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REPORT ON DIAMOND
DRILLING PROGRAM
LAKE SELINA AREA
EL 9/66
J.P. McKibben 1971

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REPORT ON DIAMOND DRILLING PROGRAMLAKE SELINA AREA E.L. 9/66

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J.P. McKibben

December, 1971

LIST OF PLANS

LAKE SELINA GRID

LINE 48N

LINE 64N

LINE 72N

LINE 120N

LINE 128N

LINE 136N

1. INTRODUCTION

Testing of an extensive geophysical anomaly in the Lake Rolleston - Lake Selina area of E.L. 9/66 by diamond drilling has been carried out since April, 1970. The drilling program has consisted of two distinct and geographically separate phases, each involving the drilling of three diamond drill holes.

A zone of strong, anomalous IP, resistivity and magnetic response was located in sheared pyroclastics and lavas of the Cambrian Mt. Read Volcanics between lines 40N and 80N during geophysical surveys conducted in the 1969-70 summer field season. Coincident anomalous geochemical responses for Cu, Pb, Zn were recorded in soil sampling on traverses 56N, 64N, 72N and 80N. Accordingly a three-hole diamond drilling program was undertaken to test the anomalous zone. Diamond drill holes were completed on lines 72N, 64N and 48N between April, 1970 and February, 1971. The results of this drilling are discussed in Section 2.

Continued geophysical surveying during the 1970-71 summer field season detailed the northward extension of the previously outlined anomalous zone. A strong IP and resistivity axis was revealed from traverses 88N to 136N. A magnetic anomaly coincides in part with the IP axis. Particularly strong IP response was obtained from from traverses 112N to 136N (see Sections 4, 5 and 6). The anomaly occurs in a geologically favourable environment of sheared lavas and pyroclastics of the Mt. Read Volcanics. A number of old workings in massive pyrite-magnetite mineralisation are known to occur in close proximity to the anomalous zone. Costeaming on traverse 124N over the axis of the anomaly exposed sheared Cambrian volcanics containing strong, disseminated pyrite mineralisation with minor amounts of molybdenite as thin films on schistosity surfaces.

A program of three diamond drill holes was recommended (McKibben, 1971) to test the peak of the anomalous zone between traverses 124N and 136N. These holes were drilled during the period from April, 1971 to September, 1971 and the results are detailed in Section 3.

All drilling was carried out under contract by Associated Diamond Drillers Pty. Ltd. using a Mindrill F52 rig. Holes were drilled BX wireline initially and later with 3Q wireline equipment.

A total footage of 5,370 feet was drilled.

2. PHASE I DRILLING2.1 D.D.H. Selina 1 3750.16.70 E 5 3539 31.76 N

D.D.H. Selina 1 was collared on traverse 72N/100E, drilling west on 240° bearing at a depression of 45° using BX-wireline equipment. A composite section showing all surface exploration and drilling results is attached (Section 1).

Considerable difficulty was experienced in drilling this hole; largely due to the drillers forcing the hole down at an excessive rate, resulting in considerable dip and azimuth deviations.

D.D.H. Selina 1 collared in Pleistocene moraine gravels, passing into acid tuffs and lavas of the Cambrian Mt. Read Volcanics at 20 ft. The hole passed through these Cambrian volcanics, which exhibited only minor textural, mineralogical and structural changes throughout, until it entered a fine grained sandstone member of the Ordovician Owen Conglomerate at 703 ft.

Very minor chalcopyrite, galena and sphalerite mineralisation was encountered. Disseminated pyrite (up to 7.1%, but generally below 3%) was encountered between 265 - 410 ft. Haematite and minor magnetite were widespread throughout the hole.

Sufficient pyrite and magnetite was present to explain both the IP and magnetic responses obtained in this area.

2.2 D.D.H. Selina 2

D.D.H. Selina 2 was collared 800 feet west of the baseline on traverse 64N to test a strong IP anomaly with a non-coincident strong magnetic anomaly associated with a small geochemical anomaly.

The hole collared in unconsolidated fluvioglacial sands and gravels. At 25 ft. a sequence of coarse pink to dark red grits and quartzites (representing a fine grained facies of the Owen Conglomerate) was encountered and extended to 315 ft. From 315 - 329 ft. a dark green porphyritic quartz chlorite rock with strong haematite and magnetite mineralisation occurred. Dark red, highly sheared haematitic tuff, similar to that in D.D.H. Selina 1 occurred from 329 - 565 ft. No sulphide mineralisation was present in this zone. Dark green, sheared

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quartz-chlorite schist containing small magnetite veins and disseminated pyrite in small veinlets subparallel to schistosity occurred from 565 - 695 ft. Minor traces of chalcopyrite were present. The 65 ft. section from 565 - 630 ft. assayed:

65 ft. of 0.175% Cu, 1.6% FeS₂, 0.01% Pb, 0.04% Zn.

A basically similar, unsheared quartz-chlorite rock with feldspar groundmass occurs from 695 - 776 ft. Fine grained pyrite occurred very weakly disseminated throughout this zone.

The mineralisation intersected in the hole was sufficient to account for the geophysical anomalies.

2.3 D.D.H. Selina 3

Following the completion of D.D.H. Selina 2, it was decided to drill a hole on traverse 48N to test the southern extension of the anomalous zone intersected in holes Selina 1 and 2.

D.D.H. Selina 3 was collared on December 8, 1970 on traverse 48N, 400 feet west of the baseline at a bearing of 270°, depressed -57°, EXWL size.

The hole collared in 20 feet of unconsolidated Owen Conglomerate rubble. Highly weathered sheared quartz porphyry with quartz phenocrysts in a quartz, sericite and chlorite matrix was intersected from 20 - 200 ft. No sulphide mineralisation was present but strong iron staining suggested leaching. Slightly sheared, unweathered quartz porphyry was intersected from 200 - 450 ft. Mineralisation occurred as very fine grained pyrite throughout with minor blebs and veinlets of chalcopyrite and traces of galena. Massive dark green quartz-feldspar porphyry containing very weak mineralisation occurred from 450 - 522 ft. Extremely fine grained pyrite, chalcopyrite and galena occurred sparsely scattered through this zone. From 522 - 595 ft. grey-green quartz porphyry with no apparent mineralisation was intersected. Extensively sericitised quartz-sericite schist showing strong weathering and bleaching occurred from 595 - 835 ft. probably representing a fault zone. From 835 - 917 ft. haematitic tuff, equivalent to that previously intersected in D.D.H.'s Selina 1 and 2, was encountered. Owen Conglomerate was intersected at 917 feet and drilled to 922 ft. at which depth the hole was completed.

Drilling commenced on June 3, 1971 and the hole collared in 20 ft. of soil and rubble cover. From 20 - 446 ft. the hole passed through massive, unsheared acid volcanics with varying degrees of chloritisation. Rock types probably represent rhyolites and keratophyres. Pink albite blebs and patches are common throughout this zone. Massive magnetite-pyrite mineralisation occurred in the interval 208 - 212 ft. From 446 - 642 ft. a highly siliceous massive pinkish grey rhyolite (?) contains disseminated fine to medium grained pyrite throughout with very minor traces of chalcopyrite. Pyrite occurs as scattered veinlets and blebs and the mineralisation is generally weaker than that intersected in D.D.H. Selina 4.

From 642 - 845 ft. the hole intersected highly siliceous, chloritised acid volcanics containing disseminated pyrite with minor traces of chalcopyrite. Veinlets of pyrite were present throughout and minor blebs of chalcopyrite occurred in quartz-chlorite patches. From 845 - 902'6" the hole passed through massive, unmineralised quartz-feldspar porphyry and was completed at that depth.

Assays include:

107 ft. (208 - 315 ft.)	0.05% Cu	10.1% FeS ₂
400 ft. (445 - 845 ft.)	0.08% Cu	9.2% FeS ₂
including		
30 ft. (720 - 750 ft.)	0.35% Cu	23.6% FeS ₂

- 3.3 D.D.H. Selina 6 385433.9 E
5 362777.0 N
D.D.H. Selina 6 was collared on traverse 136N/2700W and commenced drilling BQWL on July 26, 1971.

The hole collared in brecciated highly siliceous "cherty" volcanics to 59 ft. From 59 - 685 ft. the hole intersected highly siliceous, chloritised acid lavas containing very patchy disseminated pyrite with minor traces of chalcopyrite from 140 ft. From 685 ft. the hole passed through tuffaceous rocks of similar composition to the acid lavas. Massive magnetite and pyrite patches are scattered from 736 ft. to 868 ft. From 868 - 972 ft. siliceous acid volcanics are present with small veinlets of very fine grained pyrite. At 972 ft. massive unmineralised quartz-feldspar porphyry (identical to that intersected in D.D.H. Selina 5) was intersected and drilled to 1000 ft.

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Three zones of pyrite mineralisation were intersected:

170 ft. (215 - 385 ft.)	0.07% Cu	5.2% FeS ₂
60 ft. (625 - 685 ft.)	0.04% Cu	4.0% FeS ₂
232 ft. (740 - 972 ft.)	0.05% Cu	7.5% FeS ₂

3.4 Conclusions

Drilling results obtained from D.D.H.'s Selina 4, 5 and 6 indicate a zone of strong pyrite mineralisation in excess of 1,200 feet long and up to 500 feet wide. The grade and intensity of mineralisation decreases northwards from traverse 120N to 136N with the mineralised zone breaking up into a number of narrower zones.

