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TIN-TUNGSTEN PROJECT

EXPLORATION LICENCE 5/63 PART 2

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AUTHOR/S: **G F Pigott**

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COMSTAFF PROPRIETARY LIMITEDINTERIM REPORT ON THE MOUNT RAMSAY TIN - TUNGSTEN PROJECTEXPLORATION LICENCE 5/63 PART 21. INTRODUCTION

This report covers the work carried out in the Mount Ramsay (CAF) area during the 1981/82 summer field season. It is divided into three sections, the first covers the geology and geochemistry of the CAF grid, particularly the southern extensions. The second reviews the geophysical techniques used and the responses obtained. The third describes the results of the diamond drilling programme carried out to test the skarn mineralisation. Following a discussion of results achieved recommendations are put forward for further work.

2. LOCATION AND ACCESS

The Mount Ramsay Tin-Tungsten Prospect lies on the eastern slopes of Mount Ramsay within the western portion of EL 5/63 Part 2 (Plan TAS/2/1586) and lies 17 km south south west from Waratah. Access is provided by a four wheel drive track - the Ramsay Road - which leaves the Waratah-Corinna Road 8 km southwest of Waratah. Alternative access is provided from the Murchison Highway by the South Huskisson Road via the Associated Forest Holding's Hatfield Road.

3. PREVIOUS WORK3.1 Old Records

There are several published and unpublished reports of occurrences of bismuth in possible skarn on the east slopes of Mount Ramsay. The earliest report is in a prospectus published in "The Mercury" in 1890 on behalf of the Mount Ramsay Bismuth Mining Co., which quotes a report of inspection by Prof. G H F Ulrich, who originally wrote the article in 1876 for the Tasmanian Bismuth and Gold Mining Company, Mount Ramsay.

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According to Ulrich the mineralisation was discovered by two prospectors, Messrs Heazlewood and Harman, who observed detrital bismuth and scheelite grains in Greco Creek (then named Bismuth Creek). Ulrich describes the deposit as being lenticular in shape extending 60m along a NW-SE strike, approximately 30m wide and dipping at a relatively flat angle to the north east and south east. The workings are listed as comprising a shaft 4.6m deep, sunk on the south east corner of the outcrop, and a series of less^{er} excavations along the north eastern or upper contact with an open face near the south western corner. It was noted that the deposit was composed of a coarsely and finely crystalline granular amphibolite or "hornblende-rock" impregnated with native bismuth, arsenopyrite, pyrite, chalcopyrite magnetite ilmenite, scheelite fluorspar, garnet and rarely axinite.

It was considered that the deposit had potential in bismuth, gold and copper. The best mineralisation was seen to occur in the shaft, where it was exposed over a three metre width. Ulrich estimated the bismuth grade at 7-10% and the copper grade at 1.6%. He selected samples of the different mineral species to check the gold content by assay. Interestingly it was found that the gold was associated with the chalcopyrite, arsenopyrite and pyrite but not with the magnetite or bismuth, although Ulrich did observe that the bismuth was intimately associated with the gold bearing sulphides. Assay values for selected samples for chalcopyrite contained 80 g/t and for arsenopyrite 100 g/t and 120 g/t Au.

Ulrich recommended in his report that an adit be driven across the width of the hornblenderock towards the shaft, but little work was done as up to 1897. Further development was carried out between 1897 and 1918 in that the shaft was deepened to 9.1m and Ulrich's recommended adit was excavated.

H Conder, in a report thought to date from 1918, described the Mount Ramsay Mine. He noted that the skarn zone occurred between granite to the north and west and hornfelsed sediments to the south and east.

He mapped the skarn where exposed in the shaft and tunnel as comprising irregular bands of hard flinty rock called "hornstone" and soft rock composed of hornblende with pyrite fluorspar and scheelite. A number of samples were collected for assay, but only the bismuth and gold values are recorded. The net results were an average value of 4.6 g/t Au and 0.15% Bi from the shaft but virtually nothing from the adit.

Conder measured the adit as extending 36.3m and noted that it did not extend far enough to the east to test the mineralised zone as exposed in the shaft. He recommended that the adit be extended a further 30m eastwards. However no further work was done and no mining was ever carried out.

3.2 Recent Exploration

In 1972 stream sediment samples were collected from the lower reaches of Greco (or Bismuth) Creek 2.5 km downstream from the mineralisation. No anomalous values were realised.

The area was included in the Input EM survey of 1975 and two anomalies were identified - CAF (W) and CAF (E). In 1979 the locations of these input anomalies were determined and a grid established. The grid was extended westwards to cover the granite contact and the old workings rediscovered. Geological mapping, soil sampling and ground magnetic surveys delineated the skarn and demonstrated that it was considerably larger than had been previously realised.

Further gridding was carried out in 1981, primarily over the skarn zone where lines were established on 60m spacing. The input anomalies were confirmed by Crone EM ground responses but were shown not to be related to the skarn. The old workings were mapped and sampled and the major mineral assemblages of the skarn recognised. In the latter part of 1981 two diamond drill holes were completed, a total of 384.3m. Although the intersected mineralisation was sub-economic, the best intersection was 0.19% Sn over a drilled width of 12.3m, it was seen that the skarn represented a significant zone of mineralisation and that further exploration was warranted.

4. WORK COMPLETED4.1 Grid Cutting

Grid CAF was extended 600m to the south, and lines cut 60m apart from off a base line. A tie line was established along the western boundary of the grid while the bulldozed access track was utilised at the eastern end. In all a total of 10.8 km were cut and surveyed.

4.2 Geological Investigations

The grid lines were geologically mapped utilising rock chips brought up by hand auger sampling as well as float in creek beds and scree on slopes. Few outcrops were found, so the geological interpretation must be recorded as tentative.

4.3 Geochemical Surveys

Auger samples were collected at 20m stations along the grid lines, the total number collected being 411. These were dried at Waratah and sieved to -80 mesh the +80 mesh being retained. The samples were then submitted to Analabs, Thirkell St, Cooee, 7320, pulverised, and, after perchloric/nitric acid partial digestion, analysis was carried out for Cu, Pb, Zn, Ag and Ni by AAS. As was analysed by AAS after arsenic hydride generation. Sn and W were determined by XRF.

4.4 Geophysical Surveys

A Pulse Electromagnetic (PEM) survey was carried out on the new grid extensions and on four of the previously cut lines 4400N, 4640N, 4760N and 5000N. A ground magnetometer survey was carried out which was tied in with the previous surveys allowing for direct integration of the data. An aeromagnetic survey was carried out over the southern sector of EL 5/63 Part 2 incorporating the CAF area. Details of the work carried out and the results achieved are reported in section two of this report.

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4.5 Diamond Drilling

Five diamond drill holes, totalling 726.3 metres were completed. All core was geologically logged, measured for magnetic susceptibility and sampled for geochemical assay. Full details of work completed and a discussion on results are incorporated in section three of this report.

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APPENDIX 1 PETROLOGY OF SELECTED ROCK SAMPLES

COMSTAFF PROPRIETARY LIMITEDINTERIM REPORT ON THE MOUNT RAMSAY TIN - TUNGSTEN PROJECTEXPLORATION LICENCE 5/63 PART 2SECTION 1A GEOLOGY OF THE CAF (MOUNT RAMSAY) GRID1A.1 LITHOLOGICAL UNITS (Table 1)1A.1.1 Cambrian1A.1.1.1 Cambrian Sedimentary Units

The sedimentary lithologies mapped on CAF can be assigned to the Lower Cambrian Crimson Creek Formation on the basis of regional correlation and interpretation. The rock types recognised include tuffaceous lithicwacke sandstone, siltstone and argillite - the volcanoclastic components being of basic to intermediate composition; pelite, pelite chert and impure carbonate. The distribution of the various rock types is shown on the detailed geology plans (TAS 2/1845, 2410, 2811). The rocks can be grouped into recognisable sequences as shown on the geological interpretation plans (TAS 2/2101 and 2812) which are presented for the whole grid.

Volcanoclastic Lithicwacke

The dominant sedimentary rock type in the CAF area is basaltic volcanoclastic lithicwacke which varies in grain size from coarse sandstone to fine silty argillite. Generally the rocks are finely bedded, with graded bedding common. Evidence of both normal and density current deposition is seen in the sedimentary structures such as rip up clasts, mud flake breccias, cross bedding with erosional basal surfaces, flame structures and load casts. Petrological descriptions of a number of samples from both the surface and drill holes are presented in Appendices I, III and VII, while sequences are logged in detail in the seven drill holes (Green: Section 3 this report, Pigott, 1982).

Typically the rocks are dark grey, dense and weakly bedded. Much of the primary sedimentary characteristics are obscured by subsequent hornfelsing. The bulk of the rock is composed of volcanoclastic material of basaltic to andesitic composition which probably represent reworked lava and pyroclastic clasts. Splintery to angular clasts of feldspar and quartz occur in varying amounts - the quartz may be of pre Cambrian origin. Detrital magnetite is a common accessory.

The depositional environment of the volcanoclastic lithicwacke sequences can be construed as being within a rapidly infilling rift controlled trough with associated basic volcanism, the basement and margins of the trough being of pre Cambrian sediments.

Pelitic Sediments

Sequences of predominantly pelitic sedimentary rocks can be mapped at CAF. The rocks are characteristically well bedded comprising thin units of fine grained cherty mudstone and pelitic chert which vary in colour from reddish brown to white. The cherty units are finely interbedded with units of tuffaceous siltstone and carbonaceous argillite. Brecciation is a common characteristic of these sequences. Only the major mapable units of pelites are shown on the geological interpretation plans. However it can be seen from the amount of float throughout the grid, and from the drill intersections that these pelitic sediments are a common occurrence.

Calcareous Sediments

Units of calc-silicate altered, generally fine grained, rocks occur at CAF. Generally such rocks are silicified, finely banded and have been given the field term "calc-silicate altered pelite". Others are more massive, but are still banded, although the banding may be compositional and fracture controlled rather than representing bedding. The common calc silicate minerals which make up these rocks are diopside, garnet and vesuvianite in varying proportions. The original rocks are considered to range from impure argillaceous limestones to massive calcic limestones.

If the limestone is pure the assemblage is andradite garnet - diopside, but if argillaceous, vesuvionite has formed. Commonly the rocks show a retrograde metasomatic phase whereby the anhydrous calc-silicates are partially replaced by hydrous silicates.

Successful identification of carbonate units within the Crimson Creek Formation is of primary importance in the search for tin deposits of the Renison-Cleveland-Mount Bischoff style. Where intersected in drill holes or mapped on the grid, calcareous sediments are seen to be intimately associated with pelitic sequences. It appears that within these sequences there is every gradation from siliceous cherty sediments to pure calcic limestone with the average rock type being a calc-silicate altered pelite. Further more it has been observed at CAF that carbonaceous sediments commonly occur in association with calcareous rocks. Thus it can be seen that careful geological mapping can lead to the discovery of prospective carbonate units by the association:- pelitic sequences — carbonaceous argillite — calcareous rock types.

Basaltic Tuffaceous Sediment and/or Tuff

A distinctive rock type which forms mappable units at CAF is a granulitic magnetic densely packed medium grained rock. It proves difficult to tell in hand specimen whether the rock is basic igneous or sedimentary. In thin section however it can be seen that the rock is sedimentary but with a high basaltic content. The basalt clasts and the basic matrix characteristically show extensive replacement by microgranular ferrohastingsite. On maps the rock is given the field term "amphibolitised volcaniclastic lithicwacke".

Quartz - Feldspathic Sandstone

A rock type with a characteristic felsic composition can be mapped in the south west corner of the grid. It is well bedded, clearly sedimentary in origin and comprises quartz and feldspar grains in an interlocking grain supported frame work with subordinate amphibolitised basic volcanic lithic clasts.

Calc silicate altered pelite and carbonaceous argillite occur as intercalated minor units. This sub unit appears to be conformable with the more basaltic volcanoclastic units and may represent a depositional period of relative volcanic quiescence with increased input from a pre Cambrian provenience.

1A.1.1.2 Cambrian Igneous Units

Conformable sill like bodies of meta basite outcrop in the southern sector of CAF. The rocks are characteristically porphyritic in plagioclase feldspar and vary from porphyritic microgabbro to basalt in textural rather than mineralogical differences. Petrological descriptions of a number of samples are presented in Appendix 1. The rocks are interpreted as representing lava flows and/or high level sill-like intrusives which formed contemporaneously with the Crimson Creek sediments. Relatively fresh outcrops are well exposed on the South Ramsay access road. The rocks are seen to be massive with no primary evidence of extrusion such as pillow lavas or vesicles. However intercalated units of tuffaceous siltstone and argillite indicate a subaqueous environment of deposition.

The rocks are demonstratively magnetic, which is a characteristic and distinctive feature of Crimson Creek Basalts. Basalts of Middle Cambrian age associated with major fractures such as at Heazlewood, Magnet and Renison are relatively non magnetic. The relatively high proportion of basaltic rocks in the southern sector of CAF give rise to strong aeromagnetic and ground magnetic responses. Here basalts form 30-40% of the lithologies mapped which forms the thickest development mapped in the Ramsay area. It may be traced eastwards (down the succession?) into grid CAJ (Pigott, 1980). Generally basalts only form a relatively minor component of the Crimson Creek succession.

Basaltic rocks have not been observed either in float or outcrop in the central or northern sectors of grid CAF. However minor units are present as evidenced by intersections in DDH CAF 4 (<2m wide). This is in sharp contrast with the southern sector and lends weight to the evidence for an East-West fault separating the two sequences.

South of the grid the proportion of basaltic units decreases but basic rocks do occur as significant mappable units on grids CAI and CAF (Green 1982, Pigott 1980).

1 A.1.2 Devonian - Meredith Granite

The Devonian Meredith Granite outcrops along the western and northern sectors of the CAF grid. It has been intersected in drill holes CAF 1, 2, 3, 5 and 7. In addition two associated dykes of leuco adamellite have been mapped intersecting the sedimentary succession east of the main granite outcrop. Two main granite types are recognised, although there are variations in between. Petrological descriptions are included in Appendices 111 and V11 in Section 3 of this report.

The main granite phase at Mount Ramsay is a coarse grained equigranular, to densely porphyritic, biotite granite with an average composition of 60% feldspar, 30% quartz and 10% biotite. DDH CAF 7 terminated in this granite type. It is relatively unaltered and appears not to be associated with the mineralisation. The second granite type is a porphyritic biotite microgranite or adamellite which forms a marginal intrusive phase between the sedimentary units and the coarse biotite granite. It is of intermittent thickness and form, and is similar in composition to the dykes which intrude the sediments east of the main contact. Where fresh the rock is seen to be comprised of phenocrysts of perthitic orthoclase, quartz, sodic oligoclase and biotite in a medium grained matrix of the same minerals. Locally however, for example in drill holes CAF 5 and 7, this granite phase is intensely altered, with the development of a quartz-chlorite-muscovite-carbonate assemblage, and patchy tourmalinisation.

1 A.1.3 Quaternary - Sediments

Poorly sorted gravel and coarse sand infill the main water courses particularly in the southern part of the grid. The alluvium forms an effective mask for geochemical sampling.

The creeks tend to follow the skarn and carbonate rocks on account of the relative ease of weathering as compared to the hornfels and basalt.

1A.2 STRUCTURE (see composite sections and detailed drill sections)

The CAF prospect lies on the western limb of a major north trending anticline. Rock units of the Crimson Creek Formation generally dip and face to the west with local overturning and facing reversals due to folding and the granite emplacement. Through CAF the strike varies from WNW-ESE in the north to NNW-SSE in the south while adjacent to the granite the strike is parallel to the contact (NNW-SSE).

Little information can be obtained from the mapping on the fold pattern as outcrop is scarce and primary sedimentary features are obscured by hornfelsing. Measured dips from outcrops vary from 25-90° W with some dips steep to the east. Observed facing directions are to the west. More detailed information can be gleaned from the diamond drill hole intersections:-

CAF 1 (TAS/2/2676): Bedding and facing directions are to the east with vertical to steep westerly dips. The skarn banding is vertical, with facing to the west.

CAF 2 (TAS/2/2693): Bedding facing directions are to the east while the dips are steep to the west into the granite. Skarn rocks on the same section dip to the west.

CAF 3 (TAS/2/2920): Measured facing directions within the skarn zone are consistently to the west while dips are steep to the east and west.

CAF 4 (TAS/2/2921): Tight isoclinal folding is indicated towards the top of the hole with facings both to the east and west. Dips are generally steep to the east, and facings to the west further down the hole.

CAF 5 (TAS/2/2922): Tight folding is indicated in this hole since dips and facings are both to the east and west with east facings dominant. The skarn body is vertical.

CAF 6 (TAS/2/2923): Dips are steep to the west while west facings predominate over east facings. This hole intersected the two carbonate units also mapped on surface.

It seems possible that there could be only the one carbonate bed folded into an asymmetric syncline with a northerly plunge.

CAF 7 (TAS/2/2924): Dips are steep both to the west and east. Facings are entirely to the west. The skarn body is vertical.

It appears that the folding pattern is more complex adjacent to the Meredith Granite batholith with the development of tight asymmetric isoclinal folds. The emplacement of the granite is post kinematic but local deformation of the sedimentary envelope might be expected giving rise to superimposed irregular folds over the regional fold pattern. Only one cleavage has been recognised in the rocks of the Crimson Creek Formation at CAF.

Only one fault of any consequence can be recognised at CAF (see Plan TAS/2/2812). This WNW-ESE striking fault appears to terminate the main skarn to the south. This shows up clearly both from geological mapping and the ground magnetic pattern (plan TAS/2/3159 Section 2 this report). The fault also truncates the replaced carbonate units intersected by DDH CAF 6. Again, this is very evident from the abrupt termination of the ground electromagnetic and magnetic effects associated with these units. Continuation of the fault east of this is evidenced by the contrast between the difference in the basalt component in the sequences north and south of the structure, while to the west there is some evidence to suggest displacement of the granite-sediment contact. The throw and hade of the fault cannot be measured, but it is considered that it is normal, downthrowing to the south.

Evidence from the ground magnetic data suggests the presence of a NW-SE fault in the southernmost sector of the grid. There is little geological evidence to support this as it is virtually parallel to strike. However float of calc-silicate altered rocks have been mapped in the area in association with a co-incident soil geochemical anomaly in Sn (+35 ppm) and W (+11 ppm).

1A.3 METAMORPHISM

1A.3.1 Regional Metamorphism

The effects of regional metamorphism at CAF are effectively masked by the thermal metamorphism associated with the emplacement of the Meredith Granite. The main rock types - the basic tuffaceous lithicwackes

show extensive replacement by tremolite-actinolite with chlorite, carbonate, talc, saussurite, albite and biotite. Such effects are so widespread that the mineral assemblage is considered to have formed under the upper greenschist facies of regional metamorphism.

1A.3.2 Contact Metamorphism

The Crimson Creek sedimentary and igneous rock units at CAF are hornfelsed to varying degrees. The mineral assemblages developed, formed under conditions of lower to upper amphibolite facies. The highest grades of thermally metamorphosed rocks occur within carbonate rocks adjacent to the granite contact. Distinctive suites of skarn mineral assemblages are developed over a continuous zone varying between 15 and 100m wide, 25 and +220m deep, over a 700m strike length, along the NE margin of the granite. The skarn is made up of crystalline garnet-vesuvianite-diopside-ferrohastingsite rocks with characteristic compositional and wrigglyite banding. Fluorite and calcite are common as interstitial minerals. Massive crystalline and banded magnetite with pyrrhotite and chalcopyrite occur in association with the ferrohastingsite. Calc-silicate altered pelite and hornfelsed argillite occur intercalated with the skarn rocks. The rock suite represents a multi stage replacement calcic Sn-F skarn derived from an impure argillaceous limestone.

To the south the skarn appears to terminate against the WNW-ESE fault. However the soil geochemistry results in Sn, W, Cu and As suggest some continuation of the unit. The lack of magnetic or conductive responses could be due to the fact that the fault marks the skarn- argillaceous marble interface. The unit may continue to the SE in the downthrown side of the fault as an argillaceous marble or limestone but the lack of outcrop and the widespread development of alluvium prevent verification of this. There is evidence of calc silicate alteration in carbonate sediments in the south east portion of the grid from float mapping, soil sample results and ground magnetic responses. This could represent a repetition or strike continuity of the replaced carbonate horizons.

Diamond drill hole CAF 6 intersected two carbonate units within a dominantly pelitic sequence.

Two zones of calc-silicate alteration had previously been outlined from geological mapping, ground magnetic and electromagnetic surveys. The units are approximately 20m wide, with a strike length of 300m, but with an unknown depth. Both zones are enriched in Sn, Cu, As and Pb. Narrow bands of true skarn mineral assemblages eg diopside-garnet-calcite along with axinite and scapolite occur within the replaced carbonates. Pyrrhotite, with minor pyrite makes up 10% of the rock mineral constituent. These carbonate zones remain largely unprospected, with only one drill intersection at a shallow depth (35 and 70m). Northwards along strike the PEM and Sirotem responses indicate the presence of a more massive conductor which requires testing by diamond drilling.

Calc-silicate alteration and minor skarn development occur in other calcareous units mapped at the eastern end of the grid. These rocks are heavily silicified with a widespread development of fine grained tourmaline, and contain phlogopite, diopside and tremolite.

The effects of contact metamorphism on the argillaceous and arenaceous rocks are seen as spotting by cordierite, anthophyllite and phlogopite, total recrystallisation into a denser hornfels, the introduction of magnetite and ferrohastingsite and veining by actinolite-carbonate-pyrrhotite assemblages along fractures.

1A.4 MINERALISATION

The minerals sought in the early days at Mount Ramsay were gold, bismuth and copper. Although scheelite was identified the tungsten potential was apparently not considered. There are no records of tin mineralisation nor any mention of tin being sought. The current work has not substantiated expectations of economic gold-bismuth mineralisation.

The dominant sulphide species in both the skarn and calc silicate altered calcareous rocks is pyrrhotite. In skarns it is in concentrations of up to 30% of the rock. It varies in form from discrete irregular crystalline blebs increasing to an interlocking stringer network in ferrohastingsite-calcite retrograde assemblages. Pyrrhotite also forms as coalescing patches along bands, disseminations in fractures or interstitial to the coarse crystalline ferrohastingsite. The pyrrhotite clearly postdates the magnetite in the skarn - veinlets and stringers of pyrrhotite cut magnetite bands while patches of pyrrhotite form within the magnetite by replacement.

The pyrrhotite occurs as fine discontinuous and irregular veins and patches in calc-silicate altered sediments, but is finely disseminated in pelitic layers. It occurs in actinolite-carbonate filled fractures in volcanoclastic lithicwacke units.

Chalcopyrite is intimately associated with the pyrrhotite. It occurs as rims to pyrrhotite patches or as discrete inclusions within pyrrhotite. Essentially it is seen to be replacing the pyrrhotite but the ratio of Po:Cp is about 10:1. Pyrite occurrence is fairly rare, it is associated with the pyrrhotite and occurs as fine grained thin discrete veins. Arsenopyrite is very rare, it occurs as fine grained patches intergrown with pyrrhotite.

Fluorite forms an essential mineral of the skarn assemblage. It occurs as translucent to white coarse crystals, and is not highly fluorescent. Values of up to 9.9% have been recorded in drill core samples (278.5m to 279.5m in CAF 1).

The prime commodity targets sought at CAF are tin and tungsten. The skarn zones are distinctly anomalous in Sn, WO₃, Cu, Fe, S, F, Au and Bi. The best tin values are recorded in drill holes CAF 1 and 7 which correspond with zones of ferrohastingsite-pyrrhotite retrograde alteration:-

CAF 1	203.0 - 216.3m	0.19% Sn
	233.45- 244.75m	0.13% Sn
CAF 7	145.3 - 152.6m	0.16% Sn

Zones of retrograde alteration or the skarn-marble interface are regarded as having the greatest potential for tin mineralisation. The greatest proportion of retrograde alteration in the Ramsay skarn occurs in the southern portion immediately north of the WNW-ESE fault, and this corresponds with the highest tin values recorded. The skarn-marble interface has not been found. It may occur along, or south of, the fault, but further diamond drilling would be required to test for this.

The occurrence of tungsten has proved to be an enigma at CAF. The main Ramsay skarn is a calcic Sn-F type, with which tungsten need not be associated. WO₃ values in the drill holes, while anomalous are well below economic grade. However rock chip and C horizon auger samples collected over the northern sector of the main skarn indicate a significant geochemical anomaly, the source of which remains untested.

1A.5 REFERENCES

Green, N P 1982 Stage Report on the Ramsay Grids CAI and CAG in EL 5/63 Part 2. Comstaff Pty Ltd, unpublished report.

Pigott, G F 1980 Interim Report on the Ramsay Area EL 5/63 Part 2. Comstaff Pty Ltd, unpublished report.

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T A B L E 1

AGE	NAME	UNIT	THICKNESS	LITHOLOGIES
Quaternary		Alluvium	0 - 10 m	Boulder and cobble gravel, sand
Tertiary		Basalt	0 - 25	Alkali olivine vesicular/ amygdaloidal basalt; basal gravel, sand, mudstone
unconformity				
Upper Devonian				Porphyritic biotite microgranite
to		Meredith Granite		Coarse grain biotite granite
Lower Carboniferous				Biotite granite ± hornblende
intrusive				
Middle Cambrian		Basic intrusives	0 - 100 m	Porphyritic microdolerite, and basalt
Lower Cambrian	Crimson Creek Formation	Greywacke Sequence	800 - 1200+m	Basic to intermediate volcaniclastic greywacke, tuff, siltstone, argillite; pelite (possibly dolomitic) chert conglomerate
unconformity				
Upper Proterozoic	Ramsay Group	Sandstone/Shale Sequence	800+ m	Carbonaceous sandstone, phyllite and shale; micaceous sandstone, siltstone, conglomerate, breccia; carbonate.

From Pigott 1980

COMSTAFF PROPRIETARY LIMITEDINTERIM REPORT ON THE MOUNT RAMSAY TIN - TUNGSTEN PROJECTEXPLORATION LICENCE 5/63 PART 2SECTION 1B GEOCHEMISTRY OF THE CAF (MOUNT RAMSAY) GRID

The soil geochemical results for both the original CAF grid and extensions are presented in this report. This allows for a comprehensive review of all the results, and for the assessment of the relationship between geophysical and geochemical responses. The soil sample values must be regarded in a geological framework for each element.

1B.1 TIN (Plans TAS/2/1849, 2820)

The Sn soil values can be divided into three populations 0-10, 11-34, greater than 34 ppm. The main skarn zone is distinctly anomalous with a concentration of high values (maximum 1400 ppm) over the area north of the WNW-ESE fault. Results from the diamond drilling have indicated that the greatest concentration of Sn does occur in this sector of the skarn. Continuation to the south of the skarn zone and/or the carbonate host is indicated by the anomalous soil patterns. While the response between lines 4220N and 3980N may be enhanced by concentrations of Sn in alluvium, the response further south is certainly valid. It is co-incident with a ground magnetic anomaly (Plan TAS/2/3159) and furthermore, mapping indicates the existence of calc silicate alteration in calc pelite sediments. This continuation of anomalous geochemical patterns south of the fault gives substantial evidence for the repetition or down faulted continuity of the replaced carbonate units, in which skarn development occurs adjacent to the granite.

The Meredith Granite contact with the Crimson Creek Formation is faulted to the southwest south of line 4280N while the skarn zone retains a north-north westerly strike. The rock units which occur between the skarn and the granite comprise biotite hornfelsed argillite and lithic-wacke, with, to the south, bodies of basalt. Where the skarn continues as replaced carbonate units, which may be traced out diverging from the granite, it must be regarded as being highly prospective for tin-sulphide mineralisation.

The zones of calc-silicate alteration east of the main skarn and drilled by DDH CAF 6 show up as a Sn soil anomaly. The order of magnitude of values is substantially less than that over the main skarn, but, nevertheless it does point to the prospectivity of these zones. The anomalous Sn geochemistry is co-incident with large ground EM responses and is therefore a viable target for further diamond drilling.

1B.2 TUNGSTEN (Plans TAS/2/1850, 2821)

The W soil values can be divided into three populations 0-10, 11-47, greater than 47 ppm. There is a substantial soil anomaly with values of up to 320 ppm W over the central and northern sectors of the main skarn zone. Diamond drill hole CAF 3 failed to intersect any tungsten mineralisation, and, indeed W values down the hole were below the limit of detection. Thus the source of the anomaly remains undetermined. An in depth assessment of the tungsten potential of the skarn is presented in paragraph 3.7.3 of this report (Section 3 N P Green).

The postulated south eastward repetition of the skarn zone as replaced carbonate units is again substantiated by the patterns of W soil anomalies, where anomalous values are co-incident with anomalous Sn.

1B.3 COPPER (Plans TAS/2/1846, 2814)

No positively anomalous values were recorded but four populations can be discerned from the cumulative frequency curves:- 0-24, 25-42, 43-84 and greater than 84 ppm. The 24 ppm contour clearly outlines the margin of the Meredith Granite with both skarn and sedimentary units. The main skarn is not anomalous in Cu except for some single point anomalies. The zones of calc silicate alteration with minor skarn development which were drilled by DDH CAF 6 are outlined by the 85 ppm contour. Elsewhere on the grid the 85 ppm contour is co-incident with outcrops of basalt units in the southern sector and with minor chalcopyrite mineralisation in pelitic rocks.

1B.4 ARSENIC (Plans TAS/2/2164, 2817)

Values of 37 ppm As and above are considered as being anomalous. The central section of the main skarn zone is clearly anomalous with values of up to 370 ppm. This corresponds with observed arsenopyrite mineralisation in diamond drill holes CAF 1 and 5.

The pattern of sporadic one to two point soil anomalies along strike to the south east suggests some repetition of this mineralisation. This is consistent with the anomalous Sn and W patterns and adds further to the evidence supporting the south eastward development of replaced carbonate units.

1B.5 LEAD (Plans TAS/2/1847, 2815)

Although three populations may be defined from the values viz; 0-11, 12-89 and greater than 89 ppm, no anomalies occur. The highest values, maximum 350 ppm, occur in the south east sector of the grid. These responses are broadly co-incident with the postulated repetition or continuity of the replaced carbonate units and could indicate peripheral galena mineralisation. The high lead values are co-incident with high Zn values suggesting some associated sphalerite mineralisation also.

1B.6 ZINC (Plans TAS/2/1848, 2816)

The values may be divided into four populations: 0-14, 15-17, 38-139 and greater than 139 ppm. There is some similarity in the distribution and pattern of values to those for Cu. The 37 ppm contour value outlines the granite margin. The sporadic +140 ppm anomalies may indicate minor sphalerite mineralisation associated with skarn and replaced carbonate units.

1B.7 NICKEL (Plans TAS/2/2165, 2818)

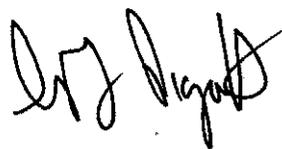
The values may be subdivided from statistical analysis into three population 0-12, 13-46 and greater than 46 ppm. There are no positive anomalous responses. The 12 ppm contour value clearly defines the granite margin, the 47 ppm contour broadly outlines that section of the Crimson Creek Formation which includes a relatively high proportion of basalt units.

1B.8 ANOMALOUS RESPONSES

There is strong evidence from the soil geochemical results for the continuation or repetition of the replaced carbonate unit south of the WNW-ESE fault. This is supported by anomalous ground magnetic responses and the discovery of calc silicate altered sediments in float material.

It seems likely that if the fault downthrows to the south, as appears indicated, then the highly prospective skarn-marble interface could be preserved. Diamond drilling south of DDH CAF 7 is required to test this hypothesis.

The co-incident Sn and Cu anomaly associated with the calc silicate altered carbonate sediments east of the main skarn point to the prospectivity of these units as potential hosts for a replacement tin deposit. Although CAF 6 failed to intersect economic mineralisation further diamond drilling is surely required to test the large EM conductor centered to the north of the drill intersection.



G F PIGOTT

L I S T O F P L A N SSECTIONS 1A and 1B

<u>Plan No</u>	<u>Description</u>	<u>Scale</u>
TAS/2/1586	Comstaff Project Map. Location of Ramsay Area EL 5/63 Part 2	1:250 000 ✓
1799	Ramsay Area. Location of CAF Mount Ramsay Grid	1: 50 000 ✓
3062	Ramsay Area. Geological setting of CAF Mount Ramsay Grid	1: 10 000 ✓
1845	Ramsay Grid CAF Detailed Geology Nth Sht	1: 2 500 ✓
2410	" " " " " Mid Sht	1: 2 500 ✓
2811	" " " " " Sth Extn	1: 2 500 ✓
2101	" " " Geological Interpretation Northern Sheet	1: 2 500 ✓
2812	Ramsay Grid CAF Geological Interpretation Southern Extensions	1: 2 500 ✓
2676	Ramsay Grid CAF DDH CAF 1 Detailed Geol	1: 500 ✓
2693	" " " " " 2 " "	1: 500 ✓
1853	" " " Composite Section Line 5000N	1: 2 500
1852	Ramsay Grid CAF Composite Section Line 4880N	1: 2 500
2251	Ramsay Grid CAF Composite Section Line 4820N	1: 2 500
1851	Ramsay Grid CAF Composite Section Line 4760N	1: 2 500
2253	Ramsay Grid CAF Composite Section Line 4640N	1: 2 500
2472	Ramsay Grid CAF Composite Section Line 4580N	1: 2 500
2471	Ramsay Grid CAF Composite Section Line 4520	1: 2 500
2470	Ramsay Grid CAF Composite Section Line 4460N	1: 2 500
2469	Ramsay Grid CAF Composite Section Line 4400N	1: 2 500
2468	Ramsay Grid CAF Composite Section Line 4340N	1: 2 500
2467	Ramsay Grid CAF Composite Section Line 4280N	1: 2 500
2822	Ramsay Grid CAF Composite Section Line 4220N	1: 2 500
2823	Ramsay Grid CAF Composite Section Line 4160N	1: 2 500
2824	Ramsay Grid CAF Composite Section Line 4100N	1: 2 500

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025

TAS/2/2825	Ramsay Grid CAF Composite Section Line 4040N	1: 2 500
2826	Ramsay Grid CAF Composite Section Line 3980N	1: 2 500
2827	Ramsay Grid CAF Composite Section Line 3920N	1: 2 500
2828	Ramsay Grid CAF Composite Section Line 3860N	1: 2 500
2829	Ramsay Grid CAF Composite Section Line 3800N	1: 2 500
2830	Ramsay Grid CAF Composite Section Line 3740N	1: 2 500
2831	Ramsay Grid CAF Composite Section Line 3680N	1: 2 500
1849	Ramsay Grid CAF Auger Sample Results and Contours Sn Northern Sheet	1: 2 500
2820	Ramsay Grid CAF Auger Sample Results and Contours Sn Southern Extensions	1: 2 500
1850	Ramsay Grid CAF Auger Sample Results and Contours W Northern Sheet	1: 2 500
2821	Ramsay Grid CAF Auger Sample Results and Contours W Southern Extensions	1: 2 500
1846	Ramsay Grid CAF Auger Sample Results and Contours Cu Northern Sheet	1: 2 500
2814	Ramsay Grid CAF Auger Sample Results and Contours Cu Southern Extensions	1: 2 500
2164	Ramsay Grid CAF Auger Sample Results and Contours As Northern Sheet	1: 2 500
2817	Ramsay Grid CAF Auger sample Results and Contours As Southern Extensions	1: 2 500
1847	Ramsay Grid CAF Auger Sample Results and Contours Pb NorthernSheet	1: 2 500
2815	Ramsay Grid CAF Auger Sample Results and Contours Pb Southern Extensions	1: 2 500
1848	Ramsay Grid CAF Auger Sample Results and Contours Zn Northern Sheet	1: 2 500
2816	Ramsay Grid CAF Auger Sample Results and Contours Zn Southern Extensions	1: 2 500
2165	Ramsay Grid CAF Auger Sample Results and Contours Ni Northern Sheet	1: 2 500
2818	Ramsay Grid CAF Auger Sample Results and Contours Southern Extensions	1: 2 500

026

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A P P E N D I X 1

REPORT CMS 82/5/46Rock Samples Z 0682 - Z 0688

Seven rock samples were received for petrological examination; thin-sections were prepared, and are briefly described in the accompanying table.

Summary

All the rocks are severely metasomatised, but nevertheless have retained sufficient primary features to be at least broadly recognisable.

Four of the rocks originated as sediments; three of these (Z 0683, 85, 88) were greywackes or impure tuffs (xenotuffs) and can be correlated with the tuffaceous units of the Crimson Creek formation. The other rock (Z 0686) is believed to have originated as a chemical sediment, perhaps a carbonate rock.

The other three rocks are of igneous origin and were clearly minor intrusives; however, they appear to have been of different composition, though quite possibly genetically related. Since they are all severely metasomatised, they must be pre-Devonian.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Central Mineralogical Services Comments
20682 (T.S. 42390) 4004 410E	Altered ?Lamprophyre. Altered, semi-opaque biotite, other minerals replaced by amphibole, phlogopite, quartz. Conspicuous apatite; fine ilmenite.	Relict medium-grained random igneous fabric.	Fine chlorite, ultra-fine relict ?feldspars. Manganepidote. Pyrite.	Thought to have been a minor intrusive of intermediate lamprophyric composition, contact-metamorphosed/metasomatized.
20683 4040N 440E	Metasomatized ?Greywacke. Relict subangular grains of quartz, feldspars; very extensive replacement by microgranular ferrohastingsite throughout.	Fine relict bedding preserved, and clastic textures recognisable.	Granular magnetite conspicuous. Microgranular sphene.	Believed to have been Crimson Creek tuffaceous greywacke, with ?detrital magnetite. Thoroughly metasomatized.
20684 3860N 475E	Metasomatized ?Microdiorite. Scattered, partly replaced andesine phenocrysts in a mass of fine andesine, bundles of fibrous actinolite and phlogopite.	Medium-grained porphyritic igneous fabric. Replacement textures.	Many random thin plates of ilmenite. Goethite after fine ?sulphides.	Strongly feldspathic composition originally; may have been a lamprophyre. Minor intrusive.
20685 3450N 4370E	Metasomatized ?Greywacke. Quartz, feldspar, grains; suspected igneous (?andesitic) fragments. Pervasive fine tremolite needles, phlogopite flakes.	Relict clastic textures and faint bedding recognisable. Medium-grained.	Small pyrrhotite and pyrite patches. Fine ?ilmenite throughout.	Although sedimentary features clearly preserved, nature of lithic grains uncertain because of extensive metasomatism.
20686 WTL 3735N	Cumingtonite Rock. Small random matted needles of cumingtonite, interstitial quartz. Sericite bands, lenses, with fine graphite flakes.	Relict bedding(?) in sericite bands, otherwise random, structureless.	Poikiloblastic pyrite patches. Chlorite veinlets, with ?gypsum.	Nature of original rock not known, but possibly a bedded carbonate with carbonaceous clay bands.
20687 WTL 3950N	Metasomatized ?Dolerite. Random laths of recrystallized, untwinned plagioclase, very abundant replacive matted-fibrous actinolite.	Relict medium-grained igneous fabric. Extensive replacement.	Scattered oxide opaques with typical igneous distribution. Massive actinolite veins.	Little doubt of igneous origin (minor intrusive), but composition could have ranged from intermediate to basic.
20688 (T.S. 42396) 4209/3735N	Metasomatized ?Greywacke. Subangular detrital quartz and feldspar fragments, altered lithic grains; abundant fine matted actinolite.	Relict clastic textures and bedding preserved. Medium-grained.	Very fine oxide opaques, pyrite, pyrrhotite, chalcopyrite, phlogopite-chlorite.	Similar lithology to Z 0683/85, and most probably metasomatized Crimson Creek formation.

Sample No.	Classification - Composition	Fabric	Accessories	Central Mineralogical Services Comments
T 8863 (T.S. 36282) 4520E/4460E	Skarn. Vesuvianite with varying proportions of fine-grained included and intergranular diopside-hedenbergite, actinolite, minor cloudy sphene.	Coarse, granular, semi-orientated vesuvianite. Faint contorted/segmented relict banding.	Minor traces of chloritised biotite or phlogopite.	Brecciated, skarnised sediment, but of uncertain affinities (labile cl. alternately, less likely carbonate facies). Patchy vein vesuvianite.
T 8866 4520E/4420N	Skarn. Fine granular to coarse poikilitic vesuvianite with closely intergrown diopside, minor actinolite. Sporadic diopside veins with talc (after carbonate).	Distinct relict, weakly bedded, fine sandy clastic fabric.	Traces prehnite, tremolite, ultrafine cloudy semi-opaque sphene. Rare poikilitic arsenopyrite	Clearly a skarnised labile (?tuffaceous) "wacke" and tends to confirm 8863 as such.
T 8868 4520E/4350N	"Skarn". Coarse granular to radiating vesuvianite with subordinate included and intergranular dark hastingsitic actinolite, minor diopside	Essentially massive with no tangible relict features.	Traces wollastonite, grossular-andradite. Minor Fe-staining (after amphibole).	Probably represents a vein. Assembly essentially isograde with the above contact-metamorphosed/metasomatized sediments.
T 8873 4460N/4520E	Metasomatized Psammite. Fine-grained grunerite, closely intergrown albite-oligoclase, semi-pervasive ultrafine diopside-hedenbergite, graphite, minor pyritised pyrrhotite.	Contorted to brecciated, relict fine-grained psammitic to pelitic banding.	Traces phlogopite, partly chloritised. Ultrafine cloudy sphene.	contact-metamorphic assemblage is slightly lower-grade in comparison with 8863, 66, 68. Brecciation pred. alteration (sim. 8863).
T 8882 4280N/4520-15C	Metasomatized Psammite. Fine Acicular tremolite, closely intergrown phlogopite with recrystallized relict clastic feldspar, intermediate lava clasts, quartz, chert fragments.	Weakly bedded, silty fine to medium sandy clastic fabric. Minor tremolite-quartz veinlets.	Conspicuous opaques (relict clastic). Disseminated fine-grained pyrrhotite.	Hornfelsic recrystallization/magnesian metasomatism at essentially albite-epidote-hornfels facies. Affinities with Crimson Ck. Fm. tuffaceous wacke

REPORT CMS 81/8/31

Twelve drill core specimens (Z 0601 - Z 0612) were received for thin-section preparation and petrological examination; after a preliminary check of each thin-section, the rocks were discussed with G. Pigott and it was agreed that brief descriptions, without photographs, could be sufficient, especially as field identifications were excellent and the rocks, on the whole, were of simple composition. Pending assessment of this report, the samples and sections are to be held at CMS for possible further examination; also, assay results will help to decide how much more detail is required; if they are disappointing, further expenditure may not be justified.

Summary

Z 0601 is a thoroughly metasomatised rock, and hence its lithology is obscured and facings difficult to recognise; the rock is believed to be a tuff or greywacke with chert bands or layers, possibly correlatable with the Crimson Creek formation.

Z 0602 - Z 0608 are skarns, composed of varying combinations of vesuvianite, diopside, garnet, with ferrohastingsite, pyrrhotite and traces of chalcopyrite. Vesuvianite is the dominant mineral, and diopside is a constant component; ferrohastingsite is younger, a replacive phase which is associated with the sulphides. The skarns were checked for scheelite, but none was detected. Accessory minerals include sphene, carbonate and fluorite.

Both vesuvianite and garnet are amber-brown in hand specimen and would be difficult to distinguish; diopside is light green, and ferrohastingsite is dark green to almost black.

The only sulphides detected were pyrrhotite and chalcopyrite, but no polished sections were prepared at this stage; any other sulphides would be present as minor traces only.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Central Mineralogical Services Comments
Z 0601 (T.S. 38352) 204 CAF1 87.9	Metasomatized Sediments. Chert, tuff or tuffaceous greywacke, thoroughly impregnated with phlogopite, actinolite, ultrafine diopside, and extensively replaced.	Bedded; conformable and unconformable contacts. Top of core is top of sequence.	Veins of quartz-siderite-pyrrhotite/pyrite. Fine pyrrhotite throughout.	Believed to be Crimson Creek formation, with chert bands. Varying response to metasomatism, depending on lithology.
Z 0602 110.85	Garnet Skarn. Massive featureless grossularite-andradite, with embedded small diopside grains and a few larger vesuvianite crystals.	Weak alignment of diopside grains. Fractures, filled with diopside. Featureless.	A few pyrrhotite patches. Small networks of ferrohastingsite veinlets.	Garnet is pinkish-beige colour and comprises bulk of rock. Vesuvianite diopside are contemporaneous with garnet, ferrohastingsite is younger.
Z 0603 123.70	Vesuvianite Skarn. Dominantly composed of coarse vesuvianite crystals, with interstitial diopside; some crystals full of small diopside grains.	Very coarsely-crystalline, random fabric. Single crystals up to 10-15 mm.	Traces of carbonate, and isolated ferrohastingsite grains.	Vesuvianite is an unusual amber-brown colour (normally green or grey); green mineral is diopside.
Z 0604 132.25	Vesuvianite-Diopside Skarn. About 2/3 vesuvianite, generally as coarse crystals with diopside inclusions; granular diopside masses fill interstices.	Medium- to coarsely-crystalline, random fabric, interlocking textures.	Scattered pyrrhotite, traces of chalcopyrite. Fine ferrohastingsite, carbonate, biotite.	Variation on Z 0603, with more diopside, hence mottled green/amber appearance in hand specimen.
Z 0605 156.80	Garnet-Vesuvianite-Diopside Skarn. Large vesuvianite crystals full of diopside; garnet lenses; granular diopside aggregates, all haphazardly intergrown.	Coarsely/finely-crystalline, random fabric, typical of skarns.	Interstitial carbonate and ferrohastingsite. Minor pyrrhotite, trace chalcopyrite.	Variation on the other skarns. Mottled green and brown in hand specimen; garnet, vesuvianite very similar.
Z 0606 185.50	Vesuvianite-Pyrrhotite-Hastingsite Skarn. Stubby, prismatic vesuvianite, extensively veined/replaced by ferrohastingsite; abundant fresh pyrrhotite throughout.	Medium-grained; extensive microfracturing and replacement.	Sheaves of sphene crystals. Carbonate networks. Traces of chalcopyrite, fluorite.	Additional minerals include garnet, quartz, diopside. Ferrohastingsite and sulphides are younger, replacing.
Z 0607 226.45	Diopside-Hastingsite-Sulphide Skarn. Bands of granular diopside, and wide zones of intergrown hastingsite-actinolite-coarse pyrrhotite masses.	Crude compositional banding probably due to selective replacement.	Acicular sphene in sheaves. Chalcopyrite as rims on pyrrhotite.	Pyrrhotite evidently formed later than the ferrohastingsite, judging from textural relationships.
Z 0608 242.40	Vesuvianite-Hastingsite Skarn. Coarse, prismatic vesuvianite crystals, microfractured and with extensive ferrohastingsite networks in places.	Coarsely-crystalline, random, typical skarn fabric.	Fine diopside in vesuvianite; acicular sphene. Traces of pyrrhotite, phlogopite.	Good evidence of replacive nature of the younger ferrohastingsite, as an Fe/Na metasomatic phase.
Z 0609 277.25	Ferrohastingsite Rock. Dominantly composed of small bunches of fine hastingsite needles, with cloudy sphene throughout; hastingsite ranges into actinolite.	Fine matted textures, uniform and structureless. No relict features.	Broad veins of fluorite with pyrrhotite and chalcopyrite.	This may represent complete replacement of, say, a diopside skarn, but there is no definite evidence of this.

				Central Mineralogical Services
Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Comments
Z 0610 290.85	Spotted Biotite Hornfels. Mostly small random orange-brown biotite flakes, microgranular quartz; needles, grains of anthophyllite, "spots" of anthophyllite-diopside.	Typical fine-grained hornfels with faint relict bedding.	Ultrafine ilmenite flakes; scattered pyrrhotite grains.	Diopside/anthophyllite porphyroblasts are random, and represent a second prograde phase of metamorphism.
Z 0611 296.40	Granite. About 40 % perthitic orthoclase, 40 % shapeless quartz; 5-10 % albite; remainder = introduced tourmaline, carbonate, and veins.	Coarse-grained, with feldspar phenocrysts up to 15 mm.	Tourmaline-fluorite-pyrrhotite veins, with trace chalcopyrite. Altered biotite; xenotime.	Normal plutonic rock. Xenotime is characteristic accessory of W. co granites. Veins are replacive.
Z 0612 (T.S. 38363) 307.20	Porphyritic-Biotite-Microgranite. Phenocrysts of perthitic orthoclase, quartz, sodic oligoclase, biotite, in medium-grained mass of the same minerals.	Medium-grained porphyritic, intrusive fabric.	Abundant xenotime, in biotite, with strong pleochroic haloes.	Probably a local variation in fabric though composition differs from Z 0610. Fresh rock; verging on adamellite.

Patchy late chlorite has developed by replacement of phlogopite marginal to late quartz veinlets with accessory pyrite and chlorite.

T 8261

(T.S. 32706)

This rock can be categorised as a uralitised microgabbro.

Relict features comprise abundant intergranular to ophitic and lath-like pyroxene, enclosing random/slightly felted plagioclase laths (30-150 μ , mean 60-70 μ) and stained with evenly disseminated opaques. The fabric is distinctly doleritic and medium-grained, consistent with a minor intrusive (e.g. a dyke or sill) or a mildly chilled submarginal phase.

Sparse relics of near-colourless, pigeonitic augite persist, but the bulk is altered pseudomorphously to uralitic, mid-green actinolite. Feldspar laths are pseudomorphed by cloudy saussurite- and actinolite-stained albite. Opaques are incipiently leucoxenised. Minor traces of fine to ultrafine sulphide (mainly pyrrhotite, rare pyrite, ?chalcopyrite) are more or less evenly disseminated throughout.

T 8262

(T.S. 32707)

This is a fine-grained, rather featureless actinolite rock with conspicuous fine-grained (mean 50 μ) magnetite. Accessories comprise thinly disseminated grains of apatite, minor traces of chlorite and sparse, very fine, cloudy sphene.

Actinolite is an- to subhedral and semi-ragged with an incipient preferred orientation. Magnetite is evenly disseminated to weakly clustered and locally concentrated into crude films mantling actinolite aggregates (to 1 mm) of vaguely uralitic character. Chlorite is a pale green magnesian variety developing partly as a late replacement of actinolite. Elsewhere, chlorite forms equant clots (to 500 μ) with included actinolite laths, conceivably representing amygdales. Sphene forms as a progressive replacement of fine flaky ?ilmenite.

This rock is best interpreted as metasomatic and representing a thoroughly altered, medium-grained, basic or ultramafic igneous phase. There is no evidence to support a vein or metasomatised sediment interpretation. Magnetite is relict primary.

034

T 8263

(T.S. 32708)

This uralitised microgabbro is essentially similar to T 8261. Similarly, T 8262 evidently represents a more thoroughly altered variant.

Main constituents are saussurite-stained/albitised, random/slightly felted plagioclase laths (mean 60-70 μ) and fine-grained actinolite. Amphibole is partly pseudomorphous after lath-like to subophitic pyroxene, but also pervades the mesostasis. Accessory chlorite is sparsely disseminated in aggregates to 1 mm with included actinolite laths. These features are closely analogous to those in T 8262 and are interpreted as amygdales. There are sparse, discontinuous chlorite veins with accessory actinolite.

Conspicuous fine-grained, evenly disseminated opaques comprise magnetite with accessory platy ilmenite and confirm the similarity with T 8262.

The rock is partly weathered, with patchy, partial degradation and Fe-staining of actinolite and kaolinisation of albite.

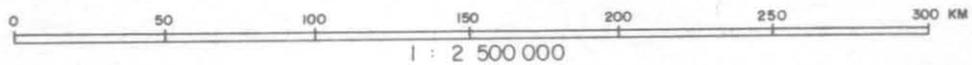
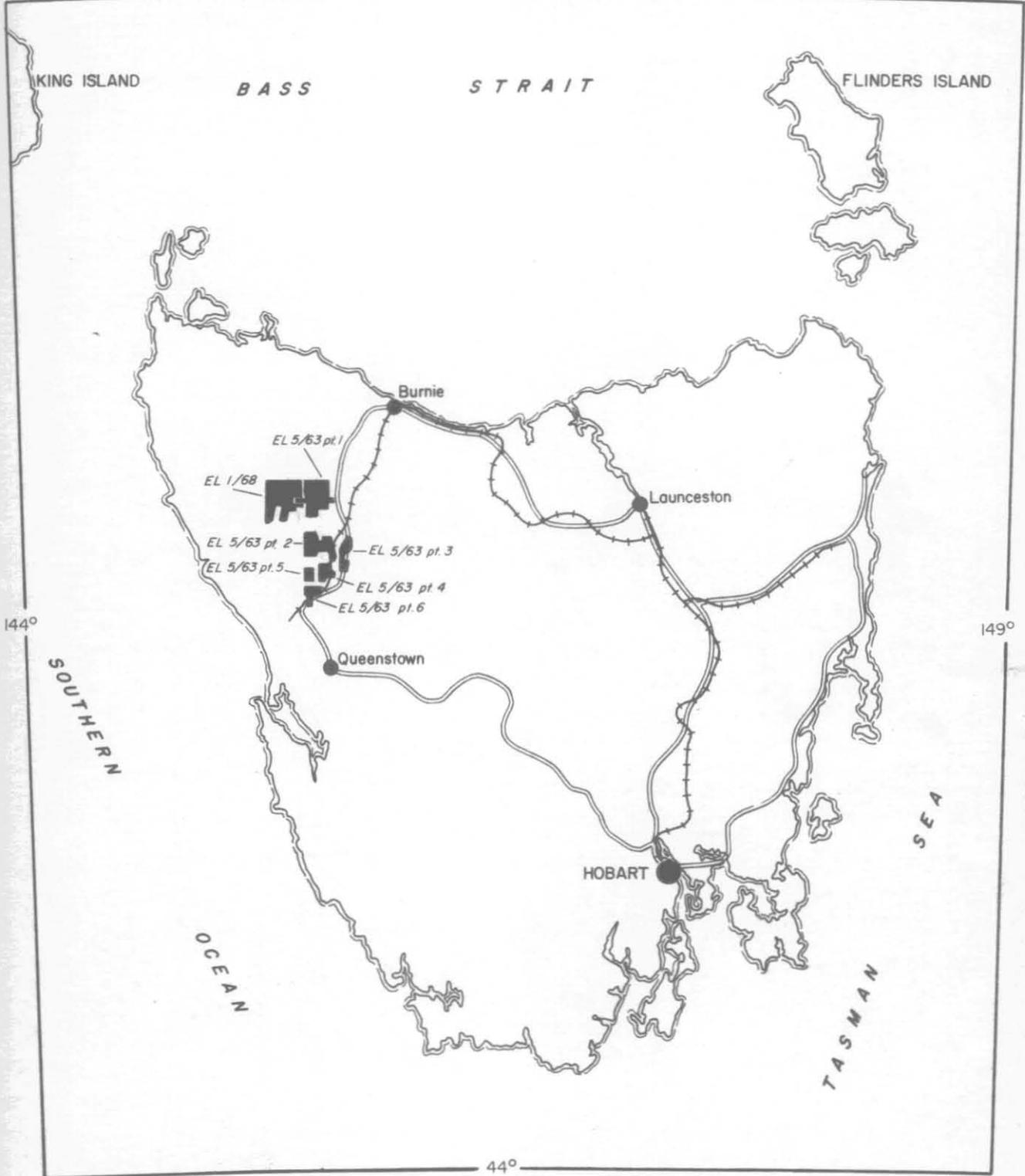
In the absence of field relationships, it is not clear whether these rocks are representative of the Jurassic dolerites or sparsely developed Cambrian basics. Problematically, the two types are very poorly resolved petrologically and field relationships are critical to interpretation.

T 8264

(T.S. 32709)

This is an extensively weathered metasomatic rock with some similarities to T 8262, although the two do not appear closely related in terms of primary rock type.

This rock can be classified as a tremolite-phlogopite-magnetite rock on the basis of relict mineralogy and microtextures. It consisted locally of more or less massive, fine- to medium-grained, random, semi-ragged tremolite-actinolite, elsewhere of similarly-textured amphibole and fine, random flakes and rosettes of mica in varying proportions. Fine (mean 75 μ) magnetite, partly degraded to martite and limonite, is abundant throughout, comprising around 20-40 % of the rock. Accessories include disseminated patches (to 2 mm, typically around 500 μ) of limonite representing degraded pyrrhotite, sparse granular to subhedral quartz of hydrothermal character, patchy, partly degraded talc (after tremolite) and chlorite (after phlogopite), and rare grains of zircon.



