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PROJECT NAME:

COMSTAFF PROPRIETARY LIMITED

TITLE:

INTERIM REPORTS ON GROUND FOLLOW-UP WORK ON INPUT ANOMALY GAG

OPEN FILE

AREA NAME/S, STATE 1:250,000 SHEET NO/S & COORDINATES: Pieman Area, Burnie Sheet SK55-5
373870E, 5375950N.

COMMODITY/IES:

Lead, Copper, Zinc and Tin

TEXT PAGES NO:

8

PLAN NOS:

See Appendix

TABLE NOS:

Nil

APPENDICES:

List of Plans

AUTHOR/S:

G. F. Pigott

DATE:

14th April, 1977

AUSTRALIAN ANGLO AMERICAN LIMITED

Incorporated in the State of Victoria

AUSTRALIAN ANGLO AMERICAN LIMITEDCOMSTAFF PROPRIETARY LIMITEDINTERIM REPORT ON GROUND FOLLOW UP WORK ON INPUT ANOMALY GAG1. SUMMARY

Mapping at GAG shows a sedimentary sequence of shales, fine greywackes, tuffs and a fine siliceous quartzite rock, into which intermediate to basic sills and ultramafite bodies have been intruded. A^o soil samples were collected and the results considered separately for residual soils and glacial deposits. Anomalies in zinc, lead, copper and nickel were outlined. Some are associated with deeply weathered basic sills which contain trace amounts of sulphides, while others are associated with the serpentinised ultramafite and the fine siliceous quartzite. Costeaining of the anomalies over the sills indicated that the rocks, when weathered, contain anomalous amounts of zinc, lead and copper. Further costeaining, grid cutting and geophysical surveys are recommended to examine the unexplained soil anomalies.

2. INTRODUCTION

The work combined a follow up programme of examination of soil geochemistry anomalies located on the Pieman South Grid in the field season of 1973/1974, with a follow up programme on an Input anomaly. The area is designated as GAG and combines part of GAA, the known soil anomalies, with the Input anomaly at Fid. No. 017.41 on line 124mE.

The eastern part of the area is well drained by Sheila Creek and its tributaries. Residual soils are developed and sporadic rock outcrops exist. The western part is swampy with poor drainage definition over peri-glacial moraine deposits. Some of this may be flooded by the Huskisson River when the Pieman River is dammed.

Access is provided by a bulldozed track from the Murchison Highway and is only drivable in dry weather. However, all weather access will soon be possible via the new Hydro-Electric Commission road.

3. PREVIOUS WORK

1972: The area was included in a regional programme combining geological mapping with sampling of heavy

Concentrates, stream sediments and soils. Low order sediment sample anomalies in tin, antimony and zinc were recorded.

1973-1974: A wide spaced regional grid, called the Pieman South grid was cut and sampled. Plotting and interpretation of soil sample results revealed anomalous zones of copper, lead, zinc, nickel and barium. Sulphide mineralisation in the form of galena, sphalerite, chalcopyrite and pyrite was recorded from rock chips recovered by auger drilling to the C zone at the main soil anomaly.

1975: An airborne electromagnetic Input survey was carried out by Geoterrex Pty. Ltd. over the area. An anomalous response was recorded on line 124E at fiducal 017.41. This Input anomaly was one of a number in a diffuse complex zone of anomalous responses.

4. WORK DONE

A four line Input follow up grid was established to prospect the area of the Input anomaly. This was tied in with three lines of the old Pieman South grid. The lines and access roads were geologically mapped, and the soils sampled at 20m stations. A Crone electromagnetic survey was carried out over the area.

Three costeans were excavated over the area of the geochemical anomalies and over geological contacts. The intended costeaning programme was not completed due to adverse weather conditions.

5. GEOLOGY

GAG lies within Cambrian sedimentary rocks, folded along north west-south east axes. The sediments are intruded by a complex of gabbro and diorite sills and by bodies of serpentinised ultramafite. The western portion of the grid may be underlain by quartzites and shales of the Lower Ordovician Huskisson Group.

As mentioned above, rock outcrops are sparse and, therefore, most of the geological mapping is based on float. Although three costeans were excavated, only one of them (Costean 3) contains good exposure of bedrock. The others were not completed and are little more than tracks.

5.1. Sedimentary Rocks

Grey and green silty shales interbedded with fine

greywacke sandstones and feldspathic tuffs make up the sedimentary sequence at GAG (see Plan 2). The shales are generally fissile and well cleaved and they vary in grain size from mudstones (grey) to siltstones (green). The greywackes are fine to medium grained sandstones, are typically graded and contain chloritised lithic fragments. The tuffs are coarse grained, massively bedded and very feldspathic, with both crystal and lithic fragments.

