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79-1409 Vol 1/3

also refer reports 78-1307 - 78-1313.

MICROFILMED

COMMONWEALTH ALUMINIUM CORPORATION LIMITED

EXPLORATION DEPARTMENT

E.L. 1/76 GUILDFORD

AND

SOUTHERN PART OF E.L.4/77 HIGHCLERE

REPORT ON ALL EXPLORATION

FROM

OCTOBER, 1978 to DECEMBER, 1979

OPEN FILE

G. Weste.
December, 1979.

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1. INTRODUCTION

Exploration Licence 1/76 was granted to Comalco Limited on 29th March, 1976. The licence covers 264 sq. km. and is situated about Guildford which lies 62 km South West of Devonport (See Fig. 1).

Exploration licence 4/77 was granted to Comalco Limited on 1st June, 1977. A small 1 km wide strip of this licence abuts two northern sides of licence 1/76 for a distance of 19 km and is mostly isolated from the rest of 4/77 (see Fig. 1). Exploration of this strip has been carried out as part of the programme for licence 1/76 and for this reason it is included in this report.

During 1979 the titles of both E.L.'s were transferred to Commonwealth Aluminium Corporation Limited, a wholly owned subsiduary of Comalco Limited.

Field work began in the 1976-77 summer and involved stream geochemical surveys followed by geological reconnaissance. This work is covered in an earlier report by this author titled "E.L. 1/76, Guildford and southern part of E.L. 4/77 Highclere, Tasmania. Report an all investigations to September, 1978".

This report only covers exploration carried out from November, 1978. To avoid duplication topics such as general geology and previous exploration in the area are not included in this report.

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2. SUMMARY

Exploration over the period covered by this report mainly concentrates on investigation of stream geochemical anomalies detected previously (see 1978 report) and on areas considered favourable for carbonate replacement. Grids were cut and detailed exploration carried out at two localities; St. Valentine's Peak and Blythe Road.

Minor magnetite skarn on St. Valentine's Peak grid proved to be barren. Investigations on the Blythe Road grid have yeilded an area of I.P. anomalies under Tertiary basalt which has yet to be tested.

Investigation of aeromagnetic anomalies at Talunah Road, Basil's Road and Companion Road indicated that the anomalies have sources in Tertiary basalt.

Further exploration is required before the area will have been adequately explored.

3. STREAM SEDIMENT ANALYSES.

A. MAGNETIC SEDIMENT SAMPLING.

149 magnetic samples were collected by dragging a powerful magnet through the stream sediment during the main stream survey (see 1978 report). The samples have been analysed by semi quantitative emission spectroscopy at the Australian Mineral Development Laboratories (Amdel) in Adelaide for Sn, Cu, Pb, Zn, Ag by emission spectroscopy Code A2.

Results are tabulated in Appendix 2 and have been plotted in tree form at the sampling locations on 1:20,000 sheets accompanying this report. (Drgs. 78-181B, 182B, 183B and 197).

B. DISCUSSION OF MAGNETIC SAMPLE RESULTS.

No statistical assessment of the analyses has been attempted because of the qualitative nature of the results.

(1) Sn - Only one sample is possibly anomalous for Sn (Sample No. RD/T/HI-M 519) at 100 ppm, collected from the creek which follows the western contact of the granite cupola 2 km north east of Companion Hill. Two other samples from the same area have supporting high values of 40 ppm. The country rocks in the area are calc-silicate rich hornfels. Minor scheelite was detected in panned concentrates taken from the same creek (see Drg. TAS-78-186) The area yeilded higher than background Pb values.

(2) Pb - Three samples are anomalous for Pb (RD/T/GU-M 376, 377, 378). They contain 500 ppm and were collected from a locality containing up to 395 ppm Pb in conventional minus 80 mesh samples at the southern boundary of E.L.17/68 with E.L.4/77.

(3) Zn - No clear anomalies exist, the highest value being 300 ppm.

(4) Cu - Three samples contained 200 ppm Cu. Some iron minerals (e.g. goethite and possibly magnetite) strongly scavenge Cu and this has caused a high background in the magnetite samples. The highest values were in samples collected from areas mainly covered by Tertiary basalt.

(5) Ag - No anomalies exist. The highest values tend to correspond with Cu highs, probably because of the tendency for iron to also scavenge Ag. The highest value is 0.4 ppm.

C. PANNED CONCENTRATES.

During reconnaissance exploration 8 panned concentrate samples were collected (additional to those already collected and reported on). Samples 330, 549 and 550 were collected to check the source of scheelite previously observed in panned concentrates (see 1978 Report, Sec. 8E).

Analyses and examination under ultra violet light (see Appendix 3) showed that the scheelite is distributed only along the creek which flows NE into Tasminex.

Samples 282, 284, 383 and 552 were collected from streams not previously panned, but in possibly prospective areas. Sample 383 collected from a small tributary of the Blythe River contained minor Sn and W and two fine specs of blue scheelite were observed under ultra violet light.

4. GENERAL RECONNAISSANCE

A. A. EXAMINATION OF AREAS WITH DRAINAGE ANOMALIES

Following completion of the assessment of all the stream geochemical data (see 1978 report), reconnaissance of favourable rock types was carried out with particular attention to those areas with geochemical anomalies.

(1) Blythe Road/Blythe River Area.

A detailed examination of the Blythe River and tributaries west of the Blythe Road crossing in the east of the area was carried out to follow-up a number of drainage anomalies. Tertiary columnar basalt outcrops in the Blythe River immediately east of the (siluro-Devonian?) sandstone ridge. A discontinuous ridge of greybilly trends south along the edge of basalt south from the river. Between the greybilly and basalt an area of limonite stained secondary $CaCO_3$ encrustations occurs around springs. The water from which contained 0.13 ppm F. The source of the $CaCO_3$ may be limey interbeds within, and the cement of the sandstone sequence. Outcrops about 1km to the north indicate that the sandstones should continue east beneath the basalt. This is subtantiated by the composition of greybilly outcropping to the north-north-east which consists entirely of pebbles and fragments of the siluro-Devonian sandstone. The sandstone is fine grained white to pale yellow in colour with very little (often carbonate rich) cement. Interbeds of siltstone and shale are common.

The rocks have been contact metamorphosed by the underlying granite to quartzite, metasiltstone and hornfels.

The main scheelite anomalies occur along a siltstone-shale horizon which is less resistive to erosion than the sandstones allowing the Blythe River to meander north. The 'strongest' anomaly (12 grains of scheelite) was detected where this unit is cut by a major north-east trending fault along

which much fracturing (but no significant quartz veinging) has occurred.

No Carbonates were observed in this poorly exposed unit and those rocks outcropping contain very little or no carbonate. This tends to downgrade the possibility of a replacement type ore body occurring in these rocks. Only very minor quartz veining occurs in the rocks and a sample of this material contained no Sn or W.

Ordovician limestones probably occur to the west of Blythe Road, beneath the basalt.

(2) St. Valentine's Peak area.

Reconnaissance of anomalous localities to the west and north-west of St. Valentine's Peak failed to locate strong indications of mineralization.

Anomalies to the west and north-west of the Peak appear to have the quartz tourmaline dyke and veins as their source. Samples of the dyke material are weakly anomalous for both Sn and W (see App. 4 and Drg. TAS-79-316). These rocks are discussed in Section 4B.

Examination of the anomalies 3-4km north of St. Valentine's Peak (discussed in Sect. 3B (1)) also failed to detect mineralization. However the area was not prospected in detail. Anomalies to the easr of the Peak were covered by the St. Valentine's Grid (see Sect. 6).

(3) Gin Creek area.

Low order Pb anomalies along Gin Creek are caused by minor limonite-quartz veining in thin sericitised and chloritised quartz porphyries (probably a tuff) collected on Bunker's Road south the the creek.

These gossany veins contain up to 1.65% Pb as cerussite and 6.5 ppm Ag. (see App. 4). The area is largely covered by basalt and alluvium and any massive sulphides would not be obvious.

(4) Basalt areas in the south of E.L. 1/76.

A number of anomalies occur in areas of Tertiary basalt. Rapid reconnaissance of the anomalous localities failed to detect windows in the basalt. Some of the amonalous samples were collected just downstream from the Waratah and Emu Bay railways.

B. ROCK SAMPLING

During reconnaissance 57 rock samples were collected for further examination and/or analysis. Sample descriptions locations and analyses are listed in App. 4 and shown on the 1:20,000 geology plan (Drg. TAS-79-316).

Samples 10 to 64 were analysed at Amdel for Sn and W by XRF code B1 and for Cu, Pb, Zn by AAS Code C1. Samples 54 to 64 were analysed by emission spectroscopy for 10 elements. Samples A7495 to 7498 were analysed by Analabs for 9 elements (courtesy of Pennzoil Australia).

All samples were examined under short wave ultra violet light in the dark room and were checked for radio-activity using a scintillometer.

Samples taken from highly weathered quartz-tourmaline ±? feldspar dykes and veins along the axis of the Companion Hill anticline are weakly anomalous for Sn, W and Pb, indicating that potential ore forming solutions have passed through them. These rocks are somewhat similar to the dykes at Mt. Bischoff where significant mineralization is only present (in the dykes and other rocks), where they intersect carbonate horizons. Any localities in Comalco's tenement where the 'dyke' rocks intersect carbonates must be highly prospective. However this would probably be under the Tertiary basalt.

C. EXAMINATION OF AREAS CONTAINING POSSIBLE CARBONATE HORIZONS

(1) Cambrian.

A sequence of contact metamorphosed siltstones, mudstones limey mudstones and cherts is partially exposed in the north-north-

east trending 'Companion Hill Anticline'. Reconnaissance was carried out in an attempt to locate fairly pure carbonate horizons. Although none were found, some could still exist in areas of poor outcrop or to the south under the Tertiary basalt. Narrow limestone beds would be much less resistive to physical and chemical erosion than the surrounding rocks and would therefore tend not to outcrop.

Carbonate rich mudstones and siltstones (metasomatised by granite) were located at a few localities (see Drg. TAS-79-316, "Parts of E.L.'s 4/77 and 1/76, Geology). At most exposures the rocks are thinly bedded and consist mainly of pale grey fine calc-silicate minerals with small clots or 'eyes' of coarse diopside/epidote/garnet/wollastonite. Samples of these rocks were collected and analysed (see App. 4). One sample (No.54) of coarse grained garnet-epidote rock collected from a thin highly weathered bed in a road cut just to the north of St. Valentine's Peak, contained 230 ppm Sn. Other samples collected from these rocks contained background values in all elements analysed for.

Sample 12 collected on P.M.G. Road on the east flank of Companion Hill is a finely banded grey chert with minor scheelite and pyrrhotite on cleavage faces. The scheelite is medium grained and fluoresces bright blue. ? STOLZITE Sample 20 collected at the eastern contact of a granite cupola on St. Valentine's Road contains some fine specs of yellow fluorescing material - possibly powerlite. The sample was collected from finely banded calc-silicate rocks containing minor wollastonite and calcite.

(2) Ordovician

Vertically dipping, probable Ordovician shales, meta siltstones and snadstones immediately east of St. Valentine's Peak contain magnetite skarn. Reconnaissance rock samples of completely weathered ironstone collected from the area are weakly anomalous for W (240 ppm) and Cu (1500 ppm).

This area has been covered by the St. Valentine's Grid, (see Sect. 6). No probable Ordovician rocks were observed for 7 km further east. Conglomerate outcrops as a ridge 1 km east of St. Valentine's Peak. The facing is unknown. If this ridge faces east then Ordovician carbonates probably occur in the vicinity of the Old Park River which is a large swamp. A northeast trending fault appears moved siluro-Devonian rocks close to this ridge (see Drg. TAS-79-316) further complicating the structure. Examination of the Old Park River swamp failed to find any outcrop north west of this fault.

Minor undulant folding in the Old Park River and Old Park Road areas appears to maintain a moderate cover of Siluro-Devonian rocks. However, exposures in this area (mainly swamp) are few and very poor. Possible Ordovician rocks appear to outcrop on a minor anticlinal axis to the north-east of Kara .

Ordovician sandstone and conglomerate outcrops on the west flank of Mt. Everatt, east of Blythe Road. This area has been covered by the 'Blythe Road' reconnaissance grid and is described in Sect. 7.

(3) Siluro-Devonian

Pale yellow fine grained soft sandstones, fine grained siltstones and shales occur over a relatively low lying flat area between the Old Park River and Blythe Road. The rocks have been gently folded and have been metamorphosed by underlying granite north of about 20,000mN.

Monotonous faintly banded grey clac-silicate rich hornfels forms fractured outcrops and rubble in creeks and on hill tops. The sandstones are also strongly fractured and in places have a carbonate cement.

No carbonate rich sediments were observed, although very minor fine garnets were observed at one locality.

5. AEROMAGNETIC SURVEYS

A. PREVIOUS SURVEYS.

A number of previously flown surveys cover parts of the E.L.'s. A regional survey was flown by Rio Tinto Zinc over much of E.L.1/76 and the B.M.R. flew part of E.L. 4/77. These two surveys have been joined as a composite plan (Drg. 79-304) and are described in App. 12.

Two detailed surveys have been flown over Tasminex's E.L. 17/68 by Scintrex (½ mile spacing) and by Geoex (150 m spacing). These surveys slightly overlap onto the area covered by this report.

The magnetic contour plans show a distinct, narrow north-south high about 500 metres east of St. Valentine's Peak.

B. SURVEY FOR COMALCO.

(1) Survey detail.

To assist mainly with exploration of areas not covered by basalt, a magnetic survey using a helicopter towing a bird was flown for Comalco by Geoex Pty. Ltd. The survey also covered some Tertiary basalt adjacent to outcropping older rocks to allow for the possibility of tracing trends under the basalt. The area covered is "L" shaped and includes parts of E.L.'s 4/77 and 1/76 west and south of Tasminex E.L. 17/68. A total of 520 line kilometres were flown at 120 metres above ground level in an attempt to gain penetration. The flight line spacing was 200 metres. Flight path recoveries, stacked profiles and contour plans were compiled at 1:10,000 scale and reduced to 1:20,000 for laying over the appropriate geology plan. Copies are included in the map supplement (Drg. 79-323, 324A,B,C, 325A,B,C, 326A,B,C,) and details of the survey are included as Appendix 5.

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(2) Results.

The north-south anomaly east of St. Valentine's Peak ("St. Valentine's anomaly") showed on earlier fixed wing surveys as a low order high. This was thought to be caused by the adjacent razor back preventing the aircraft from flying low over the target. However, the anomaly remains low order for the helicopter-borne survey which maintained low ground clearance. The anomaly is also discontinuous. This anomaly was further investigated by ground exploration (see Sect. 6).

Three strong large north-north-east trending anomalies occur over basalt in the north-west of the area. They have been labelled Talunah Road, Basil's Road and Companion anomalies.

The Talunah Road and Basil's Road anomalies were followed up by ground profiling (see Sect. 8).

A complex high trends north-north-east along the axis of the Companion Hill anticline. In the north the source appears to be the acid volcanics, whilst in the south the source is probably Tertiary basalt. This high has not been followed up on the ground.

A broad high over Tertiary basalt south of St. Valentine's Peak appeared on earlier survey plans to have a buried skarn as a possible source. However the helicopter borne survey shows low gradients typical of the basalt occurring over a basalt hill.

Small highs occur over Blythe Road and in the far east of the surveys. These have been covered by the reconnaissance Blythe Road Grid described in Section 7.

The Siluro-Devonian rocks show very low magnetic relief. The Ordovician conglomerates and the Devonian granites also have low gradients. Areas of Tertiary basalt contrast strongly particularly in the west of the area flown.

6. ST. VALENTINE'S GRID.

A. GENERAL.

Regional aeromagnetic surveys over the region (see Drg. TAS-79-304) show a north-south magnetic high extending south along strike from the Kara scheelite mine. Reconnaissance of the area showed a potential for Kara type magnetite-scheelite skarn (completely weathered iron stone contained 240 ppm W) and a grid was constructed over the prospective area.

Initially grid lines were cut along National Grid east-west bearing (79°M) every 200 metres from a north-south base line. Pegs were placed at slope corrected 50 metre intervals. The location and outline of the grid is shown on the 1:20,000 geology map (Drg. 79-316) and a plan of the grid is attached as Fig. 2. Following declineation of the magnetic anomaly, a number of "fill-in" lines were constructed to close down the line separation to 100 metres over the prospective area.

B. GEOLOGY.

The grid was mapped at 1:2,500 scale (Drg. 79-272). The western boundary of the grid is the base of the St. Valentine's Peak razorback of basal Ordovician conglomerate. Scree from the razorback and from another smaller conglomerate ridge in the west of grid covers most of the grid area. Outcrops occur occassionally in creeks but most of the geological boundaries are determined from vegetation changes and therefore are rather approximate.

The oldest rocks in the grid are probably the basal Ordovician conglomerate which is non sorted to poorly sorted with a mostly discontinuous coarse quartz sand matrix. Pebbles are round to subround and consist predominantly of pale grey chert and quartzite. Occassional pebbles of hornfels and quartz porphyry also occur. Large lenses of coarse conglomerate (pebbles to 40 cm) occur near western margin of the grid.

Contact metamorphism by underlying granite has partially rexstallised the quartz and hornfelsed pebbles of carbonate rich rock which was probably derived from carbonate bearing beds 1 km to the east. A similar but narrow ridge of conglomerate occurs on the east side of the grid. This conglomerate is probably much thinner than is shown on the map. Very large boulders from the razorback may have been misinterpreted as outcrop in the south flowing creek. Outcropping siltstones indicate that the western boundary of this conglomerate may lie east of the north and south flowwing creeks.

A narrow valley separating the conglomerate ridges contains a unit of siltstones, graded sandstone-siltstone and limey mudstones which have been metamorphosed to hornfels. Small blebs of carbonate and organic rich material have been altered to pyrite-magnetite and calc silicate minerals.

In the northern part of the grid the shales are partially underlain to the west by a magnetite skarn. This rock does not outcrop on the grid but completely weathered ironstone has been exposed in a logging track 200 metres to the north. Only two small pebbles of completely weathered ironstone were found on the grid.

In the south eastern corner of the grid fine grained sandstone and minor thin graded sandstone-siltstones outcrop. A unit of thinly bedded grey siltstones has been metamorphosed to hornfels. These rocks show strong similarities to the Siluro-Devonian units outcropping well to the east.

Tertiary basalt obscures the older rocks in the southern part of the grid.

Twelve rock samples were collected during mapping of the grid. They are described with their analytical results in App. 6.

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C. STRUCTURE

Very poor outcrop and a number of major faults have prevented adequate interpretation of the structure. St. Valentine's Peak conglomerate and the (?overlying) siltstone unit dips very steeply to and faces east. Conglomerate to east dips vertically but no facings were obtained because of poor outcrop. Sandstones and siltstones in the southeast of the grid strike at 45° to the conglomerates and dip (and probably face) to the southeast.

A number of interpretations are possible. A fault was intersected in the drill hole, SV 1. Severe fracturing along the creek through 20400N/397000E indicates a northeast trending fault. Movement along this fault appears to be east block south and down. A major fault trends northeast through the area just southwest of the grid. This fault appears to terminate the conglomerates with movement south block to the northwest. The strikes in the southeast of the grid may represent drag on the major fault (see Geology Drg. 78-178A and accompanying Linear plan Drg. 179-381).

Three possible structural sections through St. Valentine's Peak are shown in Fig. 3. Sections A and C show the magnetite skarn as developing in Ordovician rocks, whereas Section B shows it developing in Cambrian rocks. A fourth possible section would be a continuous stratigraphic sequence in which two conglomerate units were deposited. Although this alternative would help explain the difference in thickness between the two conglomerates it is considered unlikely that the conglomerate deposition would repeat here (i.e. two uplifts in rapid succession) and not elsewhere (e.g. Mt. Everret, Companion Hill and Two Hummocks).

D. GEOPHYSICS.

(1) Magnetics

The initial grid was covered by a total field magnetic survey using proton precession magnetometers. A recording base station was used to correct data for diurnal drift to within ± 10 nanoTeslas. Readings were taken every 25 metres (sensor on

2 metre pole) along grid lines and along the base line. A more detailed survey was carried out over the main magnetic anomaly (readings every 10 metres on lines 100 metres apart). The corrected readings are shown on Drg. 79-261 which overlaps the geology plan. Profiles at geology plan scale were prepared from the data (Drg. 79-267) and from them a contour plan overlay the geology was prepared (Drg. 79-266).

A series of narrow, lensoidal 64000/62000 nT highs trend north-south along the eastern contact of the St. Valentine's Peak conglomerate with the hornfels. The high between 21000N and 21500N overlaps the high to its north indicating faulting of magnetite rich rocks or original en echelon deposition of the host rocks. Although a small isolated high lies south along the strike, the main magnetite bodies clearly do not extend south of 21000N. The magnetite extends north of the grid towards the Kara scheelite ore body within Tasminex' E.L. 17/68.

West of the main line of highs, smaller, north-south trending highs apparently occur within the conglomerate. These are very narrow and therefore are at shallow depth. Diamond drill hole SV 1 intersected conglomerate with pebbles and blebs of magnetite skarn indicating that the source for the highs may be small lenses of carbonate pebble rich conglomerate which have been replaced by magnetite.

Shales and siltstones east of the magnetite skarn show as a magnetic low. To their east a low order north-south magnetic high (62550/62300 nT) has an apparent conglomerate source. However it is quite probable that the siltstones and hornfels extend this far east and may contain minor magnetite.

In the south of the grid Tertairy basalt shows typically variable intensities.

(2) Induced Polarisation.

A time domain, gradient array electrical induced polarisation survey was carried out along the 200 metre grid lines by Comalco personnel. Chargeability and resistivity

data were plotted as profiles which overlay the geology sheet (Drgs. 79-264 and 79-265). From the profiles contour plans were prepared at the same scale (Drgs. 79-260 and 79-295).

The resistivity trends are strong and clear. The conglomerates are highly resistive, whereas the hornfels and siltstones are much less so. A continuous resistivity low marks the contact of the St. Valentine's Peak conglomerate with the hornfels indiciating a faulted contact dipping steeply to the east. The resistivity also indicates that the conglomerate in the east of the grid is thinner than shown on the geology plan. In the south east of the grid a series of north east trending highs and lows reflect the contrasts between sandstone/quartzites and siltstones/hornfels in that area. One of these lows corresponds with the faulted contact of the Ordovician conglomerate with the Siluro-Devonian sandstone.

Tertiary basalt in the south of the grid shows a characteristicly flat, low profile.

Although the chargeability contrasts are much weaker than for the resistivity, the same trends are obvious. A small high (16/10m.s.) corresponds with the magnetic high over the magnetite skarn. Strongly chargeable material occurs within the ?Siluro-Devonian sandstones immediately east of their faulted contact with the conglomerate. Minor pyrite was observed in these rocks and is the probable source.

(3) Interpretation of anomalies.

Although a strong resistivity low corresponds with the magnetic anomaly over the prospective skarn horizon, the chargeability shows only a very weak high. A massive pyrrhotite body should contain sufficient disseminated sulphide to give a large chargeability anomaly. The induced polarisation survey therefore indicates that abundant sulphides are not present and that the source rock contains magnetite.

A trend sheet showing the trends and relative magnitudes of magnetic, resistitivity and chargeability highs and lows was prepared as an overlay to the geology sheet (Drg. 79-390).

E. GEOCHEMISTRY

(1) Soil sampling.

Although the skarn horizon does not outcrop an attempt was made to determine if any economic minerals were present by auger sampling into the scree slope to as great a depth as possible. The hand auger failed to penetrate the scree and most 'C' horizon soil samples were collected from a depth of less than one metre.

Samples were dried, sieved through 80 mesh and analysed by Amdel for Sn and W by XRF Code B1 and for Cu, Pb, Zn and Bi by AAS Code C1. Results are plotted at sample sites on a sheet which overlaps the geology plan (Drg. 79-269). They are also tabulated in App. 7.

Values are generally very low. A few samples were apparently obtained of soil from the skarn and have values of 20 ppm or more W and higher than expected Bi, Cu, Pb and/or Zn. All Sn values were very low. The results indicate that minor mineralization is present, but the extreme weathering of the skarn and dilution by scree from up slope prevent any definite conclusions being reached.

(2) Rock sampling.

A number of rock samples were collected during geological mapping. Their descriptions and analyses are attached in Appendix 6. Five of the rock samples were analysed by Amdel for Sn and W by XRF Code B1 and for La, Nb, Ag, Cd, Ge, Sb, As, Cu, Bi, Ba, Co, Mn, Ta, V, Yb, Be, Mo, Ce, Ga, Pb and Zn by emission spectroscopy Code A1 and A2.

Sample 29 (quartz vein and iron oxide) collected from within fractured sandstone near the northeast trending fault contains anomalous Ag (30 ppm), Pb (5000 ppm), Cu (300 ppm), Bi, Sb and As. Veins such as this appear to be responsible for a number of stream sediment Pb anomalies in the area. High Pb and Ag and low Zn are characteristic of

quartz veining associated with the intrusion of acid granites. Sample 6 (a pebble of completely weathered magnetite skarn) is slightly anomalous for W (45 ppm) and Cu (200 ppm).

F. DIAMOND DRILLING.

(1) Justification for drilling.

Because lack of outcrop prevented adequate assessment of the potential of the skarn an initial estimate of 'possible' ore was made on the assumption that the skarn contained economic grades of scheelite where ground magnetic values exceeded 64000 nT. This rule of thumb estimate showed a very optomistic maximum possible 6.3×10^6 tonnes (app. 8). Cross sections for two proposed drill sites were also prepared and are included in the same appendix.

(2) Drilling and results.

Diamond drill hole SV 1 was collared at 21600N 39545E and drilled at an angle of 50° to the west. The hole initially encountered sandstone-siltstones and hornfels before entering a zone of mixed skarn which included epidote-green garnet skarn, pale grey calc-silicate skarn and magnetite-garnet-pyrite skarn. The total skarn thickness intersected was 6 metres. Of this only 1.8 metres was magnetite rich. A fault was then intersected followed by sandstone, siltstone and finally conglomerate, all metamorphosed. The core was geologically logged (see App. 9) and a cross section prepared (see Fig. 4). The core was examined under short wave ultra violet light (no fluorescence observed), photographed, checked for radioactivity and sampled for analysis. Half core samples were sawn from 49.00 to 71.00 metres and sent to Amdel for analysis for Sn and W by XRF Code B1 and 70 element spectrographic scan Code A10. The analytical results are tabulated in App. 10.

The core contained no mineralization and plans to drill a second hole were abandoned.

G. CONCLUSIONS.

In spite of a strong, if narrow, ground magnetic anomaly, diamond drilling failed to locate either a sizeable skarn body or any mineralization. Comparison of the helicopter borne magnetics with the ground survey over the area shows a rapid drop off in intensity with increasing height. This supports the drilling information that the magnetite skarn is small and does not presist to depth. Although completely weathered surface material collected to the north of the grid was weakly anomalous for W (230 ppm), the lack of significant mineralization encountered by drilling is reflected in the absence of scheelite from the creeks draining the area.

The area warrants no further investigation.

026

7. BLYTHE ROAD GRID

A. GENERAL.

Ordovician Gordon Limestone probably underlies Tertiary basalt of unknown thickness in the Blythe Road area in the NW corner of the Guildford E.L. and in the adjoining strip of the Highclere E.L. The limestone here would dip W being on the E limb of a broad synclinorium, the W limb of which appears in the St. Valentine's grid.

Where the limestone - Housetop granite contact is exposed on Blythe Road in the Tasminex E.L., 2 km N of the proposed grid, magnetite skarn bodies have developed. Surface grab samples are anomalous for Zn (3000 ppm) Sn (500 ppm) and W (100 ppm). Very limited drilling by Tasminex for scheelite was unsuccessful. It is probable that no Sn analyses of drill material were carried out.

The aeromagnetic surveys show a number of small, low isolated magnetic anomalies occuring to the S of the magnetite deposits in or under the Tertiary basalt. One of these anomalies straddles the Comalco/Tasminex boundary.

The probable limestone beneath the Tertiary basalt is a prospective host for Kara, Renison, King Island and wrigglite types of mineralization. To assess the thickness of the basalt cover, and to test initially for Renison style massive pyrrhotite mineralization and fluorite skarn, seven east-west grid lines were cut across the possible limestone area spaced 400 metres apart. The grid lines coincide with the helicopter borne airmag survey. No base line was necessary because accurate control of grid line positions was made using 5X airphoto blowups.

Where the basalt was thin enough for induced polarisation to gain information from the underlying rocks fill in lines were cut at 100 metre spacing from 21100N to 21700N. The location of the 400 metre spaced lines is shown on the geology sheet Drg. 79-316 and on Fig. 5. A plan of the fill-in lines is shown on Fig. 6.

The topography of the area consists of a flat swampy basalt plain covered with rainforest. A low ridge of Siluro-Devonian sandstone outcrops on the western boundary and a large steep ridge of Ordovician sandstone and conglomerate forms the eastern boundary.

B. GEOLOGICAL MAPPING.

Reconnaissance mapping was carried out to check for windows in the Tertiary basalt and to define the margins and rock types at the edges of the basalt. The geology was plotted as part of the composite sections for each line (Drgs. 79-347 to 353).

One window of Ordovician sandstone was located near the eastern boundary of Line 21600N. Elsewhere the basalt cover appeared to be extensive although almost no outcrop was observed.

Line 21200N was cut over an extended distance for induced polarisation electrodes and traversed the probable Ordovician-Cambrian boundary near its eastern end. The boundary is not represented by any sudden change in sedimentation, the sandstones becoming finely bedded, disturbed and silty across the "boundary". To the west this line crosses a low Siluro-Devonian ridge of snadstone (which is shown dipping in the wrong direction on the profiles) and terminates in gently west dipping Devonian hornfels.

C. GEOPHYSICS.

The geophysical results are also shown on the seven composite profiles (one for each line).

(1) Magnetics.

A total field proton precession survey was conducted along the lines with readings taken every 25 metres.

Characteristic highly variable intensities occur over the basalt in contrast to the flat profiles over the older rocks on each side. On some lines the magnetic data indicates that the basalt-sandstone contacts are closer to the valley

centre than mapped. This problem is caused by remanent basalt soil and the lack of outcrop.

(2) Induced Polarisation.

A time domain gradient array electrical induced polarisation survey was conducted along the grid lines. Readings were taken every 25 metres using a 25 metre dipole. The data shows that in many places the basalt is thin particularly in the east of the area.

Where the basalt is thick it shows characteristic low resitivities (around 200 ohm metre) and undulating noisy chargeabilities. The soft Siluro-Devonian sandstones in the west are only moderately resistive, whereas the Ordovician sandstones are strongly resistive.

Chareability anomalies were obtained on 2 of the original grid lines. On line 21600N at 403150E a 38/12 millisecond chargeability anomaly corresponds with a slight resistivity low (150/400 ohm metre). The magnetic profile has only moderate relief indicating thin basalt.

On the next line south (line 21200N) a 44/12 millisecond anomaly corresponds with flat resistivities typical of basalt. In this case the chargeability has been read through the basalt but the resistivity of the underlying rocks has probably been blanketed. The magnetics show moderate to gently gradients indicating thin basalt.

To further check these anomalies a pole dipole survey was carried out (also plotted on the composite profiles) using electrode spacings of a = 25, 50 and 75 metres in an attempt to determine the maximum depth to the top of the chargeable material. Only low chargeabilities were obtained because the swampy low conductivity conditions prevented adequate current from being directed into the underlying rocks. However, the survey appears to indicate that the top of the chargeable source is at about a maximum depth of 25 metres. The effectiveness of the survey was also reduced by insufficient coverage to the east of the anomaly centre.

Three pairs of vertical electrical soundings (Schlumberger array) were carried out in an attempt to determine the thickness of the Tertiary basalt. One was at 19600N 3000E where the basalt appeared to be thick, (Fig. 7); the others at 22000N 2700E (Fig. 8) and 22000N 3400E (Fig. 9) close to the zone of chargeability anomalies. At each locality two soundings were carried out in perpendicular directions.

The soundings produced complex results which would be very difficult to model.

At 19600N 3000E the soundings to 100 metres have a very similar form. This suggests that the resistivity of the layer down to 10 to 15 metres is between 1000 - 2000 ohm metres. After this there is a fast decrease in resistivity to perhaps as low as 100 ohm metres, after which the resistivity increases to perhaps as high as 10,000 ohm metres at depth of the order of 50 to 60 metres. The layering is not horizontal but either uneven or inclined plane. The greater than 45° slope of the data for spacings greater than a = 40 metres clearly infoer this.

At 22000N 2700E the soundings show some similarities in spite of their obvious lateral in homogenities. The surface layer to 4.5 metres shows resistivities around 200 ohm metres, after which resistivities drop to about 20 ohm metres. Between 30 and 40 metres the resistivities rise again indicating a more resistive layer below this point.

At 22000N 3400E the individual soundings give clear but opposite interpretations. The surface layer down to 30 to 40 metres about a radius around the centre of the sounding of 50 to 70 metres varies between 1000 and 2500 ohm metres, after which the soundings current electrodes pass over discontinuities as indicated by the steepness of the rise and fall of the resistivity profile.

D. GEOCHEMISTRY

(1) Soil Sampling.

Because of the complete lack of outcrop in the area of the induced polarisation anomalies C horizon soil sampling was carried out over short intervals along lines 21200N and 21600N. If only a shallow cover of basalt soil was present then a geochemical anomaly may have been detected.

The samples were dried, sieved through 80 mesh and analysed by Amdel for Sn and W by XRF Code B1. The results are plotted on the two composite profiles concerned and are tabulated in App. 11.

All samples contained very low Sn and W contents typical of basalt. Examination of the auger samples also found no trace of quartz sand or other material derived from non basaltic rocks.

(2) Rock Sampling.

During mapping along the grid lines, a number of rock samples were collected. Their locations, descriptions and analyses are tabulated in App. 6. Samples were analysed by Amdel for Sn and W by XRF Code B1 and for 21 other elements by emission spectroscopy Code A1 and A2.

None of the samples were anomalous. The hornfels contained higher trace element contents than the snadstones.

E. FOLLOW-UP GEOPHYSICS.

Extra grid lines at 100 metre spacings were cut to cover the induced polarisation anomalies on Lines 21200N and 21600N. Fig. 6 is a plan of these lines. Induced polarisation and magnetic surveys were carried out over this closed in section of the grid.

(1) Magnetics.

Magnetic data was plotted on a 1:2500 scale plan (Drg. 79-317). Magnetic profiles were plotted at the same scale on Drg. 79-318. The total intensity survey was tied

into the same base station as the original. Survey and readings were again taken at 25 metre intervals along the lines.

The profiles show typical basalt edge effect variabilities over the central portion but broad highs, possibly originating beneath the basalt occur in the south east. Trends are very difficult to determine but appear to be north-south.

(2) Induced Polarisation

A time domain gradient array induced polarisation survey was conducted along the follow-up lines (and along the original lines in the area concerned) using the same electrodes as for the initial widely spaced survey. Resistivity profiles were plotted on Drg. 79-319 and the chargeability contours on Drg. 79-320.

The chargeability profiles show a series of simple and complex highs about 40/12 milliseconds. Insufficient information is presented for positive trending, but the trend or trends could be either northwest or north. The maximum high occurs on the original survey line 21200N (composite anomaly 42/12 milliseconds). The width of the anomalies indicates that the basalt is very thin to non existant in parts of the area.

The edge of the basalt as mapped is only about 300 metres to the northeast of the area. The resistivity profiles also indicate thin basalt. Distinctive lows do not occur at the locations of the chargeability highs and no real correlation between the two parameters is obvious. Trends are also indistinct.

F. CONCLUSIONS.

A number of induced polarisation anomalies occur in the east of the area. The source(s) of these are shallow but unknown. Ordovician limestone possibly underlies a thin veneer of weathered basalt in the vicinity and outcropping Ordovician sandstones a few hundred metres to the west are contact metamorphosed by a granite at shallow depth.

The area has potential for carbonate replacement by Sn bearing pyrrhotite, which cause induced polarisation anomalies similar to those observed.

032

8. TALUNAH ROAD AIRMAG ANOMALY

A. GENERAL

The helicopter borne aeromagnetic survey shows three distinct magnetic highs in the northwest of the area flown. The strongest is just south of Talunah Road and is a broad high of 750 nT above background. The high trends northeast for about 1.7 km.

Two other highs lie to the south and are around 400 nT above background with characteristics and trends similar to the Talunah Road high. These were named Basil's Road and Companion anomalies.

The area in which the magnetic highs occur is a Tertiary basalt peneplain covered with pine plantations. Ordovician limestone very probably underlies the basalt in this area in the axis of a syncline which should exist west of Companion Hill. This axis would trend north east parallel to the magnetic highs.

These anomalies were thought to possibly have very large deeply buried scheelite bearing magnetite skarns as their source. This hypothesis appeared to be supported by the offset between the Basil's Road and Talunah Road anomalies corresponding to north west trending fault which passes through the Kara deposit (see 1 mile geology plan Drg. 78-178A) and has apparent movement of north block to the west.

Rather than put a conventional grid over the area, a number of magnetic and induced polarisation profiles and soundings were carried out to locate the anomalies accurately on the ground and to enable initial assessment.

B. MAGNETICS

Total field intensity profiling was carried out along roads traversing the Talunah Road and Basil's Road anomalies. Readings were taken every 20 metres along the roadsides except where sudden changes in intensity were observed.

Readings were then taken every 5 metres until the area of strong gradient was passed. This was done to gain information on the depth to the source of the gradient and to correlate with magnetic susceptibility measurements which were taken on basalt float or outcrop.

(1) Talunah Road anomaly.

Data for the Talunah Road anomaly is shown on Drg. 79-345. The ground magnetics show very broad gentle gradients indicating either a sheet source (Tertiary basalt) or a more massive source at gret depth (Cambrian mafic volcanics?) magnetic susceptibilities of surface basalt boulders are all reasonably low but are sufficient to cause the observed values.

(2) Basil's Road anomaly.

Ground magnetic profiling was carried out along two roads which cross the anomaly east-west. (Dudfields and Ringwood roads). Data was plotted on Figs. 10 and 11.

Strong near surface gradients reflect the variable and often high magnetic susceptibilities of surface basalt boulders.

C. TALUNAH ROAD INDUCED POLARISATION

In a vain attempt to assess the thickness of the basalt and to detect any sulphides, time domain gradient array profiling was carried out as two east-west traverses. Three vertical electrical soundings (Schlumberger expanders) were also carried out.

Data from the gradient array profiling was plotted on Drg. 79-346 which overlays the magnetics. The vertical electrical soundings were plotted on graph paper and are attached as Fig. 12.

The gradient array resistivity profiles show broad gradients similar to the magnetics and the values are low. The gradient array chargeabilities show a typical flat

undulating basalt character.

Although the basalt is obviously very thick, the sounding profiles are complex reflecting lateral changes in the resistivity of the basalt. These changes prevented detailed interpretation of the data.

D. CONCLUSIONS.

The Talunah Road, Basil's Road and Companion magnetic anomalies have sources either in the Tertiary basalt or in deep seated mafic igneous rocks. The area is covered by thick basalt and there is no indications of mineralization.

035

9. SUB-BASALTIC TIN-TUNGSTEN SEARCH

90% of E.L. 1/76 is a peneplain of thick Tertiary basalt. Beneath the basalt there exist potential host rocks for Renison-Mt. Bischoff style pyrrhotite-cassiterite mineralization, Kara and King Island styles of scheelite mineralization, and Kuroko-Rosebery style volcanogenic Cu-Pb-Zn mineralization.

The Tertiary basalts present a barrier to most subsurface exploration techniques. They have strongly variable magnetic susceptibilities and orientations. They are resistive near the surface, but conductive at depth and also show lateral variations in resistivity. Numbers of flows exist (some massive, some vesicular) separated by weathered soil horizons and tuffs. These characteristics make the basalt impenetratable by most magnetic, electrical and seismic techniques. An even greater barrier is presented to return of geophysical signals from the underlying Palaeozoic rocks to the surface.

An initial feasibility study of a sub-basalt search is attached as App. 12. Magnetic modelling of a Renison type ore deposit is included in the same appendix. This model indicates that detection through basalt using magnetics is not possible.

Rapid reconnaissance magnetic induced polarisation (frequency domain) was proposed as a technique capable of reading the Palaeozoic rocks beneath the basalt. A comparison was conducted over Two Hummocks a few kilometers east of E.L.1/76 and the results, discussed in App. 13, were negative. In fact conventional induced polarisation appeared to work better.

Three diamond drill holes were drilled by Northern Prospecting (North Broken Hill) in an attempt to see through the basalt. What core could be found was geologically logged and magnetic susceptibility readings were taken (App.14). Much of the core is strongly vesicular basalt, the vesicles often being filled with zeolites (mainly chabazite). Weathered soil and tuffaceous horizons also occur. Magnetic susceptibility is highly variable (0.1 to 1.7 x 10^{-3} c.g.s. units), particularly in the zeolitic sections. The core is stored at the Department

of Mines store and much was lost before transit there.

A satisfactory sub-basaltic search would be expensive and would require much carefully conducted geophysics. However the possible rewards (e.g. a Renison or a Mt. Bischoff) are large.

10. RECOMMENDATIONS

The conclusions drawn in sections 3 to 9 show that some areas warrant further exploration as set out below.

A. GENERAL RECONNAISSANCE.

(1) More ground geological prospecting is needed in the Companion Hill Anticline in an attempt to locate carbonate horizons. Efforts should be concentrated on those areas unmapped on the 1:20,000 geology map, particularly between Guildford Road and Companion Hill.

(2) The area around the western contact of the granite Cupola 5 km north of St. Valentine's Peak has Sn and scheelite stream anomalies and minor carbonate rich rocks. Detailed prospecting of the area is needed (see Sec. 3B (1)).

(3) Scheelite detected in three streams draining a narrow Siluro-Devonian meta siltstone unit, trending north-north west from ref. 402200E 420200E, warrants further examination and detailed rock chip sampling (see Sections 3C and 4C + 1978 Report Drg. 78-186).

B. BLYTHE ROAD.

Induced polarisation anomalies occur over possible unexposed Ordovician limestone which may have been replaced by Sn bearing pyrrhotite skarn (see Section 7 F). Two diamond drill holes are warranted to test this possibility. The first hole (vertical) should be drilled at grid ref. 21600N/403140E and the second at ref. 21200N/403600E. Detailed geophysical logging should be carried out down and around hole to test the characteristics of the basalt.

C. SUB-BASALTIC SEARCH.

The recommendations for a comprehensive sub-basaltic search in E.L.1/76, listed in App. 12 deserve the most serious consideration. However, the aeromagnetic survey recommended may not be much use. Although the cost of search would be

expensive, the possible reward of ($3000 million worth of ore) justifies it.

Areas deserving particular attention are:-

(1) Mt. Bischoff like dykes anomalous for Sn and W, southwest of St. Valentine's Peak beneath the basalt.

(2) North of Mt. Pearse.

(3) Where basal Cambrian carbonates may occur in the west of E.L. 1/76.

D. VOLCANOGENIC Cu - Pb - Zn.

Gossany quartz veins containing 1.65% Pb in altered acid volcanics (see Section 4A (3)) indicate that the area around Gin Creek is prospective for Rosebery style mineralization. Exploration beneath the surrounding basalt is warranted.