- Major roads
- Major railways
- Major towns
- Comstaff lease areas



83-1985

COMSTAFF PROPRIETARY LIMITED

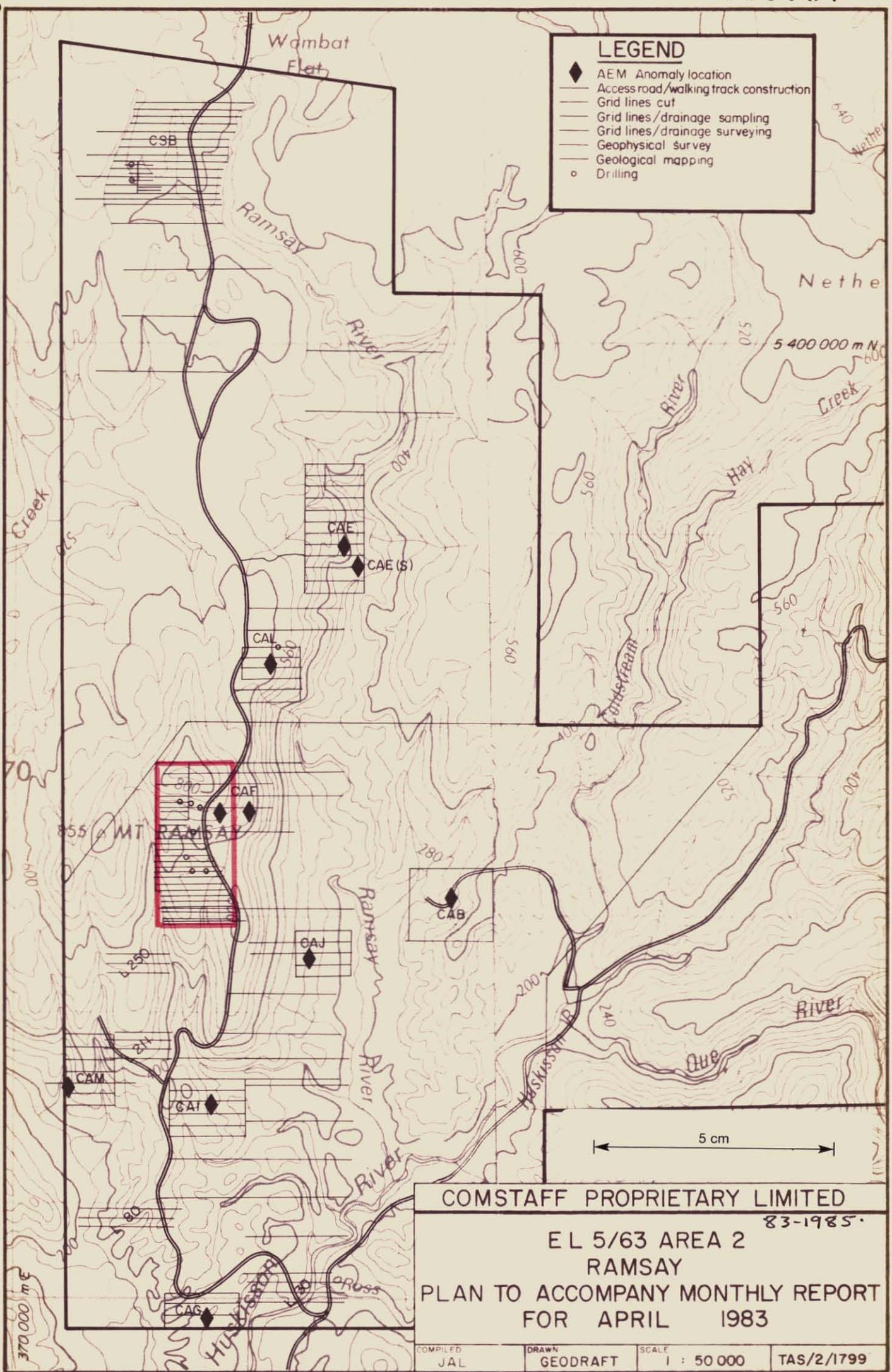
LOCATION OF COMSTAFF LEASES
IN TASMANIA

DRAWN GEODRAFT 7/78	COMPILED	SCALE 1 : 2 500 000	TAS/2/1586
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038

LEGEND

- ◆ AEM Anomaly location
- Access road/walking track construction
- Grid lines cut
- Grid lines/drainage sampling
- Grid lines/drainage surveying
- Geophysical survey
- Geological mapping
- Drilling



COMSTAFF PROPRIETARY LIMITED
 83-1985
 EL 5/63 AREA 2
 RAMSAY
 PLAN TO ACCOMPANY MONTHLY REPORT
 FOR APRIL 1983

COMPILED JAL	DRAWN GEODRAFT	SCALE 1 : 50 000	TAS/2/1799
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COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1775

DETAILED GEOLOGICAL PLAN

DRAWN G.F.P. 5/79 COMPILED G.F.P. SCALE 1:2500 TAS/2/1845

5 395 000 m N

375 000 m E

5 395 000 mN

566040



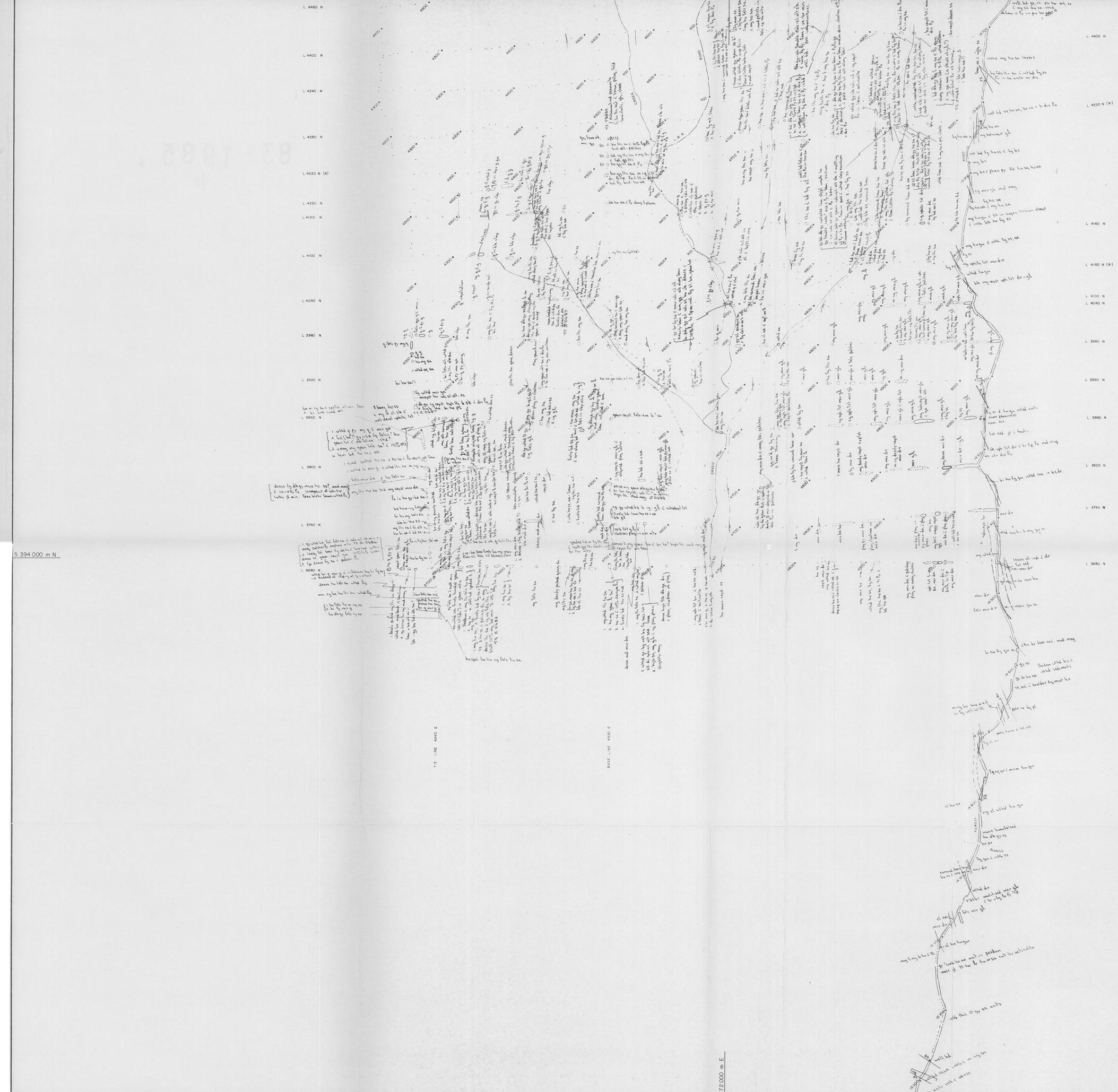
TAS/2/1845
TAS/2/2410

SHEET INDEX

COMSTAFF PROPRIETARY LIMITED			
RAMSAY GRID - CAF 1776			
DETAILED GEOLOGICAL PLAN			
DRAWN G.F.P.	COMPILED G.F.P. 2/81	SCALE 1:2500	TAS/2/2410

5 cm

372 000 m E



5 394 000 m E

5 372 000 m E

TAS/2/1945	TAS/2/2153
TAS/2/2810	
TAS/2/2811	

SHEET INDEX



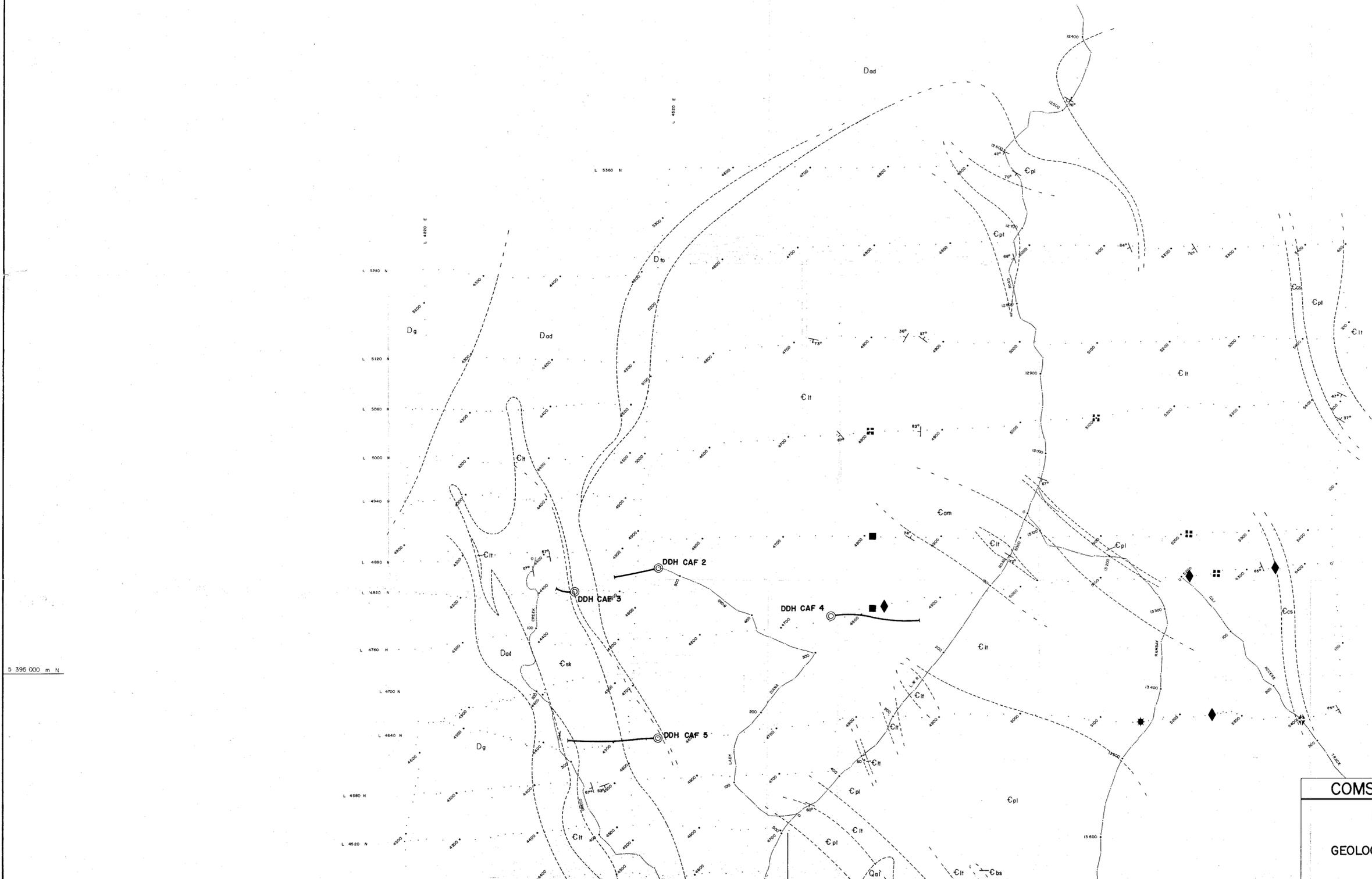
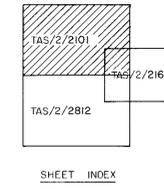
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF, SOUTHERN EXTENSIONS

DETAILED GEOLOGICAL PLAN 1777

COMPILED	DATE
DRAWN	DATE
AMENDED	
SCALE	1 : 2500
PLAN NO.	TAS/2/2811

372 000 m E



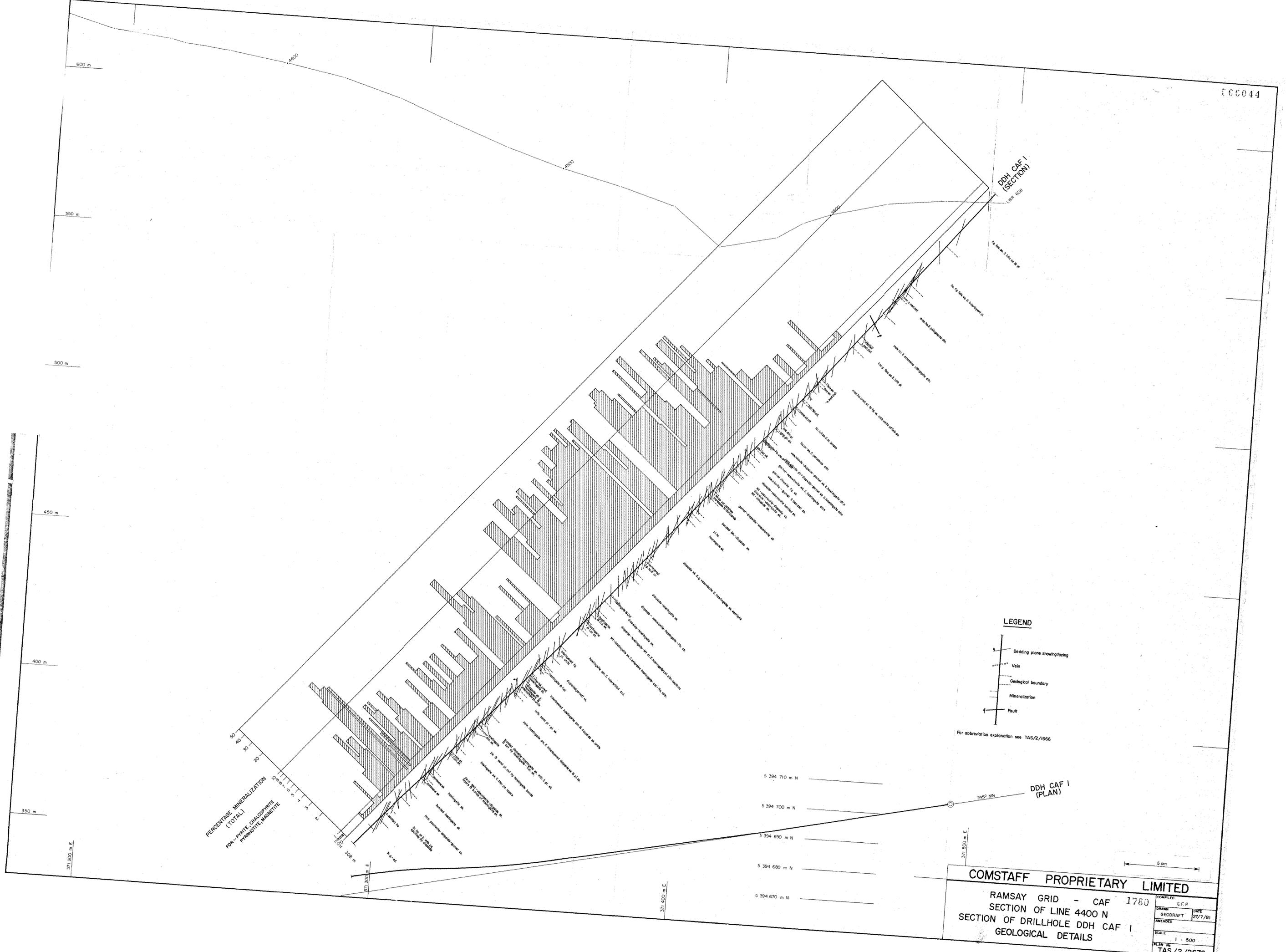
5 395 000 m N

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1778

GEOLOGICAL INTERPRETATION PLAN

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DRAWN	DATE
GEO-DRAFT	6/8/82
AMENDED	8 / 7 / 82
SCALE	1 : 2500
PLAN No.	TAS/2/2101



DDH CAF 1 (SECTION)

LEGEND

- Bedding plane showing facing
- - - Vein
- - - Geological boundary
- - - Mineralization
- ⊥ Fault

For abbreviation explanation see TAS/2/1566

DDH CAF 1 (PLAN)

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1780

SECTION OF LINE 4400 N

SECTION OF DRILLHOLE DDH CAF 1

GEOLOGICAL DETAILS

COMPILED	G.F.P.
DRAWN	DATE
GEODRAFT	27/7/81
AMENDED	
SCALE	1:500
PLAN No.	TAS/2/2676

PERCENTAGE MINERALIZATION (TOTAL)

FOR: PYRITE, CHALCOPYRITE, PHOSPHATE, MAGNETITE

50
40
30
20
10
0

0 1 2 3 4

5 cm

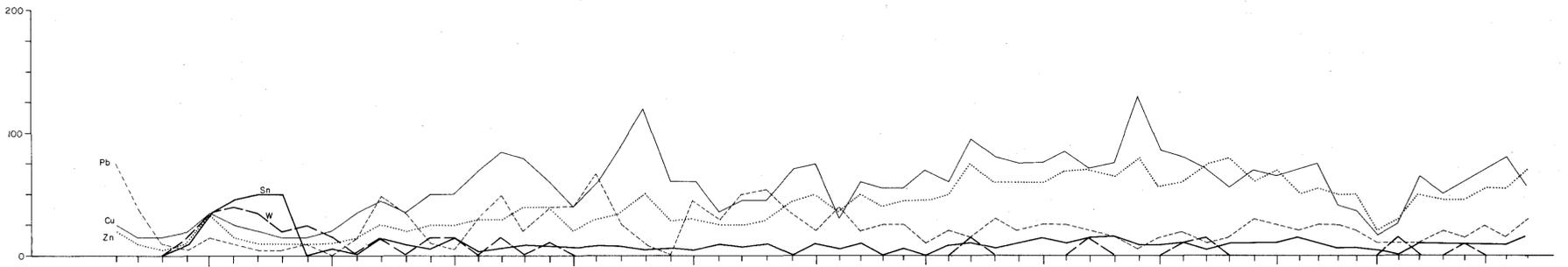


COMSTAFF PROPRIETARY LIMITED

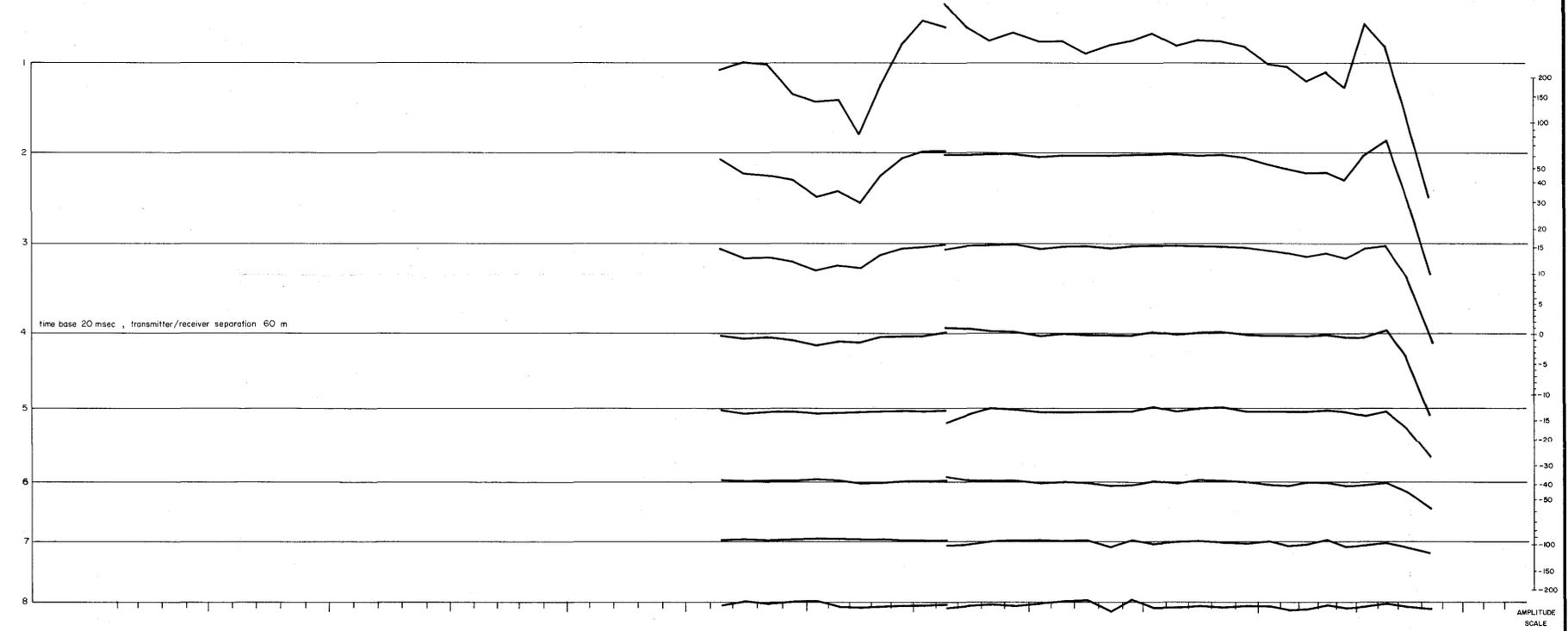
RAMSAY GRID - CAF
SECTION OF DRILLHOLE DDH CAF 2
GEOLOGICAL DETAILS 1781

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DRAWN	DATE
GEO DRAFT	
AMENDED	
SCALE	1 : 500
PLAN No.	TAS / 2 / 2693

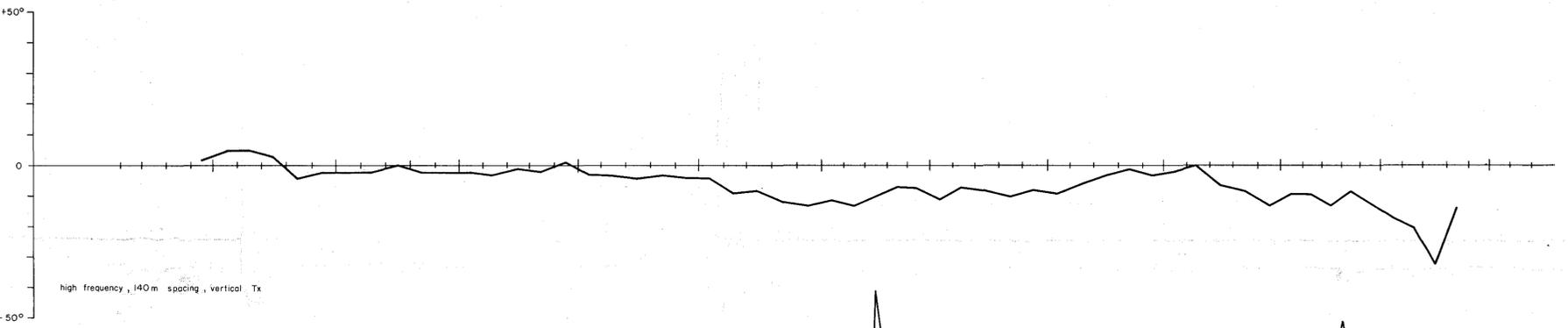
GEOCHEMISTRY ppm



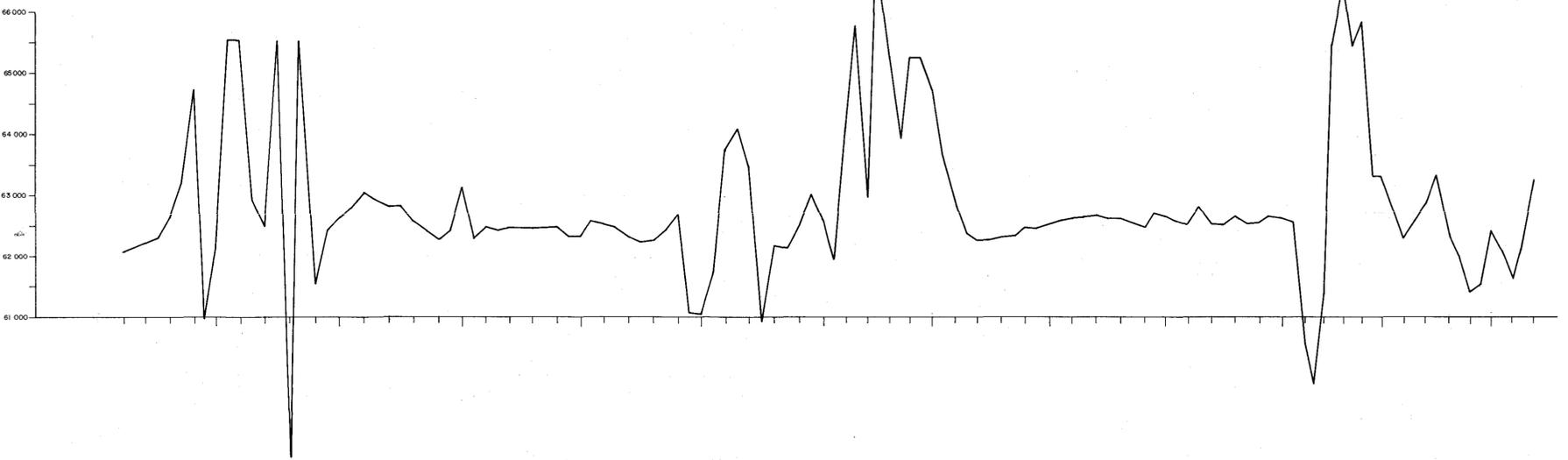
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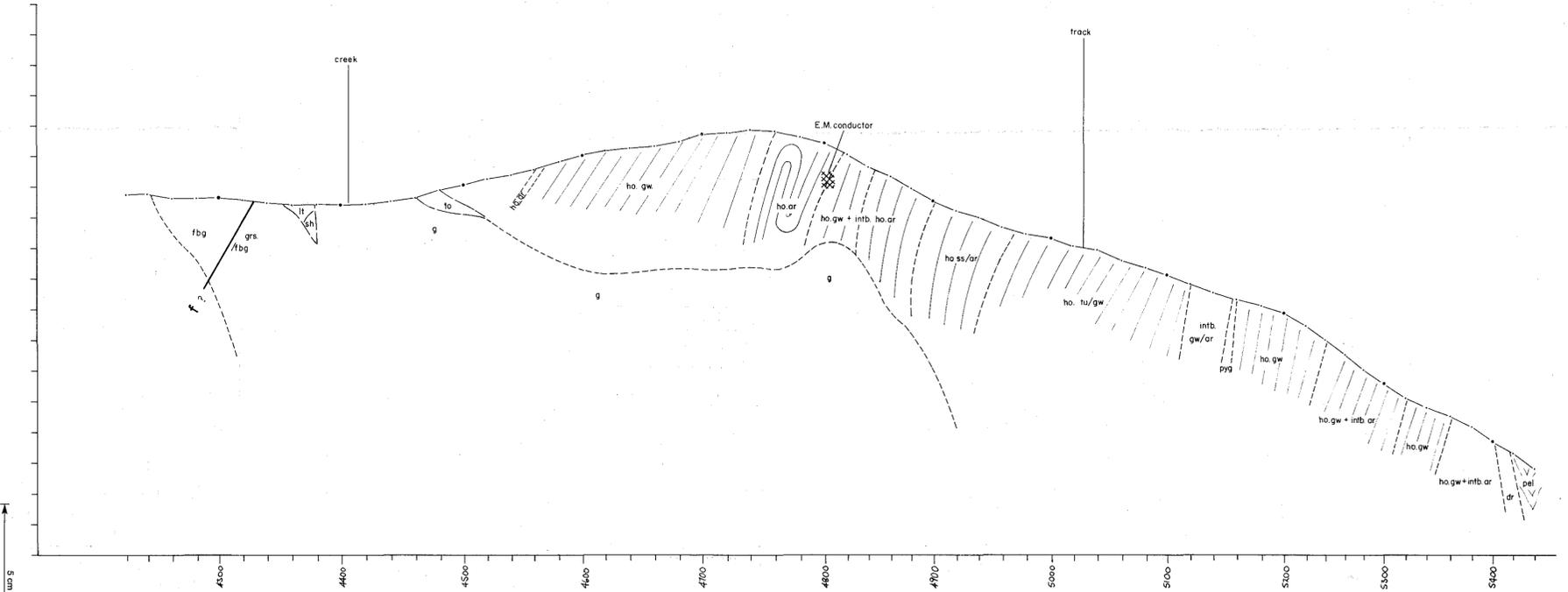
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MAGNETICS nT



TOPOGRAPHY



566046

COMSTAFF PROPRIETARY LIMITED

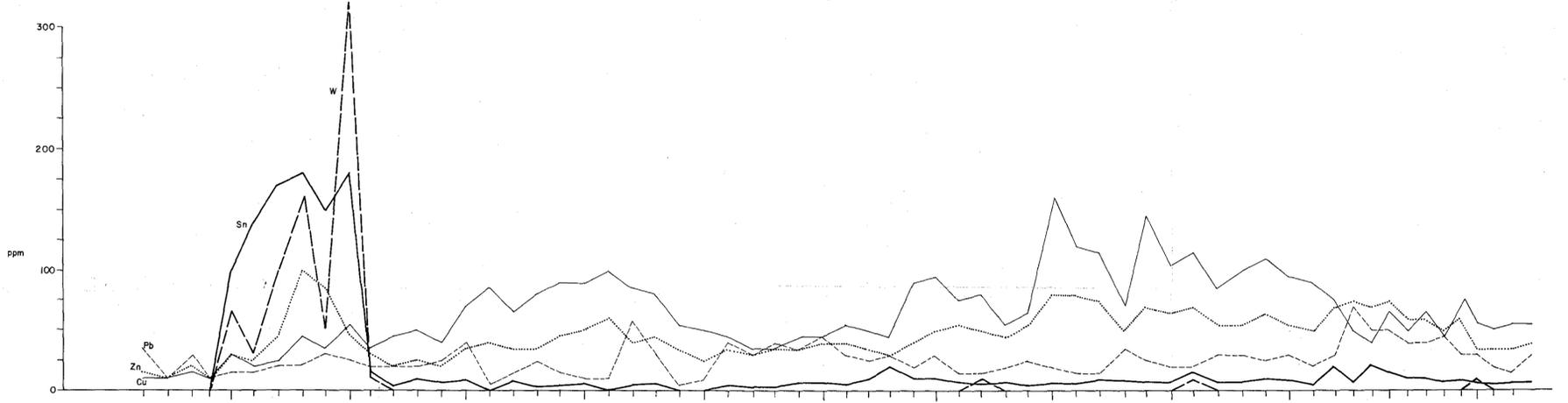
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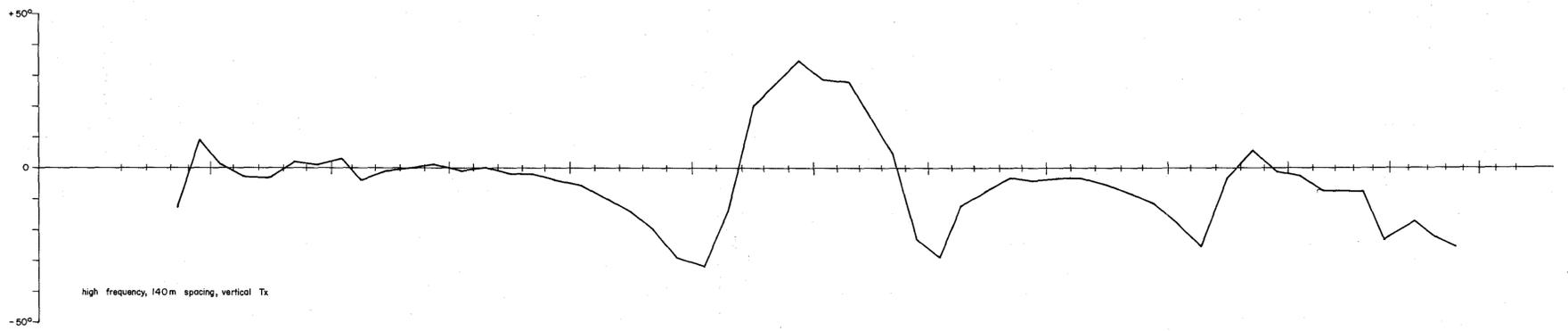
TOPO, MAG, CRONE, GEOCHEM

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DRAWN	DATE
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AMENDED	5/83
SCALE	1:2000
PART NO.	TAS/2/1853

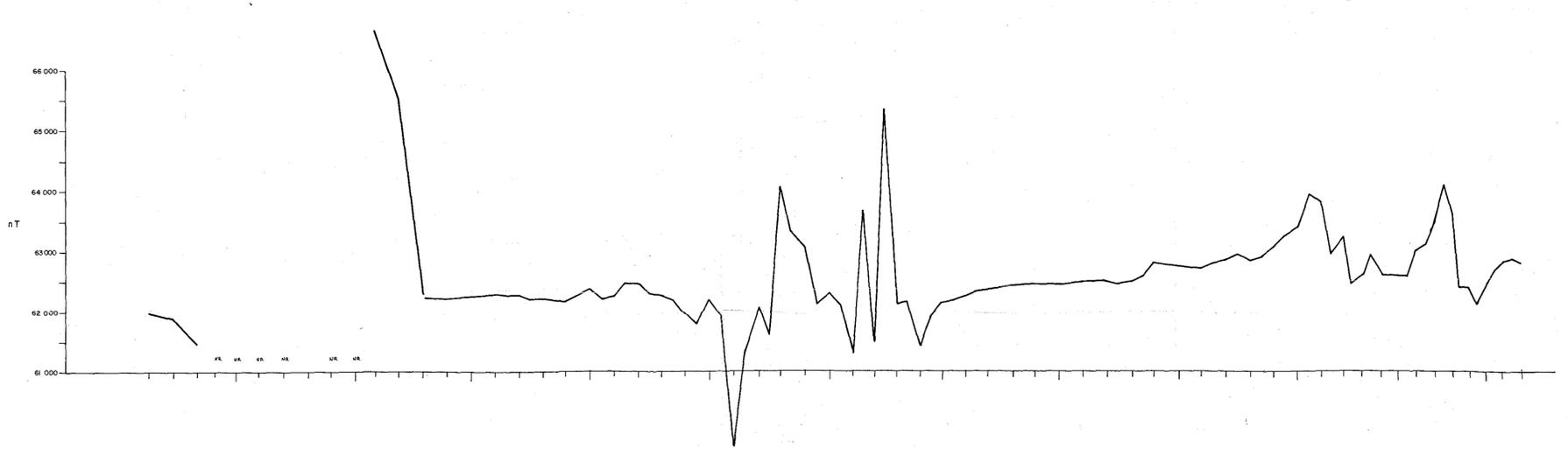
GEOCHEMISTRY



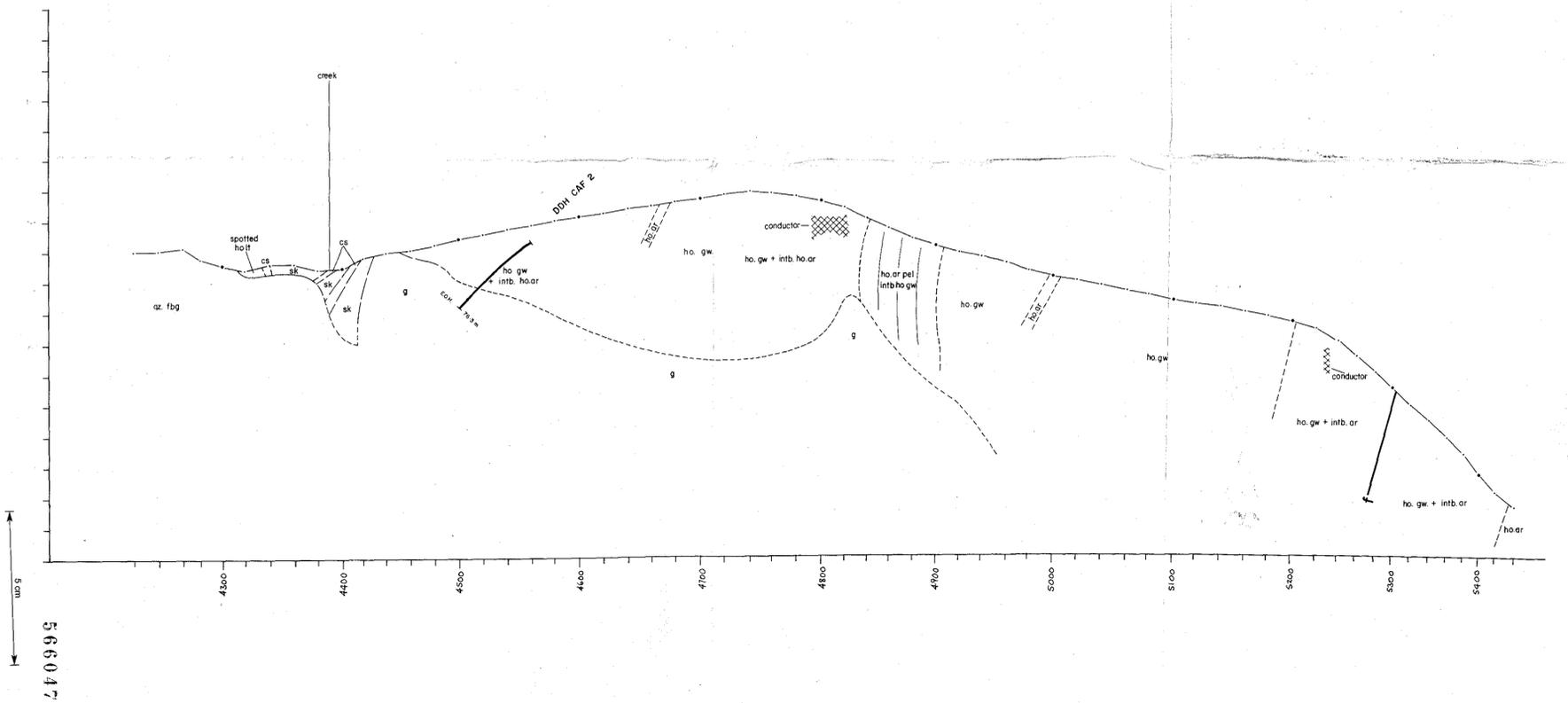
CRONE E.M.



MAGNETICS



TOPOGRAPHY



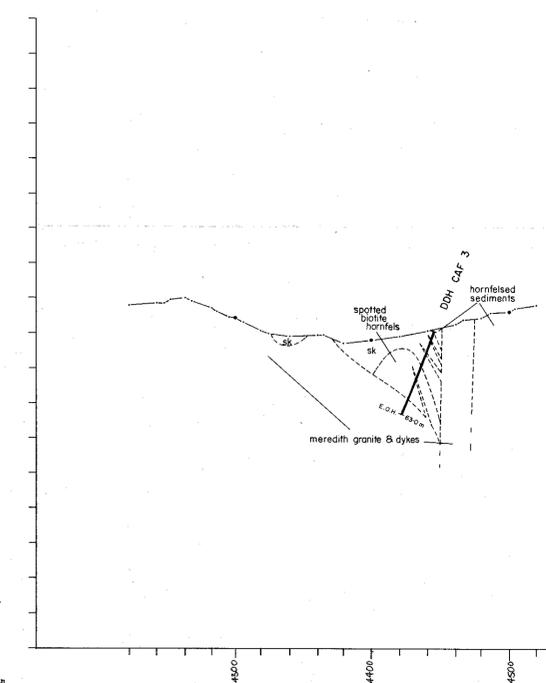
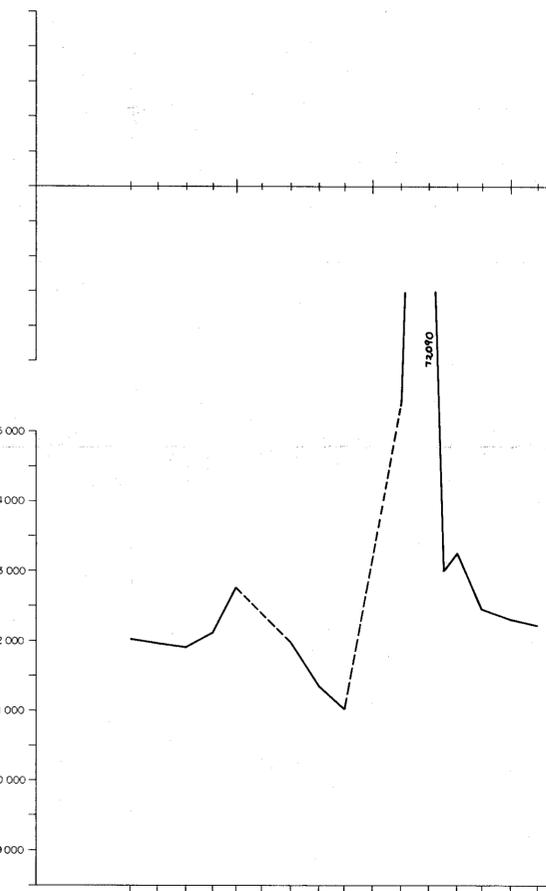
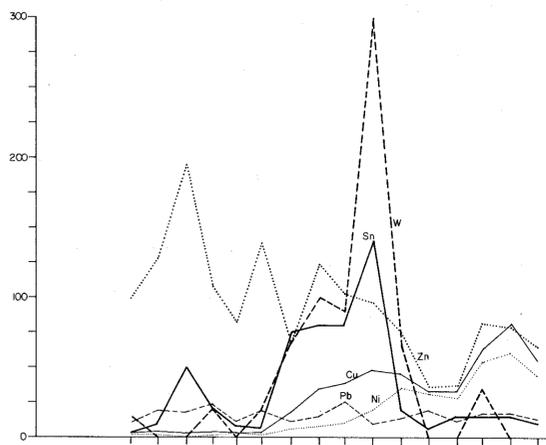
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1783

L 4880 N PROFILES

TOPO, MAG, CRONE, GEOCHEM

COMPILED G.F.P.	DATE
DRAWN G.F.P.	5/79
AMENDED 5/83	
SCALE 1:2500	
PLAN NO. TAS/2/1852	



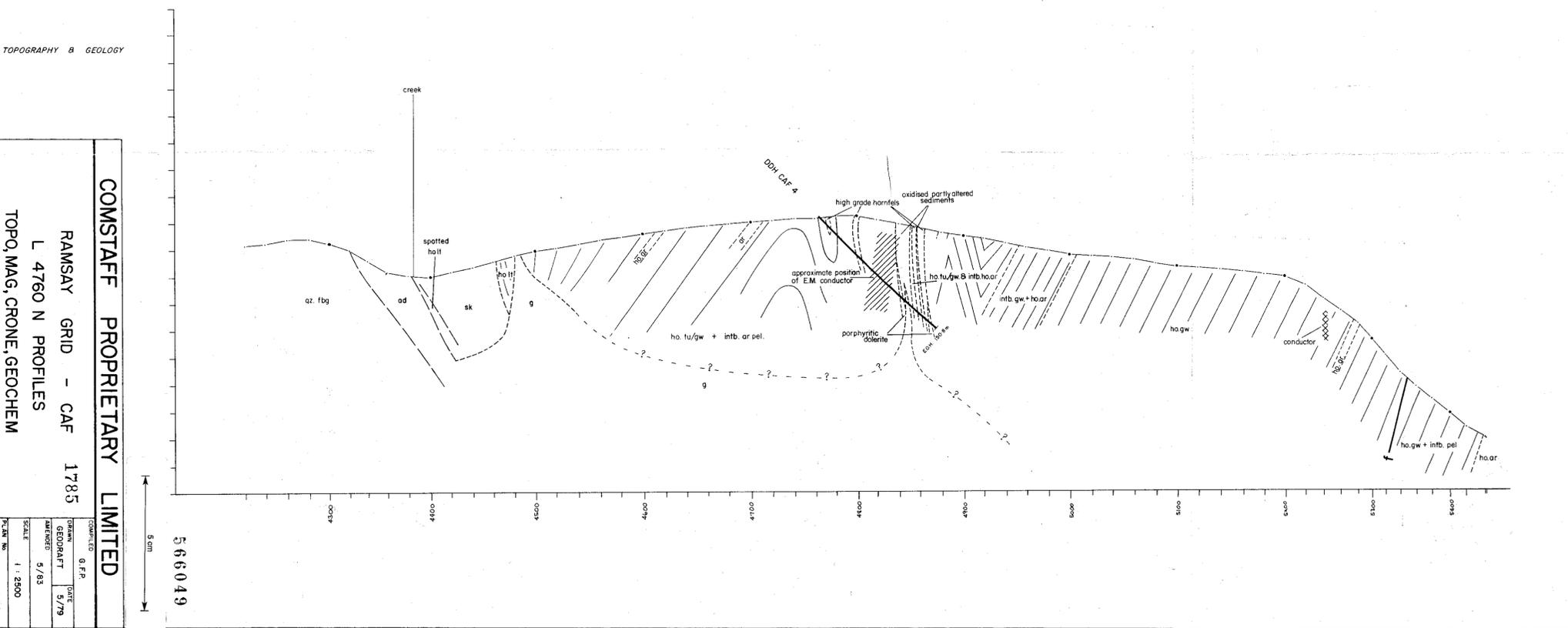
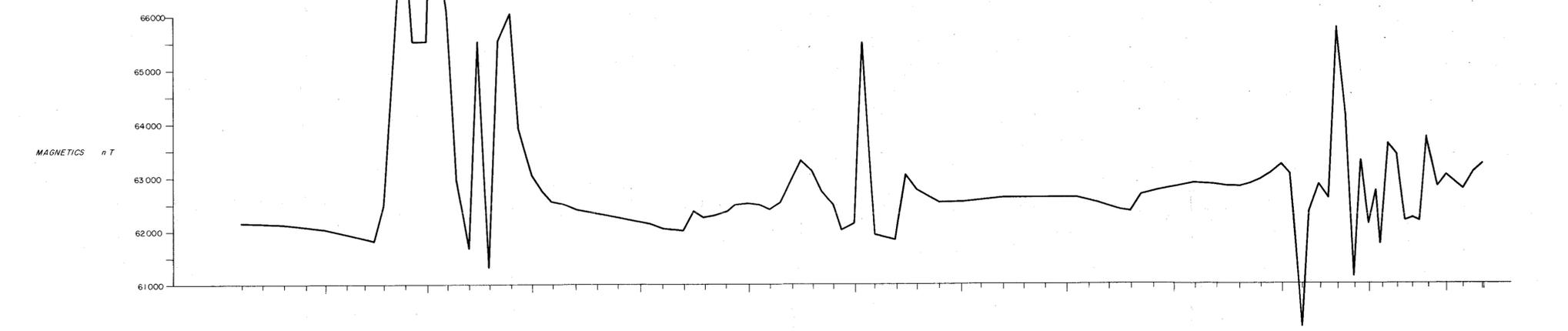
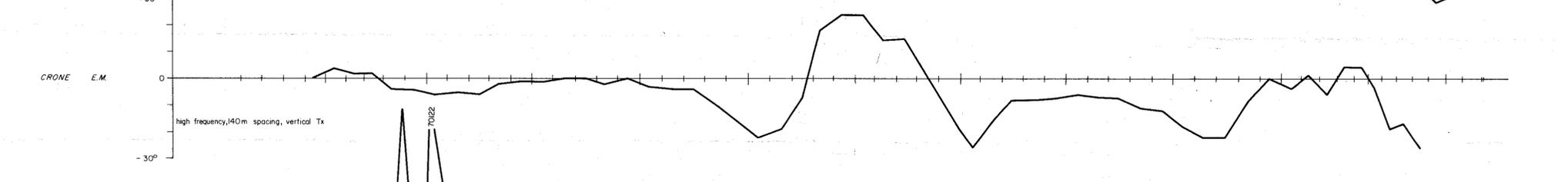
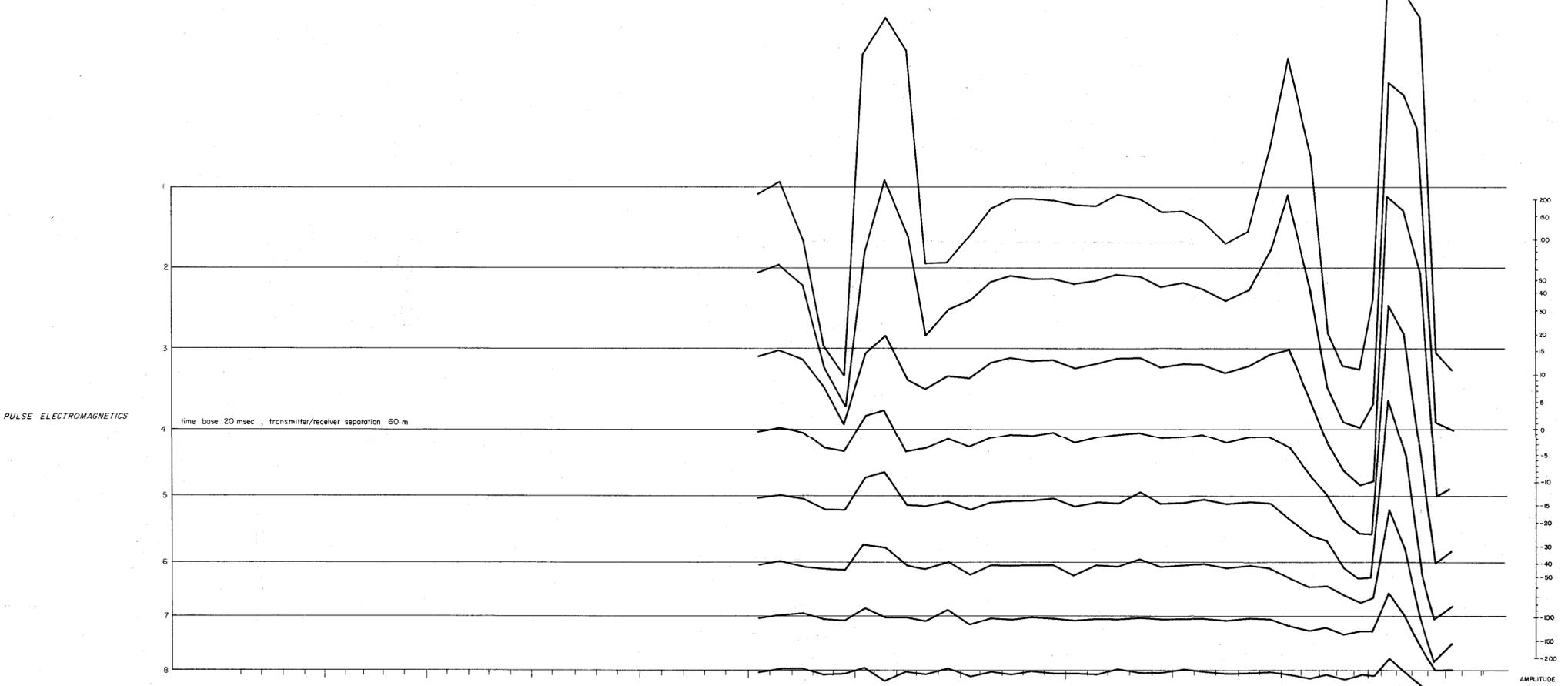
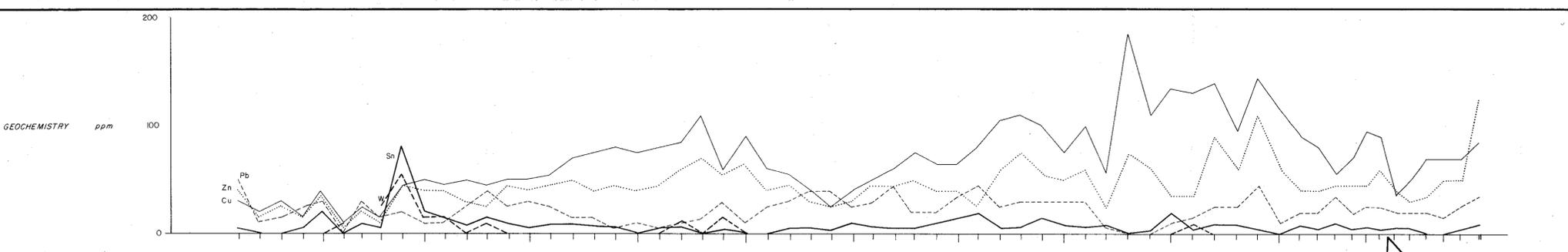
FOR LEGEND SEE TAS/2/2030

5 cm

566048

COMSTAFF PROPRIETARY LIMITED
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 L 4820 N PROFILES
 TOPO, MAG, CRONE, GEOCHEM, GEOLOGY

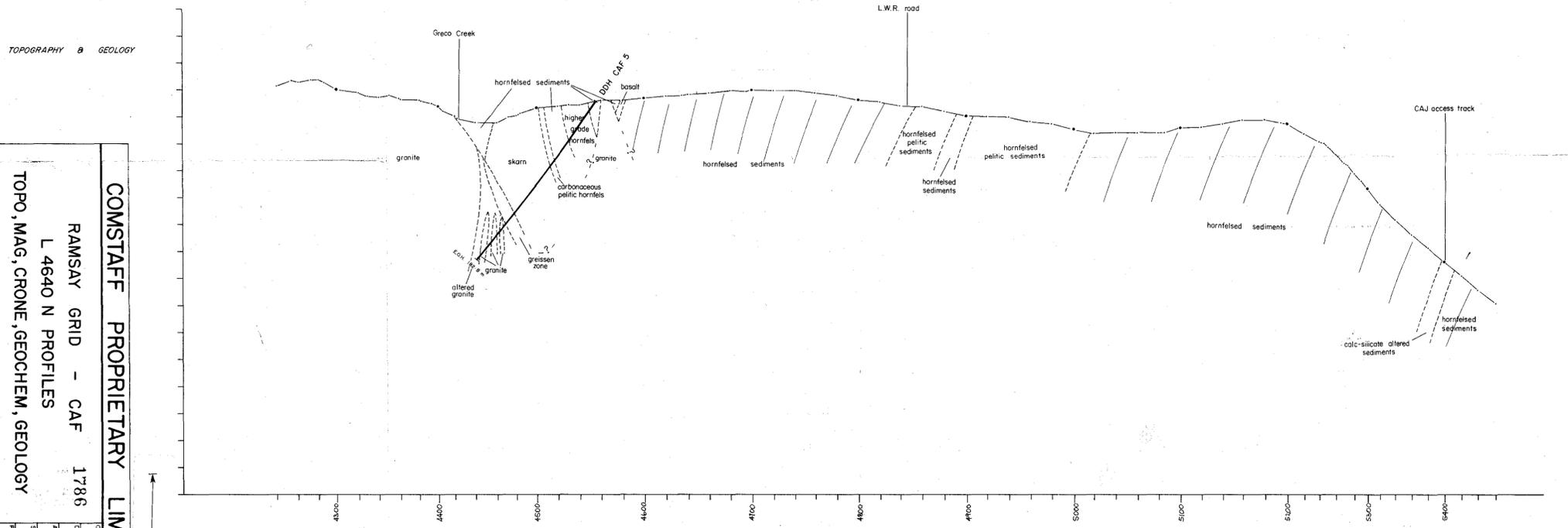
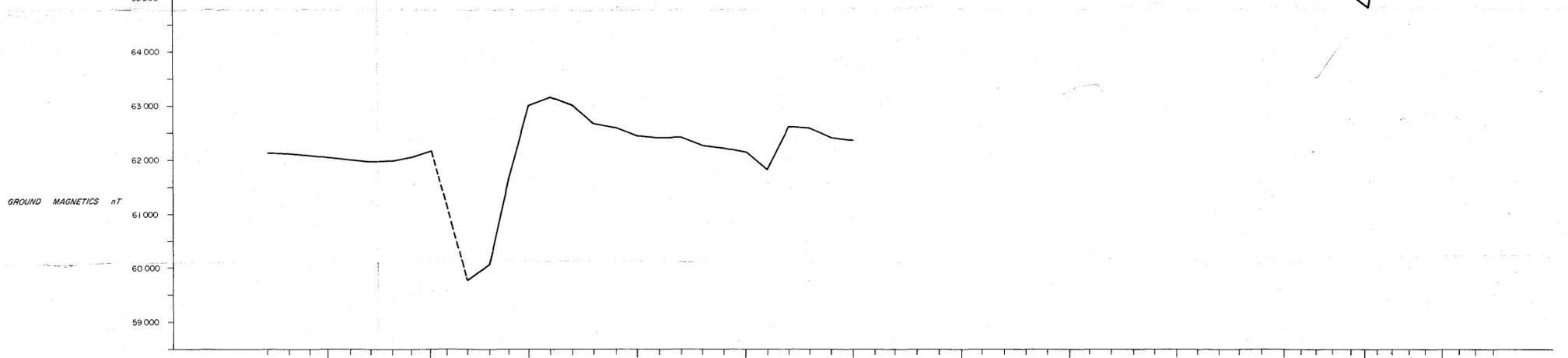
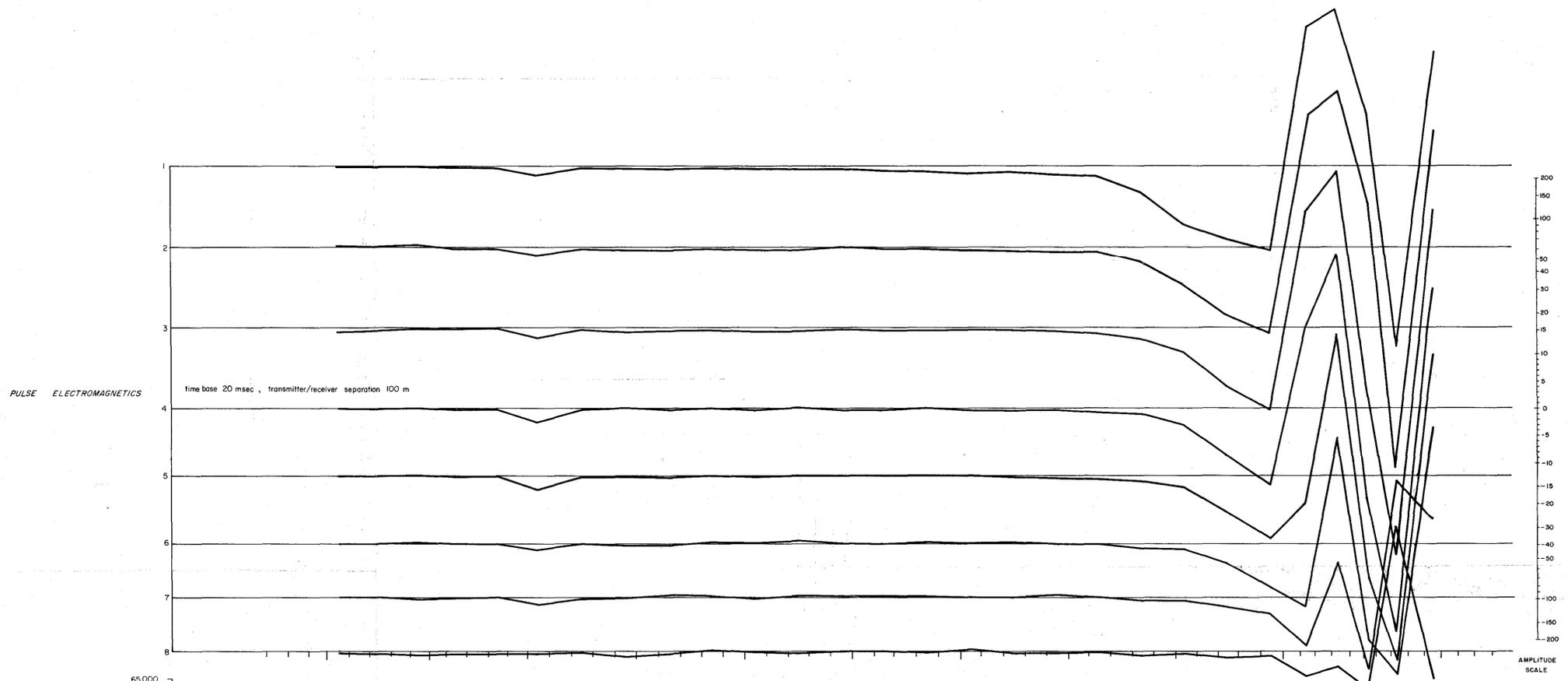
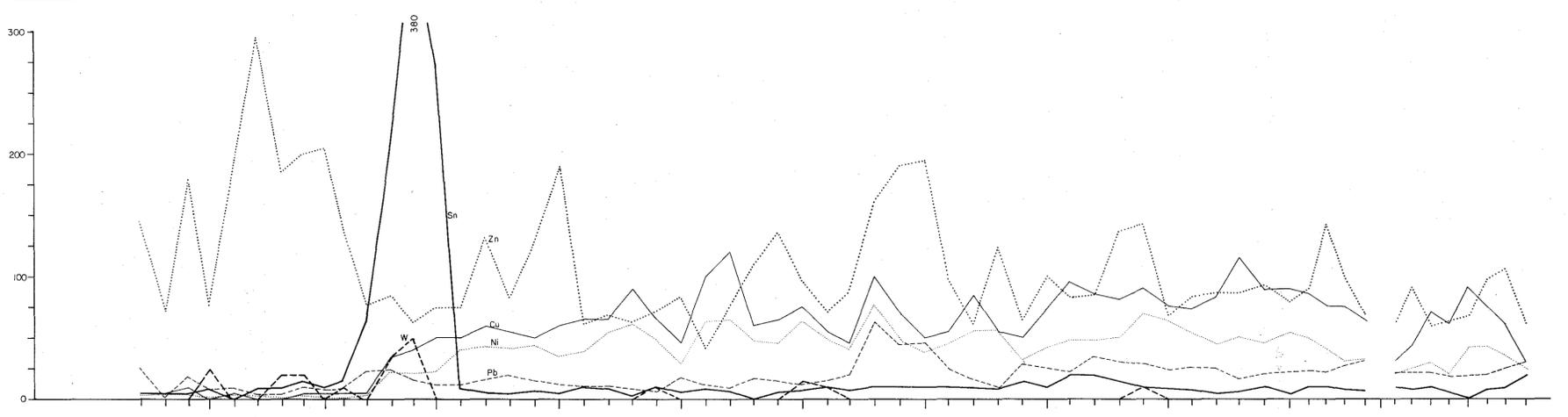
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CHECKED	14/8/82	
SCALE	1	2800
PRINTED	TAS/2/2251	



COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1785
L 4760 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

