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RENISON LIMITED

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S.P.L. 129

TRIAL HARBOUR AREA

WESTERN TASMANIA

ANNUAL REPORT 1976/77

BY A. Ross
GEOLOGIST

October, 1977

Copies to: Mt. Lyell (1)
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1. SUMMARY

Exploration for stanniferous replacement mineralisation adjacent to the Heemskirk Granite continued by means of ground magnetics, soil geochemistry and diamond drilling.

This work was confined to Area D, and was a continuation of a programme initiated in 1973-74. During the year the East Heemskirk Grid was established and this will facilitate the generation of exploration targets by future work, in a geologically favourable area to the north of Area D.

Results of the one diamond drill hole, TH 2, were disappointing yet highlighted the metasomatic alteration of the contact sediments.

Expenditure during 1976-77 was \$37,075 and a total of \$74,619 has been spent since 1973.

Work planned for 1977-78 includes

- (i) diamond drilling in Area D
- (ii) ground magnetics and I.P., soil geochemistry and mapping surveys on the East Heemskirk Grid.

An expenditure of \$40,000 is estimated for 1977-78.

2. INTRODUCTION

The Area D and East Heemskirk Grids are located 7 kilometres west of Zeehan, on the SE margin of the Heemskirk Granite. Cambrian sediments and ultrabasic intrusives in this area have undergone contact alteration and faulting related to the intrusion of the Heemskirk Granite. (Refer to Locality Map).

The area is regarded as prospective for primary tin deposits for the following reasons.

- (1) The Heemskirk Granite is stanniferous. Recorded production from alluvial and primary deposits of the Heemskirk Field is 1300 tons of concentrates (814 tons metallic tin).
- (2) The sedimentary sequences intruded by granite are stratigraphically equivalent, on a regional scale, to the Proterozoic-Cambrian Formations at Renison Bell - Pine Hill, Mt. Cleveland, Mt. Bischoff and Mt. Lindsay i.e. the Oonah Quartzite/Crimson Creek Formations which are host to stanniferous mineralisation. In addition, altered ultrabasic rocks occur and are regarded as favourable replacement hosts (e.g. Razorback, Pine Hill).

Skarn replacement or hydrothermal replacement, carbonate-ultrabasic horizons and fault infillings are seen as prospective targets within Area D and ground exploration has been carried out to outline these targets.

This report details the results of exploration carried out during 1976-77. Proposals for further work are outlined.

3. LAND TENURE

S.P.L. 129 is held by the Mt. Lyell Mining and Railway Co. Ltd., and exploration is undertaken by Renison Limited under a Joint Venture.

As detailed in the 1975-76 Annual Report, several Mineral Leases occur within S.P.L. 129. No significant tenure alterations occurred during 1976-77.

It should be noted, however, that 5 Mineral Leases totalling 145 ha occur in the Tenth Legion area and are reserved for iron ore only. The East Høemskirk Grid covers these leases.

4. PREVIOUS WORK

Exploration of Area D has been carried out since 1974 and has been reported in Annual Reports 1974-75 and 1975-76. Coverage by means of magnetic, I.P., soil geochemistry and mapping surveys succeeded in outlining two anomalous areas, as follows:

(i) East of Kelvin's and Mayne's Workings:

Geochemically anomalous Sn, Cu, As values were obtained on line 24E, 12N to 19N and line 25E, 11N to 17N. Diamond drill hole, TH1, on line 25E and testing this zone, intersected magnetite/pyrrhotite mineralisation within a steeply dipping sequence of metasomatised ultra-basics and volcaniclastic sediments of the Crimson Creek Formation. Tin values, however, were low (<0.1% Sn).

(ii) The "East-West Fault Zone":

From 21E 10S to 27E 8N, anomalous responses (soil geochemical and/or magnetic responses) were evident on most lines. Gossanous material is reported to occur on lines 24E and 26E associated with the anomalous zone.

The aim of work in 1976/77 was to:

- (i) define, by soil geochemistry and magnetic techniques, the eastward extensions of the two anomalous zones.
- (ii) test the anomalies by diamond drilling.

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5. WORK COMPLETED 1976-77

- (i) Traverse Line Cutting. Approximately 19.8 km of new grid were established. This included extensions to the Area D Grid, i.e. lines 28E, 29E and part of lines 26E, 27E, and the establishment of the East Heemskirk Grid.
- (ii) Ground Magnetics. Readings were taken along lines 26E to 29E of Area D and lines 1000N, 1200N of the East Heemskirk Grid. A Geometrics 6816 Proton Magnetometer was used (sensor height 2.3m). Readings were taken at 10m intervals.
- (iii) Soil Geochemical Sampling. "C" horizon samples were taken at 25m intervals on lines 28E, 29E where possible. The -85# fraction was analysed for tin and arsenic (by XRF) and nickel, copper, lead and zinc (by AAS).
- (iv) Diamond Drilling. D.D.H. TH 2 was collared at 27E, 25N bearing grid line south and at 45° declination. It was designed to test,
- (a) the eastern extension of the magnetite/pyrrhotite zone of D.D.H. TH 1.
 - (b) the major linear anomaly trending east-west across the southern part of Area D i.e. "the East-West Fault Zone".

6. EXPENDITURE

A total of \$37,075 was spent during 1976-77. A breakdown of dollars spent is presented in Appendix 1.

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7. RESULTS7.1. Geology - Area D

Further mapping has been carried out in the area of lines 28E, 29E; 23E - 24E; 1000N-1200N. Results are incorporated into the interpretation (figure 3). Appendix 4 contains petrological descriptions of hand specimens collected during mapping.

Little change to the overall geological structure is suggested and the reader is referred to previous reports for a description of Area D. In the south of the area, about lines 28E and 29E, the nature of the "East-West Fault Zone" has been clarified.

A traverse down Bridge Creek indicates a change from predominantly volcanoclastic sediments (tuffs, greywackes) to a sequence of well bedded quartzites and siltstones. The contact is characterised by a thick zone (approx. 40m) of silicified conglomerate, which correlates with material found on line 27E (8N to 9N) and 250m east of 24E 2N. Traces of sulphide mineralisation have been detected in float material and outcrop.

The conglomeratic zone was intersected in D.D.H. TH 2 and is discussed below in detail in section 7.3.

North of the conglomeratic zone, the rock types are typical of the Lower Cambrian Crimson Creek Formation, which may contain carbonate rich rocks such as are evident in the Mt. Lindsay area and in the Pine Hill area south of the Renison Mine. In Area D, metasomatic alteration and the introduction of sulphides is widespread although only minor to trace amounts of sulphide have been detected so far. The reader is referred to petrographic descriptions for an appreciation of the style of metasomatic alteration adjacent to the Heemskirk Granite.

South of the conglomerate zone, the well-bedded quartzites and siltstones are uncharacteristic of the Crimson Creek Formation and stratigraphic relationships are unresolved, relying on the interpretation of the conglomeratic zone i.e. "East-West Fault Zone", and the facing directions of the sedimentary sequences.

Several interpretations are possible:

- (i) If the sedimentary sequences are conformable then the conglomeratic zone represents a significant lithological change. A north facing direction would infer that the well bedded quartzite and siltstones are older than the tuffs and greywackes. As a consequence the conglomeratic zone could represent the base of the Crimson Creek Formation and may be equivalent to the Red Rock Member at Renison Bell.
- (ii) Conversely, a south facing direction would place the conglomeratic zone at the top of the Crimson Creek Formation and may represent the contact between the Crimson Creek Formation and Dundas Group.
- (iii) The zone contains recognisable sheared lithologies (hand specimens TH 27E 8N, 9N from Annual Report 1975-76) and could be a complex fault.

7.2. Magnetics and Soil Geochemistry:

Results are presented in profile and plan form (Figs 4, 5, 6) and the raw data comprise Appendices 5 & 6.

The major linear anomaly defined in the southern part of the area, i.e. the "East West Fault Zone", continues to be defined on lines 28E, 29E. On both lines a combined arsenic, tin, (copper) and magnetic response is evident i.e. 28E, 425 to 475N; 29E, 375 to 425N. These responses coincide with the conglomeratic zone cropping out in Bridge Creek.

From 700N to 1000N on both lines, the geochemical responses are weak apart from anomalous tin at 29E, 800N. This area is largely covered with swamp and the high tin response is not considered to be significant as the residual soil development is poor.

The distribution of lead is interesting (Fig. 6(d)). The higher values located in the southern part of the area appear to reflect the change in lithology south of the conglomeratic zone.

The eastern extensions of the geochemically anomalous zone tested by D.D.H. TH 1 cannot be distinguished on lines 28E, 29E perhaps due to the lack of well developed residual soils. The magnetic data is complicated north of 700N and appears to reflect metasomatically altered sediments and ultrabasics adjacent to the granite.

7.3. Diamond Drilling:

The profile of D.D.H. TH 2 is presented on Fig. 4(b) and the log and petrological descriptions comprise Appendix 3.

The hole encountered a steeply dipping sequence of variably metasomatised tuffaceous greywackes, siltstones and minor chert to 441m. Traces of sulphide mineralisation (mainly pyrrhotite) are present throughout and associated with narrow actinolite rich zones. The mineralisation is typical of altered Crimson Creek Formation sediments near granitic intrusives, such as at Pine Hill. Metasomatic alteration consists mainly as narrow actinolite bands, perhaps replacing original carbonate rich layers, and as irregular actinolite veinlets. Within these zones, sulphides are usually developed as minor patches and veinlets.

Intruding the sedimentary sequence, from 387 to 389.7m, is an altered ultramafic which is similar to the magnetite/pyrrhotite rich altered serpentinite of D.D.H. TH 1. Primary magnetite is replaced by pyrrhotite in the TH 2 interval but is non stanniferous. (387-389.7m assayed <0.05% Sn).

A narrow quartz-tourmaline vein was intersected from 408.0 to 408.4m, and contains traces of pyrite, pyrrhotite and chalcopyrite.

From 441m a complex suite of lithologies was encountered. Overall the dominant rock type is conglomerate with clasts of chert, quartzite and siltstone. Minor zones are extensively metasomatised with the development of diopside, actinolite, tourmaline and traces of pyrrhotite, chalcopyrite, arsenopyrite and sphalerite. No tin was detected from 441 to 494m.

Petrographic investigations indicate the conglomeratic zone (441 to 503m) contains altered zones which are of ultramafic or possibly carbonate origin. Much of the conglomeratic material is derived from basic, intermediate and rhyolitic volcanic sources.

From 503m, the hole encountered less altered siliceous sediments - mainly siltstones and sandstones. These are less typical of the Crimson Creek Formation.

8. CONCLUSIONS AND RECOMMENDATIONS

- (i) Conventional surface techniques were successful in delineating a linear anomaly from 22E to 29E in Area D. Drilling of this anomaly on line 27E intersected a wide conglomeratic zone containing highly altered zones and traces of sulphide mineralisation.
- (ii) The magnetite/pyrrhotite mineralisation intersected in D.D.H. TH 1 is possibly represented by the zone 387 to 389.7m in D.D.H. TH 2. Tin values are low and the zone is narrow.
- (iii) Apart from the conglomeratic zone, D.D.H. TH 2 failed to intersect any major carbonate or skarn lithologies within the Crimson Creek Formation sediments. Consequently the potential for the discovery of primary replacement deposits is downgraded in the north of Area D.

It is recommended that the conglomeratic zone be further tested by diamond drilling near line 24E. In this area, the zone appears to be transected by a N-S fault (as yet unobserved); the magnetic response of the zone is greatest; and tin has been detected in gossan developed on this zone (Annual Report 1974/75).

With regard to the East Heemskirk Grid, work should involve ground magnetic, soil geochemistry, mapping and I.P. surveys. The area is relatively unknown and the possibility exists of tin replacement deposits within sediments, altered basic rocks or as fault infillings.

9. BUDGET

Expenditure of \$40,000 is estimated during 1977-78. Details are set out in Appendix 2.

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BIBLIOGRAPHY

1. Preliminary Exploration Proposals SPL 129 Trial Harbour Area by L.A. Newnham. 1974 Unpubl. Rep. Renison Ltd.
2. Progress Report SPL 129 Trial Harbour Area by L.A. Newnham and R.N. Lees 1974 Unpubl. Rep. Renison Ltd.
3. Annual Report 1974-75 S.P.L. 129 Trial Harbour Area by K. Wells. Mt. Lyell M.&R. Co. Ltd., Unpubl. Rep.
4. Annual Report 1975-76 S.P.L. 129 Trial Harbour Area by K. Wells. Renison Ltd., Unpubl. Rep.

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APPENDIX 1

1976-77 EXPENDITURE

SALARIES	9,204
DIAMOND DRILLING	19,417
TRACK CUTTING	4,825
ROAD CONSTRUCTION	1,112
CONSUMABLES	1,822
MISCELLANEOUS	<u>695</u>
TOTAL	<u>\$37,075</u>

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 PROPOSED EXPENDITURE 1977-78

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PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
SALARIES	250	250	250	250	1000	1000	1500	1500	1500	1500	500	500	10,000
DIAMOND DRILLING	-	-	-	-	-	-	-	-	10000	10000	-	-	20,000
ACCESS DEVELOPMENT	-	-	-	-	-	1000	1000	-	-	-	-	-	2,000
GEOPHYSICS	-	-	-	-	-	-	3000	3000	-	-	-	-	6,000
CONSUMABLES	-	-	-	500	-	-	500	500	500	-	-	-	2,000
TOTALS	250	250	250	750	1000	2000	6000	5000	12000	11500	500	500	40,000

APPENDIX 2.

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RENISON LIMITED - DIAMOND DRILL RECORD

HOLE NUMBER	TH. 2	SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
		Depth	Bearing	Dip			D. Sin Dip	R.L.	D. Cos Dip	Prog. Total
PURPOSE	To test skarn of TH1 and "fault" zone.	00		-45 ⁰				00		0
		50	172 ⁰	-38 ^{1/2}	0-25	25	15.6	-15.6	19.6	19.6
		100	172 ⁰	-34	25-75	50	28.0	-43.6	41.5	61.1
LOCATION	Line 27E 2500N Area D.	150	172 ⁰	-31	75-125	50	25.7	-59.3	42.9	104.0
		200	169 ⁰	-28	125-175	50	23.5	-92.8	44.1	148.1
COLLAR R.L.		250	-	-22	175-225	50	18.7	-111.5	46.4	194.5
		280	-	-21	225-265	40	14.3	-128.8	37.3	231.8
CO-ORDINATES		300	174 ⁰	-17	265-290	25	7.3	-133.1	23.9	255.7
		320	-	-20	290-310	20	6.3	-139.9	18.8	274.5
LENGTH	512.7m	335	-	-14	310-327 ^{1/2}	17 ^{1/2}	4.2	-144.1	17.0	291.5
		≈ 350	-	-25	327 ^{1/2} -342 ^{1/2}	15	6.3	-150.4	13.6	305.1
HOLE SIZE	0-48 NQ 48-512.7m BQ	≈ 370	-	-17	342 ^{1/2} -360	17 ^{1/2}	5.1	-155.5	16.7	321.8
					360-513	153	39.6	-195.1	147.8	469.6
COMMENCED	March 28th 1977.									
COMPLETED	May 17th 1977									
SIGNIFICANT CORP LOSS ZONES										
ONE ZONE GROUND CONDITIONS										
LOGGED BY	A. ROSS.									
COMMENTS	Magnetite - pyrrhotite basic rock from 387 to 389.4m - May correlate with altered ultrabasic zone in TH. O.D.H. 1. Metasomatised conglomerate rich zone from 441 to 494m									

SUMMARY - ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m.)	AVERAGE WEIGHTED ASSAYS				
				Sn.	Cu.	As.	S.	