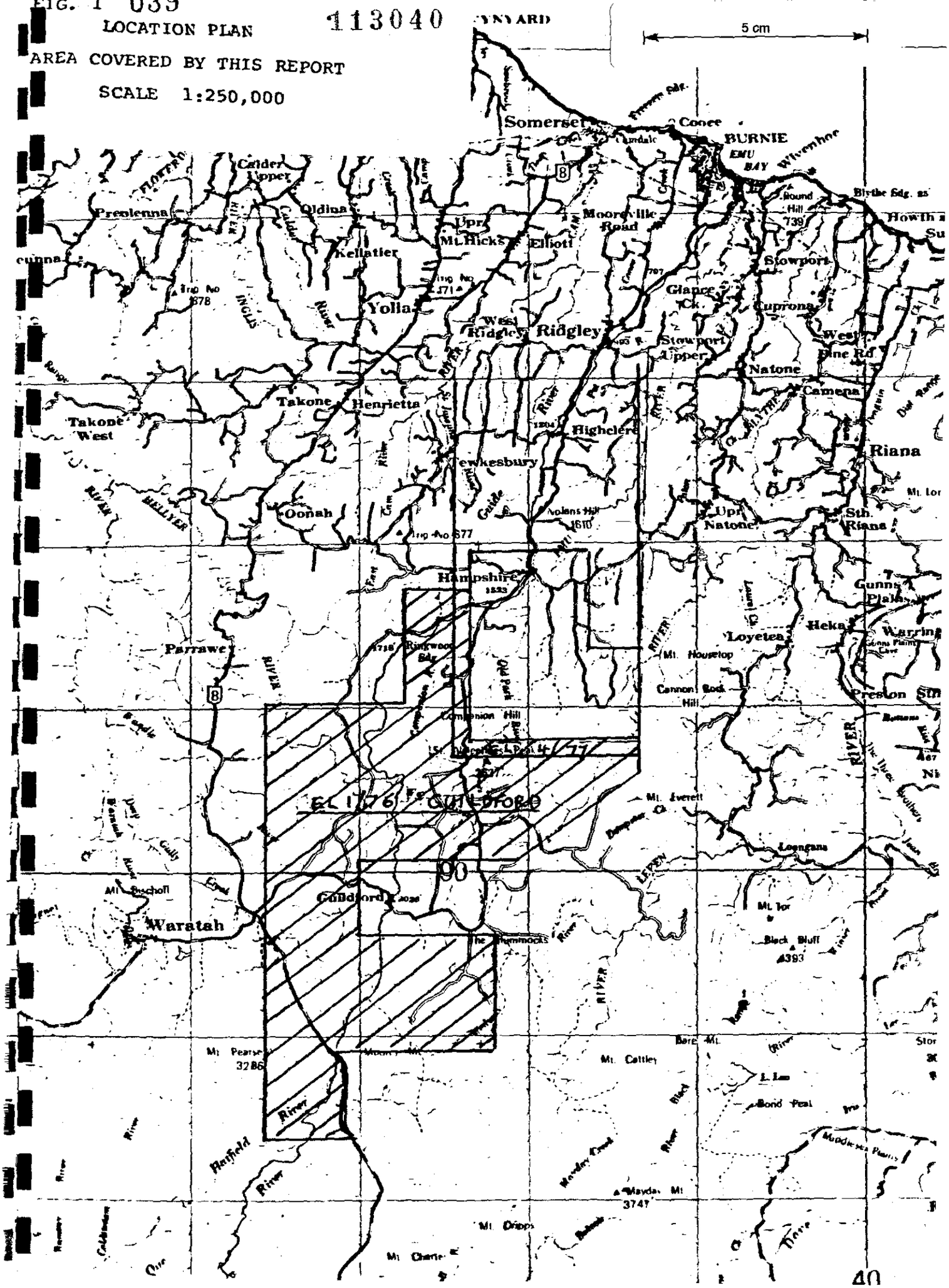
FIG. 1 039

LOCATION PLAN

AREA COVERED BY THIS REPORT

SCALE 1:250,000

113040



[redacted]

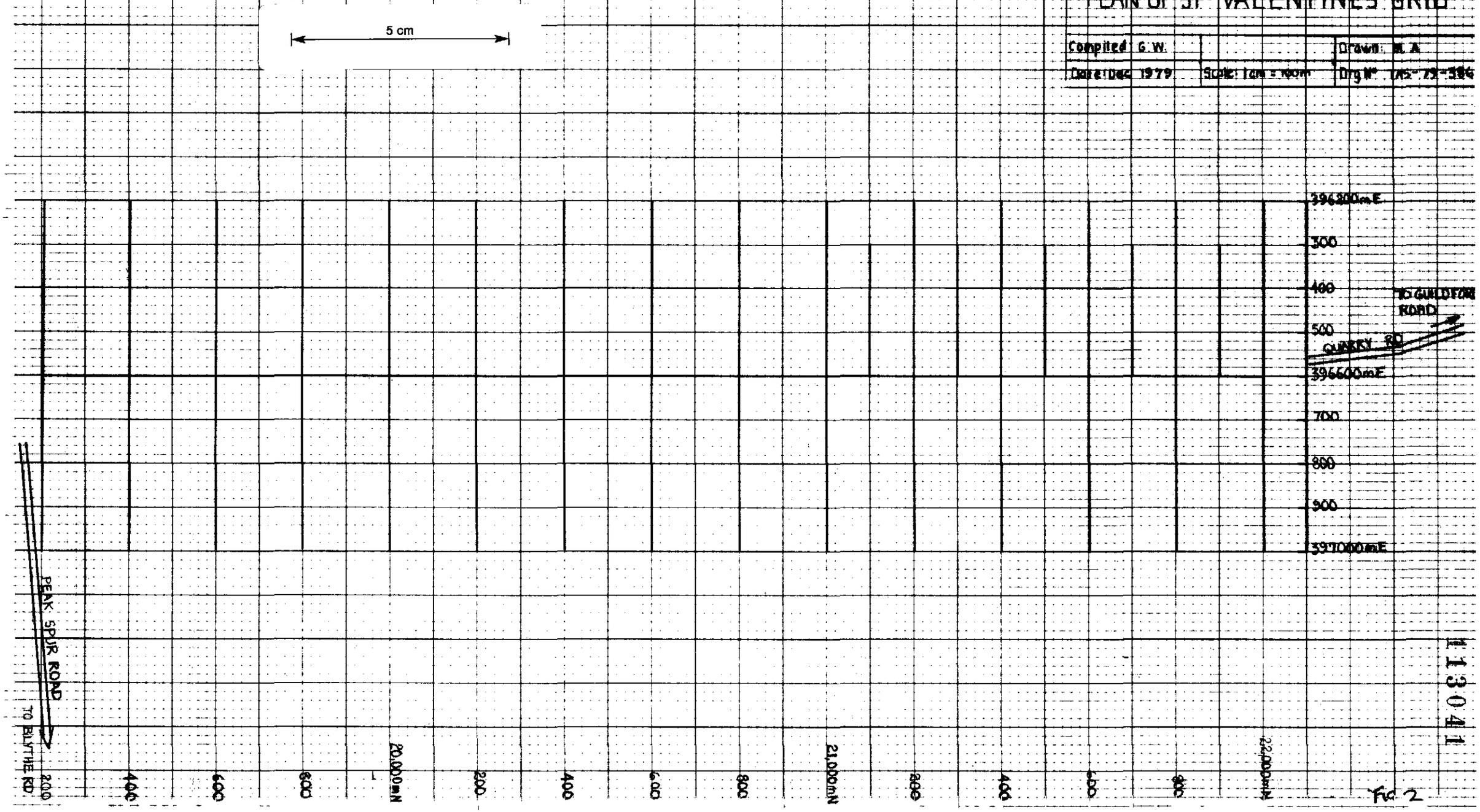
COMALCO

040

TASMANIA
EL 4/77 & EL 1/76

PLAN OF ST VALENTINES GRID

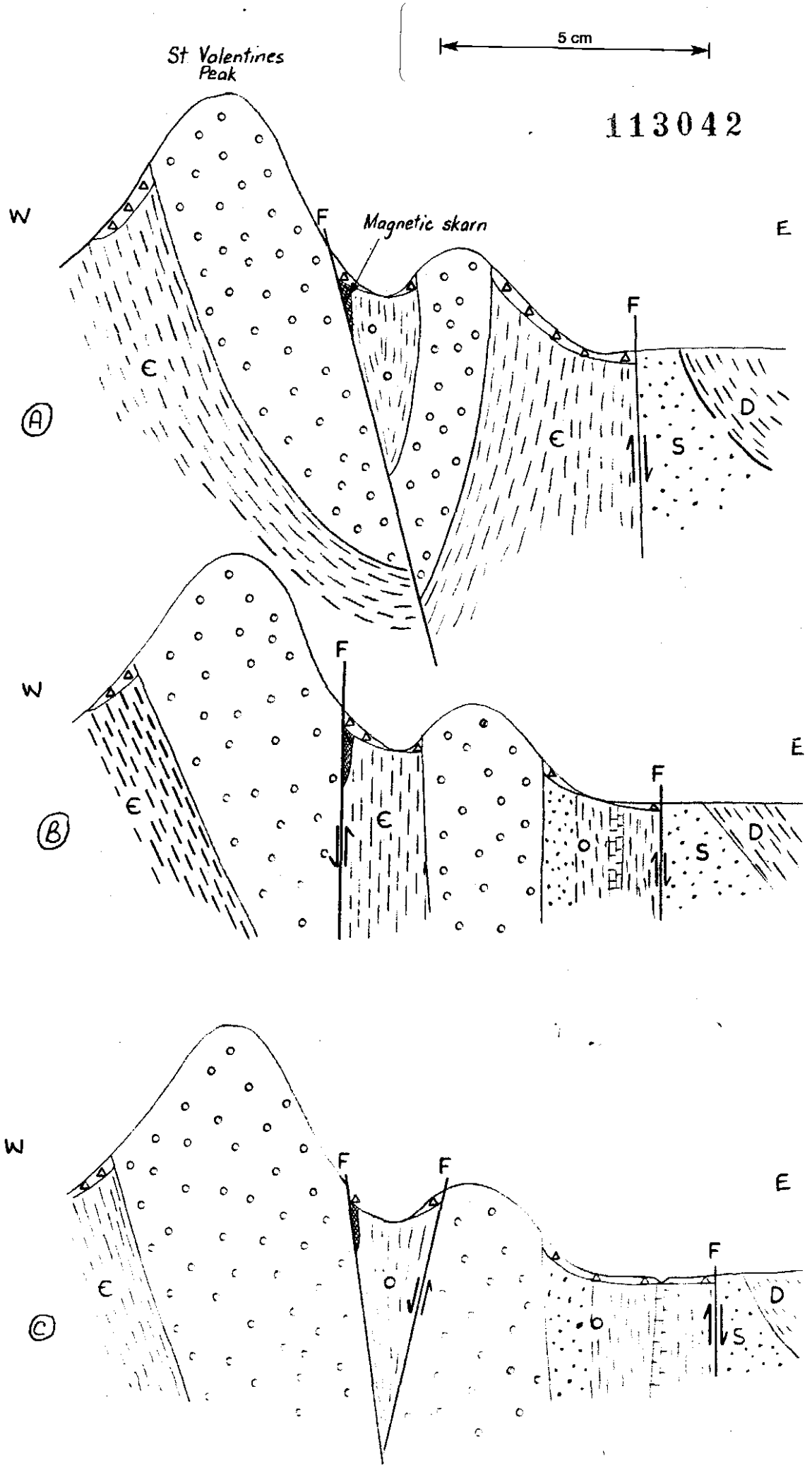
Compiled: G.W.		Drawn: M.A.
Date: Dec 1979	Scale: 1cm = 100m	Drg N° TAS-79-386



113041

Fig 2

041

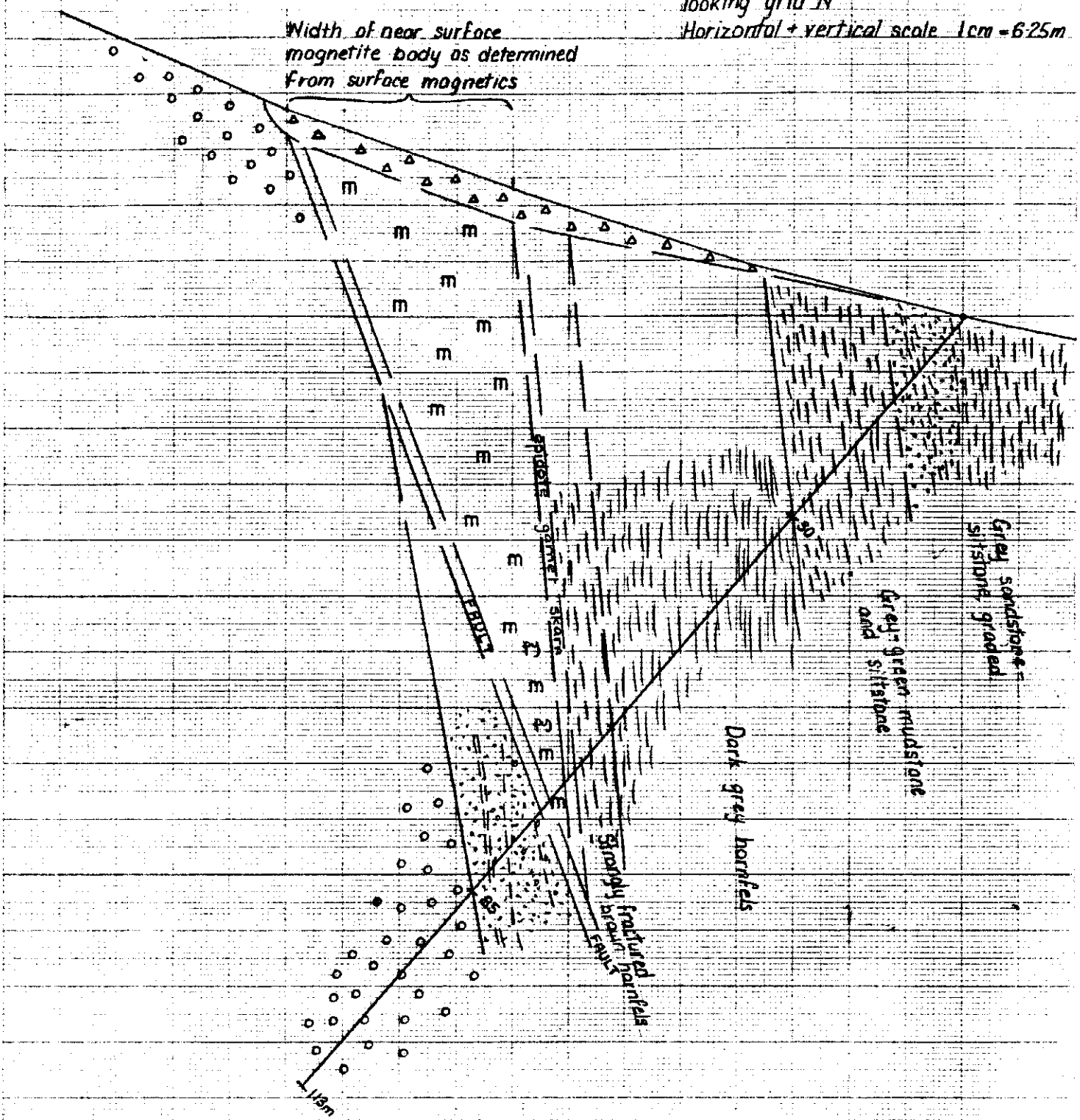


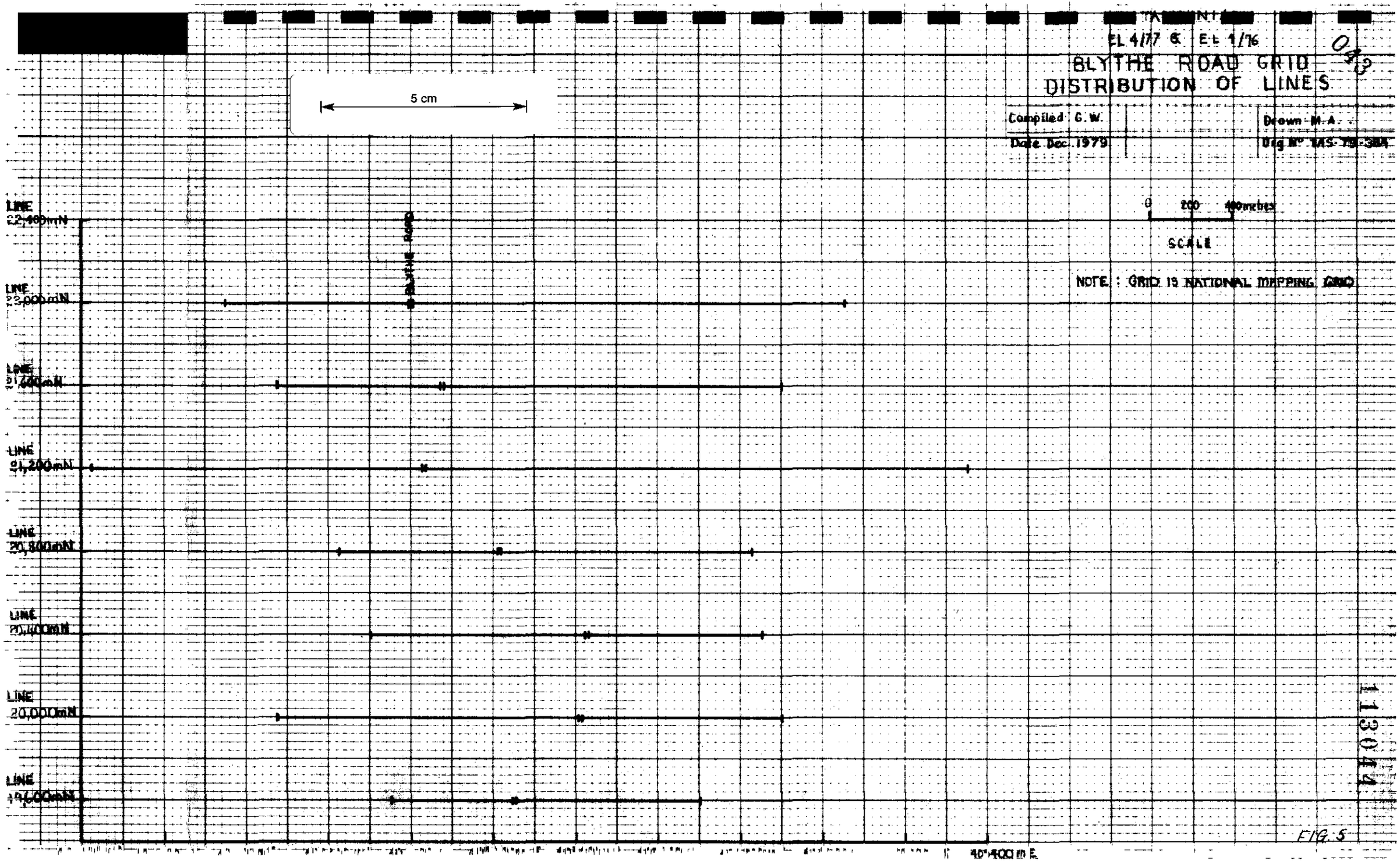
Various hypothetical sections through St Valentines Peak. Section width about 4 km

Fig 3

W 042 E

E.L. 4/77 HIGHCLERE
St Valentines Grid
Section through diamond drill hole SY1
looking grid N
Horizontal + vertical scale 1cm = 6·25m

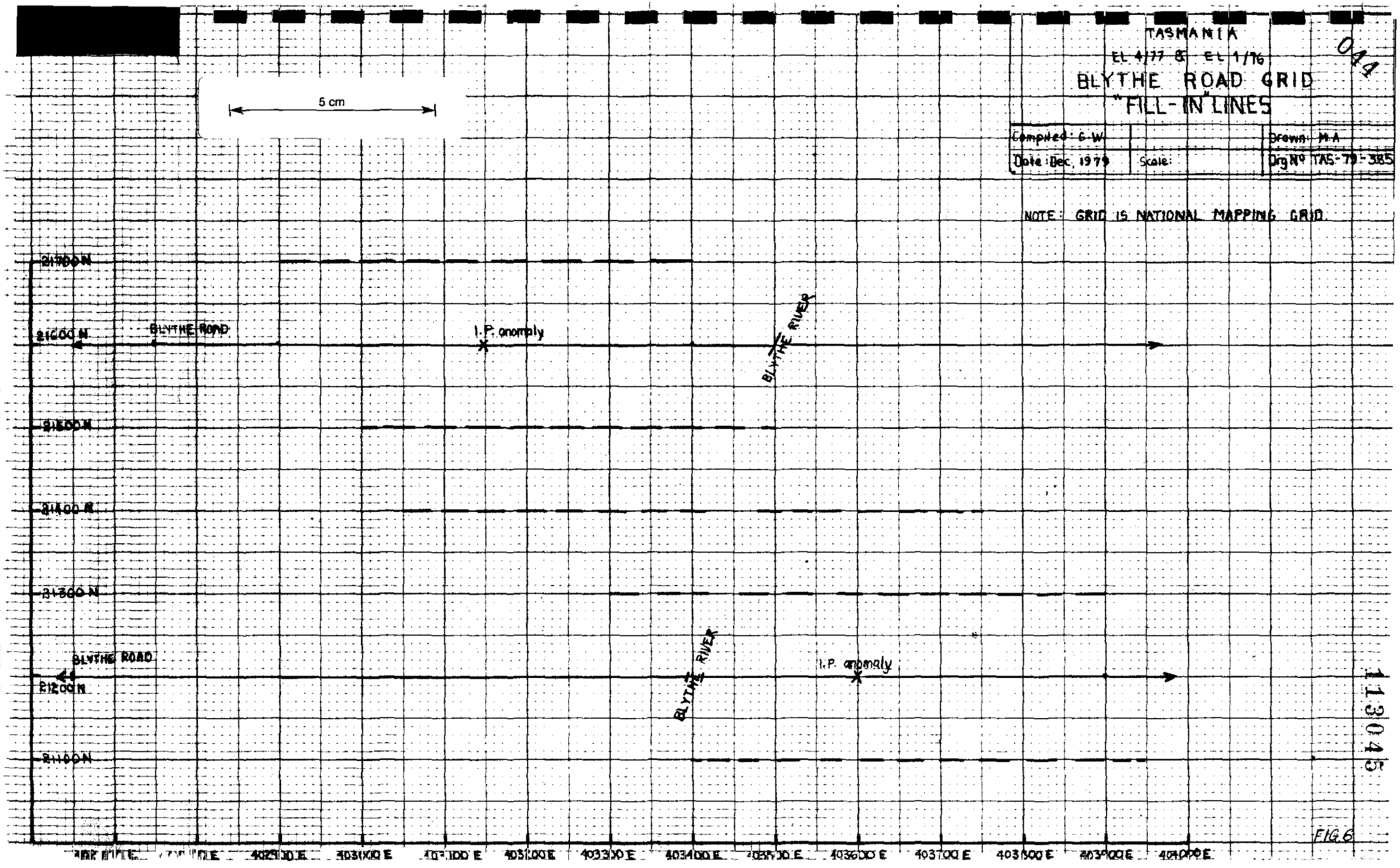

Width of near surface magnetite body as determined from surface magnetics
m
m
m



EL 4/77 & EL 4/76
BLYTHE ROAD GRID
DISTRIBUTION OF LINES
Compiled G.W.
Date Dec. 1979
Drawn M.A.
Drg No TAS-79-384
0 200 400 metres
SCALE
NOTE : GRID IS NATIONAL MAPPING GRID
5 cm
LINE 22,400mN
LINE 22,000mN
LINE 21,600mN
LINE 21,200mN
LINE 20,800mN
LINE 20,400mN
LINE 20,000mN
LINE 19,600mN
BLYTHE ROAD
40°400 m E

FIG. 5

113044


TASMANIA
EL 4/77 & EL 1/76
BLYTHE ROAD GRID
"FILL-IN" LINES
Compiled: G.W.
Drawn: M.A.
Date: Dec. 1979
Scale:
Drg No TAS-79-385
NOTE: GRID IS NATIONAL MAPPING GRID
5 cm
21700N
21600N
21500N
21400N
21300N
21200N
21100N
BLYTHE ROAD
I.P. anomaly
BLYTHE RIVER
BLYTHE ROAD
BLYTHE RIVER
I.P. anomaly
402900E
403000E
403100E
403200E
403300E
403400E
403500E
403600E
403700E
403800E
403900E
404000E
FIG 6

045

113046

Fig. 7

5 cm

A [illegible] LAUDINO
RECTIFIER ROAD CKRK
Vertical electrical soundings
Schlumberger expander
Area grid 19600N 1400E
Equipment Resistivity transmitter
Scintrex IRIS receiver
Operator A Laudino

2000 2

N-S

E-W

Appr. Resistivity in Ωm

Chargeability in ms

distance a in metres

N-S

E-W

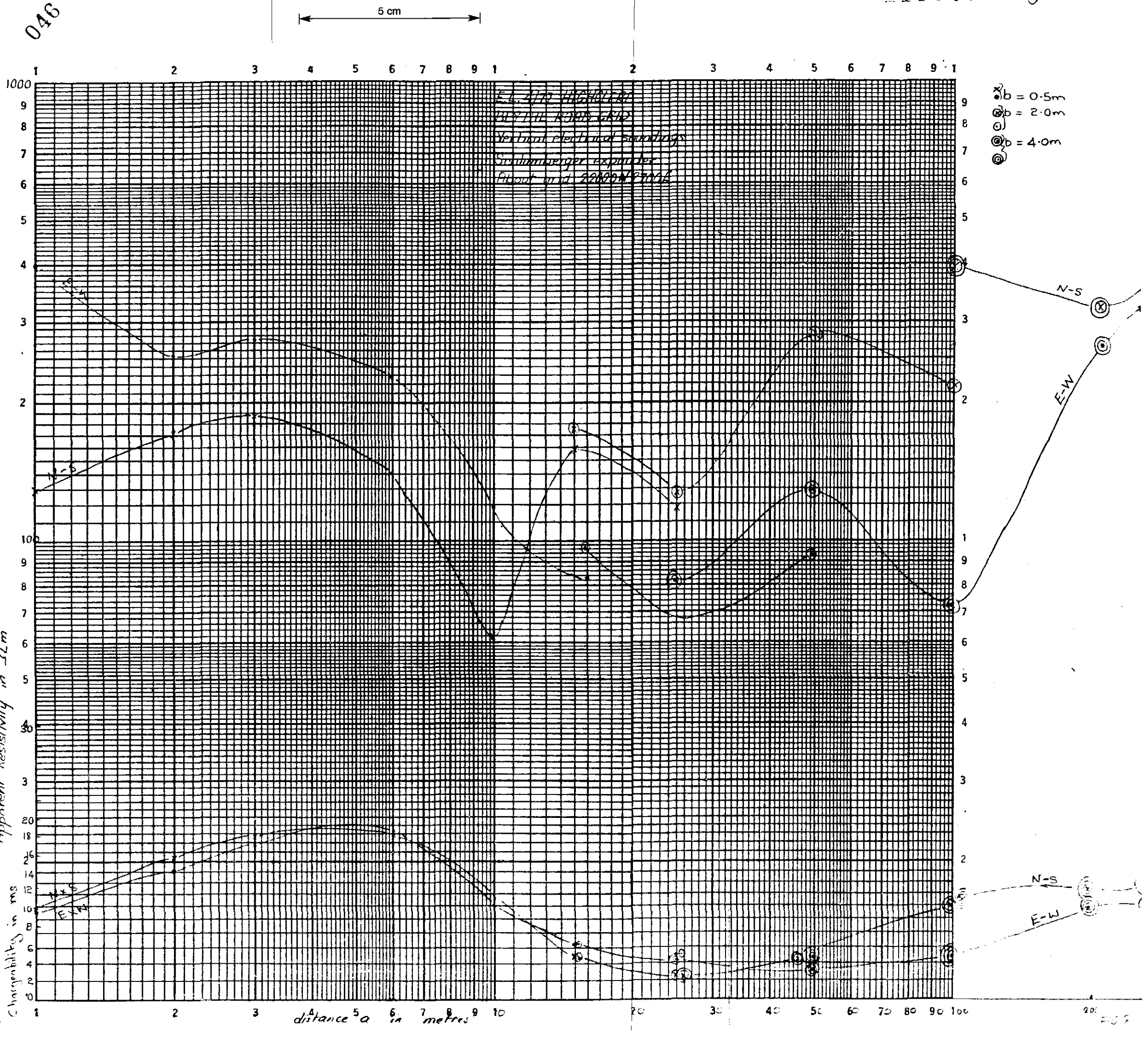
b=0.5

b=1.0

HARDING & HALDEN—AUSTRALIA

046

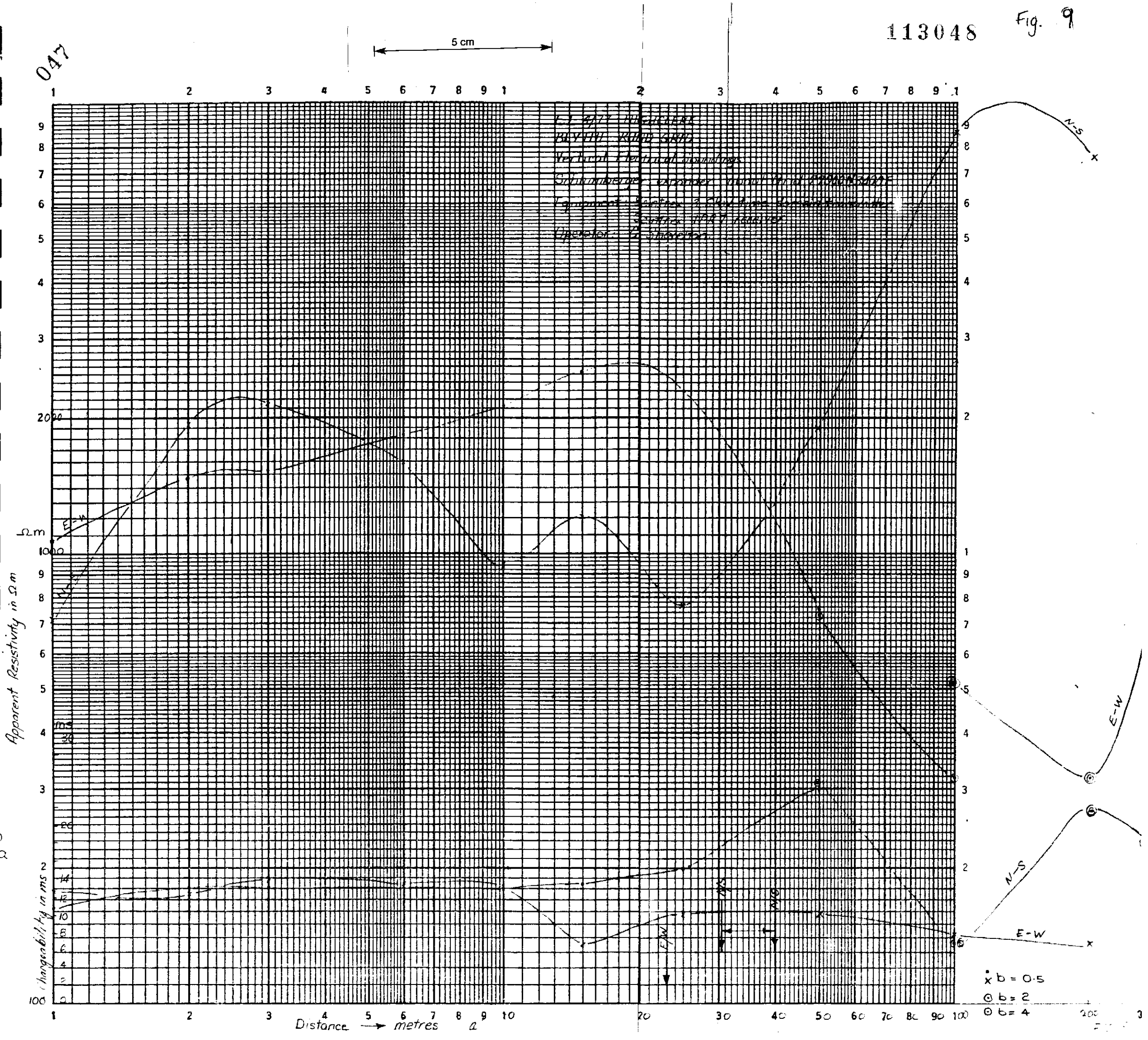
113047 Fig 8

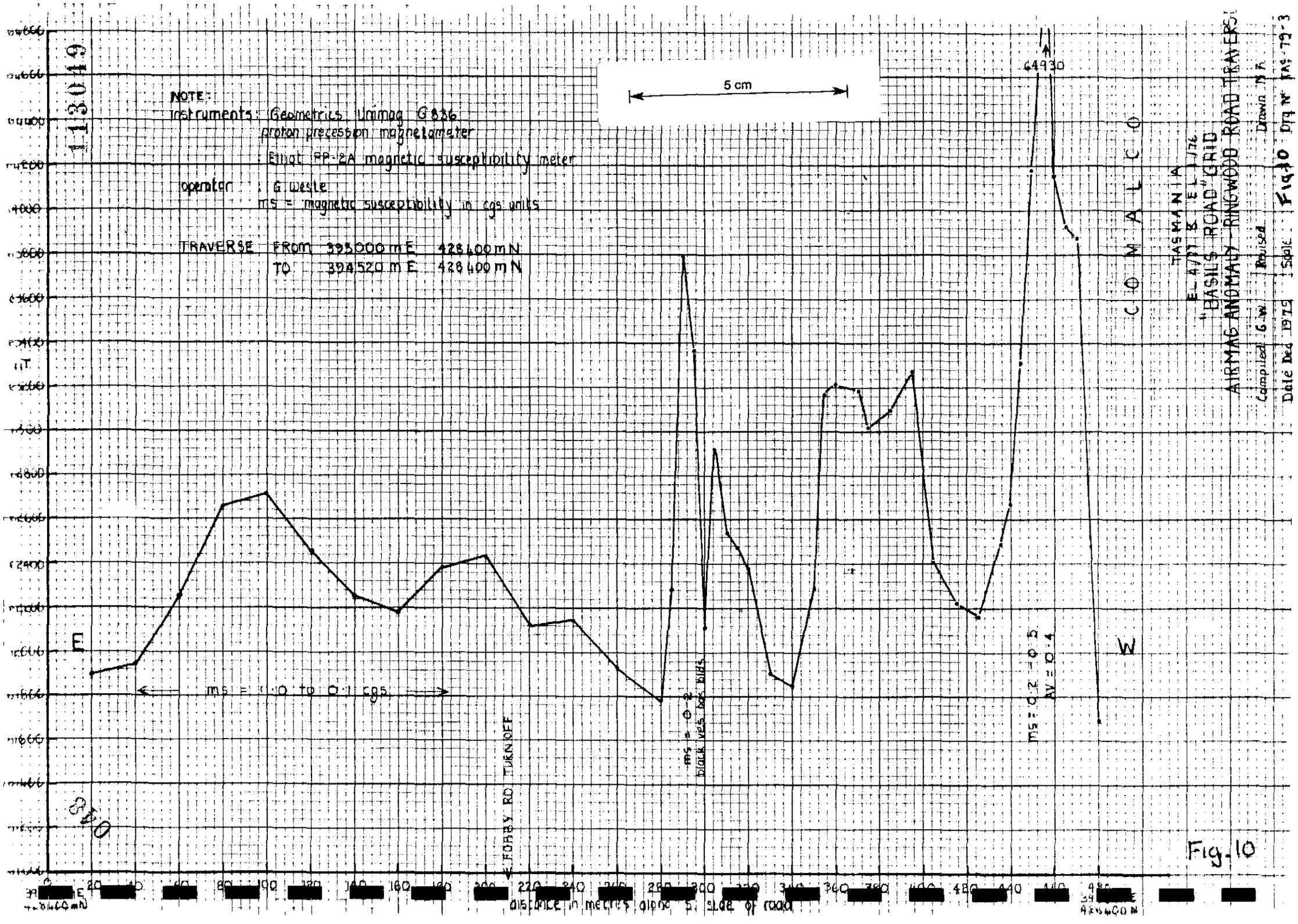


047

113048

Fig. 9





113049
NOTE:
Instruments: Geometrics Unimag G836
proton precession magnetometer
: Elliot PP-2A magnetic susceptibility meter
operator : G Weste
ms = magnetic susceptibility in cgs units
TRAVERSE FROM 395000 mE 428400 mN
TO 394520 mE 428400 mN
5 cm
64930
COMALCO
TASMANIA
EL 4/77 & EL 1/76
"BASILS ROAD" GRID
AIRMAG ANOMALY - RINGWOOD ROAD TRAVERSE
Compiled G.W.
Revised
Drawn N.A.
Date Dec 1979
Scale
Fig 10
Drg No TAS-79-3
E
W
ms = 0.0 to 0.1 cgs
FOBBY RD TURNOFF
ms = 0.2
black ves bas blds
ms = 0.2 - 0.5
AV = 0.4
distance in metres along S. side of road

Fig. 10

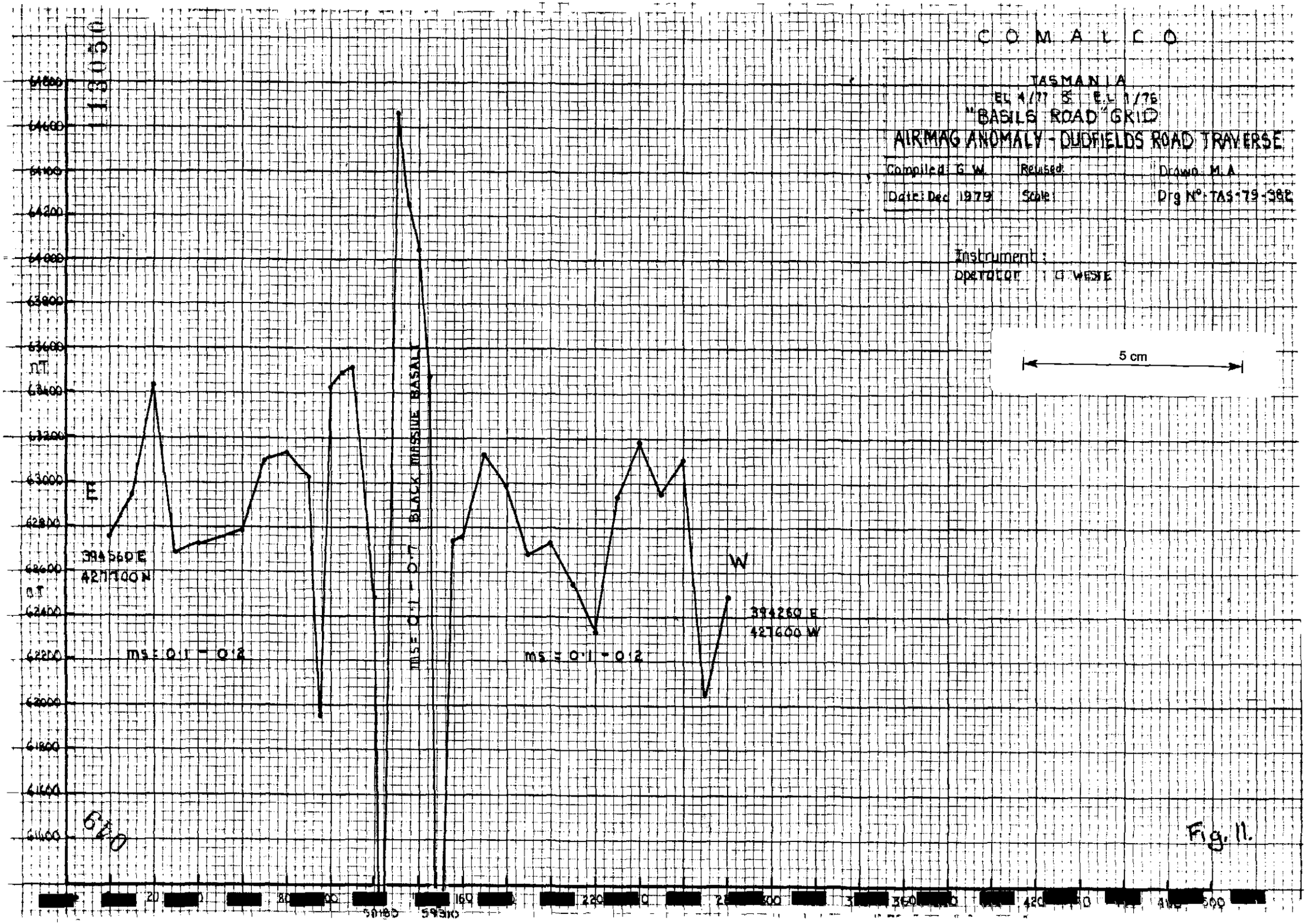

COMALCO
TASMANIA
EL 4/77 & EL 1/76
"BASILS ROAD" GRID
AIRMAG ANOMALY - DUDFIELDS ROAD TRAVERSE
Compiled: G.W.
Revised:
Drawn: M.A.
Date: Dec 1979
Scale:
Drg No: TAS-79-382
Instrument:
Operator: G WESTE
5 cm
nT
E
394560 E
427700 N
ms = 0·1 - 0·2
ms = 0·1 - 0·7 BLACK MASSIVE BASALT
ms = 0·1 - 0·2
W
394260 E
427600 W
50180
59310

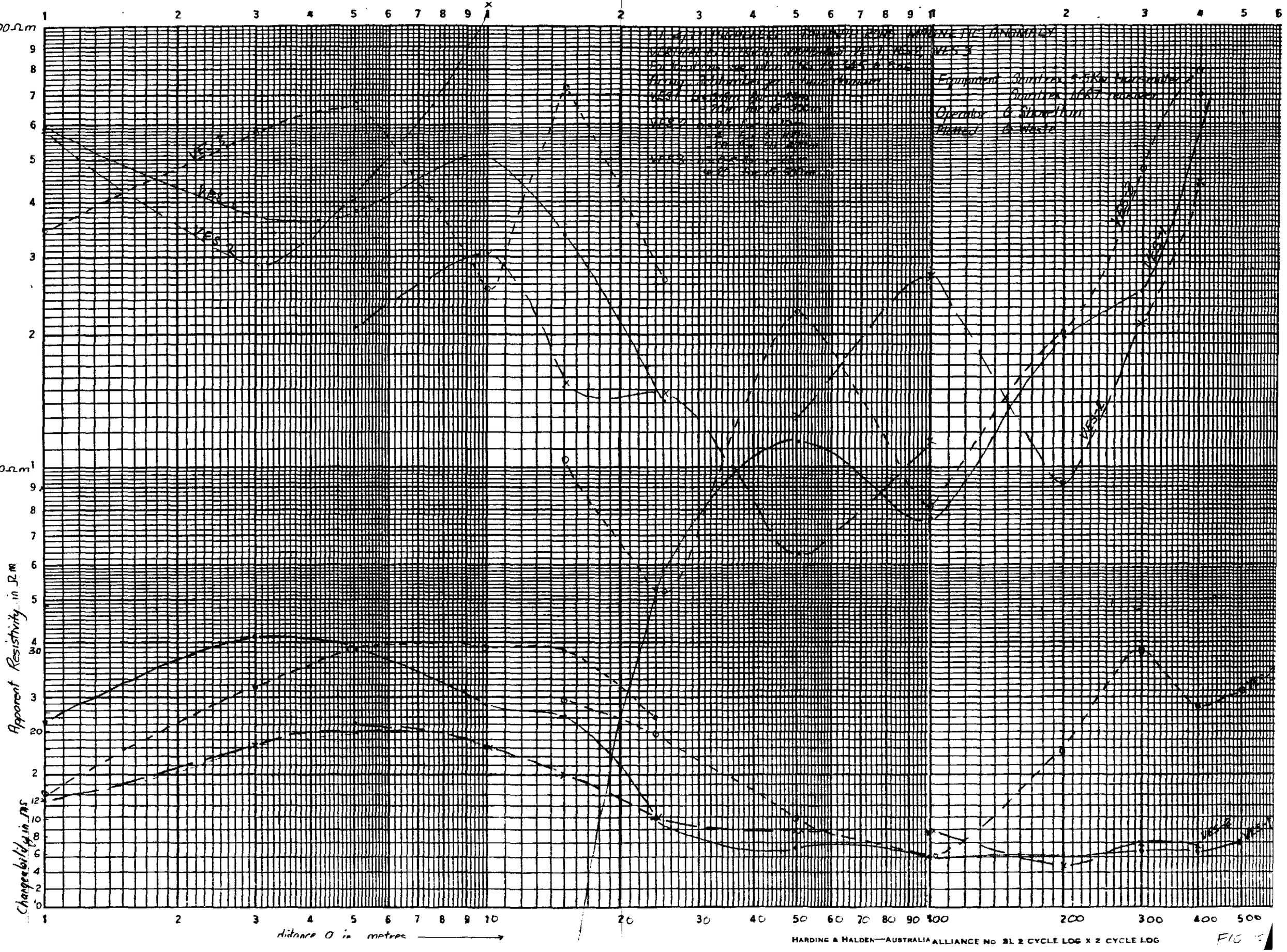
Fig. 11.

050

Fig. 12

113051

5 cm



113052

APPENDIX 1

ANALYTICAL RESULTS

USED BY AMDEL

APPENDIX 1

ANALYTICAL METHODS USED BY AMDEL

EMMISSION SPECTROSCOPY

Semi quantitative analysis by DC are exitation.
Codes A1, A2, A10
Detection limits on next page.

X-RAY FLUORESCENCE

Code B1
Sample is powder proned into a sample holder following fine pulverisation. Peak intensities are corrected for background, matrix and interferring elements by computer.
Detection limits are: Sn : 4ppm; W : 10ppm

ATOMIC ABSORPTION SPECTROSCOPY

Code C1
Digestion with boiling perchloric acid. Values are corrected for spectral background absorption.
Detection limits are: Cu : 2 - 10,000ppm
Pb : 5 - 5,000ppm
Zn : 2 - 10,000ppm
Bi : 10 - 10,000ppm

SPECTROGRAPHIC ANALYSIS

Detection-Limit Concentrations of Elements
DC Arc Excitation

ELEMENT	ppm	ELEMENT	ppm
Ag	0.1	Mo	3
Al	100	Na	50
As	50	Nb	20
Au	3	Ni	5
B	3	P	100
Ba	200	Pb	1
Be	1	Rb	10
Bi	1	Sb	30
Ca	100	Sc	3
Cd	3	Si	100
Ce	300	Sn	1
Co	5	Sr	10
Cr	20	Ta	100
Cs	30	Te	20
Cu	1	Th	100
Fe	100	Ti	100
Ga	1	Tl	1
Ge	1	V	10
In	10	W	50
K	5	Y	10
La	50	Yb	1
Li	1	Zn	20
Mg	100	Zr	100
Mn	10		

053

113055

APPENDIX 2

STREAM MAGNETIC SAMPLES

EMISSION SPECTROSCOPIC ANALYTICAL RESULTS

054

REPORT AC 1570/79 113056

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
FD/T/HI M 427	x	60	20	70	0.1					
8	x	200	30	100	0.3					
9	x	40	5	70	x					
30	x	50	10	80	0.2					
1	x	100	20	60	0.3					
2	x	50	10	100	x					
3	7	200	30	150	0.3					
4	x	40	5	80	x					
5	2	40	1	70	x					
6	x	40	5	80	x					
7	x	80	10	30	x					
8	x	150	20	70	0.1					
9	x	70	10	100	x					
40	x	100	30	200	x					
1	x	100	20	20	0.3					
2	x	70	20	40	x					
3	x	70	10	50	x					
4	x	100	10	30	x					
5	x	100	10	40	x					
6	x	150	20	30	0.2					
7	x	80	20	30	0.2					
8	x	70	10	100	0.1					
9	x	80	20	70	0.1					
50	x	70	10	80	x					
1	x	80	10	100	x					
2	x	80	10	60	x					
53	x	80	10	40	x					

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical techn...

055

113057

REPORT AC 1570/79

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
M454	x	310	15	510	x					
5	x	1010	110	160	0.1					
6	x	310	15	510	x					
7	x	1010	310	1010	x					
8	x	1010	110	140	0.1					
9	x	810	110	1010	x					
60	x	1010	210	160	0.1					
1	x	1010	210	2010	x					
2	x	710	110	1010	x					
3	x	1010	210	2510	x					
4	SAMPLE	LOST		REJECTED						
5	x	1010	310	210	x					
6	x	710	310	160	x					
7	x	310	110	1010	x					
8	x	1010	110	100	0.2					
9	x	810	110	410	x					
70	x	710	210	1510	x					
1	x	610	210	710	x					
2	x	710	210	2010	x					
3	x	710	210	1510	x					
4	x	710	210	710	0.2					
5	x	1010	110	1510	x					
6	x	810	110	410	x					
7	x	710	110	1010	x					
8	x	1010	310	710	0.2					
9	1	710	210	1010	0.1					
M480	5	1010	310	310	0.3					

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

056

REPORT AC 1570/79

113058

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
M481	12	710	310	1010	x					
2	13	1510	310	1510	x					
3	17	810	510	1510	x					
4	12	410	310	710	0.1					
5	x	1010	110	200	0.2					
6	13	810	310	1010	0.2					
7	11	710	310	1010	x					
8	12	810	510	1100	x					
9	x	1010	510	1510	x					
90	12	810	510	1010	x					
1	13	810	510	1010	x					
2	14	710	510	710	0.2					
4	x	710	110	200	x					
5	x	810	210	810	0.2					
6	x	710	110	710	0.2					
7	x	710	15	100	x					
8	14	810	510	1010	0.2					
9	14	710	510	1010	0.2					
500	x	1510	310	710	0.2					
1	x	1010	310	610	0.2					
2	13	1510	1010	810	0.1					
3	x	1010	210	1510	0.1					
4	x	810	210	1510	x					
5	x	1010	210	1010	x					
M506	14	1010	710	1510	x					

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique

Off Rec'd not listed

REPORT AC 1570179

113059

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
M507	x	1010	510	1010	x					
8	x	1010	310	1010	0.1-.2					
9	x	1010	510	1510	0.1-.1					
10	x	710	210	610	0.1-.2					
1	x	810	310	1510	0.1-.1					
3	30	810	310	1010	0.1-.1					
* 514	x	810	210	1010	0.1-.1					
515A	x	810	510	1010	0.1-.2					
515B	LOST	ED	NOT	REC'D						
517.	LOST	ED	NOT	REC'D						
* 517.	2	710	810	70	x					
9	1010	810	1010	810	0.1-.1					
20	410	1010	1010	2010	0.1-.4					
1	110	310	810	510	x					
2	210	810	510	1510	x					
3	3	1510	510	1010	0.1-.1					
4	x	510	210	1510	0.1-.1					

058

REPORT AC 15701/79

113060

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
					10.2					
RDITG U M253	x	710	110	710	10.1					
4	x	710	210	710	x					
5	x	610	110	710	x					
6	x	810	310	710	x					
7	x	510	110	310	x					
8	x	610	310	1100	10.1					
9	1	610	810	1200	10.1					
260	1	810	1010	1510	10.2					
271	x	610	110	710	x					
?	x	710	210	610	131.10					
:	x	710	115	810	x					
.	x	710	210	1510	101.1					
5	140	610	110	1010	x					
M276	x	810	210	1510	101.2					

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

059

REPORT AC 15701/79

113061

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
M277	x	710	210	1510	0.1					
E	x	610	10	1510	0.1					
9	x	810	10	2000	0.2					
80	x	610	5	1510	x					
1	x	510	710	1510	0.1					
2	x	810	510	1510	0.2					
83	40	810	2010	1510	x					
86	x	1010	1010	3010	x					
87	x	310	210	710	x					
90	x	510	210	1000	x					
91	x	510	5	1510	0.1					
97	x	510	210	2000	0.2					
298	x	710	210	2010	0.1					
300	x	710	5	1810	0.3					
01	x	710	310	1010	0.1					
04	x	710	210	1510	0.2					
05	x	710	5	1010	0.1					
06	x	710	210	140	0.1					
11	x	810	210	2010	x					
12	x	1010	210	2000	0.3					
13	x	1010	110	1510	x					
15	x	1010	110	1010	0.8					
16	x	1010	110	1510	0.1					
17	x	1010	110	2000	x					
19	x	1010	110	2010	0.1					
10	x	510	5	1310	0.2					
[illegible]	x	1010	110	2010	0.1					

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

060* Results not included

REPORT AC 1570/79

113062

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Sn (1)	Cu (1)	Pb (1)	Zn (20)	Ag (0.1)					
M321	x	18	10	180	0.1					
22	x	110	10	180	0.2					
23	x	110	10	100	0.2					
55	x	110	10	140	0.1					
56	x	130	x	100	x					
61	x	110	10	150	0.2					
62	2	2100	30	250	0.4					
64	x	140	10	170	0.1					
67	x	110	10	100	0.2					
73	x	110	20	130	0.1					
76	2	130	50	150	0.1					
77	2	130	50	100	0.1					
78	2	130	50	180	0.1					
A	x	70	20	150	0.1					
B	x	50	20	130	x					

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique.

APPENDIX 3

PANNED CONCENTRATES

SAMPLE	SN	W	GRID REFERENCE
RD/T/ H330	12	<10	40890E/21530N
RD/T/ H383	38	20	41860E/21140N
RD/T/ H264	<4	<10	42170E/20400N
RD/T/ H282	6	<10	42580E/20380N
RD/T/ H549	8	30	41940E/23000N
RD/T/ H550	14	<10	41840E/23040N
RD/T/ H551	65	60	42080E/23460N
RD/T/ H552	18	<10	40890E/22260N
DETN LIMIT	(4)	(10)	

EXAMINATION UNDER SHORT WAVE ULTRA VIOLET LIGHT

SAMPLE NO.	SCHEELITE	ZIRCON
H330	NIL	Minor fine
H383	2 fine blue	Moderate fine
H264	NIL	V. minor fine
H282	NIL	Minor fine
H549	NIL	NIL
H550	NIL	Minor fine
H551	10 fine blue + 1 fine yellow	Minor fine
H552	4 fine blue	Moderate fine

062

113065

APPENDIX 4

RECONNAISSANCE ROCK SAMPLES

LOCATIONS, DESCRIPTIONS & ANALYSES

113066

APPENDIX 4

RECONNAISSANCE ROCK SAMPLES

SAMPLE NO.	GRID REF.	ANALYSED	DESCRIPTION
GW/T/GU R10	42370N/3945E	✓	Massive hornfels with minor calc-silicate bands. Coarse pyrite, minor pyrrhotite.
12	42290N/3941E	x	Gray calc-silicate hornfels, faint fine banding with minor coarse scheelite and pyrrhotite on cleavage.
13	42310N/3941E	x	Thinly banded gray calc-silicate hornfels.
14	42270N/3948E	✓	Quartz tourmaline vein material in sandy siltstone.
15	42270N/3947E	✓	Completely weathered dyke or vein, medium grained quartz + coarse tourmaline in white clay matrix.
16	42250N/3951E	✓	Quartz tourmaline vein or dyke material.
17	42242N/3951E	✓	Quartz crystals in clay with minor fine tourmaline.
18	42240N/3951E	✓	Clay and quartz crystals.
20	42290N/3951E	✓	Weathered banded calc-silicate rock (quartz-diopside-wollastonite).
21	42070N/4026E	x	Massive gray hornfels.
22	42070N/4025E	✓	Soft FeO stained secondary $CaCO_3$ crust at spring beneath greybilly.
23	42060N/4024E	✓	Completely weathered sandy silty claystone.
24	42030N/4022E	x	Soft siltstone with calcareous cement (fizzed in acid).
25	42190N/3966E	x	Thinly bedded gray-green soft shaley mudstone and minor silt stone
26	42244N/3966E	x	Massive dark gray hornfels.
27	42220N/3956E	✓	Calc-silicate rock with coarse dots of epidote and garnet surrounding pyrite.
28	42220N/3954E	✓	Cherty rock with pods of green and brown garnet and green pyroxene.
29	42240N/3952E	✓	Coarse vein quartz and felspar with clots of tourmaline.
30	42234N/3951E	✓	Soft lump of quartz and tourmaline and completely weathered feldspar.
31	41930N/3943E	✓	Quartz porphyry volcanic, highly weathered.
32	42200N/3949E	x	Vitric lithic crystal tuff, welded.
33	42620N/3947E	✓	Highly weathered soft pink-white hornfels.
34	42630N/3949E	x	Hard, finely banded white, gray and green calc silicate rich hornfels.
35	42320N/3946E	✓	White hard hornfels with clots of epidote in bedding.
36	42320N/3947E	✓	Curdy green-gray calc-silicate rich hornfels with leached carbonate? Cavities.

E90

APPENDIX 4

113067

RECONNAISSANCE ROCK SAMPLES

SAMPLE NO.	GRID REF.	ANALYSED	DESCRIPTION
GW/T/GU R37	42300N/3948E	✓	Pale yellow tuff.
38	42290N/3949E	✓	Fine tourmaline veins cutting vitric crystal tuff.
39	42290N/3949E	✓	Tourmaline veinlets cutting vitric lithic tuff.
40	42290N/3951E		As above.
42	42310N/3949E	✓	Many fine tourmaline quartz veinlets with pale alteration haloes in hornfels.
43	42310N/3951E	✓	As above.
44	42320N/3951E	x	Hard hornfels.
45	42330N/3954E	✓	Quartz epidote in hornfels with minor veinlets of tourmaline.
46	42360N/3954E	✓	Hornfels with minor brown garnet.
47	42210N/3949E	✓	Completely weathered vein material with tourmaline and minor quartz.
48	42210N/3951E	x	Pale yellow vitric lithic crystal ash flow tuff, massive, looks welded.
49	42110N/3979E	✓	Highly weathered red-brown ferruginous grit.
50	42110N/3981E	✓	Pale gray strongly fractured hornfels.
51	42000N/3981E	x	Pale gray fractured hornfels with minor pyrite.
52	42290N/3949E	x	Moderately weathered cream shale with radiating tourmalines on cleavage
53	42230N/4016E	✓	Moderately weathered iron stained pale gray hornfels and fine sandstone float.
54	42220N/3957E	✓	Coarse brown garnet epidote rock.
55	42090N/3944E	✓	Quartz aplite? with tourmaline and abundant pyrite.
56	41930N/3944E	✓	Gossany quartz vein material with
57	41930N/3944E	✓	Quartz aplite?
58	42090N/3944E	x	Moderately weathered sericitised & chloritised quartz porphyry.
59	22000N/39565E	✓	Highly weathered massive magnetite.
60	22000N/39565E	✓	Highly weathered magnetite & limonite stained sandstone pebbles.
61	42240N/3967E	✓	Completely weathered magnetite skarn.
62	42240N/3968E	✓	Completely weathered magnetite skarn.
63	42240N/3956E	✓	Finely banded cherty hornfels with moderately abundant fine pyrrhotite.
64	42220N/4014E	✓	Small quartz pebbles collected from stream sediment.

