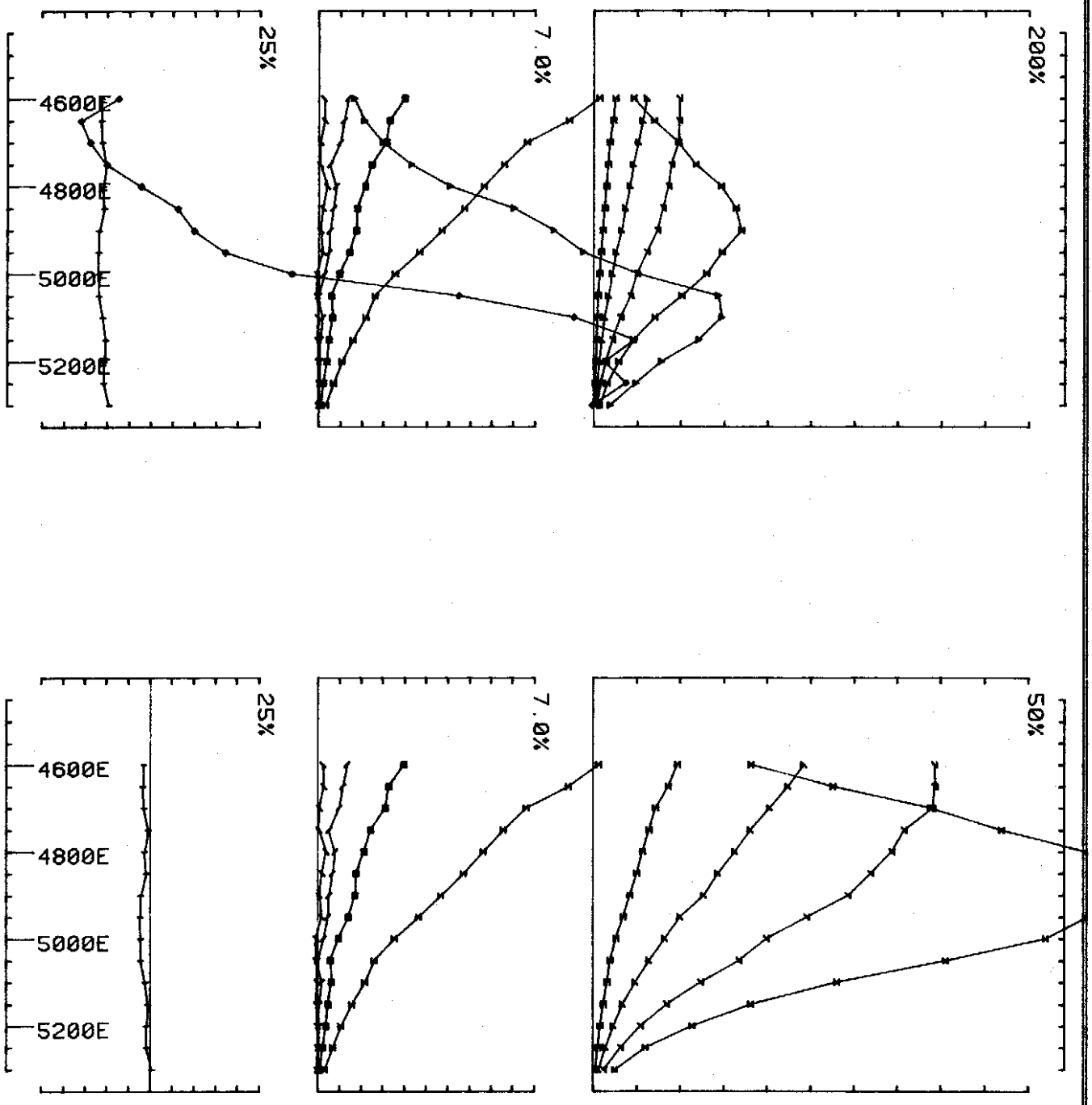
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 7000N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



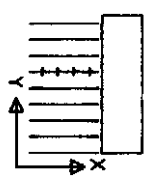
NORTH PINNACLES
LOOP 0010
LINE 7000
Hz

385

898386



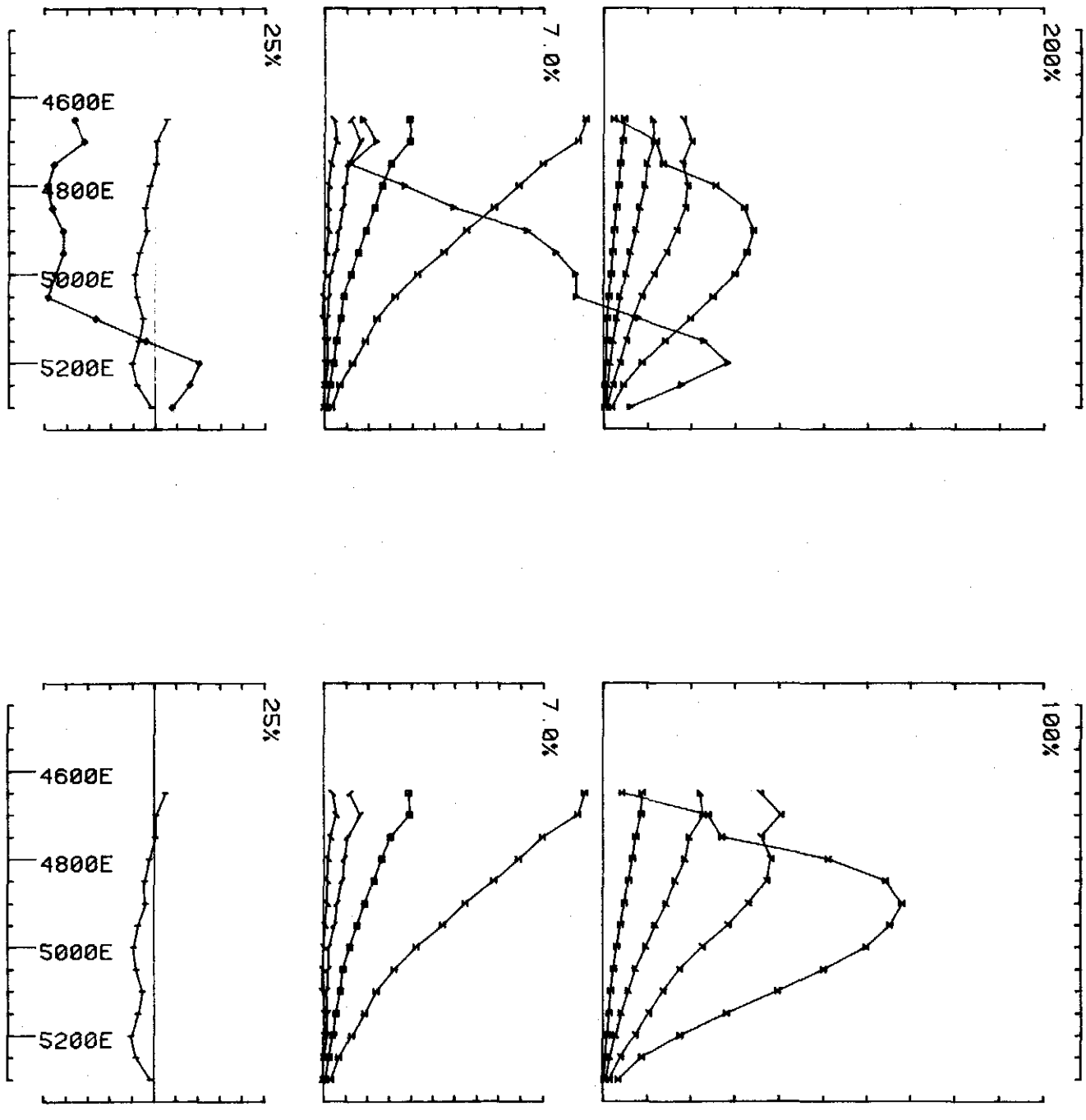
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7200N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



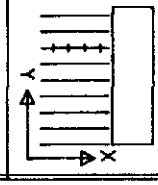
NORTH PINNACLES
LOOP 0010
LINE 7200
Hz

386

898387



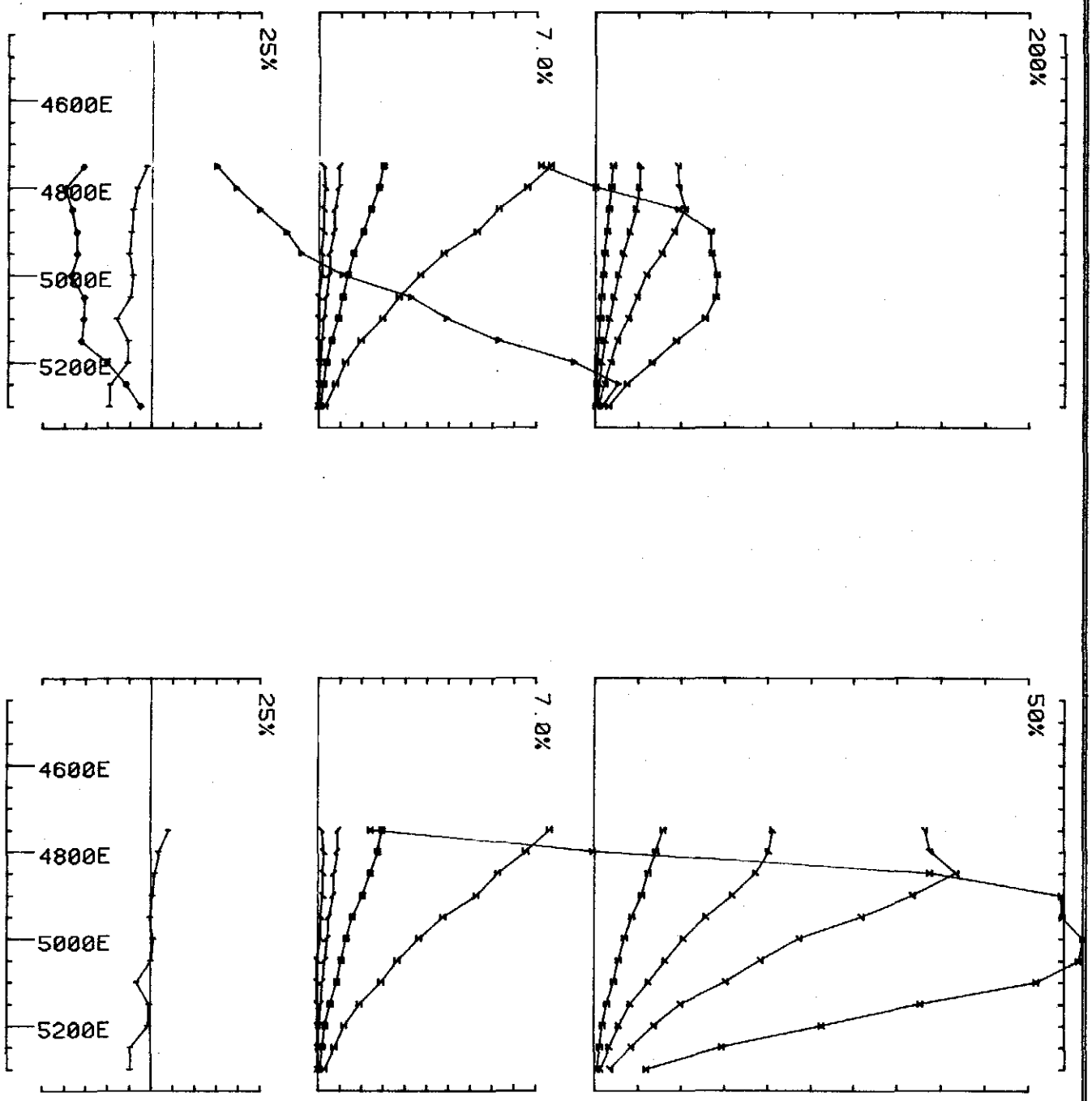
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7400N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



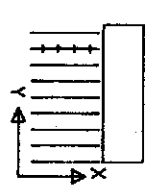
NORTH PINNACLES
LOOP 8010
LINE 7400
Hz

387

898388



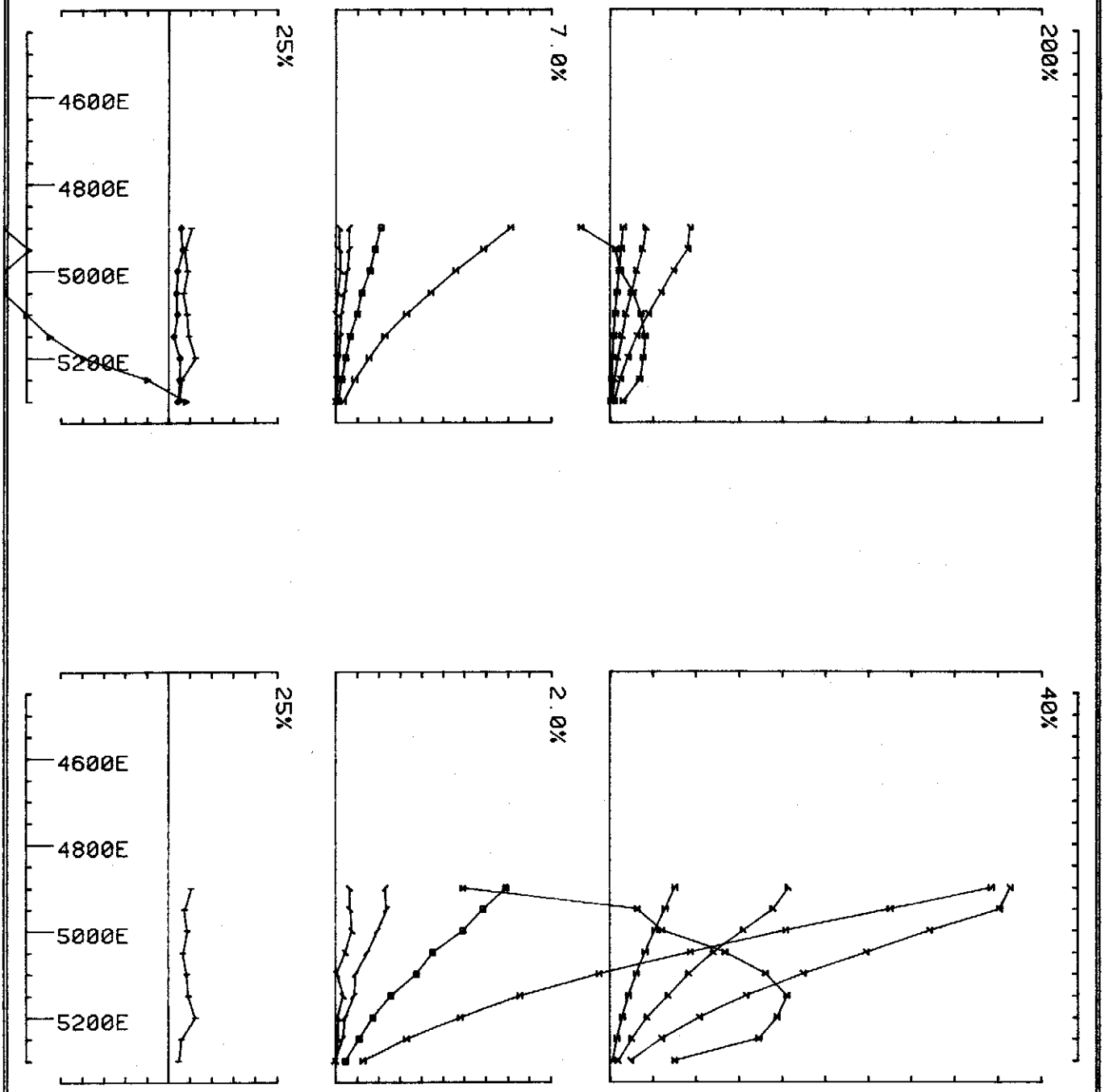
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7600N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



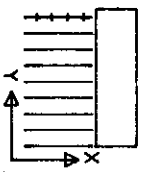
NORTH PINNACLES
LOOP 0010
LINE 7600
Hz

388

893389



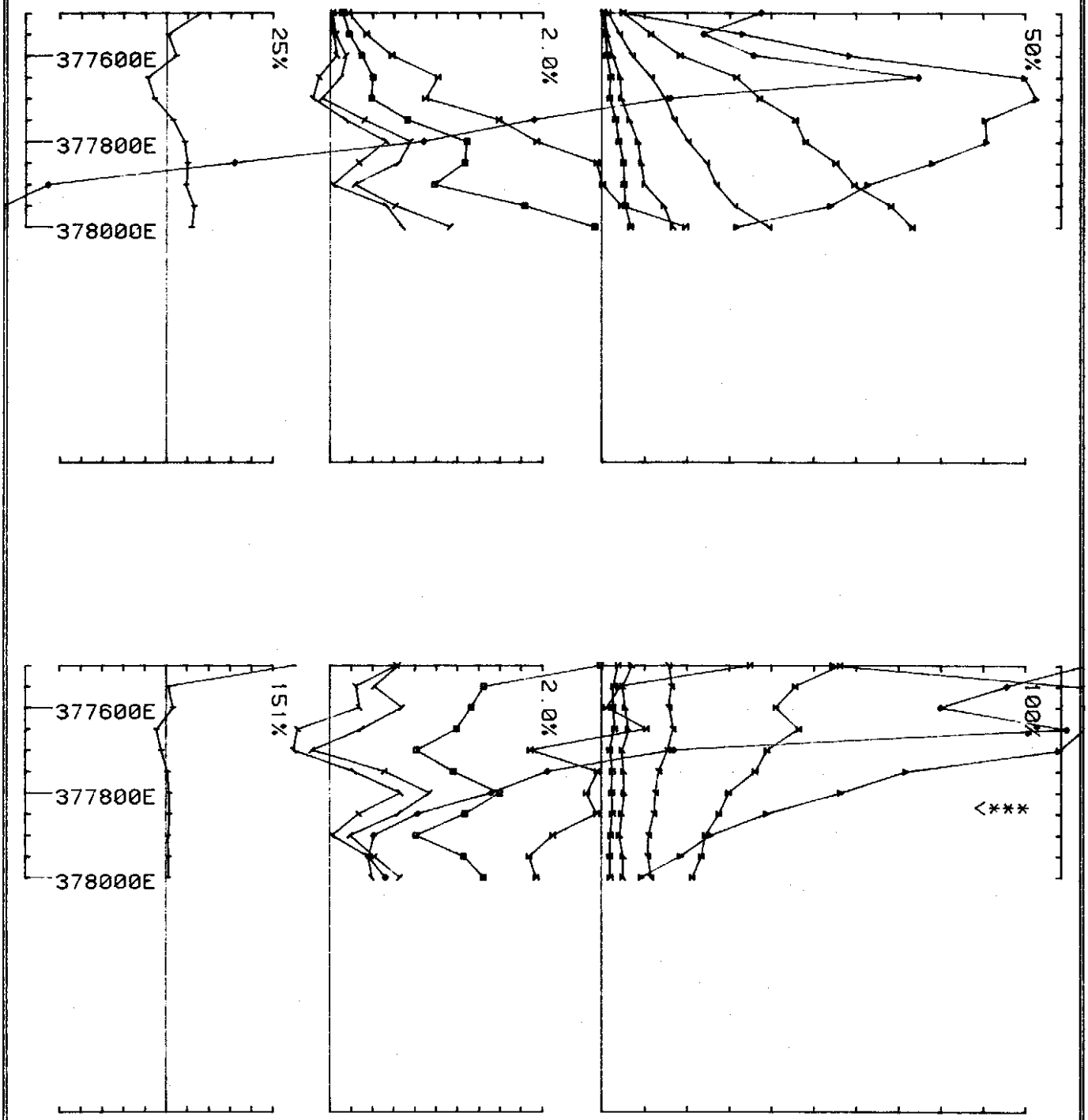
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- NORTH PINNACLES
CLIENT :- B.H.P. CREW :- ART Rx10 C3
Line 7800N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



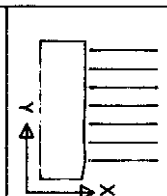
NORTH PINNACLES
LOOP 0010
LINE 7800
Hz

389

898390



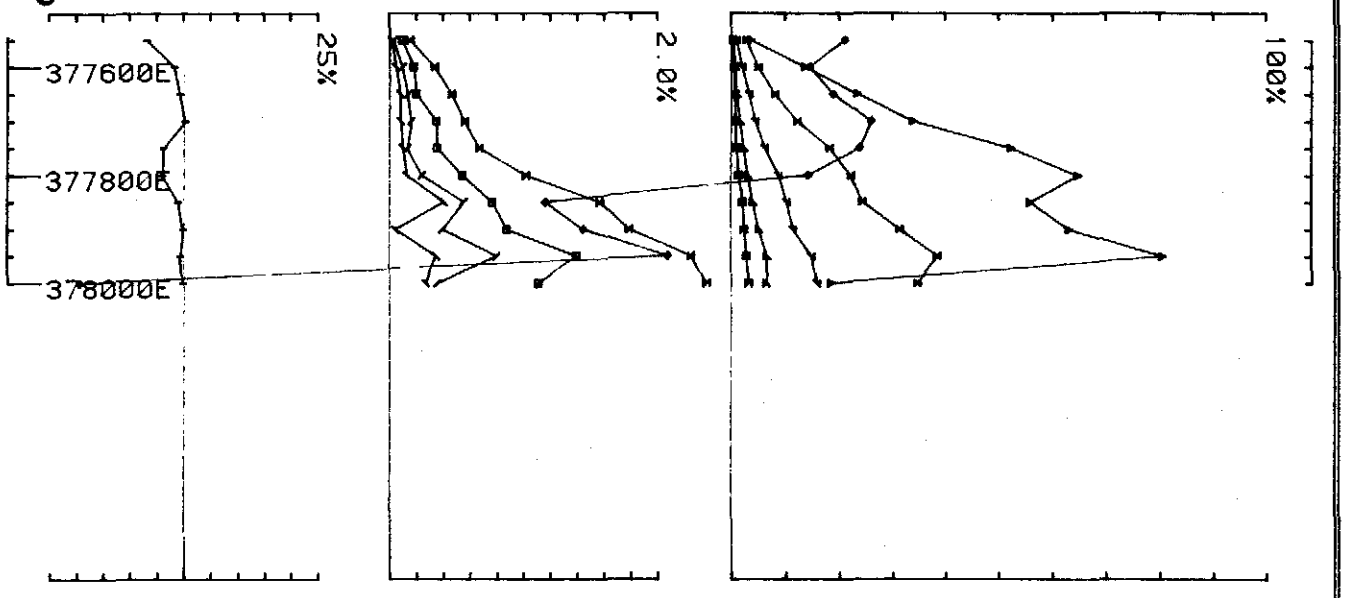
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CHESTER
CLIENT :- B.H.P. CREW :- BJS Rx10
Line 81900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

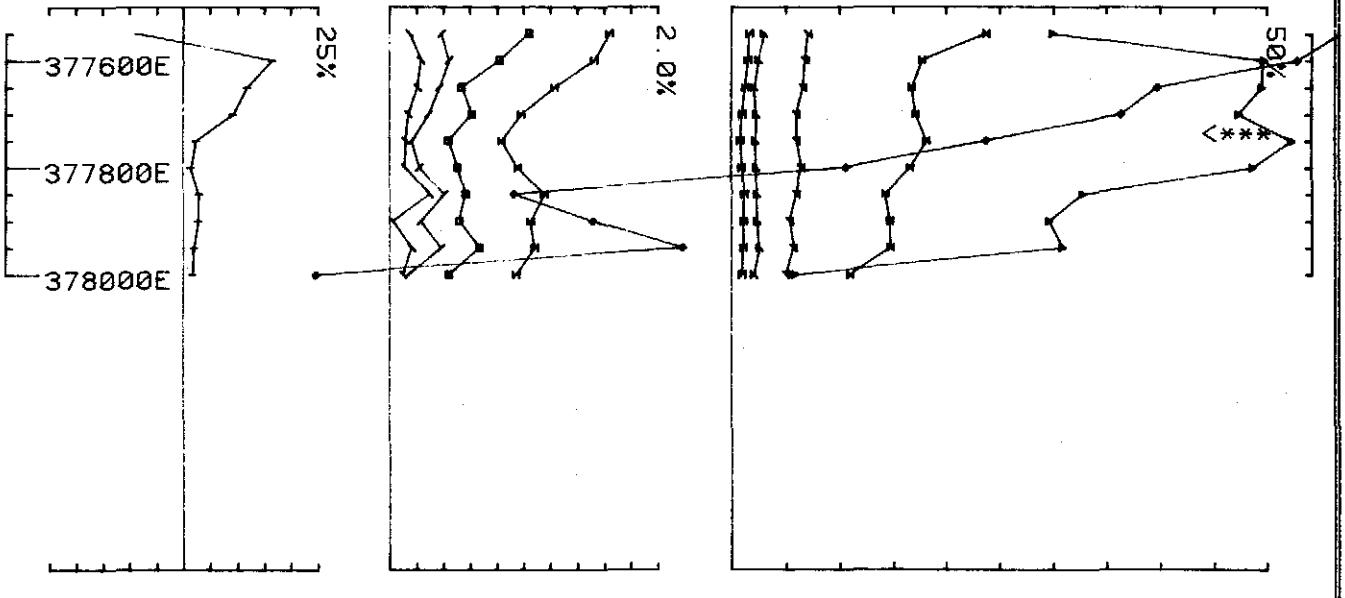


CHESTER
LOOP 8011
LINE 81900
Hz

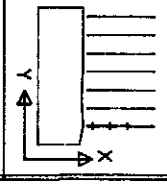
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898391





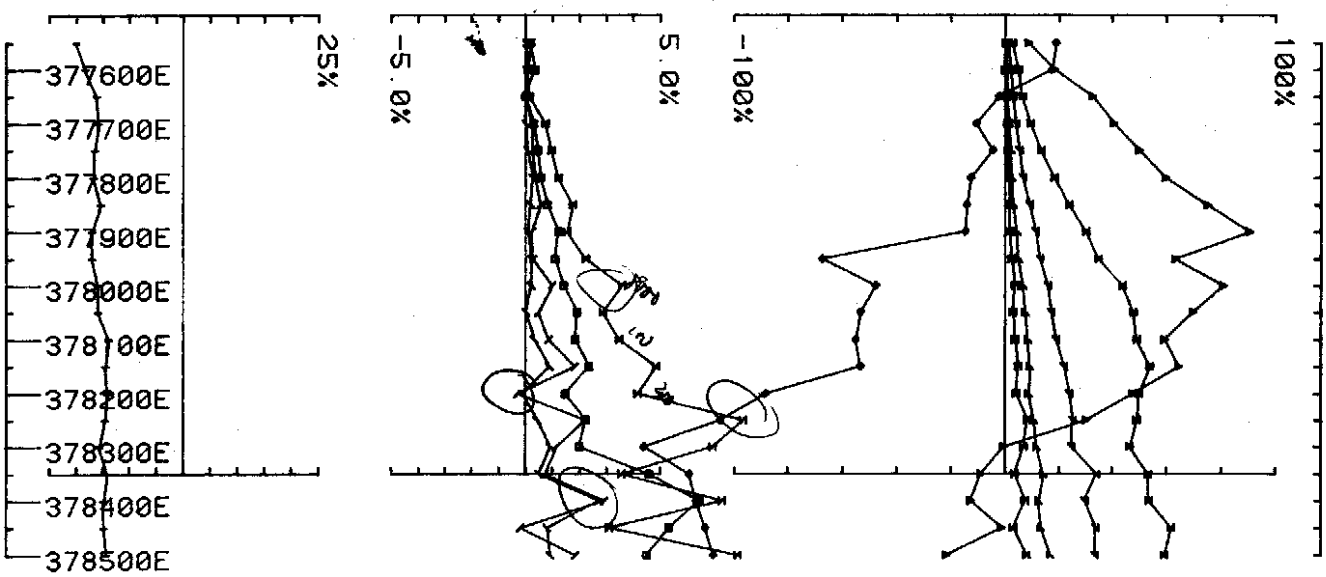
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CHESTER
CLIENT :- B.H.P. CREW :- BJS Rx10
Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



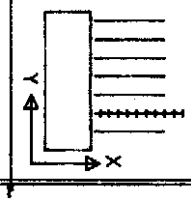
CHESTER
LOOP 0011
LINE 82100
Hz

391

898392



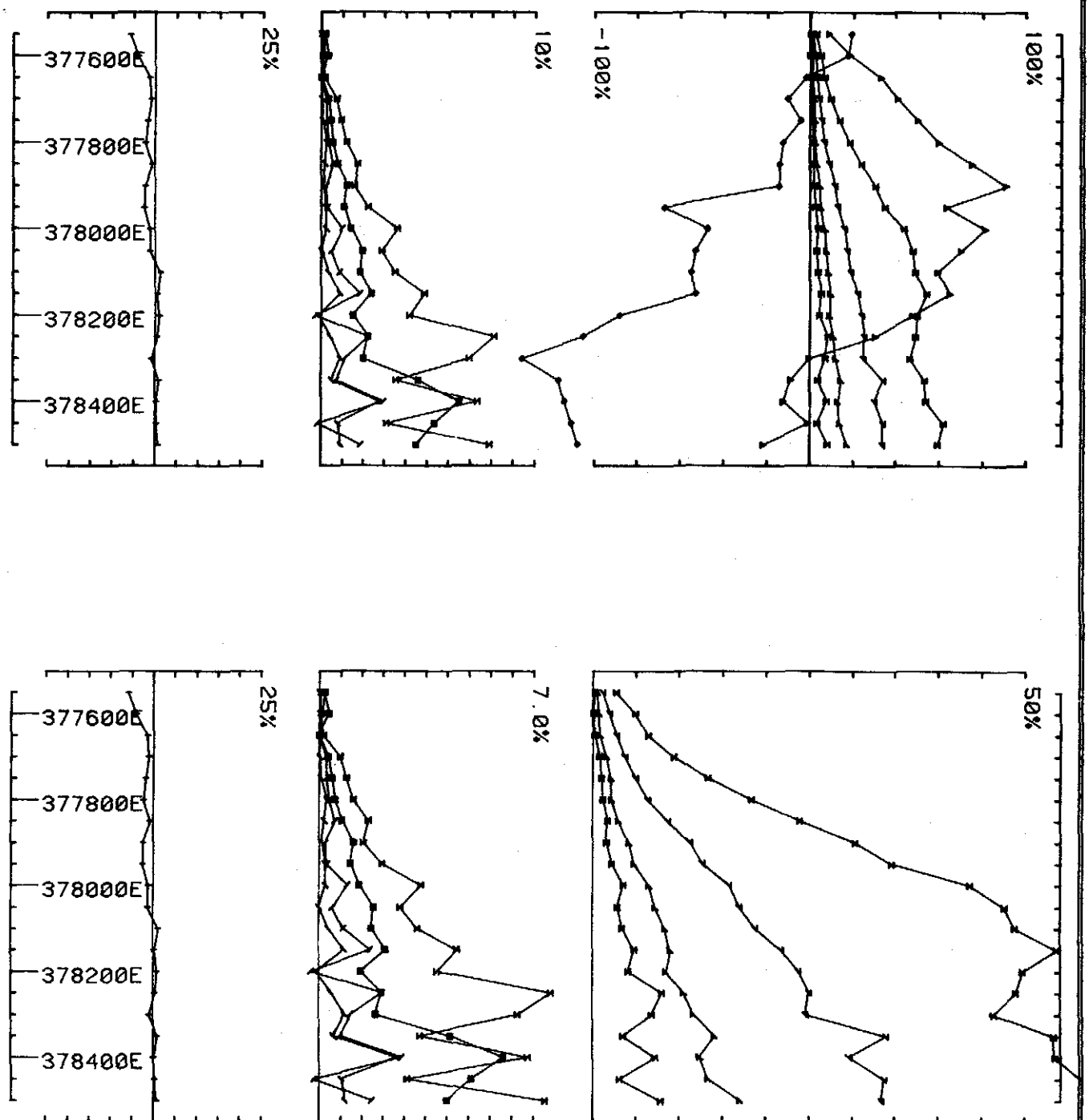
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CHESTER
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 82300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



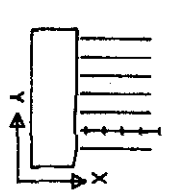
CHESTER
LOOP 8011
LINE 82300
Hz

392

898393



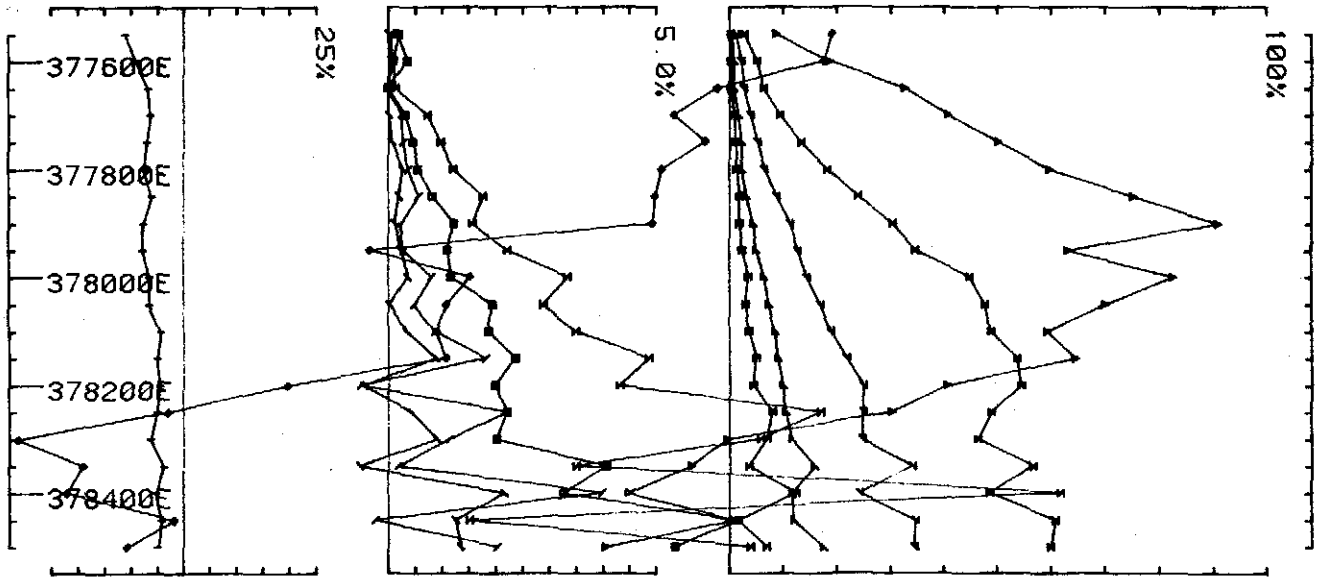
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CHESTER
CLIENT :- B.H.P. CREW :- BJS Rx10
Line 82300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

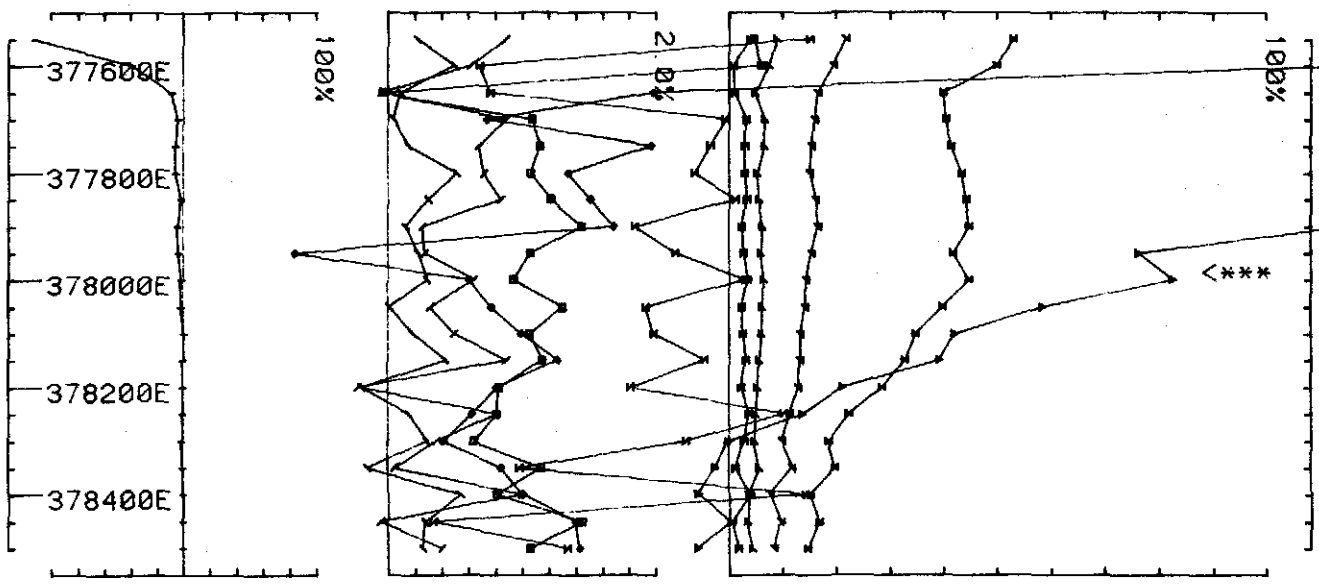


CHESTER
LOOP 0011
LINE 82300
Hz

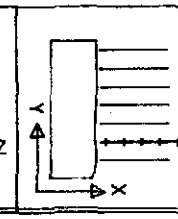
393

898394





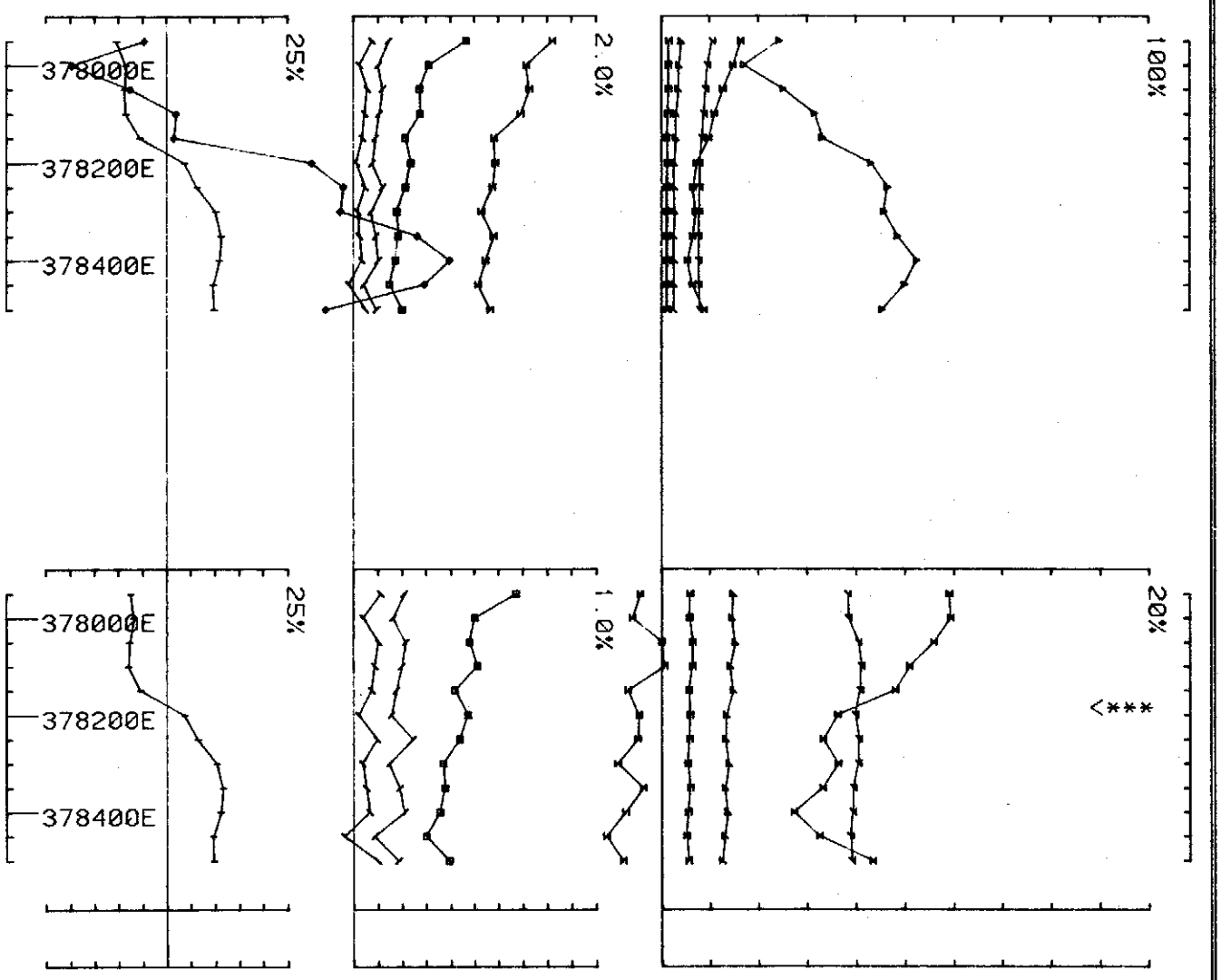
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CHESTER
CLIENT :- B.H.P. CREW :- BJS Rx10
Line 82300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