SUMMARY METALLURGICAL DATA COMPOSITE SAMPLE

LODE NAME	FROM	TO	Sn.	Cu.	As.	S	Ca F ₂	Ag.	Bi		Sn - Rec.	Cu - Rec.	Carb.	Silic.	S.G.

Appendix 3.

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DIAMOND DRILL RECORD

HOLE NUMBER TH 2

LOGGED BY: A.R.

INTE FROM	VAL TO	RECOVERY		DESCRIPTION	FORMATION	ASSAYS														
		m	%			FROM	TO	Sn	S	As	Cu	Pb	Zn	Bi	Ag					
0	21	2		Weathered rock and clay. Poor recovery.																
21	32	10		Fresh but broken, massive to weakly bedded sandstones, grey-wacke. Variable mottled colours and irregular veinlets indicating metasomatic alteration. Colours predominantly grey to dark brown. One metre core loss between 30 and 31m. No visible sulphides.	CRIMSON CREEK FORMATION VOLCANICLASTIC SEDIMENTS.															
32	86.6			Light grey to cream, grey to brown metasomatised, altered sandstones and minor chert-siltstone. Poorly bedded. Trace pyrrhotite associated with some actinolite/chlorite veins. Bedding slumped - turbidite. Core slightly broken. Main alteration by way of pale green patches and diffuse layers parallel to bedding. BCA 44 at 77m. Brecciated fragments in carbonate-filled fracture at 86m (Zone 4cm wide)																
86.6	90.1			Colour change. Predominantly light grey to green altered siltstones, greywacke -- mainly cherts with less volcanoclastic sediments. Trace very fine pyrrhotite. Metasomatic alteration as before. Carbonate filled breccia at 88.9 to 90m.																
90.1	99.5			Change to dark brown (bluish tinge) massive poorly bedded greywacke. Metasomatised volcanoclastic sediment. BCA 60																
99.5	104.5			More cherts in volcanoclastic sequence. Grey colour. Now Non-calcareous. Irregular mottled alteration. Trace pyrrhotite.																
104.5	118.7			Brown metasomatised (actinolite/Chlorite), volcanoclastic, poorly bedded sediments																
118.7	161			This zone displays greater metasomatic alteration. Grey to cream, more siliceous, fine grained sediments. Bedding often contorted although BCA av. 50°. Actinolite patches and veinlets, some containing black fine grained tourmaline and/or trace sulphide (pyrrhotite). Microbrecciation throughout. Brown volcanoclastic sediments from 135 to 137m. From 145 to 161, zone particularly altered with mottled cream and grey colours and trace pyrrhotite. Bedding often contorted. Pinkish tinge to cream patches could be fine axinite. Patches of black tourmaline																
161	288			Slight change in colour to darker grey-green and brown volcanoclastic sediments. Variable alteration. From 170m veinlets of cross cutting, later stage carbonate occur. Very common from 173.2 to 176.5m (Veinlets are 30° to 60°). Carbonate infilled fractures occur at 173.5, 174.6, 175.9m. Lesser veining from 176 to 179m then carbonate veins and broken core common from 179-181.4m. FAULT ZONE 173 to 181.4m No mineralisation evident. Carbonate veinlets cross cut the actinolite/chlorite alteration. Veinlets occur sporadically up to 195m. From 181.4 to 195, metasomatised cherty sediments with trace pyrrhotite. Well bedded FCA 70°, Non calcareous. After 195, lithologies are predominantly brown with green alteration. Mainly slumped bedded volcanoclastic sediments. Fine to medium grained greywackes, siltstones, with very minor buff cherty layers. Trace sulphide in actinolite zones and very rare black tourmaline. After 253m, minor quartz veinlets as alteration.																

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DIAMOND DRILL RECORD

HOLE NUMBER: TH 2

LOGGED BY: A.R.

INTERVAL		RECOVERY		DESCRIPTION	FORMATION	ASSAYS									
FROM	TO	m	%			FROM	TO	Sn	S	As	Cu	Pb	Zn	Bi	Ag
288	288.8			Altered actinolite rich zone. Trace pyrrhotite and black tourmaline Minor bedded chert.											
288.8	294.3			Brown pebbly turbidite. Clasts are slumped, rounded fragments in volcaniclastic matrix.											
294	387			Core slightly broken from 296 to 305m. Grey to dark grey-brown metaso- mised volcaniclastic sediments. Irregular blotchy alteration. Mainly quartz rich with lesser actinolite. Core very broken from 324.5 to 330m Actinolite alteration increasing from 336m BCA 60° at 345m. Brown, poorly bedded slumped volcaniclastic sediments with minor chert layers. Core very broken from 353 to 356m, with 1 metre lost. Less alteration from 360 to 365m, then normal actinolite rich al- teration. Core broken from 384 to 386.5 with 0.5 metre lost.											
387	389.7			Very dark to black semi-massive magnetite/pyrrhotite rich rock. Blotchy altered basic rock. May correlate with altered serpentinite in D.D.H. 1.		387	389.4	<0.05 Sn core analyser							
389.7	441.4			Mainly brown, metasomatized volcaniclastic sediments with minor chert Slumped bedding. B.C.A. 65° at 398m. Minor quartz actinolite alteration. From 408.0 to 408.3 Zone of black tourmaline, trace pyrrhotite, chalcopy- rite. Increased actinolite alteration from 417.3 to 421.5. Trace pas. From 421.5 to 431m, brown slumped sediments with one or two minor carbonate veinlets. Some pelletal rich zones. From 431 to 434.5m green altered chert and volcaniclastic sediments. Microbrecciated BCA 50° at 434m. Rare carbonate veinlets. Increasing clastic component in last few metres of this interval.											
441.4	512.7			Complex, metasomatized, altered weakly mineralised conglomerate/breccia rich lithology. Zones of axinite, actinolite rich alteration common up to 494m. Very indurated - possibly silicified carbonate component or diopsidic. Minor development of black tourmaline. BCA's 70-90°. Sulphides up to 2% in rare zones. After 494.5, narrow well bedded and laminated siltstone occur. PCA 50° Siltstone from 494.5 to 495.5, and 496.5 to 500.5m. Cemented siliceous pebble grit from 503.6 to 505.2m. From 505.2 to 512.7 mainly poorly bedded siltstone with minor coarse zones. Little alteration. Definite sedimentary facings difficult to find, although suggest facing is "down the hole".		441	494	<0.05 Sn core analyser Check samples taken.							
						480.2	480.5	0.06	0.62	0.14					
						476	477.0	0.05	<0.10	40.05					
				END OF HOLE 512.7m											

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DIAMOND DRILL HOLE PLOT

No. 1, DDH-TH2

SCALE:

Diamond Drill Core DDH-TH2TH2/344m (TS 21412)

This is a metamorphic rock consisting largely of pale green actinolite with irregular to crudely vein-like masses of phlogopite studded with fine dark but color-variable tourmaline. Small grains, and irregular aggregates of albite occur intergrown with the phlogopite and these features include sporadic subhedral grains of apatite (to 75 μ) in addition to frequent very fine inclusions (tourmaline, actinolite, phlogopite). Sphene is a minor accessory constituent. Occasional late-stage zeolitic veinlets (with recognisable stilbite and chabazite) are present. Most of the rock is featureless in terms of relict features but there is some evidence that it represents a metasomatised breccia. It contains a few altered fragments of a fine-grained clastic sediment and grades marginally into a strongly phlogopitised sandy siltstone with some similarities to TH 6622 and TH 6623.

TH2/388.5m (TS, FS 21413)

This is a partly metasomatised granular fine to medium grained ultra-mafic evidently closely related to DDH TH1/68m. Where relatively fresh it consists of granular olivine (mean 200-300 μ) with accessory magnetite as olivine-intergranular particles and irregular to spongy aggregates. Elsewhere olivine interstices consist of pale green phlogopite which on textural grounds has developed by replacement of serpentine. These phlogopitised areas grade into weakly sheared masses crudely vein-like areas of massive phlogopite and a more or less complete progression can be seen from fresh dunite to phlogopite rock. The paragenesis (partial serpentinisation and subsequently metasomatism) is identical to that in TH1/68m.

Polished section examination reveals the magnetite is primary as disseminations and aggregates which are partly to extensively replaced by secondary pyrrhotite aggregates with included patches of chalcopyrite and locally accompanied by bladed grains of ilvaite. No pentlandite was observed but extremely rare subspherical inclusions (<10 μ) of thazlewoodite are seen in magnetite and assay for Ni may be warranted.

TH2/408.4m (TS, FS 21414)

This is a quartz-tourmaline rock with a vague relict "granitic" fabric and is considered as a completely altered "microgranite" (or ?micro-adamellite). The main constituents are weakly stressed anhedral quartz and strongly zoned color variable schorl. A few variably sericitised feldspar relics persist and in places feldspar "ghosts" are seen in vaguely pseudomorphous quartz with sericite inclusions.

Accessory carbonate is present and occasional irregular patches of chlorite developed at a late stage by replacement of tourmaline. Rare tabular grains of topaz occur closely intergrown with tourmaline. Fine to ultrafine granular to subhedral sphene is common throughout the rock and developed in part by replacement of primary ilmenite which persists in sporadic corroded relics. Polished section examination reveals sparsely disseminated patches of pyrite and partly pyritised pyrrhotite intergrown with tourmaline aggregates and rare patches of chalcopyrite (to 400 μ) intergrown with quartz. No cassiterite was observed in the sectioned areas.

TH2/422.3m (TS 21415)

This is a brecciated and pervasively phlogopitised fine sandy siltstone possibly weakly tuffaceous originally, although clastic components, apart from disseminated quartz grains are altered beyond recognition.

The rock consists mainly of microcrystalline quartz, phlogopite which is pervasive but also concentrated into veinlets and aggregates in brecciated areas and subordinate to minor semi-fibrous to euhedral poikilitic tremolite-actinolite. Minor accessory sphene is present and very fine ilmenite, typical of similarly phlogopitised pelites from the Renison Mine area is common throughout. Traces of pyrrhotite occur within the phlogopite segregations.

A late 200 μ - 1mm wide vein of colorless chlorite cut across the sectioned area. Marginal portions of this feature include thinly dispersed microscopic grains (typically <10 μ) and small clusters (to 75 μ) of cassiterite.

TH2/442m (TS 21416)

A weakly brecciated and thoroughly metasomatised labile pebbly sandstone by analogy originally a poorly sorted Crimson Creek Formation tuffaceous greywacke. The clastic fabric persists with random to weakly bedded angular to subangular rock fragments now consisting of actinolite and cloudy microcrystalline quartz and feldspar and "cemented" by semi-ragged actinolite. Diopside and cloudy blue schorl are accessory alteration products. Traces of Fe-sulphide (?pyritised pyrrhotite) are associated with the tourmaline. Cloudy granules of sphene are weakly disseminated throughout.

TH2/448.4m (TS 21417)

This is a weakly sheared diopside-tremolite rock consisting essentially of granular to subhedral diopside particles (mean 50 μ) enclosed within and marginally corroded by semi-orientated subhedral to ragged grains of tremolite. Magnetite is disseminated throughout in two generations with chromiferous-cored primary grains partly overgrown by secondary fine-grained material. Small patches of pyrrhotite are also present loosely associated with fine particles and spongy aggregates of secondary magnetite.

General features indicate this rock was initially a fine to medium-grained granular pyroxenite (diopsidite) altered and weakly mineralised more or less contemporaneously with a weak phase of shearing. It contrasts with previous ultramafics from this area in carrying primary chromite-cored magnetite. Ni-assay may be warranted.

RENISON LIMITED
DIAMOND DRILL HOLE PLOT

019
E No.: DDH-TH2 Cont. SCALE:

TH2/466.8m (TS 21418)

This is a weakly sheared tremolite-rock with accessory amounts of chlorite, green phlogopitic mica, poikilitic carbonate, opaques, and "grading" locally into semi-schistose diopside-tremolite rock. The paragenesis is similar to that at 448.4m with tremolite (and phlogopite, chlorite) developing in part at least from diopside.

Opagues tend to be concentrated into semi-orientated spongy aggregates and thin films parallelling the crude schistosity. Much of this material is fine grained "secondary" magnetite locally accompanied by and intergrown with fine grained pyrite and pyrrhotite. Also present are rare relict primary grains of magnetite with chromiferous cores. These indicate an altered ultramafic (?pyroxenite) origin and provide a link with the 448.4m specimen.

TH2/452.1m (TS 21419)

This is a metasomatized and incipiently sheared tuffaceous or at least volcanomict conglomerate.

The coarser pebbles are typically fine grained basic to intermediate volcanics (leucobasalt-leuco-andesite) typified by semi-felted feldspar laths (now saussurite-stained albite) or less commonly microcrystalline. Accompanying these are occasional fragments of tuffaceous sandstone, disseminated sand-sized quartz grains, chert fragments and altered (tremolitised) dolomite fragments. The matrix consists of finer clastic particles of similar composition but with relatively abundant quartz.

The rock is semi-pervasively impregnated with finer grained tremolite grading locally into crudely vein-like masses of tremolite-actinolite. Accessory traces of cloudy sphene are present and this phase may mask a little ultrafine cassiterite (thus a Sn-assay would be warranted).

TH2/457m (TS 21420)

This is a coarse quartz-tourmaline-diopside-actinolite rock with traces of sphalerite. The rock is characterised by abundant strongly growth- and color-zoned schorl interspersed with granular to poikilitic intergrowths of quartz and diopside. Tremolite-actinolite is an accessory constituent over most of the area sectioned but locally semi-massive. Accessory cloudy albite is present. The sphalerite is a red (moderate to high Fe-variety) as diopside interstitial patches (to 500 μ) locally accompanied by small patches of pyrrhotite. This rock is a crudely zoned vein or segregation. The assemblage is similar to that of some of the associated metasomatized rocks.