NATA CERTIFICATE XRF ANALYSIS CODE B1 RESULTS IN PPM

SAMPLE	SN	W	B1
GVR10	6	10	<4
GVR14	36	55	<4
GVR15	46	25	<4
GVR16	34	35	<4
GVR17	36	75	<4
GVR18	12	35	<4
GVR20	4	10	<4
GVR22	<4	<10	<4
GVR23	<4	<10	<4
GVR27	6	10	<4
GVR28	8	<10	<4
GVR29	20	15	<4
GVR30	28	20	<4
GVR31	14	<10	<4
GVR33	4	10	<4
GVR35	26	10	<4
GVR36	10	10	<4
GVR37	<4	10	<4
GVR38	46	35	<4
GVR39	8	<10	<4
GVR40	28	<10	<4
GVR42	<4	10	<4
GVR43	18	10	<4
GVR45	90	10	<4
GVR46	65	15	<4
GVR47	24	20	<4
GVR49	110	50	<4
GVR50	<4	<10	<4
GVR53	<4	15	<4
GW/T/GU54	230	<10	—
GW/T/GU55	48	10	—
GW/T/GU56	16	<10	—
GW/T/GU57	140	25	—
GW/T/GU59	<4	75	—
GW/T/GU60	6	<10	—
GW/T/GU61	<4	240	—
GW/T/GU62	44	110	—
GW/T/GU63	6	<10	—
GW/T/GU64	4	15	—
TW/T/CH 1	4	20	—

DETN LIMIT	(4)	(10)	(4)	DETN LIMIT	(4)	(10)	(4)

966

FORM 6 JOB 2903/79

AMDEL ANALYTICAL SERVICE

Results in ppm unless otherwise stated

113069

BATCH NO. 1/2 A

TT	Sample No.		Cu	Pb	Zn				
1	GW/T/GV R 10		90	18	45				
2	14		85	70	40				
3	15		22	8	5				
4	16		25	8	10				
5	STD								
6	"		10	40	8				
7	18		15	18	30				
8	20		8	12	60				
9	22		8	12	25				
10	23		85	5	100				
11	27		15	12	42				
12	28		8	18	40				
13	29		15	5	8				
14	30		10	5	5				
15	31	x	110	1850.	310				
16	33		80	160	440				
17	35		8	30	30				
18	36		8	35	50				
19	GW/T/GV R37		12	8	10				
20	31	x							

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 2903/79

Results in ppm unless otherwise stated

BATCH NO. 2 A

TT	Sample No.		Cu	Pb	Zn				
1	GW/T/GV R 38		12	8	5				
2	39		15	<5	5				
3	40		185	12	20				
4	42		70	12	42				
5	43		55	5	48				
6	45		80	5	25				
7	46		12	10	20				
8	47		10	15	10				
9	49		20	260	580				
10	STD								
11	50		20	20	75				
12	GW/T/GV R53		8	32	25				

FORM 91B THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES 113070 3

067

REPORT AC 3928/79

x = not detected at the limits quoted

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Ag (0.1)	Cd (3)	Ge (1)	Sb (30)	As (50)	Cu (1)	Bi (1)	Ga (1)	Pb (1)	Zn (20)
WT160 54	101·13	x	x	x	x	210	4	10	40	180
55	101·17	x	1	x	x	215	10	20	210	x
56	101·17	x	x	x	5000	5000	10	10	8000	4000
57	101·12	x	1	x	x	30	210	15	1000	x
59	101·18	x	x	x	x	15000	2000	2	1000	700
60	101·12	x	x	x	x	2000	6	4	500	2000
61	101·18	x	2	x	x	10000	10000	3	80	15000
62	101·13	x	2	x	x	4000	8	5	40	2000
63	101·12	x	1	x	x	500	x	5	30	300
64	101·12	x	x	x	x	310	x	3	40	200

ANALABS (W.A.) PTY. LTD.

52 Murray Road, Welshpool, W.A. 6106
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Phone (09) 458 7999
Phone (090) 21 1416

Code No. 61.5.01.7469
Rack No. 31
Page No.
Order No. —

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.	Ag	Bi	Cu	Pb	Zn	Au	Sn	W	F
1	A7495	0·5	x	16	5	16	x	25	10	115
2	96	0·3	20	23	20	11	x	30	x	257
3	97	6·5	15	455	1·65%	660	0.30	25	T	81
4	98	0·1	T	12	135	12	x	45	25	1365
5										
6										
7										
8								Analysis by XRF		

Results ... tin ... Elements ... usually present in concentrations of economic

068

113071

APPENDIX 5

HELICOPTER - BORNE AEROMAGNETIC SURVEY

PROPOSAL & CONTRACT DETAILS

069

113072

22nd December, 1978.

A.H. Bartlett
Melbourne

G. Weste.
Devonport.

P.W. Askins
J. Cucuza

E.L.1/76 Guildford
E.L.4/77 Highclere
PROPOSED AIRMAG. SURVEY

SUMMARY

An airborne magnetic survey is recommended over the N part of E.L.1/76 Guildford and the adjoining S part of E.L.4/77 Highclere. With a line spacing of 200 metres the survey will directly prospect for Renison/Bischoff type tin, Kara type scheelite, and wrigglite fluorite deposits. The survey will also greatly aid structural and lithological interpretation of the area.

THE NEED FOR AIRMAG.

Rocks in the N part of the Guildford and S part of the Highclere licences are highly prospective for Renison - Mt. Bischoff type massive pyrrhotite tin, stockwork tin, Kara type scheelite, magnetite, King Island type scheelite and fluorite deposits. A number of large geochemical anomalies and other indications of mineralisation occur in areas of suitable host rocks (see attached geology plan).

The accurate location of the source of geochemical anomalies has not been determined because of the generally poor outcrop over much of the area and the fact the carbonate rocks tend to be obscured. Any gridding carried out on the basis of geochemical anomalies alone will need to cover large areas. Poor access and thick rain forest will make this expensive.

A detailed airmag. survey will allow more detailed interpretation of the indications of mineralisation so far obtained and will reduce the amount of costly gridding and (grid cutting and mag. cost about $400 per km, airmag. costs a maximum of $30 per km). A survey flown at slightly greater than normal ground clearance will see through magnetitic Tertiary basalt soils and may see through thin basalt flows, ground magnetics cannot do this. Some of the area has already been flown by Scintrex for Anreco Tasminex (½ mile spacing) and by Geoex for McIntyre/Tasminex (150m spacing). These surveys were flown to cover E.L.17/68 but overlapped our E.L.'s 1 76 and 4 77. Contoured plans of those portions of the surveys over out E.L.'s have been obtained and copies are attached.

2 ...

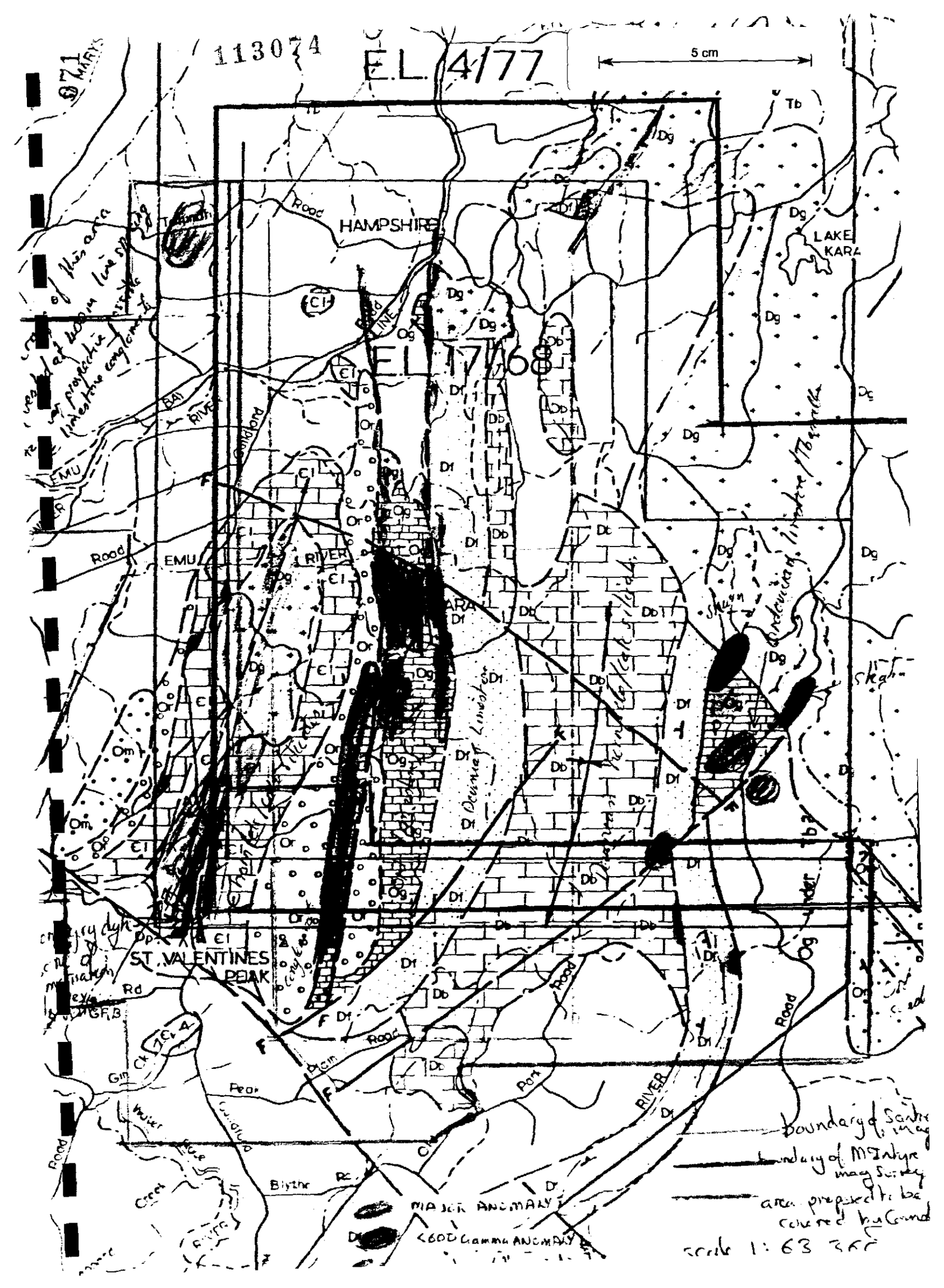
I have examined the survey data over E.L.17 68 at McIntyres invitation (see attached note). I consider the overlap of the Geoex survey to be insufficient to be of much use to us although the line spacing is very close. The Scintrex survey overlapped sufficiently but the line spacing is insuffiwient because it covers highly prospective ground. The actual boundaries of the Geoex and Scintrex surveys are outlined in red and blue pencil respectively on the attached geology. The area requiring coverage for our purposes is outlined in green. Major magnetic anomalies are shown in purple and lower odder anomalies in purple around red.

A low order magnetic anomaly runs S from Kara, passing into our E.L.s just to the E of St. Valentine's Peak. Ordovician limestone possibly occurs here and if so will be metasomitised or hopefully replaced by skarn. It is proposed to grid this area during January 1979 (see separate memo). It is also proposed to fly this anomaly in directions (E-W and N-S) because the extremely rugged topography will produce ground clearance problems. (Geoex and Scintrex must have flown too high over this anomaly - depressing values). The N-S lines could be flown at low ground clearance.

REQUIREMENTS FOR SURVEY

Line spacing	:	200 metres
Aircraft	:	Bell 206 helicopter
Bird ground clearance	:	170 metres
Ground speed	:	60 knots (approx.)
Line direction	:	Mainly grid E-W (349°M)
Magnetometer	:	Scintrex MAP2A or Varian 4937A
Reading interval	:	1 second
Ancillary equipment	:	Recorder, altimeter, tracking camera, recording base station
Total line Kilometres	:	380
Navigation	:	1:7,400 photo enlargements.

N.B. Flight lines have been plotted on 1:20,000 photo machine plots and will require transferal by navigator to photo enlargements.


113074
E.L. 4/77
5 cm
HAMPSHIRE
Road
LAKE KARA
E.L. 17/68
EMU
RIVER
Road
ST. VALENTINES PEAK
Rd
Road
Road
Road
Road
Blythe
Creek
RIVER
MAJOR ANOMALY
<600 Gamma ANOMALY
boundary of Santos mag
boundary of McIntyre mag Survey
area proposed to be covered by Ground
scale 1:63 360

072

113075

TELEPHONE: 272 5211
CABLE: GEOEX

GEOEX PTY. LTD.

50 MARY STREET, UNLEY, SOUTH AUSTRALIA
POSTAL ADDRESS: P.O. BOX 42, UNLEY, SOUTH AUSTRALIA 5061

AGREEMENT FOR AIRBORNE GEOPHYSICAL SURVEY

- B E T W E E N -

GEOEX PTY. LTD.

A N D

~~COMALCO LIMITED~~
Commonwealth Aluminium Corp. Ltd. (Comalco).
No. 79216

Geoex Pty. Ltd. (the contractor) hereby agrees to conduct a geophysical survey for Comalco ~~limited~~ (the client) in accordance with the following specifications.

1. SURVEY TYPE:

The survey shall be an airborne magnetic survey employing the equipment specified in Section 5.

2. COMPANY REPRESENTATIVE:

The client may have a representative in the field area during the survey, and he shall have the authority to request or to agree to changes in the survey specifications, if necessary.

3. SURVEY LOCATION:

The survey base will be Wynyard, Tasmania.

In the event that the nominated survey base proves to be unsuitable, the contractor reserves the right to re-assign the base site, without references to the client, except that should this materially alter the cost of operation of the survey, the client shall be notified before proceeding with the change.

4. SURVEY TIMING:

The estimated commencement date, subject to weather delays, is mid-January, 1979.

. . 2.

5. SURVEY SPECIFICATIONS:

(a) Aircraft:

The contractor reserves the right to alter the type of aircraft used provided this does not materially alter the cost or operating procedures of the survey.

(b) Equipment:

The following equipment can be supplied and operated by the contractor:

(i) In the Aircraft:

Varian V4937A proton precession magnetometer, with towed bird sensor.

Geoex digital acquisition system recording on 800 b.p.i., ASCII Cassette.

Century 444 7 channel light beam recorder.

Geoex intervalometer.

Vinten 16 mm. ground tracking camera.

TRN 70 radar altimeter.

(ii) Ancillary Equipment:

Geometrics G826 diurnal magnetometer crystal clock controlled, with analogue recorder.

(c) Personnel:

Survey Manager: P.J. McDougall (Manager, Airborne Division)

Eight years experience with airborne surveys in Australia, the Pacific Islands, Canada and the United States.

Data Processing Supervisor: G.L. Semmens (Chief Draftsman)

Sixteen years experience in all phases of geophysical and geological data processing and compilation.

Supervising Geophysicist: J.E. Haigh (Chief Geophysicist)

Fifteen years experience with the B.M.R., McPhar Geophysics and Geoex in planning and supervision, interpretation, data processing, programming and instrumentation design.

(d) Operating Procedures:

~~The minimum flight line length shall be 6 kilometres. For flight lines shorter than this, the charges shall be computed for a 6 kilometre length.~~

TWO TIE LINES MAY BE RUN AT THE CONTRACTORS DISCRETION TO ENABLE ACCURATE CONTOURING OF RESULTS TO BE COMPLETED.

. . 3.

The client may change the nominated flight line spacing at any time, provided that this does not interfere with the efficient operation of the survey. or reduce the total survey distance to less than the specified minimum.

Every effort shall be made to conduct the survey at a constant (nominated) terrain clearance. However, the final adopted terrain clearance on any portion of a flight line shall be at the discretion of the pilot of the aircraft. and the contractor shall not accrue any penalty for failure to maintain the nominated terrain clearance, provided such failure is due to severe terrain.

(e) Accuracy:

The magnetometer has a nominated accuracy of $\pm$ 1 gamma peak to peak. Should the magnetometer noise exceed this value for a continuous line length of more than 1 kilometre, that portion of the line shall be reflown as specified below at no additional cost to the client.

Flight navigation shall be by visual means by reference to aerial photographs supplied by the client. Subject to the photographs being accepted by the contractor as being of sufficient quality for reliable navigation, the flight line spacing shall not deviate by more than 50% from the nominated value. Where the distance between adjacent flight lines exceeds 1.5 times the nominated spacing, for a distance of more than 1 kilometre, that portion of the line shall be reflown as specified below at no additional cost to the client.

All reflights by the contractor shall be of sufficient length to give adequate overlap with existing data, and will be extended to intersect tie lines wherever possible.

A diurnal base station magnetometer will be maintained and comparisons made with the survey magnetometer for each flight. Where the diurnal drift exceeds 5 gammas in 5 minutes, the relevant flight lines shall be reflown. The diurnal records shall be annotated in the usual manner to show the base level, time, etc.

In the event that the unsuitability of the data as defined above is not demonstrated before the aircraft leaves the survey base, the contractor reserves the right not to refly the relevant sections of the line, but to make a proportionate reduction in the survey charges.

. . 4.

Every effort shall be made to adhere to the survey schedule as stated. However, the contractor shall not be responsible for any loss to the client if the survey is delayed for reasons normally beyond the control of the contractor.

The client may elect to supply prepared photomosaics. and if these are accepted by the contractor, navigation errors due to poor mosaic joins shall not incur any reflight as specified above, or any other penalty.

(f) Survey Cancellation

In areas lacking topographic features, or where the photography does not reflect the current surface features, or where the quality of the photography is too poor for adequate navigation, the contractor reserves the right to restrict or cancel the survey. The contractor will inform the client of any event which effects the smooth progress of the survey and if necessary discuss alternative procedures with the client.

In the event of survey cancellation the client shall pay the full mobilisation/demobilisation charges and normal survey charges prportionate to the work completed by the contractor.

6. DATA PROCESSING:

The flight path of the survey shall be recovered on to the navigation photographs by reference to the 16 mm. ground tracking film. Subject to the quality of the photographs, and the presence of recognisable recovery features, line recovery will be controlled by one fiducial point recovered at intervals of no more than 1 kilometre. Quality control will be maintained by rechecks on the initial recovery in the Adelaide office of the contractor.

The data recorded during the survey will consist of the following:

(a) Flight logs.

(b) Analogue recorder traces.

(c) Tracking film.

(d) Digital magnetic tape.

(e) Diurnal records.

This data will be edited, annotated and presented to the client with the navigation photomosaic showing recovered fiducial points and flight line numbers.

The magnetic data may be presented in the form of a contour map as an overlap for the navigation photographs, or for a semi-controlled topographic base map. The contour interval will be chosen so that reasonable detail is apparent within the main anomalous areas.

The flight path information will be presented on a map which is a transparent overlay to the contour map. This map will show flight line numbers and the number and position on recorded fiducials.

The scale of the above maps will normally be in the scale range of 1:20,000 to 1:25,000. The larger scale maps incur extra charges.

The above maps may, at the request of the client, be prepared on a screen transparency of the photomosaic. The preparation of the screen transparency shall be sub-contracted and this charge shall be invoiced to the client at cost.

Stacked profiles of half the above horizontal scale and a reasonable vertical scale are supplied with a contour map at no extra charge. Profiles at larger scales normally invoke an additional charge.

7. DATA DELIVERY:

The contractor will use his best endeavours to supply all data to the client within 6 weeks of completion of the flying. Preliminary data will be available sooner.

8. SECRECY:

The contractor will keep secret and will not release any information whatsoever in relation to or connected with the survey to any person except the client or to persons authorised in writing by the senior executive of the client or unless required by law to divulge such information and then only to persons who are entitled to receive it. All reasonable steps shall be taken to ensure compliance with this clause by our personnel and sub-contractors engaged on the survey and data processing.

9. INSURANCE:

The following insurance shall be maintained in force at the contractor's expense:

(a) Public legal liability insurance to the extent of $500,000.00 for any one claim.

. . . 6.

(b) Airborne legal liability to passengers for $60,000.00 carried by the aircraft operator.

(c) Employer's indemnity insurance (Workmen's Compensation) as required in Australia.

(d) Third party motor vehicle insurance as required.

The contractor will provide evidence that the above policies are current upon request.

10. DISPUTES:

Any agreement shall be governed by and construed according to the laws of the State of South Australia and in the event of a dispute arising in relation to the agreement, which is not settled between the parties within a reasonable time, such disputes shall be settled by Arbitration in Adelaide by an Arbitrator appointed by agreement between the parties and failing agreement by the President of the Australasian Institute of Mining and Metallurgy

11. CHARGES:

Based on 380 line kms., the charges for the survey, as specified, shall be as follows:

(a)	*Mobilisation/demobilisation*	. . .	$800.
(b)	Total installation charge (to be s shared)	. . .	$525.
(c)	Flying charges, all inclusive of helicopter hire, crew and equipment	. . .	$23.00 per line kilometre
(d)	Standby charge for bad weather* OR MAGNETIC STORMS* (ALSO at client request) .	. . .	$550.00 per day
(e)	Line recovery and preparation of flight path plot	. . .	$0.90 per line kilometre
(f)	Magnetic contour map preparation at 1:8000 plus stacked profiles at 1:20,000	. . .	$2.10 per line kilometre plus set-up charge of $350.00
(g)	*Photomosaic preparation*	. . .	$12.50 per hour

*- Not to exceed 2 days. Geoex has the right to withdraw, and return if required should bad weather or magnetic storms cause this standby to be exceeded. A relocation charge, at cost, will be made if necessary

12. TERMS OF PAYMENT:

Based upon approximate total of 380 line kilometres, payment shall be made according to the following schedule:

(a) Upon signing the agreement:

Mobilisation and installation charges plus 25% of the approximate contract value $3,622.

(b) Upon completion of the flying portion of the survey:

50% of the approximate contract value $5,115.

(c) On delivery of the final maps and records:

The remainder of the charges, based on the actual measured survey distance.

All charges are stated in Australian funds, payable at Adelaide.

Overdue accounts will bear interest at the rate of 1% per month.

SIGNED for and on behalf of)
GEOEX PTY. LTD. in the)
presence of)

R. J. Henderson
Marketing Director

SIGNED for and on behalf of)
~~COMALCO LIMITED~~ COMMONWEALTH ALUMINUM CORP in the)
presence of)

Manager - Exploration
8 Jan. 1979

Agreement No. 79216

2nd January, 1979.

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APPENDIX

SPECIFICATION SUMMARY

1.	Survey type	Helicopter magnetics
2.	Survey location	St. Valentine's, Tasmania.
3.	Total line length	380 km.
4.	Flight line spacing	200 m.
5.	Flight line direction	To be advised.
6.	Detector height	120~~80~~ m. nominal as far as safety allows.
7.	Type of aircraft	Bell 206 B
8.	Expected commencement date	mid-January, 1979
9.	Expected duration of survey	3 days
10.	Scale of final map presentation	~~1:8,000~~ 1 : 10,000
11.	Magnetometer Cycle Rate	1.0 seconds
12.	Contour Interval	~~To be advised~~. 10 gamma.

CHB

080

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APPENDIX 6

ST. VALENTINE'S & BLYTHE ROAD GRIDS

ROCK SAMPLES

LOCATIONS, DESCRIPTIONS & ANALYSES

TABLEYS

COMALCO LIMITED

PROJECT ROCK SAMPLE DESCRIPTIONS No. 113084

SUBJECT E.L.1/76 Guildford, 4/77 Highclere - St. Valentine's Peak

PREP BY DATE SHEET 1 OF 1

Sample No.	Grid reference	Hand Spec.	Anal. ?	Description
TW/T/SV 3	21880N/396600E	✓	x	Scree. Dark grey quartz-greywacke with quartz granules + little f pyrite.
TW/T/SV 4	22015N/396920E	✓	x	Scree. Conglomerate with quartzite sandstone & cherty pebbles and cobbles.
TW/T/SV 6	21800N/396545E	✓	✓	Scree. Magnetite skarn + Fe st + little m pyrite.
TW/T/SV 8	21962N/396770E	✓	x	Outcrop. Conglomerate with quartzite & cherty pebbles.
TW/T/SV 12	20600N/396280E	✓	✓	Scree. Quartz-tourmaline veining + f magnetite.
TW/T/SV 14	20600N/396995E	✓	x	Scree. MW conglomerate.
TW/T/SV 17	20200N/396895E	✓	✓	Scree. Silty sandstone locally MW with Fe st.
TW/T/SV 19	20375N/396990E	✓	x	Outcrop f sandstone + Fe st on fractures.
TW/T/SV 21	20355N/396660E	✓	x	Outcrop. Dark purplish-brown shale with faint bedding + cleavage & few quartz granules locally.
TW/T/SV 24	20285N/396595E	✓	x	Outcrop MW pebbly sandstone with red-brown cherty granules + Fe st.
TW/T/SV 29	20000N/396960E	✓	✓	Scree. MW quartz veining with significant Fe st.
TW/T/SV 36	19580N/396685E	✓	✓	Outcrop. Dark-grey shale with interbedded light grey silty beds.

TABLE V8

COMALCO LIMITED

PROJECT ROCK SAMPLE DESCRIPTIONS No. 113085

SUBJECT E.L.1/76, Guildford - 4/77 Highclere - Blythe Road Grid.

PREP. BY DATE SHEET 1 OF 1

Sample No.	Grid Reference	Hand Spec.	Anal. ?	Description
TW/T/BR 7	3900E/20000N	✓	✓	M pink sandstone with quartz veining (upto 1cm wide) Scree
TW/T/BR 8	3945E/20000N	✓	✓	crs - pebbly pink sandstone with quartz veining (up to 3mm wide) scree
TW/T/BR 9	4142E/20000N	✓	✓	Congl. with white quartz pebbles & pink chert pebbles (up to 2.5cm across) Scree.
TW/T/BR 11	4262E/20400N	✓	✓	m-crs pink sandstone with intense quartz veining. Scree.
TW/T/BR 12	3798E/20400N	✓	✓	crs - pebbles, off white sandstone. Outcrop.
TW/T/BR 15	4910E/21200N	✓	✓	f grey silty bioturbated sandstone. Scree.
TW/T/BR 16	1430E/21200N	✓	✓	Dark grey hornfels with disseminated f sulphide (pyrite ?) & Fe st on fractures. Scree.
TW/T/BR 17	1215E/21200N	✓	✓	Dark grey hornfels with disseminated f sulphide (pyrite?) Scree.
TW/T/BR 18	1200E/21200N	✓	✓	Grey hornfels with dark & light grey bands & disseminated f sulphide (pyrite?) Scree.
TW/T/BR 21	2505E/20400N	✓	✓	Outcrop f-m off-white sandstone.
TW/T/BR 24	2305E/22000N	✓	✓	Outcrop. Greybilly i.e. grey sandstone fragments & brown-white quartzite fragments in an off-white f sandy matrix.
TW/T/BR 25	2280E/22000N	✓	×	Outcrop. Greybilly i.e. grey sandstone fragments (up to 3cm across) in a white f sandy matrix.
TW/T/BR 28	3925E/21600N	✓	✓	Scree crs pale pink sandstone with quartz veining (up to 6mm wide) + significant black mineralisation (generally in vughs)
TW/T/BR 39	4805E/21200N	✓	✓	Scree. Grey bioturbated sandstone.

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AMDEL ANALYTICAL SERVICE REPORT AN 5099/79 PAGE

NATA CERTIFICATE XRF ANALYSIS CODE B1 RESULTS IN PP

SAMPLE	SN	W
TW/T/SV 6	10	45
TW/T/SV12	4	<10
TW/T/SV17	22	30
TW/T/SV29	18	45
TW/T/SV36	<4	<10
TW/T/GV 1	28	15
TW/T/GV 2	24	35
TW/T/GV 3	12	15
TW/T/GV 4	48	<10
TW/T/GV 5	16	<10
TW/T/GV 6	140	50
TW/T/GV 7	4	15
TW/T/GV 8	6	<10
TW/T/GV 9	4	<10
TW/T/GV10	<4	<10
TW/T/GV11	<4	<10
TW/T/GV12	<4	<10
TW/T/GV13	<4	<10
TW/T/GV14	<4	<10
TW/T/GV15	4	95
TW/T/GV16	<4	15
TW/T/BR 7	<4	<10
TW/T/BR 8	<4	15
TW/T/BR 9	<4	<10
TW/T/BR11	<4	<10
TW/T/BR12	6	10
TW/T/BR15	<4	<10
TW/T/BR16	4	<10
TW/T/BR17	8	10
TW/T/BR18	<4	15
TW/T/BR21	<4	10
TW/T/BR24	6	25
TW/T/BR28	12	15
TW/T/BR39	<4	<10
DETN LIMIT	(4)	(10)

113087

084

FORM 91

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AN 5099/79

x = not detected at the limits quoted.

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	La (50)	Nb (20)	Ag (0.1)	Cd (3)	Ge (1)	Sb (30)	As (50)	Cu (1)	Pb (1)
JT/SU 6	x	x	11-15	x	x	130	2000	2000	130
12	x	x	101-18	x	11	x	x	130	12
17	x	x	101-16	x	x	x	1000	2000	11
29	2000	x	3001-	x	x	5000	10000	3000	1000
36	1000	120	101-13	x	x	x	300	115	14
JT/GU 1	1000	120	101-12	x	12	x	x	120	11
2	x	120	101-12	x	12	x	x	115	x
3	x	120	101-11	x	11	x	x	120	x
4	1500	x	101-12	x	11	130	x	115	12
GU 5	1000	x	101-13	x	11	x	x	1100	x
/ER 7	x	x	101-13	x	11	x	x	115	x
8	x	x	101-13	x	11	x	x	14	11
9	x	x	101-13	x	11	x	x	115	x
11	x	x	101-13	x	11	x	x	17	x
12	x	120	101-13	x	x	x	x	15	x
15	1000	130	101-11	x	11	x	x	14	x
16	1000	130	101-13	x	x	x	x	115	x
17	1000	130	101-13	x	11	x	x	115	x
18	1000	130	101-13	x	11	x	x	115	x
21	x	120	101-15	x	11	x	x	110	x
24	x	x	101-13	x	11	x	x	15	x
28	1500	x	101-13	x	x	x	x	110	x
/ER	1500	120	101-12	x	11	x	x	115	x

Results are semi-quantitative. Elements apparently present in concentrations of economic

085

113088

FORM 91

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AN 5099/79

x = not detected at the limits quoted.

Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Ba (200)	Co (5)	Mn (10)	Ta (100)	V (10)	Yb (1)	Be (1)	Mo (3)	Ce (500)
[redacted]/SU 6	x	210	2510	x	310	15	3	x	x
12	2000	x	710	x	510	x	x	x	300
17	8000	x	1115	x	1000	110	11	x	x
29	2000	x	1510	x	1000	210	2	3C	x
36	2000	15	2000	x	1510	115	4	x	x
[redacted]/GU 1	x	15	2000	x	1510	8	2	x	x
2	2000	15	1510	x	1510	15	2	x	x
3	2000	15	1000	x	1000	2	3	x	x
4	2000	15	3000	x	1000	8	210	x	x
[redacted]/GU 5	8000	115	3000	x	1000	215	410	x	x
[redacted]/BR 7	x	x	710	x	310	3	x	x	x
8	x	x	710	x	310	2	x	x	x
9	x	x	310	x	3000	15	x	x	x
11	x	x	310	x	210	x	x	x	x
12	x	x	310	x	410	2	x	x	x
15	3000	x	510	x	3000	115	2	x	x
16	7000	20	3000	x	3000	115	40	x	x
17	1000	40	3000	x	3000	110	30	x	300
18	1500	40	3000	x	3000	115	20	x	300
21	x	x	310	x	310	1	1	x	x
24	x	x	110	x	310	1	x	x	x
28	x	x	310	x	310	1	1	x	x
[redacted]/32 39	4000	15	1000	x	3000	210	2	x	x

Results are semi-quantitative. Elements apparently present in concentrations of economic

FORM. 91

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

113089

086

REPORT AN 5099/79.

x = not detected at the limits quoted.

(Results in ppm unless otherwise stated. Detection limits in brackets.

Sample No.	Ga (1)	Pb (1)	Zn (20)						
W/T/SV 6	x	50	2000						
12	x	30	x						
17	20	30	x						
29	10	5000	20						
36	20	1000	20						
W/T/GU 1	30	40	80						
2	30	30	x						
3	20	20	x						
4	20	50	1000						
W/T/GU 5	15	50	50						
W/T/BR 7	x	3	x						
8	x	3	x						
9	11	5	x						
11	x	3	20						
12	x	1	30						
15	30	10	x						
16	30	20	x						
17	30	30	x						
18	30	20	x						
21	x	3	x						
24	x	3	x						
28	x	10	20						
-/32 39	25	10	x						

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be determined by an appropriate accurate analytical technique.

087

113090

APPENDIX 7

ST. VALENTINE'S GRID

SOIL ANALYSES

NATA CERTIFICATE XRF ANALYSIS CODE B1/B2 RESULTS IN PPM

SAMPLE	SN	W
6475	<4	15
6500	4	<10
6525	6	10
6550	6	15
6575	<4	25
6600	<4	30
21100-6300	4	20
6325	4	<10
6350	<4	10
6375	16	<10
6400	<4	15
6425	<4	<10
6550	<4	10
6475	8	10
6500	6	10
6525	<4	<10
6550	6	15
6575	<4	<10
6600	<4	10
21200-6300	4	<10
6325	<4	20
6350	<4	15
6375	<4	15
6400	<4	<10
6425	<4	<10
6450	6	<10
6475	<4	10
6500	4	<10
6525	4	20
6550	6	<10
6575	4	15
6600	4	<10
21300-6300	4	20
6325	<4	<10
6350	6	15
6375	6	10
6400	<4	<10
6425	4	<10
6450	<4	10
6475	6	<10
6500	<4	10
6525	<4	<10
6550	4	10
6575	<4	15
6600	<4	<10
21400-6325	<4	20
6300	10	<10
6350	4	15
6400	<4	10
6375	6	<10
22000-6300	6	<10
6325	6	15
6350	4	<10
6375	<4	<10
6400	6	10
6425	4	15
6450	<4	<10

SAMPLE	SN	W
21800-6375	<4	10
6400	6	<10
6425	4	15
6450	<4	<10
6475	4	15
6500	<4	<10
6525	<4	30
6550	<4	30
6575	8	25
6600	4	10
21900-6300	8	<10
6325	<4	<10
6350	8	10
6375	6	20
6400	4	<10
6425	6	15
6450	4	10
6475	<4	<10
6500	<4	<10
6525	8	55
6550	4	20
6575	<4	<10
6600	<4	<10

SAMPLE	SN	W
21400- 6425	8	<10
6450	4	10
6475	<4	25
6500	<4	40
6525	6	<10
6550	4	15
6575	<4	<10
6600	<4	20
21500-6300	6	<10
6325	<4	10
6350	<4	<10
6375	<4	<10
6400	6	<10
6425	8	<10
6450	<4	10
6475	4	15
6500	4	10
6525	4	15
6550	<4	<10
6575	<4	15
6600	4	<10
21600-6300	<4	15
6325	4	10
6350	6	20
6375	4	<10
6400	<4	<10
6425	<4	10
6450	<4	20
6475	6	<10
6500	<4	20
6525	4	<10
6550	<4	15
6575	4	<10
6600	8	20
21700-6300	4	10
6325	4	20
6350	6	<10
6375	10	<10
6400	<4	20
6425	8	15
6450	6	15
6475	4	15
6500	<4	10
6525	4	10
6550	4	10
6575	<4	<10
6600	<4	15
21800-6300	4	<10
6325	8	20
6350	<4	20

DETN LIMIT	(4)	(10)

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79 *Results in ppm unless otherwise stated* BATCH NO. 2

TT	Sample No.			Cu.	Pb	Zn	Bi.		
1	5+11 00N	6425E		5	8	5	<10		
2		6450		5	12	8	<10		
3		6475		10	20	15	<10		
4		6500		18	40	15	<10		
5		6525		28	10	15	<10		
6		6550		22	15	22	<10		
7		6575		.5	15	10	<10		
8	5+11 00N	660E		5	8	5	<10		
9	Sto.								
10	5+12 00N	6200E		2	5	5	<10		
11		6225		2	12	8	<10		
12		6250		2	18	8	<10		
13		6275		2	12	8	<10		
14		6400		2	8	5	<10		
15		6425		2	8	8	<10		
16		6450		2	8	8	<10		
17		6475		2	5	5	<10		
18		6500		2	5	5	<10		
19	5+12 00N	6525E		<2	5	2	<10		
20									

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79 *Results in ppm unless otherwise stated* BATCH NO. 1/2

TT	Sample No.			Cu	Pb	Zn	Bi		
1	5+22 000N	6200E		2	<5	8	<10		
2		6225		<2	<5	5	<10		
3		6250		25	<5	12	<10		
4		6275		5	15	12	<10		
5		6400		22	5	12	<10		
6	Sto.								
7		6425		2	5	5	<10		
8		6450		2	8	5	<10		
9		6475		<2	5	5	<10		
10		6500		2	10	8	<10		
11		6525		<2	10	8	<10		
12		6550		5	10	12	<10		
13		6575		35	25	70	<10		
14	5+22 000N	6600E		32	22	70	10		
15	5+11 00N	6300E		8	8	12	<10		
16		6325	x	2	5	8	<10		
17		6350		2	10	8	<10		
18		6375		38	15	20	<10		
19	5+11 00N	6400E		8	28	18	<10		
20		6325	x						

AMDEL ANALY..CAL SERVICE

FORM 6 JOB 4209/79 *Results in ppm unless otherwise stated* BATCH NO. 3/4

TT	Sample No.			Cu	Pb	Zn	Bi.		
1	5+21200N	6550	E	<2	<5	5	<10		
2		6575		<2	<5	8	<10		
3	5+21200N	6600	E	2	5	10	<10		
4	5+21200N	6200	E	<2	22	12	<10		
5		6325		2	12	10	<10		
6		6350		18	10	18	<10		
7		6375		28	10	20	<10		
8		6400		2	5	8	<10		
9		6425		<2	5	5	<10		
10		6450		<2	<5	5	<10		
11		6475	x	<2	<5	5	<10		
12		6500		<2	<5	5	<10		
13		6525		<2	<5	5	<10		
14		6550		22	5	12	<10		
15		6575		<2	<5	5	<10		
16	5+21200N	6600	E	<2	8	5	<10		
17	STD.								
18	5+21400N	6200	E	2	8	10	<10		
19	5+21400N	6225	E	40	10	20	<10		
20		6475	x						

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79 *Results in ppm unless otherwise stated* BATCH NO. 4

TT	Sample No.			Cu.	Pb	Zn	Bi.		
1	5+21400N	6250	E	<2	8	10	<10		
2		6375		<2	8	18	<10		
3		6400		<2	10	10	<10		
4		6425		<2	8	8	<10		
5		6450		2	35	25	<10		
6		6475		5	22	35	<10		
7		6500		65	150	220	10		
8		6525		22	15	25	<10		
9		6550		<2	5	8	<10		
10		6575		<2	10	8	<10		
11	5+21400N	6600	E	<2	5	10	<10		
12	STD.								
13	5+21500N	6200	E	20	15	15	<10		
14		6325		2	12	10	<10		
15		6350		2	8	12	<10		
16		6375		2	10	10	<10		
17		6400	x	5	18	12	<10		
18		6425		28	12	20	<10		
19	5+21500N	6450	E	20	15	22	<10		
20		6400	x						

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79 *Results in ppm unless otherwise stated* BATCH NO. 5/6

091 13094

TT	Sample No.			Cu	Pb	Zn	Bi.		
1	S 21500N	6475	E	2	<5	12	<10		
2		6500		22	5	12	<10		
3		6525		2	<5	5	<10		
4		6550		2	<5	5	<10		
5		6575		2	<5	5	<10		
6	S 21500N	6600	E	<2	<5	5	<10		
7	Tr.								
8	S 21600N	6300	E	5	<5	10	<10		
9		6325		<2	5	10	<10		
10		6350		2	20	10	<10		
11		6375		2	8	5	<10		
12		6400		2	5	5	<10		
13		6425		30	<5	22	<10		
14		6450		2	<5	5	<10		
15		6475		2	5	5	<10		
16		6500	x	<2	<5	5	<10		
17		6525		<2	<5	2	<10		
18		6550		2	<5	2	<10		
19	S 21600N	6575	E	<2	<5	2	<10		
20		6500	x						

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79 *Results in ppm unless otherwise stated* BATCH NO 6

TT	Sample No.			Cu	Pb	Zn	Bi.		
1	S 21600N	6600	E	2	5	5	<10		
2	S 21700N	6300	E	2	<5	5	<10		
3		6325		2	<5	5	<10		
4		6350	x	2	5	12	<10		
5		6375		32	8	18	<10		
6		6400		2	5	5	<10		
7		6425		<2	<5	8	<10		
8		6450		25	<5	25	<10		
9		6475		30	<5	20	<10		
10		6500		<2	<5	5	<10		
11		6525		<2	<5	5	<10		
12		6550		<2	8	5	<10		
13		6575		<2	<5	2	<10		
14	S 21700N	6600	E	<2	<5	2	<10		
15	Tr.								
16	S 21800N	6200	E	10	12	10	<10		
17		6225		<10	10	5	<10		
18		6350		28	<5	28	<10		
19	S 21800N	6375	E	<2	<5	10	<10		
20		6350	x						

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79. *Results in ppm unless otherwise stated* BATCH NO. 7/8.

092

1130951

TT	Sample No.			Cu	Pb	Zn	Bi		
1	521800N	6400	E	<2	5	8	<10		
2		6425		25	5	18	<10		
3		6450		2	<5	5	<10		
4		6475		5	5	5	<10		
5		6500		<2	5	5	<10		
6		6525		2	<5	5	<10		
7		6550		60	42	130	20		
8		6575		40	25	75	20		
9	521800N	6600	E	42	20	60	<10		
10	Std.								
11	521900N	6300	E	2	10	8	<10		
12		6325		<2	8	5	<10		
13		6350		<2	5	5	<10		
14		6375		2	<5	5	<10		
15		6400	x	2	<5	5	<10		
16		6425		2	5	5	<10		
17		6450		<2	<5	5	<10		
18		6475		<2	8	5	<10		
19	521900N	6500	E	35	8	15	<10		
20		6400	x						

AMDEL ANALYTICAL SERVICE

FORM 6 JOB 4209/79. *Results in ppm unless otherwise stated* BATCH NO. 8.

TT	Sample No.			Cu	Pb	Zn	Bi		
1	521900N	6525	E	12	10	25	<10		
2		6550		50	20	65	<10		
3		6575		35	18	80	<10		
4	521900N	6600	E	42	15	42	<10		
5									
6									
7	Prefix numbers on fab sheet marked as RD/T/SV								
8	Prefix numbers on all packets marked RD/T/GU								
9									
10									
11									
12	CODE			C1	C1	C1	C1		
13									
14									
15									
16									
17									
18									
19									
20									

093

113096

APPENDIX 8

ST. VALENTINE'S GRID

INITIAL ESTIMATE OF POSSIBLE ORE

094

113097

E.L. 4/77 - HIGHCLERE

ST. VALENTINE GRID

INITIAL ESTIMATE OF POSSIBLE ORE

INTRODUCTION

The St. Valentines grid lies within E.L.s 4/77, Highclere and 1/76, Guildford (see attached plan). The northern boundary of the grid is the southern boundary of Tasminex E.L. 17/68 which contains the Kara scheelite magnetite skarn deposit. The airborne magnetitic anomaly over Kara (3 km to the north) extends south into the northern (or E.L. 4/77) portion of the St. Valentines grid where weathered magnetite skarn pebbles have been found.

Ore reserves at Kara to March this year were 2 million tonnes of 0.6% WO_3. Since then drilling has located further mineralization and probable reserves would be in the vicinity of 3 million tonnes.

Current scheelite prices are around $A13500 per tonne (London June 14th) and forecasts are for longer term price stability. At this price 0.6% ore has a value of about $A80 in the ground.

Soil sampling over the magnetic anomaly in the St. Valentines grid has failed to detect mineralisation possibly because the area is covered by barren talus from the St. Valentines Razor-back and because the magnetite skarn near the surface will be strongly weathered and the scheelite lost.

The calculation of "possible ore" set out below is an initial rule of thumb guide only.

ASSUMPTIONS

1. Magnetic values of $>$ 64,000 nT directly overlay magnetite skarn.

2. The trends between magnetic values are as interpreted on the magnetic contour plan.

3. The magnetite body dips vertically and does not increase or decrease in width or strike extent with depth.

4. The skarn has a density of 3.5.

5. Overburden of weathered skarn and rubble is 20m thick.

6. Deposit is opencuttable to 300 metres below surface.

3/...

113098

035

CALCULATION

Area enclosed by 64000 nT contour line = $6437m^2$

Then possible ore = 6437 x 280 x 3.5 tonnes

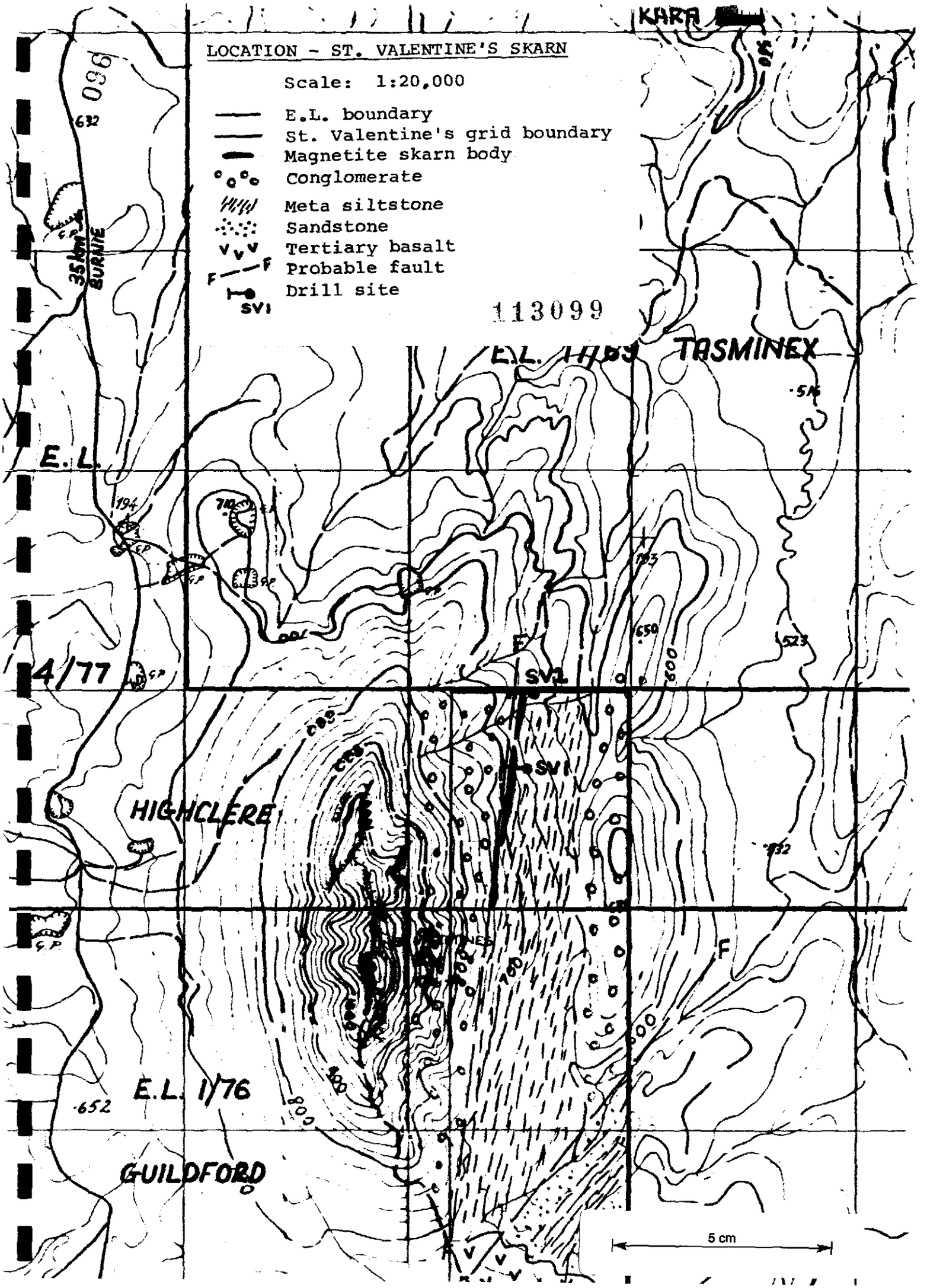
= 6.3×10^6 tonnes

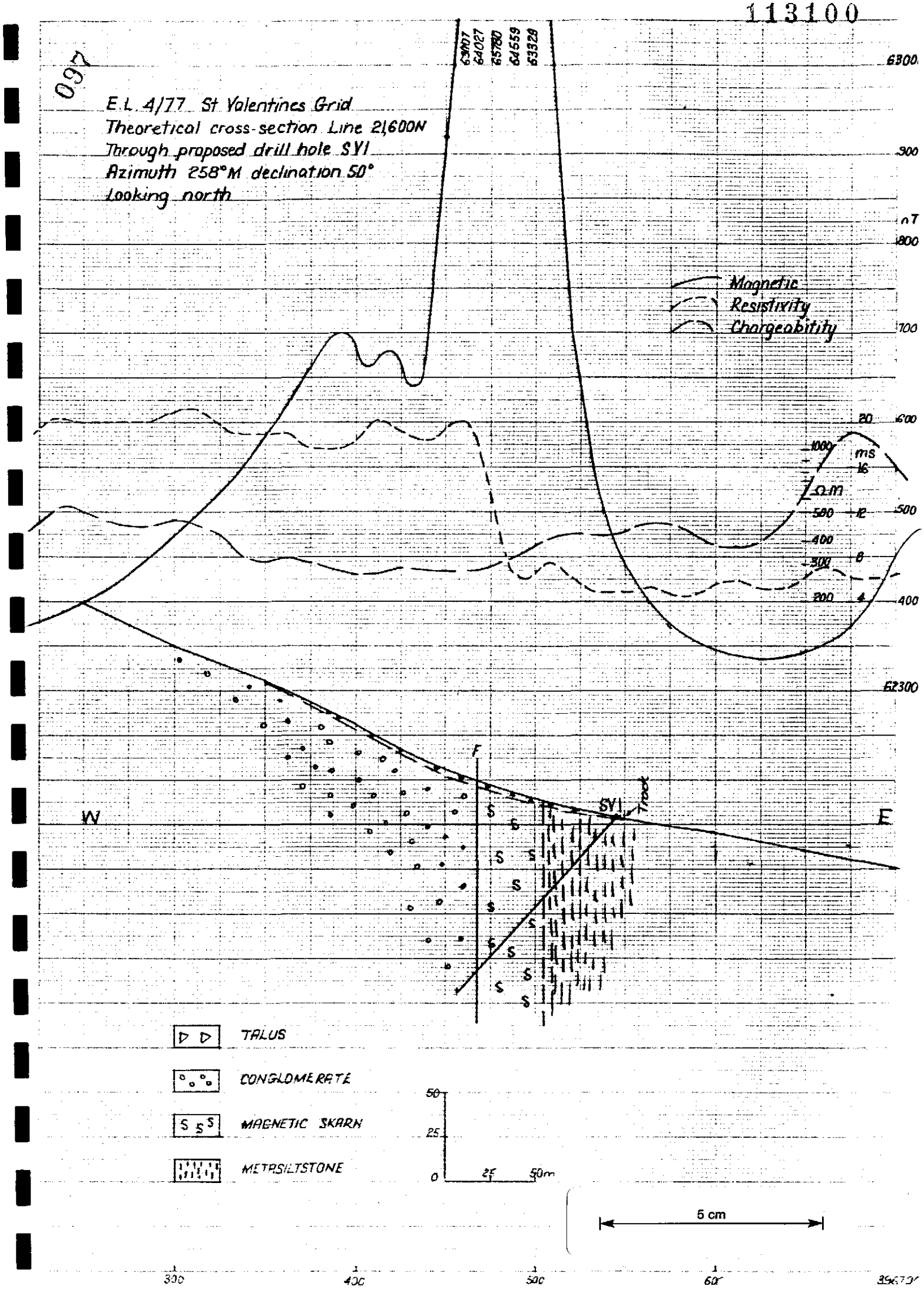
CONCLUSION & RECOMMENDATIONS

The potential for an open cut Kara type scheelite-magnetite orebody exists. Using a minimum target of 3 million tonnes of 0.6% WO_3, at least 50% of the skarn would need to be of the same grade as Kara (0.6%) to a depth of 300 metres.