A unit of grey, well jointed, fine grained, grey siliceous rock is interbedded with the sequence. No primary textures are visible as the rock is extremely quartz veined and brecciated. It generally weathers to white siliceous gravel. This rock may be decalcified siliceous carbonate, a fine grained quartzite or silicified serpentinite.

5.2. Igneous Rocks

Sill-like bodies of quartz gabbro, porphyritic microgabbro and diorite occur intruded into the sedimentary sequence. The rocks are generally deeply weathered with extensive ferruginous and manganiferous staining. Where fresh they are dark grey in colour and exhibit a coarse ophitic texture.

The main intrusive body is a 100m wide pyroxenitic serpentinite with associated irregular bodies of talc rich rocks. Emplacement of the serpentinite, which has a north-south trend, was accompanied by shearing and silicification of the country rock. The three costeans expose contacts between the serpentinite and sedimentary rocks. In Costeans 1 and 2 a talc-magnesite-quartz-pyrite mineral assemblage is developed on the contact with the grey siliceous rock. In Costean 3 a talc-magnesite-magnetite mineral assemblage is developed on the contact with shales, but there is no evidence of sulphide mineralisation. Anomalous nickel and zinc values in the soils indicate a second serpentinite, 300m west of the main one. This is supported by the presence of two serpentinites on the Pieman West - Huskisson track, 0.4km to the south of the grid. Finally, the configuration of conductive trends and aeromagnetic structures as indicated by the Input survey suggests a formational bedrock conductor.

5.3. Structure

The Cambrian rocks at GAG are located close to the axial zone of the Huskisson syncline and are folded, sheared and foliated along north west-south east axes. Generally the rocks strike between 290° and 340° M, and dip to the north east. Suitable data for measuring facing directions is rare, due to the poor exposure and the weathered condition of the rocks. Facing directions to both east and west have been observed.

5.4. Mineralisation

Trace amounts of pyrrhotite and chalcopyrite occur in the intermediate-basic rock suite. Deep weathering of these rocks give manganiferous and ferruginous ochres which carry anomalous amounts of copper, lead and zinc. A quartz vein, 34cm wide, striking 070° and dipping at 58° to the south, was exposed in Costean 3, quartz-limonite boxworks are associated with it where it cuts a porphyritic microgabbro.

Limonitic vugs and cavities, some resembling boxworks occur in the fine grained grey siliceous rock. These could represent sulphides as suggested by the concentration of pyrite in the mineral assemblage when in contact with ultramafite. However, neither soil nor rock geochemical anomalies have yet been found to be associated with this rock.

6. GEOCHEMISTRY

6.1. Rock Geochemistry

Three costeans totalling 30lm were excavated at GAG. The costeans were geologically mapped, and where fresh bedrock was exposed, were channel sampled in three metre sections. Spot samples were collected at three metre intervals where inadequate bedrock was exposed. The costeans were excavated to expose rocks below geochemical anomalies found during the 1973/1974 survey.

The costean chip sample results reflect the different lithologies, but no values of economic significance were obtained. The ultramafites are relatively high in nickel and low in copper and

lead. The grey siliceous rock is relatively low in the elements analysed. The deeply weathered gabbro sills are relatively high in copper, lead and zinc, particularly in the vicinity of the limonitic quartz vein. This is probably the source of the soil anomalies recorded on the old base lines (GAA) rather than the mineralised dolomite reported from the auger sampling. Mapping in fact indicates that the dolomites and gossans recorded on that survey are pieces of float derived from the limonite stained grey siliceous rock.

6.2. Soil Geochemistry

In situ residual soils are developed over the eastern portion of the grid. However, in the western part a thick glacial cover occurs. Care was taken to collect samples only from the A⁰ soil horizon, and the sample results from the residual and transported soils were processed separately. Scattered anomalies in nickel and zinc were recorded from that portion of the grid over the Input anomaly which suggest the presence of an ultramafite. Also the survey confirmed the soil anomalies found in the 1973/1974 survey, over the greywacke-shale-gabbro succession to the east.