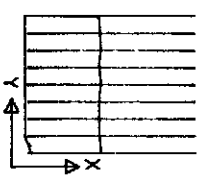
CHESTER
LOOP 8011
LINE 82300
Hz

394

898395



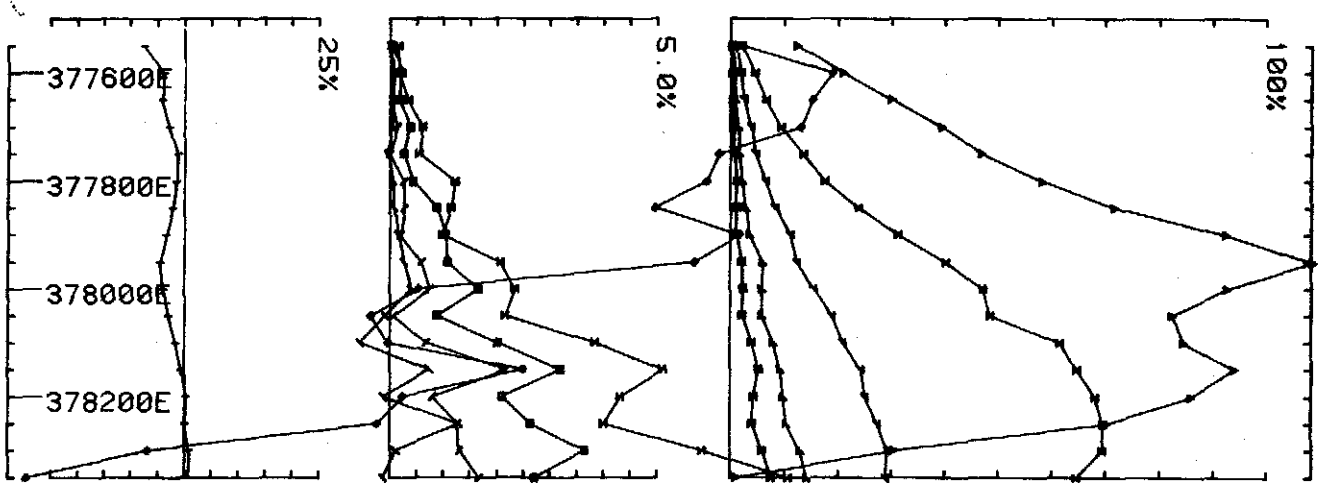
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 82300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

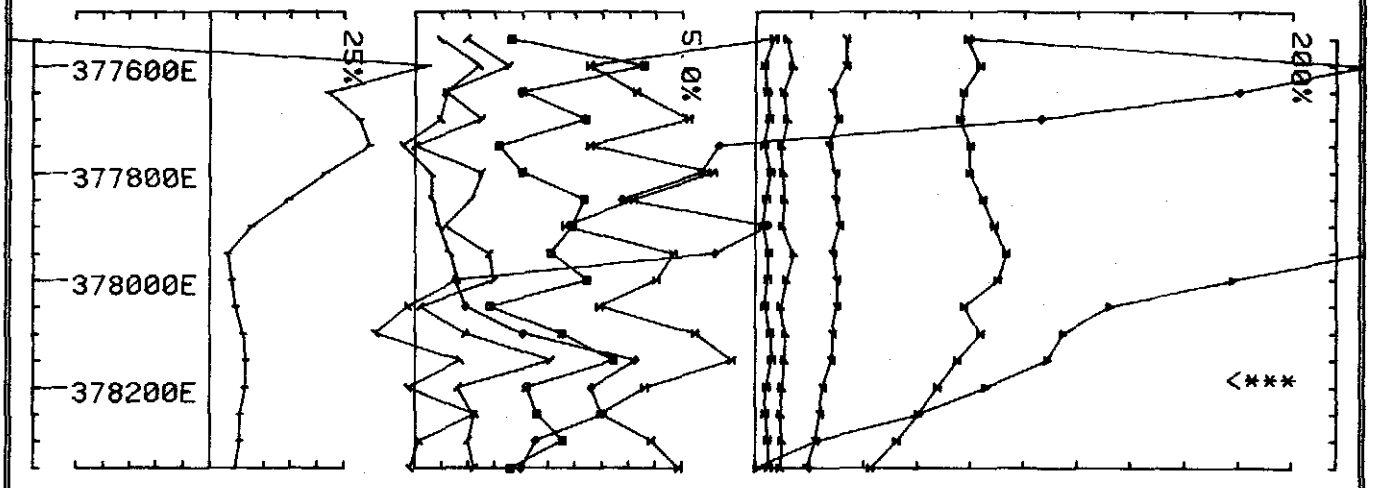


MT. KERSHAW
LOOP 0007
LINE 82300
Hz

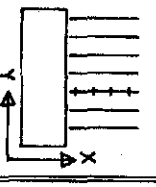
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898396





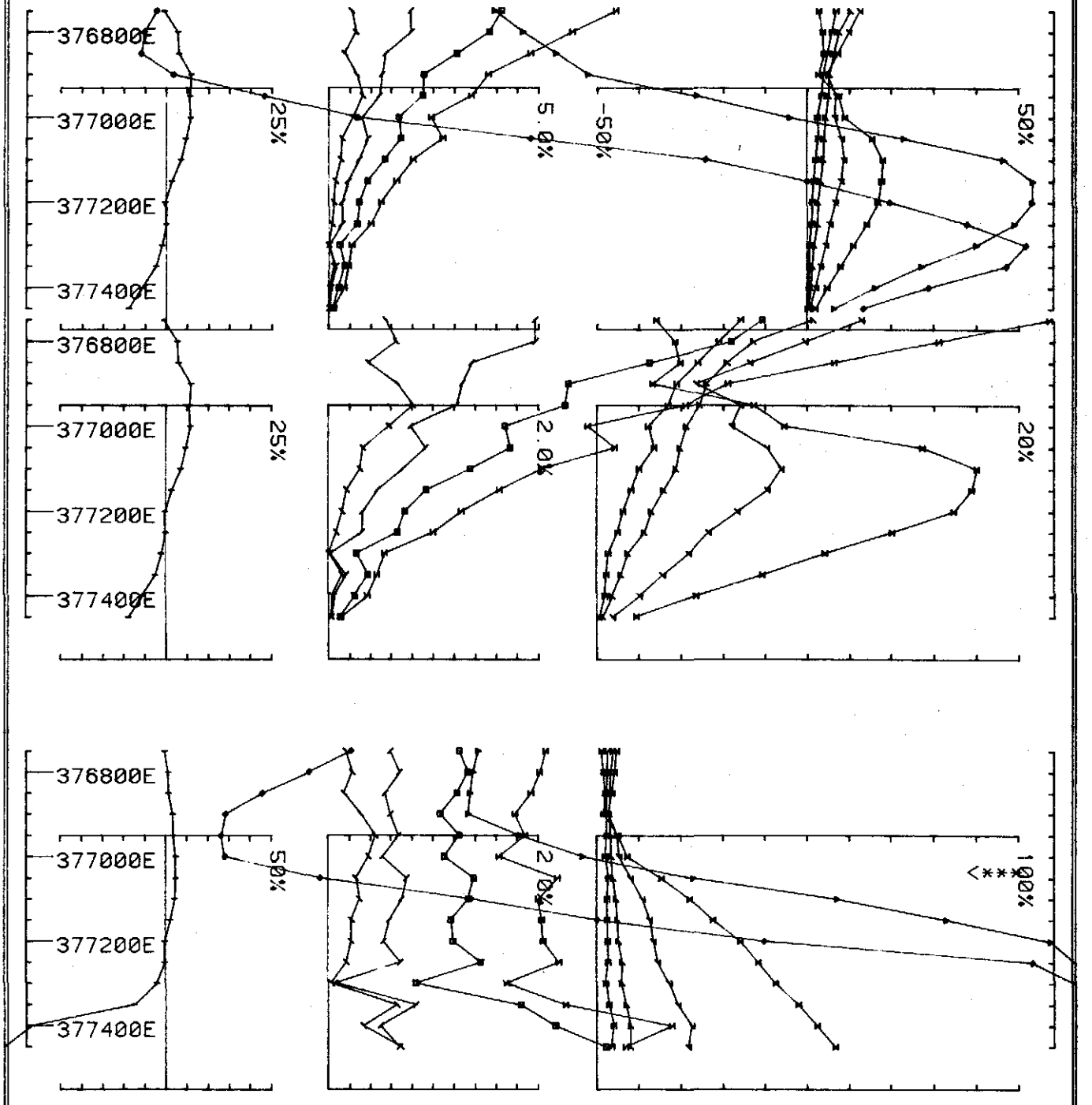
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- CHESTER
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 82500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



CHESTER
LOOP 0011
LINE 82500
Hz

396

893397



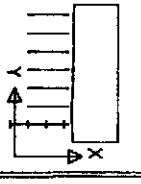
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- ART Rx10

Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ

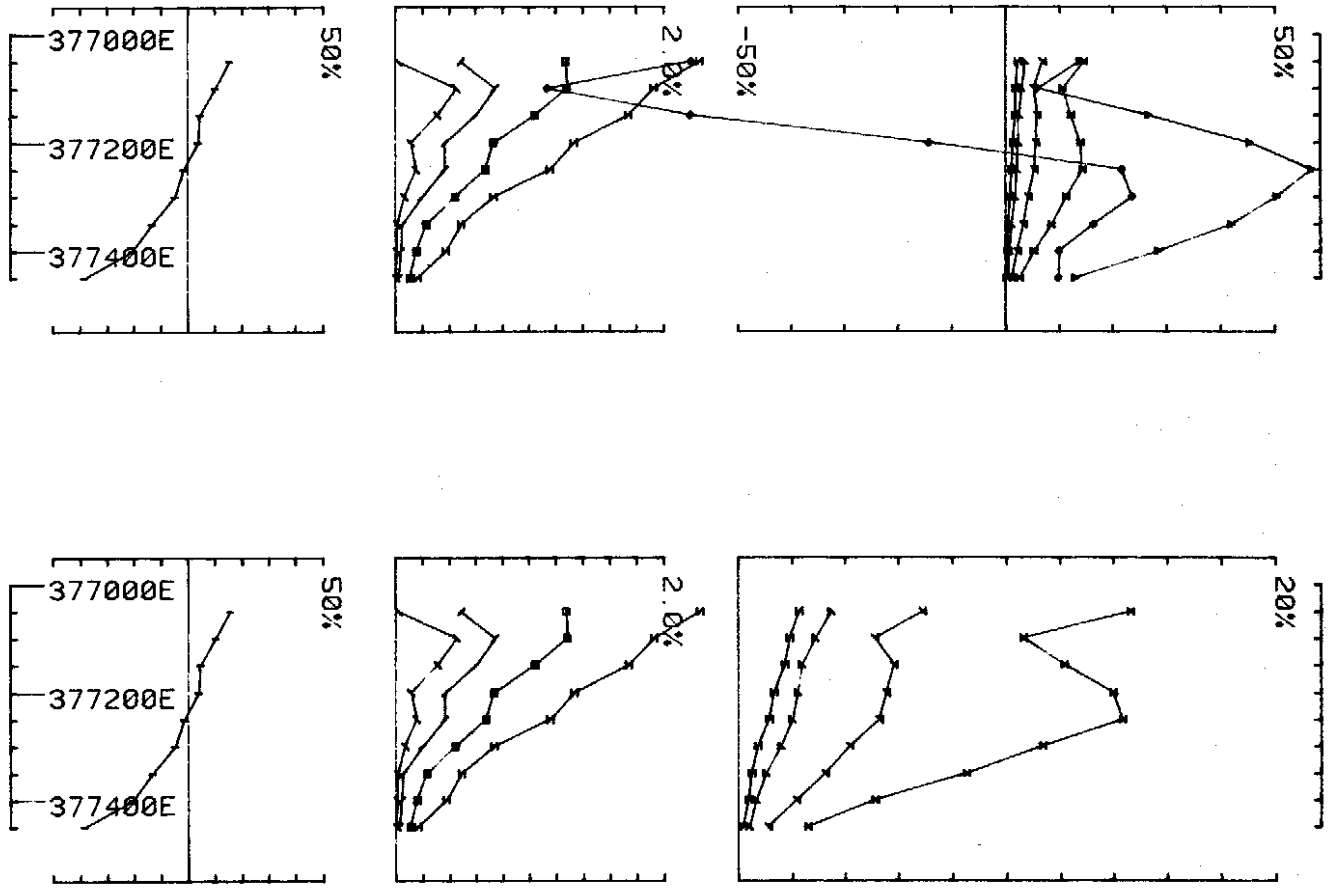
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



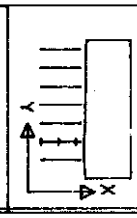
MT. KERSHAW
LOOP 8012
LINE 82100
Hz

397

898398



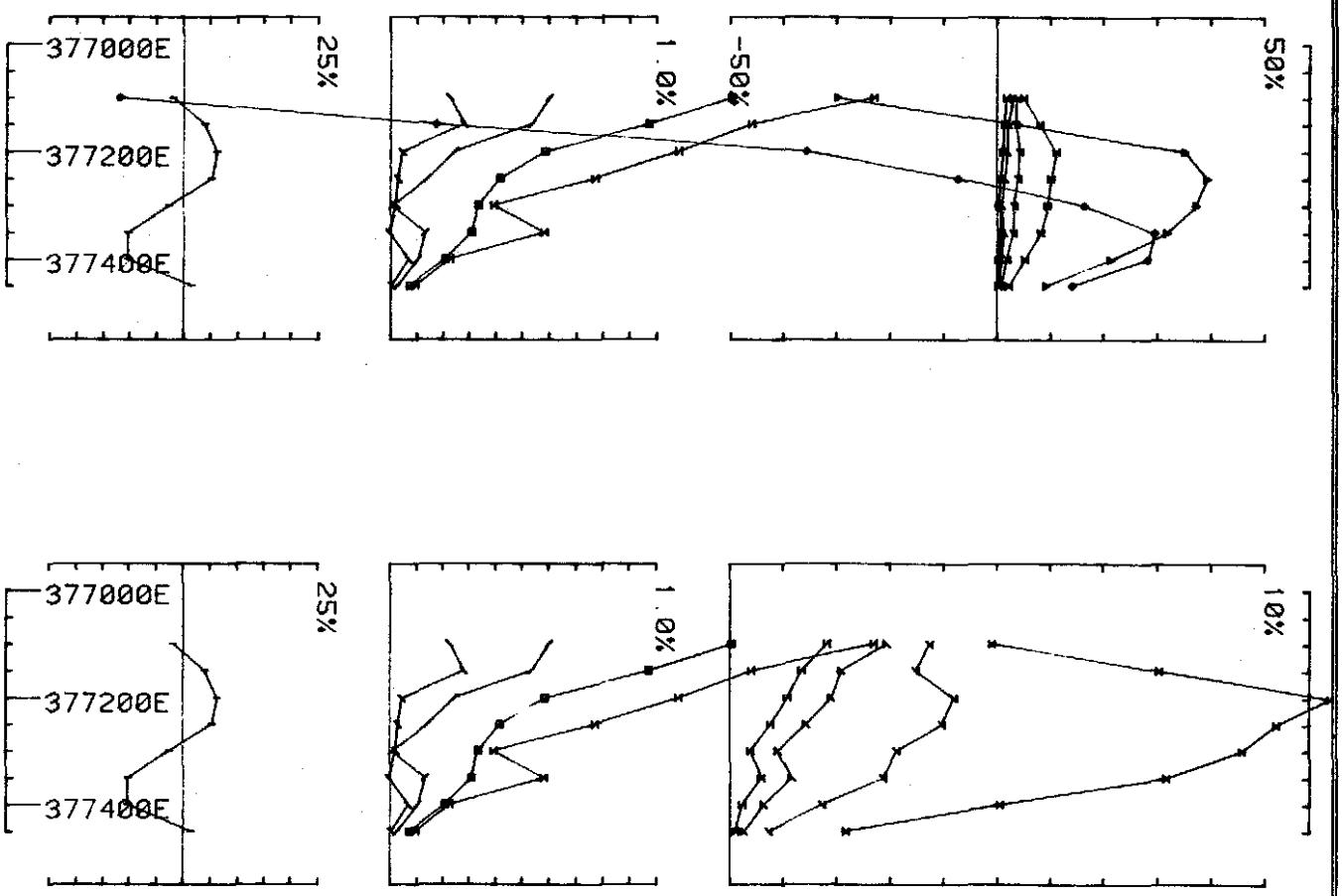
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART Rx10
Line 82300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



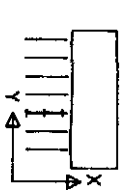
MT. KERSHAW
LOOP 0012
LINE 82300
Hz

398

898399



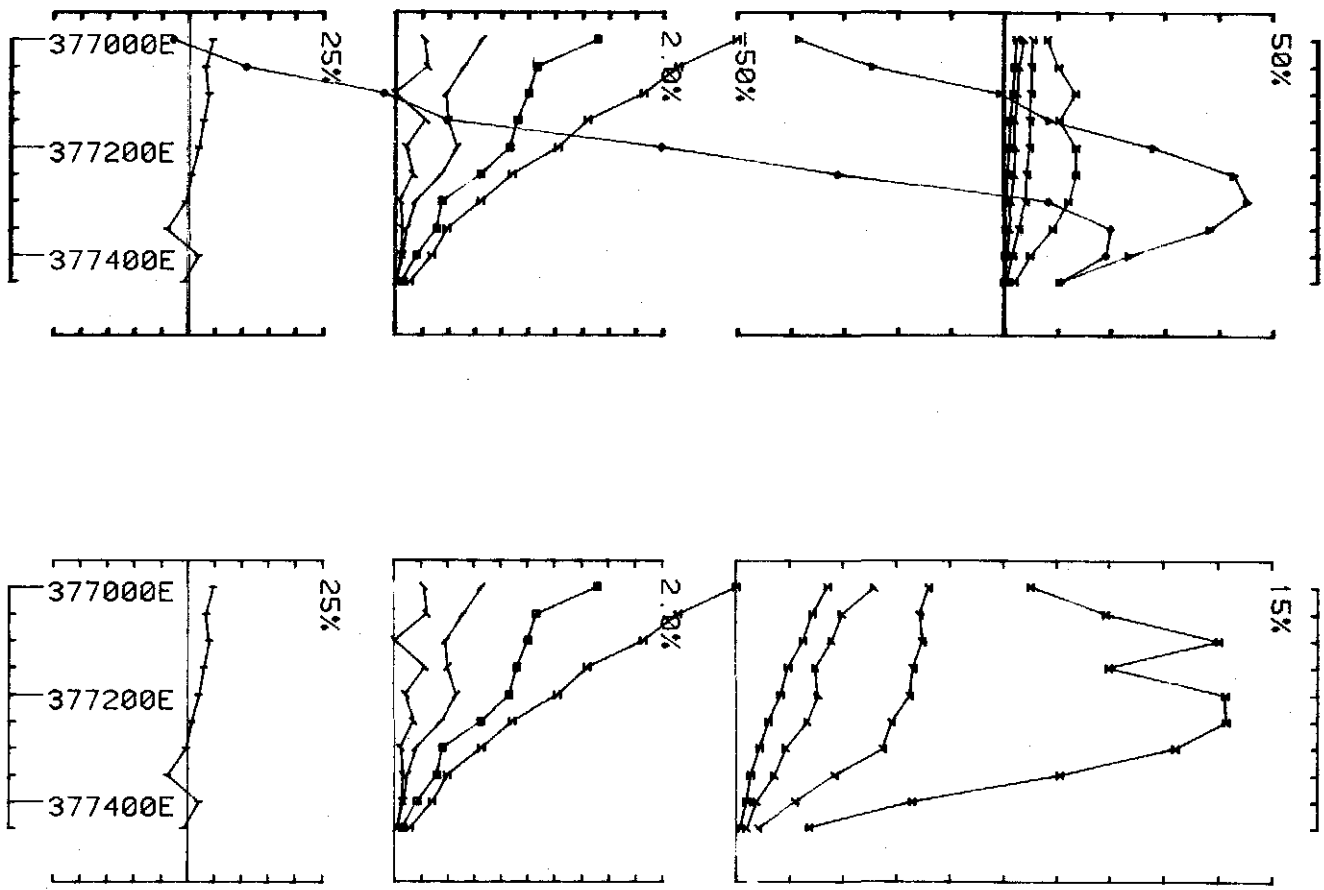
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART Rx10
Line 82500N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



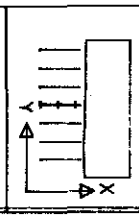
MT. KERSHAW
LOOP 0012
LINE 82500
Hz

399

898400



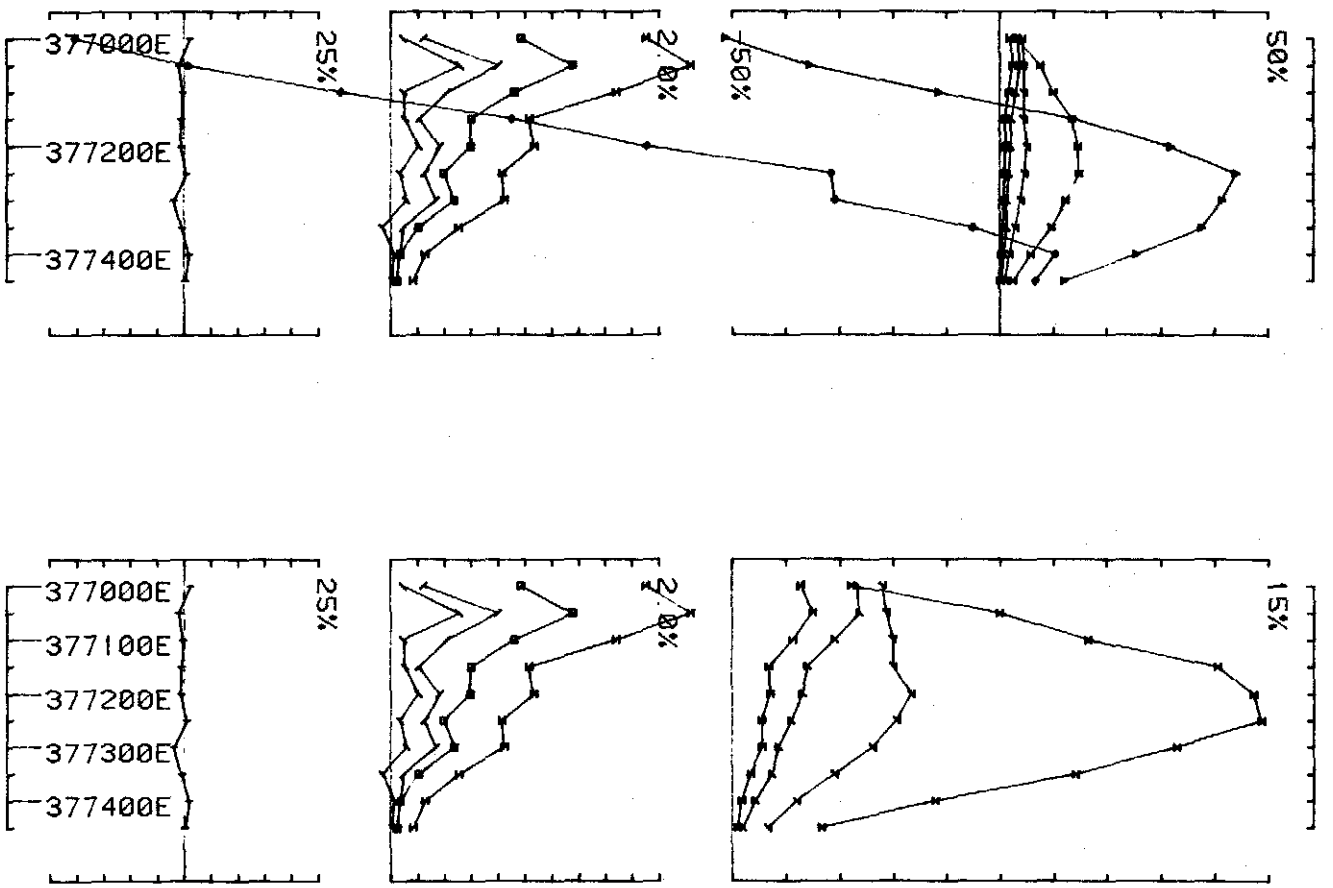
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART Rx10
Line 82700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0012
LINE 82700
Hz

400

898401



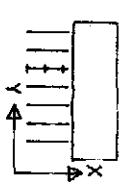
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- PMM Rx8

Line 82900N Hz COMPONENT BASE FREQ :- 26.230HERTZ

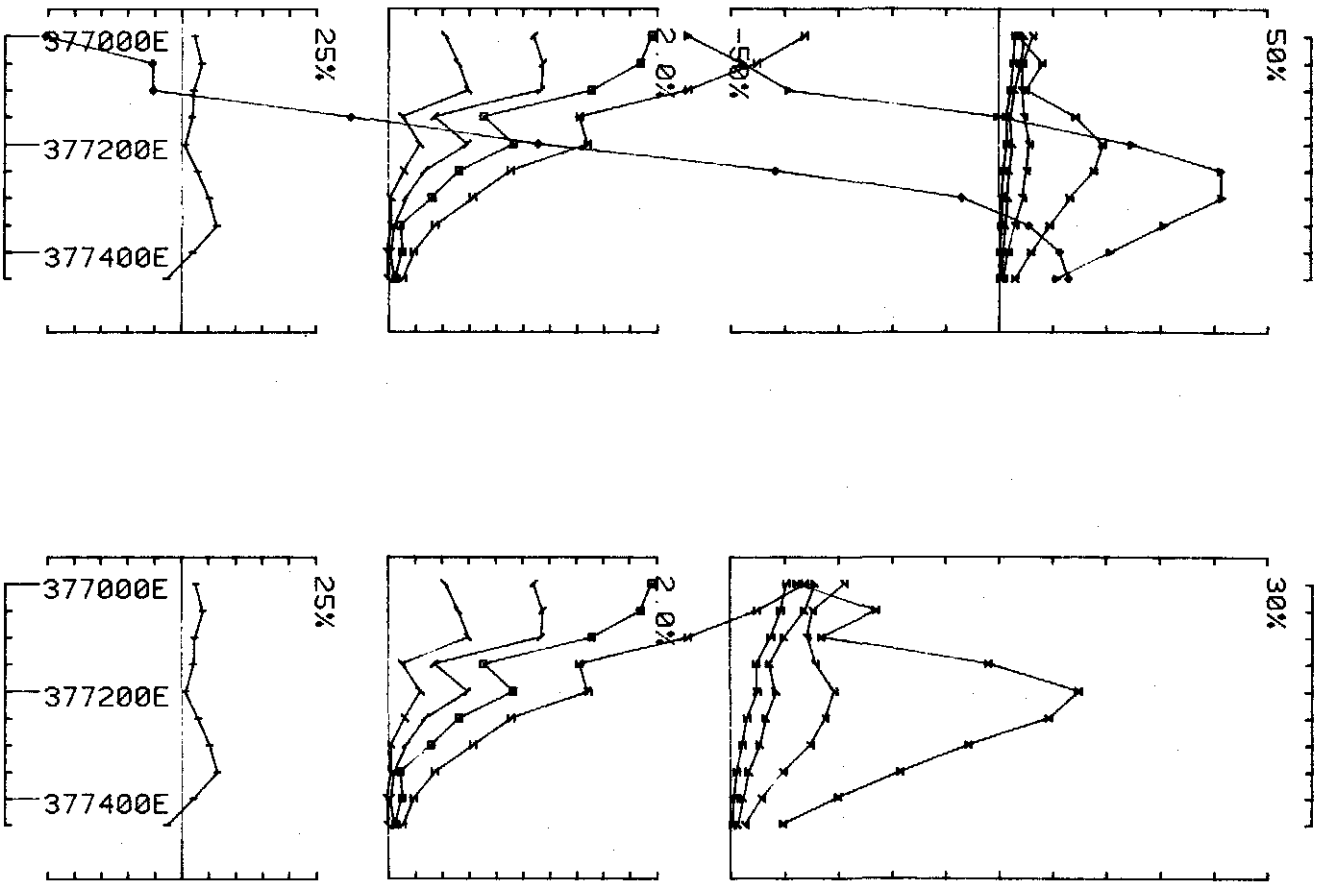
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



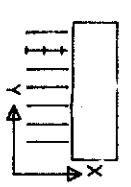
MT. KERSHAW
LOOP 0012
LINE 82900
Hz

401

898402



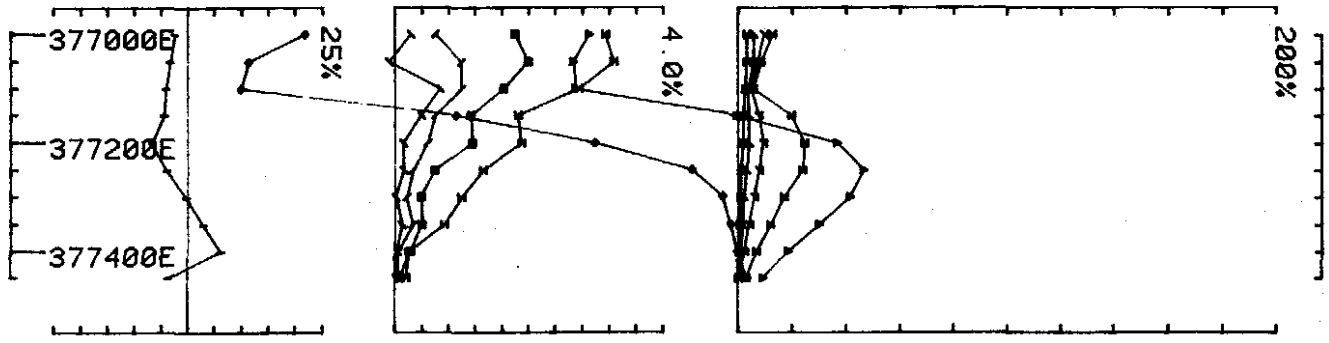
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM Rx8
Line 83100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

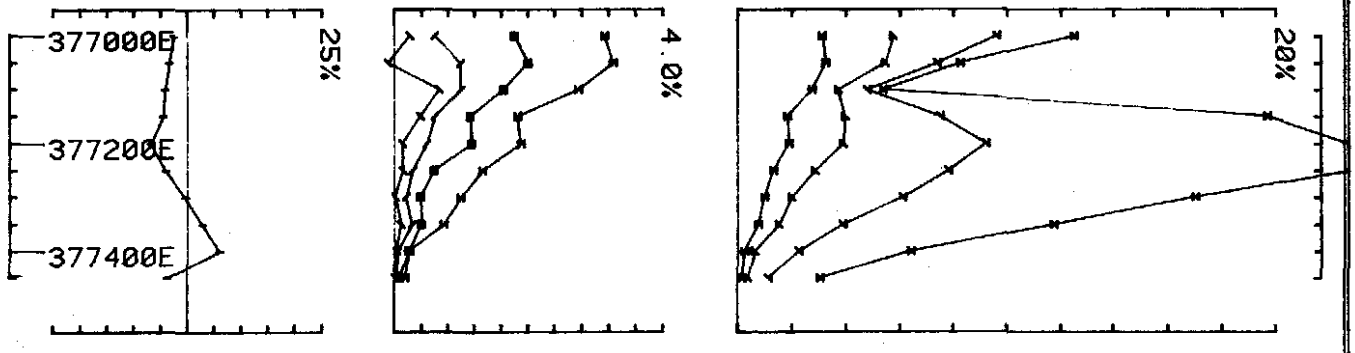


MT. KERSHAW
LOOP 0012
LINE 83100
Hz

402

898403





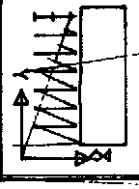
KAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

~~AREA~~ MT. KERSHAW

~~CLIENT~~ B.H.P. CREW :- PMM Rx8

~~Line 83300N~~ Hz COMPONENT BASE FREQ :- 26.230HERTZ

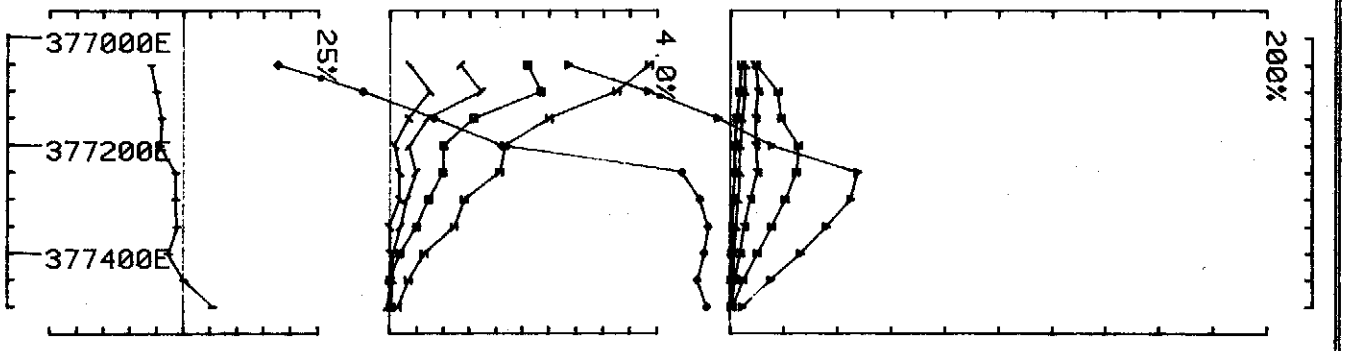
~~SECONDARY FIELD~~ CONTINUOUS Ch 1 NORMALIZATION

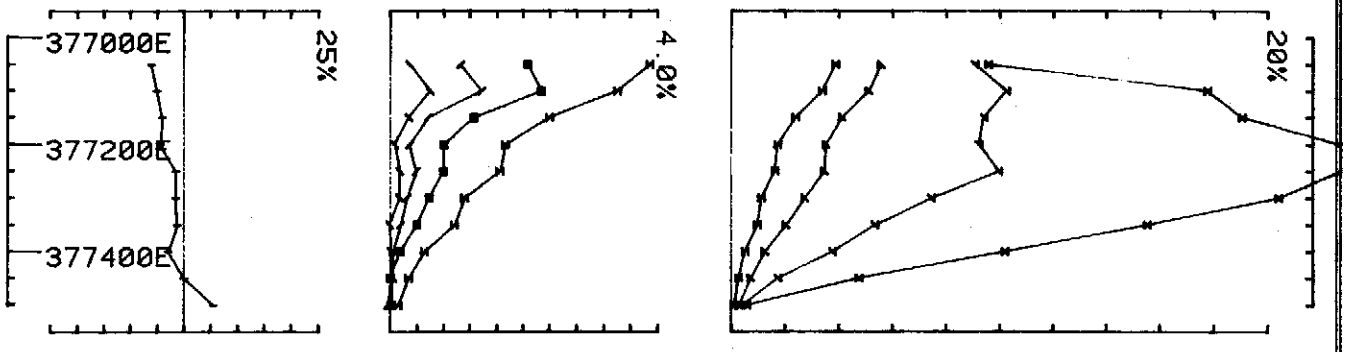


MT. KERSHAW
LOOP 8012
LINE 83300
Hz

403

898404





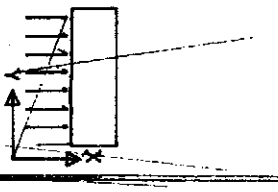
KAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