TH2/474m (TS 21421)

This is a diopside-tourmaline-tremolite rock evidently related to the 457m specimen. It consists mainly of fine granular to subhedral diopside with disseminated skeletal to poikilitic anhedral grains and aggregates of green to brown pleochroic schorl. Irregular patches of tremolite-actinolite occur and are partly altered at a late stage to aggregates of talc flakes. Fine grained sphene is an accessory component and more or less evenly disseminated throughout. There are trace to minor amounts of pyrrhotite as small blebs typically interstitial to diopside and/or tourmaline and thinly dispersed very fine particles of near-opaque sphalerite.

TH2/480.8m (TS 21422)

This is a metasomatized chert crudely banded and probably dolomitic in part originally. Cherty microcrystalline quartz persists in places but elsewhere the rock consists largely of granular and cloudy poikilitic diopside with accessory tremolite actinolite and small aggregates and vermiform-like veinlets of prehnite. Accessory comprise disseminated pyrite crystals blebs and fine spongy aggregates of pyrrhotite, minor very fine sphene and rare poikilitic blebs of sphalerite. Cloudy discontinuous veinlets of diopside occur sporadically and conceivably represent metasomatized diagenetic carbonate veinlets.

TH2/485.1m (TS, FS 21423)

This is a metasomatized pebbly tuffaceous greywacke originally poorly sorted weakly bedded and with a variety of rock fragments including basic to intermediate volcanics, cherts quartz grains and silicified rhyolitic material in addition to reworked clasts of tuffaceous sandstone (these could reflect an early phase of brecciation). An unusual feature is the presence of frequent detrital grains (mean 250-300 μ to 500 μ) of chomite.

Metasomatism is rather subtle and selective. Some areas of the rock are pervasively stained with phlogopite (largely degraded) whilst elsewhere tremolite-actinolite is the dominant phase and accompanied by anhedral quartz grains stuffed with fine tremolite inclusions.

Pyrrhotite is disseminated throughout as fine particles and discontinuous veinlets. Sulphide is most abundant in the tremolitic areas and here pyrrhotite forms spongy aggregates and occasionally vein-like masses (to 1cm wide) with tremolite. Minor traces of chalcopyrite are associated and pyrrhotite is incipiently replaced at a late stage by pyrite.

RENISON LIMITED
DIAMOND DRILL HOLE PLOT

No. : DDH-TH2 Cont. SCALE:

TH2/488.4m (TS 21424)

This is a diopside-tourmaline rock essentially similar and closely related to the 437m and 474m specimens. Some areas consist of more or less massive granular to subradiating and subhedral diopside weakly clouded with ultrafine indeterminate inclusions. Elsewhere color zoned tourmaline is closely intergrown with the diopside. Accessory carbonate and prehnite are present in dispersed diopside-intergranular masses and in thin semi-continuous veins. Sparsely disseminated blebs of pyrrhotite are present and these are also of intergranular habit.

TH2/491.7m (TS, PS 21425)

This is a near-monomineralic tremolite rock fine-grained, with a weakly schistose fabric, and with sparsely disseminated grains and small clusters of chromite indicating that it represents a completely altered ultramafic. In contrast with 485.1m there are no relict clastic features.

In other respects the rock is fairly featureless. However, it carries sporadic spongy patches (to 1cm+) of pyrrhotite of tremolite-interstitial habit and of fairly constant optical orientation. Sporadic patches of chalcopyrite are closely intergrown with pyrrhotite which is locally replaced pseudomorphously by secondary pyrite. As with the previous altered ultramafics assay for Ni may be warranted.

TH2/503m (TS 21426)

This is a metasomatised tuffaceous grit or greywacke rather similar and closely related to 485.1m specimen. Related types are 452.1m, 422m, TH6622, TH6623 and the (TH27E)8N and 9N specimens of CMS 76/6/2.

Recognisable clastic material is sized in the medium sand to fine pebble range, angular to subangular, poorly sorted and vaguely bedded. Cloudy microcrystalline quartzofeldspathic basic-intermediate ("basaltic/leuco-andesitic") volcanic fragments are common. Accompanying these are a variety of chert fragments and clasts of labile psammopelites (tuffaceous shale, siltstone, fine sandstone). There are occasional clastic feldspar and quartz grains and detrital chromite (similar to 485.1m) is a characteristic accessory component. The original matrix is obscure having been replaced entirely by metasomatic aggregates of green tremolite-actinolite with a little associated quartz, prehnite, traces of tourmaline and fine grained disseminations of pyrrhotite. The framework is similarly but less extensively altered. Late zeolitic veinlets occur locally.

TH2/505m (TS 21427)

This is an unusual rock recognisable as an altered rhyolitic tuff. Similar rocks are present but very sparsely in the Crimson Creek Formation where the volcanics either primary or reworked are typically of more basic character.

The rock consists mainly of platy subvitic and rather featureless lithic fragments and slightly subordinate quartz grains, many of which are recognisable as fragments of phenocrysts. There are sporadic altered (silicified) feldspar grains and a few lithic fragments include quartz or feldspar phenocrysts. The lithic fragments exhibit a fairly marked dimensional orientation (ash flow tuff). The matrix consists mainly of microcrystalline quartz and may have contained shards although there is no longer any microtextural evidence to support this.

Alteration comprises the introduction of very fine quartz, partly in crude veins, and subordinate but variable amounts of finer grained colorless tremolite which has partly degraded to colorless chlorite and carbonate. Traces of fine brown tourmaline are associated and accessory fine grained sphene is developed locally. Rare partly leucogenised magnetite crystals are of primary origin. Close microscopic examination did not reveal any cassiterite.

TH2/512.2m (TS 21428)

This is an extensively metasomatised bedded and relatively well sorted fine-grained sandstone.

Relict angular to subangular clastic quartz grains comprise from <10 to around 35% of the various layers and are accompanied by partly to completely altered similarly shaped grains of feldspar (now albite) in varying proportions. Accompanying these are frequent completely altered (to actinolite) clastic particles which were probably fine to microcrystalline volcanic material (tuffaceous greywacke). Bedding is now reflected in an alternation of relatively siliceous bands and bands consisting largely of very fine grained actinolite.

Irregular patches of cloudy carbonate develop from actinolite. Late stage quartz-chlorite veinlets occur sporadically.

TH2/450m (TS 21429)

This is a phlogopitised volcanoclastic conglomerate composed largely of poorly sorted angular to subround rock fragments with a relatively sparse phlogopite-stained and poorly resolved cement.

Rock fragments include basic to intermediate lavas with subordinate more acid ("rhyolitic") types in addition to quartzose and argillic to psammopelitic sediments. Accompanying these are sporadic chert fragments, occasionally with fibrous actinolite pseudomorphing diagenetic carbonate rhombs, and a sand sized clastic matrix consisting of angular to subangular quartz grains and finer rock fragments with minor accessory feldspar and rare detrital chromite (up to 500µ diameter).

021

REI ON LIMITED
DIAMOND DRILL HOLE PLOT

HOLE No.: DDH-TH2 Cont. SCALE:

Much of the matrix quartz is of acid volcanic character and a few rhyolite fragments show ignimbrite-like microtextures.

Reddish, partly degraded, fine grained metasomatic phlogopite is virtually pervasive particularly in the matrix. This material is accompanied by very fine opaques (illmenite) and locally by a little ultrafine Fe-sulphide.

No facing criteria are evident in the area sectioned. Determination of facing in conglomerates is a tenuous problem and one rarely resolved from micro- as against macrostructures.

289022

022

Hand Specimens

TH 6620 (TS, PS 21405) Location: Creek 10m west of 24E 9N

A metasomatic rock composed largely of colorless semi-ragged tremolite with subordinate to minor quartz and disseminated fine grained magnetite (i.e. a tremolite-quartz-magnetite rock). Tremolite forms semi-massive aggregates of random to radiating tufts enclosing small intergranular patches, single grains (<10-250 u) and crude films of magnetite or locally is included in coarse irregular patches of optically continuous quartz. The amphibole is incipiently altered to chlorite, now oxidised and Fe-stained in response to weathering.

Magnetite is partly martitised. Some magnetite films form discontinuous rims around quartz anhedra and others are somewhat sinuous with cores of tremolite. These features suggest the rock may have been a vuggy "limestone" (or dolomite) originally. In contrast to TH 6621 there is no evidence to support an altered ultramafic interpretation.

TH 6621 (TS, PS 21406) Location: Creek 100m east of 24E 6.5N

This is a talc-antigorite-magnetite rock reasonably interpreted as an altered ultramafic if only on the basis on composition.

Most of the rock consists of randomly orientated antigorite flakes (mean 20-25u) with interstitial ultrafine-grained talc aggregates. In places talc is virtually massive. It developed partly by replacement of antigorite and locally forms crude discontinuous veins. A few small areas of relatively fine antigorite are seen and some of these show a relict mesh structure characteristic of serpentinites. Textural evidence is sketchy but suggestive of a very fine-grained peridotite, serpentinitised and subsequently staurolitised. There is some evidence of brecciation in the distribution of magnetite which occurs as single grains (10-150u) and spongy semi-massive aggregates (to 1cm+) with angular outlines defined partly by veins of talc. The magnetite is of secondary character.

023

TH 6622 (TS 21407) Location: Creek 90m east of 24E 4.5N

This is a fractured, locally brecciated and extensively metasomatised labile sandy siltstone considered as tuffaceous by analogy with texturally similar but less altered rocks from the Crimson Creek Formation.

The relict fabric indicates a bedded and generally poorly sorted clastic sediment sized mainly in the silt to fine sand range but with disseminated subangular medium to coarse sand sized "megaclasts". These features are completely altered typically to ultrafinely granular diopside with patchy associated chlorite and semi-fibrous tremolite-actinolite but were mainly rock fragments most likely basic to intermediate volcanics. The matrix is similarly altered but comprised splintery to angular clastic material (?fine ash) and is pervasively stained with ultrafine cloudy leucoxenitic material. The fabric overall is strongly reminiscent of the Crimson Creek tuffs and "tuffaceous greywackes" from the Renison Mine area.

Very fine particles of pyrrhotite are weakly disseminated throughout and incipiently layered in their distribution parallelling bedding. There are sporadic late stage quartz veinlets with traces of phlogopite and disseminations of pyrrhotite. One margin of the section consists of vein laumontite and this appears to postdate the quartz veinlets although the two types were not observed in contact.

TH 6623 (TS 21408) Location: Creek 90m east of 24E 4.5N

A metasomatised subaqueous tuff or tuffaceous greywacke (reworked tuff) essentially similar and closely related to TH 6622. The rock has been brecciated and more or less completely altered to very fine-grained diopside and tremolite-actinolite. Pyrrhotite is disseminated throughout and is slightly more abundant and coarser grained than in the previous specimen. Overall the assemblage indicates a slightly higher "grade" of metasomatism/mineralisation.

The original sediment was a bedded poorly sorted clastic rock with a very fine clastic (?ashy) matrix. Ultrafine leucoxenitic material is

024

common and is locally altered to microcrystalline sphene. A few clastic quartz grains and chert fragments persist. Late quartz veinlets with traces of phlogopite and pyrrhotite occur sporadically. The very fine sphene conceivably masks traces of cassiterite and assay for Sn may be warranted.

TH 6624 (TS 21409) Location: Creek 90m East of 24E 4.5N

This rock is best termed a chert breccia. It consists of angular to subround variably sized (<1mm-1cm) fragments of weakly carbonaceous chert (grey in hand specimen) cemented by relatively clear and slightly coarser grained granular/semi-interlocking quartz (white in hand specimen). The quartz cement is of low temperature hydrothermal character with occasional small vugs partly lined with microscopic quartz crystals.

Carbonaceous matter occurs as ultrafine dusty inclusions in the cherty quartz, coarser more or less evenly disseminated clots (mean 20-30u) and to some extent in discontinuous films. A few carbonaceous films have been disrupted and healed with cherty quartz. Thus the rock may represent a thoroughly silicified carbonaceous sediment (e.g. limestone or dolomite= rather than a primary chert.

TH 6625 (TS 21410) Location: Creek 90m east of 24E 4.5N

This is a fine grained quartz-tourmaline rock considered as a tourmalinised impure chert. It consists of weakly interlocking microgranular quartz (mean 20u) with slightly subordinate fine grained color-variable schorl which is weakly layered in its distribution (relict bedding). The tourmaline evidently replaced primary argillaceous material and also occurs in thin irregular veins where it is accompanied by traces of sphalerite (red, partly opaque). Highly poikilitic patches (to 1mm) of cloudy semi- amorphous ?sphene are disseminated throughout the rock.

TH 6626 (TS 21411) Location: 22E 8S

A thoroughly metasomatised weakly bedded pelite most likely a tuffaceous siltstone although the interpretation is made only by comparison with

025

289026

similar rocks in the Crimson Creek Formation.

The rock consists largely of fine-grained tremolite-actinolite locally chloritised and frequently impregnated with single grains and spongy aggregates of color zoned schorl. Accessory quartz and adularia are present and small crystals of ilmenite and sphene have developed from primary layered leucoxene material. Fine-grained an-to euhedral pyrite occurs in single grains (to 250u) and crudely layered micro-granular aggregates locally accompanied by marcasite and of secondary development after pyrrhotite, traces of which persist as relics accompanied by isolated grains (mainly 30u) of chalcopyrite.

Irregular discontinuous veins of quartz and dravitic tourmaline occur sporadically. No cassiterite was detected in the areas sectioned but assay for Sn may be warranted.

028

289028

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 27E. DATE 25/3/76 OBS A.F.R.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
30N (BL)	2.30pm	61813					
		61866					ft level?
31N		61832					Swamp
		63055					water
32N		62015					bush
		61475	erratic				crack.
33N		67460					mod. uphill slope.
		67540					mobile
34N		64720					etc.
		62385	erratic				
35N		64974					
		62022					
36N		65017					
		62913					
37N		62322					
15ft before 38N		63015					
38N		63733					
		66620	erratic				
39N		64184					edge of banana.
		69333					
40N		67457					galbno etc.
		65701					"
41N		63482					
		62490					galbno edge of scrub.
42N		66490					clear
		63868					clear
43N		62691					clear
		62455					clear
44N	3.20pm	62382 62382					clear.

028

289029

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 28E DATE 26/5/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
200N	11.00am	63546					
		62965					In creek
		62975					on right hand. old mine?
150N.		62615					slight ascent
		62452					"
		62387					"
		62356					"
100N.	11.20am	62376					"
200N	11.25am	62853					Track.
		62630					creek on right
		62553					"
		62505					slight ascent.
250N		62469					"
		62456					ascent.
		62433					ascent
		62409					ascent.
300N		62457					ascent
		62486					ascent
		62504					ascent.
		62500					flatter
350N		62503					flatter
		62511					flat forest
		62494					level to left.
		62465					"
400N	11.40am	62441					creek on right
		62400					steep descent to right.
		62411					"
		62594					Waterfall on right.
450N		62848					"

030

289030

Form No. 69/88

REINSON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE ZRE DATE 26/8/76 OBS A.F.R.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62566					
		62378					flat.
		62294					"
500N		62221					"
		62190					slight descent.
		62034					IN CRACK. <u>not</u>
		62212					steep ascent.
550N		62251					"
		62292					"
		62261					"
		62236					"
600N		62244					"
		62247					ascent.
		62215					"
		62185					"
650N		62173					"
		62156					"
		62123					"
		62098					flatter
700N	12.05pm	62099					flat
		62050					flat.
		62160					flat
		60905					flat.
750N		62900	unstable				flat
		64800	unstable				flat.
		62545					flat
		62168					flat
800N		62106					flat
		62062					flat
		62073					slight descent.

