COMSTAFF PROPRIETARY LIMITED

PROJECT NAME: INTERIM REPORT ON THE RAMSAY AREA EL 5/63 PART 2

TITLE:

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INTERIM REPORT ON THE RAMSAY AREA EL 5/63 PART 2

1. INTRODUCTION

This report reviews the work carried out in the Ramsay Area (EL 5/63 Part 2) during 1979. The area concerned is outlined on Plan TAS 2/1799. Following a review of previous work carried out in this area, the 1979 work programme is outlined. A resume of the geology is followed by the presentation of results from the regional stream sediment sample surveys. Then the geology geochemistry and geophysics of the input follow up grids are presented and put into a regional context. A summary of results achieved with proposals for further work concludes the report.

2. LOCATION AND ACCESS

The area under review forms the western sector of EL 5/63 Part 2 (Plan TAS 2/1799). The northern boundary of which lies 10km south west of Waratah. Access is provided by a four wheel drive track from the Corinna-Waratah Highway. This track progressed 13 km to CAF and was stopped at the onset of winter. Walking tracks were constructed to give access to the grids CAE and CAJ. Access to the eastern sector of the area is provided by a four km track from the Associated Forest Holdings road (Hatfield Road).

3. PREVIOUS WORK

The southern part of the Ramsay River and some of its tributaries were geologically mapped and sediment sampled during the 1971/1972 Summer Field Season (Rugless 1972). This (1979) work follows on from that programme to some extent. Rugless's geological observations have been confirmed particularly that of his recognition of two distinct sequences in the Ramsay River group of rocks.

The area was included in the Input E-M survey of 1975 and a number of anomalies identified. Two of the anomalies CAB and CAI were followed up but in both cases no firm conclusions as to their importance or significance were formed. CAB lies on part of the Wow grid and has been confirmed on the ground by anomalous geochemical responses and a minor Crone E-M response. CAI lies on part of the Ott Creek Grid but its position on the ground is doubtful. An Input follow up grid was established to find CAI on the ground but it appears to have been cut too far to the north. However a strongly positive Crone E-M response was found associated with anomalous Cu, Zn soil geochemistry on the grid.

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4. WORK COMPLETED

4.1 Geological Investigations

Access tracks, sections of the Ramsay River and selected creeks were geologically mapped. All grid lines and tie lines were mapped utilising rock chips brought up by hand auger sampling. Appropriate rock samples were submitted for petrological description from their sections and for geochemical analysis.

4.2 Geochemical Surveys

Stream sediment sample values obtained from previous surveys were plotted on the 1 : 5000 base sheets. This highlighted areas of poor coverage and drew attention to areas of anomalously high values. Sediment sampling on this programme was designed to fill in and to follow up the previous results. Sediment from the active stream channels and base of slope soil samples were collected. C horizon auger samples were collected from the Input follow up grids except CAJ. This was considered to be the most appropriate soil sampling method as there are no glacial deposits and the relief on some of the grid lines is high. Ao samples were collected on CAJ as some of the grid is overlain by Quaternary sediments. A portion of the Ramsay access track was channel sampled.

4.3 Geophysical Surveys

The positions of the Input anomalies in the Ramsay area were checked by the photogeologist (M.H.) following some doubts as to the accuracy of the 1 : 5000 base plans in the region. The positions were replotted on more recent aerial photographs (1978) using the original flight strip negatives. The anomalies were positioned on the ground using tape and compass survey data combined with aerial photo interpretations.

Input follow up grids were established at CAE CAL CAF and CAJ. Crone E-M and proton procession magnetometer surveys were used to locate the anomalous sources.

4.4 Statistics

Geological Mapping		tracks,grid lines and creeks - 45,050 metres
Thin section analyses	-	25 samples
Rock geochemical analyses	-	72 samples
Stream sediment samples	-	237 samples
Base of slope soil samples	-	129 samples
Soil samples	-	856 samples
Grid lines cut	-	19620 m
Access tracks bulldozed	-	17080 m
Walking tracks cut	-	3450 m

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TABLE 1

AGE	NAME	UNIT	THICKNESS	LITHOLOGIES
Quarternary		Alluvium	0 - 10 m	Boulder and cobble gravel, sand
Tertiary		Basalt	0 - 25	Alkali olivine basalt; basal gravel, sand.
			unconformity	
Upper Devonian to Lower Carboniferous		Meredith Granite		
			intrusive	
Lower Cambrian	Crimson Creek Formation	Greywacke Sequence	800 - 1200+ m	Basic to intermediate volcaniclastic greywacke, tuff, siltstone; argillite; pelite (possibly dolomitic); chert; conglomerate; minor basic sills, dykes, lavas.
			unconformity	
Upper Proterozoic	Ramsay Group	Sandstone/Shale Sequence	800+ m	Carbonaceous sandstone, phyllite and shale; micaceous sandstone, siltstone; conglomerate; breccia; carbonate.

5. GEOLOGY

The rocks in the Ramsay area may be grouped into quite different discrete sequences (see Table 1), depending on lithology, degree of deformation, and age relationship. The interpreted distribution of these sequences is shown on plan TAS 2/2029, 2030 and 2031. These plans were compiled from the 1 : 5000 field maps on which all geological observations are recorded. The detailed geology of the various grids are shown on separate plans, CAE on Plan TAS 2/2099, CAL on Plan TAS 2/2100, CAF on Plan TAS 2/2101 and CAJ on Plan TAS 2/2102.

5.1 Lithologies

Ramsay Group. Rocks of the Ramsay Group outcrop in the Ramsay River Valley and underly sections of Grids CAE CAL and CAJ. The Group consists of dark grey carbonaceous phyllite, metasiltstone and shale; micaceous semi pelite and pelite; micaceous quartz wacke and psammite, feldspathic sandstone and siltstone. Generally the rocks are thinly bedded with soft sediment deformation, scour and fill texture and rhythmic bedding developed. The lower part of the group has undergone two, possibly three, periods of deformation, and is strongly cleaved.

The upper part of the Ramsay Group, below its contact with the Crimson Creek Formation, includes carbonate and conglomerate units. Calc silicate rocks with interstitial sulphides and secondary goethite have been mapped on grid CAL and east of CAF. The rocks are heavily metasomatised with relict features obliterated, but with a faint banding barely recognisable. They are made up of matted and granular aggregates of calc silicate minerals mainly tremolite and diopside with minor sphene, feldspar and quartz. Coarse angular conglomerate has been mapped in situ and as float. The uppermost unit of the Ramsay Group where exposed in Osborne Creek is an argillite-chert-quartzite conglomerate with minor sulphides (Pyrite) in a siliceous matrix. Float of pyritised conglomerate has been mapped in the Ramsay River north of CAL. It consists of poorly sorted pebbles of pyritic quartzite and carbonaceous meta siltstone in a siliceous matrix with interstitial pyrite/marcasite. In Green Creek float of gossanous shale breccia has been recorded from this contact zone.

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The Ramsay Group is regarded as being Upper Proterozoic (possibly to Lower Cambrian) in age, and although poly folded in sections, the rocks are relatively unmetamorphosed. The rock sequence is comparable to the Bischoff Series exposed at Mount Bischoff and to the Oonagh Formation exposed west of Renison Bell. It resembles the Success Creek Group in lithologies but not in degree of deformation. The Ramsay Group therefore may be regarded as forming part of the Proterozoic basement to the Cambrian Dundas Trough and is exposed in the Ramsay Valley as an inlier similar to those which occur at Mt Dundas and Mt Bischoff. Its relationship to the Success Creek Group is not clear. Recent mapping by Geological Survey Geologists north of Renison Bell indicates that the Success Creek Group is the earliest trough unit and it rests unconformably on rocks of the Oonagh Formation (A. Brown personal communication). Rocks similar to those of the Success Creek Group outcrop north of Rosebery in the Rosebery Group - namely the Stitt Quartzite. These rocks may represent shelf-type shallow water facies which formed at the base of and marginal to the fault controlled, rapidly subsiding Dundas Trough (Pigott 1978). It is quite possible that rocks of the Success Creek Group are represented at Ramsay below the boundary with the Crimson Creek Formation, but because of the similarity of lithologies it has not yet proved possible to distinguish them.

Crimson Creek Formation. Rocks of the Crimson Creek Formation form a thick unfossiliferous succession of basic to intermediate volcaniclastic greywacke, tuff, siltstone, argillite, calc silicate pelite, chert and conglomerate with basaltic sills dykes and lavas. Overall there appears to be an increase in the proportion of basic rocks from north to south with a progressive increase in grain size. In the northern part of the area the Cambrian sediments are predominantly flat lying to steeply dipping fine grained homogenous siltstone and argillite with interstratified tuffaceous sandstone. The rocks are finely bedded to well laminated. Southwards the sequence is predominantly made up of tuffaceous greywacke (or subaqueous tuff) which forms distinctive fine grained grey-black, poorly sorted labile clastic units. They are predominantly tremolitic rocks following the effects of regional green schist metamorphism. Commonly the clastic rocks are magnetic due to the presence of detrital magnetite. The Cambrian sediments at CAF comprise interlayered volcanomict sandstone, basic tuff, basic lithic wacke, argillite, siltstone and pelite. Further to the south at CAJ the sequence includes basaltic lava, microdolerite and basic tuff.

Fine grained, predominantly argillaceous, units occur within the greywacke sequence at CAL and CAF. They comprise pelite, meta dolomite, breccia, chert, acid tuff and meta siltstone. Characteristically the rocks are finely bedded, brecciatted and are heavily metasomatised. The rocks are thought to be meta dolomites or at least semi calcareous and as such represent quite a different facies from the turbiditic sequences. There is, in addition, evidence from thin section examination that there is an acid volcanic component in interlayered bands. Fine grained tourmaline (dravite) is a common accessory mineral in these fine grained rocks.

Essentially the rock sequence is similar to that mapped in the Renison Bell area as Crimson Creek Formation and is therefore assigned to it on the basis of correlation by lithology. The tremolitic tuffaceous greywacke units resemble the Deep Creek "tuffs" mapped at Cleveland as being the footwall rocks to the ore bearing horizon.

Meredith Granite. The emplacement of the post kinematic Meredith granite pluton took place in the Late Devonian - Early Carboniferous. It appears to be a composite intrusive complex with adamellite as the major rock type. The level of intrusion is thought to be deep subvolcanic. No associated acid volcanic rocks are known but there are numerous porphyritic dykes in the Proterozoic and Cambrian sediments of the region.

Although the granite has not been studied in detail, three facies have so far been recognised:-

Feldspar - biotite granite: this varies from being densely porphyritic to being coarsely crystalline in texture. It forms the main granite type mapped at Mount Ramsay and on the main access track south from the South Bischoff Mine. It is composed of phenocrysts of potash feldspar and quartz in a matrix of plagioclese, quartz and biotite. Biotite phenocrysts up to 10% of the rock may be present.

Porphyritic Adamellite: this varies from being fine grained with very scattered phenocrysts to containing 50% phenocrysts in a medium grained matrix. It occurs north of Wombat Flats, at the South Bischoff Mine and along the contact with the sediments on Mount Ramsay. The phenocryst phases include potash feldspar $\pm$ quartz $\pm$ biotite, and are set in a fine

to medium grained homogenous quartz-plagioclese-biotite matrix. The potash feldspar phenocrysts are subhedral to anhedral and are randomly arranged. The quartz phenocrysts are less common and are anhedral to ovoid in shape. The relative proportion and type of phenocryst phases as well as the proportion of matrix feldspar are both subject to random variation.

Microgranite: this is a fine to medium grained non porphyritic granite. It occurs on the road north of Wombat Flats and as minor dykes east of the South Bischoff Mine. It is a homogenous granite with an aplitic texture. Tourmaline and quartz aggregates occur within particular zones in this rock type. The tourmaline fills joints and fracture surfaces and displays a radially pseudo-dendritic habit.

Tertiary Basalt. The Tertiary Basalt cover is not as extensive as first thought. Basalts and gravels do occur within the areas outlined but are somewhat intermittently developed. The thickest deposits with the most widespread development occur over the granite-sediment contact zone north of CAE, across the headwaters of Green Creek and into the Ramsay River. In the area south of Wombat Flats Tertiary rocks occur on a thin veneer of boulders and cobbles set in red clay or as deposits infilling pre Tertiary topographic lows. The underlying Cambrain sedimentary rocks are often exposed in road cuttings and creek beds. Drainage and soil samples collected from such areas probably accurately reflect the elemental values in these underlying rocks.

The typical Tertiary basalt is grey to black in colour and exhibits marked textural and mineralogical variations. It is an alkali olivine basalt which has a fine grained homogeneous matrix and is often sporadically vesiculated. Feldspar and olivine are generally represented as phenocrysts, and a primary flow fabric can be distinguished by the orientation of the feldspars. Amygdales contain cryptocrystalline quartz, chlorite, carbonate and clay mineral. Rarely observed are olivine megacrysts and quartz xenoliths with complex reaction rims. Accessory fine grained magnetite is common giving the rock measurable magnetic properties.

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Quaternary Alluvium. Deposits of sands and gravels occur in the area, mainly over the Meredith granite but also in sections along the major water courses. These have acted as trap sites for heavy mineral concentrates such as cassiterite. They form as poorly sorted deposits with boulders and cobbles in a sandy matrix. The limited depth and aereal extent of these deposits preclude them from forming viable exploration targets.

5.2 Structure

The area mapped lies along the western limb of a major anticline. Rock units in both the Ramsay Group and the Crimson Creek Formation dip and face west. The inlier of Upper Proterozoic rocks occupies the axial zone of this anticline. These rocks were affected by the Penguin orogeny - a late Proterozoic period of deformation (Rugless 1972) which folded the units on N-S axes. Only one period of deformation - the Tabberabberan Orogeny - affected the overlying Cambrian rocks. This major orogeny is dated as between Early and Middle Devonian and produced the main fold and fault patterns in the area. The main trend is northwest to north north west.

This phase of deformation was followed by the emplacement of the Meredith Granite which was accompanied by brittle fracturing of the deformed sedimentary envelope . It is quite likely that the emplacement of the Granite was structurally controlled. A major crustal weakness probably occurred at the western margin of the fault controlled Dundas Trough which would have allowed a rapid rise of granitoid columns to a high crustal level.

This brittle fracture pattern gives rise to a large number of lineaments and fault blocks. Many of the contacts between different lithologies and sequences are fault controlled. North north west, north and north north eastern trends predominate with associated northeast, east and southeast tension fractures. Reference to the photogeological interpretation (Plans TAS 2/2026-2028) indicate that the granite contact zone is strongly fracture controlled as far south as CAF. This may account for the general absence of granitisation or high temperature metamorphic effects in the sedimentary rocks adjacent to the granite.

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The intensity of fracturing together with the fact that generally the beds dip and face into the granite make the eastern contact zone with the granite highly prospective. Fault structures, bedding planes and fold axes could have acted as conduits for hydrothermal mineralising fluids while porous or chemically reactive units could host replacement mineralisation.

5.3 Metamorphism

The effects of dynamic and thermal metamorphism are widespread in the area mapped. The ubiquitous development of mica in rocks of the Ramsay Group may have resulted from regional metamorphism during the Penguin Orogeny. The only possible contact metamorphic effects noted in these rocks are the intensity of quartz veins and the development of fine dravite. Tourmaline is a common accessary mineral in carbonaceous micaceous quartz arenite units, but is also seen to occur in veins and fractures. Further south, in the area yet to be mapped in detail east of CAF, tourmalinisation is more widespread. There,interlayered argillaceous units contain fine crystalline green tourmaline which can form up to 60% of the rock. Tourmaline also occurs within quartz sandstone units as fine grained green crystals concentrated in bunches and stringers. There is therefore an apparent increase in probable contact metamorphic effects within the Ramsay Group from north to south apparently reaching a maximum development east of CAF.

The rocks of the Crimson Creek Formation are pervasively metamorphosed, and like those of the Ramsay Group, show an increase in grade from north to south. Insufficient samples have been collected for metamorphic isograde to be drawn. But the metamorphic assemblages clearly depend on the bulk chemistry of the rock and therefore vary according to rock type. Overall however the mineral assemblages formed under conditions of upper greenschist to lower amphibolite facies. The main rock types - the basic tuffaceous greywackes, are extensively tremolitised. In the northern part of the area mapped the contact with the granite is almost "knife edge" sharp with no apparent increase in metamorphic grade. The rocks are dense with few persisting primary features and consist of tremolite with minor talc, saussurite, carbonate,albite biotite and magnetite. Further south, west of CAE,similar rock types, adjacent to the granite are seen as biotite-tremolite hornfels. The biotite content is 10% but the rock also contains albite, and

patches of chlorite. These are medium grade (albite-amphibolite facies) contact metamorphic rocks. The greywackes on CAF are similar being generally massive albite and/or cordierite-biotite-tremolite hornfels.

Pelitic rocks, on the other hand, contain variable mineral assemblages. The argillites and siltstones, which may be considered as fine silty-pelitic equivalents of the tuffaceous greywackes, show little evidence of contact metamorphism where mapped north of CAE, except for fibrous patches and veins of amphibole. On CAF such rocks are seen as spotted slates composed of cordierite and biotite. Relict bedding is well preserved mainly due to the presence of thin chert layers.

Units of pelitic dolomites have been mapped on grids CAL and CAF. These rocks have undergone fairly intense metasomatic replacement. On CAL the rocks consist of fine calc-silicate minerals mainly tremolite and diopside with tourmaline and sulphides. Similar mineral assemblages have been mapped on CAF in dolomitic units 1000m from the granite contact. However where a dolomitic pelite is in contact with the granite a banded complex mafic-calc-silicate hornfels is developed. These skarn rocks on CAF represent the highest grade of metamorphism yet seen in the area. The mineral assemblage represents an upper amphibolite facies within the contact metamorphic aureole. The calc silicate minerals are predominantly diopside with cordierite, albite quartz and epidote. More mafic bands or layers consist predominantly of hornblende with magnetite and pyrrhotite, while interstitial fluorite and tourmaline suggest a partly pneumatolytic genesis.

Pneumatolytic modifications of the granitic rocks include a) greisening b) tourmalisization and c) argillisation.

a) Greisening. Greisens are not extensively developed in the Ramsay Area. Muscovite greisen occurs in the porphyritic adamellite in the granite contact zone on CAF. Its distribution has not yet been mapped in detail but it does appear to be confined to this granite type which at CAF is a contact injection phase. Further north on the road at CAL the rocks are partially granitised along fracture planes. Other fracture controlled greisen zones are exposed at a number of stations along the Ramsay Road, typically on a north north-western trend. They consist of anhedral patches of quartz with aggregates of

hydromuscovite. Brown to green chlorite greisens occur at the South Bischoff Mine and at Cundy's Mine north of Wombat Flats. They are structurally controlled with sharp contacts against the enveloping granite, which in both cases is porphyritic granite. The sulphide-cassiterite mineralisation at these mines is apparently confined to the greisenised rocks.

b) Tourmalinisation. Tourmaline mineralisation is fairly widespread along the eastern contact zone of the Meredith Granite. Generally it occurs as an accessary mineral, as aggregates filling joints, or as veins. Distinctive black and white quartz-tourmaline rocks occur on the access road west of CAE (Home Track), the south west corner of CAL and on CAF. The tourmaline occurs characteristically as radial aggregates of black needle-like crystals (schorl). On the road at Home Track this style of mineralisation is pervasive but dies out north and south into discrete dyke like masses. At CAL it is closely associated with muscovite greisenisation giving rise to vuggy quartz-tourmaline-muscovite rocks. Sections of the raod from 6480 m to 12640 m were channel sampled to test if casserite mineralisation was associated with the tourmaline. The results are listed in Appendix 2. Certainly on the road no Sn values of interest were recorded. The highest W value of 90 ppm comes from a 20 m channel sample 11760-11780m in an area where anomalous soil responses have been recorded.

Quartz tourmaline mineralisation occurs along the granite contact on CAF. It appears to be a separate last stage pneumatolytic phase. Veins, dykes and pod like masses occur in the skarn rocks and within the porphyritic adamellite. Analyses of grab samples collected from outcrops indicate that no mineralisation of economic significance is associated with them. The rocks simply represent massive, pervasive quartz-tourmaline mineralisation which post dates the greisen and skarn development.

c) Kaolinization. Argillisation and the formation of clay minerals appears to be fairly restricted in this area. It occurs at the granite margins exposed along the main access road, over short widths. The most widespread development is seen on the road north of CAF from 12494-12580m. The rock consists of kaolin, sericite and quartz and is cut by ferruginous quartz-tourmaline veins. Channel samples through the zone did not indicate cassiterite, wolfram or sulphide mineralisation.

6. GEOCHEMISTRY OF STREAMS

The results from the stream sediment sampling have been assessed. The integration of values from samples collected on previous surveys with those obtained from samples carried out during this programme proved difficult in some cases. Problems arose due to the imperfect knowledge of sample locations and by the different analytical techniques used. Old and new values are distinguished on the 1 : 5000 base sheets, but are grouped for statistical appraisals and selection of anomalous zones. Table 2 below gives the statistical break down of the values and lists the critical points observed from cumulative frequency curves.

TABLE 2

Stream Sediment Sample Statistics

Element	Range of Values	Mean (m)	Standard Deviation (σ)	m + 2	Critical Points	No. Sample
Sn	0 - 1080	74.76	93.88	262.5	42, 85, 150	498
Pb	5 - 78	23.45	15.42	54.3	54	308
Cu	5 - 170	34.28	22.35	79.0	75	410
Zn	5 - 470	89.49	52.44	194.4	49, 160, 295	408
Ni	2 - 285	71.39	54.10	179.6	180	395

Anomalous sample patterns are shown on plan TAS 2/2032-2034.

6.1 Tin

A large number of sediment samples collected in the Wombat Flats area were only analysed for Sn. This means that there are more sample results for appraisal, and a greater coverage than for the other elements. Tin was analysed by colorimetric techniques on the previous programme and this method realised lower values than the currently used XRF technique.

A number of anomalous tin zones may be derived from a study of the data. These are designated on the appropriate plans. The zones can be satisfactorily related to the regional geology and seem to indicate several prospective areas:-

a) Main Zone. A clearly defined zone of anomalous patterns may be traced northwards from CAE, through Green Creek the Ramsay River and on to the creeks south east of Wombat Flats. The patterns are associated with the Ramsay Group-Crimson Creek Formation

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contact zone and indicate that Sn mineralisation may be present. The upper part of the Ramsay Group with conglomerates and calcareous rocks and the lower part of the Crimson Creek Formation comprising dolomitic argillites and pelites could form a suitable zone for the formation of replacement cassiterite sulphide mineralisation. The fact that this prospective contact zone gives rise to Sn anomalous patterns makes follow up work in the area a matter of some priority.

b) Eastern Zone. A recognisable anomalous zone occurs east of the Main Zone. It may be traced from CAE northwards along the Ramsay River and tributaries. The anomalous values in the river east of CAE may be due to concentrations within the Quaternary alluvium. Otherwise the zone may be associated with calc silicate rocks within the Ramsay Group. The main Ramsay River samples have a generally higher Pb content than the tributary samples, and the Cu values overall are higher than those in the Main Zone.

c) Western Zone. A distinct zone of anomalous patterns may be traced from west of CAE, through Green Creek and northwards into the Ramsay River. These patterns are considered to be of lesser priority than those above. Some have associated anomalous base metal values in Cu and Pb and may have their source in rocks of the Crimson Creek Formation currently covered by Tertiary Basalt. Other anomalous values with coincident Ni may be associated with the base of the Tertiary Basalt itself, and could represent alluvial concentrations within gravel and sand.

d) South Bischoff Area. The area incorporating the South Bischoff mine workings is clearly anomalous in Sn. All creeks draining the area contain enhanced Sn values including the highest yet recorded. Obviously some of the high values are due to alluvial concentrations but this sector of the granite is highlighted by the results. The granite type over most of this zone is potash feldspar-quartz porphyritic adamellite. Chlorite-muscovite greisen occurs at the South Bischoff mine and is seen as float in the creeks. Primary Sn mineralisation may be more widespread in this area than was at first thought. There could be, for example, Sn in pervasively greisenised or stockwork veined sections.

Two other anomalous responses are of note:-

e) There is an anomalous value in a creek draining the Ramsay Group rocks north east of CAL. This is considered to be of consequence because 1. it drains the contact zone between the Ramsay and Crimson Creek rocks and therefore forms a southern extension of the Main Tin Zone (a) and 2. pyritic conglomerate float has been mapped in the vicinity of the anomalous value.

f) Anomalous values occur in the Ramsay River east of CAF. This is the area where the "Ramsay Gossan" has been mapped - a mass of goethite and limonite associated with an altered breccia or conglomerate. The source of these values may either be 1. from alluvial concentrations within the Quaternary sediments or 2. from a primary source - possibly calc silicate rocks or fracture zones on the west side of the Ramsay Valley. The Ramsay Group - Crimson Creek Formation contact zone outcrops on these steep western slopes and associated altered carbonate rocks have been found containing sulphide mineralisation.

6.2 Lead

Analysis for Pb was not carried out on many of the previously collected samples. This means that much of the northern part of the area has not been adequately assessed. The only definitely anomalous values occur in the "Ramsay Gossan" area, particularly in creeks draining the eastern side of the Valley, and from a creek draining the Ramsay Group- Crimson Creek Formation contact zone north of CAL (since named Fu Creek). The Pb anomalies at the "Ramsay Gossan" may reflect a geochemical zonation around a hydrothermal source with Sn passing east into Pb and Zn. The values in Fu Creek are associated with Zn and Cu in an area where basalts and basic tuffs have been mapped.

6.3 Copper

No definitely anomalous population can be defined from the statistical analysis but values over 75 ppm may be considered as possibly anomalous. Enhanced values occur associated with the Western Tin Zone and with certain creeks draining rocks of the Crimson Creek Formation. The anomalous values in Howard Creek and in creeks 700 m to the south may indicate sulphide mineralisation. Hornfelsed

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tuffaceous greywacke and altered basic rocks exposed on the access road contain 5-10% sulphides, mainly pyrrhotite but also chalcopyrite, and aCu value of 540 ppm has been recorded from a rock analysis. However there are no associated Sn values.

Other anomalous values occur in samples from Gandalf Creek. A similar source to that above is indicated, with the Crimson Creek rocks here being basic tuffaceous greywackes containing minor sulphides. Further south in Fu Creek the enhanced Cu values are associated with Pb and Zn.

6.4 Zinc

Only one definitely anomalous Zn value of over 295 ppm has been recorded. This occurs associated with the Pb anomalies in a creek draining the eastern side of the Ramsay Valley near the "Ramsay Gossan". The possible significance of this value is mentioned in 6.2 above. Otherwise enhanced values occur in close association with Ni.

6.5 Nickel

No definitely anomalous nickel values have been recorded. The enhanced values that do occur are closely associated with Tertiary Basalt. Evidently these are neither ultramafic bodies nor mafic bodies outcropping in the area sampled associated with the Proterozoic or Cambrian rocks.

7. GEOPHYSICS

The Input anomalies followed up on this survey were CAE(2), CAL CAF(2) and CAJ. All anomalies except CAJ were successfully located on the ground. The details on the Input anomalies in the area are listed in Table 3.

TABLE 3

Description of Input Anomalies

Anomaly	Flight Line	Fiducial	Channels	Ratio	Altitude	Magnetics	Indicated Source	
CAE N	248W	63.60	6	13/2.3	130m	800nT	Bedrock	Fair
CAE S	247E	69.12	4	5/0.4	180m	20nT	Bedrock	Poor
CAL	244E	132.40	6	8/1.3	130m	400nT	Bedrock	Poor
CAF W	241AE	215.55	4	3.5/0.3	135m	100nT	Bedrock	Poor
CAF E	241AE	215.84	5	3/0.6	150m	350nT	Bedrock	Poor
CAJ	237AE	017.84	6	4/1.0	215m	620nT	Bedrock	Poor
CAI	234AW	015.68	6	8/1.4	130m	160nT	Bedrock	Fair
CAM	234AW	016.97	5	2/0.3	200m	n.r.	Surficial	Poor
CAG	228AW	121.63	4	1.5/0.2	155m	30nT	Surficial	Poor

The plotted positions of the anomalies are shown on Plans TAS 2/2029-2031 along with, where applicable, the ground geophysical responses. At CAE,CAL and CAF the ground EM response is 100-150m east of the Input anomalies. At CAJ the ground response is west of the plotted Input anomaly. It is possible that this anomaly lies further west. Poor flight recovery in this area makes accurate positioning on the ground very difficult.

No anomalous drainage sample values occur in the vicinity of an Input anomaly - except in the case of CAI. While the anomalous Sn zones can be satisfactorily related to geology their relationship to the Input anomalies is not so clear. The Input responses lie within Ramsay Group or Crimson Creek Formation units in the vicinity of the contact zone. The drainage anomalies occur along strike from them suggesting that while the prospective zones or facies may have been located, follow up work along strike is required to locate the mineralisation.

8. INPUT FOLLOW-UP GRID CAE

8.1 Geology (Plan TAS 2/2099)

Most of Grid CAE is underlain by rocks of the upper part of the Ramsay Group, which here is interpreted as belonging to the Success Creek Group or its equivalent.

The geological mapping established the presence of the Success Creek Group - Crimson Creek Formation contact zone, which here is considered to be an unconformity. It may be traced northwards through Green Creek,and southwards beyond CAL into the Ramsay River. Massively bedded quartzite with interbedded carbonaceous quartz sandstone and phyllites outcrop in the Ramsay River and on the eastern portion of the grid. These rock types pass west into flaggy micaceous quartz sandstone, siltstone and carbonaceous phyllites with interlensed pyritic carbonaceous shales. Facing directions, cleavage bedding relationships and sedimentary structures indicate that the sequence faces and dips to the west but is tightly isoclinally folded. The change from massive to flaggy micaceous rocks may not only be due to differing sedimentary facies, i.e. the onset of a turbidite style of deposition but also may reflect a higher grade of metamorphism.

The western section of the gridded area is underlain by hornfelsed graded tuffaceous greywacke, siltstone and argillite. The rocks are extensively recrystallised, so much so that the bedding is virtually obscured, but clearly belong to the Crimson Creek Formation, and comprise a turbidite sequence with basic volcaniclastics.

The proximity of the Meredith Granite is illustrated by the hornfelsic nature of the rocks and by the presence of minor veins of phlogopite-actinolite with arsenopyrite, chalcopyrite and pyrite. The Crimson Creek rocks being essentially of basic composition were readily recrystallised within the granite aureole, but there is no evidence of tourmalinisation.

The contact between the Success Creek Group and the Crimson Creek Formation is not exposed either on the grid lines nor in the creeks but can be positioned fairly accurately by inference from mapping and ground magnetics. In Green Creek north of CAE the lowermost rocks of the Crimson Creek Formation are seen as magnetic basic volcanics. Floaters of gossanous breccia and chert-argillite conglomerate have been observed which may indicate a basal clastic facies. The gossanous rock comprises pink argillite, chert and quartz angular clasts in a matrix made up of silica, ? carbonate and oxidised sulphides. A similar rock has been observed in the Ramsay River south from CAL, and south east from Wombat Flats alluvial mine.

8.2 Geochemistry

The C horizon soil samples were analysed for Cu Pb Zn and Sn. The results are presented as profiles on sections (Plan TAS2/1825-1827, 1829-1830 and 1927) and on Plan (TAS 2/2050-2053). Contour intervals were selected from a statistical appraisal (Appendix 4) and from cumulative frequency plots. The patterns were defined from a study of the stacked profiles.

The geochemical pattern over rocks of the Ramsay Group are quite distinct from those over the Crimson Creek Formation. This difference in responses may be considered as diagnostic of the contact zone between the two groups of rock units.

Sn (Plan TAS 2/2053): Values over 12 ppm may be regarded as anomalous. The only anomalous response on the grid occurs over part of the Ramsay alluvial channel and is probably due to secondary concentrations. A high response occurs in sample collected on Home Track (Plan TAS 2/1927). This may reflect Sn mineralisation and requires checking.

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Cu : The value may be grouped into three populations (Plan TAS 2/2050). An anomalous pattern is apparent in the southwest section of the grid, where the high values are coincident with Zn. In this area Crimson Creek magnetic greywackes and volcaniclastics have been mapped with phlogopite-actinolite veins carrying minor pyrite and pyrrhotite. The Cu values probably reflect the high background values of these rocks.

The anomaly in line 5240N is coincident with enhanced Pb and Zn values but requires checking as the values appear to be unusually low over the Crimson Creek rocks on this line. The anomalous response at the eastern end of line 5000N cannot readily be explained. There may be a concentration of quartz veining in this area and there is evidence of a north west trending fault structure cutting the rocks from the photogeological study (Plan TAS 2/2027).

Pb : Values over 56 ppm may be regarded as being anomalous (Plan TAS 2/2051). The few high values are dispersed over the grid but the patterns appear to be controlled by lithologies. Carbonaceous pyritic shale units in the Ramsay Group give rise to anomalous patterns which may be traced from line to line.

Zn : The values may be grouped into three populations (Plan TAS 2/2052). They are closely sympathetic with Cu. The populations reflect different bedrock chemistry with the lowest values occurring over rocks of the Ramsay Group and the higher values occurring over rocks of the Crimson Creek Formation. As with Cu, attention is drawn to the south west sector of the grid, to the anomaly on line 5240N and to the response at the eastern end of line 5000N.

8.3 Geophysics

The ground magnetic traverses over the CAE grid clearly illustrate the Success Creek Group - Crimson Creek Formation boundary (Plan TAS 2/1806). The magnetic signature of the quartzites and shales is a consistant plateau while that of the turbidites and volcaniclastics is erratic with a higher background. The contact is marked by an anomalous low adjacent to an anomalous high. This pattern is similar to that observed at the Renison Bell mine where it is regarded as diagnostic of the "Marker Horizon" which contains the stratabound dolomitic ore bodies.

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Crone anomalies are seen on these lines (Plan TAS 2/1902):on

5240N at 4950E

5120N at 4980E

and on 5000N at 5025E

forming a distinct EM anomalous zone. The source is regarded as a good conductor, clearly locating the two Input anomalies. The dip direction on the two northern lines is to the east with a magnitude of over 50°. The best response is on line 5240N where the conductor appears to be at a depth of 30m or less. The source may have a southward plunge since the amplitudes decrease to the south.

8.4 Anomalous Responses

The Crone anomaly on line 5240N is supported by anomalous Pb Zn and Cu in the soil samples but has no associated ground magnetic response. It lies within rocks of the upper part of the Ramsay Group east of the contact zone with the Crimson Creek Formation. The anomalous soil sample values do not extend to the lines on either side, and there is no evidence of an anomalous EM response on the line to the north. Photogeological evidence indicates the existence of an east-west fault traversing the grid in this area. Such a fault could truncate the EM anomaly, while associated fault controlled mineralisation could be reflected in the soil values.

The magnetic response at the Ramsay Group - Crimson Creek Formation boundary is distinctly anomalous, but may be formational. There are no EM or soil sample anomalies associated with it. Because of its similarity to the Renison Bell mine sequence, this contact zone, particularly where this magnetic pattern occurs, must be regarded as highly prospective for cassiterite-sulphide mineralisation.

The Cu/Zn soil anomaly in the south west sector of the grid is probably due to the higher background chemistry in the rocks (Section 8.2 above). This also accounts for the Cu anomaly in the stream sediment samples collected in Gandalf Creek.

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9. INPUT FOLLOW UP GRID CAL

9.1 Geology (Plan TAS 2/2100)

Grid CAL has been established over the Ramsay Group - Crimson Creek Formation and Crimson Creek Formation - Meredith Granite contact zones. The granite in this area outcrops within 350m of the Ramsay Group rocks. The sedimentary units lie within the contact metamorphic aureole of the granite and are tourmalised with concentrations of tourmaline in the pelites and calcareous argillites.

Measured dips on outcrops at CAL indicate that the rock sequence dips and faces west into the granite. The rocks exposed at the eastern end of the grid comprise carbonaceous phyllite, micaceous semi pelite, carbonaceous quartzite and pyritic quartz psammite. The rocks are cleaved and contorted, and the sequence is assigned to the Upper part of the Ramsay Group. Westwards below the Crimson Creek Formation contact sequence passes up into a 10-30m wide carbonate sub-facies made up of massive to faintly layered aggregates of tremolite and diopside with pyrrhotite, arsenopyrite, prehnite, sphene and siderite which commonly envelopes the sulphides. Clastic te ures are barely recognisable, but together with the abundant fine grained sulphides and the magnetic property serve to distinguish the rocks in the field. It required thin section examination to identify the rocks as carbonates.

To the west the basal section of the overlying Crimson Creek Formation comprises essentially fine grained, sometimes laminated, metasomatised argillite and siltstone. Conglomerates are exposed to the south in Osmond Creek. This sequence passes up into metasomatised fine to medium grained tuffaceous greywackes with interlensed argillites and siltstones, typical of the Crimson Creek Formation. Within this sequence units of heavily altered fine grained rocks have been mapped. These comprise finely bedded metadolomite, pelite, breccia, metasomatised chert, acid tuff and flow banded acid (?) lava. There is pervasive hydrothermal alterations within these rocks with extensive replacement by diopside, tremolite, tourmaline and sulphides. Similar rock sequences are exposed on CAF (see below). There may be only the one unit of this type on CAL folded into a northerly plunging asymmetric syncline.

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The contact between the Crimson Creek Formation and the granite is not exposed but may be interpreted from the vegetation and drainage pattern. The granite is mainly holocrystalline and is a coarse grained biotite-feldspar-quartz assemblage. The feldspar is predominantly plagioclase so it may be a granodiorite, however, there are few mafic minerals. Quartz-tourmaline schorl with sulphide veins is exposed on the road, the contact zone generally is moderately tourmalinised.

The dolomitic pelite horizon, apparently forming a fold-nose in the narrow portion of Crimson Creek Formation rocks contains up to 10% sulphides - pyrrhotite, pyrite and arsenopyrite. Although there is no evidence of cassiterite mineralisation it is considered that this horizon is similar to the host rocks at the Cleveland mine which also appear to be within a fine grained calcareous facies segment of the Crimson Creek Formation.

9.2 Geochemistry

The C horizon soil samples were analysed for Cu Pb Zn Sn and W while samples collected over possibly mineralised horizons were also analysed for As. The results are plotted as profiles on sections (Plans TAS 2/1821-1824) and on plans (Plans TAS 2/2045-2049). Contour intervals were selected from cumulative frequency plots and from statistical analysis of the data (Appendix 4).

Rock sample analyses indicate that the base metal contents are fairly low (Appendix 2) although As is clearly anomalous due to the presence of arsenopyrite.

Sn : (Plan TAS 2/2048) The soil values may be grouped into three populations 0-12, 13-43 and greater than 43 ppm. Values greater than 43 ppm are definitely anomalous. There is a clearly defined soil anomaly at the west end of 4760N over greisenised and tourmalinised granite. The road in this area was channel sampled but no anomolous values were recorded, suggesting that the zone cuts out sharply to the west, and dies out to the north.

An anomalous pattern of Sn soil responses occurs at the eastern end of the grid. This may be formational as it overlies rocks of the Upper part of the Ramsay Group.

W : (Plan TAS 2/2049) Tungsten values in the soils are generally low with most below the limit of detection. There is a definitely anomalous response coincident with the Sn anomaly at the western end of line 4760N.

Cu : (Plan TAS 2/2045) No definitely anomalous values were recorded. The values may be grouped into three populations 0-30 ppm over the granite; 31 - 100 ppm over the greywackes and Ramsay Group sandstones; greater than 100 ppm over the meta dolomites and pelite units within the Crimson Creek Formation. An enhanced Cu response occurs on all grid lines along the granite contact with the sediments. There is a possibly anomalous pattern of Cu values coincident with the crone and ground magnetic anomalies on the three northern lines.

Pb : (Plan TAS 2/2046) Anomalous Pb values are associated with the crone-ground magnetic anomaly in line 5120N and with the Sn/W anomaly in the south west section of the grid.

Zn : (Plan TAS 2/2047) The Zn patterns are similar to Cu. The lowest population 0-27 ppm occurs over the granite. Definitely anomalous values, greater than 370 ppm occur associated with the Sn/W/Pb anomaly at the western end of 4760N and coincident with the crone/ground magnetic anomaly on 5120N.

9.3 Geophysics

The ground magnetic patterns are quite different from those seen on CAE (Plan TAS 2/1900). The magnetic signature of the granite is typically flat while that of the Crimson Creek rocks to the east is erratic with a high background. The characteristic pattern over the Ramsay Group/Crimson Creek Formation boundary zone seen on CAE is not seen here. It may be that the grid lines do not extend far enough eastwards, for the background response over the Ramsay Group to be measured.

There are two zones of anomalous magnetic patterns. The western zone is coincident with the Crone anomaly where disseminated pyrrhotite has been mapped in the hornfelsed greywackes and pelites. The eastern response occurs over the basal Crimson Creek units, again where pyrrhotite has been mapped as concentrations in tuffaceous and arenaceous beds. Here however there is no associated EM response and no anomalous geochemistry.

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A distinct Crone anomaly is seen on three lines (Plan TAS 2/1901) : on

4880N at 5040E
5000N at 5040E
and on 5120N at 5030E

forming a distinct zone which is almost coincident with the interpreted fold axis, in the dolomitic pelite unit. The anomaly amplitude decreases northward, which indicates a northward plunge. The interpreted depth of burial on line 5120N is 40m and the dip is 60° to the east. The response on line 5120N is coincident with a definite Cu/Pb/Zn geochemical anomaly and with an anomalous ground magnetic response.

9.4 Anomalous Responses

The Crone anomaly with coincident ground magnetic and geochemical responses, particularly on line 5120N is a potential drill target. It appears to be associated with a dolomitic pelite unit which forms a tight asymmetric fold in the Crimson Creek Formation. The rocks are hornfelsed,metasomatised and contain sulphides (up to 10% modal content). However there is no evidence of Sn mineralisation either in the rock or soil sample values. It may be that Sn is developed within the zone to the north as there is an obvious increase in the geochemical response from south to north, and pyritised mineralised conglomerate float has been mapped in the Ramsay River north of the grid.

The strongly anomalous Sn/W/Pb/Zn soil anomaly at the western end of line 4760N has no related magnetic or EM response (Plan TAS 2/1821). Sulphide veins within greisenised and tourmalinised granite is the suspected source as indicated on the road. However the proximity of carbonate rocks within the Crimson Creek Formation does not preclude the development of skarns in this area. Follow up sampling and mapping are required to investigate this anomaly to the south.

10. INPUT FOLLOW UP GRID CAF

10.1 Geology (Plan TAS 2/2101)

Grid CAF is underlain by Crimson Creek Formation rock sequences in contact with the Meredith Granite. It lies west of the Ramsay Group - Crimson Creek Formation contact zone. The Crimson Creek sequence consists of basic volcanoclastic greywacke, siltstone and argillite with tuff and interbedded pelite. Measured dips and facing directions indicate that the rock sequence dips and faces westwards into the granite but there is some drag folding and faulting. Two horizons of

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somewhat different facies have been mapped within the greywacke sequence and they comprise fine grained meta-siltstone, argillite and pelite with acid tuff and chert intercalations. The eastern most unit is heavily silicified and contains calc silicate minerals indicative of calcareous rocks. This unit is interpreted as being within 100m of the Ramsay Group - Crimson Creek Formation contact. A metadolerite sill or altered intermediate lava is associated with these rocks and outcrops on the three northern lines and on the tie line.

A dyke of leuco adamellite cuts the sequence. It has been mapped on the access road and on line 5240N. There appears to be no mineralisation associated with it. The granite over the western sector of the grid is mainly coarse grained non porphyritic and holocrystalline but towards the contact with the sediment it is fine grained and porphyritic. A distinct potash feldspar porphyry occurs along this contact. It is heavily tourmalinised in parts (see section 5.3 b)) and is patchily greisenised.

A zone of muscovite greisen, quartz tourmaline mineralisation and magnetite-amphibolite skarn development may be traced through the grid along the granite-sediment contact. Outcrop within the zone is poor and is best seen in a southward draining creek near line 4880N. It is characterised by a well defined magnetic response which strangely was not located on the airborne survey.

On line 4760N these rocks are mapped between 4370E and 4410E in a thickly vegetated swampy gully. Float of magnetite veined and banded amphibolised sediment, banded pyroxene hornfels, quartz-tourmaline vein material and muscovite greisen have been observed. On 4880N outcrops and float material occur between 4300E and 4420E comprising coarse crystalline amphibolite skarn, hornblendite, fine grained brecciated banded pelite, banded siliceous-magnetite skarn, quartz tourmaline veins and greisen.

The rock mapped as skarn was confirmed as such by thin section examination. (Appendix 3) A sample collected from CAF 4880N/4360E is described as a thinly banded complex mafic calc-silicate hornfels; with altered cordierite, epidote, diopside hornblende, interstitial fluorite, accessary sphene, tourmaline, trace ? zeolite, minor pyrite, pyrrhotite and magnetite. The petrologist (I.R. Pontifex) regards the rock as being a contact metamorphosed sediment, either of argillaceous chloritic dolomitic and/or fine basic tuff facies. He adds that the rock represents the highest grade of metamorphism seen in the rocks submitted for examination.

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The zone appears to be truncated by a fault north of 5000N but may be traced through a number of old workings northwards to line 5240N as a narrow (30m) unit of mainly greisen and quartz-tourmaline. However it remains open ended to the south. Tin and tungsten geochemical anomalies with coincident high copper values occur over the skarn but there is no recognisable EM effect. Samples were collected from the old workings for examination and analyses. Pyrrhotite is the main sulphide species present with minor chalcopyrite and pyrite. Magnetite is usually seen as coarse granular veins, particularly in the coarse amphibolitic rocks. Rock analyses indicate anomalous Sn W and Cu values. F was not analysed but is probably high. The mineral originally sought in this area was probably cassiterite but it probably has a greater potential for tungsten mineralisation.

10.2 Geochemistry

All C horizon soil samples were analysed for Cu Pb Zn Sn and W while those collected over the granite contact zone were also analysed for Au and Bi. The results are plotted as profiles on sections (Plans TAS 2/1851-1856). The geochemical patterns were interpreted by appraising the data on the stacked profiles and incorporating a statistical analysis with cumulative frequency plots (Appendix 4).

Base metal values over the grid are low with the exception of the skarn zone. This is somewhat surprising as pyrrhotite and pyrite are common accessary minerals throughout the sedimentary rock sequence.

Sn : (Plan TAS 2/2038) The Sn soil values can be divided into three populations: - 0-10, 11-35, greater than 35 ppm. The skarn zone, particularly on lines 4880N and on 5000N, gives rise to anomalous responses over a maximum width of 100m (Plans TAS 2/1851-1853).

W : (Plan TAS 2/2039) The W soil values can also be divided into three populations 0-10, 11-48, greater than 48 ppm. Apart from some scattered sporadic enhanced values, anomalous responses are confined to the skarn/greisen zone. The W soil anomaly coincides directly with the Sn soil anomaly (Plans TAS 2/1851-1853), indicating that if Sn and W mineralisation is the source then it occurs in the same rock units.

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Cu : (Plan TAS 2/2035) No definitely anomalous values were recorded and the cumulative frequency curve is very similar to that for CAL. Four populations may be discerned from the values 0-24, 25-42, 43-85 and greater than 85 ppm. The 24 ppm contour outlines the boundary of the granite with the sediments on lines 5000N northwards to 5360N, and the edge of the skarn zone on lines 4760N northwards to 5000N. A series of trough and ridge patterns may be traced from line to line. The pattern near the access road may reflect minor chalcopyrite mineralisation in pelitic rock units.

Pb : (Plan TAS 2/2036) Although three populations may be defined from the values viz: 0-11, 12-90 and greater than 90 ppm; no anomalies occur. The pattern is quite different than CAL. Like Cu, the value appears to occur in ridge and trough like patterns in the Crimson Creek rocks.

Zn : (Plan TAS 2/2037) Four populations may be discerned in the values : 0-14, 15-37, 38-140 and greater than 140 ppm. The distribution and patterns of values are similar to those for Cu. The 37 ppm contour outlines the granite margin. Otherwise like Cu and to some extent Pb, the values fall into a series of ridges and troughs over the sedimentary sequence.

10.3 Geophysics

A substantial ground magnetic anomaly occurs over the skarn zone on lines 4760N, 4880N and 5000N. The source of this effect can be readily explained by the content of pyrrhotite and magnetite within these rocks. East of the skarn zone two somewhat disjointed zones of anomalous magnetic responses may be traced through the grid (Plan TAS 2/1898). The central magnetic anomaly directly coincides with the EM conductor on lines 4760N and 4880N but persists northwards past the EM location to line 5120N. It appears to be displaced westwards about 150m on this line and increases in amplitude to the north until it is truncated at the edge of the granite. The tuffaceous greywackes which form the major rock type in this zone include pyrrhotite concentrations both in bedded layers and in cross cutting fractures. So this pyrrhotite may be regarded as being the cause of the magnetic response. The displacement on line 5120N may be due to an east north east trending fault with a sinistral displacement.

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The magnetic pattern in the eastern magnetic zone is more disjointed. There does appear to be some correlation with the EM conductor on line 4760N but it is displaced to the east on line 4880N. The displacement between lines 5000N and 5240N may be due to the cross cutting sinistral fault mentioned above. Minor to trace amounts of pyrrhotite in amphobilitic patches and veins have been mapped through this zone and are the probable cause of the anomalies.

