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E.L. 42/71

ARGENT-KAPI AREA

WESTERN TASMANIA

ANNUAL REPORT 1977 - 78

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CHIEF GEOLOGIST

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OPEN FILE

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1. SUMMARY

Exploration Licence 42/71 relates to an area immediately West and South of the Renison Consolidated Mining Lease. As such it is considered to possess potential for the development of stanniferous deposits, essentially of the Renison - Razorback type.

Exploratory work during 1977-78 was confined to the diamond drilling of two holes, one South and one West of the R.M.L.

The holes were designed to test previously outlined coincident geochemical and geophysical anomalies occurring in geologically favourable areas.

Results from both holes in terms of mineralisation intersected were most disappointing. However, they did add considerably to the geological understanding of this most difficult area.

A further exploration program involving detailed mapping, geochemical and geophysical work, culminating in the diamond drilling of two holes is recommended for completion in 1978-79.

During 1977-78, \$45,937 were spent on exploration in this area. An expenditure of \$55,000 is proposed for 1978-79 in order to complete the above work.

2. INTRODUCTION

E.L. 42/71 is known to cover sequence of pre-Devonian (pre granite) sediments, volcanoes, mafic and ultramafic intrusions, all structurally complicated by abundant faulting and folding.

This structural complexity is little understood due mainly to the rugged heavily vegetated nature of the country and the general discontinuity of geological work and thinking.

However, due to its close proximity and broad geological similarities to both the Renison and Razorback tin mines, the licence area is considered to possess substantial potential for the development of stanniferous hydrothermal replacement deposits.

Work completed during 1977-78 was directed towards the search for such deposits, but was severely limited in scale by manpower commitments elsewhere.

3. PREVIOUS WORK

Several companies have completed a wide variety of programs in this area over the years, to the extent that an awesome abundance of unco-ordinated data of variable quality is in existence.

Two airborne geophysical surveys have been completed, one by Aberfoyle in 1965 and one by Renison in 1972.

Seven traverse line systems have been out over various sections of the licence area since 1970, and a variety of programs have been completed on these viz:

- (a) E.Z. Grid, South of the Argent Dam where magnetic, limited electrical geophysical, and geochemical programs and 2 diamond drill holes were completed.

- (b) Wilson River Grid, North of Argent Dam, where Paringa completed a variety of geochemical and geophysical surveys.
- (c) Crimson Creek Grid, where Comstaff completed geochemical and Geophysical surveys prior to diamond drilling 3 holes. Later similar surveys by Renison were followed by the drilling of 4 holes.
- (d) Razorback Grid, which only just comes onto E.L. 42/71 South of Pine Hill where Renison completed a magnetic - I.P. survey prior to drilling 3 holes on the ultrafamics in this area.
- (e) Commonwealth Hill Grid, South of Pine Hill, where Renison Limited completed 3 diamond holes following various geochemical, geophysical and mapping surveys.
- (f) Kapi Fault Grid, South of Pine Hill, where Renison has completed several geophysical, mapping and geochemical programs.
- (g) Argent Dam Grid, where Renison recently completed I.P. magnetic; geochemical and mapping surveys.

4. GEOLOGY

The area is underlain by thick sequences of Cambrian sediments and minor volcanics of the Success Creek Group, the Crimson Creek Formation and the Dundas Group.

Their structures are thought to be quite complex and poorly understood in most places, with an apparent abundance of folding and minor faulting.

During the upper Cambrian, gabbroic intrusions were widespread. Further there is a layered sequence of basic lavas and ultramafics lying south of Pine Hill between the Dundas Group sediments and the Crimson Creek Formation sediments.

The area was intruded during the upper Devonian by a granite which outcrops at Pine Hill, and which is represented elsewhere by narrow quartz porphyry dykes.

Widespread and varied mineralisation is genetically associated with this granite. Lead-zinc-silver mineralisation is recorded south of Pine Hill in the Kapi and Madam Melba Mines and North-West of Renison in the Success-Bon Accord-Owen Meredith line of workings.

Minor tin, gold and tungsten have been recorded from a variety of locations South of Pine Hill.

5. WORK COMPLETED, DURING 1977-78

Two diamond drill holes were completed during the year. S453 was designed to test coincident magnetic and geochemical anomalies South of Pine Hill, and S495 was designed to test a similar target West of Renison Bell.

5.1 S453, was sited on the North-East Dundas Tramway on Line 1900N, 100W of the Kapi Grid. It was 486m. long, and the full log (with petrological and magnetic susceptibility readings) is appended to this report. After penetrating 70m. of Dundas Group Sediments, the hole intersected 296m of serpentinised mafic and ultramafic rocks before passing through 120m. of lavas and spilites.

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The upper portion of the serpentinitised unit was strongly altered, possibly as a result of the nearby intrusion of the Pine Hill granitic porphyry.

The lower portion of this unit was apparently less altered but possessed a significantly higher magnetite content than the adjacent rock units.

No significant stanniferous zones were intersected.

- 5.2 S495, Geochemical, geophysical and geological surveys completed on the Argent Grid West of Renison Bell in 1975-76 and 76-77, succeeded in defining several anomalous areas immediately West of the Argent Dam.

A significant geochemical response on Line 13 coincided with a moderate magnetic anomaly near some stanniferous pyrite gossans within a sequence of rocks correlated with the Renison Mine Sequence.

It was decided to drill a hole in this area, but before detailed planning commenced, it was considered wise to both repeat and detail the geochemical soil sampling and confirm the mapping in the area.

Thus limited lengths of lines 10 - 15 (inclusive) were re-sampled and the results are tabulated in the attached appendices, and graphed on the accompanying line profiles.

Results tended to confirm the anomalous nature of this area.

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Thus hole S495 of 400m. was sited at 1050W on Line 13. A full drill log is appended to this report.

It penetrated a thick sequence of shales, quartzites, siltstones and minor tuffs. Several minor (thin) fault zones were intersected. One of these at 192m contained 0.4m. of 0.32% Sn. A strongly pyritic zone was intersected between 321.4 - 338.4m., and it is interesting to note that there is apparently no substantial I.P. anomaly relatable to this zone. Further, magnetic susceptibility readings on the core failed to detect a zone which would account for the magnetic anomaly on Line 13. It is concluded that the hole may not have gone far enough.

The mapping in this area suggested this hole should have collared in Lower Crimson Creek Formation rocks and passed into Success Creek Group rocks. However, there is little justification for calling any of the units intersected anything but Success Creek Group. Thus it is suggested that a major re-interpretation of the surface geology in this area is warranted.

6. CONCLUSIONS AND RECOMMENDATIONS

Surveys completed by a variety of companies in recent years in the general area covered by E.L. 42/71 have tended to yield results which confirm the long term exploration potential of the region.

However, due to a general lack of persistent exploration founded upon logical long term programs, much of this work is not particularly useful when it comes to detailed appraisals.

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The drilling in 1977-78 confirmed that much of the geological mapping on the licence area is inaccurate.

Because of the obvious importance of this region, it is proposed that a longer term, more logical sequences of exploration be commenced on E.L. 42/71 in 1977-78.

This sequence should consist of:

- (1) Detailed compilation of the enormous volume of widely scattered existing data, onto a set of more servicable maps.
- (11) Detailed geological mapping of the whole area, in co-ordination with similar work on the nearby Renison Mining Lease.
- (111) Extension and infilling of existing traverse line systems to provide a better and more detailed coverage over most of the Licence area.
- (1V) A continuing program of diamond drilling, both of a stratigraphic nature and a specific nature, aimed at testing defined anomalous targets. Two holes per annum (minimum) are considered desirable.

During 1977-78, it is recommended that all four of the above stages be commenced. One experienced geologist should be assigned to the area full time. Two drill holes are recommended but their exact locations will have to be later determined by stages (1) - (111).

A budget of \$55,000 is proposed to undertake this work, and budget details are appended to this report.

L. A. Newnham

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CHIEF GEOLOGIST

10th August 1978.

RENISON LIMITED
GEOLOGY DEPARTMENT

EL 42/71 RENISON BELL

RESPONSIBILITY 073

W/E 27/ 6/78

-- THIS WEEK --		ACCOUNT NAME	ACCOUNT NUMBER	MONTH TO DATE		YEAR TO DATE	
ACTUAL	VARIANCE			ACTUAL	VARIANCE	ACTUAL	VARIANCE
347	347 L	SALARIES	010730702	347	1937 G	12486	23107 G
		CONSUMABLES	010730751		109 G	1428	3886 G
		VEHICLES	010730755				
		DIAMOND DRILLING	010730791			30057	14943 G
		TRACK CUTTING	010730792				
		ROAD CONSTRUCTION	010730793			1960	5540 G
		ASSAYING	010730800				
		TRAVEL & ACCOMMODATION	010730807				
		CONSULTANTS	010730810				
		OUTSIDE SERVICES	010730827			6	12933 G
		ROUNDING					
347	347 L	TOTAL	010739999	347	2046 G	45937	60409 G

APPENDIX 2: PROPOSED EXPENDITURE 1978-79

SALARIES (+ LOADING):	\$20,000
DIAMOND DRILLING:	25,000
TRACK CUTTING:	3,000
CONTRACTORS AND CONSULTANTS: (Geochem, Geophysical, road building etc)	5,000
CONSUMABLES:	2,000
TOTAL:	<u>\$55,000</u>

C.M.S. PETROLOGICAL REPORT 77/10/21

5453

38.0m This is a laminated intercalation of carbonaceous silty shale, argillaceous siltstone and fine sandy siltstone. The rock is layered on a millimetric scale, with locally weakly graded planar to weakly lenticular bedding. Clastic components comprise extensively degraded feldspar particles and rock fragments (shale & volcanics) with slightly subordinate quartz and minor white mica flakes. The matrix is argillaceous material (?kaolin) pervasively stained with carbonaceous matter and poorly resolved against the similarly altered clastic particles.

Incipient recrystallisation reflects load or burial metamorphic conditions with a very weak slaty cleavage intersecting bedding at a low angle. There are no tangible metasomatic alteration effects. Fine grained pyrite is sparsely disseminated throughout, tends to be concentrated in the coarser bands and is partly framboidal.

69.0m This is a carbonaceous pyritic lithic sandstone in faulted Contact with a carbonaceous silty shale.

The sandstone is poorly sized in the fine to medium sand range and locally grades into a finer (silty fine) sandstone. Framework components, apart from rare clastic grains comprise almost entirely chert (pure, argillaceous and carbonaceous varieties) and subordinate kaolinitic, variably carbonaceous argillite clasts. There are thinly dispersed clasts of carbonaceous quartzose siltstone and a few clasts of microfelsitic ?militite.

The matrix consists of cherty microcrystalline quartz weakly stained with kaolin, sericite and weakly but more or less pervasively with carbonaceous material. The adjacent silty shale is closely similar to that at 38m., with the faulted contact cutting bedding (in both rocks) almost at right angles and healed with films of carbonaceous matter.

Both rocks are variably pyritic. The sulphide is generally fine grained and is partly framboidal.

72.9m This is a weakly sheared chlorite-talc-carbonate rock clearly an altered ultramafic and reasonably interpreted on relict textural grounds as originally a lithic crystal tuff.

The rock has a distinct lithic-fragmental fabric enhanced by sporadic discrete bastite-like chlorite pseudomorphs of pyroxene crystals. Recognisable clasts are very poorly sized and generally show relict slaggy or spinifex-type microtextures. These and thinly disseminated particles of chromite (either discrete or included in the clasts) confirm the primary ultramafic nature of the rock.

Coarse subequant and ovoid grains of carbonate (?magnesite) are disseminated throughout the rock. These features are pre-tectonic and have the appearance of recrystallised nodules. This tends to be confirmed by thinly disseminated sheared carbonate veinlets.

75.6m This is an altered and weakly sheared, tuff similar and closely related to that at 72.9m. It consists mainly of altered (stearitised, sericitised, carbonated, locally silicified) rock fragments within a weakly schistose matrix of similar composition. Clasts are very poorly sorted and many are featureless in terms of primary rock type. However, others show relict slaggy, porphyritic and/or vesicular textures. Many include sub- to euhedral chromite grains, even the more siliceous types, and chromite also occurs as discrete particles.

This rock appears to have contained shards although these features are now altered virtually beyond recognition. Carbonate pseudomorphed indeterminate crystal fragments occur sporadically.

The rock is weakly impregnated with pyrite. Carbonate was introduced along irregular pre-tectonic veins.

83.1m This is a weakly schistose extremely fine grained talc rock with patchy weakly Fe-stained carbonate in disseminated aggregates and stressed semi-continuous veins and accessory to trace amounts of quartz and colorless Mg-Chlorite.

The rock shows a vague but semi-pervasive relict fragmental fabric essentially similar to that at 72.9m. As previously the clasts are poorly sorted. Poorly preserved fabrics are mainly finely porphyritic and/or vesicular with subordinate granular types. There are occasional stearitised bastite-like pseudomorphs of coarse crystals/crystal fragments (evidently pyroxene originally) and locally poorly preserved shard-like features.

Chromite and chromiferous magnetite are sparsely disseminated throughout the rock and again, these features reinforce interpretation as an altered ultramafic tuff. Minor traces of pyrite are associated with the carbonate veins and aggregates.

98.2m This is a weakly schistose talc-carbonate rock. Talc is extremely fine grained, incipiently orientated and forms semi-massive aggregates enclosing frequent single grains and semi-lustre mottled aggregates of weakly Fe-stained carbonate. These features are weakly layered with respect to sizing and relative abundance and show irregular (but generally equant to subspherical shapes). These are accompanied in places by similarly shaped but relative fine aggregates and single grains of quartz or rarely albite.

This rock is devoid of tangible fragmental textures. The carbonate (and quartz, albite) grains and aggregates appear to represent amygdalae. Traces of chromite are present. A faint fine scale banding is evident locally. Overall the rock is best interpreted as primarily a strongly vesicular aphyric (?glassy) ultramafic lava.

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DIAMOND DRILL HOLE PLOT

HOLE No. 1.

SCALE:

Very fine particles of Fe-sulphide are thinly disseminated throughout. Ni-essays may be warranted.

131.8m This is an incipiently schistose talc-carbonate rock with frequent irregular to crudely vein-like fine grained aggregates of albite with subordinate to minor quartz. Talcose areas of the rock show a vague but nonetheless definite lithic fragmental fabric and tend to show irregular contacts the carbonate and albite aggregates. General features suggest the rock was initially a scoriaceous lithic tuff with carbonate and albite introduced largely as cavity fillings but to some extent in discontinuous veins prior to alteration (talc) and incipient regional metamorphism.

Carbonate is weakly Fe-stained (?Fe-magnesite) and locally porcellanous but generally microgranular. In places porcellanous carbonate shows vague colloform microstructures. The rock shows sparse disseminations of pyrrhotite in addition to more or less evenly disseminated fine grained chromiferous magnetite.

143.0m This is an incipiently-sheared talc rock representing an altered coarsely spinifex-textured ultramafic.

Talc forms semi-massive aggregates showing frequent pseudomorphs (mean 50 μ) of random to felted bladed crystals. These features outline a typical sluggy (or spinifex) fabric. Primary composition is obscure but there is some evidence that talc has replaced an amphibole (?tremolite-actinolite) in which case a clinopyroxene is the most likely primary phase.