032

289032

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 29C DATE 26/3/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
30N (BL)	9.25am	66096					track.
		60877					
		59980					flat bush
		64730					"
950N		64025					"
		62481					"
		62600					swamp.
		62477					slight hill
900N		63008					slight hill
		63199					" "
		62520					slight descent.
		62860	emetic				sd. flat descent.
850N		61783					swamp.
		62053					" "
		62136					"
		62177					"
800N		62123					"
		62825	emetic				small stream ↗
		65649					magnete in sed?
		63090					sd. flat.
750N		62040					hemples and.
		62002					hill to right.
		62195					"
		62333					"
700N	9.50am	62149					"
		62266					"
		62658					descent
		62915					"
650N		62978					"
		62849					"

033

289033

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL 4. TRAVERSE 29°E DATE 2/6/76 OBS A.F.R.
 SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		6263					steep descent
		6338					steep descent
600N		63660	erratic				"
		62716					small v. steep grade.
		62220					descent.
		61806					5m from MAJOR CREEK
550N		62395					in middle of CREEK →
		66040					on steep bank.
		68140	erratic				"
		63118					ascent.
500N		61910					flat forest
		61941					flat.
		61990					"
		62003					"
450N		62438					flat on small knoll.
		63850					flat
		63838					descent
		62545					steep descent.
400N		62868					descent
		62452					steep descent.
		62241					flat hillside.
		62224					steep descent
350N		62294					"
	10:25 am	62495					MAJOR CREEK
		62539					stone bank.
		62465					CREEK again →
300N		62660					crack on right
		62451					"
		62263					waterfall on right.
		62393					Bank. Creek passes to left.

035

289035

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE BASE LINE (E.Z.) DATE 25/8/76 OBS A.F.R.

SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
24+3	1.35 pm	62274					slope down to right.
		62256					"
24+4		62232					"
		62199					"
25E		62158					"
		62091					"
25+1		62026					"
		61918					"
25+2		61561	erratic				crest. Dunoon Hill
		61012					flat
25+3		60911					flat + open
		62586					"
25+4		65648					MASOR CREEK flows to right.
		64870					bush.
26E		63053					"
		65260					"
26.1		63375	erratic				swamp
		66280	erratic				bush
26.2		61391					CREEK. old pit
		61034					bush
26.3		61304					"
		61693					swamp
26.4		61588					swamp
25' before 27E		61911					
		61960					bush-flat
27.1		62426					"
		62720					"
27.2		63524					"
		63299					"
27.3		63337					"

035

289037

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE BASELINE (E-Z.) DATE 27/5/76 OBS A.F.R.
 SPL 129.

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
29E	10.00am	66034					Track.
		62235					flat.
		63642					"
		64074					"
550		64330					"
		64793					"
		62136					T-track.
		63091					flat.
600		64134					"
		63711	analic.				"
		65714					"
		64955					T-track.
650		66440					T-track.
		65526					flat
		63305					"
		61722					"
700		61462					"
		61253					t-track
		61879					t-track
		62503					flat
750		63406					"
		62092					"
		62278					"
		62211					"
800		62456					"
		62165					use of instrument
		62201					flat
		62208					"
850		62205					"
		62200					"

083
289038

Form No. 69/88

RENISON LIMITED
FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEYAREA TRIAL H. TRAVERSE BASELINE (E.Z.) DATE 27/3/76 OBS A.F.R.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62186					swamp.
		62305					swamp.
900		62946					flat.
		63017					swamp.
		62512					flat.
		62361					T. track.
950		62322					flat.
		62287					flat
		62307					flat
		62329					T. track.
1000		62378					flat
		62475					"
		62568					"
		62631					"
1050		62691					"
		62756					"
		62732					T. track
		62716					flat
1100	10.55am	62710					"
		62758					"
		62851					"
		63004					T. track
1150		63051					flat.
		62998					"
		63006					open
		63016					open
1200		63033					open.
		63060					open.
		63103					slope to right.
		63141					"

039

289040

Form No. 59/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 1200 ~ N DATE 27/6/76 OBS A.F.R.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
0	12.50 pm	62904					
		63722					
		63600					
		64645					
50		62440					
		63583					
		64844					flat
		64182					
100		62950					
		62445					
		62233					ridge - small.
		62144					
150		61950					swamp.
		61652					
		62146					
		61970					swamp.
200		61798					creak.
		61757					T-track.
		60708					
		62649					
250		62385					swamp.
		61915					
		61933					swamp
		61965					
300		62366					flat.
		62303					
		61891					
		61780					
350		634 ⁵⁰ 80					flat.
		62096					

041

289041

Form No. 69/88

RENISON LIMITED
FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 1200mN DATE 27/6/76 OBS A.F.R.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		64487					flat
		65577					
400		63535					
		62300					
		60943					
		62454					
450.		63364					descent.
		62488					
		61275					
		63219					flat.
500		63648					
		65330					
		63770					
		62085					
550		63286					flat.
		62271					
		61314					edge of Ti tree.
		60755					
600.		58850					
		65968					
		62885					
		65707					swamp.
650		65648					
		63826					
		62458					swamp.
700.		62336					
		62296					
		62284					
		62229					
750.		62427					

042

289042

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL H. TRAVERSE 1200 mN DATE 27/8/76 OBS APR.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62835					
		62979					swamp.
		62786					
800		62413					small creek
		62355					
		62336					
		62518					
850		62568					end of swamp.
		62529					edge of gum forest.
		62540					
		62554					
900		62570					
		62596					flat.
		62641					
		62698					
950		62725					
		62770					
		62780					
		62743					
1000	2:15pm	62714					
		62720					
		62679					
		62675					
1050		62652					
		62625					
		62586					swamp
		62567					swamp
1100		62528					swamp
		62637					
		62694					

043

289043

Form No. 69/88

RENISON LIMITED

FIELD REPRODUCTION SHEET FOR MAGNETOMETER SURVEY

AREA TRIAL 4. TRAVERSE 1200 mN DATE 27/6/76 OBS A.F.R.
SPL 129

STATION	TIME	READING	SCALE	DRIFT	BASE CORR	ANOMALY	REMARKS
		62718					
1150		62726					
		62760					T. track.
		62831					
		62824					
1200		62813					
		62794					
		62810					
		62823					
1250		62848					No Pq.
		62863					
		62980					
		63742					
1300		62206					Bush Pq.
		62744					
		62827					
		62870					
1350		62883					Bush Pq.
		62902					Descent.
		62925					Swamp.
		63048					
1400		63220					Knoll.
		63480					Steep descent
		63613					"
		63586					"
1450		63387					"
		63075					"
		62833					CREEK
		62849					flowing
		62876					steep ascent.
1500		62876					"

JKB

BENTON LIMITED

Appendix 6.

289015

ORGANOMETAL SOIL SAMPLES

30N E 2 B/L. TRIAL HARBOUR

- 85#

P.P.E.

	Sr	As	Co	Pb	Zn	Ni
26.1	160	20	5	15	5	5
.2	100	25	5	20	10	5
.3	120	25	5	15	10	5
.4	35	20	25	20	20	25
27.1	60	20	10	10	5	15
.2	35	20	20	20	10	30
.3	45	5	35	20	5	30
.4	50	25	40	20	15	45
28.1	60	30	25	15	15	55
.2	50	30	30	15	20	40
.3	70	25	45	25	15	30
.4	35	20	30	20	15	40

045

REVISION LIMITED

289046

GEOCHEMICAL SURVEY

26E TRIAL HARBOUR.

- 85 #

	Si	Al	Fe	Mn	Zn	Ni
31N	45	15	20	20	15	35
32	90	35	5	10	5	5
33	80 100	30	10	55	30	10
34	10	25	10	20	10	5
35	15	15	5	15	5	10
36	20	10	<5	5	5	5
37	30	20	<5	5	5	5
38	<5	20	<5	10	5	5

046

GEOCHEMICAL SOIL ANALYSIS

28E TRIAL HARBOUR

- 85 #

P.P. 11

OH	Sn	As	Cu	Pb	Zn	Ni
1000N	45	10	25	20	15	25
975	A { 45	35	15	20	15	25
		B { 60				
950N	?	-	30	20	15	40
925	40	5	45	25	20	20
900	80	30	55	25	25	20
875	50	20	50	25	20	20
825	35	25	60	15	15	20
800	30	5	45	15	15	40
775	40	5	45	20	20	30
750	50	10	55	25	25	25
725	35	15	25	20	25	35
700	40	25	20	25	55	50
675	15	25	15	25	40	55
650	A { 50	15	20	20	45	20
		B { 40				
625	40	20	20	25	35	20
600	50	25	35	25	45	35
575	45	35	30	25	50	30
550	60	25	40	25	75	50
522	80	35	25	25	30	10
500	A { 25	20	30	20	25	10
		B { 40				
475	35	60	105	45	60	45
450	-	-	105	25	25	50
425	200	180	30	20	20	10
400	40	45	65	45	45	25
375	15	35	30	25	25	10
350	15	35	40	25	20	20
325	30	35	45	25	20	20
300	80	25	65	30	25	40
275	40	15	80	25	25	30
250	20	25	45	25	35	25

047

GEOCHEMICAL SOIL ANALYSIS

28E TRIAL HARBOUR

- 85 #

P. 0. 0. 0.

DEPTH	Sn	As	Cu	Pb	Zn	Ni
225N	60	15	10	10	15	5
200	80	15	15	35	25	15
150	<5	10	<5	5	5	5
125	<5	30	5	10	10	5
100	<5	20	5	25	10	10

140

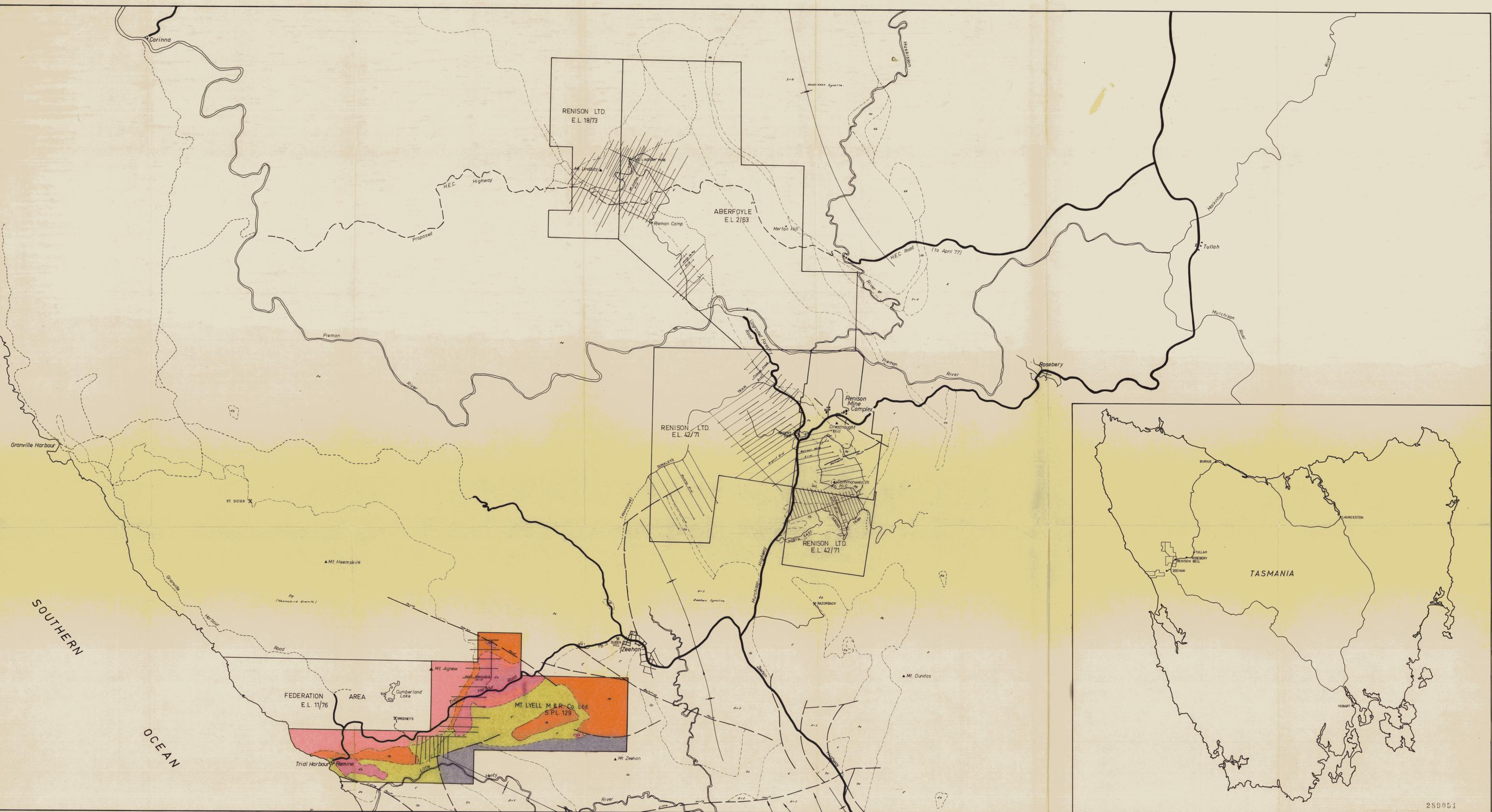
GEOCHEMICAL SOIL ANALYSIS

29E TRIAL HARBOUR

- 85 #

P.P.