Because geochemical and geophysical techniques have been unable to detect scheelite mineralisation it is necessary to assess the target by diamond drilling. It is recommended that an initial program of 2 diamond drill holes be carried out. The location of the proposed holes SV 1 and SV 2 is shown on the attached plans.

G. Weste.


LOCATION - ST. VALENTINE'S SKARN
Scale: 1:20,000
E.L. boundary
St. Valentine's grid boundary
Magnetite skarn body
Conglomerate
Meta siltstone
Sandstone
Tertiary basalt
Probable fault
Drill site
SV1
113099
KARA
TASMINEX
E.L.
4/77
HIGHCLERE
E.L. 1/76
GUILDFORD
35km BURNIE
5 cm


097
E.L. 4/77 St Valentines Grid
Theoretical cross-section Line 21,600N
Through proposed drill hole SV1
Azimuth 258°M declination 50°
Looking north
63007
64027
65780
64559
63329
6300
900
nT
800
700
600
500
400
62300
Magnetic
Resistivity
Chargeabitity
20
1000
ms
16
Ωm
500
12
400
300
8
200
4
F
W
E
SV1
Track
TALUS
CONGLOMERATE
MAGNETIC SKARN
METASILTSTONE
50
25
0
25
50m
5 cm
300
400
500
600

098

EL 4/77 ST VALENTINES GRID
Theoretical cross-section Line 22000N
Through proposed drillhole SV2
Azimuth 258°M declination 50°
Looking north.

-63279
-64483
-63266

63000
900
800
700
600
500
400
62300

magnetic
resistivity
chargeability

2000 24 ms
Ω m
20
1000
16
nT
500 12
400
300 8
200 4
150

W
E
SV.2
TRACK

Talus
Conglomerate
Magnetite skarn
Metasiltstone

50
25
0 25 50m

5 cm

300 400 500 600 3970E

099

113102

APPENDIX 9

ST. VALENTINE'S GRID

DIAMOND DRILL HOLE SV-1

GEOLOGICAL & RECOVERY LOGS

113103

100

COMMONWEALTH ALUMINIUM CORPORATION LIMITED
EXPLORATION DEPARTMENT
GEOLOGISTS DRILLING LOG
E.L. 1/76 - GUILDFORD

Project: ST. VALENTINES PEAK GRID. **Date:** JUNE - JULY 19 79

Hole No SV-1 **Location** Line 21600mN at 396545mE **Angle** 50° **Azimuth** 259° Mag

Hole No **Location** **Angle** **Azimuth**

Drilled by J. James **Drilling Method** Diamond

			Bit size	
Moving Rig	**Hrs**	0-15.0m	H	} Hole cased
Operating Rig	**Hrs**	-40.4m	N	
Delays (specify)	**Hrs**	-113.0m	B	
Daily Total	**Hrs**			

From	To	Advanced	Recovered	Description
0	12			Grey-green HW-MW graded sandstone & siltstone, poorly sorted medium to coarse grained well rounded grains of quartzite, quartz ± fragments of shale, chert.
	30.20			Grey-green MW-HW mudstone & siltstone, moderately to strongly fractured, weakly bedded @ 45° to axis. Occassional 2-10mm blebs of coarse pyrite surrounded by dark carbonaceous material.
	61.60			Grey-black MW hornfels strongly fractured & broken. Minor green shales. Minor blebs of magnetite rimmed with framboidal pyrite form elongate lensoids along bedding plains from 41.0 on, e.g. at 56.45 where bedding is approx. 55° to core axis & is disturbed. Minor magnetite & pyrite also occur in fractures. Larger blebs of epidote & green amphibol also elongate parallel to bedding, contain very minor possible sphalerite. Hornfels leached along fractures Coarse epidote fills cavities where severe re-cemented fracturing @ 54.8-55.6 & @ 52.1-52.4 where minor calcsilicate rocks occur. Very strongly fractured 58.80-61.60.
	65.3			Pink-brown SW slightly fractured massive hornfels bedded at 38° to core axis. Blebs of magnetite are lensoidal parallel to the bedding. Very minor pyrite
	67.0			Pale pink MW strongly fractured leached hornfels. Many closed fractures with leached margins. Occasional blebs of epidote-garnet.

Remarks:

101

113104

COMMONWEALTH ALUMINIUM CORPORATION LIMITED
EXPLORATION DEPARTMENT
GEOLOGISTS DRILLING LOG

Project: Date: 19

Hole No SV-1 Location Angle Azimuth

Hole No Location Angle Azimuth

Drilled by Drilling Method

Moving Rig Hrs

Operating Rig Hrs

Delays (specify) Hrs

Daily Total Hrs

From	To	Advanced	Recovered	Description
	68.3			Green MW medium grained epidote - green garnet skarn Minor wollastonite, actinolite. Coarse blebs of pyrite surrounded by red alteration mineral. Pyrite up to 20% of rock, skarn banded at 45° to core axis.
	68.8			Pale grey MW calcsilicate rock banded at 70° to core axis. No pyrite or magnetite.
	70.1			MW magnetite - garnet skarn with pale calcsilicate & epidote. Banded at 70° to axis.
	70.5			Pale grey MW calc silicate skarn. Minor magnetite & pyrite blebs. Minor epidote, garnet.
	71.0			MW medium to coarse grained magnetite (70%) - pyrite (15%) skarn. Minor chlorite, garnet, epidote.
	73.0			Green HW badly fractured faulted chloritised garnet-calc silicate skarn.
	75.3			Pink-brown HW limonite stained, badly broken, poorly sorted pebbly sandstone. Silty matrix. Pebbles of chert.
	82.1			MW maroon siltstone thinly bedded alternating with thin beds of white-pink poorly sorted medium to coarse grained graded quartz sandstone. Occassional bed of greywacke with chert fragments. Siltstone bed become thinner & coarse sandstone beds thicker with depth. Bedding at 50° to core axis. Moderate fracturing. Limonite staining along fractures. Rocks leached.

Remarks:

102

113105

COMMONWEALTH ALUMINIUM CORPORATION LIMITED
EXPLORATION DEPARTMENT
GEOLOGISTS DRILLING LOG

Project: Date: 19

Hole No SV-1 Location Angle Azimuth

Hole No Location Angle Azimuth

Drilled by Drilling Method

Moving Rig Hrs

Operating Rig Hrs

Delays (specify) Hrs

Daily Total Hrs

From	To	Advanced	Recovered	Description
	84.55			Grey SW siltstone with minor sandstone. Thinly bedded at 52° to core axis. Minor fracturing with very minor limonite staining.
	85.7			Grey SW sandstone with fragments of Cambrian chert & minor siltstone beds. Thinly bedded. Moderate fracturing.
	113.0			Grey-white SW conglomerates, discontinuous - continuous matrix of sand. Thinly bedded with minor coarse sandstone beds + very minor fine grained sandstone. Generally very poorly sorted. Pebbles round to poorly rounded up to 60mm diameter of pink & grey Cambrian cherts. Moderate to strongly fractured with limonite staining. Occassional small lensoidal patches of actinolite - epidote - chlorite &/or wollastonite. Larger patches have a central cor of coarsely crystalline magnetite from 100.15 - 113. diameter of patches about 20mm. Good examples at 109.0 & 111.0. These patches were probably pebbles of Cambrian limestone (outcrops 1km to west) which have since been metasomatised.
	113.0			HOLE TERMINATED
				Core examined under SW, UV light - no fluorescence.
				Core not radioactive
				Core photographed
				Samples sent for analysis to Amdel for Sn, W - XRF & for 70 element EM spec. scan.

Remarks: Samples 49.00 - 49.47
52.10 - 52.40
54.80 - 55.70
58.35 - 58.70
65.90 - 66.60
- 67.40
- 68.00
- 70.00 - 71.00

113106

E.L. 1/76 - GUILDFORD

DIAMOND DRILL LOG

PROJECT ST. VALENTINE'S
SHEET 1 OF 1
SCALE 1:500
LOGGED BY G. WESTE

AZIMUTH 259° MAG.
INCLINATION 50°
LOCATION Line 21600mN/396545mE
DEPTH 113.0 m.
COLLAR R L.

HOLE NUMBER SV-1
COMMENCED JUNE 1979
COMPLETED JULY 1979
DRILL TYPE JOY HD 21
DRILLERS J. James

Lithology	DESCRIPTION	% Recovery	ASSAY %
	Graded sandstone & siltstone		
	Mudstone, siltstone		
	Bedding 45° to axis		
	Hornfels - strongly fractured Bedding 55° to axis Small blebs of magnetite - pyrite		
	Severe fracturing. Bedding 38° to axis		
	Epidote - garnet - pyrite skarn. Minor pale calc silicate rock.		
M M Py	Coarse magnetite - pyrite skarn + magnetite - garnet skarn Minor calc silicate rock		
	FAULT. Chlorite - garnet - calc silicate		
	Siltstone & sandstone Strongly fractured Bedding 50° to axis		
	Medium - coarse sandstone		
	Conglomerate		
	END OF HOLE		

5 cm

104

PROJECT: St. Valentine's Peak HOLE NO: SV 1 RECOVERY LOG

FROM	TO	ADVANCED INTERVAL	RECOVERY	RECOVERED %
0	9.00	9.00	.25	3%
9.00	12.00	3.00	1.00	33%
12.00	15.00	3.00	1.00	33%
15.00	17.00	2.00	.40	20%
17.00	18.00	1.00	.75	75%
18.00	18.50	.50	.50	100%
18.50	19.00	.50	.15	30%
19.00	20.00	1.00	.40	40%
20.00	21.10	1.10	.23	21%
21.10	21.62	.52	.52	100%
21.62	22.10	.48	.48	100%
22.10	23.00	.90	.90	100%
23.00	24.20	1.20	.45	37%
24.20	26.00	1.80	1.40	78%
26.00	26.50	.50	.50	100%
26.50	27.15	.65	.50	77%
27.15	29.00	1.85	.95	51%
29.00	30.20	1.20	.25	21%
30.20	30.40	.20	.10	50%
30.40	30.75	.35	.35	100%
30.75	32.00	1.25	.80	64%
32.00	32.60	.60	.60	100%
32.60	33.05	.45	.40	90%
33.05	33.75	.70	.70	100%
33.75	34.00	.25	.25	100%
34.00	34.75	.75	.75	100%
34.75	35.00	.25	.25	100%
35.00	35.60	.60	.60	100%
35.60	36.05	.45	.45	100%
36.05	36.25	.20	.20	100%
36.25	36.60	.35	.35	100%
36.60	36.75	.15	.15	100%
36.75	37.50	.75	.60	80%
37.50	38.10	.60	.60	100%
38.10	38.60	.50	.40	80%
38.60	39.00	.40	.15	37%
39.00	40.00	1.00	.50	50%
40.00	40.40	.40	.30	75%
40.40	41.00	.60	.60	100%
41.00	41.25	.25	.25	100%
41.25	41.50	.25	.25	100%
41.50	41.90	.40	.40	100%
41.90	42.10	.20	.20	100%
42.10	43.10	1.00	1.00	100%
43.10	44.00	.90	.90	100%
44.00	44.75	.75	.75	100%
44.75	45.20	.55	.35	64%
45.20	45.35	.15	.15	100%
45.35	45.60	.25	.25	100%
45.60	46.10	.50	.50	100%
46.10	46.30	.20	.20	100%
46.30	47.25	.95	.95	100%
47.25	48.00	.75	.75	100%
48.00	48.70	.70	.60	86%
48.70	50.00	1.30	1.30	100%
50.00	52.20	2.20	2.20	100%
52.20	52.75	.55	.55	100%

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PROJECT: _____ HOLE NO: SV 1 RECOVERY LOG

113108

FROM	TO	ADVANCED INTERVAL	RECOVERY	RECOVERED
52.75	53.15	.40	.40	100%
53.15	53.70	.55	.55	100%
53.70	55.00	1.30	1.30	100%
55.00	55.60	.60	.60	100%
55.60	56.00	.40	.40	100%
56.00	56.50	.50	.50	100%
56.50	57.70	1.20	1.10	92%
57.70	58.00	.30	.30	100%
58.00	58.40	.40	.30	75%
58.40	59.00	.60	.60	100%
59.00	59.25	.25	.25	100%
59.25	59.75	.50	.50	100%
59.75	60.25	.50	.30	60%
60.25	60.60	.35	.35	100%
60.60	61.25	.65	.80	123%
61.25	61.60	.35	.35	100%
61.60	61.90	.30	.30	100%
61.90	62.40	.50	.50	100%
62.40	63.45	1.05	1.05	100%
63.45	65.00	1.55	1.55	100%
65.00	65.30	.30	.30	100%
65.30	65.70	.40	.40	100%
65.70	65.90	.20	.20	100%
65.90	67.00	1.10	1.10	100%
67.00	68.00	1.00	1.00	100%
68.00	71.00	3.00	2.10	70%
71.00	71.70	.70	.70	100%
71.70	72.25	.55	.55	100%
72.25	73.00	.75	.20	27%
73.00	73.60	.60	.25	41%
73.60	73.70	.10	.03	33%
73.70	74.30	.60	.60	100%
74.30	75.05	.75	.75	100%
75.05	75.70	.65	.50	77%
75.70	76.00	.30	.30	100%
76.00	76.40	.40	.40	100%
76.40	77.00	.60	.60	100%
77.00	77.75	.75	.75	100%
77.75	78.00	.25	.25	100%
78.00	78.40	.40	.40	100%
78.40	79.00	.60	.60	100%
79.00	79.30	.30	.30	100%
79.30	80.00	.70	.70	100%
80.00	81.50	1.50	1.50	100%
81.50	82.10	.60	.60	100%
82.10	82.60	.50	.50	100%
82.60	83.20	.60	.60	100%
83.20	83.50	.30	.30	100%
83.50	84.25	.75	.75	100%
84.25	84.60	.35	.35	100%
84.60	85.00	.40	.40	100%
85.00	85.30	.30	.30	100%
85.30	86.00	.70	.70	100%
86.00	87.05	1.05	1.05	100%
87.05	88.00	.95	.95	100%
88.00	88.80	.80	.80	100%
88.80	89.75	.95	.95	100%

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113109

PROJECT: _____ HOLE NO: SV 1 RECOVERY LOG

FROM	TO	ADVANCED INTERVAL	RECOVERY	RECOVERED %
89.75	90.60	.85	.85	100%
90.60	91.50	.90	.90	100%
91.50	92.00	.50	.55	110%
92.00	92.50	.50	.50	100%
92.50	93.15	.65	.80	124%
93.15	95.00	1.85	1.85	100%
95.00	95.75	.75	.75	100%
95.75	97.25	1.50	1.50	100%
97.25	98.00	.75	.75	100%
98.00	99.75	1.75	1.75	100%
99.75	100.80	1.05	1.05	100%
100.80	102.70	1.90	1.90	100%
102.70	102.92	.22	.22	100%
102.92	104.00	1.08	1.08	100%
104.00	107.00	3.00	3.00	100%
107.00	107.75	.75	.75	100%
107.75	108.55	.80	.80	100%
108.55	110.00	1.45	1.45	100%
110.00	112.25	2.25	2.25	100%
112.25	113.00	.75	.75	100%

APPENDIX 10

ST. VALENTINE'S GRID

DIAMOND DRILL HOLE SV-1

CORE ANALYSES

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THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

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FORM 38

REPORT AC 1360/80

ANALYSIS ppm

Sample N°	TIN Sn	TUNGSTEN W		SAMPLE MARK	TIN Sn	TUNGSTEN W		
SV-1 49.00-49.47	<4	<10		815	12	<10		
SV-1 52.1-52.4	<4	10		816	<4	<10		
SV-1 54.8-55.7	6	15		817	<4	<10		
SV-1 58.35-58.7	<4	15		818	8	20		
SV-1 65.9-66.6	<4	<10		819	8	<10		
SV-1 66.6-67.4	4	10		820	6	10		
SV-1 67.4-68.0	<4	10		821	<4	<10		
SV-1 68.0-70.0	<4	15		822	<4	<10		
SV-1 70-0-71.0	8	35		823	6	<10		
				824	4	<10		
UB/T/A1 D 237 R	4	10						
399 R	<4	<10						
431 R	<4	<10						
486 R	<4	<10						
571 R	6	<10						
572 R	12	<10						
632 R	6	<10						
789 R	4	<10						
790 R	6	<10						
806	14	<10						
809	12	<10						
811	<4	15						
812	<4	<10						
813	<4	<10						
814	8	<10						

METHOD:

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AN.....1360/80...

Page.....①.....

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major 100%	Minor 10% 1%	Heavy Trace 10,000 1000 (0.1—1%)	Trace 100 (0.01—0.1%)	Faint Trace 10 (0.001—0.01%)	Very Faint Trace 1 (0.0001—0.001%)
SV-1	Si Al	K Ca Ti	Na	Ba Zr Cr P	Zn Co Pb Nb	Sc Be
49·00 - 49·47		Fe Mg		Mn Rb La V Li	Cs Y	Yb Sn
				Sr Ni B	Ga	Cu
	Si Al	Ca K	Ti Mn	Ba Sr P Cr	Zn Ni Co	Sc Be
52·1 - 52·4		Fe Mg		Na Rb La	V Ga Y	Yb Sn
				Zr	Li B Pb	Cu Ge
	Si Al	Ca Ti	Mn	P Sr Cr Ni	Li Rb Ga Co	Sc Yb Be
54·8 - 55·7		Fe Mg	K	Zr La V	B Nb	Cu Bi Ge
				Na Zn	Pb Y	Sn
	Si Al	Ca Ti	Ba	Mn Cr Ni	Li Ga Co	Sc Cu Be
58·35 - 58·7		Fe K	Na	Zr La V P	Pb Nb	Yb Sn
		Mg		Rb Sr B	Zn Y	
	Si Al	Fe K Ti	Ba	Cr Rb Mn Li	Ni Cs Mo Co	Sc Yb Be
65·9 - 66·6		Ca	Mn Na	Sr V B	Zn Pb Y	Cu Sn
		Mg		Zr P	Ga	

Elements not sought: U, Re, Hf, Hg Platinoids

Other elements not detected at limits quoted in attached sheet:

131112

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AN..... 1360/80 .....

Page..... (2) .....

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QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major 100%	Minor 10% 1%	Heavy Trace 10,000 1000 (0.1—1%)	Trace 100 (0.01—0.1%)	Faint Trace 10 (0.001—0.01%)	Very Faint Trace 1 (0.0001—0.001%)
66·6 - 67·4	Si Al	K	Ti Mn	Na P Ba Cr	V Pb Co Ga	Sn Mo Bi Be
	Fe	Ca		Rb Zr La	Li Ni Y	Cu Sc Ge
		Mg		Zn Sr	B	Yb
67·4 - 68·0	Si Fe	Al	Mn Ti	Na Ba Co Cr	Sr Mo B Y	Ga Be Ge
		Ca		K Zr La Pb	V Bi	Sn Yb
		Mg		Zn Ni	Li Cu	Ag
68·0 - 70·0	Si Fe	Al	Mn Ti	Zn Zr La	Cr Co Y Ga Sn	B Be
		Ca		Pb	Ni K V Bi	Mo Ge
		Mg		Na	Cu	Ag
70·0 - 71·0	Si Fe	Al	Mn	Ti Ba K Pb B	Co Bi Ga Sn	Mo Be
		Ca		Zn Zr	Ni Cu	Ag
		Mg		Na	V Li	Ge

Elements not sought: U, Re, Hf, Hg Platinoids

Other elements not detected at limits quoted in attached sheet: A10 x 9

113113

A10

SPECTROGRAPHIC ANALYSIS

Detection-Limit Concentrations of Elements
DC Arc Excitation

ELEMENT	ppm	ELEMENT	ppm
Ag	0.1	Mo	3
Al	100	Na	50
As	50	Nb	20
Au	3	Ni	5
B	3	P	100
Ba	200	Pb	1
Be	1	Rb	10
Bi	1	Sb	30
Ca	100	Sc	3
Cd	3	Si	100
Ce	300	Sn	1
Co	5	Sr	10
Cr	20	Ta	100
Cs	30	Te	20
Cu	1	Th	100
Fe	100	Ti	100
Ga	1	Tl	1
Ge	1	V	10
In	10	W	50
K	5	Y	10
La	50	Yb	1
Li	1	Zn	20
Mg	100	Zr	100
Mn	10		

APPENDIX 11

BLYTHE ROAD GRID

SOIL ANALYSES

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RESULTS IN PPM

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AMDEL ANALYTICAL SERVICE REPORT AN 5099/79

NATA CERTIFICATE XRF ANALYSIS CODE B1

	SAMPLE	SN	W
LINE 21200 N	403300E	6	<10
	403325E	4	<10
	403350E	<4	<10
	403375E	4	<10
	403400E	<4	<10
	403425E	<4	<10
	403450E	6	<10
	403475E	14	<10
	403500E	<4	<10
	403525E	4	<10
	403550E	<4	10
	403560E	6	<10
	403570E	4	<10
	403580E	<4	<10
	403590E	<4	<10
	403600E	<4	<10
	403610E	6	10
	403620E	<4	<10
	403630E	4	<10
	403640E	4	<10
	403650E	4	<10
	403675E	<4	<10
	403700E	<4	10
	403725E	<4	<10
	403750E	<4	10
	403775E	4	<10
	403800E	<4	<10
LINE 21600 N	402800E	6	<10
	402825E	<4	<10
	402850E	8	10
	402875E	8	<10
	402900E	4	<10
	402925E	<4	<10
	402950E	<4	<10
	402975E	<4	<10
	403010E	<4	10
	403025E	4	<10
	403050E	<4	<10
	403075E	6	15
	403100E	4	<10
	403120E	<4	<10
	403130E	4	<10
	403140E	<4	<10
	403150E	<4	<10
	403160E	4	15
	403170E	<4	<10
	403180E	4	<10
	403190E	8	20
	403200E	<4	<10
	403225E	<4	10
	403250E	<4	<10
	403275E	<4	<10
	403300E	<4	<10
DETN LIMIT		(4)	(10)

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113117

APPENDIX 12

FEASIBILITY OF SUB-BASALTIC TIN-TUNGSTEN SEARCH

E.L. 1/76 GUILDFORD

AND

MAGNETIC MODELLING

OF

RENISON TYPE ORE BODIES

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113118

FEASIBILITY OF SUB-BASALTIC TIN - TUNGSTEN SEARCH

E.L. 1/76 - GUILDFORD

G. Weste, Nov. 1979.

1. INTRODUCTION

E.L. 1/76 covers an area of 264 km^2, 90% of which is covered by a blanket of Tertiary basalt. Rocks beneath this blanket are prospective for Renison and Mt. Bischoff Sn, King Island and Kara type scheelite, and Rosebery type Cu - Pb - Zn, deposits. The feasibility of carrying out an exploration programme aimed at locating economic Sn and/or W mineralisation is considered below.

2. PREVIOUS EXPLORATION

During 1975 Northern Prospecting (NBHC), searching for volcanogenic massive sulphides, carried out a drilling programme aimed at determining the depth of the Tertiary basalt and the nature of the underlying rocks. If the basalt was less than 100 metres thick then Northern Prospecting proposed to fly the area with Barringer Input airborne E.M. Three diamond drill holes were completed to depths of 152, 90, 90 metres (see plan No. TAS-78-178A) without penetrating basement and further exploration was considered impossible.

During 1976 and 1977 detailed stream chemistry by Comalco aimed at detecting windows in, and leakage from beneath the basalt located a number of minor anomalies, most of which lay along the Emu Bay railway which carries ore from the West Coast Mines. However some anomalies do not lie along the railway (see plan 78-186 in Weste, 1978). Field inspection of the anomalous localities failed to locate windows in the basalt.

A water sampling survey carried out along the deeply

incised Hellyer River failed to detect any leakage from beneath the basalt.

3. POSSIBLE TARGETS

Sn - Renison (32km SSW of E.L.1/76): probable reserves 23 million tonnes of 1.1% Sn (ore value in ground $A2600 million).

- Mt. Bischoff (7 km W of E.L.1/76): at least 6 million tonnes of 1% Sn + probable large low grade reserves (value of ore already mined $A600 million).
- Cleveland (20 km W of E.L.1/76): 3 to 4 million tonnes of 0.8% Sn + 0.3% Cu (ore value $A340 million).

W - King Island: present and past reserves of 13 million tonnes of 0.8% WO_3 (value of ore $A1200 million).

- Kara (5 km N of E.L.1/76) probable reserves 3 to 4 million tonnes of 0.6% WO_3 (value of ore $A250 million).

4. CHARACTERISTICS OF TARGETS

(a) Size - all 5 examples are small targets. At Renison mineralisation is dispersed over an area of 3 km x 2km. However, the largest ore block occupies an area of only 600m x 300m, most ore blocks being 200 x 300 metres in area. Renison is a flat lying deposit; if the bedding was vertical then it would have a very small horizontal area, mainly consisting of narrow (5 to 15m wide) bands.

Bischoff and Cleveland are smaller targets than Renison. The main ore bodies at King Island (No.1 and Dolphin) occur in an area 500m x 300m; the characteristic ore lens width being 50m. Mineralization within ore lenses is not continuous and many barren patches occur. Plans showing the distribution of mineralization at various mines are attached.

(b) Ore body environments - At Renison the host rocks are three lower Cambrian (Success Creek Group) dolomite beds

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5 to 15m thick in a sequence of quartzite, shale, chert and tuff (Patterson, 1976). Mineralization occurs along and near the axis of an anticline which was strongly faulted prior to mineralization (providing ore solution conduits -Collins, 1972). Sn bearing greisens and granites outcrop 3 km S and 6 km N of the mine and also at depth below the mine. Devonian Porphyry dykes occur very close to the mine.

At Mt. Bischoff, Lower Cambrian or Upper PreCambrian dolomites in a thinly bedded sandstone - shale sequence have been replaced. Mineralization again occurred along the axis of an anticline (Groves et al, 1972) which was intruded by a Devonian quartz porphyry dyke swarm. The tin bearing Meridith Granite outcrops 6 km to the S. Major faulting occurs in the close vicinity and may have opened up pathways for the emplacement of the porphyry dykes acting as mineralizing conduits (Orr, 1976).

Mineralization at Cleveland occurs in steeply dipping thin, basal Cambrian limestones in a succession of greywackes, sandstones, shales and mafic/ultramafic volcanics (Palmer, 1976). Sn bearing granites occur very close to the mineralization. The mineralized area is strongly faulted.

The King Island scheelite mineralization also occurs in basal Cambrian carbonates (limestones) interbedded with siltstones and sandstones and underlain by basic volcanics. Major faulting has again played a critical role in mineralization. A Devonian hornblende-biotite granodiorite is in contact with the mineralization (Danielson and Brown, 1976).

Scheelite ore lenses at Kara occur as replacements of Ordovician limestone which occurs as thick and thin beds and lenses interbedded with sandstones. The mineralization is surrounded and underlain by Devonian granite. A number of faults appear to intersect the mine.

(c) Common characteristics - all occur in carbonates (dolomite or limestone) and all the carbonates (except at Kara) are pyritic and Lower Cambrian in age.

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- the Sn deposits are pyrrhotitic and contain significant accessory tourmaline, quartz, fluorite and minor chalco pyrite.

- pre ore major tension faulting, often N-S with smaller related conjugate fault sets.

- ore bodies located along or near to anticlinal axes.

- granite (acid and Sn bearing for Sn deposits) or acid porphyry dykes occur beneath or adjacent to the ore bodies.

- carbonate pebble conglomerates occur in the Cambrian host rock sequences.

(d) Geophysical characteristics - The Sn deposits are conductors and are chargeable.

- All bodies except King Island are magnetic.

- the host rocks are chargeable but resistive.

- the ore bodies occur on the edge of bouger gravity anomalies marking large granitic bodies (see TAS-78-178A, Geology).

- fault zones through the mineralized rocks should be evident as narrow partial conductors.

5. GEOLOGY OF THE GUILDFORD AREA

For general geology of the area see Weste, 1978.

(a) Structure - Interpreted geology is shown on plan 78-178A (copy attached). Structural axes have been extended into the basalt in an attempt to interpret the sub-basaltic structure. A syncline trends NNE from Mt. Pearse through the W parts of E.L.s 1/76 and Tasminex 17/68. The "Companion Hill Anticline" lies to the W and if extrapolated SW joins either the Mt. Bischoff Anticline" or another anticline which should exist in the SW of the map. The Mt. Bischoff Anticline is in a faulted block of possible Precambrian rocks and its trend is anomalous when compared with the other axes (Mines Dept. mapping indicates a structural hiatus). The most likely fit would be that shown on the map in orange pencil. Another

syncline must lie to the W of Companion Hill.

(b) Host rock distribution - Lower Cambrian carbonate bearing sequences outcrop in the SW of the area on the E limb (and possibly on the axis) of the postulated anticline. To the N of the basalt this anticline is less exposed, the rocks being uppermost Cambrian Calcareous siltstones and marls which appear to overlay an acid volcanic sequence. Pure carbonates may occur in the Upper Cambrian, but none have yet been observed. Probable basal Cambrian limestone conglomerate occurs at Waratah and possible Upper Precambrian dolomites at Mt. Bischoff. It is probable then that the Carbonate bearing basal Cambrian rocks subcrop beneath the basalt in places along and around the axis of the S extension of the "Companion Hill Anticline". Within E.L.1/76 the most likely area of subcrop would be the Guildford Road - Waratah railway area.

Ordovician (Gordon=V) limestones probably subcrop beneath the basalt for some distance NNE of Mt. Pearse in the S of E.L.1/76 and also in the possible syncline W of Companion Hill in the N of the E.L. Ordovician limestone should also extend S along strike from Kara but would be offset to the NW by a major NW trending fault which terminates the outcrop of the Ordovician Conglomerate which forms St. Valentines Peak and Companion Hill.

(c) Granites - No granite outcrops within E.L.1/76 or the S portion of 4/77. Contact metamorphism of the Palaeozoic rocks to the W and S of St. Valentines Peak and in the Blythe Road area indicates that the Housetop Granite extends at shallow depth in E.L.1/76.

Quartz Porphyry and quartz tourmaline veining occur just to the W of St. Valentines Peak and trend almost along the axis of the Companion Hill anticline. These 'dykes' show similarities to those at Mt. Bischoff, but contain only slightly anomalous values of Sn and W (see Weste, 1978, 1979).

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(d) Tertiary and Permian cover - Tertiary basalt covers 90% of E.L.1/76. The thickness of the basalt is very variable and the prebasaltic terrain was much more rugged than it is today. Many basalt flows were extruded over much of Tertiary time and individual flows are often separated by soil horizons. Early basalt flows dammed rivers causing lakes to form. River and creek deposits were silicified under the basalts to form "Greybilly".

Although much of the basalt has been eroded, the area presents a peneplain at 620 to 640m ASL. Rivers such as the Hellyer, although incised up to 250m into the basalt (at its N exit from the basalt) have not penetrated into the underlying rocks. The basal level of the basalt is variable but lies around 500m, ASL to the W and 500 - 700m ASL to the S. Mt. Bischoff (784m ASL) protrudes 160m above the peneplain level because of its resistant porphyry dykes. Ordovician Conglomerate sandstone peaks Mt. Pearse and St. Valentines Peak protrude 400 and 500m above the peneplain.

The depth of the basalt is therefore very variable and must be greater than 250m in many places.

A thick cover of undeformed Carboniferous - Permian sediments underlies the basalt to the NW of E.L.1/76. Windows in the Permian indicate that the Cambrian 'trough' bulges somewhat to the NW.

(e) Lineaments - Studies of air photographs and topographic maps reveal many linear features in the E.L.s 4/77 and 1/76 area. These features have been drawn on plan No. TAS-79-377 which overlies the 1 mile geology plan.

Two main (NW and NE) trends dominate the linears and known faults. The major linear trending NW through the centre of the sheet corresponds to a major fault with apparent displacement S block to N and up. The fault terminates the razorbacks of St. Valentine's Peak and Companion Hill. The linear can be traced for a long distance to the SE (on Landsat)

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where it marks the W boundary of the Jurassic dolerite. Similarly the major linear trending NE through the SE part of the area can be traced SW to the coast N of Trial Harbour. In the E of the area this linear corresponds to a fault which forms the SE margin of the Housetop Granite. Much of the present day exposure of this granite is controlled by the NW and SE fracture pattern.

A major linear trending N from Mt. Bischoff appears to have been dislocated by later movements. The Renison, and Kara ore bodies lie on N-S faults.

6. REGIONAL GEOPHYSICS

(a) Airmag

The area to the NW of E.L. 1/76 has been covered by the BMR (Goodeve, 1955, Parkinson, 1956).

E.L. 1/76 and surrounding areas have been covered by an old Rio Tinto of Australia survey, about which little information is available, but flight line spacing appears to be 1 mile. Much of the contouring of the data is suspect. The BMR and Rio Tinto data has been joined as an overlay to the 1 mile geology plan and a copy (TAS-79-304) is attached.

A more general compilation at scale 1:500,000 of W and NW Tasmania has been prepared and reported on by Beattie (1978).

Within the area covered by E.L. 4/77 Highclere and Tasminex E.L. strong NNW trends have two probable sources.

(1) Magnetite bearing skarns (e.g. Kara - St. Valentine's Peak and Highclere Iron deposit).

(2) Thick magnetic basalt flows (e.g. W of Hampshire and Buckby area). (Askins, 1978, Weste, 1979 under compilation).

These trends reflect those of the lithologies. NNW trending valleys originally formed in the softer rocks (including carbonates) were filled by basalt flows which flowed down the valleys.

Within E.L. 1/76 most trends are controlled by outcropping belts of sandstone in the NW and S. Low values follow the rivers indicating that the survey was flown at a fairly

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constant altitude.

A magnetic high S of St. Valentine's Peak appears to indicate a possible skarn in Ordovician Carbonates beneath basalt. This area has been flown for Comalco at 200m line spacing and the gentle gradients observed from this survey indicate a flat sheet-like source (i.e. Tertiary basalt).

A number of magnetic highs surround Mt. Pearse (Ordovician sandstone) in the very S of E.L. 1/76. Those trending NW on each side of the mountain show Tertiary basalt characteristics. However, one high to the N of Mt. Pearse near the Murchison Highway may have its source in Ordovician limestone which probably underlies the basalt in this vicinity. More detailed information (ground magnetic profiling and modelling) is needed to interpret this high.

An E-W trending low order magnetic high over Mt. Bischoff appears to have a composite source - the pyrrhotite in the mountain itself and basalt immediately to the E.

Most of the large highs to the N of Mt. Bischoff have basal Cambrian mafic volcanic sources. Some may have Tertairy basalt sources.

Unfortunately the Rio Tinto airmagnetics appears to have been flown at too large line separation and detailed interpretation is not possible when considering the variability of the magnetic characteristics of the basalts (see Wyatt, 1971).

(b) Gravity

Contours from the recently compiled 1:500,000 scale bouger gravity of Tasmania (joint BMR and Tas. Dept. of Mines) have been sketched on the geology sheet (Drg. No. TAS-78-178A).

A reasonably strong but steady NW gradient occurs across the centre of the area. The older Precambrian Tyennan block in the SE corner of the area appears as a thick crustal block, thinning to the NW. Superimposed on this gradient are lows associated with the Housetop Granite in the NE and the tip of the Merideth Granite in the SW. The -50 $\mu m\ sec^{-2}$ contour line cuts through Mt. Bischoff and very close to the magnetite skarns in Tasminex and Highclere E.L.s. The bouger

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contours indicate that the Merideth Granite does extend at depth to the N under Mt. Bischoff, but does not extend at depth very far into E.L. 1/76. The Housetop Granite may extend well into E.L. 1/76 but the gradients are less steep and its margin less definable.

7. TARGET AREAS

Using characteristics set out in section 4 as guidelines, and by inspecting the interpreted geology, the following 2 types of target area exist:

(a) Sn in pyrrhotite - The prospective area which contains possible lower Cambrian carbonates lies in the W of E.L. 1/76 in the vicinity of Guildford Road. This is also the closest part of the E.L. to Mt. Bischoff. The area appears to be covered by thick basalt (Northern prospecting drill hole GF 2 stopped at 90m still in Tertiary basalt) and few linears were observed in the area. Although the gravity data indicates that granite does not lie at shallow depth, part of the possible Cambrian carbonate area is only just off the -50 $\mu m\ sec^{-2}$ contour.

The upper Cambrian calcareous siltstone and mudstone sequence in the Companion Hill anticline W of St. Valentine's Peak would become very prospective if indications of pure carbonates could be found. Thin carbonate beds 5 - 10m thick (i.e. Renison host rock thickness) are very difficult to locate in areas with such poor outcrop. An obvious target would be the projected intersection of the quartz-tourmaline dyke with carbonates beneath the basalt to the SSW of the 'dyke' outcrop. The major NW trending fault through this area would provide suitable access for mineralizing fluids.

(b) Scheelite in skarn - Both Cambrian and Ordovician carbonates are potential host rocks and the prospective area within E.L. 1/76 is fairly large. Using the proximity of granite as a guide, then the most prospective areas are the Ordovician limestones in the very N of E.L.s 1/76 and 4/77. The Blythe Road area in the NW of E.L. 1/76

is currently under investigation. Detailed ground magnetic profiling and reconnaissance E.I.P. over magnetic anomalies in the NW of E.L. 1/76 and in E.L. 4/77 (e.g. Talunah Road) indicated a basalt source.

The most prospective area at this stage may be NE of Mt. Pearse in the S. The magnetic anomaly N of Mt. Pearse referred to in Section 6(a) lies over probable Ordovician limestone in the vicinity of a probable fault. Granite may occur at depth or to the W.

8. TARGET DETECTION

(a) Magnetics - All the targets except King Island should be strong magnetic sources (pyrrhotite or magnetite). Detection of these sources from those in Tertiary basalt using airborne data is difficult and is impossible if the target lies in a valley beneath magnetic basalt. Detailed ground magnetic profiling can help (see Weste, 1979 in prep. Talunah Road anomaly). If the picture is still not clear then modelling would be beneficial if the approximate depth of the basalt is known. Pyrrhotite has complex magnetic characteristics because of its high and variable remanence (Fe_7S_8 has strong remanence but Fe_9S_{10} has low remanence), leading to complex anomaly patterns which may be misinterpreted. A further problem is caused by the close proximity of strongly magnetic lower Cambrian mafic volcanics.

Magnetics could have a role to play in the search for a Renison type deposit, only if the target is not overlain by magnetic basalt. Basalt in E.L. 1/76 has highly variable susceptibilities, from 0.1 - 2.0 c.g.s. units, ($\times 10^{-3}$) 'averaging' about 0.3.

Samples of massive and vein pyrrhotite from Renison show a susceptibility range of 1.0 - 3.5 c.g.s. units. ($\times 10^{-3}$) Modelling of a Renison style ore body is in progress and will be reported on in Weste, 1979 (a preliminary model is attached).

A Kara type massive magnetite ore body will produce a

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magnetic anomaly detectible through basalt (mag. sus. 50×10^{-3} c.g.s. units). A King Island type ore body will not produce a magnetic anomaly.

(b) Resistivity and I.P. - Massive pyrrhotite is an excellant conductor and the Renison ore body has conductivities of a few to 50 ohm metres. A disseminated pyrrhotite (or pyrite) halo will produce strong chargeabilities.

I.P. has problems seeing through basalt. A number of attempts have been made to see just how much basalt can be 'seen through' but as yet no chargeable and conductive targets have been tested by drilling. Chargeability anomalies have been detected through about 25m of basalt at Moina and will possibly be tested along Blythe Road in E.L. 1/76 (see Weste, 1979).

Vertical soundings using Schlumberger expanders carried out over Tertiary basalt in the region have shown a number of problems. The basalts have highly variable resistivities, from low (<100 ohm m.) to high (2000 ohm m.). Furthermore there appears to be some lateral variation within the basalts. Soundings so far carried out (see Weste, 1979) show very low resistivities at depth, interpreted to be wet gravels and deeplead beneath the basalt. This conductive layer presents a barrier to electrical exploration of the underlying Palaeozoic rocks. Gradient array surveys carried out over thick basalts in the region produce flat resistivity profiles of about 180 ohm metres.

With careful control (a drill hole) there is a reasonable chance that vertical soundings could be used to map the thickness of the basalts and perhaps even detect a reasonably large massive pyrrhotite body sitting at the top of the Palaeozoic rocks. Careful modelling of information gained from a test drill hole would be invaluable.

(c) R.R.M.I.P. - Rapid reconnaissance magnetic I.P. as used by Scintrex failed to penetrate weakly chargeable

tuffs beneath basalt at Two Hummocks, just W of E.L. 1/76. Deep lead beneath the basalt produced a very large, wide MMR anomaly.

(d) E.M. - No E.M. studies have been attempted. It is anticipated that horizontal conductive layers in and/or beneath the basalt would have similar effects to those on I.P. and R.R.M.I.P.

(e) Gravity - No gravity surveys have been attempted in the area because the highly variable and unknown thickness of the Tertiary basalts makes modelling too difficult.

(f) Seismics - High resolution reflection seismics (such as Mini Sosie) would probably see the base of the Tertiary basalts and allow mapping of the pre basaltic surface. It would give little or no information on the nature of the underlying Palaeozoic rocks.

(g) Geochemistry - Detailed surveys using conventional -80 mesh, panned concentrate, magnetic and water sampling failed to see through the basalt although anomalies occurred in some areas (see Weste, 1978).

(h) Wildcat Drilling - This is a probability situation. A typical ore block at Renison is a horizontal slab 250m x 250m and 10m thick. The prospective area at Renison is about 3 km long and 2 km wide. If this was pattern drilled on a 400m grid then an ore block of the above size has a chance of between 1 in 10 and 1 in 6 of being intersected. If one wished to be sure of at least one drill hole in that target then a square grid of 200m would be necessary (L.A. Newnham pers. com.). This would involve 160 drill holes to cover the whole prospective area. If the ore block was tipped on its side it would present an area of only 250m x 10m as a vertical drill hole target (i.e. 1/25 that of the horizontal case). Cleveland

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is an example of a vertically dipping target.

Wildcat drilling, without a specific target is therefore most unlikely to strike mineralization.

9. CONCLUSIONS

(a) Target areas

1. The potential for a Renison style Sn ore body exists within E.L. 1/76 in the Guildford Road area. However the area which contains probable lower Cambrian carbonate is limited (about 25 km^2).

2. Conditions similar to those at Mt. Bischoff possibly occur just SW of St. Valentine's Peak beneath the Tertiary basalt.

3. A number of areas of probable Ordovician limestone beneath Tertiary basalt are prospective for scheelite ore. The most favourable are Blythe Road (under investigation) and N of Mt. Pearse (Rio Tinto airmag high).

(b) Target detection.

1. Electrical methods are of little use; resistivity expanders could possibly map the base of the basalt, but this would require one or two test holes (high resolution reflection seismics would do a better job at much greater cost). Some consideration could be given to investigating E.M. techniques such as sirotem.

2. Detailed ground magnetic profiling may be of use in areas covered by basalt of relatively low magnetic susceptibility (see modelling case by J. Cucuzza, in prep.).

3. Wildcat drilling has virtually no hope of intersecting mineralization but may be used to test distribution of carbonates.

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10. RECOMMENDATIONS

A sub-basaltic search for cassiterite and scheelite deposits is warranted if sufficient funds are available to carry out a thorough programme. This programme should involve the following steps:

(a) Fly the whole of E.L. 1/76 (below the Geoex survey) with detailed aeromagnetic survey.

(b) Carry out detailed computer modelling based on Renison, Cleveland, Mt. Bischoff and Kara ore bodies for as many variables as possible. Fit these models to the aeromagnetic data.

(c) Drill and electrically survey 2 holes through to the Palaeozoic rocks and carry out a series of resistivity expanders to test whether this technique can detect the base of the basalt (this could be incorporated with (g)(iii)). Use the information gained to model a Renison ore body beneath the basalt.

(d) Magnetic susceptibility, resistivity and weathering studies should be carried out on the core and surface studies be made using a current electrode at the bottom of the hole. Using information gained try detailed computer modelling to determine through what thickness of basalt resistivity techniques could detect a massive pyrrhotite ore body and to determine the usefulness of widespread exploration using resistivity (or E.M. such as Sirotem) techniques.

(e) If (d) indicates that resistivity or E.M. techniques are applicable as a direct prospecting method then carry out tests to determine which technique is most useful and implement a widespread survey over areas outlined below in (h).

(f) If (c) works then use resistivity to measure depth of basalt over any prospective areas. If (c) fails use Mini Sosie.

(g) Carry out detailed ground magnetic profiling over the Mt. Pearse magnetic high and other highs selected by (b). Apply models in (b) to the data.

(h) Implement a comprehensive programme of diamond drilling to:-

(i) assess interesting magnetic anomalies including that at Mt. Pearse.

(ii) test for a Mt. Bischoff SW of St. Valentine's Peak.

(iii) study the distribution of the Cambrian carbonates.