Disseminated bastite-like aggregates (to 1mm) of Mg-chlorite, partly replaced by talc, represent pyroxene, phenocrysts. In addition there are fairly frequent subsequent aggregates of quartz and albite with the appearance of amygdalae (the grey-white spots, hand specimen).

The rock carries accessory fine grained chromiferous magnetite and minor ultrafine sulphide particles. Irregular chlorite veins occur sporadically and there is some evidence of brecciation locally.

294.4m This is partly steatitised serpentinite derived from a coarse grained poikilitic-textured peridotite.

Mineralogy comprises mainly random talc with slightly subordinate relict (i.e. unsteatitised) serpentine, and accessory amounts of tremolite primary chromiferous magnetite, finer secondary ("exsolved") magnetite and minor traces of phlogopite. Pseudomorphous structures are well developed and the rock clearly consisted of coarse poikilitic "phenocrysts" of pyroxene (olivine inclusions) disseminated throughout more even grained granular pyroxene and olivine intergrowths. General paucity of tremolite (and carbonate) suggest the pyroxene was an orthorhombic variety (harzburgite-peridotite).

There are no detectable sulphides.

349.5m This is an altered and incipiently sheared ultramafic lithic tuff essentially similar to the previous examples.

The rock consists largely of incipiently orientated talc with minor associated chlorite, minor traces of tremolite-actinolite and thinly disseminated grains of chromite and chromiferous magnetite. The relict fabric is relatively distinct and comprises fairly closely packed rock fragments poorly sorted and showing generally angular to subangular shapes. Sizing is typical of this suite of altered pyroclastics with individual particles ranging from approximately 500 μ to around 5 mm.

The clasts are recognisable as porphyritic and vesicular types with subordinate sluggy textured and probably some glassy varieties. Phenocrystal shape is generally non-diagnostic but where recognisable, invariably pyroxene-types. This feature and the semi-ubiquitous chromiferous opaques confirm the ultramafic primary composition.

This rock contained thinly dispersed shards and crystal fragments. There are no detectable sulphides.

356.0m This is a talc-tremolite rock with accessory quartz and a little Ca-feldspar now extensively replaced by the pale green tremolite-actinolite. The rock is fairly fine grained with scaly talc developing largely by replacement of the amphibole.

The fabric indicates this rock was primarily a crystal tuff composed largely of moderately well sorted (mean 500 μ) ferromagnesian crystal fragments (now tremolite-actinolite, presumed pyroxene initially) with a subordinate component of clastic feldspar. Thus inferred composition is picritic.

There are occasional indeterminate altered lithic clasts. Accessory fine grained chromiferous opaques are disseminated throughout and there are minor traces of ultrafine grained sulphide.

360.2m This is a talc-tremolite-quartz-albite rock clearly recognisable as originally a highly vesicular, weakly porphyritic sluggy textured lava.

Abundant subspherical amygdalae (to 3.5mm) appear as grey-white spots in hand specimen and consist mainly of granular to subradiating quartz with subordinate similarly textured albite and patchy talc (after ?carbonate in part). These features are more or less evenly disseminated throughout the rock which consists largely of semi-fibrous tremolite actinolite pseudomorphing a well developed rather fine scale sluggy fabric and in places phenocrystal grains of pyroxene. General features are thus rather similar to the coarser grained and less strongly amygdaloidal rock at 143.m.

Minor accessory traces of relict primary chromiferous spinel are present. Rare particles of fine grained secondary magnetite and ultrafine sulphide particles are associated with the amygdalae.

RENISON LIMITED
DIAMOND DRILL HOLE PLOT

HOLE No. 1

SCALE:

373.0m This is a tremolite-chlorite-carbonate rock with accessory quartz thinly disseminated chromiferous opaques and traces of talc. Amphibole is a weakly green variety (tremolite-actinolite) partly replaced by carbonate (calcite-dolomite) or locally talc. In places quartz and tremolite form vague semi-pseudomorphs of feldspar and chlorite in part represents altered pyroxene.

Overall the fabric is relatively non-diagnostic. However, the rock appears to have been a weakly porphyritic medium-grained probably minor intrusive picritic type. Irregular vein-like masses of carbonate and relatively pale (tremolite) amphibole occur sporadically. Extremely rare very fine sulphide particles are present.

394.6m This is an altered vesicular lava of basic rather than ultramafic affinities.

The rock consists largely of random slightly felted subacicular albitised feldspar laths (mean 15 μ diameter) with microgranular interstitial quartz-feldspathic material. More or less pervasively stained with chlorite. Sparsely disseminated patches of tremolite-actinolite (partly replaced by carbonate) appear to represent phenocrystal laths and subophitic patches of pyroxene. Small (typically 500 μ) amygdalae of quartz chlorite actinolite and carbonate are evenly disseminated throughout. The rock has a weakly slaggy fabric indicating fairly rapid cooling. It carries ultrafine accessory magnetite.

There are occasional quartz-chlorite veins. Spongy aggregates of pyrite (+ pyrrhotite, occasional blabs of chalcopyrite) are disseminated throughout these features and the amygdalae. Virtually identical rocks have been seen from the Heazlewood Creek complex.

397.6m This is a generally fine grained chlorite-carbonate rock with accessory quartz, disseminated sulphides and traces of sphene. Chlorite largely represents altered tremolite which persists locally as relics. Relict textural features are vague but the rock appears to have been a fine grained somewhat slaggy textured basic to ultrabasic type partly by analogy with the associated specimens.

Crude veins of carbonate (calcite-dolomite) with accessory poikilitic quartz and patchy tremolite occur sporadically. These features include patches of pyrrhotite and chalcopyrite. In contrast the host rock is only incipiently mineralised.

436.0m This is a metasomatised coarse grained agglomerate or breccia (the distinction is tenuous due to small specimen size).

The sectioned area includes portion of four angular clasts cemented and partly replaced by fine grained random actinolite. One clast consists of heavily altered fine to medium grained incipiently porphyritic basic rock tentatively identified as a microgabbro on the basis of the incipiently ophitic-like relict fabric. The coarsest fragment (approx. 3 cm diameter) is a quartz-actinolite rock representing a heavily metasomatised chert. The remaining two clasts are vaguely recognisable as heavily altered (silicified, actinolitised) fine to medium grained poorly sorted labile greywacke-like sediments.

This rock cannot be closely correlated with the adjacent metabasites. Overall it appears to be a sedimentary breccia (agglomerate) but finer details have been obliterated by metasomatic effects.

Accessory traces of carbonate sphene magnetite and ilmenite are present. There are no detectable sulphides.

451m For want of better term this rock is best termed a metasomatised cherty spilite. It consists of irregular to ovoid clasts of chert and altered basic lava (texturally and compositionally similar to for example 394.6m) cemented by chert. Some of the variably altered lava clasts (to 1 cm +) show thin selvages suggestive of chilled margins and these features are corroded to varying degrees by the chert matrix. Overall the rock has the appearance of a pillow lava albeit on a rather fine scale.

The rock is variably altered to fine grained actinolite in irregular aggregates and veins. Secondary quartz and carbonate are common in places and there is patchy development of semi-vermiform aggregates of prehnite. Accessory traces of sphene are present and more heavily altered areas are variably impregnated with disseminations of pyrrhotite and chalcopyrite.

465.8m This is a complex rock but recognisable as a heavily altered "basalt".

Marginal portions of the area sectioned consists of random felted subacicular albite microlaths with interstitial quartz-feldspathic material interspersed with fine grained rather patchy pale actinolite. These areas are similar to the basalts at 394.6m and 451m although in contrast are non-amygdaloidal.

Elsewhere the rock consists largely of coarse poikilitic anhedral quartz enclosing fine lath-like grains of albite and actinolite (texturally similar to the above) and studded throughout with coarse grained green brown weakly color-zoned tourmaline. The schorl is poikilitic with inclusions of actinolite and rarely albite. Texturally both quartz and tourmaline postdate the albite-actinolite alteration assemblage.

Minor accessory sphene and relict primary fine grained magnetite are present. There are no detectable sulphides.

467.0m This is an albite-actinolite rock representing an altered basalt with some similarities to those at 394.6m, 451m and 465.8m.

Generally the rock consists of random felted to weakly (flow-) orientated albitised feldspar microlaths (mean 15-20 μ) with interstitial fine grained actinolite and subordinate to minor quartz-feldspathic material. Elsewhere fine grained actinolite forms semi-massive aggregates enclosing corroded feldspar microlaths.

Actinolite was introduced, partly at least, along irregular veins which carry sparse disseminations of pyrrhotite and chalcopyrite. Textural relationships suggest, that at least in this case, the actinolite postdates albitisation.

The rock is non-amygdaloidal. It carries minor accessory sphene and relict primary very fine grained magnetite.

476.2m This is an albitised and actinolitised basalt similar to the previous examples.

This rock was slightly coarser grained and has a more distinctly slaggy fabric. It was also incipiently porphyritic and weakly vesicular. Albitised feldspar microlaths have a mean diameter of about 20-25 μ and phenocrysts about 120 μ . Actinolite laths, disseminated throughout the rock, represent uraltised pyroxene laths. The thinly dispersed actinolite amygdales are sized to 3 mm and locally contain granular albite at the cores.

This rock contains sparse pyrite disseminations and traces of pyrrhotite partly associated with the amygdales and with sporadic actinolite veinlets. Ultrafine magnetite, characteristic of these altered basalts, is sparsely disseminated throughout.

HOLE NUMBER	5495	SURVEY			From - To	Distance D	VERTICAL		HORIZONTAL	
		Depth	Bearing	Dip			D.Sin.Dip	R.L.	D.Cos.Dip	Prog. Tot
PURPOSE	To test coincident I.P., Geochem, and magnetic anomalies on Line 13, Argent Grid.	Collar	065°23'	-52°11'	0-30.25	30.25	23.9	2236.0	18.6	13.5
		60.5	NA	-51.5°	- 75.75	45.5	35.7	2200.3	28.3	46.9
LOCATION	Line 13, Argent Grid, EL42/71	91.0	069°	-44°	-100.5	24.75	17.2	2183.1	17.8	64.7
		110.0	069°	-50°	-142.5	42.0	32.2	2150.9	27.0	91.7
COLIAR R.L.	2259.89	175.0	069°	-47.5°	-194.0	51.5	38.0	2112.9	34.8	126.5
		213.0	068°	-43.5°	-228.3	34.3	23.6	2089.3	24.9	141.4
CO-ORDINATES	N 19127.72 ; E 14418.95	243.6	069°	-43°	-256.8	28.5	19.4	2069.9	20.8	172.2
		270.0	067°	-43°	-287.3	30.5	20.8	2049.1	22.3	194.5
LENGTH	400.1m	304.6	065°	-43°	-319.8	32.5	22.2	2026.9	23.8	216.3
		335.0	061°	-42°	-350.3	30.5	20.4	2006.5	22.7	241.0
HOLE SIZE	0 - 3.0m triconed 3.0 - 67.3m NQ 67.3 - 400.1m BQ	365.6	059°	-41°	-377.8	27.5	18.0	1988.5	20.7	261.7
		390.0	058°	-41.5°	-400.1	22.3	14.8	1973.7	16.7	276.4
DATE DRILLED	22/3/78 - 6/4/78									
SIGNIFICANT CORE LOSS ZONES	See recoveries									
ORE ZONE GROUND CONDITIONS										
LOGGED BY	L. D. Bond									
COMMENTS	Appears to have collared in Dalcoath Member, and passed through fault into ?Donah Fmtn at 203.7m Intersected strongly pyritic tourmalinised zone in turbidite 321.4 - 338.4m, and sphalerite 312.9 - 313.1m. Magnetic susceptibility of core was measured at 1.0m intervals, and found to be less than 0.2cgs units throughout, except for a reading of 1.9cgs units in the fault at 203m.									

SUMMARY - ASSAY DATA

LODE NAME	FROM	TO	LENGTH (m)	AVERAGE WEIGHTED ASSAYS											B.C	
				Sn	Acid Sol. Sn	Cu	As	S	Pb	Zn	Bi	WO ₃	Ag g/t			
Fault ?	192.7	193.1	0.4	0.32	0.026	0.06	2.12	3.1	0.13	0.29	0.008		8			
				?	?											
	321.4	338.4	17.0	<0.01	0.013	0.05	<0.10	7.2	0.010	0.015	0.005		3			

Appendix A

HOLE No. 1, S495

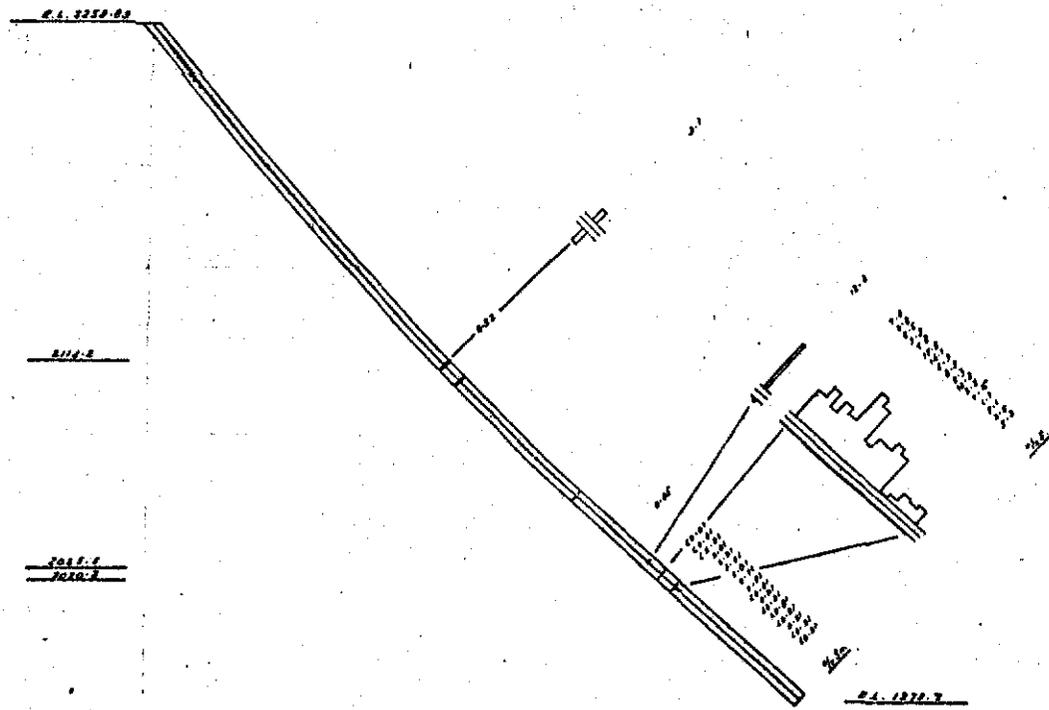
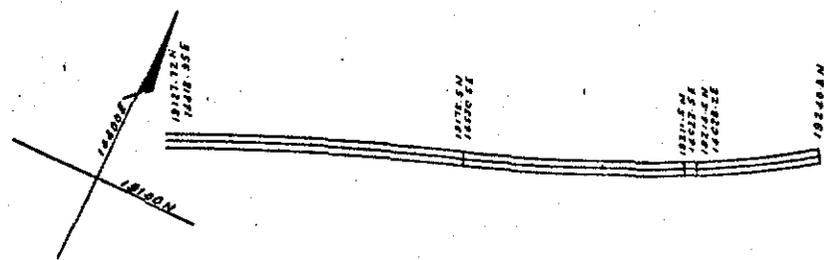
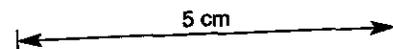
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RENISON LIMITED
DIAMOND DRILL HOLE PLOT