The CAF (west) anonaly is evident in the Crone responses on the two most southern lines at (Plan TAS 2/1899) :

4810E on line 4880N
4820E on line 4760N
and open to the south.

The source is within 10m of the surface, has a near vertical dip and is over 20m in width. There is a direct correlation of magnetic response with the EM conductor suggesting that pyrrhotite mineralisation is the source. However there are no associated geochemical effects seen either in the soil (Plans TAS 2/1851-1852) or rock (Appendix 2) values.

The CAF (east) anomaly is seen as the Crone responses on the same lines to the east (Plan TAS 2/1899) at:

5210E on line 4880N
5240E on line 4760N
and open to the south.

The responses are less distinctive than those at CAF(W) but have a similar pattern. The erratic nature of the magnetic results precludes a reliable analysis of their effects. Again pyrrhotite appears to be the most likely source of the geophysical effects.

10.4 Anomalous Responses

The zone of skarn and greisen along the granite/sediment contact on CAF form a high priority target. The coincidence of strongly anomalous Sn and W soil values with substatial ground magnetic effects is suggestive of mineralisation, which, within such a geological setting, could be of economic grades. If the source of the anomalies can be shown to be scheelite (with or without

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cassiterite) with sulphides, then diamond drilling must be carried out as the next step in evalution of the zone.

The source of both EM anomalies needs determination. Although interpreted as being close to surface, the absence of geochemical effects does not suggest economic grades of mineralisation. It is possible that these anomalies, if they extend to the south may improve in prospectivity. If pyrrhotite alone is the source, it could pass, either with depth or along strike, into a different style which might contain Sn or Cu minerals.

11. INPUT FOLLOW UP GRID CAJ

11.1 Geology (Plan TAS 2/2102)

Grid CAJ is established over the contact between the Ramsay Group and the Crimson Creek Formation. This contact appears, in part to be faulted, between lines 4880N and 5000N. Much of the eastern section of the grid is overlain with fluvial sediment which restricts the outcrop of the Ramsay Group. Outcrop over the western section of the grid is good. The older rocks comprise carbonaceous quartz sandstone and siltstone, quartz pelite and semi pelite, quartz-feldspathic sandstone and black carbonaceous shale. The contact with the Crimson Creek rocks is not exposed and is not revealed by any geochemical or geophysical features.

The Crimson Creek rocks comprise tuffaceous greywacke, basic tuff, microdolerite and argillite. No evidence of chert or carbonate sediments has been found. Only trace amounts of sulphide mineralisation were observed - mainly pyrrhotite in the basic rocks. None of the rock units are strongly metamorphosed. The pyroxenes in the microdolerites have not been tremolitised and the rocks are not hornfelsed. However minor amounts of muscovite and tourmaline occur in the Ramsay Group quartz sandstones.

11.2 Geochemistry

The Ao horizon soil samples were analysed for Cu Pb Zn Sn and Ni. The results are plotted as profiles on sections (Plans TAS 2/1893-1896). The results may be subdivided into populations based on a statistical analysis of the data (Appendix 4) and on cumulative frequency plots.

No anomalous sample values in the elements analysed were recorded.

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Sn : (Plan TAS 2/2043) The values fall into three populations 0-17, 18-24, and greater than 24 ppm. One sample is possibly anomalous with an isolated value of 35 ppm at 4760N/4790E.

Cu : (Plan TAS 2/2040). Three population groups may be distinguished 0-26, 26-74 and greater than 74 ppm. The patterns are similar to those for Zn and Ni and appear to define the Crimson Creek basic units.

Pb : (Plan TAS 2/2041). Only two populations are apparent 0-42 ppm and greater than 42 ppm. There is, overall, a higher background in value over the Crimson Creek rock units with a slight build up at the contact.

Zn : (Plan TAS 2/2042). The values may be divided into three populations:- 0-40, 41-79 and greater than 79 ppm. The 41 ppm contour delineates the eastern boundary of the Crimson Creek Formation. Otherwise the pattern of values is similar to those for Ni.

Ni : (Plan TAS 2/2044). As with Cu and Zn the values may be divided into three populations 0-23, 24-68 and greater than 68 ppm. The lowest values are recorded over the alluvium and Ramsay Group. Higher values may indicate basic units within the Crimson Creek Formation.

11.3 Geophysics

No anomalous magnetic responses were recorded (Plan TAS 2/1891). The CAJ Input response is a major conductor on the eastern flank of an aeromagnetic anomaly. The absence of a ground magnetic response indicates that the actual Input response has not been located. It is suspected that it may be further to the west, although this grid was established with a fair amount of confidence.

Ground EM anomalies were found on all four grid lines (Plan TAS 2/1892):-

at 4860E on line 5120N
4860E on line 5000N
4860E on line 4880N
and at 4970E on line 4760N

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The conductors dip steeply (plus 80 degrees) to the east and are near surface at 5000N and 4760N. The western conductor, picked up on the three northern lines lies in Crimson Creek rocks while the eastern one, on line 4760N is in rocks of the Ramsay Group. Both EM anomalies are weak and have no associated ground magnetic or geochemical responses. The nature of these conductors is not known.

11.4 Anomalous Responses

The only anomalies found on this grid are the ground EM responses. However more gridding to the west and south is required to establish if the Input anomaly has been located or not.

12. RECOMMENDATIONS AND WORK PROPOSALS

Vigorous follow-up work based on the results achieved to date is recommended. The following proposals are listed in order of priority (Plans TAS 2/2054, 2055, 2056). Details are listed in Appendix I.

12.1 The indications of economic mineralisation at CAF and CAL should be followed up in order to determine if diamond drilling is warranted.

12.1.1 The skarn zone at CAF should be examined by costeaning and gridding. The association of Sn, W and Cu soil anomalies with ground magnetic responses and skarn mineralogy indicates the possible presence of mineralisation. Outcrop on the three grid lines where these responses occur is poor. The road to CAI should be routed so as to expose a section through the zone. This in effect will be a costean and should be channel sampled and mapped. Three 60m spaced grid lines should be established over the zone to carry out further sampling and define its intensity and width. A grid line 120m to the south of the present grid should be cut to trace for an extension southwards (here 4640N).

Total grid lines : 1280m, tie lines : 120m, costean: estimate 100m, samples: rock 40, soil 68.

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12.1.2 The coincident Crone EM and magnetic sanomalies on CAF should be traced to the south. This could be achieved by extending the proposed line 4640N to the east. This line would also check the apparent southward displacement of Input anomaly CAF(E).

Total grid lines: 880m, tie lines: 240m, samples: 45.

12.1.3 It is proposed to extend grid CAL northwards to close with grid CAE. Two grid lines CAL 5240N and 5480N could be established from the Ramsay access track to the Ramsay River. Geological, geochemical and geophysical data collected on these lines would

(a) test for the northern extension of the coincident Crone EM, ground magnetic and Cu, Pb, Zn soil anomaly found on CAL;

(b) determine the extent of the dolomitic pelite and calc-silicate units which are mineralised on the CAL grid;

(c) trace the contact zone between the Ramsay and Crimson Creek sequences northwards to CAE, the probable source horizon of the pyritised conglomerate float found in the Ramsay River at 6100m;

(d) locate the source of the anomalous Sn content in the drainage.

In addition to these proposals two lines 120m apart should be constructed to the SW of the CAL grid to investigate and follow up the anomalous geochemistry on line 4760N.

Total grid lines: 3380m, tie lines: 240m, samples: 174.

12.2 The sources of the anomalous Sn contents of the drainage samples north of CAE need to be located. To this end it is proposed to extend grid CAE northwards by six lines 240m apart. Data collected on these lines would

(a) appraise the prospectivity of the ground drained by creeks with anomalous Sn contents;

(b) trace the contact zone between the Ramsay and Crimson Creek sequences to the north;

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(c) allow for further examination of the anomalous magnetic responses found on the CAE grid;

(d) locate the source of the gossan float found in Green Creek.

Total grid lines 4680m, tie lines 2880m, samples 234.

12.3 The Ramsay access road should be continued to CAI. This would also give access to the southern part of the CAF grid and would allow for geological mapping of the prospective granite contact zone.

Approximate length of trace 5000m.

12.4 The location of Input anomaly CAI should be established on the ground. A six line grid is proposed, if possible interpreting with the primary work carried out in the area. The lines should be auger sampled, mapped and geophysical surveys carried out (CRONE EM and Magnetics).

Total grid lines: 3840m, tie lines: 1200m, samples: 198.

12.5 The prospectivity of the Ramsay gossans on the Ramsay River should be established and the source of the anomalous Sn content in the river located. There is evidence for the presence of carbonate rocks in the area.

An unsurveyed grid was established in 1973-74 on the eastern bank of the river, but it is considered that the more prospective ground lies on the west bank.

It is proposed to extend grid CAF eastwards across the Ramsay River. The initial grid spacing would be 240m, and the lines 1000m in length. Geological, geochemical and geophysical data collected on these lines would

(a) cross the contact zone between the Ramsay and Crimson Creek rock sequences;

(b) locate the source of calc-silicate and carbonate rocks found as float in the Ramsay River;

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(c) locate the Ramsay gossans and put them in a regional context;

(d) prospect for the source of the anomalous Sn and Pb stream sediment samples;

(e) integrate with the work done previously on the old Ramsay and Wow grids.

Total grid lines: 3000m, tie lines: 480m, samples: 153.

12.6 It appears that Input anomaly CAJ may not have been located on the established follow-up grid. Further work is necessary to validate the grid location. However a ground EM response was located on the grid and is open to the south. Further work has been recommended by the geophysicist (DBT) to examine the area.

It is proposed to extend two of the grid lines 500m westward and establish a new line 120m south of 4760N to see if the response at 4970E persists.

Total grid lines: 1700m, tie lines: 360m, samples: 88.

12.7 A ground magnetic survey should be carried out over Home Track to examine the magnetic response west of the anomaly on the western margin of grid CAE.

Total magnetics 1000m.

12.8 Geological mapping, surveying and the collection of constant volume panned concentrates is proposed for three sections of the Ramsay River and for certain tributaries (see Plans TAS 2/2054, 2055 and 2056).

12.8.1 The Ramsay River south of Osborne Creek, to south of CAJ should be mapped. This would integrate with previous geological mapping and allow for access to the Ramsay gossans. The tributaries draining the east bank contain anomalous Pb so the source should be established. The main tributaries draining the east bank contain anomalous Pb so the source should be established. The

main tributaries draining the west bank north and south of CAJ would give cross sections through the Ramsay and Crimson Creek Sequences, especially across the contact zone between the two.

Total Map and survey: 8000m; panned concentrates: 16.

12.8.2 Follow up geological mapping and sampling is recommended for selected creeks which drain the tin zones north of CAE. This work would support the effort on the grid lines.

Total map and survey: 3500m, panned concentrates: 7.

12.8.3 The anomalous Sn contents of drainage samples in the northern reaches of the Ramsay should be followed up. Sections of the river and main tributaries should be prospected to locate the sources of Sn. This would also allow for an understanding of the nature of the Crimson Creek-Granite contact zone, and could trace the contact zone between the Ramsay and Crimson Creek sequence to the north. In addition prospecting along creeks in the Wombat and South Bischoff areas could locate sources of primary Sn in the granite.

Total map and survey: 6500m, panned concentrates: 13.

12.9 It is recommended that tin mineralisation in the South Bischoff area be examined and its extent established. To this end a three line grid is proposed with lines 240m apart. The old workings should be located and, if possible, sampled. A literature survey could be undertaken to appriase old records and maps, particularly to learn of grades mined. The number of old alluvial workings in the area gives promise of a substantial primary source.

Total grid lines: 2200m, samples: 113.

12.10 It is proposed to geologically map the Coldstream-Wow-Ramsay access track and to tie the work in with previous grid lines, costeans and drill holes in the area.

Total map: 4000m.

12.11 It is proposed to collate surface geological, geochemical and geophysical data and borehole data; prepare regional and local plans and sections; prepare ongoing work proposals and requisite reports.

13. REFERENCES

Central Mineralogical Services Pty Ltd (1979) Mineralogical Report No. 79/6/17.

Pigott G.F. (1978) Interim Report on Renison East (Grid GAP), Comstaff Pty Ltd

Pigott G.F. (1979) Ramsay Area Monthly Reports, Comstaff Pty Ltd January - September.

Pontifex & Associates Pty Ltd (1979) Mineralogical Reports No. 2628 and 2662.

Rugless C.S. (1972) Ramsay Area Project 1971/1972 Summer Field Season Report, Comstaff Pty Ltd.

Report written by
G.F. Pigott, Senior Geologist,
Tasmania

Approved by
R.J. Kernick,
Exploration Manager

14. LIST OF PLANS

VOL I	TAS 2/1586	Comstaff Project Map Location of Ramsay Area (EL 5/63 part 2)			1:250,000
	1799	Ramsay Area Outline of section sampled and mapped			1: 50,000
	2029	Interpretative Geology and Geophysical anomalies		Sheet 1	1: 10,000
VOL II	2030	" " " "		" 2	"
	2031	" " " "		" 3	"
	2026	Photogeological interpretation		Sheet 1	"
	2027	" "		" 2	"
	2028	" "		" 3	"
	2032	Geochemical Anomalies based on stream sediment sample results		Sheet 1	"
	2033	" " " " " "		" 2	"
	2034	" " " " " "		" 3	"
	2099	Ramsay Grid CAE geological interpretation			1: 2,500
	1825	" " composite section 4760N			"
	1826	" " " 4880N			"
	1827	" " " 5000N			"
	1927	" " " 5120N and Home Track			"
	1829	" " " 5240N			"
	1830	" " " 5360N			"
	1806	" " stacked magnetic profiles			"
	1902	" " stacked Crone E-M profiles			"
	2050	" " auger sample results	Cu		"
	2051	" " "	Pb		"
	2052	" " "	Zn		"
	2053	" " "	Sn		"
	2100	Ramsay Grid CAL geological interpretation			"
	1821	" " composite section 4760N			"
	1822	" " " 4880N			"
	1823	" " " 5000N			"
	1824	" " " 5120N			"
	1900	" " stacked magnetic profiles			"
	1901	" " stacked Crone E-M profiles			"
	2045	" " auger sample results	Cu		"
	2046	" " "	Pb		"
	2047	" " "	Zn		"
	2048	" " "	Sn		"
	2049	" " "	W		"
	2101	Ramsay Grid CAF geological interpretation			"
	1851	" " composite section 4760N			"
	1852	" " " 4880N			"
	1853	" " " 5000N			"
	1854	" " " 5120N			"
	1855	" " " 5240N			"
VOL III	1856	" " " 5360N			"
	1898	" " stacked magnetic profiles			"
	1899	" " stacked Crone E-M profiles			"
	2035	" " auger sample results	Cu		"
	2036	" " "	Pb		"
	2037	" " "	Zn		"
	2038	" " "	Sn		"
	2039	" " "	W		"
	2102	Ramsay Grid CAJ geological interpretation			"
	1893	" " composite section 4760N			"
	1894	" " " 4880N			"
	1895	" " " 5000N			"
	1896	" " " 5120N			"
	1891	" " stacked magnetic profiles			"
	1892	" " stacked Crone E-M profiles			"
	2040	" " auger sample results	Cu		"
	2041	" " "	Pb		"
	2042	" " "	Zn		"
	2043	" " "	Sn		"
	2044	" " "	Ni		"
	2054	Ramsay Area Proposed Work Programme 1980		Sheet 1	1: 10,000
	2055	" "		" 2	"
	2056	" "		" 3	"

APPENDIX I

Details of Proposed Work - Ramsay Area 1980

Access	1.	Refurbish Ramsay Access Track from highway to CAF		13080m
	2.	Establish bulldozer track to Input anomaly CAI		5000m
Costean		along CAI road		100m

Extensions to established grids

CAF	extension south	4640N 4200E - 5400E	61 samples	1200m
	fill in	4700N 4200E - 4520E	17 "	320m
	" "	4940N 4200E - 4520E	17 "	320m
	" "	5060N 4200E - 4520E	17 "	320m
	extension east	4760N 5400E - 6440E	51 "	1000m
	" "	5000N 5440E - 6440E	51 "	1000m
	" "	5240N 5440E - 6440E	51 "	1000m
		tie lines		840m
		Total	265 samples	6000m
CAL	extension north	5240N road to river		1000m
	" "	5480N " "		1100m
	extension south	4520N 4680E - 5320E		640m
	" "	4640N 4680E - 5320E		640m
		tie line		240m
		Total	174 samples	3620m
CAE	extension west	5360N 4560E - 4680E	7 samples	120m
	extension north	5600N 4560E - 5320E	39 "	760m
	" "	5840N 4560E - 5320E	39 "	760m
	" "	6080N 4560E - 5320E	39 "	760m
	" "	6320N 4560E - 5320E	39 "	760m
	" "	6560N 4560E - 5320E	39 "	760m
	" "	6800N 4560E - 5320E	39 "	760m
	" "	base and tie lines		2880m
		Total	241 samples	7560m
CAJ	extension south	4640N 4650E - 5350E	36 samples	700m
	extension west	4880N 4150E - 4650E	26 "	500m
	" "	5000N 4150E - 4650E	26 "	500m
		base and tie lines		360m
		Total	88 samples	2060m

Proposed new grids to be established

CAI		4760N 4680E - 5320E	33 samples	640m
		4880N 4680E - 5320E	33 "	640m
		5000N 4680E - 5320E	33 "	640m
		5120N 4680E - 5320E	33 "	640m
		5240N 4680E - 5320E	33 "	640m
		5360N 4680E - 5420E	33 "	640m
		base and tie lines		1200m
		Total	198 samples	5040m
South Bischoff Grid		4760N	41 samples	800m
		5000N	37 "	720m
		5240N	35 "	680m
		Total	113 samples	2200m
		Grand Total: Soil Samples	1074 Cut Lines	26480

Appendix I (cont)

Details of Proposed Work - Ramsay Area 1980 (cont)

Creeks

Survey map and pan concentrate sample:		
The Ramsay River and major tributaries south of Osmond Creek		8000m
Creeks draining the tin zones north of CAE		3500m
The Ramsay River and tributaries draining the Granite/ Crimson Creek contact zone		6500m
Total: heavy concentrate samples 36		18000m

Magnetometer Surveys

All grid lines		20960m
Home Track		1000m
	Total	21960m

Crone EM surveys

All grid lines	Total	20960m

Geological Mapping

All cut lines		26480m
Access tracks		9000m
Creeks		18000m
	Total	53480m

APPENDIX 2

ROCK ANALYSES

041

RAMSAY ROADS

	LOCATION		Sn	W	Cu	Pb	Zn	As	Ag	Ni		GEOLOGICAL	LOG		SAMPLE NUMBER
TS	RamRd	6880	4	10	50	5	55					Amygdaloidal chlorite basalt, strongly magnetic Tertiary			20 1117
TS	"	6540	18	<10	540	10	50					Hornfelsed tuffaceous greywacke with 10% disseminated Py Gossanous veinlets			20 1119
TS	"	5880	10	bld	10	5	20	bld				Cpx-rich: Quartz-hydromuscovite assemblage			T 7882
	"	10010	3	10	10	5	15	bld				Coarse grained crystalline quartz-tourmaline			T 7883
TS	"	10180	5	20	15	15	50	10	1	60		Hornfelsed tuffaceous greywacke of intermediate to basic assemblage			RAM 1
	"	11680	6	20	10	5	15	bld				Quartz tourmaline ? sheared granite			T 7881
	"	11780 — 11800	35	bld	90	10	15	240				Tourmalinised granite (select)			T 7798
	"	12614	6	25	240	115	395	90				Gossanous fine grained bedded sediment with quartz veinlets			T 7880

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RAMSAY CREEKS

	LOCATION		Sn	W	Cu	Pb	Zn	As				GEOLOGICAL LOG	SAMPLE NUMBER
TS	RYR	6100	10	bld	25	bld	5	80				Pyritised conglomerate of pyritic quartzite, carbon siltstone, c quartz matrix + interstitial Py	T 7799
	RYR	6760	3	bld	15	10	15	10				Semi pelite, grey, laminated and contorted with kaolin. Soft sediment deformed	T 7885
TS	RYR	7780	3	35	30	10	10	15				Interbedded carbonaceous pyritic sandstone micaceous siltstone and carbon-pyrite layers	T 7886
	RYR	7800	bld	bld	55	210	35	70				Vein quartz with limonite staining in drusy cavities Py boxwork	T 7887
	RYR	7920	5	bld	55	25	30	70				Quartz sandstone cut by quartz veins c crystallites	T 7888
	RYR	8120	7	bld	50	20	25	15				Carbonaceous phyllite and quartz sandstone sequence - brecciated	T 7889
	GCK	70	bld	bld	10	20	20	8				Pyritic carbonaceous phyllite with carbonaceous quartz sandstone.	T 7890
	RYR.	8755	10	bld	20	25	30	8	Sb. 6	Ag bld	Mo bld	Recrystallised s.s. c clcte + Po, Py.	T 8182
	RYR	8820/2	7	.	60	225	130			bld		Wthd. pale brown micaceous gossanous? silic. breccia?	T 8187
	RYR	8820/5	15	bld	100	455	900	8	9	bld		Cbte rich recrystallised ss. Py 15%	T 8188
	RYR	8820/6	20		70	25	30	bld	2	bld		Sheared talc like rock, green chl. bands	T 8189
	RYR	9290	bld		15	305	2500	28		0.5		'Ramsay' Gossan.	T 8192
	RYR	9650	5		25	5	170			bld		m-co sa.s. c gossanous boxwork	T 8193
	RYR	9825	bld		10	105	20			bld		dk gy-bk. s.s. c q.v. + diss Py.	T 8194
	RYR	9930	7		10	25	95		8	bld		Completely silic. rock c 15% cavity c open qtz	T 8195

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RAMSAY CAL

	LOCATION		Sn	W	Cu	Pb	Zn	As	Ag	Ni		GEOLOGICAL LOG				SAMPLE NUMBER
TS	4760N	4955E	10	20	95	25	15	20	1	210		Hornfelsed tourmaline sediment with tourmaline,			Py Po Cp	RAM 6/1
TS	4760N	5045E	10	20	80	30	20	10	1	90		Hornfelsed fine grained sediments breccia with calc silicate, dark layers & tourmaline				RAM 6/2
TS	4760N	5055E	60	61d	175	15	60	2400				Metasomatised fine grained siliceous sediment ca volcanic & Assy Py				T 7884
TS	4760N	5240E	20	20	85	110	25	350	2	85		Tourmaline diopside hornfels - calc silicate amentlage			Po Assy	RAM 7

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RAMSAY CAF

096045

	LOCATION		Sn	W	Cu	Pb	Zn	As	Ag	Ni				GEOLOGICAL	LOC		SAMPLE NUMBER
	5180N	4520E	180	460	595	10	310	380						Pyroxenite - magnetite skarn with Fl Po Py ? Post greenschist.			T7797
TS	5180N	4520E	bld.	10	60	10	65	10	1	70				Marmore hornfels - tuffaceous sediment with lenses Po Sp			Ram 4
TS	5240N	4610E	10	20	155	10	40	60	1	130				Banded actinolite - biotite - albite hornfels cut by amphibolitic veins. Tr Po Sp Cp			Ram 5
TS	5240N	5150E	bld	bld	25	10	20	5						Plag - K feld - Quartz lenses calcsilicate with 5% biotite			T7873
	5360N	4680E	20	Tr	15	5	15	45						Coarse crystalline quartz with crystalline black tourmaline, dark cavities			T7877
	5000N	5415E	80	Tr	90	25	335	8						Heterogeneous amphibolitic calc silicate with ? skarn mineralogy in coarse calc arenite.			T7876
	T.L.	165	8	bld	230	30	95	20						Microdiorite ± 10% Po	Sill? to altered basalt. Plag: mafics 2:1.		T7875
TS	4880N	4360E	260	bld	295	5	140	20						Calc-silicate mafic skarn. Thinly banded ± hornblende, diopside, tourmaline mt Fl Po			T7878
	4880N	4410E	180	170	50	25	165	15						Pyroxene (amphibolite) skarn. Coarse crystalline calc marble. Green-black.			T7879
TS	4760N	4890E	bld	20	55	25	120	bld	2	75				Pelitic hornfels, finely bedded with pyrrhotite dolomitic layers Tr Po Cp			RAM 2
TS	4760N	4820E	bld	20	65	15	115	30	1	90				Tremolite - biotite hornfels - tuffaceous greywacke ± Po Cp Py			RAM 3
	4940N	4290E	350	bld	7	F 9763	Au bld	90	24	bld	Mo bld	Bi 40	Sb 16	Hornfelsite stained (often Sulphides) coarse crystalline amphibolite skarn			T8233
	4940N	4400E	380	90	750	7263	0.040	130	9.2	0.6	bld	30	bld	Massive coarsely cryst. amphibolite Fe-Mg skarn ± gossanous patches often Cp > Py			T8234
	4940N	4400E	bld	25	9	3373	0.013	6	0.8	bld	4.0	bld	bld	Coarse cryst. quartz-tourmaline Rock		mineralised	T8235
TS	4940N	4400E	340	20	31	8503	0.005	115	32	bld	bld	25	bld	Cryst. amphibolite skarn in contact with f.g calc-silicate pelitic rock.			T8236

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RAMSAY CAF

096046

	LOCATION		Sn	W	Cu	F	Au	Zn	As	Ag	Mo	Bi	Sb			SAMPLE NUMBER
	4820 N	4390E	180	200	55	7153	bld	140	8·8	bld	bld	bld	bld	Cayst. amphibolite shears with magnetite rich band.		T8237
TS	4820N	4411SE	260	380	550	4033	bld	100	2·8	bld	0·5	bld	bld	Phlogopite - magnetite shear assemblage with lunarite after Po + Sp		T8238

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RAMSAY CAT

096047

LOCATION		Sn	W	Cu	Pb	Zn	As				GEOLOGICAL			LOG		SAMPLE NUMBER
4760N	5190E	3	Tr	10	10	35	6				Ferruginous brecciation with feldspathic veins			quartz	rock	T789H

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047.

CAH. RAMSAY RD.

[redacted]

ROCK CHIPS.

52 Murray Road, Welshpool, W.A. 6106
44 Lane Street, Kalgoorlie, W.A. 6430
Phone (09) 458 7999
Phone (090) 21 1416

ANALABS (AUST.)
ANALYTICAL REPORT

0960048

This report must be read in conjunction with the results given for JOB No. 6.1 01 8469

Client: Comstaff Pty. Ltd.,

(1) Mt. Bischoff Road, WARATAH. TAS.

Order No. ..... Date Received 25.6.79

Reference 79/34 Results Required .....

Delivered by ..... Total No. of Samples 47

(2) SAMPLE NUMBERS	STATE OF SAMPLES: Refer to section (5) for terminology	Average Weight	PRETREATMENT: Dry	Crush	Split	Pulverize	Sieve	Evaporate	Other (see remarks)	None	ANALYSIS: Refer to section (5) for terminology	Preparation	Method	Coefficient of variation (%)
	RO			1	3	24					Cu Pb Zn	Al	AAS	
											Sn W	PP	XRF	

(3) Number of pages of results: 2

Date Reported: 28 6 79

Results to: (1) as above (2) .....

Per: .....

Number of Copies: 3

(4) Remarks:

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

Authorized Officer ..... M.A. Clayton

043

096049

[redacted]

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Phone (077) 43 6837

Code No. 6.1.01.8469
Rack No. 84
Page No. 1
Order No. 79 | 34

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.			Cu	Pb	Zn				
1	RMR	6480m	- 6490m	100	15	115				
2		-6500	6490	50	15	205				
3		- 6510	6500	20	10	160				
4		- 6520	6510	95	10	125				
5		- 6530	6520	130	15	95				
6		6530	- 6540	190	15	75				
7		6540	- 6550	160	10	70				
8		- 6560	6550	165	15	60				
9		- 6570	6560	140	15	75				
10		- 6580	6570	140	25	100				
11	Ram Rd	10, 120m	- 10, 130	10	10	20				
12		10, 130	- 10, 140	10	10	60				
13		10, 140	- 10, 150	15	5	20				
14		10, 150	- 10, 160	30	10	30				
15		10, 160	- 10, 170	20	10	40				
16		10, 170	- 10, 180	60	5	50				
17		11, 600	- 11, 620	10	x	5				
18		11, 630	11, 640	5	x	5				
19		11, 640	- 11, 660	10	x	10				
20	Ram Rd	11, 660	- 11, 680	5	x	5				
21		11, 680	11, 700	5	x	5				
22		11, 700	11, 720	5	5	10				
23		11, 720	11, 740	10	5	10				
24		11, 740	11, 760	5	x	10				
25		11, 760	11, 780	10	10	15				
26		11, 780	11, 800	5	x	5				
27		11, 800	11, 820	15	5	10				
28		11, 820	- 11, 840	5	x	5				
29		11, 840	11, 860	5	5	5				
30	Ram Rd	11, 860	- 11, 880	10	10	10				
31		11, 880	11, 900	10	10	10				
32		12, 480	12, 490	130	70	50				
33		12, 490	12, 500	80	80	50				
34		12, 500	12, 510	50	60	35				
35		12, 510	12, 520	40	90	30				
36		12, 520	12, 530	45	60	30				
37		12, 530	12, 540	35	90	35				
38		12, 540	12, 550	50	170	40				
39		12, 550	12, 560	55	230	65				
40	Ram Rd	12, 560	- 12, 570m	50	100	80				
Detection				5	5	5				
Standard	FS5			140	10	115				
Repeat–	RMR	6480	6490	100	15	115				
Repeat–	Ram Rd	11, 860	11, 880	5	5	5				
Method				AA	BAS					

RESPONSIBLE OFFICER ..... DATE 23/6/89

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

043

[redacted]

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Phone (077) 43 6837

Code No. 6.1.01. 8469
Rack No. 5
Page No. 2
Order No. 79/34

GEOCHEMICAL RESULT SHEET

TUBE No.	SAMPLE No.			Cu	Pb	Zn				
1	Ram Rd.	12,570	12,580	30	25	35				
2		12,580	12,590	50	50	75				
3		12,590	12,600	60	150	100				
4		12,600	12,610	60	100	100				
5		12,610	12,620	55	90	50				
6		12,620	12,630	70	95	130				
7		12,630	12,640	75	145	210				
8										
9										
10										
11										
12										
13										
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39										
40										
Detection				5	5	5				
Standard	1-85			140	10	110				
Repeat–	Ram Rd.	12570	12580	30	25	35				
Repeat–										
Method				aa/DBS						

RESPONS. OFFICER 23.4.79

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

050

096051

[redacted]

ANALABS (AUST.)

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Code No. 6.1018469

Page No. 3

Order No. 74/34

XRF RESULT SHEET

	SAMPLE No.		Sn	W.						
1	RMR 6480-6490		15	15						
2	6490-6500		15	20						
3	6500-6510		20	60						
4	6510-6520		8	15						
5	6520-6530		X	X						
6	6530-6540		10	X						
7	6540-6550		4	X						
8	6560-6560		9	10						
9	6560-6570		15	10						
10	6570-6580		15	10						
11	RAN RD. 10120-10130		10	30						
12	10130-10140		40	40						
13	10140-10150		5	15						
14	10150-10160		X	X						
15	10160-10170		10	10						
16	10170-10180		10	X						
17	11600-11620		X	X						
18	11620-11640		X	15						
19	11640-11660		X	X						
20	11660-11680		X	15						
21	11680-11700		X	15						
22	11700-11720		X	20						
23	11720-11740		3	X						
24	11740-11760		X	X						
25	11760-11780		X	90						
26	11780-11800		X	X						
27	11800-11820		X	X						
28	11820-11840		X	15						
29	11840-11860		4	15						
30	11860-11880		X	15						
31	11880-11900		X	10						
32	12480-12490		7	X						
33	12490-12500		X	10						
34	12500-12510		7	15						
35	12510-12520		7	X						
36	12520-12530		6	15						
37	12530-12540		5	20						
38	12540-12550		10	X						
39	12550-12560		6	X						
40	12560-12570		7	15						
	Detection		3	10						

RESPONSIBLE OFFICER [signature]

3 / 7 / 74

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

051

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[redacted]

ANALABS (AUST.)
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Code No. 6.1018469
Page No. 4
Order No. 79/34

XRF RESULT SHEET

	SAMPLE No.		Sn	W						
1	RAMRD 12510-12580		X	X						
2	12580-12590		6	20						
3	12590-12600		10	10						
4	12600-12610		3	X						
5	12610-12620		20	X						
6	12620-12630		8	15						
7	12630-12640		X	15						
8										
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38										
39										
40										
	Detection		3	10.						

RESPONSIBLE OFFICER: [signature]
4/7/79

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

APPENDIX 3

PETROLOGICAL REPORTS

053

096054

Central Mineralogical Services

231 Magill Road
Maylands, S.A. 5069
Telephone 42 5659

Mr. G. Pigott
Senior Geologist
Comstaff Pty. Ltd.
c/o Post Office
WARATAH / TAS. 7321

28th June, 1979

REPORT CMS 79/6/17

YOUR REFERENCE:	Letter dated 5.6.1979 79/31
DATE RECEIVED:	8th June, 1979
SAMPLE NOS.:	T 7851 - T 7871
SUBMITTED BY:	G. Pigott
WORK REQUESTED:	Petrology

H.W. Fander, M. Sc.

REPORT CMS 79/6/17

T 7851 to T 7871

The twenty-one rocks were examined in thin-section and hand-specimen; five polished sections were prepared, and other optical tests were also carried out. The rocks are briefly described in the accompanying tables. Further comments are given below.

Comments

The great majority of the rocks are affected by varying degrees of metasomatism, and a number are no longer recognisable because of the thoroughness of alteration As a general rule, the more "reactive" a rock in a given metasomatic environment, the more altered and the less recognisable (e.g. contrast the reaction of cherts and limestones).

The obsidian-like volcanics are unusual and have not hitherto been seen by this author from that region; the "greywackes" and other sediments are more familiar from the Cambrian.

Apart from the difficulty of correctly interpreting the original rock from the metasomatised "mass" now representing it, the major problem is that of the presence or absence of cassiterite.

There is little doubt that sphene has formed in many of the rocks; unfortunately, when this mineral is fine-grained, poorly-defined and cloudy, it is very easily confused with fine, granular cassiterite. Considerable pains were taken to determine, by various optical tests, that the mineral was in fact sphene, but the results were not always unequivocal; hence, it is strongly advisable that check assays for Sn be carried out (e.g. on samples T 7858, 62, 63, 67 and perhaps others). Apart from its confusion with cassiterite, there is some evidence that sphene carries Sn in its structure, perhaps forming a continuous series with malayite.

Sample T 7854 is magnetic, partly because of detrital (free and composite) magnetite, partly because of introduced, metasomatic magnetite.

H.W. Fender, M. Sc.

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Sample Details	Rock Type - Composition	Fabric	Minor Minerals	Comments
T 7851 (T.S. 27854)	Greisen. Anhedral patches of quartz, aggregates of hydromuscovite pseudomorphing feldspars, coarser hydromuscovite after ?biotite flakes.	Even-grained, granitic fabric. Minor shearing, fracturing.	Secondary rutile (from biotite). Barren quartz veins.	Greisenised granite or related rock, but exact composition unknown, because feldspars totally replaced. Featureless.
T 7852	Metasomatised Igenous Rock. Pseudomorphous aggregates of biotite after ?hornblende; coarse, extensively altered ?oligoclase, coarse sphene crystals. Actinolite patches.	Relict coarse igneous fabric of an intrusive rock.	Primary smoky apatite conspicous. Relict oxide openues (ilmenite).	Ferromagnesian minerals replaced by phlogopitic biotite. Inferred composition of primary rock was dioritic, perhaps gabbroic.
T 7853 .	Olivine Basalt (Tertiary). Fresh olivine phenocrysts (small) in groundmass of small fresh labradorite laths, interstitial brown glass and fine magnetite, augite.	Typical basaltic fabric; no flow-banding, no vesicles.	Rare quartz xenoliths with complex reaction-rims.	Freshness of olivine, complete absence of devitrification of glass, suggest young age; good correlation with Tertiary basalts.
T 7854	Metasomatised "Greywacke". Subrounded grains of reworked andesite/basalt, ferromagnesian minerals, feldspar, quartz; replacive fine phlogopite, actinolite, magnetite.	Well-sorted/sized, clastic textures preserved. Weakly bedded.	Phlogopite-actinolite-epidote veins. Felsite and chert grains.	Strictly a volcanomict sandstone, composed of re-worked andesitic to basaltic minerals + rocks, pervasively metasomatised.
T 7855	Metasomatised ?Volcanic. Numerous round/ovoid shapeless patches of fibrous actinolite set in featureless cryptocrystalline SiO_2 - ?K-feldspar mass.	Relict ?perlitic cracks otherwise devoid of textures, structures.	Patches of coarser actinolite intergrown with prehnite.	Actinolite patches could be replacing phenocrysts (?feldspar) or spherulites, or may be vesicle-fillings; puzzling rock, ?obsidian.
T 7856	Carbonaceous, Micaceous Sandstone. Fine sand- to silt-size quartz grains, muscovite flakes, argillised ?feldspar; well cemented with quartz interstitial fine carbon.	Uniform, well-sorted/sized, faintly bedded; mica flakes aligned.	Detrital heavy minerals - tourmaline, goethite, leucoxene, zircon.	Well-indurated, but not metamorphosed. Verging on siltstone in grainsize and on arkose in composition.
T 7857	Metasomatised ?Obsidian. Cryptocrystalline siliceous rock, with ultrafine diopside, possibly other calc-silicates, throughout. Streaks of pyrrhotite, pyrite.	Very well-preserved relict fine, complex flow-banding.	Lenses and veins of more coarsely crystalline diopside. Fine leucoxene/sphene.	Interpretation based almost entirely on relict textures. Correlatable with T 7855. Sulphides = pyrrhotite, pyrite, trace chalcopyrite.
T 7858	Metasomatised Chert. Micro/cryptocrystalline silica, impregnated with fine dravite; sub-parallel zones of coarser dravite, sulphides, quartz. Trace ?cassiterite.	Suspicion of pyroclastic textures in places. Faint bedding.	Ultrafine leucoxene/rutile. K-feldspar formed next to coarser zones.	Right context for cassiterite, but identification not certain, because crystals are very small (< 50 μ) and resemble rutile. Assay confirmation needed. Sulphides = pyritised pyrrhotite.

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Sample Details	Rock Type - Composition	Fabric	Minor Minerals	Comments
T 7859 CAL 4760N/5055E ✓	Metasomatised ?Obsidian. Microcrystalline, devitrified glassy felsic material, extensively replaced by diopside, tremolite, plagioclase, sulphides.	Well-preserved relict flow-banding, folded. Devitrification textures.	Fine sphene occurs as stringers throughout. Arsenopyrite, pyrrhotite (pyritised).	Closely similar to T 7857. Potash stain test positive, indicating a K-silicate glass phase. Pyrometasomatised. Sn assay advisable.
T 7860 CAL 4580N/4900E ✓	Metasomatised ?Obsidian. Virtually completely replaced, but microgranular diopside, patches of tremolite/actinolite, fine ilmenite and sulphides.	A few relict patches with flow-banding, but mostly very fine-grained.	Veins of fibrous, pale actinolite. Sulphides are pyrrhotite only.	Very thorough pyrometasomatism has virtually obliterated original rock, except for a few relict patches resembling T 7859.
T 7861 CAL 4660N/5170E ✓	Metasomatised Sediment. Probably volcanomict siltstone, composed of small plagioclase grains, other altered minerals, extensively replaced by tremolite, tourmaline, sulphides.	Clastic textures recognisable, but largely obliterated.	Fine cloudy leucoxene-sphene throughout. Pyritised pyrrhotite, chalcopyrite.	Original rock was a clastic sediment, possibly re-worked volcanics or possibl correlatable with T 7856.
T 7862 CAL 5100N/5105E ✓	Metasomatic Rock. Composed entirely of fine metasomatic pale actinolite, chlorite, fine sulphides, carbonate and abundant ultrafine sphene.	Microgranular and matted intergrowths; no relict features.	Gypsum crystal-clusters on surfaces. Altered pyrrhotite, pyrite.	Microgranular sphene very difficult to positively distinguish from cassiterite Sn assay essential. Original rock unknown.
T 7863 CAL 4760N/5240E ✓	Metasomatic Rock. Matted and granular aggregates of diopside, prehnite, altered feldspar, granular sphene, fine sulphides, siderite.	Faint layering/banding and ?clastic textures, barely recognisable.	Pyrrhotite as small clusters throughout, partly oxidised.	Present assemblage suggest original rock may have been semi-calcareous, but relict features obliterated.
T 7864 Ram River 4600	Olivine Basalt. Small scattered phenocrysts of fresh olivine in a uniform groundmass of andesine laths, granular augite, interstitial brown glass.	Homogeneous fabric with random orientation.	Small magnetite crystals. Occasional amygdales with carbonate, chlorite.	Typical fresh Tertiary basalt, very similar to T 7853 in all details. Quench textures in glass.
T 7865 Ram River 6100	Pyritised Conglomerate. Large and small, rounded grains, pebbles of pyritic quartzite, carbonaceous metasiltstone, quartz matrix and interstitial pyrite/marcasite.	Rounding of grains indicates conglomerate. Relict clastic textures.	Quartz veins cut metaquartzite pebbles.	Featureless oligomictic conglomerate, pervasively pyritised, but unmetamorpho
T 7866 Ram River 7780	Carbonaceous, Pyritic Sandstone. Fine quartz, feldspar (sericitised) as subangular grains, grading into micaceous siltstone; carbon films, streaks.	Some slump structures, superimposed fracturing, veining. Graded bedding.	Pyrite crystals in rock, pyritised pyrrhotite and fine dravite in quartz veins.	Original carbonaceous, pyritic, feldspathic sandstone/siltstone was slumped later fractured, veined after lithification

057

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Pontifex & Associates Pty. Ltd.

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26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

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SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 2628

11th June, 1975

TO:	Mr. G.H. Krummei, Preussag Australia Pty. Ltd., Ferrer House, 4th Floor 24-26 Collins Street, MELBOURNE, Victoria 3000
YOUR REFERENCE:	GHK/sh letter 25/5/75
MATERIAL:	Rock Samples
IDENTIFICATION:	RAM 1 to 7
WORK REQUESTED:	Petrographic and mineragraphic examination with detailed comments as specified
SAMPLES & SECTIONS:	Returned to you with this report

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

All samples were examined in thin and polished section as requested. They are all more or less hornfelsic in hand specimen, and indeed they do represent contact-metamorphosed 'sediments', which has to a fairly large extent resulted in a generally similar metamorphic assemblage throughout but with minor differences in minerals, and/or textures which indicate different original facies. These may be grouped as follows -

(1) Samples RAM 1, 3 and 4

'Hornfels' composed of albite and/or cordierite, intimately mixed with a generally essential abundance of secondary biotite and tremolite with an anomalous abundance of disseminated ilmenite (10%). Minor fine sand grains are scattered.

A vague relict detrital texture (including lithic fragments) is preserved.

The collective evidence (also considering the metasediment RAM-2), indicates this group to be a rather immature lithic detrital facies (? wacke), derived mainly from an andesitic-basalt terrain (? tuff or lava), with a separate minor quartzose contribution.

Minor disseminated pyrrhotite, generally altered and plus trace chalcopyrite are essentially indigneous.

Apart from contact (temperature) metemorphism the cordierite and biotite may in part be due respectively to minor Mg and K metasomatism. Likewise pyrrhotite may be in part also due to enrichment in S.

(2) Sample RAM-2

A relatively more homogeneous fine grained, hornfelsic spotted slate; composed of cordierite and biotite, plus ubiquitous fine ilmenite, and minor chert interbeds. Objectively this may be a metamorphosed pelitic dolomite, however the anomalous disseminated fine ilmenite and minor iron sulphides indicate a genetic relationship with group (1), and it may be considered as a fine silty-pelitic equivalent of that facies.

(3) Sample RAM-5

This rock has the same gross composition as group (1) above, and must surely have essentially the same genesis, even though it is texturally different. It consists of fine biotite and amphibole (actinolite) more or less segregated into bands, both within a 'matrix' of extremely fine, diffuse microcrystalline albite. Fine ilmenite is dispersed throughout, minor altered pyrrhotite + trace chalcopyrite, and rare galena are also present.

(4) Samples RAM 6/1, 6/2 and 7

The common characteristic in these three samples is essential extremely fine calc-silicate; (tremolite in 6/1 and 6/2, and diopside + tremolite in 7). Also sphene is disseminated, but there is no ilmenite.

Sample 6/1 is brecciated ? tectonically which has facilitated mineralisation by pyrrhotite (essentially indigenous but reconstituted), also by tourmaline which is almost certainly epigenetic.

Sample 6/2 has a heterogeneous, relict sedimentary breccia texture in which pyrrhotite has the same mode of occurrence as in 6/1.

Sample 7 is a massive, tremolite-diopside rock, with scattered euthigenic pyrrhotite grains and rare arsenopyrite. The in-situ mode of occurrence of these indicates that they are predominantly indigenous, although as in group (1), some enrichment in S may have occurred during metamorphism.

This group is interpreted as probable metamorphosed dolomitic facies, albeit with minor fine clastic impurities, most abundant in 6/2.

There is no evidence throughout the suite, of tin mineralisation, however if anomalous tin values are recorded chemically, it is suggested that the titaniferous phases (noteably the sphene in group (4) rocks should be checked for possible Sn.

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RAM - 1 : (albite or cordierite)
biotite tremolite 'hornfels';
minor scattered quartz disseminated ilmenite;
contact metamorphosed tuffaceous intermediate
volcanic facies, or a sediment derived from
basaltic-andesite + quartz contamination

RmRd 10180

A homogeneous, massive, very fine grained hornfelsic-looking rock. The bulk of it consists of a 'matrix' of essential diffuse, patchy, anhedral, probable cordierite (but possible untwinned albite), crowded with abundant clusters and randomly interlocking minute prisms of tremolite, also minor, scattered fine (secondary) brown biotite (10%). (The optical properties of untwinned albite and cordierite in this form are virtually identical.)

Quartz forms an estimated 10% of the rock, as disseminated single subangular to subrounded crystals, average size 0.2 mm. These may be clastic sand or possibly tuffaceous. Minor patches and discontinuous veins of ?hydrothermal quartz micromosaic occur sporadically throughout.

Minor small patches of chlorite are also present, some as alteration selvages along chlorite stringers.

Minute opaques (10%), average size of 0.02 mm, are ubiquitous, variably as individuals and locally in irregular clumps. In polished section these are identified as minute laths and anhedral grains of ilmenite, accessory pyrite, trace pyrrhotite. There is no magnetite.

This is a medium grade (albite-amphibolite facies) contact metamorphic rock. Its gross composition indicates an original intermediate probably transitional to basic, tuffaceous volcanic; alternatively it may be interpreted as a volcaniclastic (derived) sediment, mainly from basaltic-andesite source, contaminated with quartz from another source.

RAM - 2 :

CAF 4760N/4890E

relict banded, spotted, biotite-cordierite hornfels or hornfelsed slate, with abundant fine ilmenite (minor altered pyrrhotite and chalcopyrite) scattered along the layering; minor intercalated chert

This is a layered rock, generally finer grained and spotted, indicating more advanced hornfelsing than in RAM-1. This appears to reflect original sedimentary bedding, including intraformational slumping.

Aggregates of loose-packed attenuated lenses are probably intraclasts of mud flake type; i.e. allochemical components transported and/or differentiated within a carbonate facies.

Most bands consist of spotted, or fine mottled mass of ovoid, incipient cordierite porphyroblasts. Extremely fine (secondary) biotite ± minor chlorite is ubiquitous in areas between these ovoids, and dispersed in lesser concentration as inclusions within them. The concentration of biotite varies from 25% in some bands to 50% in others.

Minor thin chert bands are intercalated. Abundant extremely fine (0.001 to 0.05 mm) opaques are scattered along the layering in variable concentration, but commonly forming up to 10% of a given band. These are identified in polished section as mainly ilmenite, variably as lath-form crystals, skeletal and amoeboidal in form.

.../

RAM - 2 continued :

Anhedral grains of pyrrhotite, largely altered to secondary, melnicovite pyrite-mercesite, are scattered along some layers and rarely occur in stringers. This is generally slightly coarser than the ilmenite; it forms about 5% of the rock. Trace chalcopyrite accompanies some grains.

This rock may be interpreted as an original magnesia-rich pelite, i.e. a dolomitic pelite, or composed of extremely fine detritus derived from a basic igneous provenance. It has been contact metamorphosed, but without destruction of primary sedimentary structures.

The sulphides are indigenous. The amount of ilmenite is anomalously high and almost certainly indicates a relationship with RAM - 1, as an indigneous ? tuffaceous impurity, or as pelitic detritus derived from an intermediate to basic source.

RAM - 3 : massive (albite or cordierite), tremolite-biotite 'hornfels'; with scattered fine quartz grains, pyrrhotite and ilmenite; (same facies as RAM-1 and 4)

CAF 4760N/4820E

This rock is very similar to RAM-1 except that it contains relatively more biotite and less amphibole.