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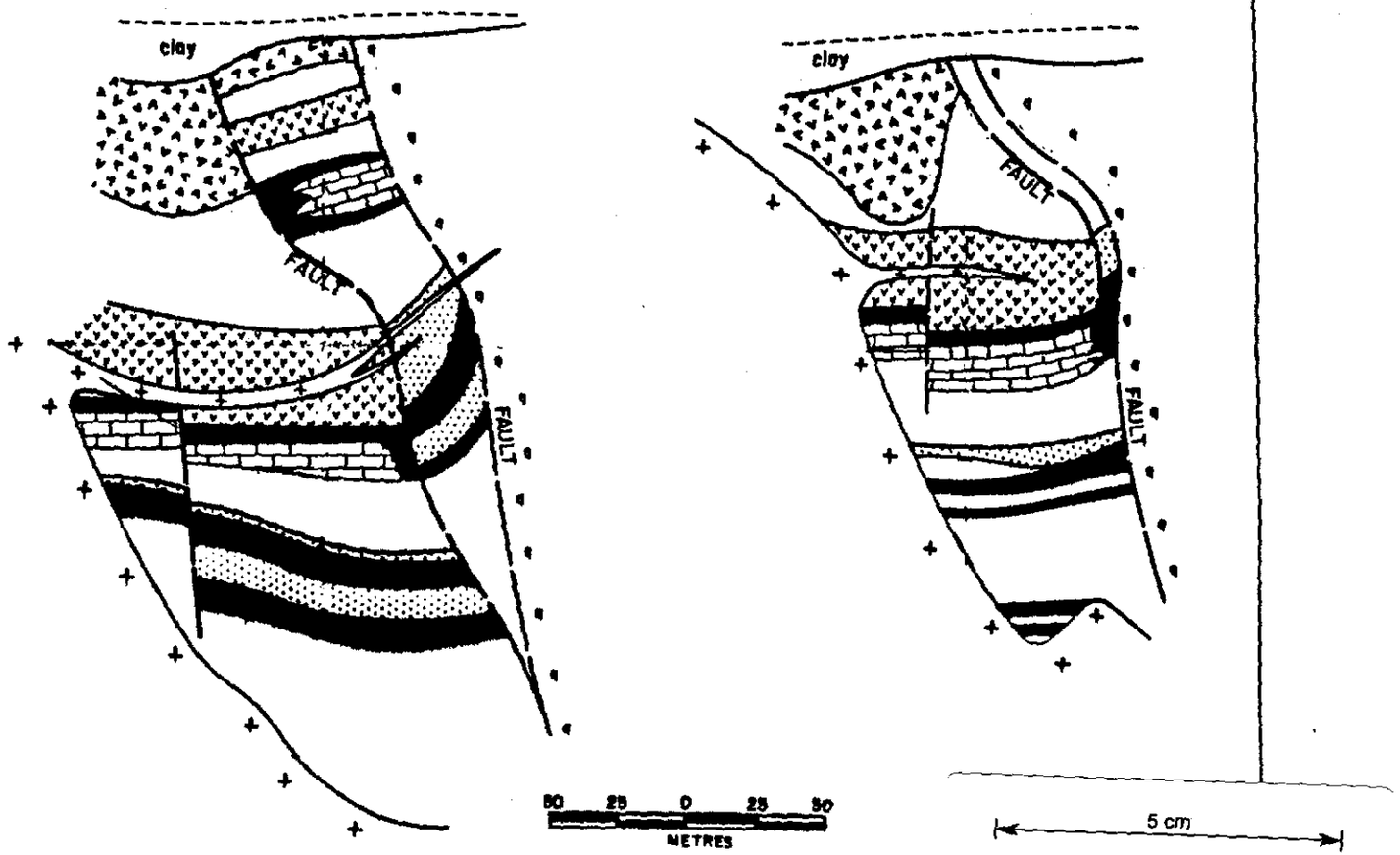

Fig 3 *East-west sections, looking north, of the Rold Head orebody, King Island Scheelite mine.*

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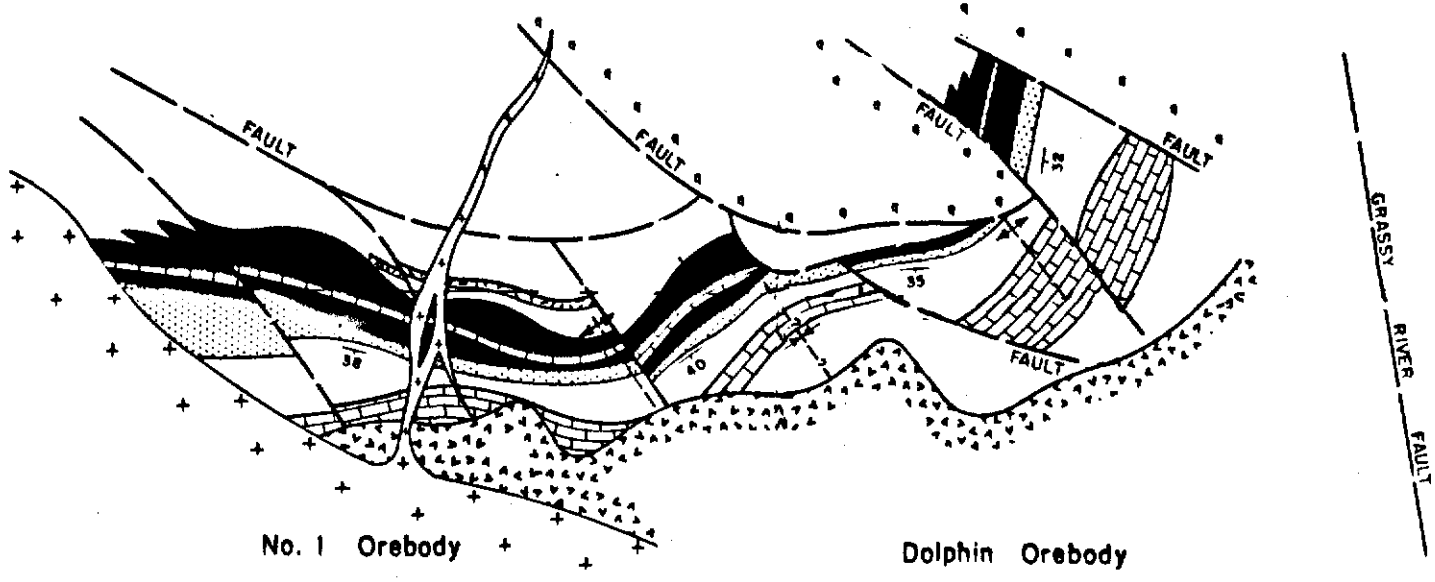

LEGEND: (Figures 7 and 8)

- Upper metavolcanics
- Middle metavolcanics (Bold Head)
- Calcite hornfels
- Pyroxene garnet hornfels
- Garnet hornfels (Scheelite)
- Lower metavolcanics
- Quartzite
- Granodiorite / Adamellite
- Strike and dip
- Syncline (int.
- Anticline

80 0 50 100 150 200
METRES

5 cm

Geological plan at 75 m above sea level, No 1 and Dolphin orebodies, King Island Scheelite mine.

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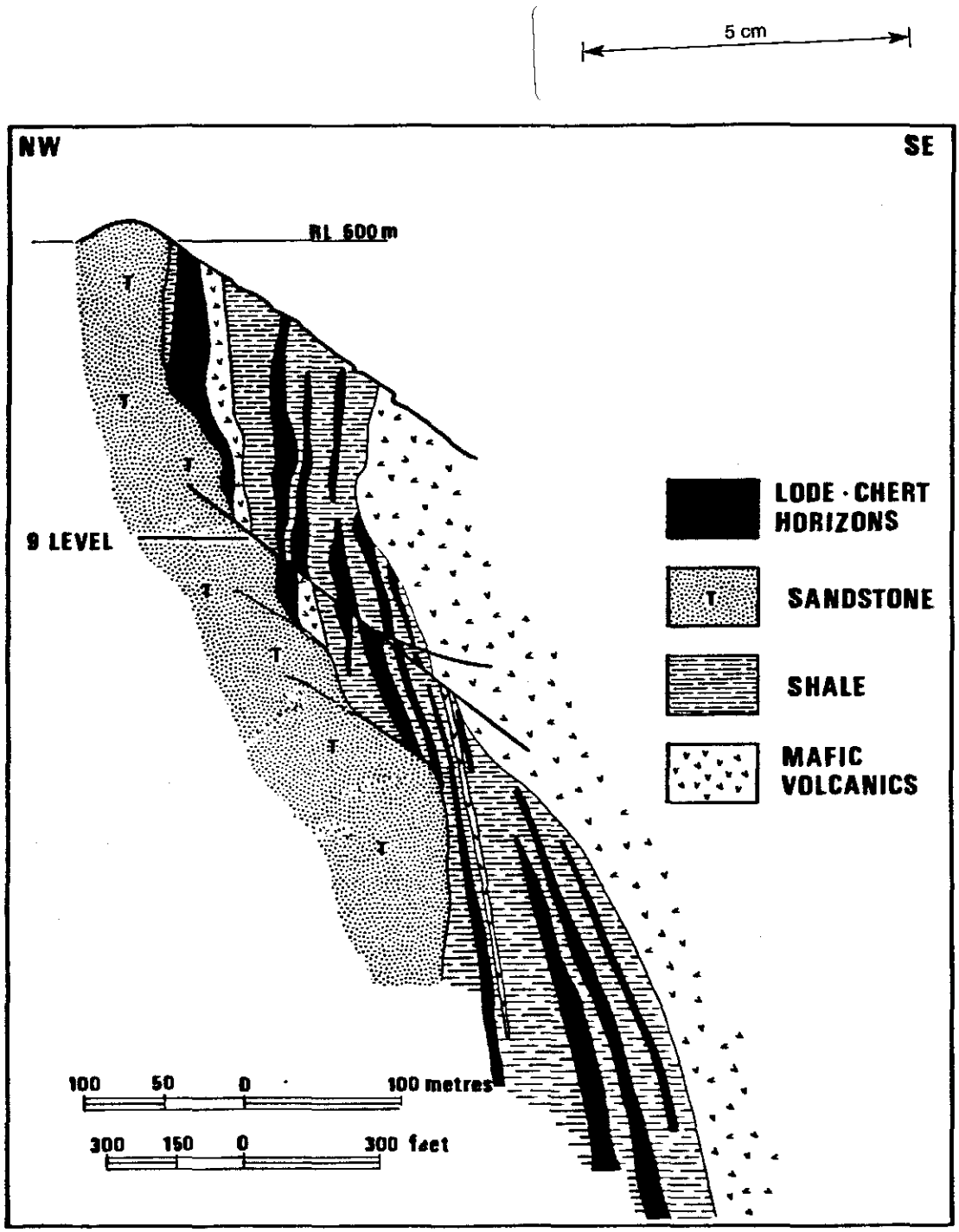


Section QA *looking northeast, Cleveland mine.* FIG.3.

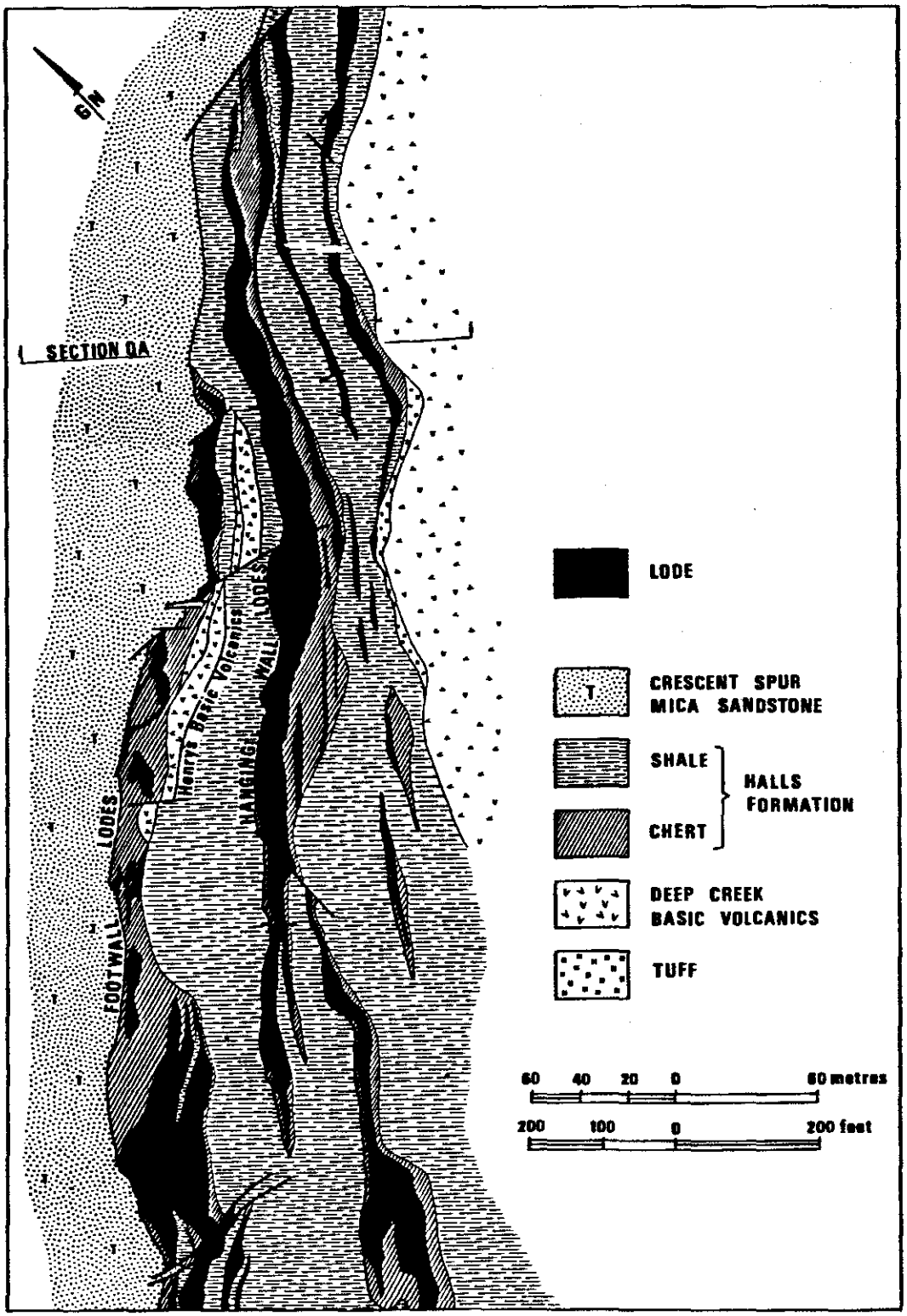
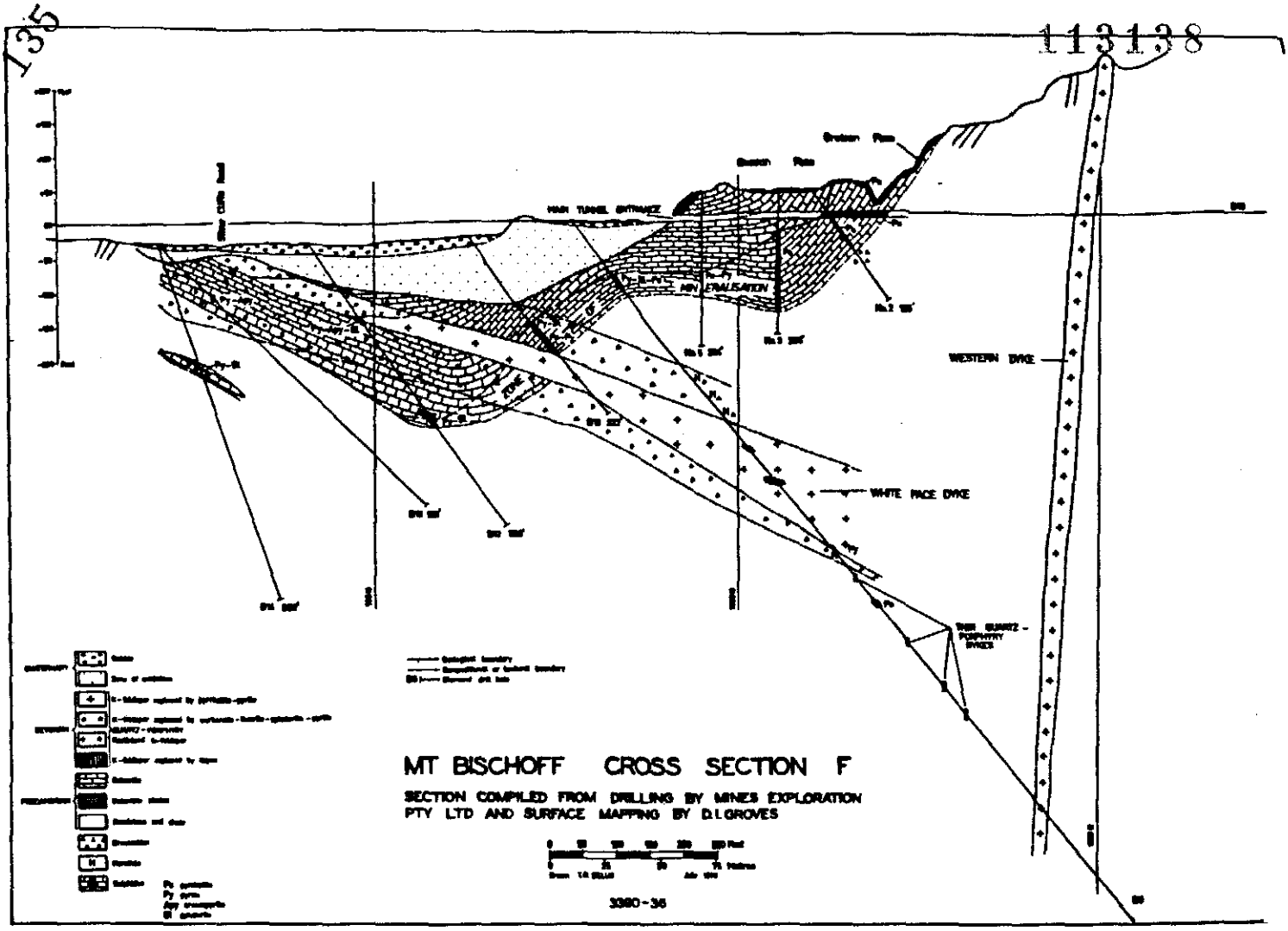
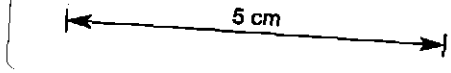


FIGURE 15. Geological plan, 9 level (see Fig. 16), Cleveland mine

5 cm


WESTERN DYKE
WHITE FACE DYKE
MT BISCHOFF CROSS SECTION F
SECTION COMPILED FROM DRILLING BY MINES EXPLORATION PTY LTD AND SURFACE MAPPING BY D.L.GROVES
3380-36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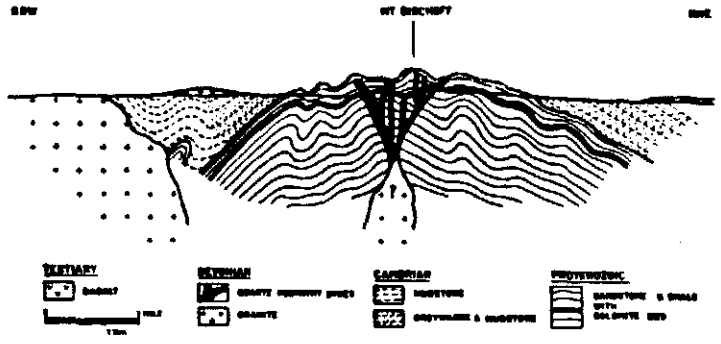
MT BISCHOFF
TERTIARY
DEVONIAN
CAMBRIAN
PROTEROZOIC

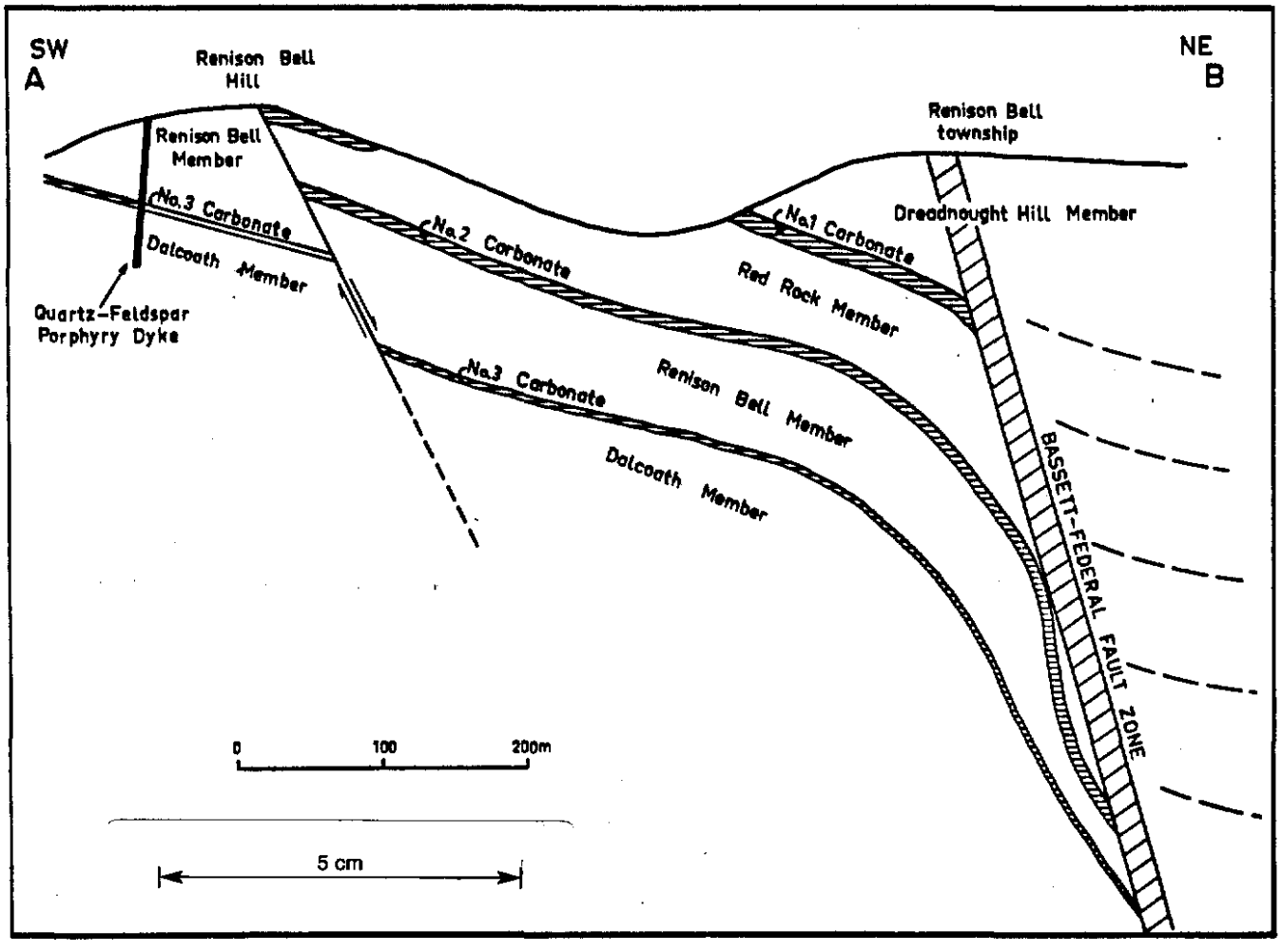

FIGURE 20. Northeast-southwest section, looking northwest, of the Renison mine area (location on Fig. 19).

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COMALCO LIMITED

COMALCO

MEMORANDUM

Ref.

Date 27 November, 1979

To G. Weste

From J. Cucuzza

At Tasmania

At 8/Citicorp

Copies A.H. Bartlett

Subject MAGNETIC MODELLING OF RENISON TYPE ORE BODIES.

In order to gain some idea as to the magnitudes of the magnetic anomalies expected over a Renison type ore body which is overlain by basalt, two models of slightly different configuration were studied.

Model A is a thin horizontally lying plate with a thickness of 10 metres and 250 metres by 250 metres sides. Model B has exactly the same dimensions but lies vertically. Both models are assumed to lie below a homogeneous basaltic layer (cwf Guilford, the model would lie within Palaeozoic) whose bottom interface is flat.

Under these simplifying assumptions both the basalt layer and the Palaeozoic can be neglected in the modelling. The susceptibility of the ore is assumed to be 2×10^{-3} cgs.

The table below sets out the resultant maximum amplitudes of the anomalies for various model depths.

MODEL DEPTH OF BURIAL METRES	A	B
	MAXIMUM AMPLITUDE NANOTESLAS.	
100	27	12
200	8	3.3
300	3	1.4
400	1.5	0.7

The most striking feature is that the maximum amplitudes are very small, thus making their detection almost impossible. This would be particularly so when a more realistic model of the overlying basalt is considered, in which the susceptibility is nonuniform.

/2

As expected, in the horizontal configuration the model has a higher amplitude anomaly. This indicates that for a given depth it is easier to detect a horizontal thin sheet of ore than a vertical sheet.

As this has been a simple modelling exercise it suffices to point out the difficulties in attempting to see such anomalies in the Guilford E.L.
The problem is obviously compounded by the inhomogeneity of the basalt.

Analysis of more realistic models will be undertaken. Modelling will be carried out for magnetic, gravimetric and resistivity anomalies. The result of which will be the subject of a subsequent report.

J. CUCUZZA.

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APPENDIX 13

COMPARISON OF

RAPID RECONNAISSANCE MAGNETIC INDUCED POLARISATION

(RRMIP)

AND

ELECTICAL INDUCED POLARISATION (EIP)

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COMPARISON OF RRMIP AND EIP

Summary.

An EIP survey was carried out over a weakly mineralised area previously covered by RRMIP. The area is adjacent to the Guildford E.L. and contains similar exploration problems caused by Tertiary basalt cover. EIP and RRMIP performed similarly over outcropping Cambrian rocks. RRMIP obtained large false anomalies over the basalt which totally obscured any data from underlying Cambrian rocks. Neither survey indicated significant mineralisation in the area.

Aims.

1. To determine the usefulness of RRMIP surveys in Tasmanian conditions over:-
   (a) Outcropping Cambrian rocks.
   (b) Cambrian rocks covered by thin Tertiary basalt.
2. To compare RRMIP with EIP.
3. To explore an area with disseminated sulphides.

Area.

The area chosen for comparison was Two Hummocks which lies within Geopeko-EZ, E.L.2/76 Loongana, and a few kilometres east of Comalco E.L.1/76, Guildford. An RRMIP survey was carried out over the area by Pennzoil following geological mapping and soil sampling by Geopeko.

At Two Hummocks steeply dipping, fine grained, Cambrian acid lavas, tuffs and tuff-shales strike NW-SE, disappearing under Tertiary basalt to the W, S and E. Disseminated galena and pyrite have been observed in the tuff-shales which also have associated zinc soil anomalies. This environment is prospective for 'peripheral' volcanogenic massive sulphide deposits.

RRMIP Survey

Pennzoil used three RRMIP (frequency domain) spreads to read 11 NE-SW grid lines 200 metres apart. Readings were taken at 25 metre intervals for 1000 km along each line.

Computer plotted 'derived' data show weak MMR 'anomalies' over the black shales where they outcrop. However where apparently thin basalt overlies the shales the MMR trends are lost and one broad large MMR anomaly occurs. (See computer profile line 3000). The RPS is flat over the whole of the area.

EIP Survey

Comalco carried out time domain gradient array profiling along three of the Pennzoil lines, using a 25 metre potential dipole. One line (1800S) covers outcropping volcanics and pyrite/galena bearing shales. The second line (2400S) covers an area of the same rocks covered by a few metres of peat and basalt soil. The third line (3000S) is over Tertiary basalt along the SE strike of the Cambrian volcanics.

Low resistivities occurred over the black shale on Line 1800S and on the projected strike of the same rock unit on Line 2400S. Basalt resistivities were obtained along Line 3000S except for small responses between 700 and 850E.

The black shale on Line 2400S is chargeable.

East-west and north-south vertical electrical soundings (schlumberger expander) were carried out on Line 3000S about point 450E. The soundings are of very little use because variable near surface resistivities were encountered by the current electrodes. However, soil and basalt of quite variable resistivities around 1500 m at 3 to 5 metres appear to be underlain by a less resistive layer (deep lead?). Chargeabilities increase initially with depth but show no anomalies. A plot of the soundings is attached.

Comparison of RRMIP and EIP Results.

Although the two techniques are designed to produce different 'images' of the same subject and are in different domains, certain valid comparisons can be made.

1. The black shale is seen as a partial conductor by both techniques to approximately the same degree (see attached Comalco EIP profiles for Lines 1800S and 2400S).

2. EIP sees the shale on Line 2400S as being moderately chargeable. The RRMIP equivalent sees nothing although pyrite and galena have been observed in the shale.

3. The EIP sees a moderate thickness of basalt on Line 3000S and is only able to see through it over a short distance. No EIP chargeability or resistivity anomalies occur. This is in marked contrast to the large, wide, MMR anomaly which must be 'false' and is probably caused by water filled deep lead beneath the basalt.

4. Neither technique indicated the presence of economic massive or disseminated sulphides.

Conclusions.

RRMIP is totally unsuitable for areas with Tertiary basalt. It suffers from the same problem as conventional MIP and sees relative resistivities only. At Moina large MIP anomalies occurred due to the contrasting resistivity of water/clay filled caves with limestone. At Two Hummocks RRMIP saw Tertiary basalt and deep lead as highly anomalous relative to the underlying Cambrian rocks. Where there is strong 'geological noise', relative techniques (such as MIP and RRMIP) are of less useful than absolute techniques (EIP) even if the former are more sensitive.

Where the shales are covered by only a few metres of overburden the RRMIP failed to detect chargeable pyrite and galena in the shales.

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Attached: 1. Three EIP profiles by Comalco, plus plot of soundings.
2. Copy of Pennzoil report (courtesy of Geopeko)

In Devonport vertiplan: 1. Geopeko geology plan of Two Hummocks.
2. Pennzoil plan showing location of RRMIP anomalies.

28.9.79

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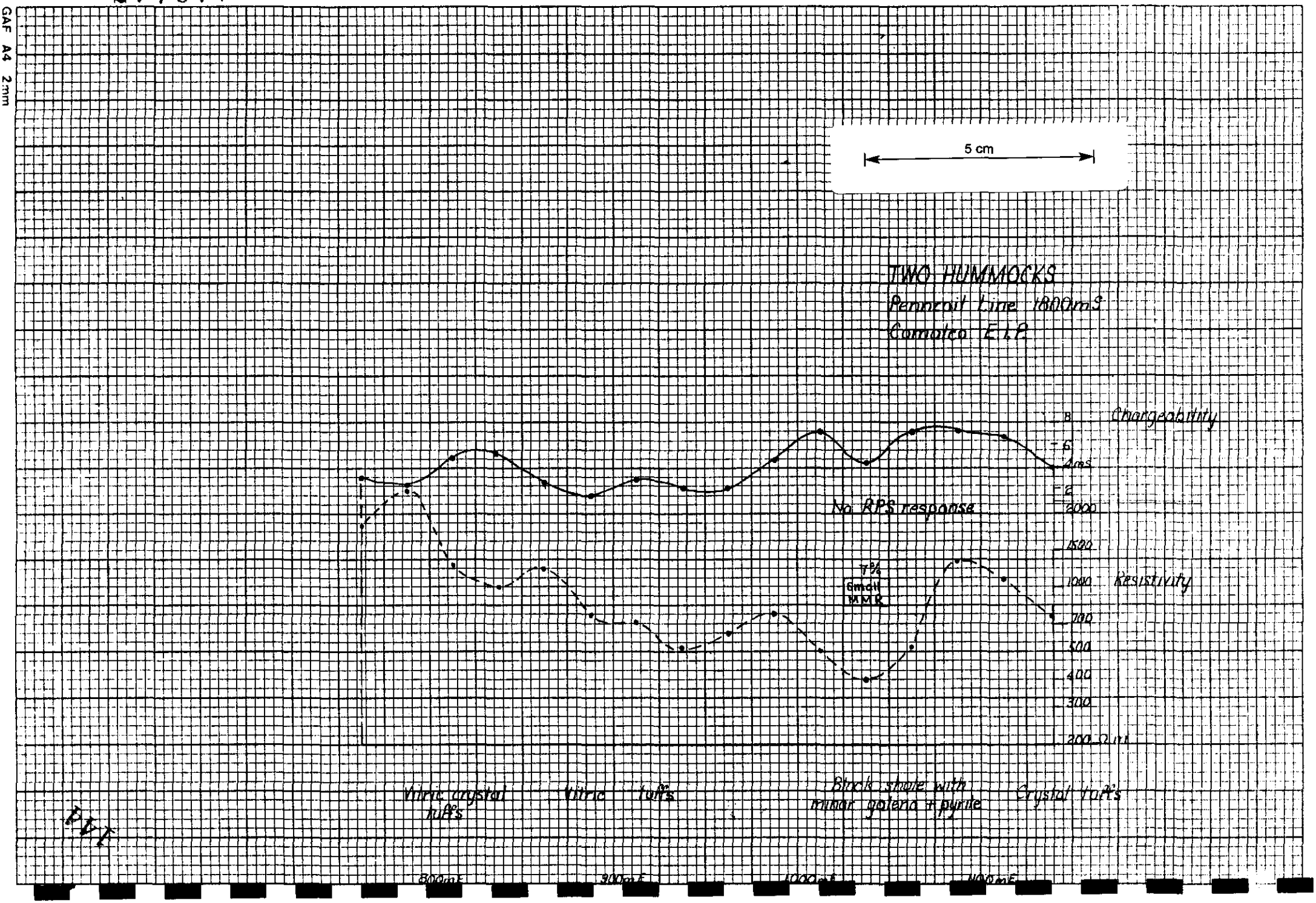
GAF A4 2mm



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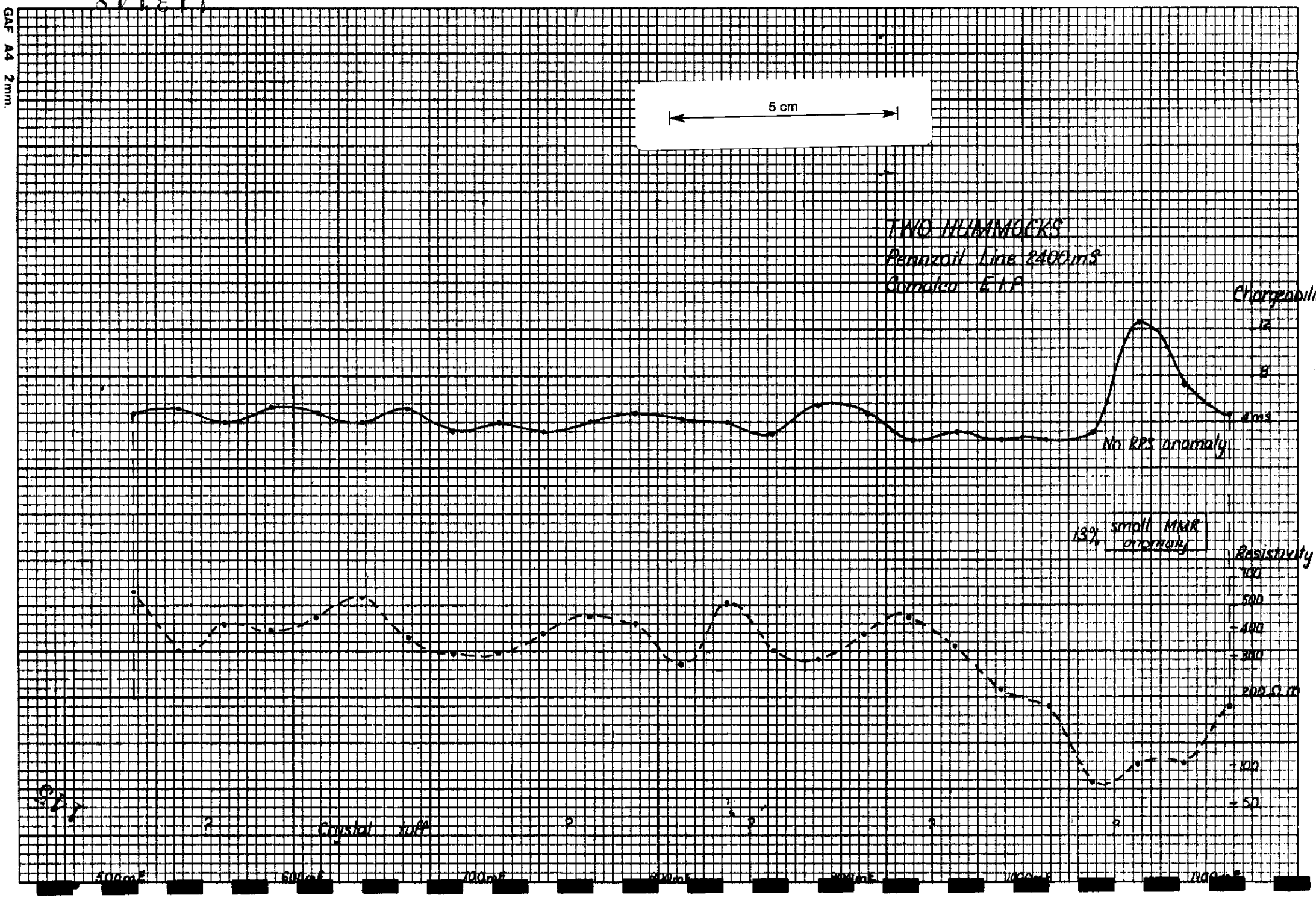
GAF A4 2mm.



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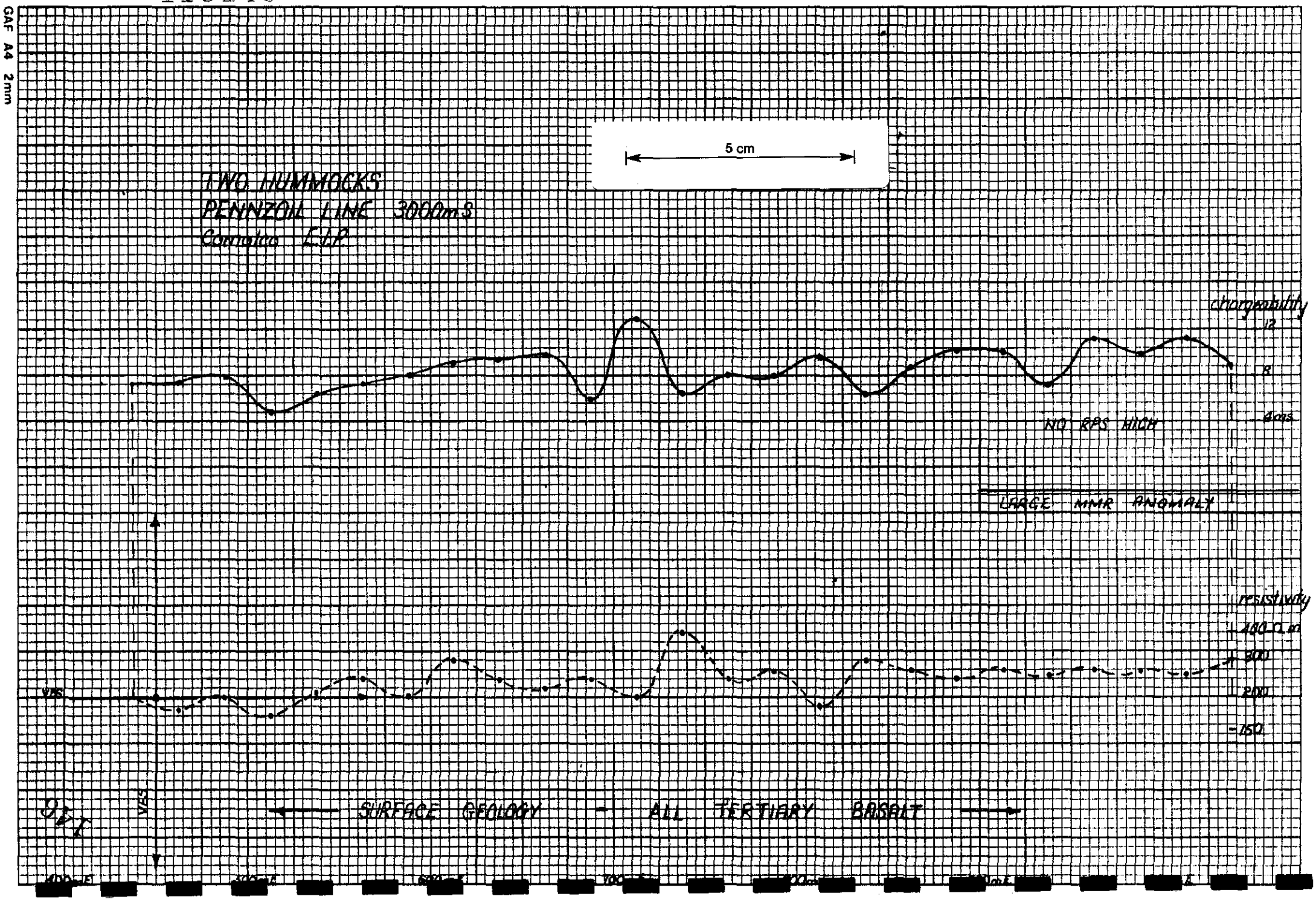

GAF A4 2mm
5 cm
TWO HUMMOCKS
PENNZOIL LINE 3000mS
Comalco E.I.P.
chargeability
12
8
4ms
NO RPS HIGH
LARGE MMR ANOMALY
resistivity
400 Ω m
300
200
150
VES
VES
SURFACE GEOLOGY - ALL TERTIARY BASALT

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APPENDIX 14

GEOLOGICAL LOGS

ALL OR PARTS OF

DIAMOND DRILL HOLES GU-1, GU-2, GU-3

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COMMONWEALTH ALUMINIUM CORPORATION LIMITED

EXPLORATION DEPARTMENT

GEOLOGISTS DRILLING LOG

Hole drilled - logged by I.G.Gould, 1975. Logged G. Weste at Mines Dept. 15 79

Project: NORTHERN PROSPECTING E.L.1/75 Guildford **Date:**

Hole No GW 1 **Location** 9095mE 1310mN **Angle** Vertical **Azimuth** -

Hole No **Location** **Angle** **Azimuth**

Drilled by A.D.D. **Drilling Method** Diamond

Moving Rig **Hrs**

Operating Rig **Hrs**

Delays (specify) **Hrs**

Daily Total **Hrs**

From	To	Advanced	Recovered	Description
0	6.6m			MW massive dark grey + CW vesicular basalt boulders and soil. MS = 0.3 - 1.0 av = 0.3
	12.0			CW vesicular basalt. MS = 0.3
	16.8			HW vesicular basalt. MS variable 0.15 - 0.6
	20.0			SW massive basalt.
	20.6			HW-CW crumbly basalt tuff. MS = 0.15 - 0.3 av 0.15
	21.8			SW massive medium grained basalt with occasional open vesicles. MS = 0.3 - 0.75, av. 0.3
	22.8			HW-CW crumbly basalt tuff. MS = 0.15 - 0.3, av. 0.1
	27.8			MW medium to coarse grained brown-grey massive basalt, minor vesicles up to 1cm diam. fractures coated with zeolite. MS = 0.3 - 0.6, av. = 0.3
	28.8			MW crumbly vesicular basalt, obsidian, tuff. MS = 0.15
	38.0			MW strongly vesicular basalt vesicles mostly lined with zeolite but 30% are empty, zeolite 50% chabazit MS = 0.15 - 1.0, av. 0.4

Remarks: Tuff bands indicate thickness of main flows i.e. 0 - 20.1
However core has been transferred to Al core trays 20.6 - 21.8
from 0 - 127.2m and tuff material may have occurred 22.8 - 27.8
at other intervals and later lost. 28.8 - 62.5
64.0 - 130.5
131.5 - ?

(Note: MS = magnetic susceptibility in 10^{-3} c.g.s. units)

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COMMONWEALTH ALUMINIUM CORPORATION LIMITED
EXPLORATION DEPARTMENT
GEOLOGISTS DRILLING LOG

Project: Date: 19

Hole No GF 1 Location Angle Azimuth

Hole No Location Angle Azimuth

Drilled by Drilling Method

Moving Rig Hrs

Operating Rig Hrs

Delays (specify) Hrs

Daily Total Hrs

From	To	Advanced	Recovered	Description
	47.6			MW-HW crumbly broken highly vesicular basalt. Most vesicles empty or lined with fine zeolite. MS = 0.3 - 2.0, av. 7.5
	51.6			MW massive black basalt. Minor empty vesicles. MS = 0.3 - 1.2, av. 0.4
	62.5			MW very strongly vesicular basalt. Most vesicles empty or lined with fine zeolite, zeolite ≤ 5% MS = 0.6 - 1.7.
	63.5			HW crumbly tuff.
	64.0			HW baked orange clay.
	127.2			MW massive basalt slightly vesicular in patches, eg. 108.0 - 113.0 5% chabazite + fine zeolite material. MS = 0.1 - 0.4, av. 0.3 Change in vesicle contents corresponding to change in type of core tray. Core to 127.2m has empty or almost empty vesicles and is stored in aluminium trays without lids. Core below 127.2m has vesicles filled with zeolite and is stored in cardboard trays with lids.
	130.5			SW mixed strongly vesicular (60%) and non-vesicular (40%) basalt. vesicles filled with zeolite - mainly chabazite. MS = 0.1 - 0.4, av. 0.3
	131.5			MW basaltic tuff.
	150.0			MW medium grained basalt vesicular in places, 30% of rock is strongly vesicular. Nearly all vesicles filled with coarse chabazite + fine zeolite material MS = 0.1 - 0.4, av. 0.4
	152.0			SW slightly vesicular basalt.
			HOLE	COMPLETED.

Remarks:

113153 p1 of 2

150

COMMONWEALTH ALUMINIUM CORPORATION LIMITED

EXPLORATION DEPARTMENT

GEOLOGISTS DRILLING LOG

Hole drilled, logged by I.G. Gould, 1975.
Logged by G. Weste at Mines Dept.

Project: NORTHERN PROSPECTING E.L.1/75 Guildford **Date:** 19 79

Hole No GF 2 **Location** 8785mE 1635mN **Angle** Vertical **Azimuth**

Hole No **Location** **Angle** **Azimuth**

Drilled by A.D.D. **Drilling Method** Diamond

Moving Rig **Hrs**

Operating Rig **Hrs**

Delays (specify) **Hrs**

Daily Total **Hrs**

From	To	Advanced	Recovered	Description
0	3m			Soil
	10.0			CW vesicular basalt MS = 0.
	12.0			HW vesicular basalt 15-20% zeolite (mainly chabazit
				MS = 0.3 - 1.0, av. 0.6
	16.3			MW-HW medium grained massive basalt.
				MS = 0.1 - 0.3, av. 0.2
	19.0			MW moderately vesicular basalt. Vesicles filled with zeolite (mainly chabazite) MS = 0.7 - 2.0, av. 1.2.
	22.4			MW massive weakly vesicular non zeolitised dark grey basalt. MS = 0.1 - 0.3, av. 0.2
	30.2			MW-HW red-brown altered basalt. Abundant large vesicles are filled or nearly filled with coarse chabazite. The basalt itself may be finely zeolitised. MS = 0.9 - 1.2, av. 1.0
	32.8			SW massive grey basalt MS = 0.4 - 0.6, av. 0.4
	41.0			MW brown altered basalt. Abundant large vesicles filled with chabazite. Groundmass maybe zeolitised. MS = 0.4
	43.2			SW dark grey massive basalt with numerous fine white acicular? crystals which may be zeolite MS = 0.4 - 0.6, av. 0.4
	45.18			MW brown altered basalt. Abundant large vesicles filled with chabazite. MS = 0.8 - 1.2, av. 1.0
	50.0			SW black massive basalt with fine white specs as at 43.2. MS = 0.1 - 0.4, av. 0.3
	63			SW vesicular basalt with tuffy bands. Vesicles large 0.5 - 1cm and increase in abundance with depth. Approximately 70% of core is vesicular, containing 30-40% zeolite (mainly chabazite) MS = 0.

Remarks: All core is stored in cardboard trays and lids and all vesicles contain zeolite.

(Note: MS = magnetic susceptibility in 10^{-3} c.g.s. units)

151

113154

p 2 of 2

COMMONWEALTH ALUMINIUM CORPORATION LIMITED
EXPLORATION DEPARTMENT
GEOLOGISTS DRILLING LOG

Project: Date: 19

Hole No GF 2 Location Angle Azimuth

Hole No Location Angle Azimuth

Drilled by Drilling Method

Moving Rig Hrs

Operating Rig Hrs

Delays (specify) Hrs

Daily Total Hrs

From	To	Advanced	Recovered	Description
	76.4			MW massive grey basalt. Non vesicular.
				MS = 0.1 - 0.6, av. 0.3
	77.5			MW basaltic tuff
	80.5			MW massive basalt with small white crystals as at
				43.2. MS = 0.1 - 0.3, av. 0.3
	88.5			SW black massive basalt as at 80.5.
				MS = 0.1 - 0.6, av. 0.4

Remarks:

113155

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COMMONWEALTH ALUMINIUM CORPORATION LIMITED

EXPLORATION DEPARTMENT

GEOLOGISTS DRILLING LOG

Hole drilled then logged by I.G. Gould, 1975. Logged by G. Weste at Mines Dept 1979

Project: Northern Prospecting E.L.1/75 Guildford **Date:**

Hole No GF3 **Location** 9310mE 1445mN **Angle** Vertical **Azimuth** -

Hole No **Location** **Angle** **Azimuth**

Drilled by A.D.D. **Drilling Method** Diamond

Moving Rig **Hrs**

Operating Rig **Hrs**

Delays (specify) **Hrs**

Daily Total **Hrs**

From	To	Advanced	Recovered	Description
0	88.0			Core lost.
82.0	88.0			SW dark grey basalt 60% of core is strongly vesicular containing 30-40% zeolite (mostly chabazite) some vesicles are empty
				MS = 0.3 - 1.3, av 1.0
	90.0			SW massive dark grey basalt non vesicular.
				MS = 0.1
			HOLE	COMPLETED

Remarks: Most of core was lost whilst stored at the Guildford Station house.

(Note MS = magnetic susceptability in 10^{-3} c.g.s. units)

005

PLANS

113156

(In separate folder)

Transparencies held in Library

* No transparencies held

GENERAL

VOL 2.

TAS-78-178A	Guildford, Highclere, Riana Regions - Geology.
TAS-79-316	Parts of E.L.1/76, Guildford and 4/77 Highclere - Geolog
TAS-78-197	Analyses of magnetic fractions of stream sediment.
*TAS-78-181B	Stream magnetic and panned concentrate analyses.
*TAS-78-182B	Stream magnetic and panned concentrate analyses.
*TAS-78-183B	Stream magnetic and panned concentrate analyses.
TAS-79-304	Composite regional airmag BMR + Rio Tinto.
TAS-79-323	Aeromagnetic total intensity contours at 1:20,000.
TAS-79-324A	Aeromagnetic stacked profiles.
TAS-79-324B	Aeromagnetic stacked profiles.
TAS-79-324C	Aeromagnetic stacked profiles.
TAS-79-325A	Aeromagnetic flight path plots.
TAS-79-325B	Aeromagnetic flight path plots.
TAS-79-325C	Aeromagnetic flight path plots.
TAS-79-326A	Aeromagnetic total intensity contours at 1:10,000 sh.3.
TAS-79-326B	Aeromagnetic total intensity contours at 1:10,000 sh.2.
TAS-79-326C	Aeromagnetic total intensity contours at 1:10,000 sh.1.
TAS-79-381	Guildford and Highclere lineaments.
TAS-79-388	Two Hummocks EIP Schlumberger expander.

ST. VALENTINE'S GRID.

TAS-79-272	Geology.
TAS-79-253	Slope corrections.
TAS-79-261	Magnetic data.
TAS-79-267	Stacked magnetic profiles.
TAS-79-266	Total magnetic field contour plan.
TAS-79-264	Stacked resistivity profiles.
TAS-79-260	Resistivity Contours.

VOL 3

TAS-79-265	Stacked chargeability profiles.
TAS-79-295	Chargeability contours.
TAS-79-390	Geophysical trends.
TAS-79-269	C horizon soil analyses.

BLYTHE ROAD GRID

TAS-79-297	Stacked resistivity profiles.
TAS-79-259	Slope corrections.
TAS-79-298	Stacked chargeability profiles.
TAS-79-347	Composit profile Line 20800N.
TAS-79-348	Composite profile Line 20400N.
TAS-79-349	Composite profile Line 20000N.
TAS-79-350	Composite profile Line 19600N.
TAS-79-351	Composite profile Line 21600N.
TAS-79-352	Composite profile Line 22000N.
TAS-79-353	Composite profile Line 21200N.

TAS-79-266

transparency supplied — position in report marked.