~~AREA~~ MT. KERSHAW

~~CLIENT~~ B.H.P. CREW :- PMM Rx8

~~Line 83400~~N Hz COMPONENT BASE FREQ :- 26.230HERTZ

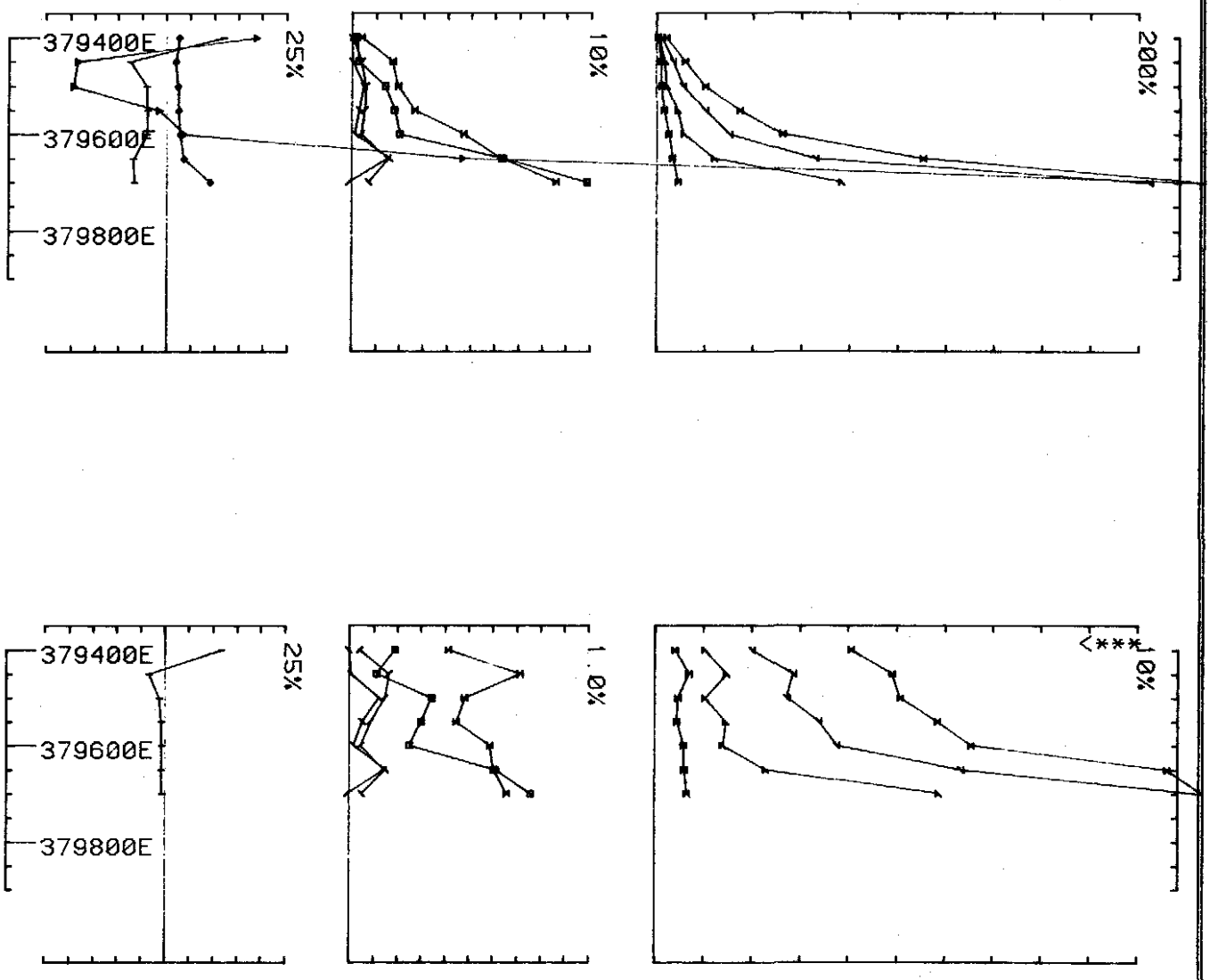
~~SECONDARY~~ FIELD CONTINUOUS Ch 1 NORMALIZATION



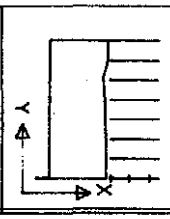
MT. KERSHAW
LOOP 0012
LINE 83400
Hz

404

898405



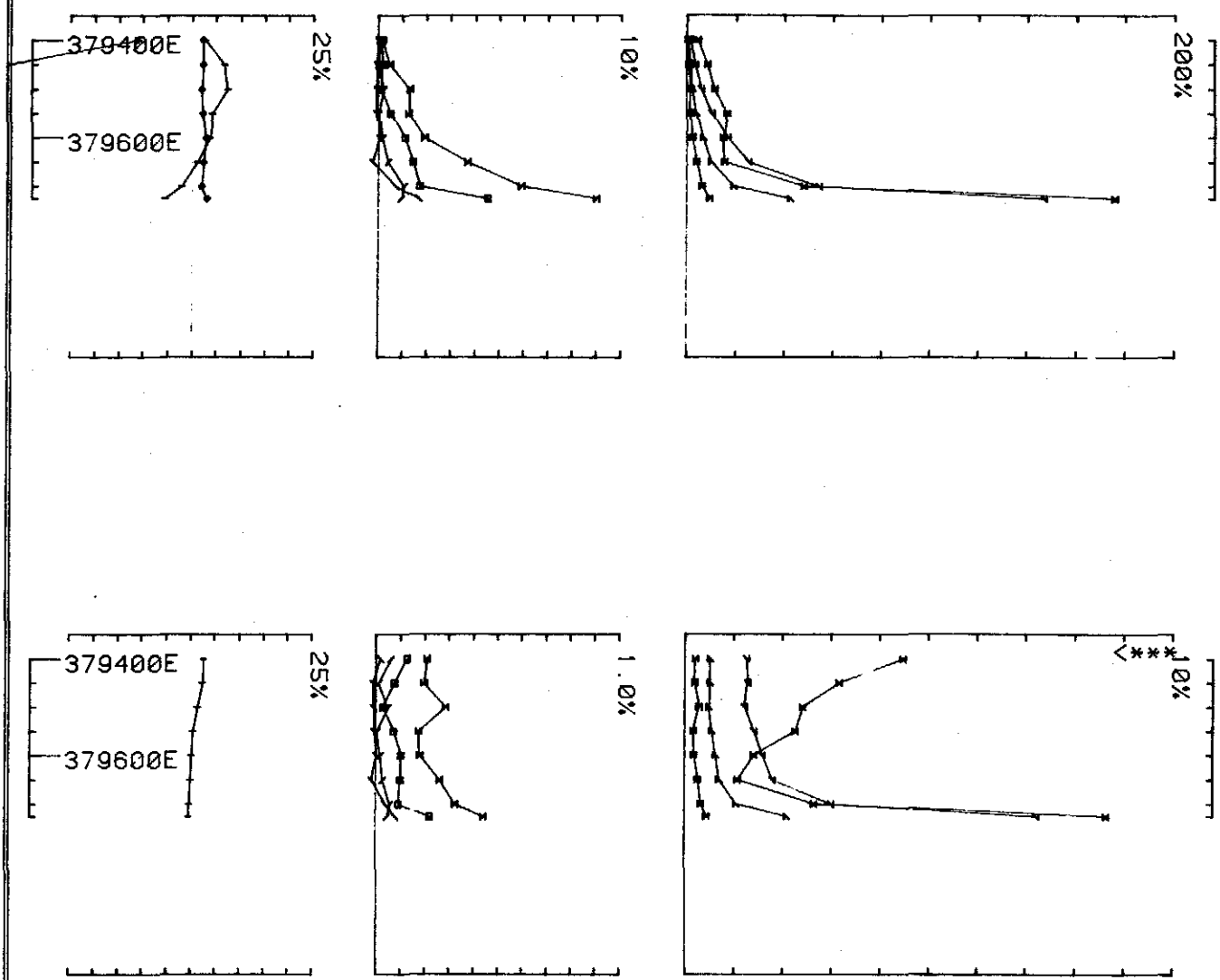
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



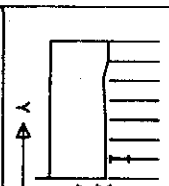
MT. KERSHAW
LOOP 0013
LINE 80700
Hz

405

898406



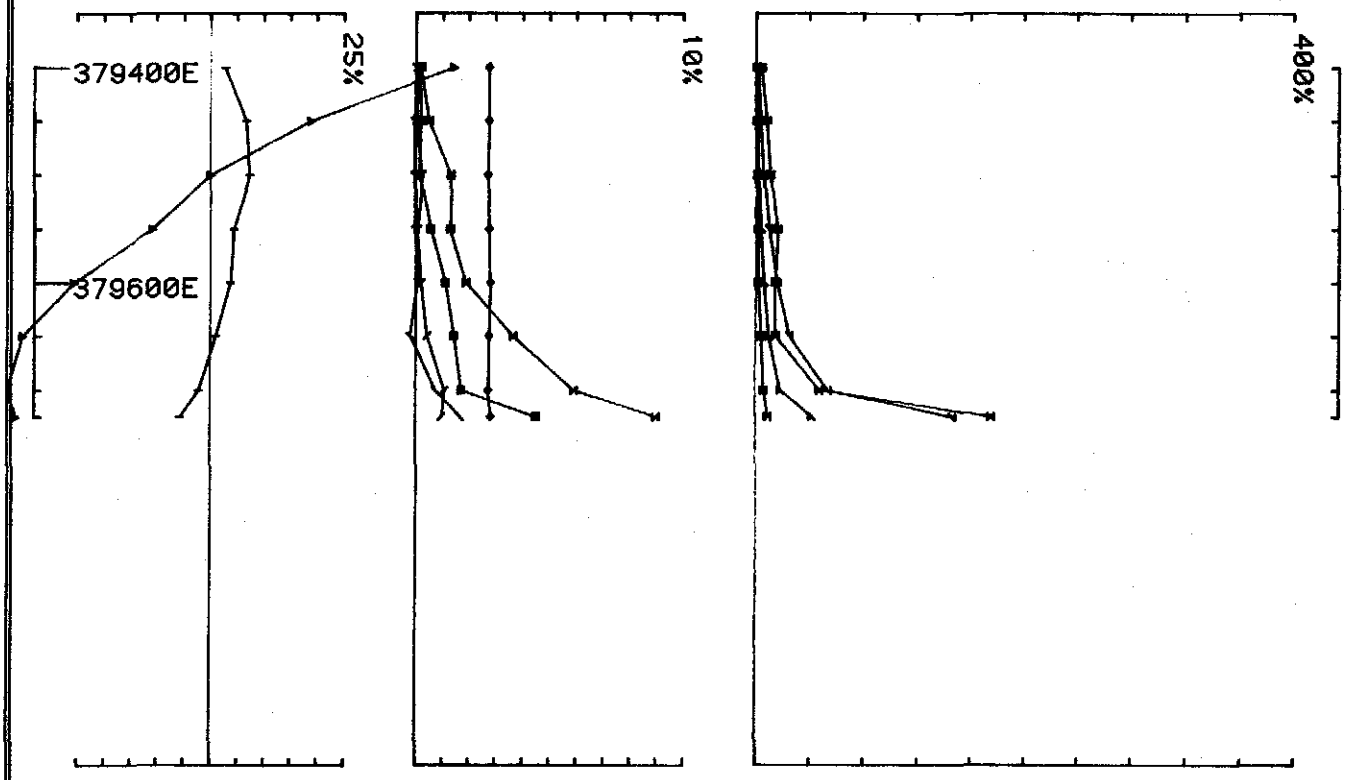
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



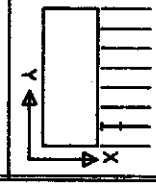
MT. KERSHAW
LOOP 0013
LINE 80900
Hz

406

898407



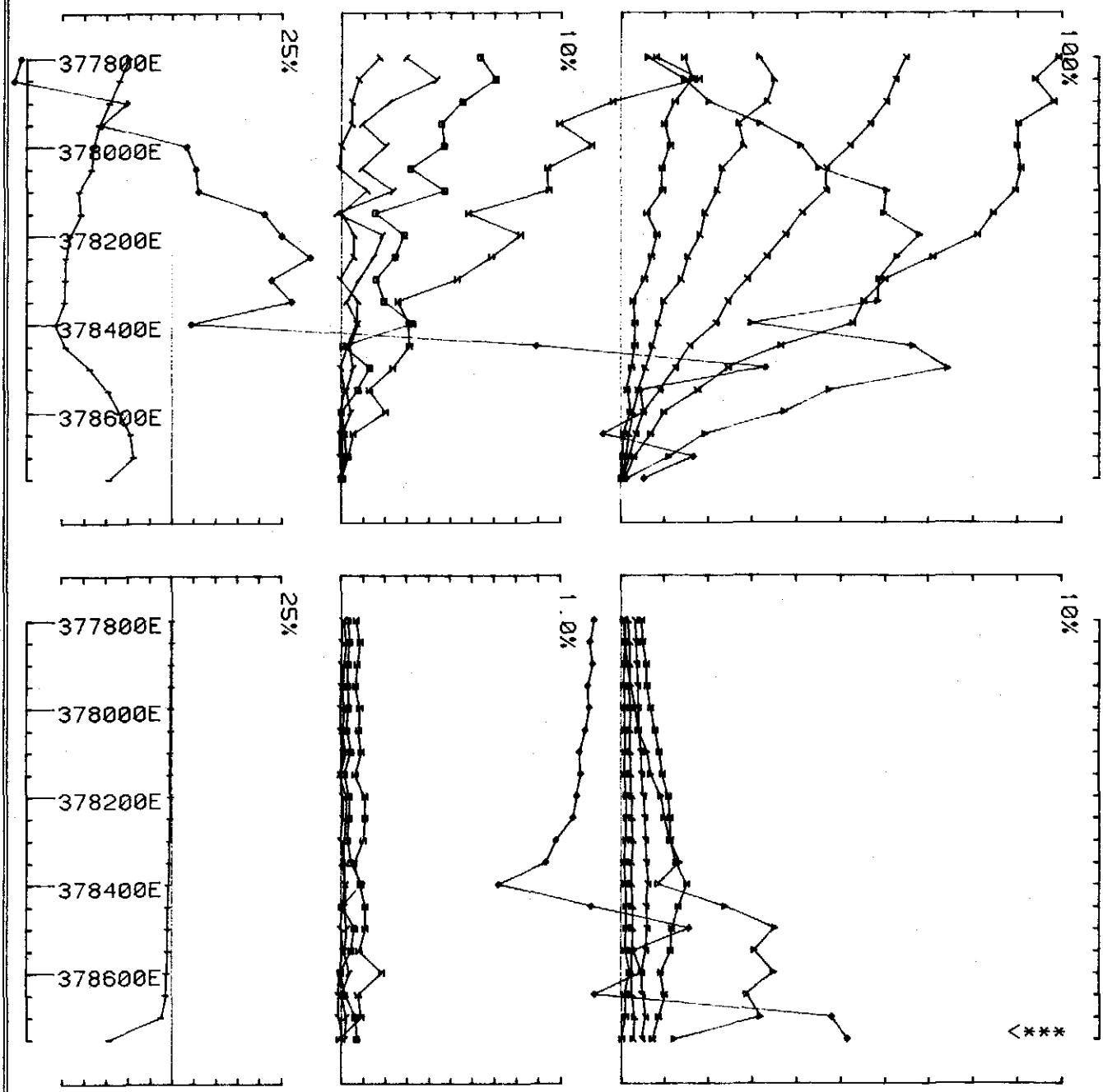
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 80900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



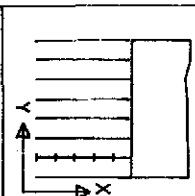
MT. KERSHAW
LOOP 8013
LINE 80900
Hz

898408

407



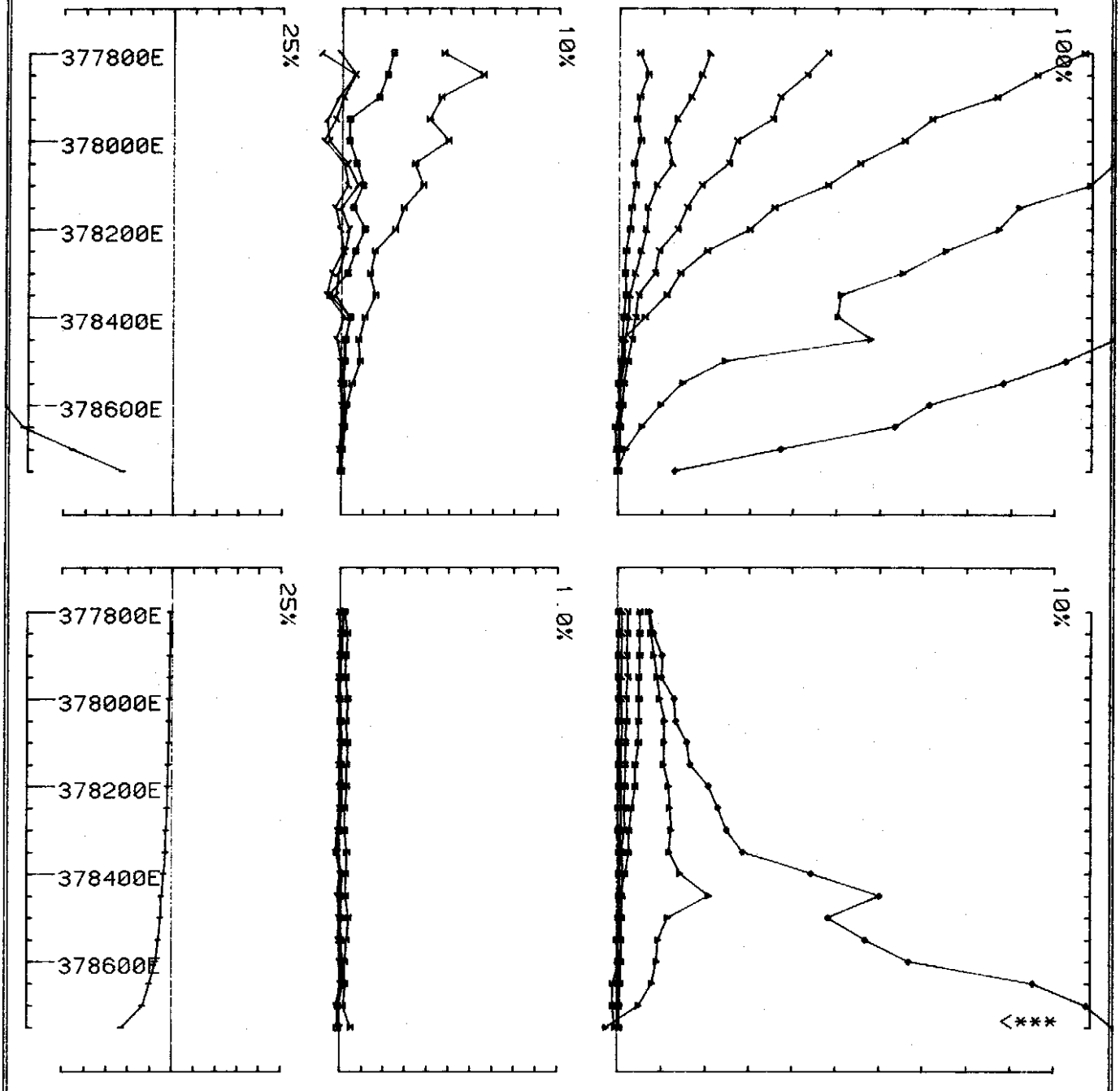
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- ART Rx8
Line 80900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



Mt. Kershaw
LOOP 0031
LINE 80900
Hz

408

898409



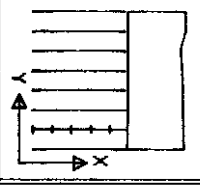
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- Mt. Kershaw

CLIENT :- B.H.P. CREW :- ART Rx8

Line 80900N Hx COMPONENT BASE FREQ :- 26.230HERTZ

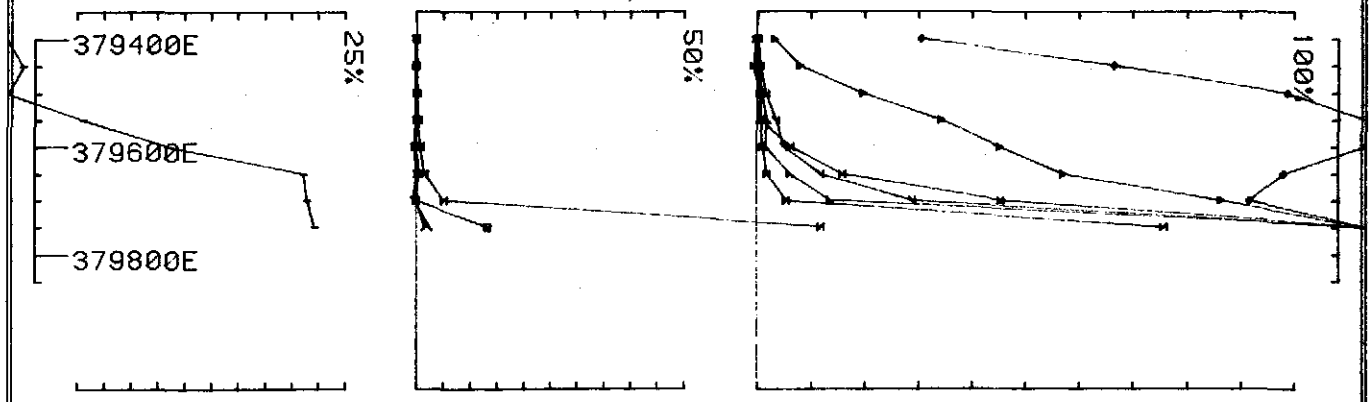
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

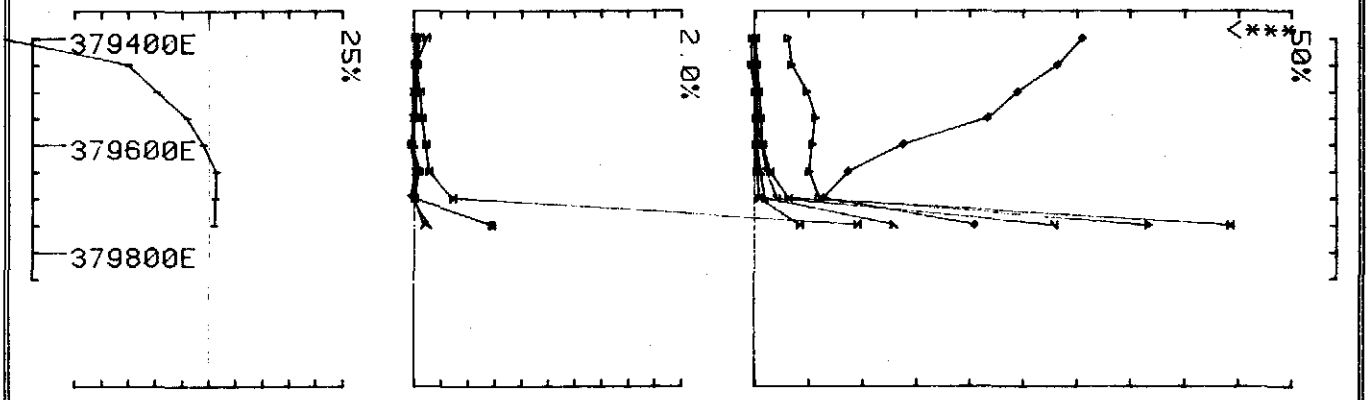


Mt. Kershaw
LOOP 0031
LINE 80900
Hx

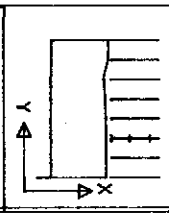
409

898410





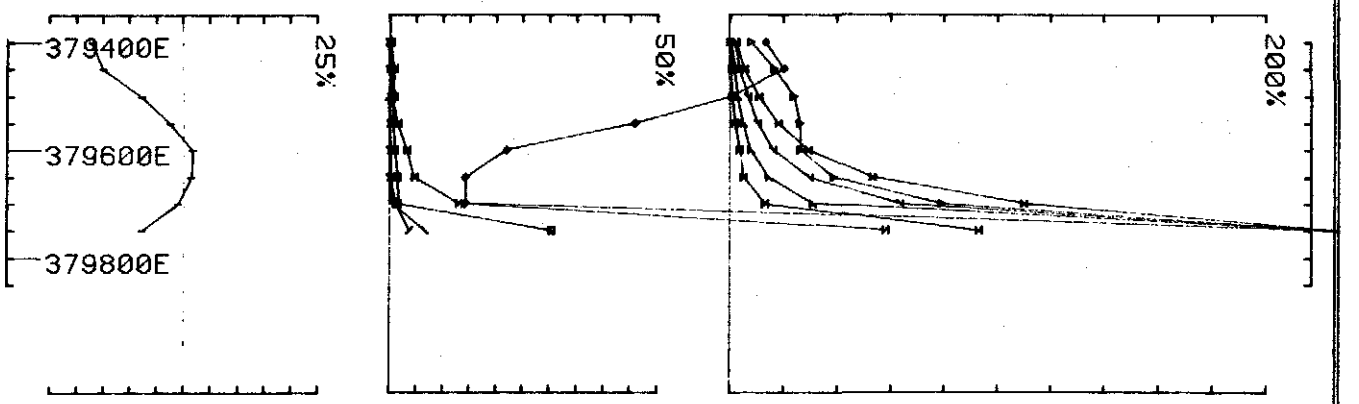
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 81100N Hx COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

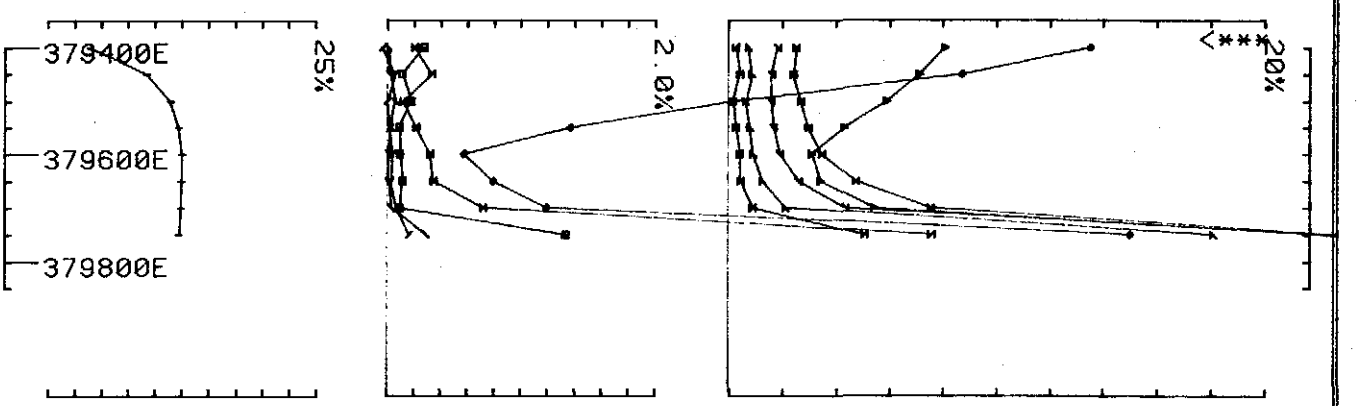


MT. KERSHAW
LOOP 0013
LINE 81100
Hx

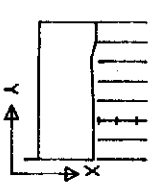
410

898411





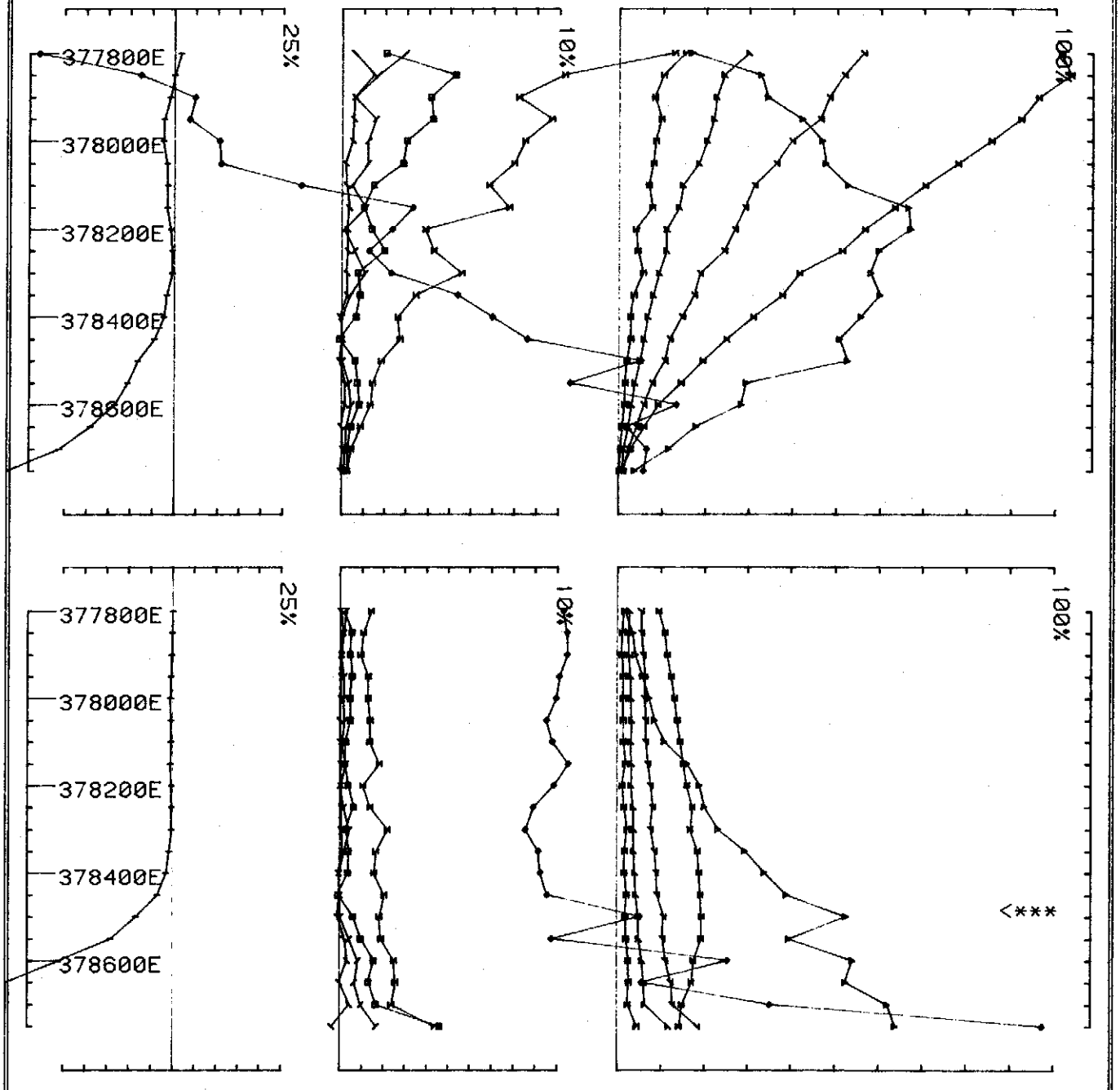
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 81100N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



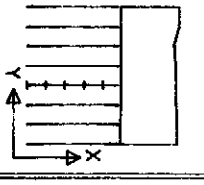
MT. KERSHAW
LOOP 0013
LINE 81100
Hz

411

898412



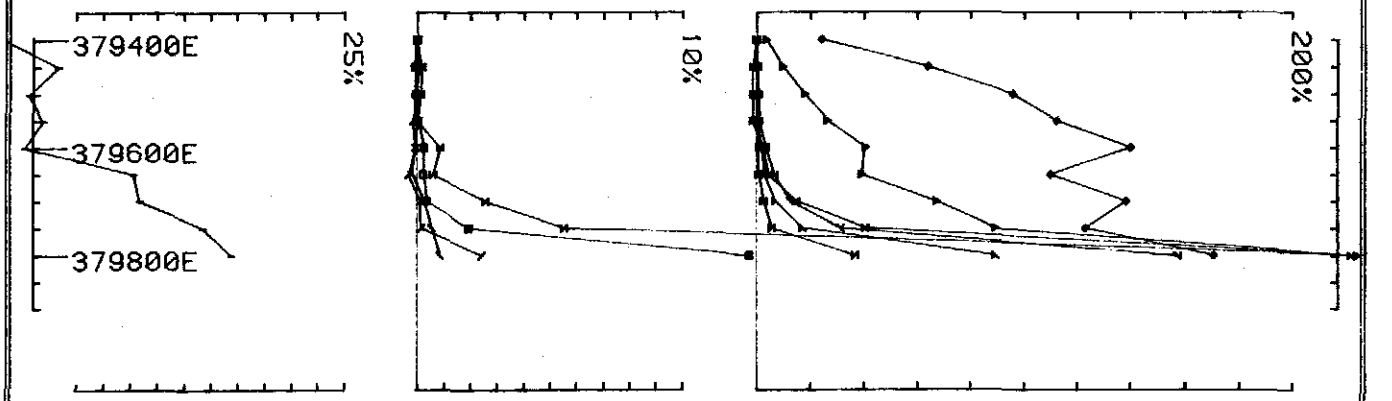
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- Mt. Kershaw
CLIENT :- B.H.P. CREW :- ART Rx8
Line 81300N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

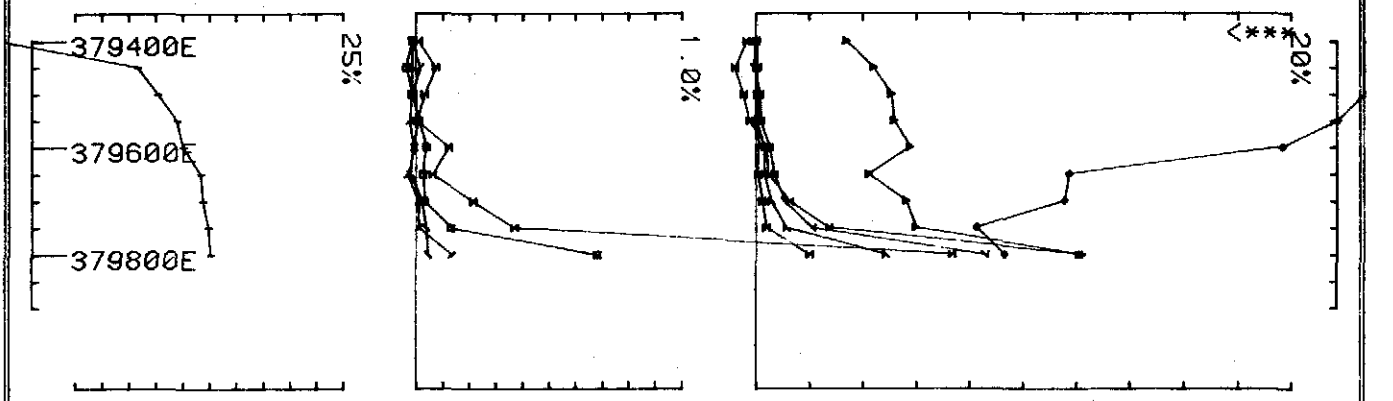


Mt. Kershaw
LOOP 003!
LINE 81300
Hz

412

898413





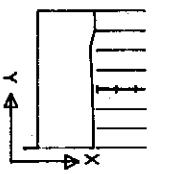
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- BM Rx10

Line 81300N Hx COMPONENT BASE FREQ :- 26.230HERTZ

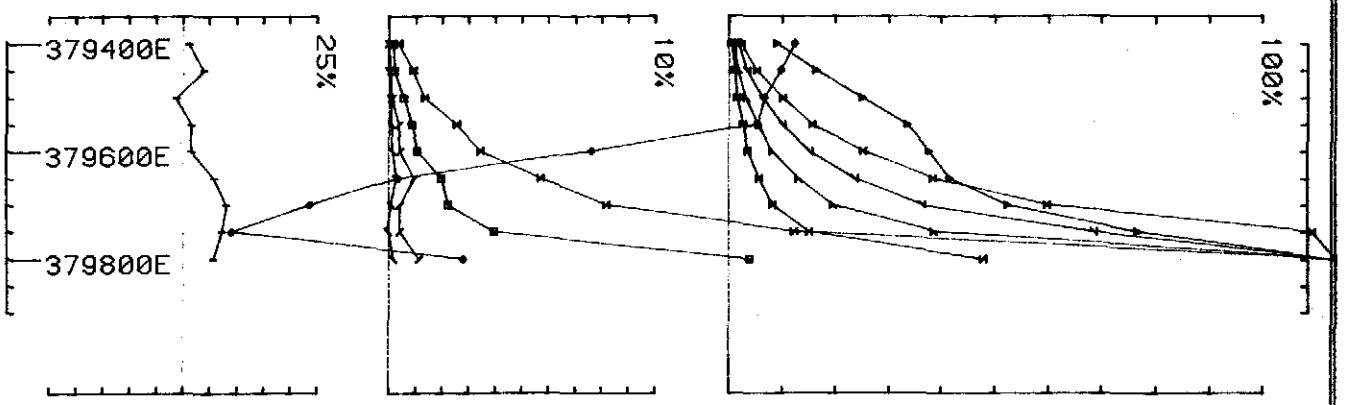
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