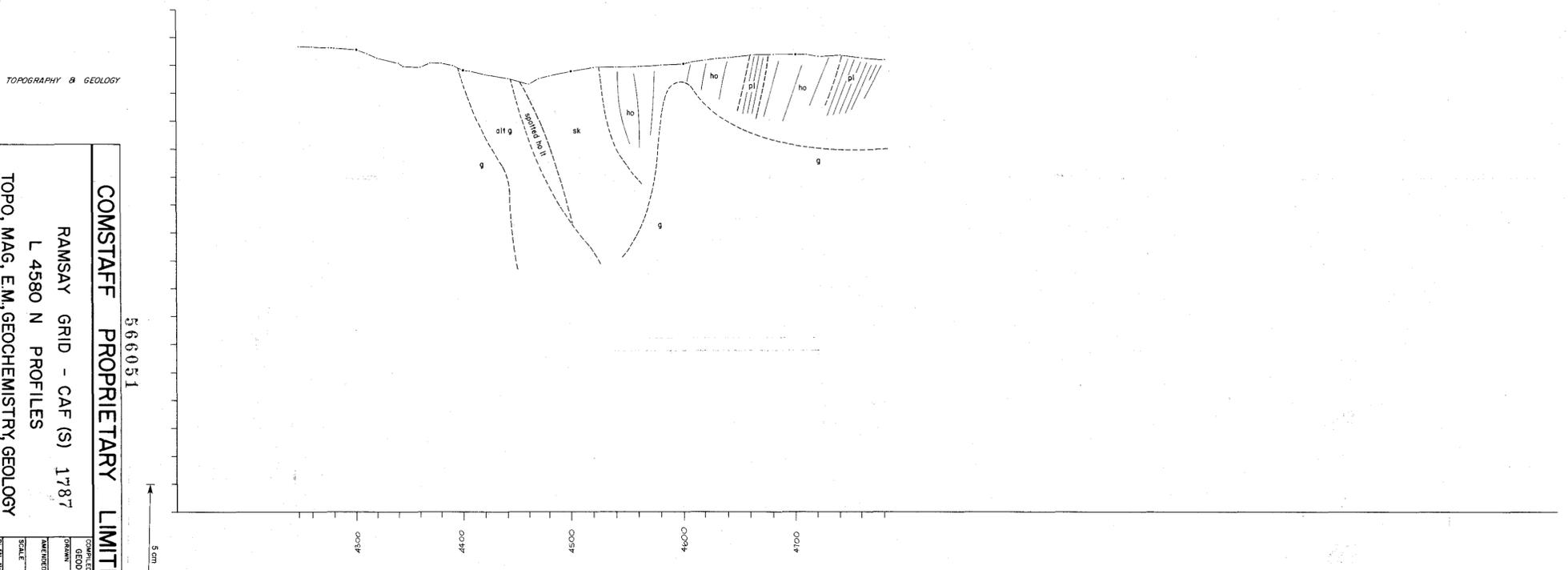
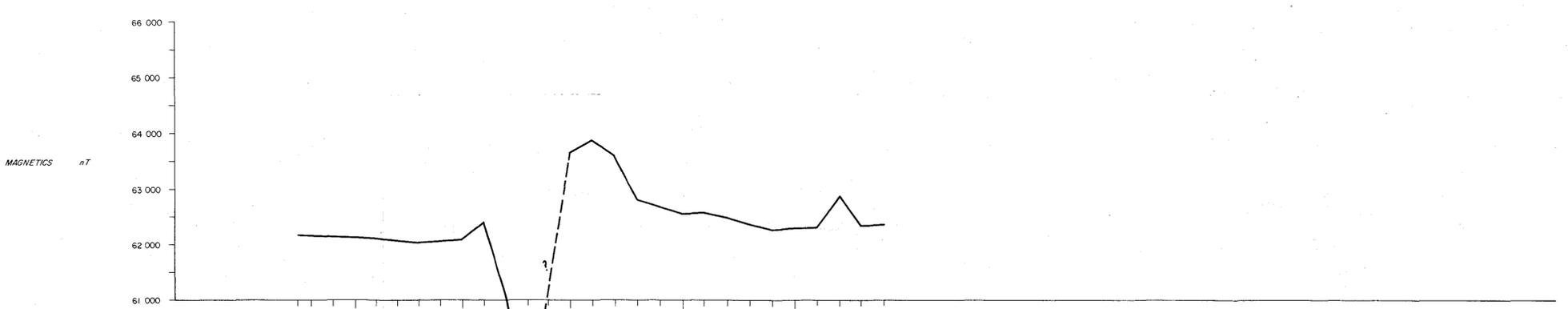
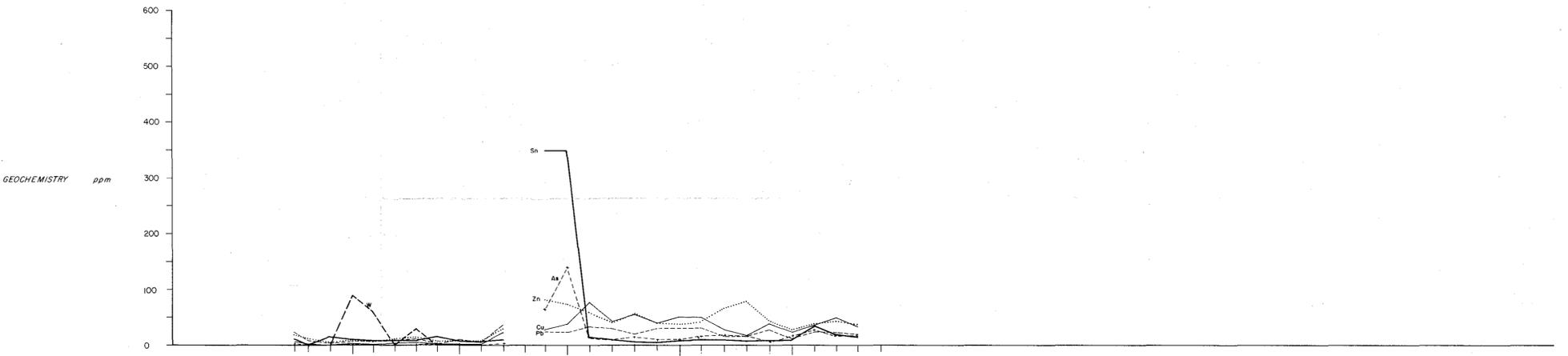
DATE	5/79
GEODRIFT	5/79
SCALE	1:2800
PLANT NO.	TAS/2/1851



COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1786
L 4640 N PROFILES
TOPO, MAG, CRONE, GEOCHEM, GEOLOGY

DATE: 26/10/82
SCALE: 1:2500
PROJECT: TAS/2/2253



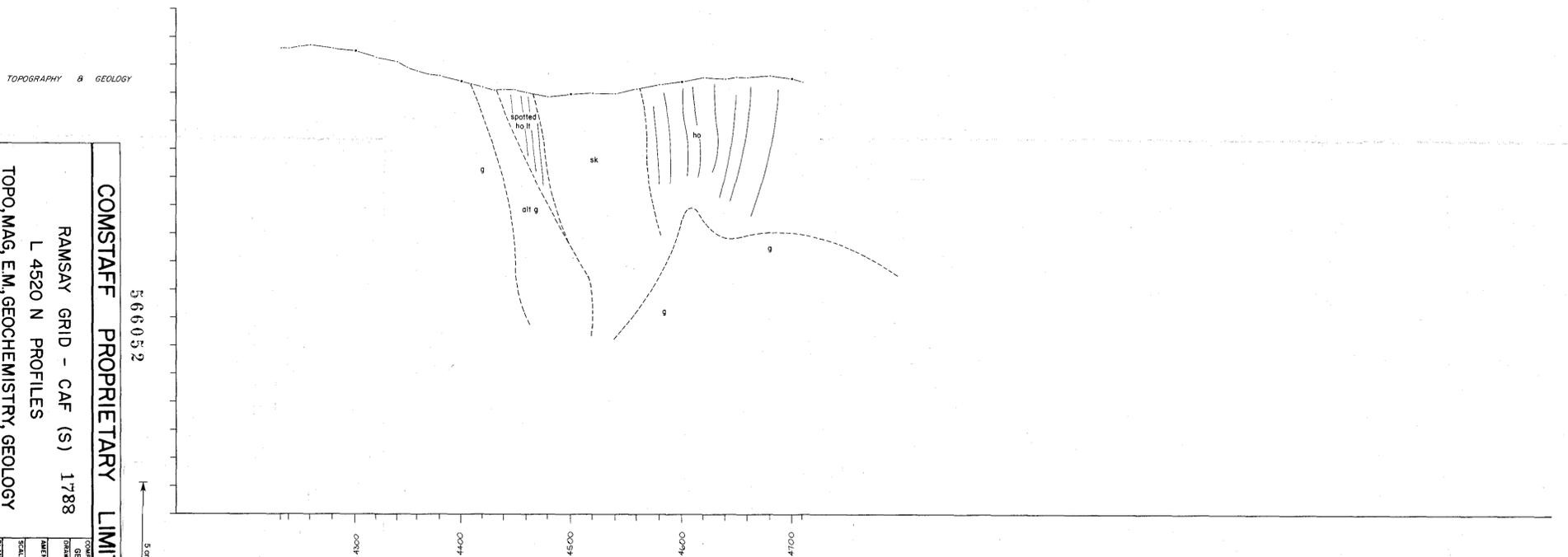
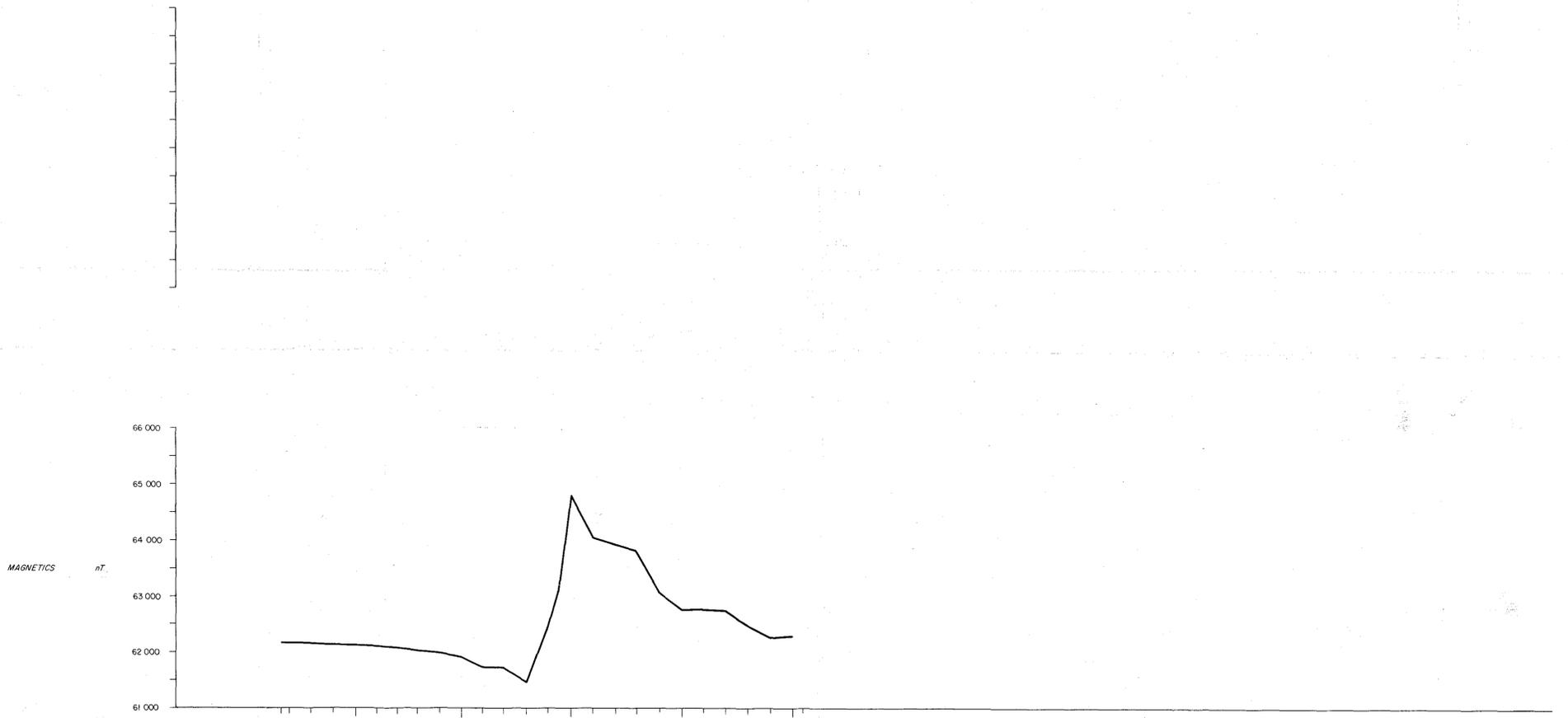
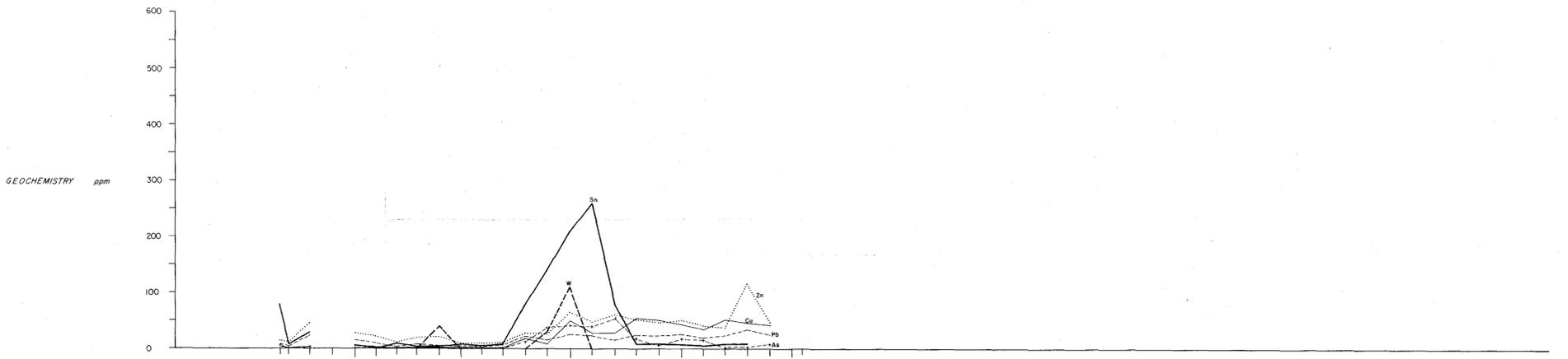
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF (S) 1787
L 4580 N PROFILES

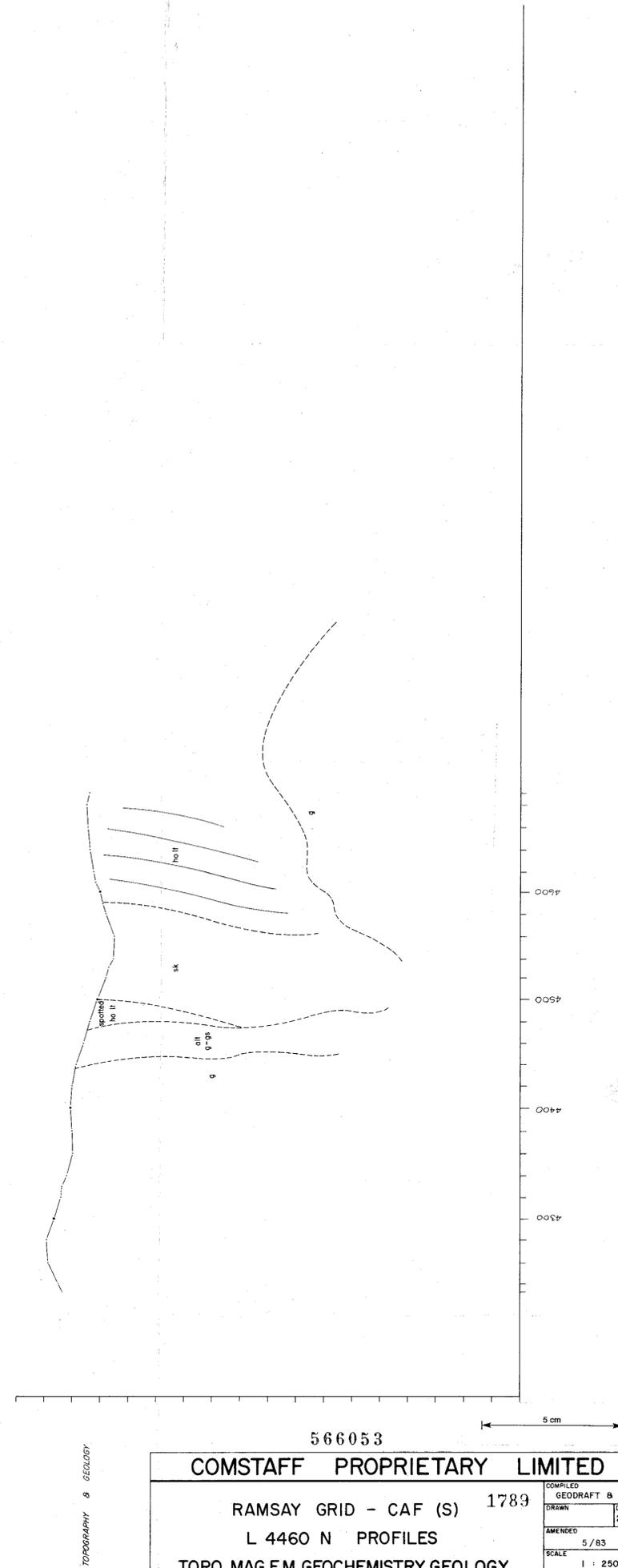
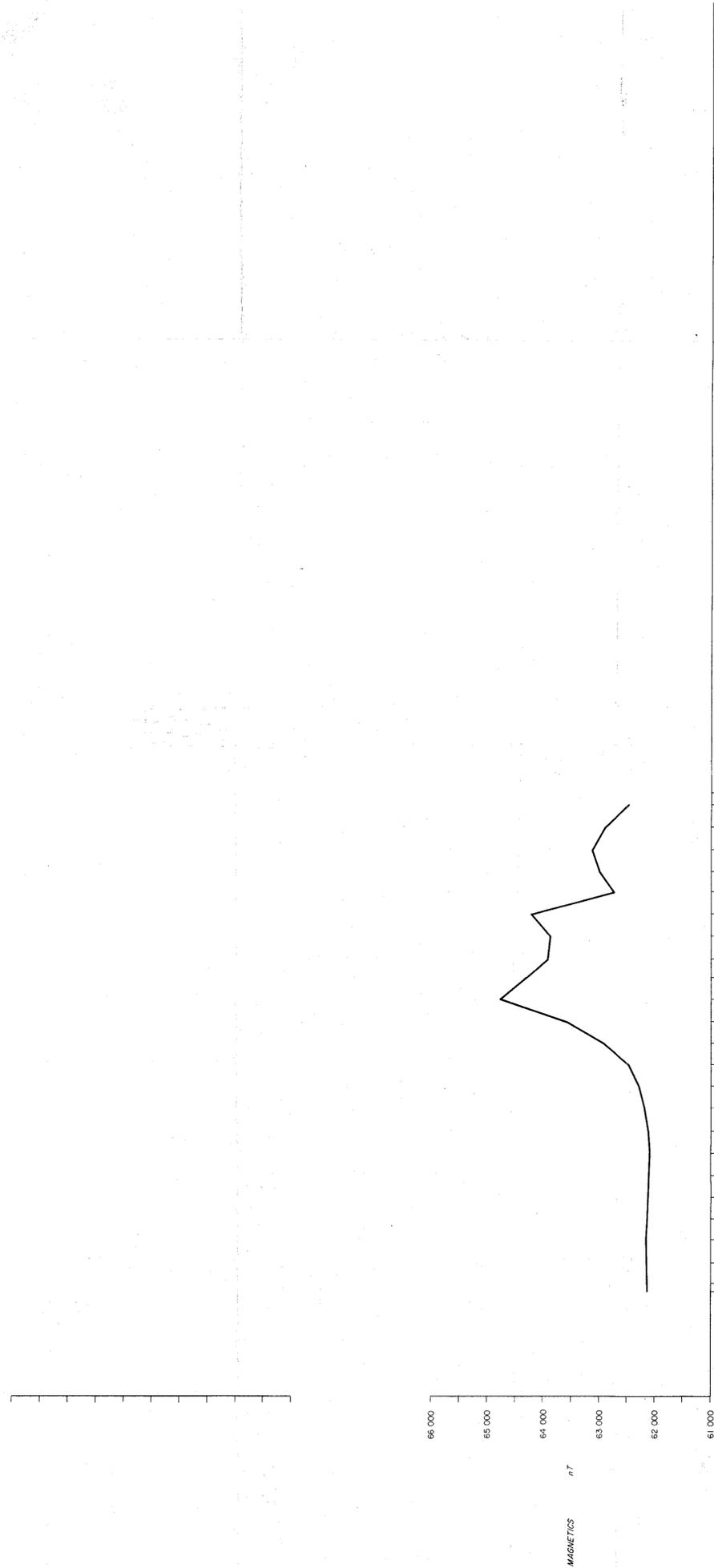
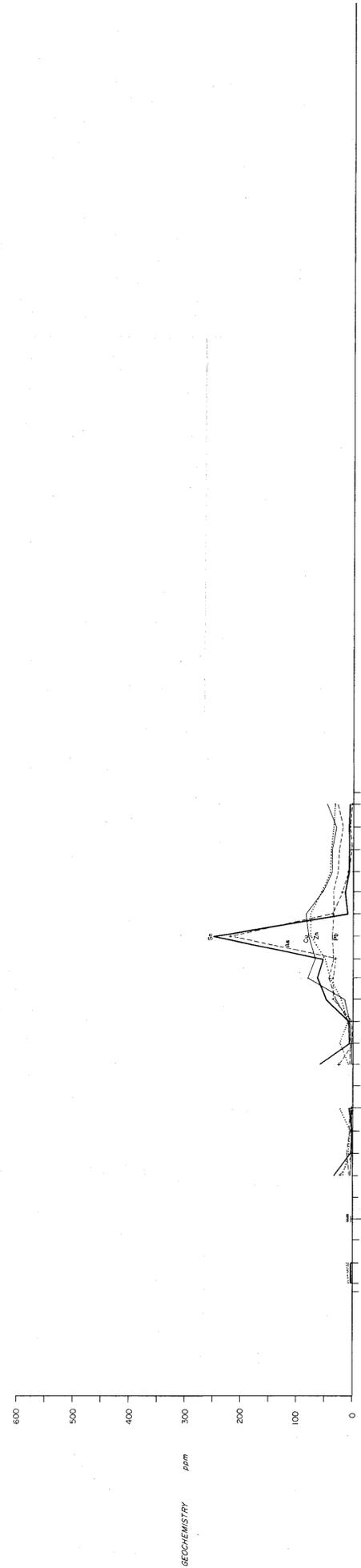
TOPO, MAG, EM, GEOCHEMISTRY, GEOLOGY

566051

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PROFESSOR	L 4580 N PROFILES
DATE	21/3/81
SCALE	1 : 2500
DATE	5/83
FILE NO.	13/2/2472



COMSTAFF PROPRIETARY LIMITED
 RAMSAY GRID - CAF (S) 1788
 L 4520 N PROFILES
 TOPO, MAG, EM, GEOCHEMISTRY, GEOLOGY
 SCALE 1 : 2500
 DRAWN 2/3/81
 CHECKED 5/83
 PROJECT TAS / 2 / 2471



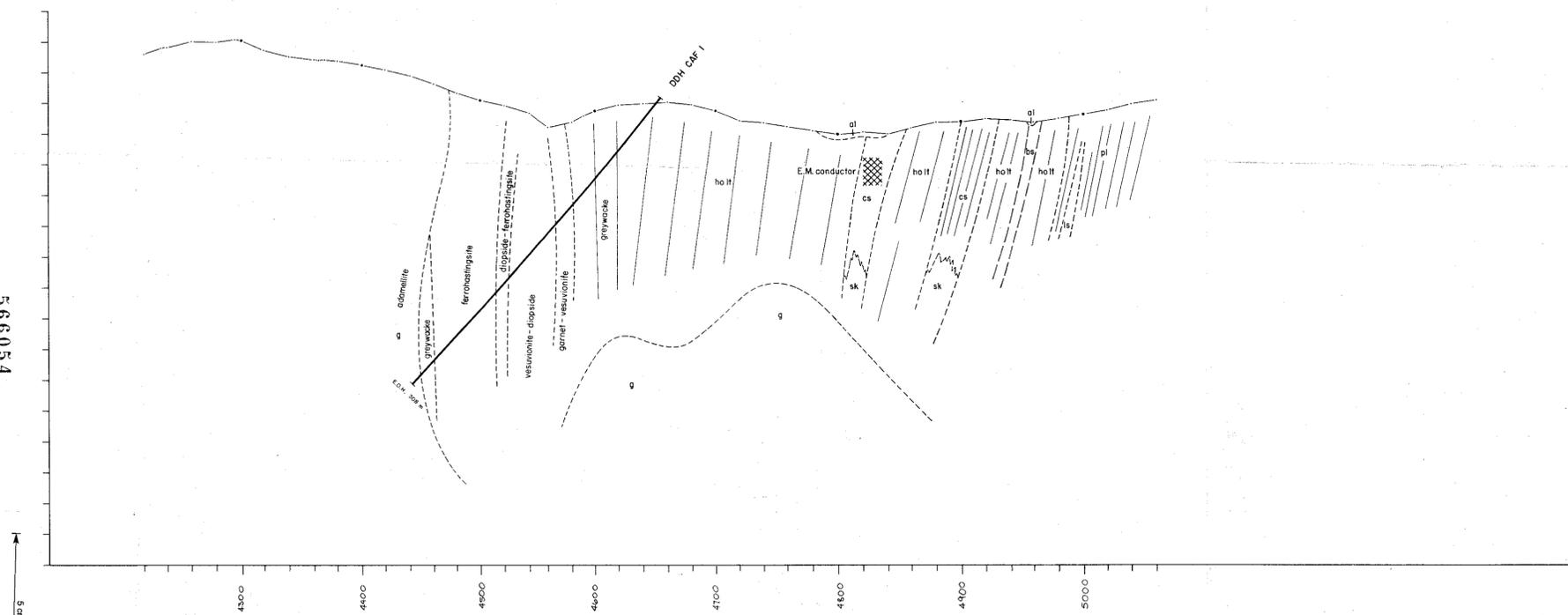
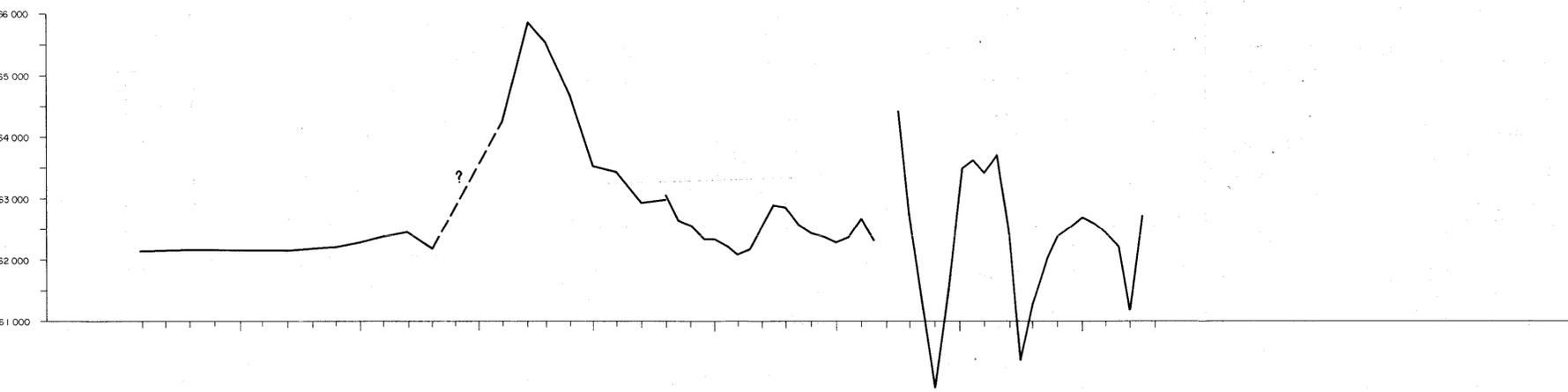
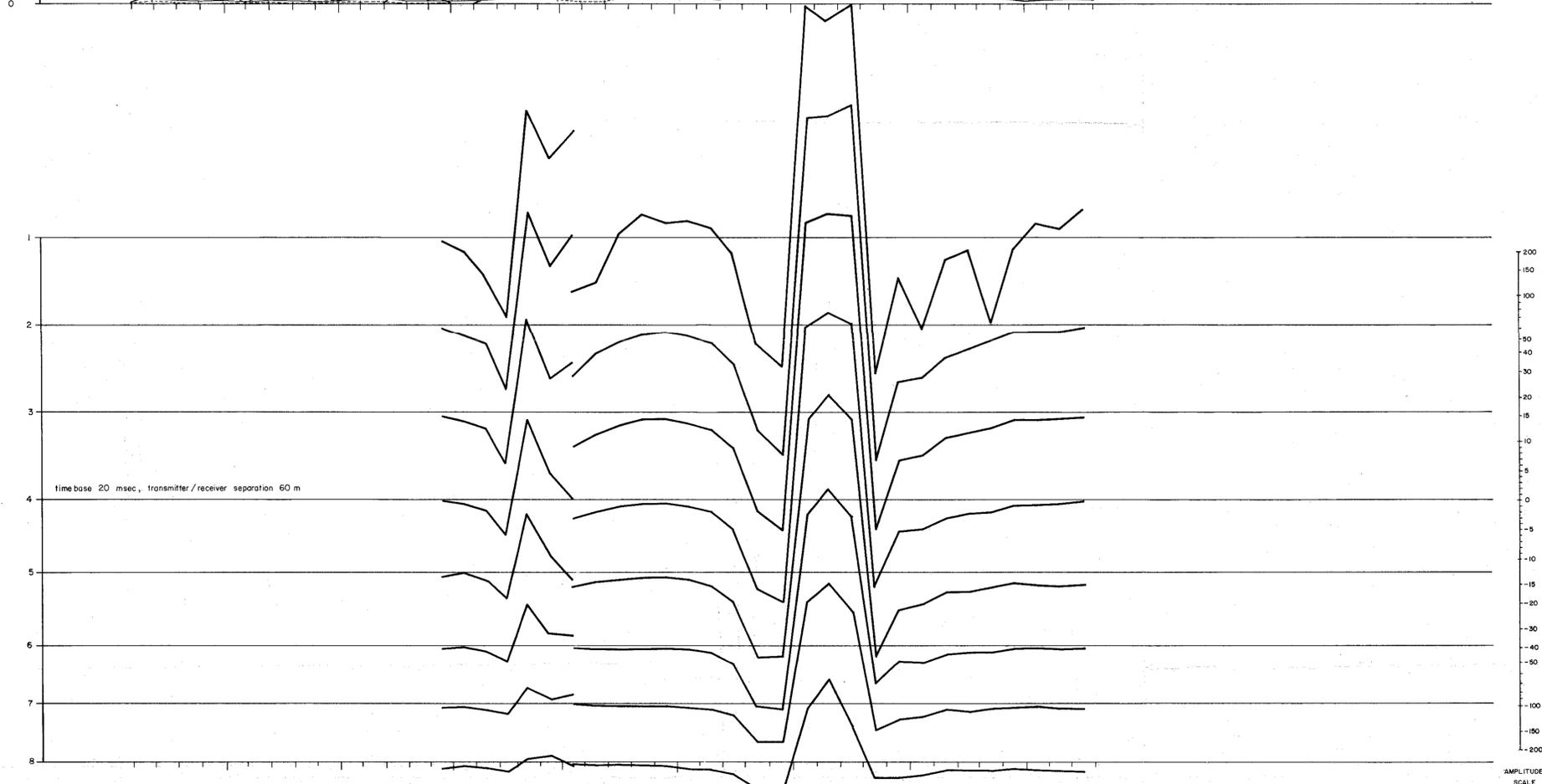
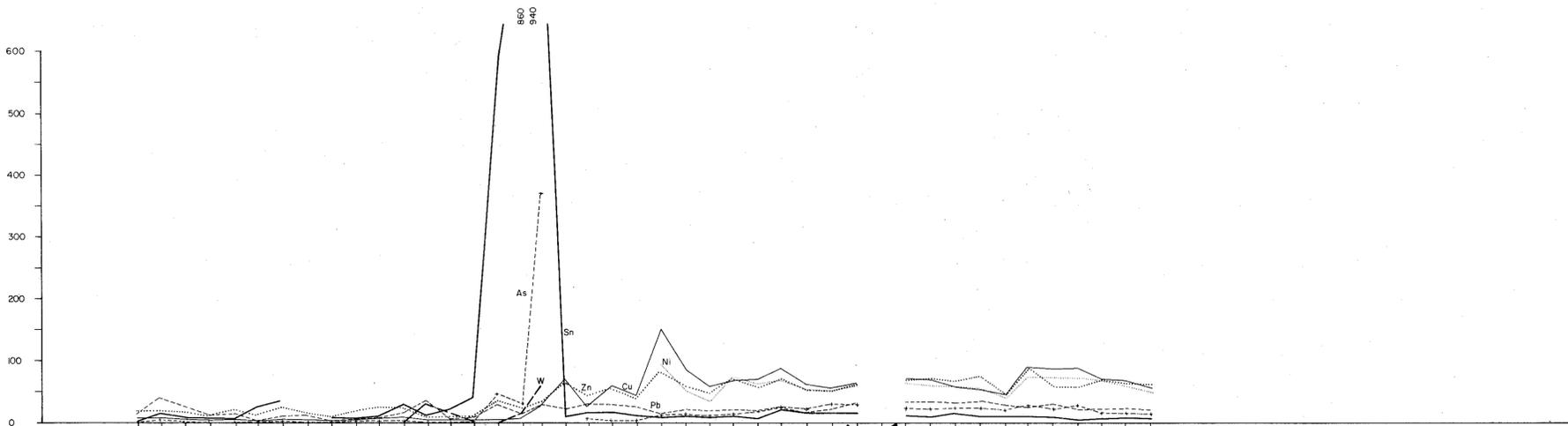
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF (S) 1789

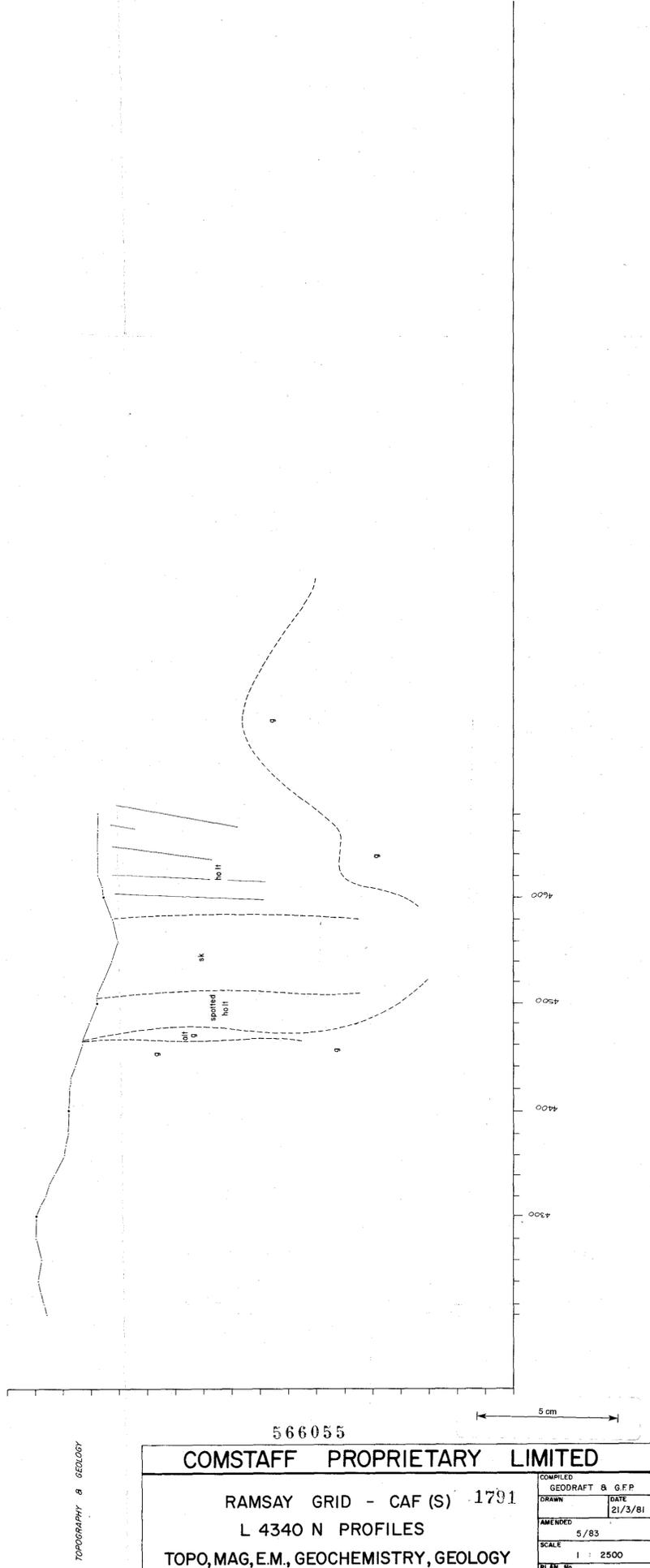
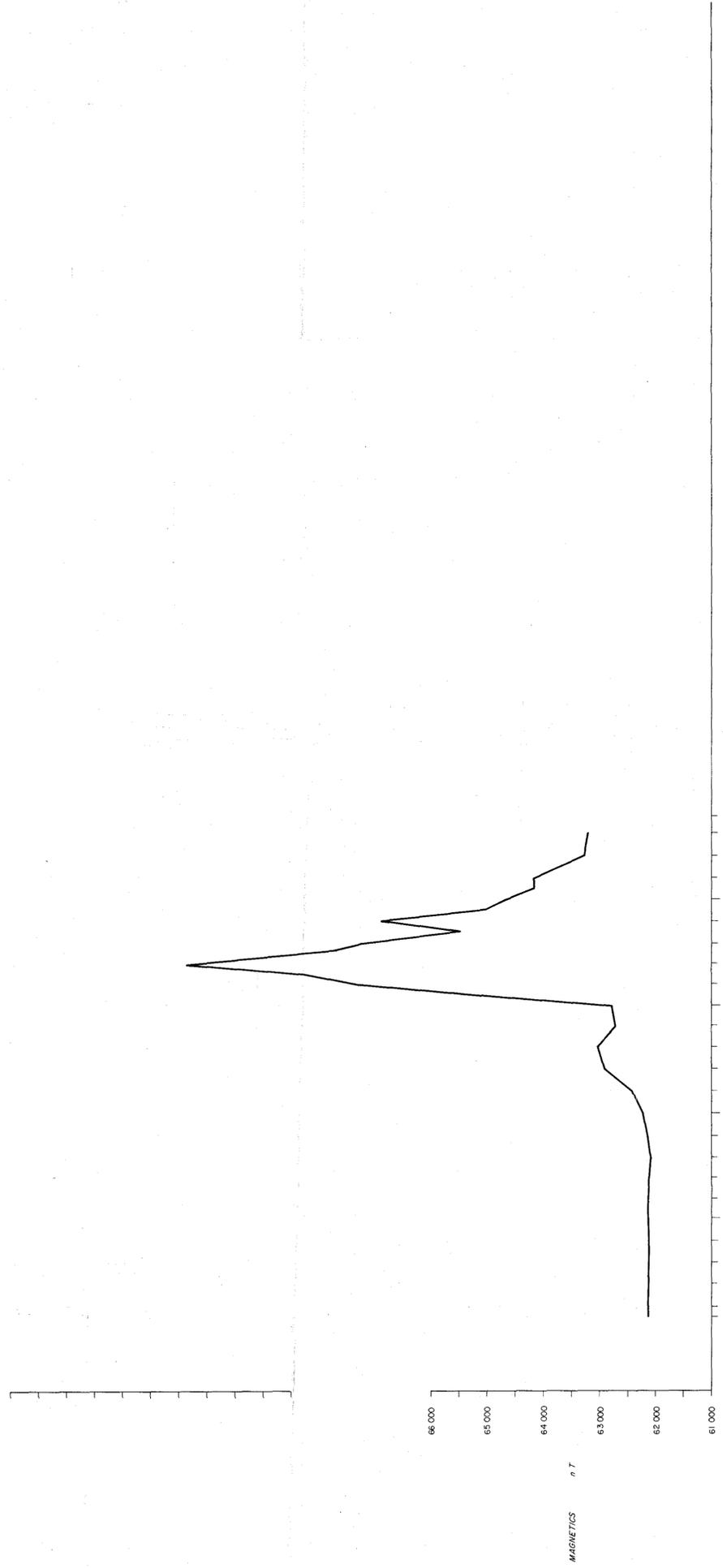
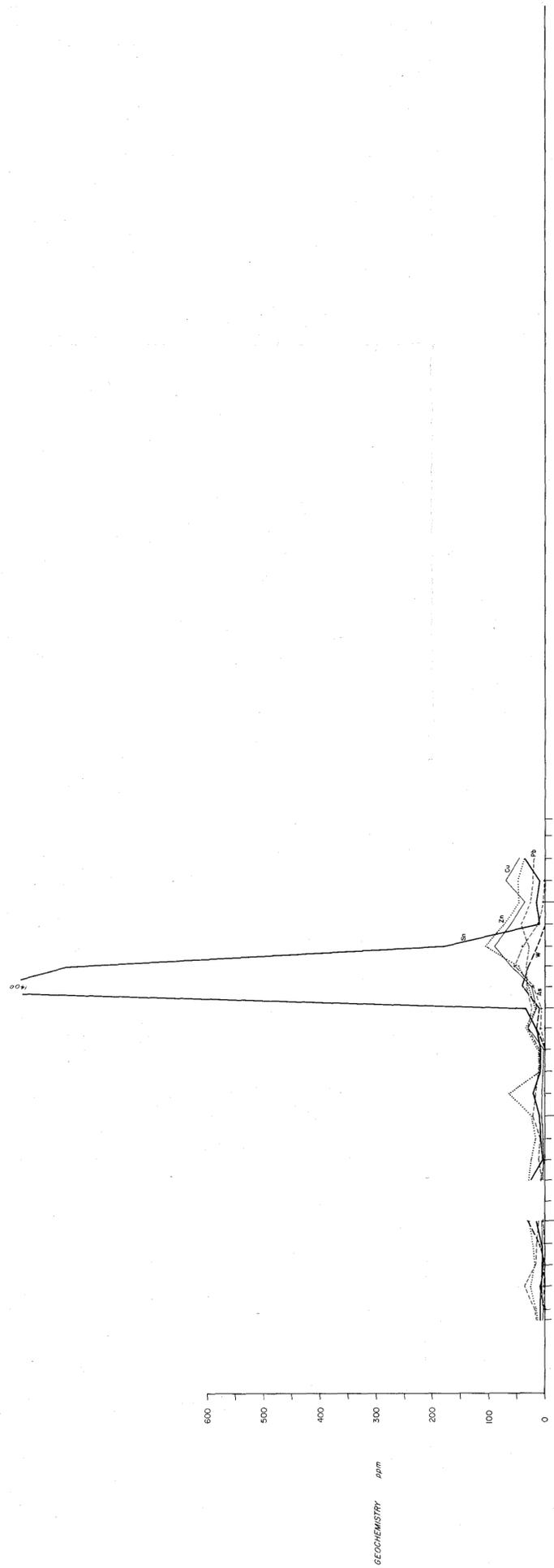
L 4460 N PROFILES

TOPO, MAG, E.M., GEOCHEMISTRY, GEOLOGY

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DRAWN	DATE
AMENDED	5 / 83
SCALE	1 : 2500
PLAN NO.	TAS / 2 / 2470

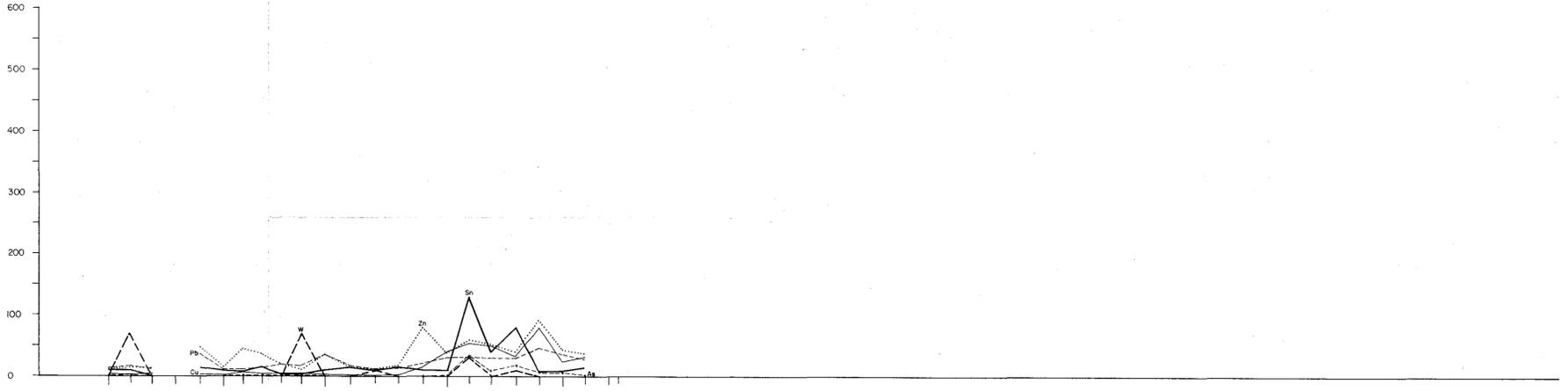


COMSTAFF PROPRIETARY LIMITED
 566054
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 L 4400 N PROFILES
 TOPO, MAG, E.M., GEOCHEMISTRY, GEOLOGY
 COMPLETED BY G.E.P.
 GEODRAFT BY G.E.P.
 DATE 21/3/81
 APPROVED 5/83
 SCALE 1:2500
 FILE NO. TAS/2/2469

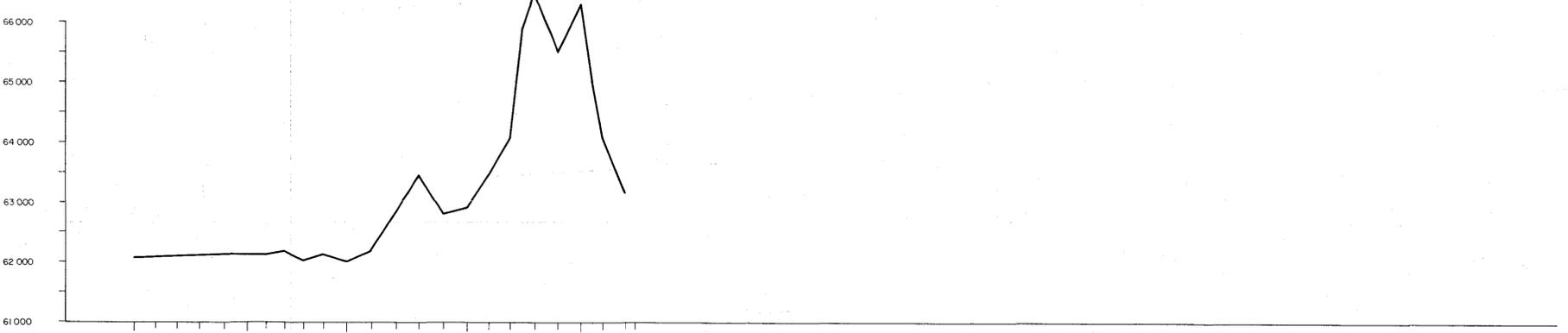


COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF (S) 1791	
L 4340 N PROFILES	
TOPO, MAG, E.M., GEOCHEMISTRY, GEOLOGY	
COMPILED GEOGRAFT & G.F.P.	DATE 21/3/81
DRAWN	AMENDED 5/83
SCALE 1 : 2500	PLAN No TAS / 2 / 2468

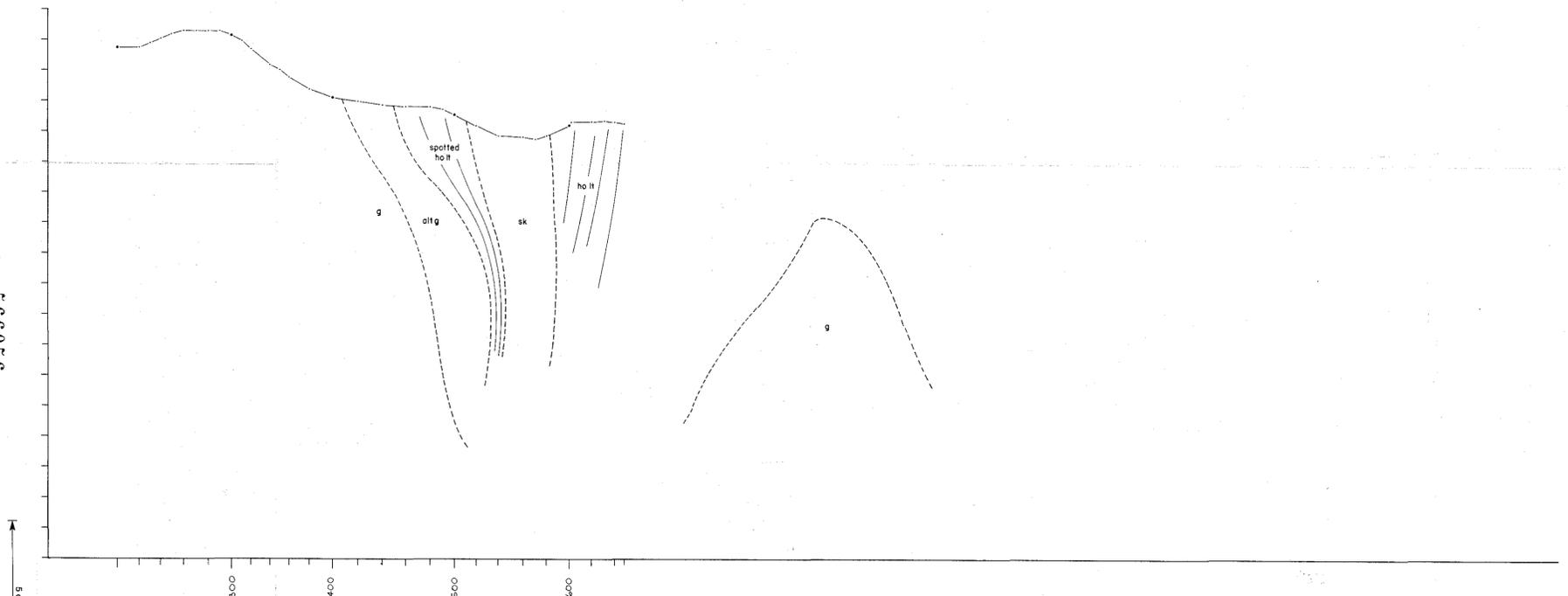
GEOCHEMISTRY ppm



MAGNETICS nT



TOPOGRAPHY & GEOLOGY



566056
COMSTAFF PROPRIETARY LIMITED
 RAMSAY GRID - CAF (S) 1792
 L 4280 N PROFILES
 TOPO, MAG, EM, GEOCHEMISTRY, GEOLOGY
 DRAWN BY: J. S. P.
 DATE: 2/1/81
 SCALE: 5/83
 PROJECT: 1 : 2800
 FILE NO: TAS/2/2467

992

D of M	A.O.	O.G.	E.O.	D.S.M.E.
Received Answered				
= 6 JUN 1983				E & L
DEPT. OF MINES				
REF. NO: 4860/83				

PROJECT NAME: COMSTAFF PROPRIETARY LIMITED

TITLE: INTERIM REPORT ON THE MOUNT RAMSAY
TIN-TUNGSTEN PROJECT
EXPLORATION LICENCE 5/63 PART 2
VOLUME II

AREA NAME/S, STATE 1:250,000 SHEET NO/S & COORDINATES: Burnie Sheet S 55/3
Metric Co-ordinate 5395000N
372000E

COMMODITY/IES: Sn

TEXT PAGES NO:
PLAN NOS: As detailed

TABLE NOS: 1

APPENDICES: 1

AUTHOR/S: G F Pigott

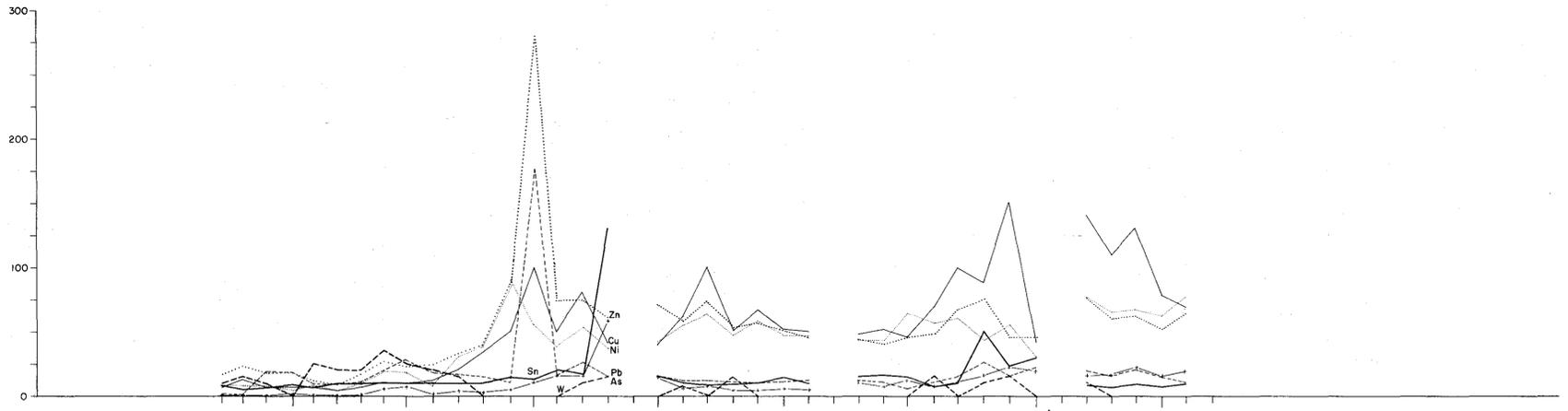
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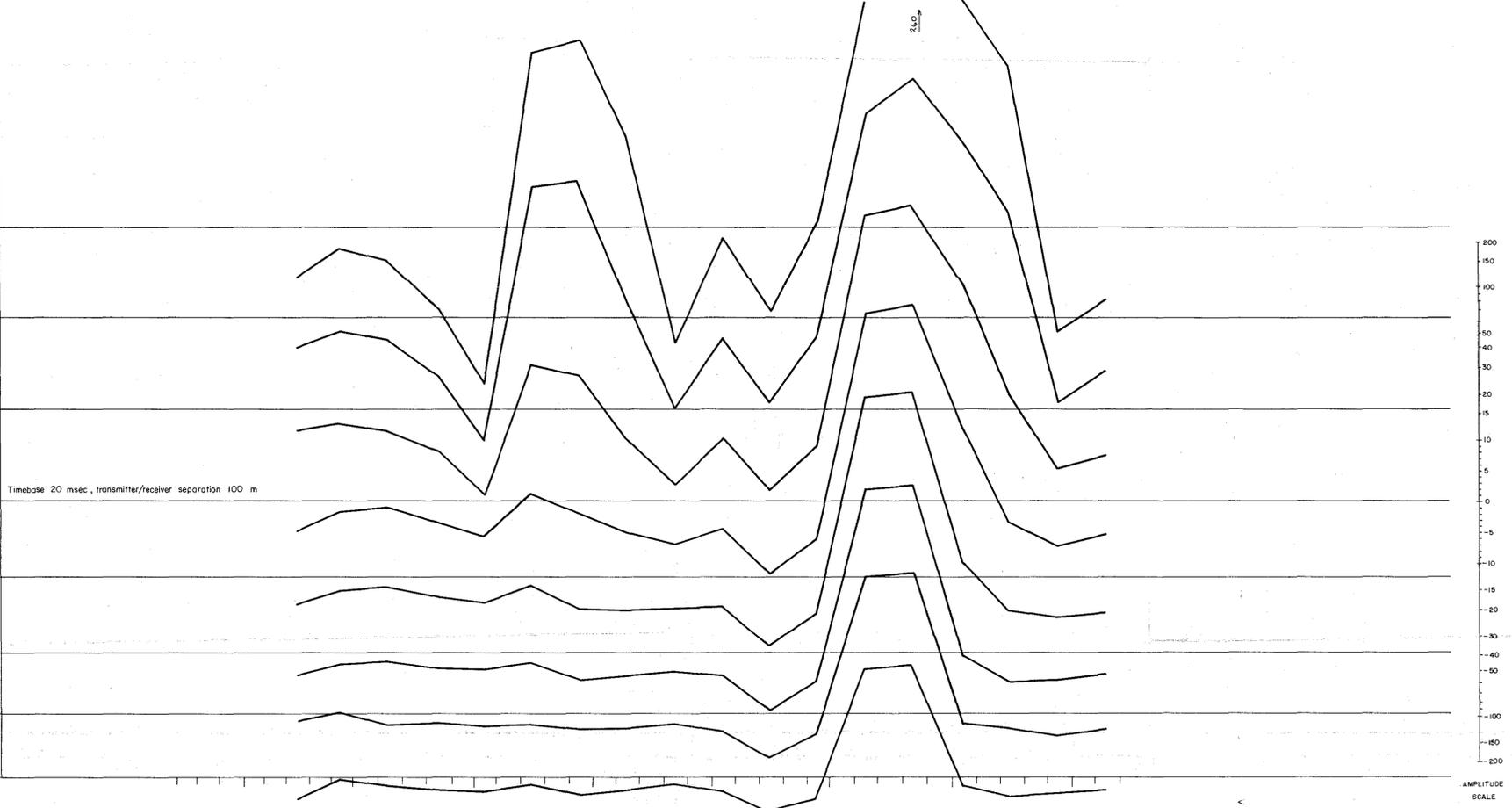
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AUSTRALIAN ANGLO AMERICAN LIMITED

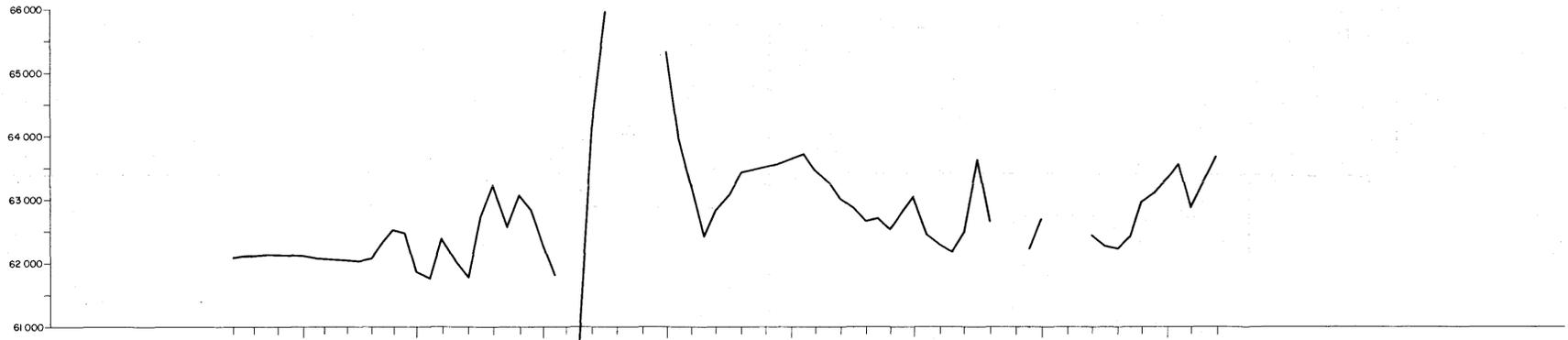
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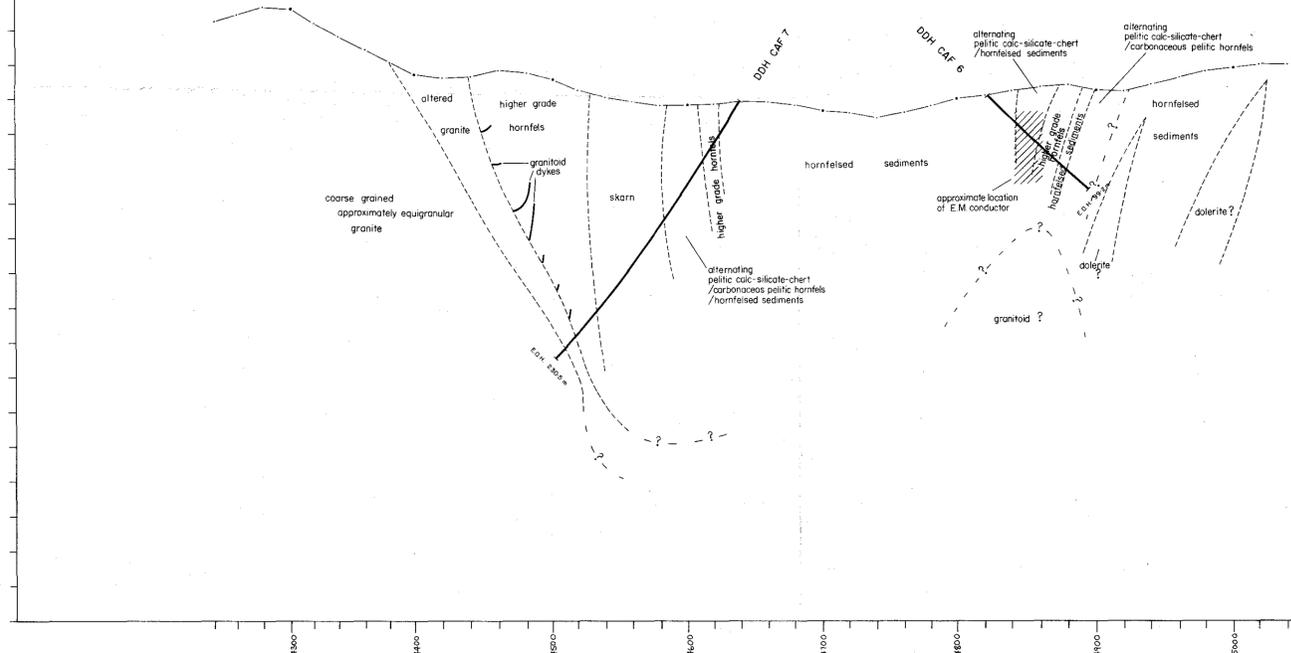
PULSE ELECTRO-MAGNETICS