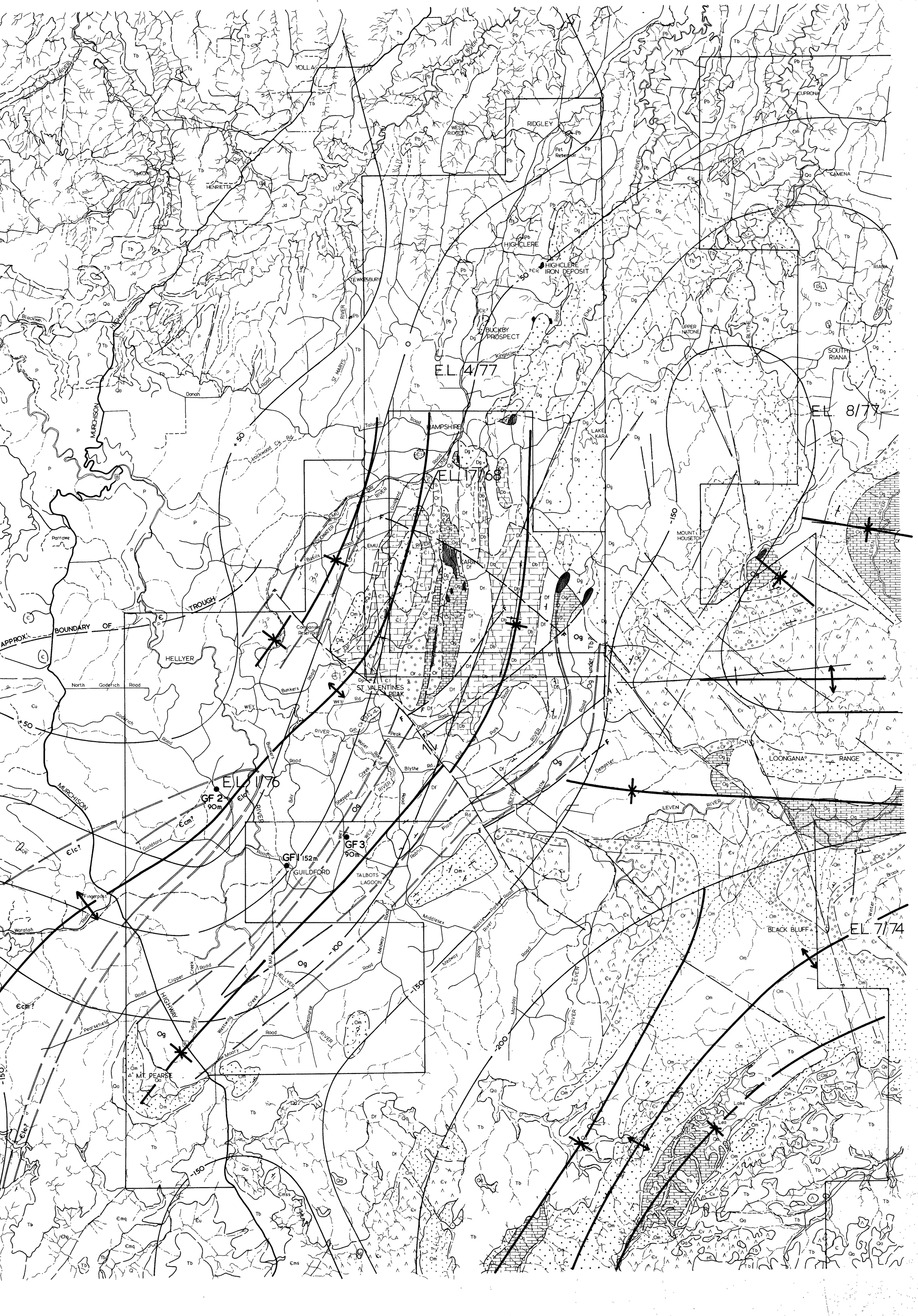
006

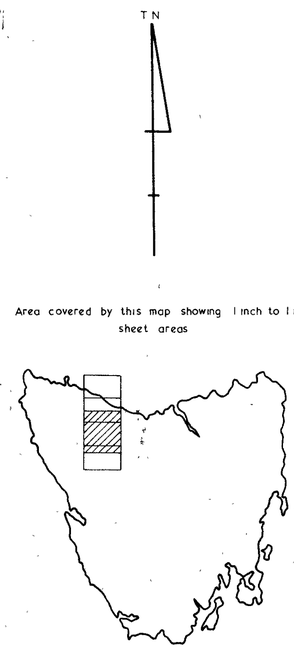
BLYTHE ROAD GRID (Cont.)

TAS-79-317	Follow up magnetic data.
TAS-79-318	Follow up magnetic profiles.
TAS-79-319	Follow up resistivity profiles.
TAS-79-320	Follow up chargeability profiles.

TALUNAH ROAD MAGNETIC ANOMALY

TAS-79-345	Ground traverse total magnetic field profiles.
TAS-79-346	Electrial induced polarisation profiles.





QUATERNARY

Qa — Alluvium

TERTIARY

Ts — Conglomerate & grits

PERMO - CARBONIFEROUS

P — Sandstone, siltstone, tillite

Unconformity

DEVONO - SILURIAN

Db — Bell shale

Df — Florence sandstone

Magnetite rich skarn

ORDOVICIAN

Og — Limestone

Om — Sandstone

Or — Conglomerate

CAMBRIAN

€l — Limestone, mudstone

€v — Acid / intermediate volcanics & sediments

€ms — Mudstone with slate & sandstone

€mq — Mudstone, quartzite & greywacke sequence

€hg — Greywacke & mudstone

€lc — Limestone conglomerate

€gc — Greywacke conglomerate – sandstone & mudstone

€cm — Mudstone & greywacke

€s — Siliceous siltstone containing hematite jasper bodies

CAMBRIAN (cont.)

€u — Undifferentiated

PRECAMBRIAN

Pb — Burnie Beds - slates, siltstones, sandstones

Pε — Undifferentiated Mainly Tyennan Block rocks

IGNEOUS ROCKS

Tb — Tertiary basalt

Jd — Jurassic dolerite

Dp — Devonian porphyry

Dg — Devonian granite - Housetop Granite

Ub — Proterozoic ? ultrabasic

KEY

Highways

Roads

Tracks

Creeks

Rivers

Railway

• GF 2 90m — N.P. diamond drill hole & depth in metres

Structural axis

Bouger contour with value in $\mu m\ sec^{-2}$

5 cm

79-1409

COMALCO LIMITED

EL 1/76, 4/77, 8/77, TASMANIA

GUILDFORD, HIGHCLERE, RIANA, REGIONS GEOLOGY

113158

Compiled: R Pollock, P Watkins, G Weste	Revised: October, 1978	Drawn: G Hedditch	
Date: October, 1978	Scale: 1 : 63,360	Drg No: TAS-78-178A	

2698

E.L. 1/76

E.L. 17/68

E.L. 4/77

TALLIAH ROAD

MOORLAND ROAD

ROSEBYTHAMS ROAD

RINGWOOD ROAD

DUFFIELDS RD.

BASILS ROAD

KARA NORTH

KARA

KARA SOUTH

ST. VALENTINES GRID

Magnetic traverse

Magnetic traverse

Large tourm. qtz. pyrite veins.

Epidote garnet

Qtz. porphyry

Metal silt

qtz. Fe Mn vns

Vitric Lithic tuff

Garnet

Py + Po

Tourm. vns

Metasilt vns

Scree

Possible concealed fault

Fractured resilicified quartzite

FAULT ZONE

quartzite

v. minor garnet

Travertine

ss silt

soft fossil shale

shale

Db

DU

Dbl

hf

KEY

QUATERNARY

- Moraine

SILURO DEVONIAN

- Magnetite skarn
- Quartz tourmaline veins & dykes
- Granite
- Shale hornfels (hf)
- Fine grained sandstone (ss) siltstone (slst) & quartzite.

TERTIARY

- Basalt
- Deep lead (greyblly + minor travertine)

ORDOVICIAN

- Hornfels (hf) minor metasiltstone (slst) & shale
- Coarse-medium grained sandstone quartzite
- Conglomerate

CAMBRIAN

- Hornfels (hf), including garnet-calc silicate-epidote (c) rich bands. Minor shale siltstone.
- Acid volcanics vitric lithic crystal ash flows and quartz feldspar porphyry

- Geological boundary
  - Definite (usually outcrop boundary)
  - Approximate
  - Inferred
- Dip & strike
- Fold axis
- Fault (? = inferred)
- Blythe Road grid line
- Boundary St. Valentines grid.

NGN

MN

5 cm

113159 79-1409

COMALCO

TASMANIA

PARTS OF E.L. 1/76 GUILDFORD & E.L. 4/77 HIGHCLERE

GEOLOGY

2399

Compiled: G. Weste	Revised:	Drawn: O. Hedditch
Date: Dec. 1979	Scale: 1:20000	Drg. No. TAS-79-316

TASMANIA 1:20 000

Index numbers shown on this tenure map when used in conjunction with the sheet number provides a unique reference to any lot. (e.g.28/20/4845). Details of Tenure: G = granted lot. P.G. = purchase grant. P. = purchase lot. L.O. = location order. C.I = certificate issued. S.S. = soldier settlement. S.S.L. = soldier settlement lease. R.A. = residence area. L = lease lot. T.L. = temporary licence. C.L. = crown land. G.R.P. = granted under Real Property Act. Copies of this plan may be obtained from the Lands Dept. or Box 44a. G.P.O. Hobart.

CADASTRAL REFERENCE SHEET 20/3943

Index	Map Ref.	Survey Plan	Lot	Area	Name / Purpose	Tenure
1	A10	60/16	-	6.070ha	Diprose, C.A.	P.G.
2	A10	130/2	-	20.24ha	Franks, E.H.	P.G.
3	A10	76/14	-	42.96ha	Holloway, L.G.A.	P.
4	A10	--	-	4692ha	State Forest Gaz. 10.7.63	C.L.
5	A10	39/27	-	37.89ha	Cross, W.	P.G.
6	A10	78/28	-	12.85ha	Cross, W.	P.G.
7	A10	102/6	-	90.60ha	Beamish, S.S.	S.S.
8	B10	-	-	-	Vacant	C.L.
9	C10	78/20	-	60.20ha	Vacant	C.L.
10	C10	44/25	-	58.07ha	Deacon, J.	P.G.
11	C10	67/15	-	20.90ha	Radford, E.A.	P.G.
12	C9	44/23	-	20.26ha	Deacon, J.	P.G.
13	D9	39/31	-	19.99ha	Curator of Intestate Estates	P.G.
14	D9	319/9	-	8.696ha	Pander, E.M. & T.E.	P.G.
15	C9	36/16	-	19.53ha	Radford, E.A.	P.G.
16	C9	39/25	-	18.64ha	Radford, E.A.	P.G.
17	B9	42/32	-	10.12ha	Docking, W.T.	P.G.
18	A9	39/23	-	32.01ha	Cross, W.	P.G.
19	A9	47/23	-	15.58ha	Cross, W.	P.
20	A9	39/23	-	41.35ha	Cross, W.	P.G.
21	B8	45/16	-	58.96ha	Turnbull, A.S.	P.G.
22	C9	36/14	-	80.97ha	Turnbull, M.E.H.	P.G.
23	C8	29/17	-	59.15ha	Deacon, J.	P.G.
24	C8	36/15	-	18.47ha	Turnbull, M.E.H.	P.G.
25	C8	29/16	-	39.72ha	Duffield, S.	P.G.
26	C7	16/44	-	40.47ha	Duffield, S.	P.G.
27	B7	36/12	-	61.66ha	Duffield, S.	P.G.
28	B8	45/16	-	19.87ha	Vacant	C.L.
29	A8	78/25	-	19.83ha	Burnie Board & Timber P/L	P.G.
30	A8	76/10	-	64.14ha	Burnie Board & Timber P/L	P.G.
31	A8	94/14	-	44.16ha	Vacant	C.L.
32	A7	39/24	-	79.36ha	Dodd, J.	P.G.
33	A7	124/5	-	75.94ha	Hayes, F.R.G.	P.G.
34	A7	50/20	-	19.85ha	Atkinson, J.H.T.	P.G.
35	A7	67/20	-	11.49ha	Dodd, T.K.	P.G.
36	B7	40/30	-	18.06ha	Dodd, J.	P.G.
37	B7	G10/6	-	9.902ha	Dodd, A. (Town Res. Oonah)	P.
38	B7	189/19	-	30.75ha	Townsend A.E. (Town Res Oonah)	P.
39	B7	G10/7	-	2.021ha	Townsend, A.E. (Town Res. Oonah)	P.
40	C6	113/21	-	60.71ha	Broadbent, C.E.	S.S.
41	C6	113/21	-	61.67ha	Haywood, R.R.	S.S.
42	C6	47/21	-	15.06ha	Deacon, F.T.	P.G.
43	C5	40/28	-	19.83ha	Martin, T.G.	P.G.
44	C6	40/29	-	20.07ha	Deacon, F.T.	P.G.
45	B6	40/27	-	18.28ha	Robotham, H.V., C.B. & M.H.	P.G.
46	B6	39/28	-	20.17ha	Robotham, H.V.	P.G.
47	A6	42/30	-	60.35ha	Townsend, T.	P.G.
48	B6	47/22	-	19.95ha	Townsend, E.J.	P.G.
49	A6	44/26	-	81.54ha	Atkinson, H.W.	P.G.
50	B5	47/17	-	52.78ha	Craw, P.A.	P.G.
51	A5	110/18	-	257.9ha	Tewkesbury Potato Station	C.L.
52	B6	39/28	-	80.65ha	Martin, J.	P.G.
53	B4	36/10	-	111.1ha	Smedley, J.E.W.	P.G.
54	C5	40/24	-	39.76ha	Martin, T.G.	P.G.
55	C4	53/14	-	58.58ha	Morris, J.	P.G.
56	C5	54/26	-	58.64ha	Morris, A.H.	P.G.
57	D3	56/25	-	60.98ha	Townsend, J.	P.G.
58	C3	50/15	-	60.68ha	Smedley, J.E.W.	P.G.
59	B3	42/24	-	20.22ha	Reid, W.	P.G.
60	B3	43/18	-	42.39ha	Atkinson, C.E.	P.G.
61	A3	47/13	-	62.52ha	Tewkesbury Additional Land	C.L.
62	A3	47/24	-	8.162ha	Reid, W.	P.G.
63	A2	27/6	-	20.19ha	Tewkesbury, Potato Station	C.L.
64	A2	60/1	-	81.07ha	Assoc. Forest Holdings Pty. Ltd.	P.G.
65	A2	78/27	-	Part of 97.81ha	Atkinson, C.E.	P.G.
66	C2	44/28	-	40.36ha	Reid, W.	P.G.
67	B2	47/26	-	10.11ha	Reid, W.	P.G.
68	B2	60/9	-	24.02ha	Reid, W.	P.G.
69	E3	42/29	-	128.8ha	Cumming, R.A.	P.G.
70	F3	42/28	-	80.97ha	Barker, F.	P.G.
71	F3	47/19	-	80.85ha	Cumming, T.S.	P.G.
72	E2	41/25	-	79.45ha	Owen, M.	P.G.
73	E2	47/16	-	60.64ha	Cumming, L.S.	P.G.
74	D2	54/26	-	109.7ha	Robotham,	P.G.
75	B2	44/28	-	40.33ha	Reid, W.	P.G.
76	F10	105/18	-	36.39ha	Burnie Board Timber Pty. Ltd.	P.G.
77	F10	105/18	-	35.32ha	Bligh, R.N.	P.G.
78	G9	104/33	-	65.34ha	Radford, E.C.	S.S.
79	J6	99/23	-	62.78ha	Beveridge, S.R.	S.S.
80	H3	P.2	-	4046ha	V.D.L. Co. Hampshire Hills	P.G.
81	H1	15/28	-	4047m2	Burnie, Warden Etc. Town Res. of Brand	S.S.
82	H1	--	-	--	--	--
83	I1	99/24	-	37.28ha	Vacant	S.S.
84	C1	--	-	--	V.D.L. Co. Surrey Hills	P.G.
85	D7	11/24SS	32263	4199m2	The Warden Etc. Muny. of Burnie	P.G.
86	B6	40/22	-	20.29ha	Townsend, C.	P.G.
87	B2	67/18	-	20.15ha	Reid, W.	P.G.

KEY:

Sample No.	Sn
Pb	Zn
Cu	Bi
Mo	Be

ppm, in magnetic fraction of stream sediment. Analyses by Amdel, semi-quantitative spectrographic, codes A1, A2.

5 cm

COMALCO LIMITED

E.L. 4/77 HIGHCLERE, TASMANIA 19-1409

ANALYSES OF MAGNETIC FRACTIONS OF STREAM SEDIMENT

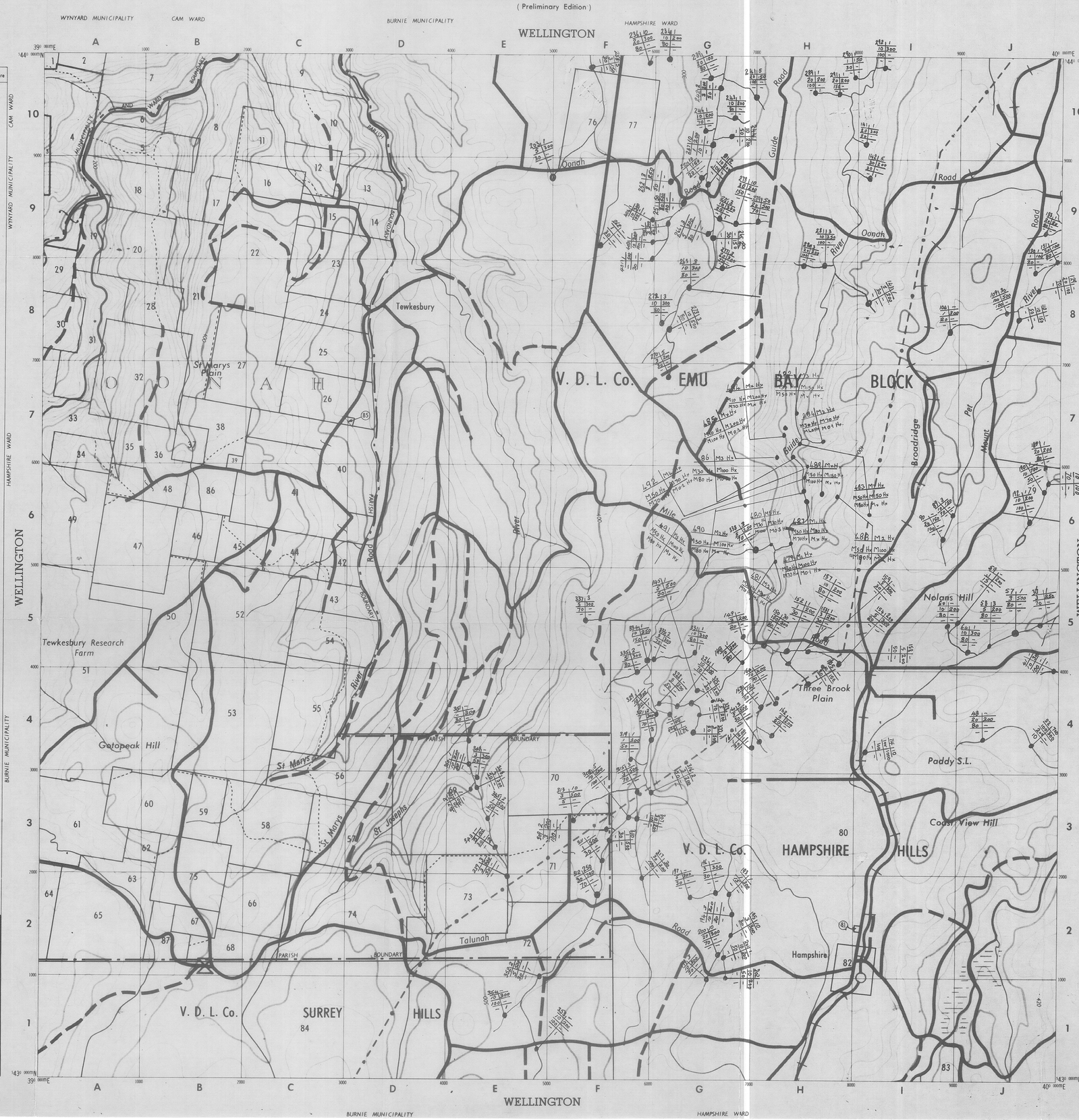
Compiled: R. Duraj, R. Pollock		
	Scale: 1:20 000	Drg. No.: TAS-78-197

113160 (2700

CADASTRAL - TOPOGRAPHIC SERIES

(Preliminary Edition)

REFER TO THIS MAP AS: SHEET 20/3943



This is a Preliminary Edition prepared to provide advance information on areas in which mapping is in progress. This map is Crown Copyright and may only be reproduced upon written authority from the Surveyor General

PRODUCTION: Lands Dept 1975
PROJECTION: Transverse Mercator
HORIZONTAL DATUM: Australian Geodetic Datum 1966.
VERTICAL DATUM: Mean Sea Level
COMPILATION: Based on 1:100 000 Topographical Series and Land District Charts.

SCALE 1:20 000

Line Scale Factor K for this sheet = 0.99974

CONTOUR INTERVAL 20 METRES

CONVERSION TABLES

METRES TO FEET
1 = 3.281
2 = 6.562
3 = 9.843
4 = 13.124
5 = 16.404
6 = 19.685
7 = 22.966
8 = 26.247
9 = 29.528
1 FOOT = 0.3048 METRES

THIS IS A METRIC MAP

KILOMETRES TO MILES
1 = .62
2 = 1.24
3 = 1.86
4 = 2.49
5 = 3.11
6 = 3.73
7 = 4.35
8 = 4.97
9 = 5.59
1 MILE = 1.6093 KILOMETRES

GRID CONVERGENCE CENTRE OF SHEET = 0.8°

MAGNETIC VARIATION 1970 APPROX 12.0°
RATE OF CHANGE APPROX +0.1° EVERY 2 YEARS

MAP REFERENCE SYSTEM

① ②

20/3943

① Fractional scale in thousands i.e. 1:20 000

② South-West co-ordinates of this map sheet as represented by 10,000 metre grid intervals of the Australian Map Grid i.e. 430,000m East and 390,000m North.

BOUNDARY LEGEND

Land District
Municipality
Parish
Ward
Town
Lease
Licence
State Forest
Survey
Miscellaneous

ROAD CLASSIFICATIONS

Principal road and highway
Secondary road.
Minor road
Vehicular track.
Reserved road.

The representation of a road or track on this map is no evidence of the existence of a right of way

INDEX TO ADJOINING SHEETS.

3844	3944	4044
3843	3943	4043
3842	3942	4042

LOCATION DIAGRAM

Users are requested to notify any error to the Surveyor-General, Box 44A, G.P.O. Hobart

TASMANIA 1:20 000

Index numbers shown on this tenure map when used in conjunction with the sheet number provides a unique reference to any lot. (e.g.28/20/4845). Details of Tenure: G = granted lot. P.G.= purchase grant. P. = purchase lot. L.O. = location order. C.I = certificate issued. S.S. = soldier settlement. S.S.L = soldier settlement lease. R.A. = residence area. L = lease lot. T.L. = temporary licence. C.L. = crown land. G.R.P.= granted under Real Property Act. Copies of this plan may be obtained from the Lands Dept. or Box 44a G.P.O. Hobart.

CADASTRAL REFERENCE SHEET 20/3942

Index	Map Ref	Survey Plan	Lot	Area	Name / Purpose	Tenure
1	H10	P2 Well	–	60703ha	V.D.L. Co. (Hampshire Hills)	P.G.
2	I10	99/24	–	40.11ha	Vacant	S.S.
3	F8	P.3621	–	27.73ha	Henter, R.A.	P.G.
4	G8	P.3621	–	32.68ha	Blacklow, M.I.J.	P.G.
5	H5	125/24	–	72.27ha	Ellis, M.T. & A.C.	P.G.
6	I8	138/22	–	29.42ha	Vacant	C.L.
7	I8	157/7	–	19.68ha	Ashton, W.E.	P.
8	J8	111/13	–	82.48ha	Lade, P.G.	P.G.
9	J8	111/13	–	82.51ha	Calf, P.C.	P.G.
10	J7	P.2067	–	99.30ha	Pigott, P.L.	P.
11	J7	111/13	–	61.19ha	Lade, P.G.	P.G.
12	J7	118/23	–	34.87ha	Ballantyne, E.S.	P.G.
13	I7	118/22	–	Part of 80.90ha	Closer Settlement Board	S.S.
14	H7	125/24	–	80.55ha	Ellis, M.T. & A.C.	P.
15	I7	118/22	–	40.45ha	Darcey, C.M.	P.G.
16	J6	122/20	–	41.67ha	Ballantyne, E.S.	P.
17	J6	–	–		Vacant	C.L.
18	J5	145/2	–	40.83ha	Vacant	C.L.
19	J5	145/2	–	40.76ha	Vacant	C.L.
20	J5	138/26	–	40.57ha	Vacant	C.L.
21	I5	138/25	–	40.26ha	Lohrey, S.P.	P.G.
22	I5	138/24	–	39.98ha	Lohrey, E.A.	P.G.
23	I4	147/24	–	40.45ha	Vacant	C.L.
24	J3	145/1	–	80.04ha	Vacant	C.L.
25	H3	–	–	–	Vacant	C.L.
26	G6	154/11	–	Part of 798.4ha	Cumming Bros. E.F.P.	C.L.
27	G7	151/15	–	101.2ha	Vacant	C.L.
28	G7	–	–	–	Vacant	C.L.
29	C5	P2 Well.	–	6073ha	V.D.L. Co. (Surrey Hills)	P.G.

113161

5 cm

COMALCO LIMITED

E.L. 1/76 TASMANIA 79 1H09

GUILDFORD

STREAM MAGNETIC & PANNED CONCENTRATE ANALYSES

Date:	1977-78	Scale:	1:20,000	Drg.No.	TAS-78-181B

2701

SAMPLE NR | M. Sn H Sn
M. Pb H Pb | M. Zn H Zn
M. Cu H Cu | M Ag H Ag
▲ Anomaly

M. MAGNETITE
H. PANNED CONCENTRATE
X. BELOW DETECTION LIMIT

CADASTRAL – TOPOGRAPHIC SERIES

(Preliminary Edition)

REFER TO THIS MAP AS: SHEET 20/3942

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PRODUCTION: Lands Dept. 1975
PROJECTION: Transverse Mercator
HORIZONTAL DATUM: Australian Geodetic Datum 1966
VERTICAL DATUM: Mean Sea Level
COMPILATION: Based on 1:100 000 Topographical Series and Land District Charts.

SCALE 1:20 000

Line Scale Factor K for this sheet = 0.99974

CONTOUR INTERVAL 20 METRES

CONVERSION TABLES

METRES TO FEET
1 = 3.281
2 = 6.562
3 = 9.843
4 = 13.124
5 = 16.404
6 = 19.685
7 = 22.966
8 = 26.247
9 = 29.528
1 FOOT = 0.3048 METRES

KILOMETRES TO MILES
1 = 62
2 = 124
3 = 186
4 = 249
5 = 311
6 = 373
7 = 435
8 = 497
9 = 559
1 MILE = 1.6093 KILOMETRES

THIS IS A METRIC MAP

GRID CONVERGENCE CENTRE OF SHEET = 0.8°

MAGNETIC VARIATION 1970 APPROX 12.0°
RATE OF CHANGE APPROX +0.1° EVERY 2 YEARS

MAP REFERENCE SYSTEM

① ②
20/3942

① Fractional scale in thousands i.e. 1:20 000
② South-West co-ordinates of this map sheet as represented by 10,000 metre grid intervals of the Australian Map Grid i.e. 420,000 m East and 390,000 m North.

BOUNDARY LEGEND

Land District
Municipality
Parish
Ward
Town
Lease
Licence
State Forest
Survey
Miscellaneous

ROAD CLASSIFICATIONS

Principal road and highway
Secondary road.
Minor road
Vehicular Track.
Reserved road.

The representation of a road or track on this map is no evidence of the existence of a right of way

INDEX TO ADJOINING SHEETS.

3843	3943	4043
3842	3942	4042
3841	3941	4041

LOCATION DIAGRAM

Users are requested to notify any error to the Surveyor-General, Box 44A, G.P.O. Hobart.

TASMANIA 1:20 000

Index numbers shown on this tenure map when used in conjunction with the sheet number provides a unique reference to any lot. (e.g.28/20/4845). Details of Tenure: G = granted lot. P.G. = purchase grant. P. = purchase lot. L.O. = location order. C.I. = certificate issued. S.S. = soldier settlement. S.S.L. = soldier settlement lease. R.A. = residence area. L. = lease lot. T.L. = temporary licence. C.L. = crown land. G.R.P. = granted under Real Property Act. Copies of this plan may be obtained from the Lands Dept. or Box 44a G.P.O. Hobart.

CADASTRAL REFERENCE SHEET 20/4041

Index	Map Ref.	Survey Plan	Lot	Area	Name / Purpose	Tenure
1	I10	–	–	3764ha	State Forest Gaz. 28.12.26	C.L.
2	F9	–	–	–	Vacant	C.L.
3	J8	120/17	–	39.84ha	Alstergren, Pty. Ltd.	P.
4	J8	120/17	–	40.45ha	Vacant	C.L.
5	B8	158/17	–	24.36ha	Nielsen, R.	P.G.
6	B8	119/2	–	40.42ha	Burke, T.H.	P.G.
7	G8	119/2	–	32.31ha	Fenton, A.K.D.	P.G.
8	G8	157/12	–	12.22ha	Fenton, A.K.D.	P.G.
9	E8	125/29	–	79.14ha	Haines, F.H. Pty. Ltd.	P.
10	F8	120/20	–	58.24ha	Auld, A.C.	P.G.
11	F8	118/36	–	58.05ha	Vacant	C.L.
12	G7	118/31	–	60.82ha	Maxfield, F.J.	P.G.
13	H7	114/15	–	63.88ha	Haines, F.H. Pty. Ltd.	P.
14	B8	125/30	–	10.54ha	Nielsen	P.G.
15	B8	120/16	–	10.12ha	Vacant	C.L.
16	I8	120/16	–	20.22ha	Haines, F.H. Pty. Ltd.	P.G.
17	J7	–	–	2.023ha	Gravel Res.	C.L.
18	J7	–	–	–	Vacant	C.L.
19	J7	120/14	–	56.48ha	Haines, F.H. Pty. Ltd.	P.G.
20	I7	160/16	–	130.9ha	McHugh, J.L.	P.G.
21	I6	120/14	–	40.87ha	Johnston, J.	P.G.
22	I6	119/1	–	40.06ha	Aitken, L.D.	P.
23	H6	120/15	–	37.38ha	Short, E.	P.G.
24	G6	118/30	–	79.49ha	Bester, I.M.	P.G.
25	G7	119/3	–	56.70ha	Aitken, R.	P.
26	G6	–	–	–	Vacant	C.L.
27	F6	157/14	–	170.9ha	Williams, N.E.	P.G.
28	F7	157/13	–	41.18ha	Edwards, R.L. Appt.	C.L.
29	E7	–	–	51.62ha	Vacant	C.L.
30	E6	157/11	–	68.98ha	Williams, E.L.	P.G.
31	E6	125/31	–	–	Vacant	C.L.
32	B6	–	–	6070ha	Surrey Hills (V.D.L. Co.)	P.G.
33	J6	125/25	–	12.34ha	Vacant	C.L.
34	J6	125/25	–	9.720ha	Vacant	C.L.
35	I6	153/28	–	16.80ha	Vacant	C.L.
36	I6	153/28	–	16.25ha	Vacant	C.L.
37	H5	153/29	–	19.79ha	Vacant	C.L.
38	H6	153/30	–	20.19ha	Vacant	C.L.
39	H6	153/30	–	18.21ha	Vacant	C.L.
40	G5	153/27	–	20.23ha	Vacant	C.L.
41	G5	153/27	–	20.68ha	Vacant	C.L.
42	G5	153/31	–	20.18ha	Vacant	C.L.
43	F5	153/31	–	15.62ha	Vacant	C.L.
44	B3	–	–	–	Vacant	C.L.
45	B6	–	–	–	Crown Reservation	C.L.

SAMPLE NO | MSa HSn | MPb HPb | MZn HZn | MCu HCu

M. MAGNETITE

H. PANNED CONCENTRATE

X. BELOW DETECTION LIMIT

▲ Anomaly

113162

5 cm

COMALCO LIMITED

E.L. 1/76 TASMANIA 79-1409

GUILDFORD

STREAM MAGNETIC & PANNED CONCENTRATE ANALYSES

Date	1977-78	Scale	1:20,000	Drg No. TAS-78-182B

2702

CADASTRAL – TOPOGRAPHIC SERIES

(Preliminary Edition)

REFER TO THIS MAP AS: SHEET 20/4041

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VERTICAL DATUM: Mean Sea Level
COMPILATION: dassed ten 1:100 000 Topographical Series and Land District Charts.

SCALE 1:20 000

Line Scale Factor K for this sheet = 0.99971

CONTOUR INTERVAL 20 METRES

CONVERSION TABLES

METRES TO FEET
1 = 3.281
2 = 6.562
3 = 9.843
4 = 13.124
5 = 16.404
6 = 19.685
7 = 22.966
8 = 26.247
9 = 29.528
1 FOOT = 0.3048 METRES

KILOMETRES TO MILES
1 = .62
2 = 1.24
3 = 1.86
4 = 2.49
5 = 3.11
6 = 3.73
7 = 4.35
8 = 4.97
9 = 5.59
1 MILE = 1.6093 KILOMETRES

THIS IS A METRIC MAP

GRID CONVERGENCE CENTRE OF SHEET = 0.8°

MAGNETIC VARIATION 1970 APPROX 12.0°
RATE OF CHANGE APPROX +0.1° EVERY 2 YEARS

MAP REFERENCE SYSTEM

① ②

20/4041

① Fractional scale in thousands i.e. 1:20 000

② South-West co-ordinates of this map sheet as represented by 10,000 metre grid intervals of the Australian Map Grid i.e. 40,0000 m East and 41,0000 m North.

BOUNDARY LEGEND

Land District
Municipality
Parish
Ward
Town
Lease
Licence
State Forest
Survey
Miscellaneous

ROAD CLASSIFICATIONS

Principal road and highway
Secondary road.
Minor road
Vehicular Track.
Reserved road.

The representation of a road or track on this map is no evidence of the existence of a right of way

INDEX TO ADJOINING SHEETS

3942	4042	4142
3941	4041	4141
3940	4040	4140

LOCATION DIAGRAM

Users are requested to notify any error to the Surveyor-General, Box 44A, G.P.O. Hobart.

TASMANIA 1:20 000

CADASTRAL – TOPOGRAPHIC SERIES

(Preliminary Edition)

REFER TO THIS MAP AS: **SHEET 20/4042**

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CADASTRAL REFERENCE SHEET 20/4042

Index	Map Ref	Survey Plan	Lot	Area	Name / Purpose	Tenure
1	A10	–	–	4046ha	Hampshire Hills (V.D.L. Co.)	G.
2	B9	14/24	–	2023m2	School Site	C.L.
3	C10	154/12	–	Part of 97.81ha	Timber Reserve Gaz. 2.8.50	C.L.
4	C10	122/16	–	40.42ha	Quirk, W.C.	P.G.
5	C10	90/2	–	Part of 39.93ha	Barker, E.	P.G.
6	C10	122/15	–	19.35ha	Holloway, E.	P.G.
7	C9	122/15	–	48.02ha	Carr, R.	P.G.
8	C8	122/18	–	65.10ha	Holjaway	P.G.
9	C8	122/17	–	40.47ha	Stitt, C.H.	P.G.
10	C8	122/17	–	20.23ha	Holloway, E.	P.G.
11	A8	111/13	–	82.50ha	Calf, F.S.	P.G.
12	A7	P.2067	–	99.30ha	Piggott, P.L.	P.
13	C6	–	–	–	Vacant	C.L.
14	A5	142/3	–	40.83ha	Vacant	C.L.
15	A3	145/1	–	80.04ha	Vacant	C.L.
16	B7	–	–	–	Vacant	C.L.
17	J7	147/33	–	20.03ha	Counsel, L.M.	S.S.
18	J7	120/21	–	19.34ha	Pilbeam, K.V.	P.G.
19	J6	116/19	–	42.58ha	Denney, C.F.	P.G.
20	J6	93/26	–	21.58ha	Nicholls, R.A.	P.G.
21	J6	128/5	–	10.30ha	Beasley, J.C.	P.G.
22	J5	102/31	–	20.91ha	Nicholls, R.A.	P.G.
23	J5	158/18	–	6.265ha	Hilder, A.E. Pty. Ltd.	P.G.
24	J5	155/18	–	6.139ha	Templar, R.A. & M.P.	P.G.
25	J5	128/15	–	20.22ha	Beasley, J.C.	P.G.
26	I5	157/16	–	8.266ha	Templar, R.A. & M.P.	P.G.
27	H2	–	–	3764ha	State Forest 28.12.26	C.L.
28	J2	129/26	–	98.96ha	Forestry Department	P.
29	G4	158/12	–	10.33ha	Emmerton, L.E.	P.G.
30	C4	157/6	–	40.42ha	Kara Sawmills Pty. Ltd.	P.G.
31	C3	147/35	–	36.36ha	Kara Sawmills Pty. Ltd.	P.
32	D3	147/22	–	78.91ha	Cummings Bros. Pty. Ltd.	P.G.
33	D3	136/9	–	40.32ha	Kara Sawmills Pty. Ltd.	G.R.
34	B1	–	–	6070ha	Surreys Hills (V.D.L. Co.)	G.

SAMPLE NO | M2a H5a
mPba H3Pb MZn HZn
MCa HCa

M. MAGNETITE
H. PANNED CONCENTRATE
X RHOMB. DETECTION
LIMIT
▲ Anomaly

113163

5 cm

COMALCO LIMITED

E.L. 1/76 TASMANIA 79-1400

GUILDFORD
STREAM MAGNETIC & PANNED CONCENTRATE ANALYSES

Date	Scale	Drg No.
1977-78	1:20,000	TAS-78-183B

2703

WELLINGTON — HAMPSHIRE WARD — BURNIE MUNICIPALITY — PENGUIN MUNICIPALITY — RIANA WARD — DEVON

V.D.L. Co. HAMPSHIRE HILLS — V.D.L. Co. SURREYS HILLS — K A R A — L O W A N N A — L O N G A N A

Tiffs Mistake Road — Rogetta Road — Dobsons Track — Holloway — Blythe River — Laurel Creek — Blythe Creek — MOUNT HOUSETOP — MOUNT EVERETT

LAND DISTRICT BOUNDARY — PARISH BOUNDARY — MUNICIPALITY BOUNDARY — WARD BOUNDARY

WARATAH MUNICIPALITY — EAST WARD

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VERTICAL DATUM: Mean Sea Level
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SCALE 1:20 000

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CONTOUR INTERVAL 20 METRES

CONVERSION TABLES

METRES TO FEET
1 = 3.281
2 = 6.562
3 = 9.843
4 = 13.124
5 = 16.404
6 = 19.685
7 = 22.966
8 = 26.247
9 = 29.528
1 FOOT = 0.3048 METRES

KILOMETRES TO MILES
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3 = 1.86
4 = 2.49
5 = 3.11
6 = 3.73
7 = 4.35
8 = 4.97
9 = 5.59
1 MILE = 1.6093 KILOMETRES

THIS IS A METRIC MAP

GRID CONVERGENCE CENTRE OF SHEET = 0.8°

TN | IGN | MN

MAGNETIC VARIATION 1970 APPROX 12.0°
RATE OF CHANGE APPROX +0.1° EVERY 2 YEARS

MAP REFERENCE SYSTEM

① ②

20/4042

① Fractional scale in thousands i.e. 1:20 000

② South-West co-ordinates of this map sheet as represented by 10,000 metre grid intervals of the Australian Map Grid i.e. 420,000 m East and 420,000 m North.

BOUNDARY LEGEND

Land District
Municipality
Parish
Ward
Town
Lease
Licence
State Forest
Survey
Miscellaneous

ROAD CLASSIFICATIONS

Principal road and highway
Secondary road.
Minor road
Vehicular track.
Reserved road.

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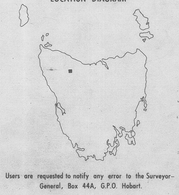
INDEX TO ADJOINING SHEETS.

3943	4043	4143
3942	4042	4142
3941	4041	4141

LOCATION DIAGRAM



Users are requested to notify any error to the Surveyor-General, Box 44A, G.P.O. Hobart.

AEROMAGNETIC MAP OF TOTAL INTENSITY

HAMPSHIRE - BLYTHE RIVER DISTRICT, TASMANIA

This map was compiled from the results of an airborne magnetometer survey in the Hampshire - Blythe River District, Tasmania, conducted by the Bureau of Mineral Resources in October 1955 and May 1956. The object of the survey was to delineate magnetic anomalies which might show the distribution of probable magnetic iron ore deposits.

The data remain uncorrected for regional gradient in total field intensity of 5.6 γ per mile in/o direction S 17° W.

The total intensity was continuously recorded by an AN/ASQ-1 airborne magnetometer. The survey was made at an altitude of 500 feet above ground level along lines spaced one half mile apart.

Photo mosaic assemblies were used as a visual aid to navigation. The actual flight course of the aircraft was plotted from continuous strip photography taken with a 35 mm camera during flight.

Discontinuity of traverse station numbers is due to unnumbered check points inserted in flight by the pilot.

APPROXIMATE SCALE IN MILES

1 0 1 2 3 4 5

CONTOUR INTERVAL 50 GAMMAS

MAGNETIC CONTOUR 500 / 50

MAGNETIC LOW

FLIGHT LINE

RAILWAY

ROAD

TRACK

RIVER

KNOWN IRON ORE DEPOSITS

RIDGELEY

HIGHCLERE

HAMPSHIRE

STOWPORT

CUPRONA

PINE ROAD

NATONE

CAMENA

RIANA

UPR. NATONE

STH. RIANA

EMU RIVER

BLYTHE RIVER

SULPHUR CREEK

RUN 1

RUN 2

RUN 3

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED

VALENTINES PEAK
AEROMAGNETIC OVERLAY

Drg N° TAS-77-76 | Scale: 1 INCH TO 1 MILE

5 cm

NOTE This plan overlays "Guildford, Highclere, Riana, Regions - Geology" (plan No. TAS-78-178)

113164

COMALCO

E.L. 1/76 GUILDFORD 4/77 HIGHCLERE

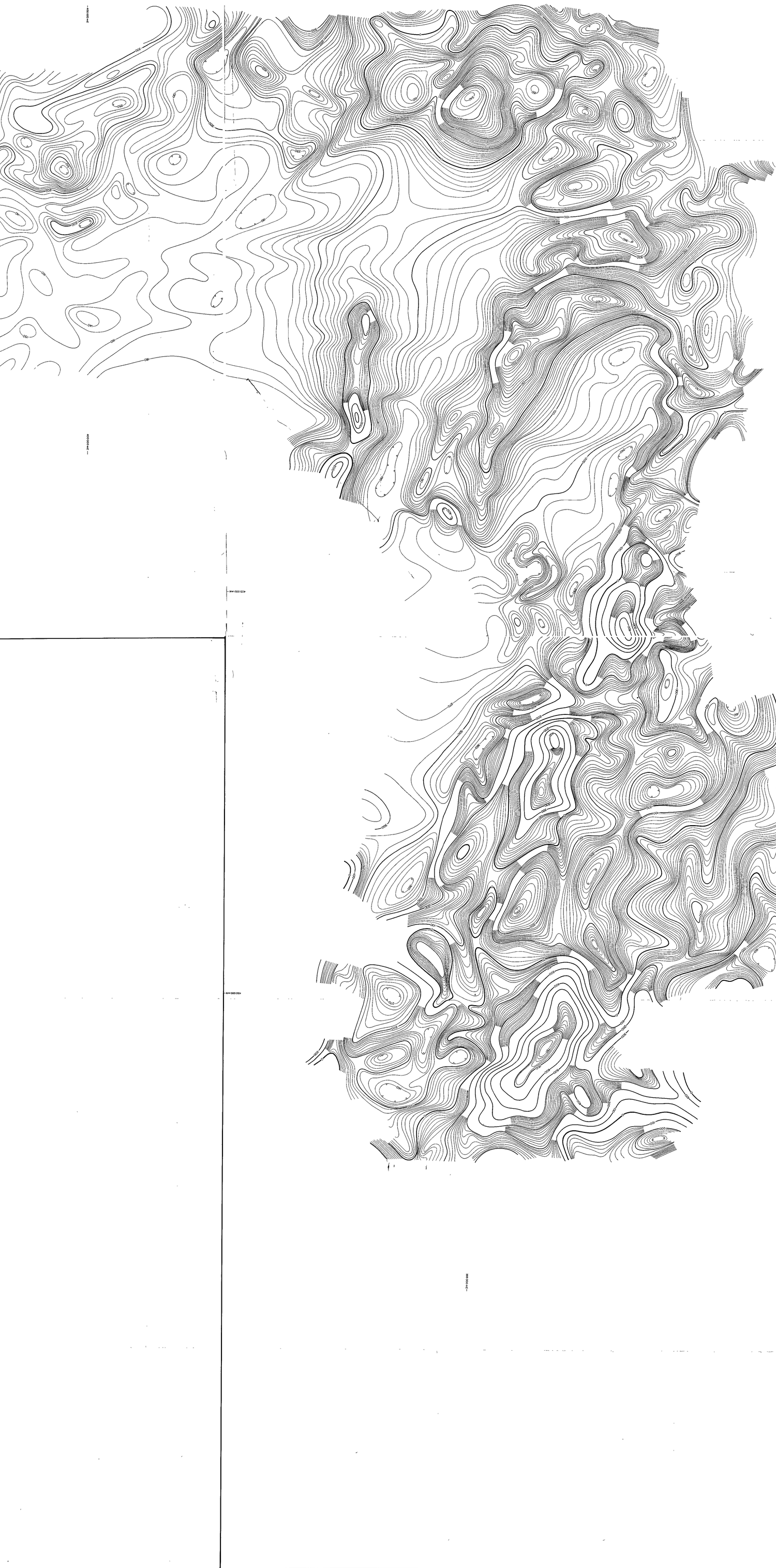
COMPOSITE REGIONAL AIRMAG
BMR & RIO TINTO

79-1409

Compiled: G. Weste		
Date Nov. 1979	Scale 1 63,360	Drg No. TAS-79-304

2704

POR REFERENCE SEE SHEET 3



ST. VALENTINE'S PEAK SHEET 3

ST. VALENTINE'S PEAK SHEET 1

2705

DRG NO TAS-79-323

DRAWN R.G.C	PROJECT NO 79016	SHEET No 3
SURVEYED MARCH '79		JANNOVSKI, J.E. HAMM

SCALE 1 : 20,000

ST. VALENTINES PEAK AREA – TAS.
AEROMAGNETIC
TOTAL INTENSITY CONTOURS

COMALCO LIMITED

GEOEX PTY LTD

5 cm

11316S

2705

79-1109

LOCATION

SHEET INDEX

SURVEY SPECIFICATIONS

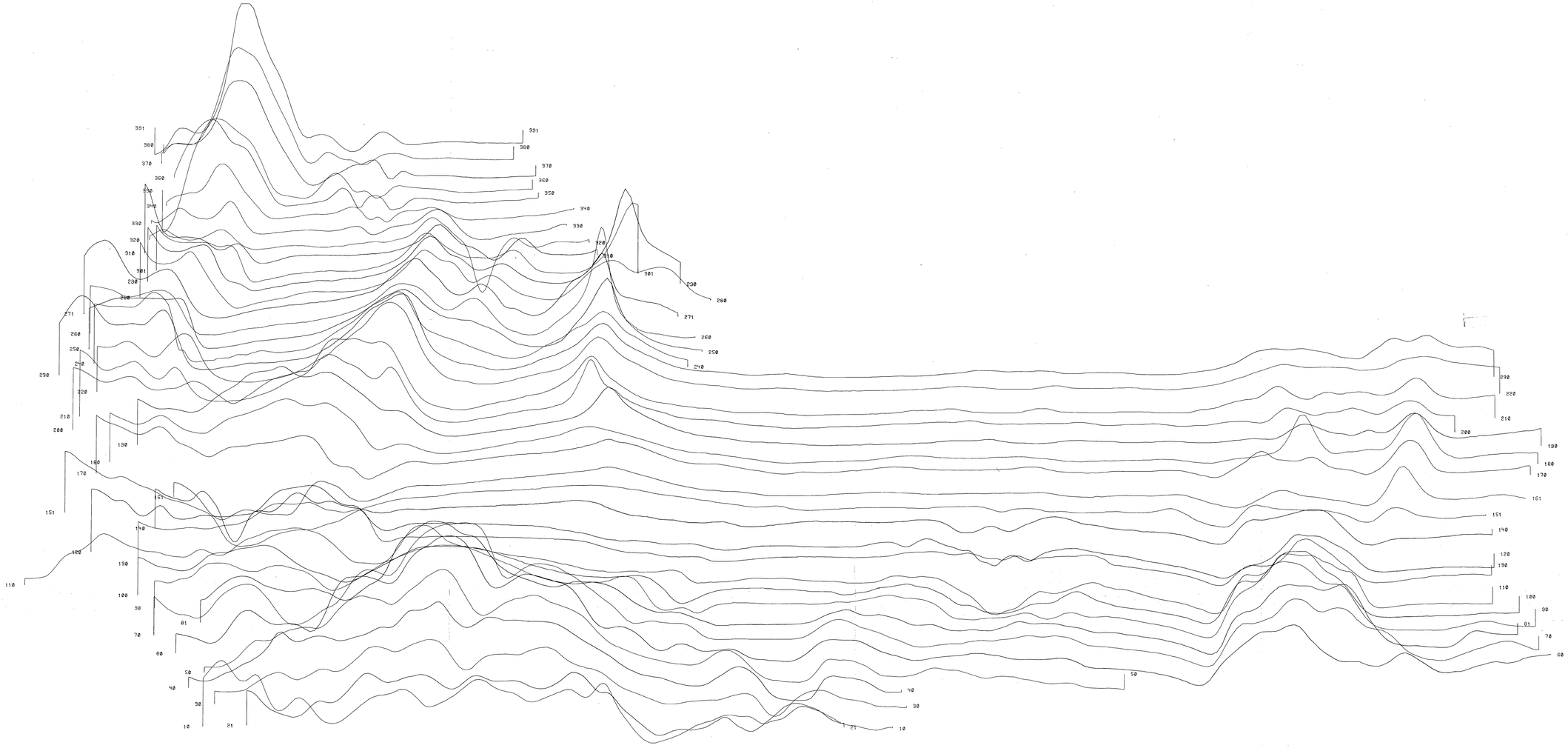
AIRCRAFT	BELL 206B
MAGNETOMETER	VARIAN 4937A PROTON PRECESSION USING TOWED BIRD COMPENSATION WITH ZYK CABLE
DIGITAL RECORDER	GEOMETRICS 8 BIRS PROTON PRECESSION MAGNETOMETER WITH MASTRAK RECORDER & CRYSTAL CLOCK
ALTIMETER	BONZER TRN-70
ANCILLIARY EQUIPMENT	GEOEX INTEGRALOMETER, GEOEX CIGITAL ACQUISITION SYSTEM
	CENTURY 444 TOURNADEL ANALOGUE LIGHT BEAM RECORDER
	VINTEN 16mm GROUND TRACKING CAMERA
FLYING HEIGHT	110 SECMO
NOMINAL AIRCRAFT SPEED	60 KNOTS
NOMINAL AIRCRAFT SURVEY ALTITUDE	90 METRES
	80K/SQR CLEARANCE 70 METRES