No significant concentration of copper mineralisation was indicated by the drilling. Some encouragement is received from the shearing and alteration observed in the volcanics intersected by D.D.H. Selina 4 (see Section 4).

4. INTERPRETATION AND RECOMMENDATIONS

The Lake Selina diamond drilling program has tested the extremities of a 9,600 ft. long IP - resistivity anomaly extending from traverse 40N northwards to traverse 136N. Mineralisation, consisting of disseminated and veinlet pyrite sometimes with associated massive fine grained magnetite veining, occurs in all drill holes. The southern section of the anomaly (between traverses 80N - 40N) is related to weakly disseminated pyrite mineralisation. The northern portion of the anomaly (traverses 120N - 136N) is related to wide, strongly developed pyrite mineralisation which appears to weaken and split up towards the north.

D.D.H. Selina 4 intersected a 280 ft. zone of sheared quartz-sericite schist which shows basic similarities to Prince Lyell and Cape Horn host rocks. In addition a costean across the area tested by D.D.H. Selina 4, exposed pyritic volcanics containing some molybdenite films on schistosity surfaces. This evidence could indicate increasing metasomatism and alteration from traverse 120N southwards.

If an increase in metasomatism can be demonstrated between traverses 120N and 80N (a distance of 4,000 ft.) the environment could represent a favourable drilling target.

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It is recommended that a detailed surface mapping program be carried out between traverses 120N to 88N to assess the possibility of stronger metasomatic alteration in the Cambrian volcanics in this area. Whilst outcrop is restricted in the area, petrological studies on available material should provide some critical information on rock alteration effects.

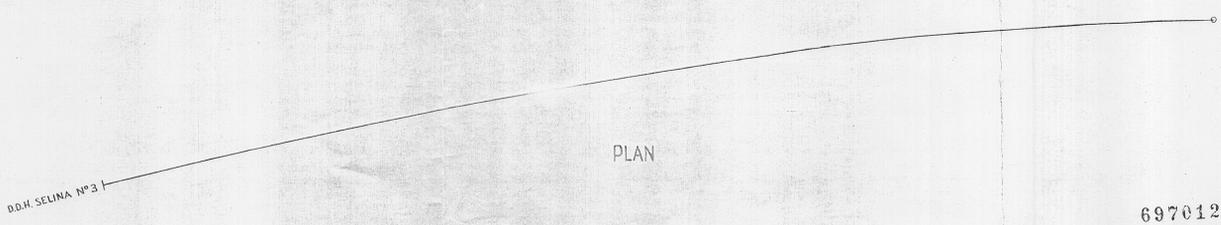
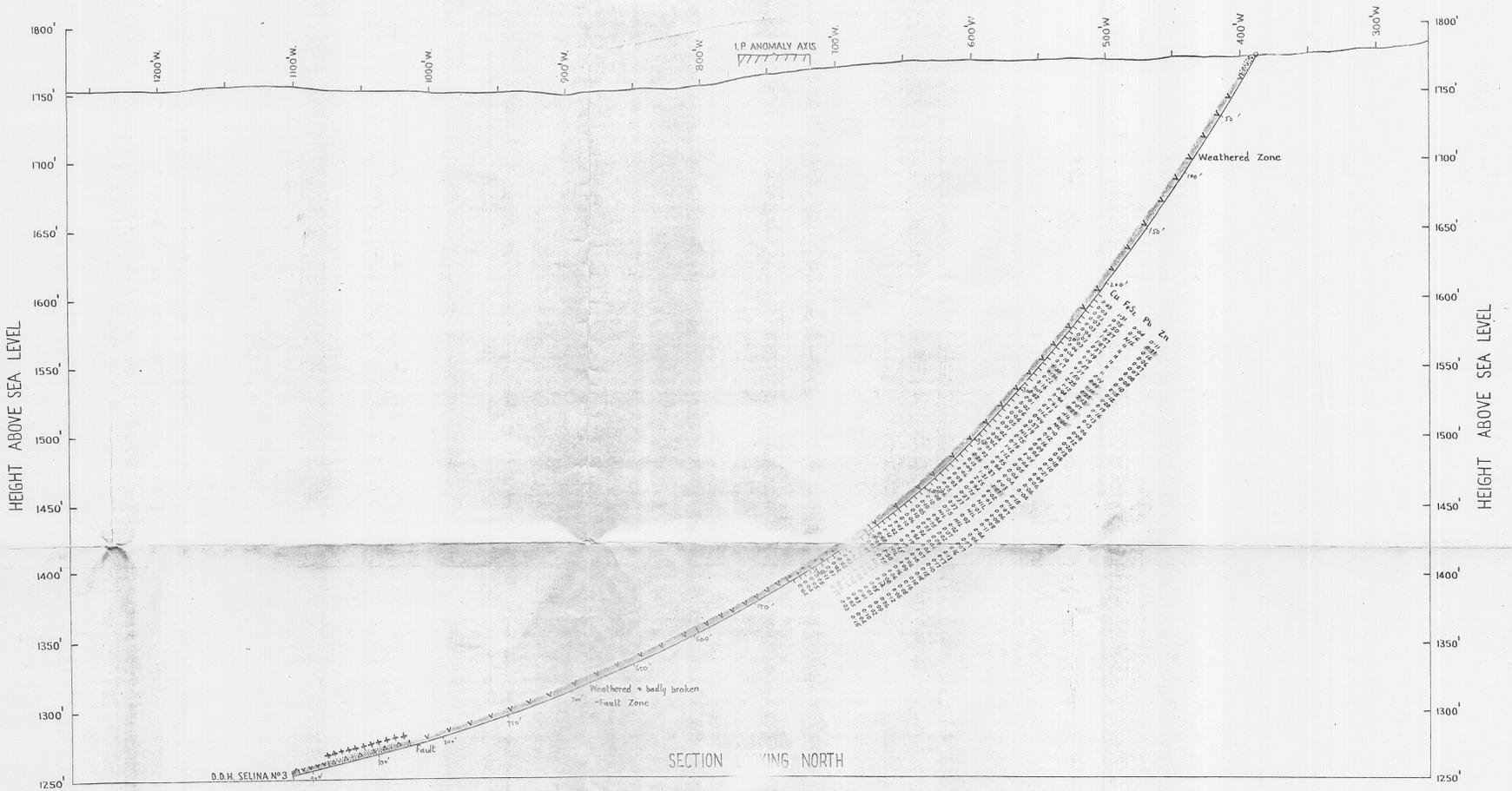
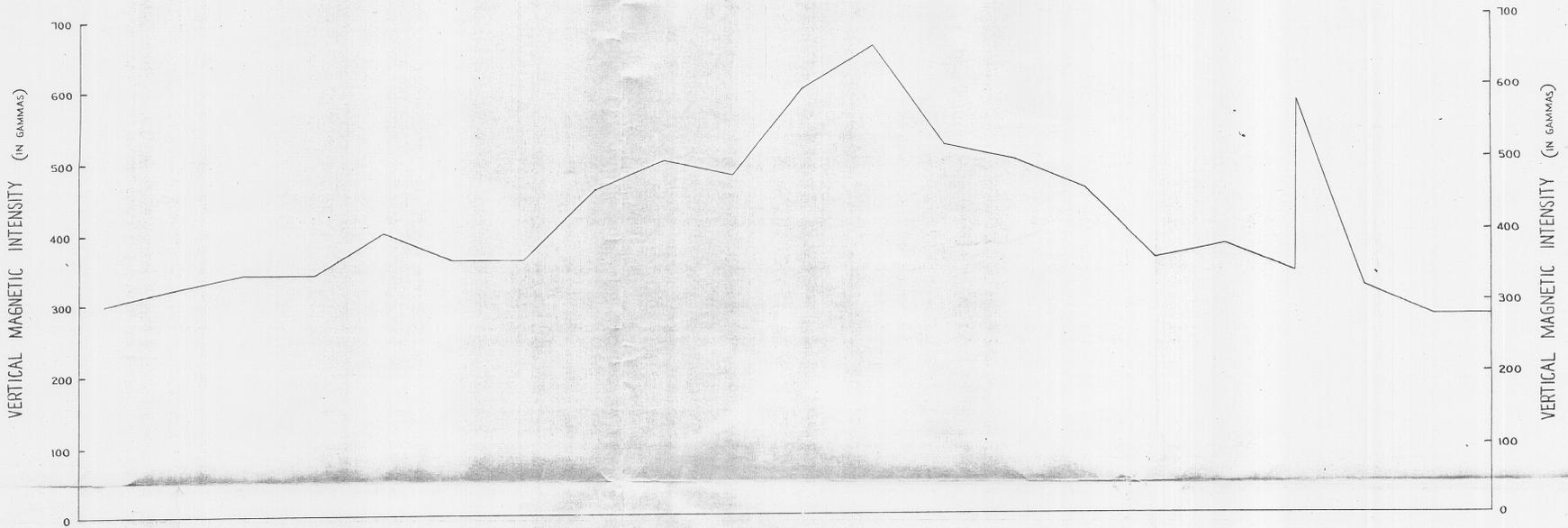
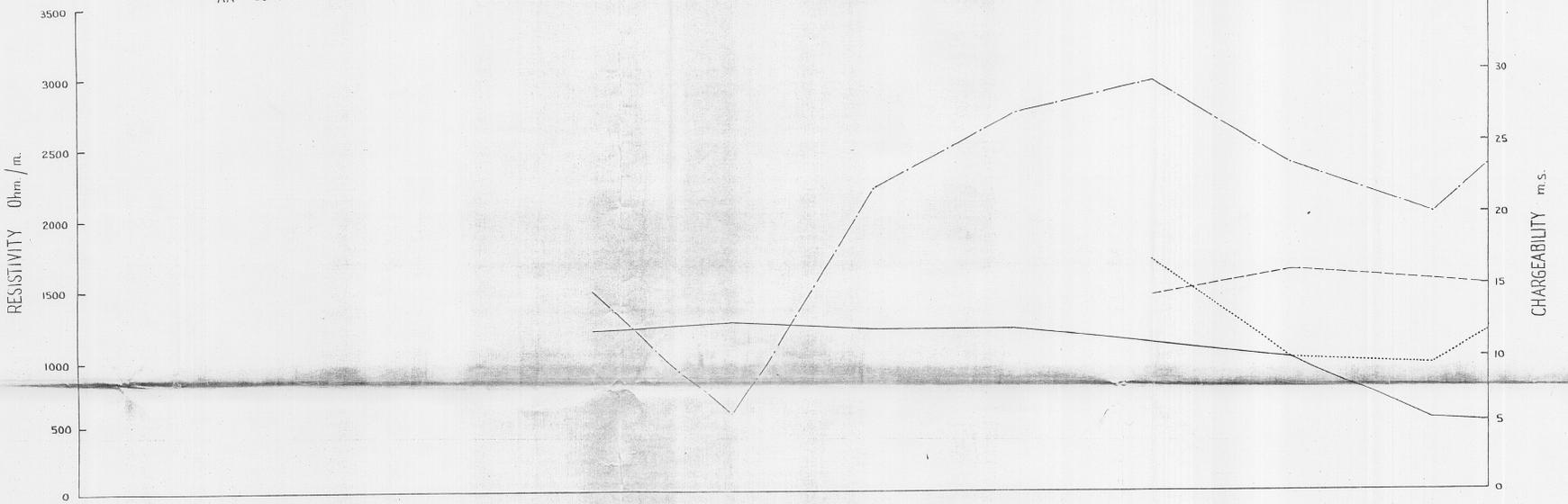
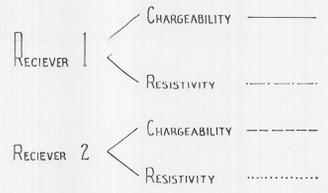
If sufficient surface encouragement is obtained, a further diamond drill hole would be required to provide a final conclusive test of the Selina anomaly. However no recommendation for further drilling is warranted at this stage.