GROUND MAGNETICS
nT



TOPOGRAPHY & GEOLOGY

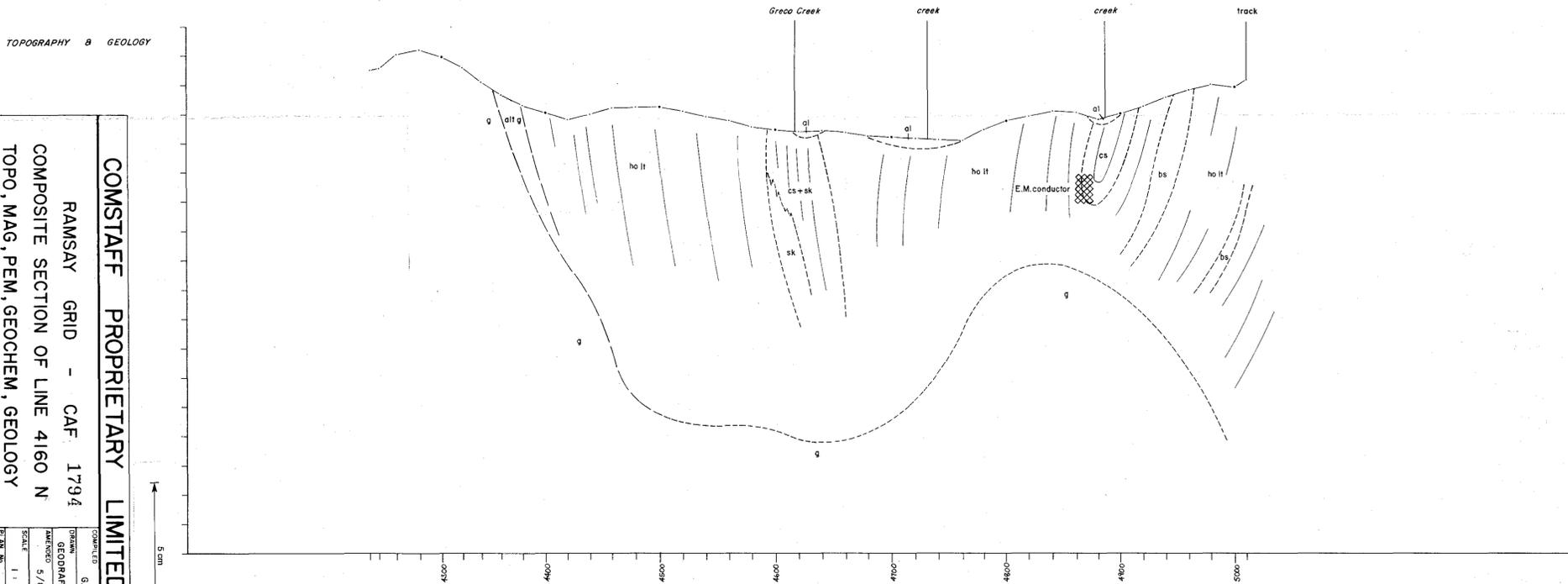
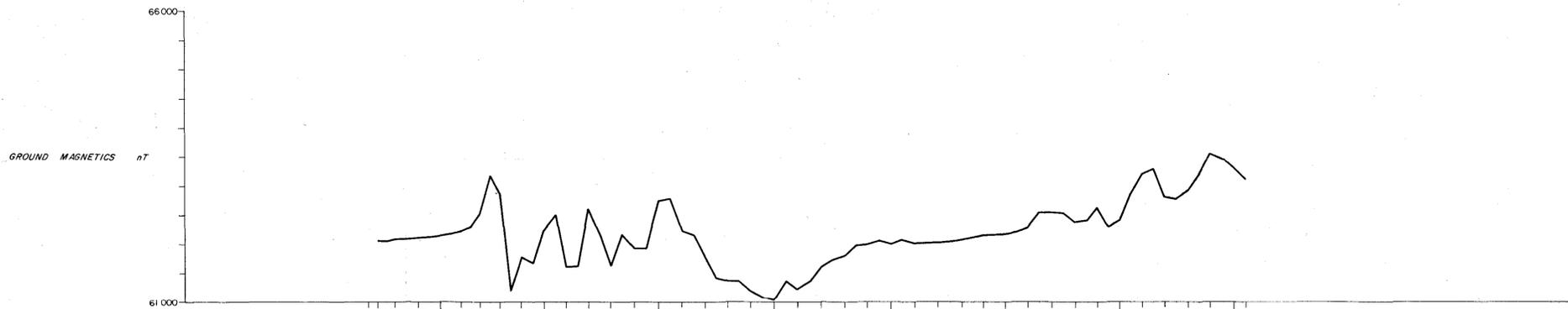
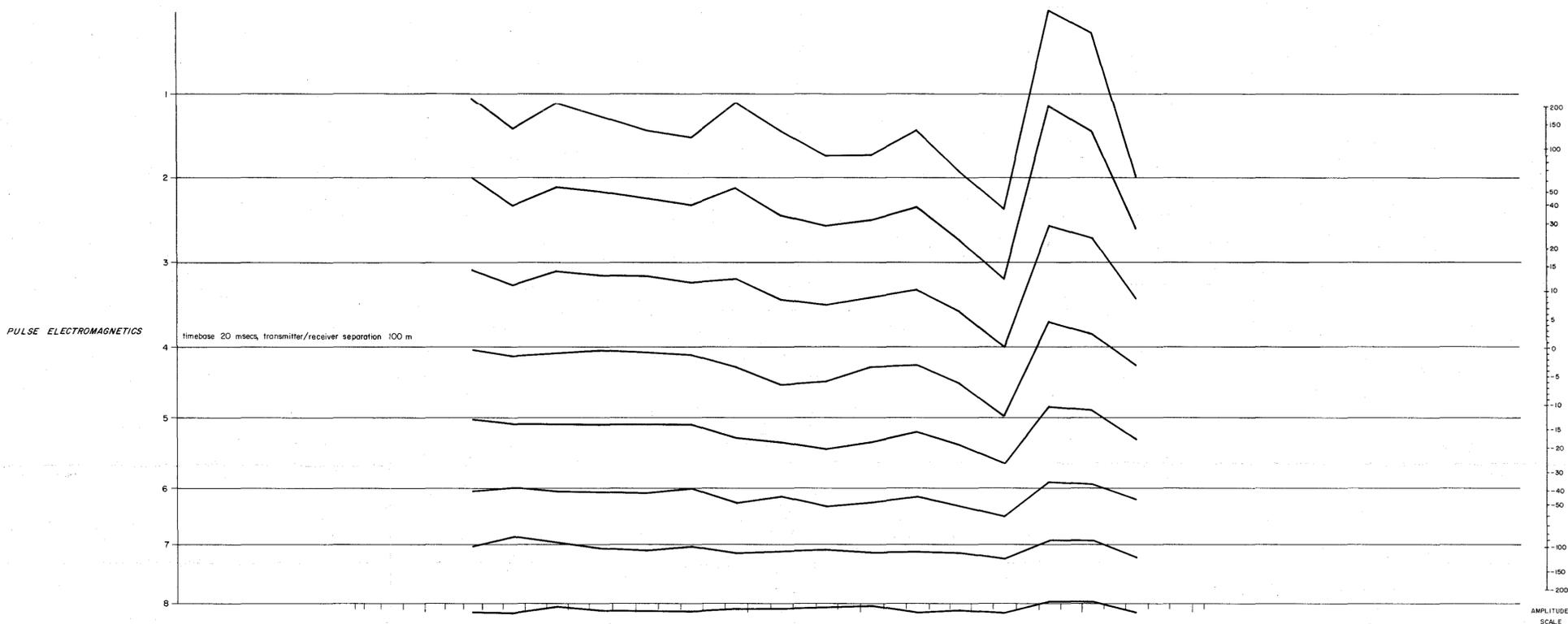
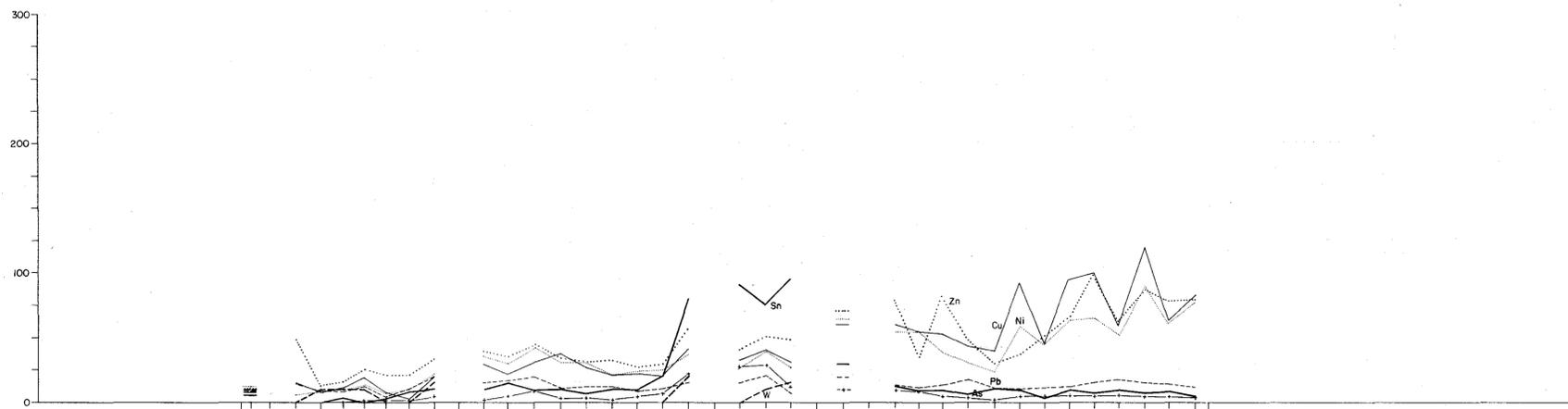


COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1793
COMPOSITE SECTION OF LINE 4220 N
TOPO, MAG, PEM, GEOCHEM, GEOLOGY

DATE	25 / 8 / 82
SCALE	1 : 2500
PROJECTED	G.F.P.
DRAWN	T.H.E.
GEOLOGIST	5/3/82
DATE	25 / 8 / 82

TAS/2/2822



COMSTAFF PROPRIETARY LIMITED

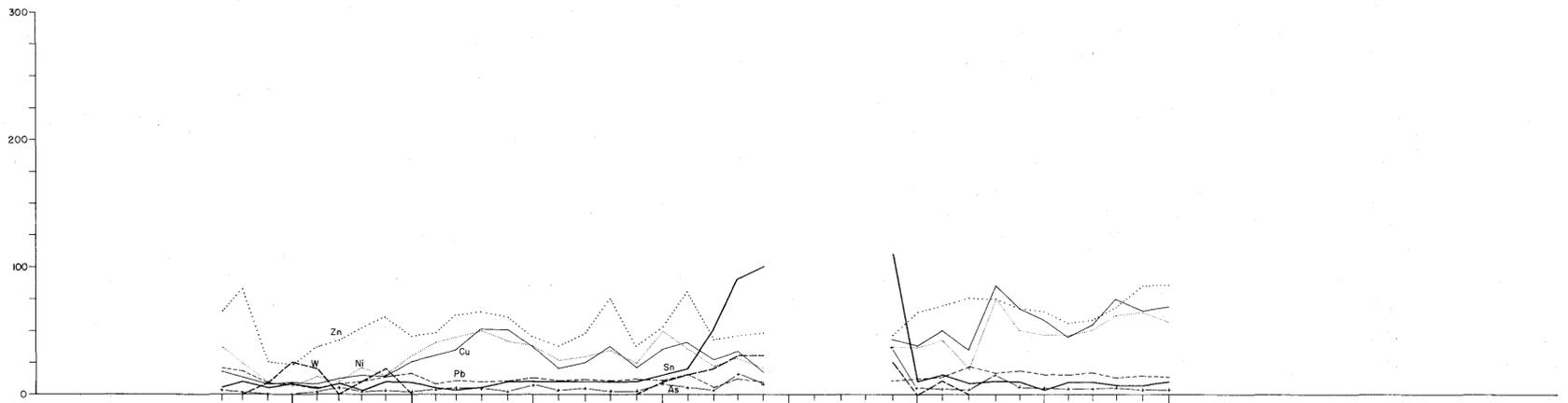
RAMSAY GRID - CAF 1794

COMPOSITE SECTION OF LINE 4160 N

TOPO, MAG, PEM, GEOCHEM, GEOLOGY

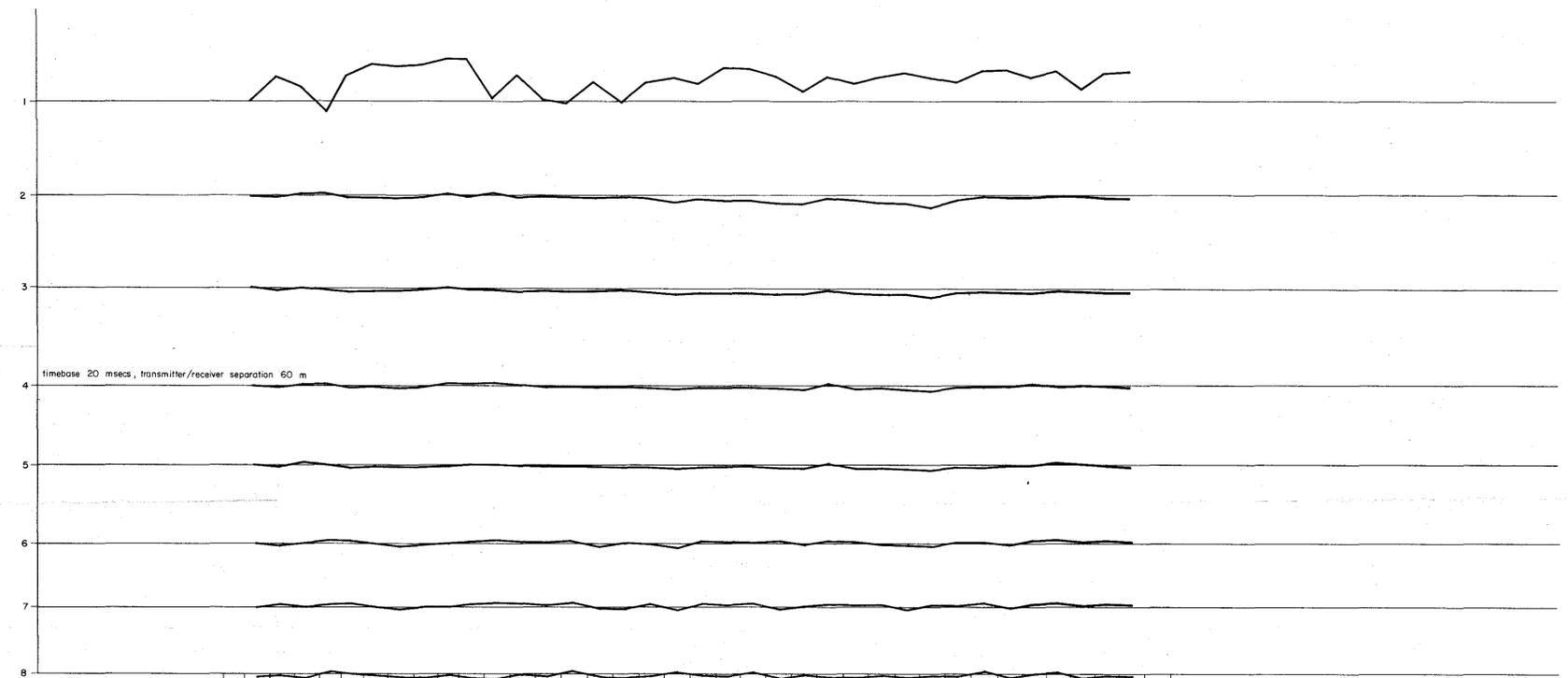
COMPILED	G.F.P.
DRAWN	GEOGRAPH
DATE	5/3/82
AMENDED	5/83
SCALE	1:2500
FILE NO.	TAS/2/2823

GEOCHEMISTRY ppm

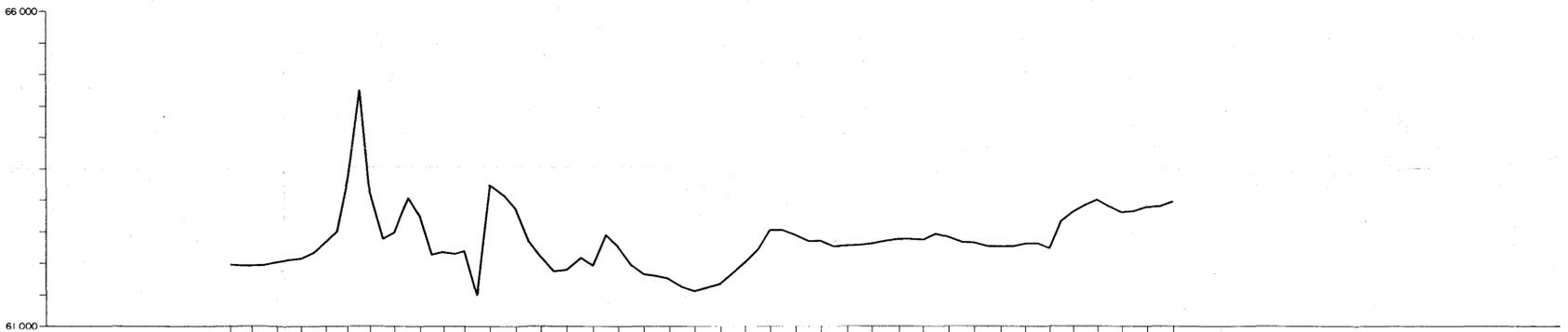


PULSE ELECTROMAGNETICS

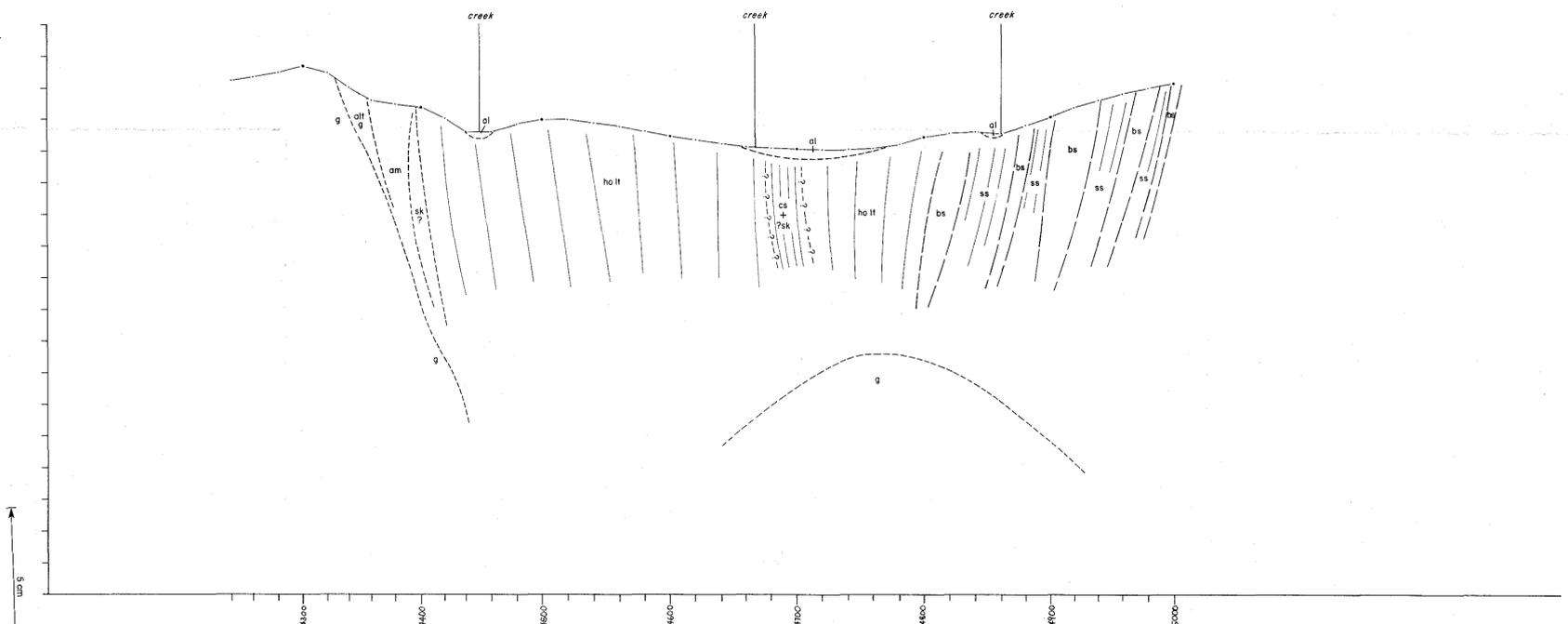
timebase 20 msec, transmitter/receiver separation 60 m



GROUND MAGNETICS nT



TOPOGRAPHY & GEOLOGY



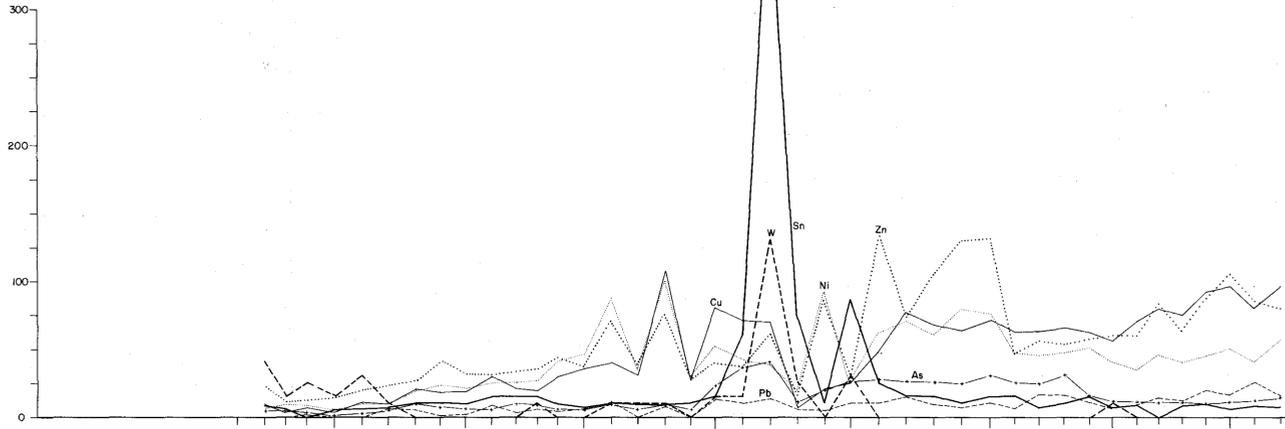
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1795
 COMPOSITE SECTION OF LINE 4100 N
 TOPO, MAG, PEM, GEOCHEM, GEOLOGY

COMPILED G.F.P.
 DRAWN G.P.
 GEOGRAPHIC 5/3/82
 DATED 5/83
 SCALE 1:2500
 PRINTED TAS/2/2824

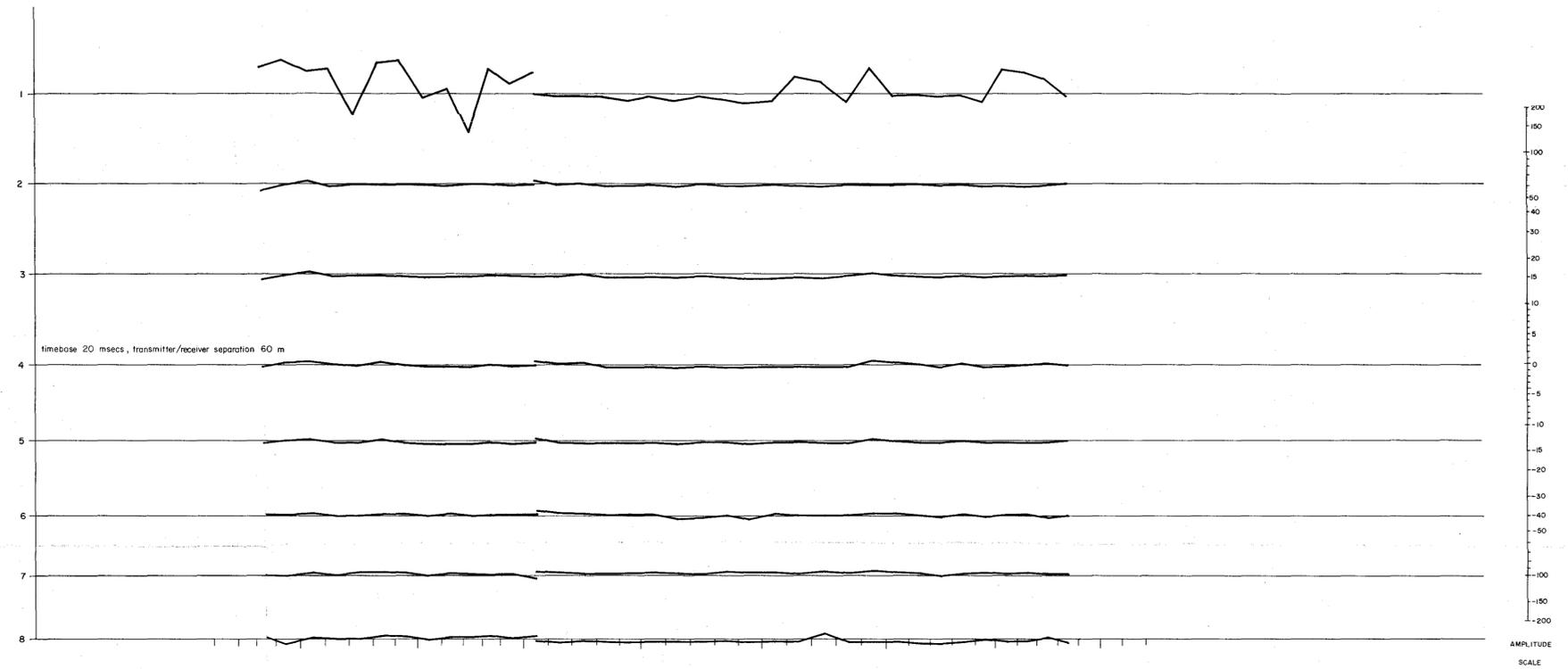
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GEOCHEMISTRY ppm

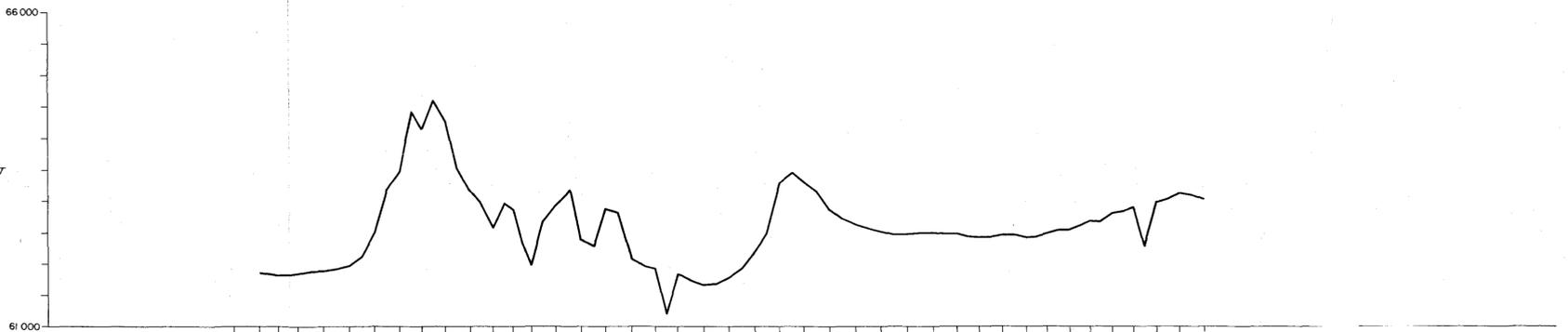


PULSE ELECTROMAGNETICS

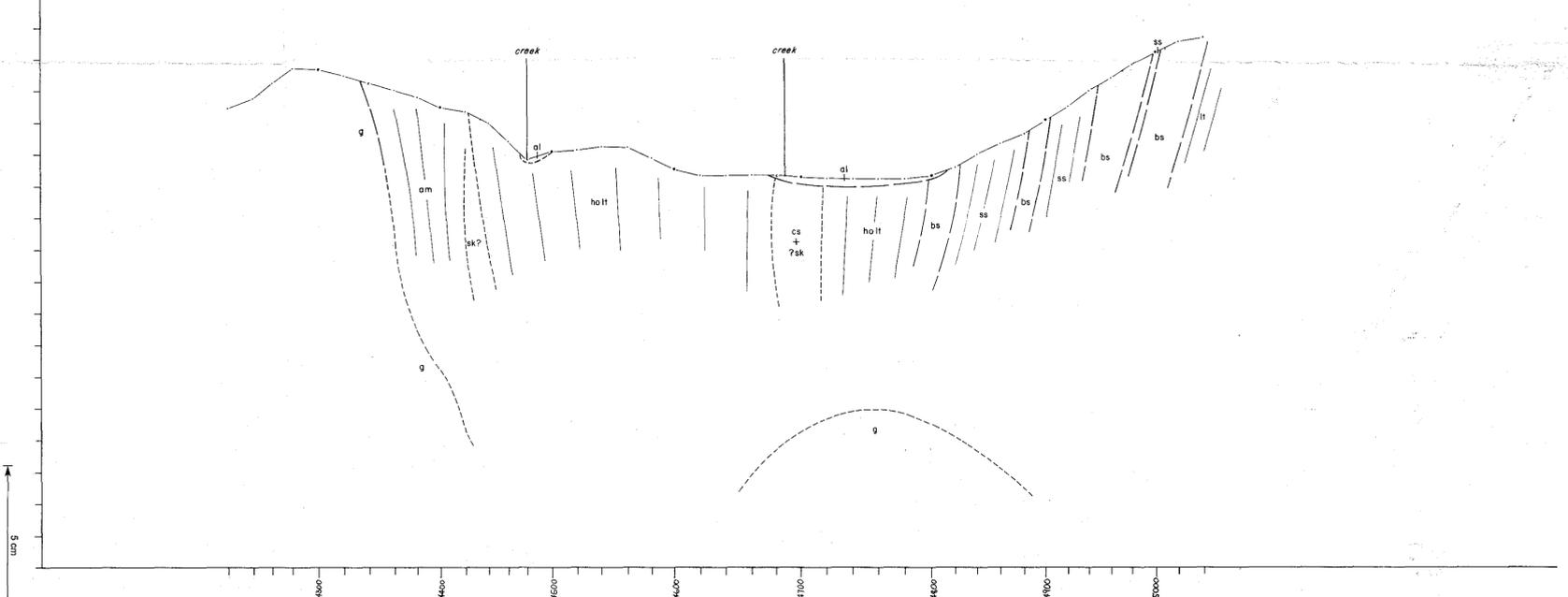
timebase 20 msec, transmitter/receiver separation 60 m



GROUND MAGNETICS nT



TOPOGRAPHY & GEOLOGY



COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1796

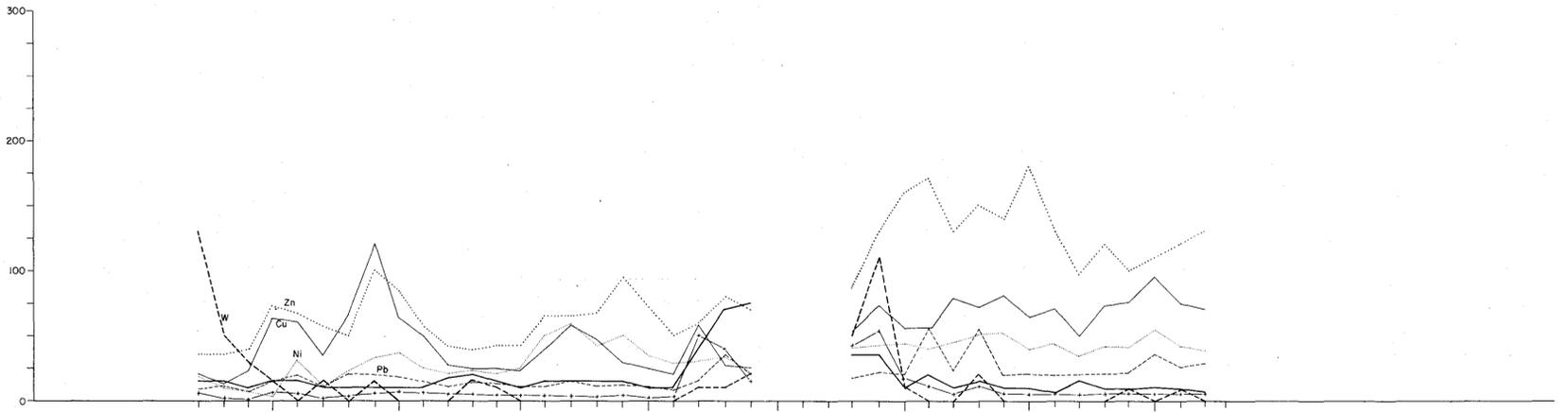
COMPOSITE SECTION OF LINE 4040 N

TOPO, MAG, PEM, GEOCHEM, GEOLOGY

DATE	5/3/82
SCALE	1:2500
PROJECT NO.	TAS/2/2825

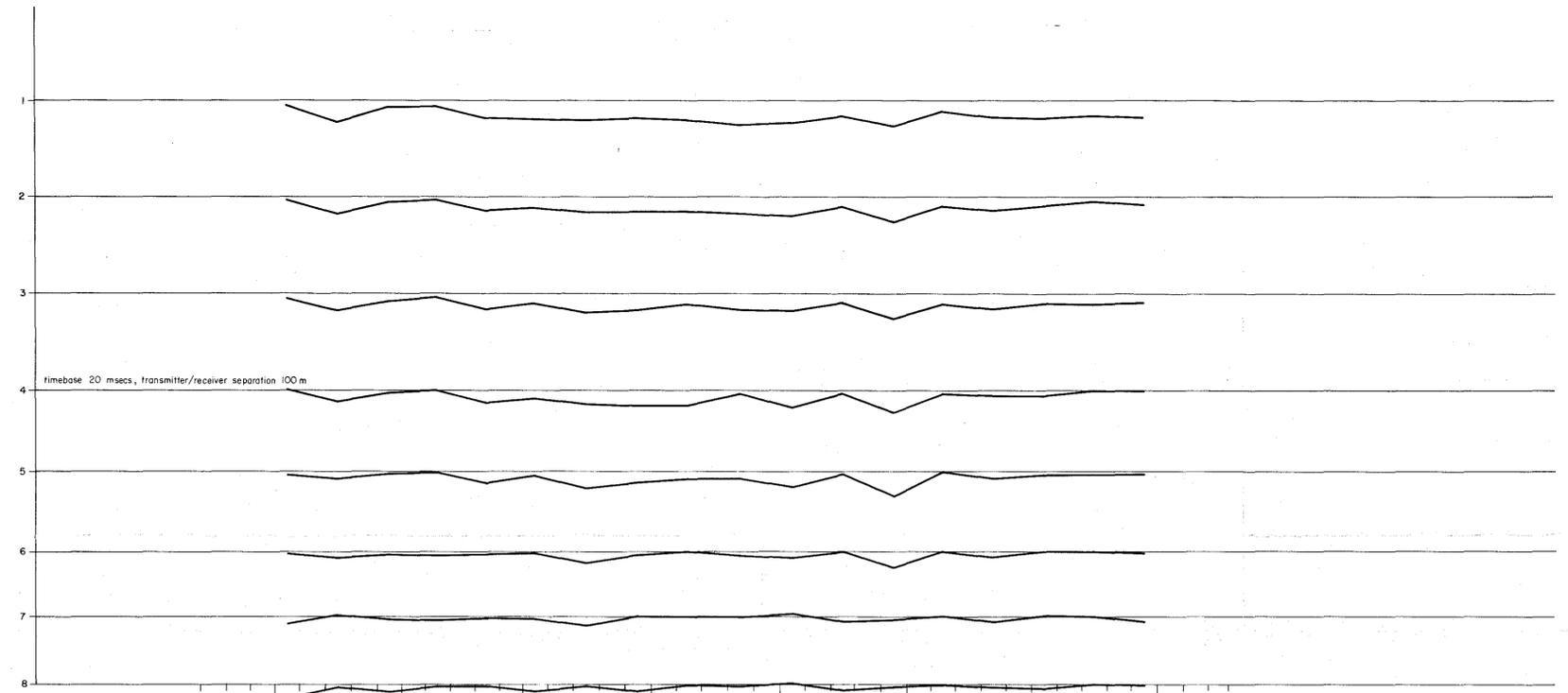
06061

GEOCHEMISTRY ppm

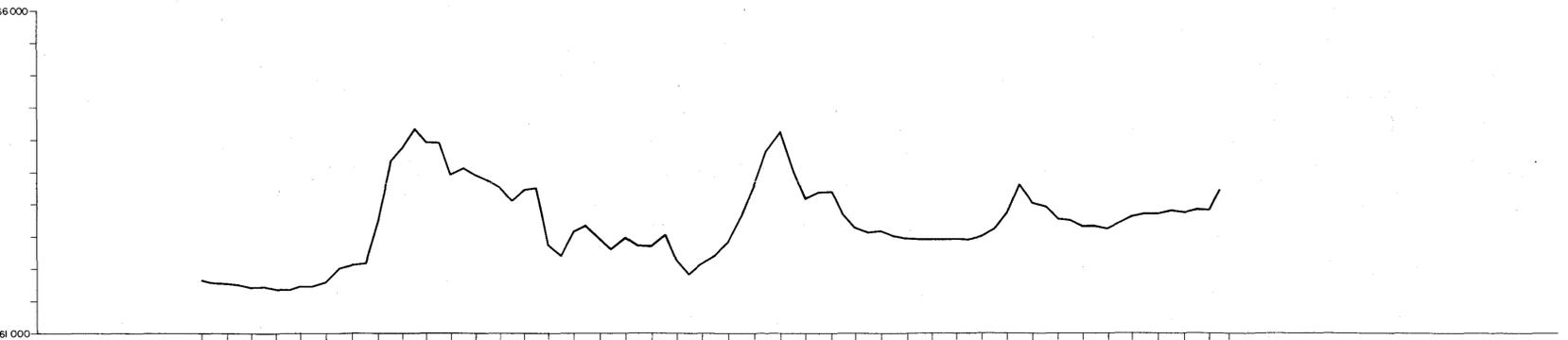


PULSE ELECTROMAGNETICS

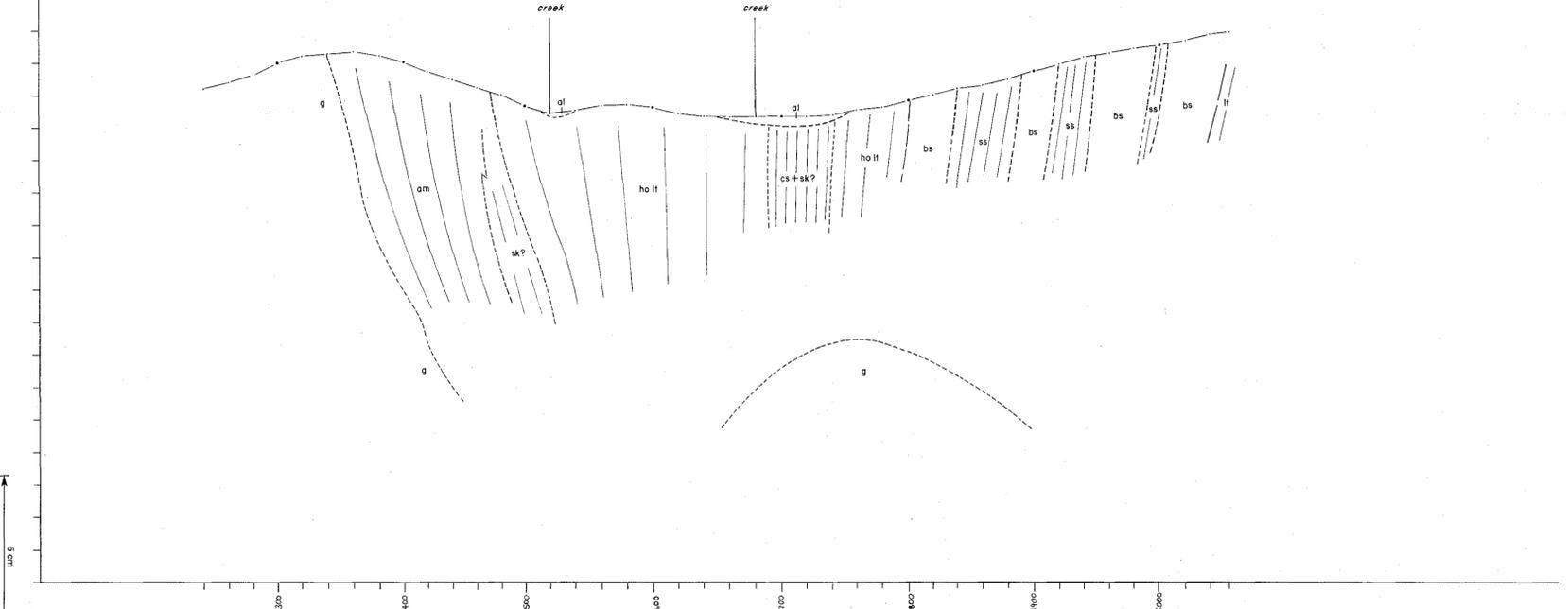
Timebase 20 msec, transmitter/receiver separation 100 m



GROUND MAGNETICS nT



TOPOGRAPHY & GEOLOGY



COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1797

COMPOSITE SECTION OF LINE 3980 N

TOPO, MAG, PEM, GEOCHEM, GEOLOGY

COMPILED G.F.P.

DRAWN AND PLOTTED J.S./J.B.

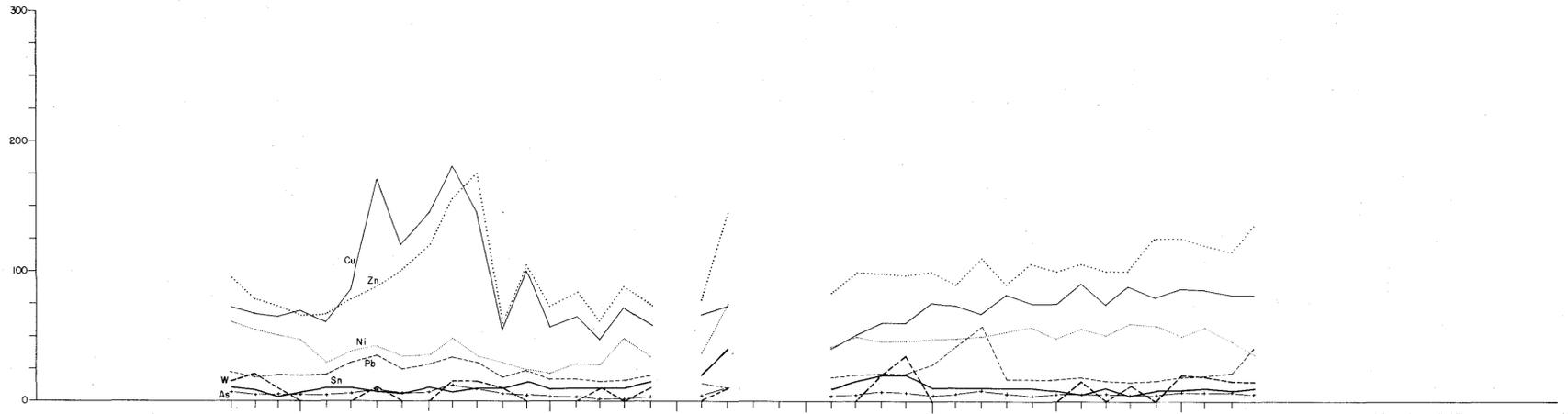
DATE 5/83

SCALE 1:2500

PLAN No. TMS/2/2826

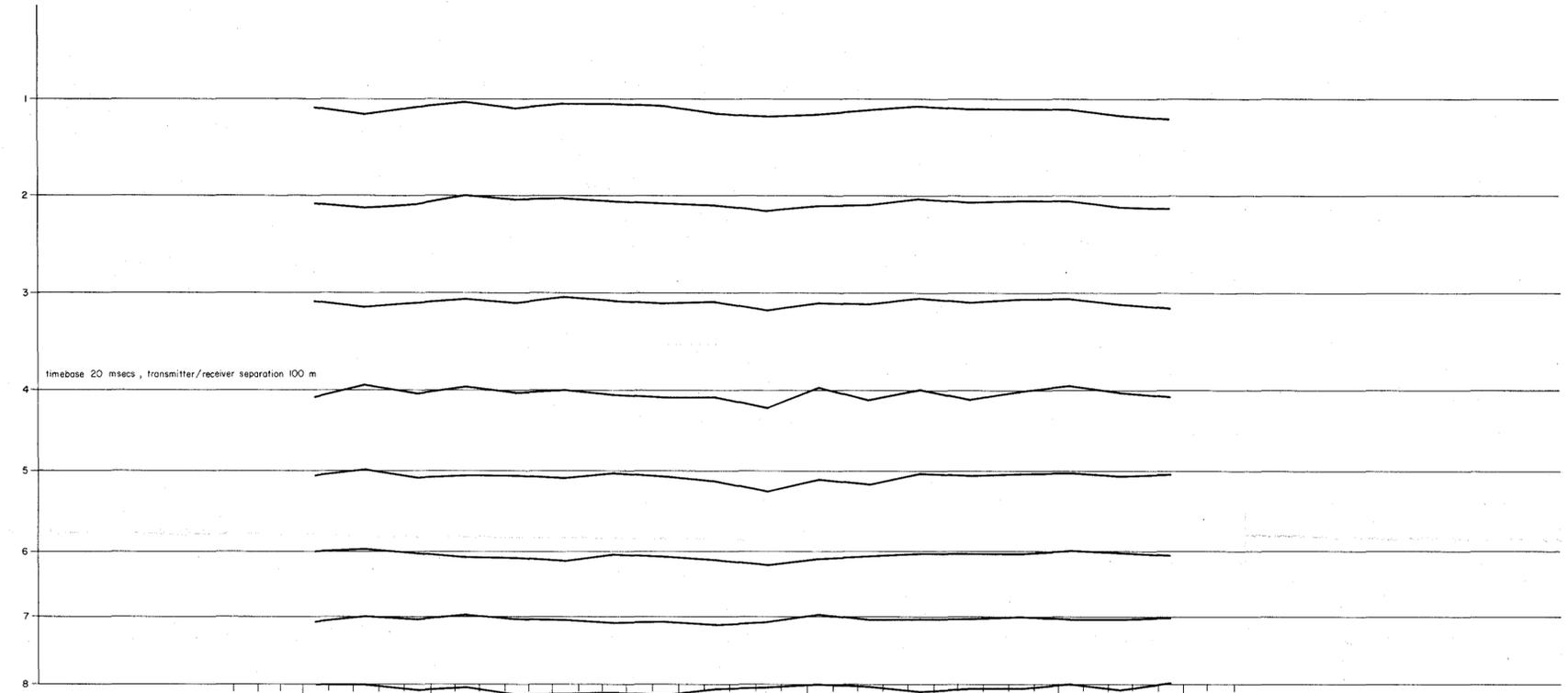
566062

GEOCHEMISTRY ppm



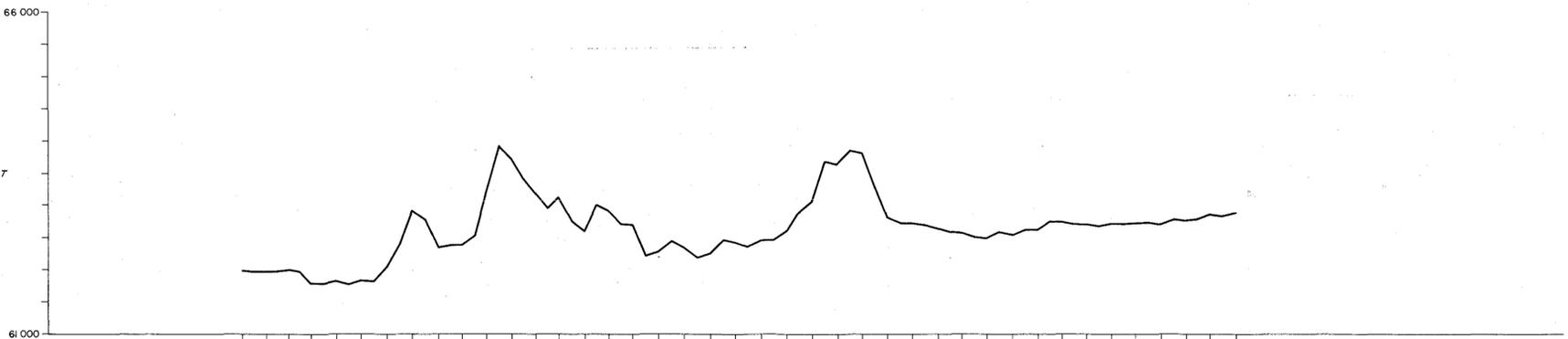
PULSE ELECTROMAGNETICS

Timebase 20 msec, transmitter/receiver separation 100 m

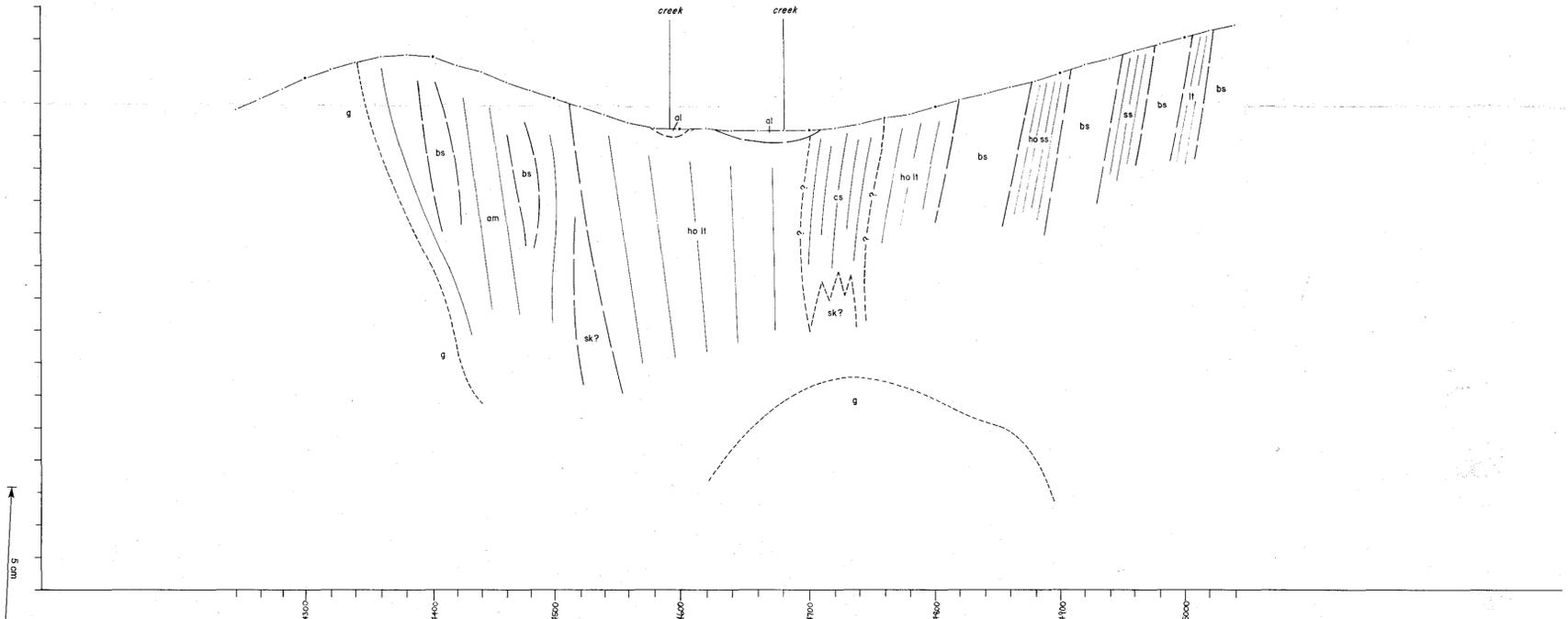


AMPLITUDE SCALE

GROUND MAGNETICS nT



TOPOGRAPHY & GEOLOGY



5m

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1798

COMPOSITE SECTION OF LINE 3920 N

TOPO, MAG, PEM, GEOCHEM, GEOLOGY

COMPILED G.F.P.

DRAWN T.D.P.