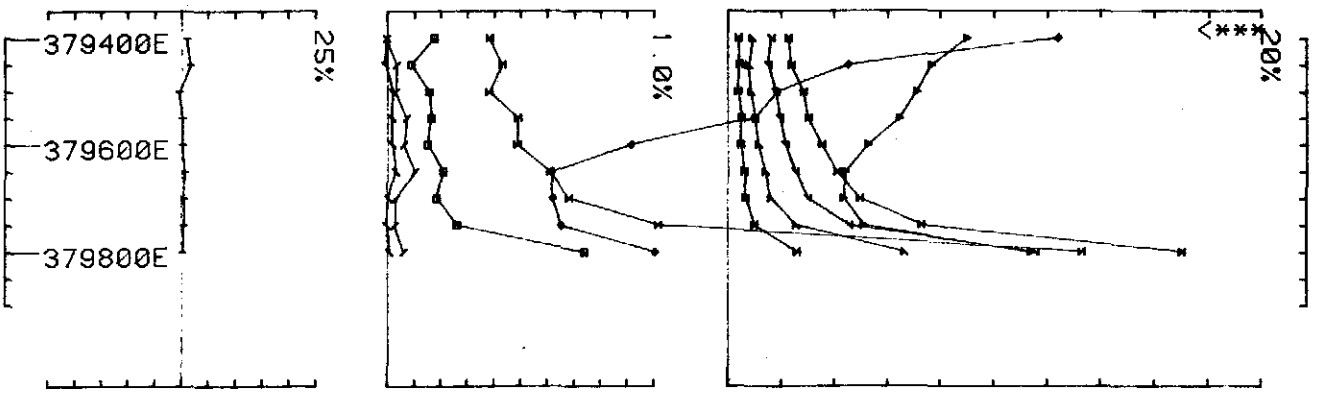


MT. KERSHAW
LOOP 0013
LINE 81300
Hx

413

898414





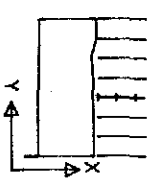
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- MT. KERSHAW

CLIENT :- B.H.P. CREW :- BM Rx10

Line 81300N Hz COMPONENT BASE FREQ :- 26.230HERTZ

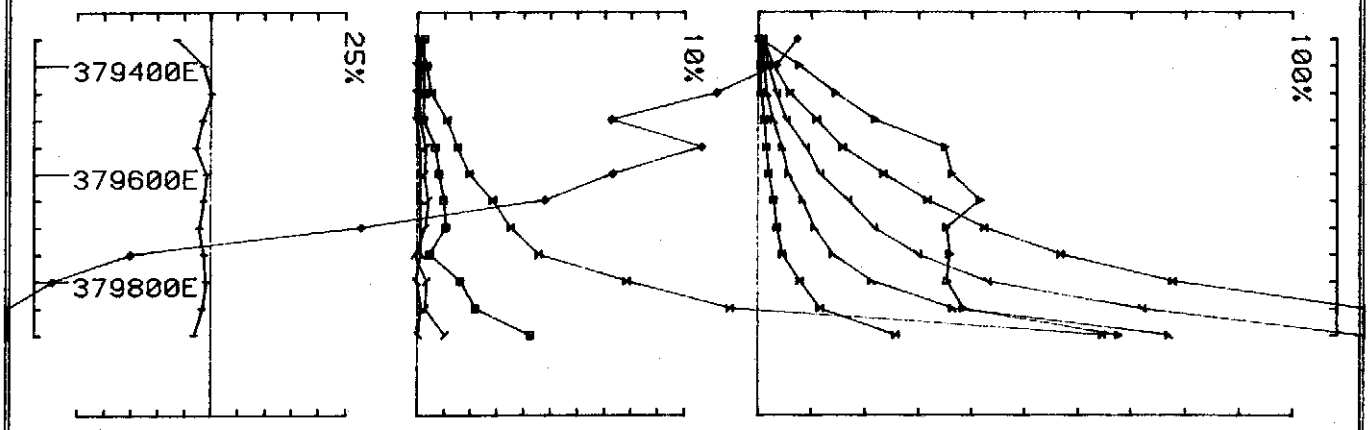
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION

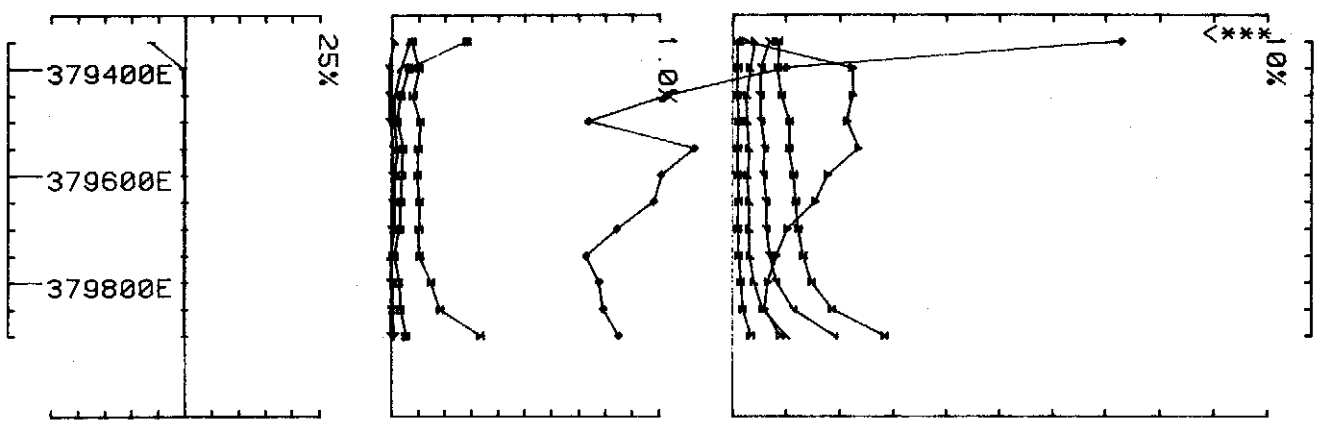


MT. KERSHAW
LOOP 0013
LINE 81300
Hz

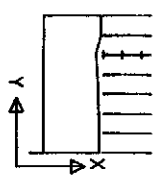
414

898415





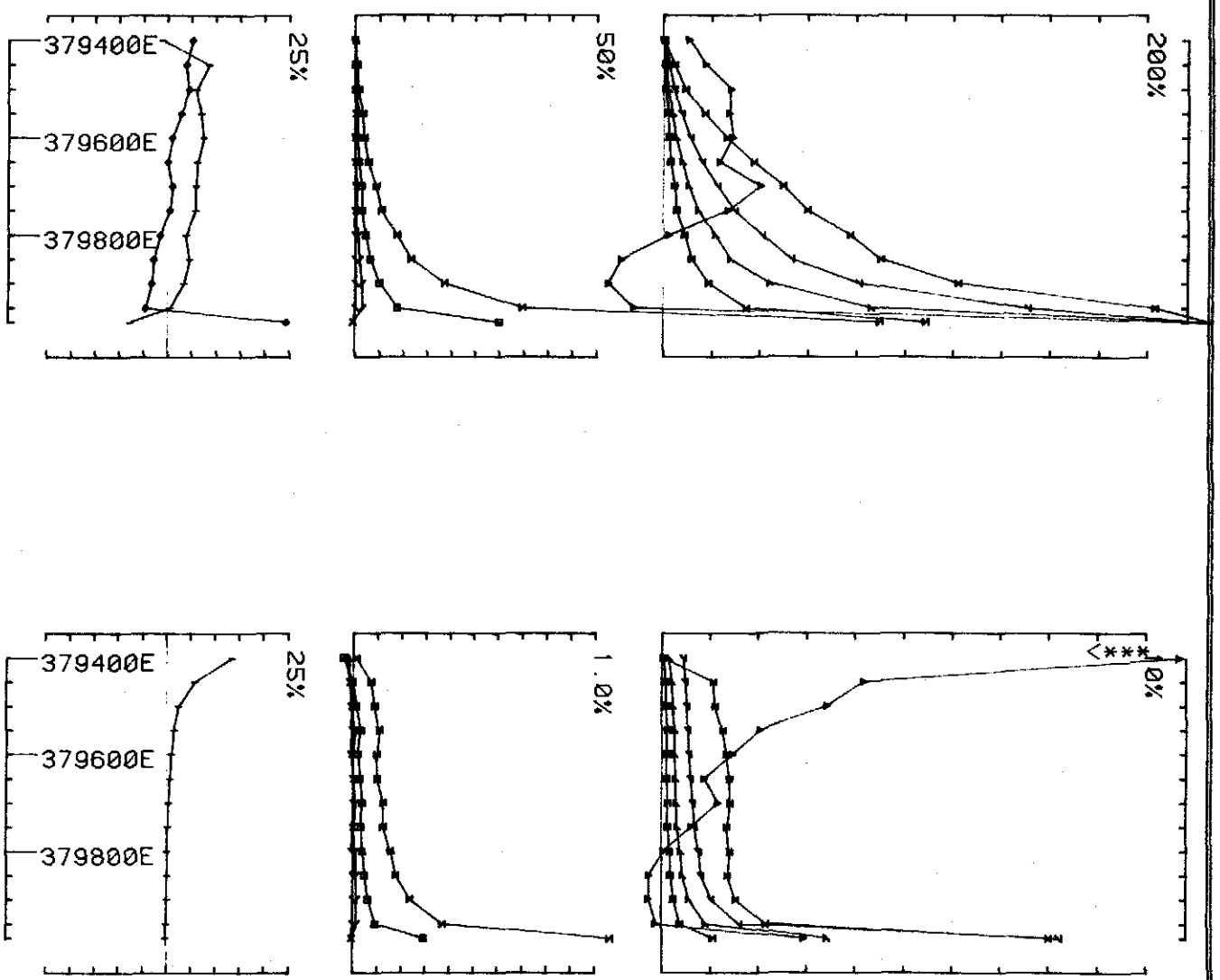
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- ART RX8
Line 81700N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



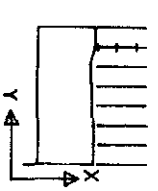
MT. KERSHAW
LOOP 0013
LINE 81700
Hz

415

898416



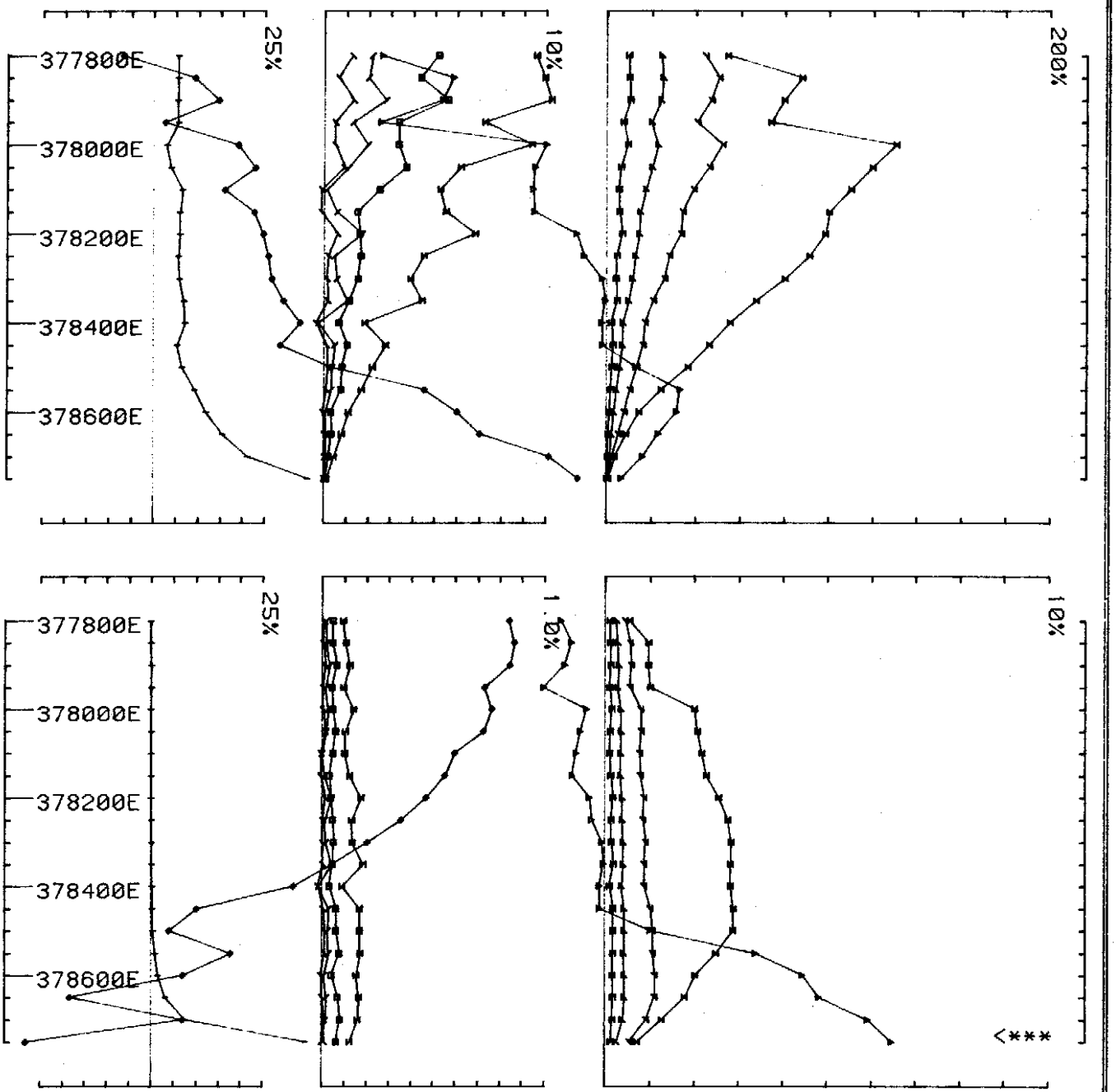
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- PMM RX8
Line 81900N Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0013
LINE 81900
Hz

416

898417



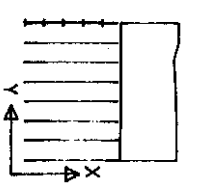
LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653

AREA :- Mt. Kershaw

CLIENT :- B.H.P. CREW :- BM Rx10

Line 82100N Hz COMPONENT BASE FREQ :- 26.230HERTZ

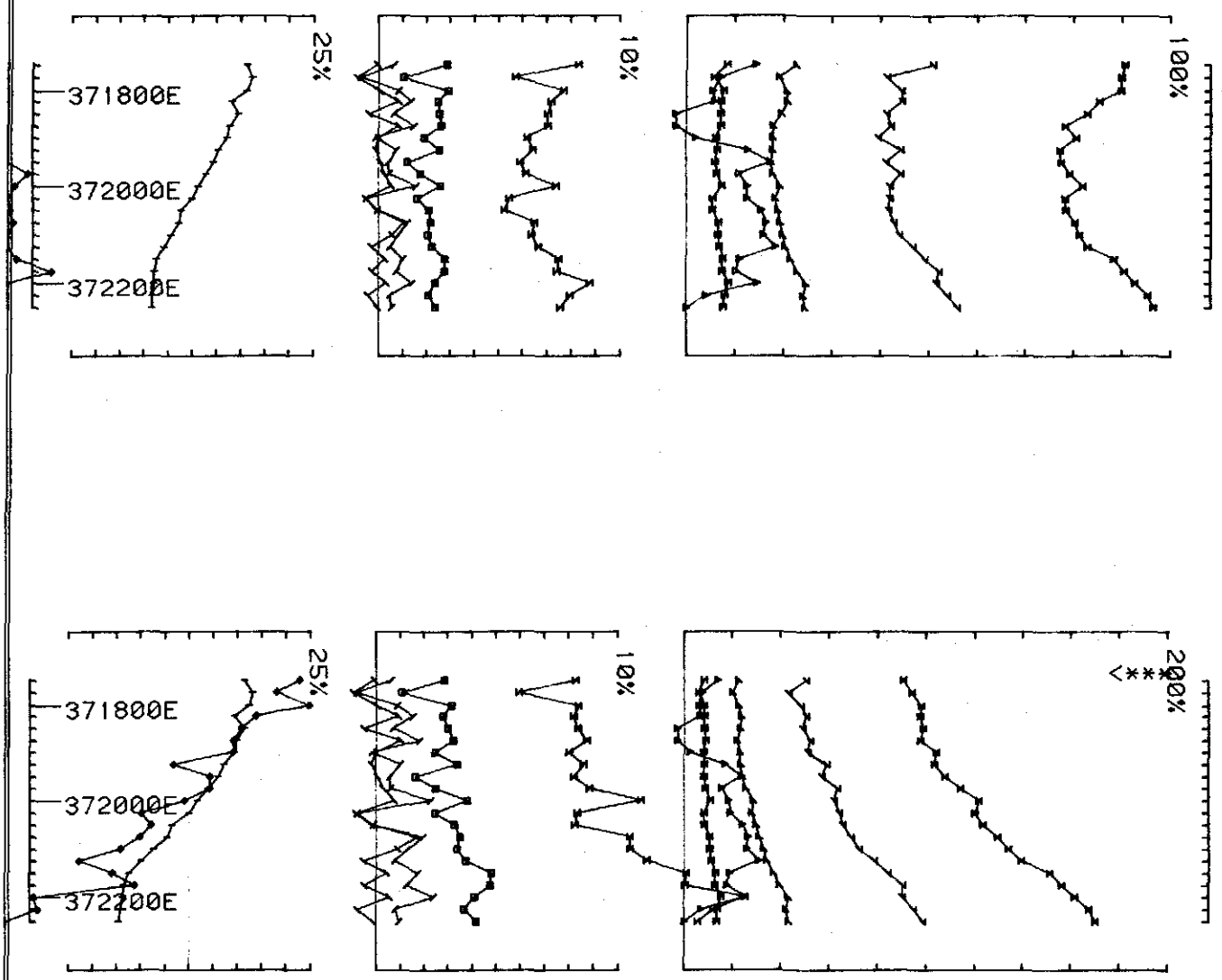
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



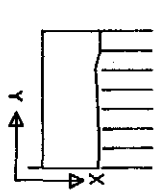
Mt. Kershaw
LOOP 0031
LINE 82100
Hz

417

898418



LAMONTAGNE GEOPHYSICS UTEM SURVEY JOB 8653
AREA :- MT. KERSHAW
CLIENT :- B.H.P. CREW :- BM Rx10
Line 2540S Hz COMPONENT BASE FREQ :- 26.230HERTZ
SECONDARY FIELD CONTINUOUS Ch 1 NORMALIZATION



MT. KERSHAW
LOOP 0013
LINE 2540S
Hz

423W

EAF 12 — EAF 8 — EAF 10 — E

Sh frags rct

RL (metres)

270° Mag

4800 E — 5000 E

500 — 400 — 300 — 200

EAF 12 — EAF 8 — EAF 10

Pitted feld ± qtz rhy — €rhy1

qtz phenocryst-rich rhy breccia — prom py stringers — €rhy1

massive qtz-feld rhy lava — some brecciation — €rt

qtz-feld rhy breccia & massive lava? — folded chert and volcaniclastic ± sph-gn vns — conglom. ser cherty frags 2% py — feld-qz rhy, rt — vd + ash ± py, cpy, sph, gn — Sh & ash ± rct — Ser dt 3% py — rare veinlets — Ser ash — €rt — €dt

T.D. 106·0m — sph-gn vns — €dt — €rhy

Massive sulph — ser pumiceous feld ± qtz dtl & ash, strong cleavage — ribbon sh & ash vc qtz-feld rict and ash — vc feld ± qtz breccia ± sh frags — ser chl feld ± qtz breccia — vc feld ± qtz - feld rct — Feld dc breccia lava ? — €dc — €rt

100 MS & barite — isoclinal folds, ovoid py fragments — feeder zone sil vc feld ± qtz breccia to ash py, cpy veining, local sph-gn vns & segregations — vc qtz-feld rict & ash bedding subparallel to core axis — vc cherty ash — thin rct sil-ser patchy py vns — (R2) breccia & ash — ?F — €dt

polymict volcaniclastic ± ser qtz-feld, pink qtz-feld, feld-phyric frags — €rhy2 — qtz-feld rhy lava breccia — feeder zone cherry vns py, cpy, sph, gn — bimodal brecc — feld qtz — auto brecciated to fibd qtz-feld rhy — €anj — vns & segs sph, gn, py — and volcaniclastic — qtz-carb vns ± sph-gn — barn py vns, local cpy — volcaniclastic alt — rct — volcaniclastic alt — F? — €anj — dominant volcaniclastic rhy ± some and detritus, graded lithic crystal to ash

pink-green sér-carb feld dc andesite — €anz — vns and lava — €anz — €dt — €rt — €dc

fibd qtz feld rhy — feld ± qtz rhy - fibd

mixed and-rhy volcaniclastic, minor py — volcaniclastic ser feld hyphen phyric and? dc — patchy sph-gn-py volcaniclastic and ash (ch) — volcaniclastic and-rhy debris flow — polymict volcaniclastic rhy breccia — feld ± qtz dc breccia — ?F — €rt — qtz-feld volcaniclastic rhy debris flows

feld ± qtz dc — €QEFP — ch sl — QFP — T.D. 285·4m

LOWER TO MIDDLE CAMBRIAN Sequence of Mount Read Volcanics	Central Volcanic	€QEFP	Quartz - feldspar porphyry intrusive (QEFP) and coarse crystal tuff (QEFT)
		€rhy2	Feldspar ± quartz rhyolite lava (rhy)
		€rhy1	Quartz - feldspar rhyolite lava (rhy)
		€an2	Feldspar - phyric andesite, locally vesicular
		€rt	Quartz - phyric rhyolitic mass flow tuffs (rt), crystal tuffs (dct), lapilli tuffs (rlt), ash often with shale blocks
		€dt	Feldspar - phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
		€dc	Feldspar - phyric dacite lava (dc)
		€an1	Chloritic andesite to basaltic andesite lavas and tuffs (at)

Lava breccia — Bedding — Flow banding

SCALE 1:1000 — 0 — 50 metres — 5 cm

Revisions:

Drawn: C. Osborne — Date: 11·8·87 — Prepared by: P. Gregory — Centre: Melbourne — Project No B56 — Drawing No A3-1745

E.L. 5/63 - COMSTAFF J.V., TAS.
PINNACLES EAF GRID
SECTION 5360 N

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

Fig. 5

8934419

W — LINE 5320 N (PLAN) — E

500 metres R.L.

EAF 13 — EAF 6 — EAF 9

metres R.L. 500

Vc pumiceous lapilli prom. sil dlt local py clasts

Vc qtz feld rhy breccia ribbon sh frags

Vc lithics ss & ash, some feld phy & ch sl frags ovoid

Sh Rt ?dt

Massive to fibd qtz-feld rhy A few small zones of cherty sil & minor sph, gn, py

Base of oxidation

Coarse vc breccia feld phyric ser-sil, py vn & disem vns sph-gn

Fg cherty si ash & ch vn & disem py to 10%

Ms & cherty vc

Ser qtz rlc sily gn sph

Feld qtz lava? crystal lithic 3% py

Qtz feld rhy breccia qfb

TD 102m

Vc siltstone

Chertified and brecc py, sph, gn

Patchy sph-gn vns

Cherty silica vns local sph-gn py

Stockwork zone

Chl zone

Py cpy chl carb vns

Prom sph-gn minor local fuchsite

Feeder zone cy-cpy

Alth fells off past here

Vc sl-sh

Vc and brecc to alc, some cherty lithics

Nodular carb alteration

Ser ves and

Rare fuchsite local ch blocks

Fe ser feld and ?

Vc brecc & ser feld and frags + 0·20m and cherty frags. Local fg ashes, debris flows and frags often mineralised

TD 262m

Ser ves and dyke ? & carbonate veins

Qtz-feld porph or rhy intrusive ? locally flbd

Vc qtz feld rhy breccia local py clasts

Vc ser ash ± sh

Vc feld ± qtz dc breccia local qtz-feld phyric lithics

Large blocks sh incorporated

Finer feld-qtz lithic crystal tuff

Massive to bedded sh & local qtz feld rct zones complexly folded

Carbonate filled fault breccia

Qtz feld rhy

Ser-sil alteration segs & veins sph-gn

White qtz masses + vns assoc. & fault

Ser-sil-feld and ? qtz vns Py, cpy, sph and replacement

Mixed sulphides, semi ms - locally ms

Ser feld and ? breccia fabric

Ms sph-gn - py ± chl, bar

50% py cherty sil

Ser ves and

Vc si & alc

Ser ves and dyke ± fuch site

Vc si and ash

Strongly ser feld dlt ± fiamme ± ovoid to spotty carb alteration segs & veins sph-gn

Prominent sph-gn rissem & veins

Vc polymict brecc sl/p ch feld ± qz dc

Feld ± quartz dc lava brecc & flbd lava

TD 240m

Vc qtz-feld rlc rlc local sh frags

Vc qtz-feld rtl angular to subrounded frags local py segregations

Part weathered felds ± qtz dc

Feld ± qtz autobrecciated dc (vc?)

Vc mixed sulphides, semi ms - locally ms

Vc si sh

Vc si ash

Vc si & alc

Ser ves and dyke ± fuch site

Vc si and ash

Strongly ser feld dlt ± fiamme ± ovoid to spotty carb alteration segs & veins sph-gn

Prominent sph-gn rissem & veins

Vc polymict brecc sl/p ch feld ± qz dc

Feld ± quartz dc lava brecc & flbd lava

Ms

Ser feld and ? breccia fabric

Ms sph-gn - py ± chl, bar

50% py cherty sil

Ser ves and

431

W E

EAF 3,4 EAF 7,14

PP 31

RL (metres)

5280

5260

500

400

300

PLAN

← 270° Mag.

Browns Track 50m

Browns Creek 90m

EAF 3 EAF 4

PP 31 EAF 7 EAF 14

4800 E

5000 E

€rt

€dc

€sh

€an$_2$

€dt

€an$_1$

Vc breccia feld-qtz

No core

Vc long

Fg ser vitric local vns sph-gn

Vc feld lithic crystal tuff Strong ser vc qtz-feld

Vc lithicvitric ash weak py

MS

Vc cherty ash

50m

Strong ser qtz rlt local eutaxidic fabric

Welded qtz-feld rlt 3% py

Fg vc ash ± local qtz phyric lithic zones some eutaxidic fabrics

ch-qtz phyric tuff mix

Sh & cherty ash

cherty vns ± sph-gn-py

TD 95.8m

Eutaxidic ser qtz-feld tuff

TD 65.8m

Vc dlt

dc lava & lava breccia

Feld dct breccia

rtc & ash

qtz vns

Coarse Vc breccia ± qtz-feld rhy, rtc & sh frags

dc lava breccia

Feld-phyric ± qtz Flbd dc to lava breccia

100m

Vc breccia

Sh

Vc qfp & Sh breccia

Feld ash Qtz-feld breccia

Sh

Ser and ch vns, carb prom sph-gn

vc alt breccia vns qtz-feld rhy

Vc-rtc. — 150m

dlt

Ser and (ves) sil ± py-cpy

some crosscutting sph-gn vns

local sags Sph-gn

TD 186.77m

TD 186.9m

Ser-chl ves and Shl py-cpy feeler

Prominent cherty sil ± py & cpy segregations

Ash-shy-gn vns & segregations

Feld-phyric Vc ash and qtz rclt, sh clasts

Coarse Vc bimodal rhy breccia

Sh ± vitric ash, rtc. bedded.

sph-carb vns

Vc andesitic ash, sh, ch ± syngenetic py, some frags gn.

cleaved

150m

ves feld and ser-chl alterated carb vns weakly mineralized

Polymodel Vc breccia, lithies dc, rhy, qfr, and fragments often mineralized ± sph, gn, py

F.g. ash, rtc, ch

200m

Ser ves, and. Prom sil, dissem py.

Feeder zone py-cpy vns

Fg dt, dvt, dtl and ash ser, local sil, 5% py

Ser-sil-chl dlt lgnim Prom py-cpy vns (25%)

Ser-chl pumiceous dlt. 3% py

Sil-ser-chl dlt py-cpy vns & dissem (20%)

250m

Ser dlt, patchy sil, spotty carb, chl local sph-gn vns.

Prom F.g. galena-sph replacement & dissem

chertified

Vc dtl, rounded siliceous frags & fiamme patchy segs sph-gn

qtz-feld porph, rhy

Vr. dtl, rounded lithics

qz-feld rhy

Feld-phyric welded dlt patchy sil, chl, spotty carb

300m

Bd cherty ash dtl ± rounded siliceous frags & fiamme weak dissem sph-gn qtz-feld porph, rhy

TD 334.6m

Sil feeder py-cpy

Decreasing py dissem

Feeder zone py-cpy vns

Feeder zone py-cpy vns

SECTION

5 cm

SCALE 1:1000

0 50 meters

Fig. 7

LOWER TO MIDDLE CAMBRIAN — Central Volcanic Sequence of Mount Read Volcanics	
€QEFP	*Quartz-feldspar porphyry intrusive (QEFP) and coarse crystal tuff (QEFT)*
€rhy$_1$	*Quartz-feldspar rhyolite lava (rhy)*
€an$_2$	*Feldspar-phyric andesite (and), locally vesicular*
€rt	*Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), ash often with shale blocks*
€dt	*Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash*
€sh	*Shale (sh), siltstone (sl) and ash*
€dc	*Feldspar-phyric dacite lava (dc)*
€an$_1$	*Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)*

Lava breccia · Bedding · Flow banding

Revisions:

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

EL 5/63 (Part 4) COMSTAFF J.V., TAS.

PINNACLES EAF GRID-SECTION 5280 N

Prepared: P. Gregory	Date: AUG. 87	Centre: Melbourne
Drawn: M. Hoffmann	Project No: B56	Drawing No: A3-1747
Checked:		

89341

898422

W E

PP 31 — 5260 mN

EAF 5 EAF 1

5220 mN

PLAN

← 270° Mag

RL metres

580

SECTION

PP 31

EAF 1

EAF 5

MS

Surface

500

€dt €sh €rt €dc €rt Black sh €sh Sh & rth €rt

Qtz-rich rlte

Eq ash ser, some dtl py vns & lenses (5% py)

Feld-qtz dtl

Ser-chl dc breccia

Dc breccia

Vc rlte sh frags

Dc breccia

TD 52.1 m

Sh & ch frags

TD 84.4 m

Dacite lava breccia

Sh sl vc ch

Ves and

Sil and ?

Sh & ch vc Vns & patches py-sph-gn

TD 186.22 m

€rt

€dt

Cherty sh & ash ser, mod sil, py vns & segs - 5%, rare sph-gn vns

Rtdc & ash, prom ser rare py

€an2

€sh

€sh

€sh

5 cm

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

€an2	Feldspar-phyric andesite (and), locally vesicular
€rt	Quartz-phyric rhyolite mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks
€dt	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
€sh	Shale (sh), siltstone (sl) and ash
€dc	Feldspar-phyric dacite lava (dc)

Bedding

Flow banding

Lava breccia

SCALE 1:1000

0 50 metres

Fig. 8

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

E.L. 5/63 - COMSTAFF J.V. TAS.
PINNACLES EAF GRID
SECTION 5240N

Prepared: P. Gregory	Date: Aug. 87	Centre: Melbourne
Drawn: C. O.	Project №: B56	Drawing №: A3 - 1748
Checked:		

Revisions:

432

898423

W

E

5220 mN

5200

5180

EAF 2

← Section orientation 270° Mag

4800 m E

4900 m E

EAF 2

?F

Scit ± qtz-feld phyric lithics chert & shale clasts local ash zones facing difficult

Feld ± qtz

Qtz phyric rlt

lava & lava brecc

Vc rtlc ± feld-phyric & qtz feld frags

Sh dtlc feld phyric frags and ash, some sh frags, some qtz-feld in matrix

Bash & fg ser ash, local chert ± cation ± fg py

Prom fg py

Ser feld and

Cherty alln ± fg py & more massive py vns ± sph gn

Most prom sph-gn vns

Dacitic ash to dtl, flamme & cherty lithics

Prom local sil, patchy sph-gn segs & veins

Ser ves and, carb in vesicles, local sil, minor sph-gn

Cherty sh & feld-phyric ash

Ser and, brecc fabric due to cherty alln

fg py carb vns

Cherty sil & andesitic ash

And prom ser chl, local cherty sil producing brecc fabric, minor mineralization only

Note: cherty alln ± fg py, rare sph gn

TD 132.4m

€an2

€rt

€dt

€sh

€dc

100

A33

PLAN

SECTION

RL metres

500

400

5 cm

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

- €an2 — Feldspar - phyric andesite (and), locally vesicular
- €rt — Quartz - phyric rhyolite mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt) ash often with shale blocks
- €dt — Feldspar - phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
- €sh — Shale (sh), siltstone (sl) and ash
- €dc — Feldspar - phyric dacite lava (dc)

Bedding

Lava breccia

0 SCALE 1:1000 50 metres

Fig. 9

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

E.L. 5/63 - COMSTAFF J.V. TAS.
PINNACLES EAF GRID
SECTION 5200 N

Revisions:			
	Prepared: P. Gregory	Date: Aug. 87	Centre: Melbourne
	Drawn: A.R.V.	Project №: B56	Drawing №: A3 - 1749
	Checked:		

898424

4700mE 4800mE 4900mE 5000mE

LINE 5080 N

EAF 160

PLAN

← Section orientation 270° Mag

R.L. (metres) W E

500 500

400 400

300 300

PINNACLES TRAMWAY ROAD 440 m

EAF 16

Fold end

Cmd breccia & dft 3% py

ash & dft, ch vns, 8% py

ser-cht dft & flamme

prom py, sph, gn vns & segs

ch ash, local vns py, sph-gn

f.g. schistose ser dft

ser ash

rcf

ash

rcf & ash, 2% py, segs sph-gn

ch tuff & moderate vns py, sph, gn

massive sulphide sph-gn-py-cpy

chert & ch tuff, prom py, sph, gn

50m

ser dft, dft, 3% py

mod-strong sil dft, prom vns & segs py, sph, gn

dft & ash

f.g. vitric dc & dc breccia

f.g. vitric dc

Bimodal volcaniclastic breccia rhy & dc frags

f.g. vitric ash

T.D. 84.5m

ϵdc

ϵrhy$_2$

ϵan$_2$

ϵdt

ϵdt

ϵdc

ϵrt

ϵrhy$_2$

ϵdc

SECTION

5 cm

Central Volcanic Sequence of the Mt. Read Volcanics

LOWER TO MIDDLE CAMBRIAN

ϵrhy$_2$	*Feldspar ± quartz rhyolite lava (rhy)*
ϵan$_2$	*Feldspar - phyric andesite (and), locally vesicular*
ϵrt	*Quartz - phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks*
ϵdt	*Feldspar - phyric dacitic ignimbritic tuffs, crystal tuffs (dct), dacitic lapilli tuffs (dlt), ash*
ϵdc	*Feldspar - phyric dacite lava (dc)*

Bedding

0 Scale 1:1,000 50 metres

Fig. 10

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

E.L. 5/63, PART 4 COMSTAFF J.V., TAS.
PINNACLES EAF GRID
SECTION 5080 N

Prepared: P. Gregory	Date: 3-9-87	Centre: MELBOURNE
Drawn: A.R.Veale	Project №: B56	Drawing №: A3 - 1750
Checked:		

Revisions:

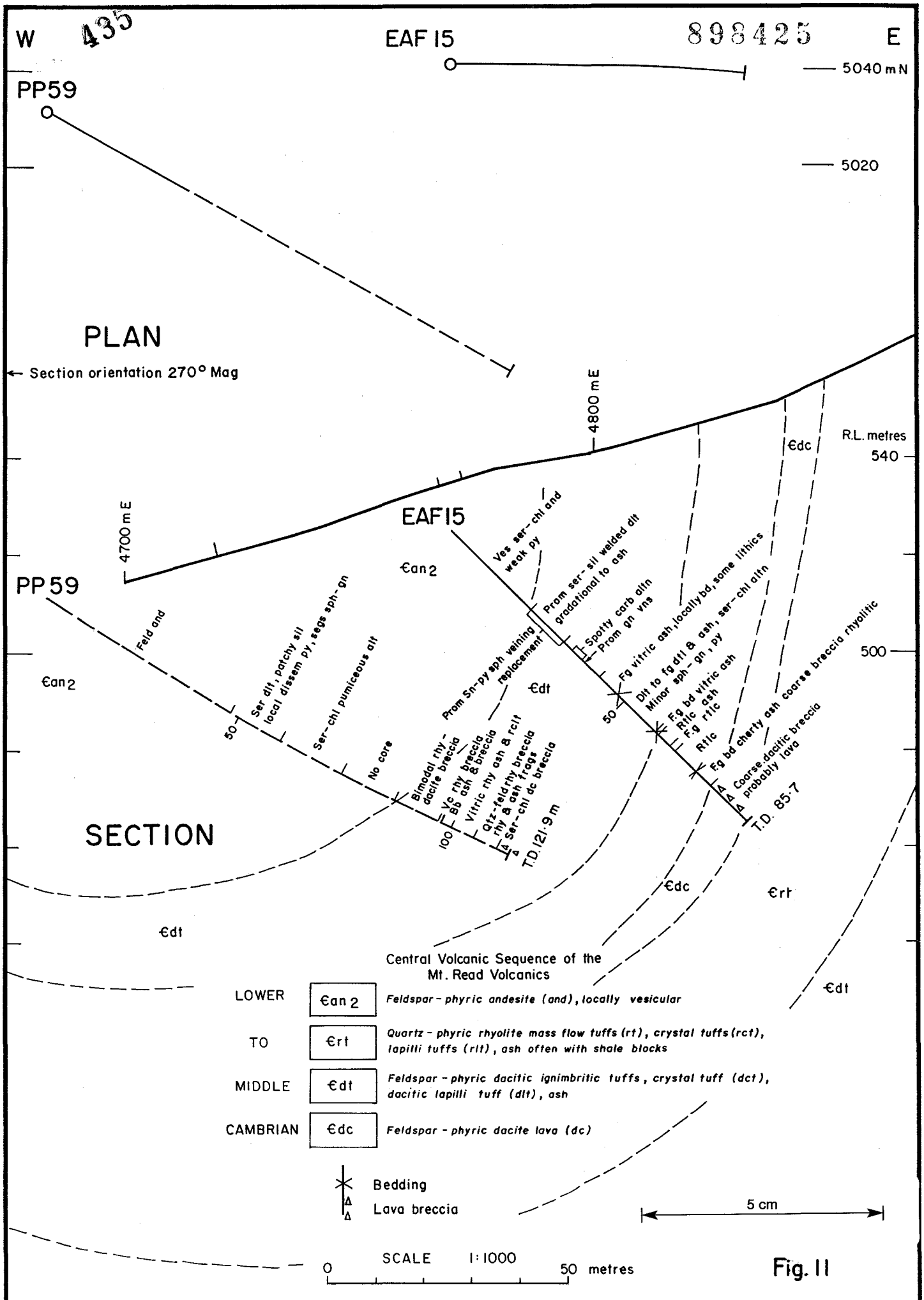


Fig. 11

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63, (Part 4) COMSTAFF J.V. TAS. PINNACLES EAF GRID SECTION 5040 N	Project Nº B56
Date Aug. 87		Drawing Nº A4-2678

898426

W

E

PLAN

PP51 PP48 PP45

270/90° M

4920mN

4920 mN

RL (metres)

McGUINESS TRACK 100m

PINNACLE TRAMWAY ROAD 630m

4600 E

4800 E

PP51

PP48

PP45

Ser-chl dlt local py Sh & ash

dlt

Vc

dc

€sh

€dc

€dt

€an$_2$

€rt

py

F

rct, sh & ash

TD 18.29m

No core

TD 23.16m

50m

100m

Qtz-feld rict-to-breccia, local sh clasts & sh-tuff mix, some ash.