POLE-DIPOLE ARRAY



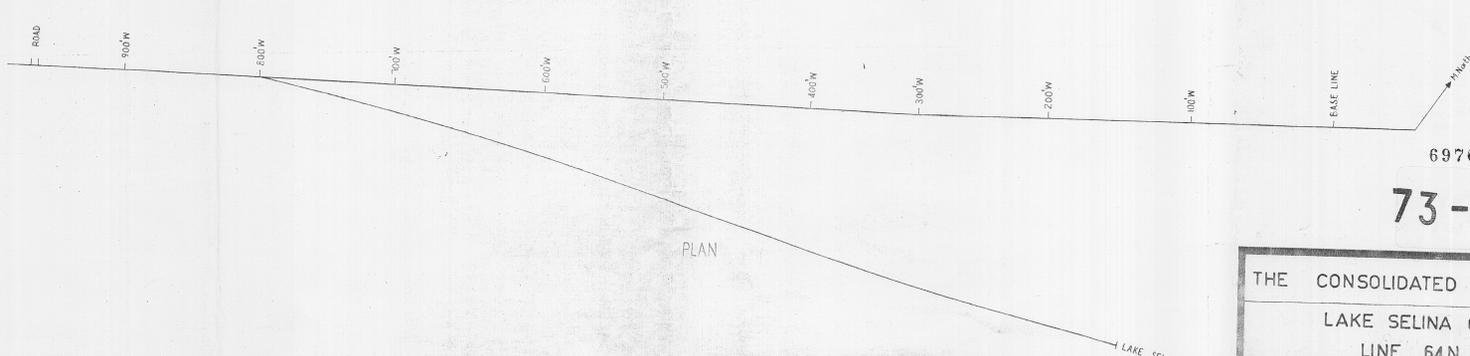
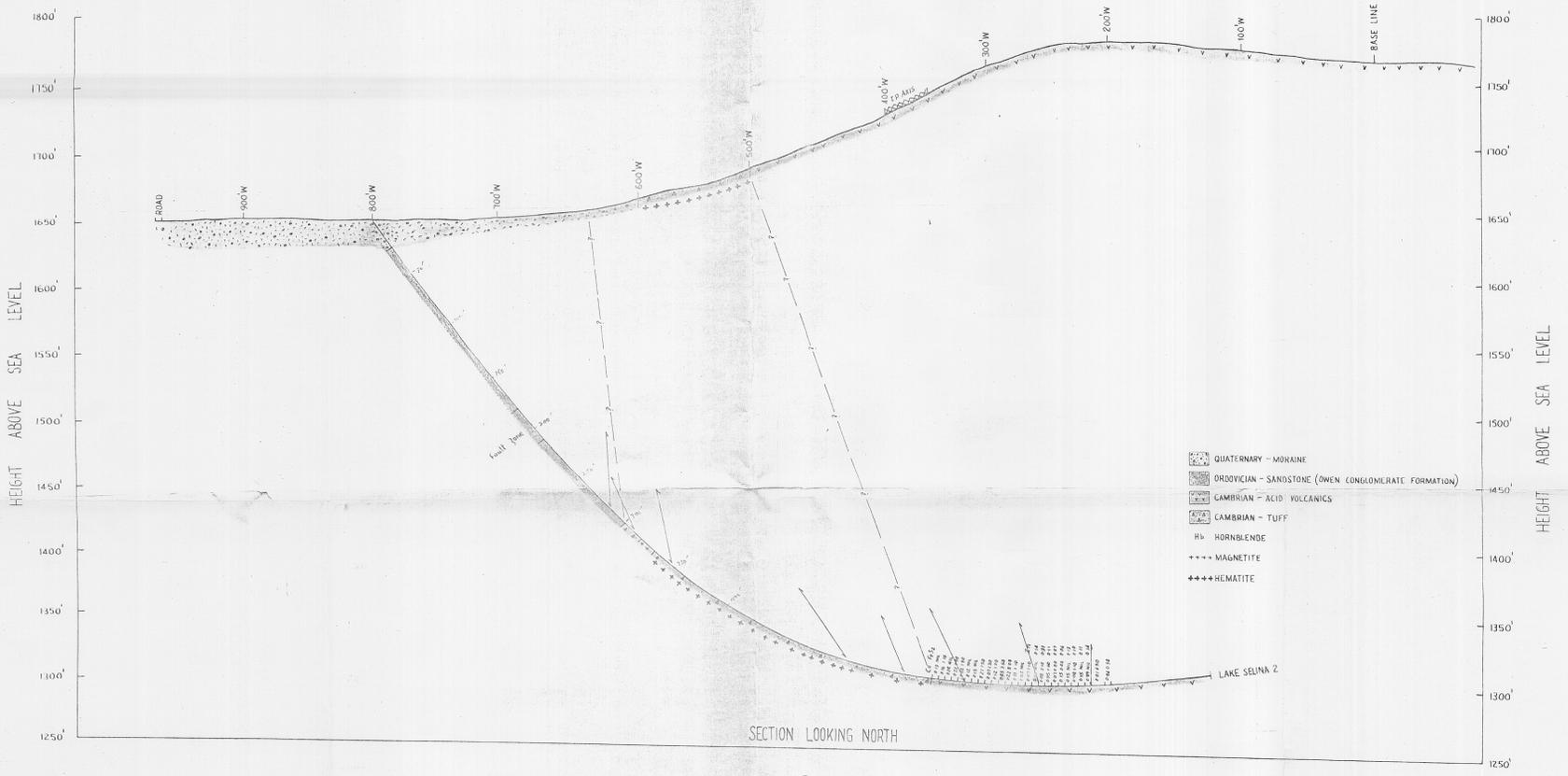
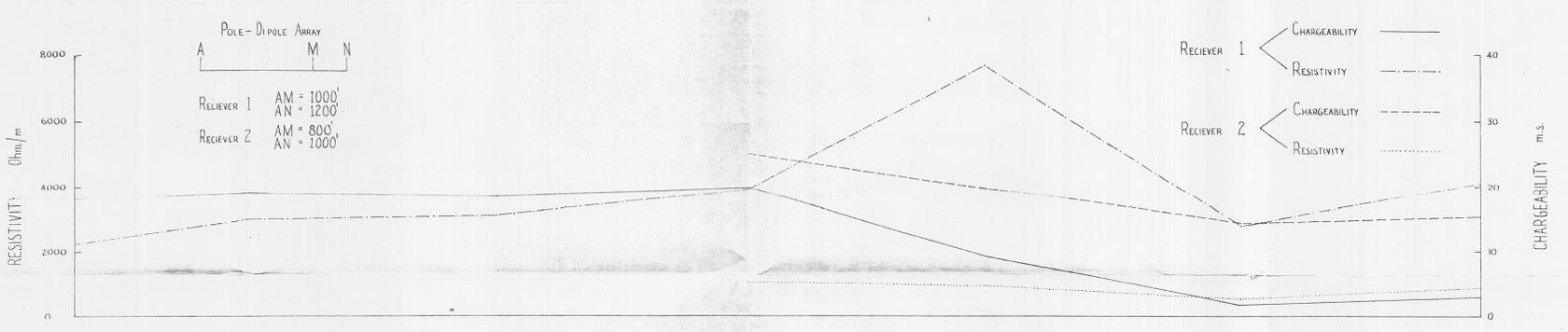
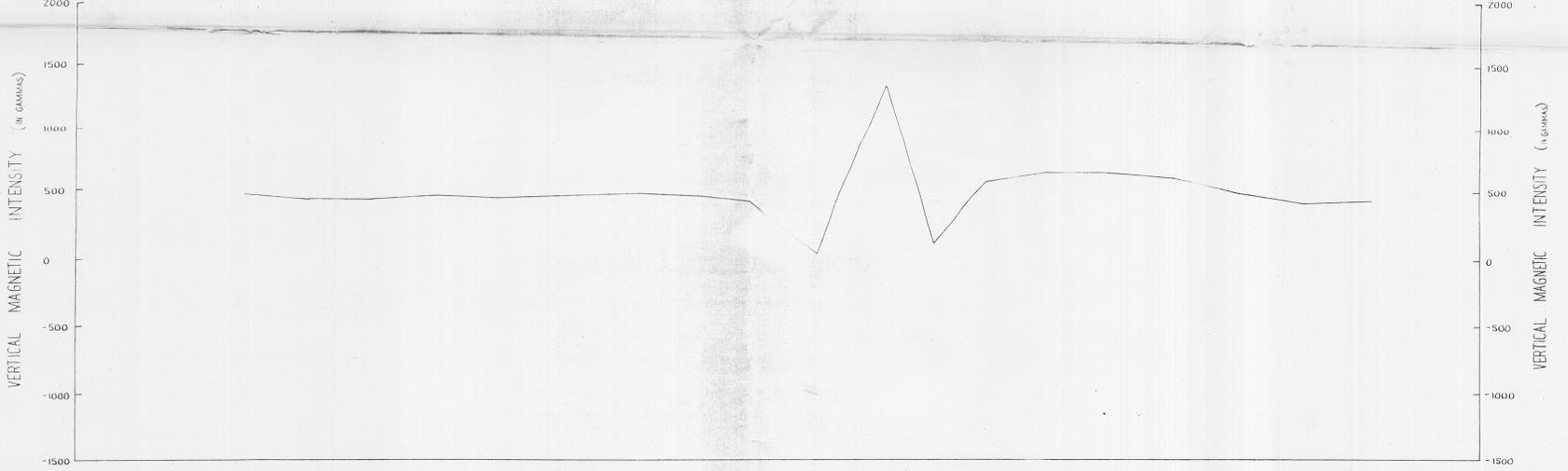
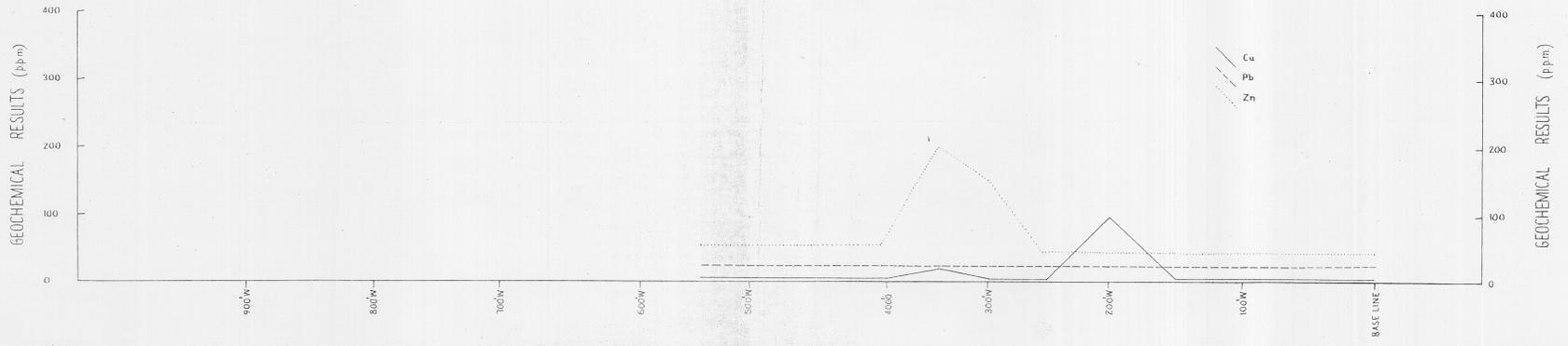
RECEIVER 1 AM = 1000'
AN = 1200'