GEOGRAPHY 5/3/82

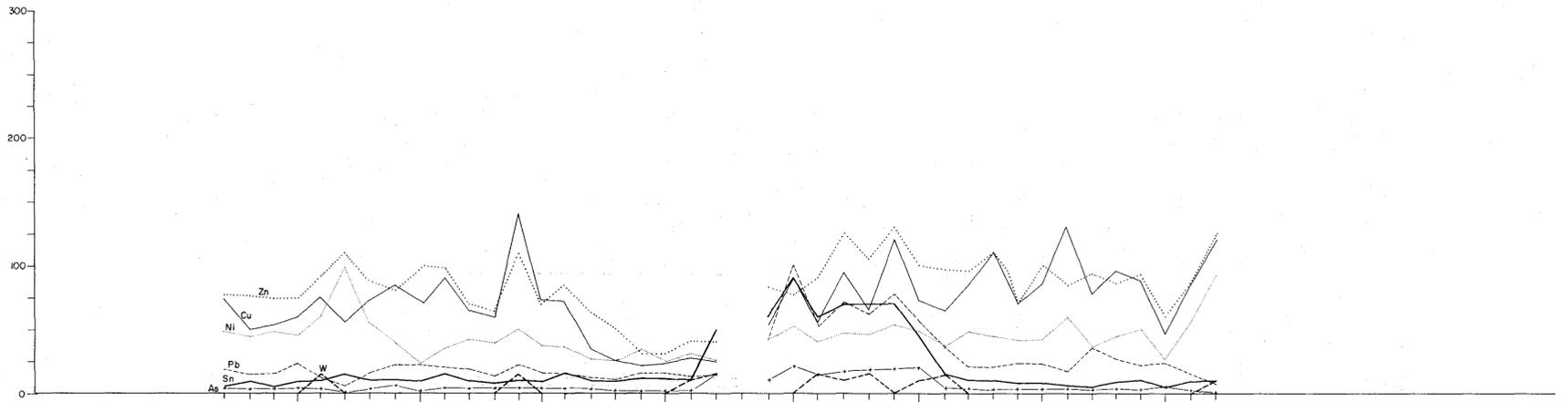
DATE 5/83

SCALE 1:2500

FILE NO TAS/2/2827

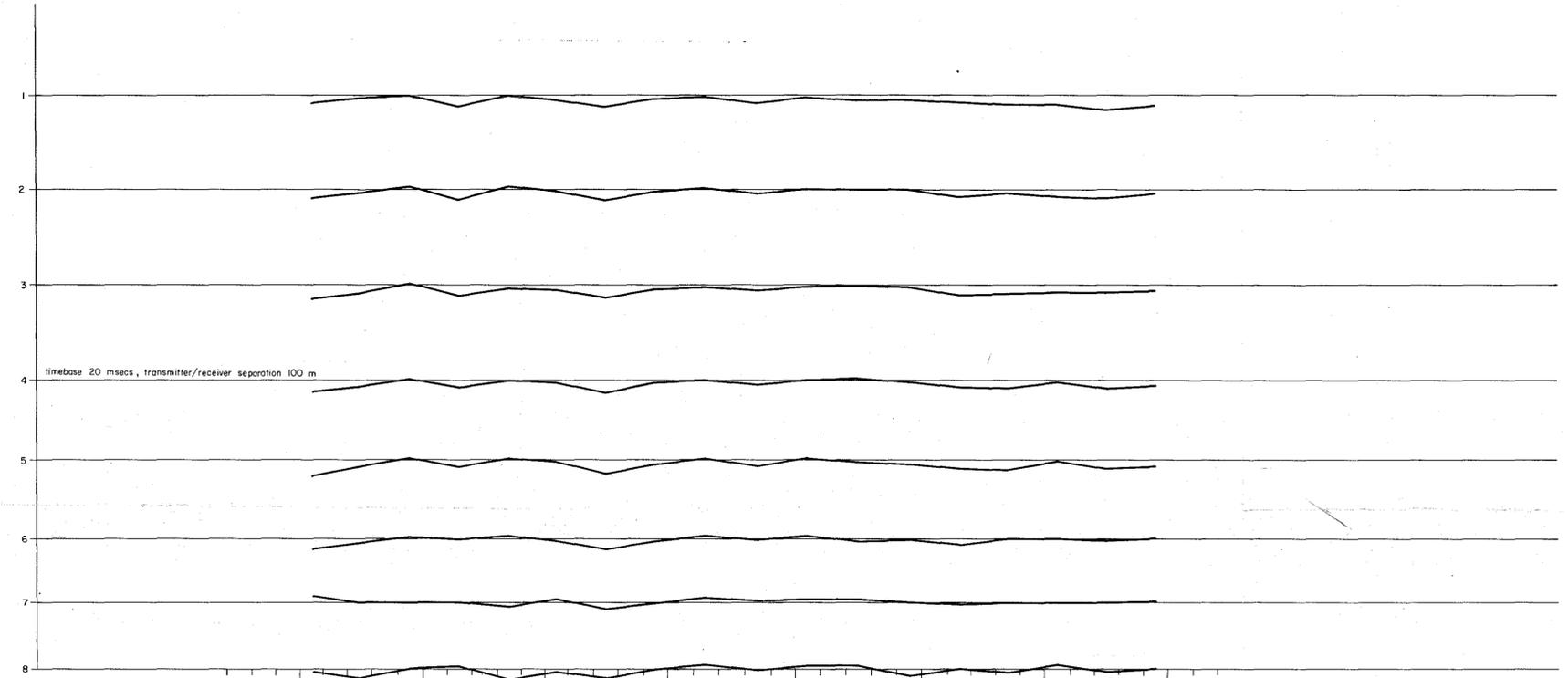
566063

GEOCHEMISTRY ppm



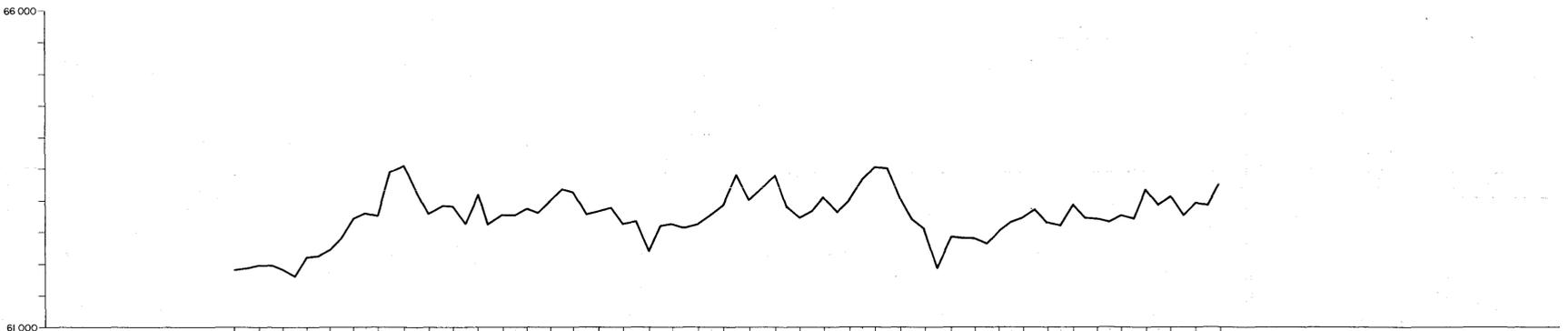
PULSE ELECTROMAGNETICS

timebase 20 msec, transmitter/receiver separation 100 m

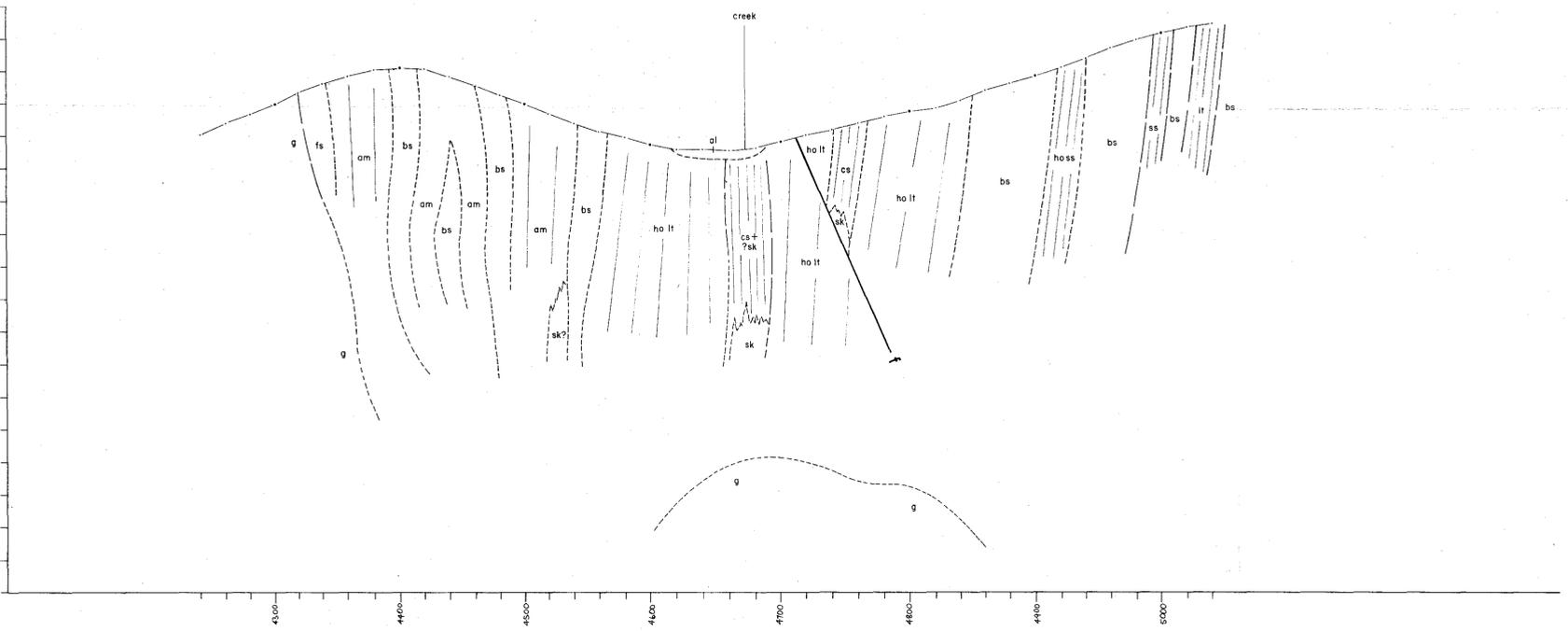


AMPLITUDE SCALE

GROUND MAGNETICS nT



TOPOGRAPHY & GEOLOGY



COMSTAFF PROPRIETARY LIMITED

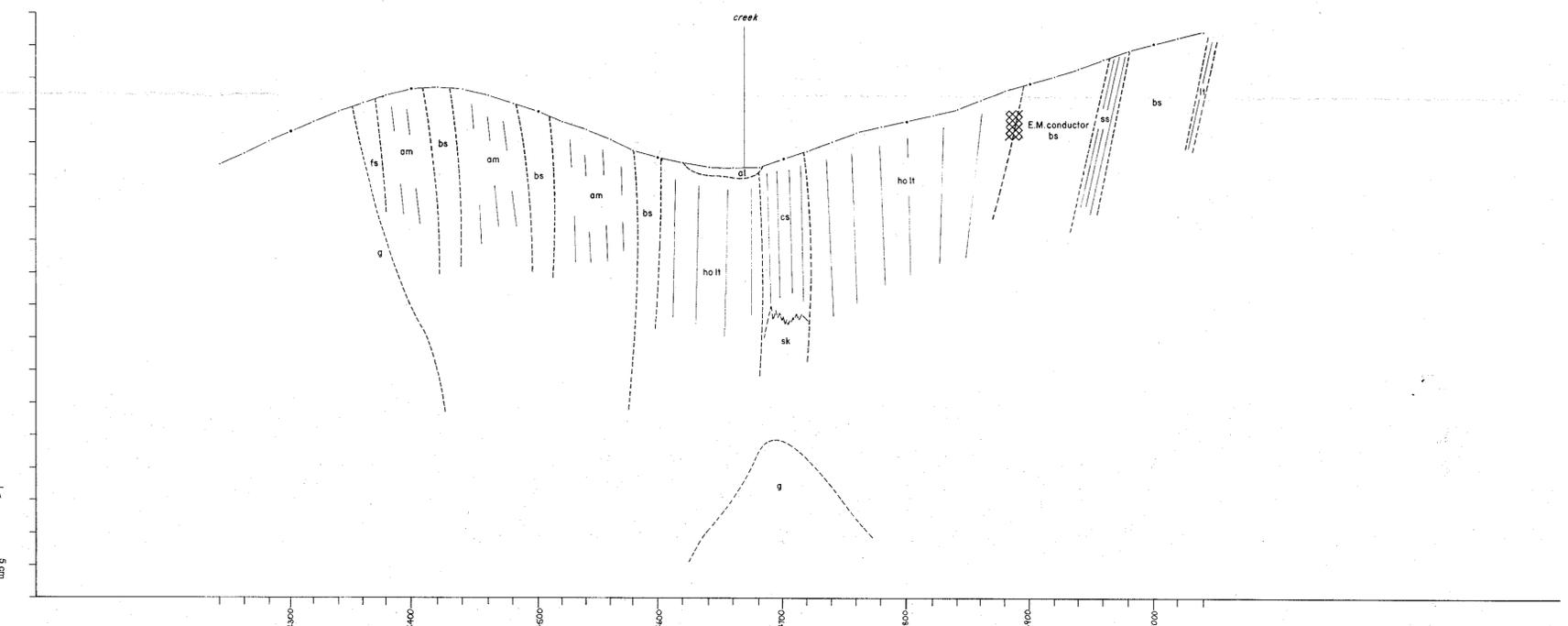
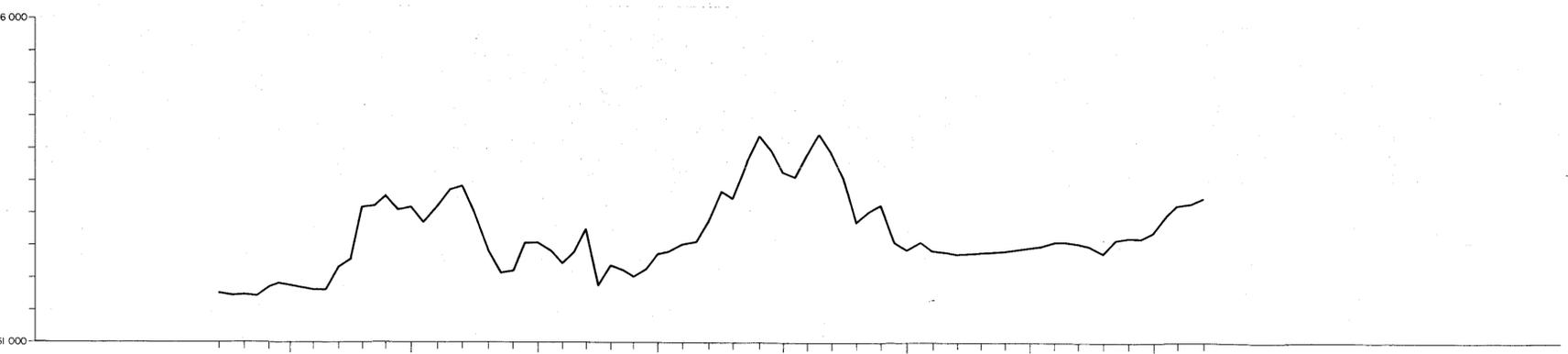
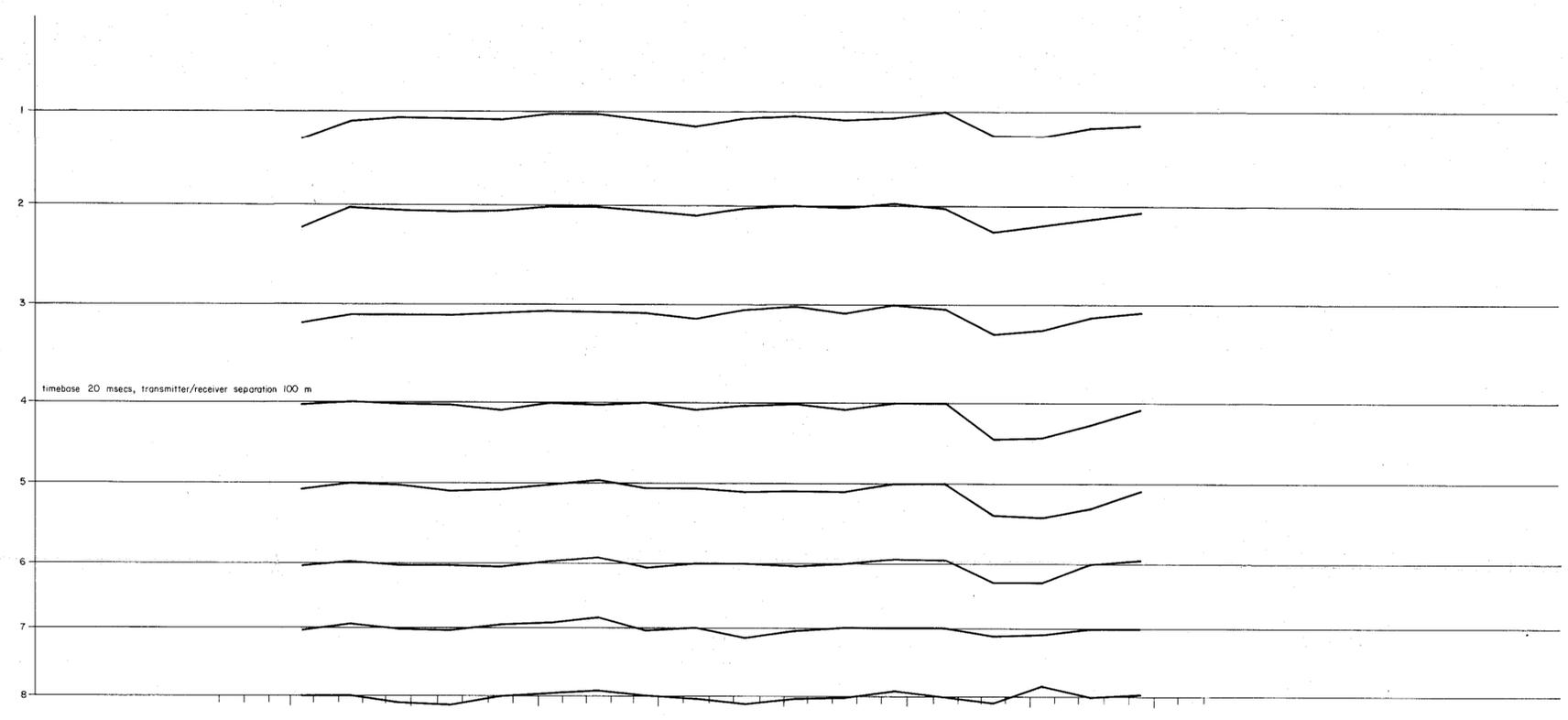
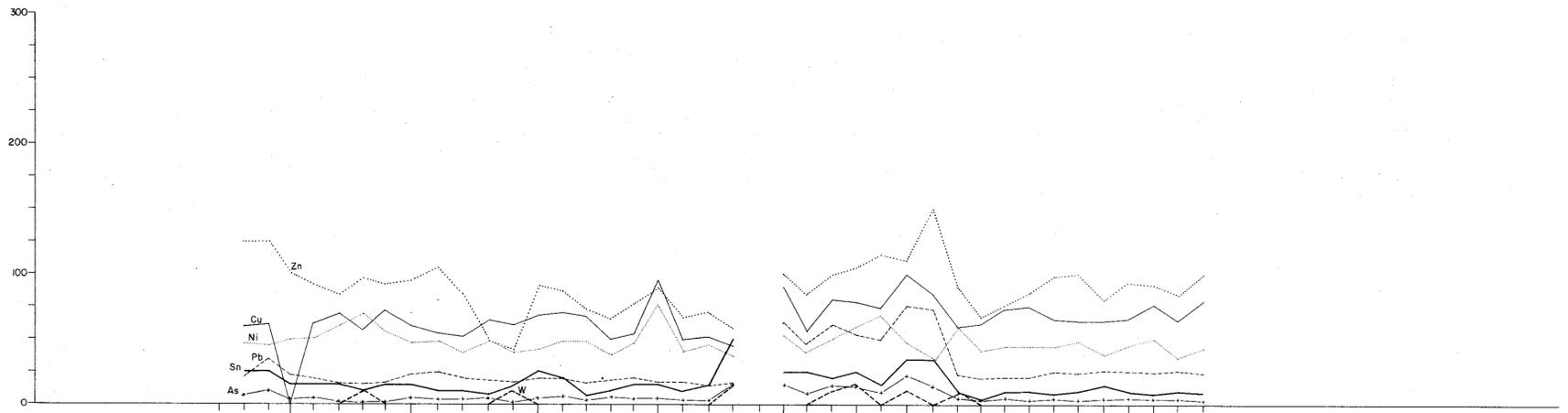
566064

RAMSAY GRID - CAF 1793

COMPOSITE SECTION OF LINE 3860 N

TOPO, MAG, PEM, GEOCHEM, GEOLOGY

DATE	5/3/82
BY	G.F.P.
SCALE	1:1,2500
PLANT No.	TAS/2/2828



COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1800

COMPOSITE SECTION OF LINE 3800 N

TOPO, MAG, PEM, GEOCHEM, GEOLOGY

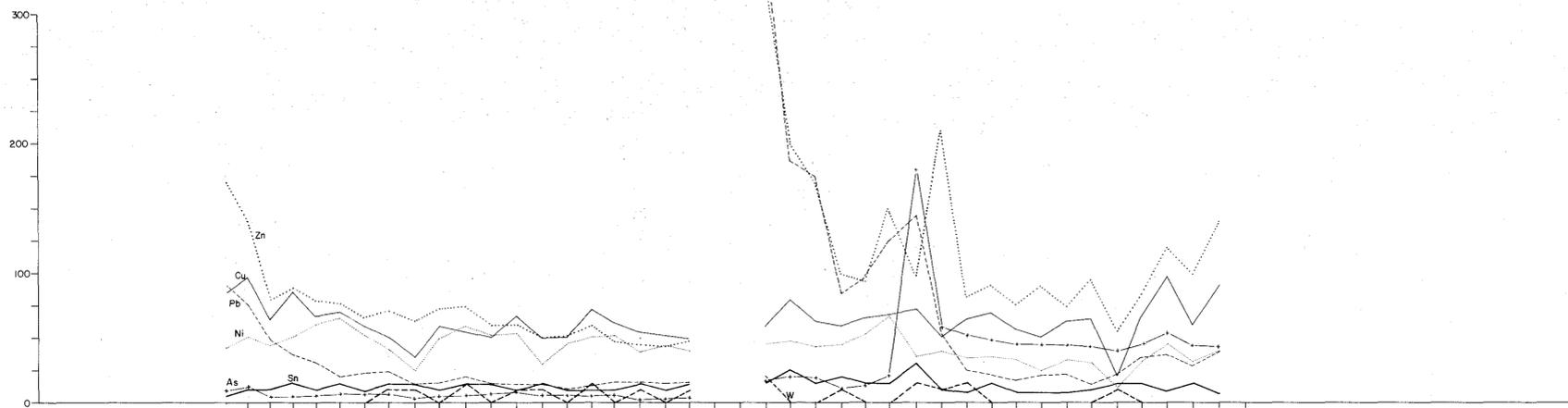
DATE 5/3/82

SCALE 1:12500

TAS/2/2829

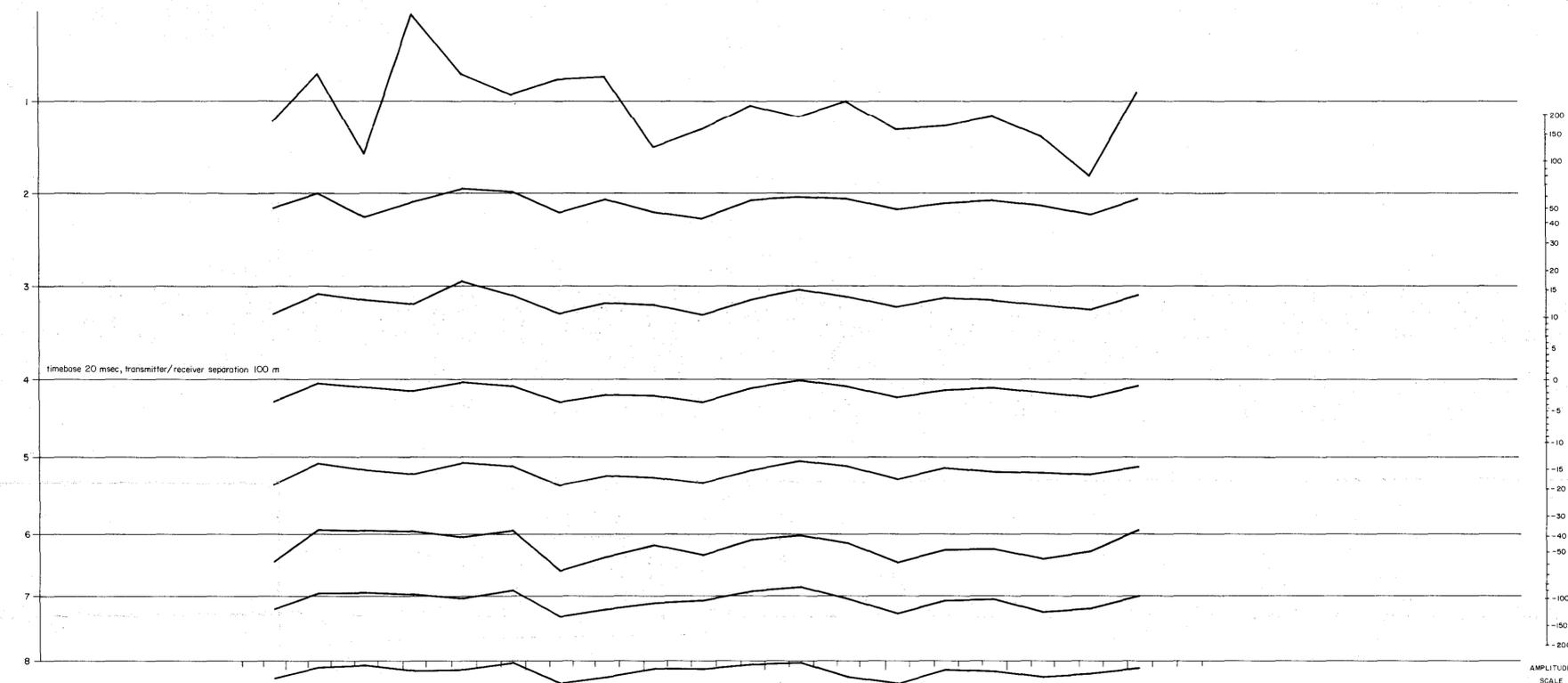
GEOCHEMISTRY

ppm



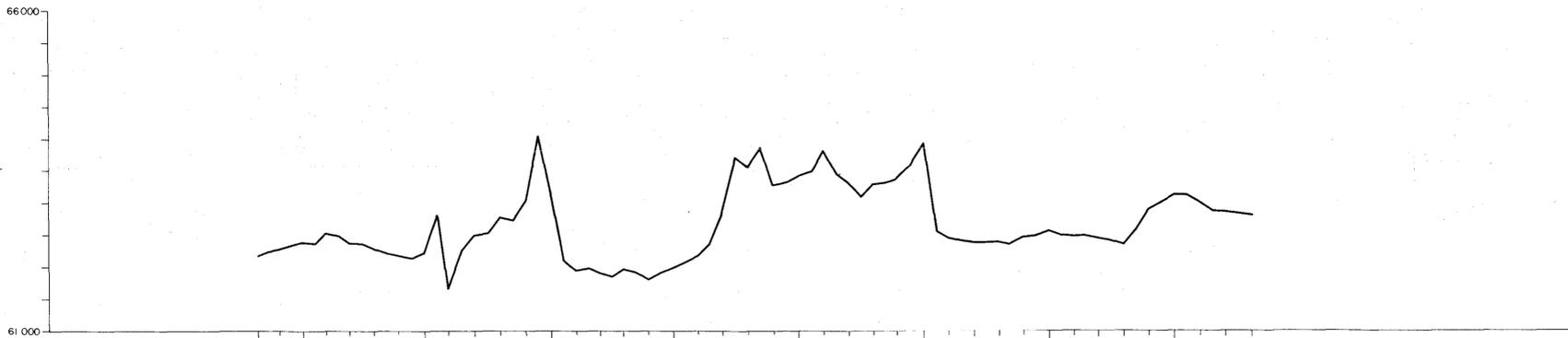
PULSE ELECTROMAGNETICS

timebase 20 msec, transmitter/receiver separation 100 m

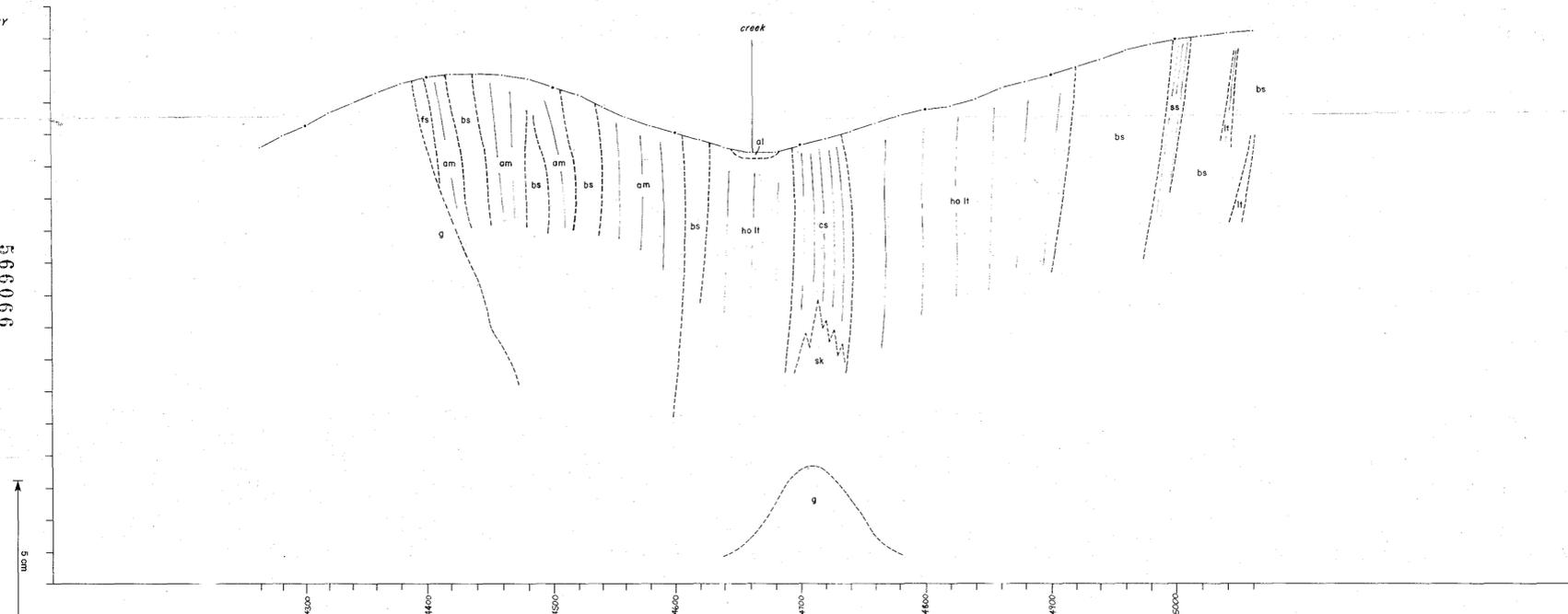


GROUND MAGNETICS

nT



TOPOGRAPHY & GEOLOGY

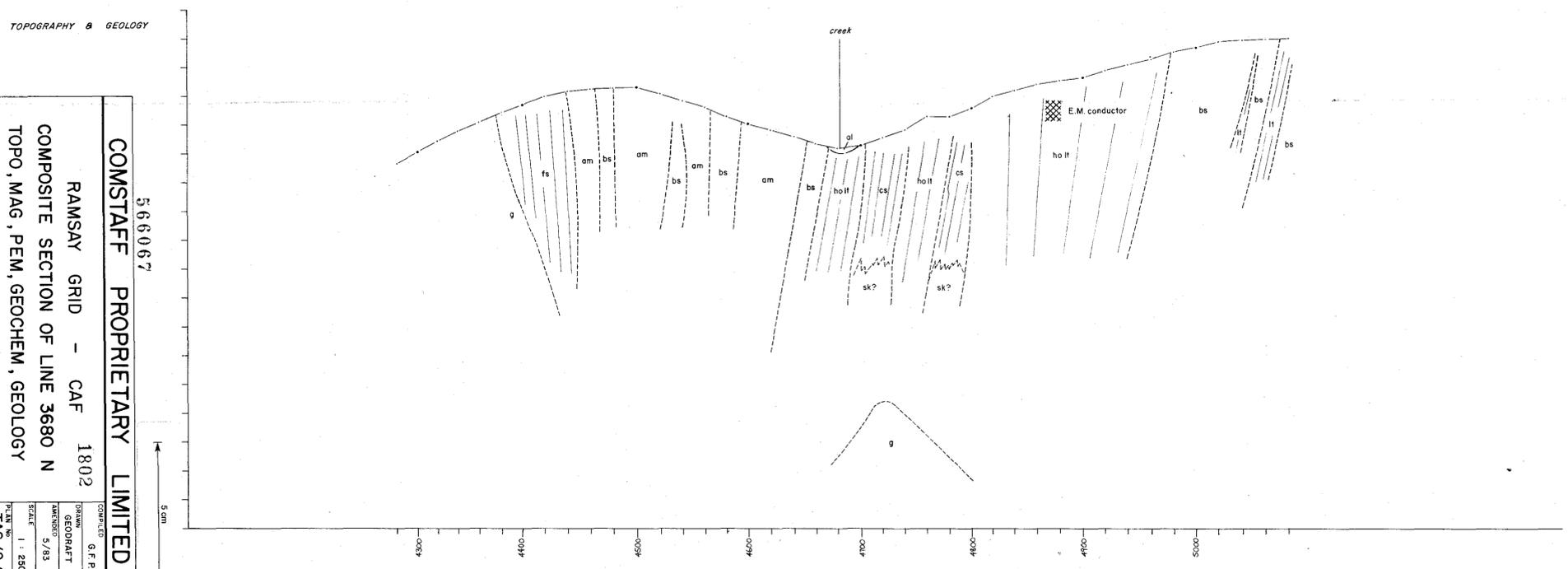
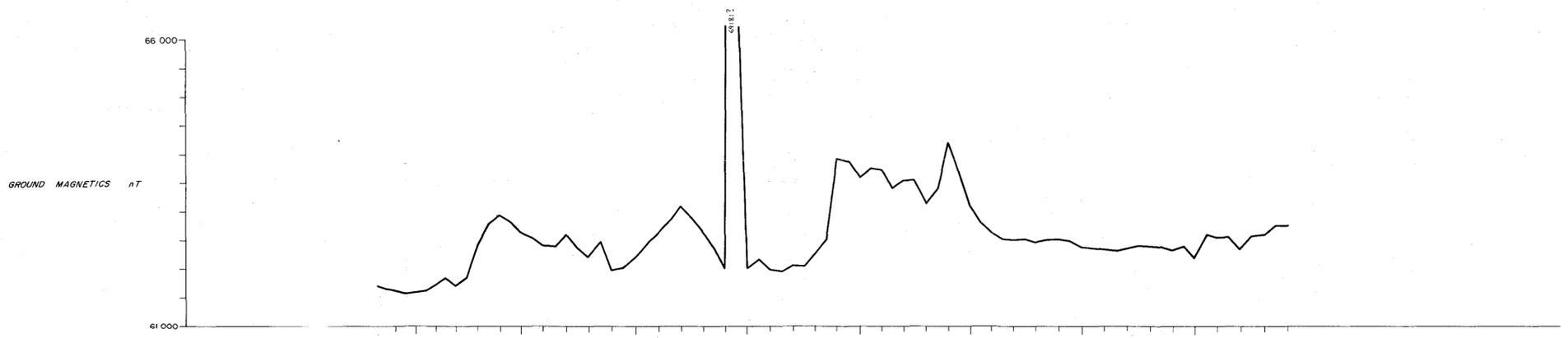
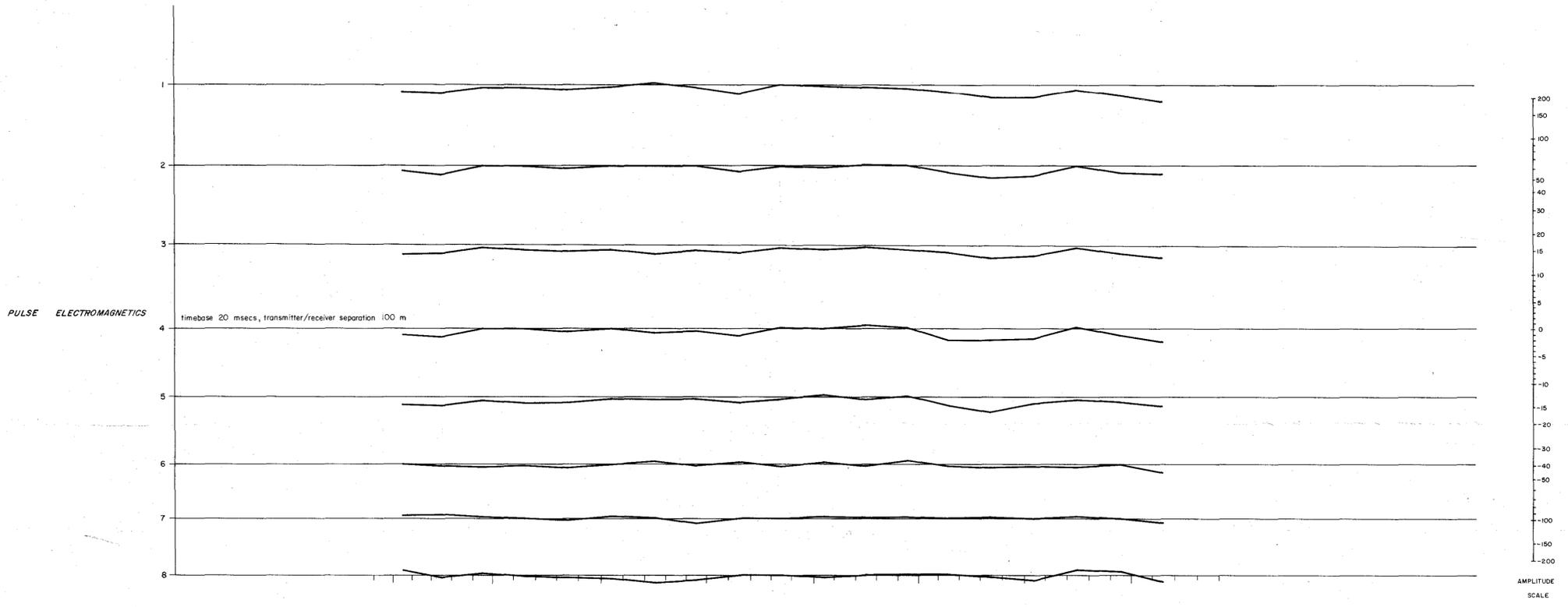
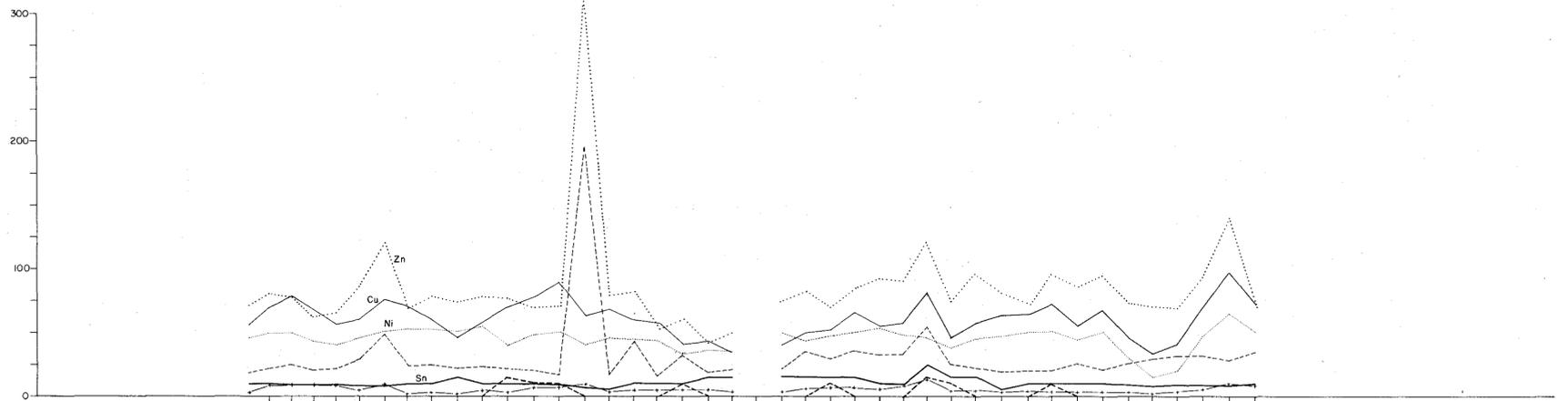


COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1801

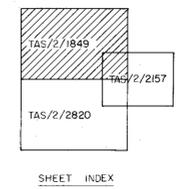
COMPOSITE SECTION OF LINE 3740 N
TOPO, MAG, PEM, GEOCHEM, GEOLOGY

DATE	5/3/82
DRAWN	G.F.P.
AMENDED	5/3/83
SCALE	1:2500
PLAN NO.	TAS/2/2830



COMSTAFF PROPRIETARY LIMITED
 566067
 RAMSAY GRID - CAF 1802
 COMPOSITE SECTION OF LINE 3680 N
 TOPO, MAG, PEM, GEOCHEM, GEOLOGY
 DRAWN G.F.P.
 CHECKED G.F.P.
 DATE 5/3/82
 GEOGRAPHY 5/3/82
 SCALE 1:2500
 PLAN NO. TAS/2/2831

372 000 m E



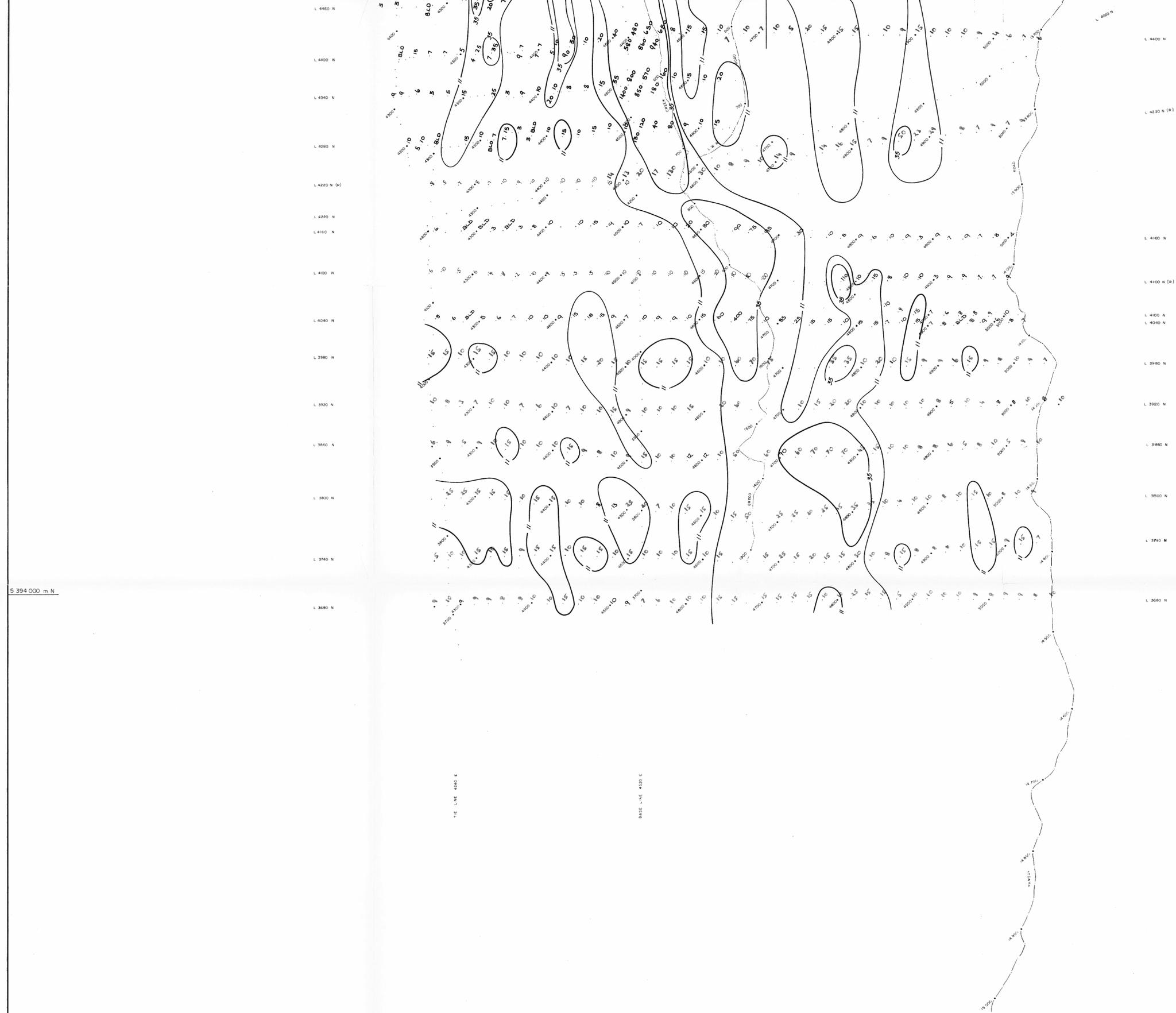
5 395 000 m N

566068

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 1803
 GEOCHEMICAL GRID AUGER SAMPLING
 TIN RESULTS in ppm

COMPILED	GEO DRAFT
DRAWN H. P.	DATE 4/79
AMENDED	2 / 8 / 82
SCALE	1 : 2500
PLAN No	TAS / 2 / 1849

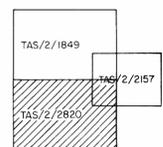


372,000 m N

TIE LINE 4260 E

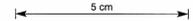
BASE LINE 4260 E

372,000 m E



SHEET INDEX

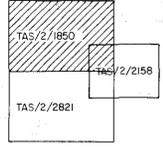
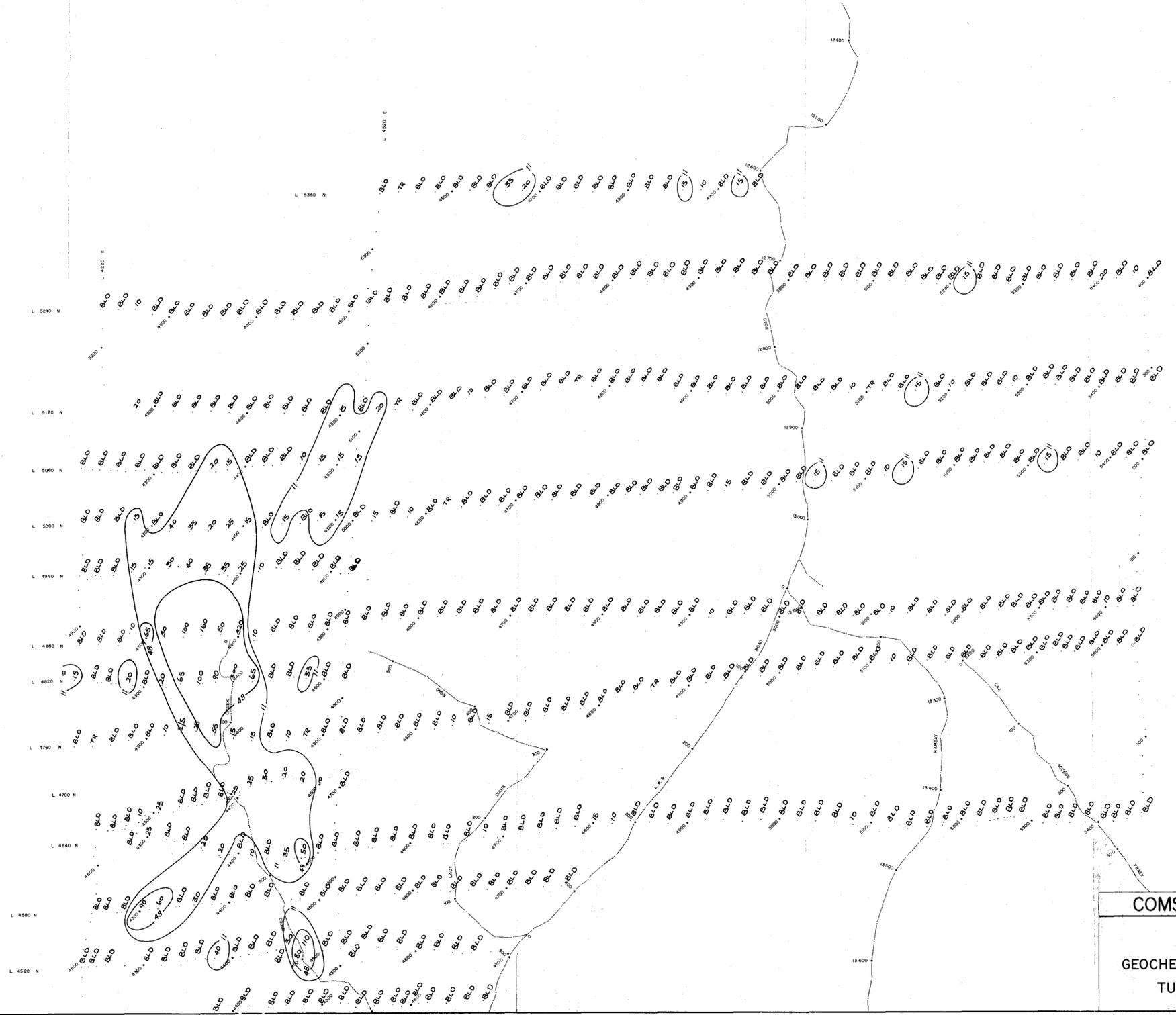
566069



COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF, SOUTHERN EXTENSIONS	
GEOCHEMICAL GRID AUGER SAMPLING	
TIN RESULTS in ppm 1804	
COMPLETED	VARIOUS
DRAWN	DATE
VARIOUS	27/3/82
AMENDED	
SCALE	1 : 2500
PLAN NO.	TAS/2/2820

372 000 m E

5 395 000 m N



SHEET INDEX

5 cm

566070

COMSTAFF PROPRIETARY LIMITED

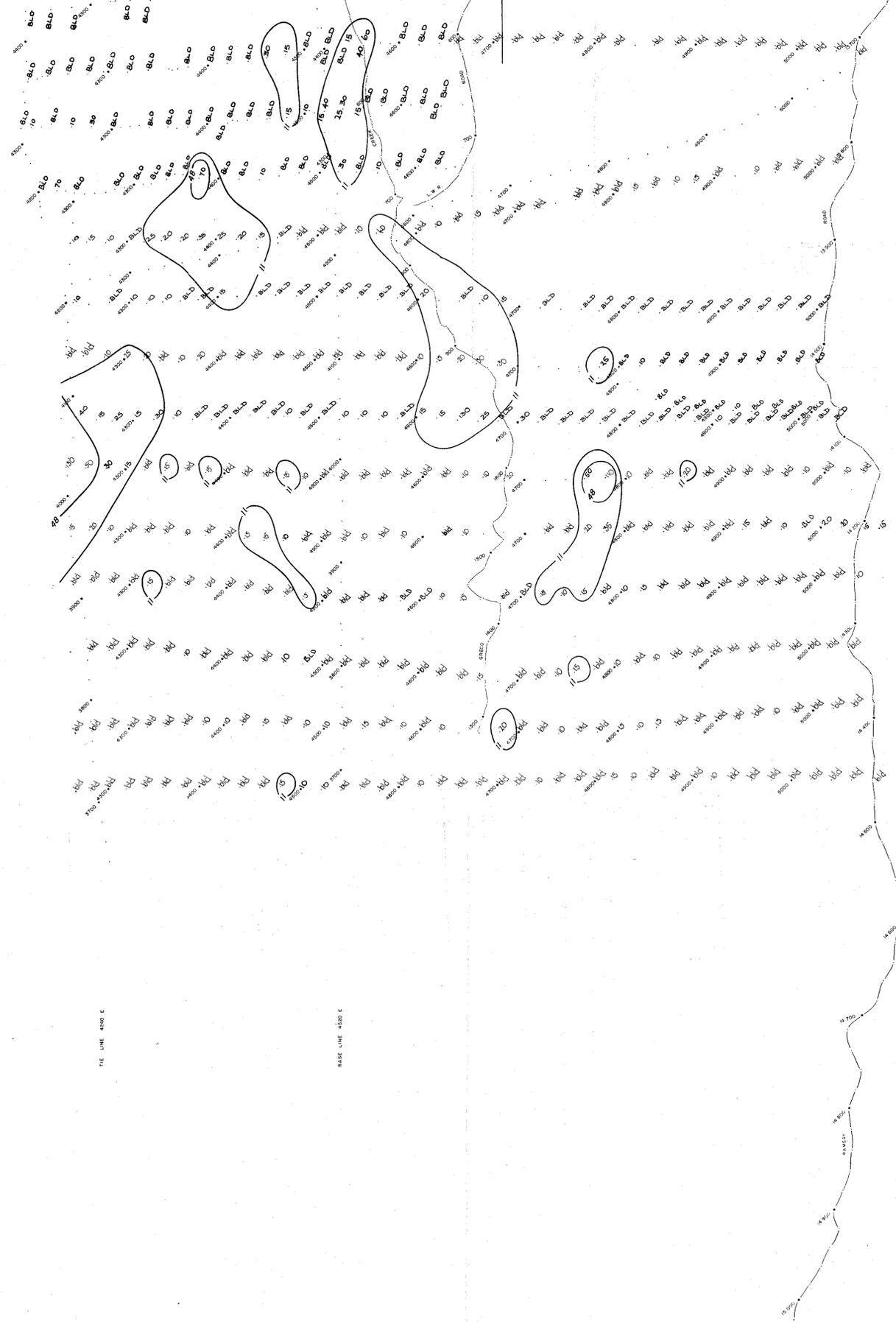
RAMSAY GRID - CAF
 GEOCHEMICAL GRID AUGER SAMPLING
 TUNGSTEN RESULTS in ppm 1805

COMPILED	GEODRAFT
DRAWN	H.P.
DATE	4/79
AMENDED	2 / 8 / 82
SCALE	1 : 2500
PLAN No.	TAS/2/1850

L 4450 N
L 4400 N
L 4350 N
L 4280 N
L 4220 N (R)
L 4220 N
L 4180 N
L 4100 N
L 4040 N
L 3980 N
L 3920 N
L 3860 N
L 3800 N
L 3740 N
L 3680 N

L 4400 N
L 4220 N (R)
L 4180 N
L 4100 N (R)
L 4040 N
L 3980 N
L 3920 N
L 3860 N
L 3800 N
L 3740 N
L 3680 N

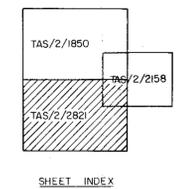
5 394 000 m E



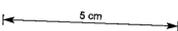
THE LINE 4000 E

BASE LINE 2300 E

572 000 m E

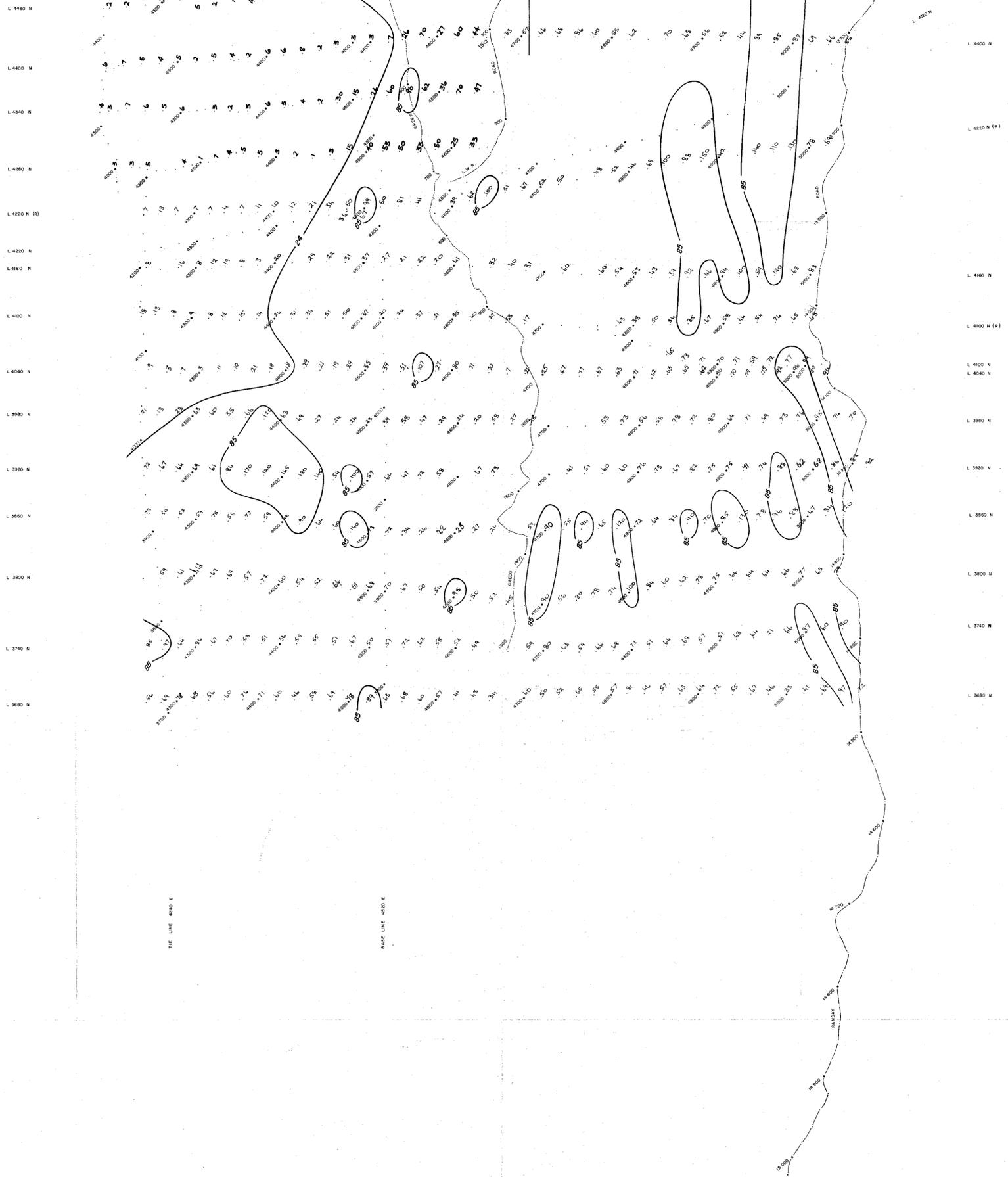


SHEET INDEX



566071

COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF, SOUTHERN EXTENSIONS	
GEOCHEMICAL GRID AUGER SAMPLING	
TUNGSTEN RESULTS in ppm 1806	
COMPILED	VARIOUS
DRAWN	DATE
VARIOUS	27/3/82
AMENDED	
SCALE	1 : 2500
PLAN No	TAS / 2 / 2821



5 394 000 m N

L 3680 N

L 3740 N

L 3800 N

L 3860 N

L 3920 N

L 3980 N

L 4040 N

L 4100 N

L 4160 N

L 4220 N

L 4280 N

L 4340 N

L 4400 N

L 4460 N

L 4000 N

L 4000 N (R)

L 4100 N (R)

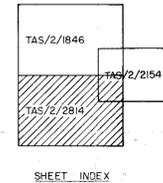
L 4100 N

L 4040 N

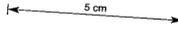
L 3980 N

L 3920 N

L 3860 N



566073



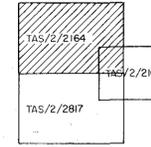
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF, SOUTHERN EXTENSIONS
 GEOCHEMICAL GRID AUGER SAMPLING
 COPPER VALUES in ppm 1808

COMPLETED	VARIOUS
DRAWN	DATE
VARIOUS	27/3/82
AMENDED	
SCALE	1 : 2500
PLAN No	TAS/2/2814

372 000 m E

372 000 m E



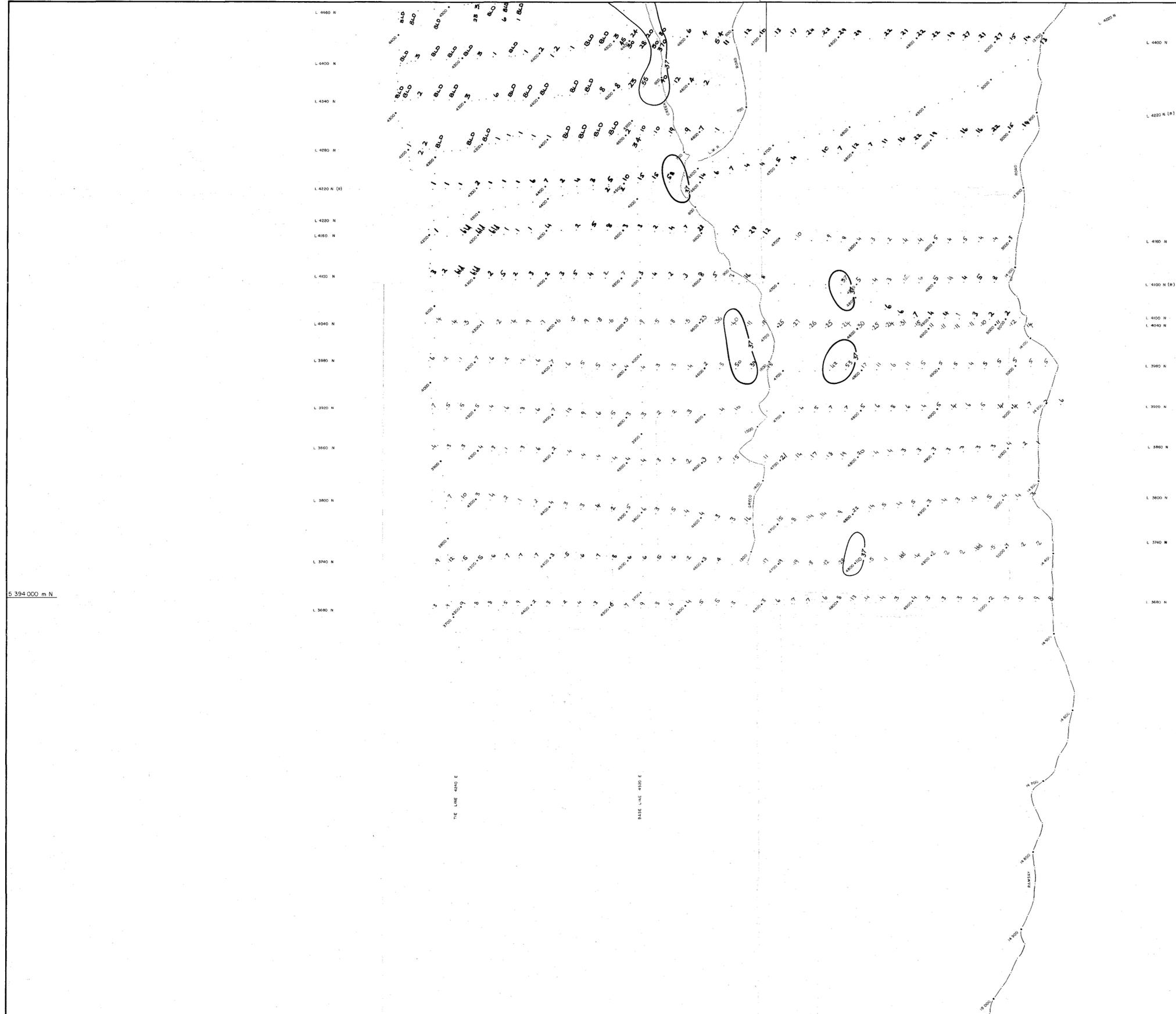
SHEET INDEX

5 395 000 m N



566074

COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF	
GEOCHEMICAL GRID AUGER SAMPLING	
ARSENIC RESULTS in ppm 1809	
COMPILED	GEODRAFT
DRAWN H.P.	DATE 4/79
AMENDED	2/8/82
SCALE	1:2500
PLAN NO.	TAS/2/2164



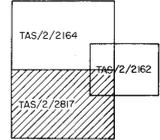
5394.000 m N

L 4460 N
L 4480 N
L 4500 N
L 4520 N (R)
L 4540 N
L 4560 N
L 4580 N
L 4600 N
L 4620 N (R)
L 4640 N
L 4660 N
L 4680 N
L 4700 N
L 4720 N
L 4740 N
L 4760 N
L 4780 N
L 4800 N
L 4820 N (R)
L 4840 N
L 4860 N
L 4880 N
L 4900 N
L 4920 N
L 4940 N
L 4960 N
L 4980 N
L 5000 N
L 5020 N
L 5040 N
L 5060 N
L 5080 N
L 5100 N
L 5120 N
L 5140 N
L 5160 N
L 5180 N
L 5200 N
L 5220 N (R)
L 5240 N
L 5260 N
L 5280 N
L 5300 N
L 5320 N
L 5340 N
L 5360 N
L 5380 N
L 5400 N
L 5420 N
L 5440 N
L 5460 N
L 5480 N
L 5500 N
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L 5560 N
L 5580 N
L 5600 N
L 5620 N
L 5640 N
L 5660 N

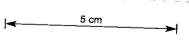
THE LINE 4250 E

BASE LINE 4350 E

372.000 m E



SHEET INDEX

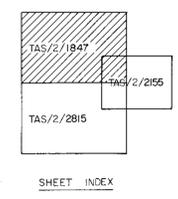
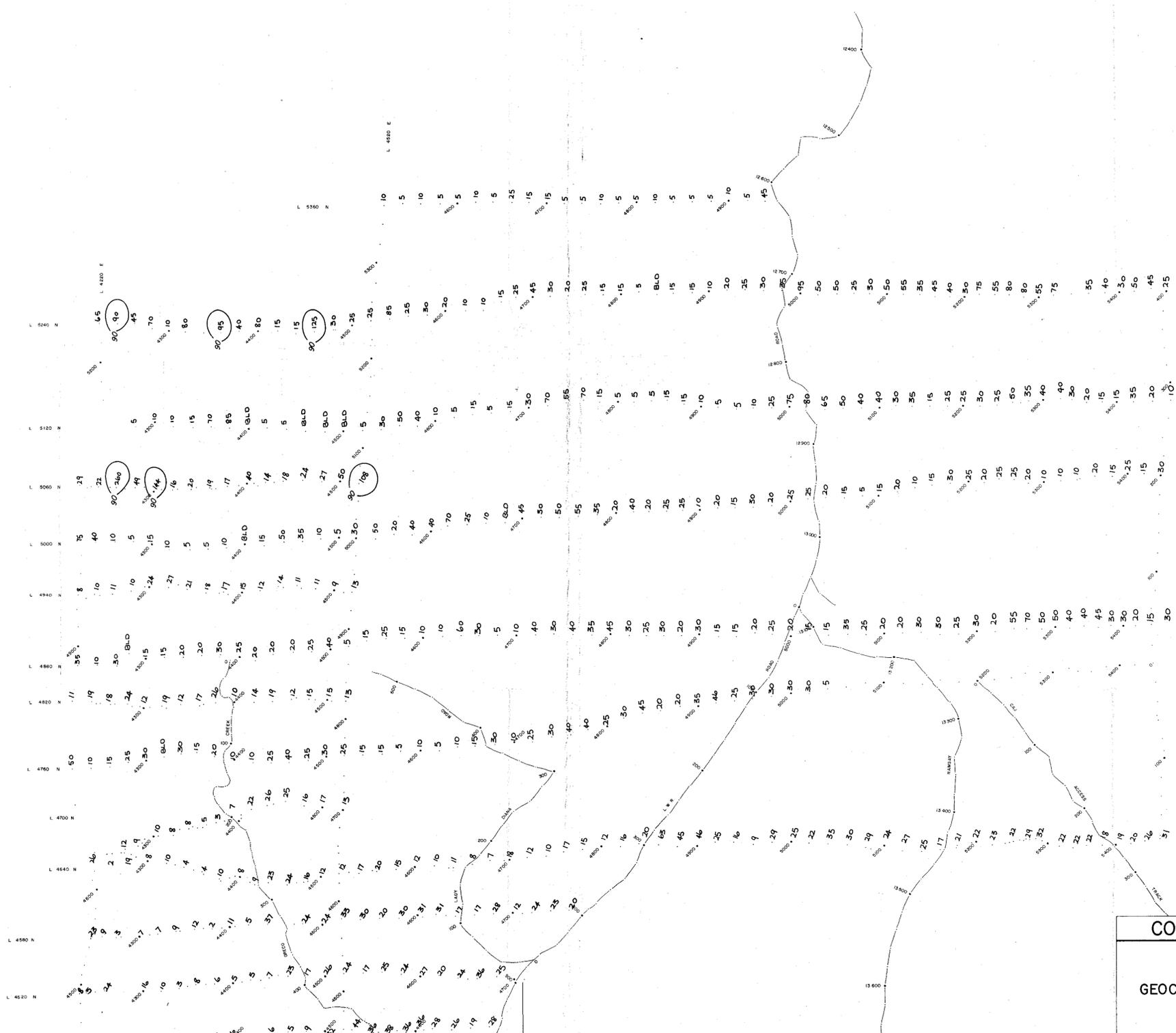