231025

24



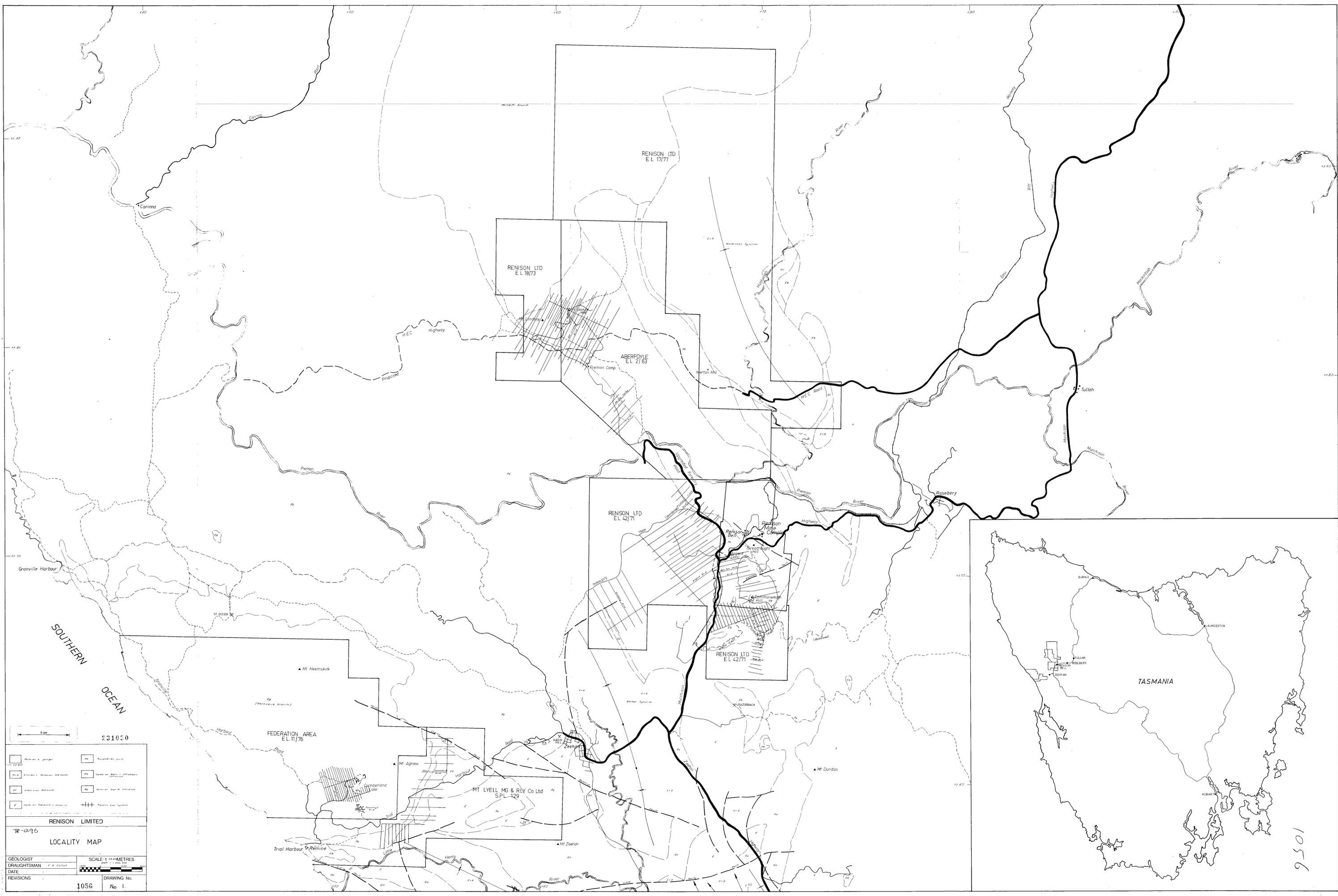
528

DIAMOND DRILL RECORD

HOLE NUMBER 5495

LOGGED BY L.D. Bond

INTERVAL (m)		RECOVERY		DESCRIPTION	FORM	% Sn										
FROM	TO	m	%			FROM	TO	TOTAL	ACID SOL.	% Cu	% Al	% S	% Pb	% Zn	% Bi	g/t Ag
248.3	261.7	13.4	100	BLACK SHALE, QUARTZITE												
				Well bedded, black shale and quartzite units up to 5cm thick. Very minor intraformational slumping. Fine quartz veins common, generally containing minor pyrite. BCA consistently 70%.												
				Firm, jointed parallel to bedding.												
261.7	400.1	138.4	100	BLACK SHALE/QUARTZITE TURBIDITE?, DOLOMITE, TUFF?												
				Turbidite composed of subangular clasts of medium grained quartzite in black shale matrix. Dolomite generally fine grained mid grey, with minor stylolites. Tuff? pale green, with subangular clasts oriented parallel to bedding.		312.9	313.1	0.05	0.029	0.11	0.79	12.4	0.91	18.1	0.007	26
				Turbidite minor 261.7 - 272.3m, with interbedded black shale and quartzite, extensively slumped, instead. Dolomite occurs at 271.7 - 272.3m (talc recrystalline, minor pyrite); 323.7 - 323.9m, and 330.8 - 334.9m (interbedded with pyritic black shale).		321.4	322.4	0.01	0.021	0.05	0.10	7.4	0.009	0.082	0.003	1
				Tuff? occurs as thin (< 5cm) beds between 365.1 and 369.5m; and as thicker slumped units 379.9 - 380.2m, 380.8 - 381.3m, 382.5 - 382.8m, 384.1 - 384.3m, and 385.4 - 387.2m.			323.4	0.01	0.012	0.05	0.10	9.8	0.017	0.004	0.005	3
				Turbidite is strongly pyritic below quartz vein at 321.4; pyrite content decreases gradually downhole, becoming very minor below 338.4m. Black shale strongly tourmalinised in the region 321.4 - 338.4m.			324.4	0.01	0.012	0.05	0.10	6.5	0.013	0.005	0.006	2
				Bröccia zones infilled by carbonate and sphalerite 312.9 - 313.1m, and 396.3. Minor quartz-carbonate veins elsewhere. Quartz veins and fracture filling common between 319.9 and 359.0m.			325.4	0.01	0.009	0.05	0.10	9.3	0.014	0.049	0.003	2
				Rock firm, slightly to moderately jointed generally; but very jointed parallel to bedding 324.5 - 334.0m. Broken ground 347.0 - 348.9m, 332.1 - 332.3m, and 399.5 - 399.9m.			326.4	0.01	0.021	0.05	0.10	7.8	0.009	0.006	0.004	2
				B.F.A's. 303.3m-45°, 313m-70°, 322m-0°, 323m-50°			327.4	0.01	0.012	0.05	0.10	15.8	0.016	0.005	0.004	2
				327m-50°, 334m-60°, 345m-70°, 350m-60°, 356m-70°			328.4	0.01	0.009	0.05	0.10	14.1	0.015	0.043	0.006	3
				END OF HOLE. 397m-70°			329.4	0.01	0.018	0.05	0.10	5.9	0.007	0.004	0.008	4
							330.4	0.01	0.012	0.05	0.10	8.3	0.011	0.006	0.007	5
							331.4	0.01	0.015	0.05	0.10	8.3	0.011	0.009	0.006	6
							332.4	0.01	0.018	0.05	0.10	10.3	0.018	0.006	0.006	4
							333.4	0.01	0.003	0.05	0.10	9.2	0.012	0.004	0.004	3
							334.4	0.01	0.003	0.05	0.10	0.16	0.002	0.005	0.006	2
							335.4	0.01	0.003	0.05	0.10	1.1	0.003	0.005	0.005	2
							336.4	0.01	0.008	0.05	0.10	3.1	0.005	0.004	0.001	1
							337.4	0.01	0.003	0.05	0.10	2.6	0.004	0.013	0.002	1
							338.4	0.01	0.003	0.05	0.10	3.2	0.007	0.003	0.001	1



5000

231030

□ Area of Renison Ltd	□ Renison Ltd
□ Area of Federation Area	□ Area of Mt Lyell MS & RLY Co Ltd
□ Area of Aberfoyle	□ Area of Rosebery
□ Area of Carinna	□ Area of Zeelton
□ Area of Federation Area	□ Area of Mt Lyell MS & RLY Co Ltd
□ Area of Renison Ltd	□ Area of Federation Area

RENISON LIMITED

78-1275

LOCALITY MAP

GEOLOGIST: A. A. Collier

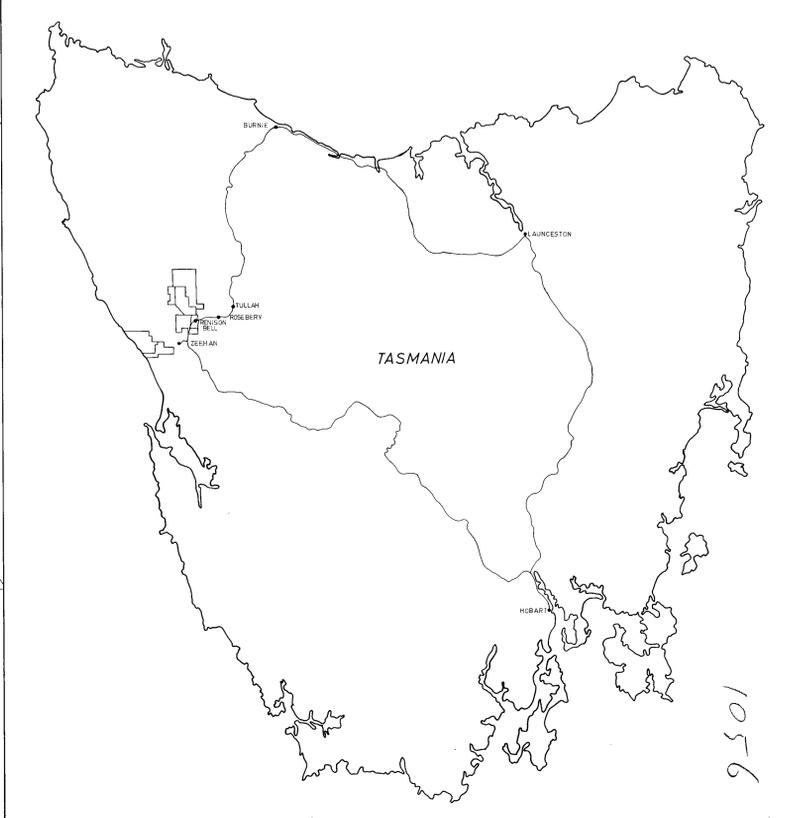
DRAUGHTSMAN: A. A. Collier

DATE: 1975

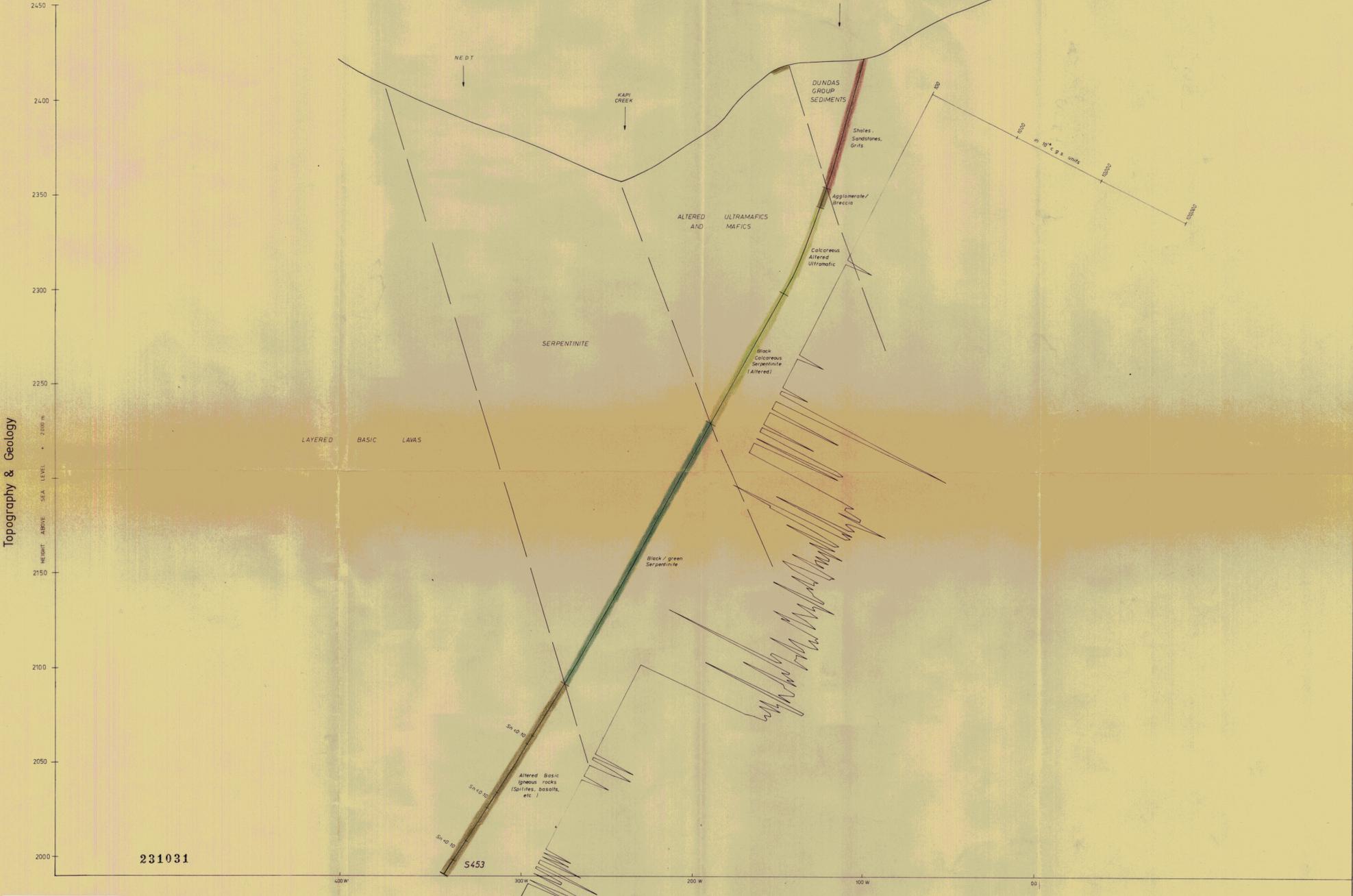
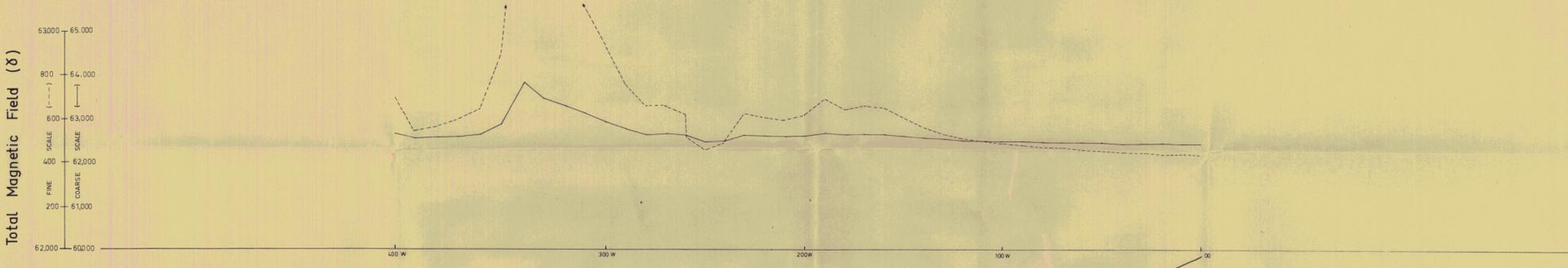
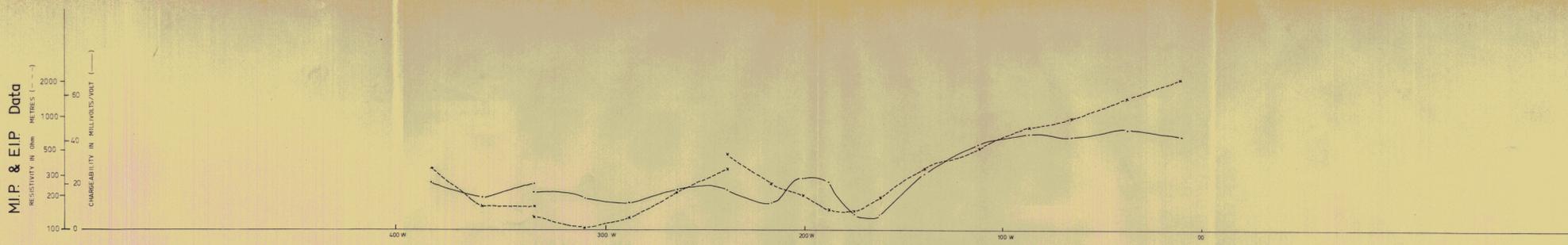
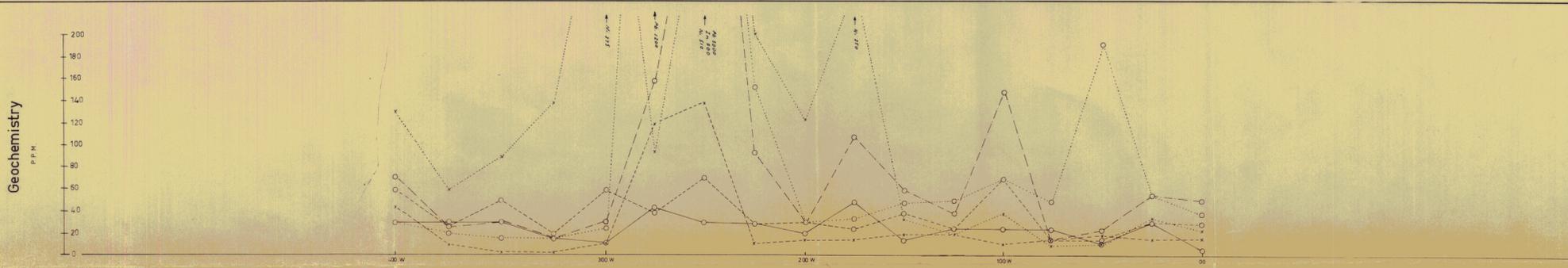
REVISIONS: 1056