RECEIVER 2 AM = 800'
AN = 1000'



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LAKE SELINA GRID	TRACED R.G.W.
LINE 48N.	CHECKED
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	SCALE 1" = 50'



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5 cm

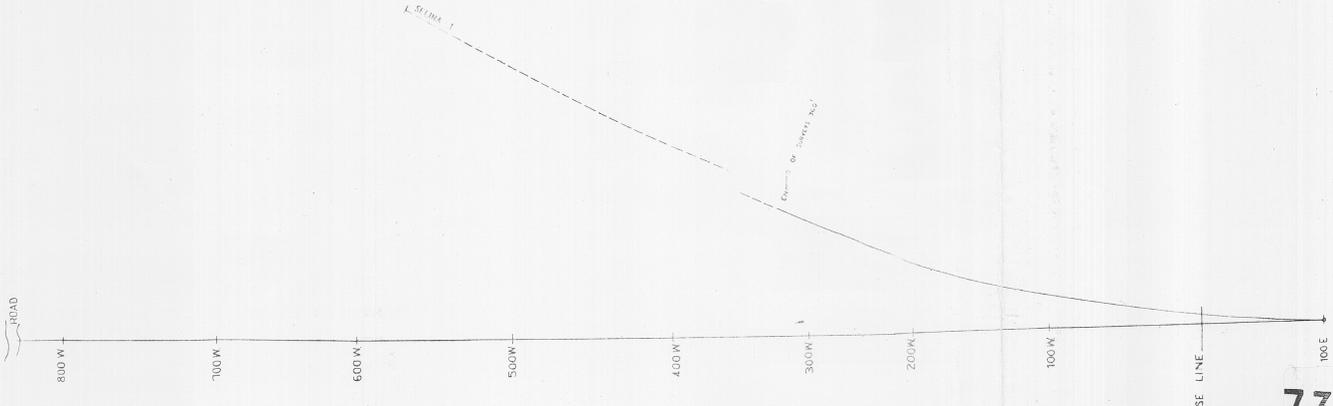
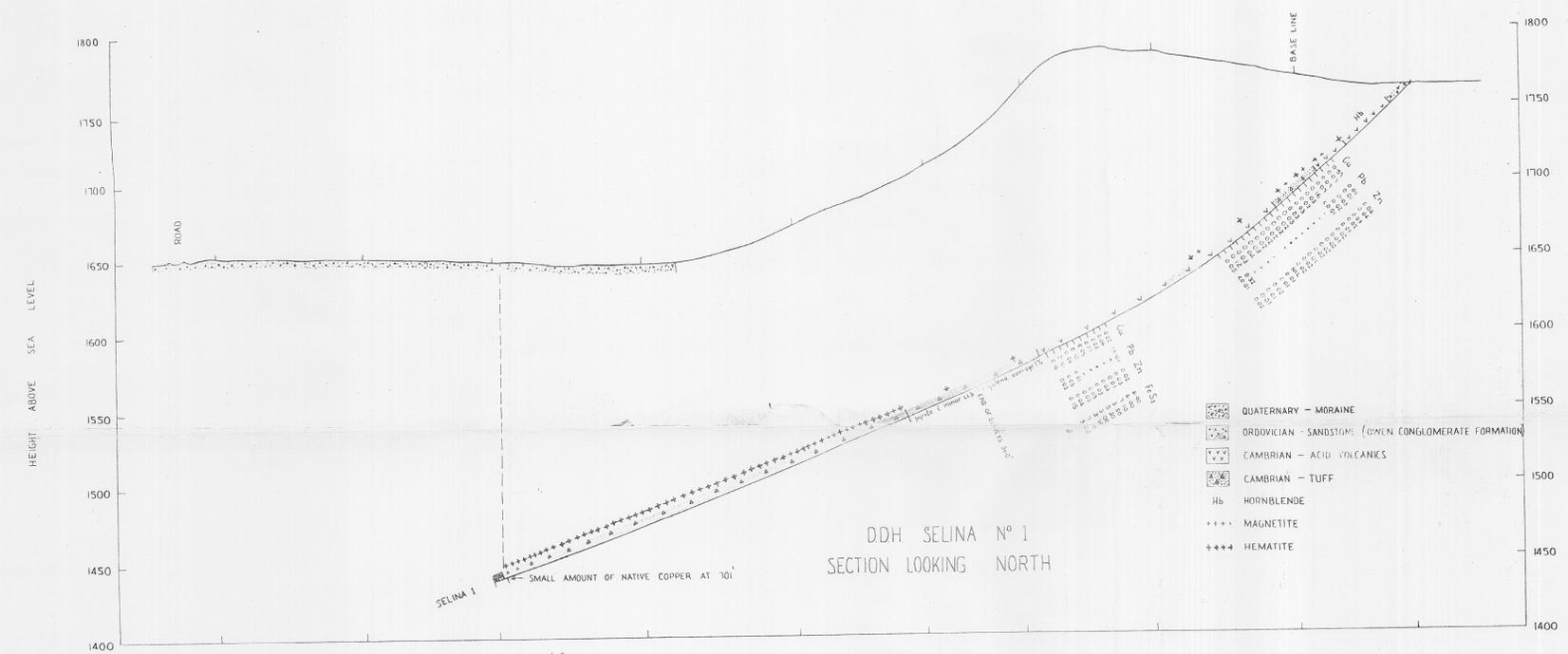
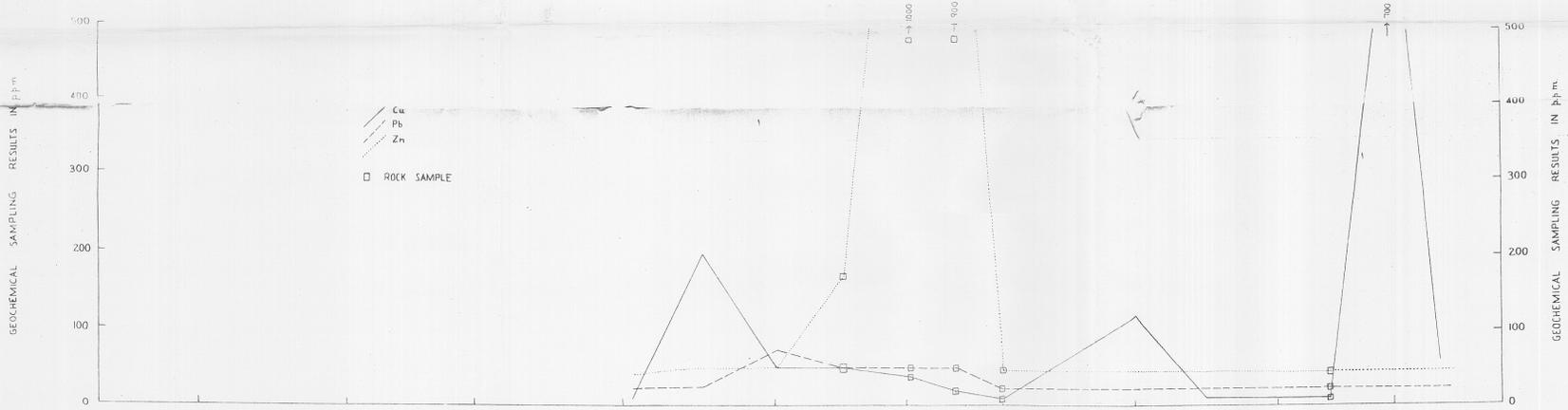
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LAKE SELINA GRID