566075

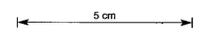
COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF, SOUTHERN EXTENSIONS	
GEOCHEMICAL GRID AUGER SAMPLING	
ARSENIC RESULTS in ppm	
1810	
TAS/2/2817	
COMPLETED	VARIOUS
DRAWN	VARIOUS
DATE	27/3/82
AMENDED	
SCALE	1 : 2500

5 395 000 m N

372 000 m E

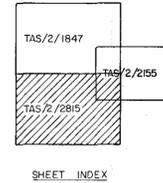
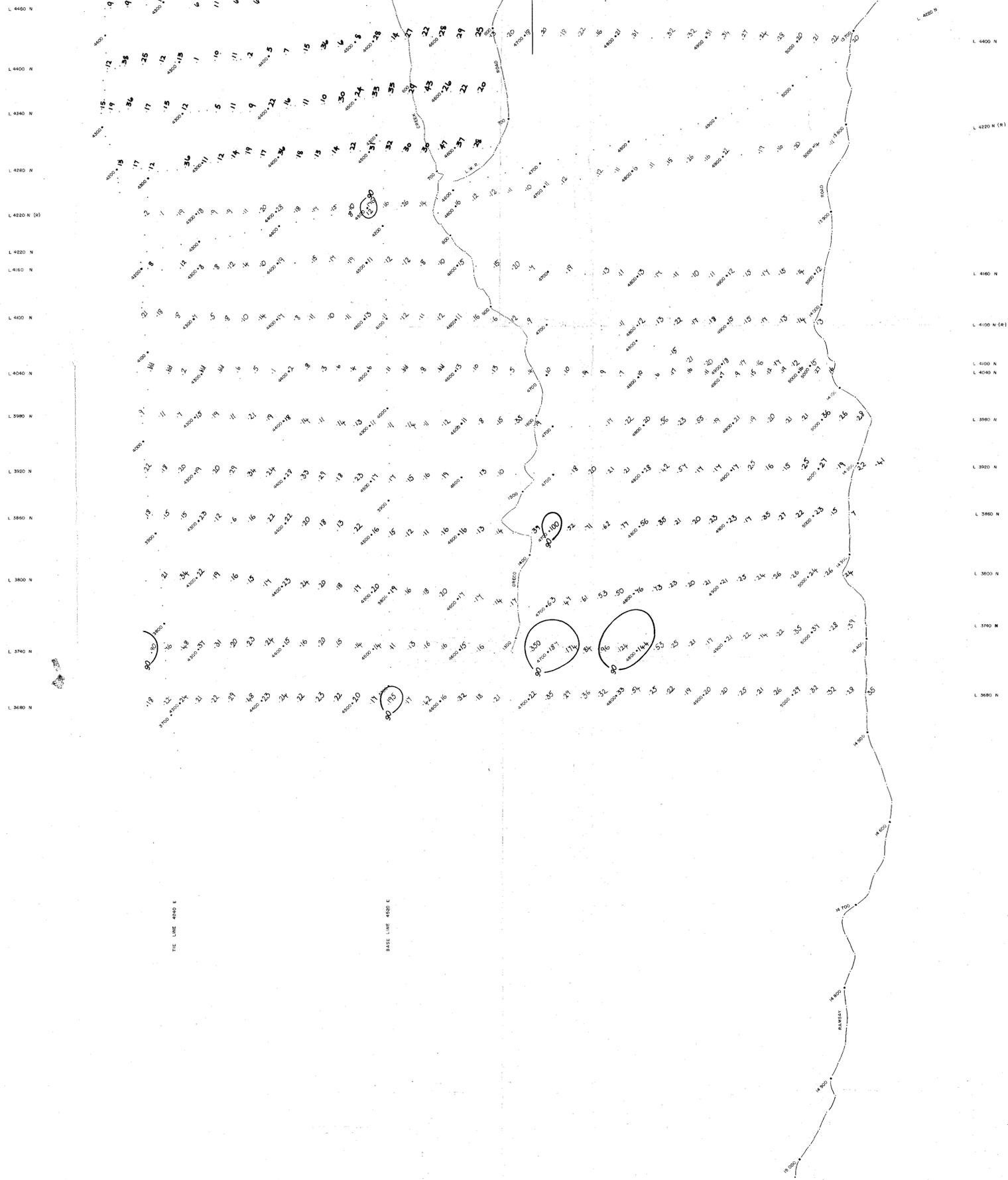


566076



COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF	
GEOCHEMICAL GRID AUGER SAMPLING	
LEAD RESULTS in ppm 1811	
COMPLETED	GEO-DRAFT
DRAWN	H.P.
AMENDED	DATE
SCALE	2 / 8 / 82
PLAN No	1 : 2500
	TAS/2/1847

5 394 000 m N



SHEET INDEX

5 cm

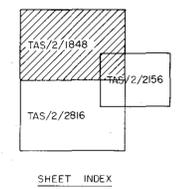
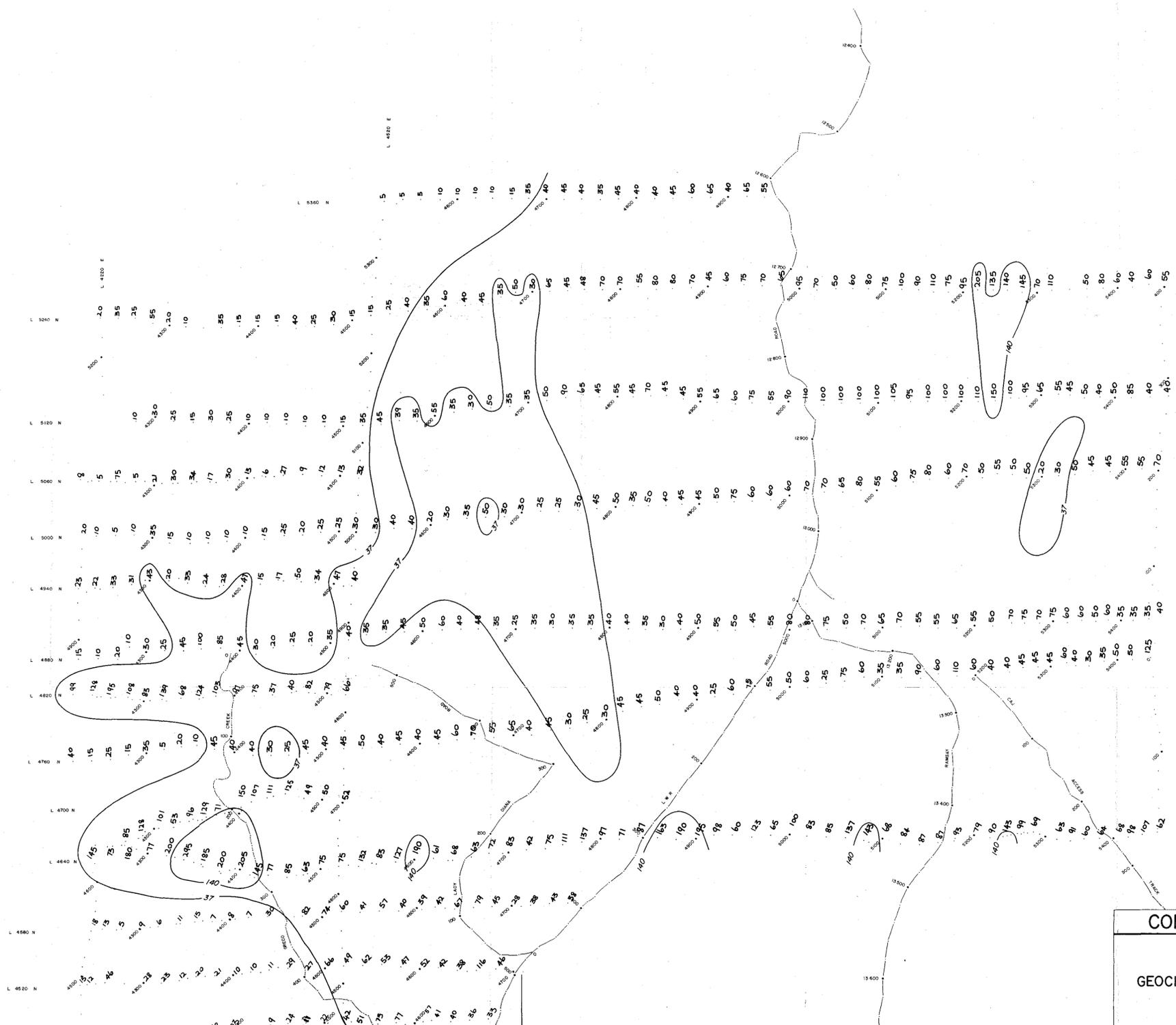
566077

COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF, SOUTHERN EXTENSIONS	
GEOCHEMICAL GRID AUGER SAMPLING	
LEAD RESULTS in ppm 1812	
COMPLETED	VARIOUS
DRAWN	DATE
VARIOUS	27/3/82
AMENDED	
SCALE	
	1 : 2500
PLAN No	
	TAS/2/2815

372 000 m E

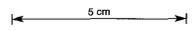
5 395 000 m N

372 000 m E



SHEET INDEX

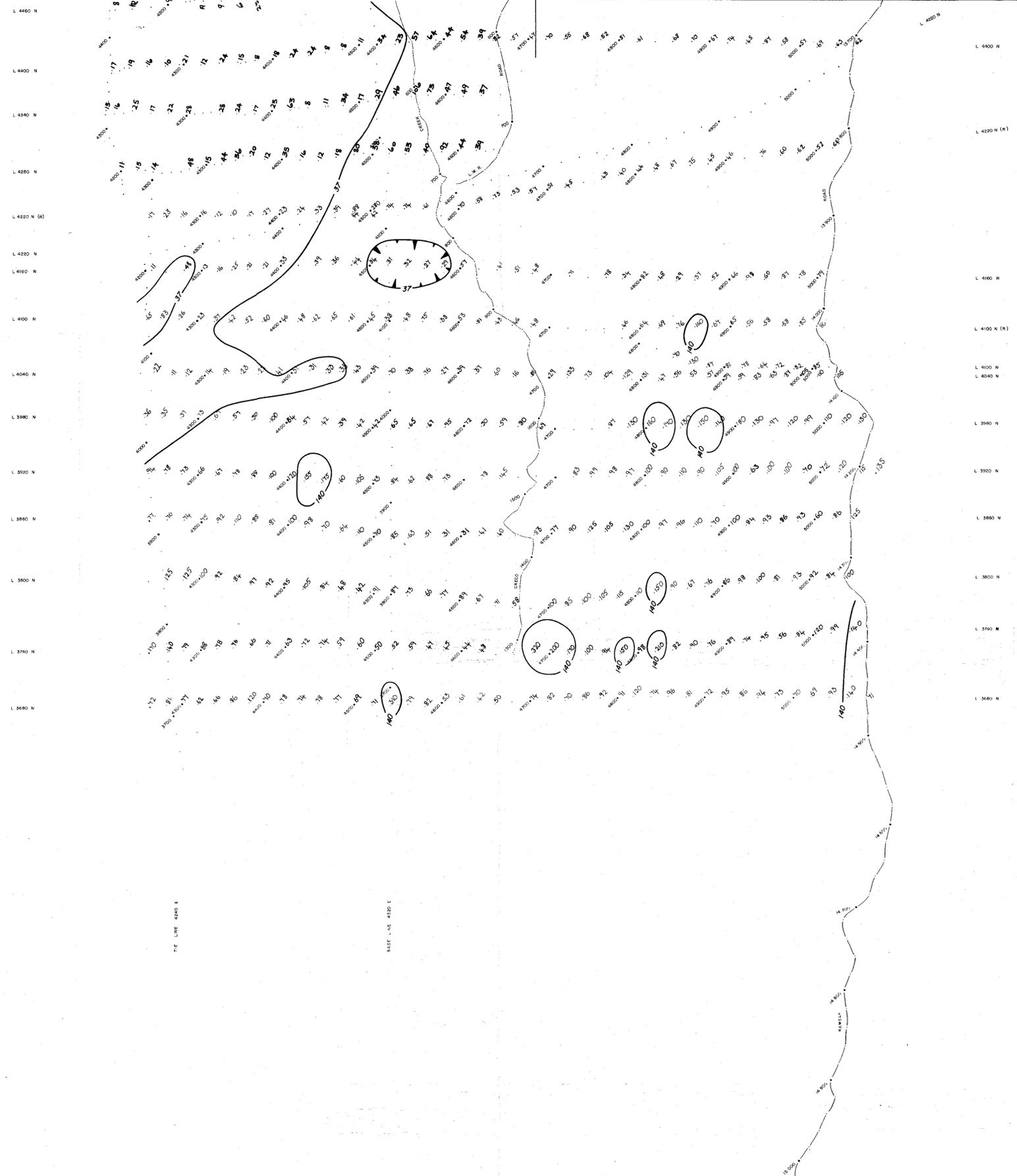
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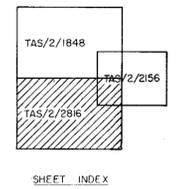
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF
 GEOCHEMICAL GRID AUGER SAMPLING
 ZINC RESULTS in ppm 1813

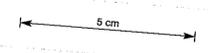
COMPLETED	GEODRAFT
DRAWN	H.P.
DATE	4/79
AMENDED	2/8/82
SCALE	1:2500
PLAN NO.	TAS/2/1848



S 394 000 m N



SHEET INDEX



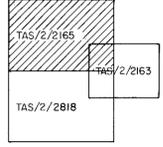
566079

COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF, SOUTHERN EXTENSIONS	
GEOCHEMICAL GRID AUGER SAMPLING	
ZINC RESULTS in ppm 1814	
COMPILED	VARIOUS
DRAWN	VARIOUS
DATE	27/3/82
AMENDED	
SCALE	1 : 2500
PLAN No	TAS/2/2816

372000 m E

372 000 m E

5 395 000 m N



SHEET INDEX



566080

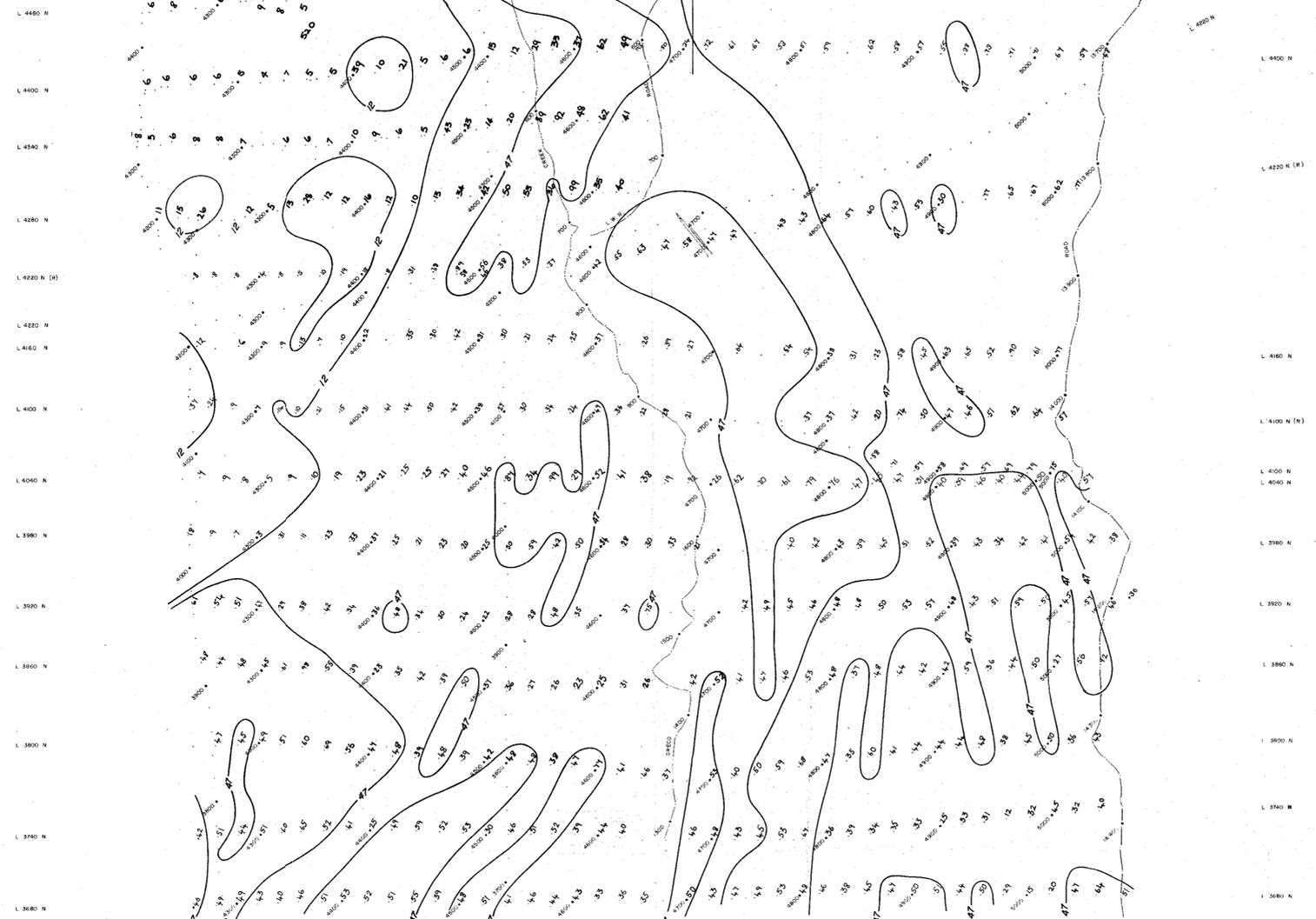
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF

GEOCHEMICAL GRID AUGER SAMPLING

NICKEL RESULTS in ppm 1815

COMPILED		GEO DRAFT	
DRAWN	H. P.	DATE	4/79
AMENDED		2/8/82	
SCALE		1 : 2500	
PLAN No.		TAS/2/2165	

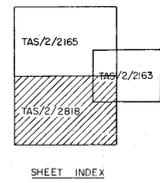


5 394 000 m N

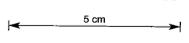
TIE LINE 4240 E

BASE LINE 4500 E

372 000 m E



566081



COMSTAFF PROPRIETARY LIMITED	
RAMSAY GRID - CAF, SOUTHERN EXTENSIONS	
GEOCHEMICAL GRID AUGER SAMPLING	
NICKEL RESULTS in ppm	
1816	
COMPLETED	VARIOUS
DRAWN	DATE
VARIOUS	27/3/82
AMENDED	
SCALE	1 : 2500
PLAN No	TAS/2/2818

000

566082

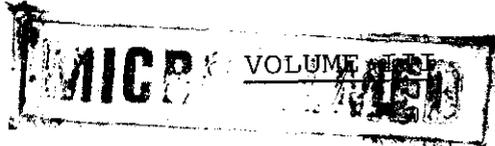
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DEPT. OF MINES				
REF. NO. 4860/83				

PROJECT NAME: COMSTAFF PROPRIETARY LIMITED

TITLE: INTERIM REPORT ON THE MOUNT RAMSAY
TIN-TUNGSTEN PROJECT

EXPLORATION LICENCE 5/63 PART 2



AREA NAME/S, STATE 1:250,000 SHEET NO/S & COORDINATES: Burnie Sheet S 55/3
Metric Co-ordinate 5395000N
372000E

COMMODITY/IES: Sn

TEXT PAGES NO:

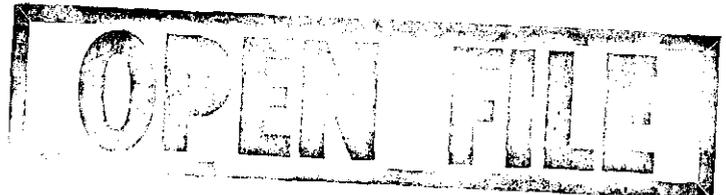
PLAN NOS: As detailed

TABLE NOS: 1

APPENDICES: 1

AUTHOR/S: G F Pigott

DATE: 27th April 1983



AUSTRALIAN ANGLO AMERICAN LIMITED

Incorporated in the State of Victoria

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I AIRBORNE GEOPHYSICS

Three separate airborne geophysical surveys have been carried out over the CAF in the last 10 years.

In April 1975 a Mark V Input survey was flown by Geoterrex on east west oriented lines spaced 400m apart. The average terrain clearance was 140m. The electromagnetic anomaly map and magnetic contour plans accompany this report. The CAF grid was initially positioned to delineate a conductor on line 241AE interpreted to be possibly due to a massive sulphide source. The original profile is reproduced in figure 1. The EM response is narrow in width and has a good shape. The anomaly is not isolated but part of an extensive north striking conductor. On line 241AE however there are two responses and for this reason it was decided follow up was warranted.

In May 1981 Geoex carried out an aeromagnetic survey over north west Tasmania for the Department of Mines. The flight line spacing was 500m. An east west flight direction was used. The mean sensor height was specified to be 140m. Actual terrain clearance was in excess of 250m. The average distance between samples was 50m. The Department of Mines aeromagnetic contour map in the vicinity of CAF is shown as figure 2.

In March 1982 Geoex carried out a detailed magnetic survey over the entire Ramsay area (see plans TAS/2/3000, 3001, 3002, 3003, 3006, 3007, 3008, 3011, 3012, and 3013). A mean terrain clearance of 225m was used. The flight line spacing was 200m. The magnetometer had a sensitivity of 1nT and a sample interval of 0.8 sec (50m). The original flight path recovery was done on a photomosaic with an inaccurate scale. Metric grid points were marked on the photographs and a new plot of the flight path and contours was carried out on standard 1:10,000 map sheets. A qualitative interpretation of the data was made (see plans TAS/2/3160-3162). All readily discernable magnetic responses were plotted. The original analog records had to be used for this work because many magnetic responses are so close together that they do not appear as separate responses on the contour plan. The Geoex stacked profile plans were not useful in this regard since filtering had been applied to the data to such a degree that anomaly resolution was seriously degraded.

Although the contour map does not accurately portray the details of the magnetic field it is useful in giving a general overview of the data. In particular magnetic gradients correctly delineate the boundaries of the Meredith Granite to the west, the Ramsay group rocks to the east and the Dundas group rocks to the far east. Overall the magnetic field is exceedingly uniform except for the Crimson Creek rocks and a small section to the north east corner (which may be an area of basalt).

003

The detailed aeromagnetic survey was carried out after extensive work on the ground. It still provided valuable information. Not only did it confirm the ground work was accurately placed (flight path recovery on the Input survey was a little doubtful due to the poor quality of the aerial photographs, but it also served to locate several anomalies in uninvestigated areas (see plans TAS/2/3160-3162) which are very similar in character to that due to the Ramsay skarn. Ground follow up using magnetics and EM has been recommended for each of these anomalies.

II GROUND GEOPHYSICS

Magnetic and electromagnetic surveys were carried out in the area. Profile data for most of this work is contained in plans accompanying section one of the report "Ramsay Areas with Specific Reference to Grid CAF". Only those profiles not in sections 1 and 3 of this report are appended here.

MAGNETICS

The ground magnetic data from the area is plotted at 1:2,500 on plans TAS/2/2436, TAS/2/2813 and TAS/2/3235. The data in general are quite noisy and can only be contoured meaningfully on 500nT intervals. The erratic nature of the data precludes useful quantitative interpretation. A qualitative interpretation of the data has been carried out and is presented on plans TAS/2/3158 and TAS/2/3159.

The skarn zone has a magnetic anomaly of irregular amplitude (often over 1000nT) associated with it. This response stands out clearly from the surrounding data. The magnetic susceptibility of the skarn is, however, highly variable ranging from less than 100×10^{-6} to over $80,000 \times 10^{-6}$. The susceptibility of the adjacent Crimson Creek formation is approximately 200×10^{-6} .

The eastern boundary of the Meredith Granite is easily distinguished in the magnetic data. The magnetic field over the granite is quite uniform (± 30 nT) whereas that over the Crimson Creek to the east is quite variable (± 300 nT or more).

Several other anomalous features have been plotted on the interpretation overlay. Anomalies labeled A in the southern part of the area appear to be quite similar to the skarn anomaly although the magnetic susceptibility of these anomalies is substantially less than that over the skarn. Anomalies labeled B may also be due to skarn but they are of more limited size. Two other regions over which the magnetic profiles are very erratic are shown with dashed lines. There is a small possibility that they could reflect development of skarn mineralisation.

The calc silicate sediments of the Crimson Creek formation have magnetic anomalies associated with them. These are marked C on the interpretation plan.

Major faults are also marked on the interpretation plan.

EM

Three major ground EM surveys were used to locate the Input anomalies on the ground. In 1979 a Crone "Shootback" (CEM) survey was completed using a 140m coil separation, a 20 metre station interval, and three frequencies (222, 888 and 1777 Hz). In 1982 a Crone Pulse EM (PEM) survey was carried out using a 100m coil separation, a 40m station interval, and a 20ms time base.

CEM

CEM work was carried out on 4760N, 4880N, 5000N, 5120N, 5240N and 5360N. Coverage was from 4350E to 5380E on all lines. A prominent response due to a near surface (within 15m) conductor is located on line 4760N at 4810E and on line 4880N at 4810E. The dip is near vertical. There is a possibility the conductor plunges steeply to the north since there is a low amplitude negative anomaly on line 5000N at 4800E. A poorly defined conductor exists in the south east portion of the grid. It occurs at 5100E on 5000N at 5210 on 4880N and about 5250E on 4760N.

MAX-MIN

Max-min coverage was 4324E-5354E on 4640N, 5566E-6540E on 4760N, 5575E-6494E on 5000N and 5551E-6527E on 5240N. A small section of 4880N (4333E-4620E) was also traversed but this segment of line is too short for a meaningful interpretation of the data.

Line 4640N has no anomaly in the vicinity of 4800E. Thus the CEM anomaly at 4810E on 4760N and 4880N is cut off both to the north and to the south. On line 4640N there is a conductor at 5150E. The chaining is in error on this part of the line. However, the inphase data becomes intelligible (quadrature data is not greatly affected by chainage errors) when the low frequency inphase data is used to normalise the data at 888 Hz and 1777 Hz. The two negative inphase peaks at the west end of the line disappear as does the apparent offset between inphase and quadrature anomalous response at the east end of the line. The source of the anomaly at 5150E dips east. It has intermediate conductivity. This response does not line up with anomalies on the eastern end of the southern most CEM lines.

Max-min lines 4760N, 5000N and 5240N are located northeast of the CEM work. Once again inphase normalisation with respect to the lowest frequency considerably improves the quality of the data. In particular the data on the western end of the lines becomes smoother and there is clearly no conductor on the west portion of the area surveyed. Two conductors are present on each line. They may, in fact, be due to the same source in which case there is a fold structure present. The two conductors are too close to each other for a reliable estimate of dip to be made. The data on line 4760N suggest the fold structure may be synclinal (with a plunge to the south). The anomaly locations are:

Line 4760N at 5935E and at 6280E
 5000N at 6047E and at 6255E
 5240N at 6080E and at 6210E

The inphase to quadrature ratio of two conductors is less than one. The source, therefore, has low conductivity and so it may be two intersecting shear zones rather than a conductive fold structure..

PEM

PEM coverage was obtained as follows:

Line 3680N	5310E-5030E
3740N	4290E-5010E
3800N	4310E-4990E
3860N	4310E-4990E
3920N	4310E-4990E
3980N	4310E-4990E
4040N*	4270E-4970E
4100N	4270E-4970E
4160N	4350E-4950E
4220N	4370E-5030E
4400N	4370E-4610E
4400N*	4610E-5050E
4640N	4310E-5390E
4760N*	4710E-5410E
5000N*	4730E-5370E

The line numbers marked with an asterisk were surveyed using a 60m coil separation and a 20m station interval.

There are no significant conductors on lines 3680N to 4100N inclusive. Minor anomalies indicative of horizontal conductors occur on 3680N at 4870E and on 3800N at 4890E.

On the rest of CAF five principal conductors have been located. Three of these have been detected in the CEM programme. The CEM conductor in the vicinity of 4810E on 4880N and 4760N was located more precisely on the PEM survey to be at 4830E on line 4760N. The conductor dips steeply east. The source is close to the surface (within 20m). It has intermediate conductivity. A drillhole collared at 4765N 4755E and inclined to the east failed to intersect a substantial conductor. The conductor must therefore terminate abruptly just north of line 4760. A drill-hole EM survey or another hole placed further to the north was recommended to test this conductor.

Two PEM conductors were detected as one CEM response. One conductor is at 5210E on 4760N and at 5250E on 4640N. The other is at 5350E on 4760N and just off the eastern end (5400E?) of 4640N. The conductors are open to the south. To the north they terminate south of line 5000N. The conductors may not be parallel to each other. They are both quite conductive and are close to the surface (8m?). These anomalies may confidently be attributed to conductive shales unless there is some geochemical or geological evidence to the contrary.

The fourth PEM conductor is located at 4830E on line 4400N at 4870E on line 4220N and at 4870E on line 4160N. The conductor is open to the south and cut off to the north by line 4640N. The response on 4400N is of very high conductivity and is located within 20m of the surface. The dip is near vertical. The character on line 4220N is almost identical. The response on 4160N is lower in amplitude. The source here is interpreted to be at a depth of 50m. Therefore, the conductor may have a southerly plunge. A follow up line of CEM on 4220N using 100m coil spacing, a 20m station interval, 2525 Hz and 825 Hz operating frequency also placed the location of the conductor at 4850E. The interpreted depth to the top of the conductor evident from this data is 15m. A drillhole inclined at 45° to intersect 4220N 4850E at a depth of 30m failed to encounter the source of the anomaly. This result is discussed further under drillhole EM.

The fifth conductor occurs on two lines. On 4400N at 4530E it is interpreted to have good conductivity, a depth of burial of 60m and a steep westerly dip. On line 4220N the conductor is located at 4570E. The dip on this line is steep and to the west. The depth of burial is 35m. The conductivity is much lower on 4220N than on 4400N. The strike of this conductor is parallel to the one described above. It has no response on lines 4160N and 4640N. The conductor is therefore cut off to both the north and the south. A recommendation was made that this conductor be tested by a drillhole inclined to the east at 45°. The intersection point should be at 65m depth on line 4340N at 4545E or at 55m depth on line 4280N at 4550E.

III DRILLHOLE GEOPHYSICS

EM

Hole CAF-6 was sited to intersect a conductor obtained by a PEM survey. No obvious source of the conductor was obtained in the drilling. A drillhole EM survey was then carried out to explain the failure.

The survey was carried out using a Mark II Sirotem unit. Four transmitter loops were used. The layout is shown on figure 3. The results are shown in figures 4 through 9. The drillhole results confirm the presence of a conductor. The maximum response is at a depth of 30-40m. This is consistent with the EM results obtained in the PEM survey. The east-west location of the conductor is not in doubt. The reversal in response between transmitter loops 1 and 3 indicates the target is steeply dipping, probably to the west. A conductor to the side of the hole would give a different anomaly pattern with reversed polarities. A source below the hole seems most probable.

Transmitter loops 1 and 4 straddle the hole are located directly over it and to the south of it respectively. They yield very similar response patterns, both indicating a conductor axis within 15m of the hole at 30m and 40m depth respectively. Transmitter loop 3 to the east of the hole fits this interpretation. Transmitter loop 2 indicates a shallow source. Thus if the loops are energizing the same conductor then a source plunging in a southerly direction is required. The time constant of the source is 8ms. This indicates good source conductivity.

A hole to intersect the target at greater depth than CAF-6 should be drilled. The zone of prime interest is 4840E-4860E 4200N to 4220N further north at a depth of 40m to 50m.

MAGNETIC SUSCEPTIBILITY

Magnetic susceptibility measurements were carried out on all drill core at approximately 3m intervals. A Geoinstrument JH-8 susceptibility meter was used to make the measurements. Individual pieces of core at least 20cm long were used to sample geometry influencing the results.

Most of the geologic units have a characteristic magnetic susceptibility. The contacts between the major rock types and alteration zones are, in general, readily determined from the magnetic susceptibility data. The results from CAF-7 are representative and illustrate the response of most rock types encountered in the CAF drilling. Progressing eastward from the granite the following responses are typical:

granite - averages 14×10^{-5} cgs units (ranges from 10 to 15×10^{-5})

biotite hornfels - averages 70×10^{-5} (ranges from 40 to 110×10^{-5})

eastern skarn flank - averages $1,000 \times 10^{-5}$ (ranges from 100 to $3,000 \times 10^{-5}$)

western skarn flank - averages $1,000 \times 10^{-5}$ (ranges from 100 to $2,000 \times 10^{-5}$)

hornfels and sediments w/calc pelite - averages 500×10^{-5} (ranges from 100 to 900×10^{-5})

biotite hornfels and sediments - averages 100×10^{-5} (ranges from 50 to 150×10^{-5})

Calc silicate pelites sections within the Crimson Creek sediments have an average susceptibility of $1,000 \times 10^{-5}$ (ranges from 300 to $2,000 \times 10^{-5}$).

<u>Plan No.</u>		<u>Scale</u>
Figure 1	CAF INPUT PROFILE	
Figure 2	Aeromagnetic Map	1:50,000
Figure 3	Transmitter Loop Layout CAF-6	1: 2,000
Figure 4	Transient EM Profile CAF - Loop 1	1: 500
Figure 5	Transient EM Profile CAF - Loop 2	1: 500
Figure 6	Transient EM Profile CAF - Loop 3	1: 500
Figure 7	Transient EM Profile CAF - Loop 4	1: 500
Figure 8	SiroteM Voltage Decay curve fitting	
Figure 9	SiroteM Voltage Decal curve fitting	
Figure 10	Max-min CAF Line 4760N	1: 2,500
Figure 11	Max-min CAF Line 4760N, normalised inphase	1: 2,500
Figure 12	Max-min CAF Line 5000N	1: 2,500
Figure 13	Max-min CAF Line 5000N, normalised inphase	1: 2,500
Figure 14	Max-min CAF Line 5240N	1: 2,500
Figure 15	Max-min CAF Line 5240N, normalised inphase	1: 2,500
Figure 16	Input Electromagnetic Map - Sheet 8	1:10,000
Figure 17	Input Magnetic Contour Map - Sheet 8	1:10,000
TAS/2/3000	Mt Ramsay Area Aeromagnetic Flight Path	1:10,000
TAS/2/3001	Mt Ramsay Area Aeromagnetic Flight Path	1:10,000
TAS/2/3002	Mt Ramsay Area Aeromagnetic Flight Path	1:10,000
TAS/2/3003	Mt Ramsay Area Aeromagnetic Flight Path	1:10,000
TAS/2/3006	Mt Ramsay Area Aeromagnetic Contours	1:10,000
TAS/2/3007	Mt Ramsay Area Aeromagnetic Contours	1:10,000
TAS/2/3008	Mt Ramsay Area Aeromagnetic Contours	1:10,000
TAS/2/3011	Mt Ramsay Area Aeromagnetic Profiles	1:10,000
TAS/2/3012	Mt Ramsay Area Aeromagnetic Profiles	1:10,000
TAS/2/3013	Mt Ramsay Area Aeromagnetic Profiles	1:10,000
TAS/2/3160	Ramsay Aeromagnetic Interpretation Plan Sh. 1	1:10,000
TAS/2/3161	Ramsay Aeromagnetic Interpretation Plan Sh. 2	1:10,000
TAS/2/3162	Ramsay Aeromagnetic Interpretation Plan Sh. 3	1:10,000
TAS/2/2436	Ramsay Grid - Ground Magnetic Contour Plan	1: 2,500
TAS/2/2813	Ramsay Grid - Southern Extention Ground Magnetic Contours	1: 2,500
TAS/2/3235	Ramsay Grid - East Extention Ground Magnetic Contour Plan	1: 2,500
TAS/2/3158	Ramsay Grid - Interpretation of Ground Magnetic Results	1: 2,500
TAS/2/3159	Ramsay Grid - Interpretation of Ground Magnetic Results	1: 2,500

009

566091

CAF

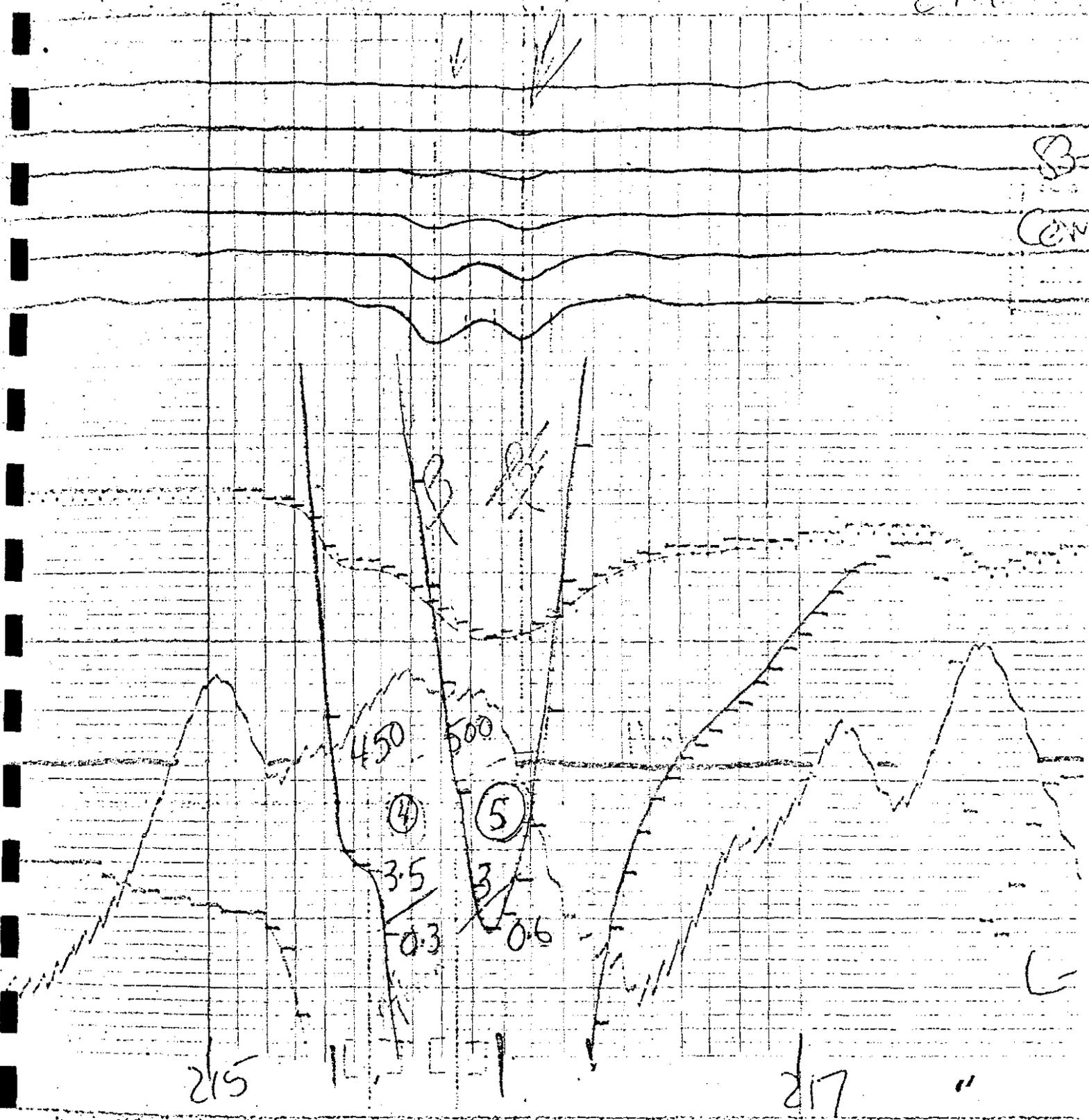
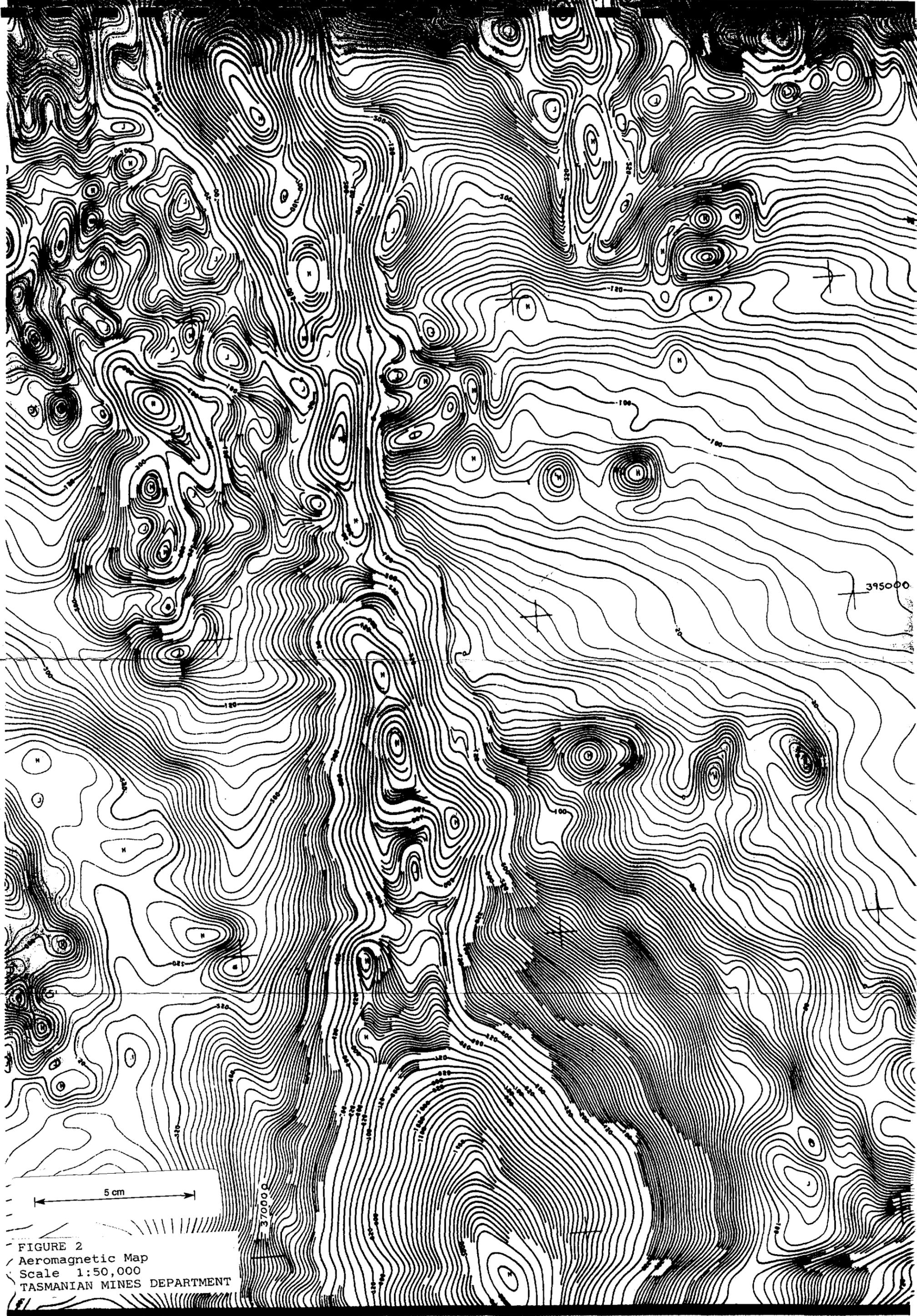


FIGURE 1
CAF INPUT PROFILE



395000

5 cm

FIGURE 2
Aeromagnetic Map
Scale 1:50,000
TASMANIAN MINES DEPARTMENT

566092
010

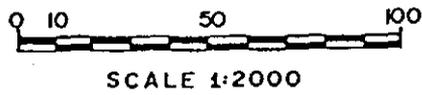
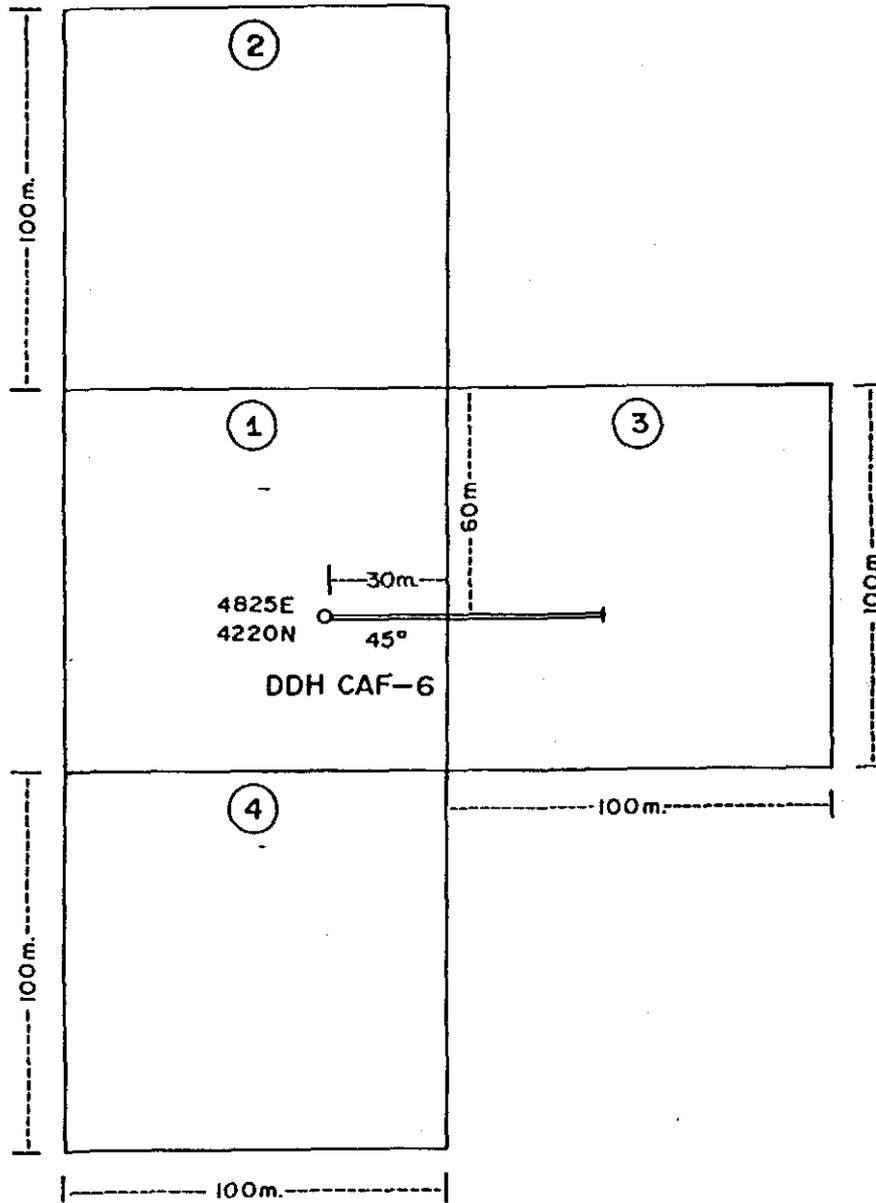
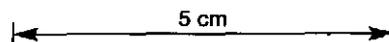
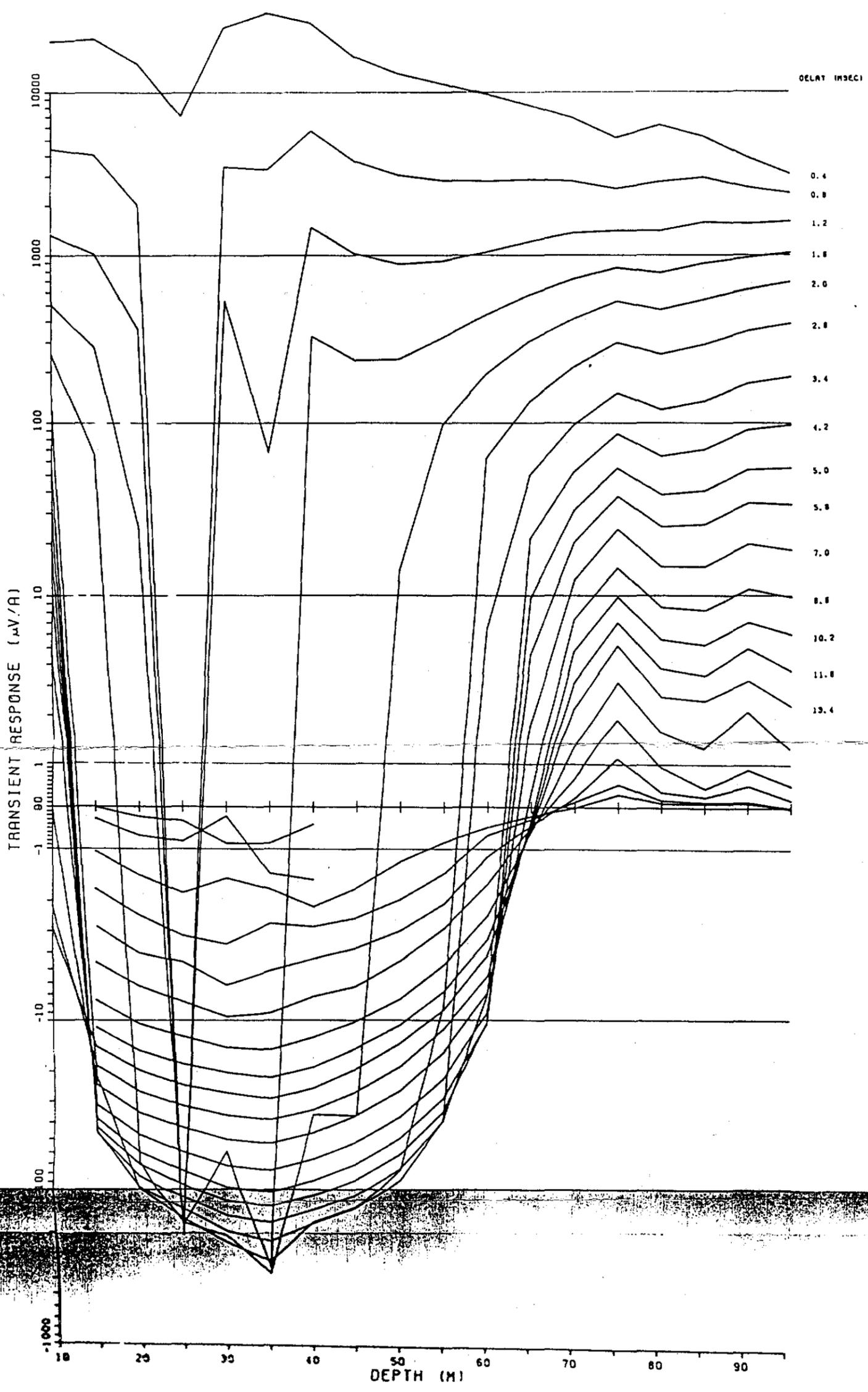
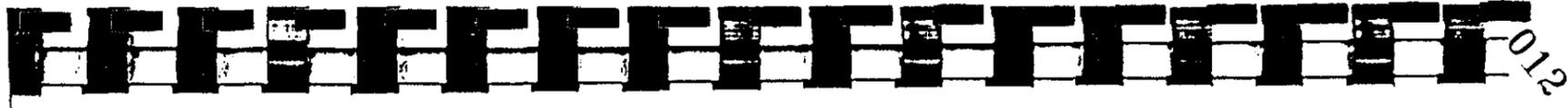


FIG 3
TRANSMITTER LOOP LAYOUT

CAF-6 DOWNHOLE SIROTEM SURVEY



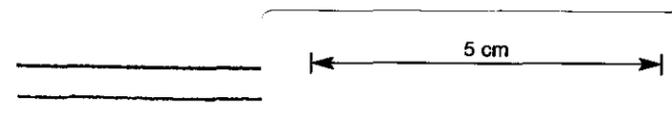


INSTRUMENT ISIACOM
 CONFIGURATION: 100M SQUARE TRANSMITTER LOOP.
 DRILL HOLE SURVEY
 READING INTERVAL 5M
 COMSTAFF PTY. LTD.
 TRANSIENT E.M. PROFILE
 DDH CAF-6, LOOP 1, PROSPECT CAF

SCALE: 1:500
 DATE: 17/12/82
 MAP: WARRATAH, TAS.

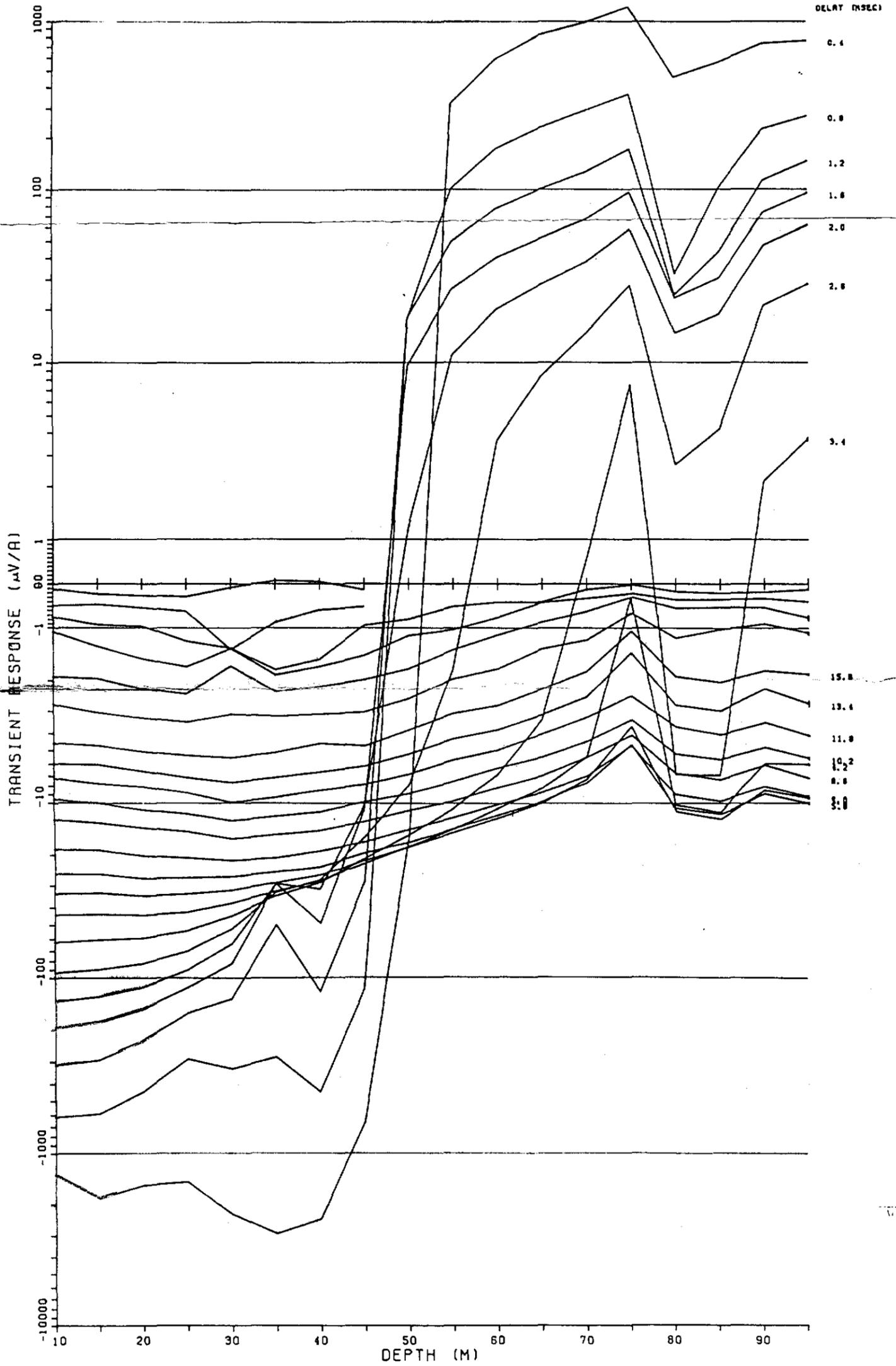


FIG. 4



566094

566095



INSTRUMENT :SIROTEM
 CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
 DRILL HOLE SURVEY
 READING INTERVAL 5M

SCALE: 1:500
 DATE : 17/12/82
 MAP : WARRATAH, TAS.

5 cm

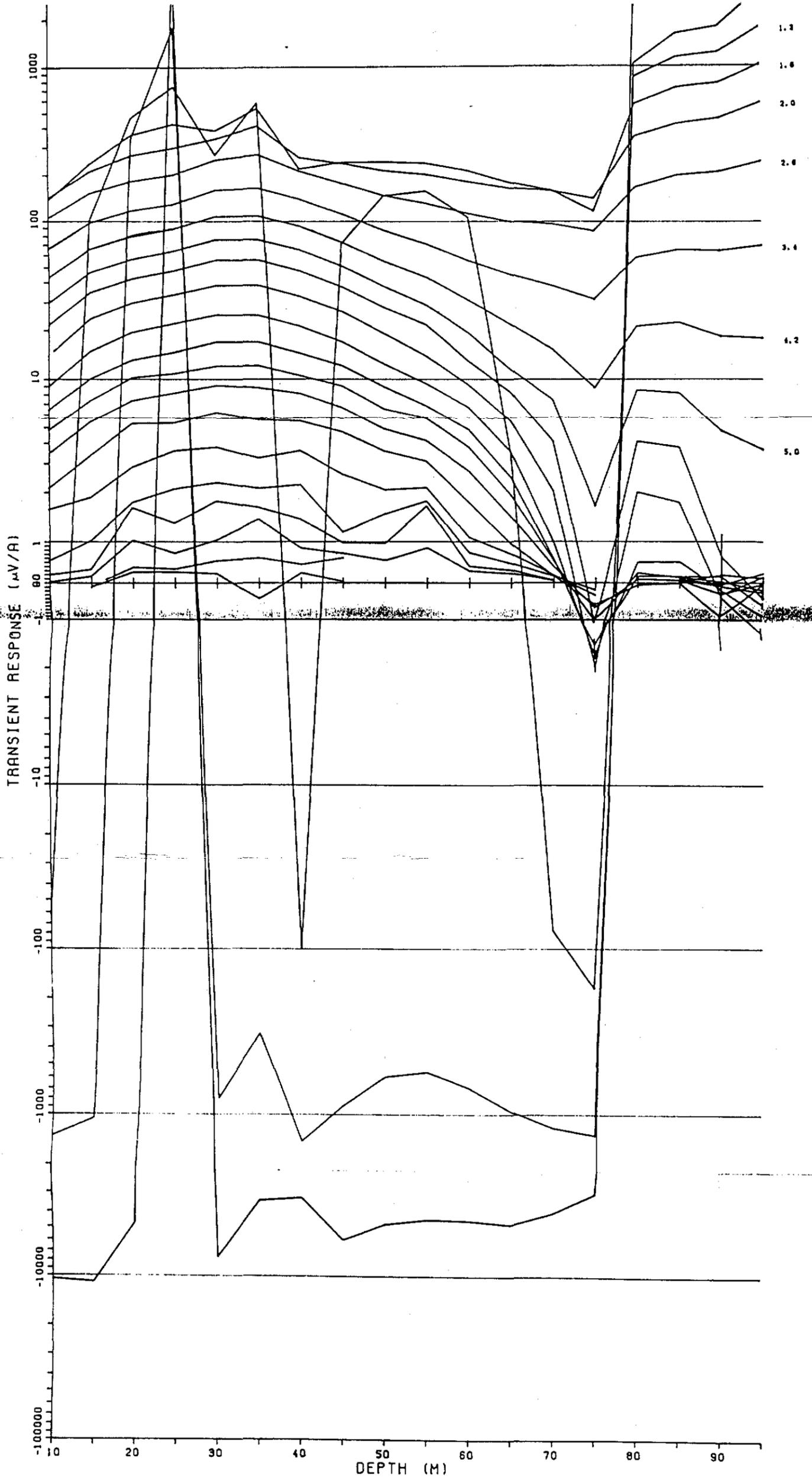
COMSTAFF PTY. LTD.
 TRANSIENT E.M. PROFILE
 DDH CAF-6, LOOP 2, PROSPECT CAF



FIG. 5

013

566096



INSTRUMENT :SIROTEM
 CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
 DRILL HOLE SURVEY
 READING INTERVAL 5M

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 MAP: WARATAH, TAS.