SCALE IN METRES

0 200 400 600 800 1000

REFERENCE

THE DATA HAS BEEN ADJUSTED FOR DIURNAL VARIATION WITH AN ADOPTED VALUE OF 58000 GAMMAS AT THE DIURNAL BASE STATION AT WYNDHAM AERODROME WITHIN THE DATA AREA THE TOTAL MAGNETIC INTENSITY CONTAINS IS THE INTERNATIONAL GEOMAGNETIC REFERENCE FIELD 1975 2.5



GEOEX PTY LTD

COMALCO LIMITED

ST VALENTINES PEAK AREA TASMANIA

STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 50 GAMMA PER CM.
PROFILE BASE VALUE 62200
HORIZONTAL SCALE 1: 10000

79-1409

2706

LINES 10 TO 391

PROJECT No 79216
COMALCO DRG No TAS-79-324a
SURVEYED MARCH 1979

79-1409

SURVEYED MARCH 1979 113166 COMALCO Drg No TAS-79324a
PROJECT NUMBER 79216

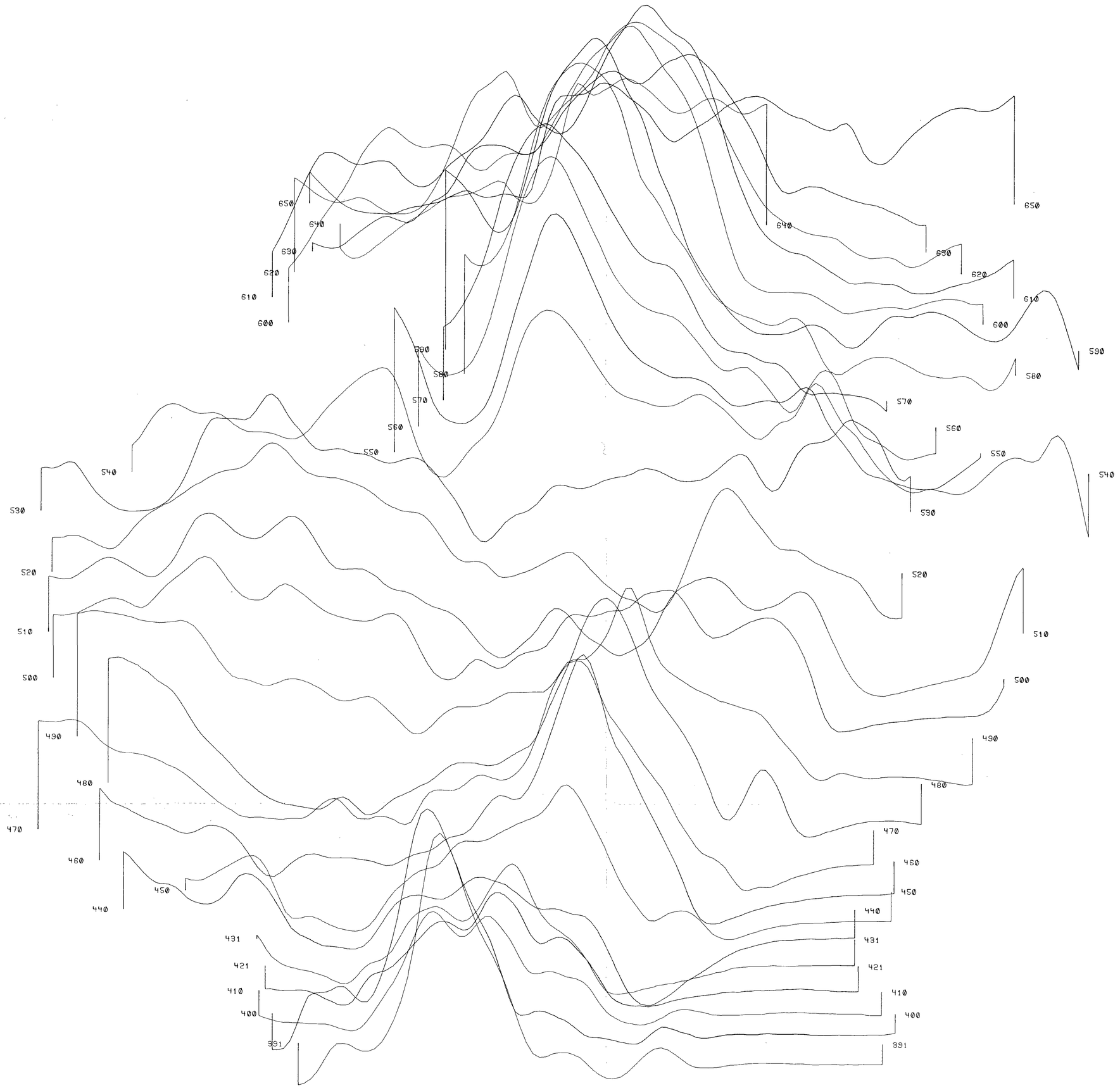
2706

2707

GEOEX PTY LTD

COMALCO LIMITED

ST VALENTINES PEAK AREA TASMANIA



STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 50 GAMMA PER CM.
PROFILE BASE VALUE 62200
HORIZONTAL SCALE 1: 10000

5 cm

LINES 391 TO 650

113167

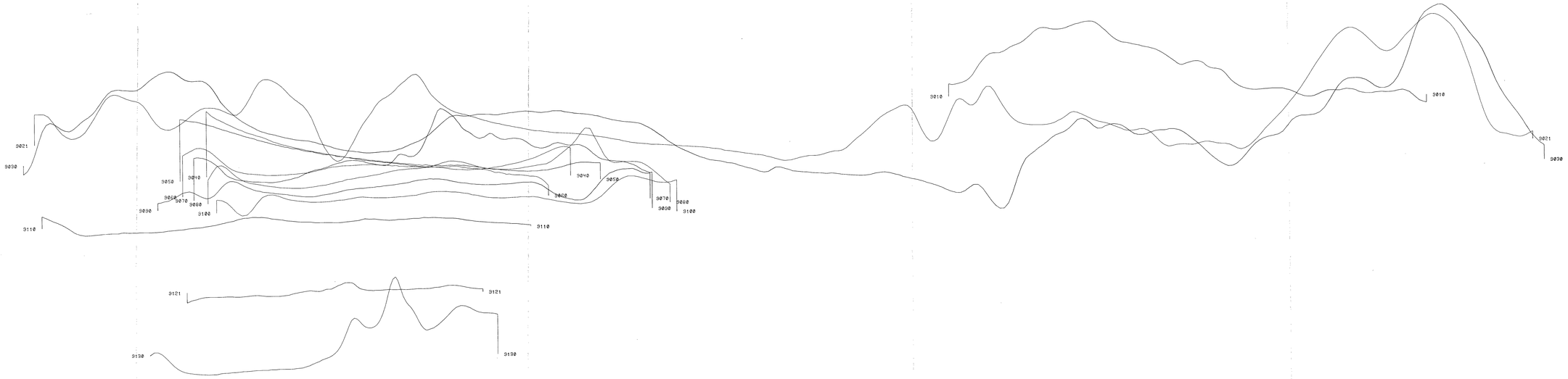
79-1409

2707

COMALCO Drg. No. TAS-79-324b

PROJECT NUMBER 79216

SURVEYED MARCH 1979



2708

GEOEX PTY LTD

COMALCO LIMITED

ST VALENTINES PEAK AREA TASMANIA

STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 50 GAMMA PER CM.
PROFILE BASE VALUE 62200
HORIZONTAL SCALE 1: 10000

1 cm

LINES 9010 TO 9130

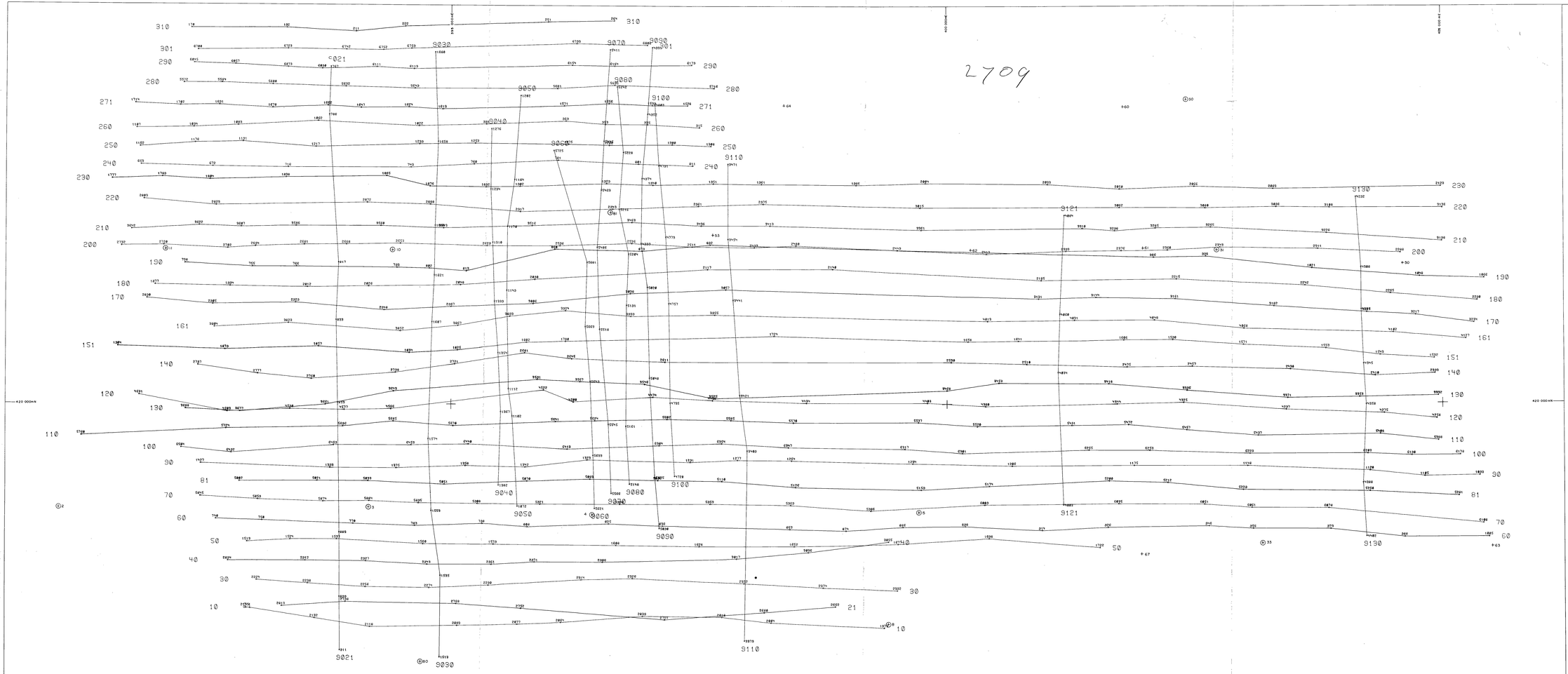
113168

79-409

SURVEYED MARCH 1979

COMALCO Drg No TAS-79-324c
PROJECT NUMBER 78216

2708



GEOEX PTY LTD

COMALCO LIMITED

ST VALENTINES PEAK AREA TASMANIA

FLIGHT PATH PLOT

HORIZONTAL SCALE 1: 10000

5 cm

LINES 10 TO 310

⊕7 GEOEX CONTROL POINT LOCATED ON MOSAIC AND BASE SHEET

+50 GEOEX CONTROL POINT LOCATED ON MOSAIC ONLY

CONTROL AND 500,000mN A M G GRID DIGITISED FROM HELLYER SOUTH 1:20,000 MAGNETIC CONTOUR MAPS PROVIDED BY CLIENT

113169

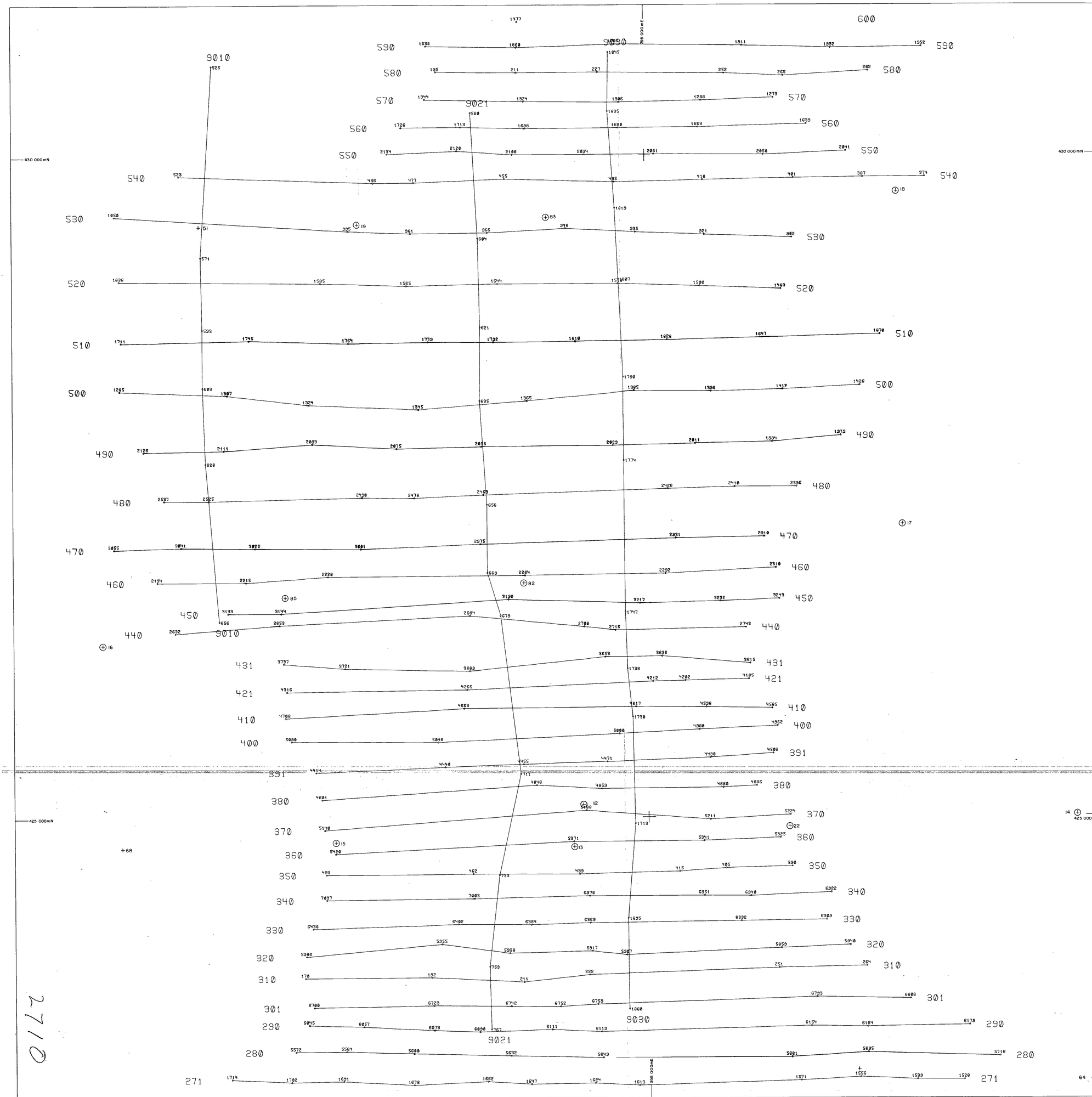
2709

M-1409

COMALCO Drg. No. TAS-79-325a

SURVEYED MARCH 1979

PROJECT NUMBER 7921G



GEOEX PTY LTD

COMALCO LIMITED

ST VALENTINES PEAK AREA TASMANIA

FLIGHT PATH PLOT

HORIZONTAL SCALE 1: 10000

5 cm

LINES 271 TO 590

FOR REFERENCE SEE SOUTHERN SHEET.

113170 2710

79-1409

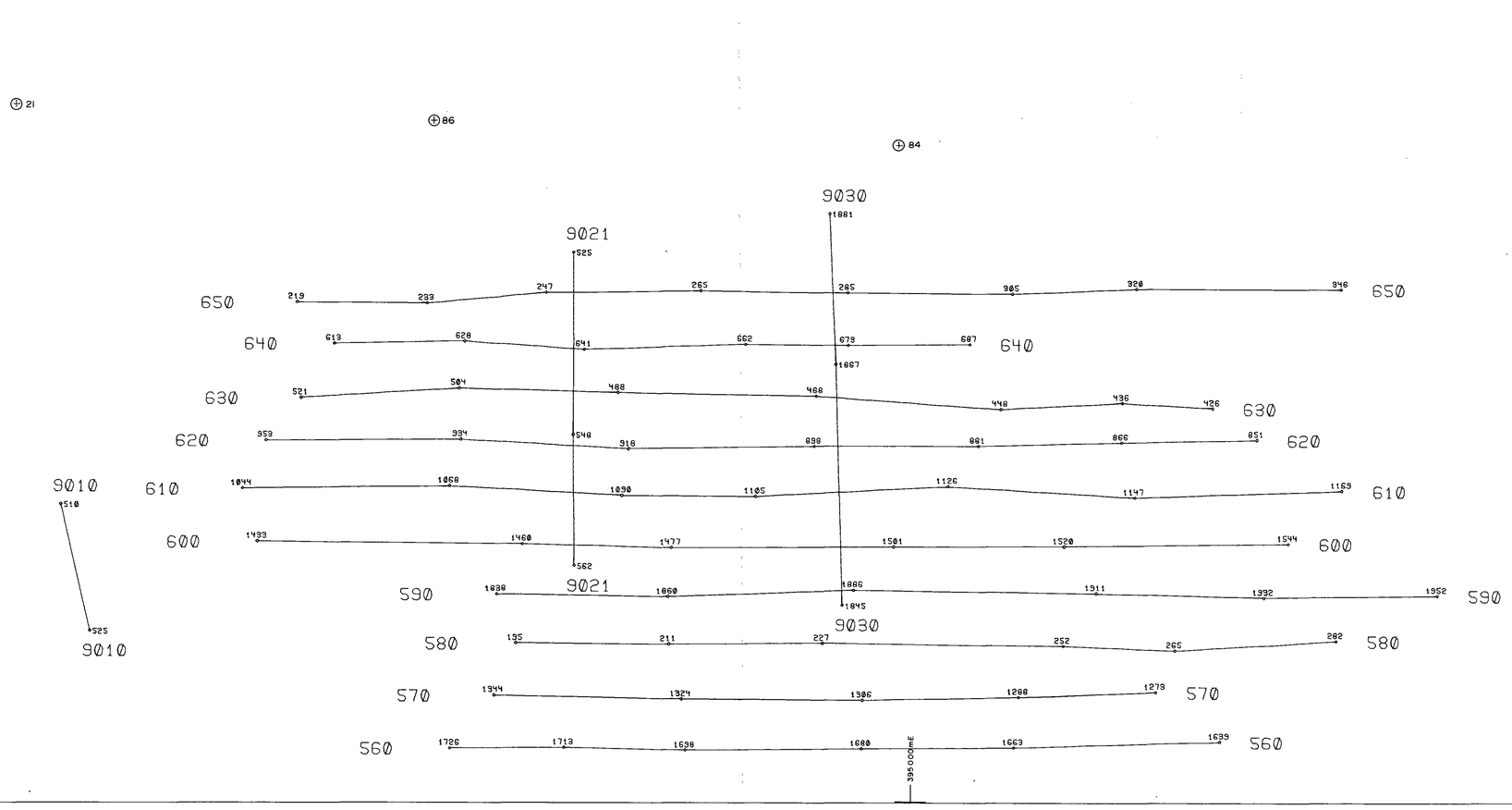
COMALCO Drg. No. TAS-79-325b

SURVEYED MARCH 1979

PROJECT NUMBER 79216

2710

395 000mE



2711

GEOEX PTY LTD

COMALCO LIMITED

ST VALENTINES PEAK AREA TASMANIA

FLIGHT PATH PLOT

HORIZONTAL SCALE 1: 10000

5 cm

LINES 560 TO 650

FOR REFERENCE SEE SOUTHERN SHEET

113171 2711

79-1409

COMALCO Drg. No. TAS-79-325c

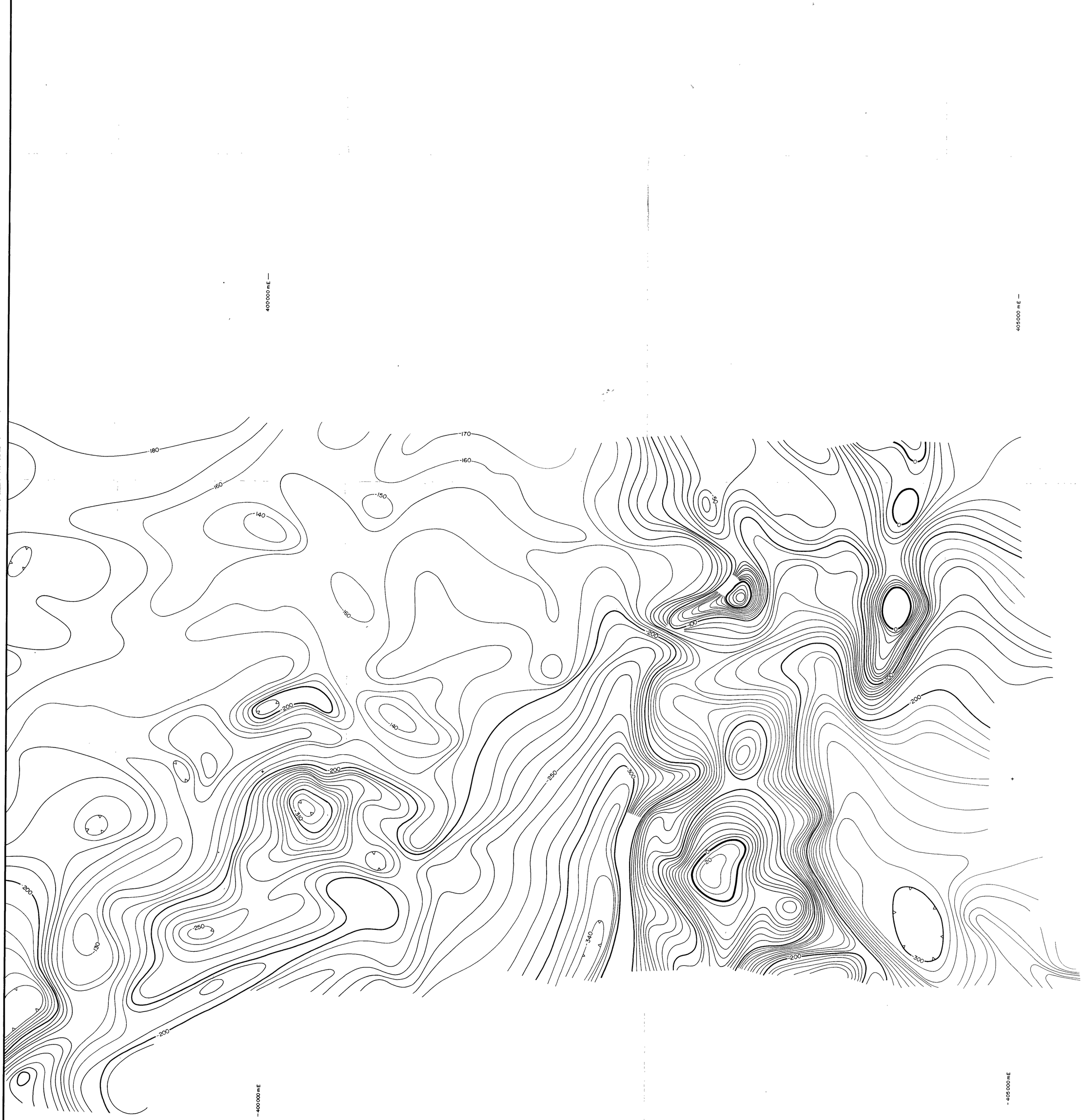
SURVEYED MARCH 1979

PROJECT NUMBER 79216

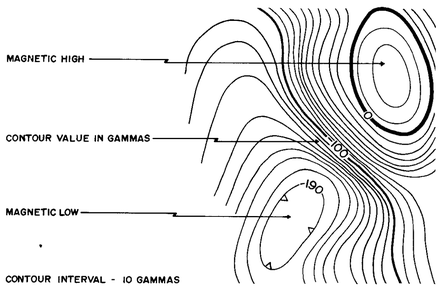
2712

400000 mE

405000 mE



REFERENCE



THE DATA HAS BEEN ADJUSTED FOR DIURNIAL VARIATION WITH AN ADOPTED VALUE OF 62255 GAMMAS AT THE DIURNAL BASE STATION AT WYNYARD AERODROME 40°59'51"S AND 145° 43'34"E. THE SENSOR HEIGHT WAS 2 METRES.
THE DATUM FOR THE TOTAL MAGNETIC INTENSITY CONTOURS IS THE INTERNATIONAL GRID REFERENCE FIELD 1979 25.

SURVEY SPECIFICATIONS

AIRCRAFT	BELL 206 B
MAGNETOMETER	VARIAN 4937A PROTON PRECESSION USING TOWED BIRD CONFIGURATION WITH 37m CABLE
DIURNAL RECORDER	GEOMETRICS G826 PROTON PRECESSION MAGNETOMETER WITH RUSTRAK RECORDER & CRYSTAL CLOCK
ALTIMETER	BONZER TRN-70
ANCILLIARY EQUIPMENT	GEOEX INTERVALOMETER, GEOEX DIGITAL ACQUISITION SYSTEM
	CENTURY 444 7 CHANNEL ANALOGUE LIGHT BEAM RECORDER
	VINTEN 16mm GROUND TRACKING CAMERA
READING INTERVAL	1.0 SECOND
NOMINAL AIRCRAFT SPEED	60 KNOTS
NOMINAL AIRCRAFT SURVEY ALTITUDE	90 METRES
	SENSOR CLEARANCE 75 METRES

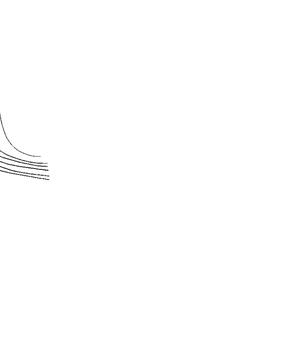
200 100 0 200 400 600 800 1000

SCALE IN METRES

5 cm

SHEET INDEX

LOCATION



113172

79-12409

GEOEX PTY. LTD 2712

COMALCO LIMITED

ST. VALENTINE'S PEAK AREA - TAS.

AEROMAGNETIC TOTAL INTENSITY CONTOURS

SCALE 1: 10000

SURVEYED MARCH '79		APPROVED J.E.HAIGH
DRAWN R G Z	PROJECT Nº 79216	SHEET Nº 3

COMALCO Drg. No. TAS-79-3260

2713

425000 mN

425 000 mN

420 000 mN

395 000 mE

5 cm

113173 79-1409

2713
326b

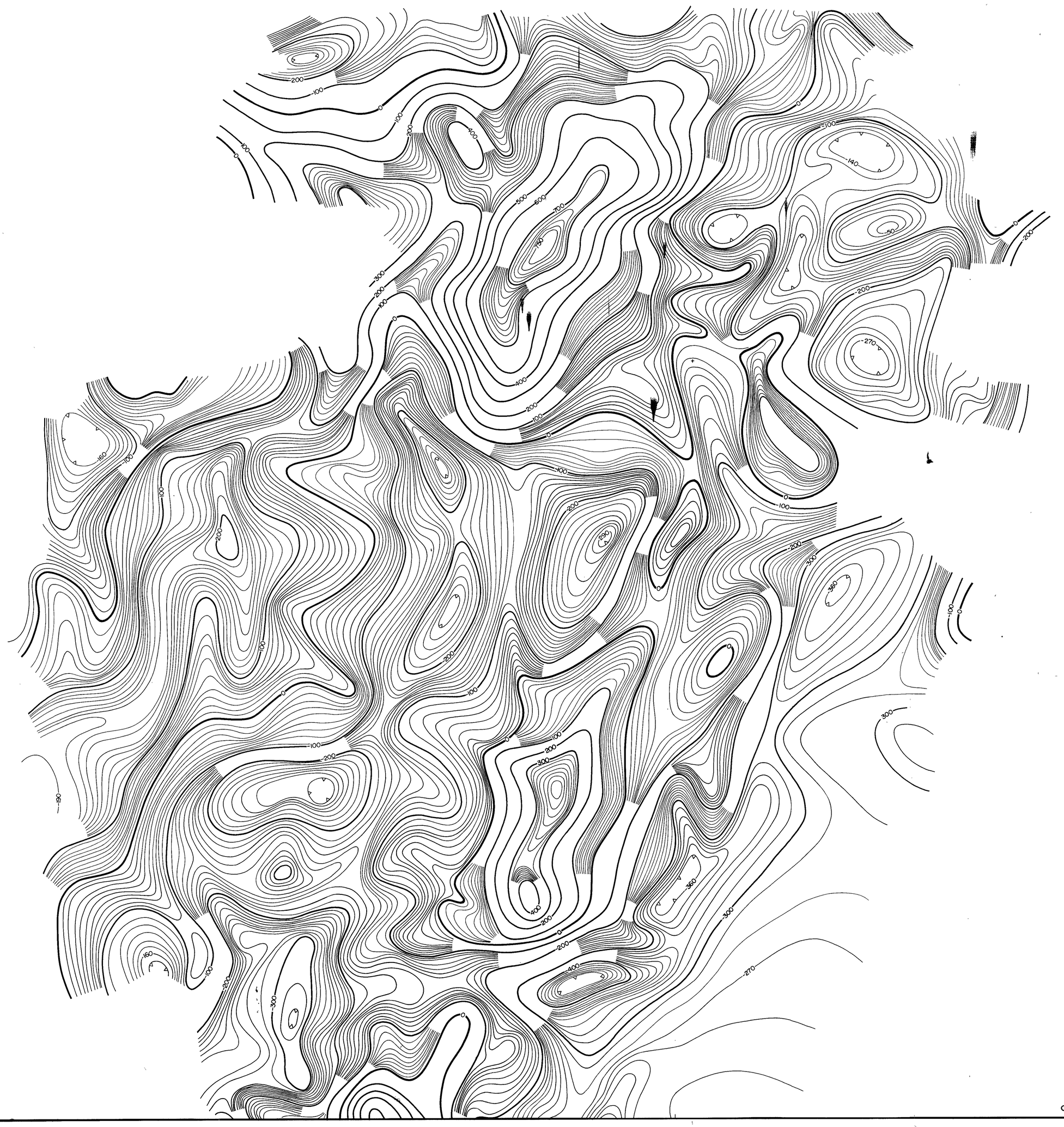
COMALCO Drg. No. TAS - 79-~~2361~~

FOR REFERENCE SEE SHEET 3

2714

395 000 mE

430 000 mN



430 000 mN

113174

79-1409

2714

COMALCO Drg. No. TAS - 79-326c

FOR REFERENCE SEE SHEET 3

2715

NOTE : This plan overlays "Guildford, Highclere, Riana Regions – Geology" Drg N° TAS-79-178

Linearment observed on airphotographs & or topographic maps.

ML — Major linearment.

F — Probable fault observed in field.

T.N.

5 cm

113175

79-1409

COMALCO

TASMANIA

E.L 1/76 GUILDFORD + 4/77 HIGHCLERE

LINEARMENTS

2715

Compiled G.W.	Revised	Drawn M.A.
Date Dec. 1979	Scale 1:63,360	Drg N° TAS-79-381

KEY

x b = 0·5m

⊙ b = 2·0m

- Expander orientated about Pennjoil grid 3000 m S / 450 m E
- GRID LINES RUN NE - SW
- Equipement - Scintrex 3·5 kw transmitter and IPR7 recieuer
- Operator G Shovelton.

5 cm

113176

79-1409

C O M A L C O

TASMANIA

EL 4/77 HIGHCLERE

TWO HUMMOCKS EIP

SCHLUMBERGER EXPANDER

2716

Compiled: G W	Revised.	Drawn : M.A.
Date : Dec, 1979	Scale:	Drg N° TAS-79-388

APPARENT RESISTIVITY

ρa Ωm

M (ms)

DISTANCE IN METRES

a

ALLIANCE No 3L 2 CYCLE LOG X 2 CYCLE LOG

HARDING & HALDEN—AUSTRALIA ALLIANCE No 3L 2 CYCLE LOG X 2 CYCLE LOG

N. Boundary E.L. 1/76

North extension of grid into Tasminex E.L. 17/68

Boundary E.L. 4/77
E.L. 1/76

79-1409

COMALCO

TASMANIA 113177
E.L. 1/76 GUILDFORD
ST VALENTINES GRID

GEOLOGY

2717

Compiled T. Waite	Revised		Drawn O. Headditch
Date June 1979	Scale 1:2500		Drg. No. TAS 79-272

5 cm

LEGEND

- Definite geological boundary
- Approximate geological boundary
- Inferred geological boundary
- Change in slope and/or vegetation
- Dip and strike of bedding
- Vertical dip and strike of bedding
- Cleavage
- Facing
- Outcrop
- Scree
- Road
- Inaccessible track
- Creek + direction of flow
- GU 218 Location of stream sediment samples
- Swamp
- ● 4 Rock sample position (TW/T/SV)
- SVI Diamond drill hole

KEY

- Tertiary Basalt
- Shale – Hornfels
- Sandstone
- Conglomerate scree (rock fragments) + few Magnetite skarn pebbles
- Conglomerate
- Magnetite rich skarn

NOTE Inferred contacts of magnetite skarn and hornfels with surrounding rocks have been based mainly on changes in slope and vegetation

396 200E 396 400E 396600E 396800E 397000 E

Line 22000m N, 21900m N, 21800mN, 21700m N, 21600mN, 21500mN, 21400mN, 21300m N, 21200m N, 21100m N, 21000mN, 20800mN, 20600mN, 20400mN, 20200mN, 20000mN, 19800mN, 19600m N, 19400mN

22,000mN
21900mN
21,800mN
21,700mN
21,600mN
21,500mN
21,400mN
21,300mN
21,200mN
21,100m N
21,000mN
20,800mN
20,600mN
20,400mN
20,200mN
20,000mN
19,800mN
19,600m N
19,400mN

396,200 E
396,400 E
396,600E
396,800E
397,000E
397,200E

5 cm

COMALCO 79-1409

113178 TASMANIA
EL 1/76 GUILDFORD

ST. VALENTINES GRID
SLOPE CORRECTIONS

2718

Compiled: O Hedditch	Revised	Drawn: O Hedditch
Date: March 1979	Scale 1 2500	Drg No TAS. 79-253

Line 22000mN

Line 21900mN

Line 21800mN

Line 21700mN

Line 21600mN

Line 21500mN

Line 21400mN

Line 21300mN

Line 21200mN

Line 21100mN

Line 21000mN

Line 20800mN

Line 20600mN

Line 20400mN

Line 20200mN

Line 20000mN

Line 19800mN

Line 19600mN

Line 19400mN

396 200mE

396 400mE

BASE LINE

396 600mE

396 800mE

397 000mE

G.N.

M.N.

Instruments: Scintrex MP 2 Proton precession
Geometrics G816 Proton precession
Austral PPM-2 Proton precession base station
with RUSTRAK POTENTIOMETRIC RECORDER

Data is uncorrected - base station variation less than ± 10 n T

NOTE: Data recorded on S side of grid lines was recorded on more detailed follow-up survey

5 cm

79-1409

COMALCO LIMITED

TAS-79-261

TASMANIA

E.L. 1/76 GUILDFORD

ST. VALENTINES GRID

MAGNETIC DATA

2718

113179

Drawing No. 79-261

Compiled: O. Hedditch	Revised	Drawn: O. Hedditch
Date: April 1979	Scale: 1:500	

INSTRUMENTS Geometrics 816 and Scintrex MP2 with pole mounted sensors
Data corrected to within ± 15 nT using Austral MMP2 recording base station

NOTE This sheet overlays other St Valentine's grid sheets

5 cm

COMALCO

TASMANIA
E L 1/76 GUILDFORD

ST. VALENTINES GRID
STACKED MAGNETIC PROFILES

1cm = 50 nT

Compiled G Shovelton	Revised	Drawn O Hedditch	
Date May, 1979	Scale 1 2500	Drg No TAS - 79-267	

113180 79-1409 2720

79-1409

113181

TOP

396 200E | 396 400E | 396 600E | 396 800E | 397 000E | 397 200E

Line 22000m N
Line 21800mN
Line 21600m N
Line 21400mN
Line 21200m N
Line 21000m N
Line 20800m N
Line 20600m N
Line 20400m N
Line 20200m N
Line 20000m N
Line 19800m N
Line 19600m N
Line 19400mN
Line 19200N

GN MN 11.4

NOTES.
Contours drawn from stacked profiles.
Contour interval 100 and 50 nT
Contour lines continuous where data available at 100m line separation and discontinuous where data at 200m line separation. For distribution of readings see Drg No. TAS-79-261
Instruments. Geometrics 816 and Scintrex MP 2 with pole mounted sensors
Data corrected within ± 15 nT using Austral PPM 2 recording base station.

5 cm

COMALCO

TASMANIA
E.L. 1/76 GUILDFORD
ST. VALENTINES GRID
TOTAL MAGNETIC FIELD
CONTOUR PLAN

Compiled G Weste	Revised	Drawn O Hedditch
Date May, 1979	Scale 1 2500	Drg No TAS - 79 - 266

396 200E
396 400E
396 600E
396 800E
397 000E
397 200E

22000mN
21800mN
21600mN
21400mN
21200mN
21000mN
20800mN
20600mN
20400mN
20200mN
20000mN
19800mN
19600mN
19400mN

GRID NORTH
MAG NORTH
11.4

C1
395 600 E

C2
395 600 E

C3
395 600E

10,000 ohm metre
2000
1000
500
400
300
200
100
40
Grid line

NOTE
C2 Current electrode position
Instruments Scintrex 3 5kw transmitter and IPR 7 receiver
Operator G Shovelton
Readings taken every 25 metres along grid lines using 25 metre potential dipole

5 cm

113182 COMALCO 2721

79-1409

TASMANIA
E L. 1/76 GUILDFORD
ST. VALENTINES GRID
STACKED RESISTIVITY PROFILES
ELECTRICAL INDUCED POLARISATION
TIME DOMAIN GRADIENT ARRAY

Compiled · G Shovelton	Revised .	Drawn O Hedditch
Date May, 1979	Scale 1 2500	Drg No TAS - 79-264

Grid N

Mag N

C1
395,600mE

C2
395, 600mE

C3
395,600mE

C1

C2

C3

Line 22000mN

Line 21800mN

Line 21600mN

Line 21400mN

Line 21200mN

Line 21000m N

Line 20800mN

Line 20600mN

Line 20400mN

Line 20200mN

Line 20000m N

Line 19800m N

Line 19600m N

Line 19400m N

396 200mE

396 400m E

396 600m E

396 800m E

397000mE

BASE LINE

NOTE

Contours 150, 200, 300, 400, 500, 700, 1000, 1500, 2000, 3000, 5000, 10,000 ohm metres

Equipment. Scintrex 3 5 kw transmitter and IPR7 receiver

Operator G. Shovelton

Survey Gradient array potentral dipole 25m
Spacing between readings 25m
Readings taken along grid lines which are 200m apart

●C1 Current electrode position

5 cm

113183 COMALCO LIMITED

TASMANIA
E.L 1/76 GUILDFORD
ST. VALENTINES GRID

79-1406

RESISTIVITY CONTOURS

ELECTRICAL INDUCED POLARISATION

TIME DOMAIN, GRADIENT ARRAY

2722

Compiled G Weste	Revised ·	Drawn O Hedditch
Date April, 1979	Scale. 1 2500	Drg No TAS - 79 - 260

79-1409

PLANS

113184

(In separate folder)

Transparencies held in Library

* No transparencies held

GENERAL

VOL 2.

TAS-78-178A	Guildford, Highclere, Riana Regions - Geology.
TAS-79-316	Parts of E.L.1/76, Guildford and 4/77 Highclere - Geolog
TAS-78-197	Analyses of magnetic fractions of stream sediment.
*TAS-78-181B	Stream magnetic and panned concentrate analyses.
*TAS-78-182B	Stream magnetic and panned concentrate analyses.
*TAS-78-183B	Stream magnetic and panned concentrate analyses.
TAS-79-304	Composite regional airmag BMR + Rio Tinto.
TAS-79-323	Aeromagnetic total intensity contours at 1:20,000.
TAS-79-324A	Aeromagnetic stacked profiles.
TAS-79-324B	Aeromagnetic stacked profiles.
TAS-79-324C	Aeromagnetic stacked profiles.
TAS-79-325A	Aeromagnetic flight path plots.
TAS-79-325B	Aeromagnetic flight path plots.
TAS-79-325C	Aeromagnetic flight path plots.
TAS-79-326A	Aeromagnetic total intensity contours at 1:10,000 sh.3.
TAS-79-326B	Aeromagnetic total intensity contours at 1:10,000 sh.2.
TAS-79-326C	Aeromagnetic total intensity contours at 1:10,000 sh.1.
TAS-79-381	Guildford and Highclere lineaments.
TAS-79-388	Two Hummocks EIP Schlumberger expander.

ST. VALENTINE'S GRID.

TAS-79-272	Geology.
TAS-79-253	Slope corrections.
TAS-79-261	Magnetic data.
TAS-79-267	Stacked magnetic profiles.
TAS-79-266	Total magnetic field contour plan.
TAS-79-264	Stacked resistivity profiles.
TAS-79-260	Resistivity Contours.

VOL 3

TAS-79-265	Stacked chargeability profiles.
TAS-79-295	Chargeability contours.
TAS-79-390	Geophysical trends.
TAS-79-269	C horizon soil analyses.

BLYTHE ROAD GRID

TAS-79-297	Stacked resistivity profiles.
TAS-79-259	Slope corrections.
TAS-79-298	Stacked chargeability profiles.
TAS-79-347	Composit profile Line 20800N.
TAS-79-348	Composite profile Line 20400N.
TAS-79-349	Composite profile Line 20000N.
TAS-79-350	Composite profile Line 19600N.
TAS-79-351	Composite profile Line 21600N.
TAS-79-352	Composite profile Line 22000N.
TAS-79-353	Composite profile Line 21200N.

79_1409

113185

BLYTHE ROAD GRID (Cont.)

TAS-79-317	Follow up magnetic data.
TAS-79-318	Follow up magnetic profiles.
TAS-79-319	Follow up resistivity profiles.
TAS-79-320	Follow up chargeability profiles.

TALUNAH ROAD MAGNETIC ANOMALY

TAS-79-345	Ground traverse total magnetic field profiles.
TAS-79-346	Electrial induced polarisation profiles.

28mS

396 200E
396 400E
396 600E
396 800E
397000E
397 200 E

GRID NORTH
MAG. NORTH
11.4

21800m N
21600mN
21400m N
21200mN
21000mN
20 800m N
20 600mN
20 400mN
20 200m N
20000m N
19800m N
19600m N
19400m N

C1
395 600E

C2
395 600E

C3
395 600E

20 Milliseconds
16
12
8
4
Grid line

NOTE
C2 Current electrode position
Instruments: Scintrex 3.5 kw transmitter and IPR 7 receiver
Operator: G Shovelton
Readings taken every 25 metres along grid lines using 25 metre potential dipole

5 cm

113186 COMALCO 2723

79-1409

TASMANIA
E L 1/76 GUILDFORD

ST. VALENTINES GRID
STACKED CHARGEABILITY PROFILES

ELECTRICAL INDUCED POLARISATION
TIME DOMAIN GRADIENT ARRAY

Compiled G Shovelton	Revised	Drawn O Hedditch
Date May, 1979	Scale 1 2500	Drg No TAS - 79-265

396200mE 300mE 400mE 500mE 600mE 700mE 800mE 900mE 397000mE

Line 22,000 mN
Line 21,800mN
Line 21,600 mN
Line 21,400 mN
Line 21,200 mN
Line 21,000 mN
Line 20,800 mN
Line 20,600 mN
Line 20,400 mN
Line 20,200mN
Line 20,000 mN
Line 19,800 mN
Line 19,600mN
Line 19,400 mN
Line 19,200 mN

Grid North
Magnetic North
11 4°

C1
395600 E

C2
395600E

C3
395600 E

NOTE: Contours every 4 milliseconds
Equipment Scintrex 3 5 kw transmitter & 1 PR7 receiver
Operator G Shovelton
Survey: Potential dipole 25 m
Spacing between readings 25 m
Reading taken along grid lines which are 200m apart
C1 Current electrode position

5 cm

113187 COMALCO 2724

79-1209

TASMANIA
E.L. 1/76 GUILDFORD
ST. VALENTINES GRID

CHARGEABILITY CONTOURS

ELECTRICAL INDUCED POLARIZATION
TIME DOMAIN GRADIENT ARRAY

Compiled G Weste	Revised	Drawn S Hutchison
Date May, 1979	Scale 1 2500	Drg No Tas - 79 - 295

396200mE 300 400 500 396600mE 700 800 900 397000mE

22000mN
21800mN
21600mN
21400mN
21200mN
21000mN
21800mN
21600mN
21400mN
21200mN
20000mN
20800mN
20600mN

396200mW 300 400 500 600 700 800 900 397000mW

NOTE Trends drawn from stacked profiles

Thickness of line increases will increase in magnetic field and chargeability, but increase with decrease in resistivity.

MH Magnetic High

ML Magnetic Low

CH EIP chargeability High

CL EIP chargeability Low

RL EIP Resistivity Low

RH EIP Resistivity High.