	Sn	Ag	Cu	Pb	Zn	Ni
275N	15	20	50	35	35	20
250	60	20	35	30	40	25
225	15	20	40	30	25	20
200	160	15	15	35	25	5
175	80	25	10	25	25	10
150	90	20	10	25	15	10
125	45	30	15	35	25	10
100	45	30	10	35	10	5
75	45	60	10	20	15	5



SOUTHERN OCEAN

1112

KEY

	Permian & Tertiary		Proterozoic gneiss
	Permian & Tertiary sediments		Carboniferous & Silurian sediments
	Ordovician & Silurian		Permian & Tertiary intrusives
	Carboniferous & Silurian		Traverse Line System

5 cm

77-1236

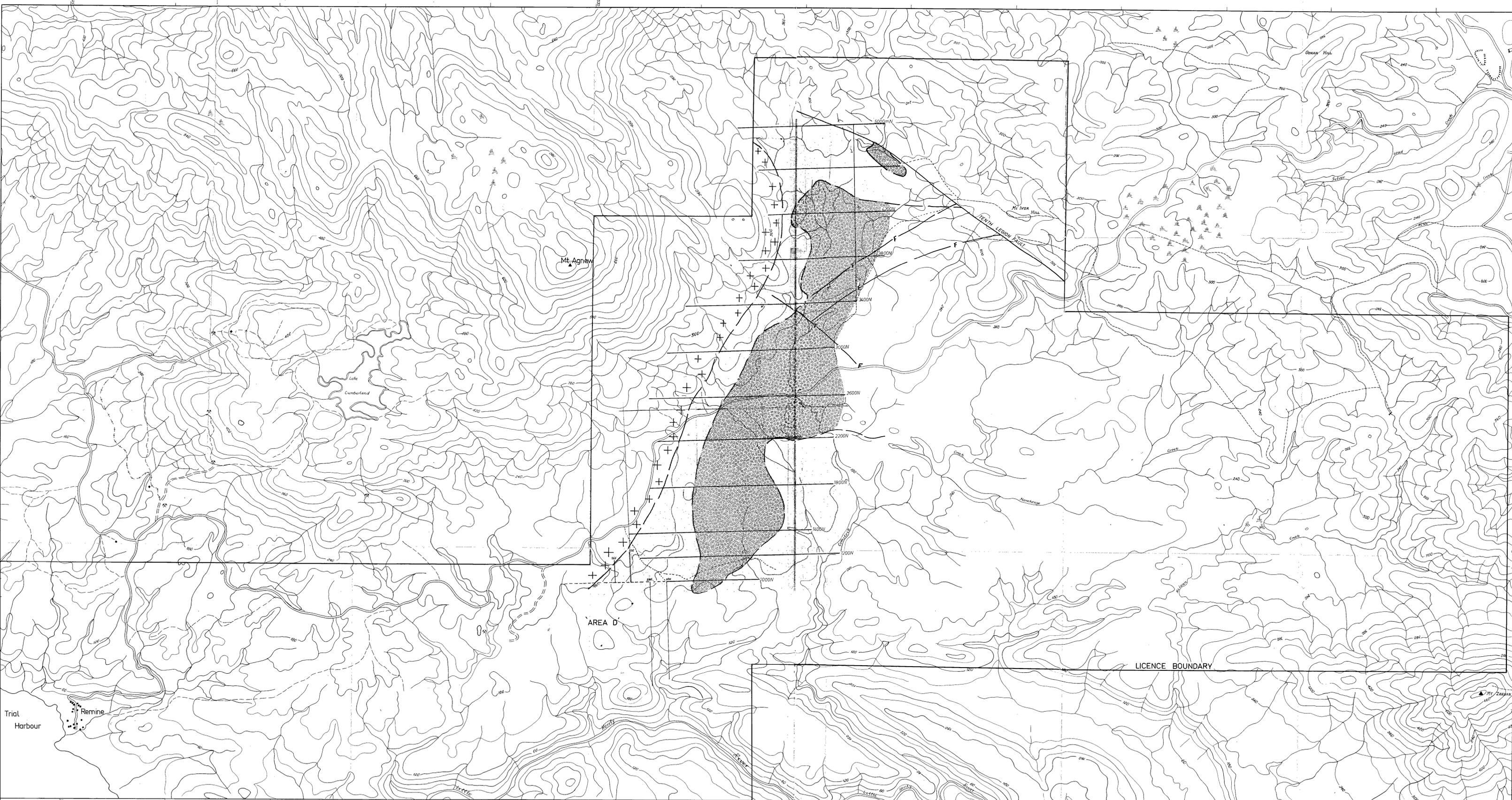
289051

RENISON LIMITED

LOCALITY MAP

1152

GEOLOGIST :	SCALE 1:100,000 METRES
DRAUGHTSMAN :	MAP 1:100,000
DATE :	
REVISIONS :	DRAWING No. FIG. 1.

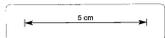


ZEEHAN A/A	ZEEHAN B/B
ZEEHAN C/C	ZEEHAN D/D

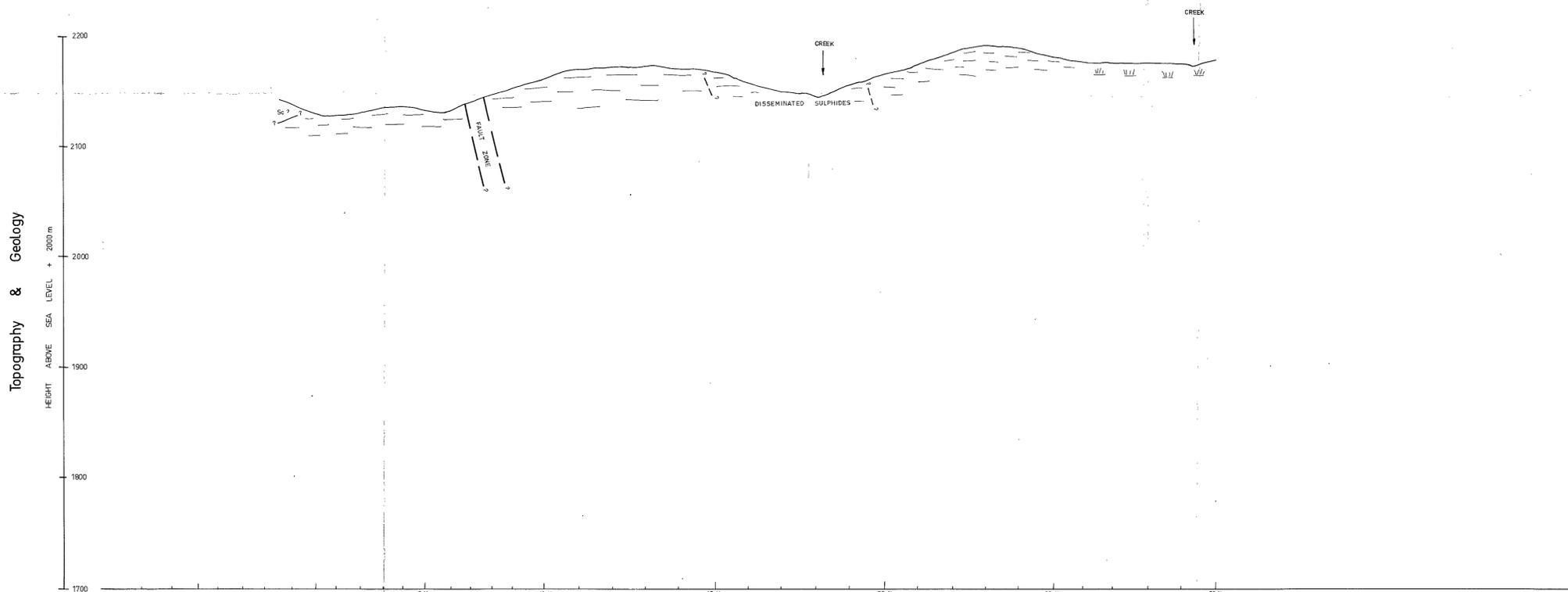
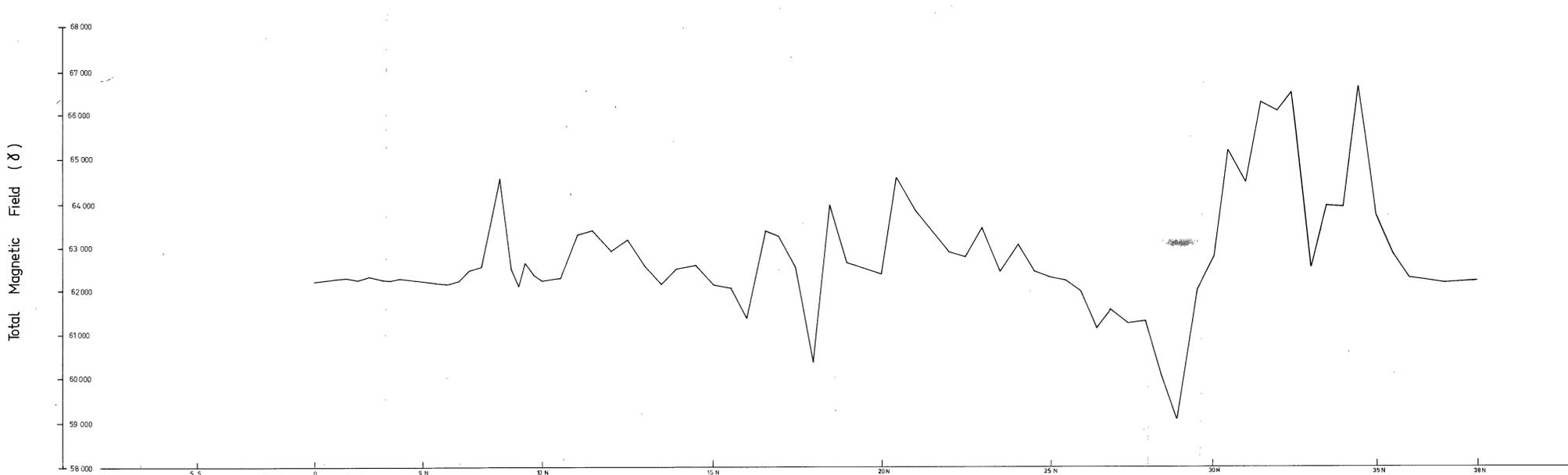
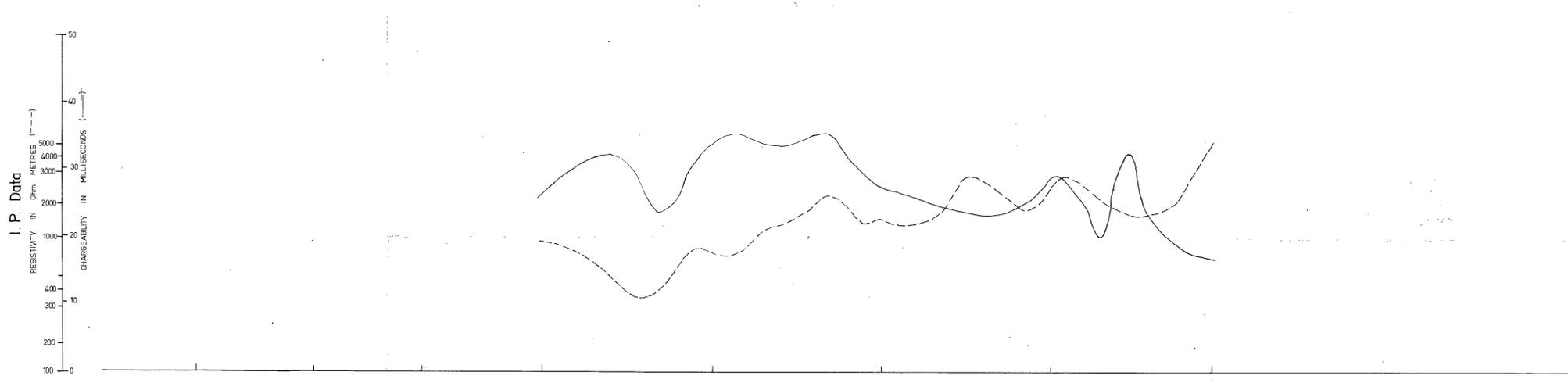
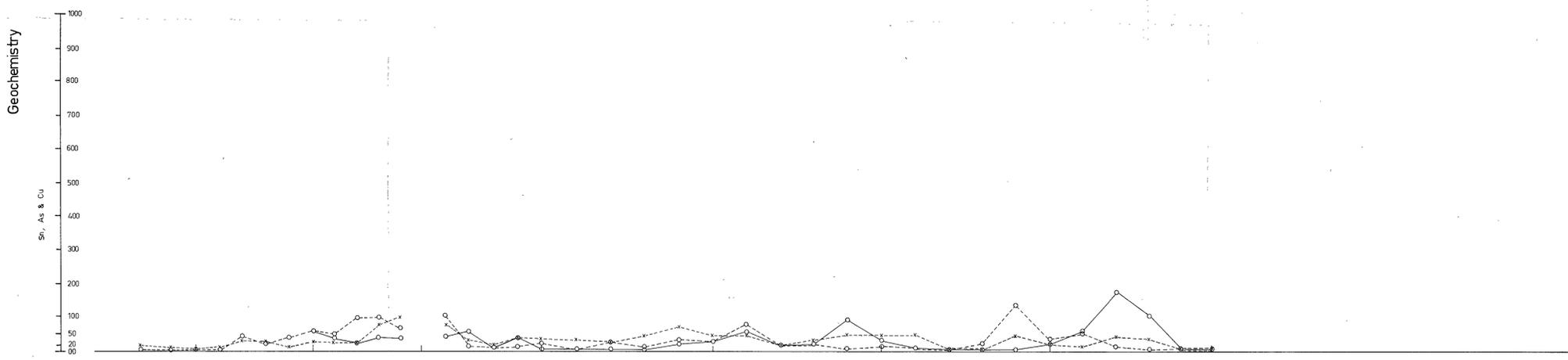
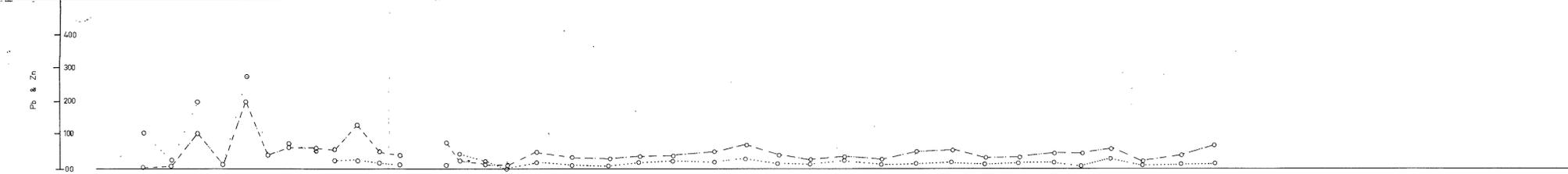
- CAMBRIAN - PROTEROZOIC SEDIMENTS
- CAMBRIAN - ULTRABASIC INTRUSIVES
- DEVONIAN GRANITE

GEOLOGY ADAPTED FROM DEPT OF MINES ZEEHAN SHEET

NB TRAVERSE LINES NOT SURVEYED



RENISON LIMITED 28907	DRAWN AFR
S.P.L. 129	TRACED
EAST HEEMSKIRK GRID 1153	DATE MAY 77
	SCALE 1:10000
	DRAWING No.
SCALE 1:10000 METRES	FIG. 2.