LINE 64N.

GEOPHYSICAL, GEOCHEMICAL & DRILLING RESULTS

DRAWN: R.G.W.
 TRACED: R.G.W.
 CHECKED: L.A.N.
 DATE: 23-11-70
 SCALE: 1" = 50'



PLAN OF DDH SELINA N° 1 AND LINE 72N (BEARING 242°)

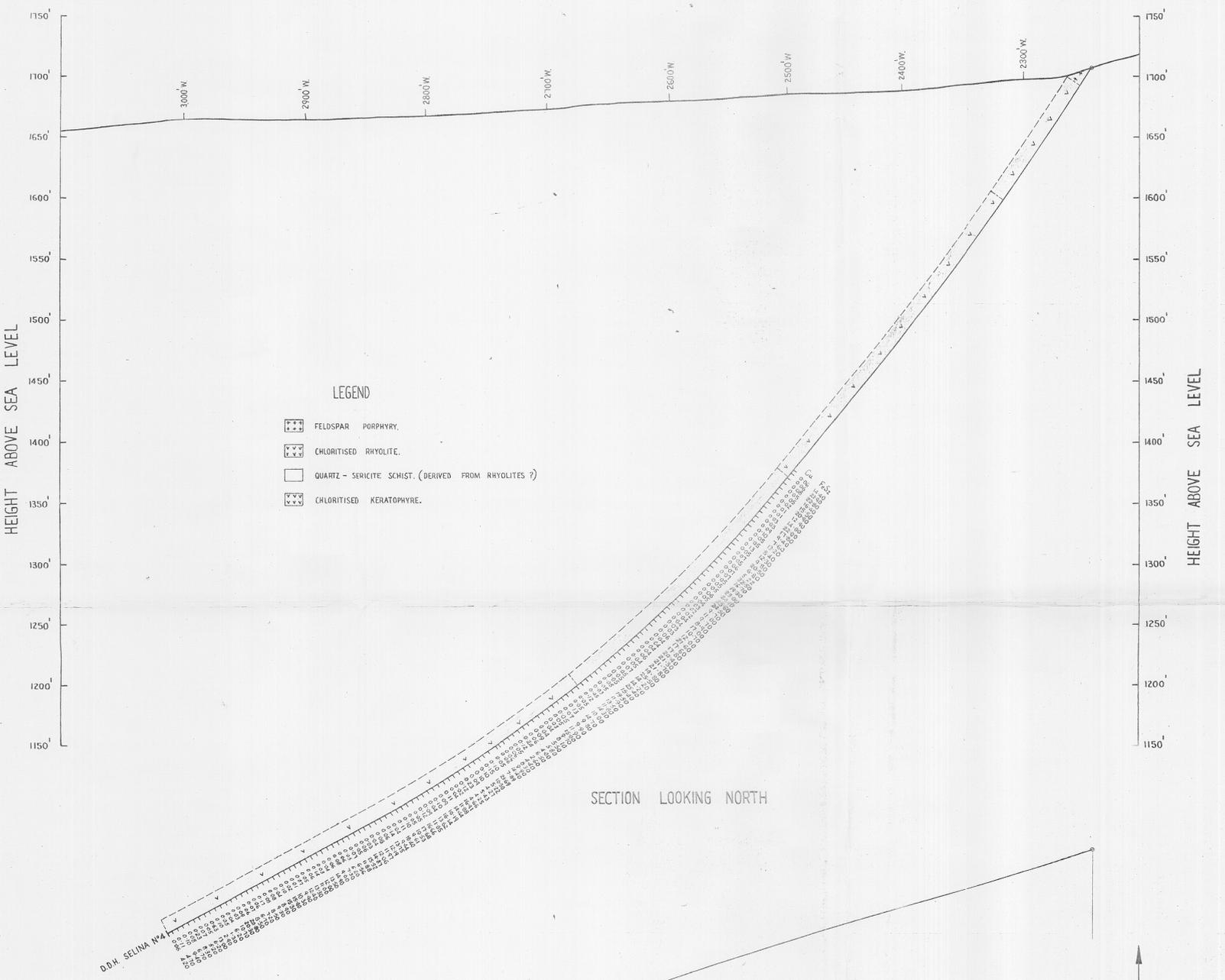
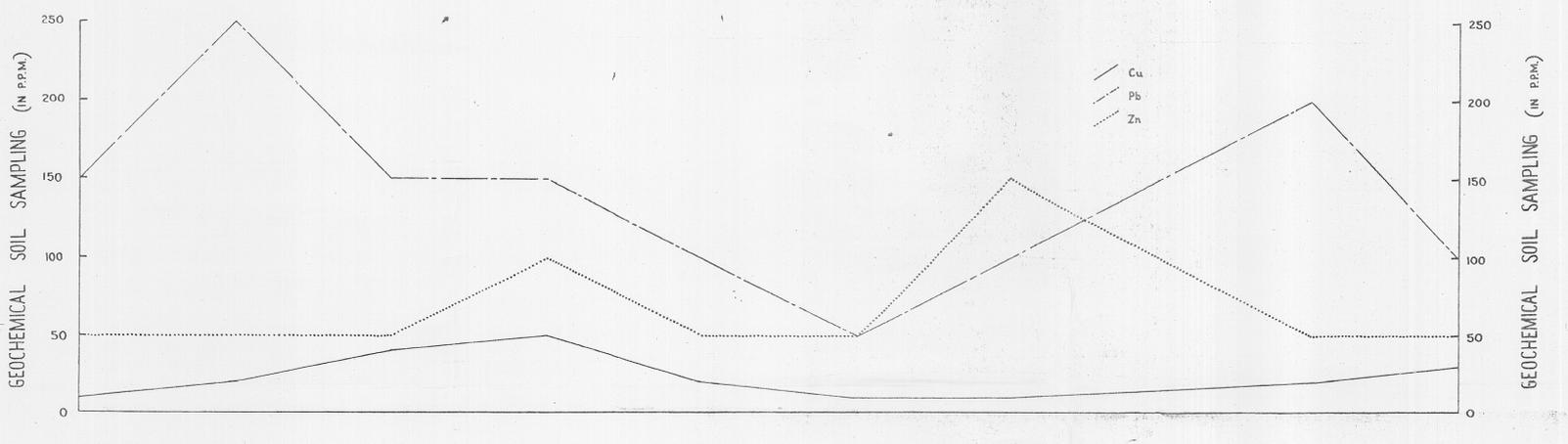
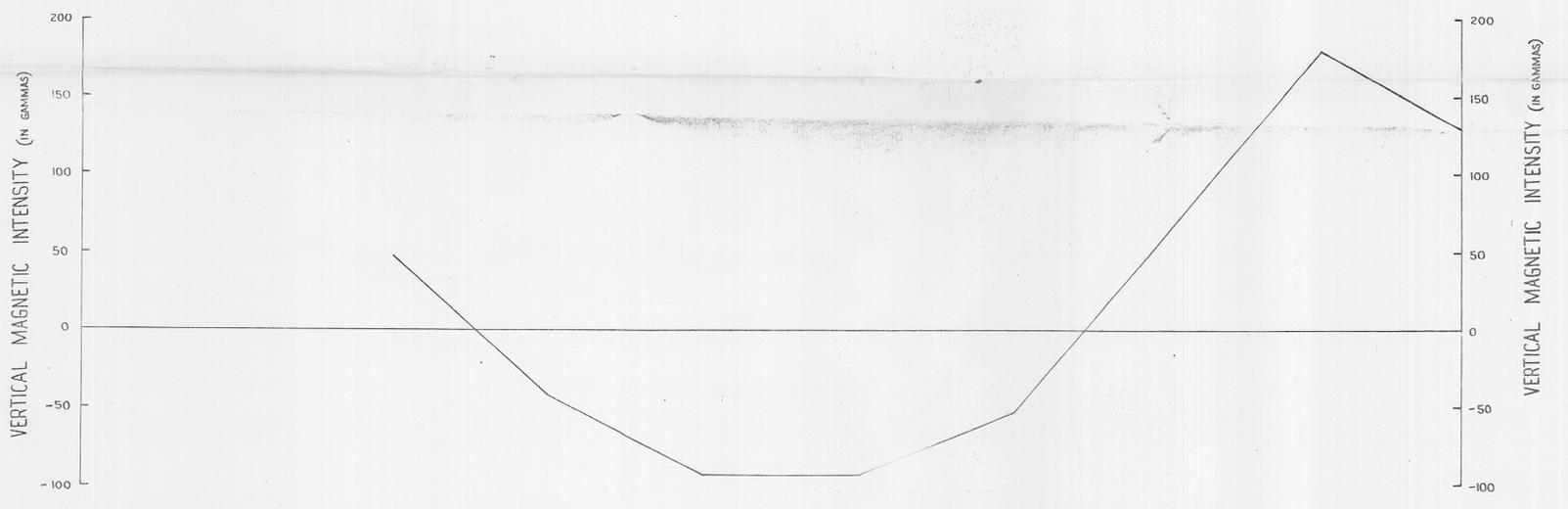
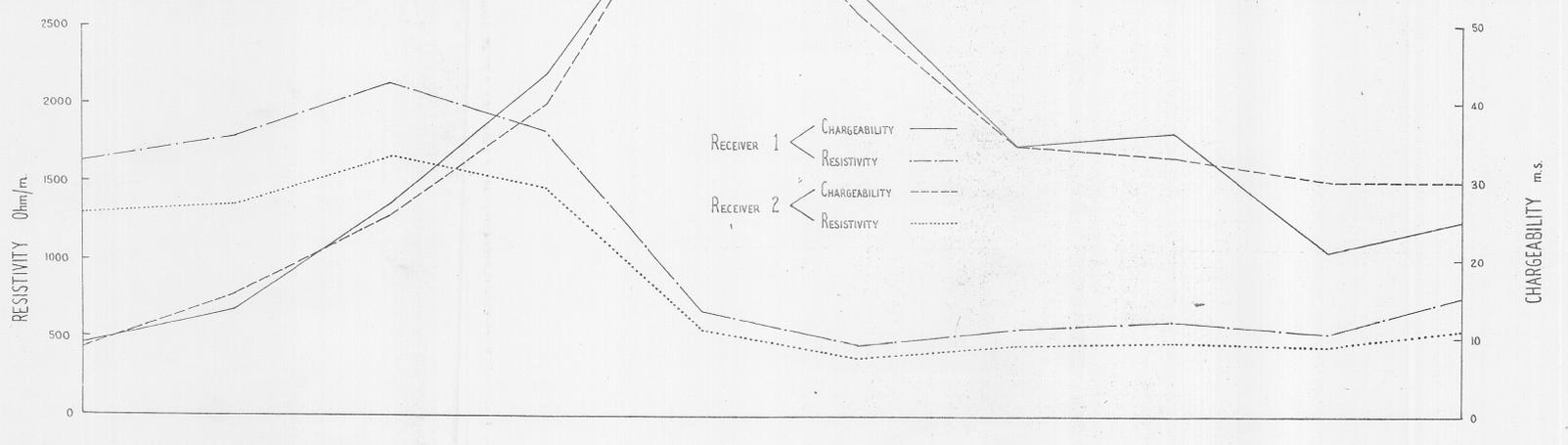
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THE MOUNT LYELL M. & R. COY. LTD.
GEOLOGICAL DEPARTMENT
LAKE SELINA GRID
LINE 72N.
GEOPHYSICAL, GEOCHEMICAL & DRILLING RESULTS