Frg. slumped ash

Coarse vc rhy breccia Ash & lithic ash

Vc rhyolitic breccia & ash

rct, rict & ash ash & lithic ash rct

Vas and fragment

Bd rhyolitic ash & sh, local lithic zones

Vc rhy breccia Bd ash

Vc rhy breccia, rict F.g. ash

Mod ser rct

TD 118.87m

400

300

SECTION

5 cm

Fig. 13

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

- €an$_2$ — Feldspar-phyric andesite (and), locally vesicular
- €rt — Quartz-phyric rhyolite mass flow tuffs (rt), crystal tuffs (rct), ash often with shale blocks
- €dt — Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
- €dc — Feldspar-phyric dacite lava (dc)
- €sh — Shale (sh), siltstone(sl) and ash

Bedding

SCALE 1:1000

0 50 metres

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

EL 5/63 (Part 4) COMSTAFF J.V., TAS.

PINNACLES EAF GRID-SECTION 4920 N

Prepared: P Gregory	Date: AUG. 87	Centre: Melbourne
Drawn: M. Hoffmann	Project Nº: B56	Drawing Nº: A3 - 1751
Checked:		

Revisions:

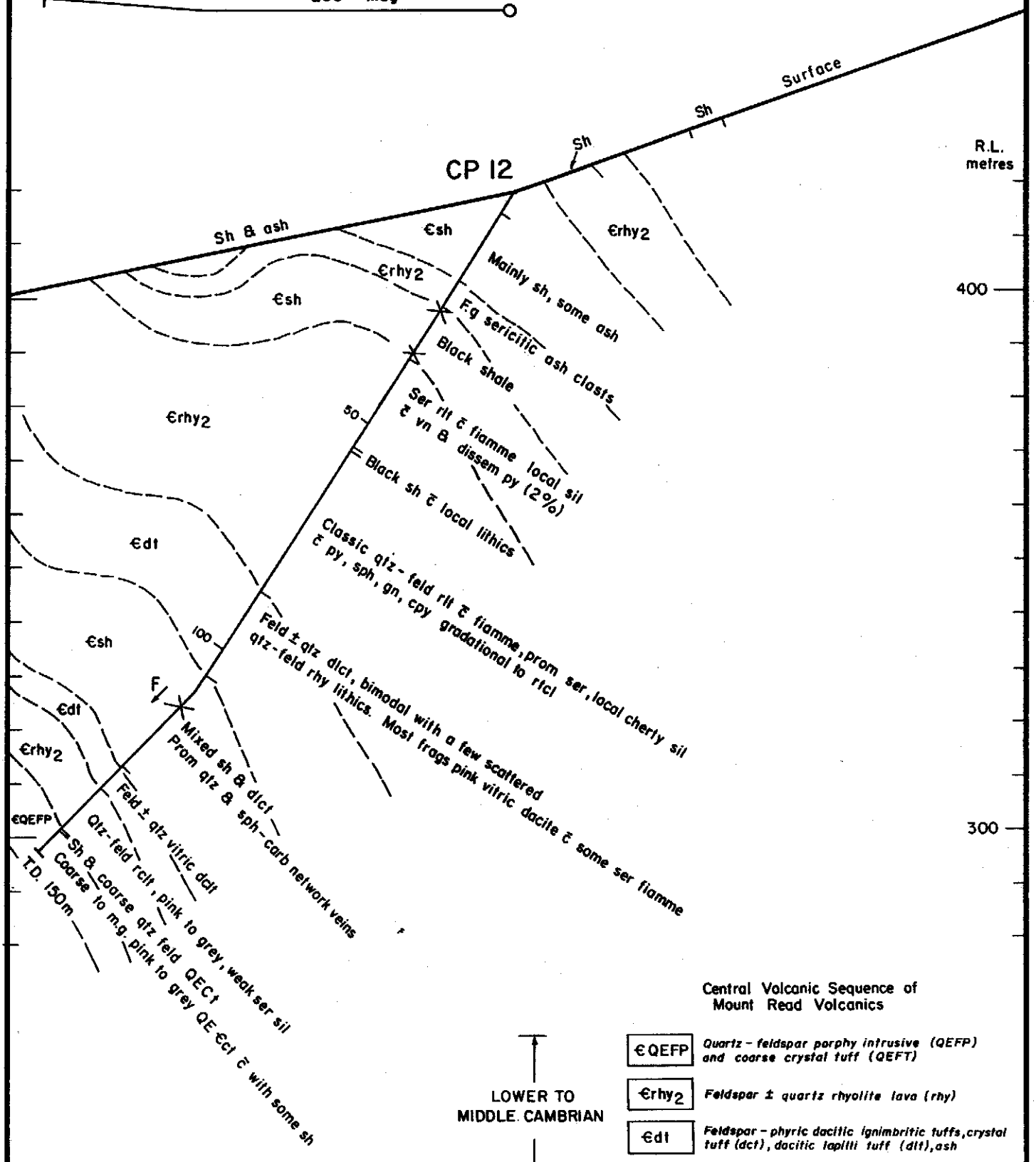
436

W 437

898427 E

CP 12 PLAN

268° Mag



SECTION

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

- €QEFP — *Quartz - feldspar porphy intrusive (QEFP) and coarse crystal tuff (QEFT)*
- €rhy2 — *Feldspar ± quartz rhyolite lava (rhy)*
- €dt — *Feldspar - phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash*
- €sh — *Shale (sh), siltstone (st) and ash*
- Bedding

SCALE 1:1000

0 50 metres

5 cm

Fig. 14

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. E.L. 5/63 - COMSTAFF J.V. TAS. PINNACLES EAA GRID SECTION 1800 S	Project No B56
Date Aug. 87		Drawing No A4 - 2679

W

CP 9 CP 8 CP 13 EAF 17

PLAN

90° Mag

R.L. (metres)

EAF 17

CP 13

CP 9 CP 8

1800 W

400

300

€rt €an2 €edt €esh

Black sh Ser ash

Py veinlets Ser dacitic ash to dte & brown qtz vns

TD 39·75

Bd sh & ash layers

Fg qtz SEE INSET

Ser dte & ash, patchy py & spn

Fg. ser ash, rare sph

Black sh & network sph

Ser dlt (pumiceous)

Pink qtz-feld rtl, rlct

Grey feld ± qtz dlct

Coarse ae clt

Ser rlt

Green grey feld and & and breccia qz-carb vns

ser-chl-sil alt'n

Qtz-feld rhy & vc rhy breccia ser & patchy chl

Black sh & rlc debris

Vc rclt, mg to coarse qtz crystals to cal sh detritus

Black shale

Fg rlt, dlt

Black sh

Fg qtz-feld rclt & sh zones

Fg siliceous sh & ash

Ser lithic ss - tuff

Rtl & sh

Sh & prominent folds & interlaminated ss

qtz vns

TD 249·15m

Vns & segregation sph-gn most prominent

Ser ignimbrite dlt & flattened ser pumice lithics, vitric in part, locally sil 2% py dissem, local vns & segregations sph & gn

Ser dlt & patchy sil, local zones spotty pink carb, vns & segregations sph-gn from ser-carb-chl alt dlt, dissem 1% py, local vns & segregations sph-gn

Fg. ser vitric dtl

Vc rtl & breccia Some ser-chl alteration

Ser chl dlt & vitric dc & pumice lithics, local py dissem & vns to 3%, some cpy-sph-gn

Chl-ser and & patches cherty sil, carb vns

Cherty and & py vns

Chl-ser feld and & carb vns

Pink qtz-feld rhy breccia, rtl

Chl-ser and breccia

Vitric weak ser qtz-feld rhy lava ? Vc breccia

T.D. 176·2m

SEE INSET

T.D. 158·4m

SECTION

5 cm

E

CP 9 Surface CP 13 EAF 17

— 1600 W

Some ser dlt flamme → 5% py local sph-gn

locally sil & py, sph segs

← Minor dct

50 Qtz-feld reworked tuff & ash Bd dacitic ash & 8% py

Prom py, some cpy in rtc

Sil dtl & sph-gn segs, 10% py

Fg ash & 10% py

Ser dlt

D/t local cherty sil red br sph vns, 50m cpy 5-8% py

100 Dtc

Alt (ignimbritic) & local sh 1-3% py carb vns, rare sph-gn

150

T.D. 158·4m

INSET

(SAME SCALE)

898428

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

- €an2 — Feldspar-phyric andesite (and), locally vesicular
- €rt — Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks
- €dt — Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
- €sh — Shale (sh) siltstone (sl) and ash

Bedding

Lava breccia

SCALE 1:1000

0 50 metres

Fig. 15

438

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

E.L. 5/63 (Part 4) - COMSTAFF J.V. TAS.
PINNACLES PROSPECT EAA GRID
SECTION 2000 S

Prepared: P. Gregory	Date: Aug 87	Centre: Melbourne
Drawn: C. Osborne	Project No: B56	Drawing No: A3 - 1752
Checked:		

Revisions:

898429

270° Mag ← PIN I → 90° Mag

PLAN

SECTION

RL(m)

1800 W | 1700 W | 1600 W

PIN I

400

300

€QEFP

Coarse qfp

Feld dlt
Ser altered 3-5% py, rare Sph-gn

€dt

50

increasing sil

Py<1%
chl alteration

5-8% py, local sph-gn

fg sil ash, dissem fg py to 5%
Prom ser dlt, dtl, 1-2% py.
Bd cherty ash & fg feld dclt

100

Prom sph gn vns

8% py, local sph-gn seg

Feld dlt, ser-sil, 5% py dissem.

Feld dc? andesite ser-chl alteration
carb & qtz carb vns.

Qtz-feld rlt-breccia (mass slide?)
sh & rlt debris

Qtz-feld rhy breccia-rlt
Mixed sh & rlt, m g carb vns.

150

Course rhy breccia, some sh in matrix, carb vns

Rhy breccia volcaniclastic

Sh & rlt

Qtz feld rhy volcaniclastic breccia local zones

sh

rlt-brecci & sh detritus

€an2

€rt

€sh

ROSEBERY FAULT

TD 178m

Sheared & folded interbedded shales & sandstones of Rosebery Group.

GEOLOGY

Central volcanic sequence of Mount Read Volcanics

	€QEFP	Qartz-feldspar porphyry intrusive (QEFP) and course crystal tuff.
LOWER TO MIDDLE CAMBRIAN	€an2	Feldspar phyric andesite, locally vesicular.
	€rt	Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs.(rlt) ash often with shale blocks.
	€d	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuffs (dct) dacitic lapillituff (dlt) ash.
	€sh	Shale (sh), siltstone (sl) and ash.

Bedding

5 cm

SCALE 1:1000

0 50 m

Fig. 16

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

EL 5/63 (Part 4) COMSTAFF J.V., TAS.

PINNACLES EAA GRID – SECTION 2100S

Revisions:	Prepared: P. Gregory	Date: Aug 87	Centre: Melbourne
	Drawn: M. Rosker	Project №: B56	Drawing №: A3 - 1753
	Checked: P. Gregory		

A3

440

898430

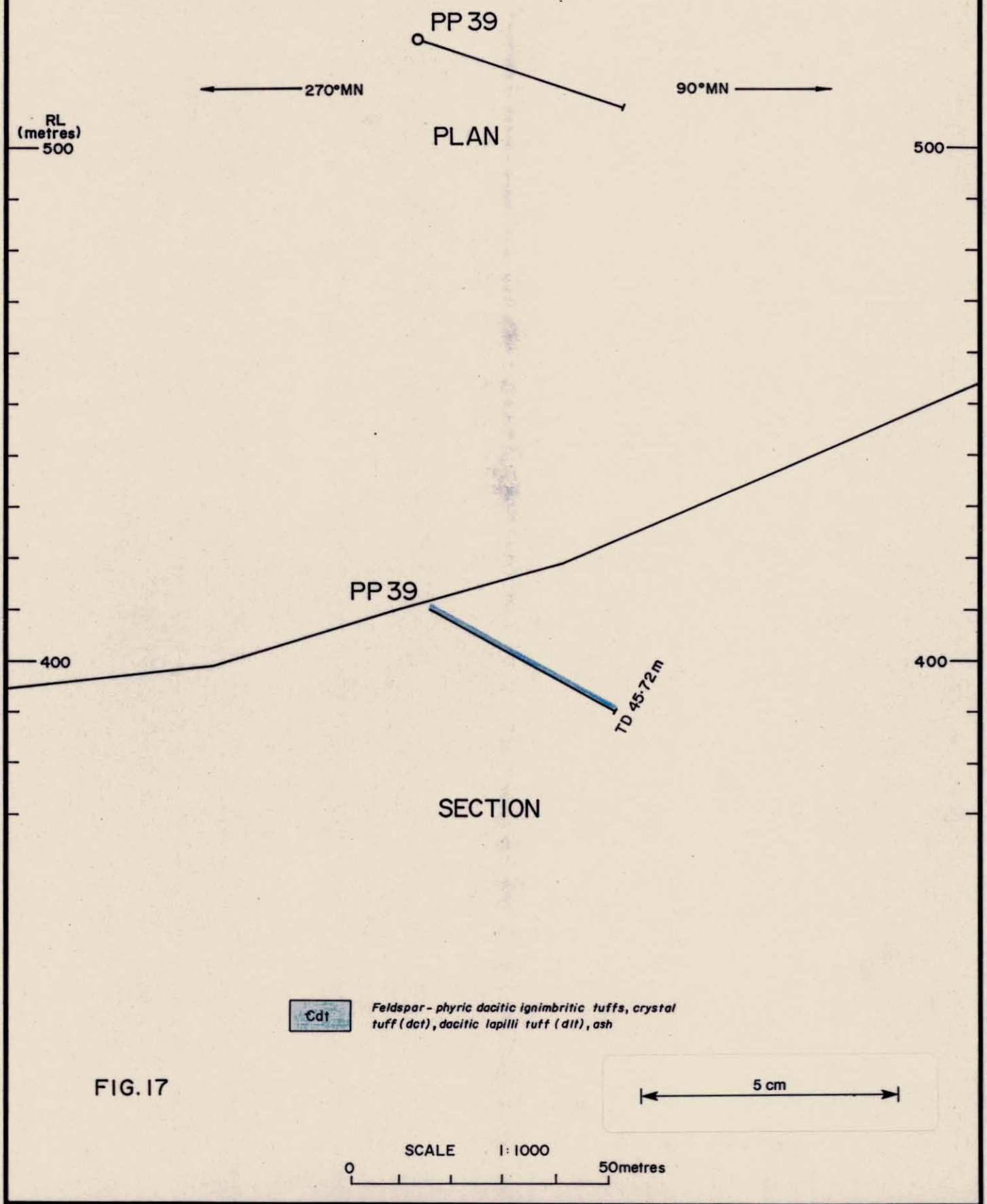


FIG. 17

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63 (Part 4) COMSTAFF J.V., TAS.	Project Nº B56
Date AUG 87	PINNACLES EAA GRID-SECTION 2150 S	Drawing Nº A4-2680

898431

metres RL

W

PP34,36,42

PP40

EAF 18

91° Mag.

metres (R.L.)

E

EAF 18 (SEE INSET)

PP 40

Dlt

Chert & cherty ash ± semi MS sph, gn, py & vns

Ser dlt ± dissem & vns py, sph, gn (5%)

T.D. 24.38m

€sh

€dt

400

PP34

PP42

PP36

Ser-chl and

€anl

Prom ser dlt ? locally sil & dissem. py, segs & veinlets sph-gn

Core split

50

Prominent py veining

Ser rtc ± patchy to prominent sph-sh vns & py dissem.

Ser-si alt ? & ash, prom vns & segs, py, sh, gn.

Sh & cherty ash, some dlt, prom sph-gn-py-cpy vns

Ser dlt to vitric tuff

Patchy py and vns sph-gn

T.D. 75 m

T.D. 110.84 m

100

€rt

€anl

ROSEBERRY FAULT

No core

Qtz feld vc.? rhy vc.?

Ser rlt & dlt

local vns & segs py, sph, gn, rare cpy

rtc, rlt

Prom py vns & dissem

Prom sph gn cpy

Host horizon sh, ch & ash

Prom sil dlt ± prom sph-gn vns

Chl dlt, dtc, probably some rtc 1% py

Typical ser dlt, 2% py

T.D. 15.22

150

Qtz feld vc.? breccia, ill sorted

Sh + vc rhy detritus

Vc rhy breccia & rlct mod ser rare sph-gn vns

Rct

Rct to rhy breccia

Ser-chl rtc & rct

Core not found

T.D. 193m

€edg

DUNDAS GROUP

SEDIMENTS

300

INSET EAF 18 (SAME SCALE)

W E

dlt (ignimbrite)

Cherty ash & sh

Sph-gn-py vns & replacement

50

Prominent vein of sph-gn ± cross cutting later cpy

400

PP 34

Local nodules of sil ± py, sph, gn

Ser-sil dlt

T.D. 75m

5 cm

MIDDLE MIDDLE CAMBRIAN TO MIDDLE LATE CAMBRIAN	Dundas Group	€dg	Shales, greywackes, coarse qtz-feldspar crystal tuffs, ash
LOWER	Central Volcanic	€rt	Quartz-phyric rhyolitic mass flow tuffs (rt), crystal-tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks
TO	Sequence of	€dt	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
MIDDLE	Mount Read	€sh	Shale (sh), siltstone (sl) and ash
CAMBRIAN	Volcanics	€anl	Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)
			Breccia zones

SCALE 1: 1000

0 50 metres

Fig. 18

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (PART 4) COMSTAFF J.V., TAS.
PINNACLES PROSPECT
EAA GRID - SECTION 2200S

Prepared by P. Gregory	Centre Melbourne	
Date Aug. 87	Project No B56	Drawing No A3-1754
Drawn		

Revisions

442

898432

W

E

PIN2

PP41

400

300

€Dg

ROSEBERY FAULT

€rhy2

€an2

€dt

€QEFP

ser dlt & ash
patchy dissem & segregations
py, sph, gn

ash
main conc sph, gn, py

50
T.D. 51.81m

feld vitric dclt, dct & dtl (ignimbritic)
coarse to fine ser pumice lithics
trace py

50

qtz-feld porph
some internal brecciation

100

ignimbritic dlt, welded in part
mod-strong ser, local sil
patchy segs sph-gn, weak py (usually <1%)

prom sil

150

F

F

intense sil, mod sph-gn vns & segs
f.g. ash & dlt, local sil-ser, patchy sph-gn vns, rare cpy

f.g.-m.g. dlt, patchy sph-gn assoc sil patches

ser-chl dc? and, some internal brecciation
prom carb-qtz vns
coarse qtz-feld rhy volcaniclastic breccia
sh
rhy volcaniclastic breccia
sh & dlt
rhy breccia & some sh detritus

200

Fault zone of sheared & crumpled shales & sandstones

Rosebery Group
folded interbedded shales & sandstones

f.g. feld-phyric vitric dtl, rare pumice clasts

T.D. 231m

5 cm

SCALE 1:1,000

0 20 40 60 metres

MM to ML CAMBRIAN

LOWER TO MIDDLE CAMBRIAN

Dundas Group

€Dg — Shales, greywackes, coarse quartz-feldspar crystal tuffs, ash

Central Volcanic Sequence

€QEFP — Quartz-feldspar porphyry intrusive (QEFP)

€rhy2 — Feldspar±quartz rhyolite lava (rhy)

€an2 — Feldspar-phyric andesite (and), locally vesicular

€dt — Feldspar-phyric dacitic ignimbritic tuffs, crystal tuffs (dct), dacitic lapilli tuffs (dlt), ash

Fig. 19

THE BROKEN HILL PROPRIETARY CO LTD
EXPLORATION DEPARTMENT

E.L.5/63 (PART 4) COMSTAFF J.V., TAS.
PINNACLES PROSPECT
EAA GRID – SECTION 2250S

Prepared by P. Gregory	Centre MELBOURNE	
Date July 1987	Project No B56	Drawing No A3-1755
Drawn A.R. Veale		

898433

W

E

PLAN

← 268·5 MN

CP 10

CP15

1500 W

1600 W

1700 W

400

CP10

CP15

ser dlt

dct

Feld ± qtz dclt, patchy sph-gn vns, 1% py

QEFP?tuff

dclt

50

Sheared bl sh &-ss interbeds

ROSEBERY FAULT

ser dlt

sil

50

local rare sph-gn vns 1% py

carb vns

100

vitric rtl

m-vd ser vitric dlt patchy py dissem segs sph-gn

porph feld dc

rlct

150

dclt, ch sil, 3% py, local sph-gn

ser dlt

ser & ch dacitic ash, 2% py

F

vitric dlt, trace py

T.D. 195·15m

€Dg

conglom

sh & conglom detritus

conglom

sh

quartzo-feldspathic ss

sh & ss interbeds

100

feld-phyric tuffaceous ss

folded interbedded sh & ss

feld-qtz-phyric lithic ss

Interbedded sh & ss

Tuffaceous conglom - ss of rhyolitic parentage

Tuffaceous lithic ss

Conglom & local py vns

f.g. ss

300

150

Interbedded sh & ss

T.D. 151·5m

SECTION

MM to ML CAMBRIAN	€Dg	**Dundas Group**	*Shales, greywackes, coarse quartz-feldspar crystal tuffs, ash*
LOWER TO MIDDLE CAMBRIAN	€QEFP	**Central Volcanic Sequence**	*Quartz-feldspar porphyry intrusive (QEFP)*
	€rt		*Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks*
	€dt		*Feldspar-phyric dacitic ignimbritic tuffs, crystal tuffs (dct), dacitic lapilli tuffs (dlt), ash*
	€dc		*Feldspar-phyric dacite lava (dc)*

Fig. 20

5 cm

SCALE 1:1,000

0 20 40 60 metres

THE BROKEN HILL PROPRIETARY CO LTD
EXPLORATION DEPARTMENT

E.L. 5/63 (PART 4) COMSTAFF J.V., TAS.
PINNACLES PROSPECT
EAA GRID – SECTION 2400S

Prepared by P. Gregory	Centre MELBOURNE	
Date July 1987	Project No. B56	Drawing No. A3- 1756
Drawn A.R. Veale		

A43

898434

SW

CP1

Re-drill

CP2

NE

R.L. metres

PLAN

235·5 M'ag

CP2 redrilled

CP2

400

ser-chl feld ± qtz dct or dc lava

€dt

ROSEBERY FAULT

Dundas Group Sediments

50

50

1% py

CP1

€rt

F

rct

fg. rvt

F

rct

€Dg

shales

100

T.D. 92·43m

T.D. 109·73m

Shales and Sandstones

50

100

150

300

200

T.D. 192 m

SECTION

5 cm

Scale 1:1,000

0 20 40 60 metres

Dundas Group

MM to ML CAMBRIAN — €Dg

Shales, greywackes, coarse quartz-feldspar crystal tuff, ash

Central Volcanic Sequence

LOWER TO MIDDLE CAMBRIAN — €rt

Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), vitric tuffs (rvt), ash often with shale blocks

€dt

Feldspar-phyric dacitic ignimbritic tuffs, crystal tuffs (dct), dacitic lapilli tuffs (dlt), ash

Fig. 21

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 5/63 (PART 4) COMSTAFF J.V., TAS.
PINNACLES PROSPECT
SILVER FALLS GRID - LINE 70S

Revisions

Prepared by P. Gregory	Centre MELBOURNE	
Date July 1987	Project No B56	Drawing No A3-1757
Drawn A. R. Veale		

W

E

898435

147° Mag

DDH EAB 1

1200

1000

Coarse quartz 'eye'-feldspar porphyry, locally flow banded.

€QEFP

50

€QEFT

Volcaniclastic ? quartz 'eye' - feldspar porphyry breccia, ser - chl. lithics

SEE INSET

QEClt. M-g rtl, some sh. detritus, gn-sph. veinlets

sh. & lithics QEFP and rt.

€rt

€QEFP

€dt

Broken qtz vn. fault? Black sh.

100

€sh

€dt

€sh

Qg

Black sh. and rtl. detritus.

Feld.-± qtz dacitic breccia and dclt.

Black sh. & QEFP lithics and detritus.

Feld. dacitic volcaniclastic breccia and dtl.

QEFP, locally flow banded

Ser dtl, rare sh. lithics

Black shale

150

€sh

€dt

Fg ss

Shale

Fault

200

F.g. bedded ss - gw for greywacke of dacitic derivation

Andesitic volcaniclastic lithic tuff (atl.), matrix cherty in part. local veinlets and segs. sph-gn.

€an1

Lithic gw to breccia of dacitic affinity, ser. and chl. clasts strong crustiform carb. veining

Bd tuffaceous ss of dacitic affinity

Crustiform carb. vein

Altered vitric andesite breccia passing into vesicular andesite chl.-carb. alteration

Local narrow flow breccia zones

250

€an2

F.g. - m.g. atl. and ash

Sph. vns. and segs. assoc. with carb.

€an2

Fg. py. veining

Chl ves and & and breccia

Chl atl and breccia with Fl

local graded aclt zones

T.D. 295·5m

INSET (SAME SCALE)

Qtz.-pyritic rtl. & sh. lithics

Qtz 'eye'-feldspar QEtl

100

€rt

€sh

€dt

€sh

Qg

QEFP

€QEFP

€dt

5 cm

HORIZONTAL & VERTICAL SCALES 1:1000

0 50 m

Fig. 22

QUATERNARY	Qg	*Glacial deposits*
LOWER TO MIDDLE CAMBRIAN — Central Volcanic Sequence of Mount Read Volcanics	€QEFP	*Quartz-feldspar porphyry intrusive - (QEFP) and coarse crystal tuff (QEFT)*
	€an2	*Feldspar-phyric andesite (and) locally vesicular*
	€rt	*Quartz-phyric rhyolitic mass flow tuffs (rct), crystal luffs (rlt), lapilli tuffs (rlt), ash often with shale blocks*
	€dt	*Feldspar-phyric dacite ignimbrite tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash*
	€sh	*Shale (sh), siltstone (sl) and ash*
	€an1	*Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)*
		Bedding

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 5/63 (Part 4), COMSTAFF J.V., TAS.

EAST CHESTER PROSPECT, SECTION 2430 S

Revisions:	Prepared by: P. Gregory	Centre: Melbourne	
	Date: 27·7·87	Project No B56	Drawing No A3-1758
	Drawn:		

CAT

898436

W

E

EAB 2

€rt

€sh

1400 W

rt & sh

€rt

€sh

€rt

Bd black sh

Bb dt, ash, sh

1300 W

Ves and

Coarse rlt ξ ser pumice and vitric rhy frags 2% py dissem.

Fg. bdsh

Fg bd ash

Coarse m.g. rhyolitic breccia ξ frags, rhy ash pumice, vitric rhy mod ser ξ 1% py

Fg bd ash, ser-sil ξ 3% py

Mixed f.g. rlct and ash

Fg ash and lithic ash ξ some sh interbeds and local coarse qfp lithics

Coarse breccia ξ rhy, fl bd rhy, ser rhy, sh clasts

Coarse dacitic breccia ξ feld dc, ser frags in finer matrix

Fg dacitic ash ξ local lithic zones ξ feld-phyric frags

Fg bd ser ash ξ local fg sericitic lithics

50m

€dt

F

Bd ash ξ flamme

Fg. bdash

Ft

Feld dlct ξ dc and pumice clasts

Bd black sh

Fg bd ash ξ local lithic zones

Coarse dlt and dlct

Slumped Fg dacitic ash ξ local lithics

Feld-phyric ash and dlct

Slumped bd ash

100m

€an1

€dt

Distinctive pink feld dclt, ser ξ local dark chloritic lithics ?

may be welded in part suite, homogeneous

150m

F

Coarser lithics in dacitic breccia

Some scattered and lithics in breccia

Ves and lava breccia

€an1

200m

Ves and, probably pillowed, carb vns carbonate in vesicles; trace sulphide

Fuchsite veining

T.D. 229.5m

Fig. 23

LOWER TO MIDDLE CAMBRIAN — Central Volcanic Sequence of Mount Read Volcanics

€rt	Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), ash often with shale blocks
€dt	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
€sh	Shale (sh), siltstone (st) and ash
€an1	Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)

Bedding

Lava breccia

5 cm

SCALE 1:1000

0 50 metres

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (Part 4), COMSTAFF J.V., TAS.
EAST CHESTER PROSPECT EAB GRID
SECTION 2950 S

Revisions:

Prepared by: P. Gregory | Centre: Melbourne

Date: 29·7·87 | Project Nº | Drawing Nº A3-1759

Drawn:

446

898437

EAB 3

134°M

PLAN

N.W.

S.E.

Elevation (metres)

1600 W

Inferred axis of Burns Peak Syncline

€sh

Df & Rf

Sh & Df

And

Df

1800 W

Inferred axis of Pinnacles Anticline

€df

EAB 3

€QEFP

€df

Coarse QFP

Feld ± qtz welded dtl rare sph-gn-py vns

Qtz-feld rhy lava and lava breccia

Prom cherty sil & py, sph-gn vns

50

Flow banding

€rhyl

100

Flow banding

Flow banding

150

Flow banding

Flow banding

Flow banding

200

Flow banding

Flow banding

TD 215.04m

€rhyl

€rhyl

€sh

€an

€df

€df

?

€anl

550

500

450

400

350

SECTION

5 cm

SCALE 1:1000

0 50 metres

Fig. 24

LOWER TO MIDDLE CAMBRIAN	Central Volcanic Sequence of Mount Read Volcanics	€QEFP	Quartz-feldspar porphyry intrusive (QEFP) and coarse crystal tuff (QEFT)
		€rhyl	Quartz-feldspar rhyolite lava (rhy)
		€df	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct) dacitic lapilli tuff (dlt), ash
		€sh	Shale (sh) siltstone (sl) and ash
		€anl	Chloritic andesite (and) to basaltic andesite lavas

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (Part 4), COMSTAFF J.V., TAS.
EAST CHESTER PROSPECT
PLAN & SECTION 3550 S

Revisions

Prepared by: P. Gregory	Centre: Melbourne	
Date: 30-7-87	Project No	Drawing No: A3-1760
Drawn: C.O.		

447

898438

124° M

W — EAB4 — E

PLAN

EAB 4 SECTION

480

400

East Chester Loop Road

Surface

Creek

Base of weathering

50

150

Csh

Micac ss, sl, sh

With feld ± qtz dc

Cdc

Csh

Can1

Cdt

Fg. ss with local shaley bands

Fl

Sh & ss 100

Fl

ss

sh

ss

sh

ss

sh

Sh

Sh & ss graded unit

Ss, rare sph blebs

Hyaloclastitic andesite brecc

And breccia, 2% py trace red brown sph

Carb altered andesite breccia

Ves andesite, 1% py

Pillowed and, carbonated tr py

Pink altered andesite

Ser-chl ves andesite

Pink dacitic lapilli tuff & flamme

T.D. 178·0 m

Bedding

SCALE 1:1000

0 50 metres

5 cm

Fig. 25

LOWER TO MIDDLE CAMBRIAN — Central Volcanic Sequence of Mount Read Volcanics

Cdt	*Feldspar-phyric dacitic ignimbrite tuffs crystal tuff (dct), dacitic lapilli tuff (dlt) ash*
Csh	*Shale (sh), siltstone (sl) and ash*
Cdc	*Feldspar-phyric dacite lava (dc)*
Can1	*Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)*

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (Part 4), COMSTAFF J.V., TAS.

EAST CHESTER PROSPECT, SECTION 1700 S

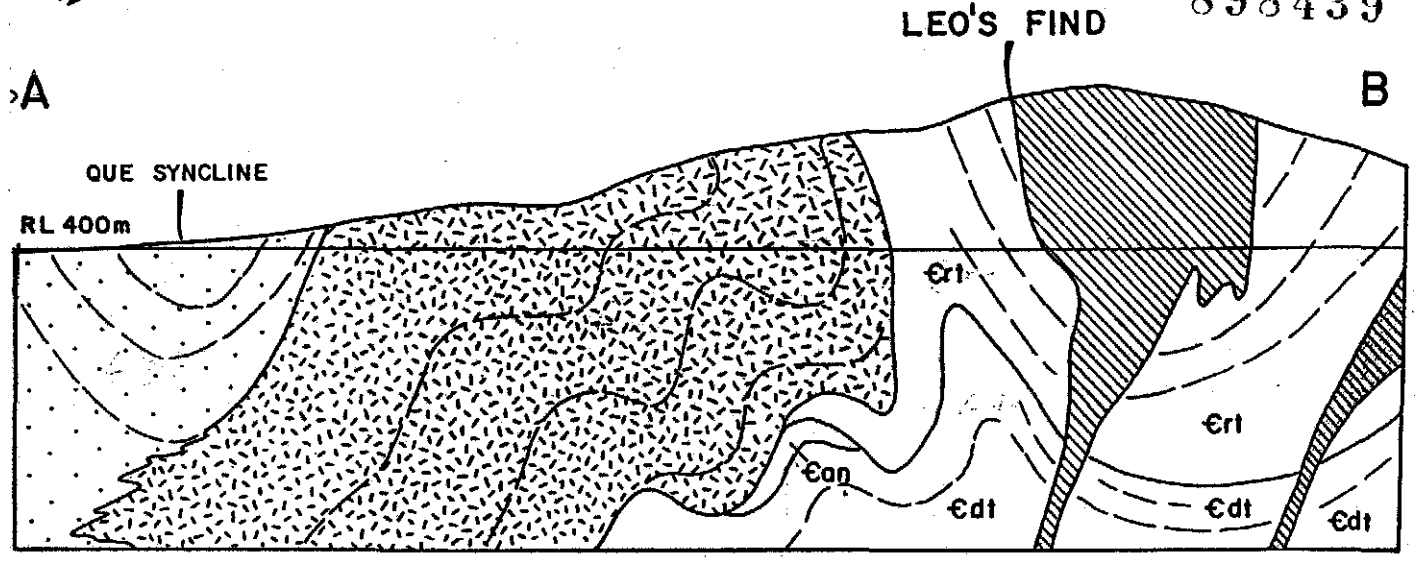
Revisions:

Prepared by: P. Gregory	Centre: Melbourne	
Date: Aug. 87	Project No: B56	Drawing No: A3-1761
Drawn: C.O.		