Basically it consists of a heterogeneous mass of diffuse fine crystalline untwinned albite and/or cordierite, intimately mixed with essential amounts of extremely fine secondary biotite, needles and small aggregates of tremolite. Single crystal quartz grains (10%), average size 0.15 mm, variably subangular to subrounded and some splinters are randomly scattered as in RAM-1. Accessory relict, ill defined, detrital felspar grains (3%) are also present.

A component not seen in RAM-1 however consists of small patches of diffuse microcrystalline quartz; these appear to be fragments of chert or volcanic exhalative material.

Rather larger fragments 10 mm are vaguely outlined, since they differ from the bulk of the rock, only in their relative paucity of scattered quartz grains. Nonetheless they do indicate an original fragmental or lithic sediment.

Very fine opaques, generally <0.1 mm, and commonly 1 to 10 microns, are dispersed throughout almost certainly as an essentially indigenous component. In polished section these are identified mainly as irregularly anhedral grains of pyrrhotite (7%). Rarely pyrrhotite is aggregated and localised into discontinuous, short metamorphic veins + trace chalcopyrite (and with intergrown tremolite).

Generally finer ilmenite (5 - 7%) is also scattered throughout, variably as minute laths, anhedral and skeletal grains.

This rock represents essentially the same facies as RAM-1, and 4, see comments at the beginning of report.

RAM - 4 : massive (albite and/or cordierite) biotite tremolite 'hornfels'; minor scattered quartz fine ilmenite accessory pyrrhotite ± trace chalcopyrite; (same facies as RAM-1 and 3)

CAF near old workings

The bulk of this rock consists of a very fine diffuse microcrystalline mosaic of albite and/or cordierite, intimately mixed with an essential amount of equally fine biotite and tremolite.

Small (0.15 mm) relatively discrete grains of single crystal quartz (10%), and of quartz micromosaic (3%), are scattered, also minor, relict single detrital grains of plagioclase (3 - 5%) are present. Minor fragments of essentially the same composition as the bulk of the rock are vaguely preserved.

Very fine (generally <0.5 mm) opaque grains are scattered with a vague layered distribution. In reflected light these are identified mainly as ilmenite (7 - 10%), but with minor, slightly coarser anhedral grains of pyrrhotite (2 - 3%), rarely accompanied by trace chalcopyrite. Rare, very small, metamorphic segregation-type veins of pyrrhotite + trace chalcopyrite are present.

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RAM-5 : Fairly broad banded actinolite, biotite, albite hornfels; extremely fine ilmenite, pyrrhotite dispersed; lesser coarser pyrrhotite + trace chalcopyrite and rarer galena, in actinolitic vein-like segregations

CAF 52HON/46106

This is a hornfels, banded on a scale of about 20 mm, brownish bands in hand specimen are rich in fine biotite; the dark grey bands contain essential very fine amphibole instead of biotite.

Petrographically the biotite-rich bands are also seen to carry minor fine actinolite (10%), and extremely fine opaques (7 - 10%), identified in polished section as mainly ilmenite, subordinate pyrrhotite. These components are fairly evenly scattered as diffuse microcrystalline mosaic of generally untwinned albite.

The amphibolitic bands consist essentially of a hornfelsic aggregate of extremely fine actinolite intimately intergrown with albite, and with disseminated fine opaques (7 - 10%). The opaques are mainly ilmenite, but minor pyrrhotite is also present.

Localised irregularities and dislocations in the planar/ layering are almost certainly relict bedding characteristics, but they do act as a locus for lenticular and vein-like segregations of fairly coarse actinolite + pyrrhotite and trace very fine epidote, with minor braided stringers of cryptocrystalline quartz. Minor chalcopyrite accompanies some of this pyrrhotite, trace galena is also present.

RAM 6/1 : massive fine grained (hornfelsic) tremolite rock; minor interstitial albite; locally fractured and dislocated areas permeated by tourmaline and pyrrhotite (now altered)

In hand specimen this rock is vaguely banded, with one band displaying quite intense brecciation. Rarer fractures also occur elsewhere.

Petrographically the bulk of the rock is seen to consist of a compact mass of very fine prismatic tremolite, with minor (10%) interstitial albite, and disseminated, ultrafine sphene (15%). Locally the mass is fine banded to laminated, and these structures may be dislocated and/or ptygmatically folded with relatively coarser prismatic tremolite along movement interfaces. This tremolite carries minor pyrrhotite ± trace chalcopyrite.

Small (0.1 mm) crystals of very pale brown tourmaline crystals, some with a pale bluish-green core are irregularly scattered through the fractures and fissures in this rock, and locally permeates the layering to form a total of about 20% of it. These are associated with (but do not constitute)the opaque mineral seen in hand specimen. That mineral is identified in polished section as secondary melnicovite pyrite-marcasite, having formed by extensive supergene alteration from pyrrhotite. Trace chalcopyrite occurs with these iron sulphides.

This pale brown tourmaline may be locally confused with minor pale brown (phlogopitic) mica.

This rock is more magnesic (tremolitic) than samples above, and lacks the abundant ilmenite characteristic of them. It may be objectively interpreted as a metadolomite, fractured, and penetrated by tourmaline of (contact) metasomatic origin. The pyrrhotite seems most likely to be an indigenous, reconstituted component.

RAM 6/2 : roughly layered and apperently inherently brecciated, extremely fine hornfelsic rock composed of biotite, tremolite, bands of detritel plagioclase, minor chert fragments; disseminated sphene, altered pyrrhotite ± trace chalcopyrite (in part similar to RAM 6/1)

(PL ?FSP/SOUSE?

This rock has a combined layered and brecciated structure, certainly it is more 'fragmental' than any other rock in the suite.

Basically it is a banded rock in which each of the poorly defined bands consists of a tight packed and roughly layered aggregate of subangular to subrounded fragments, between 0.1 and 5 mm in size. These occur in a matrix which has essentially the same composition.

These fragments and layers consist of a patchy aggregate of intimately intergrown pale brown biotite, subordinate tremolite and sphene in some bands; and fine apperently detritel very fine plagioclase, in a matrix of ultrafine sphene and minor scattered tremolite in others. Extremely fine altered pyrrhotite is ubiquitous, (see below).

Minor fragments of chert carrying accessory fine tremolite and opaques are scattered.

Some fractures and/or partings, more or less between the layers but also cutting across them, consist of relatively coarser, clearer tremolite crowded with fine pyrrhotite (as in RAM 6/1).

..../

RAM 6/2 continued :

In reflected light the disseminated opaques are identified as very small (0.01 to 0.05 mm) grains of pyrrhotite (5%) completely altered to secondary melnicovite-pyrite. This same iron sulphide is scattered through the tremolite veins where it is accompanied by trace chalcopyrite.

A trace extremely fine (0.01 mm), 'opaque' titaniferous? phase is enveloped in sphene. (If tin assays are anomalous for this sample, this phase should be checked as a possible tin-bearing mineral.)

This rock is interpreted as a metamorphosed sedimentary breccia, at least partly similar to the original ?dolomitic facies as in RAM 6/1. However it does contain definite bands of detrital felsic material (? tuffaceous); also metamorphism has involved biotitisation, not seen in RAM 6/1.

RAM 7 : massive, tremolite diopside hornfels; minor disseminated sphene, pyrrhotite and trace arsenopyrite

of ca. 4760N/5240E?

This rock consists essentially of a very fine (0.5 mm) mass of colourless pyroxene (diopside), intimately intergrown with a similar abundance of ultrafine fibrous ? tremolite (or possible nephrite) in patches also about 0.5 mm across. Minor extremely fine granular sphene (10 - 12%) is disseminated.

Irregularly anhedral opaque grains (7%), average size 0.15 mm, are evenly, but randomly scattered throughout, commonly enveloped in carbonate.

These opaques consist virtually entirely of pyrrhotite. They are unaltered, and their form and abundant silicate inclusions within them indicate an essentially authigenic origin. Locally these are aggregated into a cluster up to 3 x 5 mm. Accessory, distinct, euhedral single crystals of arsenopyrite (0.2 x 0.5 mm) are present. These are also crowded with abundant in-situ silicate mineral grains.

The rock is interpreted as an impure metacalcite, with the sphene probably derived from a titaniferous-argillaceous component. The sulphides are essentially indigenous.

071

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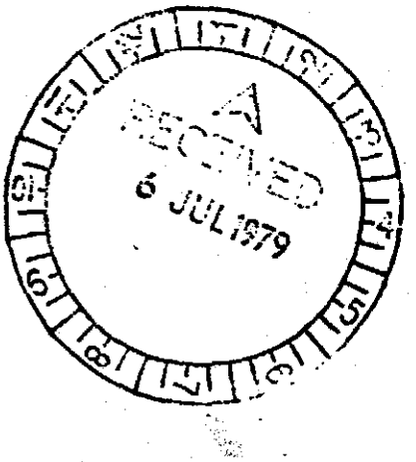
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067



MINERALOGICAL REPORT NO. 2641

5th July, 1979

TO: Mr. G.K. Krummei,
Preussag Australia Pty. Ltd.,
Farrer House, 4th Floor
24-28 Collins Street,
MELBOURNE, Victoria 3000

YOUR REFERENCE: GKK/ah letter dated 4/7/79

WORK REQUESTED: Follow-up comments on metamorphic grade, and temperature of samples RAM1 to RAM7 previously described in Mineralogical Report 2628

SECTIONS: Returned to you with this report

PONTIFEX & ASSOCIATES PTY. LTD.

Metamorphism, samples RAM 1 to RAM 7

The previous report 2628 was reassessed, and the sections re-examined specifically to offer comments on conditions of metamorphism, particularly with respect to temperature.

Discussion

The critical minerals throughout the suite, relative to this assessment are the amphibole, biotite, albite, cordierite, and chlorite. Textures were less important since they are largely controlled by the sedimentary, tuffaceous (and local breccia) textures inherent to the pre-metamorphic facies.

The common co-existence of albite, biotite and sub-aluminous rather acicular amphibole (tremolite, lesser actinolite) and the only trace occurrence of chlorite, indicates metamorphic pressure/temperature conditions of essentially lower amphibolite facies grade, but possibly gradational down into upper greenschist.

This 'down-grade' transition is indicated by the generally incipient, weakly developed crystalline form noteably of biotite through the suite; and of the rather 'diffuse-porphyroblastic' nature of the albite particularly in RAM 1, 3 and 4.

Also the biotite appears to be a very low Ti variety, and in the presence of fairly abundant titaniferous phases (ilmenite, sphene), this indicates a low temperature form of that biotite.

Likewise the cordierite in RAM 2 occurs as incipient, very weakly formed crystals.

The spotted texture, manifest as the weakly porphyroblastic habit of albite (in RAM 1, 3, 4) and of cordierite (in RAM 2), considered together with the metamorphic mineral assemblage, confirms that the samples represent a (low grade) contact-metamorphosed aureole.

Conclusion

Essentially this entire suite of samples formed under conditions of low amphibolite facies, possibly gradational down to upper greenschist facies. This occurred within a temperature range of 470 to 500°C; and at low pressures, probably about 2 kilobars.

The minor variations in mineralogy through the suite reflects variation in the bulk mineralogy of the original rock types. Unfortunately there are no variation in metamorphic characteristics, distinctive enough to indicate formation at relatively greater or lesser temperatures within this generalised range of 470 to 500°C.

Assuming that the entire suite represents a zone proximal to the intrusive which induced this low-grade contact metamorphism, (? or in a roof pendant), then that intrusive may be regarded as 'high-level'.

---

* Note - During the reassessment of these sections, the diopside noted in the original description of RAM 7 occurs in only accessory abundance, i.e. less than indicated in that description. The main mafic phase in that rock is tremolite.

074.

096075

Pontifex & Associates Pty. Ltd.

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 2662

1st August, 1979

TO:	Mr G.T. Pigott, Comsteff Pty. Ltd., Mount Bischoff Road, WARATAH, Tasmania 7321
YOUR REFERENCE:	79/37
MATERIAL:	Rock samples (8)
IDENTIFICATION:	T7872 to T7893 (not consecutive)
WORK REQUESTED:	Petrographic description, polished sections if necessary
SAMPLES & SECTIONS:	Returned to you at above address, with this report

PONTIFEX & ASSOCIATES PTY. LTD.

075

096076

T7872 : massive fine to medium crystalline quartz-tourmaline rock

CAF 4520E/5140N

This rock consists of a massive, somewhat patchy, inequigranular, allotriomorphic aggregate of quartz (about 50%), with tourmaline (50%) scattered throughout, essentially as an irregular network of ragged groups of subhedral to anhedral crystals.

The tourmaline is pleochroic, variegated from pale bluish with minor, diffuse pale brownish patches in some crystals and aggregates.

There are no other phases present, and presumably the rock represents massive, pervasive quartz-tourmaline mineralisation, of epithermal or pneumatolytic origin, associated with a granitic intrusive.

T7873 : medium grained albeit inequigranular leuco-adamellite; with accessory scattered biotite

CAF 52Mon/5150E

This rock has an inequigranular hypidiomorphic texture, average grain size about 1 mm. It consists of a mosaic of randomly interlocking, subhedral to euhedral plagioclase (30%), generally coarser subhedral to anhedral potash felspar (35 - 40%), and anhedral quartz (35%). The potash felspar is highlighted by the yellow colour on the stained section offcut. Some of the coarser crystals of K-spar carry small inclusions of plagioclase and tend to be perthitic, and some carry incipiently vermicular or graphic quartz inclusions.

Accessory plates of dark brown biotite (5%) are randomly scattered.

Clouding by clays in plagioclase, is probably due to weathering, and represents the only alteration.

Trace zircon inclusions in biotite are the only accessory minerals.

077

096078

T7874 : hornblende (?biotite) micro-diorite; recrystallised, emphibolitised and biotitised by (thermal) metemorphism and associated potash metasomatism

CAF 5240N/5380E

About 50% of this rock consists of a crystalline aggregate of randomly interlocking plagioclase crystals. These are poorly defined due to diffuse, gradational incipiently recrystallised intergranular contacts, also due to ubiquitous very fine chlorite and fine fibrous actinolite secondary alteration products, which are intimately intergrown within the plagioclase.

About 40% of the rock consists of patches of relatively concentrated very fine mafic material. Some of these consist of actinolite ± minor chlorite, tremolite and rare biotite which pseudomorphically replaces former primary hornblende crystals (?30%) about the same size as the plagioclase, and which formed an integral part of the primary aggregate.

Irregular patchy masses of fine biotite (20%) have a sporadic distribution; these may also replace a primary phase, although basically they appear to represent hydrothermal biotitisation, akin to incipient potash metasomatism.

The rock is interpreted as an original dioritic intrusive, altered by a combination of retrograde (?thermal) metamorphism and hydrothermal biotitisation.

078

096079

T7875 : urelitised, leucocratic microdolerite (? dyke); abundant scattered pyrrhotite largely altered to secondary (melnicovite) pyrite, and intergrown with ilmenite; quartz vein carries pyritised pyrrhotite ± trace fine chalcopyrite

CAF TL165

This is a homogeneous, massive microcrystalline rock. It is composed essentially of randomly interlocking plagioclase laths (60%), and subordinate more or less interstitial, relatively ragged, uralitised mafic crystals (25 - 30%) of similar fine size. This essential composition and texture indicates a leucocratic microdolerite (dyke rock).

Rare, poorly defined felspar phenocrysts are present. Minor veinlets and interstitial fillings of colourless amphibole (tremolite) ± accessory fine zeolite occur through the rock. Fine opaque grains are disseminated, with a fairly consistent size of about 0.1 mm.

In polished section these are identified mainly as primary pyrrhotite grains (10% of the rock), most of which have been completely pseudomorphically replaced by secondary (melnicovite) pyrite. About one-third of the original pyrrhotite grains remain.

Skeletal, anhedral grains of ilmenite (5 - 7%) are scattered and generally intricately intergrown with the iron sulphide grains.

A single quartz vein carries relatively coarse melnicovite-pyrite replicas after pyrrhotite, with trace fine chalcopyrite inclusions (which are unaltered), also minor fine tremolite.

T7878 : thin-banded, complex mafic, calc-silicate hornfels; including altered cordierite, epidote, diopside hornblende, interstitial fluorite, accessory sphene, tourmaline, trace ?zeolite; minor pyrite pyrrhotite magnetite; (contact-metamorphosed impure argillaceous dolomite and/or fine basic tuff facies).

CAF 4880N/4360E

Macroscopically a dark coloured hornfelsic rock with a heavily limonite-encrusted weathered surface. In thin section it is seen to consist of fairly well defined bands each about 10 mm thick, of fine, mainly calc-silicate minerals, forming compact hornfelsic aggregates. The bands have fairly sharp, but none the less partly gradational bounderies.

The outermost band consists predominantly of green hornblende aggregate, incorporating scattered anhedral grains, and trains of fine to coarse granular magnetite. This grades into a narrower more complex band of fine diopside, altered cordierite, epidote and interstitial fluorite; also carrying minor scattered magnetite, lesser sphene and trace tourmaline crystals. Trace stringers of ?zeolite are present.

This grades into a band of extremely fine diopside and/or epidote with minor interstitial quartz and/or untwinned albite; which then grades into a band of somewhat coarser diopside aggregated with altered cordierite, with fine, patchy dark green hornblende more or less interstitial and scattered crystals of sphene.

Minor fine magnetite is strung out along this band.

In polished section minor pyrrhotite completely altered to secondary (melnicovite) pyrite, and to limonite is seen to be aggregated with magnetite.

.../

T7878 continued :

Minor much finer grains of pyrrhotite, rarer pyrite, accompanied by fine skeletal, almost 'graphic' magnetite grains are widespread through some bands, noteably the extremely fine diopside and/or epidote layer. Minute inclusions of chalcopyrite occur in some pyrrhotite.

This is a banded complex mafic-calc-silicate hornfels (skarn), and is tenatively interpreted as a thermally (contact) metamorphosed 'basic' sediment, conceivably an argillaceous chloritic dolomitic and/or fine basic tuff facies. The minor fluorite and trace tourmaline suggests a partly pneumatolytic genesis.

This is the highest grade (thermally) metamorphosed rock in the suite, and would also appear to be a more intensely metamorphosed rock than represented in the recent suite from Preusseg, described in my report no. 2628 referred to in your covering letter.

T7891 : probable micro-dolerite, (possible but less likely a basalt); weakly micro-porphyritic, pyroxene completely uralitised, plagioclase weakly saussuritised and partly chloritised

CAJ 5000N/4905E

Minor phenocrysts of euhedral plagioclase (10 - 15%) average size about 1.5 mm, are scattered through a finer crystalline groundmass.

The groundmass consists of small, randomly disposed plagioclase laths, loosely aggregated with relatively squat, equant and completely uralitised crystals of pyroxene, of similar abundance and size. The plagioclase laths are weakly saussuritised, most plagioclase phenocrysts are also partly chloritised.

Interstices throughout this aggregate are filled by turbid indefinite chloritic and/or uralitic alteration products, apparently after mafic glass.

Veins and small clusters of actinolitic hornblende are scattered, as advanced manifestations of uralitic alteration.

Ultrafine Fe and/or Ti opaques are ubiquitous (however it is 'non-magnetic' in that it does not produce a response to a swinging magnet.)

T7892 : massive, fine to medium grained, lithic and micaceous quartz sandstone; turbid limonitic-chloritic-clay sedimentary alteration products ubiquitous through intergranular areas

CAT SUON/477CE

A homogeneous, massive, fine grained sedimentary rock, indurated but not metamorphically crystallised. It consists of a tight-packed aggregate of subangular detrital grains, ranging in size from about 0.1 to 0.5 mm. These consist mainly of single crystal quartz grains, subordinate 'grains' of extremely fine quartz, sericite ± clays, which seem to be mainly fragments of metasediment, but possibly some meta-acid volcanic and/or altered feldspar grains.

Minor detrital muscovite is vaguely, similarly oriented along an equally vague bedding. Accessory detrital tourmaline and lesser zircon are scattered.

Intergranular areas are occupied by turbid alteration and products of ?chlorite, chloritic clays and some possible biotite. The ubiquitous distribution of this material, in essential abundance, gives rise to the dark colour of this rock.

T7893 : probable micro-dolerite,
(possible but less likely a basalt);
CAJ 4760N/4930E weakly microporphyritic;
pyroxene completely uralitised,
plagioclase partly saussuritised;
(virtually the same as T7891)

Plagioclase phenocrysts (10 - 12%), about 0.15 mm are randomly scattered as individuals and rarely in clumps. These occur in a groundmass of randomly disposed much smaller plagioclase laths, loosely aggregated with a similar amount of equat, equant pyroxene crystals, which have been completely uralitised.

Interstices throughout this aggregate are occupied by turbid, ill-defined uralitic alteration products after mafic glass, also crowded by extremely fine Fe/Ti oxides (although the rock is 'non-magnetic'.)

The plagioclase phenocrysts and in the groundmass is turbid due to minor saussuritic alteration.

Minor veins and clusters of fine actinolitic-hornblende are scattered, as segregations of uralitic alteration products.

APPENDIX 4

SOIL SAMPLE STATISTICS

GRID CAE No. of Samples : 248

Element	Range of Values	Mean (m)	Standard Deviation (σ)	M+ 2σ	Critical Points
Cu	bld - 250	35.76	39.87	115.5	26 47 90
Pb	bld - 150	21.29	18.13	57.5	56
Zn	5 - 330	46.77	53.24	153.3	54 125
Sn	bld - 40	4.83	4.59	14.0	12

GRID CAL No. of Samples : 132

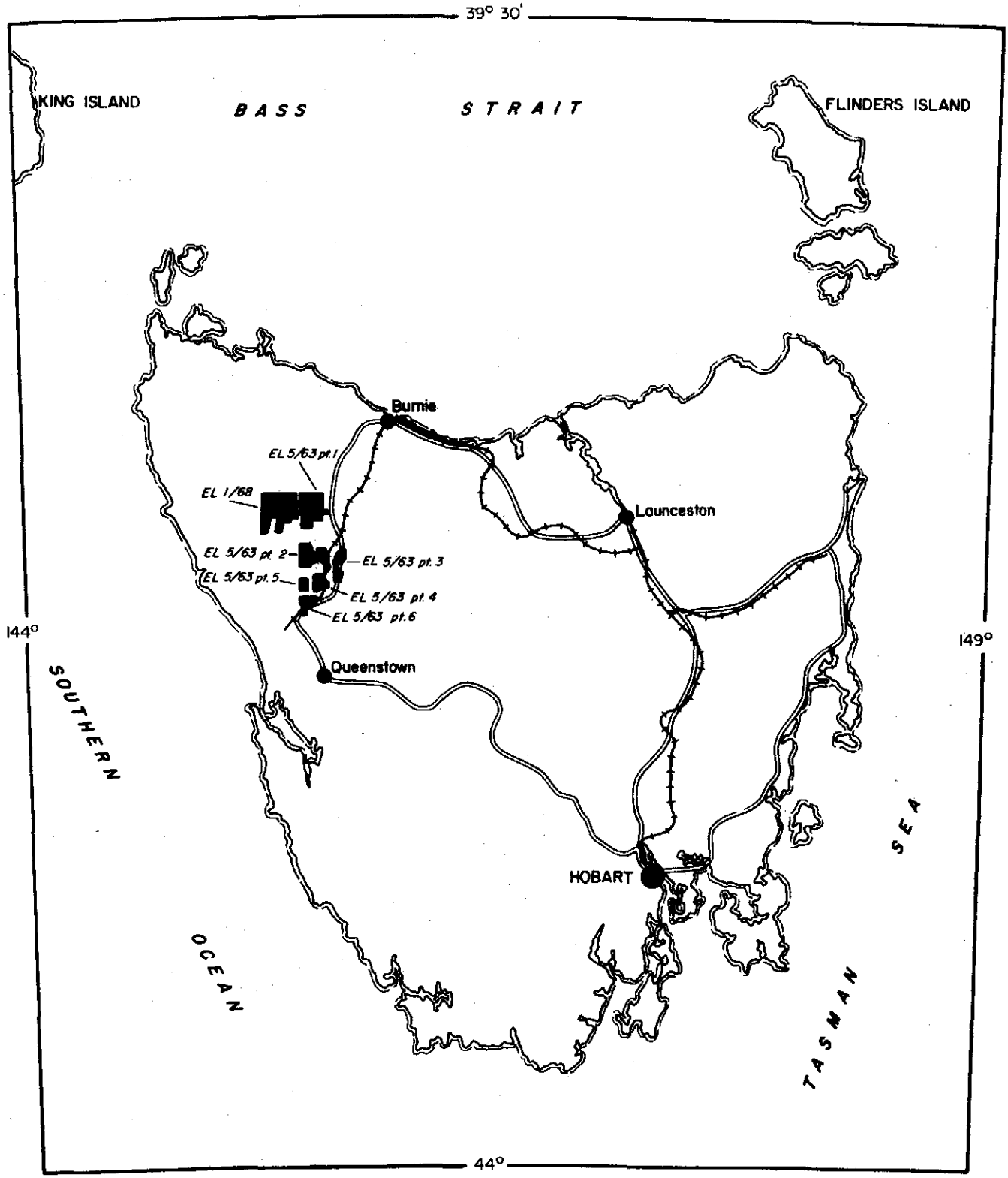
Element	Range of Values	Mean (m)	Standard Deviation (σ)	m+ 2σ	Critical Points
Cu	5 - 220	76.52	45.60	167.7	30 100
Pb	5 -4600	100.61	434.18	969.0	110 380
Zn	10 -2750	107.12	260.73	628.6	27 120 370
Sn	bld -1000	23.24	95.72	214.7	12 43
W	bld - 90	3.52	11.80	27.2	10

GRID CAF No. of Samples : 330

Element	Range of Values	Mean (m)	Standard Deviation (σ)	m+ 2σ	Critical Points
Cu	bld - 185	60.64	32.50	125.6	24 42 85
Pb	bld - 125	26.59	19.96	66.5	12 90
Zn	bld - 205	48.83	27.54	103.9	15 38 140
Sn	bld - 180	10.48	21.40	53.3	10 35
W	bld - 320	4.55	21.71	48.0	48

GRID CAJ No. of Samples : 146

Element	Range of Values	Mean (m)	Standard Deviation (σ)	m+ 2σ	Critical Points
Cu	5 - 165	42.60	32.81	108.2	27 74
Pb	bld - 60	17.77	12.05	41.9	42
Zn	5 - 280	51.82	41.85	135.5	41 79
Sn	bld - 35	7.86	5.28	18.4	18 24
Ni	5 - 105	34.01	22.49	79.0	24 68



0 50 100 150 200 250 300 KM

1 : 2 500 000

Major roads

Major railways

Burnie Major towns

Comstaff lease areas

5 cm

COMSTAFF PROPRIETARY LIMITED

LOCATION OF COMSTAFF LEASES IN TASMANIA

80-1426

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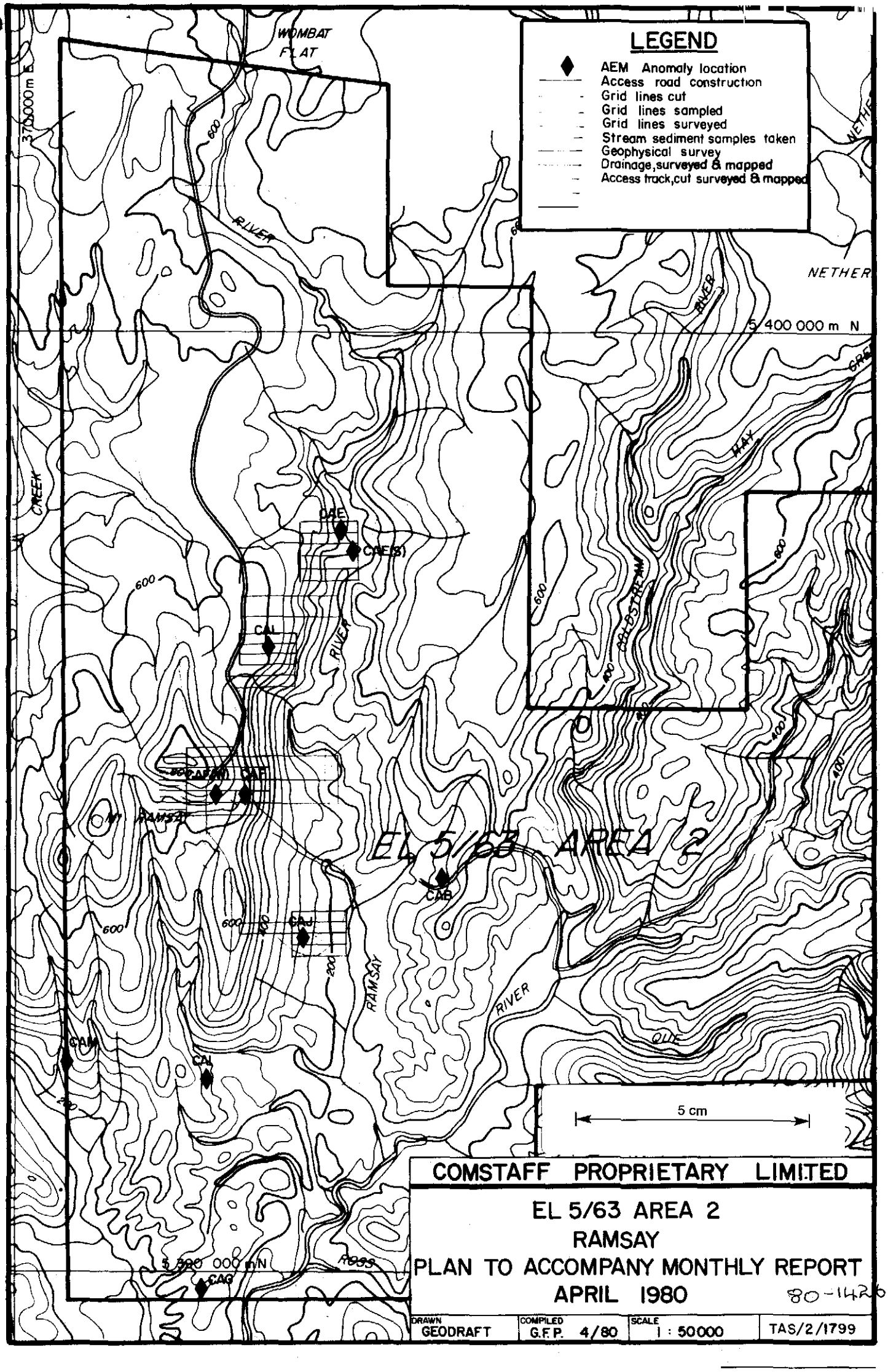
LEGEND
AEM Anomaly location
Access road construction
Grid lines cut
Grid lines sampled
Grid lines surveyed
Stream sediment samples taken
Geophysical survey
Drainage, surveyed & mapped
Access track, cut surveyed & mapped
WOMBAT FLAT
370 000 m E
5 400 000 m N
5 390 000 m N
RIVER
CREEK
RAMSAY
NETHER
CAE
CAE(S)
CAL
CAF
CAF(S)
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EL 5/63 AREA 2
5 cm
COMSTAFF PROPRIETARY LIMITED
EL 5/63 AREA 2
RAMSAY
PLAN TO ACCOMPANY MONTHLY REPORT
APRIL 1980
80-1426
DRAWN GEODRAFT
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SCALE 1 : 50000
TAS/2/1799

096088

AAC

COMSTAFF PROPRIETARY LIMITED

PROJECT NAME: INTERIM REPORT ON THE RAMSAY AREA
EL 5/63 PART 2

TITLE:

AREA NAME/S, STATE 1:250,000 SHEET NO/S & COORDINATES: Burnie Sheet S 55/3
Metric co-ordinate 5397500 372500E

COMMODITY/IES: Tin Tungsten Copper Lead Zinc

TEXT PAGES NO: 35

PLAN NOS: as detailed

TABLE NOS: 1

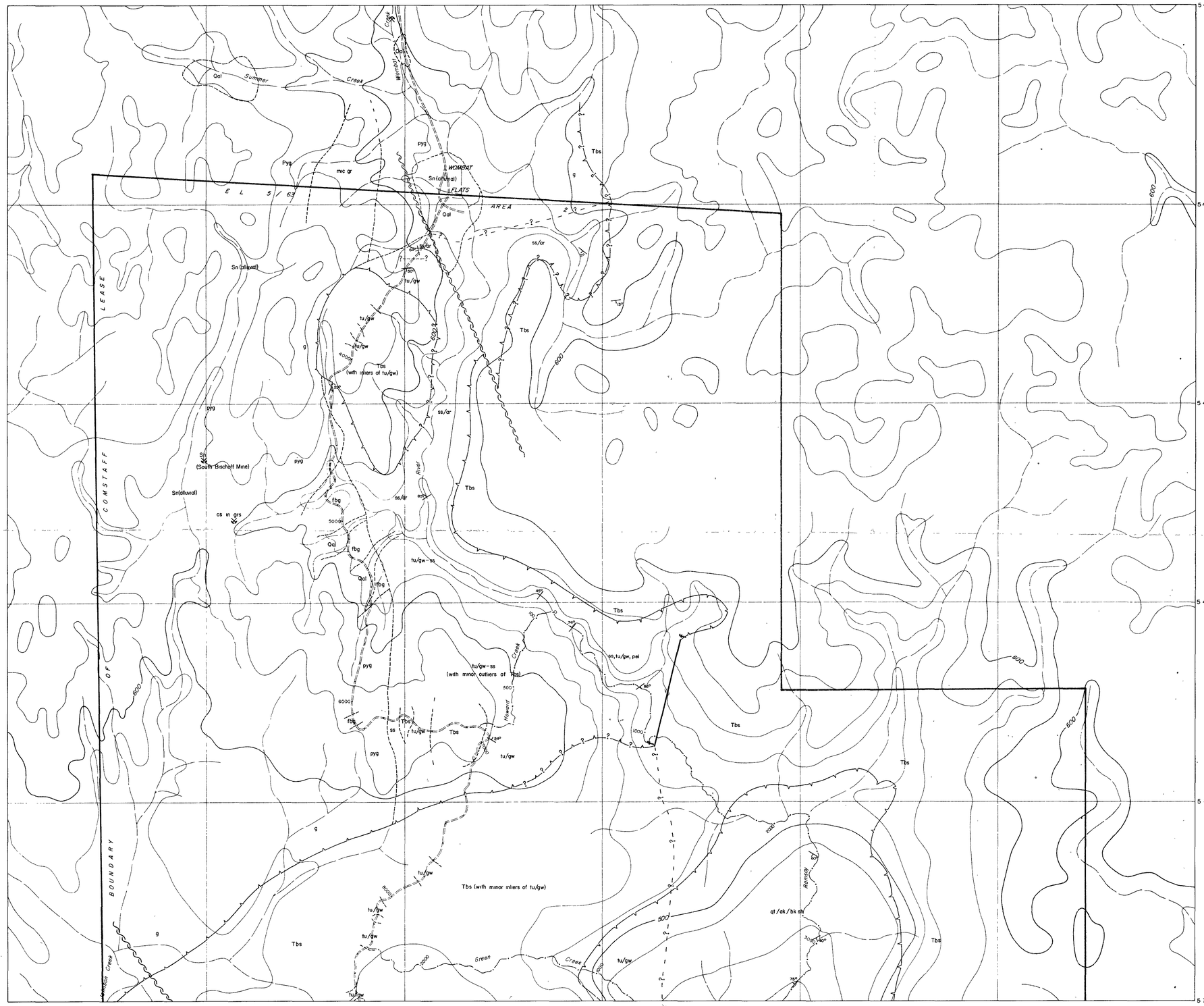
APPENDICES: 4

AUTHOR/S: G F Pigott

DATE: April 1980

AUSTRALIAN ANGLO AMERICAN LIMITED

Incorporated in the State of Victoria



FOR LEGEND SEE PLAN TAS/2/2030

5 cm

TAS/2/2029

TAS/2/2030

TAS/2/2031

TN

SHEET INDEX

3/3

COMSTAFF PROPRIETARY LIMITED

30-1426

RAMSAY AREA - CAA

GEOLOGICAL INTERPRETATION

096089 727

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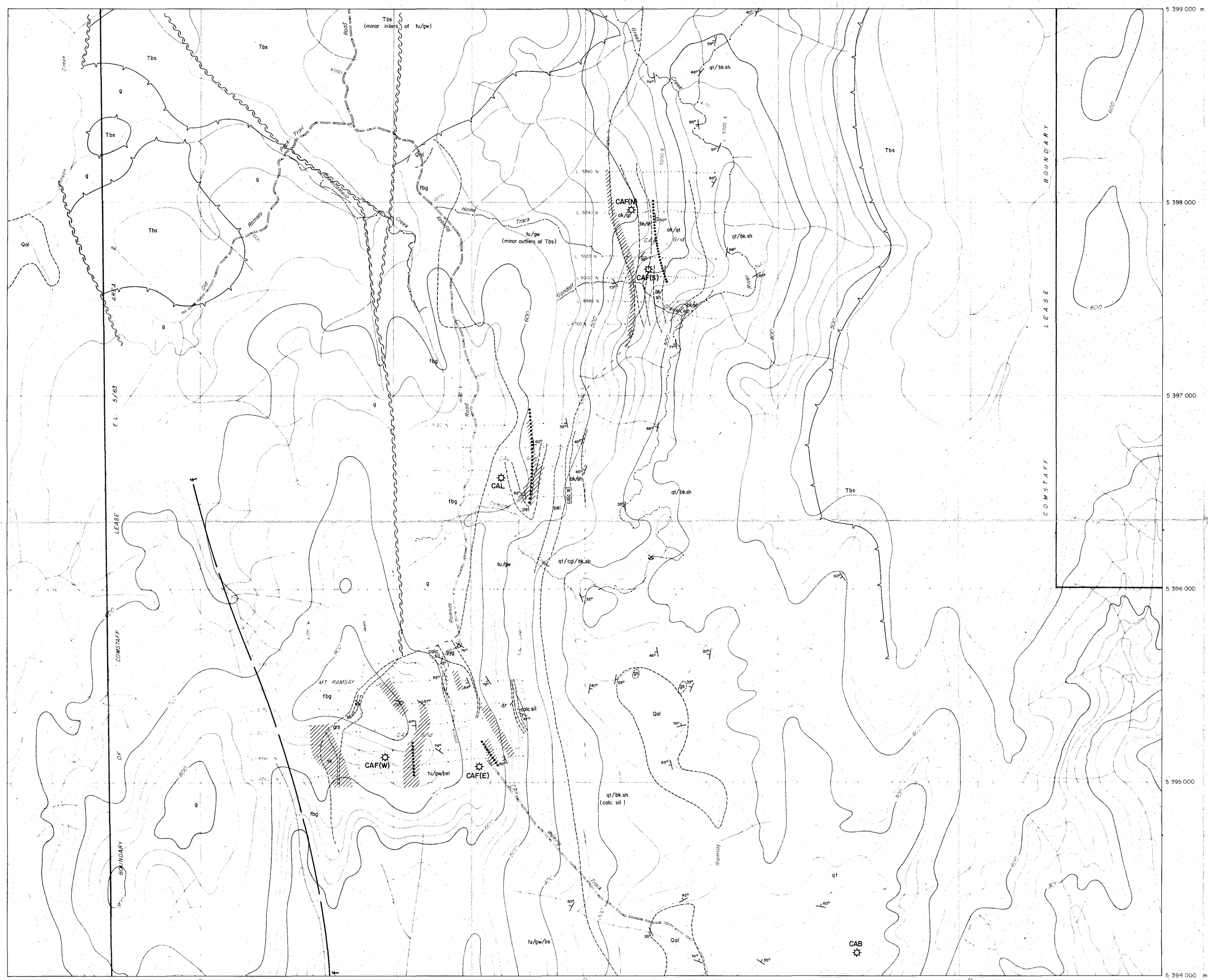
PLAN No	TAS/2/2029

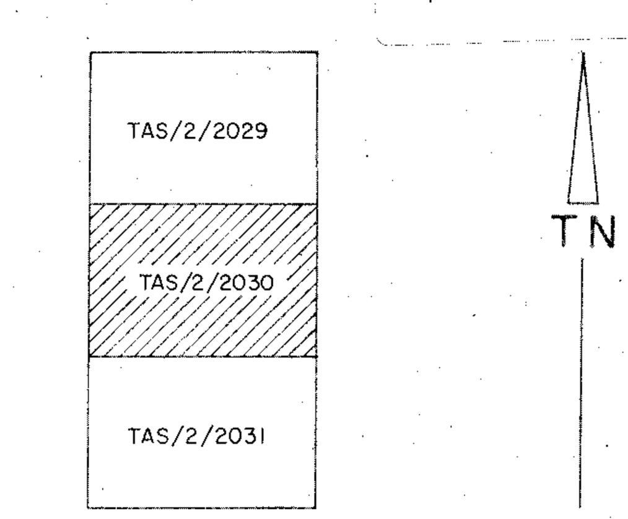


LEGEND

-------	Geological boundary
-?- - - - -?-	Geological boundary - inferred
———	Fault
— — —	Fault - inferred
60°	Strike and dip of bedding
75°	Strike and dip of foliation
~~	Shear zone / Fault ?
	Unconformity
⚒ ⚒	Mine - operating / Mine - abandoned
//////	Ground Magnetic Anomaly
••••••••	Crone Electromagnetic Anomaly
☼ CAB	Approximate location of Airborne Electromagnetic Survey Anomaly

Qal	Alluvium, sands and gravels
Tbs	Tertiary alkaline olivine basalt, lavas, dykes, minor sandstone
g	Granite - undifferentiated
mic.g	Granite - fine to medium grained, non porphyritic
pyg	Granite - porphyritic, adamellite
fbg	Granite - coarse grained, felspar, biotite
grs	Greisen
gs	Gossan, mineralisation
tu/gw	Tuffaceous greywacke
ss	Siltstone
ar	Argillite
ho	Hornfels
pel	Pelitic sediments - ? dolomitic
sk	Skarn
dr	Dolerite/Diorite
bs	Basalt, Microdiorite
qt	Quartzite, Quartz sandstone
ok	Feldspathic sandstone
bk.sh	Black shale
calc-sil	Calc-silicate rocks
cg	Conglomerate

5 cm



SHEET INDEX

096090 3/3

COMSTAFF PROPRIETARY LIMITED

80-1426

RAMSAY AREA - CAA

GEOLOGICAL INTERPRETATION

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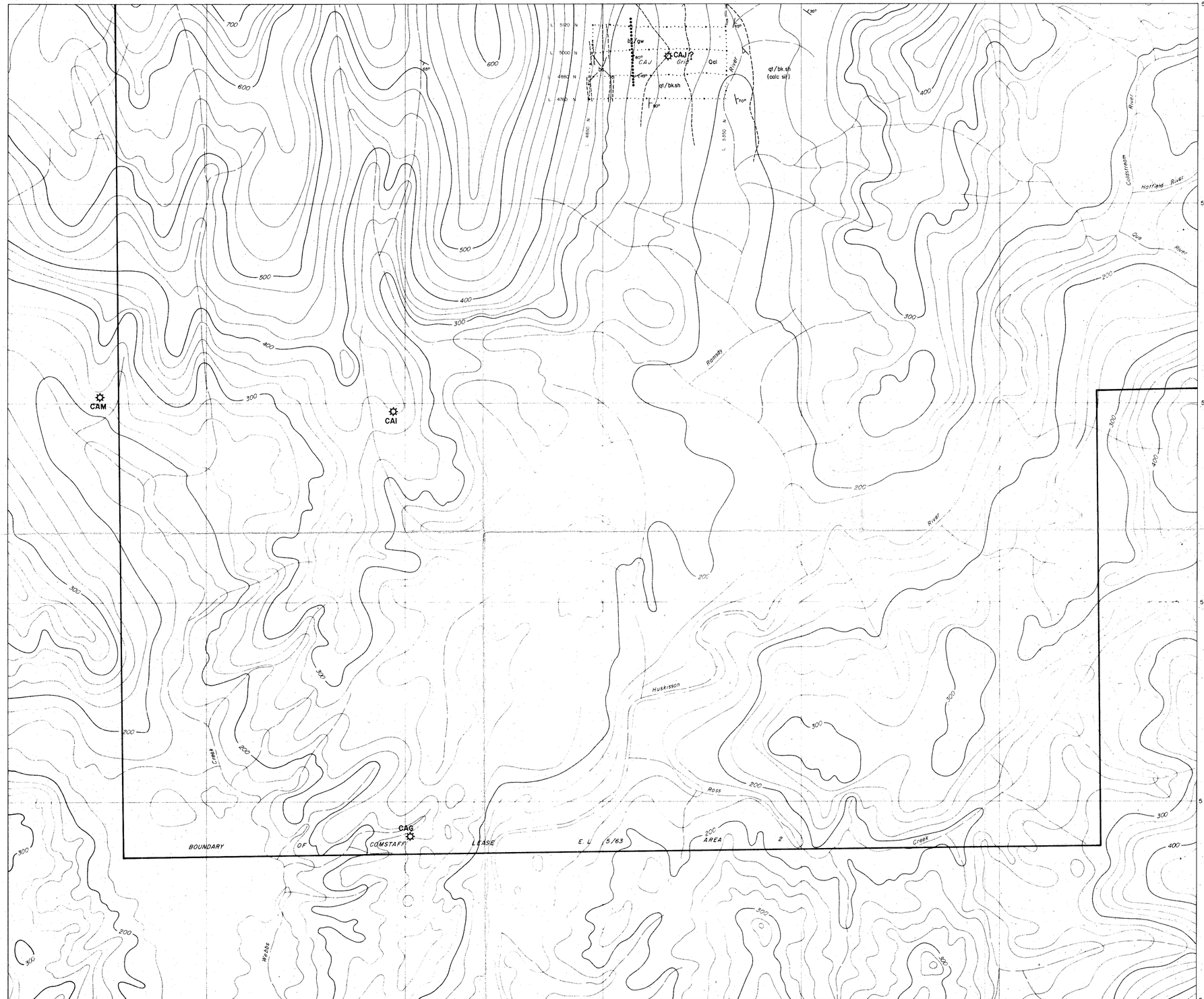

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5 cm

TAS/2/2029

TAS/2/2030

TAS/2/2031

TN

SHEET INDEX

096091 3/3

COMSTAFF PROPRIETARY LIMITED

80-1426

RAMSAY AREA - CAA

GEOLOGICAL INTERPRETATION

729

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PLAN No.	TAS/2/2031

WOMBAT
FLAT

29/54

52

30/26

28

FOR LEGEND SEE PLAN TAS/2/2027

5 cm

TAS/2/2026

TAS/2/2027

TAS/2/2028

TN

SHEET INDEX

096092 3/3

COMSTAFF PROPRIETARY LIMITED

80-1426

RAMSAY AREA - CAA

PHOTOGEOLOGICAL INTERPRETATION

730

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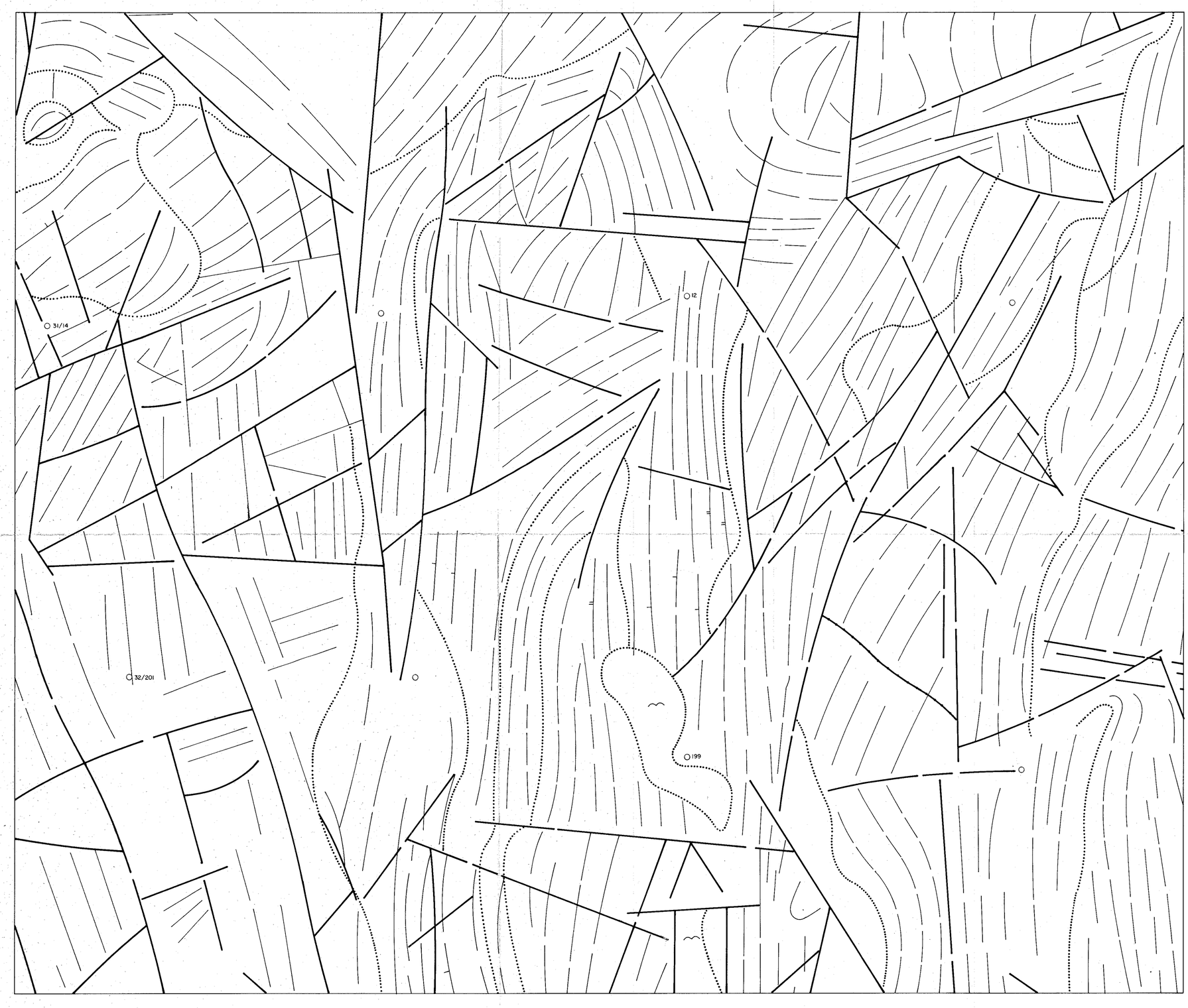