SCALE: 1:50,000 METRES

DRAWING No. No. 1.



1056



231031

RENISON LIMITED

78-1245 E.L. 42/71 KAPI GRID LINE 1900N HOLE Nº S 453

GEOLOGIST L Newnham SCALE 1 1000 METRES

DRAUGHTSMAN J Matthews

DATE July 1978

REVISIONS 1057 DRAWING No. N° 2

L.P. MAGNETICS

CHARGEABILITY 5000 δ SCALE

RESISTIVITY 1000 δ SCALE

POLE-DIPOLE

GEOCHEMISTRY

Sn

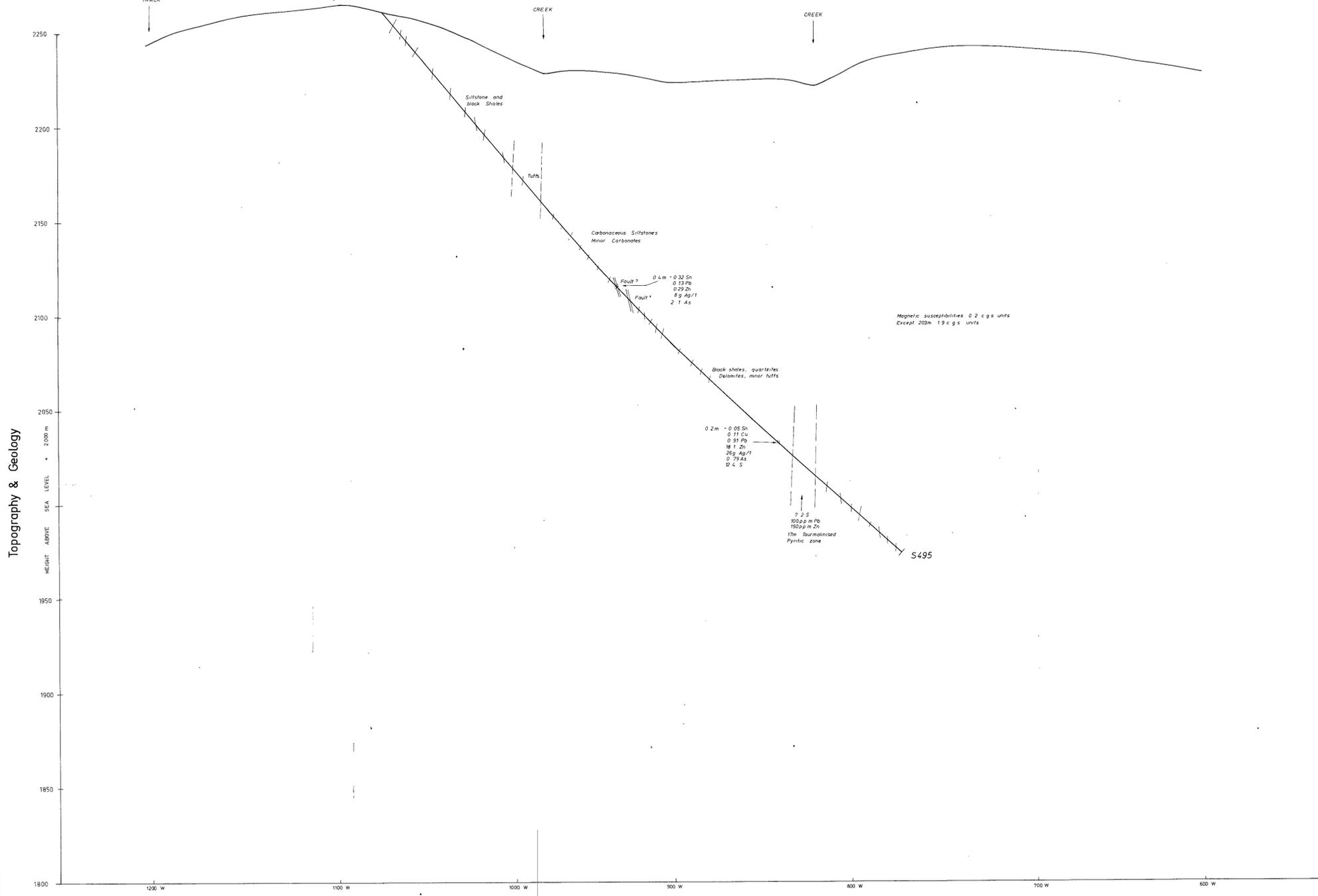
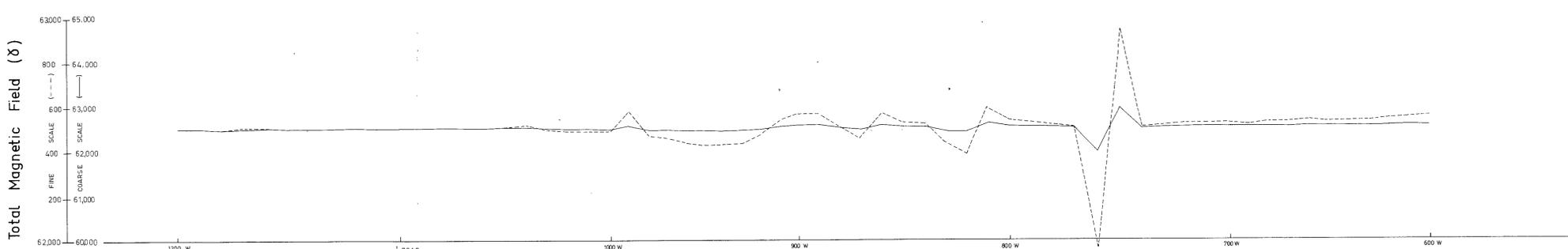
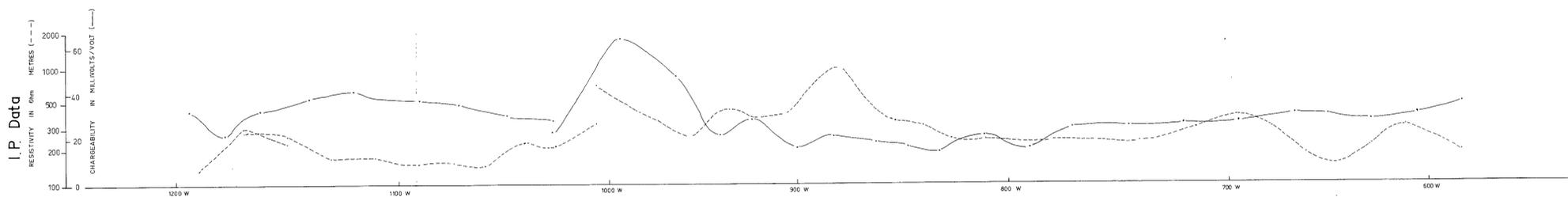
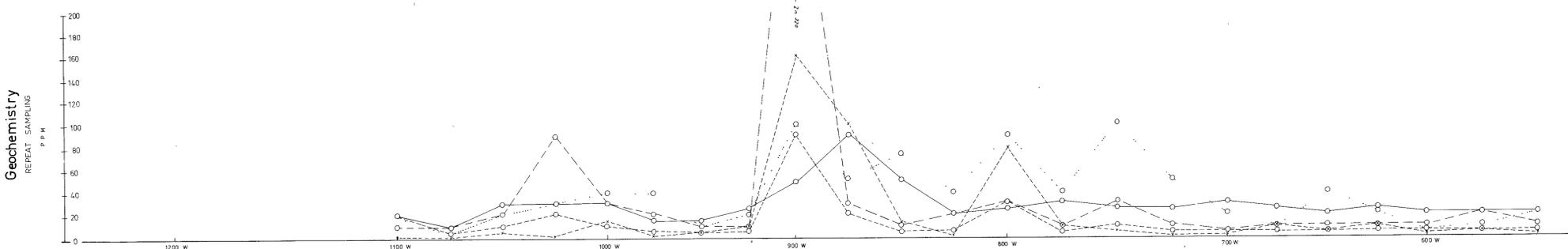
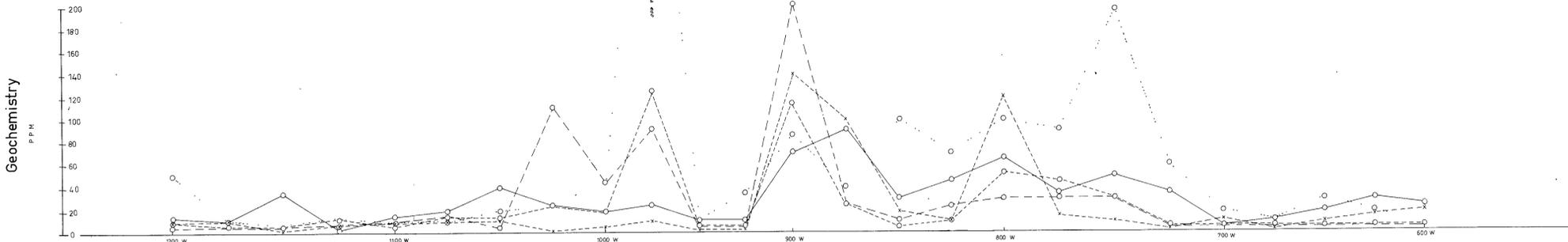
Cu