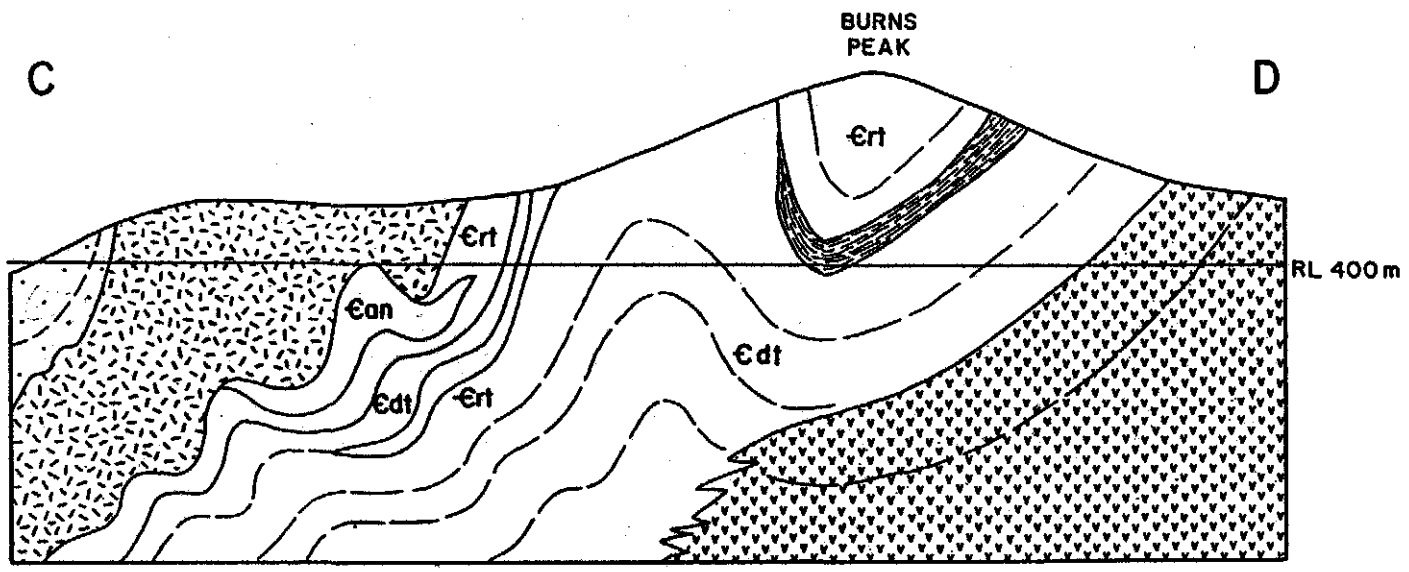
878

449

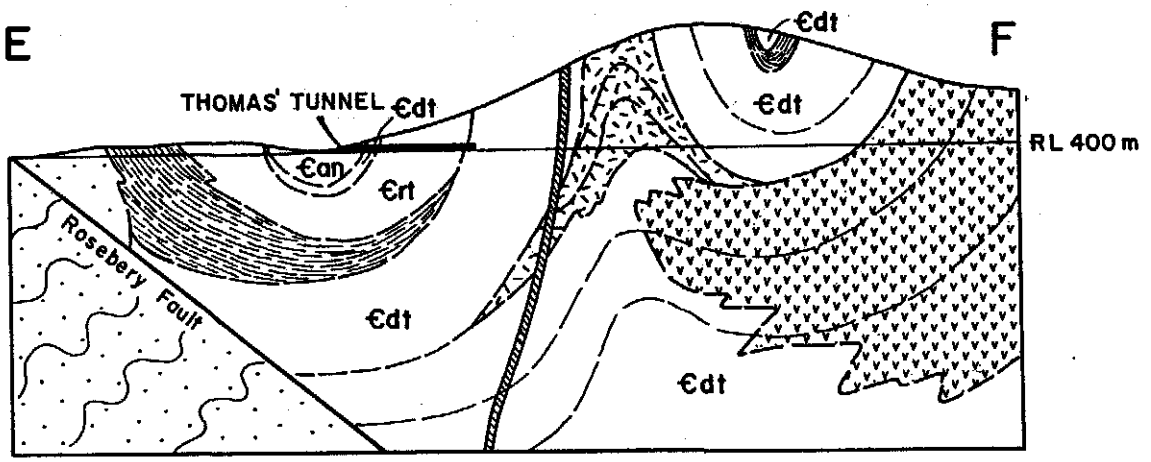
898439



SECTION A-B



SECTION C-D



SECTION E-F

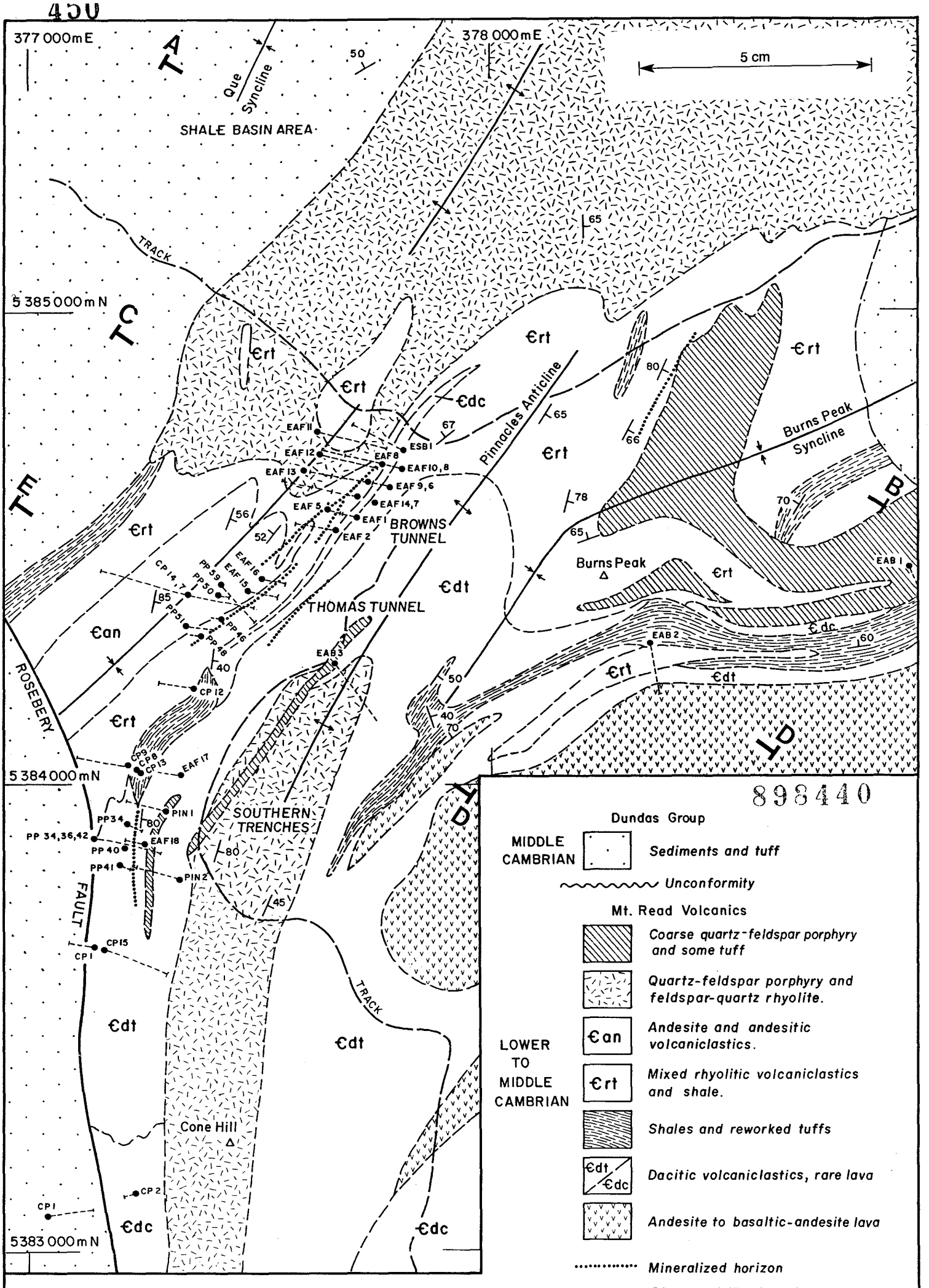
0 200 400 m

5 cm

PINNACLES AREA
SCHEMATIC CROSS SECTIONS

Sept. 87

Fig. 26
A4 - 2681



898440

Dundas Group

MIDDLE CAMBRIAN

- Sediments and tuff
- Unconformity

Mt. Read Volcanics

LOWER TO MIDDLE CAMBRIAN

- Coarse quartz-feldspar porphyry and some tuff
- Quartz-feldspar porphyry and feldspar-quartz rhyolite.
- €an — Andesite and andesitic volcaniclastics.
- €rt — Mixed rhyolitic volcaniclastics and shale.
- Shales and reworked tuffs
- €dt / €dc — Dacitic volcaniclastics, rare lava
- Andesite to basaltic-andesite lava
- Mineralized horizon
- CP15 ●——— Diamond drill hole and projection

0 500 metres

EL 5/63, PINNACLES-EAST CHESTER AREA

INTERPRETATIVE GEOLOGY Fig. 27

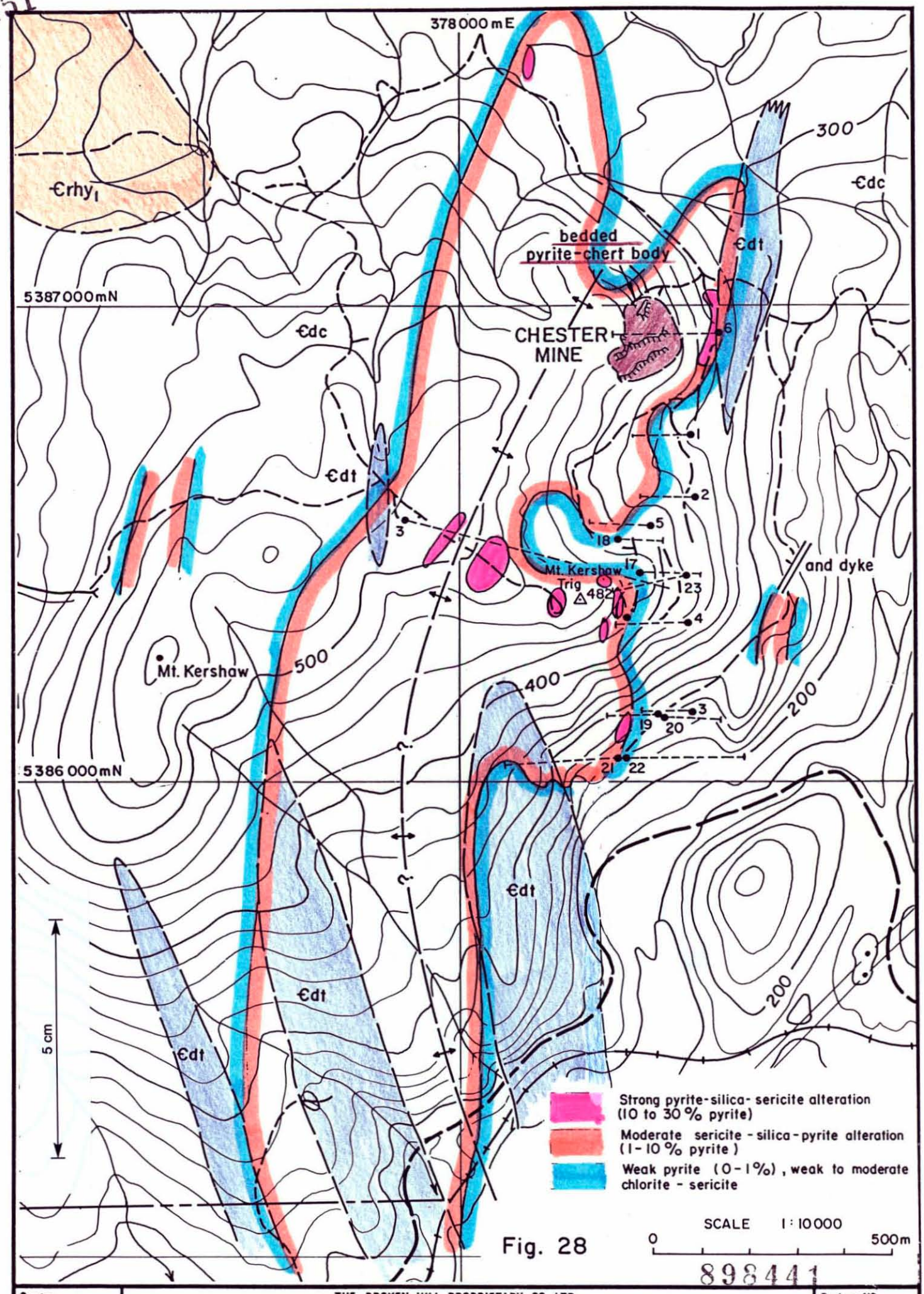


Fig. 28

898441

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63 (PART 4), COMSTAFF J V , TAS CHESTER AREA GEOLOGICAL INTERPRETATION	Project Nº B56
Date Aug. 87		Drawing Nº A4-2685

W

E

R.L. (metres)

77·5° Mag →

CP6

600 E

PLAN

Pyritic cherts

400

SECTION

898442

5 cm

Fig. 29

800 E

CP6

Bd ash & dacrt

Strong ser-py-sil feld dc 15-20% py

Strong vn & dissem py

Strong Ser-py-sil

Sharp fall off to 2% py

Strong, ser, weak chl feld dc tr py

Weak

50

Moderate ser-chl-py feld dc, vesicular 5% py dissem

Chl-py & py veins

Ser-chl ± py

And dyke

Moderate ser-chl-py dc, 1% py

Moderate ser-py-sil ± chl dc 2% py, a few vns py 10% py

Strong sil-ser-py dc, 2° qtz in vesicles some carb, 5-15% py

Moderate ser-chl feld dc, 2% py

And dyke

And dyke

Moderate ser feld dc, 3% py

And dyke

Moderate

100

Pb 5ppm Zn 490 ppm

300

Moderate ser-sil-py-carb dc 3% py

Moderate ser-silica-py dc 2% py, some veinlets

And dyke

And dyke

Moderate ser-silica-py dc, 5-15% py dissem & vns

And dyke

Moderate-strong ser silica-py-dc 15% py, some prom stringers

Strong alt

150

Moderate-strong ser-silica-py dc

Porph feld and dyke

Moderate ser-py-carb-silica dc, 2° qtz in vesicles 5% py dissem

Local highs Zn 1450 ppm

And dyke

Moderate to locally strong ser-silica-py dc 3-10% py (usually 5%), some carb

Strong alt

200

Pb 750 ppm; Zn 1500 ppm

Moderate

250

TD 299.62m

A52

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

Andesite to basalt dykes (and)

Feldspar ± qtz dacite lava (dc)

ALTERATION

Weak	Weak chloritic - serecite - pyrite (<1%)
Moderate	Chloritic - sericite - pyrite (1 - 10%)
Strong	Silica - sericite - pyrite (>10%)

Bedding

Flow banding

0 SCALE 1:1000 50 metres

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

E.L. 5/63 (Part 4) COMSTAFF J.V. TAS
CHESTER PROSPECT EAD GRID
SECTION 1000 N

Prepared: P. Gregory	Date: Aug.87	Centre: Melbourne
Drawn: C. Osborne	Project №: B56	Drawing №: A3 - 1762
Checked:		

Revisions:

W

E

CHI

PLAN

← 275·5° Mag

Projected position of Chester chert zone

600E

RL (metres)

500

400

300

?

M ser - sil - py (5-10% py)

m chl - ser dc

Moderate

CHI

800 E

Moderate alteration

Moderate ser - py - silica feld dc dissem & rare py vns, 5% py

Moderate ser - py feld dc, weak carb flbd in part

Moderate sericite - chlorite - py feld dc qtz filled vesicles locally py dissem & py - qtz - chl veinlets (3% py)

Weak

Moderate

And dyke

Moderate ser - chl feld dc, 2-3% py

And

Moderate ser - chl - py feld dc dissem & veinlet py 4%, some carb vns

Weak

Moderate

151·5m

And dyke

Moderate ser - silica - py dc 12° qtz in vesicles py dissem, local stringers (5%), some chl assoc py vns

Moderate ser - silica - py feld dc py dissem, rare vns (7%)

SECTION

ALTERATION

Weak	Weak chloritic - serecite pyrite (< 1%)
Moderate	Chloritic - sericite - pyrite (1-10%)

898443

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

€an — Andesite to basalt dykes (and)

€dc — Feldspar ± qtz dacite lava (dc)

Bedding

5 cm

SCALE 1:1000

0 50 metres

Fig. 30

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

EL 5/63 (Part 4) COMSTAFF J.V., TAS.

CHESTER PROSPECT EAD GRID - SECTION 800N

Prepared: P. Gregory	Date: AUG. 87	Centre: Melbourne
Drawn: Mariola Hoffmann	Project №: B56	Drawing №: A3 - 1763
Checked: P. Gregory		

Revisions:

A53

W 454

PLAN

898444

E

77·5 M →

CH2

RL metres

700 E

M chl-ser dc

CH2

M ser-chl-carb dc
Trpy, sph, gn

M ser-chl dc
1-1 py, minor sph, gn

Weak

50 m

300

Sph-gn assoc chl-carb vns
2% py

100 m

M ser-py-sil dc
2-3% py, some py-42 vns

and M ser-py-sil dc

and

and M ser-py-sil dc
3-5% py

Moderate

and M ser-py-sil dc, 5% py

and

TD 144·5m

And M ser-py dc, 2% py

200

SECTION

ALTERATION

Weak	Weak chloritic-serecite pyrite (<1%)
Moderate	Chloritic - sericite - pyrite (1-10%)

LOWER TO MIDDLE CAMBRIAN

Central Volcanic Sequence of Mount Read Volcanics

€an₁	*Andesite to basalt dykes (and)*
€dc	*Feldspar ± qtz dacite lava (dc)*

Central Volcanic Sequence of Mount Read Volcanics

Bedding

SCALE 1:1000

5 cm

0 50 metres

Fig. 31

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63 (Part 4) COMSTAFF J.V., TAS. CHESTER PROSPECT EAD GRID - SECTION 700N	Project Nº B56
Date Aug. 87		Drawing Nº A4 - 2684

898445

CP4

CP16

PLAN

78°Mag →

R.L. (metres)

SECTION

Weak

Strong

M chl dc

Kershaw Trig. S sil-ser-py dc

Surface

CP16

W chl-ser dc

W chl-ser dc Tr py

50

CP4

And

M chl-ser dc

100

Weak

Chalcedonic qtz in vesicles

And dykelet

M chl-ser dc 0-0.5% py

W ser-py (0.5-1%)

150

T.D. 200m

50

Weak

M ser-py (3-5% py)

Zn to 1190 ppm

100

Increasing ser-py-(chl) 1-2% py

M-S ser-sil-py dc (3-5% py)

S-M ser-sil-py dc, rare chl (5-15% py)

Cherty sil replacements 5-10% py (rare pale sph)

Intense cherification 0-2% py dissem & vns

And

Mod

Weak sph dissem

Strong

Mod

Zn to 1250 ppm

py veins

M-S ser-py-sil dc Dissem & vn py (5-15%)

Vn py zone

Vns py

Vn py zone

200

Strong

S sil-ser dc (0.5-1.0% py)

3% py

T.D. 250m

Moderate

300

5 cm

SCALE 1:1000

0 50 metres

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

Andesite to basalt dykes (and)

Feldspar ± qtz dacite lava (dc)

ALTERATION

Weak	Weak chloritic - serecite pyrite (<1%)
Moderate	Chloritic - sericite - pyrite (1-10%)
Strong	Silica - sericite - pyrite (>10%)

Bedding

Flow banding

Fig. 35

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

EL 5/63 - COMSTAFF J.V., TAS
CHESTER PROSPECT EAD GRID
SECTION 400 N

Revisions:	Prepared: P. Gregory	Date: Aug. 87	Centre: Melbourne
	Drawn: C.O.	Project №: B56	Drawing №: A3 - 1764
	Checked:		

A53

898446

W 600E 700E 800E 900E E

CH 3

78.5°M.

258.5°M

CP 19 CP 20

PLAN

RL (metres)

300

200

CP 19

CP 20

CH 3

Moderate Pb - Zn to 550 ppm Pb, 3100 Zn

Mineral and dykelets

F Zone

weak → m → weak

ves w-m chl ser dpy ser dpy

w-m chl-ser dc

ser-py

M-S ser-py-sil dc (5% py)

And

w-m sil-ser-py dc (2% py)

W-M Ser-py-(chl) dc (1-5% py)

pyrite stringers

TD 120m

100m moder.

50m moder.

weak - moderately Chl-ser feld dc

w-M chl-ser dc locally fl.bd.

Minor cross cutting Ser-py Zones

50m (0-0.5% py)

Ves and moderately And weak chl-ser dc

Qz-feld porph dyke

weak chl-ser dc and weak-moderate chl-ser dc

Moderately chl-ser dc And

T.D. 167m

150m weak

100m weak

Fl.bd.

Minor gn assoc carb-py

W ch-ser dc

TD 145.5m

SECTION

5 cm

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

Andesite to basalt dyke (and)

Quartz porphyry dyke (QP)

Feldspar ± qtz dacite lava (dc)

ALTERATION

Weak / w - Weak chloritic - sericite - pyrite (1%)

Moderate / m - Chloritic - sericite - pyrite (1-10 %)

Bedding

Flow banding

SCALE 1:1000

0 50 metres

Fig. 36

BHP-Utah Minerals International
Asia Pacific Division - Exploration Department

EL 5/63 (Part 4) COMSTAFF J.V., TAS.
CHESTER EAD GRID
SECTION 200N

Prepared: P. Gregory	Date: AUG. 87	Centre: Melbourne
Drawn: M. Hoffmann	Project №: B56	Drawing №: A3 - 1765
Checked:		

Revisions:

A56

386000 E
387000 E
388000 E
5 394 000 N
5 393 000 N
5 392 000 N
600
500
€d QEFT
€dsh
€drt
€dQEFT
€ddc
€dgw
rct and ash
rct and sh blocks
mg QEFT
sh & rct
Ves dc ε 2° qtz
Perlitic dc
ash and sh clasts
homog QEFP
ash, sh frags
mg QET blocks rt lithic ash
Pumic rct
brec ε sh blks
rct brec
sh & ash
rct
dc
Perlitic dc
qtz in vesicles
QEFP
rct & mg QET
Qg
chl QEFP
Track
mg QEFT
pumice frags
pumic rtl
dc ε 2° qtz
feld qtz dc
perlitic vitric dc
sh and micac gywk
Coarse QEFT
vitric QET
sh ash rct rare QET
spher. dc
wth dc
micac sist gywk
rct, rclt, mg QET, sh clasts
vitric dc
sh & QET
sh frags in QEFT
sh & gywk
bd micac gywk
micac gywk & sist
gywk
gywk & sist.
micac gywk
pumic rct
Murchison Hwy
MT. CHARTER FAULT
SOCK CREEK PROSPECT
SCALE 1:10 000
0 500 1000 m

EL 5/63 (Part 3)
MAP AREA
MURCHISON HWY
MT. BLOCK
N
0 1 2 3 km
LOCATION

5 cm

LEGEND

MIDDLE-UPPER CAMBRIAN
Dundas Group

- €dsh — Shale and siltstone, some tuff.
- €drt — Rhyolitic tuff, rhyolitic crystal tuff (rct), crystal lithic tuff (rclt)
- €dQEFT — Quartz eye-feldspar tuff and lithic tuff to homogeneous porphy. (QEFT)
- €ddc — Feldspar-phyric dacite lava, often spherulitic.
- €dgw — Dominantly greywacke with local siltstone.

Interpreted boundary
Fault
feld qtz dc — Observation point
9 — Diamond drill hole (N° prefixed 'SK')
Facing of strata

ABBREVIATIONS

mg	medium grained	micac	micaceous
ves	vesicular	bd	banded
pumic	pumiceous	homog	homogeneous

Fig 39

898447

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (Part 3), COMSTAFF J.V., TASMANIA.
SOCK CREEK PROSPECT
REGIONAL GEOLOGY

Prepared by:	P. Gregory	Centre:	Melbourne
Date:	June 1987	Project N°	Drg N°
Drawn:	M. Rosker	B 56	A3-1768

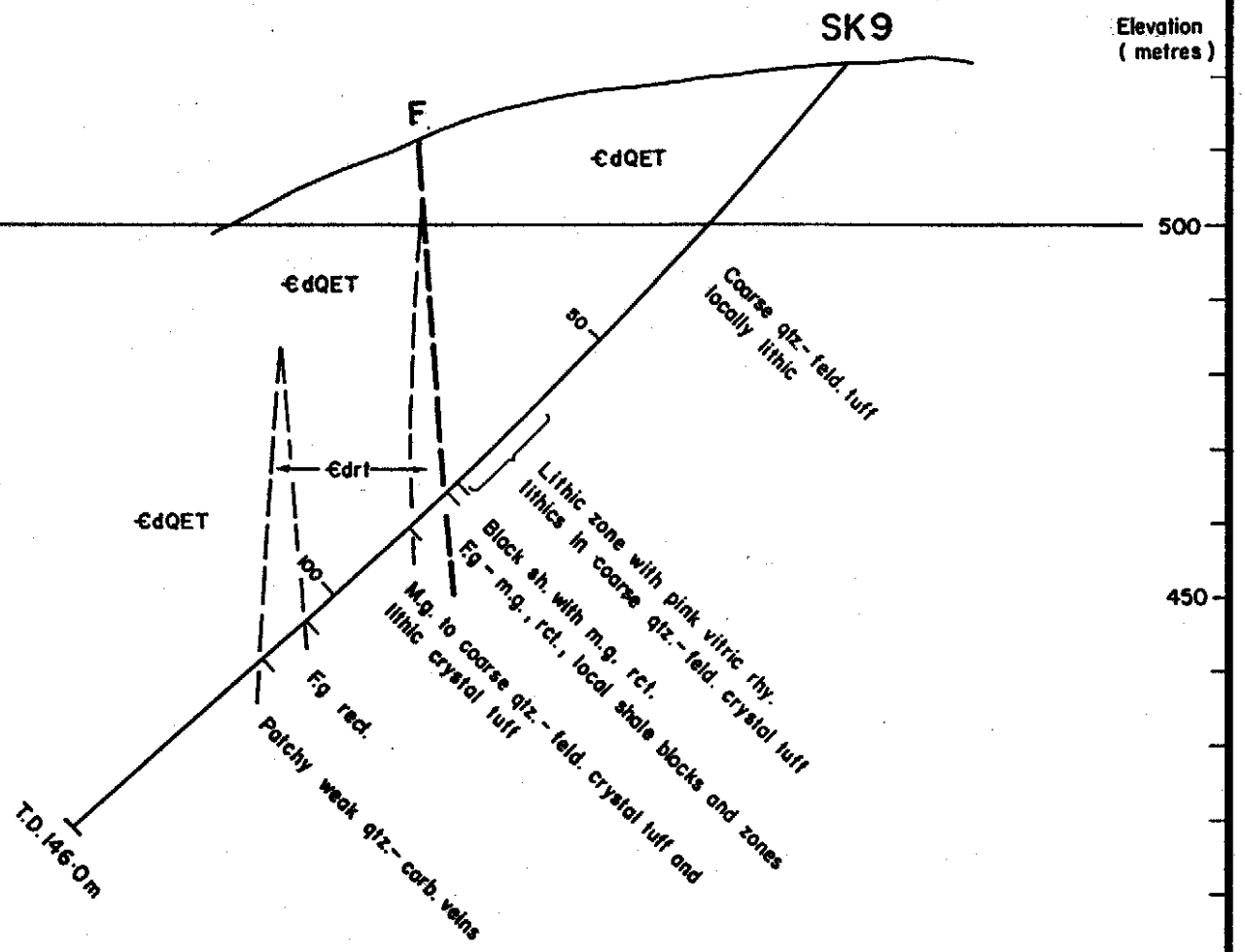
458

898448

1200mE

W

E



MIDDLE - UPPER CAMBRIAN

Dundas Group

€dQET	*Coarse to medium grained quartz - feldspar crystal tuff (QET)*
€drt	*Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash, ignimbrite breccia*

SCALES 1:1000

0 — 50 metres

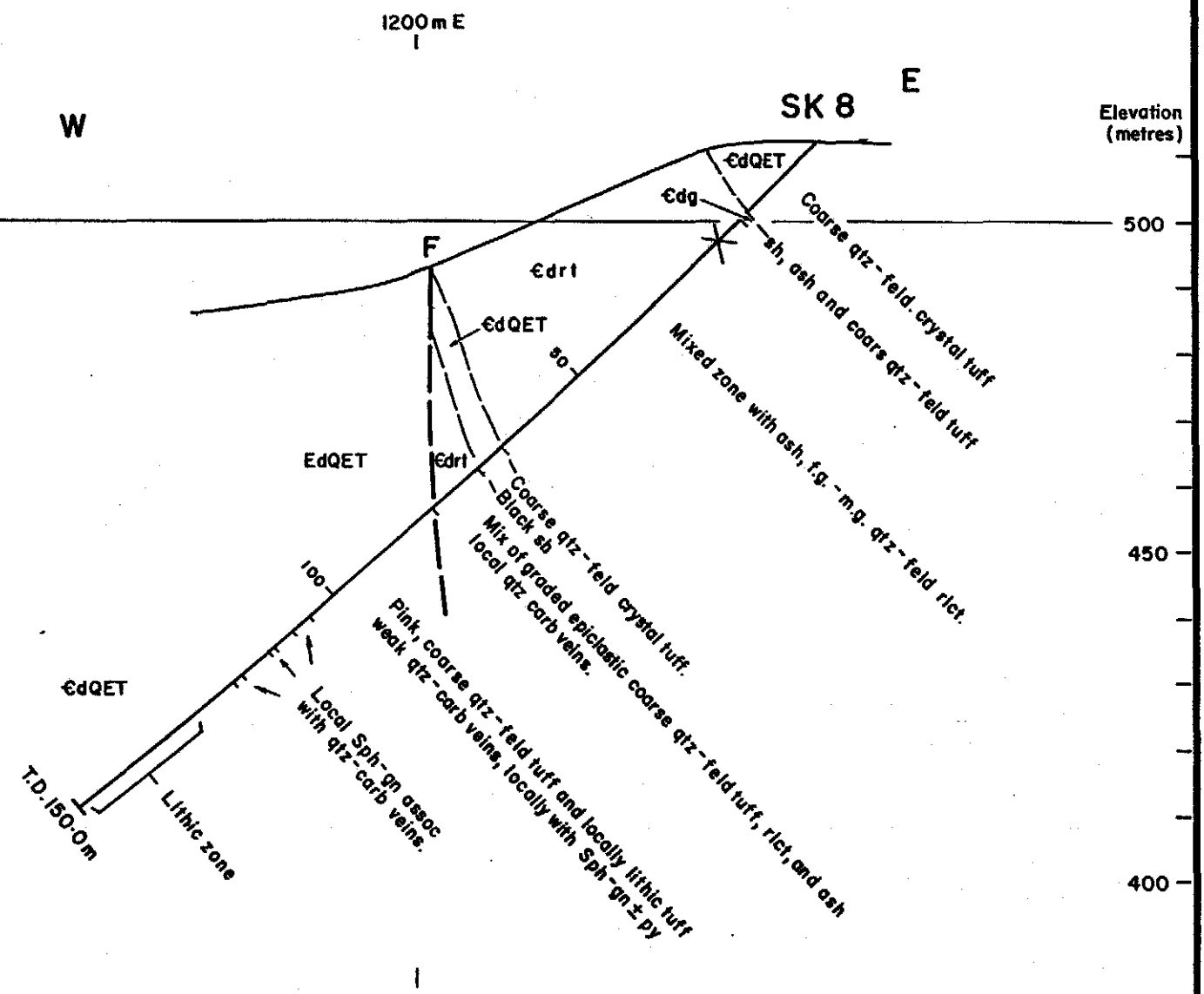
Fig 41

5 cm

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No B56
Date July 87	EL 5/63 (Part 3), COMSTAFF J.V., TAS. SOCK CREEK PROSPECT, SECTION 1320mN	Drawing No A4 2650

459

898449



MIDDLE - UPPER CAMBRIAN

Dundas Group

€dQET	*Coarse to medium grained quartz - feldspar crystal tuff (QET)*
€drt	*Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash*
€dg	*Micaceous greywacke, siltstone and shale*

SCALES 1:1000

0 50 metres

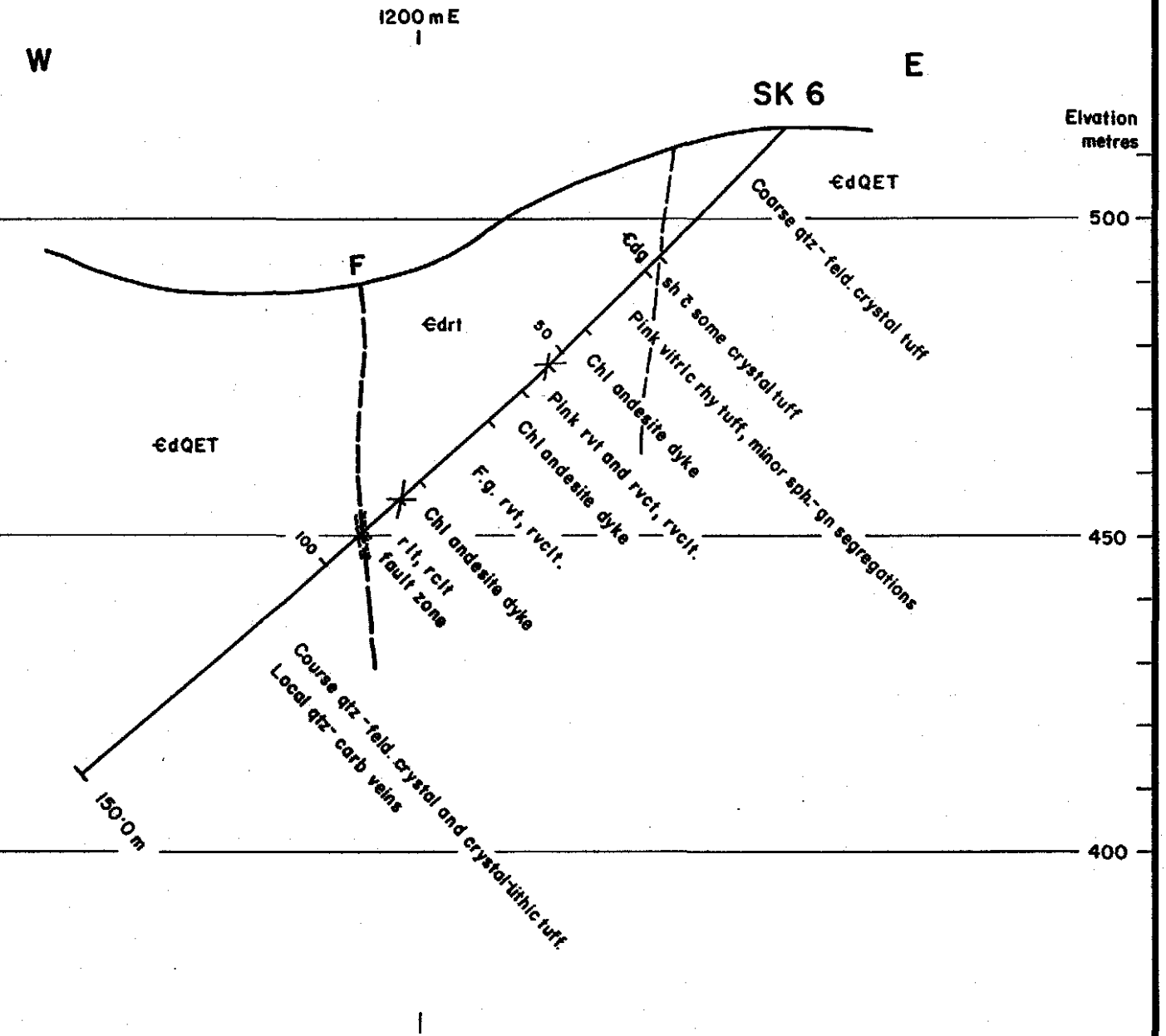
Fig 42

5 cm

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No B56
Date June 87	EL 5/63 (Part 3), COMSTAFF J.V., TASMANIA SOCK CREEK PROSPECT, SECTION 1240mN	Drawing No A4-2649

460

898450



MIDDLE - UPPER CAMBRIAN

Dundas Group

€dQET	*Coarse to medium grained quartz feldspar crystal tuff (QET)*
€drt	*Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash, ignimbritic breccia*
€dg	*Micaceous greywacke, siltstone and shale*

SCALES 1:1000

0 5 metres

5 cm

Fig 43

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No B 56
Date June 87	EL 5/63 (Part 3), COMSTAFF J.V., TASMANIA.	Drawing No A4-2688
	SOCK CREEK PROSPECT, SECTION 1160 m N	

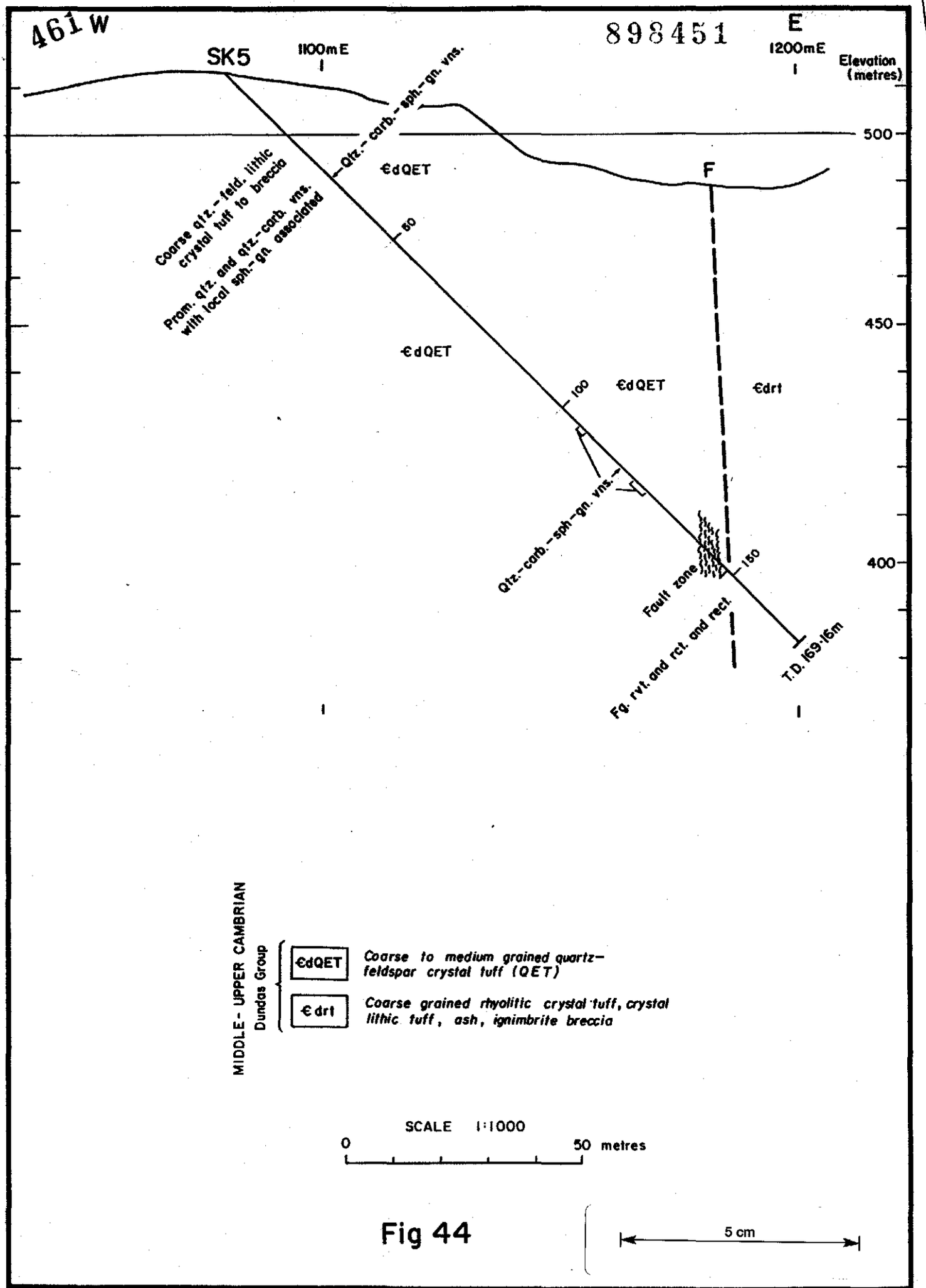


Fig 44

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63 (Part 3), COMSTAFF J.V., TAS. SOCK CREEK PROSPECT, SECTION 1080mN	Project No 856
Date July 87		Drawing No A4-2648

898452

W

E

1100mE

1200mE

Elevation (metres)

500

450

400

SK1

SK14

F

Fg. qtz - feld. rvt, rlct.