289054

RENISON LIMITED
S.P.L. 129
TRIAL HARBOUR AREA
LINE 26E PROFILE

GEOLOGIST: K WELLS
DRAUGHTSMAN: J MATTHEWS
DATE: MAY, 1976

SCALE 1:2000 METRES

REVISIONS: 1155
DRAWING No: FIG. 4a.

I.P.

CHARGEABILITY (---)

RESISTIVITY (---)

GEOCHEMISTRY

- Sn
- Cu
- Pb
- Zn
- × As
- × W

QUATERNARY

- SWAMP

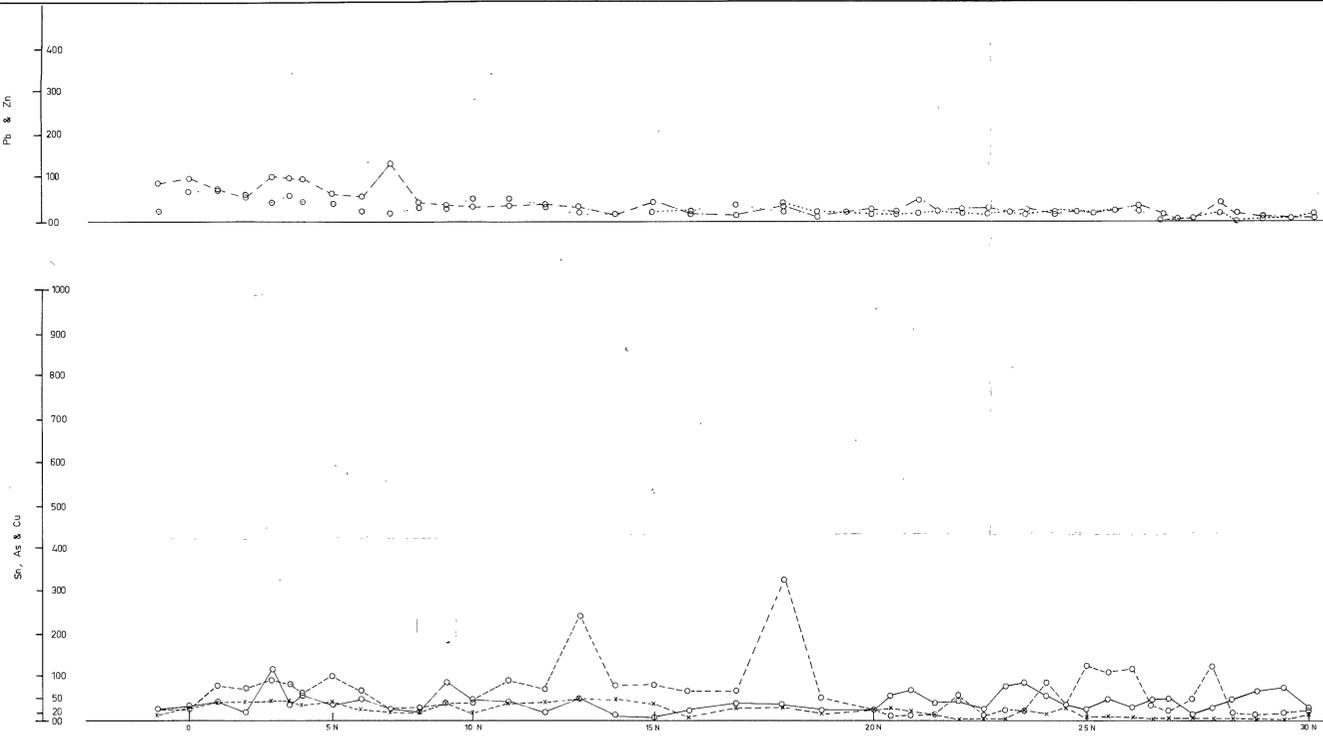
SILURIAN

- CROTTY QUARTZITE?

CAMBRIAN

- TUFFS AND ARGILLITES (Exhibiting alteration, nonfelds & silicification) — Ormsay Creek Formation

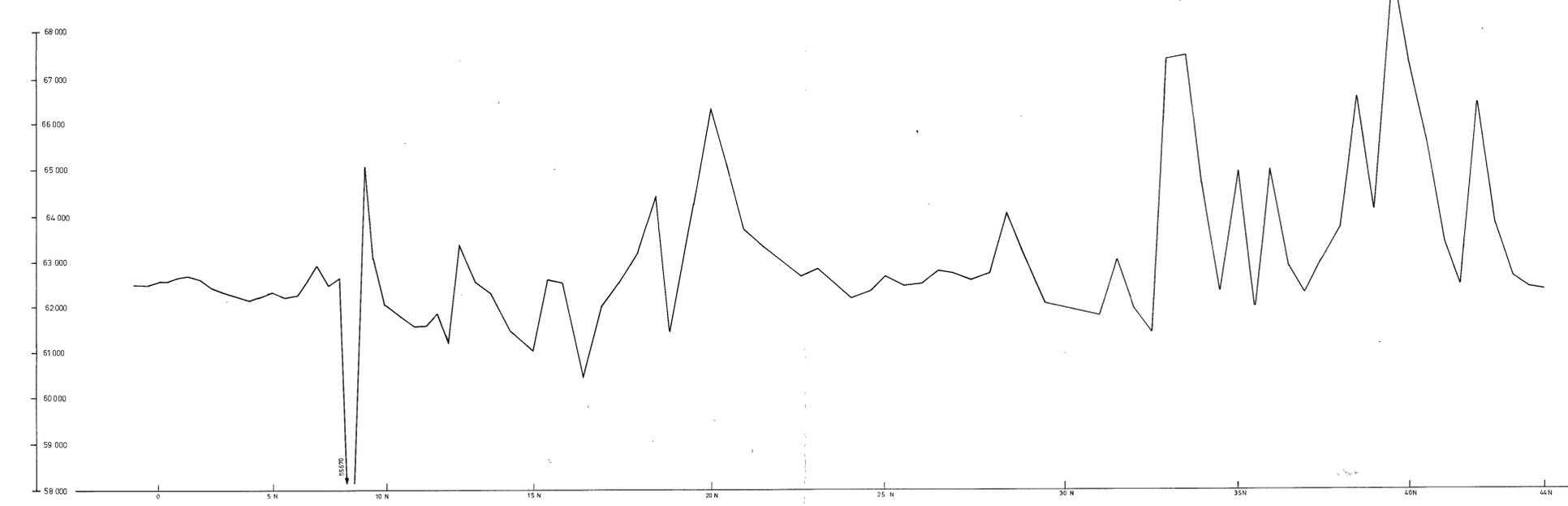
Geochemistry



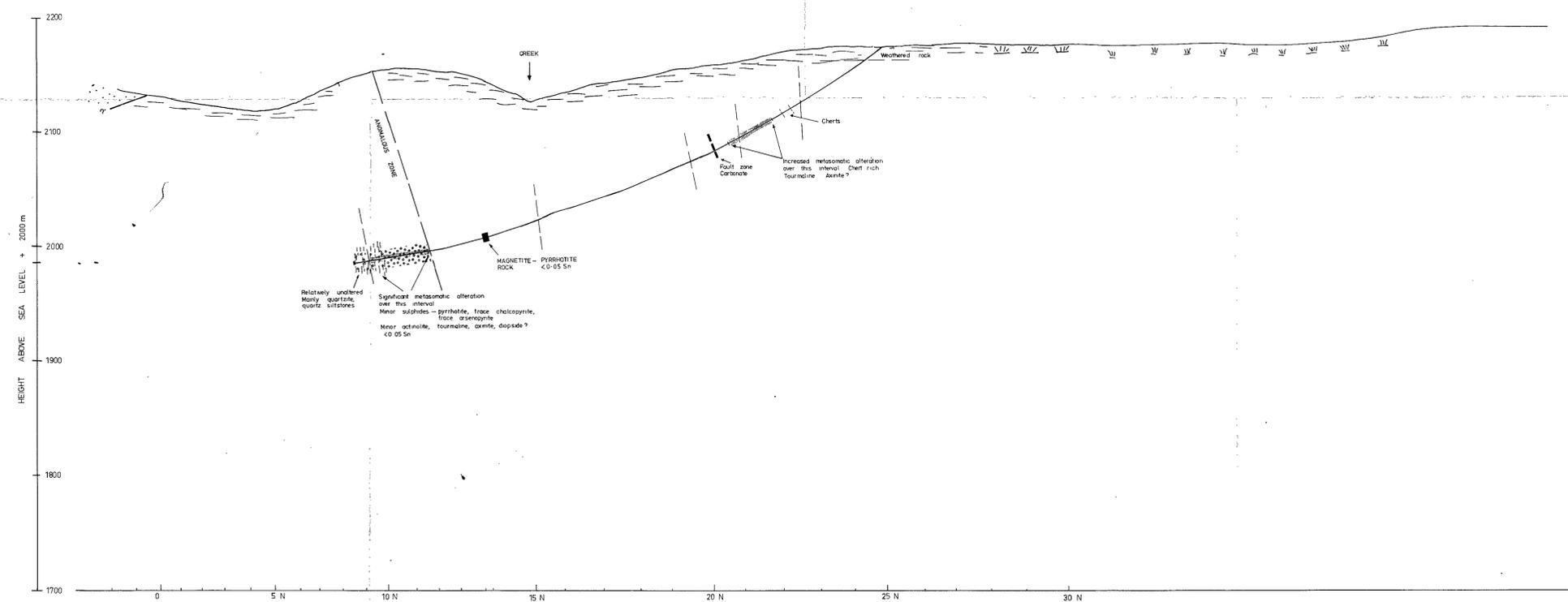
I. P. Data



Total Magnetic Field (δ)



Topography & Geology



RENISON LIMITED
S.P.L. 129
TRIAL HARBOUR AREA
LINE 27E PROFILE

GEOLOGIST: A. ROSS
DRAUGHTSMAN: J. MATTHEWS
DATE: JUNE 1977

SCALE 1:2000 METRES
DRAWING No. 1156
FIG 4b.

5 cm

289055

I.P.
CHARGEABILITY
RESISTIVITY

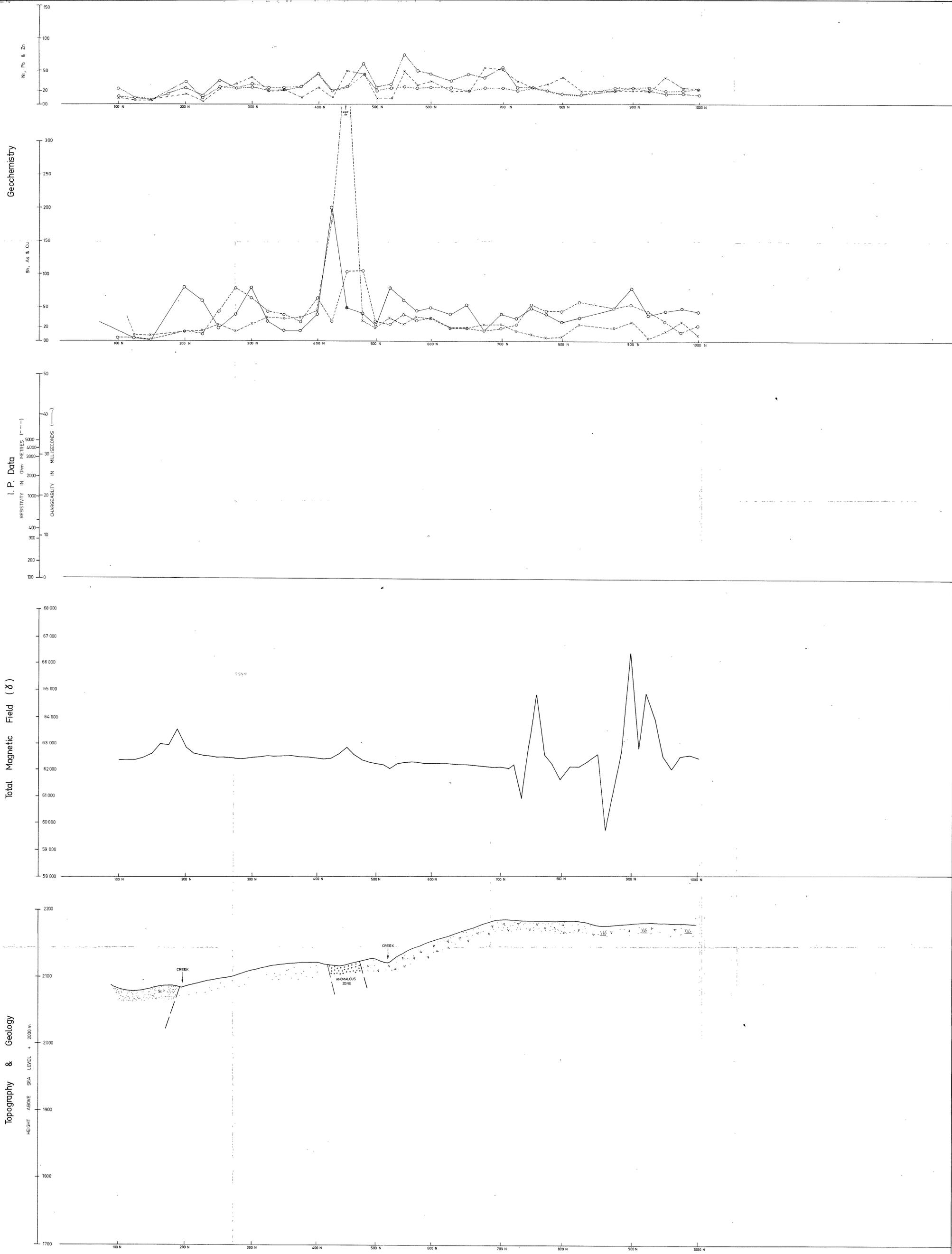
GEOCHEMISTRY
Sn
Cu
Pb
Zn
As
W

QUATERNARY
SWAMP

SILURO-DEVONIAN
QUARTZITES

CAMBRIAN
TUFFS & ARGILLITES (Altered hornfels and siltified) (Crimson Creek formation)

DIAMOND DRILL HOLE LEGEND
VOLCANIClastic SEDIMENTS (Variably metamorphosed greywacke, siltstone, very minor chert turbidites. Actinolite alteration with trace sulphide only)
CONGLOMERATE RICH ZONE (Minor quartzite, siltstone. Less volcanic component. Well bedded)

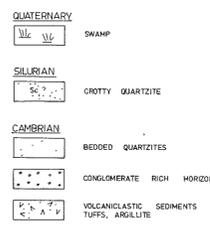
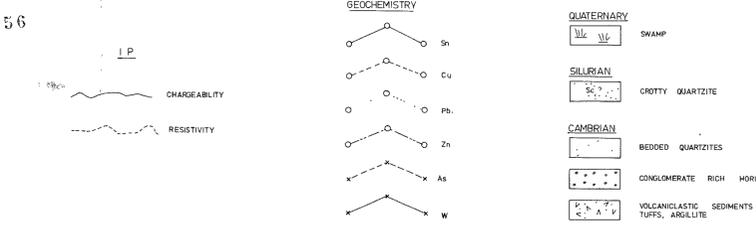