5 cm

2725

113188 COMALCO 79-1409

TASMANIA

E.L 1/75 GUILDFORD

ST VALENTINES GRID

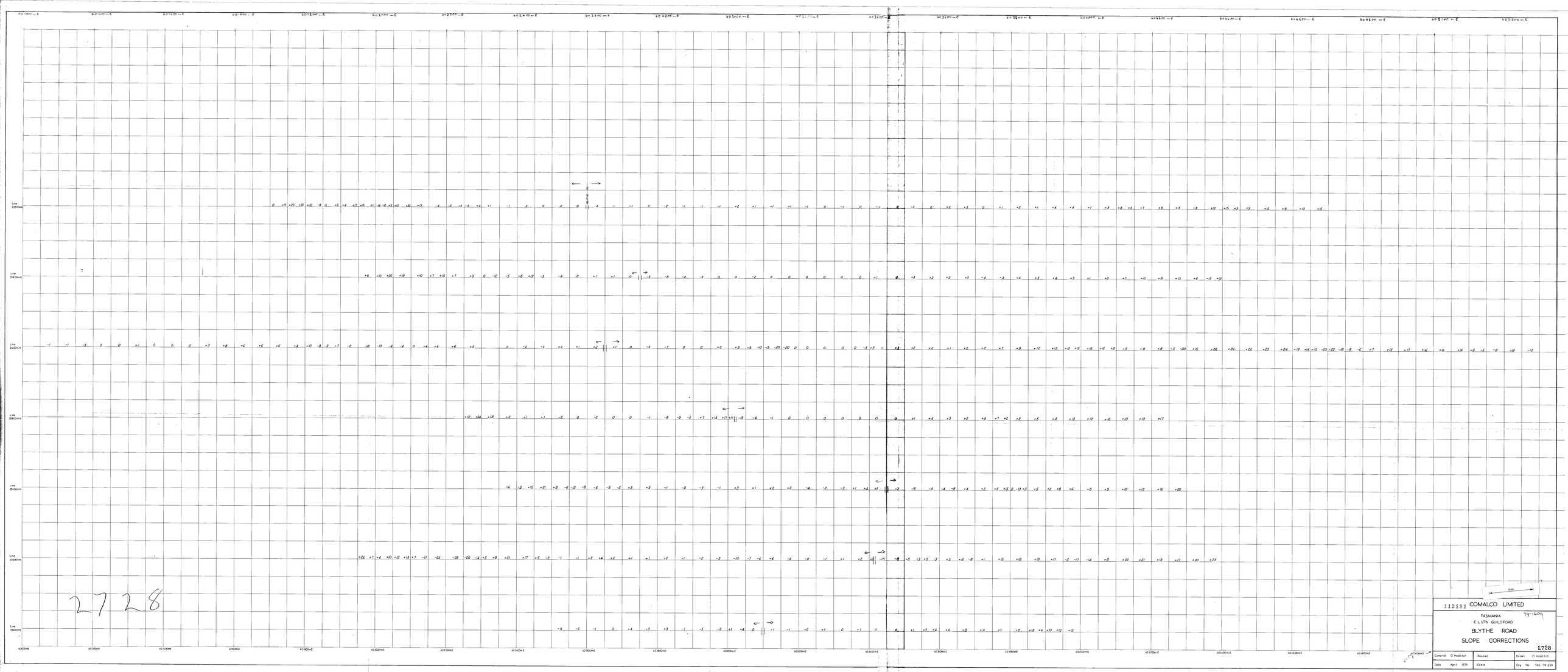
GEOPHYSICAL TRENDS

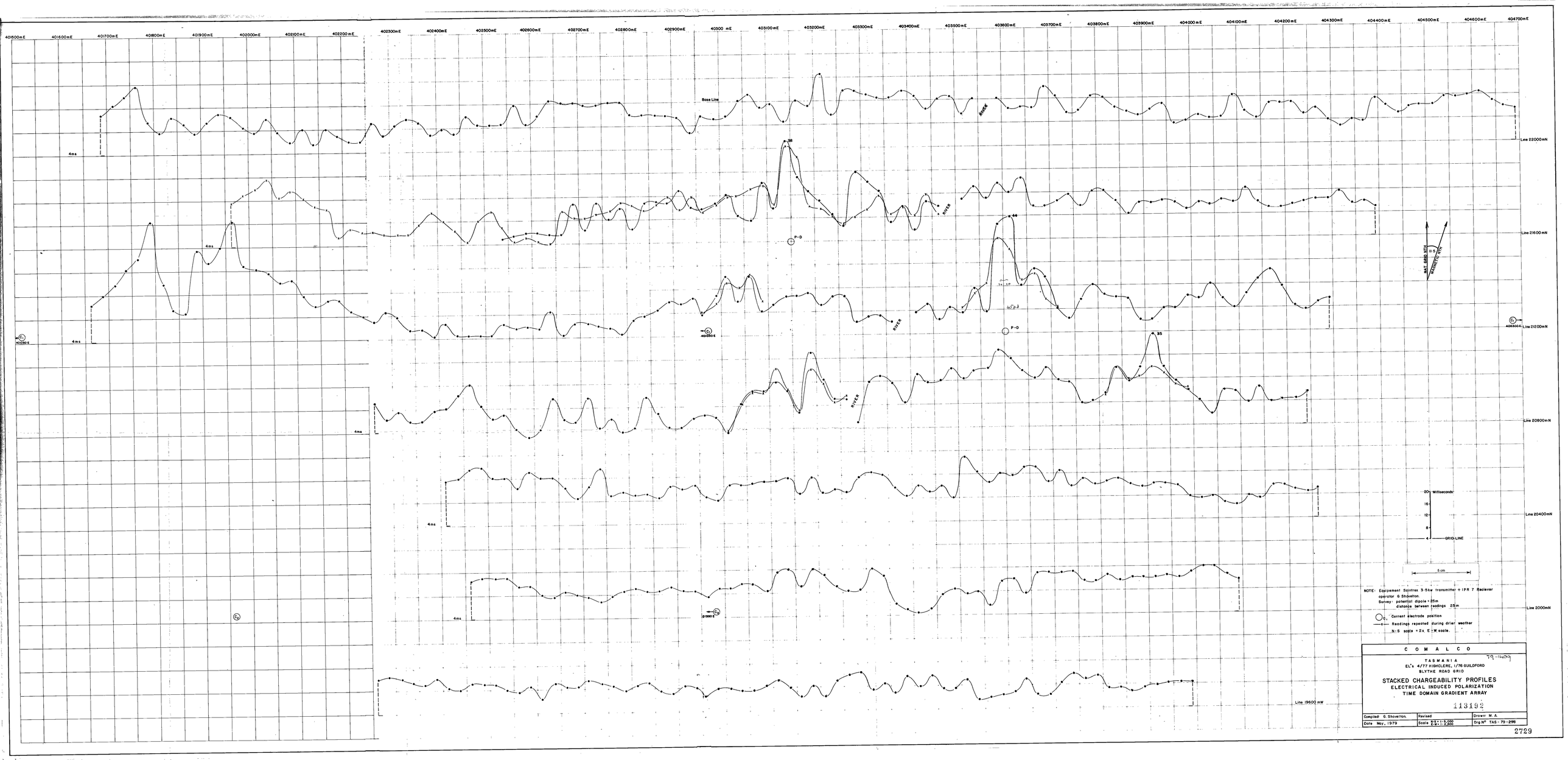
Compiled:	Revised:	Drawn:
Date:	Scale:	Drg No TAS-79-390

396 200 E

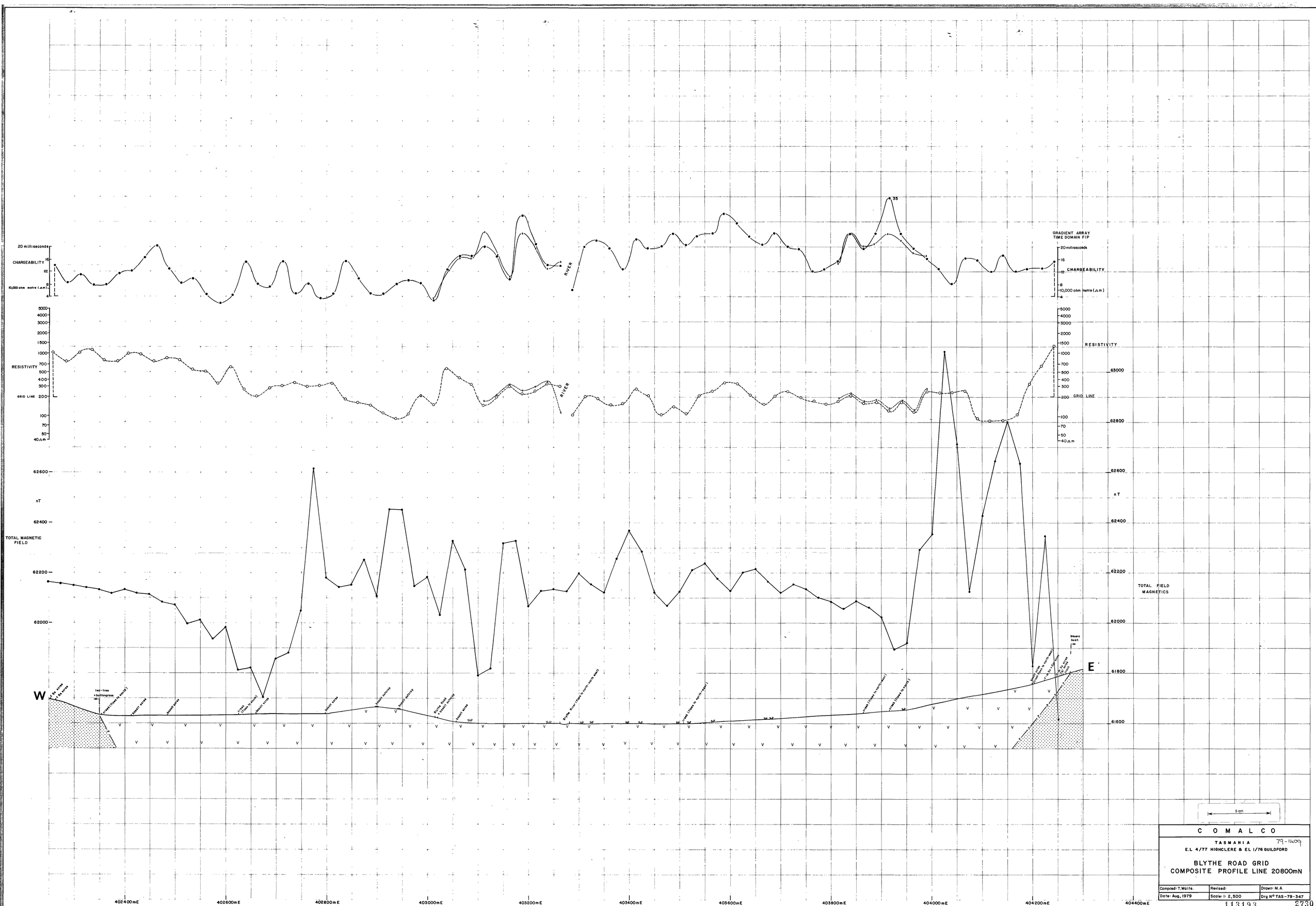
| | | |

BASE LINE
RIVER
Line 22000mN
Base Line 21600mN
Line 21200mN
Line 20800mN
Line 20400mN
Line 2000mN
NAT GRID NTH
MAGNETIC NTH
11·5
10,000 ohm metre (Ωm)
5000
4000
3000
2000
1500
1000
700
600
400
300
200
GRID LINE
100
70
50
40 Ωm
NOTE: Equipement Scintrex 3·5kw transmitter + IPR7 recieved
operator G Shovelton.
Survey: potential dipole = 25m
distance between readings 25m
C1 Current electrode position
Readings repeated during drier weather
N-S scale = 2X E-W scale:
113190
COMALCO 79-1409
TASMANIA
EL's 4/77 HIGHCLERE, 1/76 GUILDFORD
BLYTHE ROAD GRID
STACKED RESISTIVITY PROFILES
ELECTRICAL INDUCED POLARIZATION
TIME DOMAIN GRADIENT ARRAY
5 cm
Compiled: G. Shovelton.
Revised:
Drawn: M.A.
Date: May, 1979
Scale: N-S = 1:5,000 E-W = 1:2500
Drg No TAS-79-297
2727
401400mE
401500mE
401600mE
401700mE
401800mE
401900mE
402000mE
402100mE
402200mE
402300mE
402400mE
402500mE
402600mE
402700mE
402800mE
402900mE
403000mE
403100mE
403200mE
403300mE
403400mE
403500mE
403600mE
403700mE
403800mE
403900mE
404000mE
404100mE
404200mE
404300mE


Line 7700mN
Line 7400mN
Line 7100mN
Line 6800mN
Line 6500mN
Line 6200mN
Line 5900mN
Line 5600mN
BLYTHE ROAD
402400mE
402200mE
402000mE
401800mE
401600mE
401400mE
401200mE
401000mE
400800mE
400600mE
400400mE
400200mE
400000mE
403200mE
403400mE
403600mE
403800mE
404000mE
404200mE
404400mE
404600mE
404800mE
405000mE
405200mE
405400mE
405600mE
405800mE
406000mE
406200mE
406400mE
406600mE
406800mE
407000mE
407200mE
407400mE
407600mE
407800mE
408000mE
408200mE
408400mE
408600mE
408800mE
409000mE
409200mE
409400mE
409600mE
409800mE
410000mE
410200mE
410400mE
410600mE
410800mE
411000mE



401500mE
401600mE
401700mE
401800mE
401900mE
402000mE
402100mE
402200mE
402300mE
402400mE
402500mE
402600mE
402700mE
402800mE
402900mE
403000mE
403100mE
403200mE
403300mE
403400mE
403500mE
403600mE
403700mE
403800mE
403900mE
404000mE
404100mE
404200mE
404300mE
404400mE
404500mE
404600mE
404700mE
Base Line
RIVER
4ms
Line 22000mN
Line 21600mN
Line 21200mN
Line 20800mN
Line 20400mN
Line 2000mN
Line 19600mW
P-D
MAT GRID NTH
MAGNETIC NTH
Milliseconds
GRID LINE
5 cm
NOTE: Equipement Scintrex 3·5kw transmitter + IPR 7 Reciever operator G Shovelton.
Survey: potential dipole = 25m
distance between readings 25m
Current electrode position
Readings repeated during drier weather
N-S scale = 2x E-W scale.
C O M A L C O
TASMANIA
EL's 4/77 HIGHCLERE, 1/76 GUILDFORD
BLYTHE ROAD GRID
STACKED CHARGEABILITY PROFILES
ELECTRICAL INDUCED POLARIZATION
TIME DOMAIN GRADIENT ARRAY
113192
Compiled G. Shovelton.
Revised
Drawn M. A.
Date May, 1979
Scale N-S = 1:5,000 E-W = 1:2,500
Drg No TAS-79-298
2729



C O M A L C O

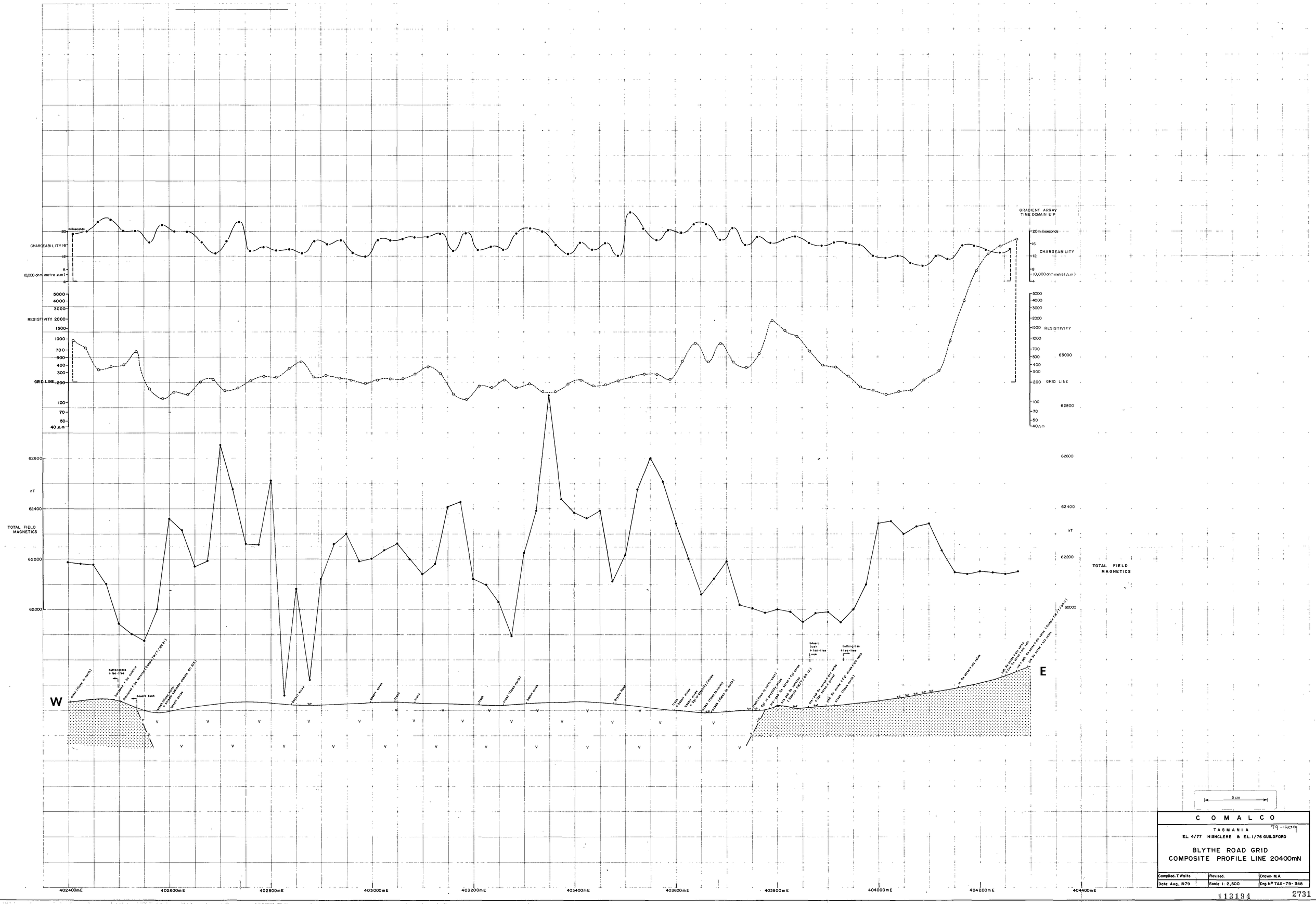
TASMANIA 79-1409

E.L 4/77 HIGHCLERE & EL 1/76 GUILDFORD

BLYTHE ROAD GRID
COMPOSITE PROFILE LINE 20800mN

Compiled: T.Waite.	Revised:	Drawn: M.A.
Date: Aug, 1979	Scale: 1: 2,500	Drg Nº TAS-79-347

113193 2730



C O M A L C O

TASMANIA 79-1409

EL. 4/77 HIGHCLERE & EL. 1/76 GUILDFORD

BLYTHE ROAD GRID
COMPOSITE PROFILE LINE 20400mN

Compiled: T. Waite	Revised:	Drawn: M.A.
Date: Aug., 1979	Scale: 1: 2,500	Drg. N° TAS-79-348

113194 2731

GRADIENT ARRAY
TIME DOMAIN IP

CHARGEABILITY
20 milliseconds
16
12
8
4

10,000 ohm metre (Ωm)
5000
4000
3000
2000
1500
1000
700
500
400
300
200
100
70
50
40 Ω m

RESISTIVITY

GRID LINE

Cs

401950E

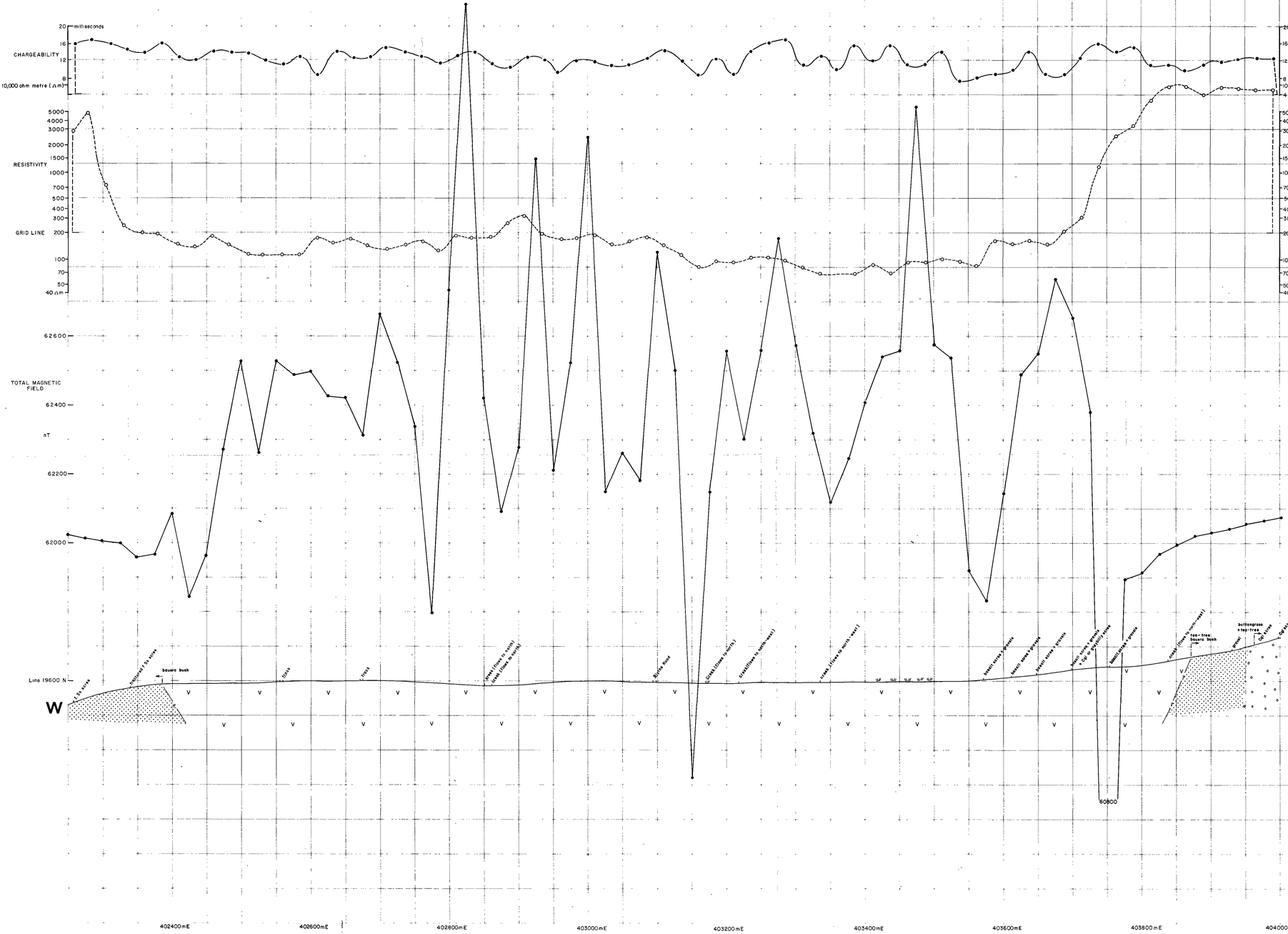
TOTAL MAGNETIC FIELD
63000
62800
62600
nT
62400
62200
62000

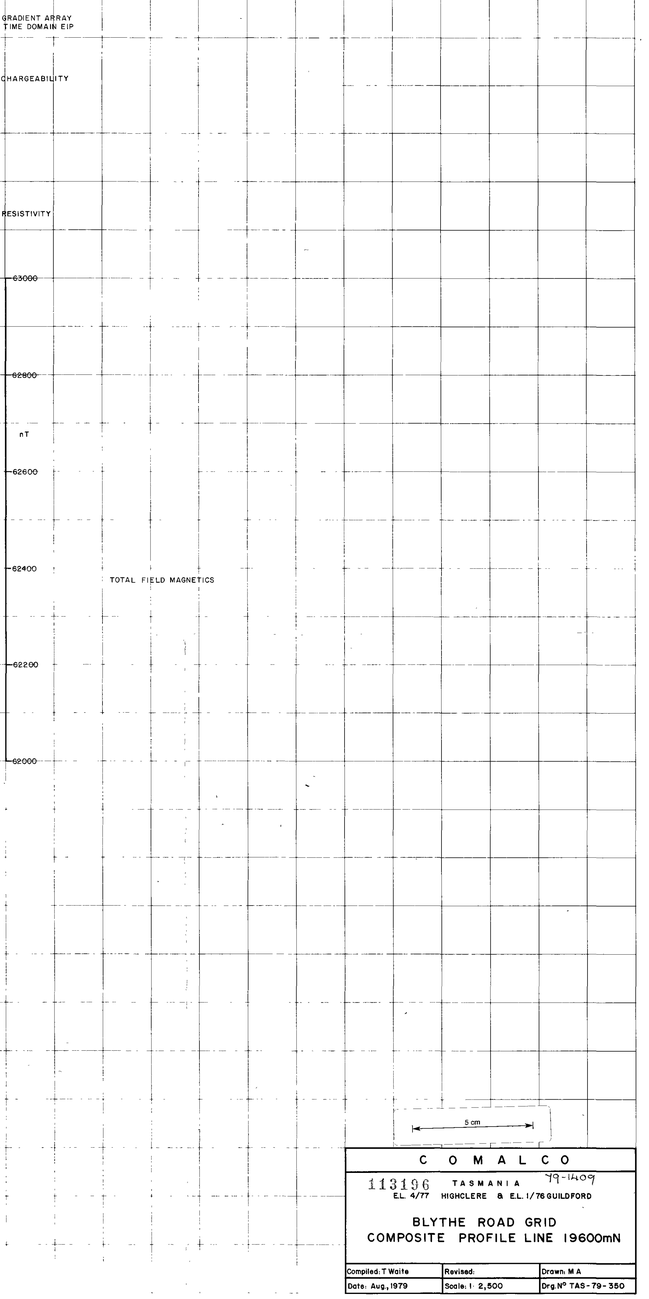
TOTAL FIELD MAGNETICS

W

E

buttongrass
bauera bush + tea-tree
tea-tree + buttongrass
tea-tree + bauera - bush
(undulating to north)
(5ft to 10ft trees)
(flat trees to north)
ferns
(20ft grass sedge plain)
thickened 4 to 6ft scrub
thickened 1 to 4ft scrub
tea-tree + buttongrass
bauera - bush
sedge scrub
trees
vine (trees to south)
vines (trees to north-west)
trees
trees
trees
(trees)
(sedge scrub
white gum)
creek (trees to north)
creek (trees to south)
trees
trees
small vines + brambles
grass (trees to north)
20ft to 30ft scrub
tea-tree
20ft to 30ft scrub
tea-tree + buttongrass
20ft to 30ft scrub
tea-tree + buttongrass + vines
20ft to 30ft scrub
20ft to 30ft scrub
20ft scrub
20ft scrub
20





5 cm

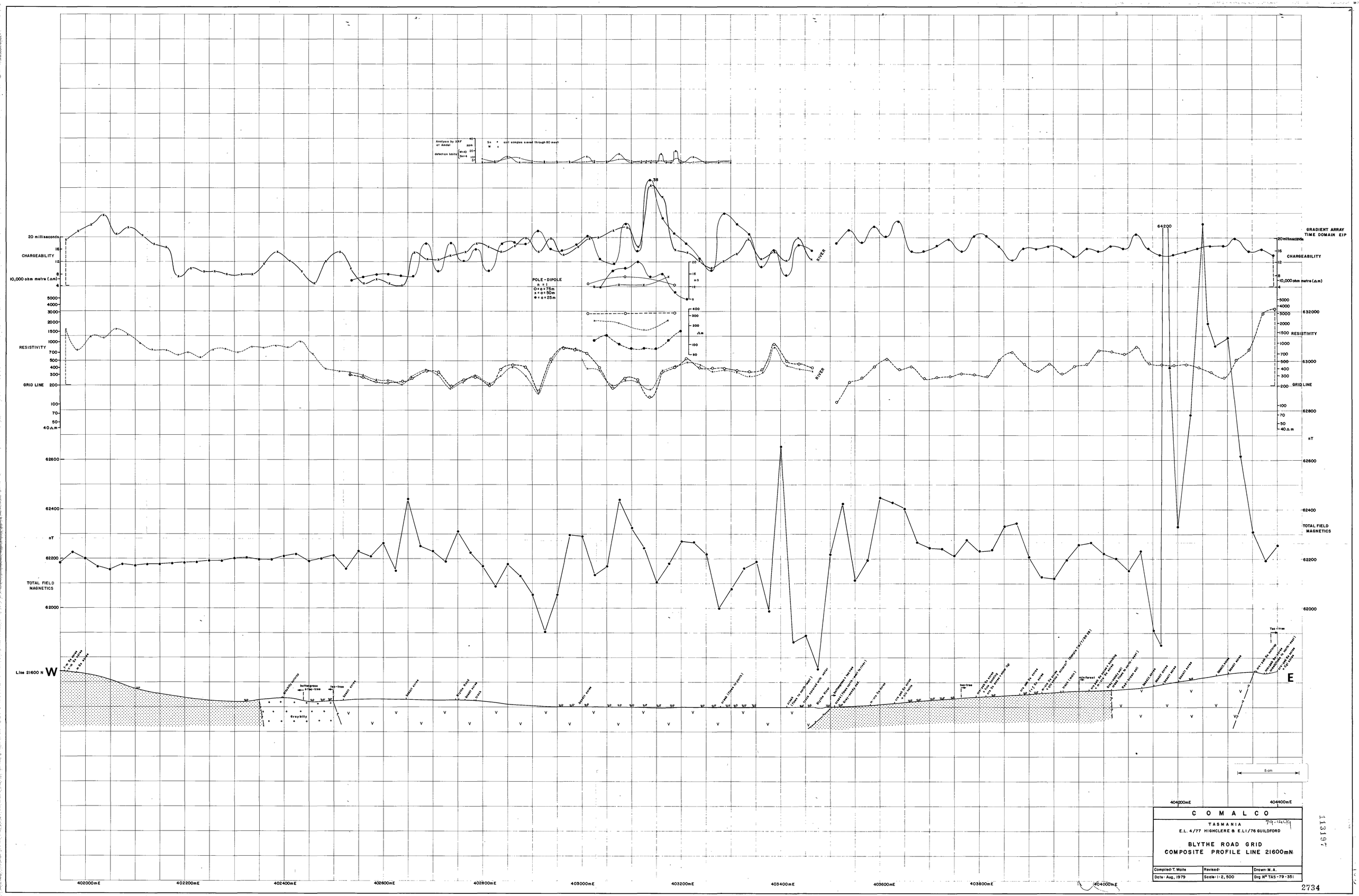
C O M A L C O

113196 TASMANIA 79-1409
EL 4/77 HIGHCLERE & EL 1/76 GUILDFORD

BLYTHE ROAD GRID
COMPOSITE PROFILE LINE 19600mN

Compiled: T Waite	Revised:	Drawn: M A
Date: Aug, 1979	Scale: 1: 2,500	Drg.N° TAS-79-350

2733



C O M A L C O

TASMANIA

E.L. 4/77 HIGHCLERE & E.L1/76 GUILDFORD

79-1409

BLYTHE ROAD GRID
COMPOSITE PROFILE LINE 21600mN

Compiled: T. Waite	Revised:	Drawn: M.A.
Date: Aug, 1979	Scale: 1:2,500	Drg No TAS-79-351

113197

2734

COMALCO

TASMANIA

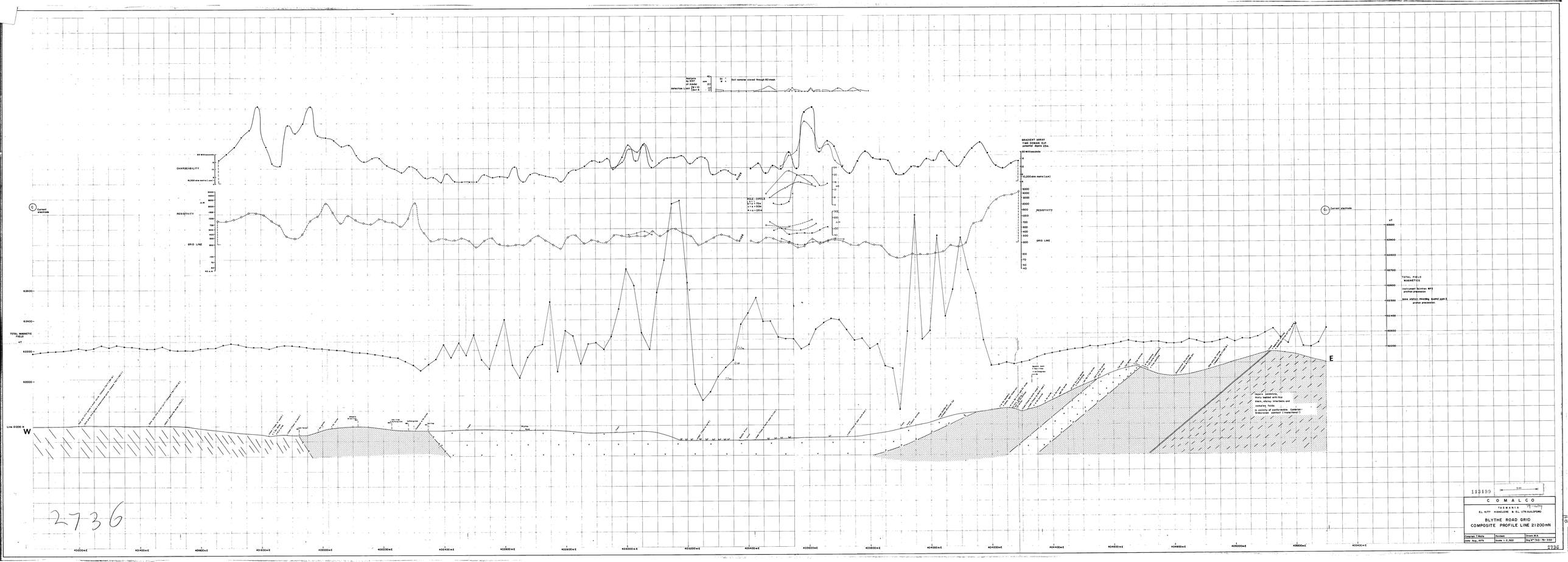
E.L. 4/77 HIGHCLERE & E.L. 1/76 GUILDFORD

BLYTHE ROAD GRID

COMPOSITE PROFILE LINE 22000mN

Compiled: T Watts	Revised:	Drawn: M.P
Date: Aug., 1979	Scale: 1: 2,500	Drg N° TAS - 79 - 332

2735



CHARGEABILITY
RESISTIVITY
GRID LINE
Current electrode
TOTAL MAGNETIC FIELD
Line 21200 N
W
E
BRADIENT ARRAY TIME DOMAIN E.I.P. potential depth 25m.
10 Milliseconds
10,000 ohm metre (Ωm)
POLE - DIPOLE
TOTAL FIELD MAGNETICS
instrument facilities MP3 proton precession
base station recording Gemini ppm E proton precession
Nature conditions, Mainly bedded with thin blocks, shiney interbeds and complex fields
In vicinity of conformable Cambrian - Ordovician contact (inconformal)
2736
113199
COMALCO
TASMANIA
EL 4/77 KISHCLERE & EL 1/76 GULDFORD
BLYTHE ROAD GRID
COMPOSITE PROFILE LINE 21200mN
Compiled: T. Watts
Date: Aug., 1979
Revised:
Scale: 1:2,500
Drawn: M.A.
Drg. No. TAS-79-353
2736

21700mN
21600mN
21500mN
21400mN
21300mN
21200mN
21100m N

402900m E
403000m E
403100m E
403200m E
403300m E
403400m E
403500m E
403600m E
403700m E
403800m E
403900m E
404000m E

NOTE Instruments used Scintrex MP 2 & Geometrics G816 magnetometers
Operator G. Shovelton

113200

5 cm

COMALCO

79-1409

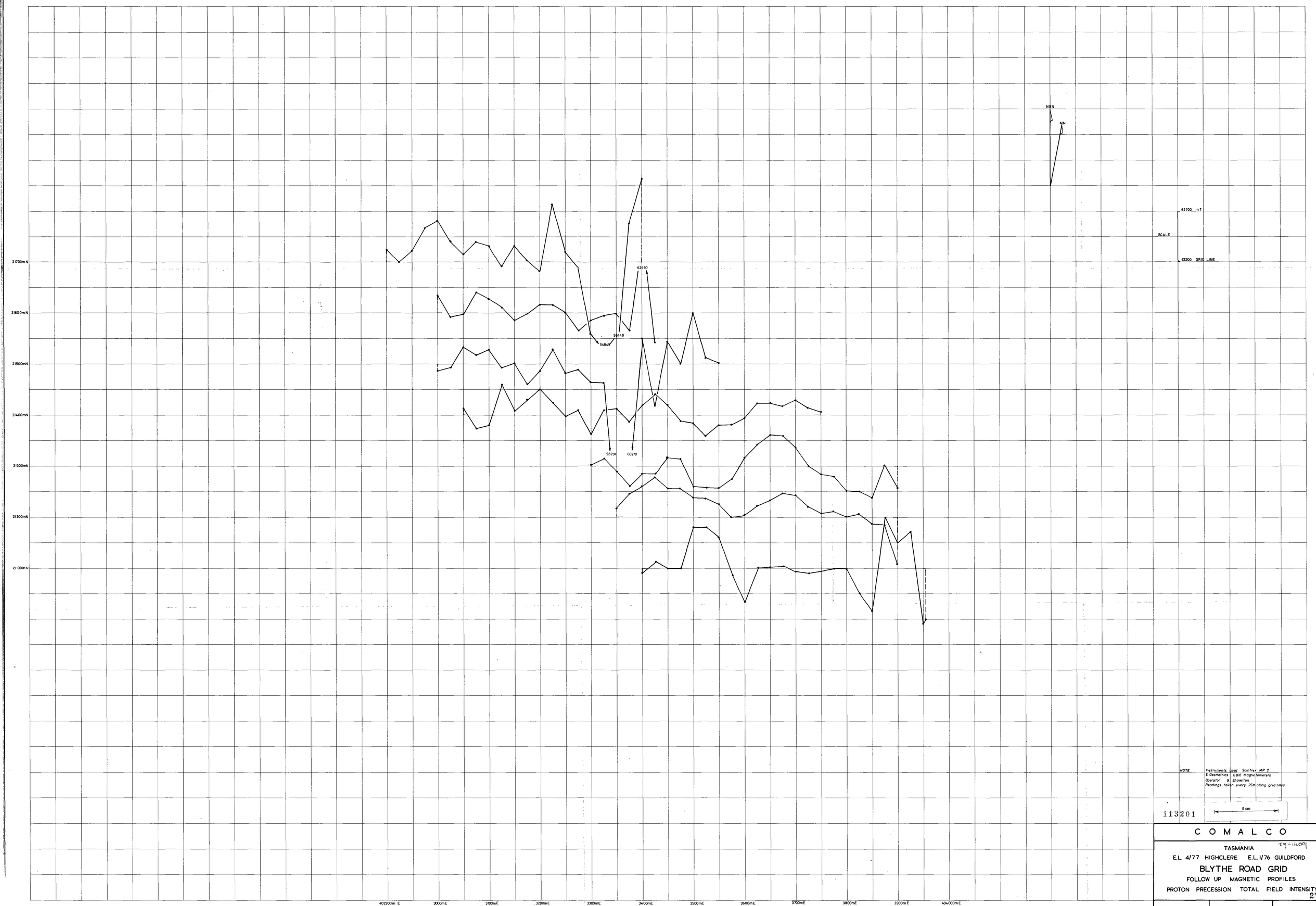
TASMANIA
E.L. 4/77 HIGHCLERE E.L. 1/76 GUILDFORD

BLYTHE ROAD GRID

FOLLOW UP MAGNETIC DATA
PROTON PRECESSION TOTAL FIELD INTENSITY

2737

Compiled G Shovelton	Revised	Drawn O Heddrich	
Date Dec 1979	Scale 1 2500	Drg No TAS-79-317	



NOTE Instruments used Scintrex MP 2
& Geometrics G816 magnetometers
Operator G Shovelton
Readings taken every 25m along grid lines

113201

5 cm

COMALCO

TASMANIA

E.L. 4/77 HIGHCLERE E.L. 1/76 GUILDFORD

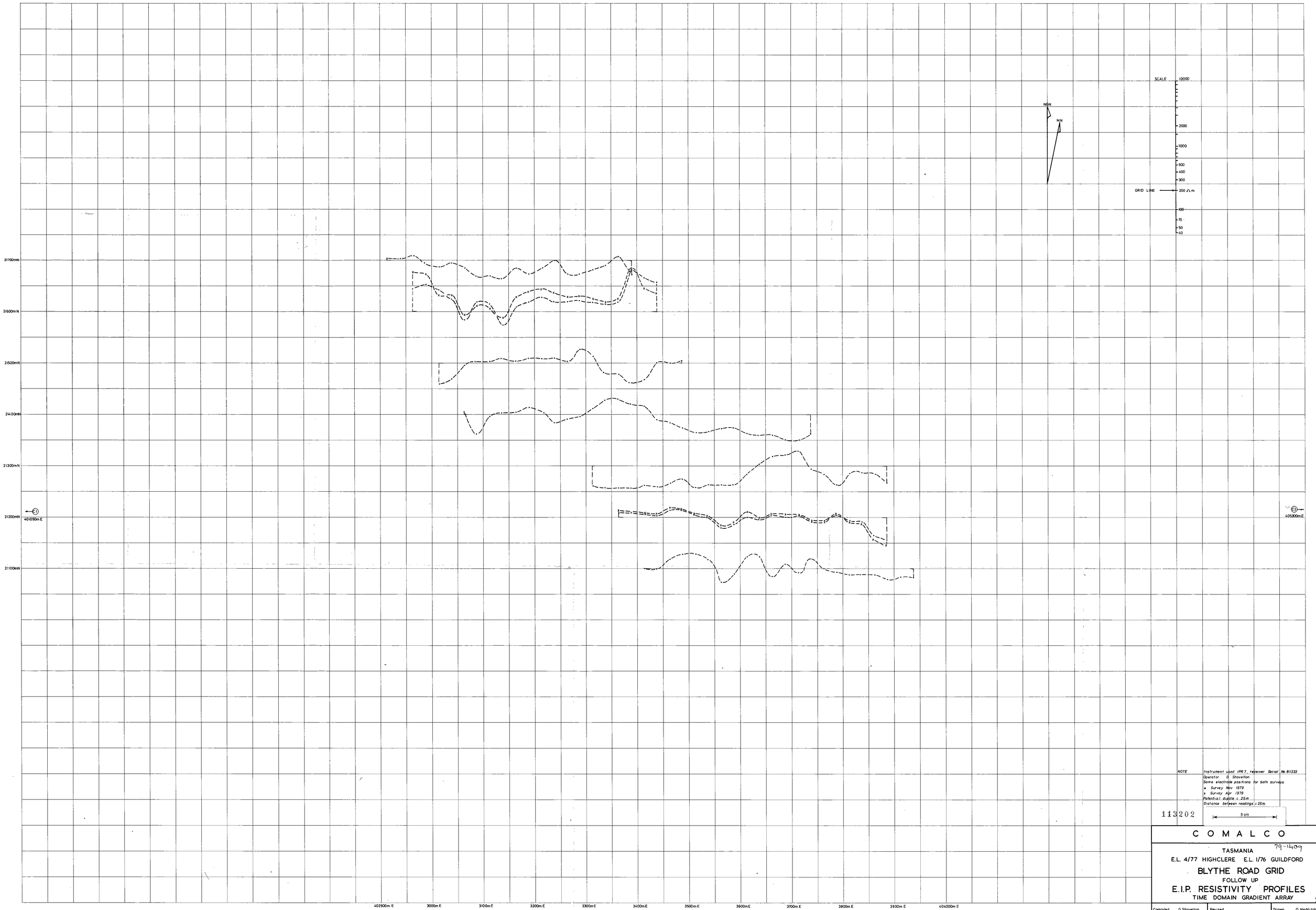
BLYTHE ROAD GRID

FOLLOW UP MAGNETIC PROFILES

PROTON PRECESSION TOTAL FIELD INTENSITY

2738

Compiled G Shovelton		Revised	Drawn O. Hedditch
Date Dec 1979		Scale 1:2500	Drg No TAS-79-316



NOTE

Instrument used IPR 7, receiver Serial No 81233
Operator G Shovelton
Same electrode positions for both surveys
a Survey Nov 1979
x Survey Apr 1979
Potential dipole = 25m
Distance between readings = 25m.

113202

5 cm

COMALCO

TASMANIA 79-1409

E.L. 4/77 HIGHCLERE E.L. 1/76 GUILDFORD

BLYTHE ROAD GRID

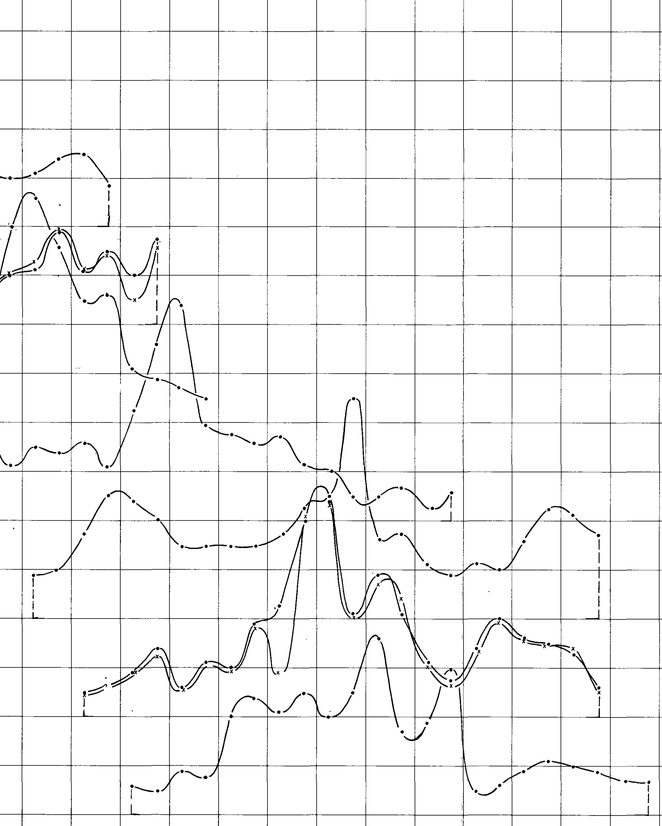
FOLLOW UP

E.I.P. RESISTIVITY PROFILES

TIME DOMAIN GRADIENT ARRAY

2739

Compiled	G Shovelton	Revised		Drawn	O Hedditch
Date	Dec 1979	Scale	1:2500	Drg No	TAS-79-319



21700mN
21600mN
21500mN
21400mN
21300mN
21200mN
21100mN

401050 E

405300E

402900m E
3000mE
3100mE
3200mE
3300m E
3400m E
3500m E
3600mE
3700mE
3800m E
3900m E
404000m E

NGN
MN

SCALE 1:2
8m S
4
0 50 100
metres

NOTE
Instrument used IPR 7 receiver Serial No BII233
Operator G Shovelton
Same electrode positions for both surveys.
Survey Nov 1979
Survey Apr 1979
Potential dipole = 25m
Distance between readings = 25 m

113203

5 cm

COMALCO

TASMANIA 79-1409

E.L. 4/77 HIGHCLERE E.L. 1/76 GUILDFORD

BLYTHE ROAD GRID

FOLLOW UP

E.I.P. CHARGEABILITY PROFILES

TIME DOMAIN GRADIENT ARRAY

2140

Compiled G Shovelton	Revised		Drawn O Heddstch
Date Dec 1979	Scale 1 2500		Drg No TAS-79-320

2741

Power Lines

62000nT

TALUNAH ROAD 62000nT

MORELAND ROAD 62000nT

mag. susc. 0·1 – 0·4 Av. = 0·2

mag. susc. 0·1 – 0·4 Av. = 0·2

ROWBOTHAMS ROAD 62000nT

Power Lines

62000nT

ROAD 62000nT

P I G

mag. susc. 0·1 – 0·5 Av. = 0·2

62000nT

62000nT

mag susc 0·3 – 0·4

62000nT

mag susc 0·1 – 0·4 Av=0·3

mag susc 0·3 – 0·6 Av=0·4

62000nT

62000nT

62000nT

ROAD

ROAD 62000nT

ROWBOTHAMS

mag. susc. 0·1 – 0·2 Av = 0·2

mag. susc. 0·1 – 0·2 Av = 0·2

62000nT

mag susc 0·1 – 0·5 Av = 0·3

ROWBOTHAMS

62000nT

ROAD

393400 m E

394000 m E

394600 m E

395200 m E

431600 m N

431000 m N

430000 m N

429400 m N

National Grid 11·4 Magnetic NW

NOTES

INSTRUMENTS: SCINTREX MP 2, PROTON PRECESSION MAGNETOMERS GEOMETRICS G816

AUSTRAL PPM-2 PROTON PRECESSION RECORDING BASE STATION MAGNETOMETER

DATA IS UNCORRECTED. DIURNAL DRIFT MAXIMUM OF LESS THAN ± 15nT

MAGNETIC SUSCEPTIBILITY READ IN C G S UNITS USING ELLIOT METER MODEL PP-2A

SUSCEPTIBILITIES ARE OF WEATHERED SURFACE BOULDERS

LEGEND

Values below 63000 nT have been profiled Thus.

Values above 63000 nT have been profiled Thus.

Probable limits of anomaly as determined from profiles

Road

Compass traverse

5 cm

C O M A L C O

79-1140

TASMANIA
E.L 4/77 HIGHCLERE

TALUNAH ROAD MAGNETIC ANOMALY GROUND TRAVERSE TOTAL MAGNETIC FIELD PROFILES

Scale 1 cm = 250 nT

Compiled: G.W.	Revised:	Drawn: M.A.
Date August, 1979	Scale 1: 2,500	Drg N° TAS-79-345

AUSTRALIAN NATIONAL MAPPING GRID – ZONE 55

11204

2741

2742

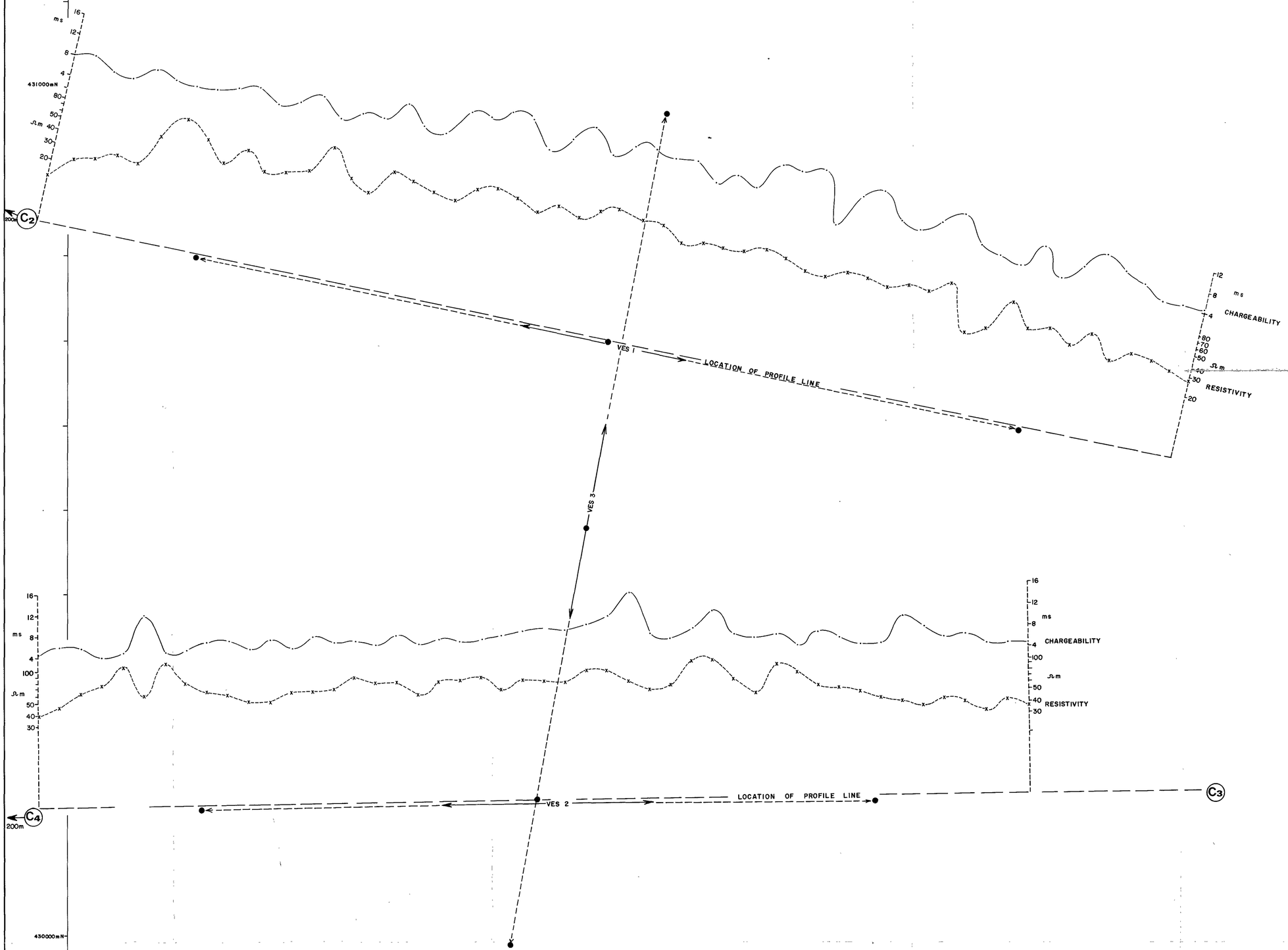
393400m E | 394000m E | 395000 m E | 396 200m E

431600mN

431000mN

430000mN

429400 mN



National Grid
Magnetic Nth

NOTES

INSTRUMENTS: SCINTREX 3·5 kw TRANSMITTER
SCINTREX IPR7 RECIEVER
OPERATOR: G SHOVELTON

POTENTIAL DIPOLE = 25 metres.
INTERVAL BETWEEN READINGS = 25 metres

NB. THIS SHEET OVERLAYS MAGNETIC FIELD PROFILES

LEGEND

C3 — Current electrode position
Resistivity in ohm metres
Chargeability in milliseconds
VES1 — Line of schlumberger electrical sounding

5cm

113205

C O M A L C O

TASMANIA
EL 4/77 HIGHCLERE

79-409

TALUNAH ROAD MAGNETIC ANOMALY
ELECTRICAL INDUCED POLARIZATION PROFILES
(TIME DOMAIN, GRADIENT ARRAY)

Compiled: G W.	Revised:	Drawn: M A.
Date: August, 1979	Scale 1: 2,500	Drg N° TAS-79-346

AUSTRALIAN NATIONAL MAPPING GRID ZONE 55

2742