PHOTOGEOLOGICAL LEGEND

- Lineament (minor - joint ? bedding ? foliation ? fault ?)
- >60° Lineament - bedding
- 30°-60° Lineament - bedding
- <30° Lineament - bedding
- Lineament (major - fault ? shear ? contact ?)
- Gravity fault
- Photogeological Boundary (marks distinct change in : slope, vegetation, tone, texture,) probably related to change in rock type
- Superficial cover ; alluvium , colluvium, eluvium , glacial till
- Antiform
- Dyke
- Photo centre

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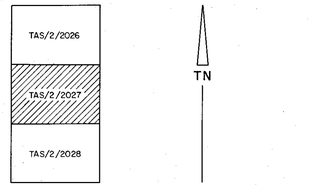

SHEET INDEX

096093 3/3

COMSTAFF PROPRIETARY LIMITED

80-1426

RAMSAY AREA - CAA

PHOTOGEOLOGICAL INTERPRETATION

731

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DATE	4/2/80
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SCALE	1 : 10000
PLAN No.	TAS/2/2027

33/172

174

34/110

108

FOR LEGEND SEE PLAN TAS/2/2027

5 cm

TAS/2/2026

TAS/2/2027

TAS/2/2028

TN

SHEET INDEX

096094 3/3

COMSTAFF PROPRIETARY LIMITED

80-1426

RAMSAY AREA - CAA

PHOTOGEOLOGICAL INTERPRETATION

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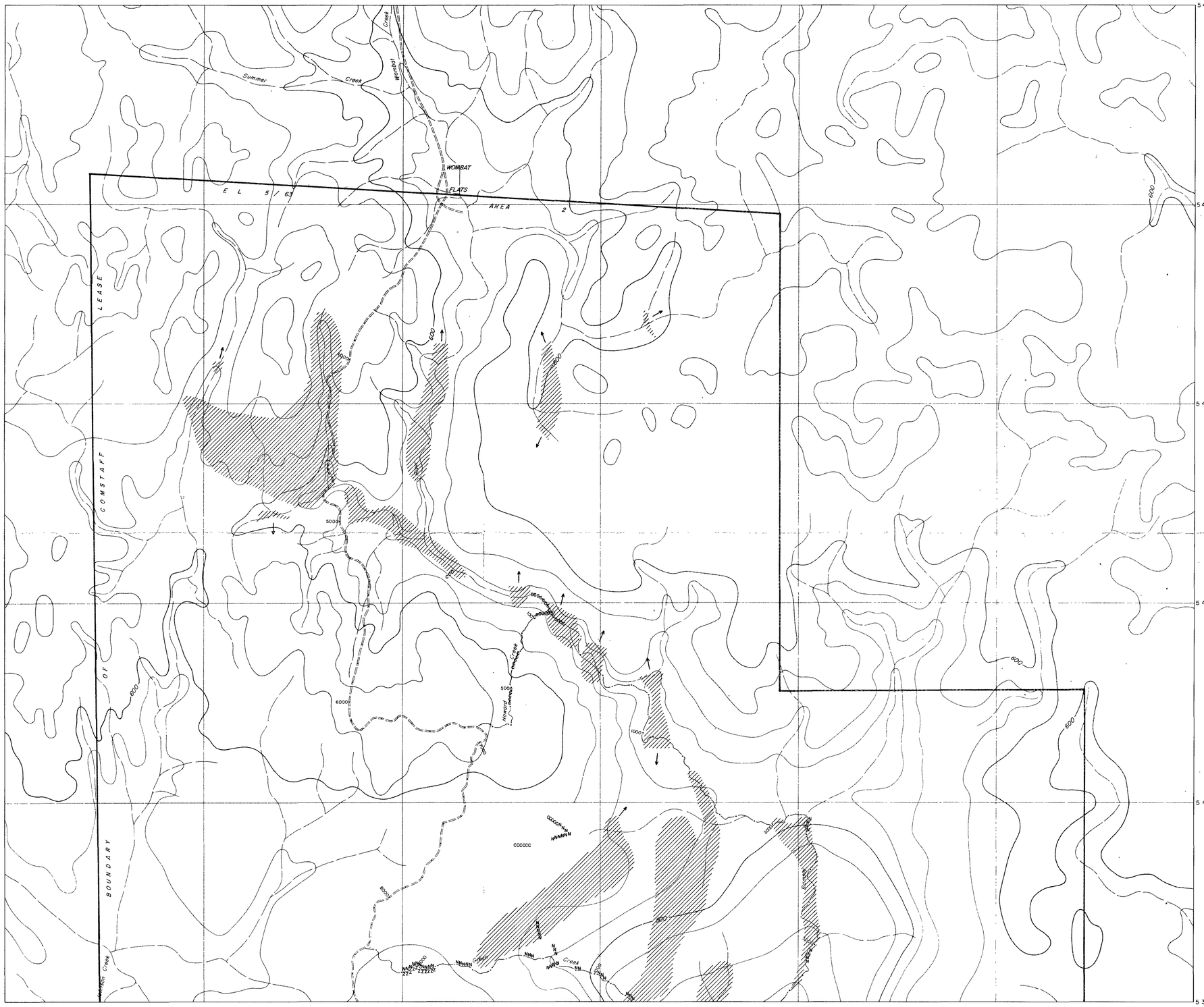

FOR LEGEND SEE PLAN TAS/2/2033

5 cm

TAS/2/2032
TAS/2/2033
TAS/2/2034

SHEET INDEX

TN

096095 3/3

COMSTAFF PROPRIETARY LIMITED

30-1426

RAMSAY AREA - CAA

LOCATION OF GEOCHEMICAL ANOMALIES AS KNOWN FEBRUARY 1980

733

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AMENDED	21/4/80
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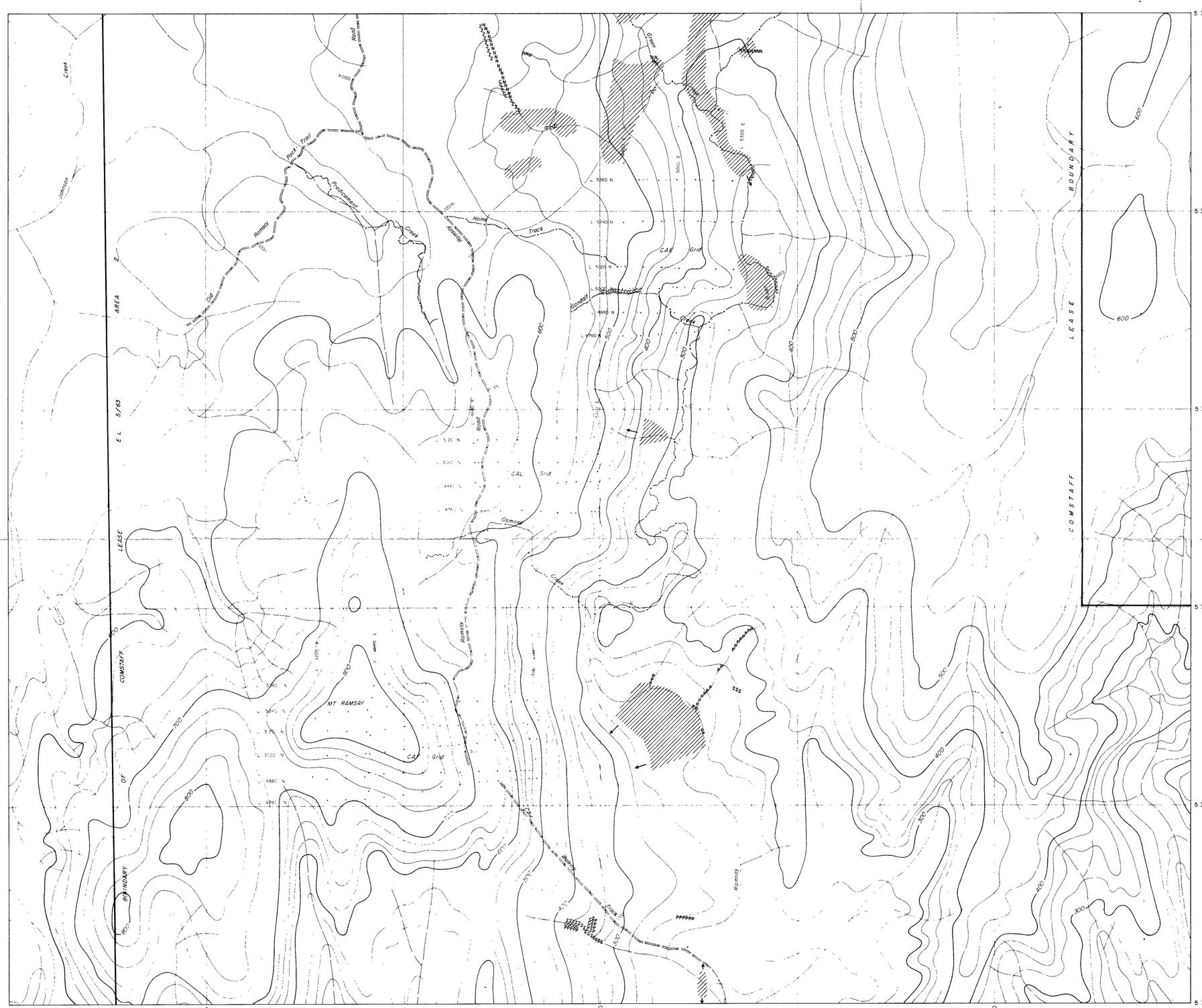

LEGEND

- Tin geochemically anomalous zone
- Direction in which open ended geochemical anomaly may continue
- CCCCCCCCC — Copper stream geochemical anomaly
- NNNNNNNN — Nickel stream geochemical anomaly
- PPPPPPPP — Lead stream geochemical anomaly
- ZZZZZZZZ — Zinc stream geochemical anomaly

5 cm

TAS/2/2032
TAS/2/2033
TAS/2/2034

TN

SHEET INDEX

096096 3/3

COMSTAFF PROPRIETARY LIMITED

SD-1426

RAMSAY AREA – CAA

LOCATION OF GEOCHEMICAL ANOMALIES AS KNOWN FEBRUARY 1980 734

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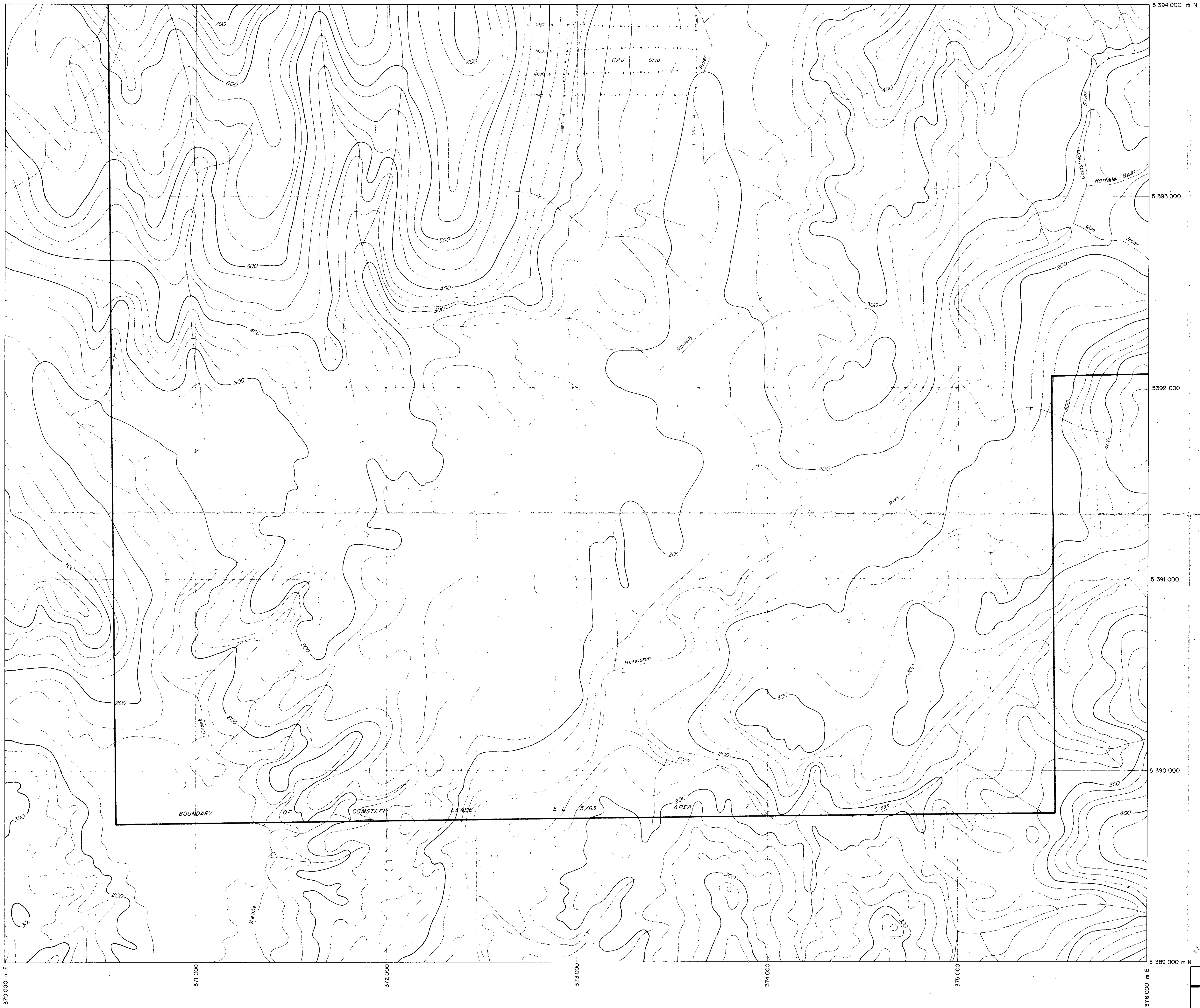
PLAN No	TAS/2/2033



FOR LEGEND SEE PLAN TAS/2/2033

5 cm

TN

SHEET INDEX
TAS/2/2032
TAS/2/2033
TAS/2/2034

096097

3/3

COMSTAFF PROPRIETARY LIMITED

80-426

RAMSAY AREA - CAA

LOCATION OF GEOCHEMICAL ANOMALIES AS KNOWN FEBRUARY 1980

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DATE	6/2/80
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PLAN No	TAS/2/2034

735

5 398 000 m N

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4680 E

L 5320 E

373 000 m E

374 000 m N

RAMSAY

RIVER

CREEK

GANDALF

TRACK

HOME

carb sh

fels sa

qt sa/ss ē carb. ss/sh

tu/gw ē ss/ar

mdr

LEGEND

Crimson Creek Formation	mdr	Microdiorite and basalt
	ss/ar	Siltstone and argillite
	tu/gw	Tuffaceous greywacke/volcaniclastics
Ramsay Group	qt sa/ss	Micaceous quartz sandstone & siltstone
	fels sa	Feldspathic sandstone & siltstone
	carb ss/sh	Carbonaceous siltstone & shale

- Geological boundary
- 38° Strike and dip of bedding
- 70° Strike and dip of foliation
- 46° Strike and dip of cleavage
- Strike of vertical cleavage
- 8° Strike and dip of jointing
- Electromagnetic anomaly

5 cm

096098

COMSTAFF PROPRIETARY LIMITED

80-1426

RAMSAY GRID - CAE

GEOLOGICAL INTERPRETATION

736

DRAWN	COMPILED	SCALE	
GEODRAFT 4/79	GFP	1 : 2500	TAS/2/2099

Geochemistry

ppm

200

100

0

Zn

Cu

Pb

Sn

Crone

+50°

0

-50°

high frequency 140m spacing

Magnetics

nT

63 200

62800

62400

62000

61600

61 200

60800

5 cm

Topography

gw/tu

ar

gw/tu

ar

bs

ar

bk sh

ak

bk sh

ak+ intb bk sh

bk sh

Ramsay river

Qal

qt

bk sh+ qt

qt

FOR LEGEND SEE TAS/2/2030

4700

4900

4900

5000

5100

5200

5300

DRAWN G F P 4/79	COMPILED G F P	SCALE 1 2500	TAS/2/1825

COMSTAFF PROPRIETARY LIMITED

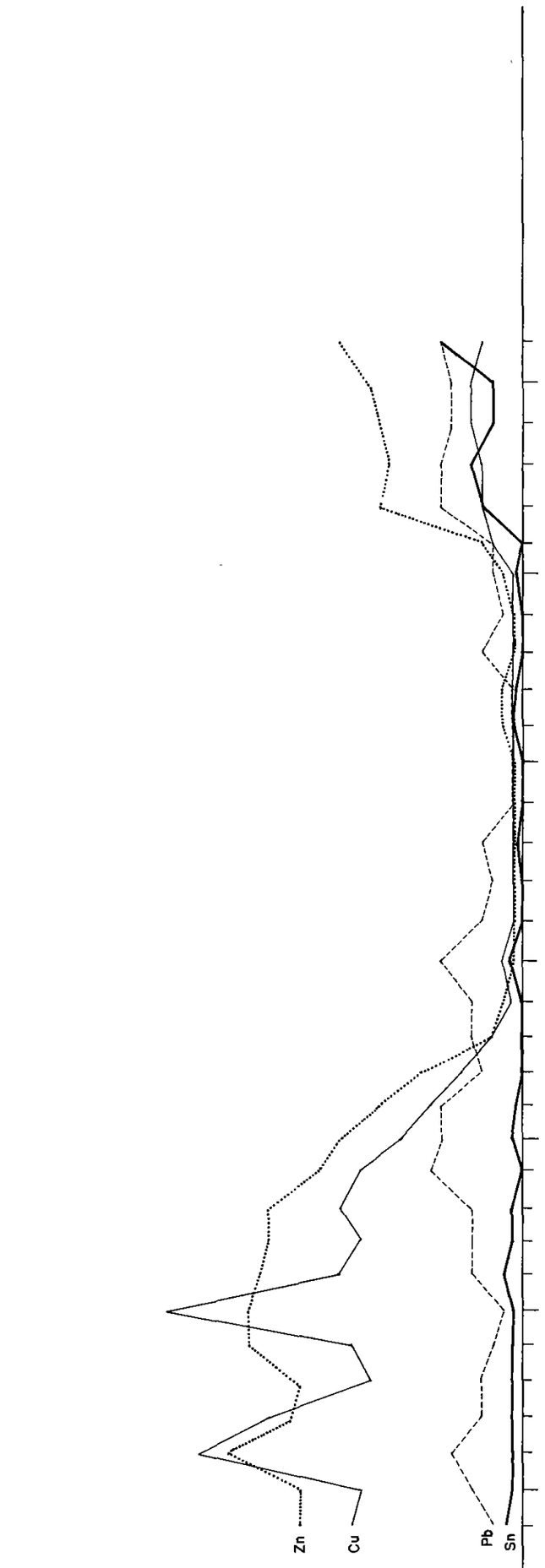
RAMSAY GRID - CAE

L 4760 N PROFILES

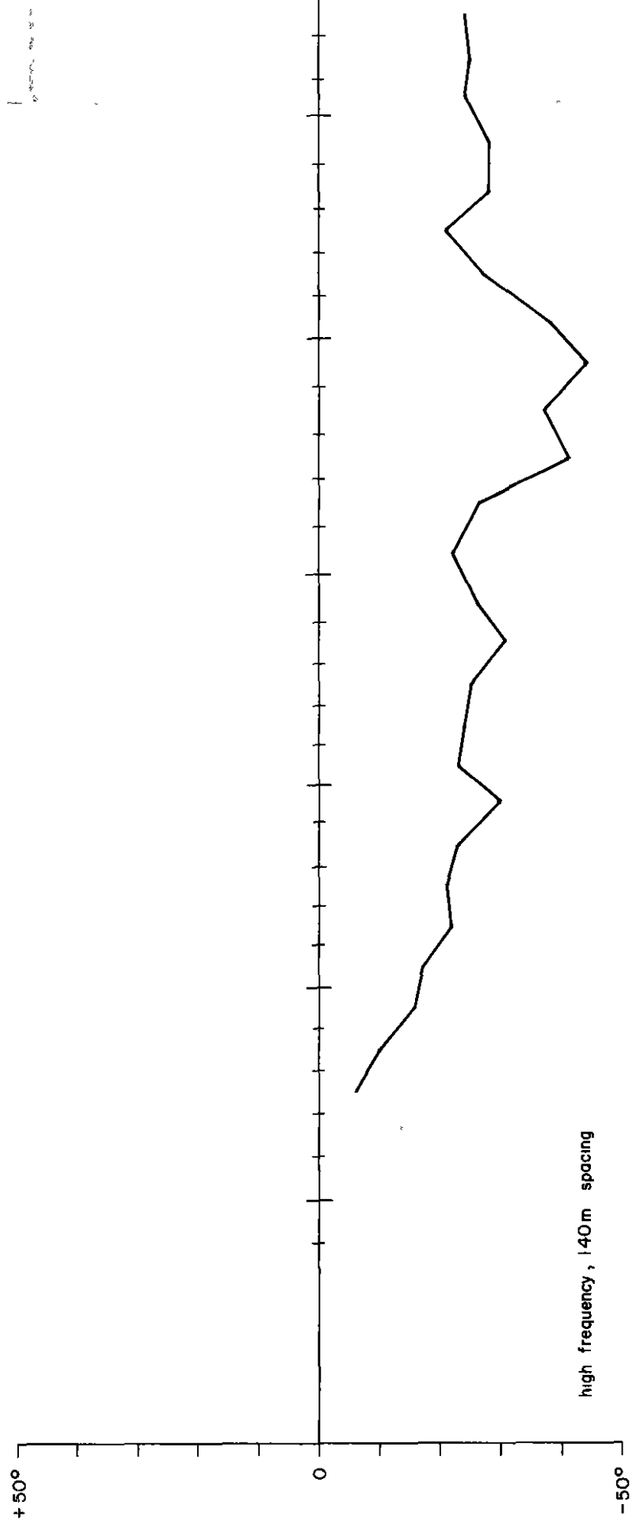
TOPO, MAG, CRONE, GEOCHEM 737

80-1426

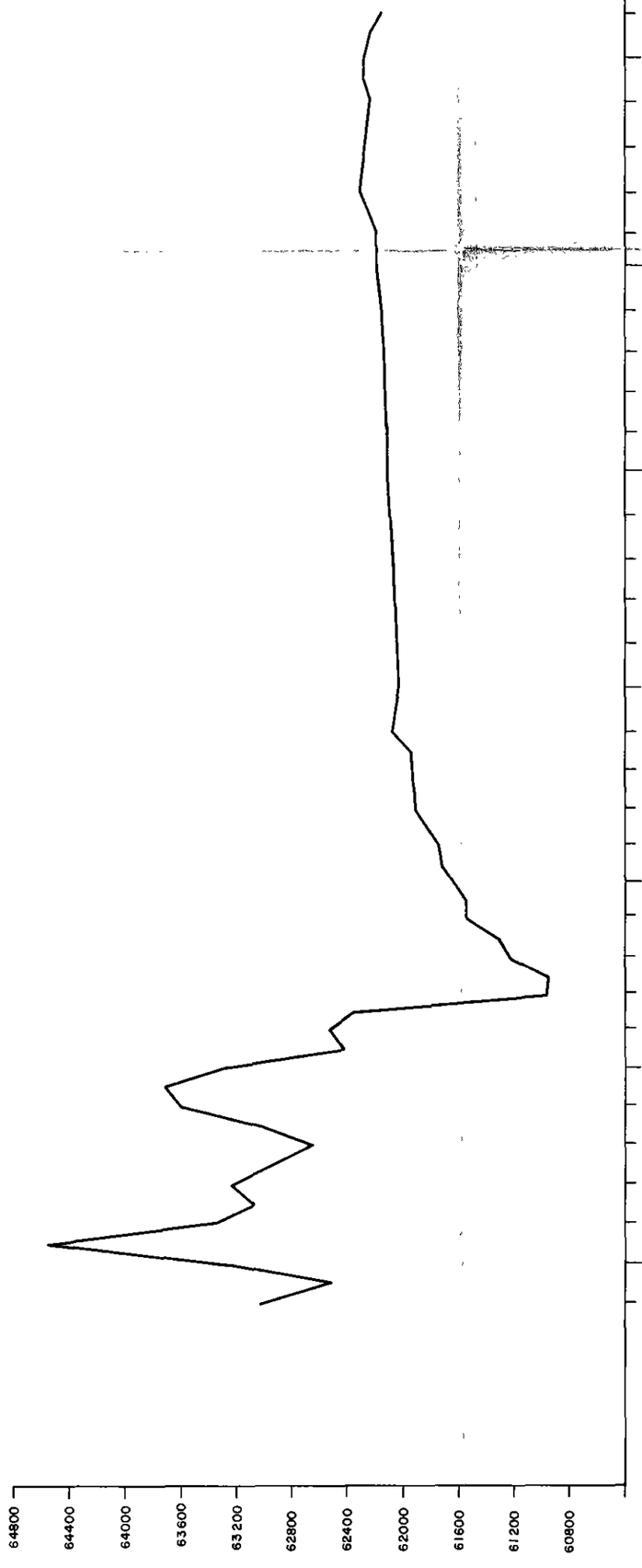
099099



Geochemistry



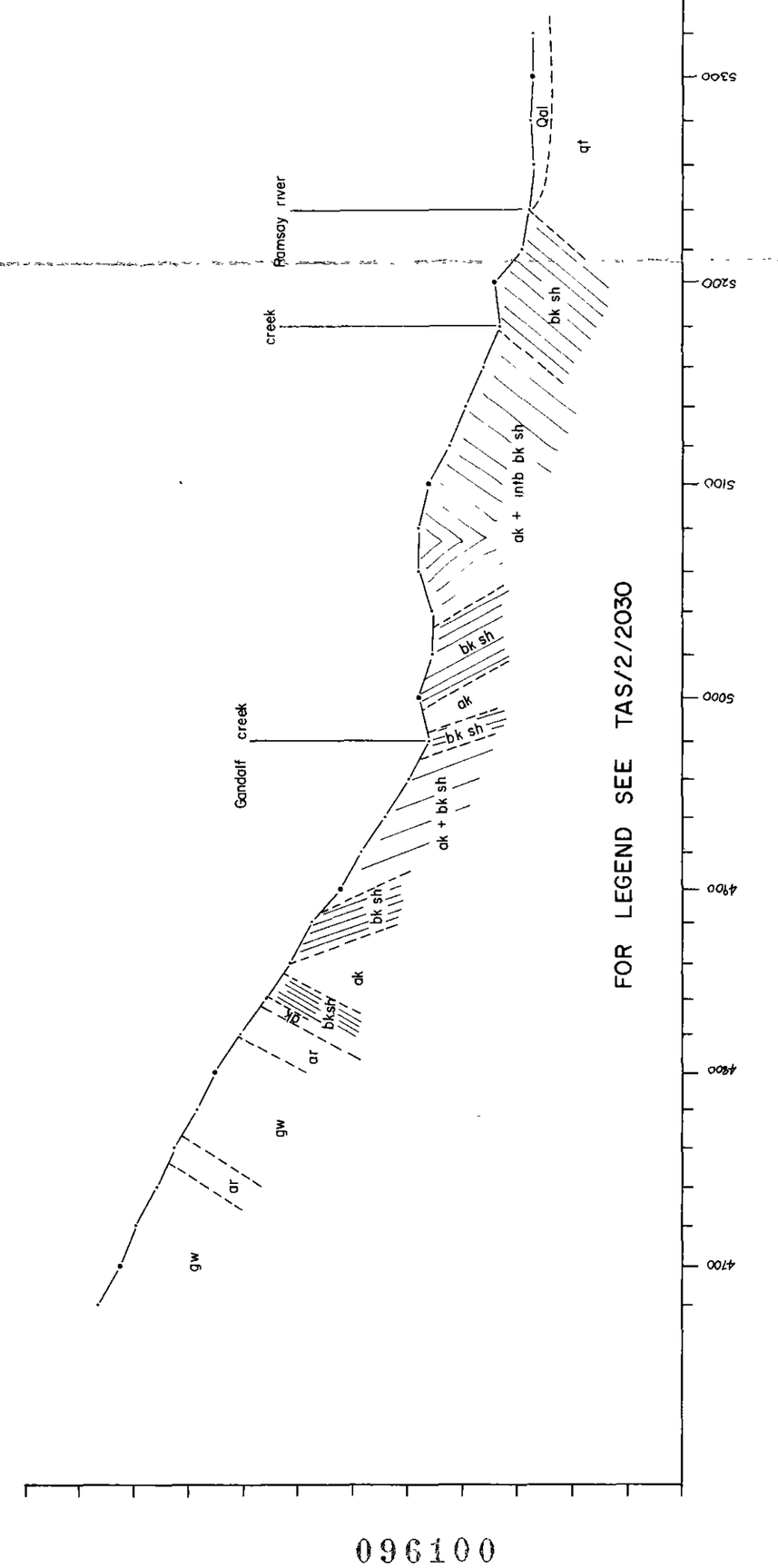
Crone



Magnetics

5 cm

Topography



096100

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE 80-1426
L4880 N PROFILES
TOPO, MAG, CRONE, GEOCHEM 738

DRAWN	COMPILED	SCALE	
G F P. 4/79	G.F.P.	1 2500	TAS/2/1826

Geochemistry

ppm

200

100

0

Zn

Cu

Pb

Sn

Crone

+50°

0

-50°

high frequency, 140m spacing

Magnetics

nT

64000

63600

63200

62800

62400

62000

61600

5 cm

Topography

gw ar gw ar gw bs gw ar/ss bk sh ak bk sh ak creek bk sh ak + bk sh conductor ak bk sh ak creek qt + intb bk sh

4700 4800 4900 5000 5100 5200 5300

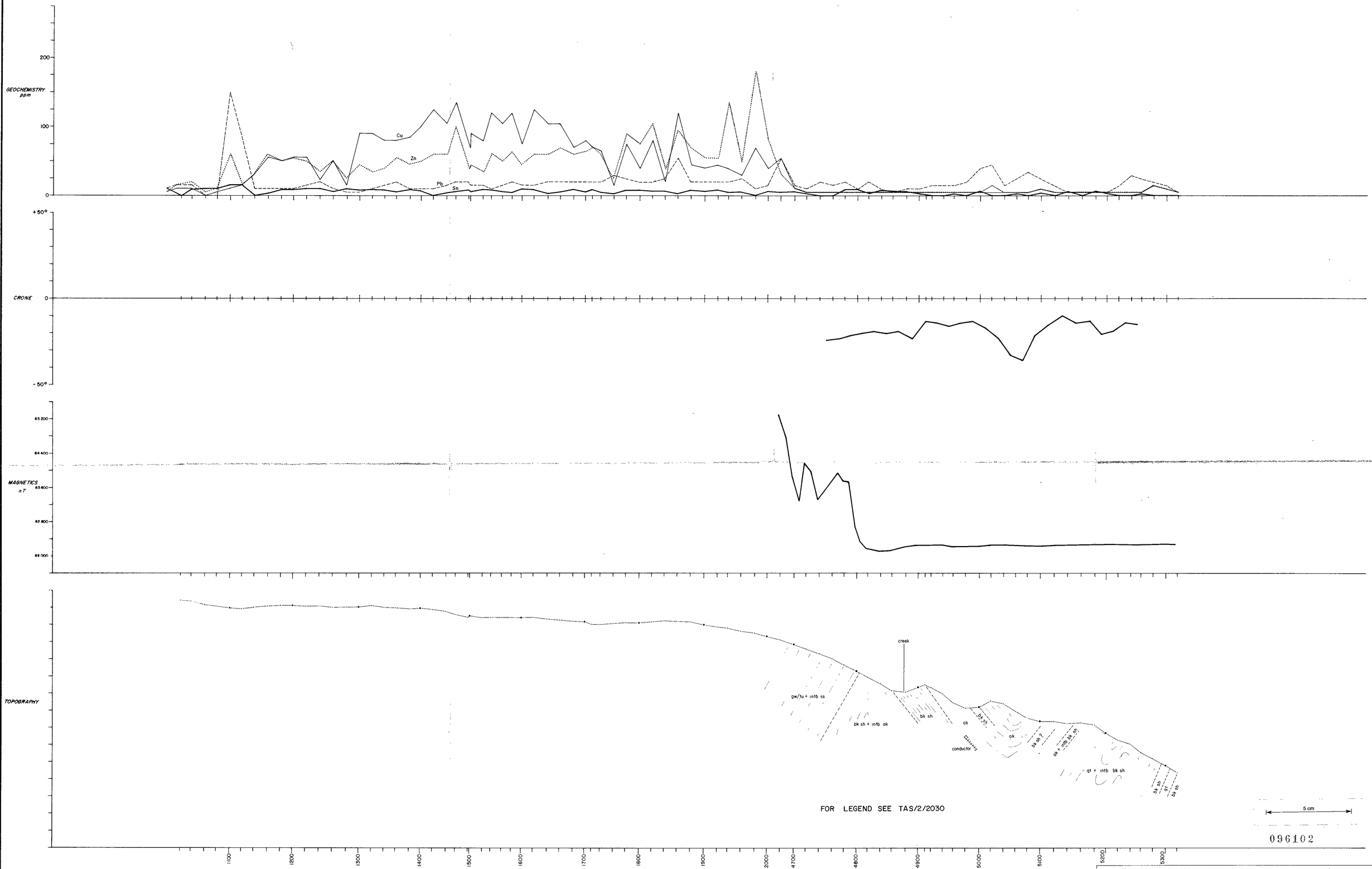
FOR LEGEND SEE TAS/2/2030

096101

80-1426

730

COMSTAFF PROPRIETARY LIMITED			
RAMSAY GRID - CAE L 5000 N PROFILES TOPO, MAG, CRONE, GEOCHEM			
DRAWN G F P 4/79	COMPILED G F P	SCALE 1 2500	TAS/2/1827



FOR LEGEND SEE TAS/2/2030

5 cm

096102

COMSTAFF PROPRIETARY LIMITED

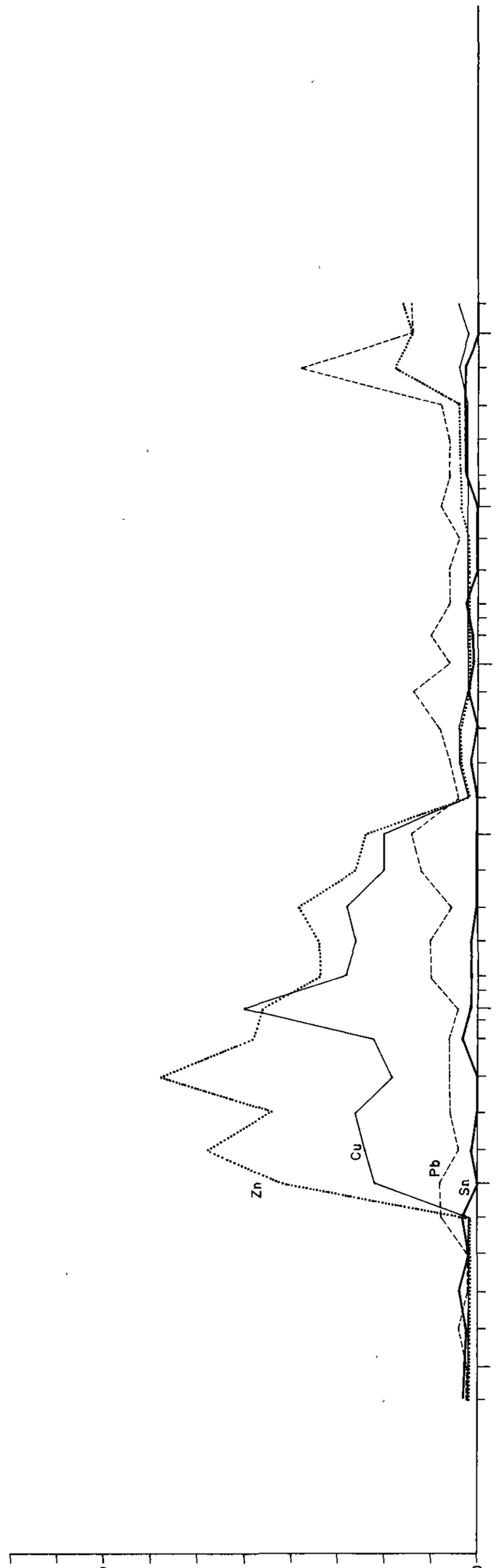
RAMSAY GRID - CAE 80-1426

HOME TRACK/L 5120 N PROFILES

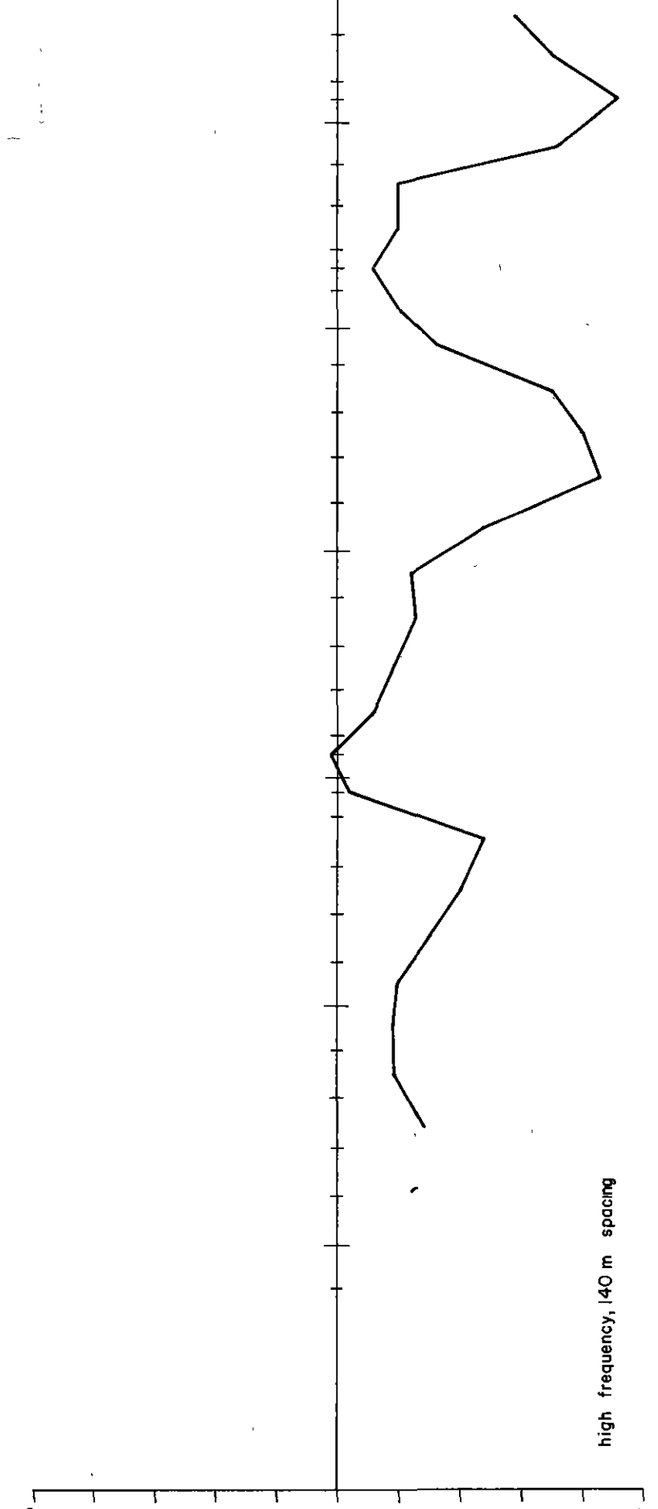
TOPO, MAG, CRONE, GEOCHEM

740

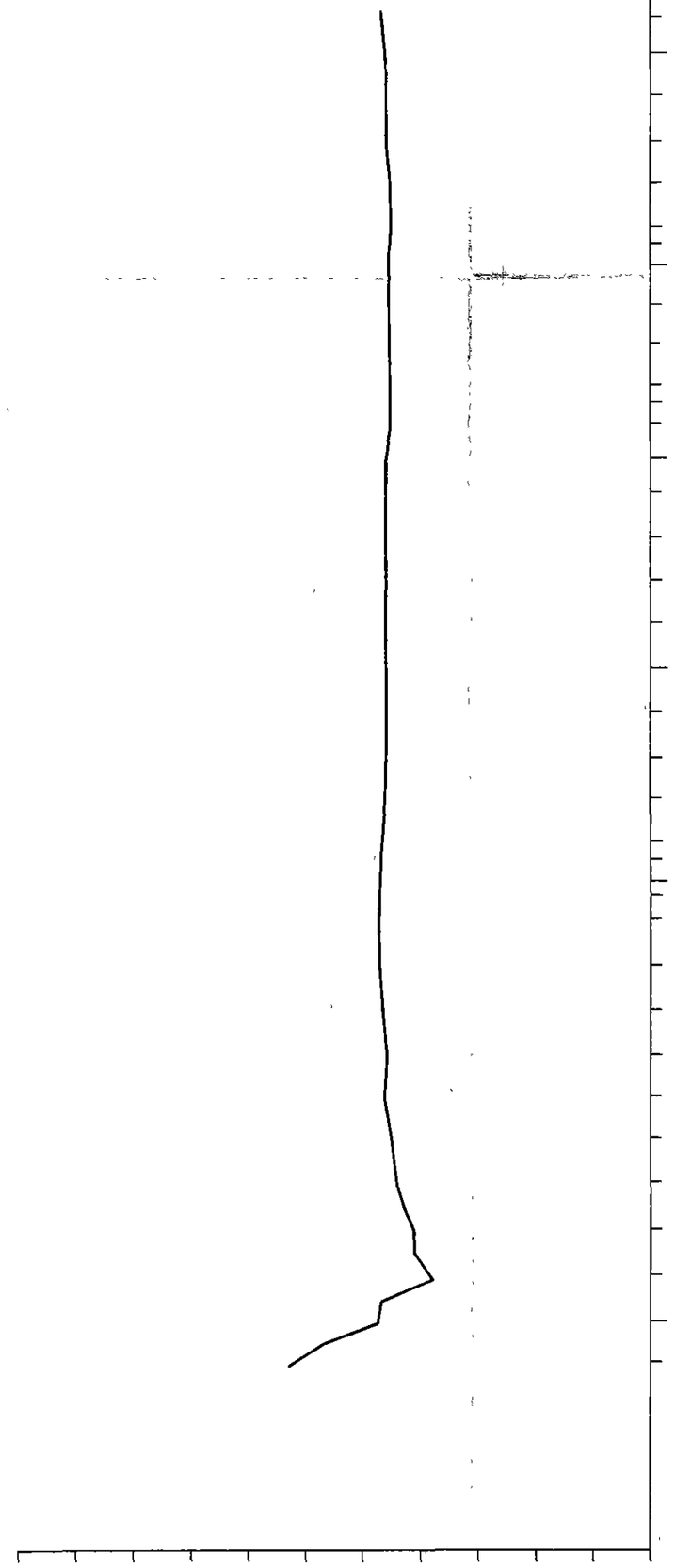
COMPILED	GEODRAFT
DRAWN	GEODRAFT
DATE	6/7/79
AMENDED	
SCALE	1 2500
PLAN No.	TAS/2/1927



Geochemistry

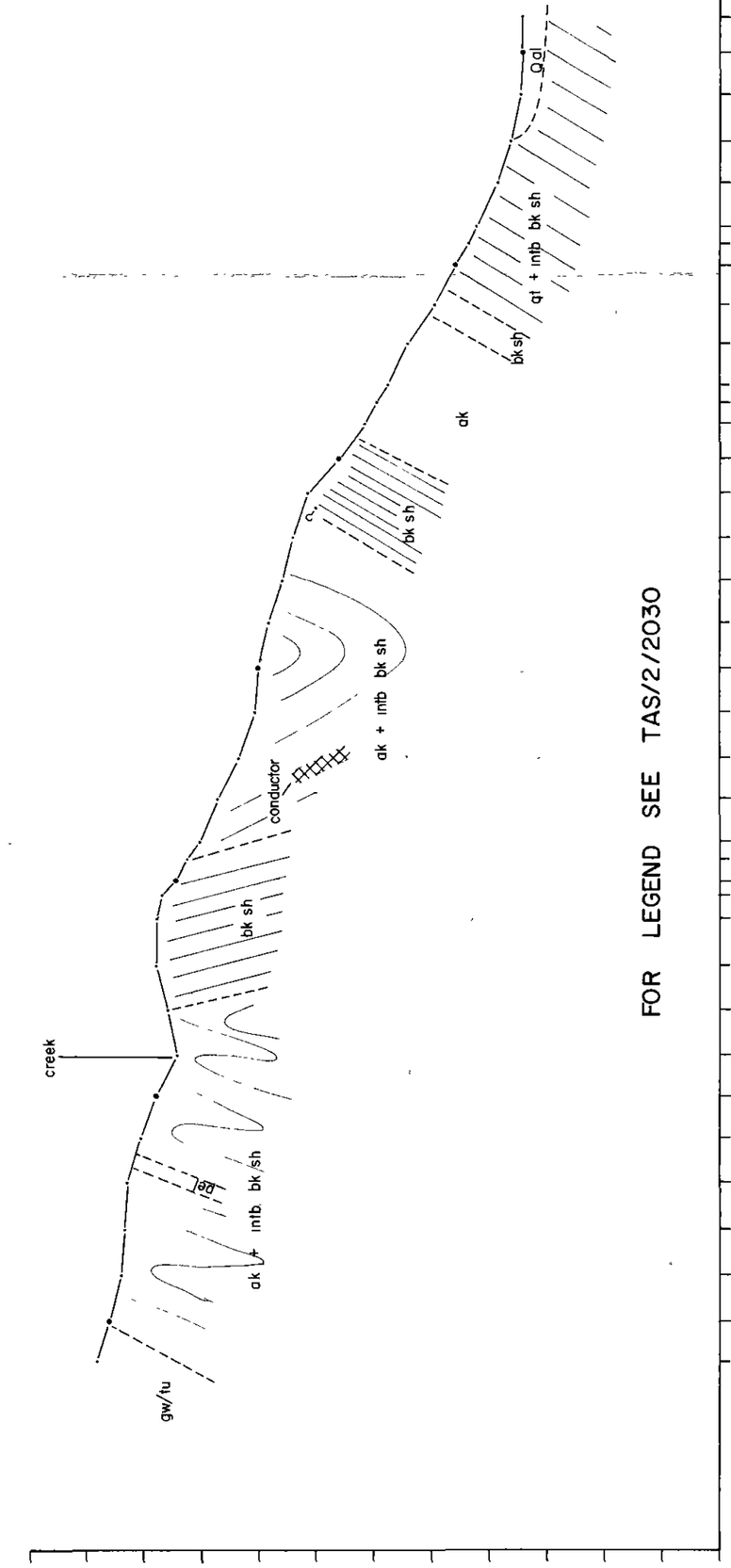


Crone



Magnetics

5 cm



Topography

80-1426

096103

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE
L 5240 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

741

DRAWN	COMPILED	SCALE	
G.F.P 4/79	G.F.P	1 2500	TAS/2/1829

Geochemistry

ppm

200

100

0

Zn

Cu

Pb

Sn

Crone

+50°

0

-50°

high frequency, 140m spacing

Magnetics

nT

63200

62800

62400

62000

61600

5 cm

Topography

gw/tu

bk sh + intb ak

ak + intb bk sh

creek

?

qt

bk sh

FOR LEGEND SEE TAS/2/2030

4800 4900 5000 5100 5200 5300

096104

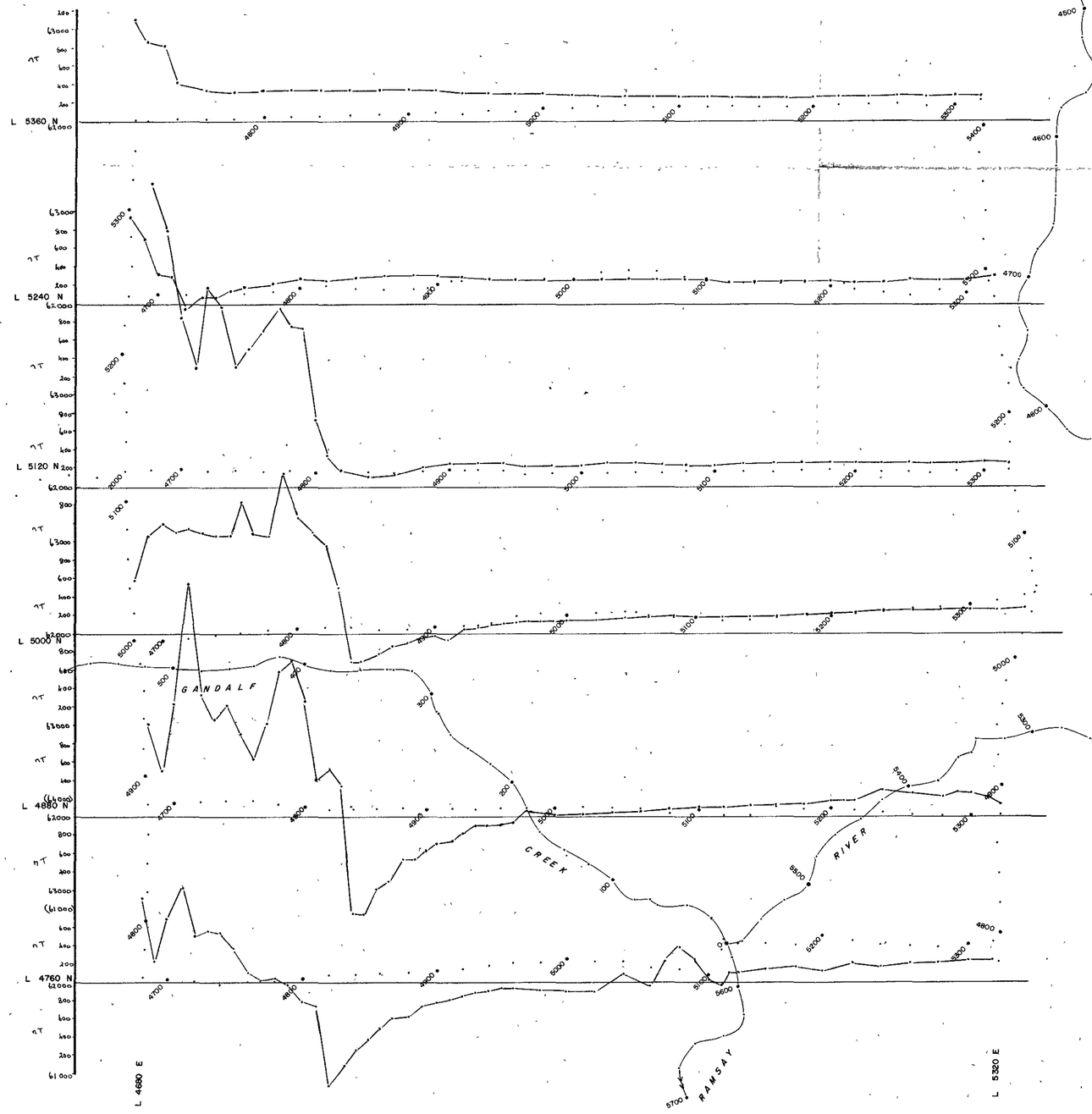
80-1426

DRAWN G F P 4/79	COMPILED G F P	SCALE 1 2500	TAS/2/1830

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE 742
L 5360 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

5 398 000 m N



373 000 m E

374 000 m N

096105

80-1420

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE 743

STACKED GROUND MAGNETIC PROFILES

DRAWN	COMPILED	SCALE	
GFP 3/79	G F P	1 : 2500	TAS/2/1806

5 398 000 m N

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4680 E

L 5320 E

373 000 m E

374 000 m N

RAMSAY

GANDALF

CREEK

RIVER

HOME TRACK

5 cm

VERTICAL SCALE 1 cm = 10° apparent dip

high frequency, 140 m spacing, vertical Tx

096106

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE 744

STACKED CRONE E M. PROFILES

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1902

5 398 000 m N

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4680 E

L 5320 E

373 000 m E

374 000 m N

RAMSAY

RIVER

CREEK

TRACK

HOME

5 cm

096107

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE 745

GEOCHEMICAL GRID AUGER SAMPLING

COPPER CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 : 2500	TAS/2/2050

5 398 000 m N

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4680 E

L 5320 E

373 000 m E

374 000 m N

RAMSAY

HOME TRACK

GANDALF

CREEK

RIVER

RIVER

RAMSAY

5 cm

096108

80-1420

746

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE

GEOCHEMICAL GRID AUGER SAMPLING

LEAD CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 : 2500	TAS/2/2051

096109

80-1426

COMSTAFF PROPRIETARY LIMITED			
RAMSAY GRID - CAE 747 GEOCHEMICAL GRID AUGER SAMPLING ZINC CONTOURS in ppm			
DRAWN GEODRAFT 2/80	COMPILED G F P	SCALE 1 : 2500	TAS/2/2052

5 398 000 m N

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4680 E

L 5320 E

373 000 m E

374 000 m N

RAMSAY

RIVER

TRACK

HOME

GANDALF

CREEK

5 cm

096110 80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAE 748

GEOCHEMICAL GRID AUGER SAMPLING

TIN CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G P P	1 : 2500	TAS/2/2053

5 397 000 m N

L 4680 E

L 5320 E

L 5120 N

L 5000 N

L 4880 N

L 4760 N

11000

11100

11200

11300

11400

11500

11600

11700

11800

11900

12000

R O A D

b. - f. gr. ☐ qz.to.