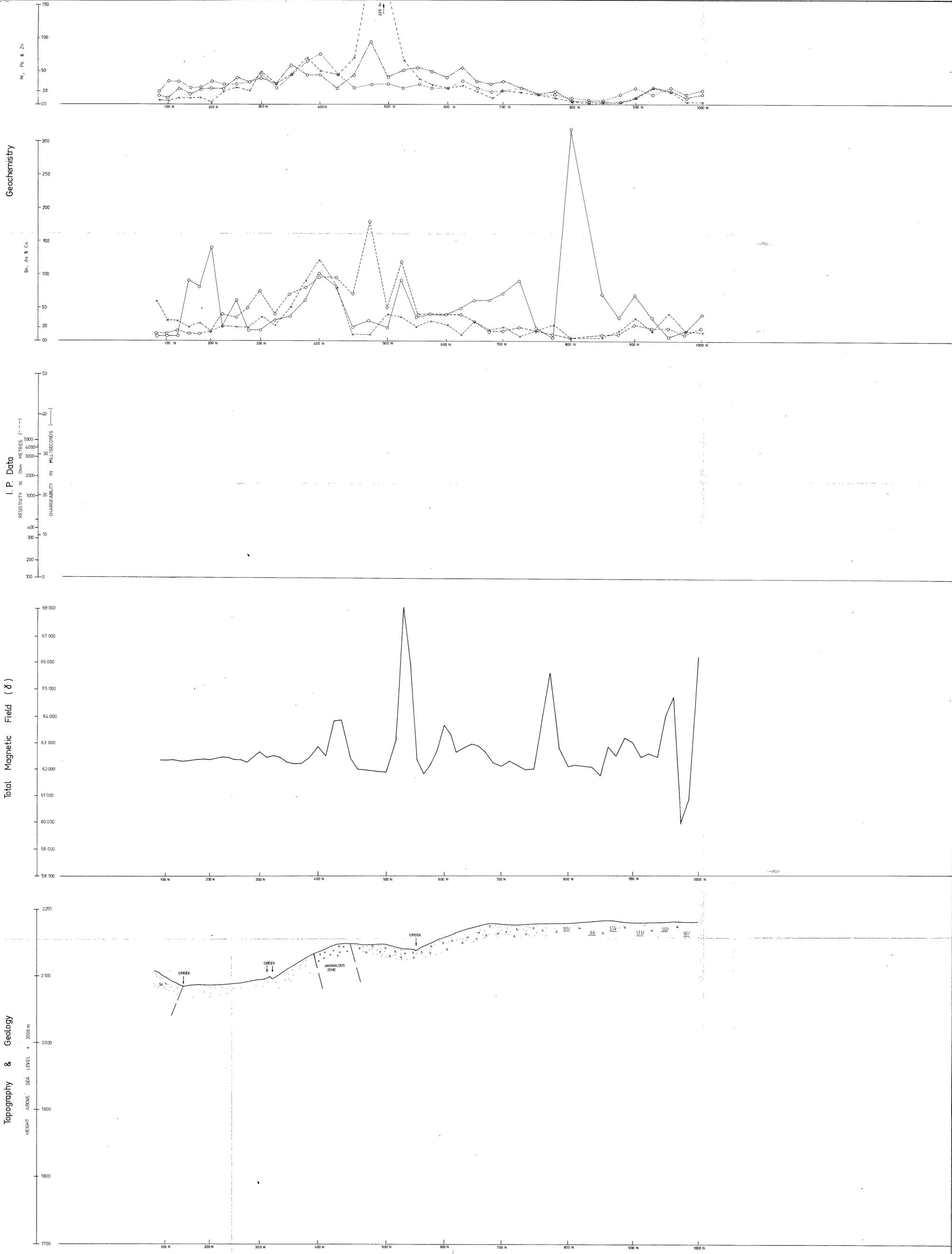
RENISON LIMITED
 S.P.L. 129
 TRIAL HARBOUR AREA
 LINE 28E PROFILE

GEOLOGIST : A ROSS
 DRAUGHTSMAN : J MATTHEWS
 DATE : JUNE, 1977

SCALE 1:2000 METRES
 40 0 40 80

REVISIONS : 1157
 DRAWING No : FIG 4c.





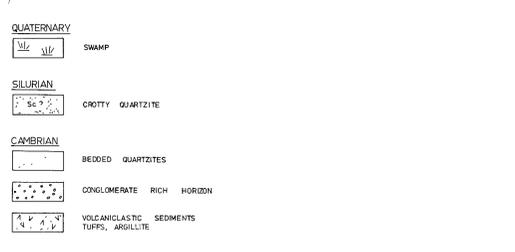
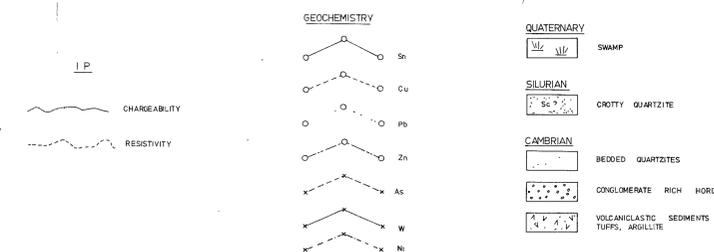
289057

RENISON LIMITED
S.P.L. 129
TRIAL HARBOUR AREA
LINE 29E PROFILE

GEOLOGIST: A. ROSS
DRAUGHTSMAN: J. MATTHEWS
DATE: JUNE, 1977

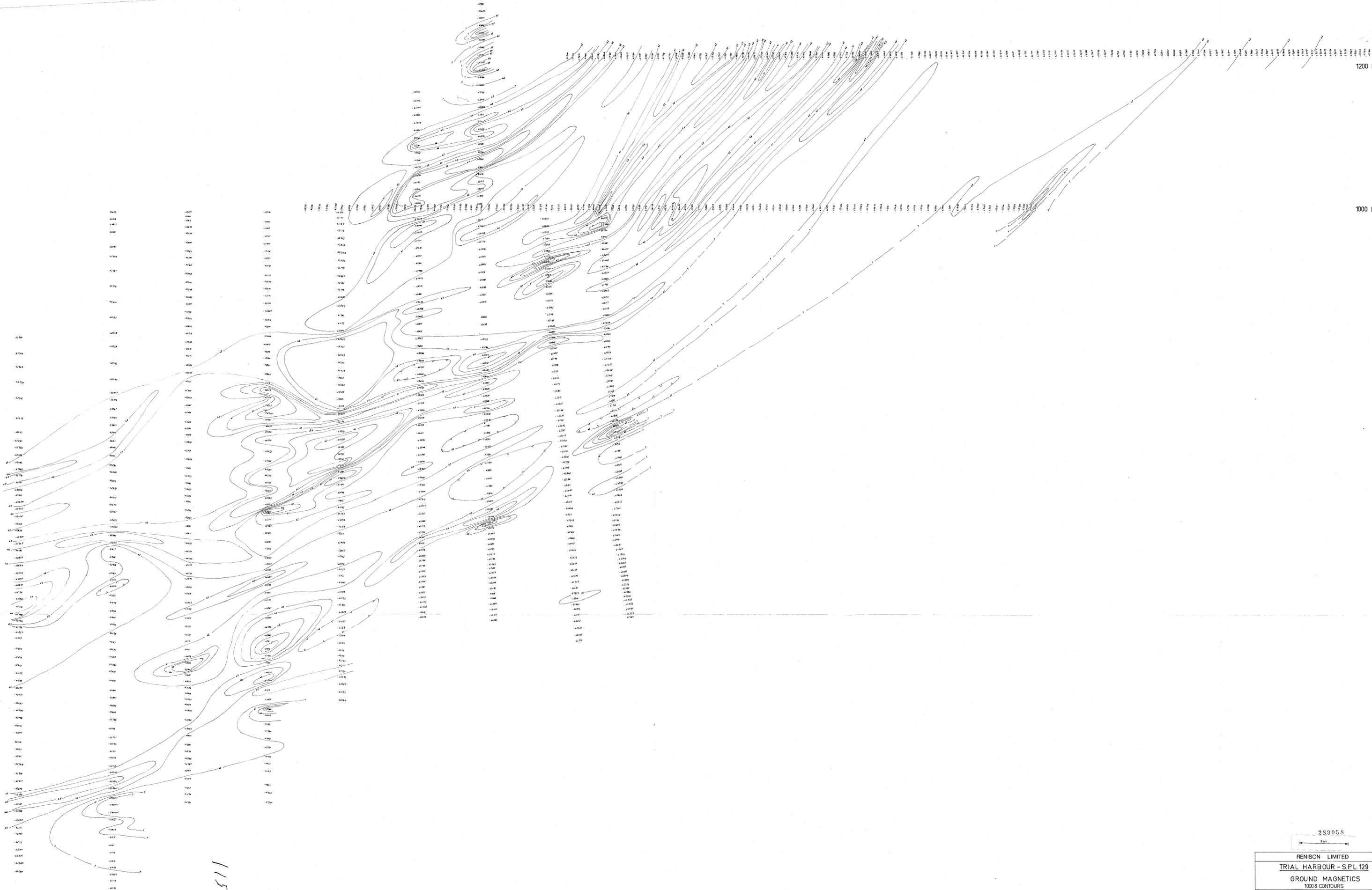
SCALE 1:2000 METRES
40 0 40 80

REVISIONS: 1156
DRAWING No: FIG. 4d.



1200 N

1000 N



21 E

22 E

23 E

24 E

25 E

26 E

27 E

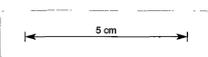
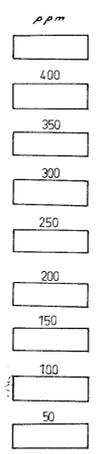
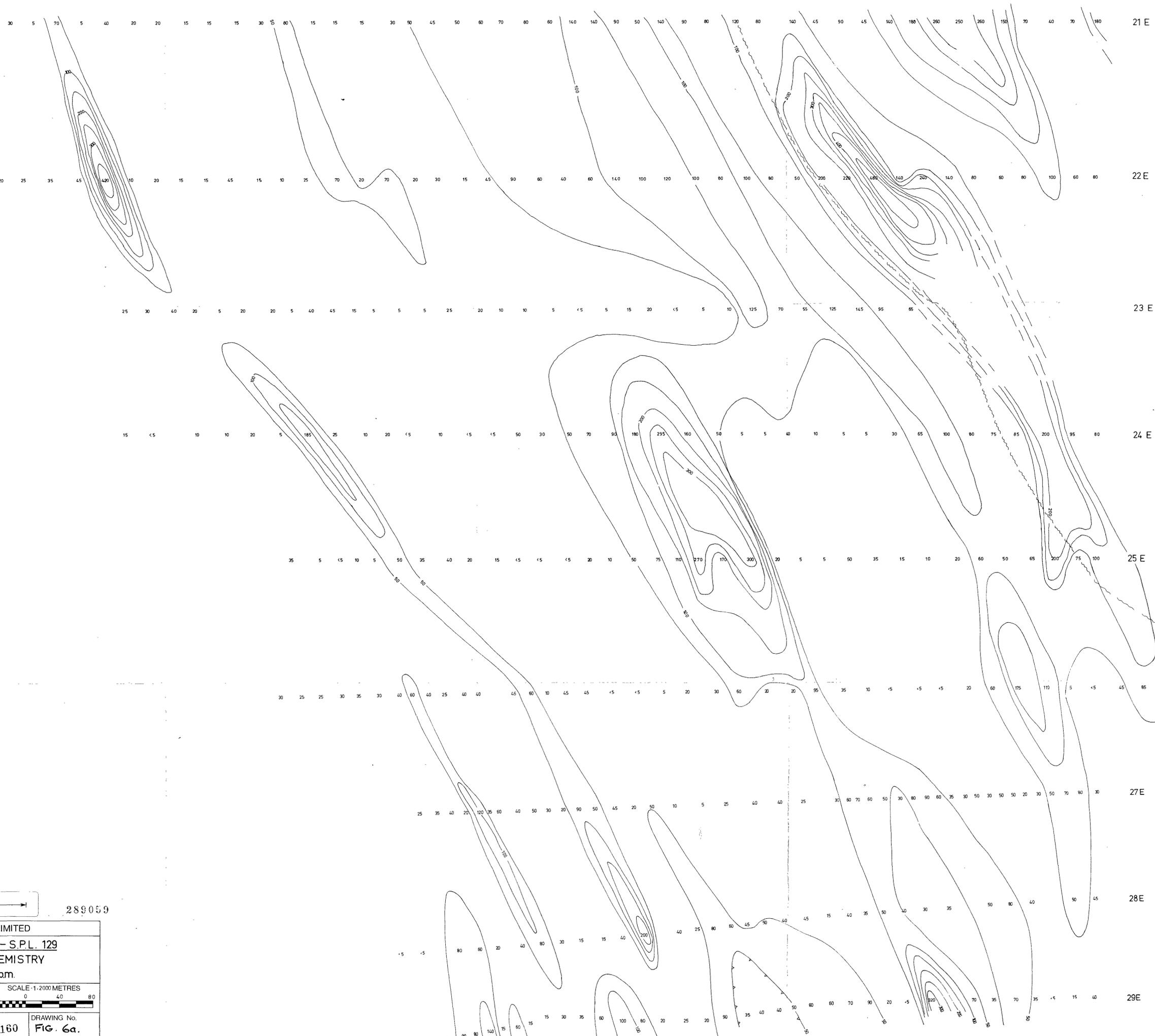
28 E