Pb

Zn

As

Ni



231032

RENISON LIMITED

18-1295 E.L. 42/71 ARGENT GRID LINE 13, S495

GEOLOGIST L. NEWNHAM SCALE 1:1000 METRES

DRAUGHTSMAN J. MATTHEWS

DATE JULY 1978

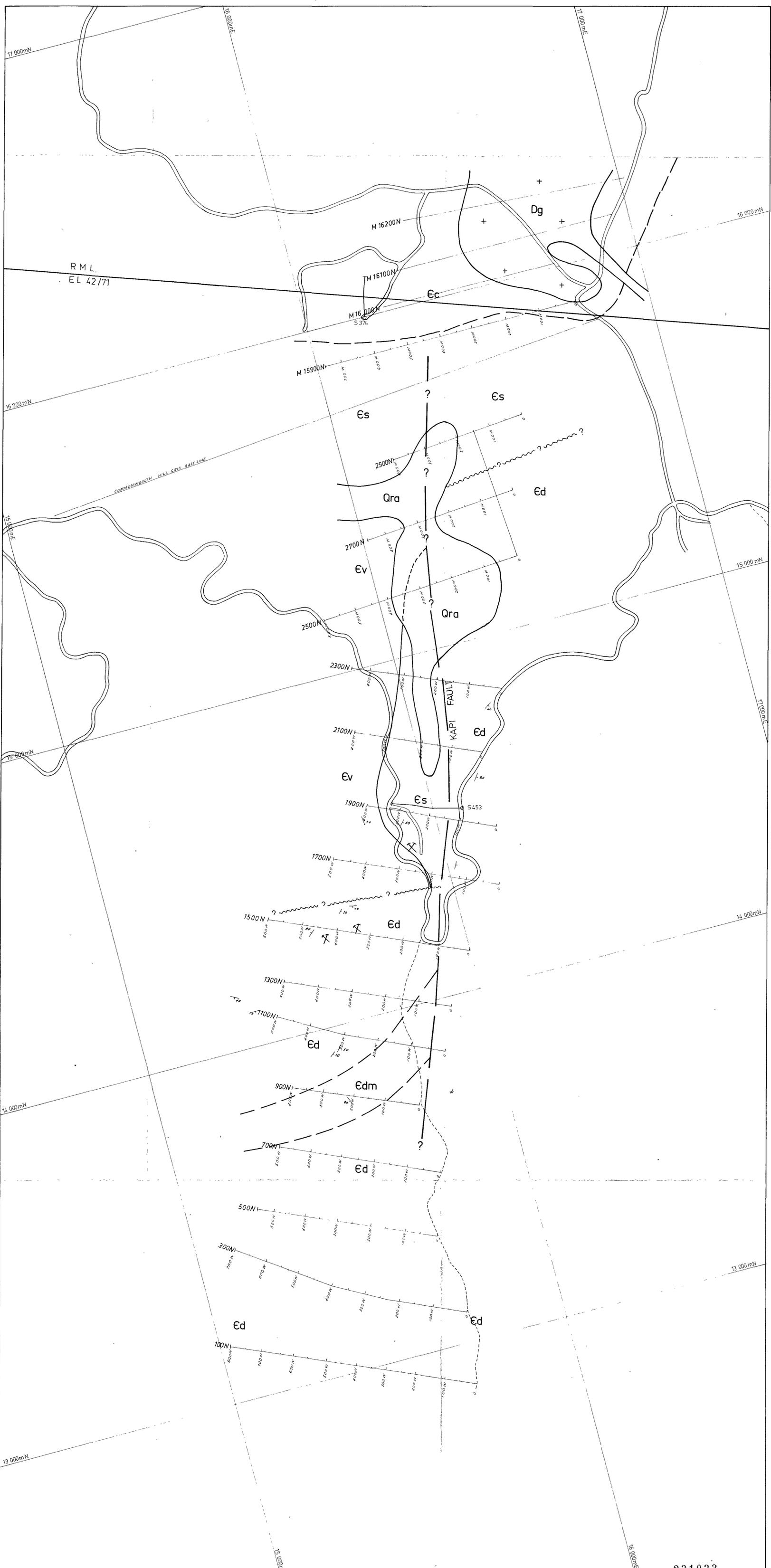
REVISIONS 1058 DRAWING No N° 3

I.P. MAGNETICS GEOCHEMISTRY

CHARGEABILITY 5000 γ SCALE

RESISTIVITY 1000 γ SCALE

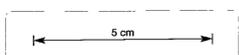
Sn, Cu, Pb, Zn, As, W



231033

LEGEND

- | | | | | | |
|-------------|------------------------------|------------|---------------------------------|---------------------|--|
| — — — — — | Geological Boundary | Qra | Alluvium | Ev | Volcanics, Lavas, Spillites |
| - ? - ? - | Inferred Geological Boundary | Ed | Dundas Group Sediments | Es | Serpentinites (? altered layered mafic, ultra-mafic rocks) |
| - - - - - | Approx Geological Boundary | Edm | Magnetic Member of Dundas Group | | |
| - - - - - | Fault | U CAMBRIAN | | | |
| - ? - ? - ? | Inferred Fault | M CAMBRIAN | Ec | Crimson Creek Group | |
| - - - - - | Approx Fault | DEVONIAN | Dg | Granite | |
| - / - / - / | Dip and Strike of Bedding | | | | |
| ⊗ | Mine Working | | | | |
| ~~~~~ | Unconformity | | | | |



RENISON LIMITED		SCALE 1:5,000 METRES	
78-295	KAPI GRID		100 0 100 200
GEOLOGY			
GEOLOGIST	JPK & LAN		
DRAUGHTSMAN	JMM		
DATE	March '77	DRAWING No	
REVISIONS	July '78	1059	N° 4



ROCK SAMPLING RESULTS

LOCATION	CHRS Report or Description	ASSAYS ppm								
		Sn	Cu	S	As	Pb	Zn	Ag	WO	Bi
19950 N 12470 E 1	76/3/20	25			35	80	160	5	45	
19950 N 12470 E 2	76/3/20	15			1400	15	260	20	2	30
19945 N 12420 E 3	76/3/20	40			700	60	150	40	1	25
17320 N 12410 E 4	76/3/20	75			1400	25	10800	300	41	40
19950 N 12450 E 5	76/3/20	45			700	65	160	70	1	30
19950 N 12450 E 6	76/3/20	20	100	18200	2000	780	140	20	25	160
19270 N 12480 E 7	76/3/20	40	45	15800	180	60	70	1	25	50
19200 N 12720 E 8	76/3/20	60	25		300	225	75	20	20	70
19950 N 12420 E 9	76/3/20	80	270		60	195	670	15	8	55
20280 N 12330 E 10	76/3/20	100	270		15	45	295	35	20	70
20280 N 12330 E 11	76/3/20	45	130		45	70	560	80	10	20
1995 N 12755 E 12	Pyritic Shale	80	175		45	160	15	15	150	2.5
17135 N 12880 E 13	Gneiss	80	170		850	1850	5800	85	50	40
19810 N 12600 E 14		70	20		80	100	300	2	<50	105
19950 N 12835 E 15		30	20		140	90	580	2	150	125
18775 N 12730 E 16		50	10		260	120	2650	2	150	120

MAPPING SYMBOLS

- Definite Geological boundaries
- - - Approximate Geological boundaries
- · - Inferred Geological boundaries
- Strike and dip of bedding
- Vertical bedding
- Horizontal bedding
- Strike and dip of jointing
- Strike and dip of shearing
- Fault dip and downthrow
- Fault, position approximate
- Fault, position inferred
- Syncline with plunge
- Anticline with plunge
- Old mine workings
- Py Pyritic Mineralization
- Pb Pb Mineralization
- Driveway road
- Track
- Diamond drill hole
- * Sample location

ROCK TYPE DESCRIPTION

QUATERNARY

- Qra Alluvium
- Opf Pleistocene fluvioglacial

LOWER TO MIDDLE CAMBRIAN

- UEc LOWER CAMBRIAN GNEISS FORMATION
Pyritic shales, gneisses, gabbros
- LEc LOWER CAMBRIAN GNEISS FORMATION
FINE SEDIMENT EQUIVALENT
Carbonaceous shale, chert, breccia, dolomite

UPPER PROTEROZOIC TO LOWER CAMBRIAN

- Esc SUCCESS CREEK GROUP
Quartzite, siliceous siltstone and shale
- Delinite, dolomitic shale
- Gneiss, amphibolite, muscovite
- Chert, chert breccia
- Heteritic argillaceous siltstone and mudstone

INTRUSIVES

- Quartz, perthite dyke
- Basic dyke

231034

5m

RENISON LIMITED

78-1245 ARGENT GRID AREA

INTERPRETATIVE GEOLOGY

GEOLOGIST J. KELLEHER SCALE 1:5000 METRES

DRAUGHTSMAN J. MATTHEWS

DATE MAY 1978

REVISIONS AUGUST 1977 1060 DRAWING No

AUGUST 1978 N 0

Geochemistry



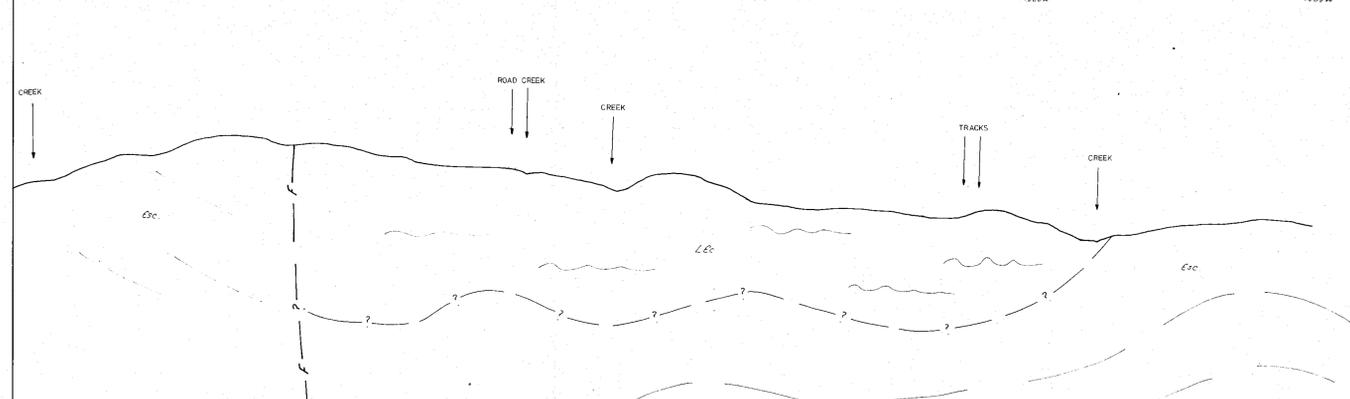
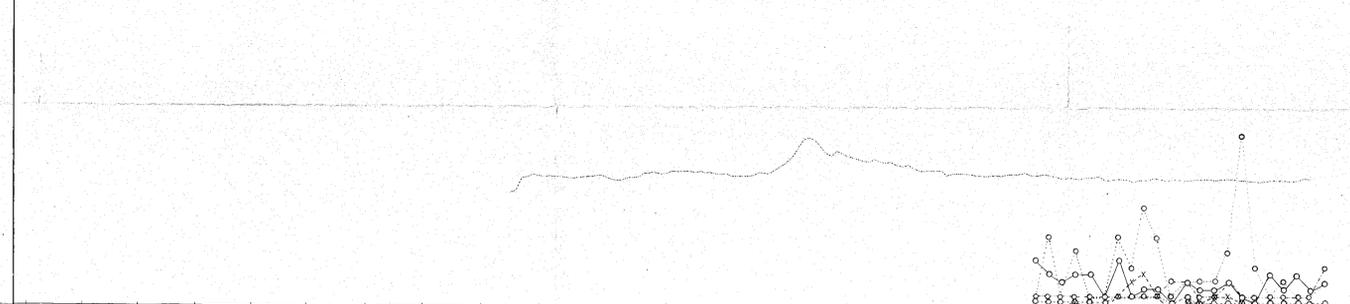
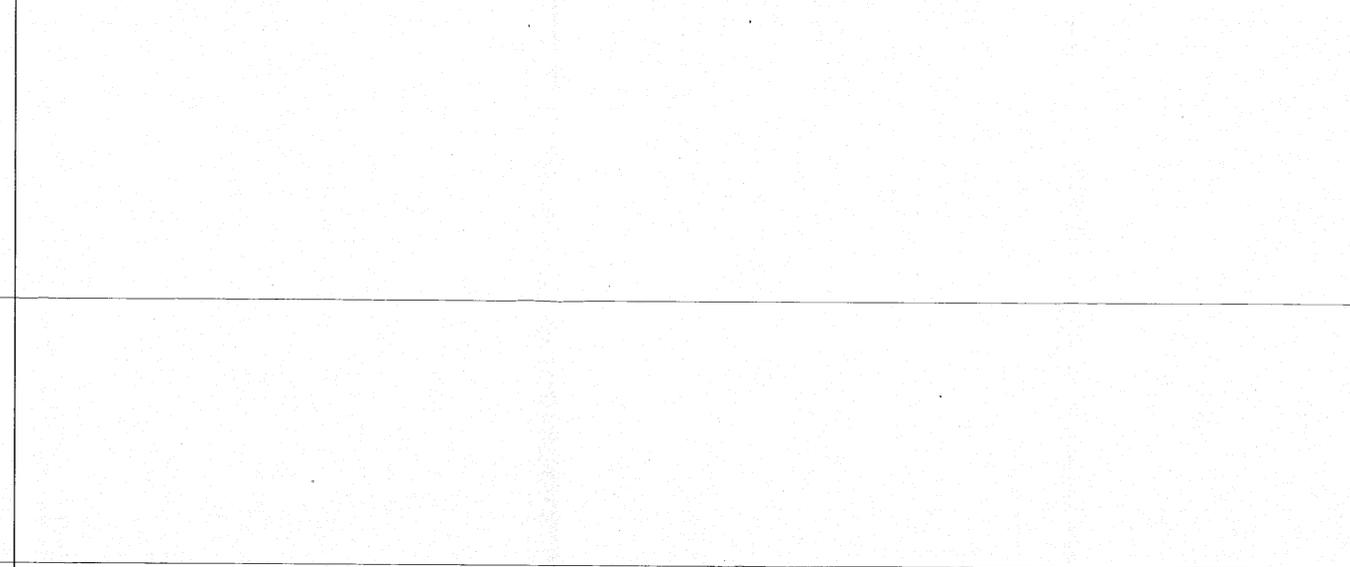
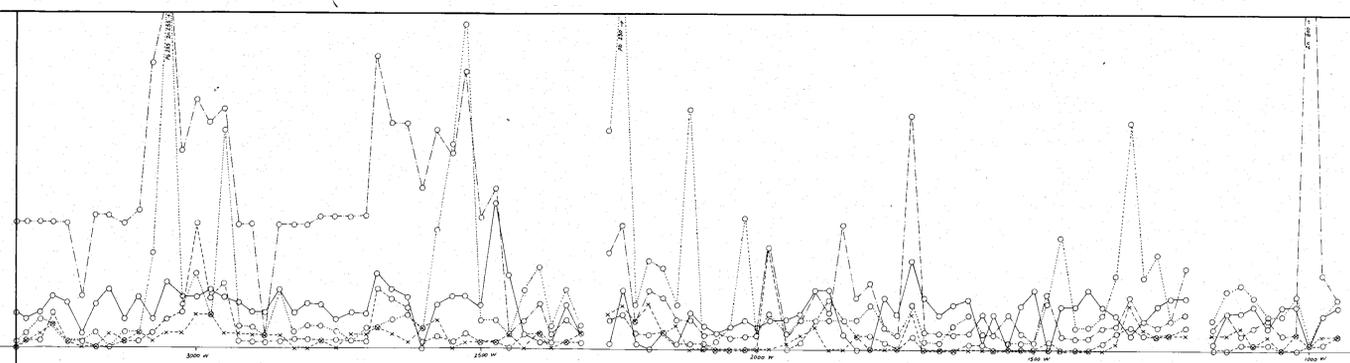
I.P. Data



Total Magnetic Field (Δ)



Topography & Geology



Geochemistry



231035

RENISON LIMITED
 ARGENT GRID
 LINE 10
 SECTION LOOKING N.W. 1061
 SCALE: 1:5000 METRES

DRAWN	J.P.K.
TRACED	J.M.H.
DATE	28.7.77
SCALE	1:5000
DRAWING No.	