CAL GRID

tu/gw

tu/gw

tu/gw + ss/ar

pel

pel/dm

pel/dm

qt. ss. ☐ carb. sh

R A M S A Y C R E E K

O S M O N D

LEGEND

Meredith Granite	qz.to.	Quartz tourmaline mineralization
	b-f. gr.	Holocrystalline biotite-feldspar granite
Crimson Creek Formation	ss/ar	Siltstones and argillites
	pel/dm	Pelite (possibly dolomitic)
	tu/gw	Tuffaceous greywacke/volcaniclastic
Ramsay Group	qt/ss	Micaceous quartz sandstone and siltstone
	carb. sh	Carbonaceous siltstone and shale

- Geological boundary
- 53° Strike and dip of bedding
- 46° Strike and dip of foliation
- Strike of vertical foliation
- 65° Strike and dip of cleavage
- Electromagnetic anomaly
- Proton Magnetometer anomaly

5 cm

80-1426

COMSTAFF PROPRIETARY LIMITED

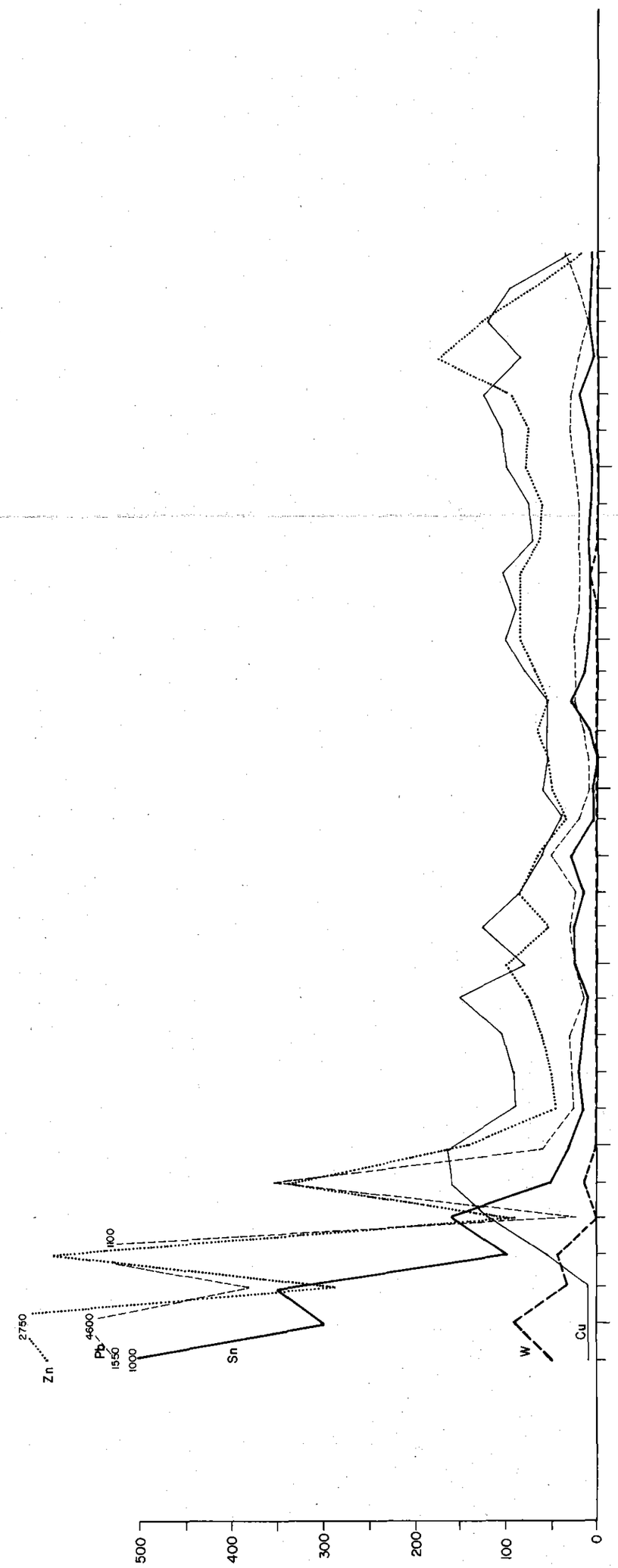
RAMSAY GRID - CAL 749

GEOLOGICAL INTERPRETATION

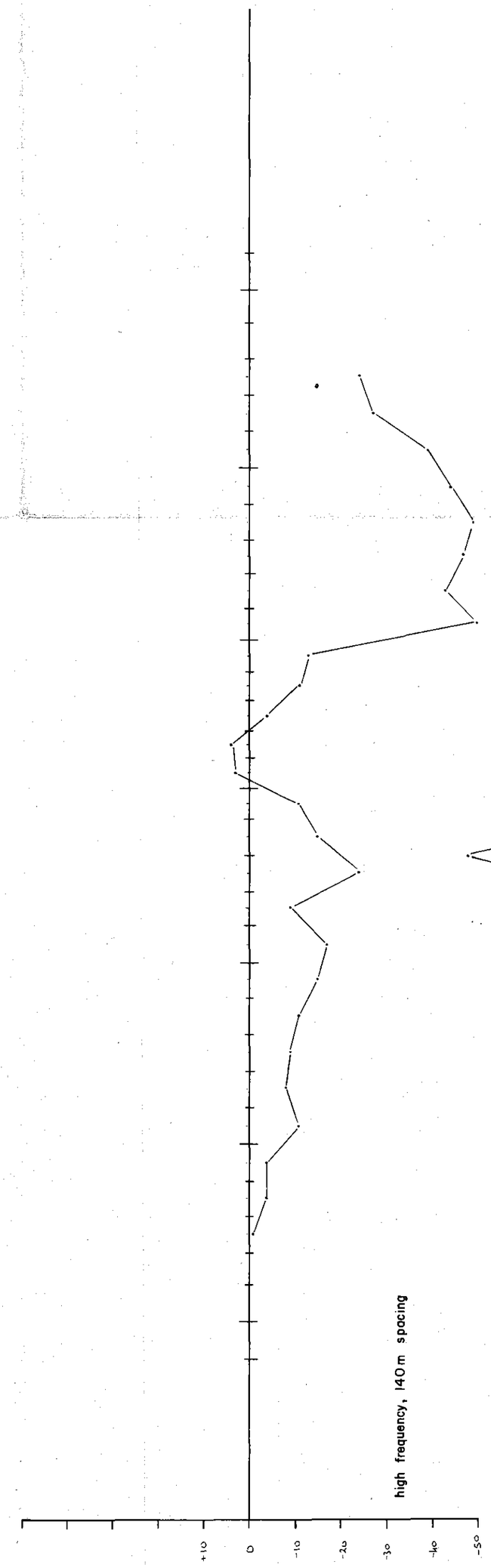
DRAWN	COMPILED	SCALE	
GEODRAFT 4/80	G.F.P.	1 : 2500	TAS/2/2100

373 000m E

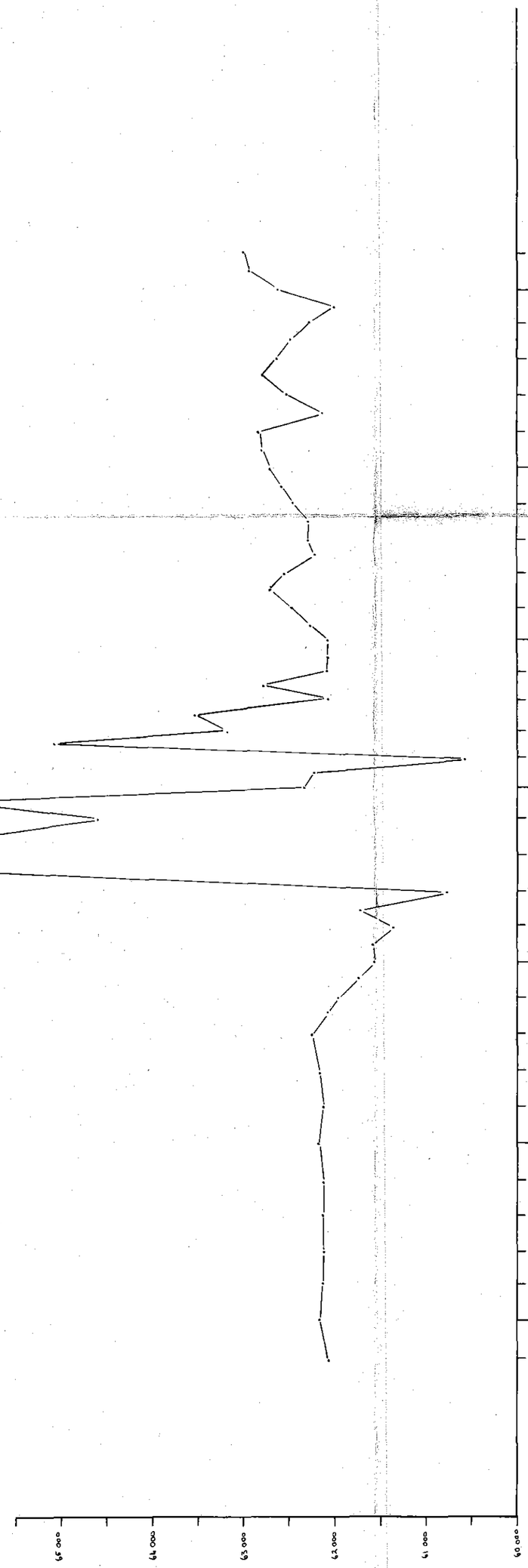
096111



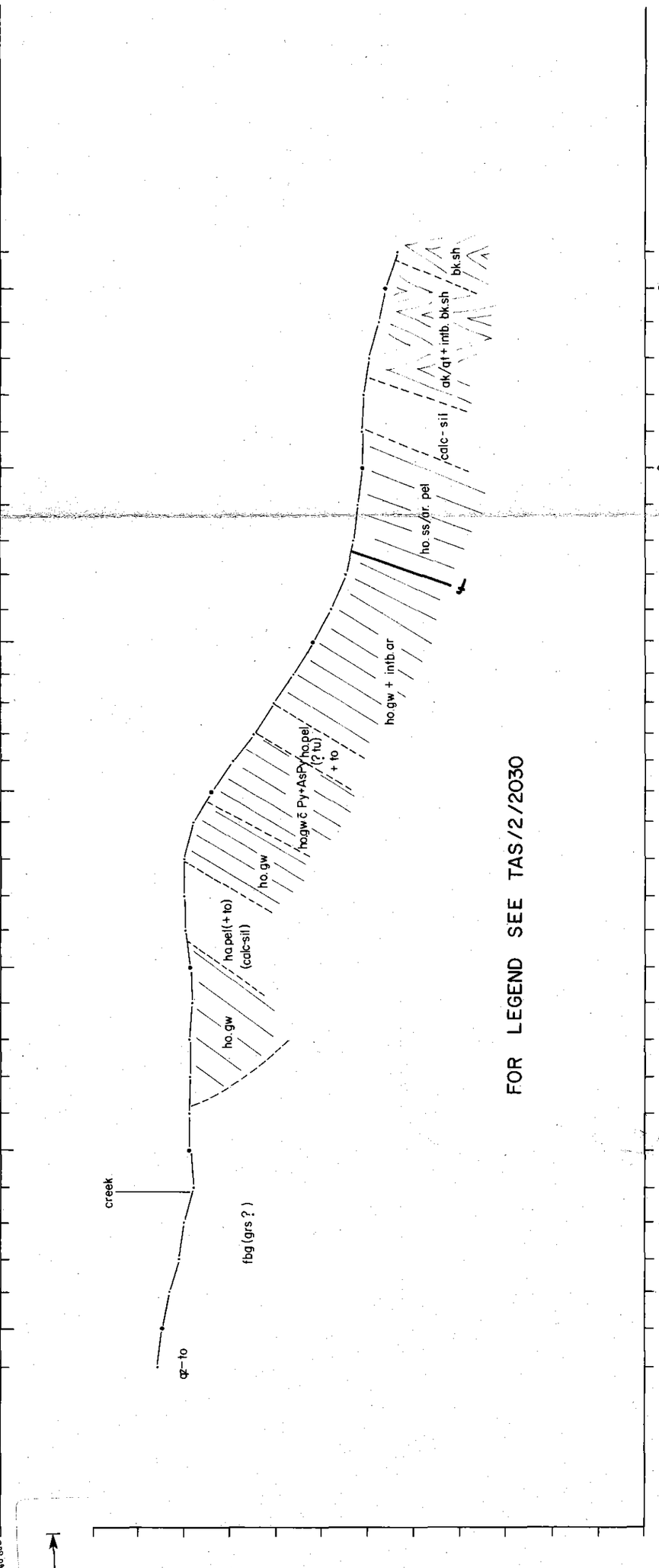
Geochemistry



Crone



Magnetics nT



SEE TAS/2/2030 FOR LEGEND

Topography

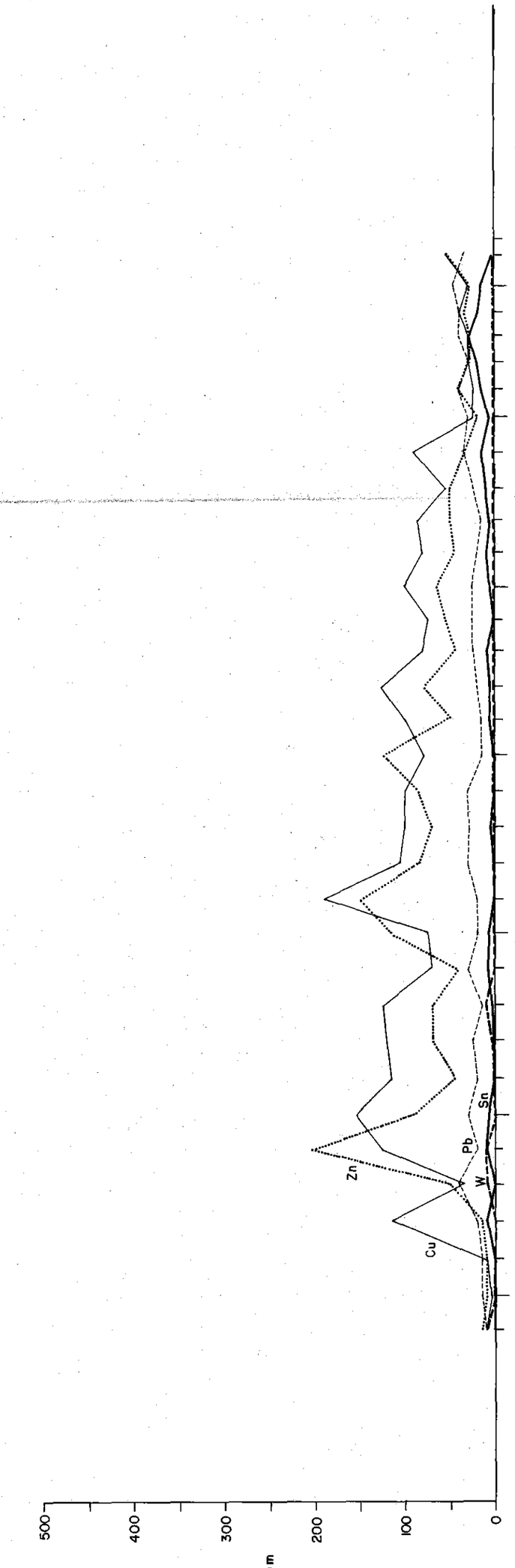
5 cm

096112 80-1426

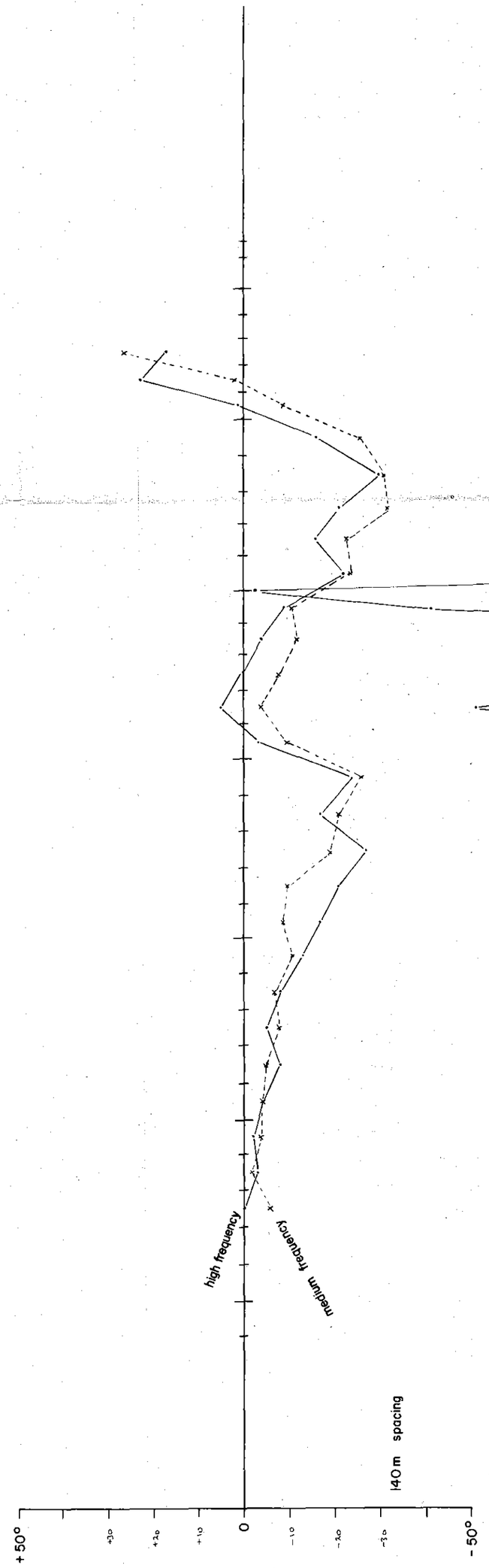
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL
L 4760 N PROFILES 750
TOPO, MAG, CRONE, GEOCHEM

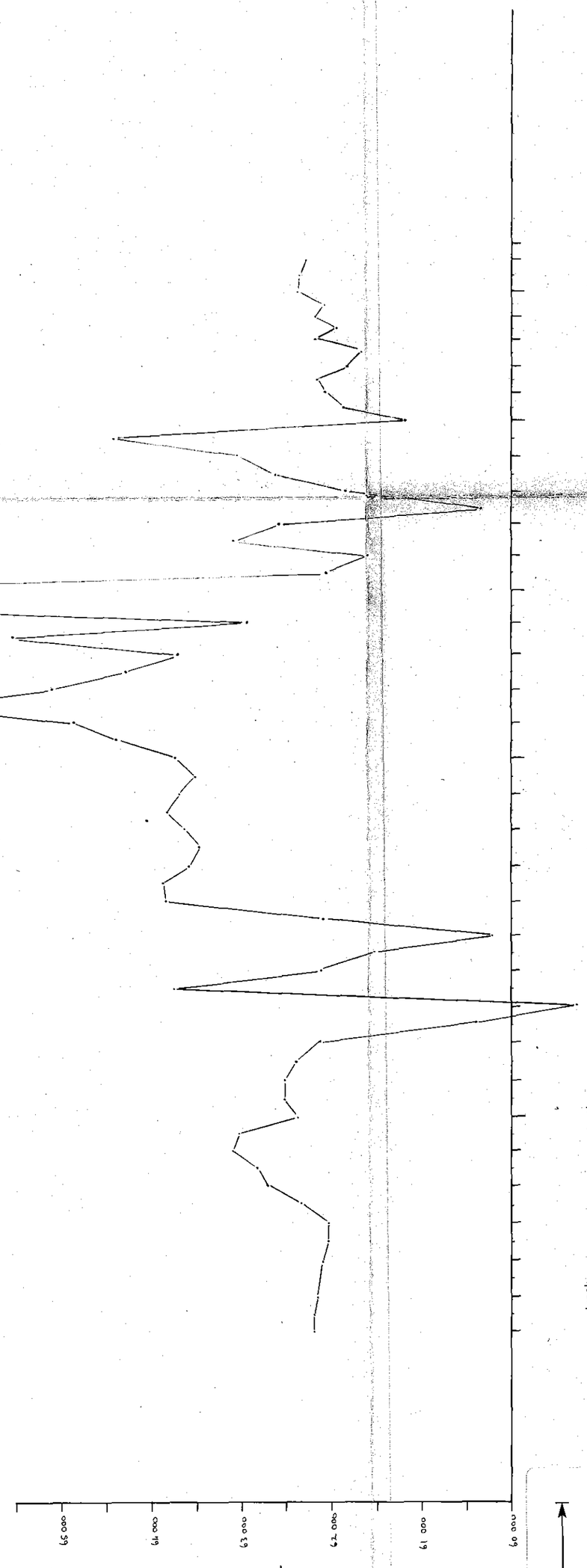
DRAWN	COMPILED	SCALE	
G.F.P. 4/79	G.F.P.	1 : 2500	TAS/2/1821



Geochemistry



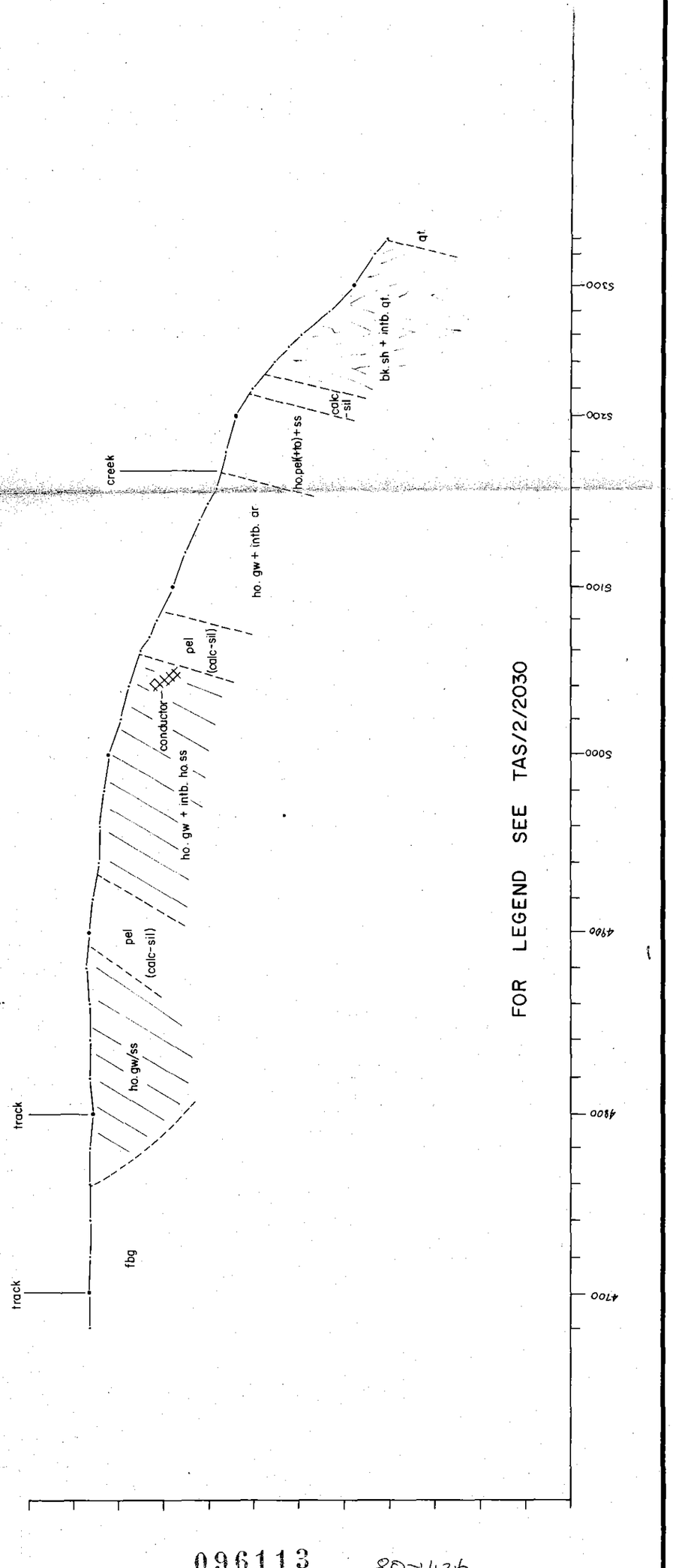
Crone



Magnetics

5 cm

Topography



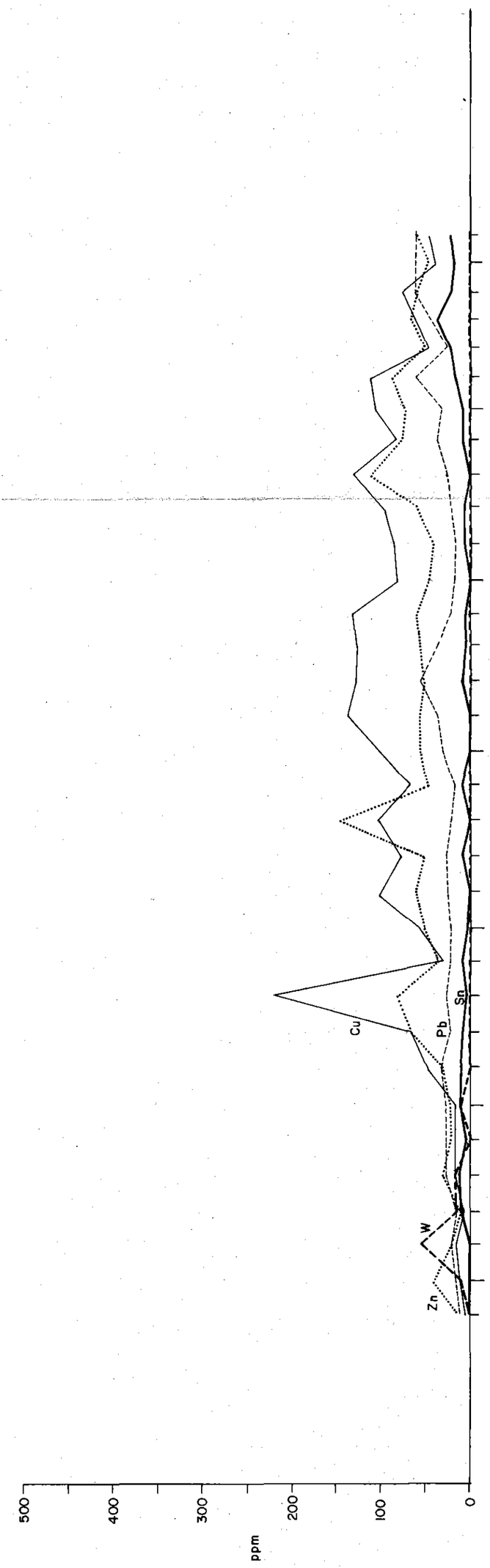
FOR LEGEND SEE TAS/2/2030

096113 80-426

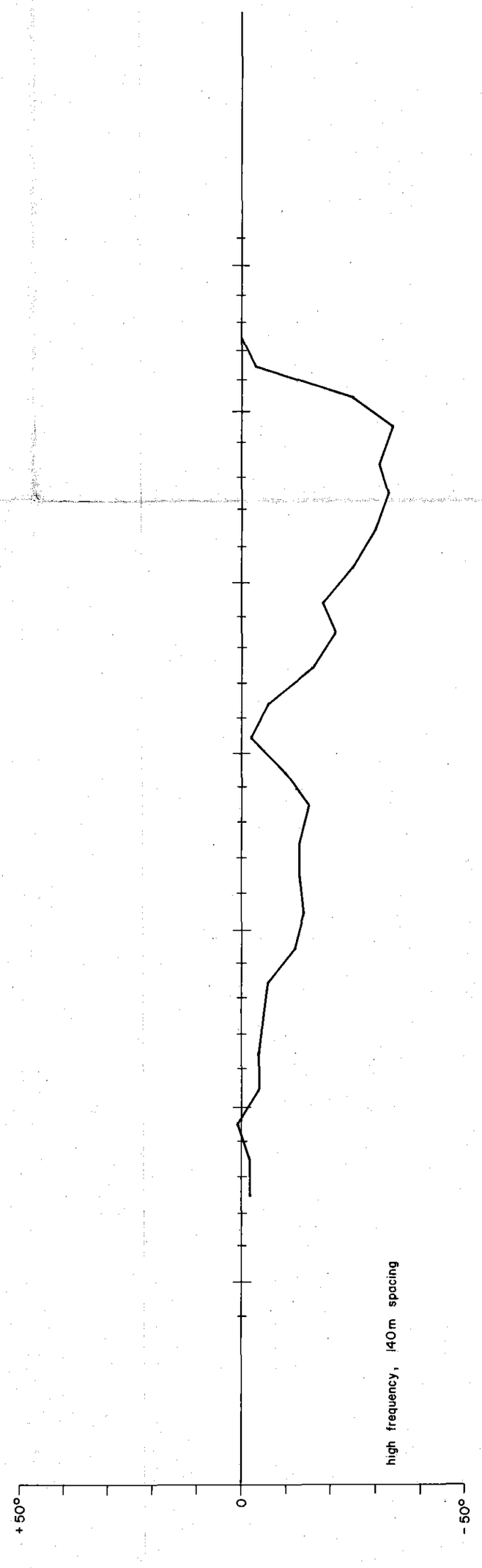
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL
L 4880 N PROFILES
TOPO, MAG, CRONE, GEOCHEM 751

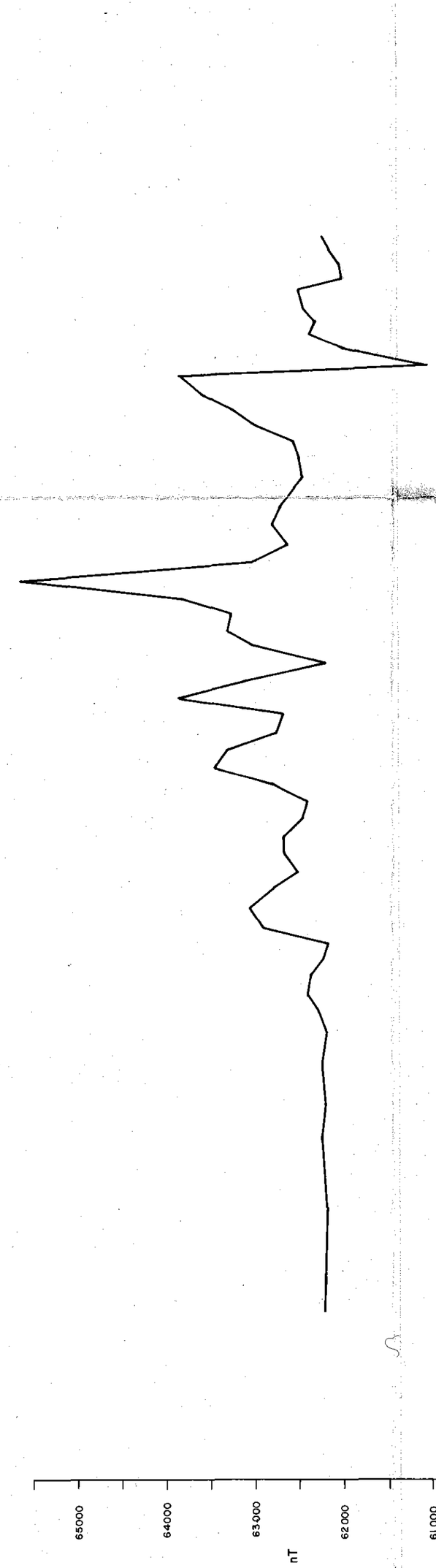
DRAWN	COMPILED	SCALE	
G.F.P. 4/79	G.F.P.	1 : 2500	TAS/2/1822



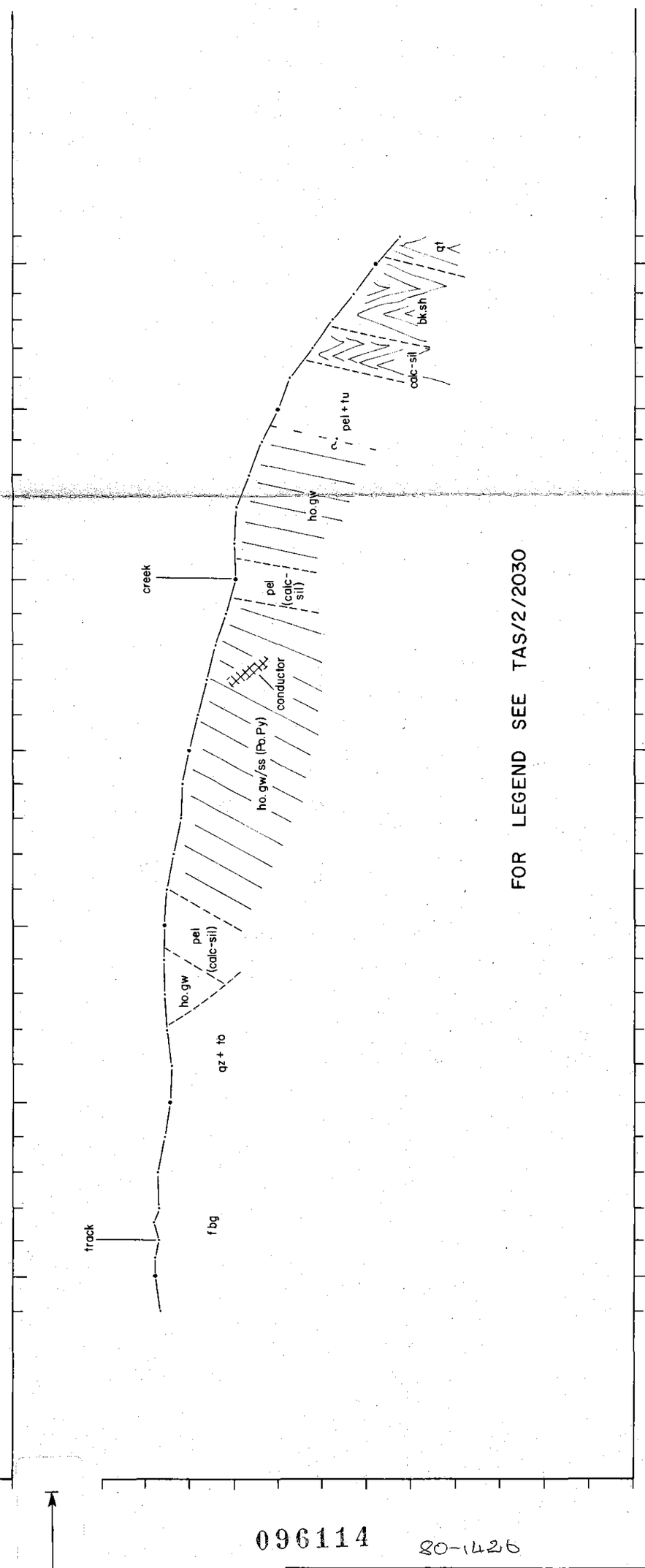
Geochemistry



Crone



Magnetics



FOR LEGEND SEE TAS/2/2030

5 cm

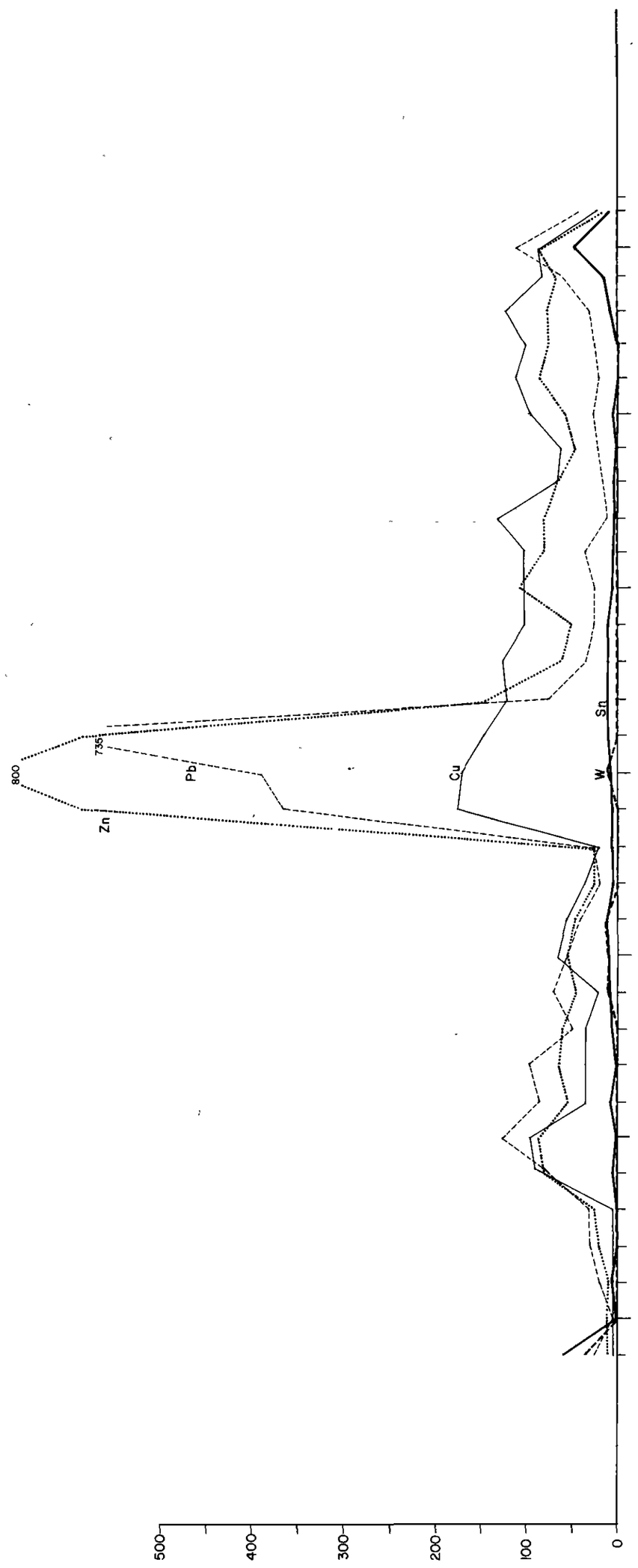
Topography

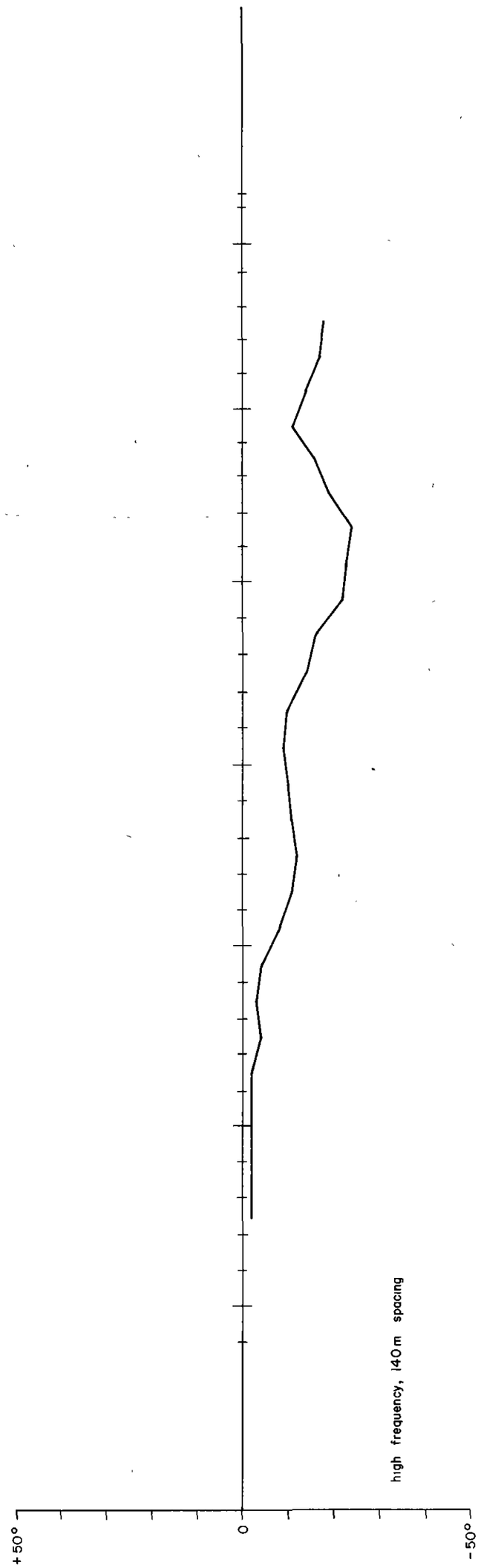
096114 80-1426

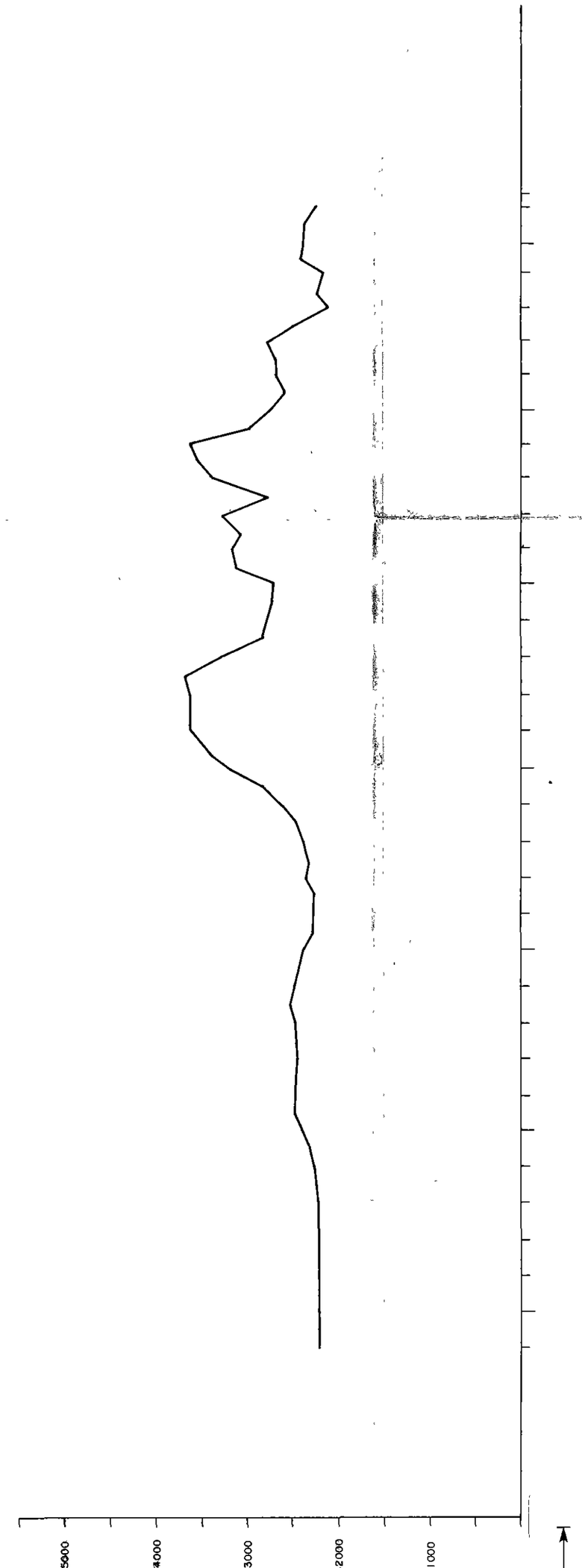
COMSTAFF PROPRIETARY LIMITED

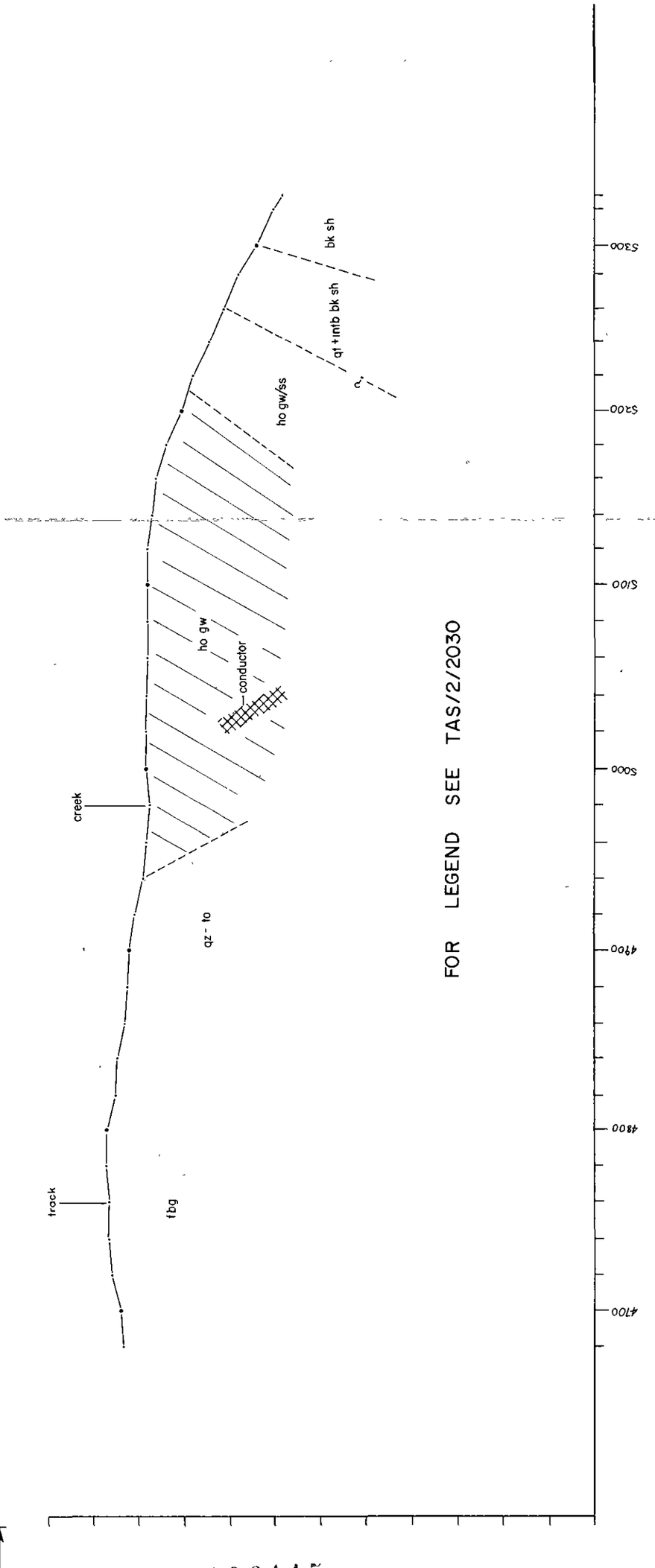
RAMSAY GRID - CAL
L 5000 N PROFILES 752
TOPO, MAG, CRONE, GEOCHEM