29 E

6511

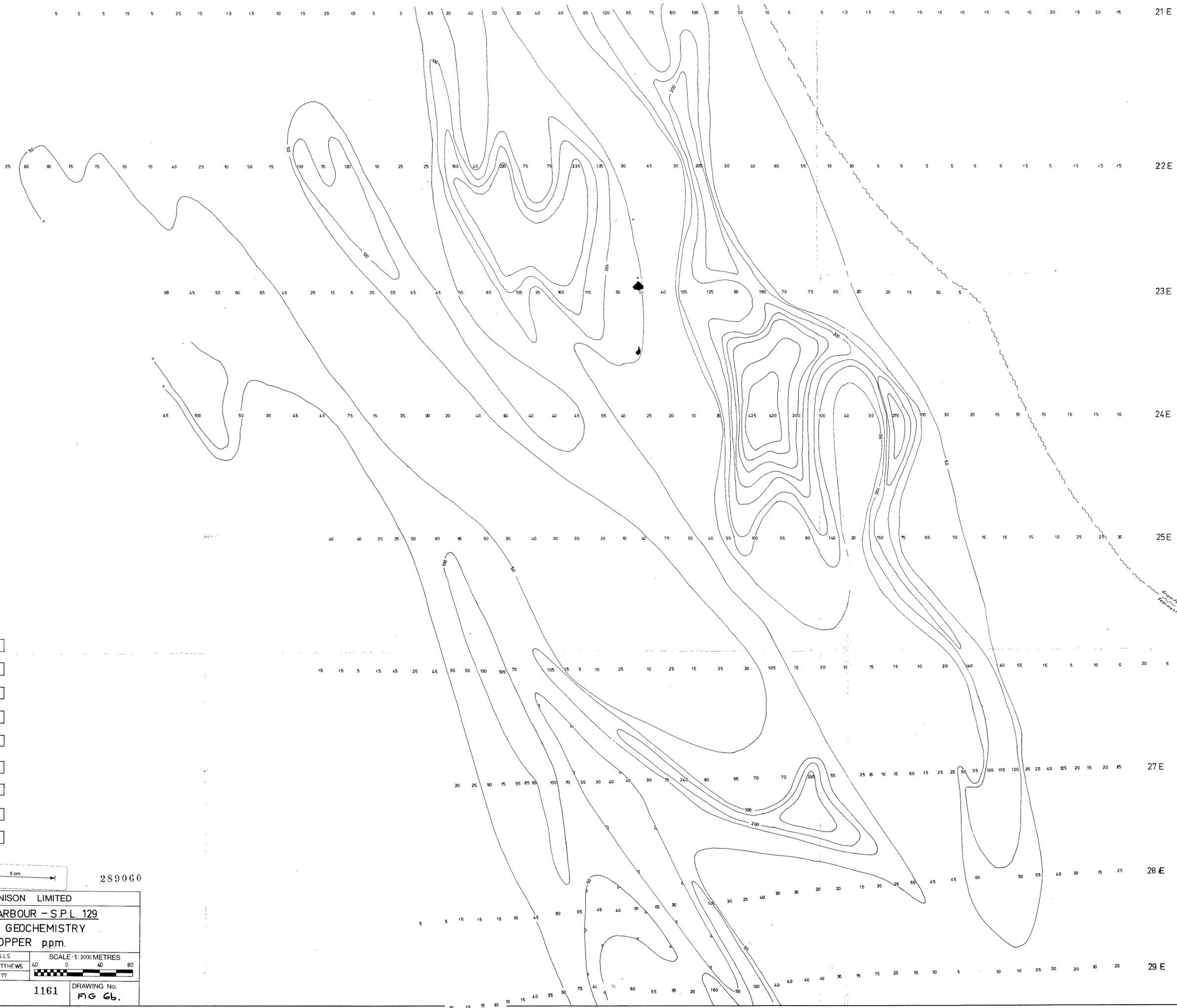


REINSON LIMITED	
TRIAL HARBOUR - S.P.L 129	
GROUND MAGNETICS	
1000 & CONTOURS	
GEOLOGIST : K.W. & P.R.	SCALE: 1:2000 METRES
DRAUGHTSMAN : J. MATHEWS	DATE : JANUARY 1977
REVISIONS	DRAWING No. 1159
	Fig. 5.

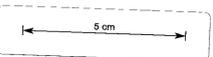
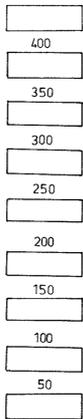


289059

RENISON LIMITED	
TRIAL HARBOUR - S.P.L. 129	
SOIL GEOCHEMISTRY	
TIN ppm.	
GEOLOGIST : K WELLS	SCALE: 1:2000 METRES
DRAUGHTSMAN : J MATTHEWS	40 0 40 80
DATE : 1.4.77	
REVISIONS :	DRAWING No.
1160	FIG. 6a.

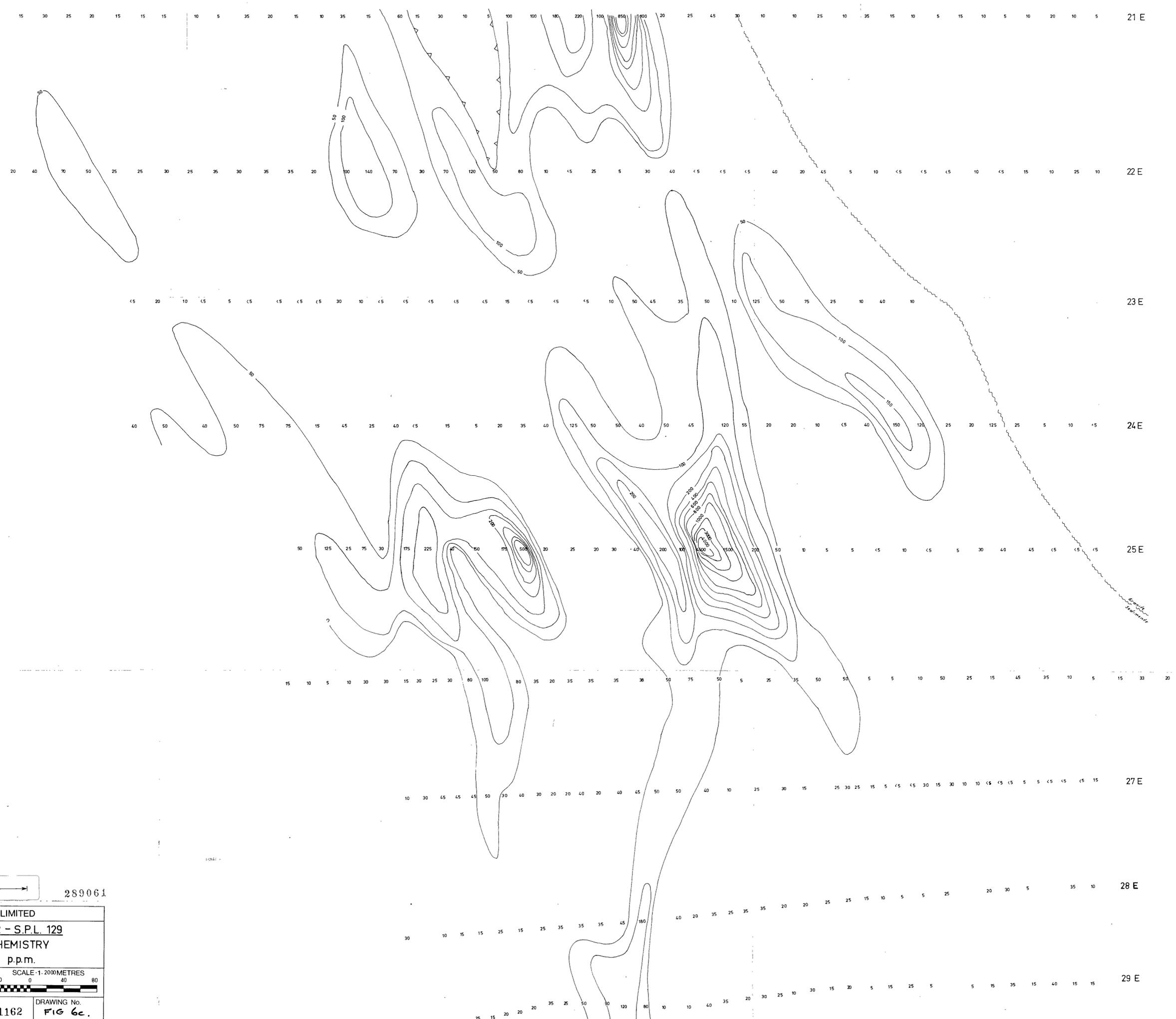


ppm

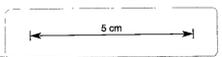


289060

RENISON LIMITED	
TRIAL HARBOUR - S.P.L. 129	
SOIL GEOCHEMISTRY	
COPPER ppm.	
GEOLOGIST : K WELLS	SCALE 1:2000 METRES
DRAUGHTSMAN : J MATTHEWS	0 40 80
DATE : 15-4-77	
REVISIONS :	DRAWING No. 1161
	FIG 6b.



- p.p.m.
- 4000
 - 3000
 - 2000
 - 1000
 - 900
 - 800
 - 700
 - 600
 - 500
 - 400
 - 200
 - 100
 - 50



289061

RENISON LIMITED	
TRIAL HARBOUR - S.P.L. 129	
SOIL GEOCHEMISTRY	
ARSENIC p.p.m.	
GEOLOGIST : K WELLS	SCALE : 1:2000 METRES
DRAUGHTSMAN : J MATTHEWS	0 40 80
DATE : 14.4.77	
REVISIONS :	DRAWING No. 1162
	FIG 6c.

77-1236

10 10 10 10 20 20 20 10 20 25 25 25 45 20 5 25 20 25 20 40 25 25 30 40 30 25 115 40 30 5 10 10 10 5 5 65 10 20 10 10 10 10 15 5 45 45 21 E

20 20 20 15 10 20 5 35 15 10 10 10 60 20 20 40 20 20 20 20 25 25 20 25 20 20 40 25 30 10 10 10 10 20 5 5 5 5 45 5 20 10 10 15 5 22 E

25 35 50 140 40 40 40 40 35 35 40 45 50 45 45 40 90 30 30 25 20 20 20 25 20 20 30 30 25 20 20 20 15 15 15 15 10 23 E

20 30 15 20 20 20 40 20 60 20 20 20 20 15 15 25 20 20 20 10 10 40 10 15 25 30 15 5 10 25 10 15 15 20 10 45 10 45 24 E

30 30 35 75 20 30 60 30 25 30 25 25 20 20 20 15 20 20 35 25 35 35 10 10 45 10 15 20 10 20 15 15 10 10 25 E

110 25 200 10 275 40 75 55 25 25 20 15 20 45 20 5 20 15 10 20 25 20 30 20 15 25 15 15 20 15 20 20 10 30 15 15 20 20 10 27 E

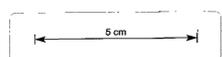
20 60 70 70 60 60 45 40 25 20 35 30 55 55 35 25 25 25 30 40 25 20 20 20 20 25 25 20 20 25 25 5 45 5 20 5 45 5 20 28 E

25 10 5 35 10 25 25 30 25 25 25 40 20 25 45 20 25 25 25 25 25 20 25 25 20 15 15 25 25 25 20 20 20 20 29 E

25
35
50
100
140

Open
excavation

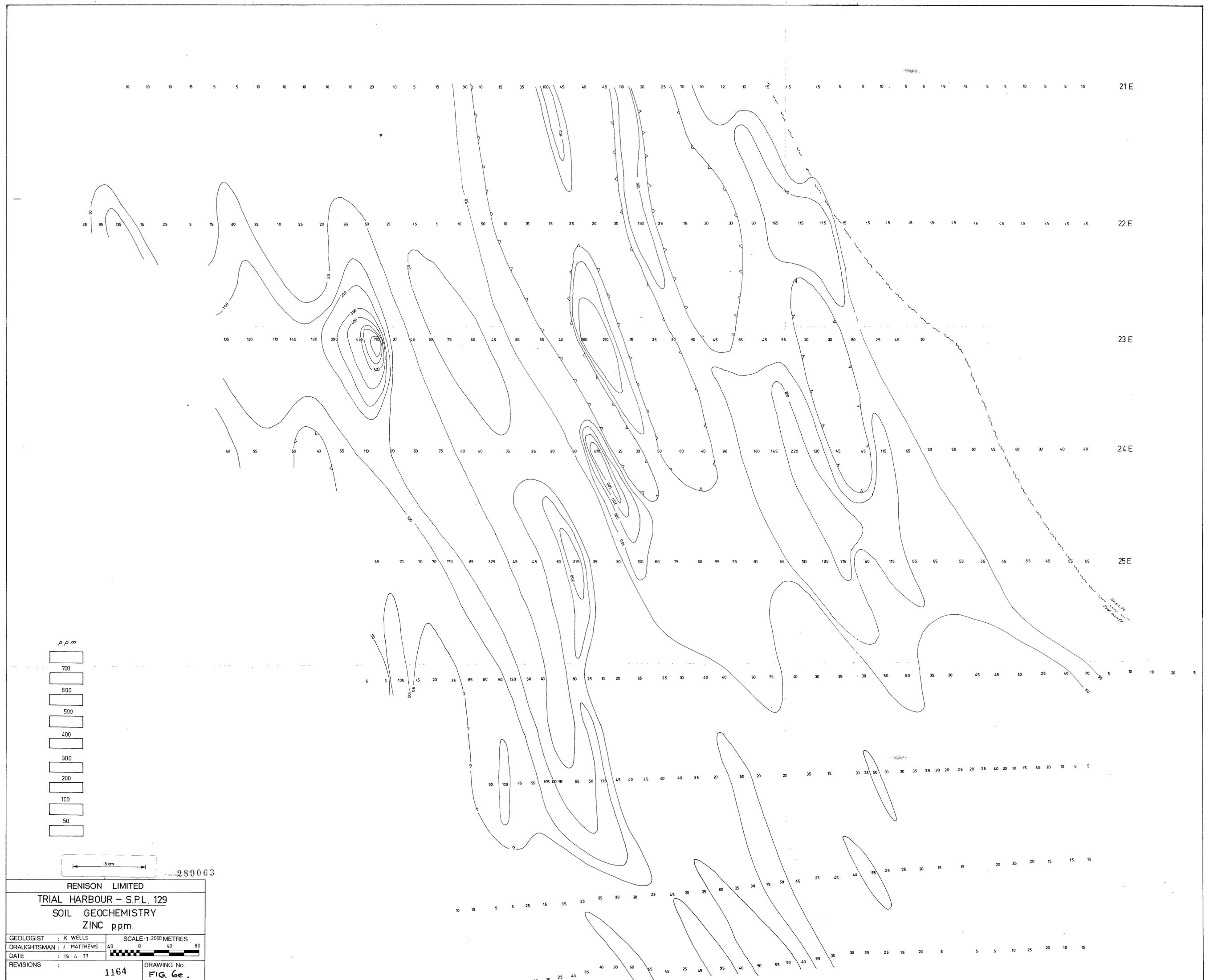
ppm
200
100
50
35
25



289062

RENISON LIMITED	
TRIAL HARBOUR - S.P.L. 129	
SOIL GEOCHEMISTRY	
LEAD ppm.	
GEOLOGIST : K WELLS	SCALE 1:2000 METRES
DRAUGHTSMAN : J MATTHEWS	0 40 80
DATE : 14 4 77	
REVISIONS :	DRAWING No.
1163	178.6d.

77-1236



ppm

- 700
- 600
- 500
- 400
- 300
- 200
- 100
- 50



289063

RENISON LIMITED	
TRIAL HARBOUR - S.P.L. 129	
SOIL GEOCHEMISTRY	
ZINC ppm.	
GEOLOGIST : K WELLS	SCALE 1:2000 METRES
DRAUGHTSMAN : J MATTHEWS	0 40 80
DATE : 18.4.77	
REVISIONS :	DRAWING No. 1164
	FIG. 6e.

77-1236