N° 6

I.P. DATA
 CHARGEABILITY & RESISTIVITY

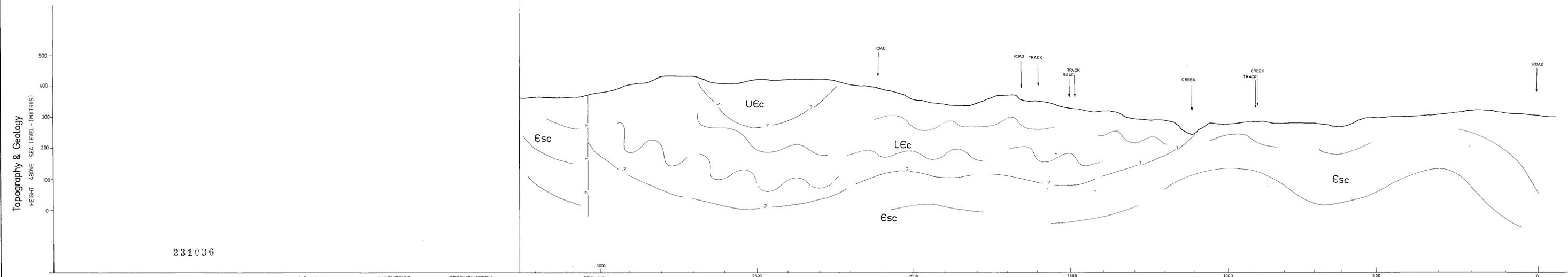
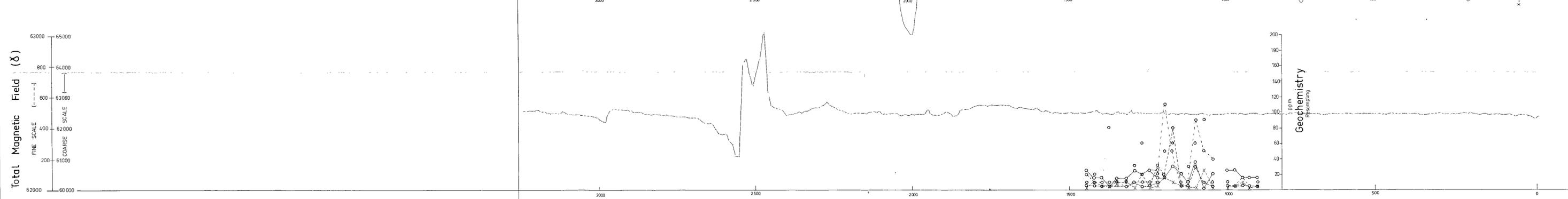
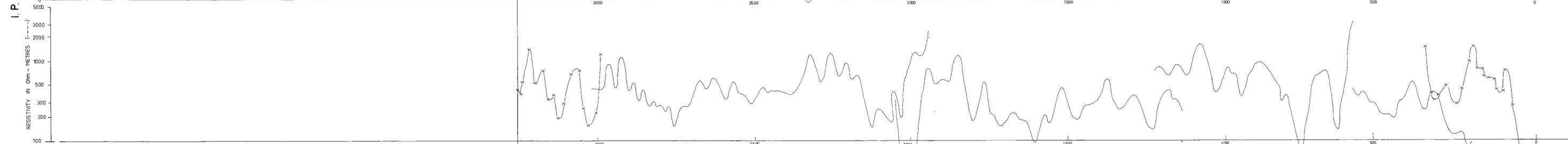
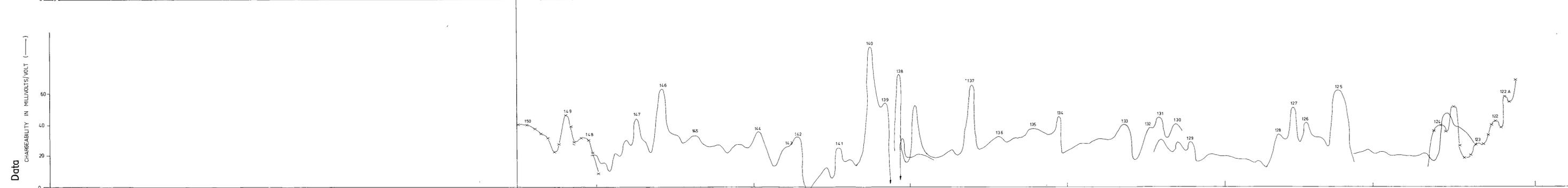
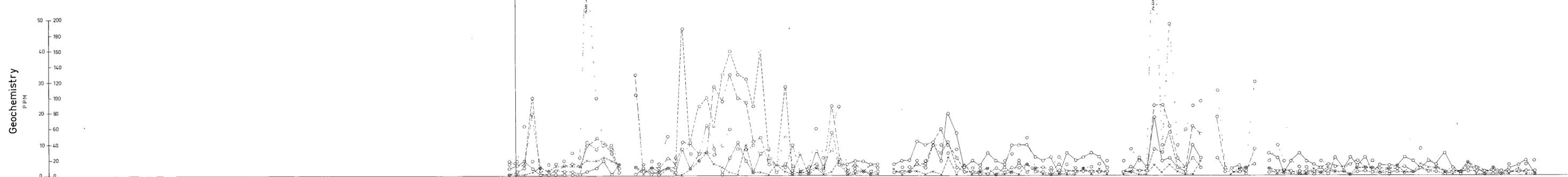
MAGNETICS
 GRADIENT ARRAY 5000 SCALE
 POLE - DIPOLE 1000 SCALE

GEOCHEMISTRY
 Sn
 Cu
 Pb
 Zn
 As
 W

5 cm

GEOLOGY

Gra Quaternary alluvium, fluvio-glacials
 UCc Upper Crimson Creek Formation
 LcC Lower Crimson Creek Formation (Mine sequence equivalent)
 Esc Success Creek Group



231036

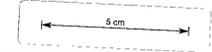
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LINE 11	DATE MAY, 76
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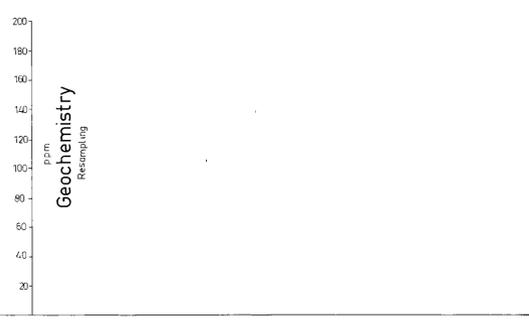
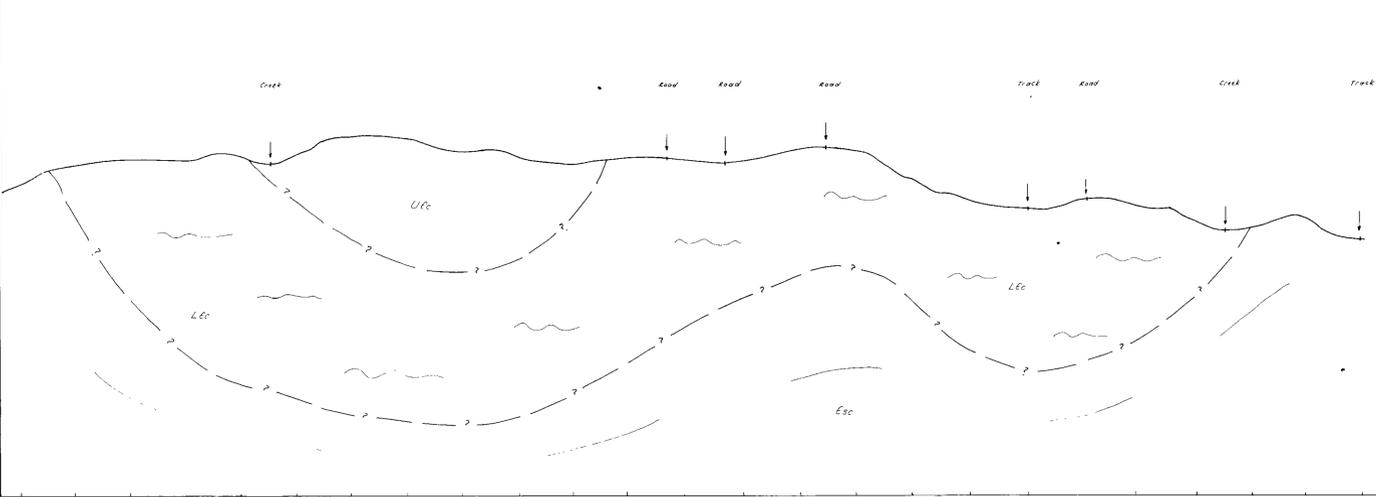
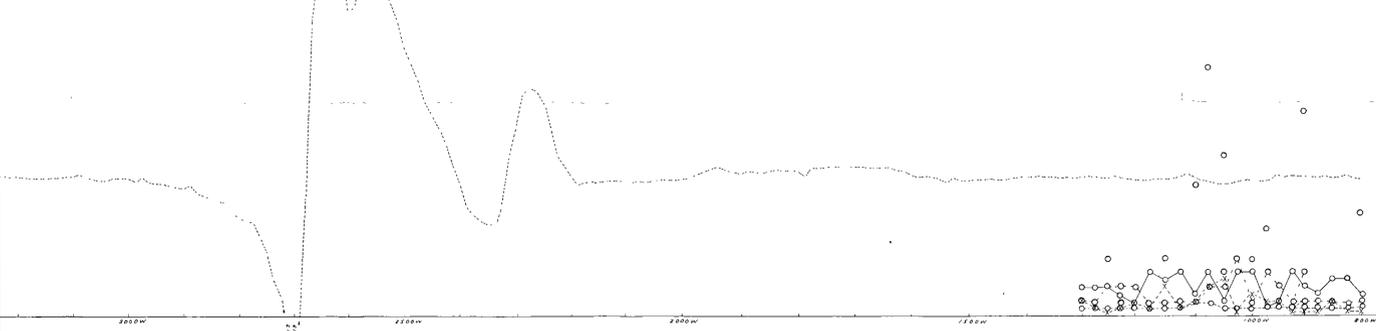
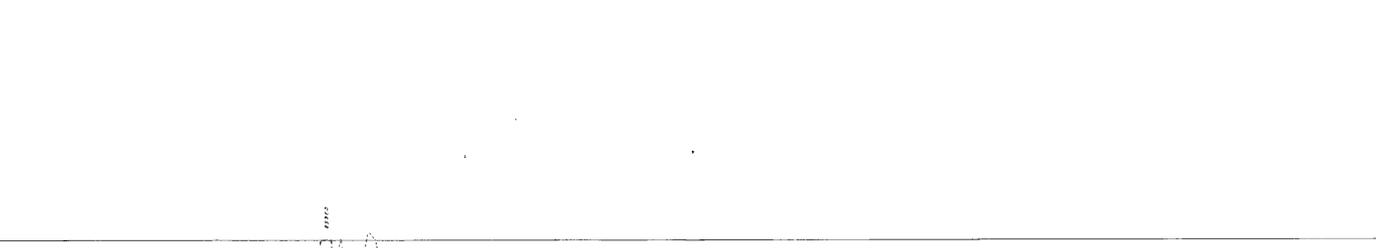
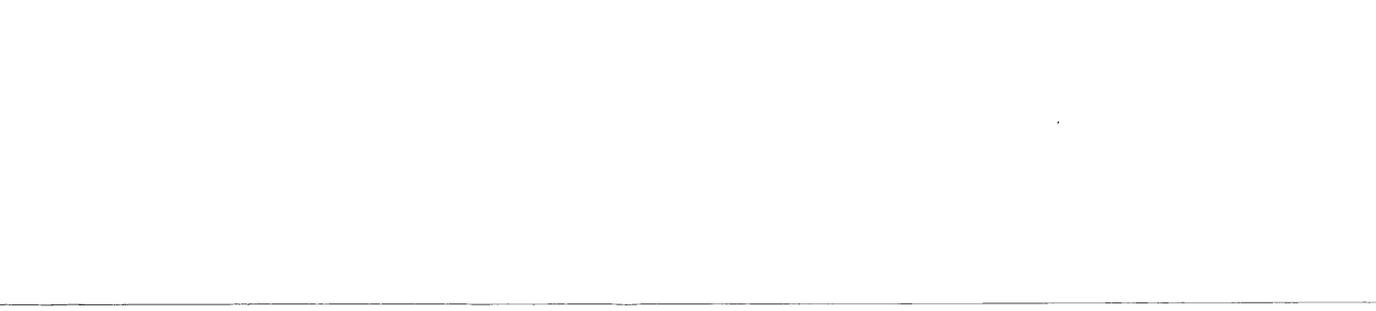
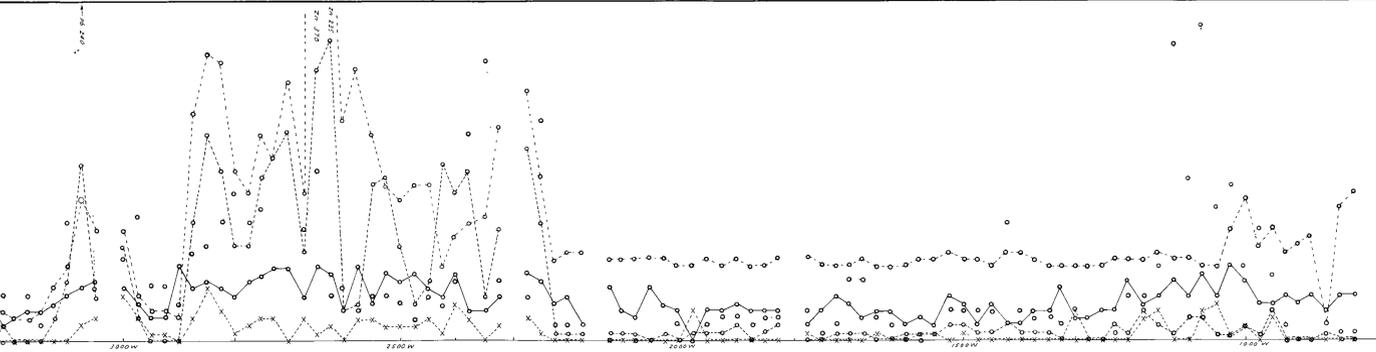
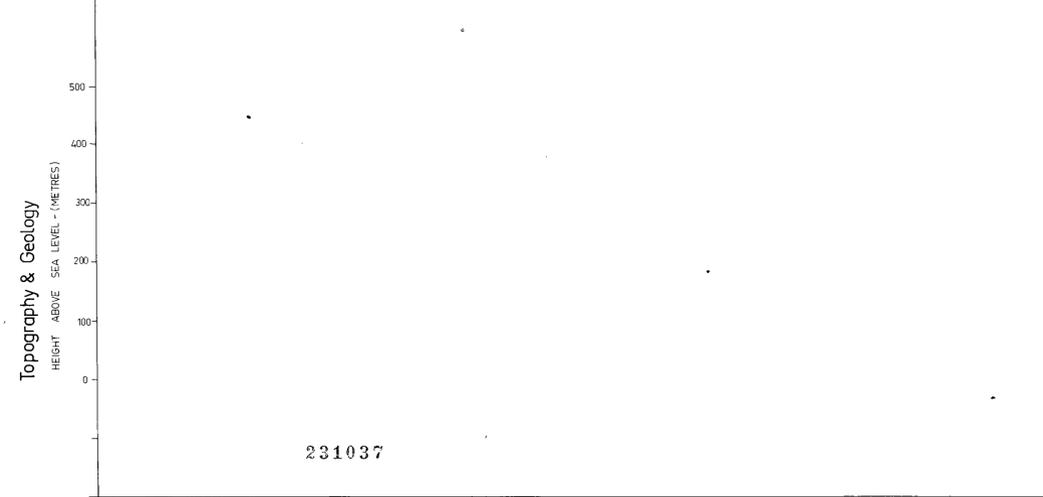
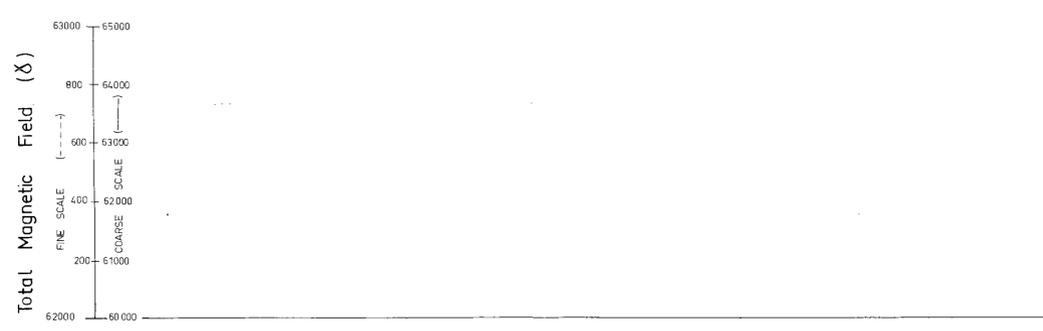
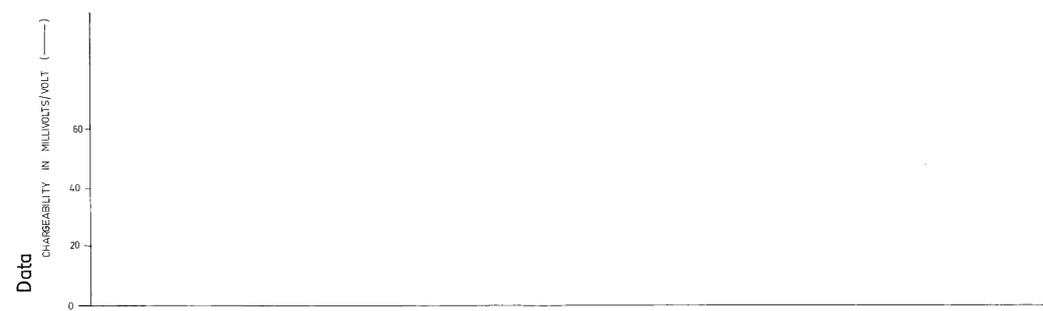
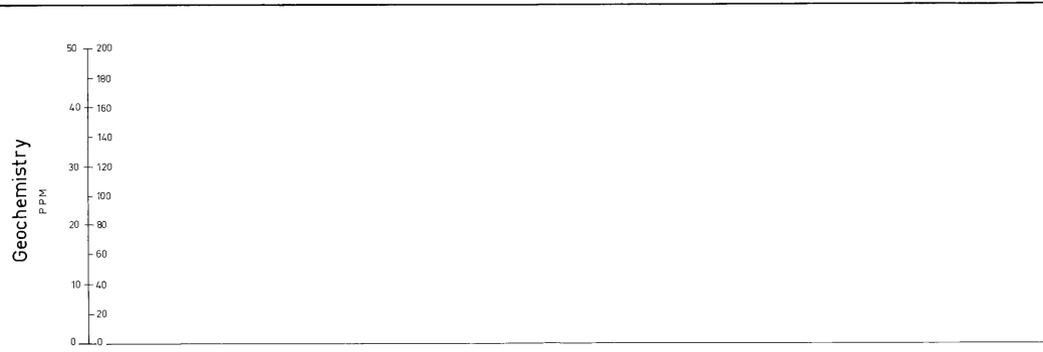
I.P. DATA
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 — GRADIENT ARRAY — 5000 J SCALE
 — X — X — POLE - DIPOLE — 1000 J SCALE