DRAWN	COMPILED	SCALE	
G.F.P. 4/79	G.F.P.	1 : 2500	TAS/2/1823









LEGEND SEE TAS/2/2030 FOR LEGEND

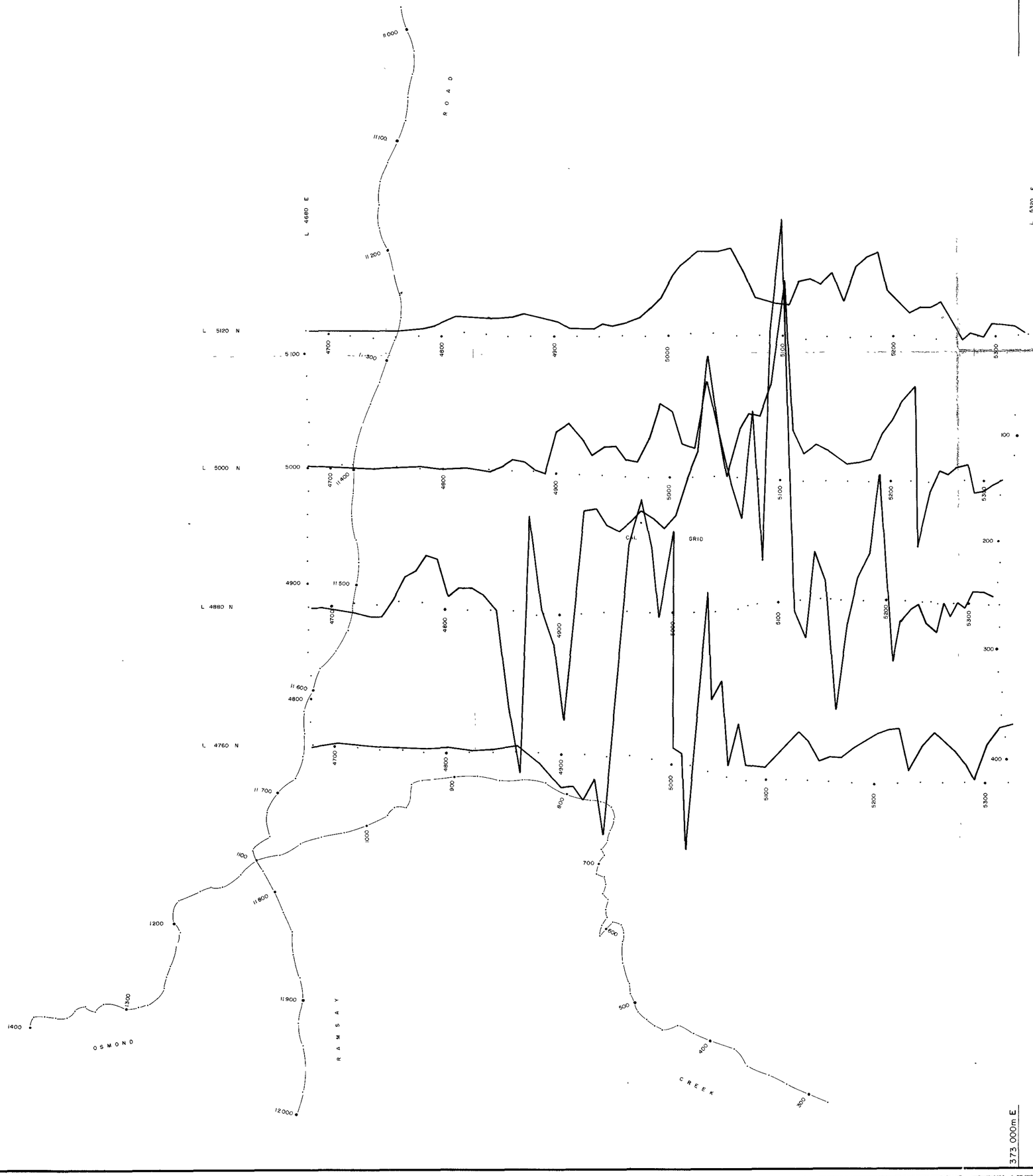
096115 80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL
L 5120 N PROFILES 753
TOPO, MAG, CRONE, GEOCHEM

DRAWN	COMPILED	SCALE	
GFP 4/79	GFP	1 2500	TAS/2/1824

5 397 000 m N



373 000m E

VERTICAL SCALE 1 cm = 500 nT

5 cm

096116

80-1426

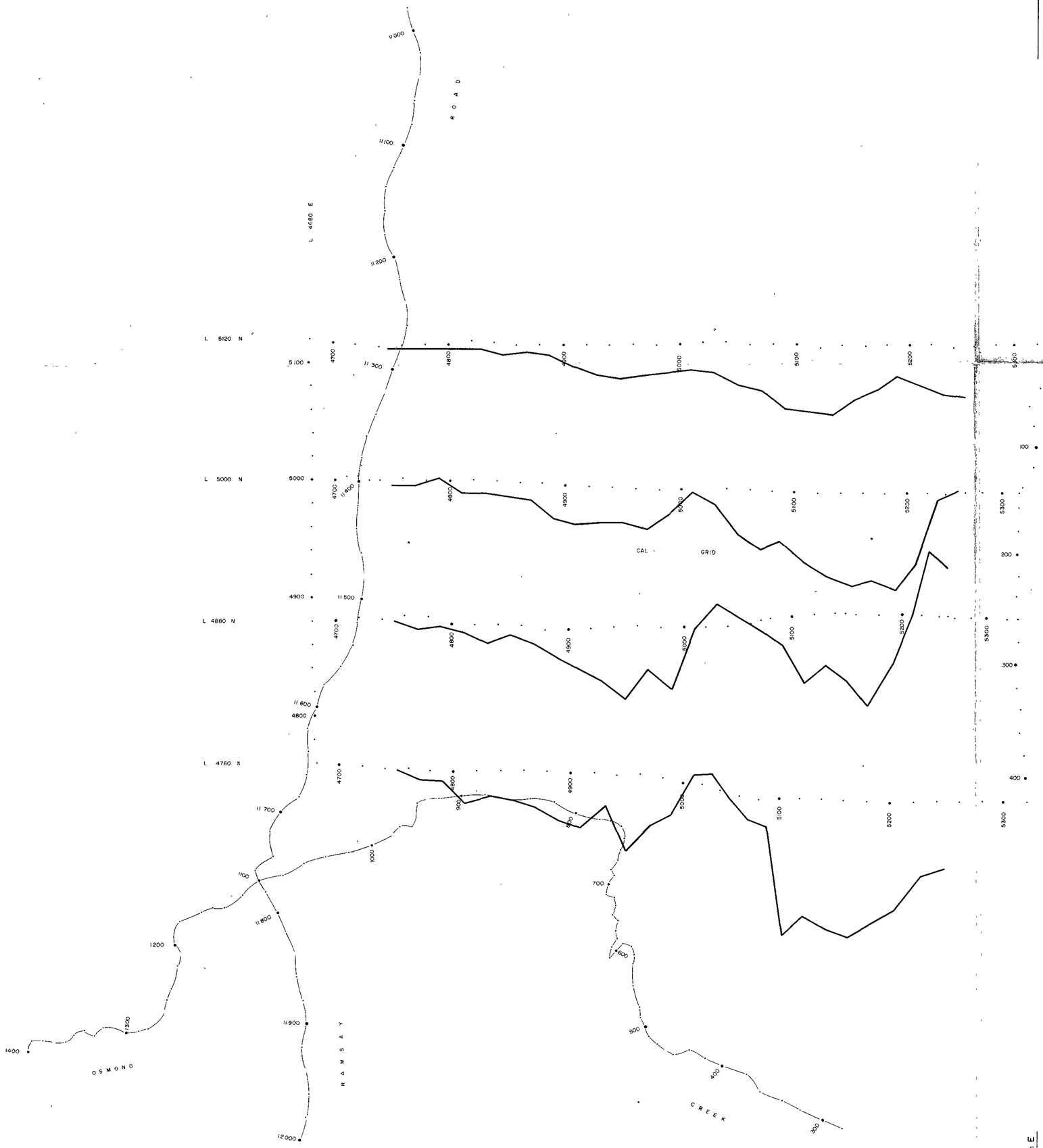
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL 754

STACKED GROUND MAGNETIC PROFILES

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1900

5 397 000 m N



373 000m E

5 cm

VERTICAL SCALE 1 cm = 10° apparent dip

high frequency, 140m spacing, vertical Tx

096117 80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL 755

STACKED CRONE E.M. PROFILES

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1901

5 397 000 m N

373 000m E

L 4680 E

L 5320 E

L 5120 N

L 5000 N

L 4880 N

L 4760 N

R O A D

CAL GRID

O S M O N D

R A M S A Y

C R E E K

5 cm

096118

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL 756

GEOCHEMICAL GRID AUGER SAMPLING

COPPER CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2045

5 397 000 m N

373 000m E

L 4680 E

L 5320 E

L 5120 N

L 5000 N

L 4880 N

L 4760 N

ROAD

CAL GRID

OSMOND

RAMSAY CREEK

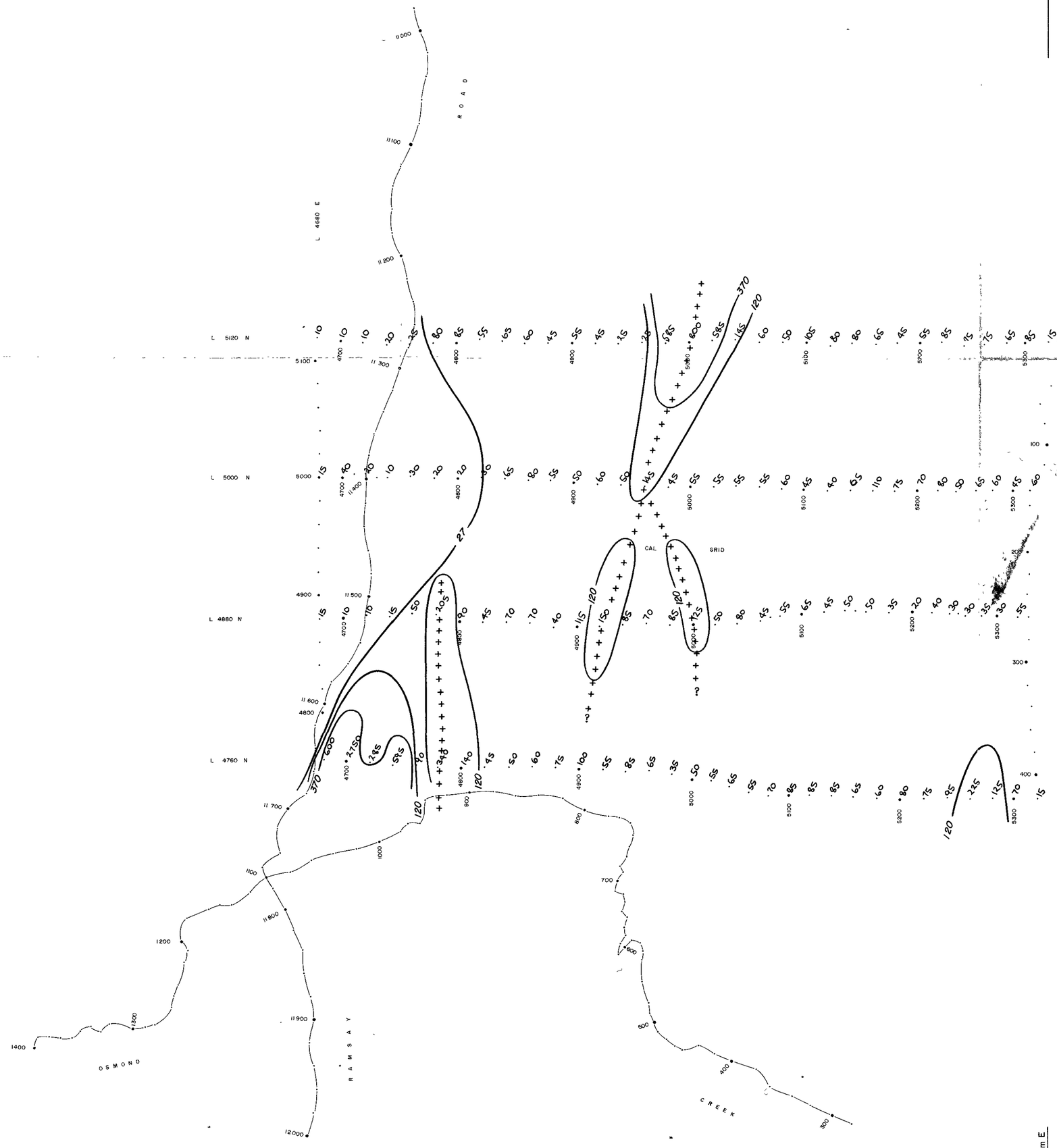
5 cm

096119 80-1426

COMSTAFF PROPRIETARY LIMITED			
RAMSAY GRID - CAL 757 GEOCHEMICAL GRID AUGER SAMPLING LEAD CONTOURS in ppm			
DRAWN GEODRAFT2/80	COMPILED G F P	SCALE 1 2500 .	TAS/2/2046

5 397 000 m N

373 000m E



096120

80-1426

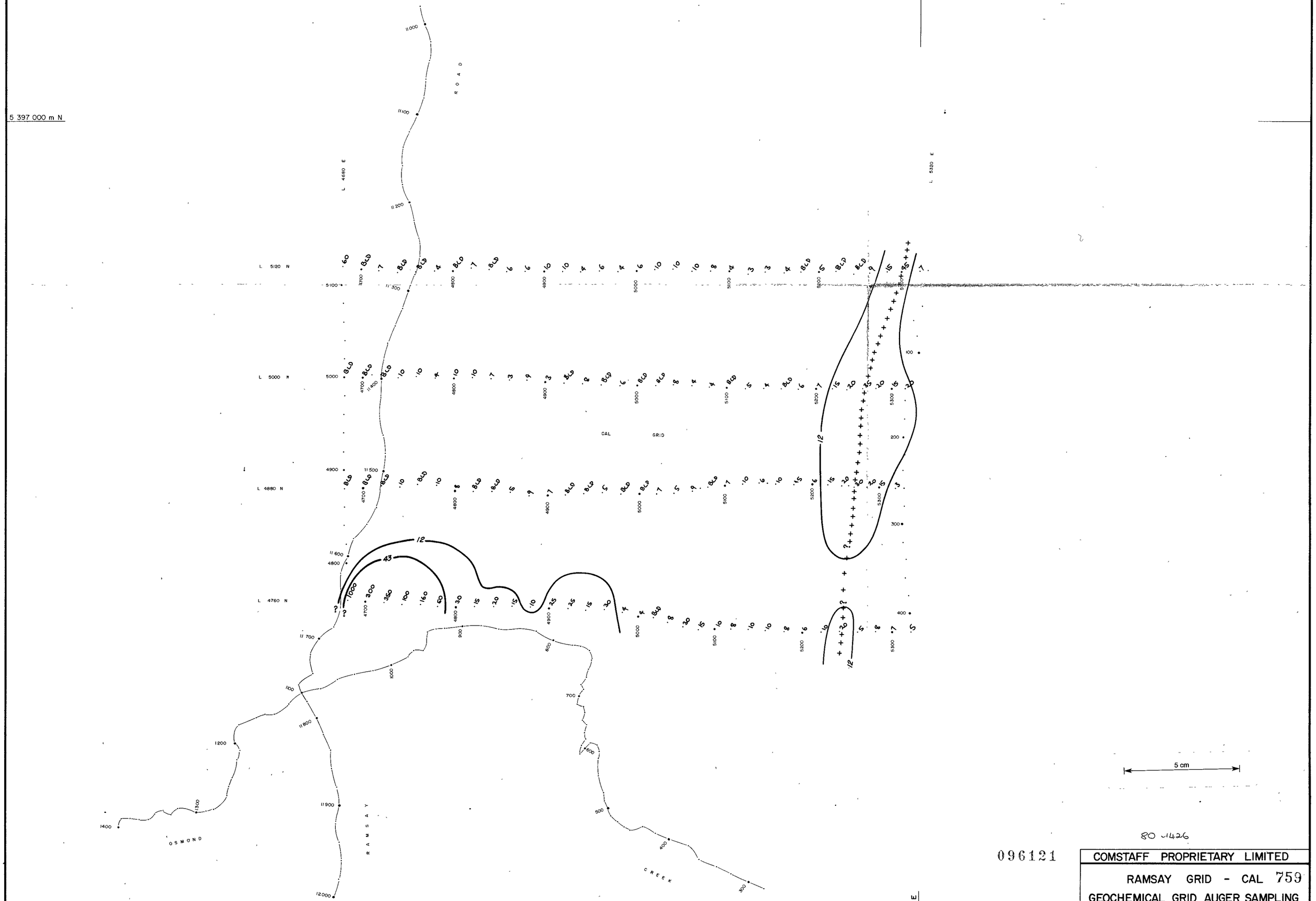
. COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL 758

GEOCHEMICAL GRID AUGER SAMPLING

ZINC CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2047



80 1426

096121

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL 759

GEOCHEMICAL GRID AUGER SAMPLING

TIN CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT2/80	G F P	1 2500	TAS/2/2048

5 397 000 m N

L 4680 E

L 5320 E

L 5120 N

L 5000 N

L 4880 N

L 4760 N

R O A D

CAL GRID

O S M O N D

R A M S A Y

C R E E K

373 000m E.

5 cm

096122

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAL 760

GEOCHEMICAL GRID AUGER SAMPLING

TUNGSTEN CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2049

LEGEND

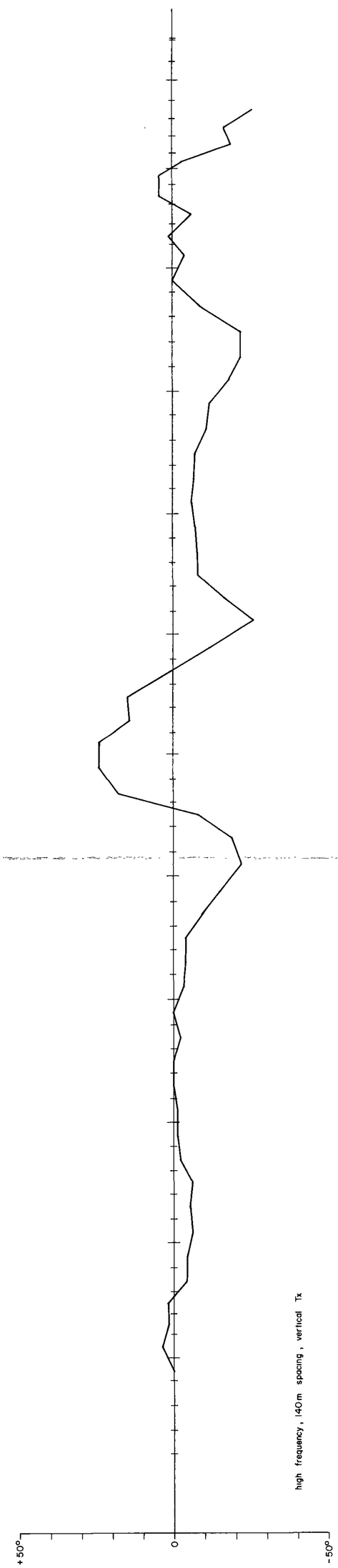
Meredith Granite	qz/to	Quartz tourmaline mineralization
	grs	Greisen
	py/ad	Porphyritic adamellite
	b-f gr	Holocrystaline biotite-felspar granite
Crimson Creek Formation	sk	Skarn assemblage
	mdr	Microdiorite and basalt
	ss/ar	Siltstone and argillite
	pel/dm	Pelite (possibly dolomitic)
	tu/gw	Tuffaceous greywacke/volcaniclastic

- Geological boundary
- f — f Fault
- 125° Strike and dip of bedding
- 53° Strike and dip of foliation
- 62° Strike and dip of jointing
- 76° Strike and dip of overturned bedding
- ☼ Electromagnetic anomaly

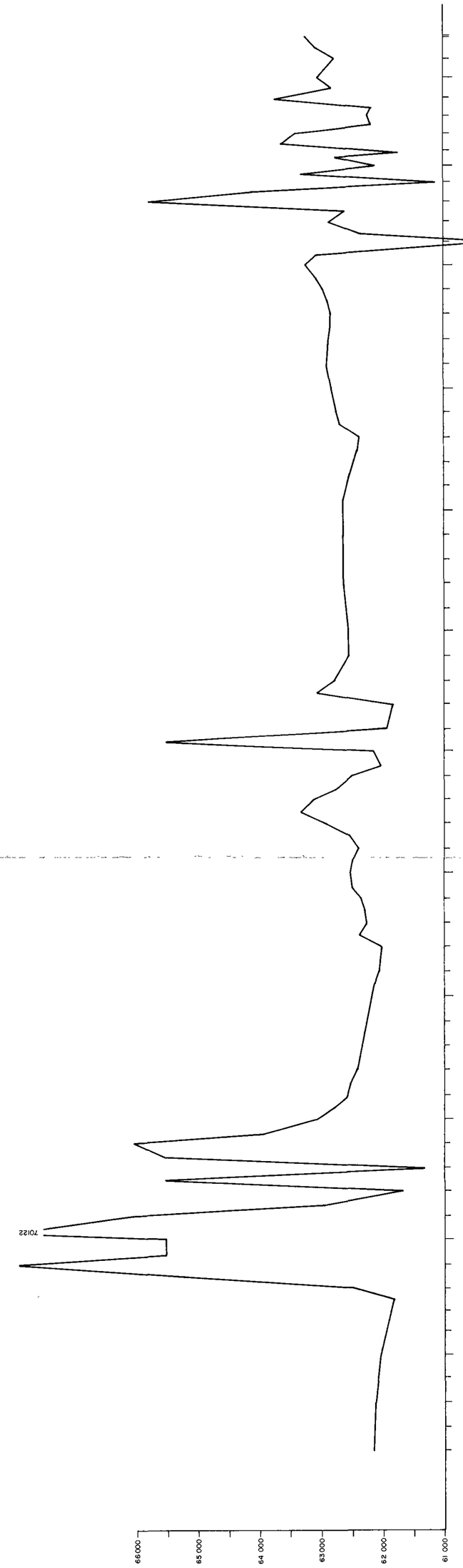
L 5360 N
L 5240 N
L 5120 N
L 5060 N
L 5000 N
L 4940 N
L 4880 N
L 4820 N
L 4760 N
L 4700 N
L 4640 N
L 4520 E
L 4220 E
TIE LINE
CAF GRID
RAMSAY
CAJ ACCESS TRACK
qz/to
b - f gr
sk
grs/py ad
grs/py ad
b - f gr
sk
tu/gw + ss/ar
tu/gw + ss/ar
tu/gw + ss/ar
pel/dm
py/ad
mdr
pel
tu/gw
5 395 000 m N
372 000 m E
5 cm
096123
80-1426

COMSTAFF PROPRIETARY LIMITED			
RAMSAY GRID - CAF 761			
GEOLOGICAL INTERPRETATION			
DRAWN GEODRAFT 4/79	COMPILED GFP	SCALE 1 2500	TAS/2/2101

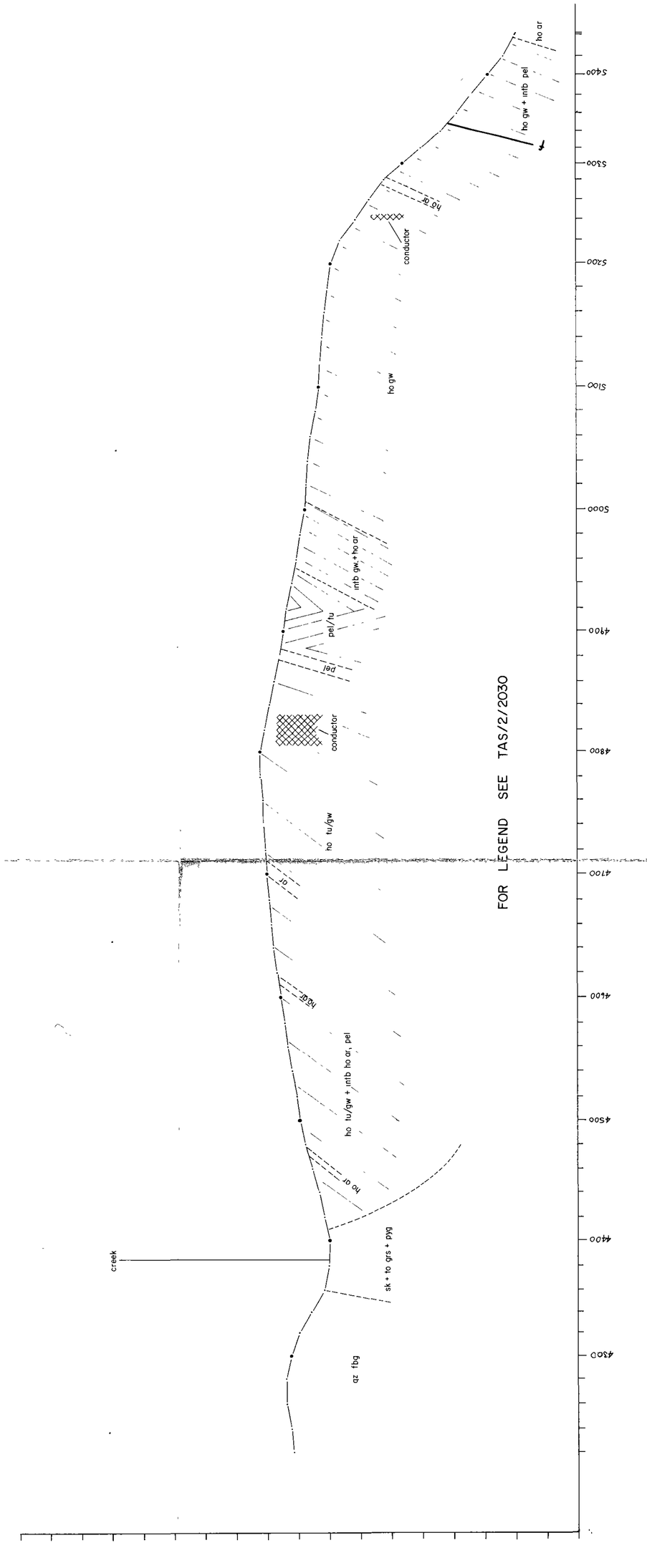
GEOCHEMISTRY



CRONE EM



MAGNETICS



TOPOGRAPHY

FOR LEGEND SEE TAS/2/2030

096124

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF

L 4760 N PROFILES

TOPO, MAG, CRONE, GEOCHEM

762

COMPILED	G F P
DRAWN	G F P
DATE	5/79
AMENDED	
SCALE	1 2500
PLAN No.	TAS/2/1851

763

RAMSAY GRID - CAF

L 4880 N PROFILES

TOPO, MAG, CRONE, GEOCHEM

COMPILED	GFP
DRAWN	GFP
DATE	3/79
AMENDED	
SCALE	1 2500
PLAN No.	TAS/2/1852

COMSTAFF PROPRIETARY LIMITED

096125

80-1426

TOPOGRAPHY

5 cm

FOR LEGEND SEE TAS/2/2030

MAGNETICS

nT

CRONE E M

high frequency, 140m spacing, vertical Tx

GEOCHEMISTRY

ppm

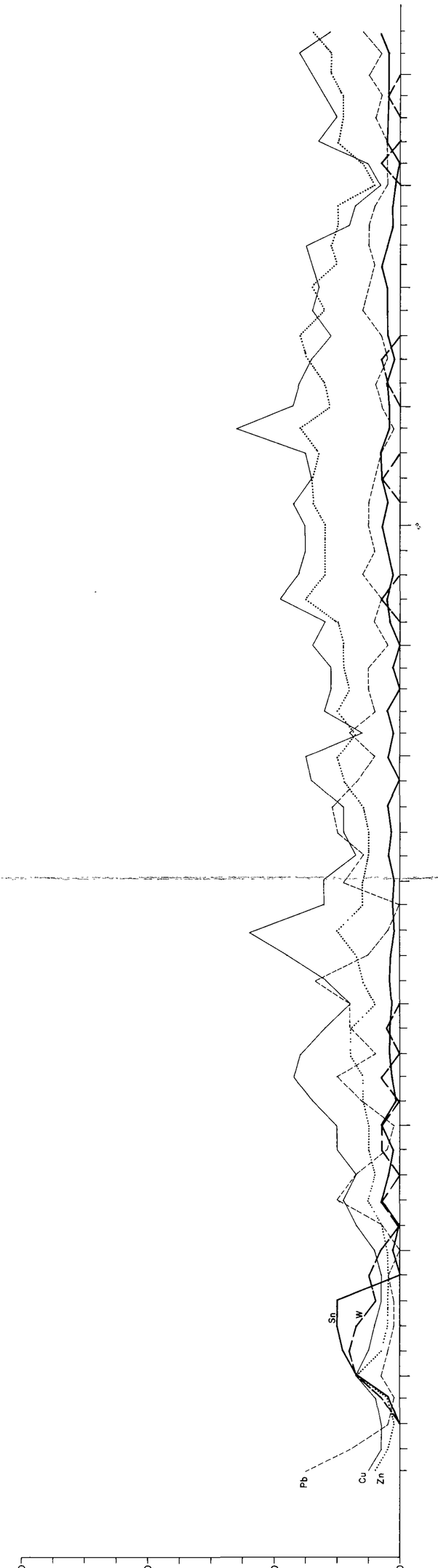
Zn

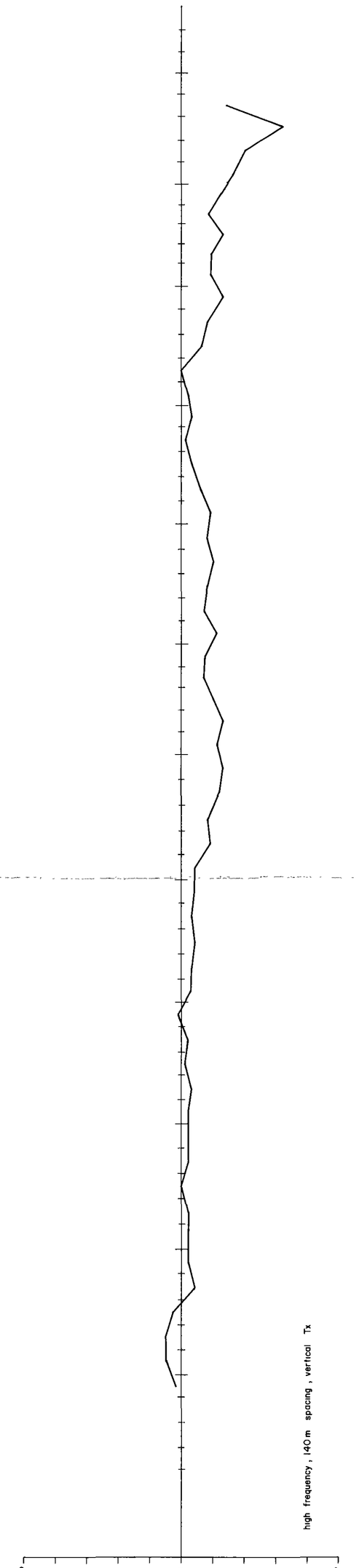
Cu

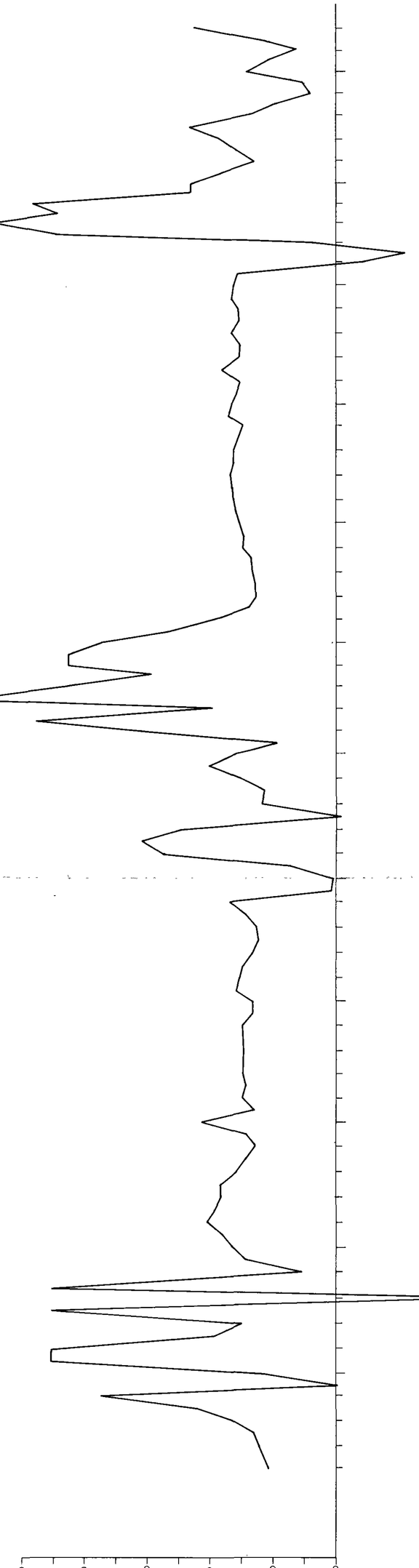
Pb

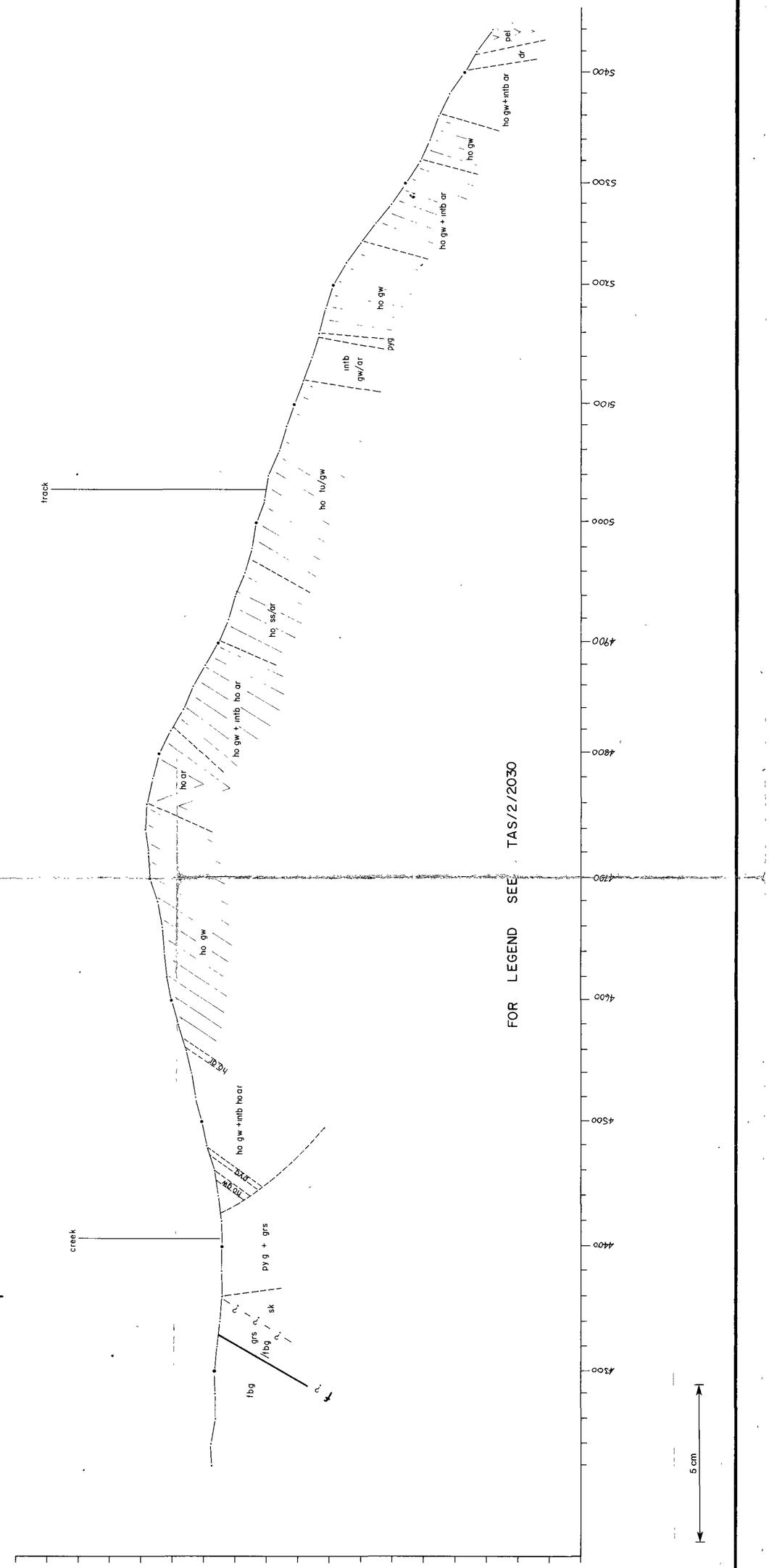
Sn

W









096126

80-1426

COMSTAFF PROPRIETARY LIMITED

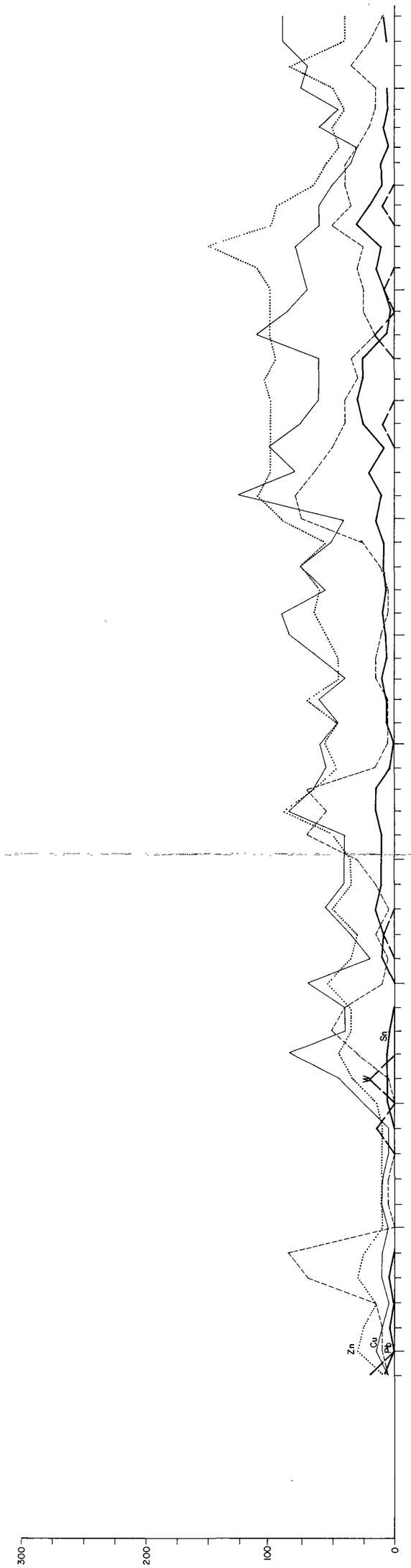
RAMSAY GRID - CAF

L 5000 N PROFILES

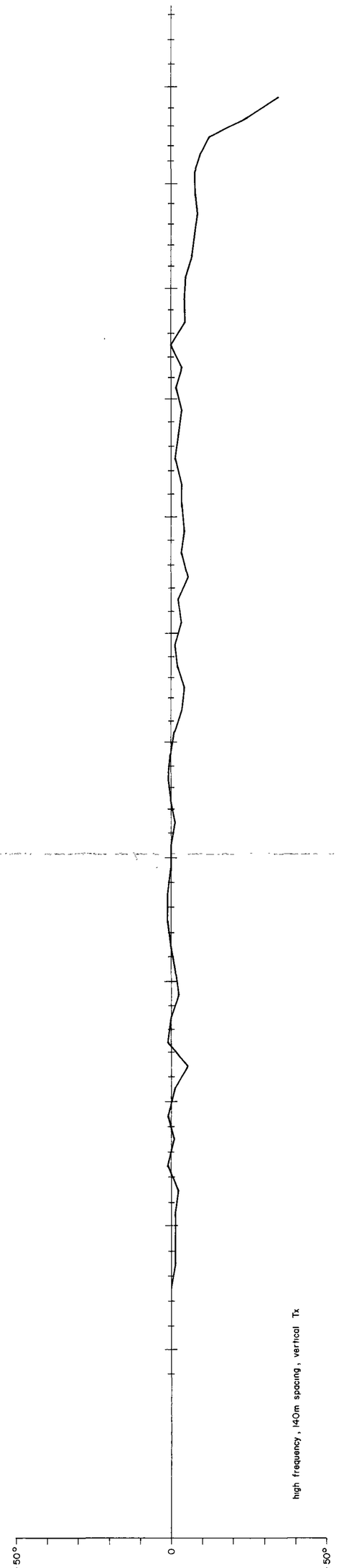
TOPO, MAG, CRONE, GEOCHEM

764

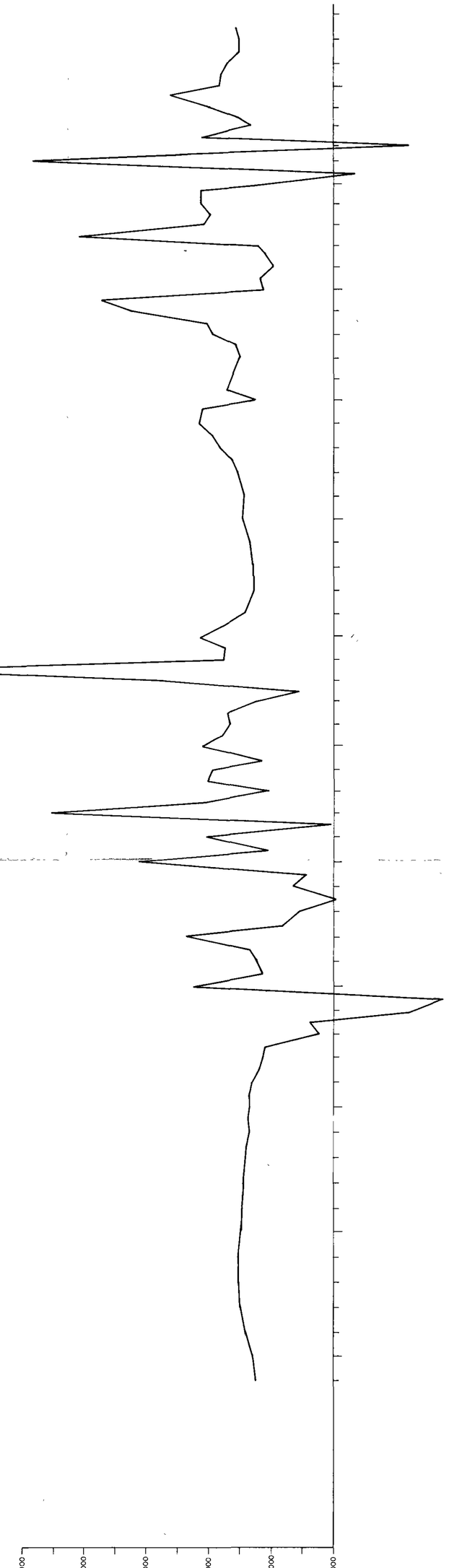
COMPILED	G F P
DRAWN	G F P
DATE	5/79
AMENDED	
SCALE	1 2500
PLAN No.	TAS/2/1853