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TRACED BY: R.W.
CHECKED BY: L.A.N.
DATE: 7-7-1970
SCALE: 1" = 50'

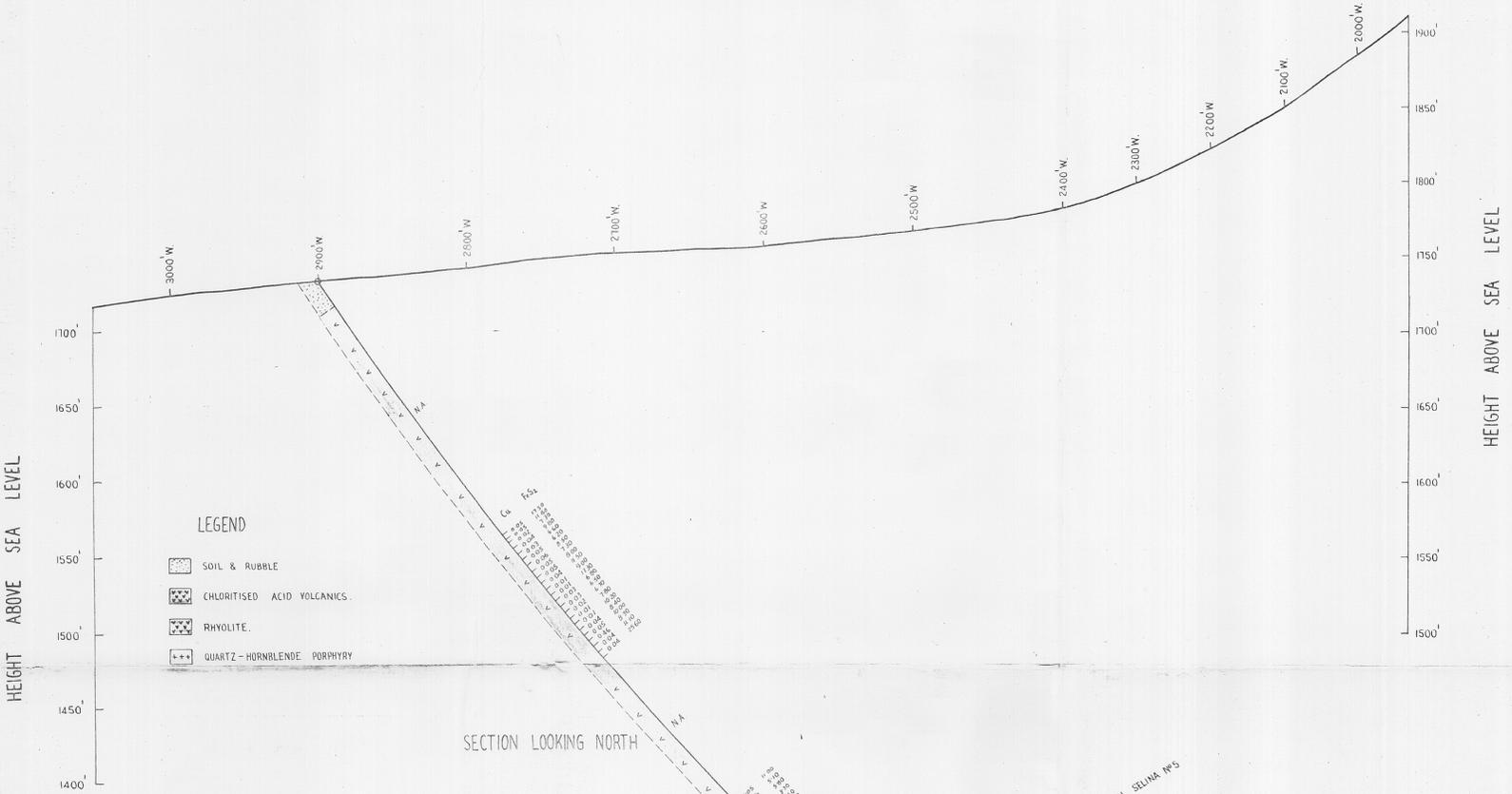
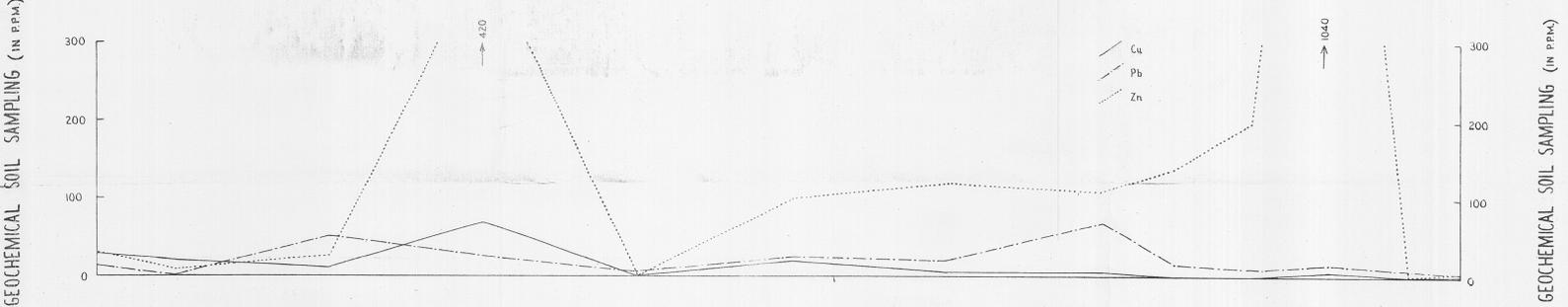
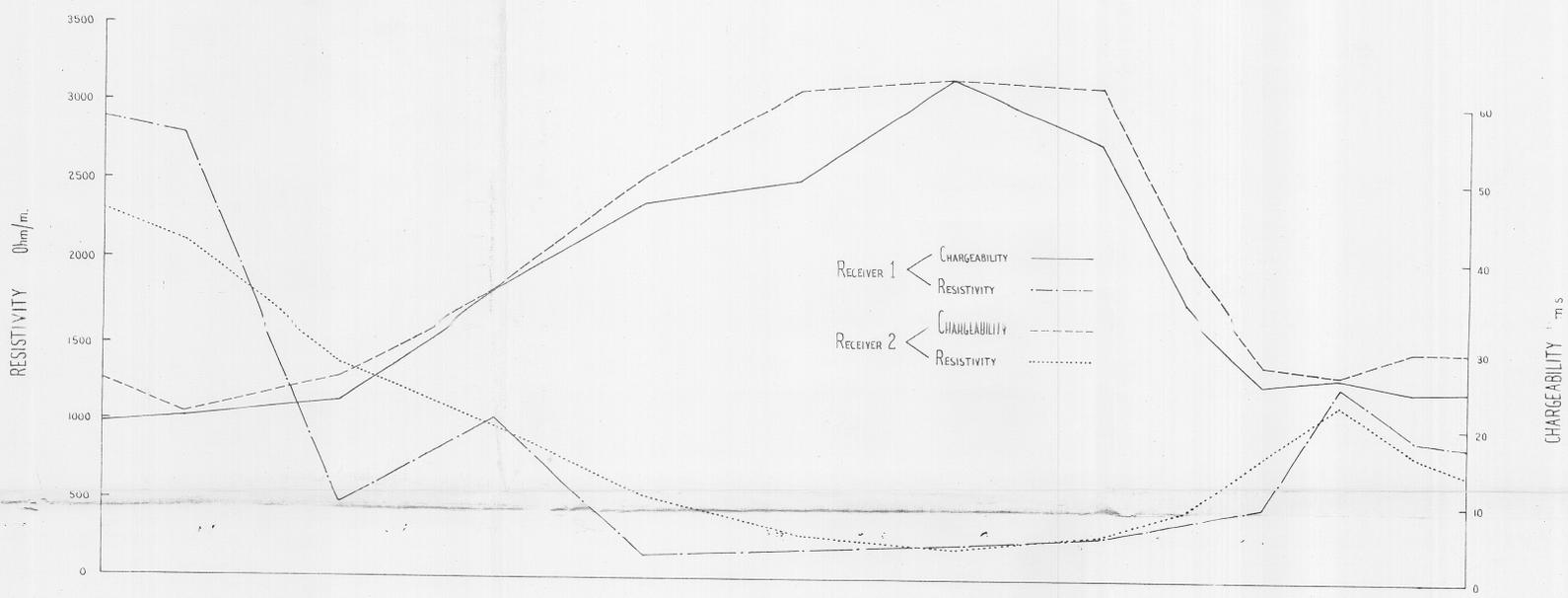
MAP 7