MAGNETICS
 — 5000 J SCALE
 — 1000 J SCALE

GEOCHEMISTRY
 ○ Sn
 ○ Cu
 ○ Pb
 ○ Zn
 X As
 X W

GEOLOGY
 Qta Quaternary alluvium, fluvio-glaciols
 U6c Upper Crimson Creek Formation
 L6c Lower Crimson Creek Formation (Mine sequence equivalent)
 E6c Success Creek Group





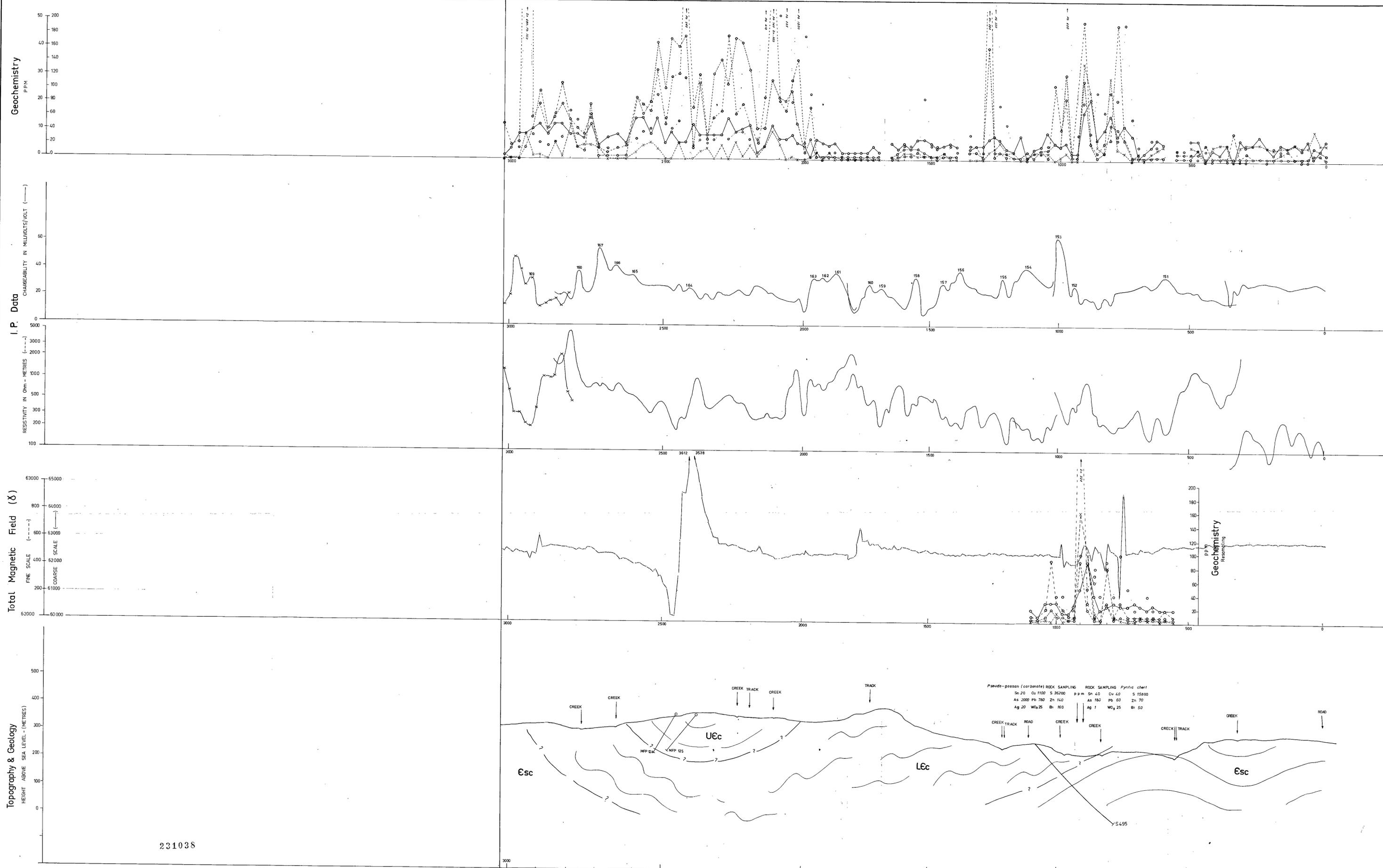
RENISON LIMITED
 DRAWN J.P.K.
 TRACED P.A.C.
 DATE July 77
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 DRAWING No. 1063
 SECTION LOOKING N.W.
 SCALE 1:5000 METRES
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 N° 8

I.P. DATA
 CHARGEABILITY & RESISTIVITY
 ——— GRADIENT ARRAY 5000 SCALE
 -X-X- POLE-DIPOLE 1000 SCALE
 5 cm

GEOCHEMISTRY
 ○ Sn
 ○ Cu
 ○ Pb
 ○ Zn
 X As
 X W

GEOLOGY
 Gra Quaternary alluvium, fluvioglacial
 UEc Upper Crimson Creek Formation
 LEc Lower Crimson Creek Formation (Mine sequence equivalent)
 Esc Success Creek Group

231037

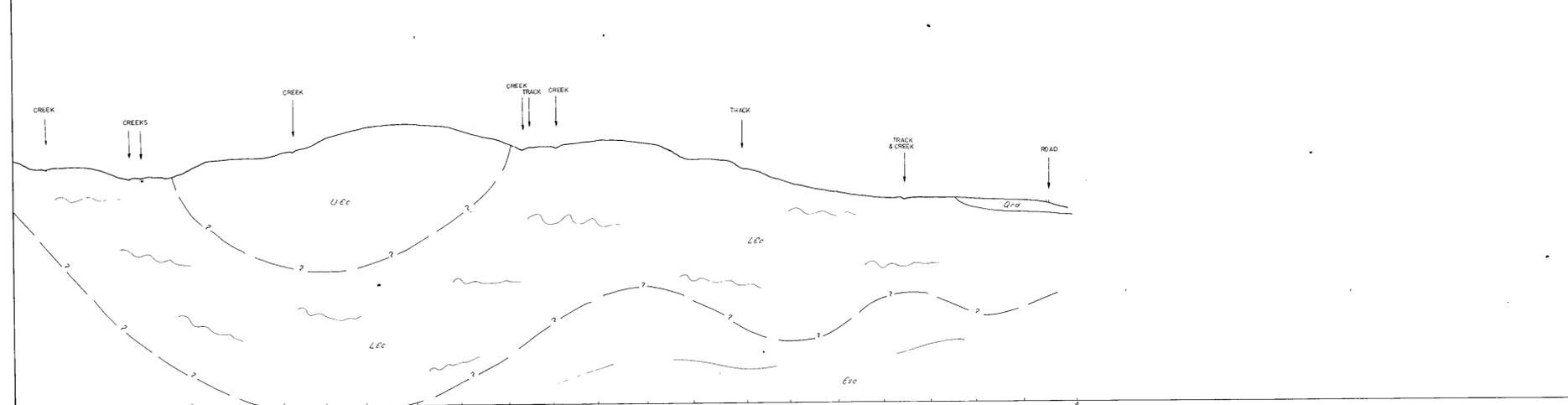
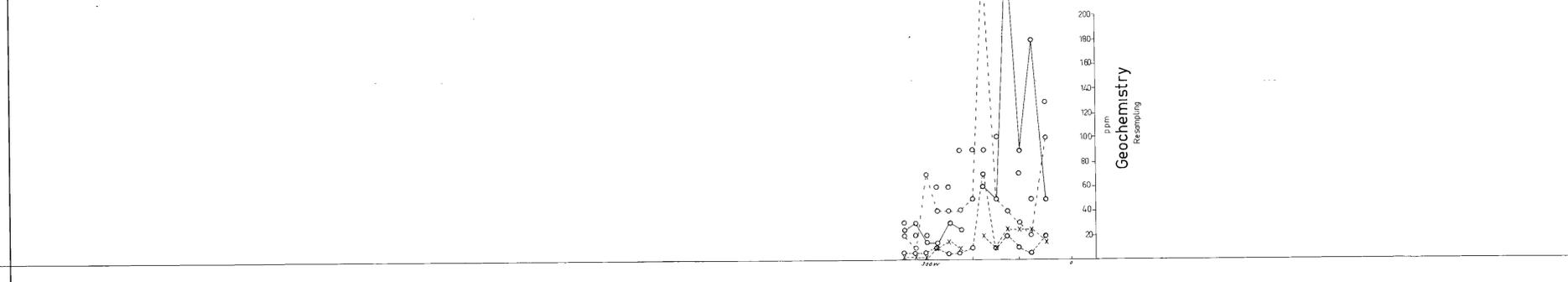
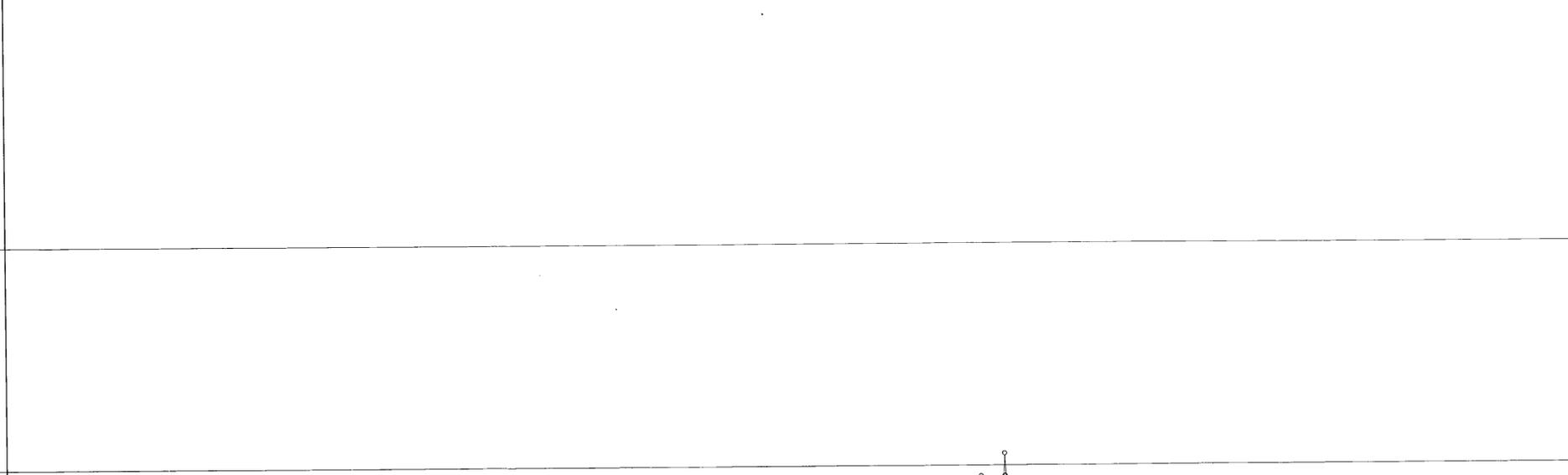
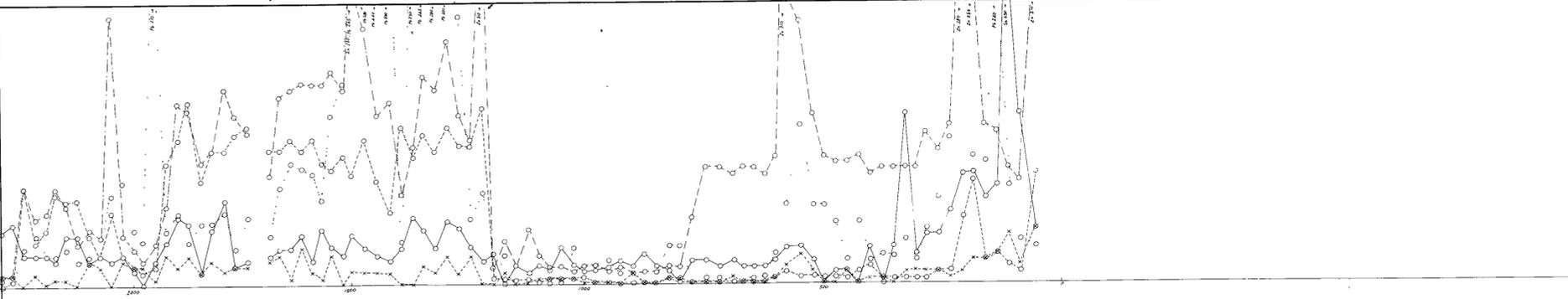
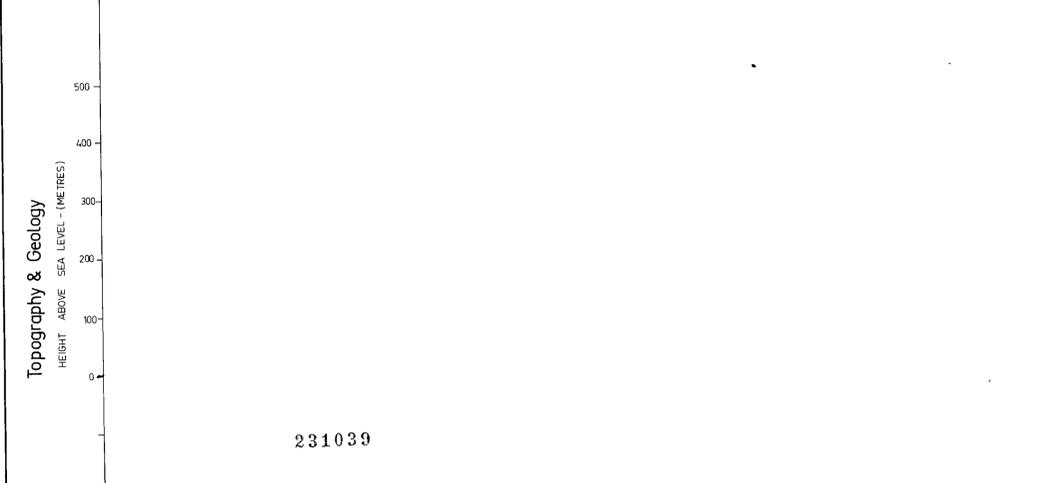
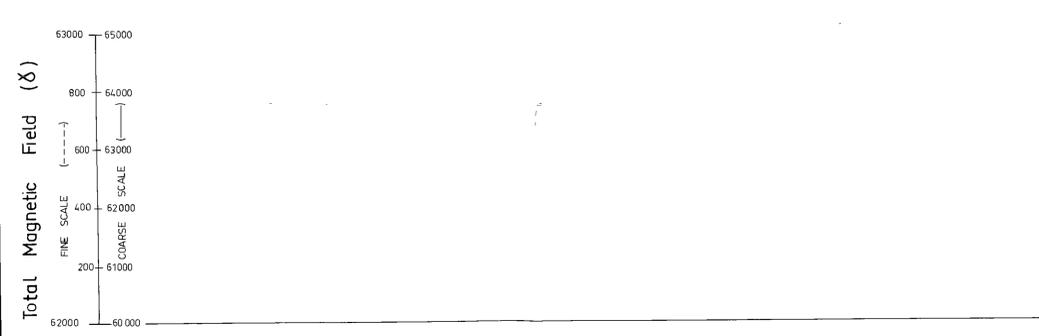
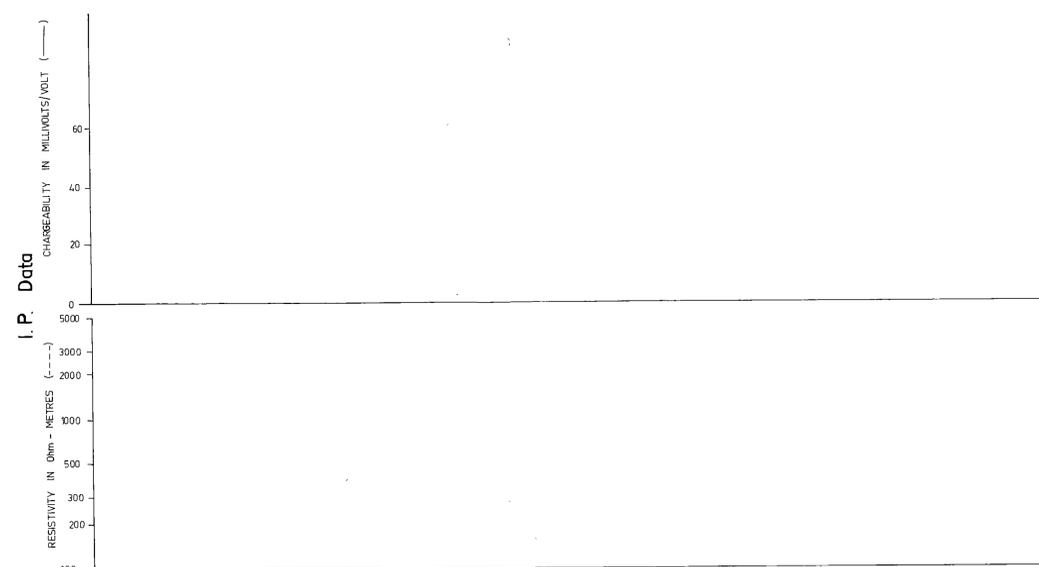
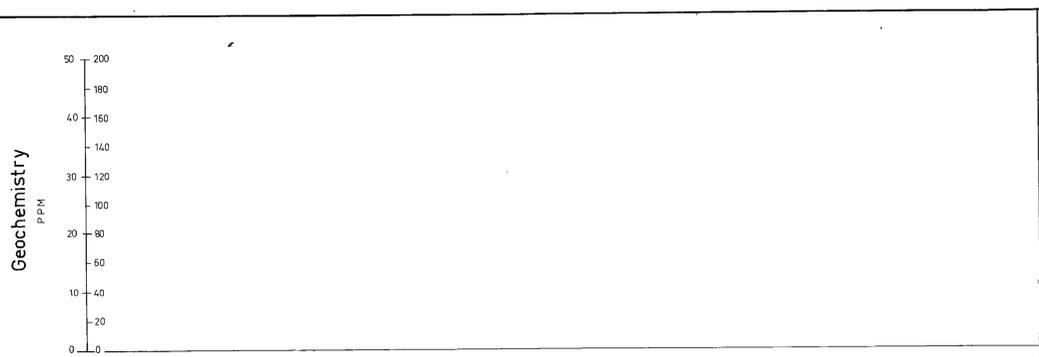