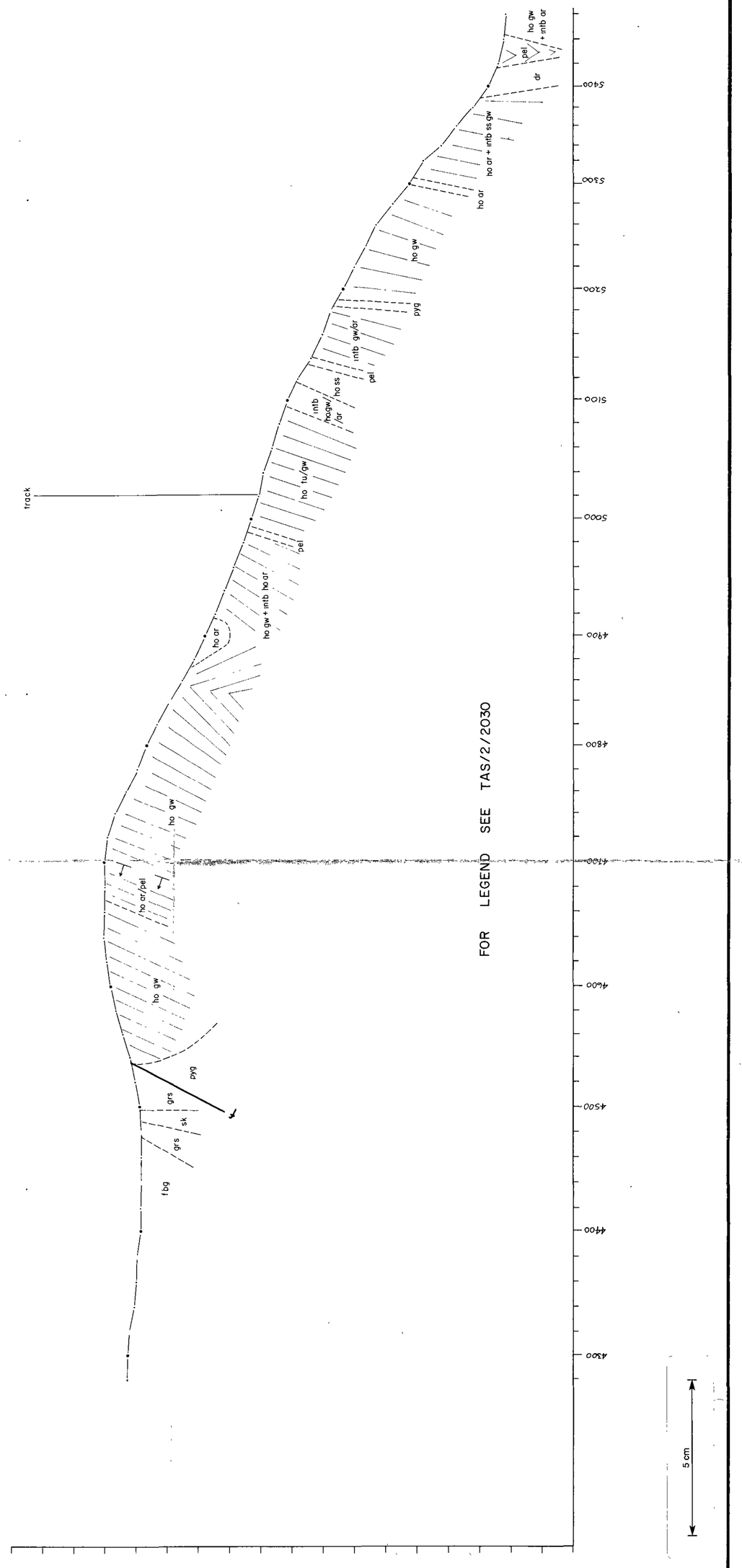
GEOCHEMISTRY



CRONE E M



MAGNETICS



TOPOGRAPHY

FOR LEGEND SEE TAS/2/2030

096127

80-1426 3/3

COMSTAFF PROPRIETARY LIMITED

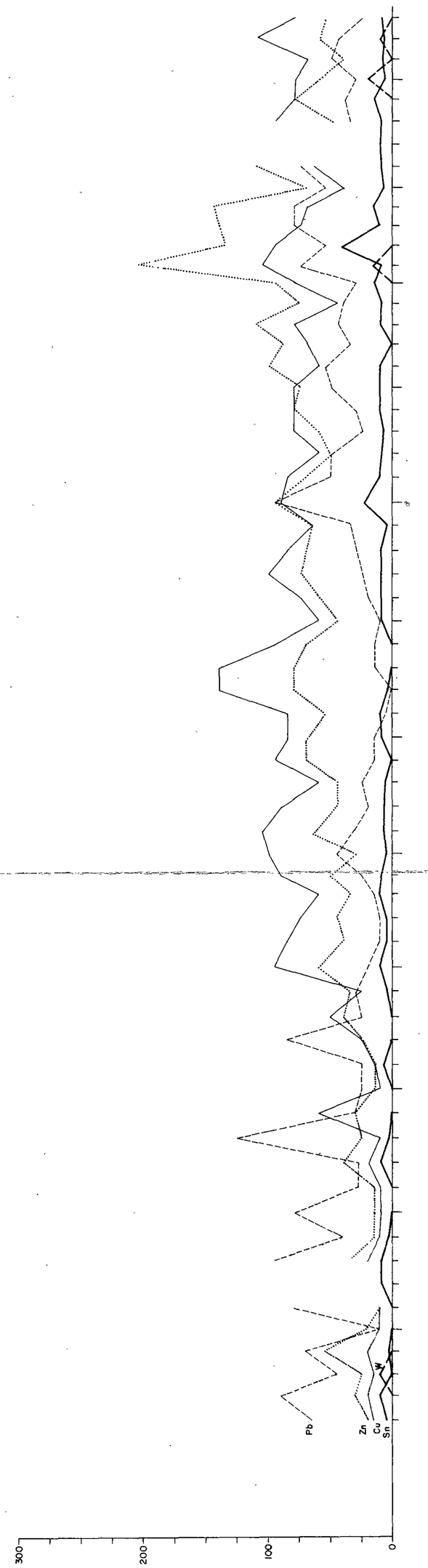
RAMSAY GRID - CAF

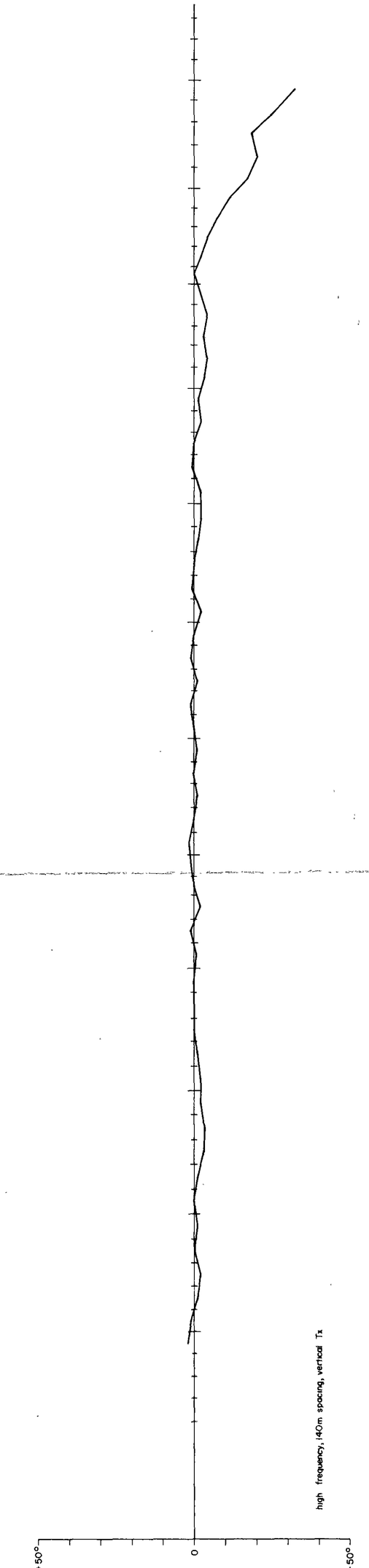
L 5120 N PROFILES

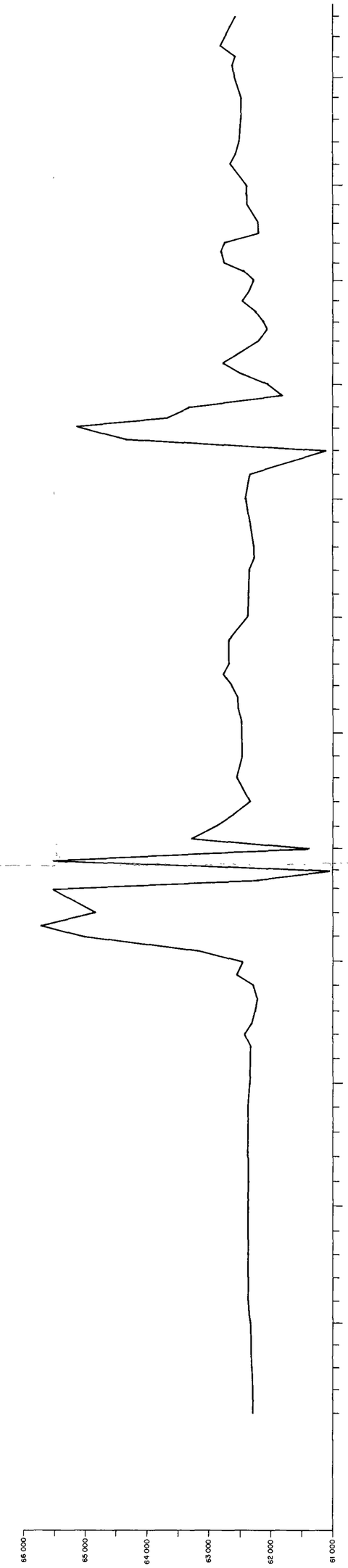
TOPO, MAG, CRONE, GEOCHEM

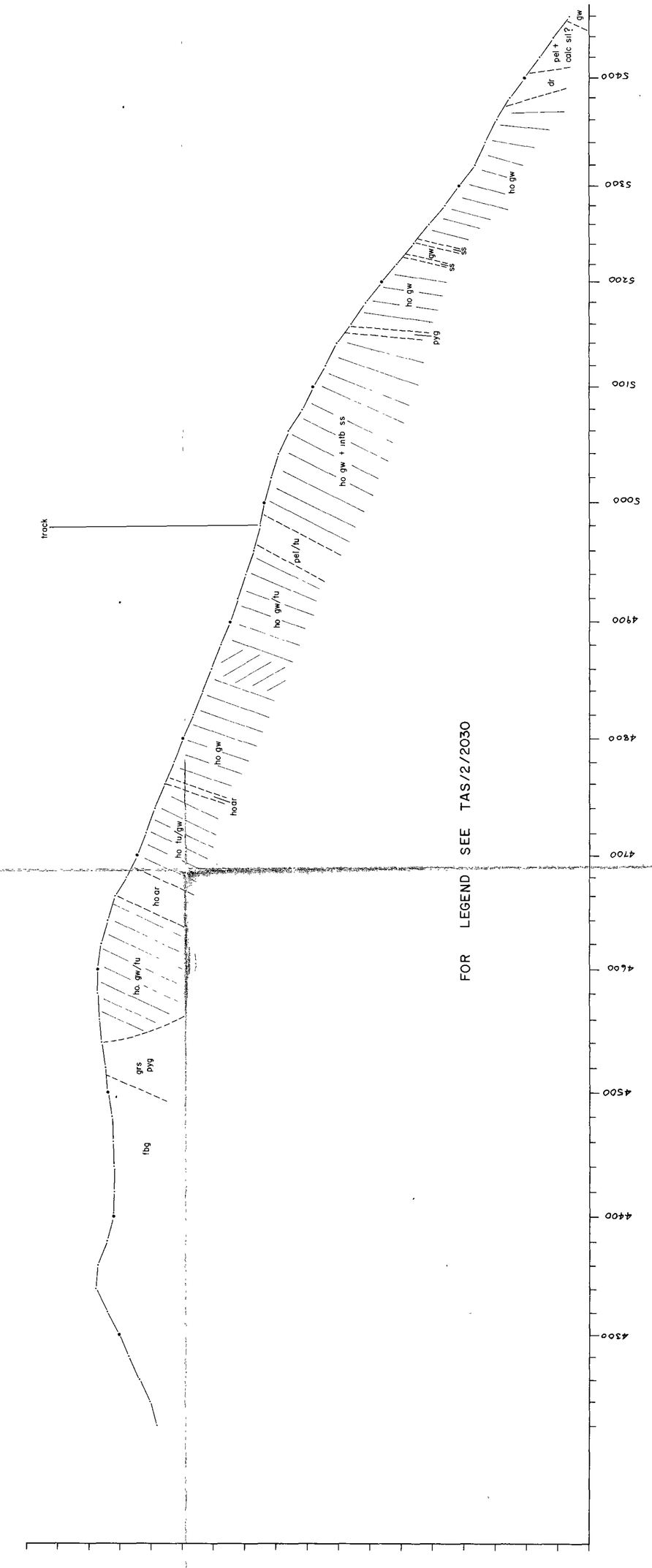
765

COMPILED	GFP
DRAWN GFP	DATE 5/79
AMENDED	
SCALE	1 2500
PLAN No	TAS/2/1854









FOR LEGEND SEE TAS/2/2030

096128 80-1420 3/3

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF

L 5240 N PROFILES

TOPO, MAG, CRONE, GEOCHEM

COMPILED	G F P
DRAWN G F P	DATE 5/79
AMENDED	
SCALE	1 2500
PLAN No	TAS/2/1855

766

AAC

COMSTAFF PROPRIETARY LIMITED

PROJECT NAME: INTERIM REPORT ON THE RAMSAY AREA
EL 5/63 PART 2

TITLE:

AREA NAME/S, STATE 1:250,000 SHEET NO/S & COORDINATES: Burnie Sheet S 55/3
Metric co-ordinate 5397500 372500E

COMMODITY/IES: Tin Tungsten Copper Lead Zinc

TEXT PAGES NO: 35

PLAN NOS: as detailed

TABLE NOS: 1

APPENDICES: 4

AUTHOR/S: G F Pigott

DATE: April 1980

AUSTRALIAN ANGLO AMERICAN LIMITED

Incorporated in the State of Victoria

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF
L 5360 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

COMPILED	G F P
DRAWN	DATE
G F P	5/79
AMENDED	
SCALE	1 2500
PLAN No.	TAS/2/1856

096130 80-11-26 3/3

5 cm

TOPOGRAPHY

MAGNETICS nT

CRONE E M

high frequency, 140m spacing, vertical Tx

GEOCHEMISTRY ppm

FOR LEGEND SEE TAS/2/2030

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4220 E

L 4520 E

TIE LINE

ROAD

RAMSAY

C A F GRID

CAJ ACCESS TRACK

5 395 000 m N

372 000 m E

5 cm

VERTICAL SCALE 1 cm = 500 nT

80 1126

096131

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF

STACKED GROUND MAGNETIC PROFILES

768

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1898

L 4520 E

L 4220 E

L 5360 N

L 5240 N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

TIE LINE

RAMSAY

C A F GRID

C.A.J ACCESS TRACK

5 395 000 m N

372 000 m E

5 cm

80-1426

VERTICAL SCALE 1 cm = 10° apparent dip

high frequency, 140m spacing, vertical Tx

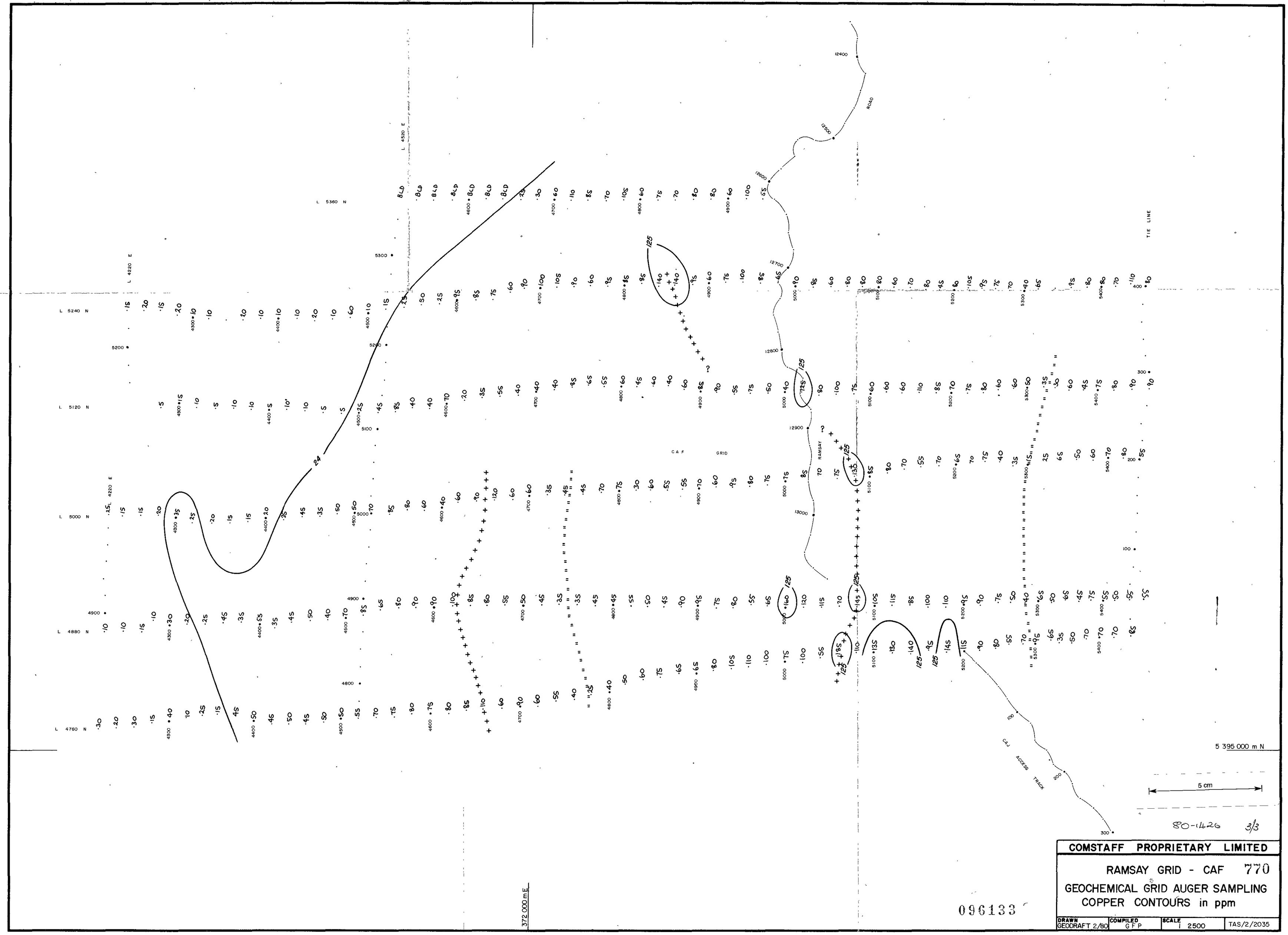
096132

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 769

STACKED CRONE E.M. PROFILES

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1899



80-1426 3/3

COMSTAFF PROPRIETARY LIMITED

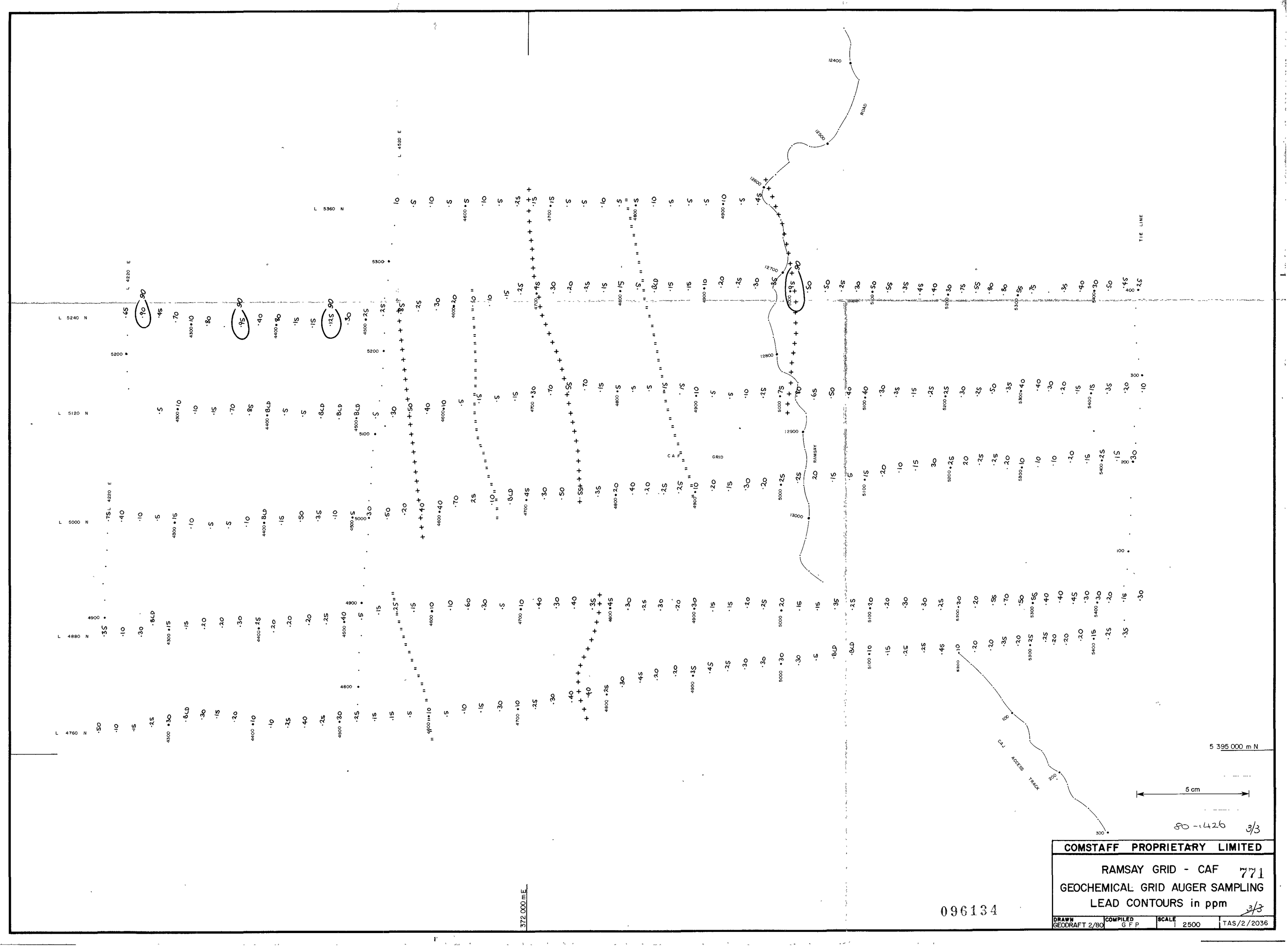
RAMSAY GRID - CAF 770

GEOCHEMICAL GRID AUGER SAMPLING

COPPER CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2035

096133



80-1426 3/3

COMSTAFF PROPRIETARY LIMITED

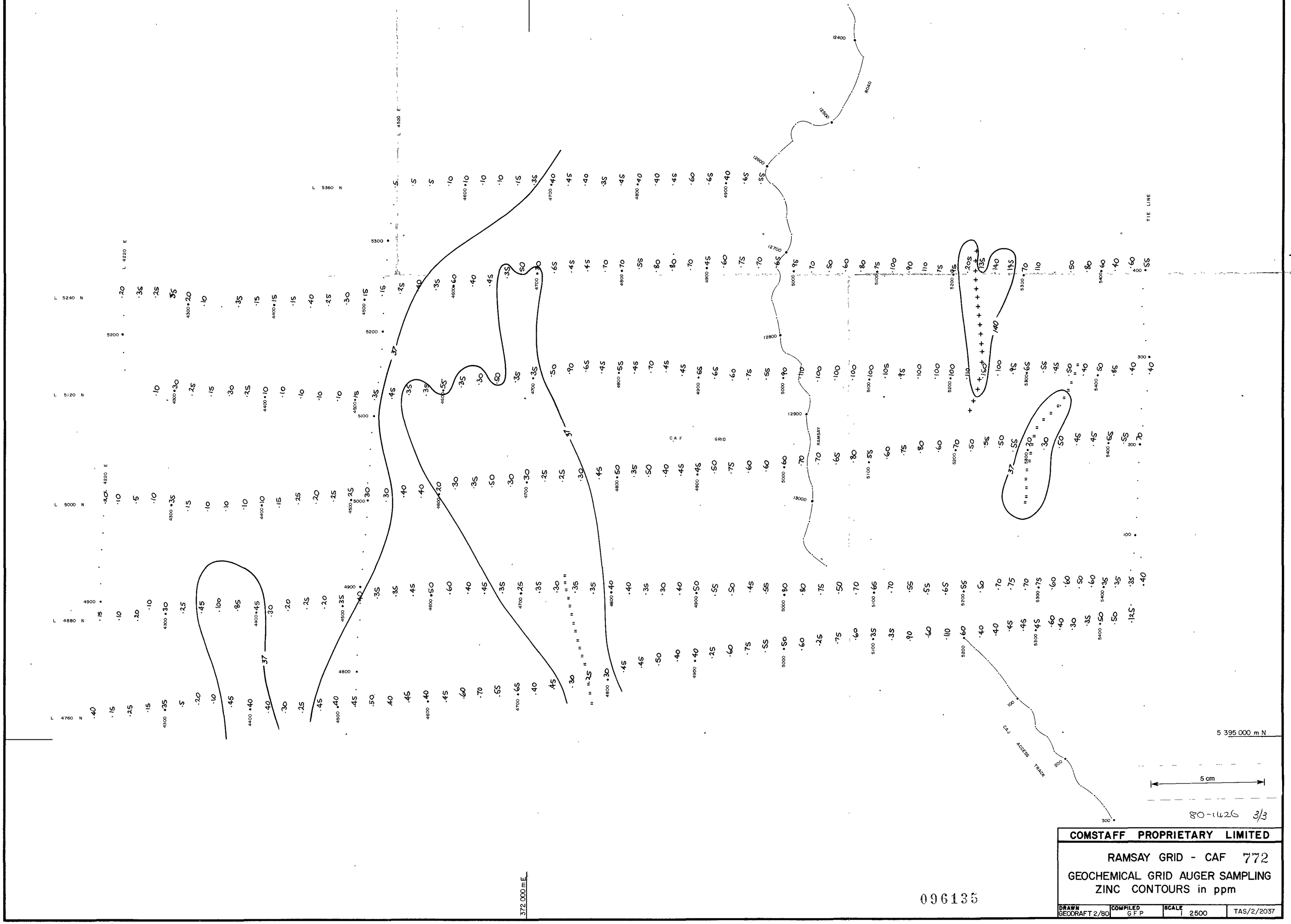
RAMSAY GRID - CAF 771

GEOCHEMICAL GRID AUGER SAMPLING

LEAD CONTOURS in ppm 3/3

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2036

096134



80-1426 3/3

096135

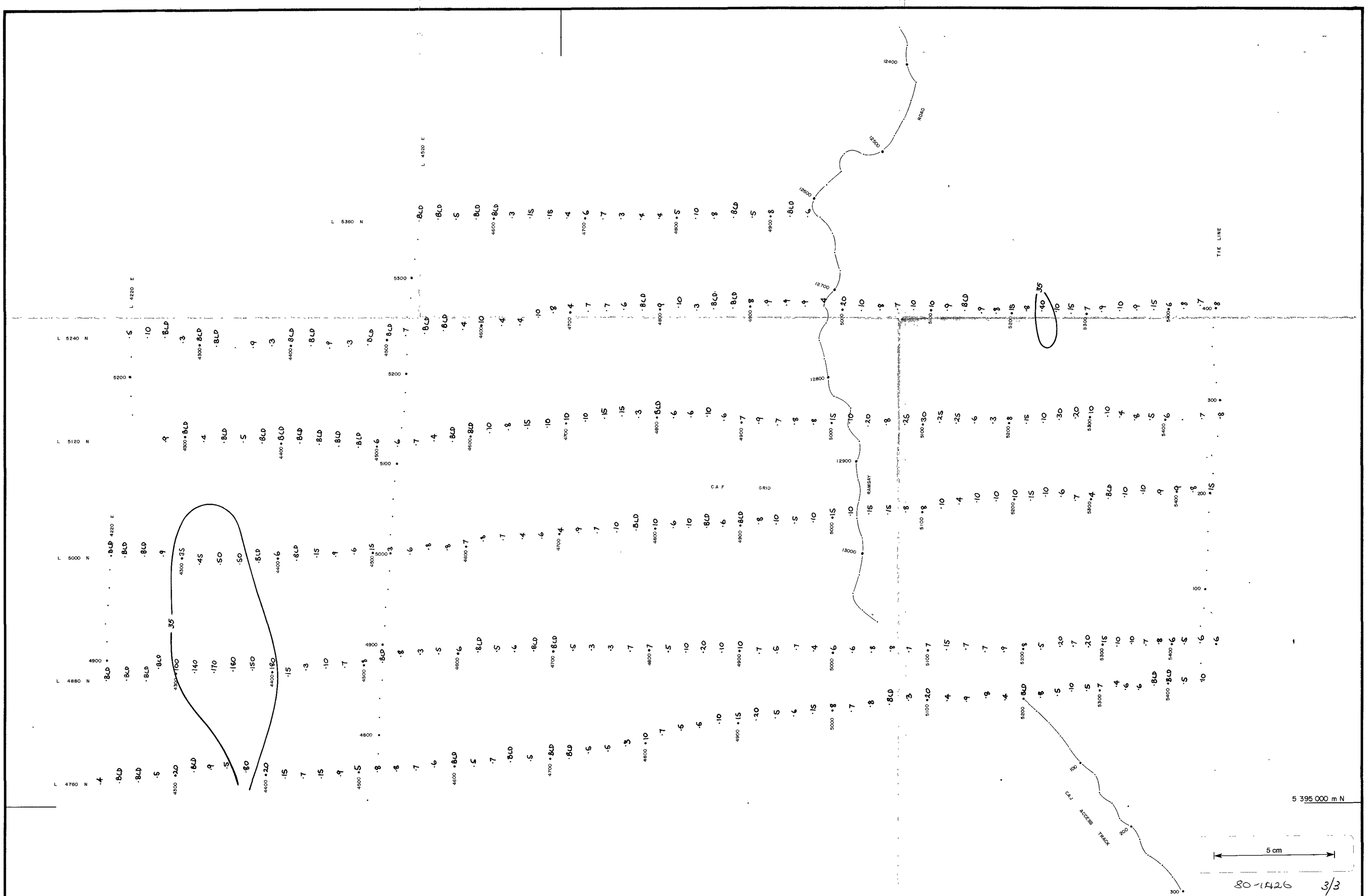
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 772

GEOCHEMICAL GRID AUGER SAMPLING

ZINC CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2037



80-1426 3/3

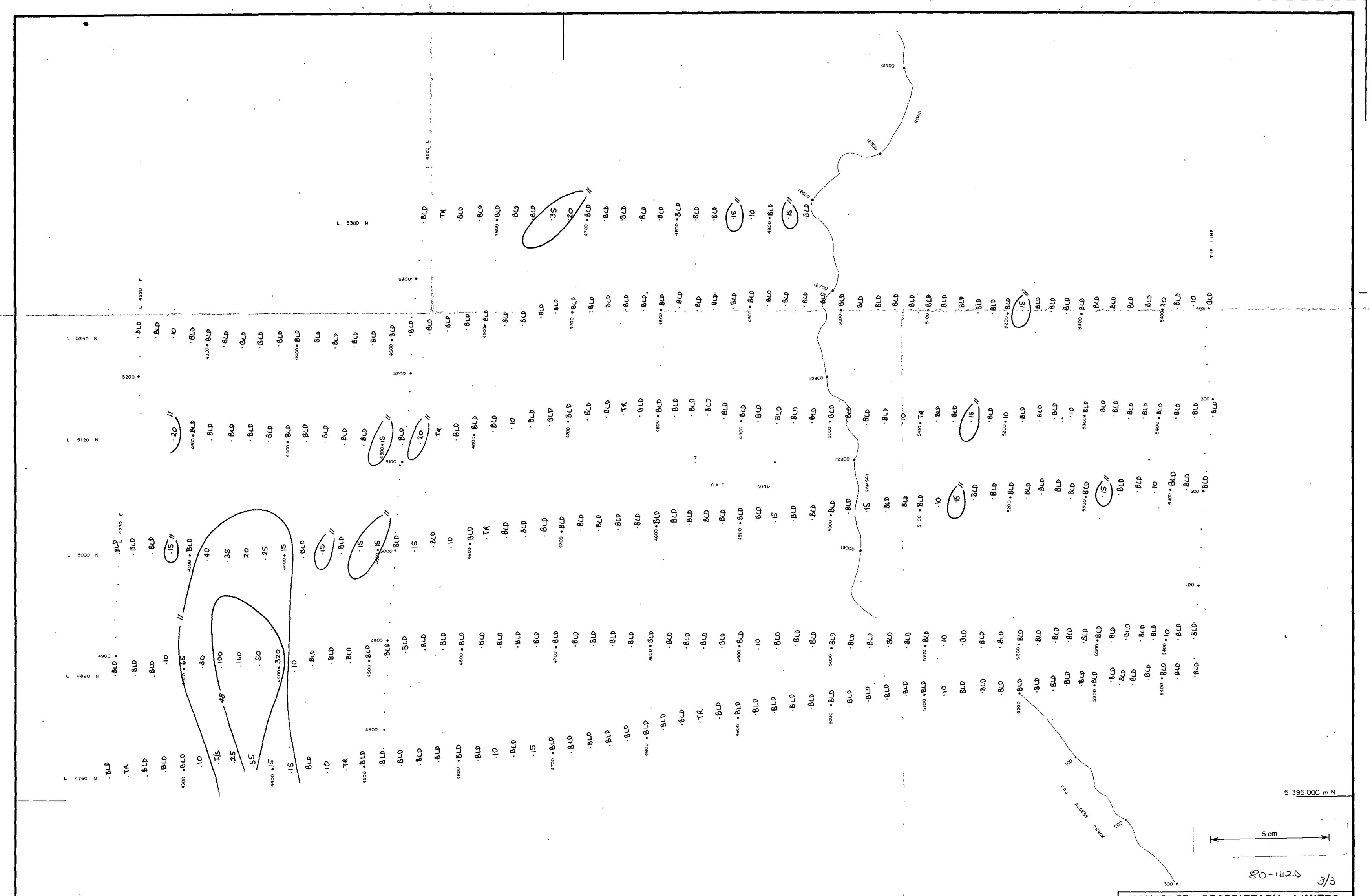
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 773

GEOCHEMICAL GRID AUGER SAMPLING
TIN CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 : 2500	TAS/2/2038

096136



80-1120 3/3

096137

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAF 774

GEOCHEMICAL GRID AUGER SAMPLING

TUNGSTEN CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2039

5 394 000 m N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4650 E

L 5350 E

4750 4850 4950 5050 5150 5250

1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100

tu/gw c mdr

qt sa/ss c carb sh

mdr

C A J GRID

65°
45°
75°
43°
67°

LEGEND

Crimson Creek Formation	mdr	microdiorite and basalt
	tu/gw	tuffaceous greywacke/volcaniclastic
Ramsay Group	qt sa/ss	micaceous quartz sandstone and siltstone
	carb ss/sh	carbonaceous siltstone and shale

Geological boundary

Geological boundary - tentative

Fault with hade

Strike and dip of bedding

Electromagnetic anomaly

5 cm

80-1426

373 000 m E

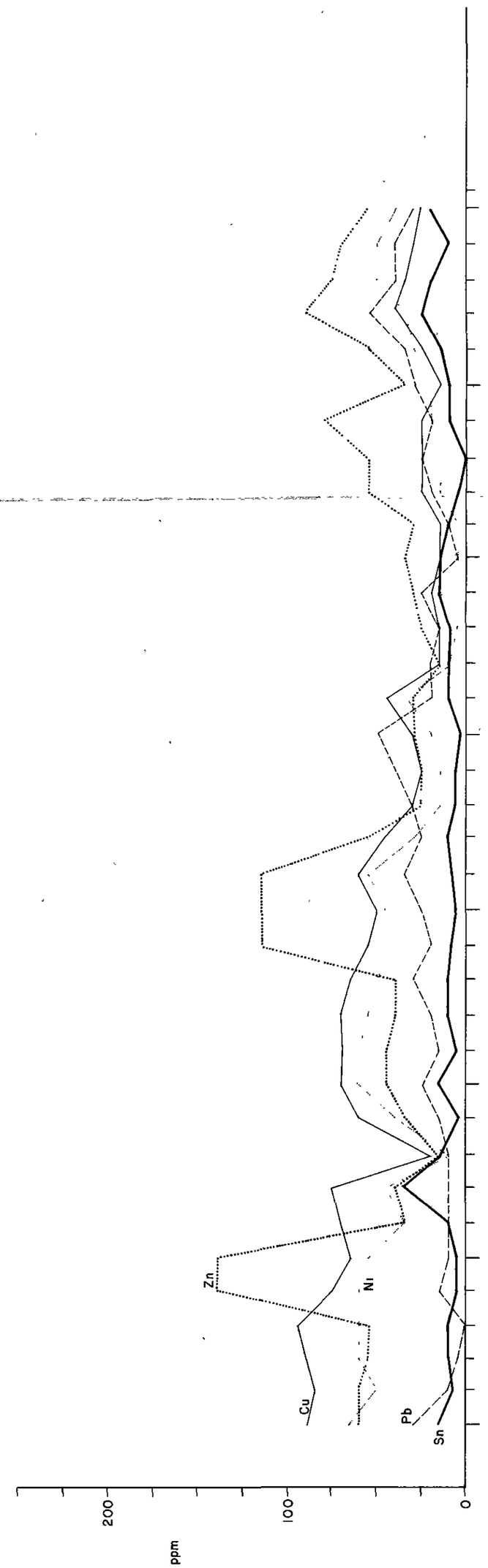
096138

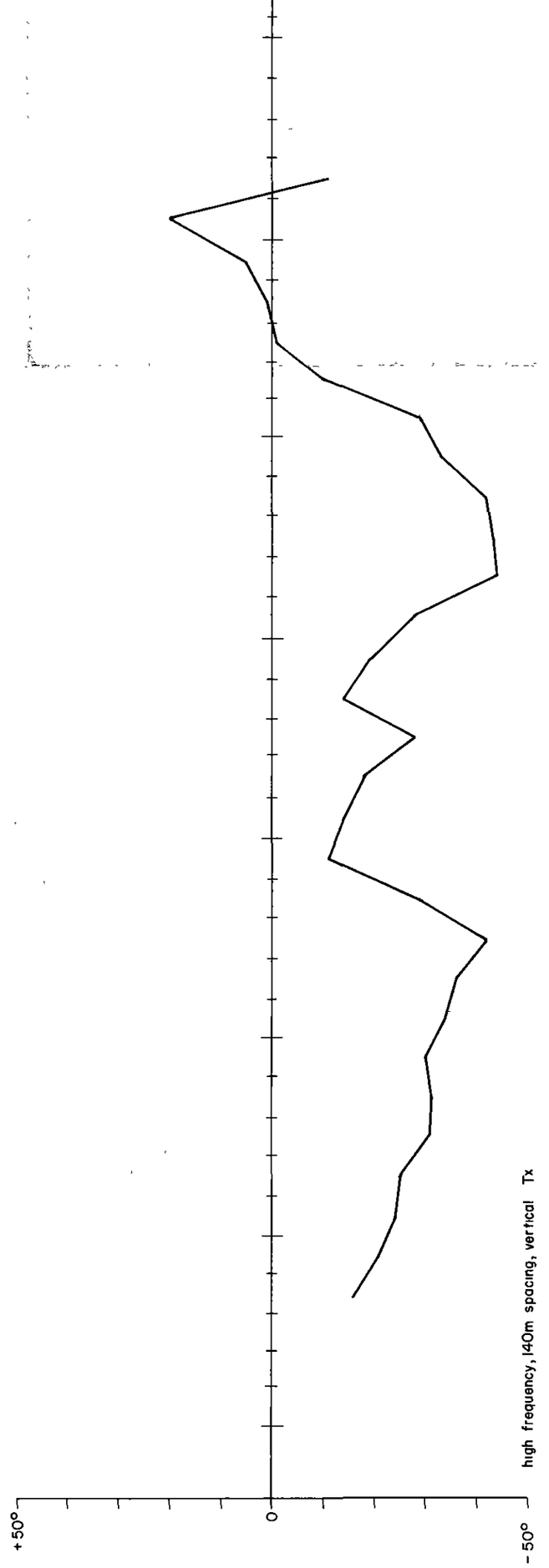
COMSTAFF PROPRIETARY LIMITED

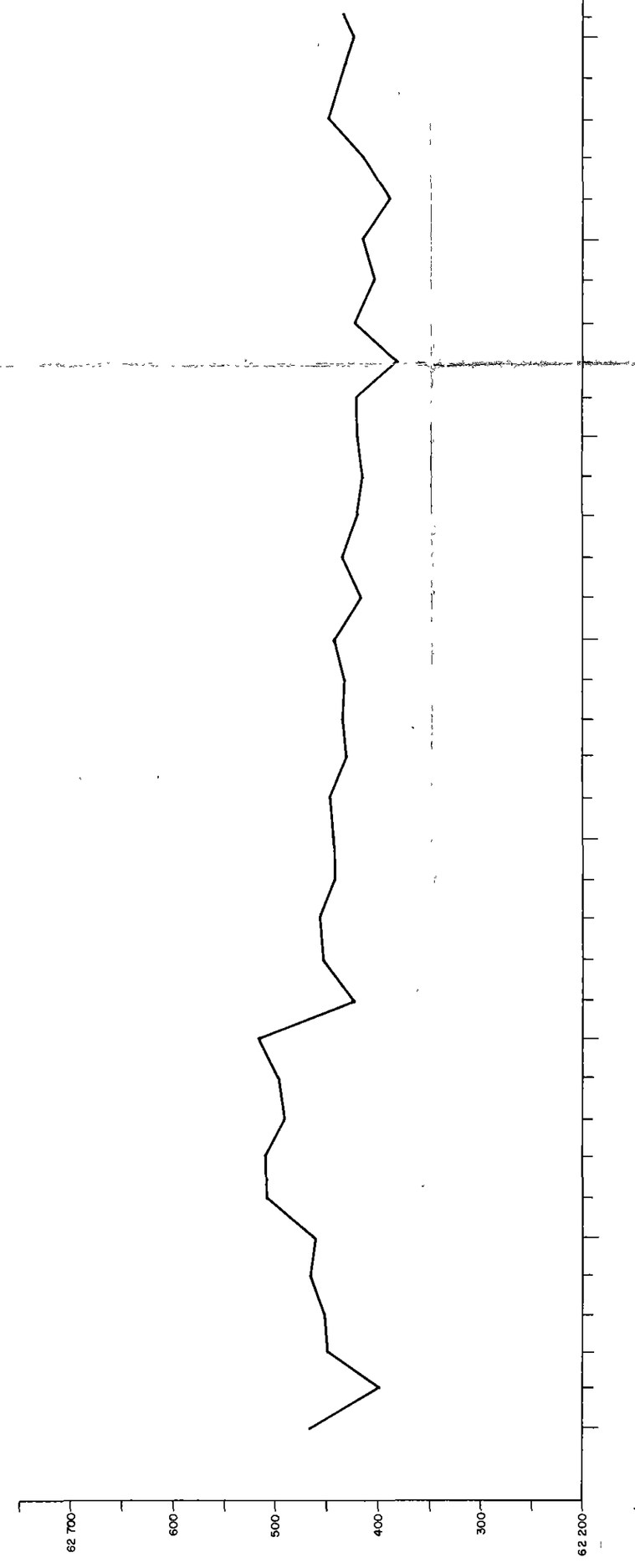
RAMSAY GRID - CAJ 775

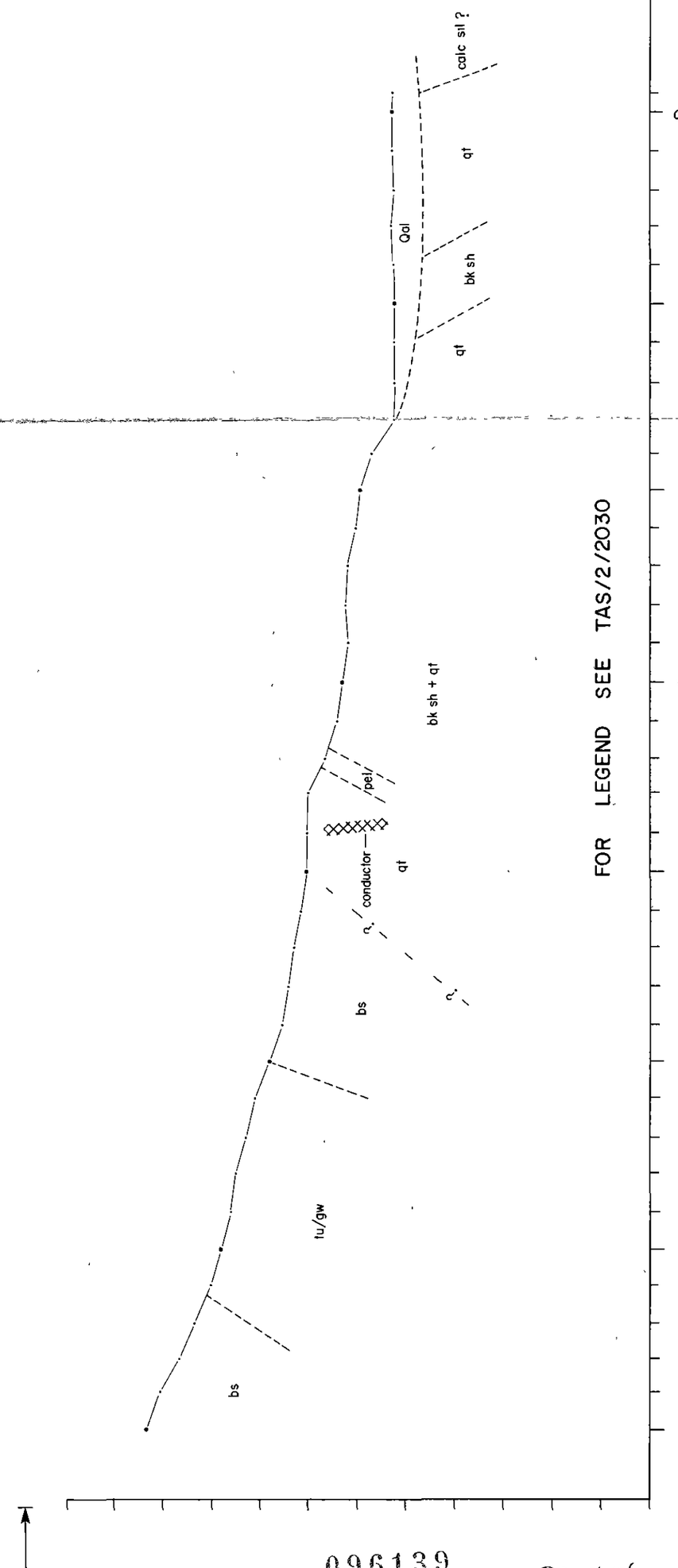
GEOLOGICAL INTERPRETATION

DRAWN	COMPILED	SCALE	
GEODRAFT 4/80	G F P	1 2500	TAS/2/2102









FOR LEGEND SEE TAS/2/2030

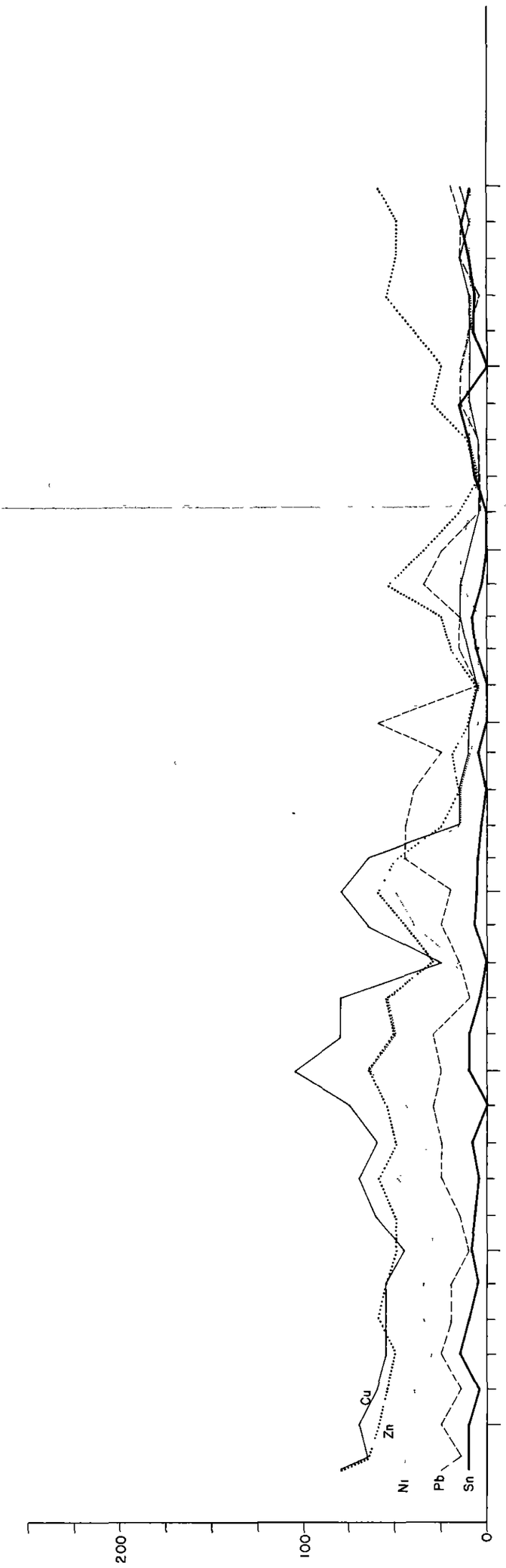
096139

80-1426

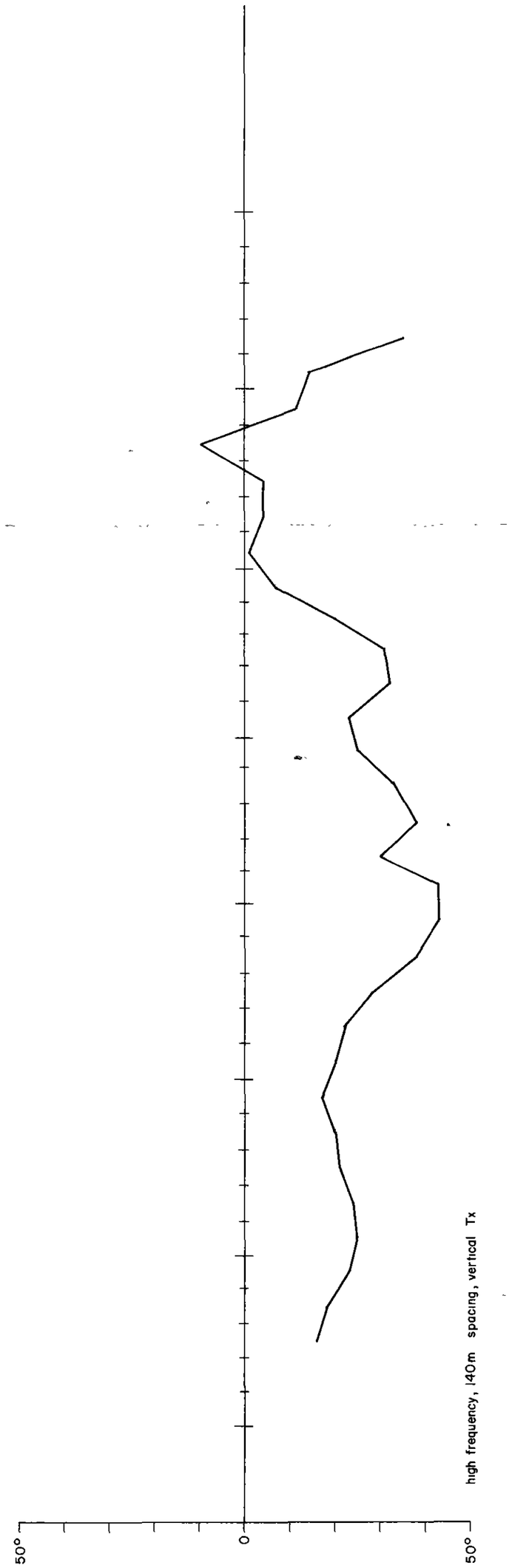
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 776
L 4760 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