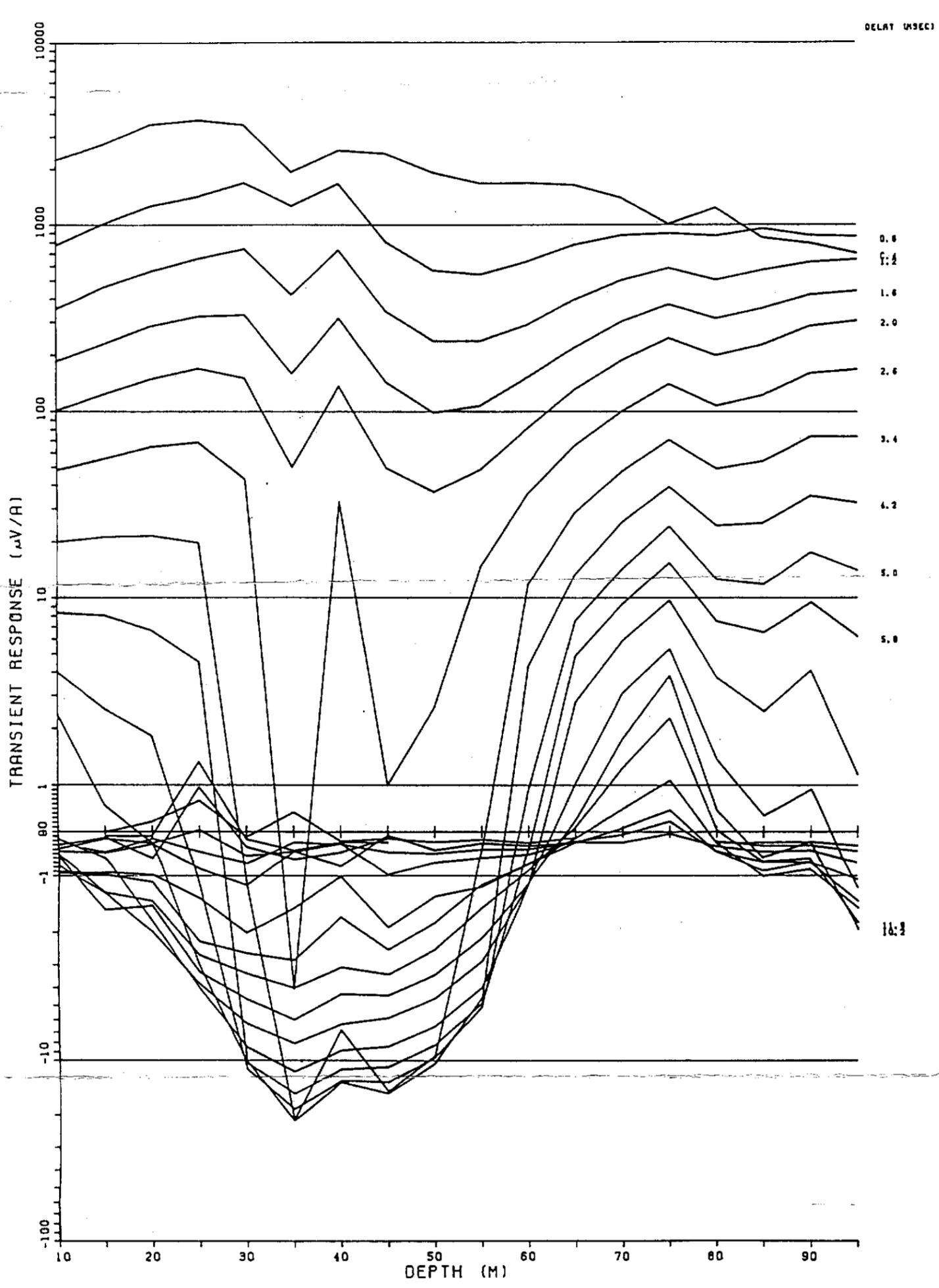
5 cm

COMSTAFF PTY. LTD.
 TRANSIENT E.M. PROFILE
 DDH CAF-6, LOOP 3, PROSPECT CAF



FIG. 6

014



INSTRUMENT : SJROTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
 DRILL HOLE SURVEY
 READING INTERVAL 5M
 COMSTAFF PTY. LTD.
 TRANSIENT E.M. PROFILE
 DDH CAF-6, LOOP 4, PROSPECT CAF

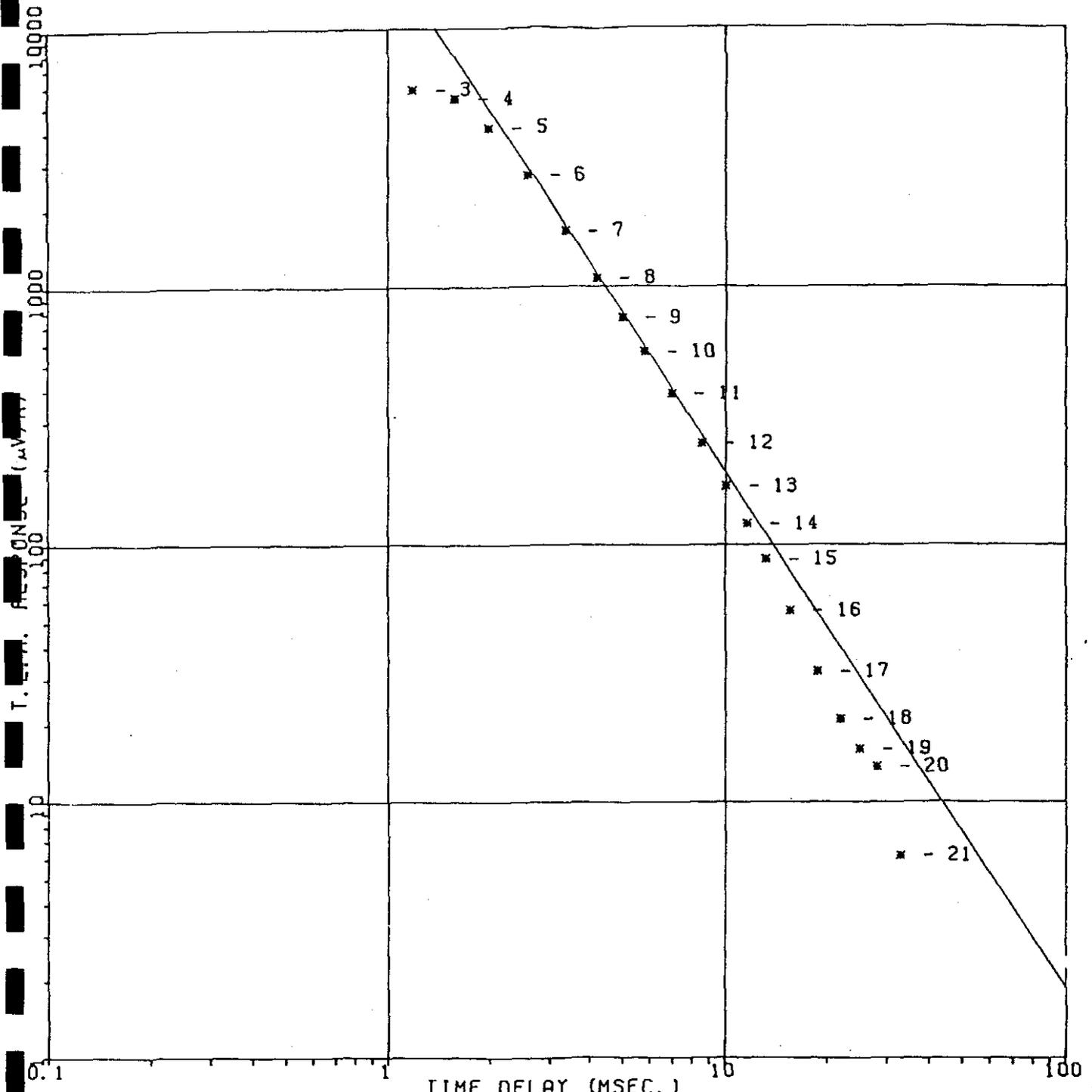
SCALE : 1:500
 DATE : 17/12/82
 MAP : HARBATH, TAS.



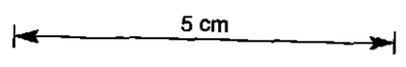
5 cm

FIG. 7

366097



* - n RESPONSE AT CHANNEL NUMBER n
 ——— POWER FIT TO CHANNELS 6 TO 12 , $V=1887.859 \cdot T^{-2.000}$
 WHERE V IS THE T.E.M. RESPONSE AND T THE TIME DELAY



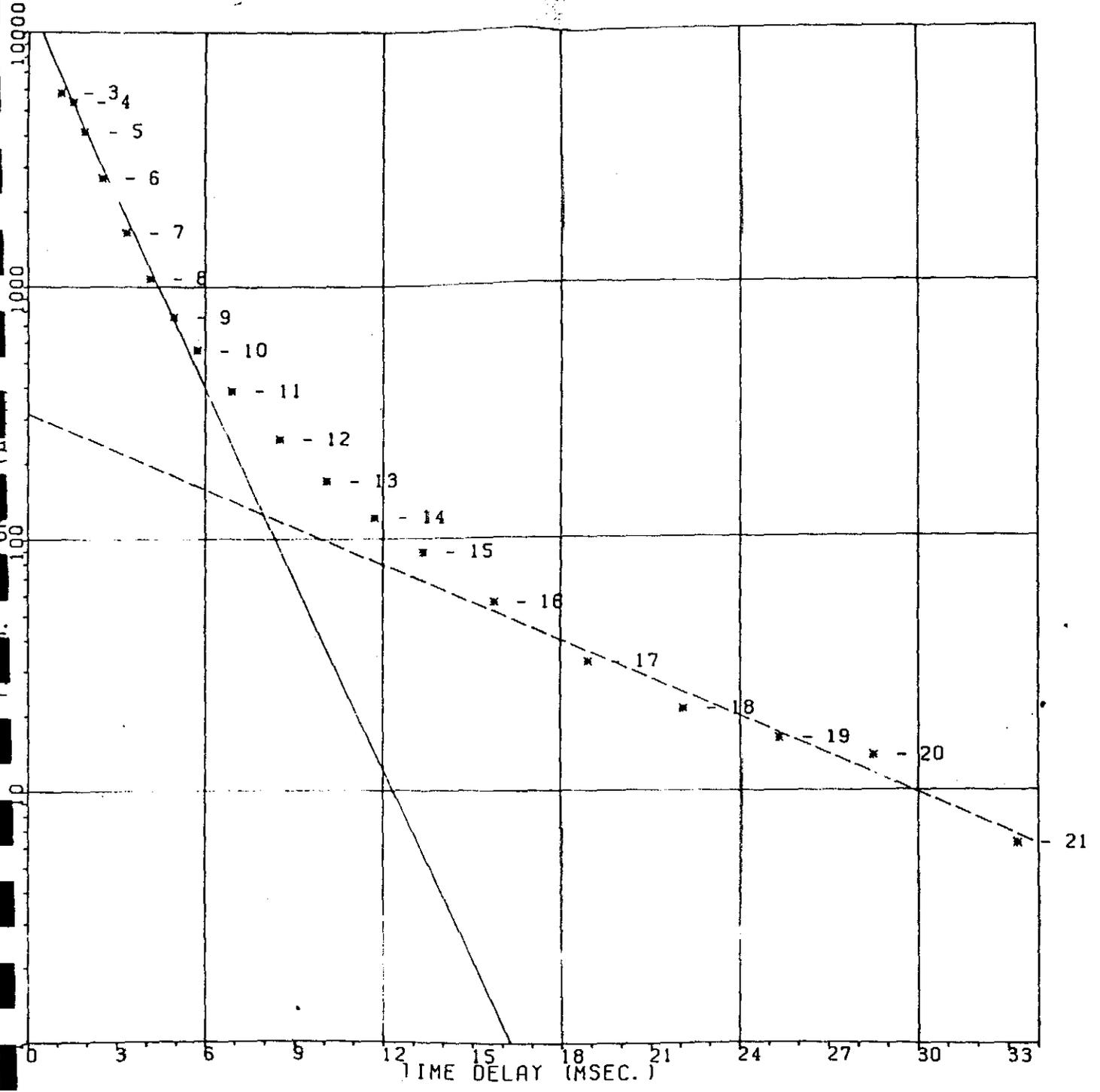
CONFIGURATION: 100M SQUARE TRANSMITTER LOOP.
 READING INTERVAL 5M
 COMSTAFF PTY. LTD.
 SIROTEM VOLTAGE DECAY CURVE FITTING
 PROSPECT CAF

AREA PREFIX : ZEEH
 EASTING : 6003
 NORTHING : 35



0.17

566099

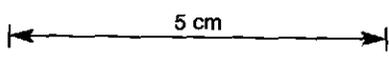


x - n RESPONSE AT CHANNEL NUMBER n

— EXPONENTIAL FIT TO CHANNELS 4 TO 9 , $V=1292.404 \cdot \exp(-0.582 \cdot T)$, TIME CONSTANT = 1.719

- - - EXPONENTIAL FIT TO CHANNELS 16 TO 21 , $V=31.347 \cdot \exp(-0.116 \cdot T)$; TIME CONSTANT = 8.655

WHERE V IS THE T.E.M. RESPONSE AND T THE TIME DELAY



CONFIGURATION: 100M SQUARE TRANSMITTER LOOP.

READING INTERVAL 5M

COMSTAFF PTY. LTD.

SIROTEM VOLTAGE DECAY CURVE FITTING
PROSPECT CAF

AREA PREFIX : ZEEH
EASTING : 6003
NORTHING : 35

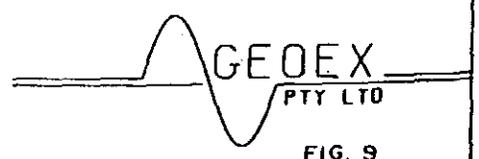
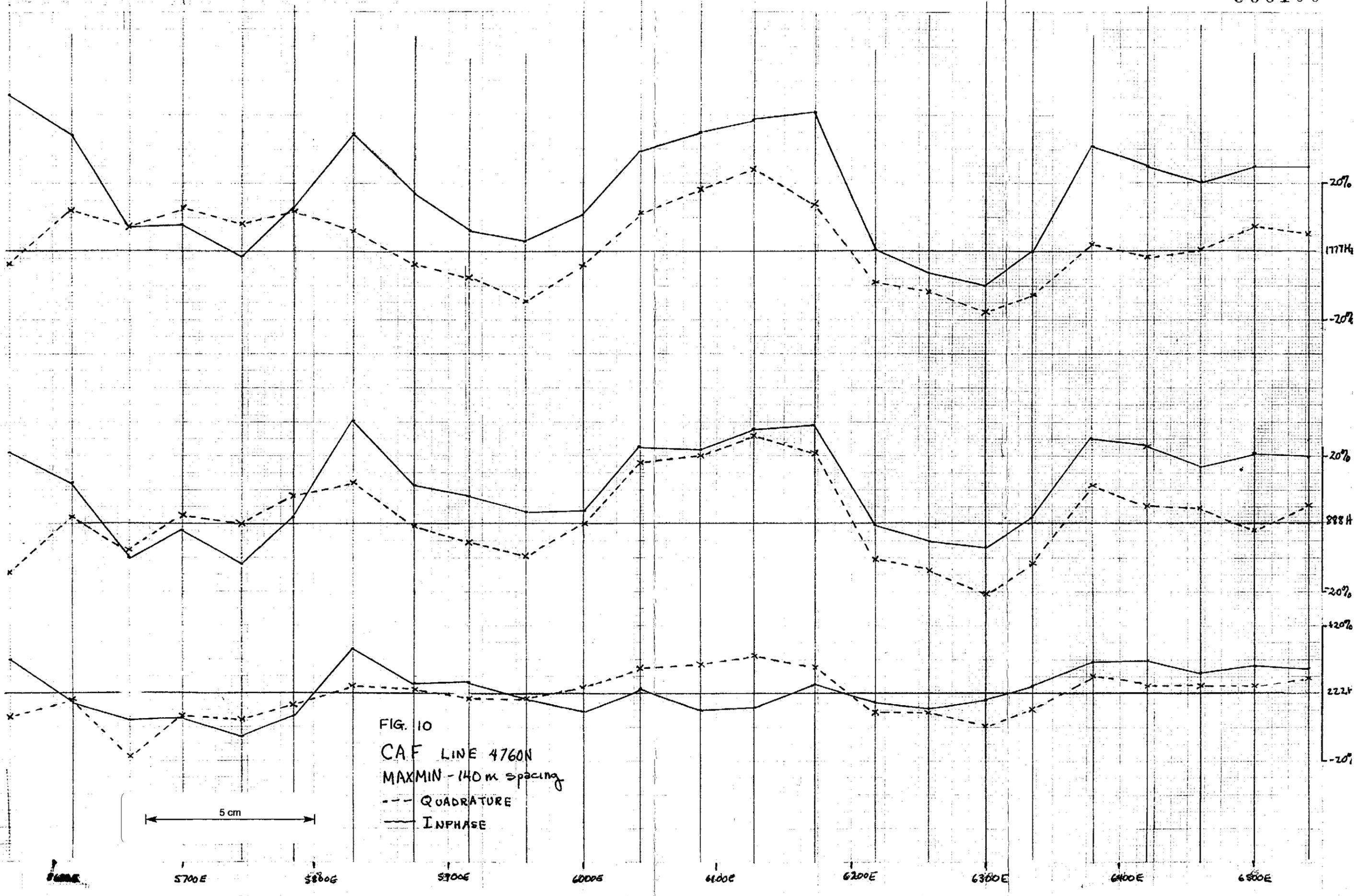
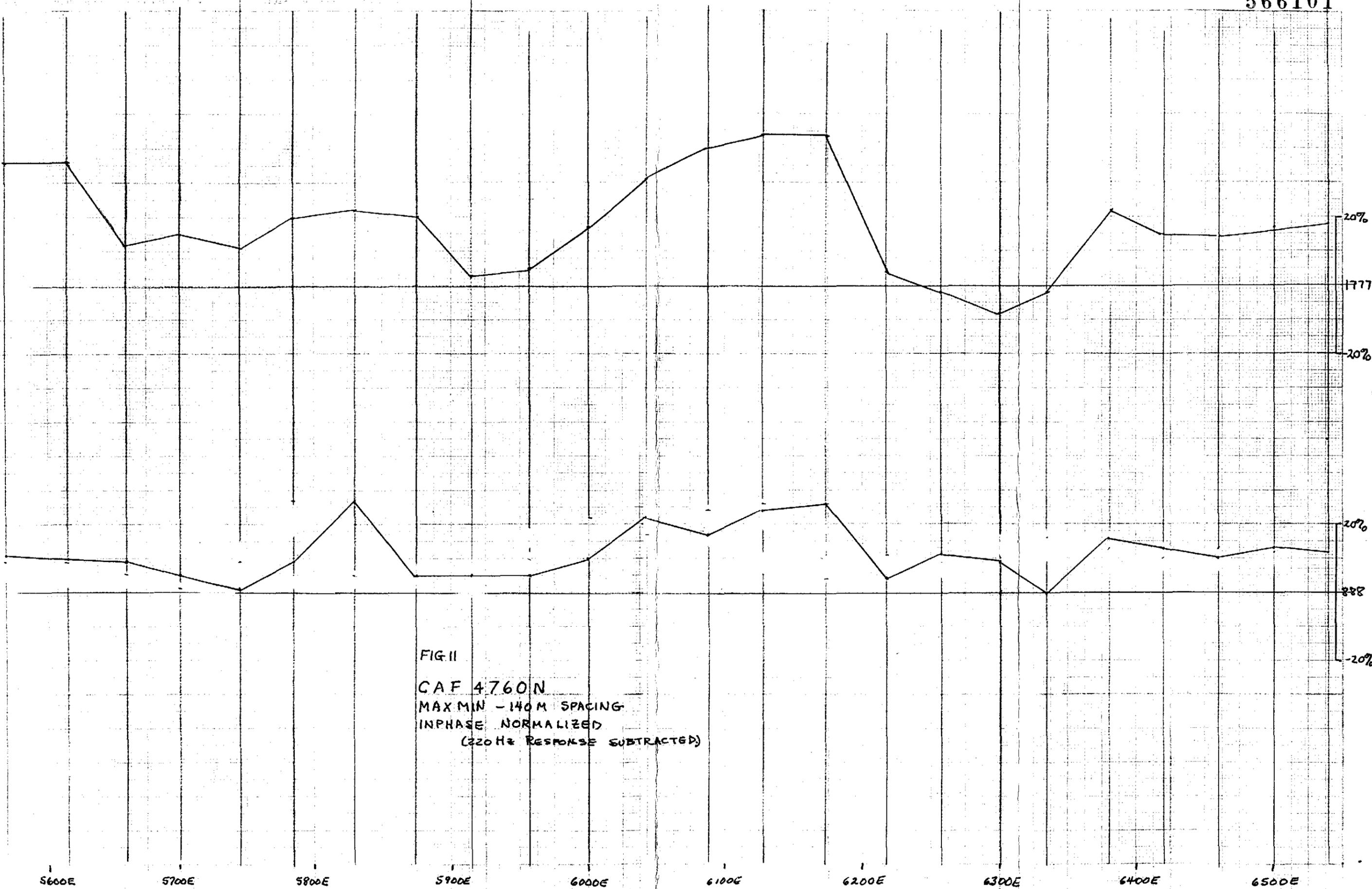
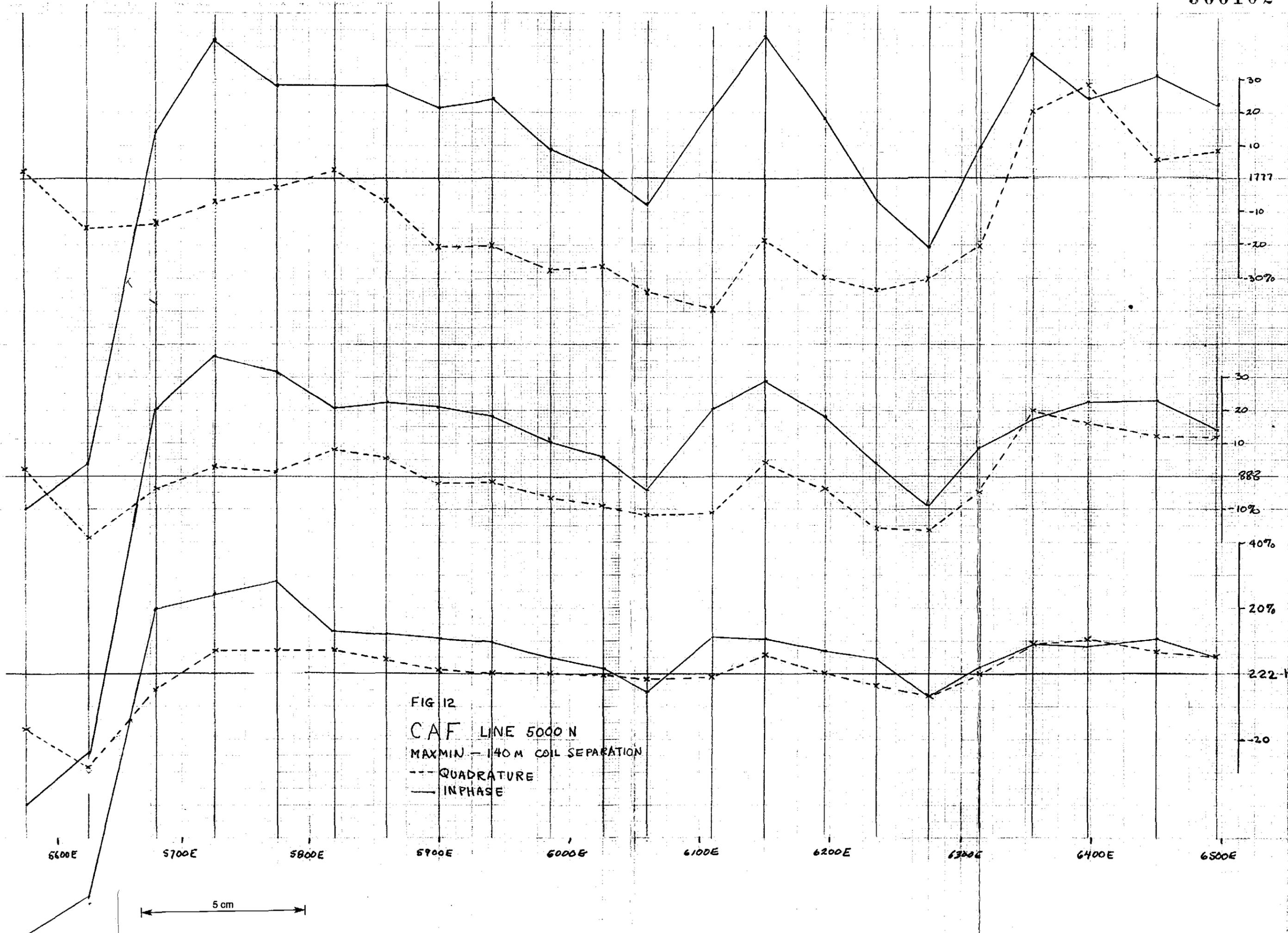


FIG. 9





5 cm



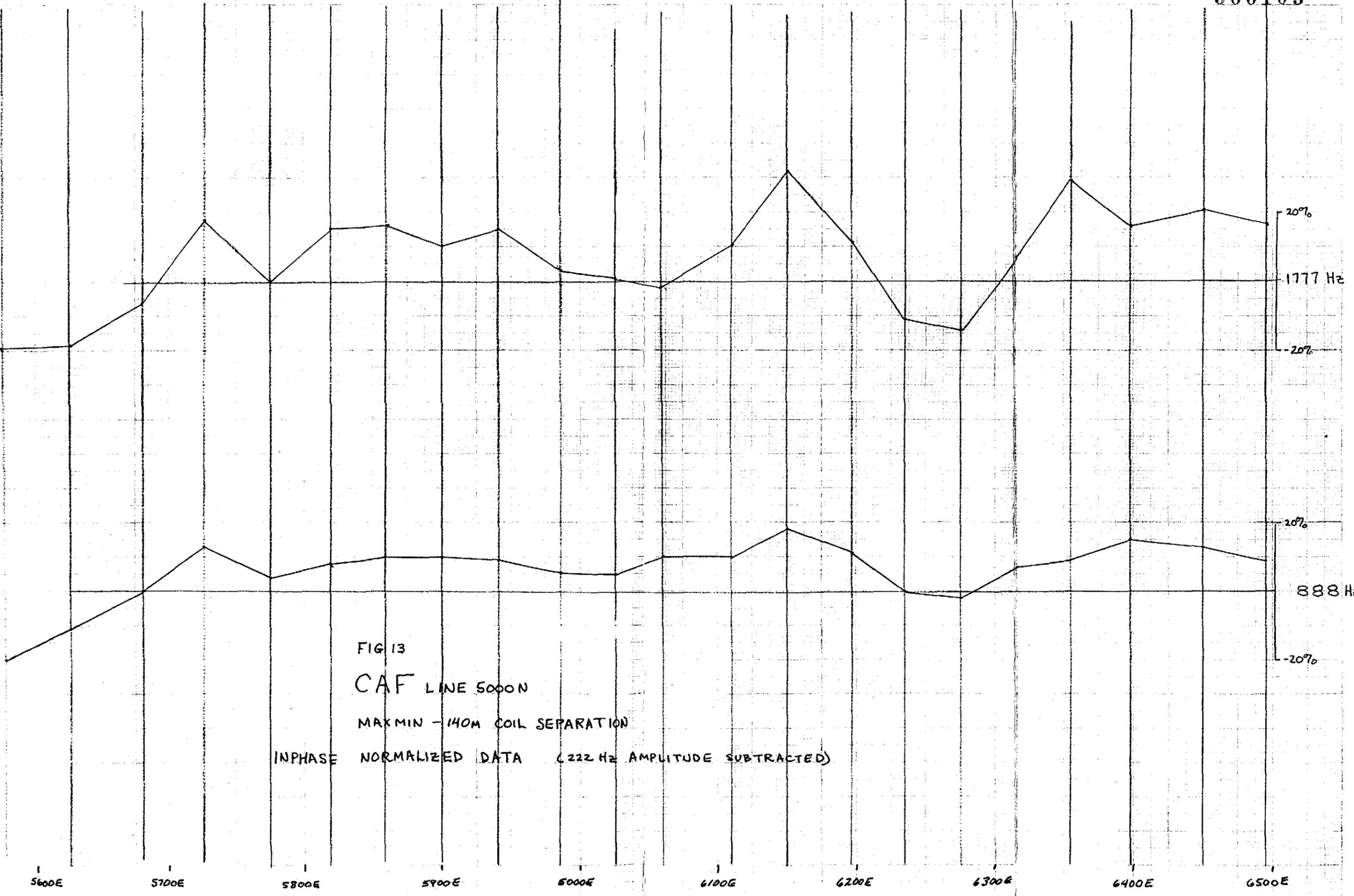
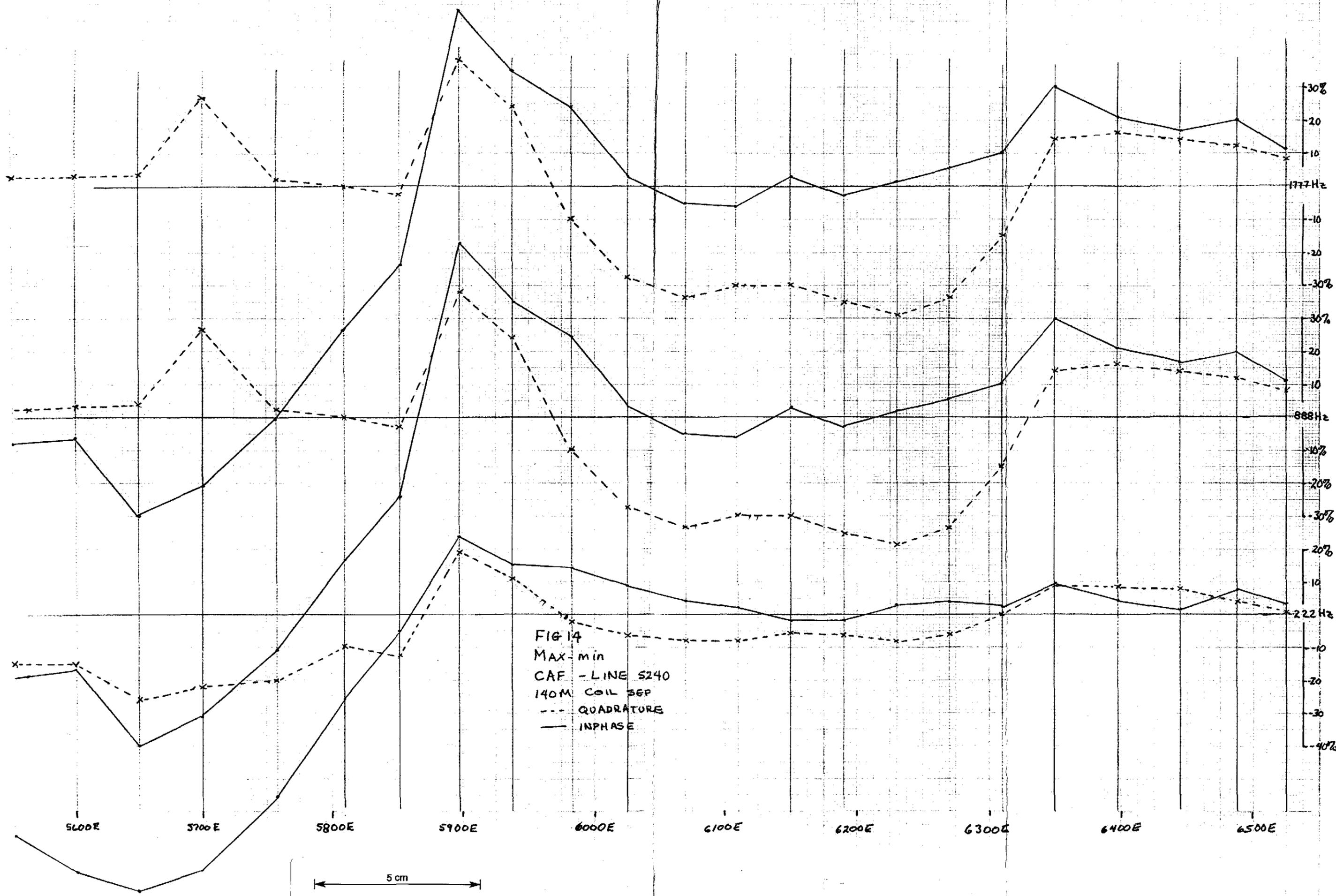


FIG 13
 CAF LINE 5000N
 MAXMIN - 140M COIL SEPARATION
 INPHASE NORMALIZED DATA (222 Hz AMPLITUDE SUBTRACTED)

5 cm



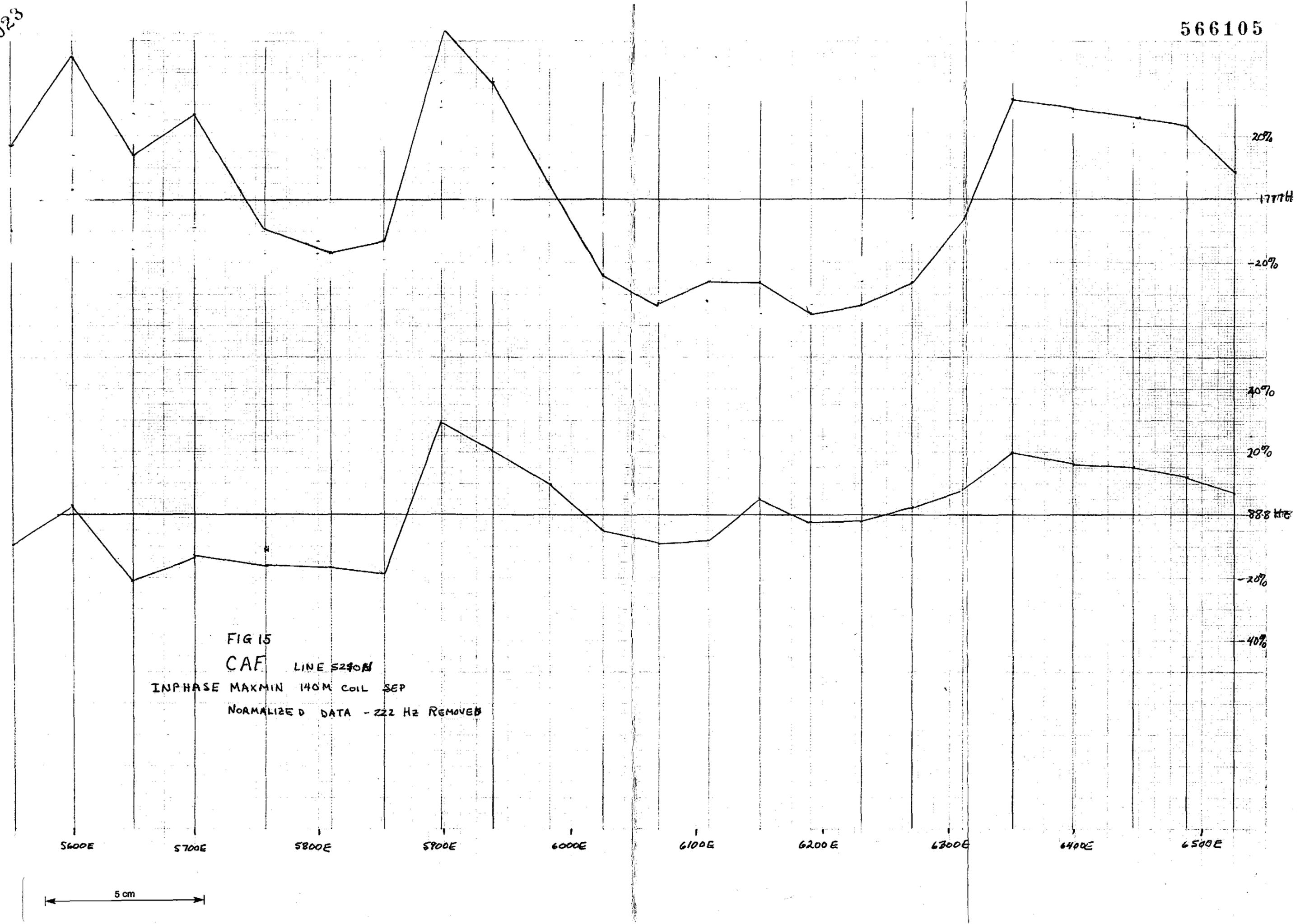
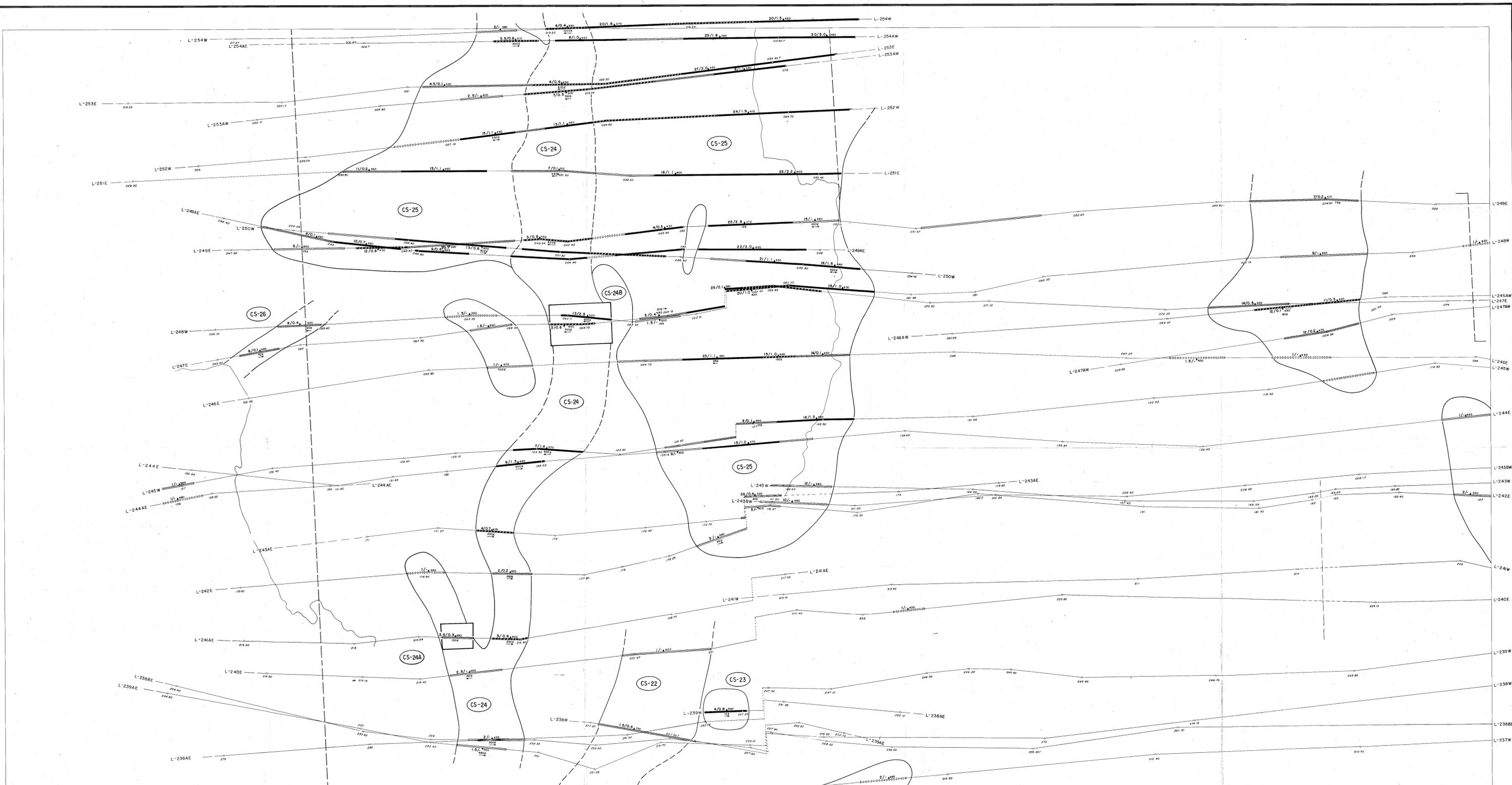


FIG 15
 CAF LINE 5290A
 INPHASE MAXMIN 140M COIL SEP
 NORMALIZED DATA - 222 HZ REMOVED

5 cm

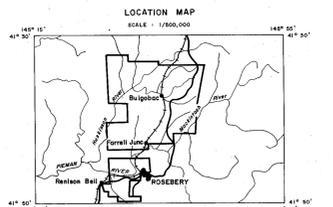


INPUT LEGEND

6 CHANNEL ANOMALY	-----
5 CHANNEL ANOMALY	-----
4 CHANNEL ANOMALY	-----
3 CHANNEL ANOMALY	-----
2 CHANNEL ANOMALY	-----
1 CHANNEL ANOMALY	-----
PEAK POSITION	▲
1ST AND 4TH CHANNEL AMPLITUDES	▲
ALTITUDE 1 FEET	▲
CONCURRENT MAGNETIC ANOMALY (geomol)	-----
OFFSET MAGNETIC ANOMALY	-----
50 Hz WITH NORMAL ANOMALY	-----
50 Hz WITH ABNORMAL ANOMALY	-----

INTERPRETATION LEGEND

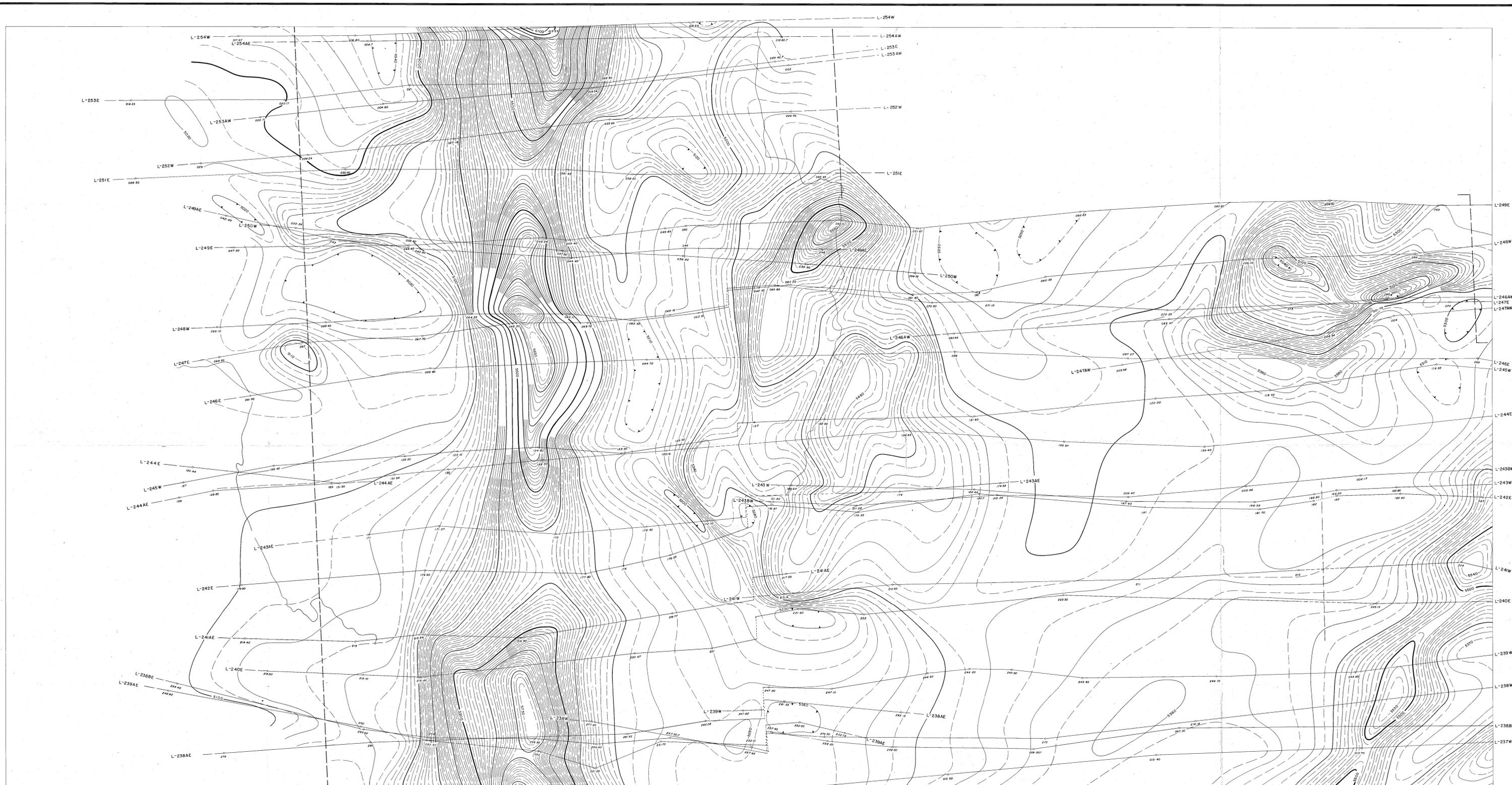
CONDUCTOR OUTLINE	○
IDENTIFICATION NUMBER	CS-2
SELECTED CONDUCTOR	□
CULTURAL ANOMALY	□



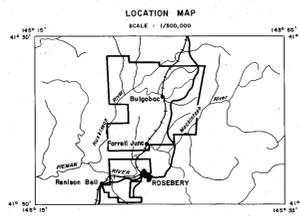
SHEET INDEX

5	7
6	8
4	3
2	
1	

	SURVEYED & COMPILED BY geotrex	FOR AUSTRALIAN ANGLo AMERICAN LTD.
	COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM	
COMSTAFF SOUTH LEASES TASMANIA	ELECTROMAGNETIC MAP 1817	
SHEET 8 OF 8 SCALE: 1/100,000	NON-ZENITH CONTROL PROJECTIONS: UTM	QUADRANT: 50S FLIGHT ALTITUDE: 4000 MTC GEOTREX PROJECT NO. 89-184



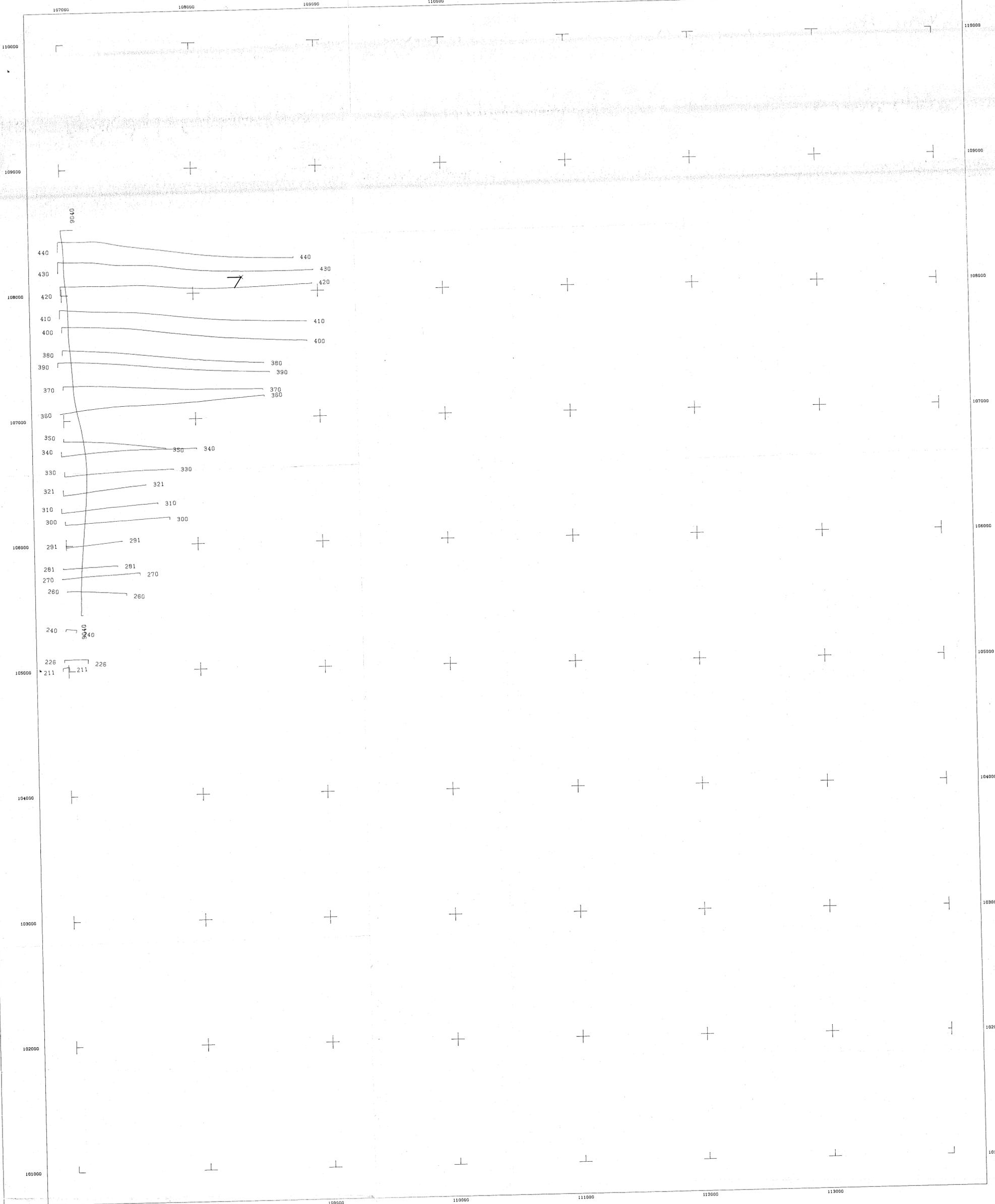
MAGNETIC LEGEND
 500 GAMMAS
 100 GAMMAS
 20 GAMMAS
 10 GAMMAS
 MAGNETIC LOW
 CONTOUR INTERVAL 10 GAMMAS



SHEET INDEX

5	7
6	8
4	3
2	
1	

	SURVEYED & COMPILED BY geotrex	FOR AUSTRALIAN ANGLO AMERICAN LTD.
	COMBINED AIRBORNE EM AND MAGNETOMETER SURVEY BARRINGER "INPUT" ELECTROMAGNETIC SYSTEM 1818	
COMSTAFF SOUTH LEASES TASMANIA	ISOMAGNETIC CONTOUR MAP	
SHEET 8 OF 8 SCALE 1/10,000	HORIZONTAL CONTROL PHOTOGRAPHS	CONTOUR INTERVAL 10 GAMMAS FLIGHT ALTITUDE 400 METERS FLOWN IN APRIL, 1975 GEOTREX PROJECT NO. 83-18

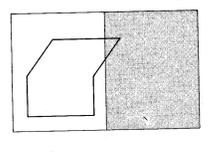


Airborne Geophysical Survey and Compilation by



for

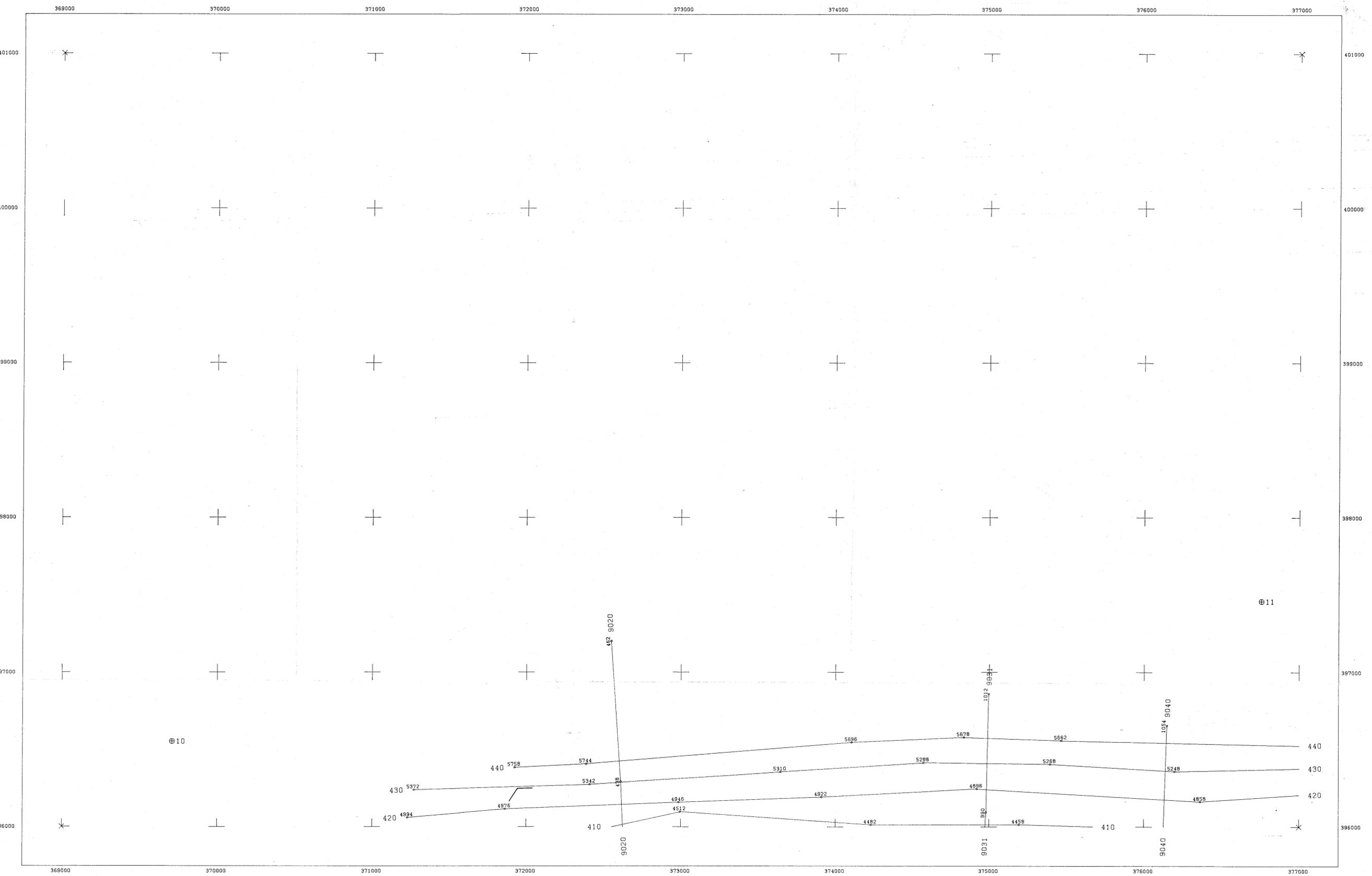
AUSTRALIAN ANGLØ AMERICAN LIMITED
 MT RAMSAY AREA TASMANIA
 PROFILES OF TOTAL MAGNETIC INTENSITY



566108



SURVEY BOUNDARY
 BASELINE VALUE 100 nT VERTICAL SCALE 100 nT/cm
 PROJECT NUMBER B2733 SURVEYED MARCH 1982



Airborne Geophysical Survey and Compilation by



for

AUSTRALIAN ANGLO AMERICAN LIMITED

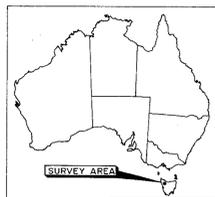
MT RAMSAY AREA TASMANIA

FLIGHT PATH PLOT

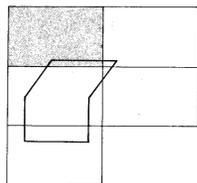
SCALE 1:10000

0 200 400 600 800 1000 METRES

5 cm



SURVEY LOCATION



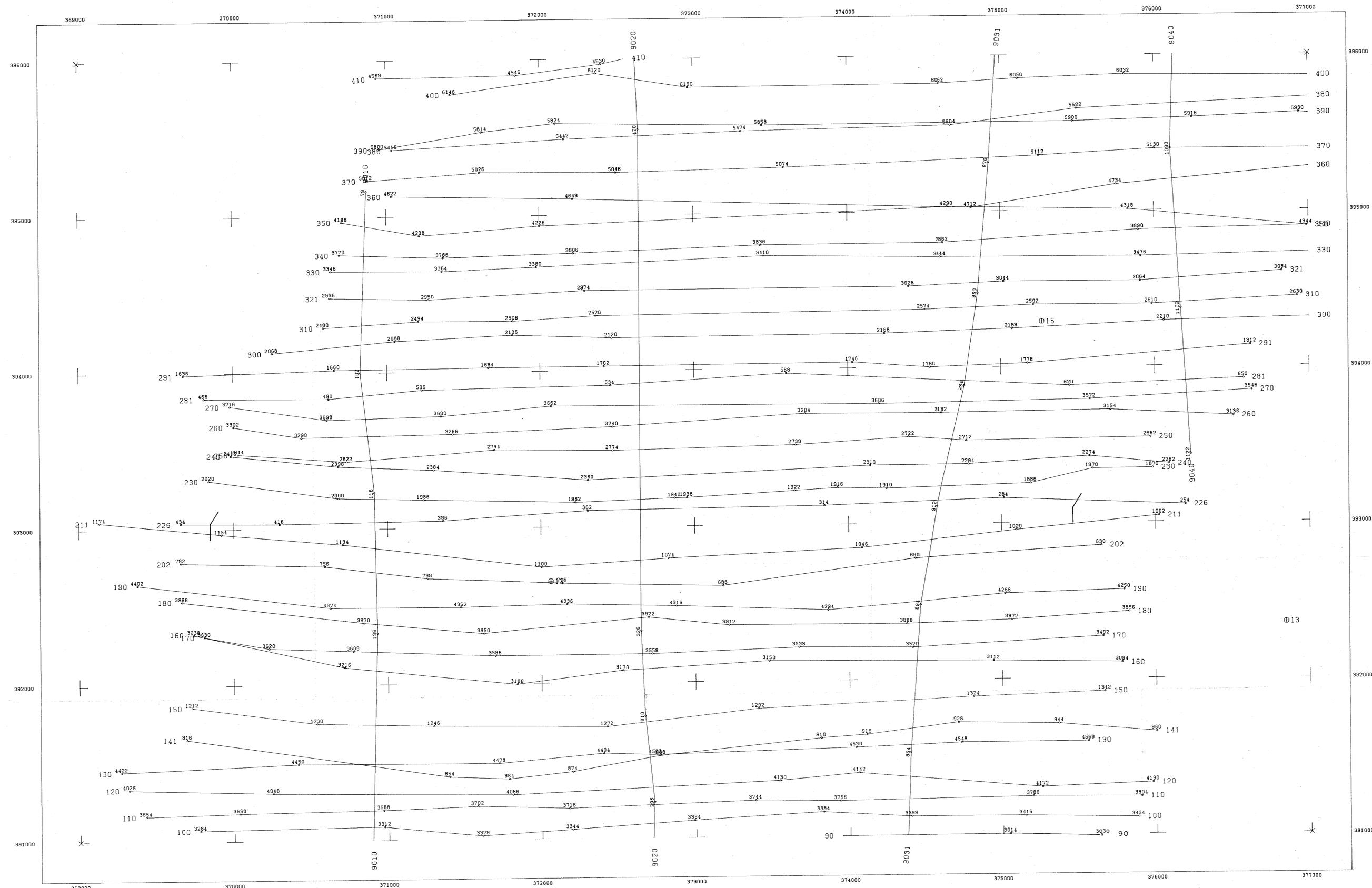
SHEET INDEX

Navigation control was by reference to photomosaics and/or photo strips. Flight path analysis was achieved by identification of 16mm. ground tracking photographs on the navigation control. The ground tracking camera was operated at a rate of one camera frame for two data samples, such that successive camera frames overlap. An attempt was made to recover fiducials at intervals of 1.0 kilometre, and only recovered fiducials are shown on the map. During processing the photomosaic was controlled using base maps supplied by the client, and this flight path map is an overlay for those maps.

SURVEY BOUNDARY
 ⊕ Registration point identified on photomosaic.
 + 1000 metre grid, relative to arbitrary origin.

566109

PROJECT NUMBER 82733 SURVEYED MARCH 1982 TA3/2/3001.