231038

RENISON LIMITED	
18-1295	ARGENT GRID
LINE 13	
SECTION LOOKING N.W.	1064
SCALE: 1:5000 METRES	
DRAWING No. N° 9	

I.P. DATA		MAGNETICS		GEOCHEMISTRY	
CHARGEABILITY & RESISTIVITY		GRADIENT ARRAY		5000x SCALE	
—X—X— POLE - DIPOLE		1000x SCALE		5 cm	
○	Sn	○	Cu	○	Pb
○	Zn	○	As	○	W

Qra	Quaternary alluvium, fluvio-glaciols
UEc	Upper Crimson Creek Formation
LEc	Lower Crimson Creek Formation (Mne sequence equivalent)
Esc	Success Creek Group

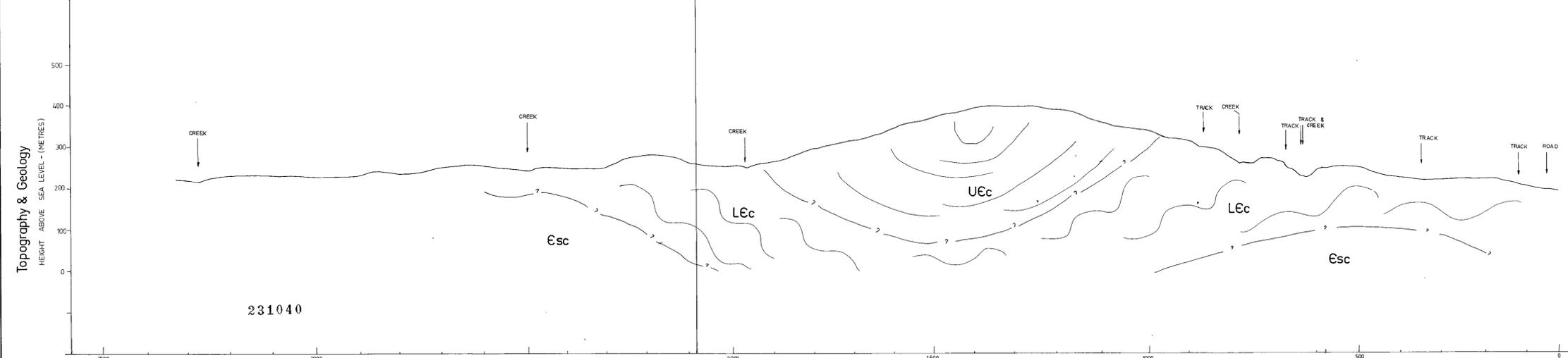
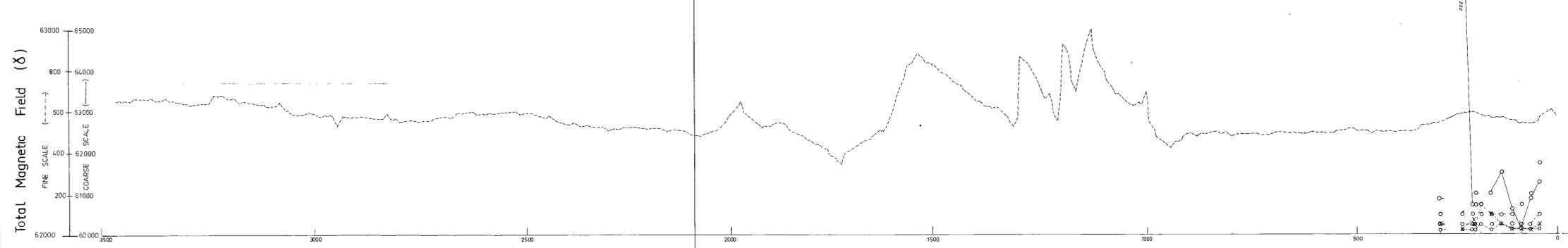
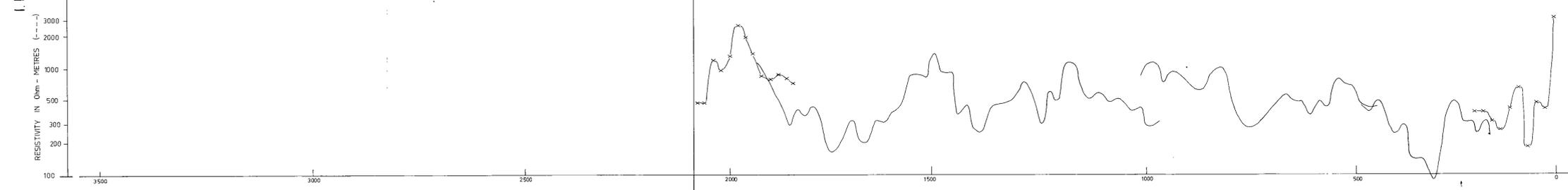
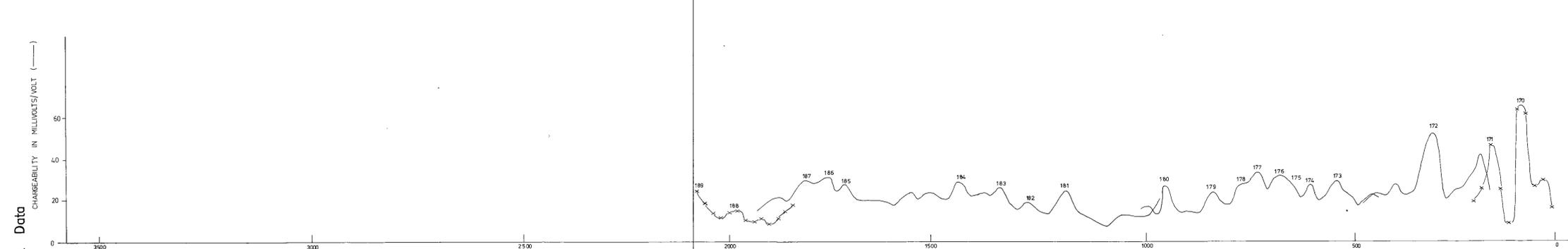
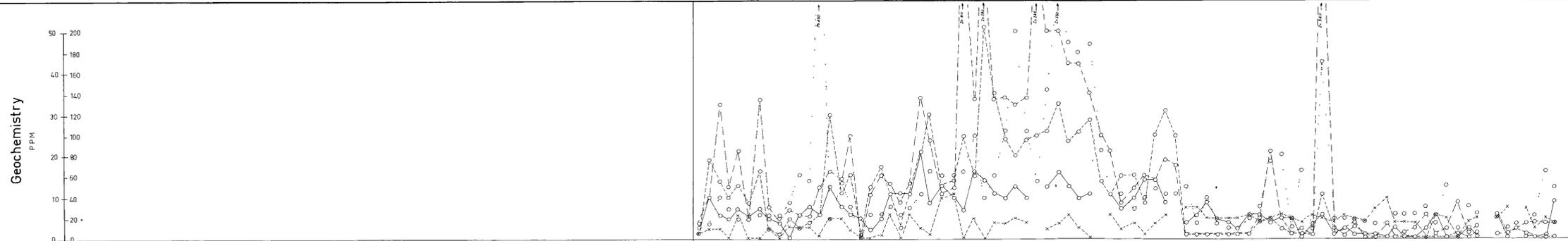


RENISON LIMITED
 DRAWN J.P.K.
 TRACED J.M.H.
 DATE 29-7-77
 SCALE 1:5000
 DRAWING No.
 SECTION LOOKING N.W.
 SCALE 1:5000 METRES
 200 100 0 100 200
 1065
 LINE 14
 N^o 10

I.P. DATA
 CHARGEABILITY & RESISTIVITY
 GRADIENT ARRAY 5000 SCALE
 POLE - DIPOLE 1000 SCALE
 5 cm

MAGNETICS
 GEOCHEMISTRY
 Sn
 Cu
 Pb
 Zn
 As
 W
 Ora Quaternary alluvium, fluvio-glacial
 UEc Upper Crimson Creek Formation
 LEc Lower Crimson Creek Formation (Mne sequence equivalent)
 Esc Success Creek Group

231039



231040

ARGENT GRID

LINE 15

SECTION LOOKING N W

SCALE: 1:5000 METRES

100 0 100 200

DRAWN	J P K
TRACED	J H M
DATE	MAY, 76
SCALE	1:5000
DRAWING No.	

I.P. DATA

CHARGEABILITY & RESISTIVITY

GRADIENT ARRAY

5000 X SCALE

POLE - DIPOLE

1000 X SCALE

5 cm

GEOCHEMISTRY

Sn

Cu

Pb

Zn

As

W

GEOLOGY

Qa Quaternary alluvium, fluvioglacial

UEc Upper Crimson Creek Formation

LEc Lower Crimson Creek Formation (Mine sequence equivalent)

Esc Success Creek Group

Geochemistry Resampling