Feld basalt - andesite

Fg. m.g. Qtz feld Erct.

Coarse qtz-feld. tuff and lithic tuff

Black sh.

Main zone of sph - gn assoc. with qtz - carbonate veins

50

100

150

E. breccia with pumice, vitric frags., sh, rare qtz phenocrysts, pale sph vns.

Coarse qtz.-feld. porph., local cal., vitric in part. (homogenous)

T.D. 175.56m

€ds

€dQET

€drt

€dqet

Black sh.

E. ash tuff to rlct.

Vitric dc.

€ddif

Fault zone

Coarse qtz. - feld. porph.

Coarse qtz. 'eye' - feld. tuff with sh. clasts

F. rct. and ash ± vitric rhy. sh.

Coarse qtz. - feld tuff with sh. clasts

Coarse homogenous patchy qtz vns.

T.D. 171.0m

MIDDLE - UPPER CAMBRIAN
Dundas Group

€ds	Black shale
€dQET	Coarse to medium grained quartz - feldspar crystal tuff (QET)
€drt	Coarse grained rhyolite crystal tuff, crystal lithic tuff, ash, ignimbrite breccia
€ddif	Vitric to perlitic weakly porphyritic dacite locally vesicular

5 cm

Fig 45

SCALE 1:1000

0 500 metres

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 5/63 (Part 3), COMSTAFF J.V. TAS.

SOCK CREEK PROSPECT, SECTION 1000mN

Revisions:

Prepared by: P. Gregory	Centre: Melbourne	
Date: July 87	Project No 856	Drawing No A3-1767
Drawn:		

A62

898453

1000 mE

1100 mE

1200 mE

W

E

Elevation (metres)

SK10 SK2 SK11 SK13

Black sh.

Black sh.

€ds

€ds

Qtz.-carb. vns. with local sph.-gn.

€d QET

Coarse qtz. feld. crystal tuff, local lithics prom. qtz.-carb. vns. to 0·5 m

€drt

F

Qtz. feld. rclt. grading to coarse qtz.-feld tuff. with sh. blocks

Coarse qtz.-feld. porph. 100 prom. qtz. carb. vns.

F.g m.g rct. and rvclt.

Bimodal E breccia with Coarse qtz feld. tuff and rhy. frags Mix of black shale and coarse-qtz feld. crystal tuff detritus

Sph. vn.

Qtz-carb. Sph-gn vns.

E. breccia with vitric rhy, coarse qz-feld. - porph. and shale frags.

Sh. with coarse qtz.-feld. detritus

M.g. qtz.-feld. crystal tuff grading to coarse qtz. feld. crystal tuff.

Qtz.-carb.-sph.-gn. vns.

Homogenous qz.-feld porph., locally prom. qtz.-carb. vns.

Coarse qtz.-feld. crystal tuff and breccia

Qtz.-carb. vns. ± sph.-gn.

Qtz.-carb. Sph-gn. vns.

€dQET

T.D. 102m

Qtz.-carb. vns. ± sph.-gn.

Qtz.-carb. Sph.-gn. vns.

Mix of sh. and qtz-feld. detritus

Fault zone with sil. F.g rvlt.

€drt

T.D. 219·45m

Shale blocks and coarse qtz.-feld. tuff detritus

€ddif

Coarse qtz.-feld. tuff with rare sh. blocks

Coarse qtz.-feld. tuff and sh.

T.D. 248·25m

Coarse qz.-feld. porph, homogenous local qtz.-carb. vns.

Prominent qtz. carb. vns.

€ds

€drt

€ddif

Qtz.-carb. vns. with local sph.

Bd. sh., local slumping, some s.s.

Mixed sh. and lithics of m.g. qtz.-feld. tuff

Pink vitric Fc. rt.

M.g. qtz.-feld. lithic crystal tuff epiclastic with pink vitric rhy. lithics, sh. frags.

Vitric dc., rare feld. microphenocrysts 2° 92 in vesicles

T.D. 210·50m

5 cm

Fig 46

SCALE 1:1000

0 500 metres

MIDDLE - UPPER CAMBRIAN Dundas Group

€ds	Black shale.
€dQET	Coarse to medium grained quartz feldspar crystal tuff (QET).
€drt	Coarse grained rhyolite crystal tuff, crystal lithic tuff, ash, ignimbrite breccia.
€ddif	Vitric to perlitic weakly porphyritic dacite locally vesicular

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 5/63 (Part 3) COMSTAFF J.V. TAS.

SOCK CREEK PROSPECT, SECTION 920mN

Revisions:	Prepared by: P. Gregory	Centre: Melbourne	
	Date: July 87	Project Nº B56	Drawing Nº A3-1766
	Drawn:		

463

898454

1000mE

1100mE

1200mE

W

E

Elevation (metres)

550

500

450

400

SK3

SK12

F

F

€ds

€dQET

Black sh.

50

€drt

€ds

Patchy sph - gn

Black sh. with - network qtz - carb. ± sph - gn. vns.

M-g qtz - feld. Eril. and sh.

Fault zone

Pron. sph - gn

100

Fg - mg. qtz - feld. rclt

pron. qtz - carb - sph - gn. vns.

Course qtz. - feld. crystal tuff to lithic - crystal tuff, rare sh.

Patchy qtz. and qtz - carb vns. - with local sph - gn

T.D. 125.27m

€dQET

Coarse qtz - feld. porph. or tuff ? patchy qtz. carb. veins

€ddlf

€drt

€dQET

50

€dQET

€ddlf

Coarse qtz - feld. lithic crystal tuff - and breccia, local sh. frags.

100

Coarse qtz - feld. crystal tuff (homogenous) - possibly lithic locally

Sh. and f.g. rvt, rct.

Coarse qtz - feld. crystal tuff

Sh., rvt. and local coarse qtz. - feld. crystal tuff

Fg. rvt., rct. and rclt.

€drt

Fg. grey to pink vitric felds. ± qtz. dc. - locally prom. qtz. and qtz - carb. vns. - weak ser., rare local py. dissem. and veinlets

Fuch. site in fracture zone

150

€ddlf

T.D. 161 m

MIDDLE - UPPER CAMBRIAN
Dundas Group

€ds	*Black shale*
€dQET	*Coarse to medium grained quartz - feldspar crystal tuff (QET)*
€drt	*Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash, ignimbritic breccia.*
€ddlf	*Vitric to perlitic weakly porphyritic dacite locally vesicular*

5 cm

Fig 47

SCALE 1:1000

0 50 metres

Revisions:

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (Part 3), COMSTAFF J.V., TAS.

SOCK CREEK PROSPECT, SECTION 840mN

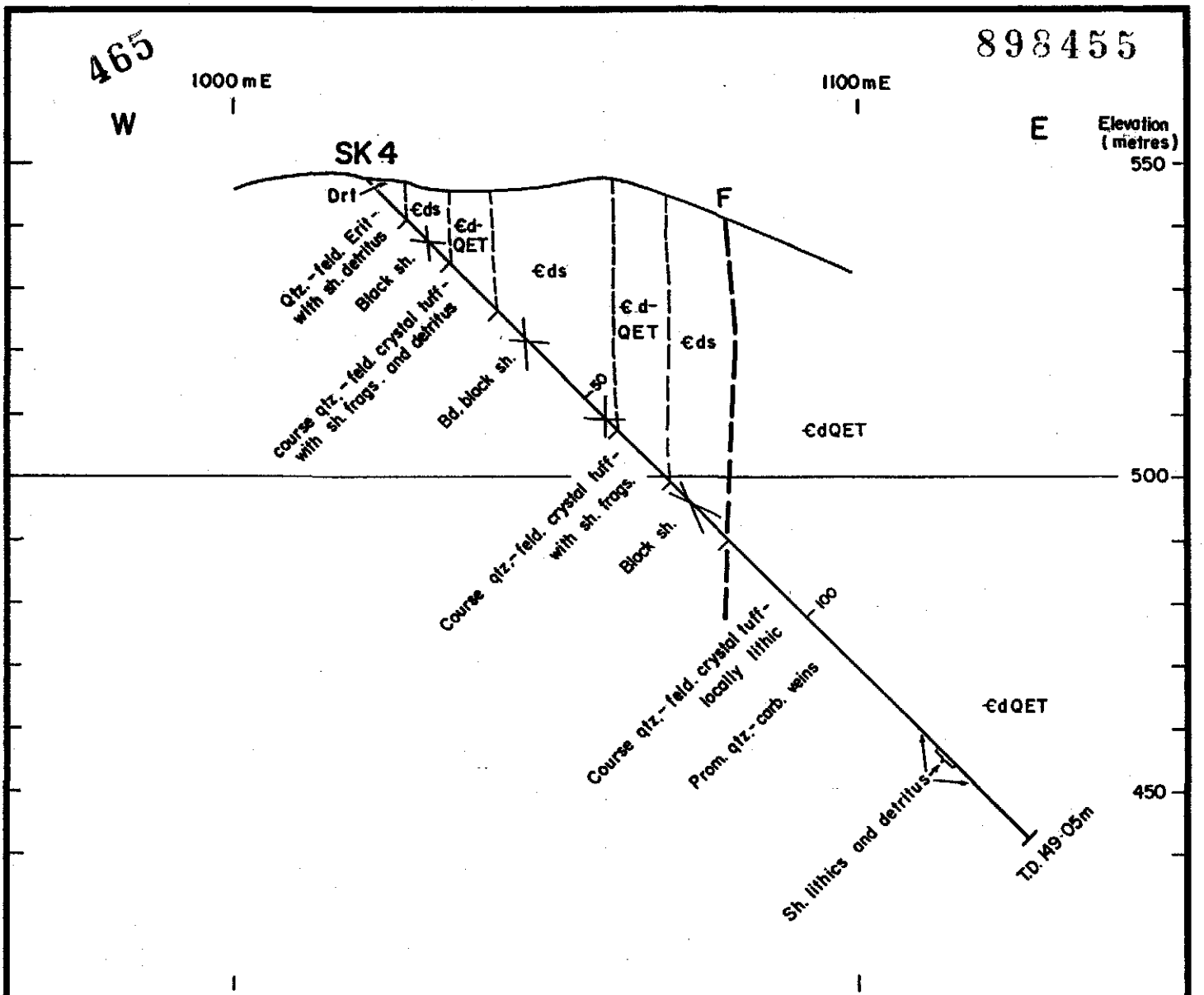
Prepared by: P. Gregory	Centre: Melbourne	
Date: July 87	Project No. B56	Drawing No. A3-1743
Drawn:		

Fig 48

464

465

898455



MIDDLE - UPPER CAMBRIAN

Dundas Group

€ds	*Black shale.*
€dQET	*Coarse to medium grained quartz – feldspar crystal tuff (QET)*
€drt	*Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash, ignimbrite breccia.*

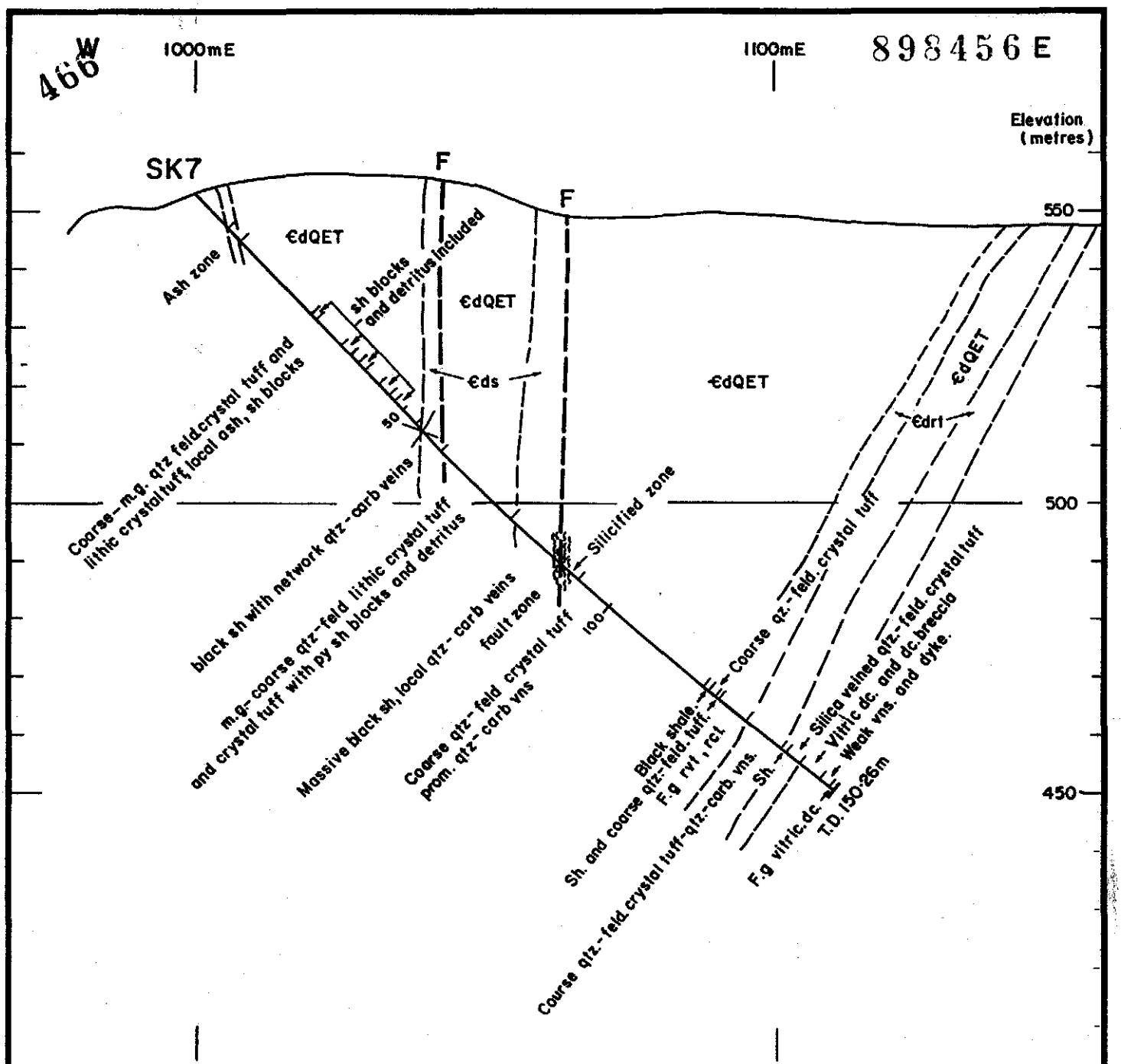
SCALES 1:1000

0 50 metres

Fig 48

5 cm

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD.	Project No B 56
Date June 87	EL 5/63 (Part 3), COMSTAFF J.V., TAS. SOCK CREEK PROSPECT, SECTION 760mN	Drawing No A4 2647



MIDDLE - UPPER CAMBRIAN
Dundas Group

Eds	*Black shale*
€dQET	*Coarse to medium grained quartz feldspar crystal tuff (QET)*
€drt	*Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash, ignimbrite breccia*
€ddif	*Vitric to perlitic weakly porphyritic dacite locally vesicular*

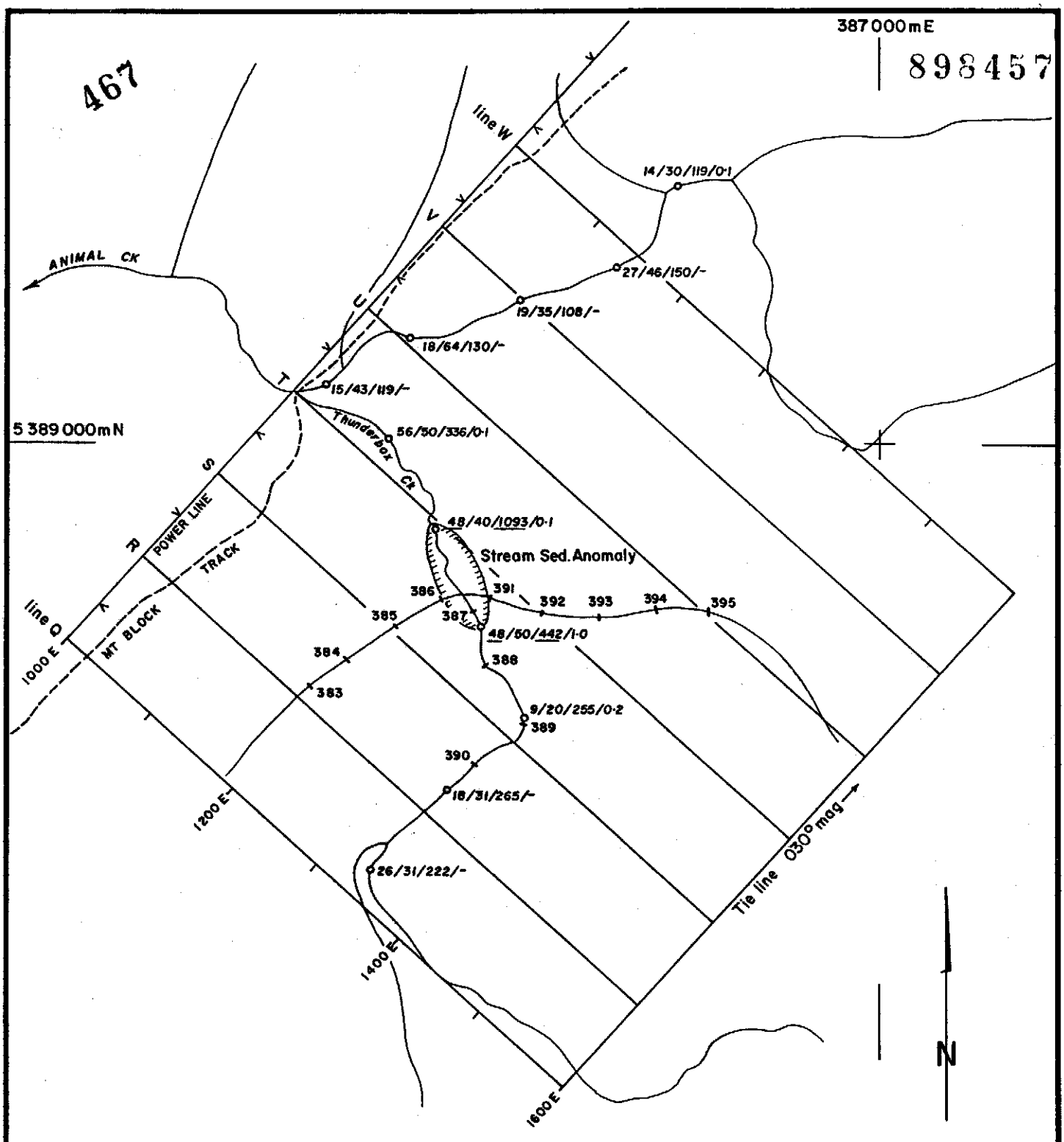
SCALES 1:1000

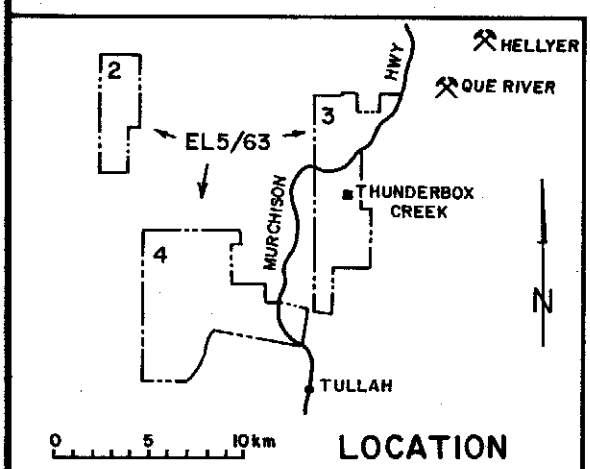
0 50 metres

5 cm

Fig 49

Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. E.L. 5/63 (Part 3), COMSTAFF J.V., TAS. SOCK CREEK PROSPECT, SECTION 680m N	Project No: B56
Date: July 87		Drawing No: A4-2687





390 BHP stream sediment sample location.

9/20/255/0·2 Comstaff stream sediment sample location and -80# results for Pb/Zn/Ba/Ag (ppm).

5 cm

SCALE 1:5000

0 100 200 300m

Fig 52

Centre: Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63 (PART 3), COMSTAFF J.V., TAS. THUNDERBOX CREEK PROSPECT GRID LAYOUT & -80 MESH STREAM SEDIMENT SAMPLE LOCATIONS	Project No: B56
Date: Sept '87		Drawing No: A4-2676

468

898458

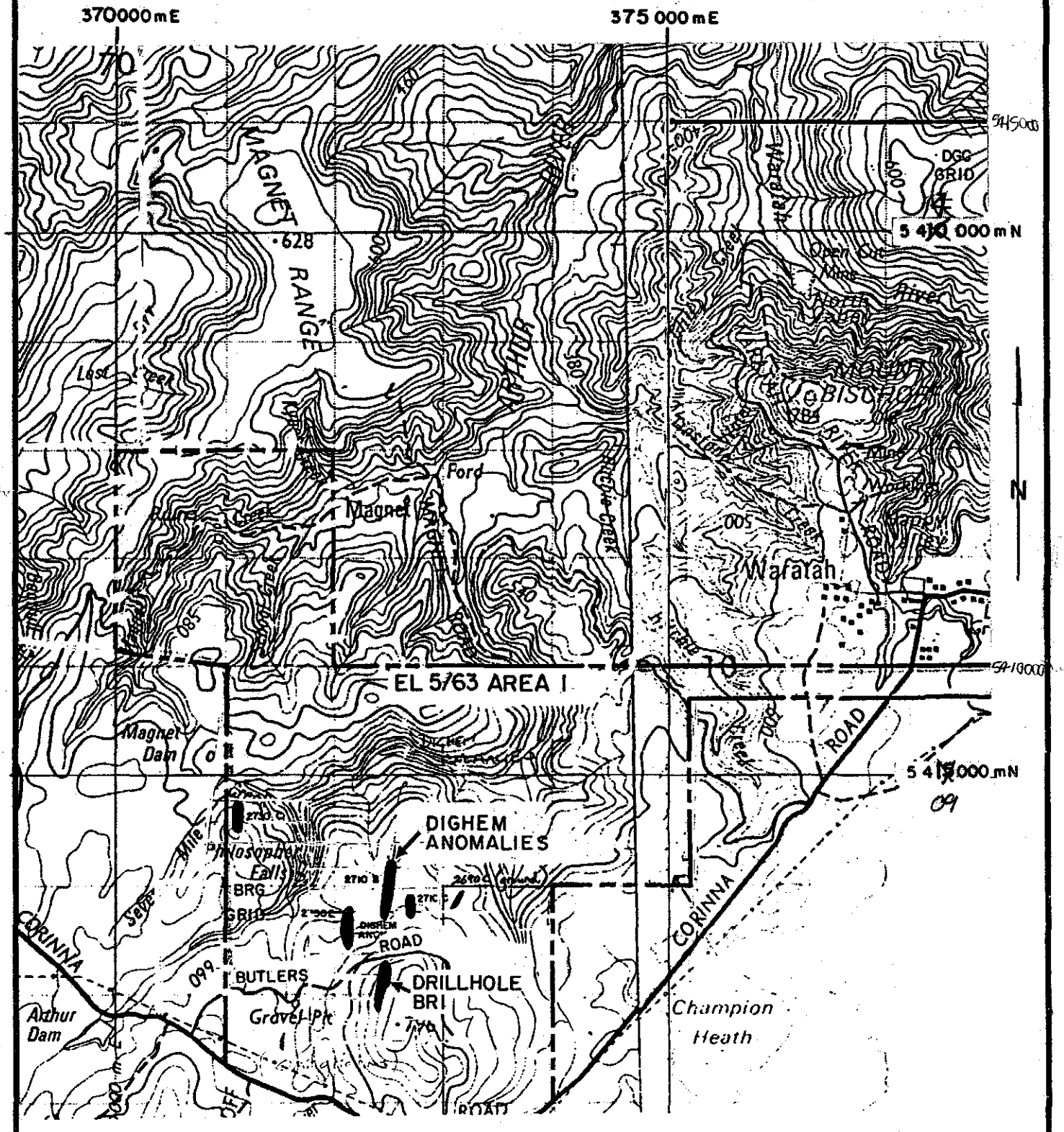


Fig 68

Centre Melbourne	THE BROKEN HILL PROPRIETARY CO. LTD. EL 5/63 AREA I - BUTLERS ROAD PROSPECT LOCATION MAP & EM ANOMALIES	Project No B56
Date Aug. 87		Drawing No A4-2677

LEGEND

QUATERNARY	Qg	Glacial deposits
MIDDLE MIDDLE CAMBRIAN TO MIDDLE LATE CAMBRIAN	Dundas Group €dg	Shales, greywackes, coarse quartz-feldspar crystal tuffs, ash
LOWER TO MIDDLE CAMBRIAN — Central Volcanic Sequence of Mount Read Volcanics	€QEFP	Quartz-feldspar porphyry intrusive (QEFP) and coarse crystal tuff (QEFT)
	€rhy$_2$	Feldspar & quartz rhyolite lava (rhy)
	€rhy$_1$	Quartz-feldspar rhyolite lava (rhy)
	€an$_2$	Feldspar-phyric andesite (and), locally vesicular
	€rt	Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks
	€dt	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
	€sh	Shale (sh), siltstone (sl) and ash
	€dc	Feldspar-phyric dacite lava (dc)
	€an$_1$	Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)

- Fault with dip
- Thrust fault with dip
- Syncline, axis approximate
- Anticline, axis approximate
- Strike and dip of bedding; vertical bedding
- Strike and dip of cleavage; vertical cleavage
- Strike and dip of flow banding
- Facing of strata
- Plunge of minor fold
- Interpreted geological boundary
- Outcrop of rock unit
- Zone of strong silicification
- Surface projection of massive sulphide lens
- EAB3 — 224·8 — Diamond drill hole with surface projection and final depth in metres
- Costean
- Adit
- Shaft
- 85/2002/35 — Forestry Department survey station
- 4-39 — BHP survey station
- rct & ash — Observation point and description
- Track

ABBREVIATIONS

bar	barite
ch	cherty
chl	chloritic
cpy	chalcopyrite
feld	feldspar
gn	galena
MS	massive sulphide
py	pyrite
qtz	quartz
ser	sericite
sil	silicified
sph	sphalerite
bd	bedded
dissem	disseminated
Fest	iron stained
fl bd	flow banded
frags	fragments
f.g.	fine grained
m.g.	medium grained
prom	prominent
pumic	pumiceous
vn	vein
wth	weathered
bl	black
br	brown
W	weak
M	moderate
S	strong
c	with

SYNCLINE — THOMAS' — THOMAS TUNNEL — ?ANTICLINE? — ?PINNACLES? — PINNACLES LINE?

Fig 2 sheet 1.

LOCATION

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

E.L. 5/63 (PART 4) COMSTAFF J.V., TAS.

PINNACLES PROSPECT

GEOLOGICAL INTERPRETATION

Sheet 1

87-2690

Drawn: P. Gregory	Date: July 1987	Centre: MELBOURNE
Traced: A. R. Veale	Project No.: B56	Drawing No.: A0-119
Checked:		
O.I.C.:		

Revisions:

Scale 1:1000

0 50 100 150 metres

5 cm

GN

5594

377 200 m E
377 400 m E
377 600 m E
377 800 m E
378 000 m E
5 384 200 m N
5 384 000 m N
5 383 800 m N
5 383 600 m N

THOMAS' SYNCLINE
ROSEBERY THRUST FAULT
Rosebery Fault Zone
BURNS' PEAK SYNCLINE

CP12 CP9 CP8 CP13 CP10 CP15 EAF17 EAF18 PIN1 PIN2
PP39 SOUTH TRENCH 1 PP40 SOUTH TRENCH 2 PP41 SOUTH TRENCH 3 SOUTH TRENCH 4

talus deposits
talus only
valley deposits
Qg
Edg
Esh
Ert
Edt
EQEFP
Erhy1
Ean2
Ean1

LEGEND

QUATERNARY

MIDDLE MIDDLE CAMBRIAN TO MIDDLE LATE CAMBRIAN

LOWER TO MIDDLE CAMBRIAN

Dundas Group

Central Volcanic Sequence of Mount Read Volcanics

Qg	Glacial deposits
Edg	Shales, greywackes, coarse quartz-feldspar crystal tuffs, ash
EQEFP	Quartz-feldspar porphyry intrusive (QEFP) and coarse crystal tuff (QEFT)
Erhy2	Feldspar + quartz rhyolite lava (rhy)
Erhy1	Quartz-feldspar rhyolite lava (rhy)
Ean2	Feldspar-phyric andesite (and), locally vesicular
Ert	Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct), lapilli tuffs (rlt), ash often with shale blocks
Edt	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
Esh	Shale (sh), siltstone (sl) and ash
Edc	Feldspar-phyric dacite lava (dc)
Ean1	Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)

Fault with dip
Thrust fault with dip
Syncline, axis approximate
Anticline, axis approximate
Strike and dip of bedding; vertical bedding
Strike and dip of cleavage; vertical cleavage
Strike and dip of flow banding
Facing of strata
Plunge of minor fold
Interpreted geological boundary
Outcrop of rock unit
Zone of strong silicification
Surface projection of massive sulphide lens
EAB3 424.8 Diamond drill hole with surface projection and final depth in metres
Costean
Adit
Shaft
85/2002/35 Forestry Department survey station
4-39 BHP survey station
Observation point and description
Track

ABBREVIATIONS

bar	barite
ch	cherty
chl	chloritic
cpy	chalcopyrite
feld	feldspar
gn	galena
MS	massive sulphide
py	pyrite
qtz	quartz
ser	sericite
sil	silicified
sph	sphalerite
bd	bedded
dissem	disseminated
Fest	iron stained
fl bd	flow banded
frags	fragments
f.g.	fine grained
m.g.	medium grained
prom	prominent
pumic	pumiceous
vn	vein
wth	weathered
bl	black
br	brown
W	weak
M	moderate
S	strong
c	with

GN

Scale 1:1000
0 50 100 150 metres

LOCATION
E.L. 5/63 (Part 4)
Sheet 1
Sheet 2
Burns Peak
Mt Farshaw
CHESTERMAN RANGE

898460

Fig.2 sheet 2

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
E.L. 5/63 (PART 4) COMSTAFF J.V., TAS.
PINNACLES PROSPECT
GEOLOGICAL INTERPRETATION
Sheet 2

Drawn: P. Gregory	Date: July 1987	Centre: MELBOURNE
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87-3600

5595

376 000mE
5 387 000mN

77 78 79 80 81 82 83 84 85 87

86 85 84 83 82 81 80 79

SHALE BASIN
PINNACLES
EAST CHESTER
HOLLWAY
CHESTER
ROSEBERY
FAULT
Syncline
Anticline
Thelma
Burns Peak
Pinnacles
Cone Hill
Mt Kershaw
Mt Rennick
CHESTER MINE
Dog Hill
Day
Cox Hill
Queenstown Bay
Queenstown
Zeehan
HOBART
LINES
TRANSMISSION
POWER
MURCHISON HWY
EMU BAY RAILWAY

LOCATION

GEOLOGY

QUATERNARY		Qt	Talus and scree deposits
		Qg	Glacial deposits
MIDDLE TO LATE CAMBRIAN	Dundas Group	€dQET	Coarse quartz-feldspar crystal tuff, mass flows, ash
		€dg	Shale, sandstone, coarse quartz-feldspar crystal tuff mass flows, ash
	Central Volcanic Sequence of Mount Read Volcanics	€b	Andesite to basalt dykes
		€QEFP	Coarse quartz-feldspar porphyry to lithic crystal tuff
		€rhy$_1$	Rhyolite lava
LOWER TO MIDDLE CAMBRIAN		€an$_2$	Feldspar andesite, andesitic tuff
		€r1	Quartz-feldspar phyric rhyolitic tuffs, mass flow units, ash, shale blocks
		€d1	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff, ash
		€sh	Shale and ash
		€dc	Feldspar+quartz dacite lava, lava breccia, rare hornblende variety (€di)
		€an$_1$	Chloritic andesite to basaltic andesite lava, hyaloclastite and tuff

SYMBOLS

- Fault with dip
- Anticline, axis approximate
- Syncline, axis approximate
- Lineament (interpreted from air photos)
- Strike and dip of cleavage ; vertical cleavage
- Strike and dip of flow banding ; vertical banding
- Facing
- Plunge and plunge direction of mesoscopic fold
- Interpreted geological boundary
- Overlying glacial deposits boundary
- Area of strong silicification
- Costean or trench
- Diamond drillhole with surface projection
- Field observation
- Track

ABBREVIATIONS

and	andesite	QET	quartz-eye tuff
ar	andesite tuff	QFP	quartz-feldspar porphyry
bar	barite	QFT	quartz-feldspar tuff
bd	bedded	qtz	quartz
bracc	brecciated)	rch	rhyolite chert
chl	chlorite	rct	rhyolite crystal tuff
conglom	conglomerate	rhy	rhyolite
dc	dacite	rt	rhyolite tuff
dct	dacitic crystal tuff	ser	sericite
di	dacitic ignimbrite	sh	shale
dlt, dlt	dacitic lapilli, lithic tuff	sil	silicified
feld	feldspar	sph	sphalerite
flbd	flow banded	spher	spherulitic
gn	galena	tr	trace
MS	massive sulphide	ves	vesicular
prom	prominent	vns	veins
pumic	pumiceous	W	weak pyrite (0 - 1%)
py	pyrite	M	moderate pyrite (1 - 10%)
QEFP	quartz-eye feldspar porphyry	S	strong pyrite (> 10%)
QEFT	quartz-eye feldspar crystal tuff	c	with
QELT	quartz-eye lapilli tuff		

Fig. 3

898401

5 cm

SCALE 1: 10,000

0 500 1000 1500 m

87-2690

Revisions

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EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., N.W. TAS.
(AREA 4) CHESTER-PINNACLES

INTERPRETATIVE GEOLOGY

Drawn: P. Gregory	Date: 5-8-87	Centre: Melbourne	
Traced: A. Veale	Project No.:	Drawing No.:	
Checked: P. Gregory	B 56	A0-121	
O.I.C.:			

5596

5596

428

W — E

PLAN

270° Mag.

EAF II

ESB I

ESB I

5000E

F

R.L (metres)

500

400

300

200

4800

EAF II

Ft

Rcl Ash Coarse vit

Volcaniclastic rhyolitic breccia

Rhy brecc

50

Rcl (0·07m)

Rcl (0·15m)

Ft

Ft

Polymict breccia

Rcl possibly welded ± cherty ash

Rcl glassy matrix

100

Glassy feld ± qtz rhy

Fe

Fe

Fe

PP 59

PP 50

CP7

CP14

Thomas' Tunnel

5020 m N

5000 m N

E

R.L. metres

480

400

300

200

PLAN

90° Mag

PP 52

PP52

4800 E

Dunhams Lode projection

Ser sil dlt py, rare sph, gn

TD 18.0m

Ser ash

PP50 CP14

Surface

Dlt Rt Dc Rz Dlt

Thomas' Tunnel

4400 E

4600 E

Massive barite - galena

CP7 CP14

€an2

€rt

€dc

€dt

Ser-chl feld sand

Felsic and - ser chl altered

Ser dlt

TD 36.9m

Ser sil dlt, patchy sil, local py segregation sph-gn

Ser chl dlt

Bd ash

TD 121.9m

Vc rhy breccia & str clasts

Pink rhy breccia & ash to rhd

Pyroliffic ash to rhd

Qtz-feld vc rhy breccia large clasts, local py

Ser-chl feld ± qtz dc breccia

Bimodal qtz-feld rhy & dc breccia ± str clasts

Rare cm lithics in breccia unit

Fg ss to cherty ash

Ser chl dlt

Ser-chl feld sand

Lithic vitric tuff (feld-phyric) & dacite clasts, rare py, sph, gn

Schistose fg ash

dlt ± homme, segs py, sph gn

Spotty carb dlt'n

Ser welded feld dlt local chl, also finer ash

Py disem and vns to 5%, local segs sph-gn

Feld ± qtz dlt and ash, ser-sil

pottily py, prominent vn sph-gn-cpy

Mass flow rhc with thy frags glass shards, sh frags

Sh often large blocks

Sh, probably a large block

Fg cherty si-ss slumped

Coarse breccia of qtz-feld rhy frags sh

Coarse mass flow breccia ε qtz feld rhy sh frags, shaley matrix

Fg ash, rhc, rtc

M.g - rtc and breccia F ↑

Fg rtc and ash

Large rhy blocks F ↑

Sh ε some tuffaceous ss

Sph veinlets

Welded dlt prom ser cherty vns - Sph-gn & py vns & py disem

TD 200.7m

Rosebery Thrust Fault

Vitric qfp, rhy

Coarse rhy breccia (vc)

Black sh

Rhy vc breccia

Sh ε dykelets qfp

Sh

Fp breccia, rtc ?

Vitric qfp

Vitric qfp ε local sh

Black sh ε rtc, some py

Black sh & tuffaceous ss

T.D. 245.25m

€sh

€dt

SECTION

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO	€an2	Feldspar-phyric andesite (and), locally vesicular
	€rt	Quartz-phyric rhyolitic mass flow tuffs (rt), crystal tuffs (rct) lapilli tuffs (rlt), ash often with shale blocks
MIDDLE	€dt	Feldspar-phyric dacitic ignimbritic tuffs, crystal tuff (dct), dacitic lapilli tuff (dlt), ash
CAMBRIAN	€sh	Shale (sh), siltstone (sl) and ash
	€dc	Feldspar-phyric dacite lava (dc)

Bedding

SCALE 1:1000

0 50 metres

5 cm

898463

Revisions:

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Traced: C. Osborne

Drawn: P. Gregory

Project No: B56

Date: Aug. 87

Drawing No: A2-1604

Centre: Melbourne

THE BROKEN HILL PROPRIETARY CO. LTD.