Airborne Geophysical Survey and Compilation by



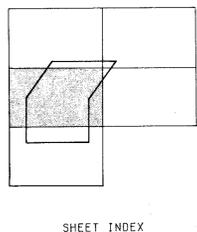
for

AUSTRALIAN ANGLO AMERICAN LIMITED

MT RAMSAY AREA TASMANIA

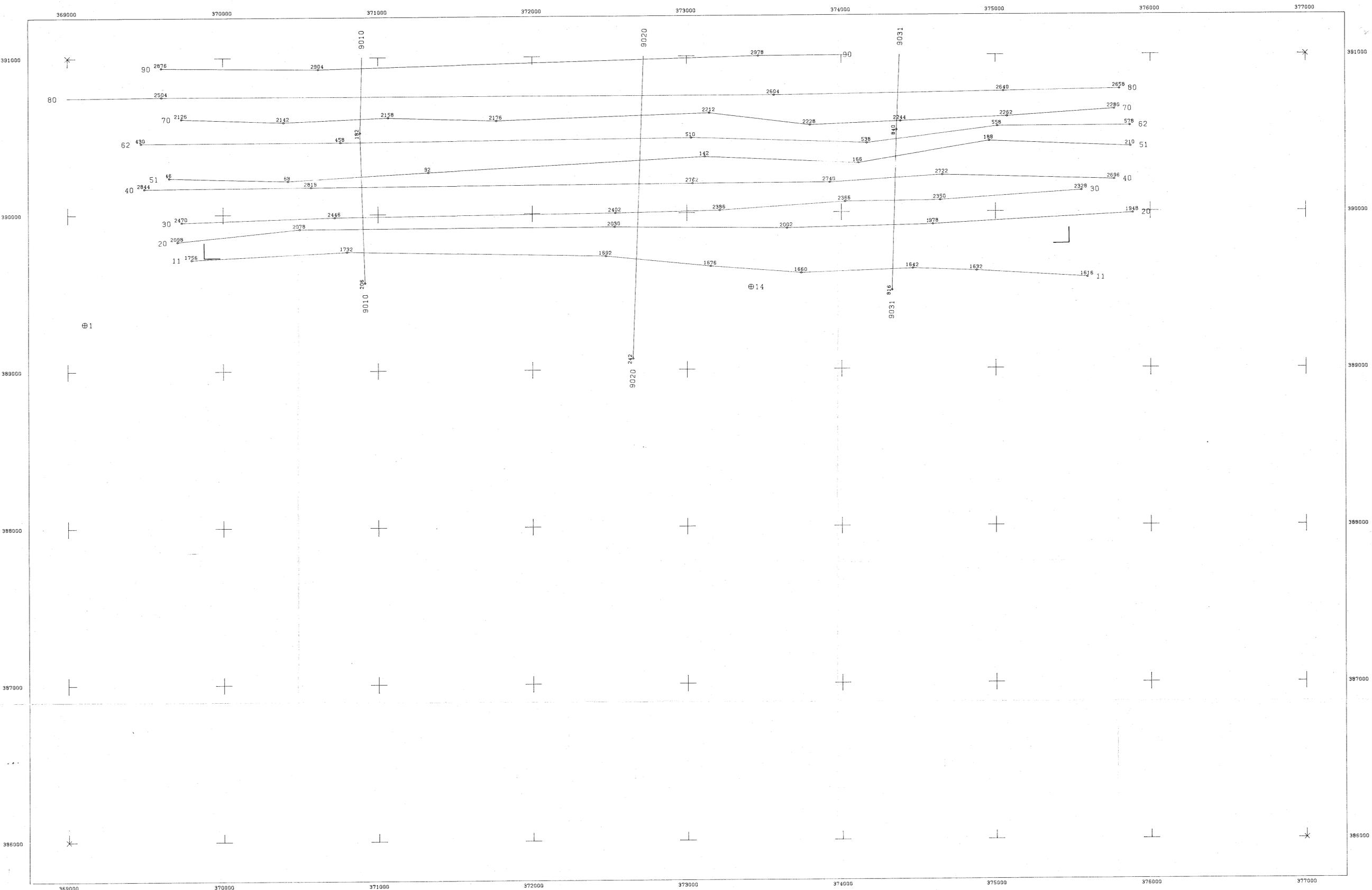
FLIGHT PATH PLOT

SCALE 1:10000



Navigation control was by reference to photomosaics and/or photo strips. Flight path analysis was achieved by identification of 10mm. ground tracking photographs on the navigation control. The ground tracking camera was operated at a rate of one camera frame for two data samples, such that successive camera frames overlap. An attempt was made to recover fiducials at intervals of 1.0 kilometre, and only recovered fiducials are shown on the map. During processing the photomosaic was controlled using base maps supplied by the client, and this flight path map is an overlay for those maps.

SURVEY BOUNDARY 566110
 + Registration point identified on photomosaic.
 + 1000 metre grid, relative to arbitrary origin.
 PROJECT NUMBER 82733 SURVEYED MARCH 1982 Tas/2/3002.



Airborne Geophysical Survey and Compilation by



for

AUSTRALIAN ANGLO AMERICAN LIMITED

MT RAMSAY AREA TASMANIA

FLIGHT PATH PLOT

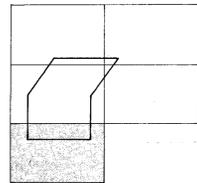
SCALE 1:10000



5 cm



SURVEY LOCATION



SHEET INDEX

Navigation control was by reference to photomosaics and/or photo strips. Flight path analysis was achieved by identification of 16mm. ground tracking photographs on the navigation control. The ground tracking camera was operated at a rate of one camera frame for two data samples, such that successive camera frames overlap. An attempt was made to recover fiducials at intervals of 1.0 kilometre, and only recovered fiducials are shown on the map. During processing the photomosaic was controlled using base maps supplied by the client, and this flight path map is an overlay for those maps.

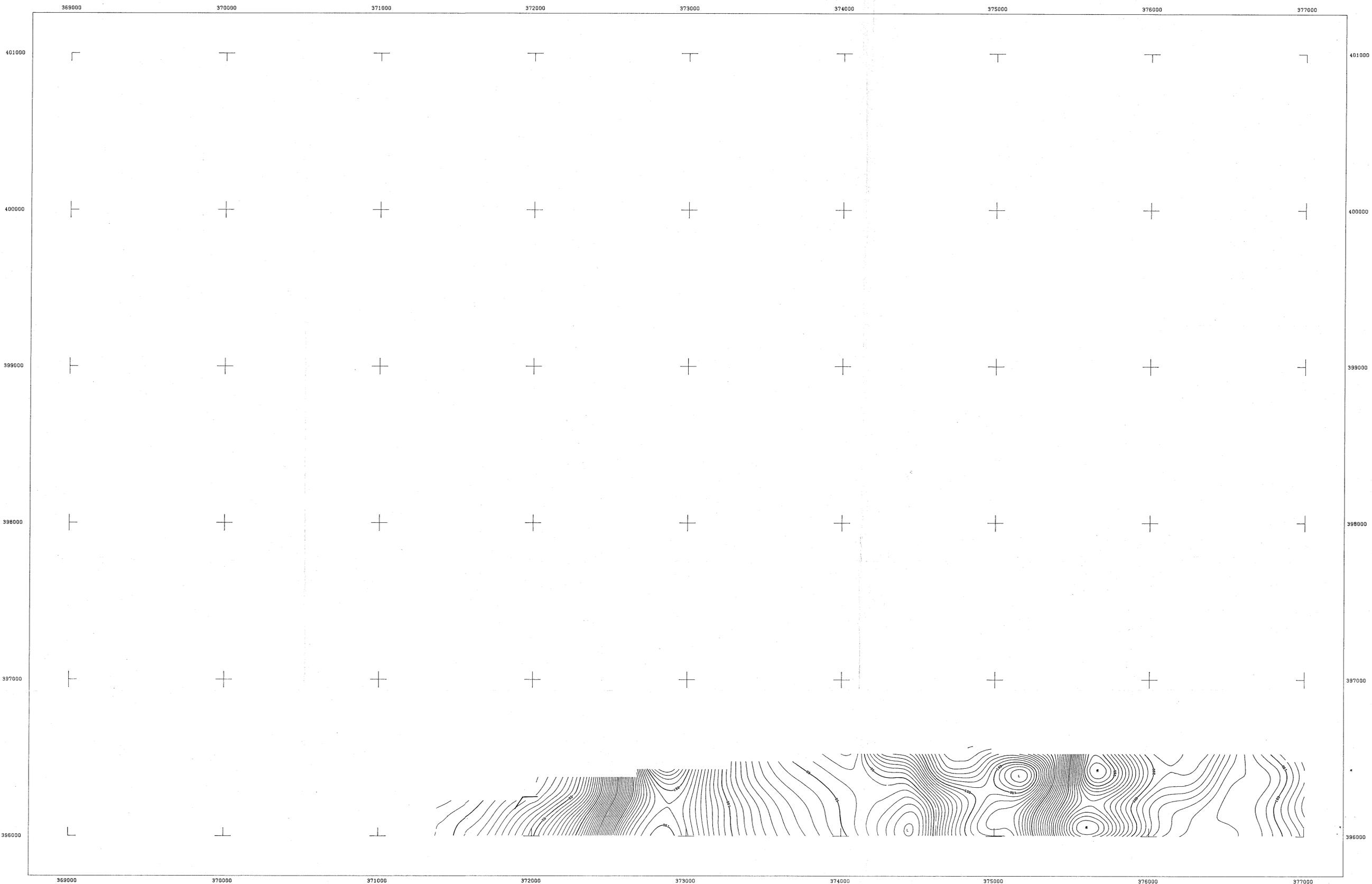
566111

SURVEY BOUNDARY

⊕ Registration point identified on photomosaic.
+ 1000 metre grid, relative to arbitrary origin.

1822

PROJECT NUMBER 82733 SURVEYED MARCH 1982 TAs/2/3003



Airborne Geophysical Survey and Compilation by

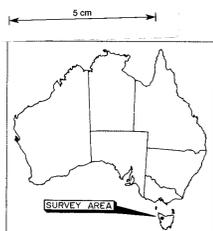


for

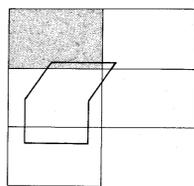
AUSTRALIAN ANGLO AMERICAN LIMITED

MT RAMSAY AREA TASMANIA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY



SURVEY LOCATION



SHEET INDEX

SCALE 1:10000



566112

The data presented is the residual magnetic intensity, after subtracting the International Geomagnetic Reference Field from the observed Total Magnetic Intensity. The data was corrected for diurnal drift using a base station monitor at SMITHTON Airfield, Latitude 40.837 S Longitude 145.083 E Altitude - Metres. The sensor height was 3 metres. The adopted value for this location was 62174 nT. Final detailed levelling of the data was performed using tie-line crossover analysis. A simple 3 point filter was applied to the data, which was then gridded and contoured using a 50m by 50m mesh cell.

EQUIPMENT SPECIFICATIONS
Cessna 441B5E Aircraft
SONOTEK IGSSI SYSTEM
0.1 nT MAGNETOMETER
256 CHANNEL SPECTROMETER
24 Litre NaI(Tl) DETECTOR
KING KRALD RADAR ALTIMETER
15cm Ground Tracking Camera
Industry Standard 9 track
32 RPM Magnetic Tape
8 Channel Analogue Recorder
3 Channel Analogue Recorder
for Magnetometer

The nominal flight line separation was 150 metres, and the nominal tie-line bearing was 0 degrees. The observed mean sample interval in the flight direction was 39 metres, achieved with a nominal aircraft speed of 100 knots, and a reading interval of 0.8 seconds. The mean sensor height was 150 metres, using a towed bird configuration. The magnetometer accuracy is 1.0 nT, and the resolution 0.1 nT.

SURVEY BOUNDARY

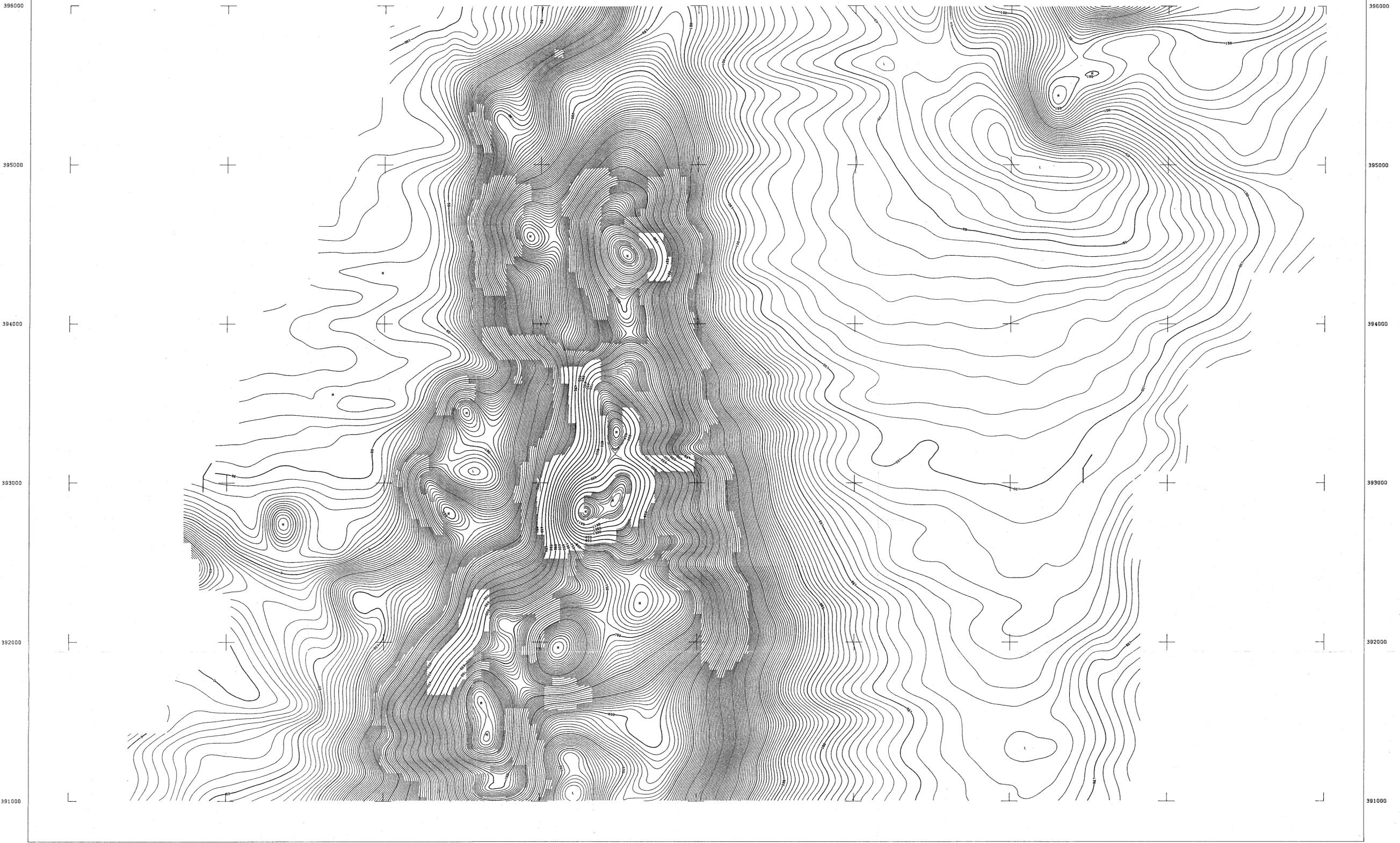
CONTOUR INTERVAL 5 nTesla

PROJECT NUMBER 82793

SURVEYED MARCH 1982 TAS/2/3006

1823

369000 370000 371000 372000 373000 374000 375000 376000 377000



Airborne Geophysical Survey and Compilation by



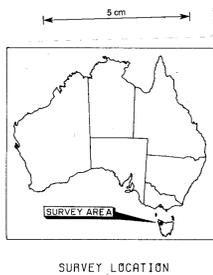
for

AUSTRALIAN ANGLO AMERICAN LIMITED

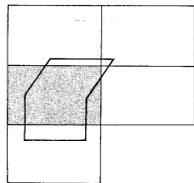
MT RAMSAY AREA TASMANIA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:10000



SURVEY LOCATION



SHEET INDEX

566113

The data presented is the residual magnetic intensity, after subtracting the International Geomagnetic Reference field from the observed Total Magnetic Intensity. The data was corrected for diurnal drift using a base station monitor at SHITTON Airfield, Latitude 40.837 S Longitude 145.083 E Altitude - Metres. The adopted value for this location was 62174 nT.

Final detailed levelling of the data was performed using tie-line crossover analysis. A simple 3 point filter was applied to the data, which was then gridded and contoured using a 50m by 50m mesh cell.

EQUIPMENT SPECIFICATIONS
 Cessna 441B5E Aircraft
 SONTEK IGSS SYSTEM
 0.1 nT MAGNETOMETER
 256 CHANNEL SPECTROMETER
 24 Litre NaI(Tl) DETECTOR
 KING MARIO RADAR ALTIMETER
 15mm Ground Tracking Camera
 Industry Standard 9 track
 32 RPM Magnetic Tape
 8 Channel Analogue Recorder
 3 Channel Analogue Recorder
 for Magnetometer

The nominal flight line separation was 150 metres, and the nominal tie-line bearing was 0 degrees. The observed mean sample interval in the flight direction was 39 metres, achieved with a nominal aircraft speed of 100 knots, and a reading interval of 0.8 seconds. The mean sensor height was 150 metres, using a towed bird configuration. The magnetometer accuracy is 0.0 nT, and the resolution 0.1 nT.

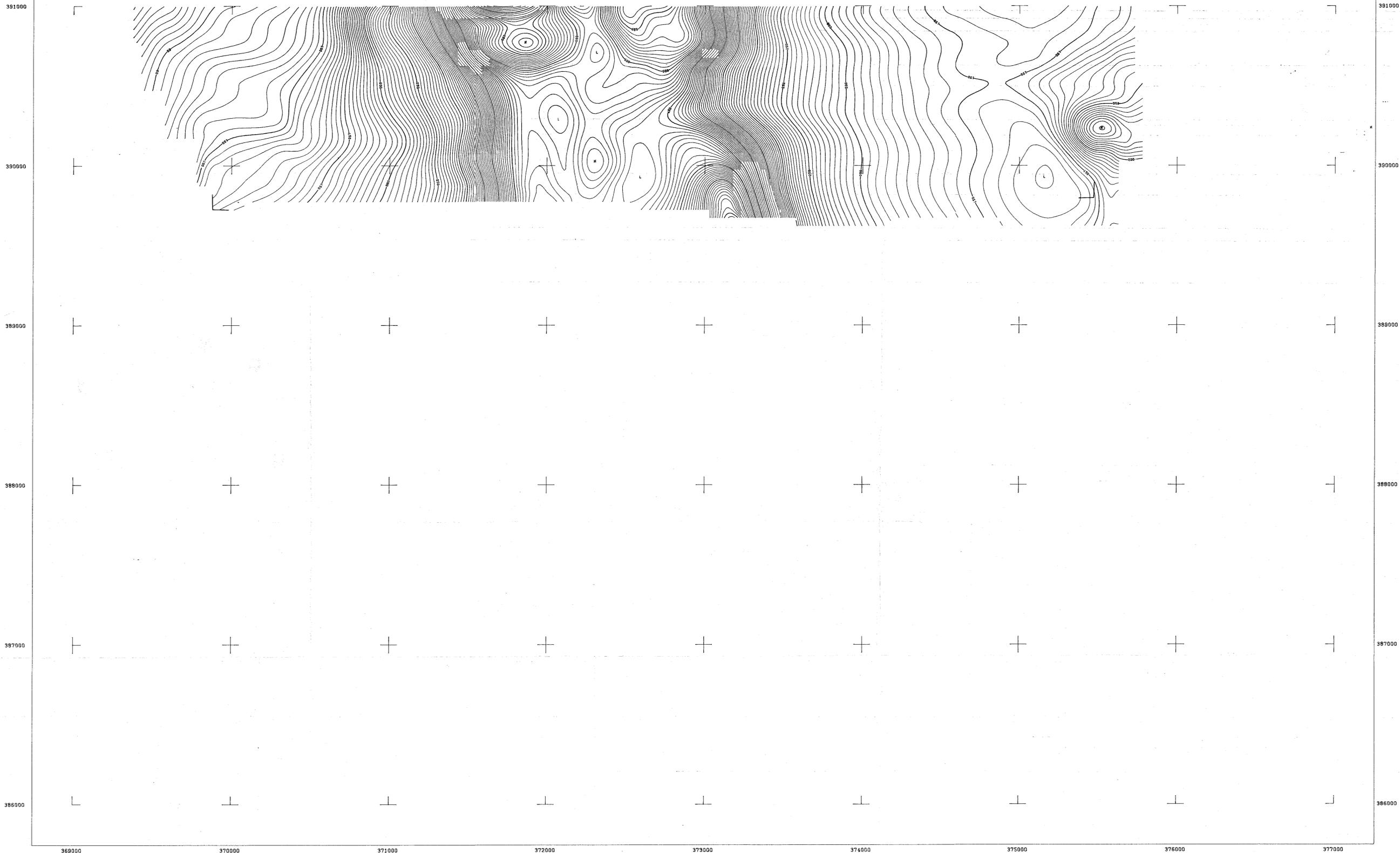
— SURVEY BOUNDARY

CONTOUR INTERVAL 5 nTesla

PROJECT NUMBER 82793 SURVEYED MARCH 1982 TAS/2/3007.

1824

369000 370000 371000 372000 373000 374000 375000 376000 377000



Airborne Geophysical Survey and Compilation by



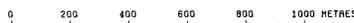
for

AUSTRALIAN ANGLO AMERICAN LIMITED

MT RAMSAY AREA TASMANIA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:10000

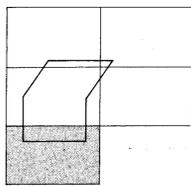


566114

5 cm



SURVEY LOCATION



SHEET INDEX

The data presented is the residual magnetic intensity, after subtracting the International Geomagnetic Reference Field from the observed Total Magnetic Intensity. The data was corrected for diurnal drift using a base station monitor at SMITHTON Airfield, Latitude 40.897 S Longitude 145.083 E. The adopted value for this location was 62174 nT. Final detailed levelling of the data was performed using tie-line crossover analysis. A simple 3 point filter was applied to the data, which was then gridded and contoured using a 50m by 50m mesh cell.

EQUIPMENT SPECIFICATIONS
Cessna 441B5 Aircraft
SONOTEK IGSSI SYSTEM
0.1 nT MAGNETOMETER
256 CHANNEL SPECTROMETER
24 Litre NaI (TI) DETECTOR
RING RADIOMETER ALTIMETER
16mm Ground Tracking Camera
Industry Standard 9 track
32 RPM Magnetic Tape
8 Channel Analogue Recorder
3 Channel Analogue Recorder for Magnetometer

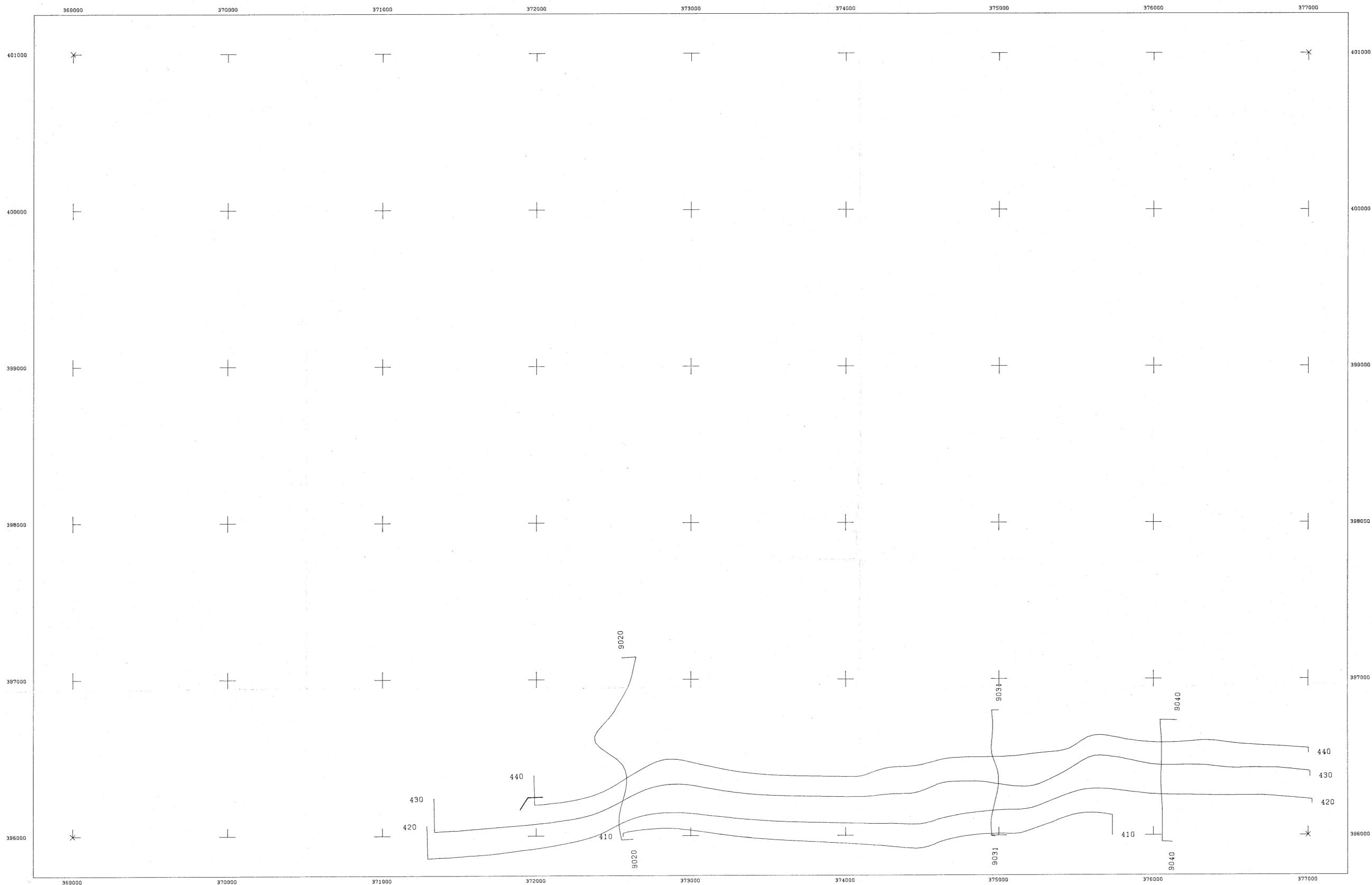
The nominal flight line separation was 150 metres, and the nominal tie-line bearing was 0 degrees. The observed mean sample interval in the flight direction was 39 metres, achieved with a nominal aircraft speed of 100 knots, and a reading interval of 0.8 seconds. The mean sensor height was 150 metres, using a towed bird configuration. The magnetometer accuracy is 1.0 nT, and the resolution 0.1 nT.

SURVEY BOUNDARY

CONTOUR INTERVAL 5 nTesla

PROJECT NUMBER 82733 SURVEYED MARCH 1982 TAS/2/3008

1825



Airborne Geophysical Survey and Compilation by

GEOEX
PTY LTD

for

AUSTRALIAN ANGLØ AMERICAN LIMITED

MT RAMSAY AREA TASMANIA

PROFILES OF TOTAL MAGNETIC INTENSITY

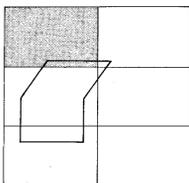
SCALE 1:10000

0 200 400 600 800 1000 METRES

5 cm



SURVEY LOCATION



SHEET INDEX

SURVEY BOUNDARY

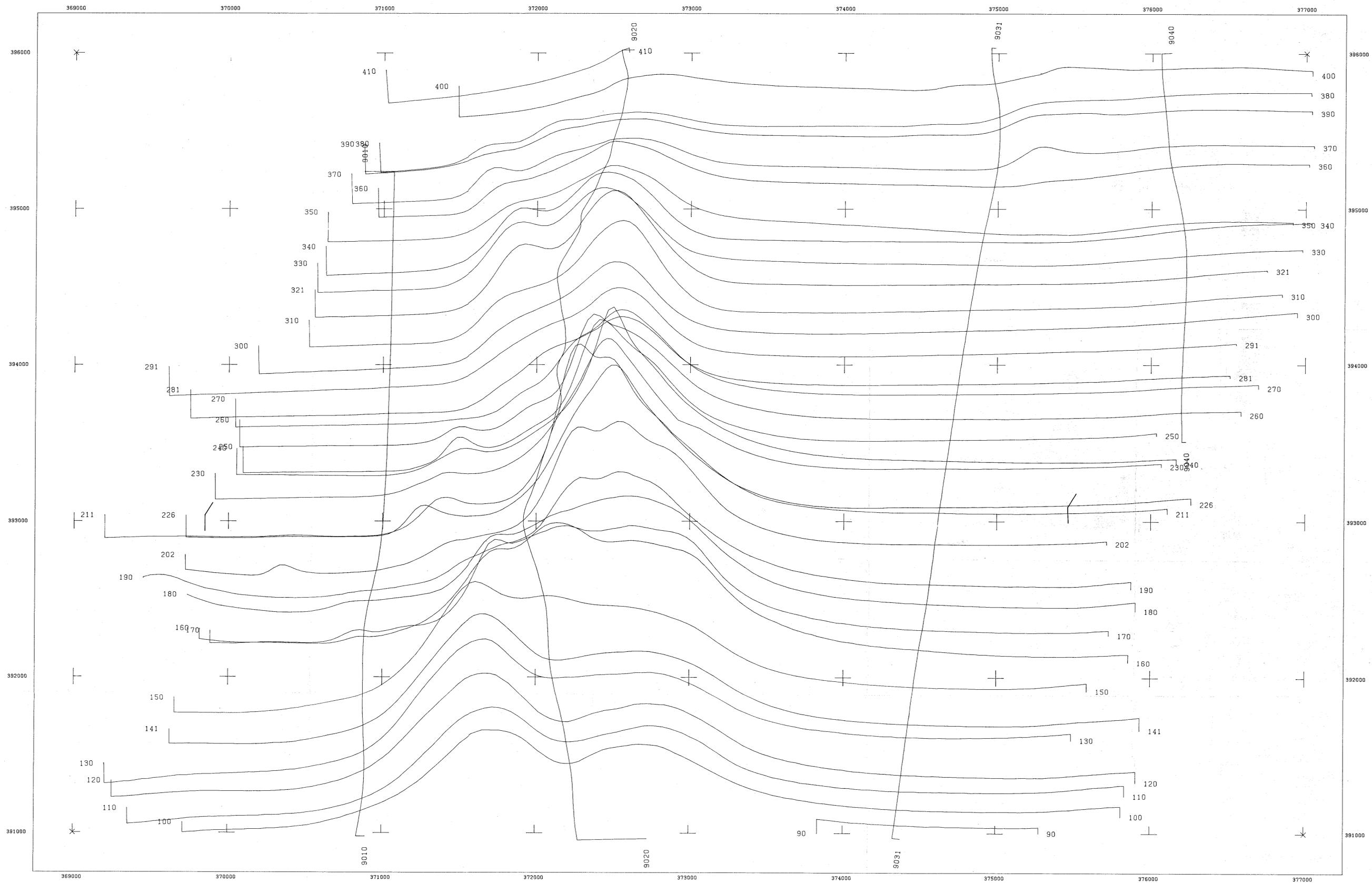
BASELINE VALUE 100 nT VERTICAL SCALE 100

PROJECT NUMBER 82733

SURVEYED MARCH 1982 TAS/2/3011

566115

1826



Airborne Geophysical Survey and Compilation by



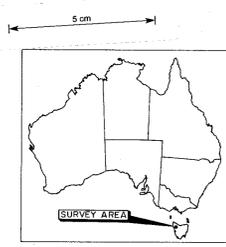
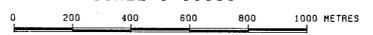
for

AUSTRALIAN ANGLO AMERICAN LIMITED

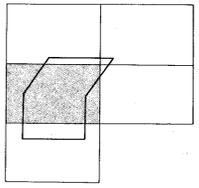
MT RAMSAY AREA TASMANIA

PROFILES OF TOTAL MAGNETIC INTENSITY

SCALE 1:10000

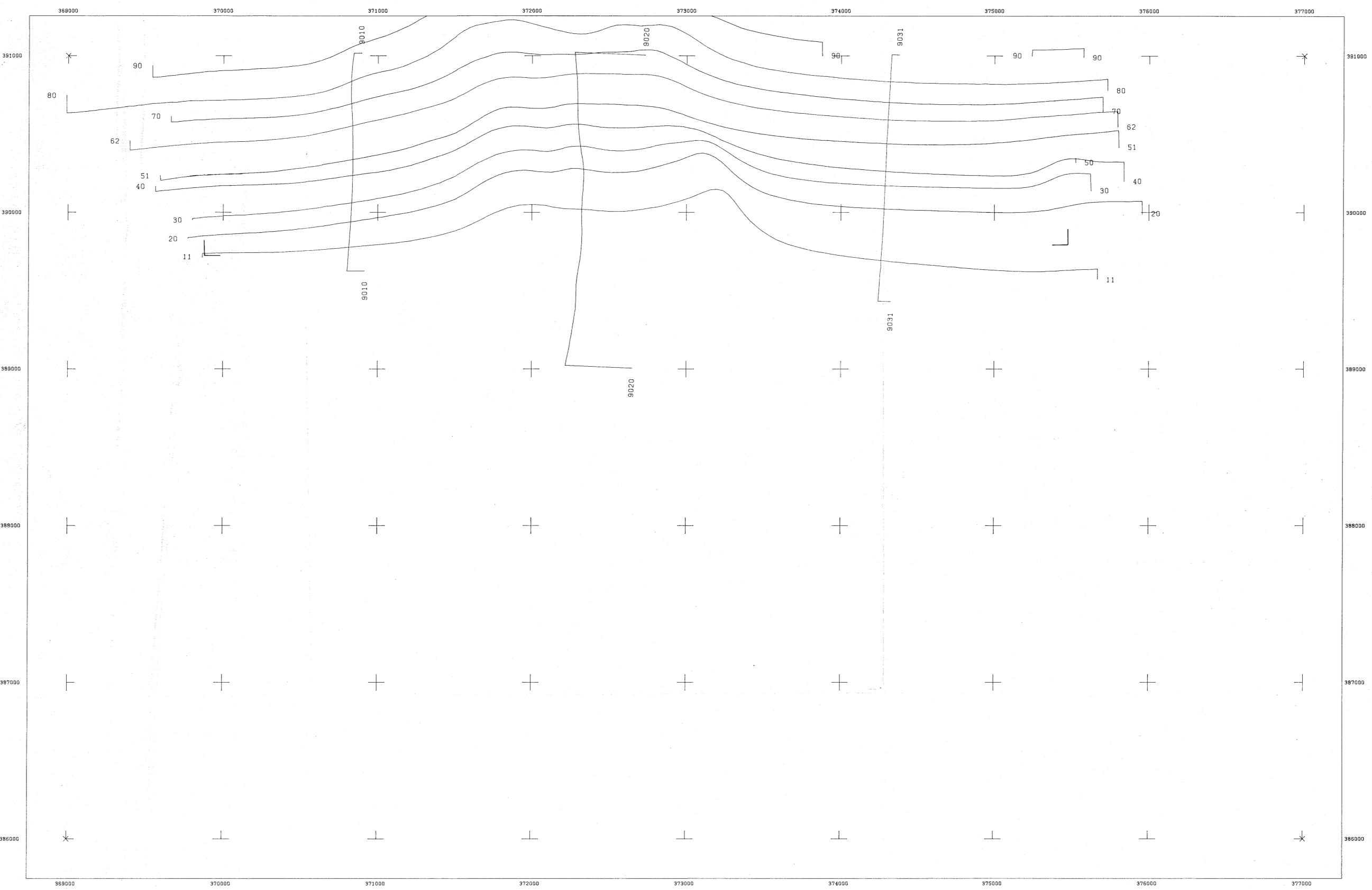


SURVEY LOCATION



SHEET INDEX

SURVEY BOUNDARY
 BASELINE VALUE 100 nT VERTICAL SCALE 100
 PROJECT NUMBER 82733 SURVEYED MARCH 1982 TAS/2/30/z
 566116
 1827



Airborne Geophysical Survey and Compilation by



for

AUSTRALIAN ANGLO AMERICAN LIMITED

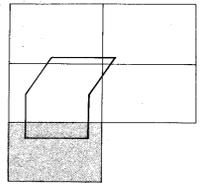
MT RAMSAY AREA TASMANIA

PROFILES OF TOTAL MAGNETIC INTENSITY

SCALE 1:10000

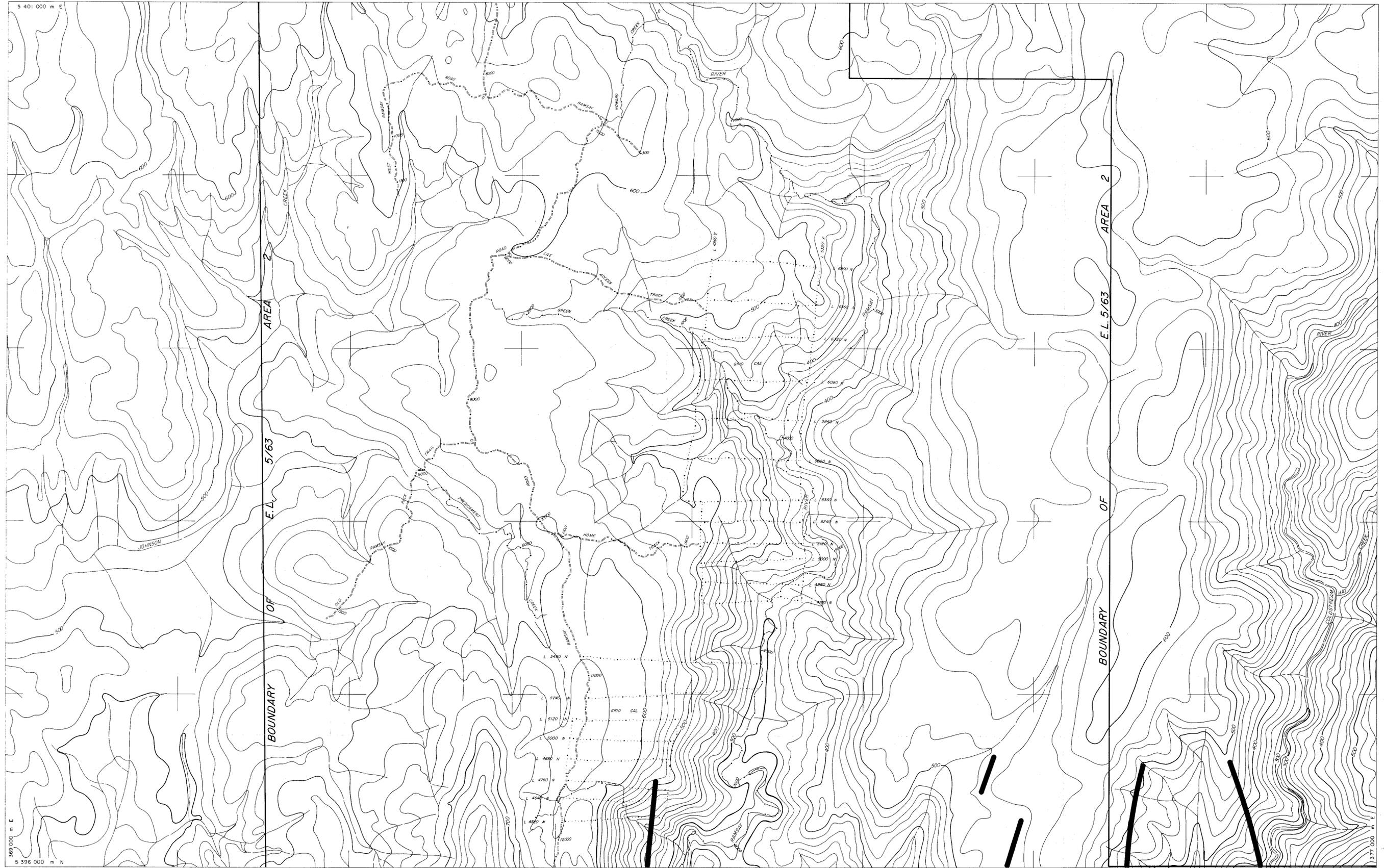


SURVEY LOCATION



SHEET INDEX

SURVEY BOUNDARY 566117
 BASELINE VALUE 100 m VERTICAL SCALE 100 1828
 PROJECT NUMBER 82733 SURVEYED MARCH 1982 TAs/2/3013



5 401 000 m E

5 396 000 m E
5 396 000 m N

5 377 000 m E

BOUNDARY OF AREA 2
E.L. 5/63

BOUNDARY OF AREA 2
E.L. 5/63

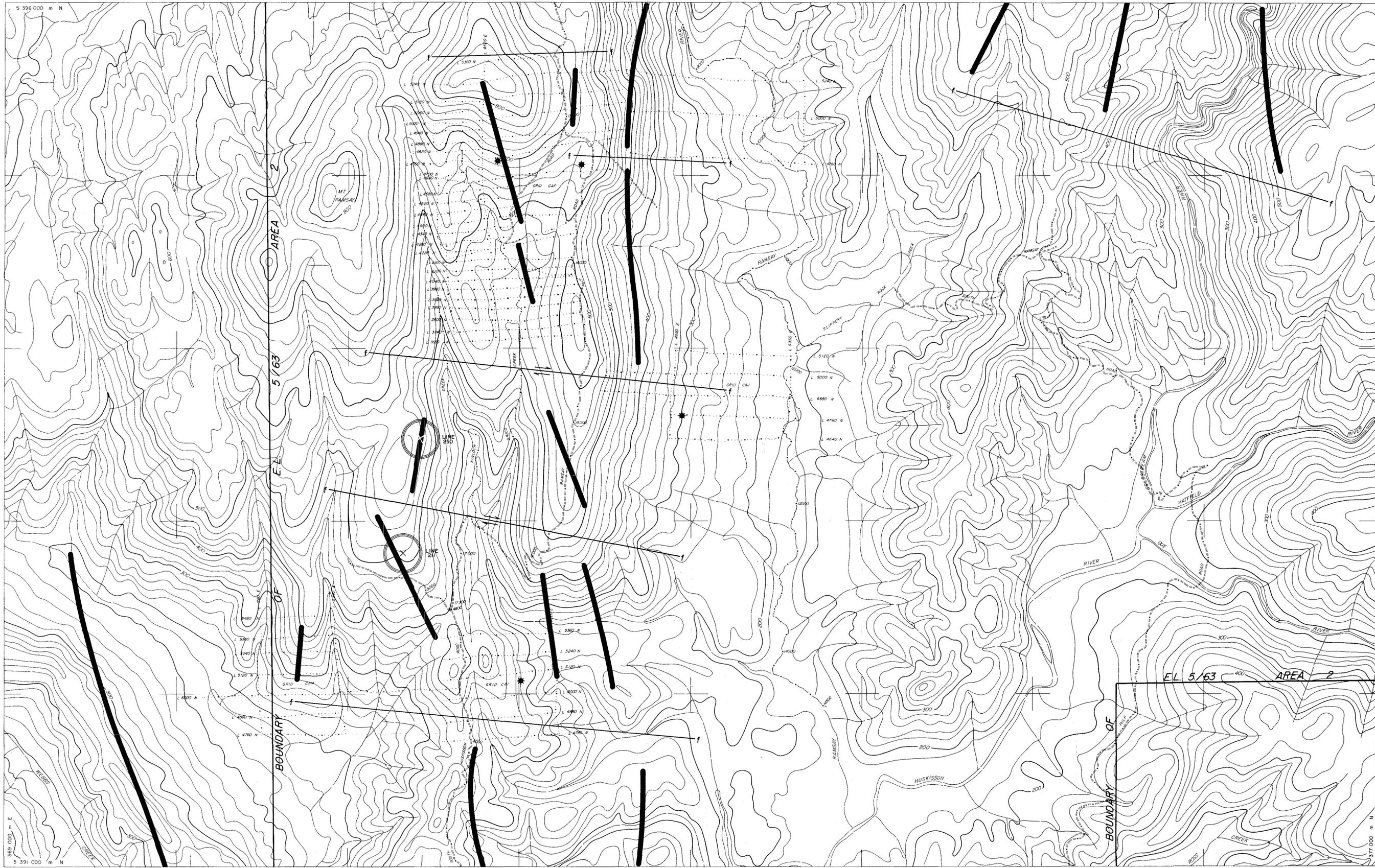
FOR LEGEND SEE TAS/2/3161

TAS/2/	TAS/2/
TAS/2/3161	TAS/2/
TAS/2/3162	TAS/2/



566118 5 cm

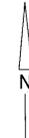
COMSTAFF PROPRIETARY LIMITED	
EL 5/63 AREA 2 RAMSAY 1829	
INTERPRETATION PLAN OF AEROMAGNETIC SURVEY DATA	
COMPILED D. S. TRUSSELL	DATE 17/12/82
DRAWN GEODRAFT	DATE 17/12/82
AMENDED	
SCALE 1 : 10 000	
PLAN NO. TAS/2/3160	



LEGEND

-  MAGNETIC ANOMALY
-  INPUT ANOMALY
-  FAULT
-  MAGNETIC ANOMALY RECOMMENDED FOR FOLLOW-UP

TAS/2/	TAS/2/
TAS/2/3160	TAS/2/
TAS/2/3161	TAS/2/
TAS/2/3162	TAS/2/



566119

5 cm

COMSTAFF PROPRIETARY LIMITED

EL 5/63 AREA 2
RAMSAY 1830
INTERPRETATION PLAN
OF AEROMAGNETIC SURVEY DATA

COMPILED	D. B. TRUSSELL
DRAWN	GEOGRAFT
DATE	17/12/82
AMENDED	
SCALE	1 : 10 000
PLAN No	TAS/2/3161



5 391 000 m N

369 000 m E
5 386 000 m N

377 000 m E

BOUNDARY OF EL 5/63 AREA 2

FOR LEGEND SEE TAS/2/3161

TAS/2/	TAS/2/
TAS/2/3160	TAS/2/
TAS/2/3161	TAS/2/
TAS/2/3162	TAS/2/



566120

COMSTAFF PROPRIETARY LIMITED

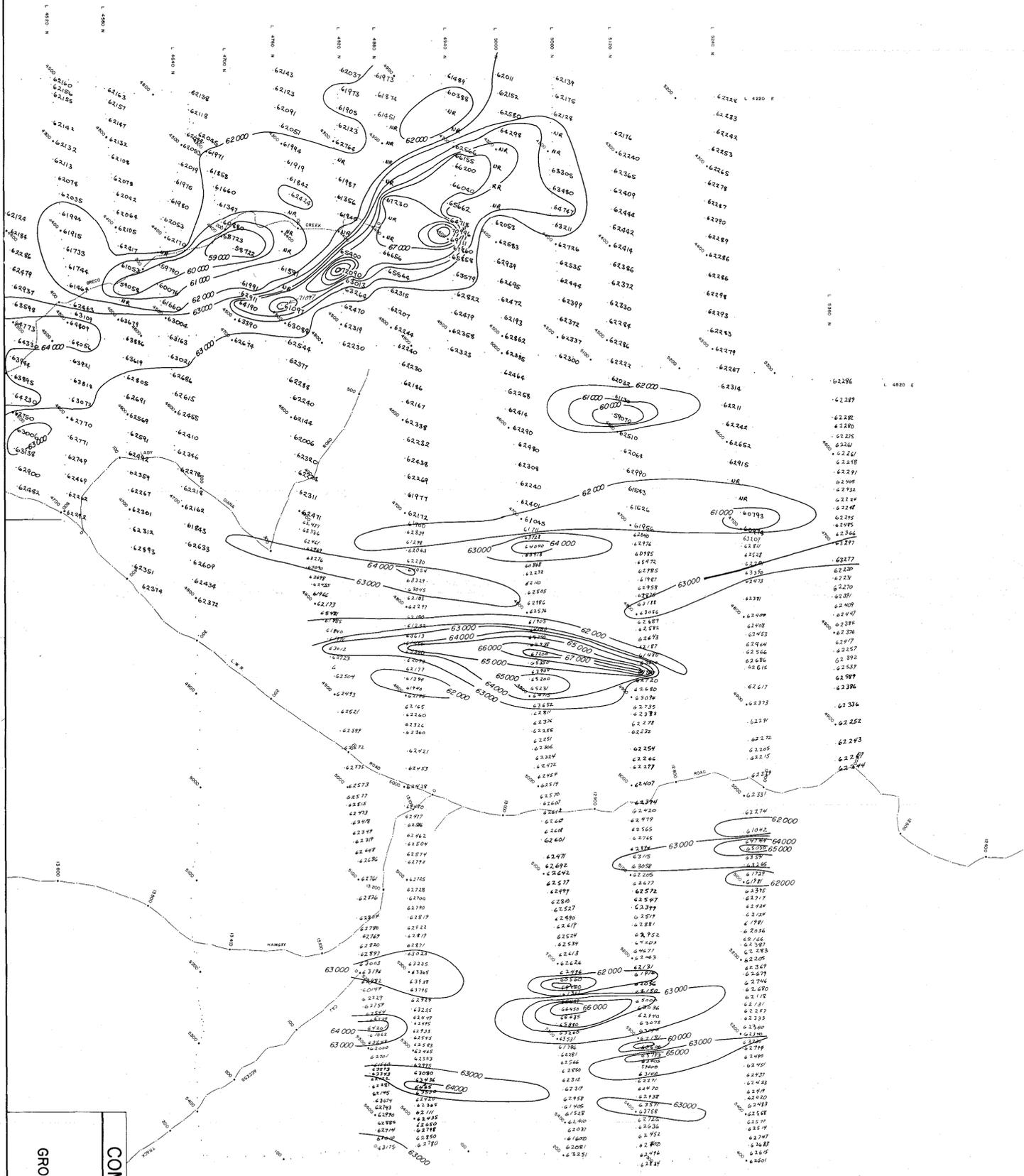
EL 5/63 AREA 2
RAMSAY 1831

INTERPRETATION PLAN
OF AEROMAGNETIC SURVEY DATA

COMPILED D. B. TRUSSELL	DATE 17/12/82
DRAWN GEODRAFT	DATE 17/12/82
AMENDED	DATE
SCALE 1 : 10 000	PLAN No. TAS/2/3162

5 cm

3 395 000 m N



372 000 m E

56121

COMSTAFF PROPRIETARY LIMITED

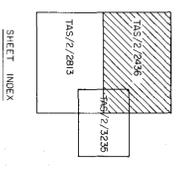
RAMSAY GRID - CAF 1832

GROUND MAGNETIC CONTOUR PLAN

DATE 4/79

SCALE 1:2500

TAS/2/2436

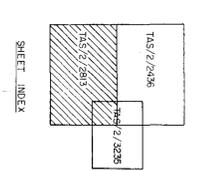




TIE LINE 4040 E

BASE LINE 4050 E

372.000 m E



566122

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF, SOUTHERN EXTENSIONS

GROUND MAGNETOMETER CONTOURS

J/1833

TAS/2/2813

SCALE 1:2500

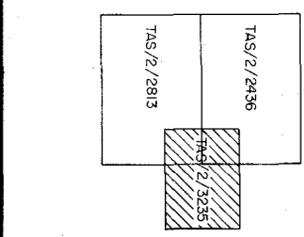
DATE II/9/82

PROJECT RAMSAY

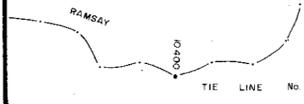


5 395 000 m N

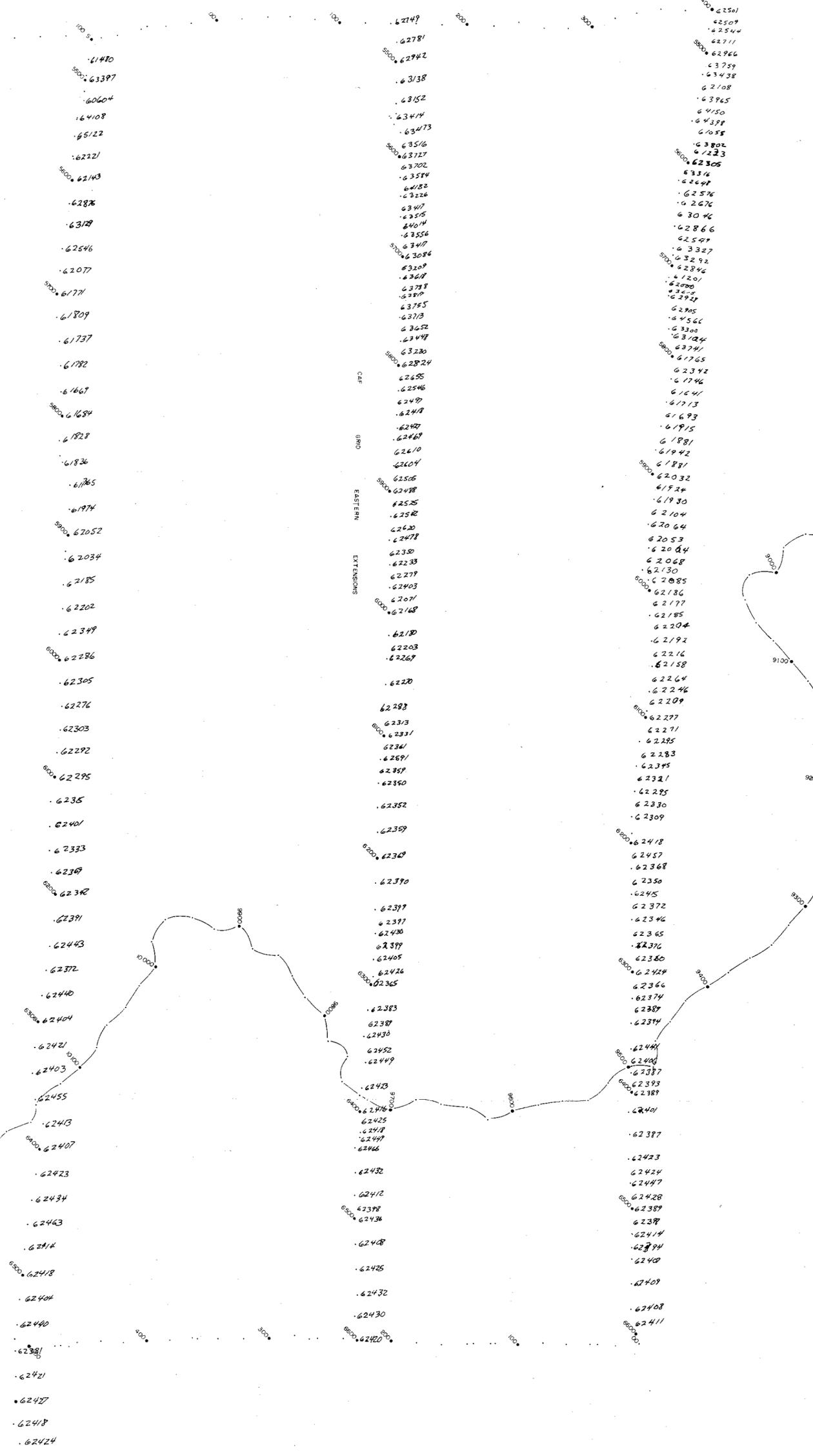
TIE LINE No 2



373 000 m E



COMSTAFF PROPRIETARY LIMITED
RAMSAY GRID CAF - EAST EXTENSIONS
GROUND MAGNETIC CONTOUR PLAN
1834



001133

L 5240 N

L 5900 N

L 4780 N

ORIGINAL

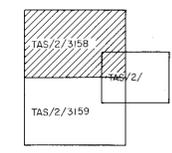
CAF

GRID

EASTERN EXTENSIONS

RAMSAY RIVER

372 000 m E



SHEET INDEX

FOR LEGEND SEE TAS/2/3159

G R A N I T E



5 395 000 m N

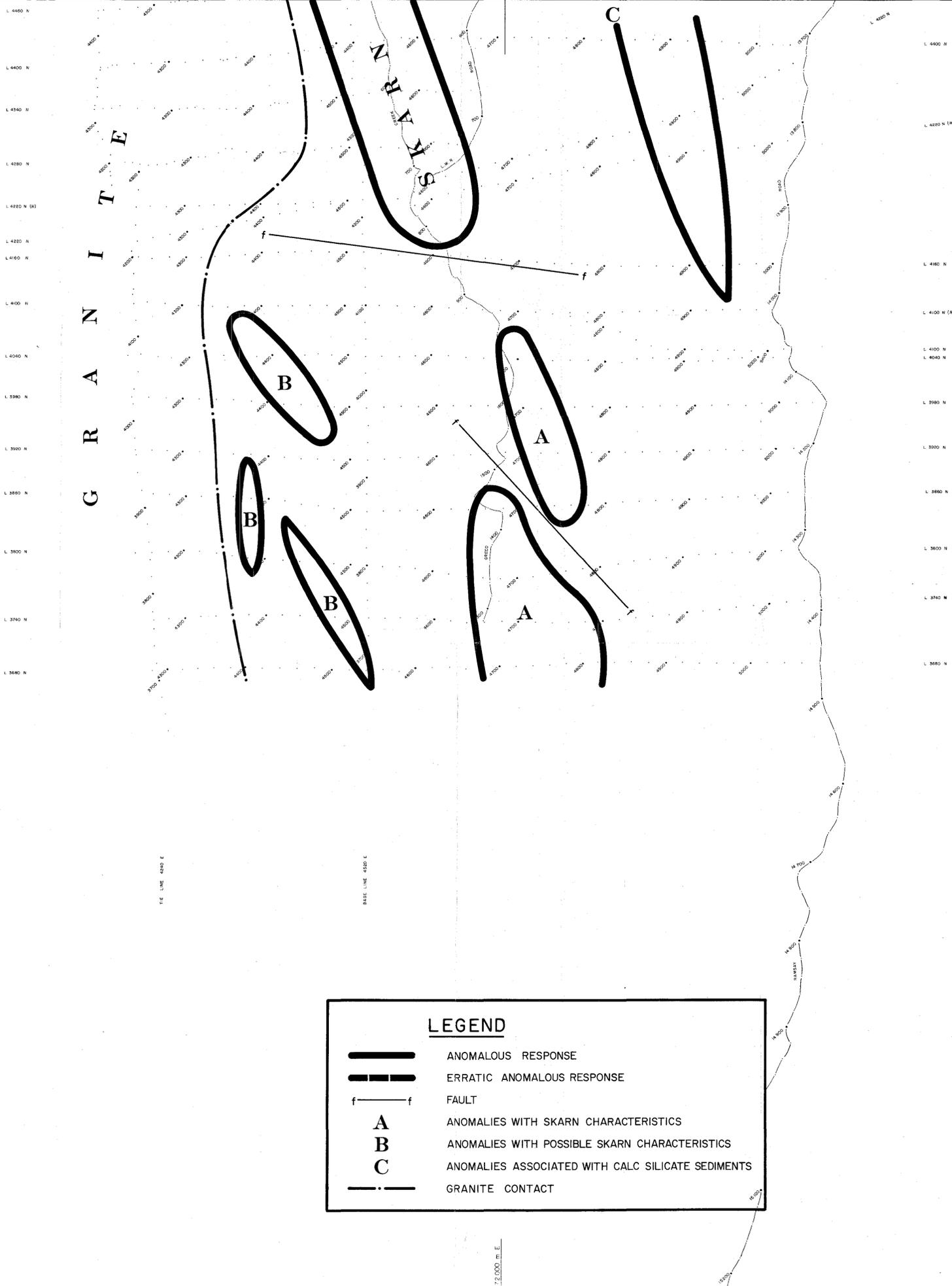
566124

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF
 INTERPRETATION OF 1835
 GROUND MAGNETIC SURVEY RESULTS

COMPILED	D. B. TRUSSELL
DRAWN	DATE
GEO-DRAFT	17/12/82
AMENDED	12/4/83
SCALE	1 : 2500
PLAN No	TAS/2/3158

S 394 000 m N

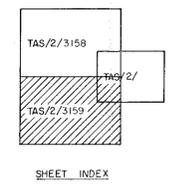


G R A N I T E

R A M S A Y

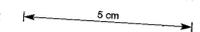
LEGEND

-  ANOMALOUS RESPONSE
-  ERRATIC ANOMALOUS RESPONSE
-  FAULT
- A** ANOMALIES WITH SKARN CHARACTERISTICS
- B** ANOMALIES WITH POSSIBLE SKARN CHARACTERISTICS
- C** ANOMALIES ASSOCIATED WITH CALC SILICATE SEDIMENTS
-  GRANITE CONTACT



SHEET INDEX

566125



COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF, SOUTHERN EXTENSIONS
 INTERPRETATION OF 1836
 GROUND MAGNETIC SURVEY RESULTS

COMPILED D. B. TRUSSELL	DATE 17/12/82
DRAWN GEOGRAFT	DATE 12/4/83
AMENDED	SCALE 1 : 2500
PLAN NO. TAS/2/3159	