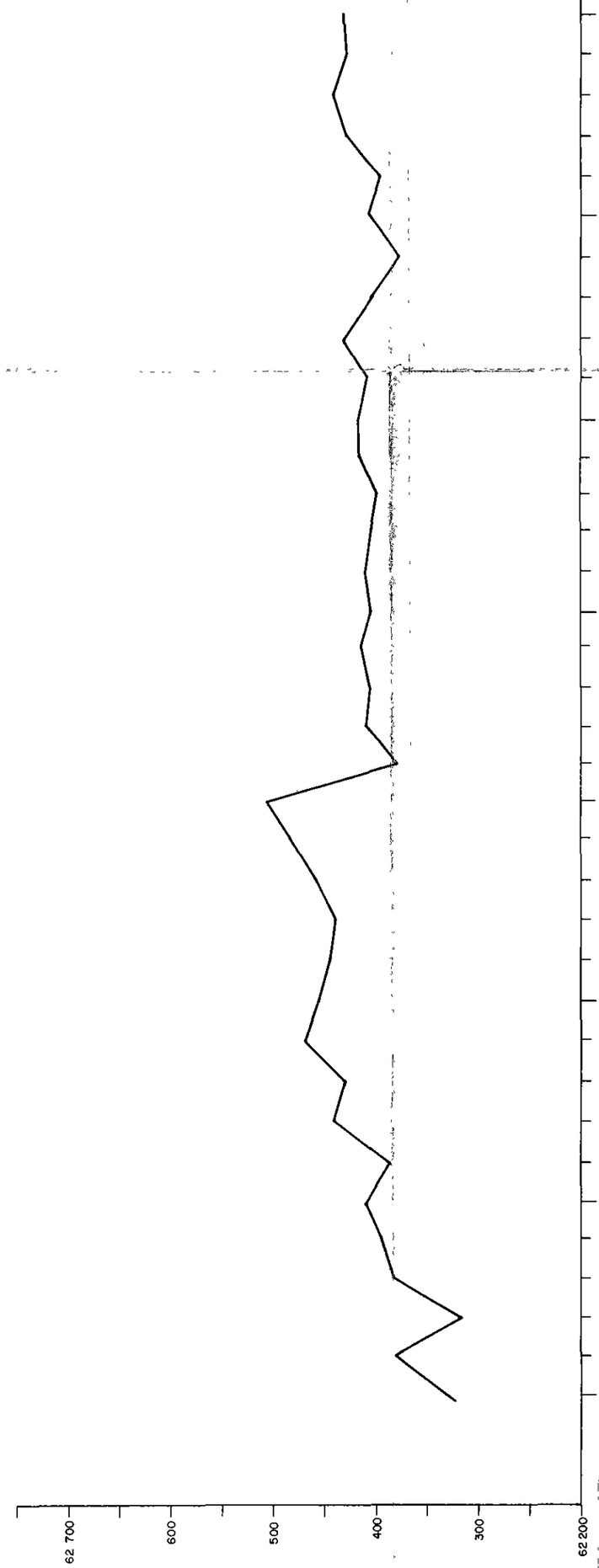
DRAWN	COMPILED	SCALE	
GFP 5/79	GFP	1 2500	TAS/2/1893



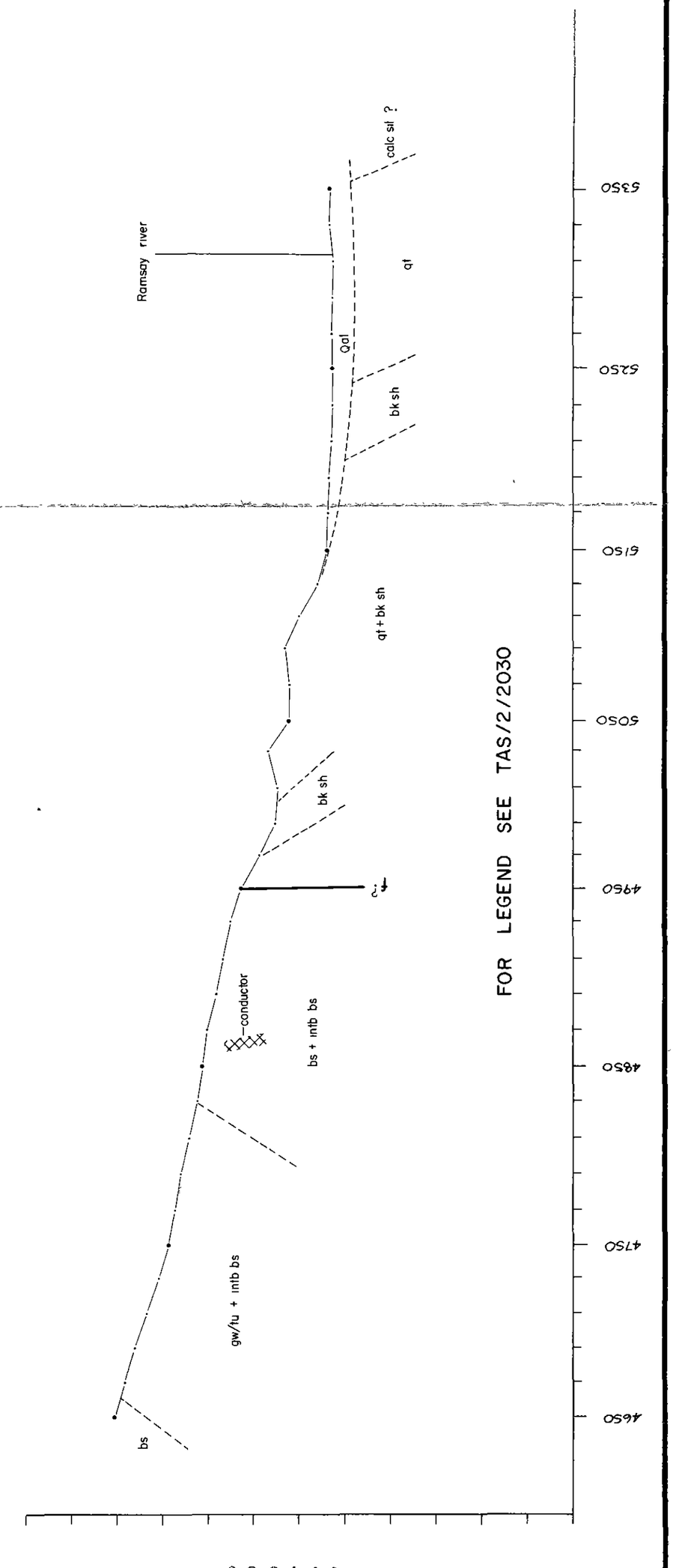
Geochemistry



Crone



Magnetics



5 cm

Topography

FOR LEGEND SEE TAS/2/2030

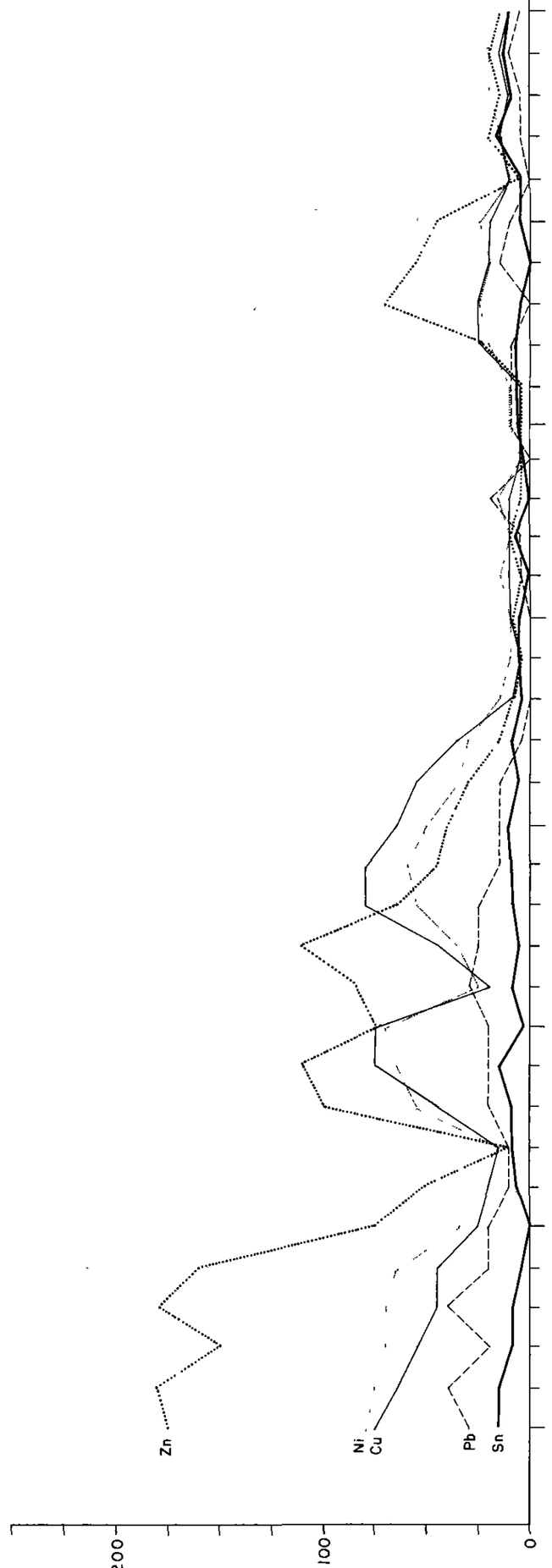
096140

80-1626

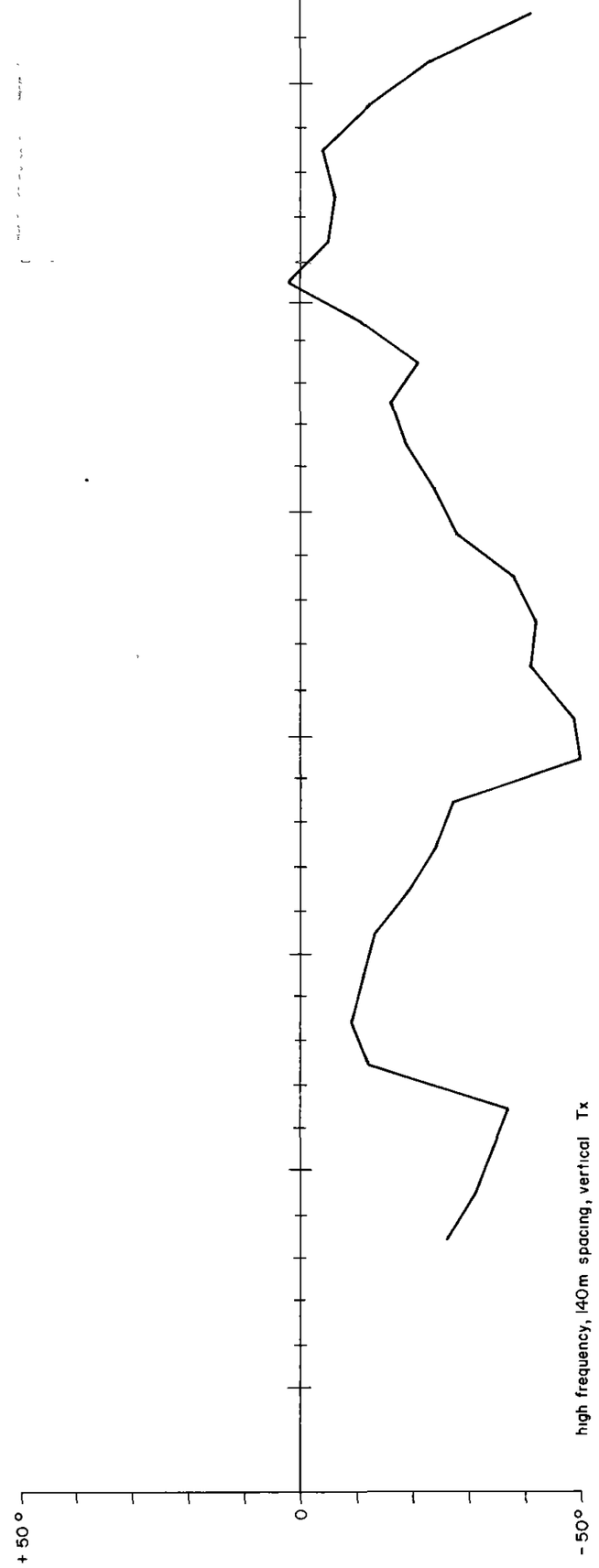
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 777
L 4880 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

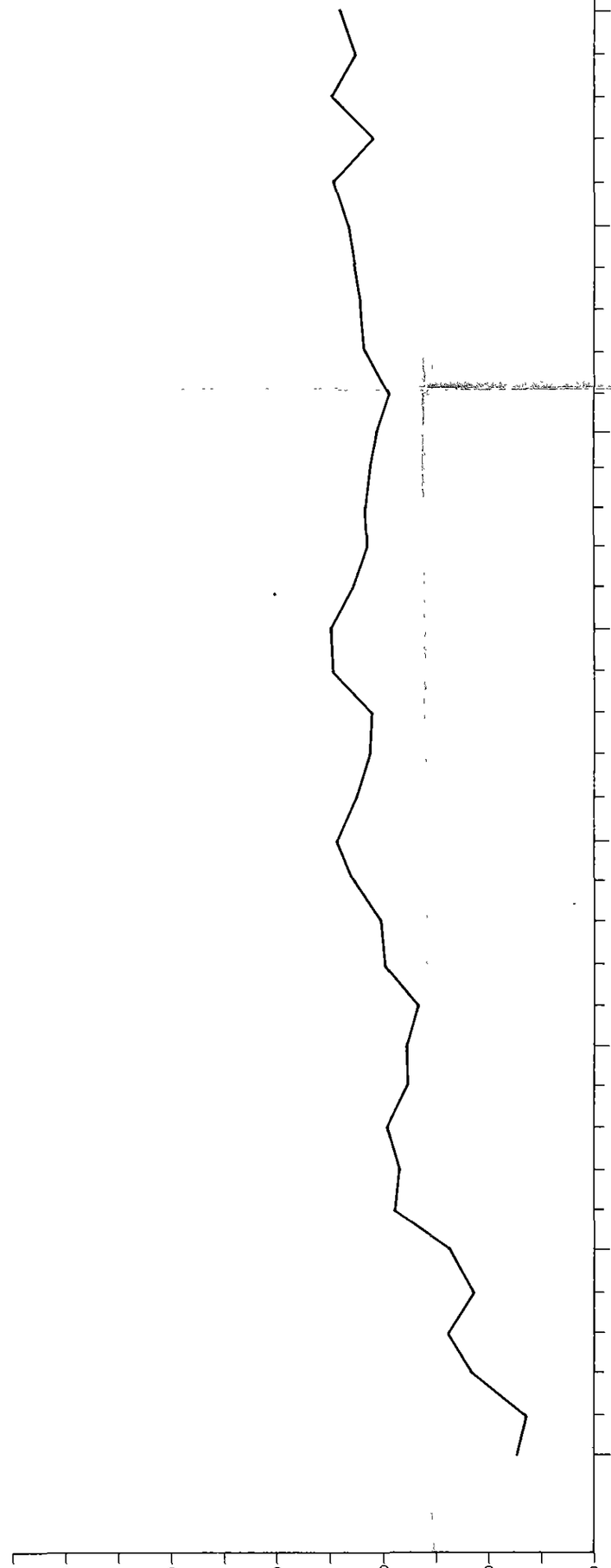
DRAWN	COMPILED	SCALE	
GFP 5/79	GFP	1 2500	TAS/2/1894



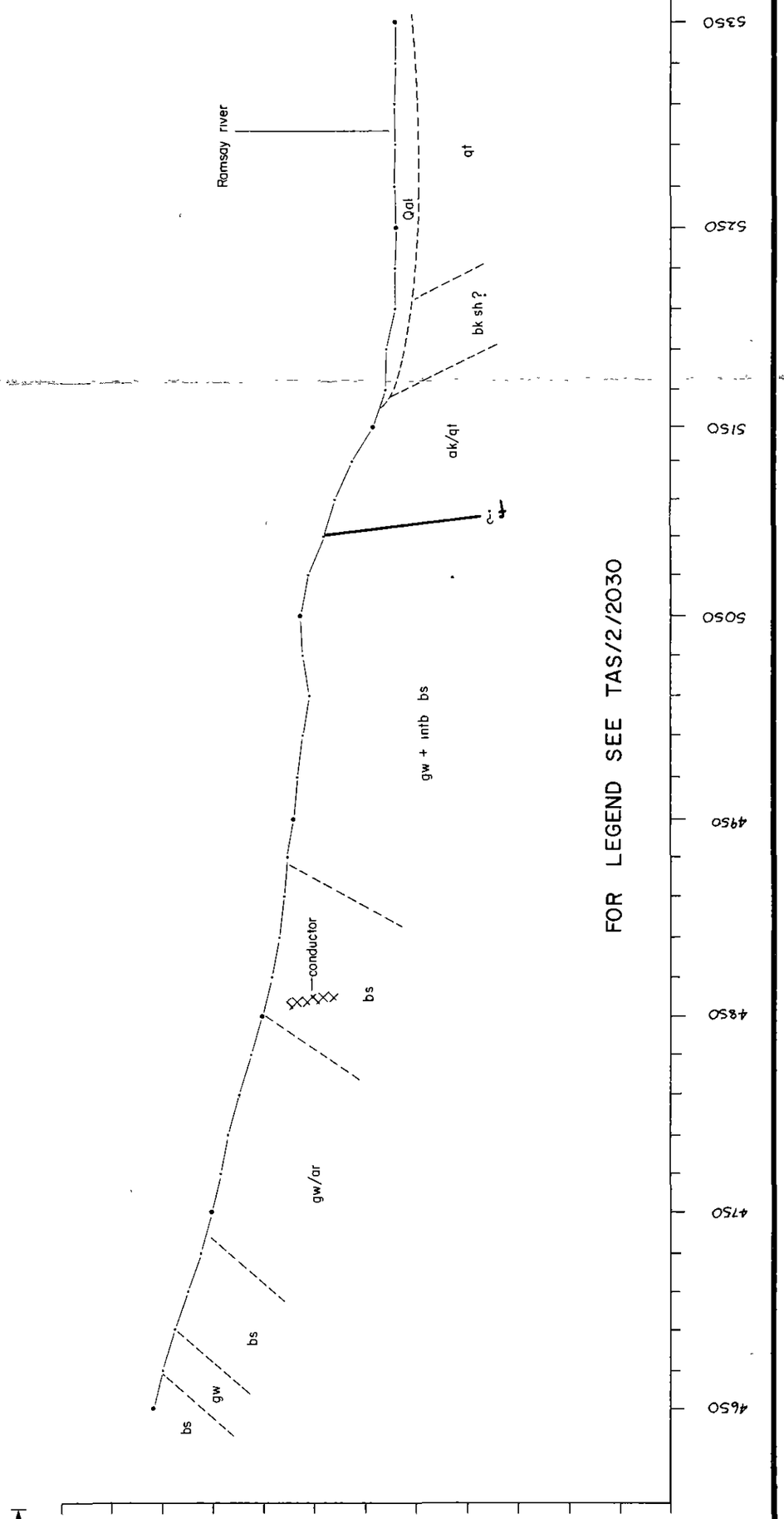
Geochemistry



Crone



Magnetics



FOR LEGEND SEE TAS/2/2030

5 cm

Topography

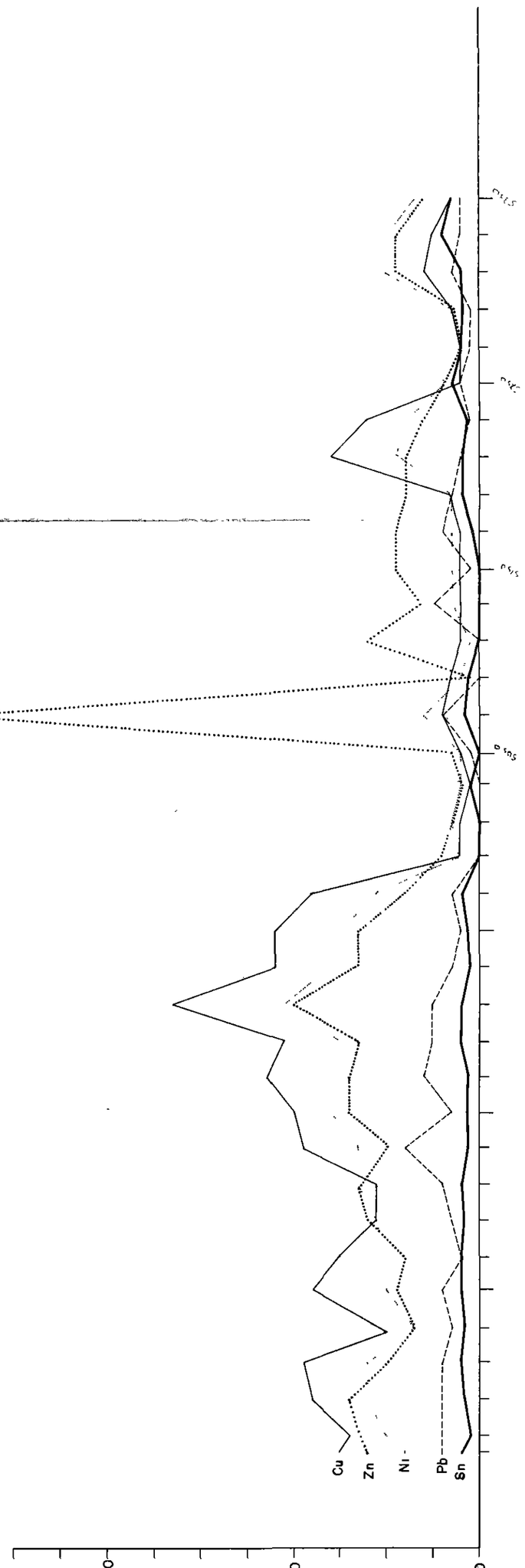
096141

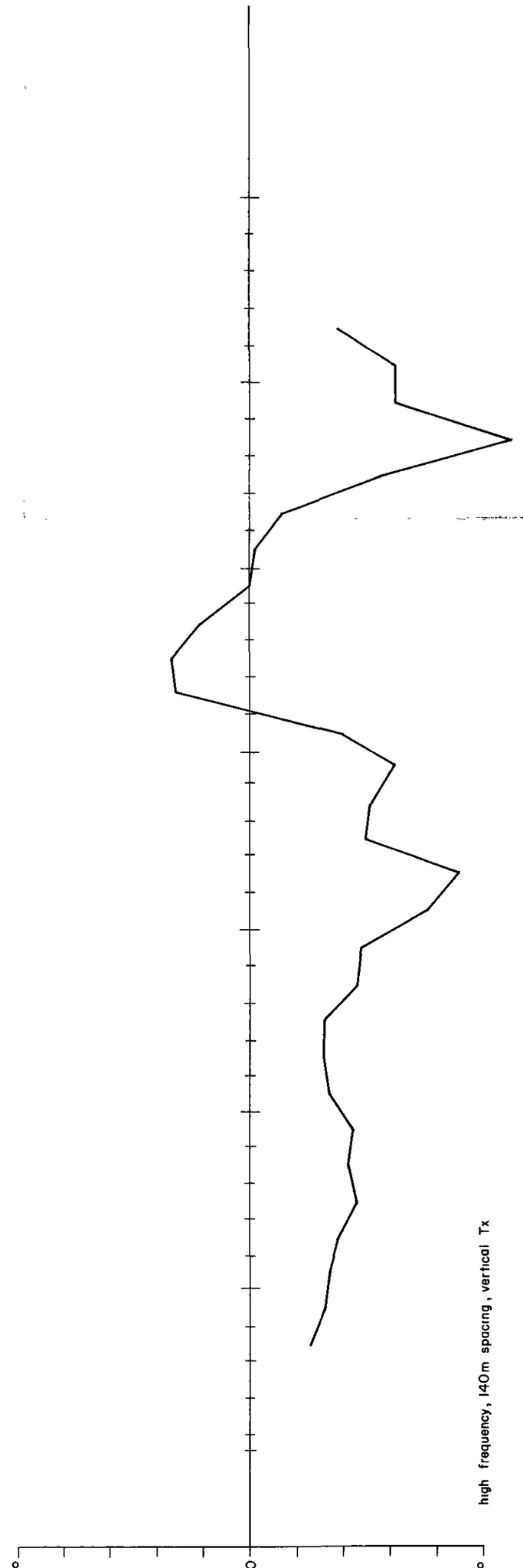
80-1426

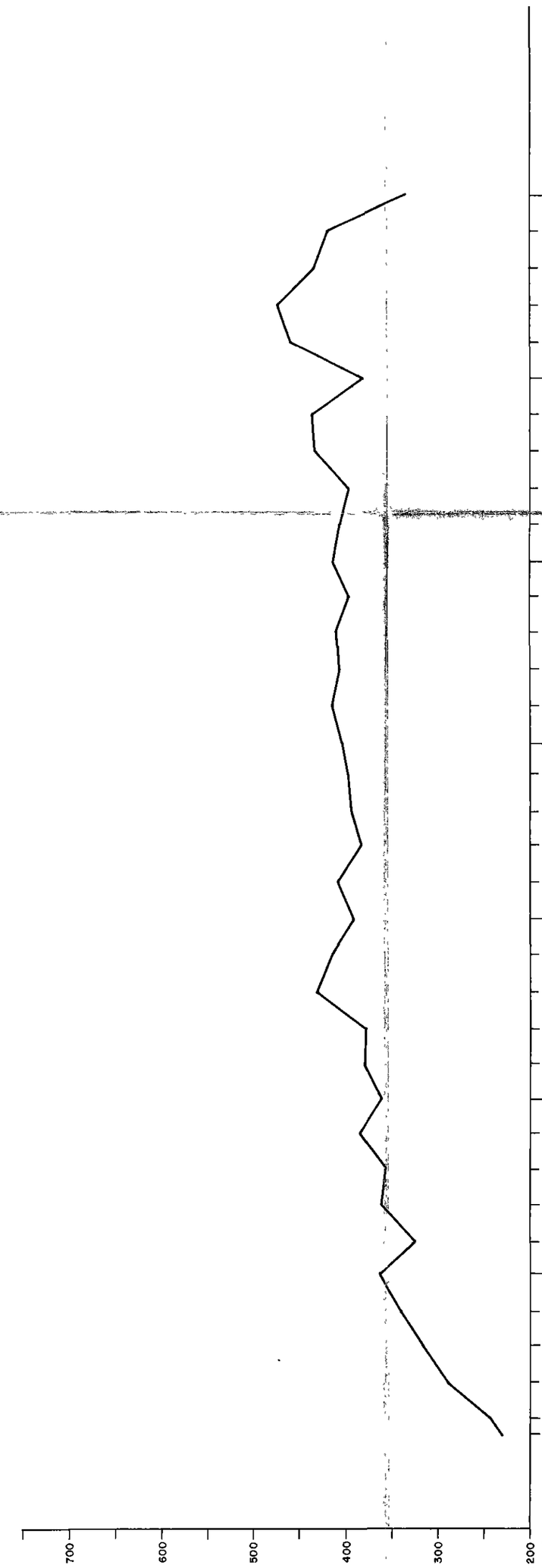
COMSTAFF PROPRIETARY LIMITED

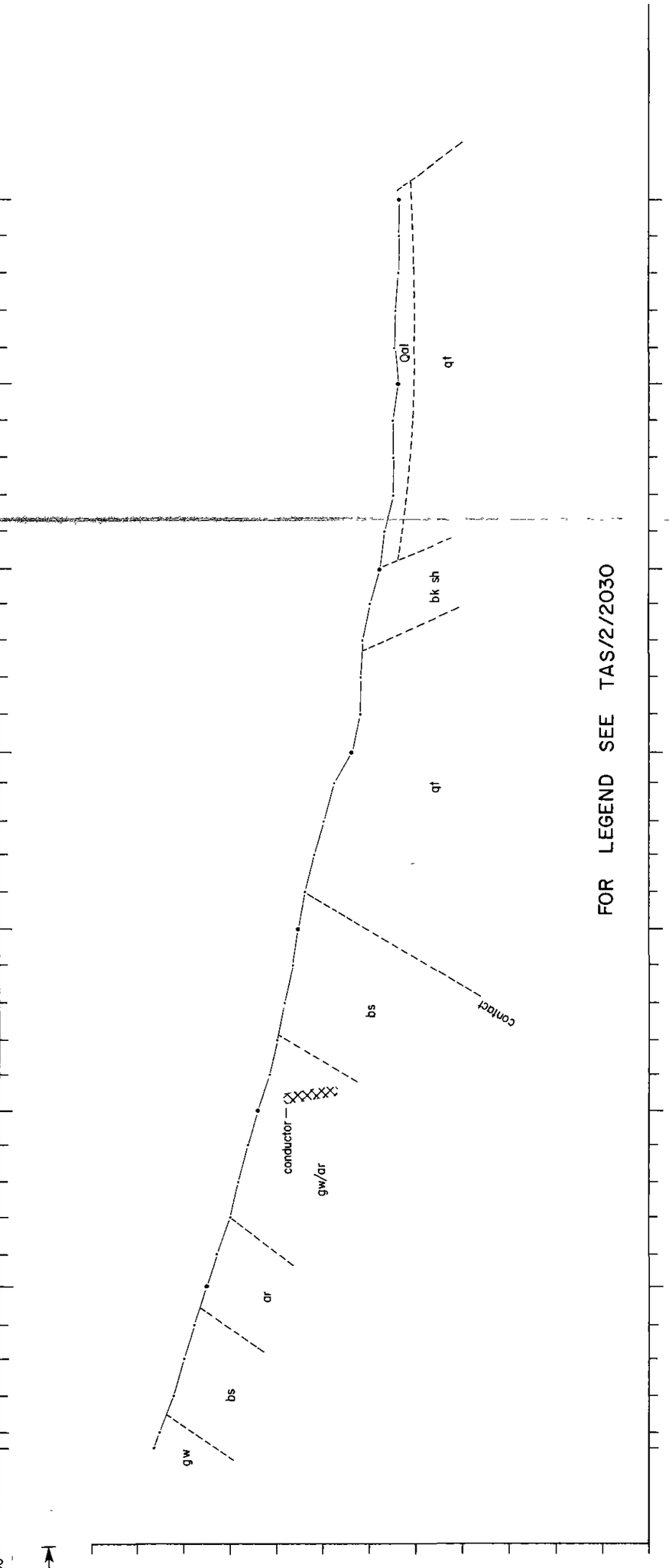
RAMSAY GRID - CAJ 778
L 5000 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

DRAWN	COMPILED	SCALE	
G F P 5/79	G F P	1 2500	TAS/2/1895









5 cm

Topography

096142 80-1426

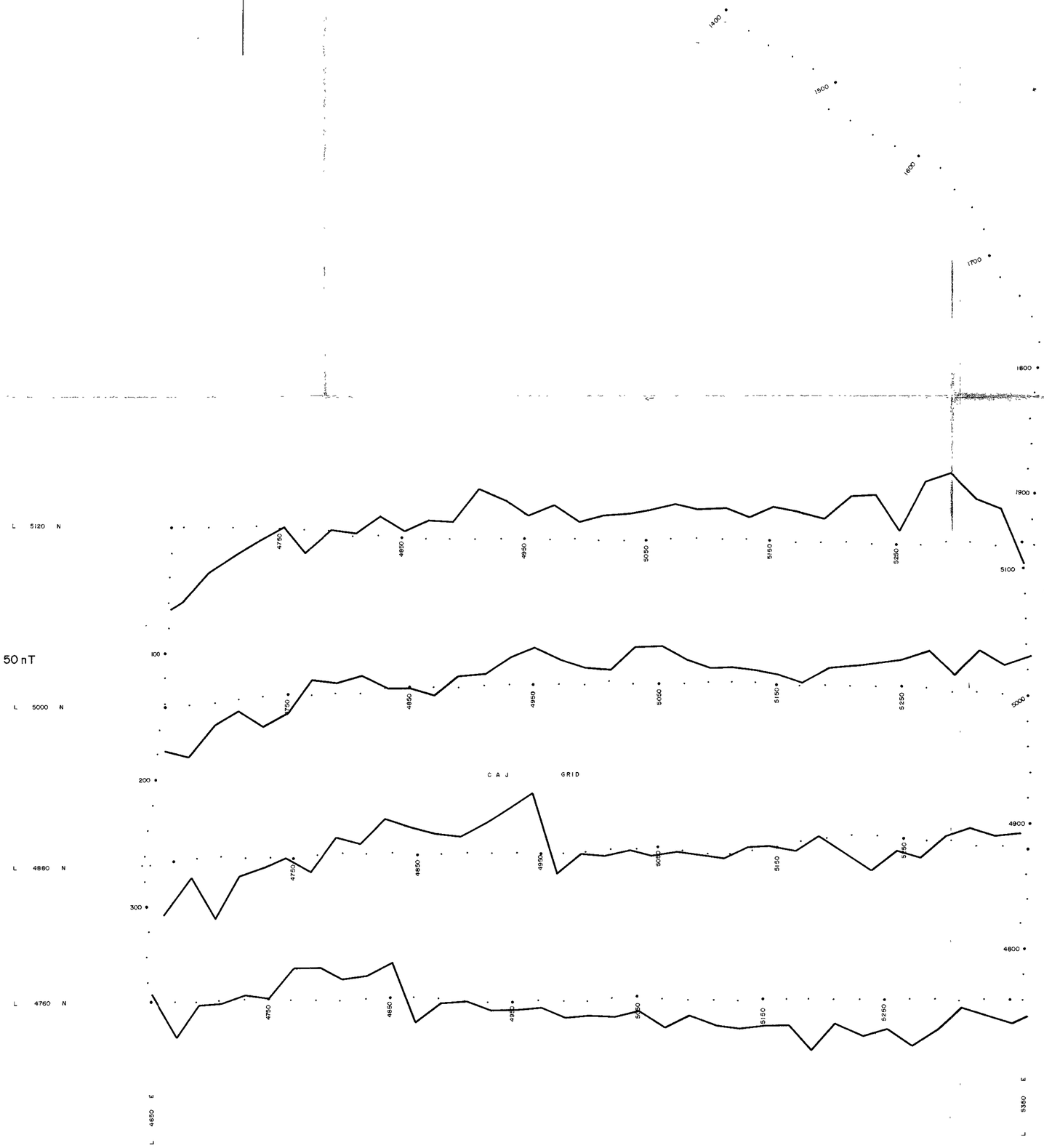
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 779
L 5120 N PROFILES
TOPO, MAG, CRONE, GEOCHEM

DRAWN	COMPILED	SCALE	
G F P 5/79	G F P	1 : 2500	TAS/2/1896

5 394 000 m N

VERTICAL SCALE - 1 cm = 50 nT



373 000 m E

5 cm

096143

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 780

STACKED GROUND MAGNETIC PROFILES

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1891

5 394 000 m N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4650 E

L 5350 E

373 000 m E

1400 1500 1600 1700 1800 1900 5100 5000 4900 4800

100 200 300

4750 4850 4950 5050 5150 5250

C A J GRID

VERTICAL SCALE - 1cm = 10° apparent dip

high frequency, 140m spacing, vertical Tx

5 cm

096144 80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 781

STACKED CRONE E.M. PROFILES

DRAWN	COMPILED	SCALE	
GEODRAFT 5/79	GEODRAFT	1 2500	TAS/2/1892

5 394 000 m N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4650 E

L 5350 E

373 000 m E

CAJ GRID

5 cm

096145

80-1426

COMSTAFF PROPRIETARY LIMITED			
RAMSAY GRID - CAJ 782 GEOCHEMICAL GRID AUGER SAMPLING COPPER CONTOURS in ppm			
DRAWN GEODRAFT 2/80	COMPILED G F P	SCALE 1 2500	TAS/2/2040

5 394 000 m N

373 000 m E

GRID

CAJ

5 cm

096146

80-1426

783

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ

GEOCHEMICAL GRID AUGER SAMPLING

LEAD CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2041

5 394 000 m N

L 5120 N

L 5000 N

L 4880 N

L 4760 N

L 4650 E

L 5350 E

373 000 m E

C A J GRID

5 cm

096147

80-1626

COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 784

GEOCHEMICAL GRID AUGER SAMPLING

ZINC CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS /2 /2042

5 394 000 m N

373 000 m E

GRID

096148

5 cm

80-1426

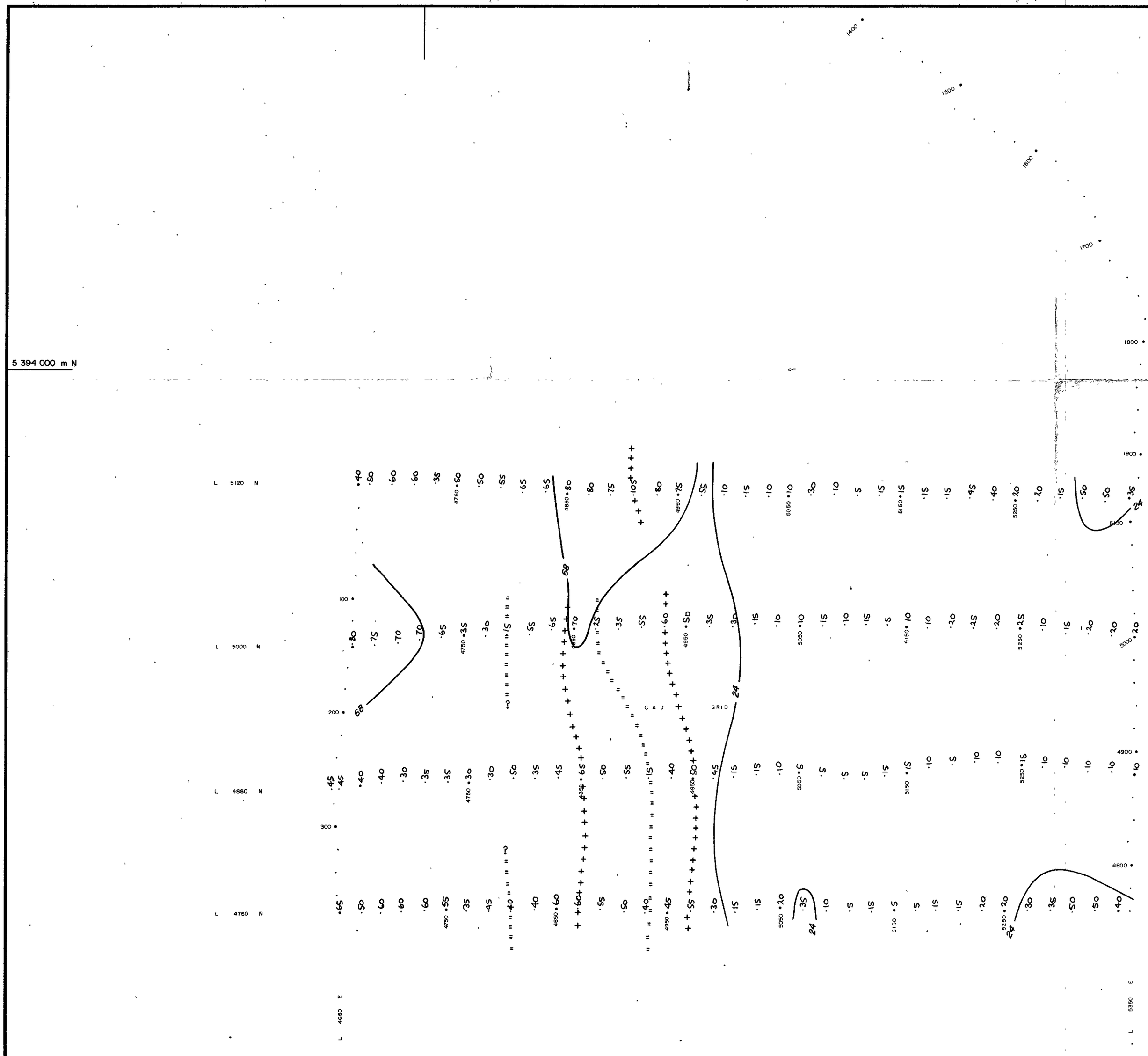
COMSTAFF PROPRIETARY LIMITED

RAMSAY GRID - CAJ 785

GEOCHEMICAL GRID AUGER SAMPLING

TIN CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2043



5 cm

096149

80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY. GRID - CAJ 786

GEOCHEMICAL GRID AUGER SAMPLING

NICKEL CONTOURS in ppm

DRAWN	COMPILED	SCALE	
GEODRAFT 2/80	G F P	1 2500	TAS/2/2044

E L 5 / 63

AREA 2

LEASE

COMSTAFF

BOUNDARY OF

WOMBAT FLATS

Summer Creek

Mount Creek

Howard Creek

Ramsay

Green Creek

Hamilton Creek

600

500

400

300

200

100

5 404 000 m N

5 403 000

5 402 000

5 401 000

5 400 000

5 399 000 m N

370 000 m E

371 000

372 000

373 000

374 000

375 000

376 000 m E

FOR LEGEND SEE TAS/2/2055

5 cm

TAS/2/2054

TAS/2/2055

TAS/2/2056

TN

SHEET INDEX

096150

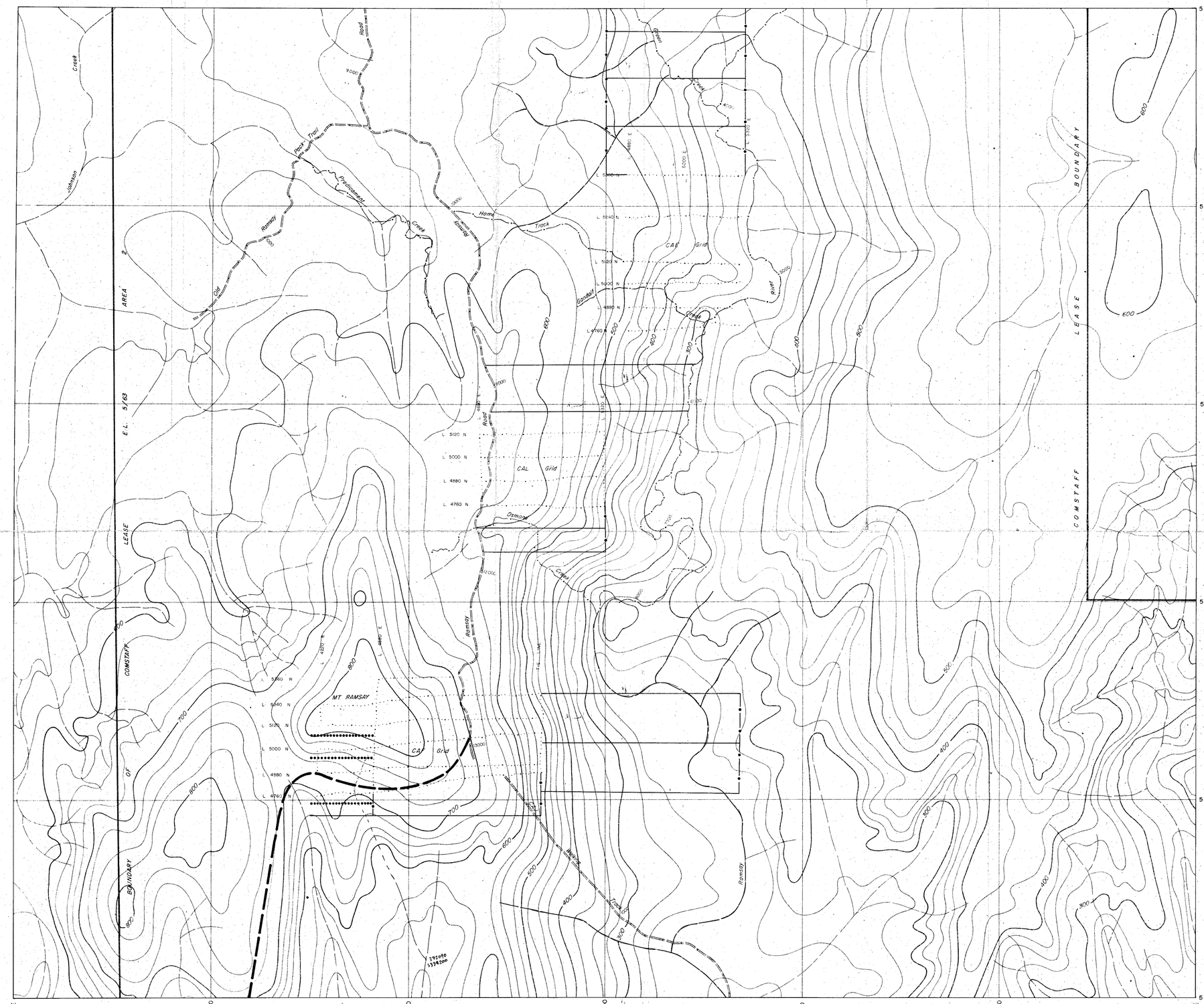
80-1426

COMSTAFF PROPRIETARY LIMITED

RAMSAY AREA 787

PROPOSED WORK PROGRAM FOR 1980

COMPILED	G.F.P.
DRAWN	GEODRAFT
DATE	11/2/80
AMENDED	
SCALE	1 : 10 000
PLAN No.	TAS/2/2054



LEGEND

- Access road construction
- Drainage surveying and geological mapping
- Grid lines cut, surveyed, sampled, geological mapping, crone EM, magnetics
- Tie and base lines cut, surveyed, geological mapping
- Contingency & intermediate lines cut, surveyed, sampled, geological mapping crone E.M, magnetics.

5 cm

TAS/2/2054

TAS/2/2055

TAS/2/2056

TN

SHEET INDEX

096151 80-1625

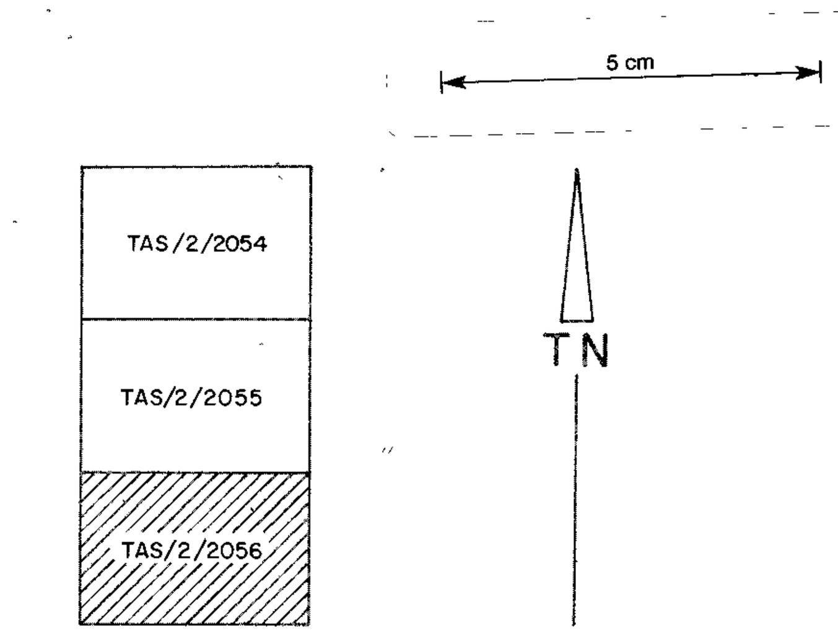
COMSTAFF PROPRIETARY LIMITED

RAMSAY AREA 788

PROPOSED WORK PROGRAM FOR 1980

COMPILED	G.F.P
DRAWN	GEODRAFT
DATE	11/2/80
AMENDED	21/4/80
SCALE	1 : 10 000
PLAN No	TAS/2/2055

FOR LEGEND SEE TAS/2/2055



SHEET INDEX

096152

80-1420

COMSTAFF PROPRIETARY LIMITED

RAMSAY AREA

789

PROPOSED WORK PROGRAM FOR 1980

COMPILED GFP	
DRAWN GEODRAFT	DATE 11/2/80
AMENDED	
SCALE 1:10000	
PLAN No TAS/2/2056	