EXPLORATION DEPARTMENT

E.L. 5/63 (PART 4) COMSTAFF J.V., TAS.

PINNACLES EAF GRID

LINE 5000 N

Fig. 12

87-2690

5597

898464

Revisions:			
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	Project No: B56	Date: Aug. 87	EL 5/63 (Part 4) COMSTAFF JV. TAS. CHESTER PROSPECT EAD GRID
	Drawing No: A2-1605	Centre: Melbourne	SECTION 600N

Fig. 32

87-2690

W

CP3

Moderate ser-sil-py feld (5-8% py)

And dyke

Feld ± qtz dc auto breccia moderate ser-py-sil-carb 5% py

And

From cleaved moderate ser-py-sil-carb 3-5% py ove

10% py as veins & disem

And

M ser-py-sil-carb dc 3% py

And

M-S ser-py-sil dc (7-15%) py

And

S ser-py-sil dc (5-15%)

And dykelet M py dc

And dyke

M ser-py-sil dc 5-10% py

M chl-ser-py-dc 1-2% py

Moderate

Strong

Mod

Strong

Moderate

F

F

400 E

Surface

Chl weaker past here

Weak

And

W ser-chl dc 0-1% py

CP18

CP11

CP5

E

PLAN

75° Mag

W chl-ser dc qtz-chl vns 0-2% py

600 E

Py-qz-chl vn

Qtz-chl-sph veinlets

Weak

W chl-ser dc Tr py

M ser-sil-py (2% py)

Traces Pb-Zn in carb veins & segs

M Ser-py (1-3%) Zone of qtz-chl-sph & qtz-carb-sph-gn veins M sph-gn-ser M ser-py (0.5-3.0%)

Pb to 1180 ppm Zn to 2040 ppm

Ba 400-2000 ppm

W ser-chl dc (0-1% py) rare sph-gn segs

W M ser-py carb (0.5-2.0%) dc

TD 602.9m

W ser ± chl-py (0-2%) dc 2-92 in vesicles

Pb to 1050 ppm Zn to 1300 ppm

TD 147m

To 1950 Pb To 3700 Zn

To 850 Pb To 2100 Zn

M-S ser-py-sil dc 5-15% py

Strong

10cm py vn

Weak

Strong

And dyke

M-S ser-py-sil (1-20% py)

M ser-py-sil (1-8% py)

And

Moderate

Pb to 410 ppm Zn to 1150 ppm

0.5% py Qtz-qz-carb vn M ser-py dc (3-5% py)

Moderate

And

M ser-py dc (3-7% py)

And

W M ser-py dc (0.5-5%) some rare chl

Weak

And

W chl-ser dc (0.5-2.0% py)

More pyritic

TD 160.33 m

And

W chl-ser-carb dc rare py

TD 205 m

SECTION

RL (metres)

500

400

300

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

ϵan_1 Andesite to basalt dykes (and)

ϵdc Feldspar ± qtz dacite lava (dc)

Bedding

SCALE 1:1000

0 50 metres

ALTERATION

Weak - Weak chlorite - sericite - pyrite (<1%)

Moderate - Chlorite - sericite - pyrite (1-10%)

Strong - Silica - sericite - pyrite (>10%)

Bedding

Flow banding

5 cm

W

CP 3

CP 11

E

PLAN

79° Mag. →

R.L. (metres)

500

400

300

CP 3

M ser - sil - py (5-8 %py) Feld dc, some chierty silica vns

100

And

M ser - py - sil (5-7 % py)

Moderate

50

Strong

And

Prom cleaved M ser - py - sil dc (3-5 % py)

And 10% py as vns & dissem

M ser - py - sil - carb (3% py)

Moder.

And

Prom cleared M ser - py - sil dc (2% py)

200

And

M-S ser - py - sil dc (7-15 % py)

And

Strong

S ser - py - sil dc (5-15 % py) usually

And dyke

And

M py dc

F

F

Moderate

250

M ser - py - sil dc 5-10 % py some sph - gn dissem

M chl - ser - py dc 1-2 % py

300

Gently dipping ash beds

Strong

Surface

M ser dc local m py

Weak

M ser - chl dc

Kershaw trig alteration zone projected

Strong

M ser - py dc 3%

Mod

W ser - chl dc

Chl weaker past here

350

Weak

400

And

W ser - chl dc auto breccia 0-1% py

450

CP II

W chl - ser dc

Tr py

Sph - gn - py vn

MS sph - gn - bar

M ser - py (0.5 - 3%)

Weak

30

0.6 cm sph - gn - qtz vn

Moderate

550

Weak

TD 601 m

M-S ser - py - sil dc 5-15 % py

100

Strong

40cm py vn

Strong

And dyke

M-S ser - py - sil (7-20% py)

And

M ser - py sil (1-8 %)

Moderate

M ser - py - sil dc (5-10% py) dissem, rare veins

TD 205m

SECTION

898465

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		Drawing No: A2-1606	

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EXPLORATION DEPARTMENT

EL 5/63 (Part 4) COMSTAFF J.V. TAS
CHESTER PROSPECT EAD GRID
SECTION 550 N

87-2690

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

€an₁ Andesite to basalt dykes (and)

€dc Feldspar ± qtz dacite lava (dc)

ALTERATION

Weak - Weak chloritic - sericite - pyrite (<1 %)

Moderate - Chloritic - sericite - pyrite (1-10 %)

Strong - Silica - sericite - pyrite (>10%)

Bedding

Flow banding

SCALE 1:1000

0 50 metres

Fig. 33

5 cm

5500

W

E

PLAN

79° Mag →

CP11

CP17

CP23

SECTION

R.L. (metres)

500

400

300

200

M-S py dc

400 E

SURFACE

Kershaw frig

600 E

CP17

Qg cobbles W ser-chl

W-M chl-ser dc alteration decreasing downhole

CP11 - SEE INSET

50

Weak

100

And

W-M Chl-ser dc part vitric Tr py to rare veinlets

CP23

M ser-chl dc

T.D.150m

To 1550 Pb 1600 Zn

Med

M ser-py-sil dc (5% py)

Rare sph-gn-qtz-carb vein

W chl-ser dc 0-2% py

Fly contact falls off W chl-ser-carb dc 0-2% py

W chl-ser dc 0·5-1·0% py

W-M Ser-sil-py dc 2-5% py disseminated, rare gn veins

TD175m

INSET

(SAME SCALE)

CP11

W chl-ser dc tr py

0-60 cm sph-gn-qtz vn

M-S ser-py-sil dc 5-15% py

Patchy Pb to 500 ppm, Zn to 640 ppm

M ser-sil-py (1-8% py)

Strong

MAJOR FAULT

M ser-py-sil 5-10% py

Moderate

CP23

TD 205m

Central Volcanic Sequence of Mount Read Volcanics

LOWER TO MIDDLE CAMBRIAN

€dc — Feldspar - phyric dacite lava

€an1 — Chloritic andesite (and) to basaltic andesite lavas and tuffs (at)

ALTERATION

Weak - Weak chloritic - sericite - pyrite (<1%)

Moderate - Chloritic - sericite - pyrite (1-10%)

Strong - Silica - sericite - pyrite (>10%)

Bedding

Flow banding

SCALE 1:1000

0 50 metres

5 cm

898466

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Drawing No: A2-1607

Centre: Melbourne

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EXPLORATION DEPARTMENT

EL 5/63 (Part 4) COMSTAFF J.V. TAS

CHESTER PROSPECT EAD GRID

SECTION 500 N

Fig. 34

87-2690

5600

TN

Sil wk py chert or dc
Chert py breccia
Chert breccia
Chert breccia underlies massive py.
gossanous chert
Barren chert beds possible dc
chert breccia
TRAMWAY
dc
Ser feld dc
pyritic chert
chert boudin
chert 2% py
py chert
BENCH A
BENCH C
BENCH D
BENCH E
BENCH F
BENCH G
BENCH B
Bd py chert
Massive py veins
chert-py
w py sil dc
py ch
Probable sil ser dc (3-5% py)
py ser dc 5-10% py
Chert
Barren chert or dc
dyke (?)
Surface projection of drill hole
DDH CP 6
ADIT
ADIT PORTAL
Bd sh & cherty ash
Mchl-Ser dc
Builldozed track
Mchl-py dc (3% py)
M Sil-py dc (5-10% py)
S Sil-Ser-py (10% py)
M Ser-Sil dc breccia
M Ser-Sil dc ē py (1%)
dt and ash
€dc
€dt
A
B

Scale 1: 500
0 10 20 30 40 50 m

GEOLOGICAL PLAN

Bench geometry and contours from Collins and Komyshan in Collins, Gulline and Williams 1981.

Abbreviations

py	pyrite
ser	sericite
sil	silicified
Bd	bedded
wk	weakly
vns	veins
W	weak
M	moderate
S	strong

- €dc — Dacite lava (dc).
- €dt — Dacite tuff (dt) bedded ash and shale.
- Pyritic chert.
- Strike and dip of bedding.
- " " " " cleavage.
- Plunge of mesoscopic fold.
- Inferred anticlinal axis.
- " synclinal "
- Inferred geological boundary

Possible original limit to pyritic chert
Bench A projected
Rubble
Top of Haulage
Bench C
Bench D
Bedded Pyrite-chert
Andesite dyke
OPEN CUT Bench G
Dacite lavas €dc
Cherty volcaniclastics (facing unknown)
drill hole projected onto section
EOH 299 62m
Depth (m)

5 cm

INTERPRETATIVE SECTION A-B

Scale 1: 500
0 10 20 30 40 50 m

898468

Fig 38 87-2690

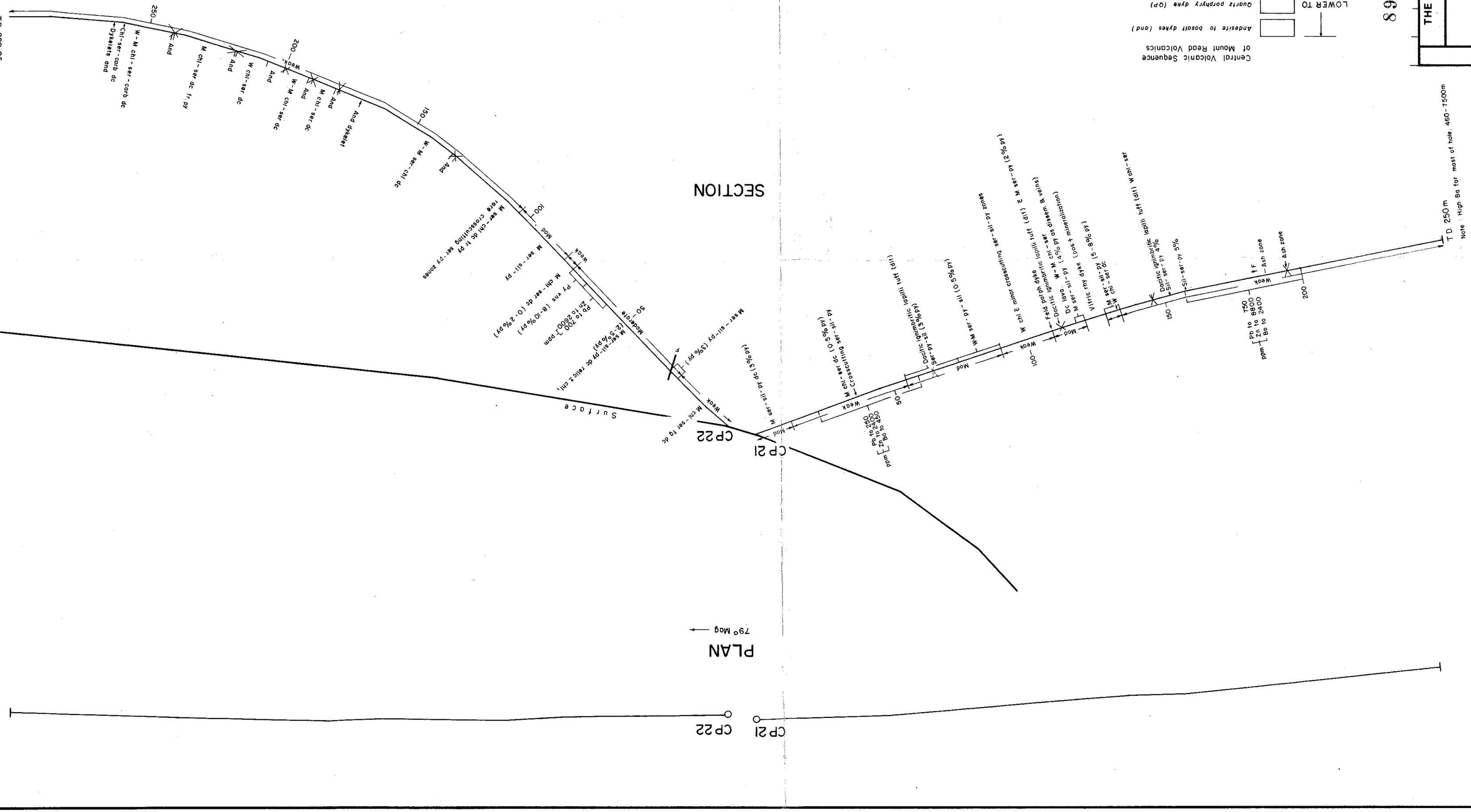
THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATATION DEPARTMENT			
EL 5/63 (AREA 4), COMSTAFF J.V., TAS. CHESTER PYRITE MINE			
PLAN & SECTION			
Drawn: P Gregory	Date: 27-7-87	Centre: Melbourne	
Traced: M Rosker	Project N° B 56	Drg. N° AI - 2198	
Checked: P. Gregory			

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5602

5601

SECTION


W
E
RL (metres)
100
200
CP 21
CP 22
Surface
TD 250m
Note : High Ba for most of hole 460 - 750m
Pb to 8800 ppm
Zn to 2400 ppm
Ba to 2400 ppm
Ash zone
Ash zone
Dacitic ignimbrite
Silic - ser - py
Vitric ash tuff
Dacitic ignimbrite
Ash zone
Ash zone
Ash zone

386 000 mE

386500 mE

5393000 mN

5392500 mN

shale

rhy xl tf & m.g. QET

m.g. QEFT

Coarse QEFT

m.g. QET

rhy xl tf, ash

m.g. - coarse QET

Sub O/C sh

mg QET rhy xl tf

rhy xl tf

sh

shear zone

QET

sh fags QET

QET & sh blocks

rhy, m.g. QE, sh blocks

QET & m.g. QET

m.g. QE rhy xl tf

vitric QET

QET

rhy vic tf.

rhy xl tf ash

Sock Ck

Boot Ck

FAULT

146 m

120m

149m

169 m

175m

219m

288m

125m

150m

SK1

SK2

SK3

SK4

SK5

SK6

SK7

SK8

SK9

SK10

SK11

SK12

SK13

SK14

€ds

€drt

€dQET

€ddlf

€dg

Qglac

chl QEFP

Q glac

QEFP

rhy ignm

sh, ash, rhy xl tf

vitric QET

coarse QET & m.g. QET

rhy xl tf, rhy xl lith tf m.g. QET c sh clasts.

vitric dc

sh & QET

520

540

560

500

580

600

35

85

Scale 1:2500

0 100 200 300 km

N

385000 E

390 000 E

5390 000 N

EL 5/63 (Part 3)

SOCK CREEK PROSPECT

MURCHISON HWY

MT. BLOCK

0 1 2 3 km

LOCATION

5 cm

LEGEND

MIDDLE - UPPER CAMBRIAN

Dundas Group

- €ds — Black shale
- €dQET — Coarse to medium grained quartz - feldspar crystal tuff (QET).
- €drt — Coarse grained rhyolitic crystal tuff, crystal lithic tuff, ash, ignimbritic breccia.
- €ddlf — Vitric to perlitic weakly porphyritic dacite locally vesicular.
- €dg — Micaceous greywacke, siltstone and shale.

——— Geological boundary; interpreted.

Surface projection of mineralized zones containing veins.

Diamond drill hole (Comstaff)

Costean

Bulldozed track

600 Topographic contour (metres A.S.L.)

898469 Fig 40

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (Part 3), COMSTAFF J.V., TASMANIA.

SOCK CREEK PROSPECT
INTERPRETATIVE GEOLOGY

Drawn: P. Gregory	Date: 29-6-87	Centre: Melbourne
Traced: M. Rosker	Project No: B 56	Drawing No: A2-1602
Checked:		

Revisions:

5603

NORTH PINNACLES

EL 5/63 SOIL GEOCHEMISTRY

Pb

NORTH PINNACLES

W.

E.

SHALE BASIN

CHESTER - PINNACLES - SILVER FALLS GOLD

Pb

EAA GRID

Pb Ag

LEOS FIND

PINNACLES

BROWN'S

THOMAS TUNNEL

STRONGS - MARIONOAK GOLD

BURNS PEAK AREA

SOUTHERN TRENCHES

NORTHERN ZONE

CENTRAL ZONE

SOUTHERN ZONE

EAST CHESTER

EAST CHESTER

HOLLWAY PYRITE

MARIONOAK
Pb - Zn

CHESTER NORTH

CHESTER MINE

WEST MT. KERSHAW

CHESTER

CHESTER SOUTH

SOUTH MT. KERSHAW

CHESTER - MT KERSHAW

Pb Ag

BOUNDARY OF LEASE EL 5/63 AREA 4

0 500 1000 1500 km

TN

Fig. 50

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 AREA 4, CHESTER-PINNACLES

GEOCHEMISTRY COMPILATION

Drawn: A. Clarke	Date: July '87	Centre: Melbourne
Traced:	Project No:	Drawing No:
Checked:		

Revisions

5 cm

898470 5604

87-2690

5605

380 000 E | 385 000 E | 390 000 E

5 395 000 N | 5 390 000 N | 5 385 000 N | 5 380 000 N

EL 5/63 (Area 3)

EL 5/63 (Area 4)

NORTH PINNACLES

PINNACLES

Bulgabac River | Animal Creek | John Lynch Creek | Hollway Rivulet | Marionook R. | Boco Ck | Form Ck | Tullabardine Ck | Chester Rivulet

EMU BAY RAILWAY | MURCHISON HWY | PIEMAN ROAD

Bulgabac Hill | Mt Block | Mt Kershaw | CHESTER MINE | Southern Trenches | Brown's Tunnel | Thomas' Tunnel | Burns Peak | Bastyan Dam | MacKintosh Dam | LAKE MACKINTOSH

LOCATION

Zeehan | Queenstown | HOBART

LEGEND

147(2·82) / 337 — Stream sediment sample locations
Italic numbers (1 to 199) are 5kg cyanide leach samples with values 0·50 ppb shown in brackets (ppb).
Upright numbers (200 to 381) are -80# mesh sieved samples.

5 cm

Scale 1:25,000

0 | 1 | 2 | 3 km

N

Fig 51

898471

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63 (parts 3, 4) COMSTAFF J.V., N.W. TASMANIA

STREAM SEDIMENT SAMPLING & ANOMALOUS GOLD VALUES

Drawn: A. Clarke	Date: June 1986	Centre: Melbourne	
Traced: M. Rosker		Project No.: B56	Drawing No.: A0-118
Checked: A. Clarke			
O.I.C.:			

Revisions:

377000 m E
378000 m E
379000 m E
380 000 m E
BOUNDARY EL 5/63 (AREA 4)
5386000 m N
5385000 m N
5384000 m N
5383000 m N
5382000 m N
5381000 m N
5380 000 m N
AREA FIGURES 54-58
AREA FIGURES 59-63
Burns Δ Peak
Cone Hill
Δ Mt Kershaw
CHESTER MINE WORKINGS
SCALE 1:1000
0 500 1000 m
5 cm
N
Fig 53 898472
THE BROKEN HILL PROPRIETARY CO LTD
EXPLORATION DEPARTMENT
EL 5/63, COMSTAFF J.V., TASMANIA
AREA 4 SOIL AUGERING
SAMPLE LOCATION
Drawn A. Clarke | Date Aug 87 | Centre Melbourne
Traced | Project No | Drawing No A0-
Checked
O.C.
87-2690
9006

RC indicates rock chip sample

Fig 54

5 cm

898473

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
HOLLWAY PYRITE ZONE
SOIL AUGERING
SAMPLE LOCATIONS

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
Traced:	Project No.: B 56	Drawing No.: A0- 5607
Checked:		
O.I.C.:		

Revisions:

5 384 000 N
5 383 000 N
5 382 000 N
83100 N
83300 N
82900 N
82700 N
82500 N
82300 N
82100 N
81900 N
81700 N
81500 N
379000 E
2540
2750
2950
3150
3350
3550
3750
3850
Cone Hill
N
5 cm

Fig 55

898474

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
HOLLWAY PYRITE ZONE
SOIL AUGERING RESULTS
LEAD (ppm)

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
Traced:	Project No.: B 56	Drawing No.: A0-
Checked:		
O.I.C.:		

Revisions:

5608

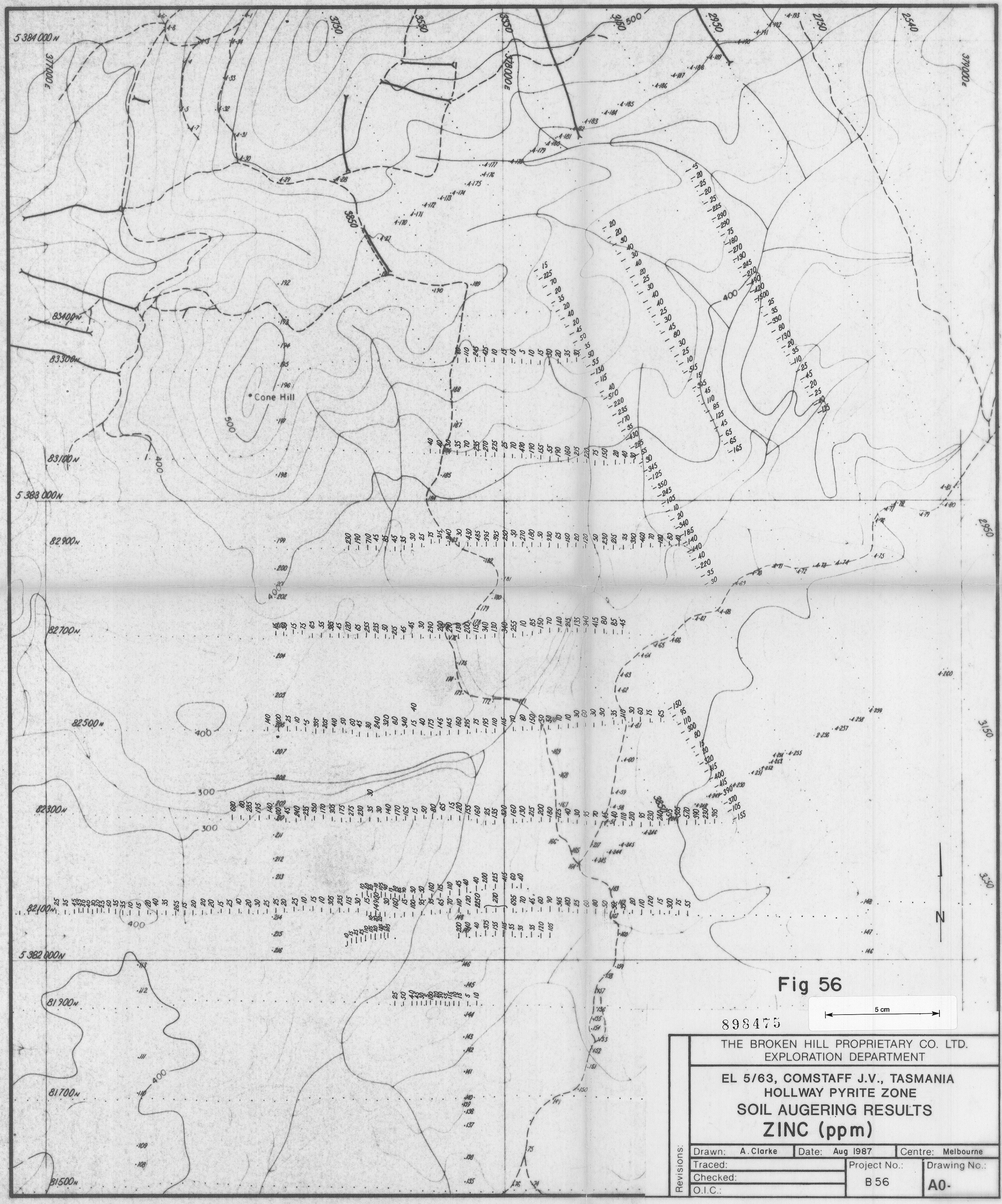


Fig 56

898475

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
HOLLWAY PYRITE ZONE
SOIL AUGERING RESULTS
ZINC (ppm)

Revisions:			
	Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
	Traced:	Project No.: B 56	Drawing No.: A0-
	Checked:		
	O.I.C.:		

5609

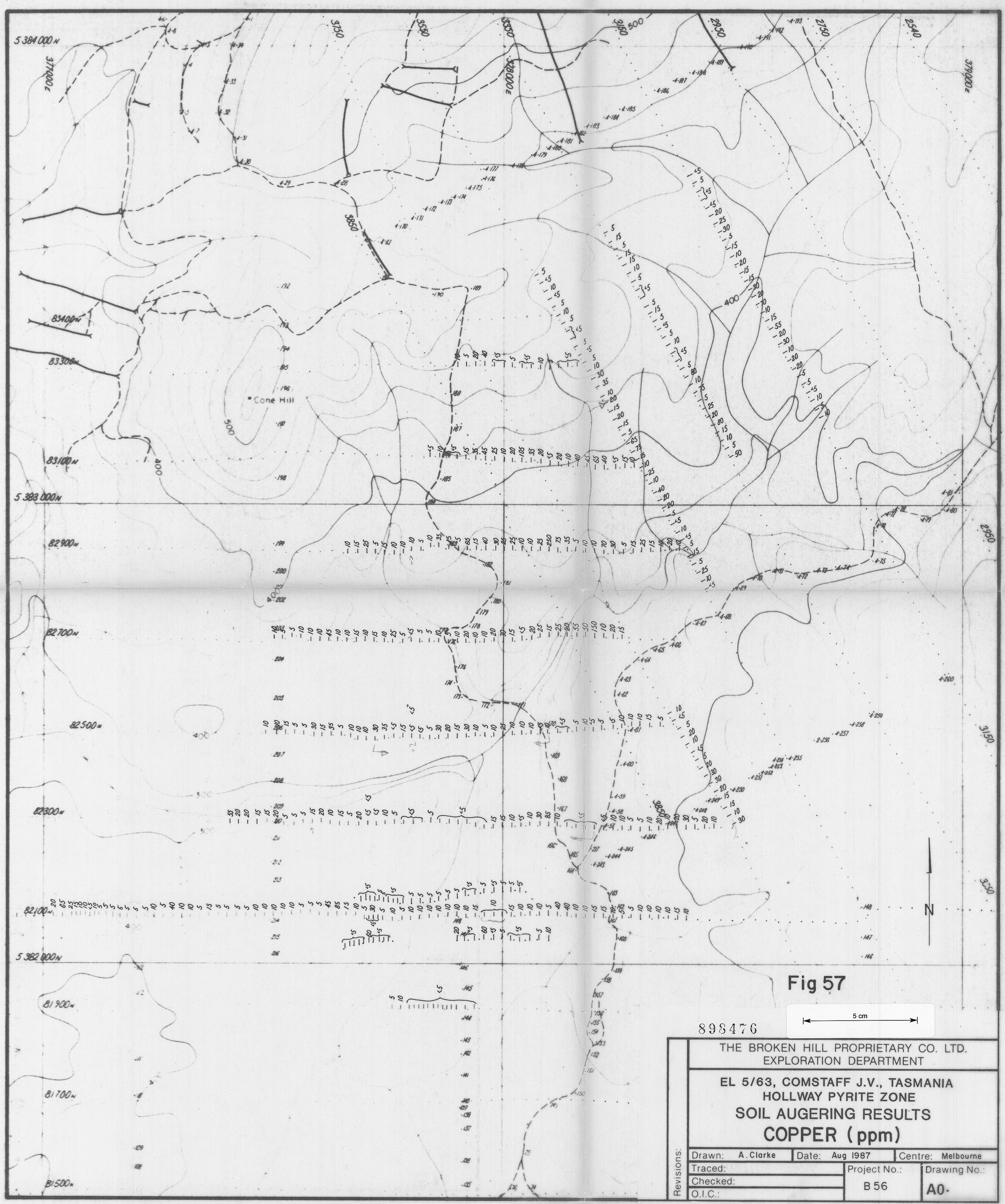


Fig 57

898476

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
HOLLWAY PYRITE ZONE
SOIL AUGERING RESULTS
COPPER (ppm)

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
Traced:	Project No.: B 56	Drawing No.: A0-
Checked:		
O.I.C.:		

Revisions:

5610

5 384 000 N
5 383 000 N
5 382 000 N
370000E
378000E
379000E
83400N
83300N
83100N
82900N
82700N
82500N
82300N
82100N
81900N
81700N
81500N
3750
3550
3350
3150
2950
2750
2540
3850
2950
3150
3350
400
500
• Cone Hill
Arsenic ppm
Gold ppm
Silver ≥0·5ppm
5 cm
N
Fig 58
898477
87-2690
THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT
EL 5/63, COMSTAFF J.V., TASMANIA
HOLLWAY PYRITE ZONE
SOIL AUGERING RESULTS
ARSENIC SILVER & GOLD(ppm)
Drawn: A.Clarke
Date: Aug 1987
Centre: Melbourne
Traced:
Checked:
O.I.C.:
Project No.: B 56
Drawing No.: A0-
Revisions:
5611

377 000 E

378 000 E

81 300 N

81 100 N

5 381 000 N

80 900 N

80 800 N

80 700 N

80 600 N

80 500 N

80 400 N

80 300 N

80 200 N

80 100 N

80 000 N

5 380 000 N

79 900 N

79 800 N

79 700 N

79 600 N

79 500 N

79400 N

79 300 N

79 200 N

5 379 000 N

Mt Kershaw

Mt Kershaw
Trig 482

RC indicates rock chip sample

Fig 59

5 cm

898478

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
CHESTER/MT KERSHAW
SOIL AUGERING
SAMPLE LOCATIONS

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne	
Traced:		Project No.: B 56	Drawing No.: A0-
Checked:			
O.I.C.:			

Revisions:

5612

377 000 E

378 000 E

81 300 N

81 100 N

5 381 000 N

80 900 N

80 800 N

80 700 N

80 600 N

80 500 N

80 400 N

80 300 N

80 200 N

80 100 N

80 000 N

5 380 000 N

79 900 N

79 800 N

79 700 N

79 600 N

79 500 N

79400 N

79 300 N

79 200 N

5 379 000 N

Mt Kershaw

Mt Kershaw Block 4R.

N

Fig 60

5 cm

898479

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
CHESTER/MT KERSHAW
SOIL AUGERING RESULTS
LEAD (ppm)

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
Traced:	Project No.: B 56	Drawing No.: A0-
Checked:		
O.I.C.:		

Revisions:

5613

Mt Kershaw

N

5 cm

Fig 61

898480

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
CHESTER/MT KERSHAW
SOIL AUGERING RESULTS
ZINC (ppm)

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
Traced:	Project No.: B 56	Drawing No.: A0-
Checked:		
O.I.C.:		

Revisions:

5614

377 000 E

378 000 E

81 300 N

81 100 N

5 381 000 N

80 900 N

80 800 N

80 700 N

80 600 N

80 500 N

80 400 N

80 300 N

80 200 N

80 100 N

80 000 N

5 380 000 N

79 900 N

79 800 N

79 700 N

79 600 N

79 500 N

79400 N

79 300 N

79 200 N

5 379 000 N

Mt Kershaw

Mt Kershaw 80 GRID

N

Fig 62

5 cm

898481

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
CHESTER/MT KERSHAW
SOIL AUGERING RESULTS
COPPER (ppm)

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne	
Traced:		Project No.: B 56	Drawing No.: A0-
Checked:			
O.I.C.:			

Revisions:

5615

377 000 E

378 000 E

81 300 N

81 100 N

5 381 000 N

80 900 N

80 800 N

80 700 N

80 600 N

80 500 N

80 400 N

80 300 N

80 200 N

80 100 N

5 380 000 N

80 000 N

79 900 N

79 800 N

79 700 N

79 600 N

79 500 N

79 400 N

79 300 N

79 200 N

5 379 000 N

Mt Kershaw

Mt Kershaw Trig 482

Arsenic in ppm
Gold in ppm
Silver ≥0·5 ppm

N

Fig 63

5 cm

898482

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
CHESTER/MT KERSHAW
SOIL AUGERING RESULTS
ARSENIC GOLD & SILVER

Drawn: A. Clarke	Date: Aug 1987	Centre: Melbourne
Traced:	Project No.: B 56	Drawing No.: A0-
Checked:		
O.I.C.:		

Revisions:

5616

5617

BOUNDARY EL 5/63 (AREA 4)

377000 m E
378000 m E
379000 m E
380000 m E

5386000 m N
5385000 m N
5384000 m N
5383000 m N
5382000 m N
5381000 m N
5380000 m N

Burns Δ Peak
Core Hill
Chester Mine Workings
Mt Kervinaw

Note: Most recent drilling south of Hollway Py Zone (Line 82100 N) not included.
Lithology as follows:
dc 9701, 03, 05, 07, 08, 15-22, 26, 29, 30, 33, 38, 40-42, 45, 47.
and 9706, 10, 12, 14.
rhy 9709, 23, 24, 27, 28, 31, 32,
dc? and 9702, 11, 13, 25, 43.
di 9739, 46.

Abbreviations:

ss	sandstone	rct	rhyolitic crystal tuff
sl	siltstone	rt	rhyolitic tuff
sh	shale	dt	dacitic tuff
Qg	glacial cover	di	dacitic ignimbrite
dc	dacite	p(5%)	pyrite percentage
and	andesite	ves	vesicular
rhy	rhyolite	ser	sericite

SCALE 1:1000
0 500 1000 m
5 cm

Fig 64

87-2690

THE BROKEN HILL PROPRIETARY CO LTD
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., TASMANIA
AREA 4 SOIL AUGERING
GEOLOGY OF CHIP SAMPLES

Drawn: A. Clarke	Date: Aug 87	Centre: Melbourne
Traced:	Project No:	Drawing No: A0-
Checked:		
O.I.C:		

893483

376 000mE

5 387 000 mN

Burns Peak

Cone Hill

Mt Kershow

EMU BAY RAILWAY

MURCHISON HWY

POWER TRANSMISSION LINES

Survey control points

Lines cut for UTEM loops shown as fine lines (not surveyed - in detail) See fig. 68 for loop layout

Note: Chester/ Mt Kershow and connection (Cone Hill) grids are pegged on AMG coordinates
East Chester grid pegged north and south from zero point base line - Comstaff line numbering system retained
North Pinnacles grid line and peg numbering follows that for Comstaff EAF grid (not shown)

895484

5 cm

SCALE 1: 10,000

0 500 1000 1500 m

Fig. 65 87-2690

Revisions

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, COMSTAFF J.V., N.W. TAS.
(AREA 4) CHESTER-PINNACLES

LINE CUTTING & GRID LAYOUT - 1986

Drawn: P. Gregory	Date: Aug. 87		Centre: Melbourne
Traced:		Project No.:	Drawing No: A0-122
Checked:			
O.I.C.:			

5648

5619

380 000 E
385 000 E
390 000 E
5 395 000 N
5 390 000 N
5 385 000 N
5 380 000 N

EL 5/63 (Area 3)
EL 5/63 (Area 4)

River
Bulgabac
Animal Creek
Bulgabac Hill
Mt Block
John Lynch Creek
NORTH PINNACLES
PINNACLES
Brown's Tunnel
Burns Peak
Thomas Tunnel
Southern Trenches
EMU BAY RAILWAY
MURCHISON HWY.
Tullabardine Ck
Holway Rivulet
Marionoak R.
Boco Ck
Farm Ck
CHESTER MINE
Mt Kershaw
Chester Rivulet
PIEMAN ROAD
MacKintosh Dam
LAKE MACKINTOSH
Bastyan Dam

Zeehan
Queenstown
HOBART

LOCATION

UTEM SURVEYS

loop — reading lines

1987 proposed BHP
1986 BHP
1984 Comstaff

Scale 1:25,000

0 1 2 3 km

N

898485

5 cm

Fig. 66

87-2690

THE BROKEN HILL PROPRIETARY CO. LTD.
EXPLORATION DEPARTMENT

EL 5/63, PARTS 3 & 4, N.W. TASMANIA.

UTEM LOOPS & GRID LAYOUT - 1986-7

Drawn:	Date: Aug. 87	Centre: Melbourne	
Traced: M. Rosker	Project No.: B56	Drawing No.: A0-124	
Checked:			
O.I.C.:			

Revisions:

5620

9
10
3
301
201
1
2
11
12
4
7
13
5
6
8

NORTH PINNACLES

EAST CHESTER

BLOWS PEAK

CHESTER MINE

MT. KERSHAW

ROSEBERY FAULT

BOUNDARY OF LEASE E.L. 5/63 AREA 4

BOUNDARY ALONG RAILWAY

BOUNDARY OF LEASE E.L. 5/63 AREA 4

BOUNDARY OF LEASE E.L. 5/63 AREA 4

MARIONOAK

PIEMAN RIVER

BOGO CREEK

5 Loop position and number

♦ Well defined anomaly

□ Less well defined anomaly
(All anomalies weak and shallow)

5 cm

SCALE 1 : 10000

0 500 1000 metres

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

TN

898486 Fig.67

87-2690

COMSTAFF PROPRIETARY LIMITED

E.L. 5/63 (AREA 4) - CHESTER / PINNACLES, TAS.

LOOP POSITION & SIMPLIFIED INTERPRETATION

COMPILED	T.G.D.S. 28/9/81
DRAWN	GEODRAFT 20/4/78
AMENDED	Sept. 87
SCALE	1 : 10 000
PLAN No.	TAS/2/2737

AO-123

5620