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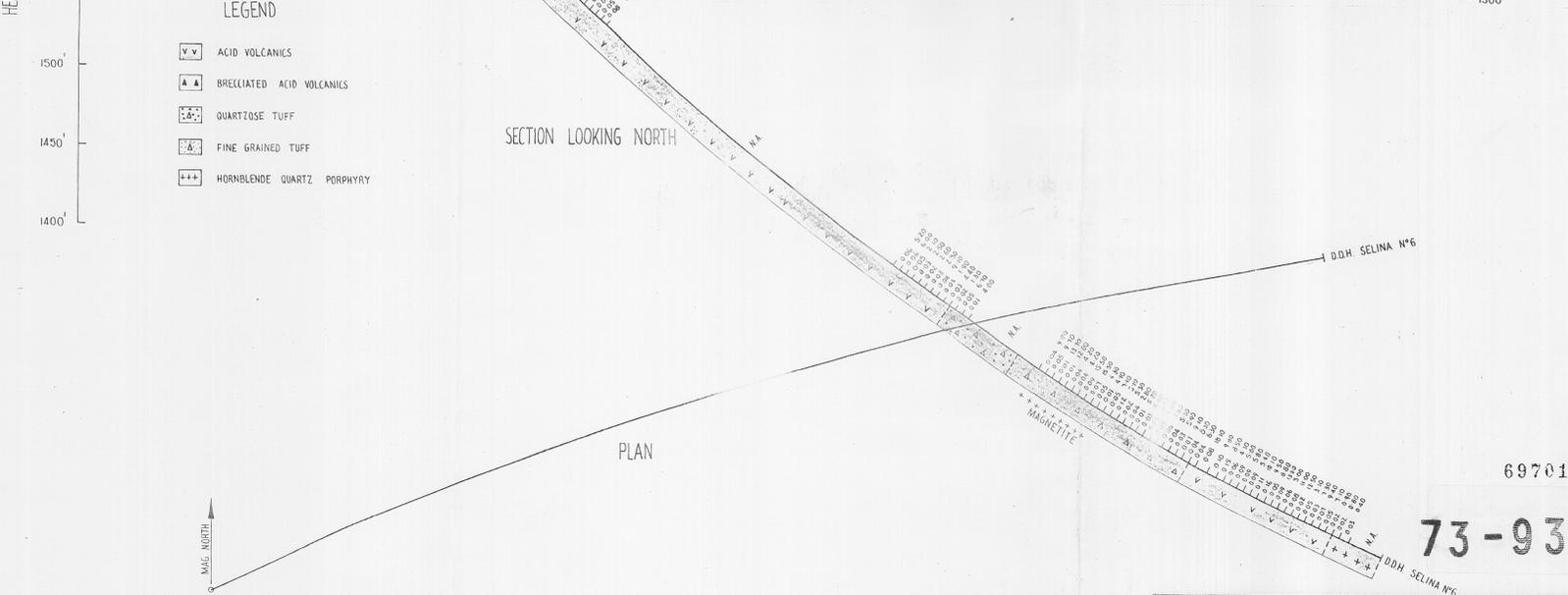
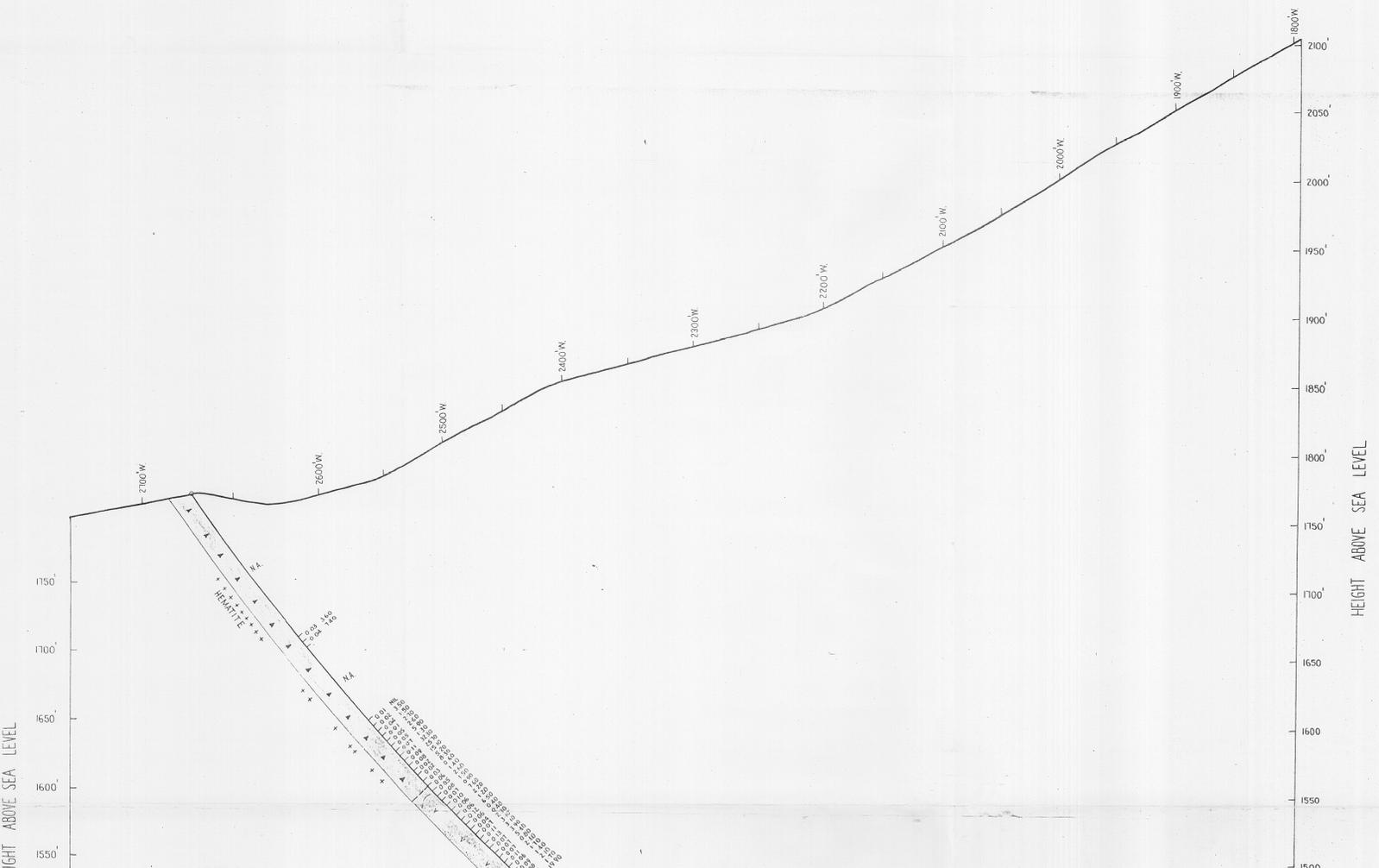
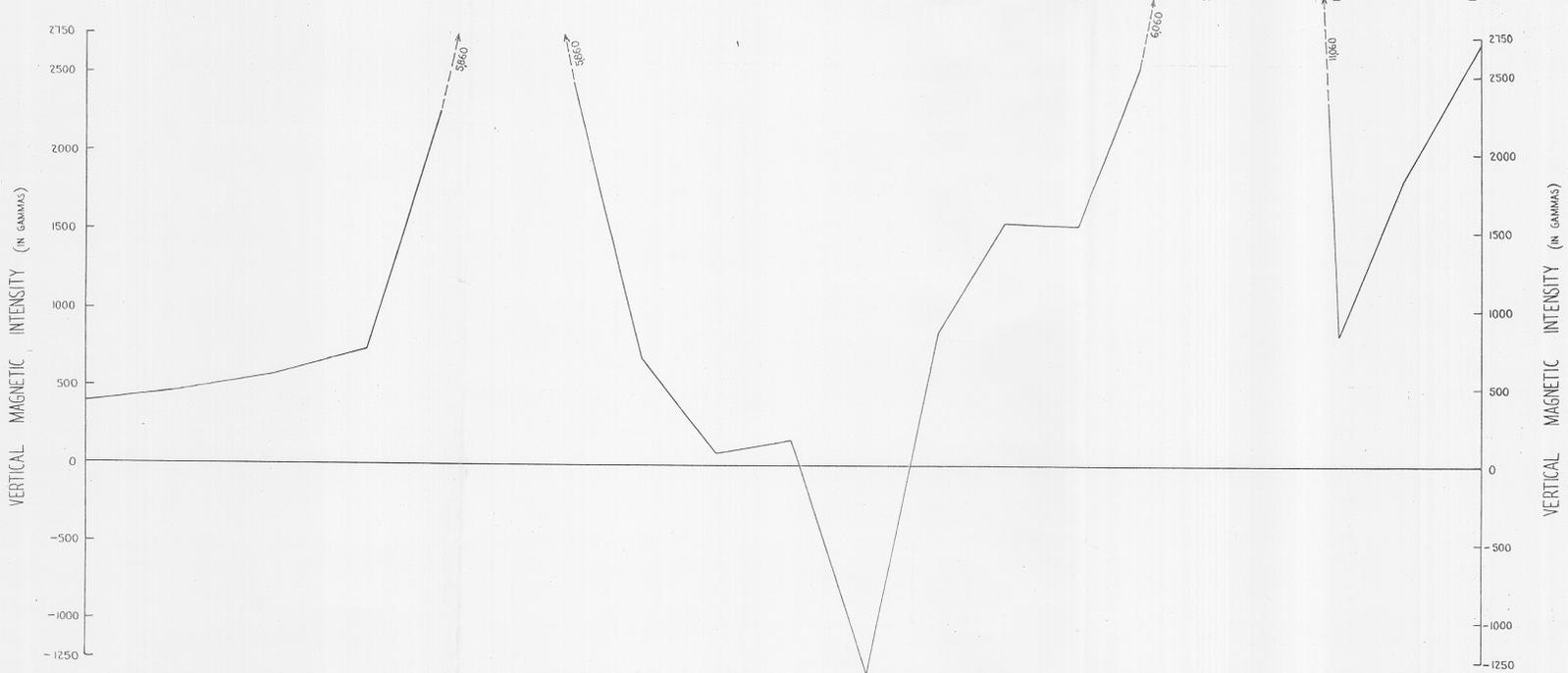
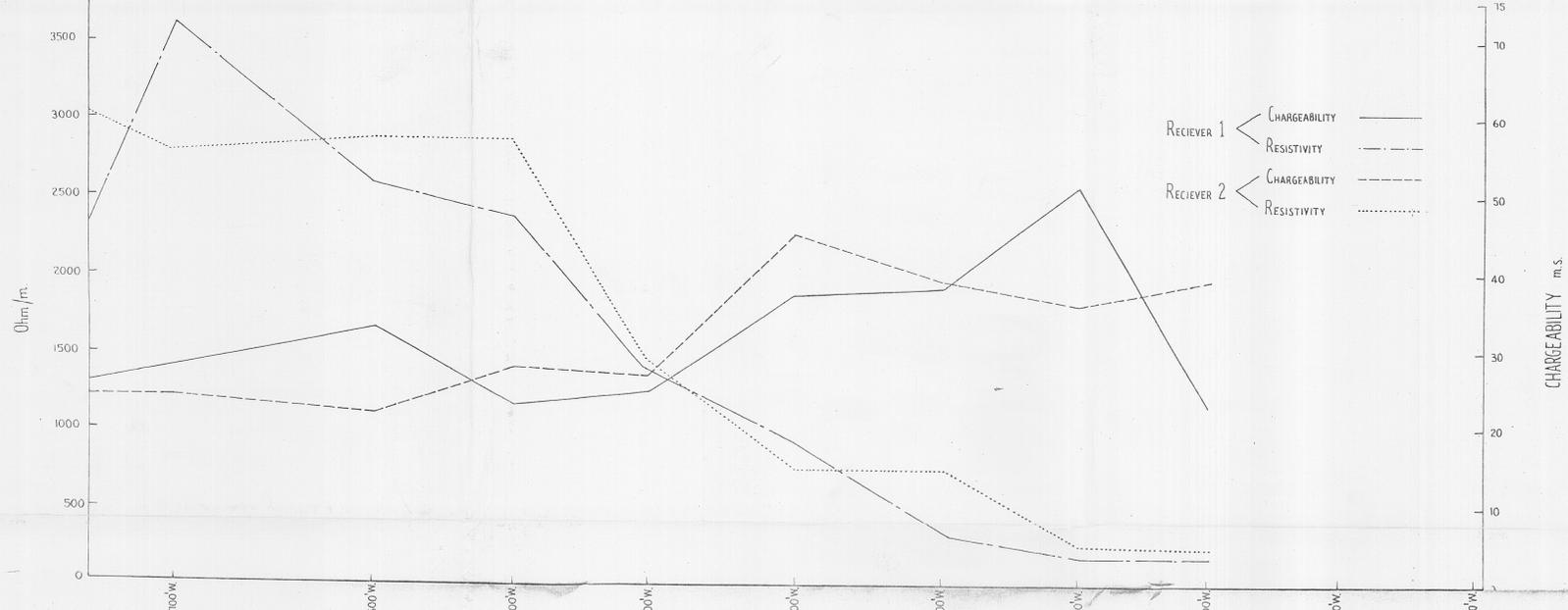
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LINE 120 N.	CHECKED. J.P.P.K.
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	SCALE. 1" = 50'



697016

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LINE 128N.	CHECKED J.V.M.
GEOPHYSICAL GEOCHEMICAL & DRILLING RESULTS	DATE 20-7-71
	SCALE 1" = 50'



- LEGEND**
- V ACID VOLCANICS
 - A BRECCIATED ACID VOLCANICS
 - S QUARTZOSE TUFF
 - A FINE GRAINED TUFF
 - H HORNBLende QUARTZ PORPHYRY

697017

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LINE 136 N.		CHECKED.
GEOPHYSICAL AND DRILLING RESULTS		DATE. 11-9-71
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