The results are tabulated below as follows:

a) Residual soil over the eastern part of the grid

Element	Low	High	Populations
Copper	2	160	<18, 18-75, >75
Nickel	4	4200	<34, 34-135, 135-440, >440
Lead	14	280	<42, 42-105, >105
Zinc	10	540	<87, 87-180, >180
Tin	*bld	130	Not divisible into populations

*bld = below level of detection

b) Transported soil over the western part of the grid

Element	Low	High	Populations
Copper	bld	60	<10, 10-23, >23
Nickel	2	2250	<42, >42
Lead	8	70	<24, 24-59, >59
Zinc	2	650	<18, 18-175, >175
Tin	bld	10	Not divisible into populations

6.2.1. Copper

Copper contents in excess of 23 ppm over transported soils, and 75 ppm over residual soils, are regarded as anomalous. There is a soil anomaly co-incident with nickel, lead and zinc at the far eastern portion of line 4880N. This occurs down slope from the main ultramafite, mostly in silty alluvium with no outcrop. The western contact zone of the ultramafite on line 5000N also gives anomalous copper values co-incident with zinc. This contact zone will require at least one costean to examine the cause of these anomalies. Anomalous copper values occur associated with porphyritic microgabbro sills which are exposed in Costean 3.

6.2.2. Nickel

42 ppm nickel in the transported soils and 440 ppm in the residual soils are considered to be anomalous. Coincident nickel and zinc occur over the main ultramafite, and along a zone parallel to Sheila Creek which may indicate another serpentinite body buried beneath the glacial cover.

6.2.3. Lead

59 ppm lead in the transported soils and 105 ppm in the residual soils are considered to be anomalous. Anomalies occur over the main ultramafite and the microgabbro sills. While the soil anomalies over the basic sills may be due mainly to high background values as seen in the costean sampling, the anomalies over the ultramafite on lines 5120N and 5180N are unexplained. They are coincident with anomalous zinc, nickel and copper. A similar anomaly occurs at the eastern end of line 4880N (see 6.2.1.).

6.2.4. Zinc

Values in transported soils in excess of 175 ppm and in residual soils in excess of 180 ppm are regarded as anomalous. Anomalous zinc values occur with high nickel values over ultramafites and associated with

lead and copper over microgabbros. Unexplained zinc anomalies associated with lead and copper require further investigation.

6.2.5. Tin

An isolated anomalous tin value of 130 ppm was recorded from a sample collected at 5000N/5520E associated with anomalous copper and zinc. The underlying rock type is weathered microgabbro with minor quartz veins, but no tin values above the level of detection were recorded in the nearby costean.

7. GEOPHYSICS

A Crone EM survey was carried out using a coil spacing of 160m. The results are difficult to interpret due to a high level of background noise, particularly over the area of the Input anomaly. There certainly are no obvious conductors, only a possible one at 4920N on line 5480E. This is over the porphyritic microgabbro sill which is exposed in Costean 3, where traces of pyrrhotite and chalcopyrite have been identified.

8. DISCUSSION

The lead, zinc and copper anomalies at GAG can be partly explained by the traces of pyrrhotite and chalcopyrite in the intermediate-basic sills. When weathered, these rocks form manganese and ferruginous ochres. The limonitic gossanous quartz vein exposed in Costean 3 may also give rise to soil anomalies.

The soil anomalies on lines 5180N and 5120N found in this survey, and the other anomalies found in the 1973/1974 survey have not been explained. These appear to be associated with the main ultramafite, particularly in the vicinity of the contact zones with the fine grey siliceous rock. This rock is usually limonitic and may contain sulphides. Fresher samples are required to ascertain the nature and economic mineral potential of this rock.

Isolated soil anomalies in copper, zinc, lead and nickel are associated with the western contact zone of the main ultramafite. Some small costeans are required to see if this zone is mineralised. No soil anomalies are

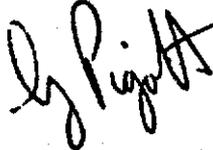
associated with the eastern contact zone, except on line 5180N where it is in contact with the grey siliceous rock. The Input anomaly has not been adequately explained, but is most likely due to an edge effect of a buried ultramafite.

It was reported from the 1973/1974 survey that auger drilling to bedrock returned pieces of dolomite with visible chalcopryrite, sphalerite and galena. This could not be substantiated from this survey and therefore, more costeaning is required. Certainly some of the mineralised dolomite reported from lines 5000N and 5480E has been found to be either pieces of limonitic vein quartz, or floaters of fine grained grey quartzitic rock derived from outcrops further up slope.

9. RECOMMENDATIONS

- 9.1. Costeans 1 and 2 should be deepened and extended to cover the soil anomalies associated with the ultramafite and the grey siliceous rock.
- 9.2. Two short costeans should be excavated to examine the western contact zone of the ultramafite.
- 9.3. A ground magnetic survey should be carried out.
- 9.4. Three grid lines, 120m apart and each 640m long, should be cut to the north of the present grid, using line 5320E as a centre base line.
- 9.5. A Self Potential survey should be carried out.

14th April 1977


G. Pigott

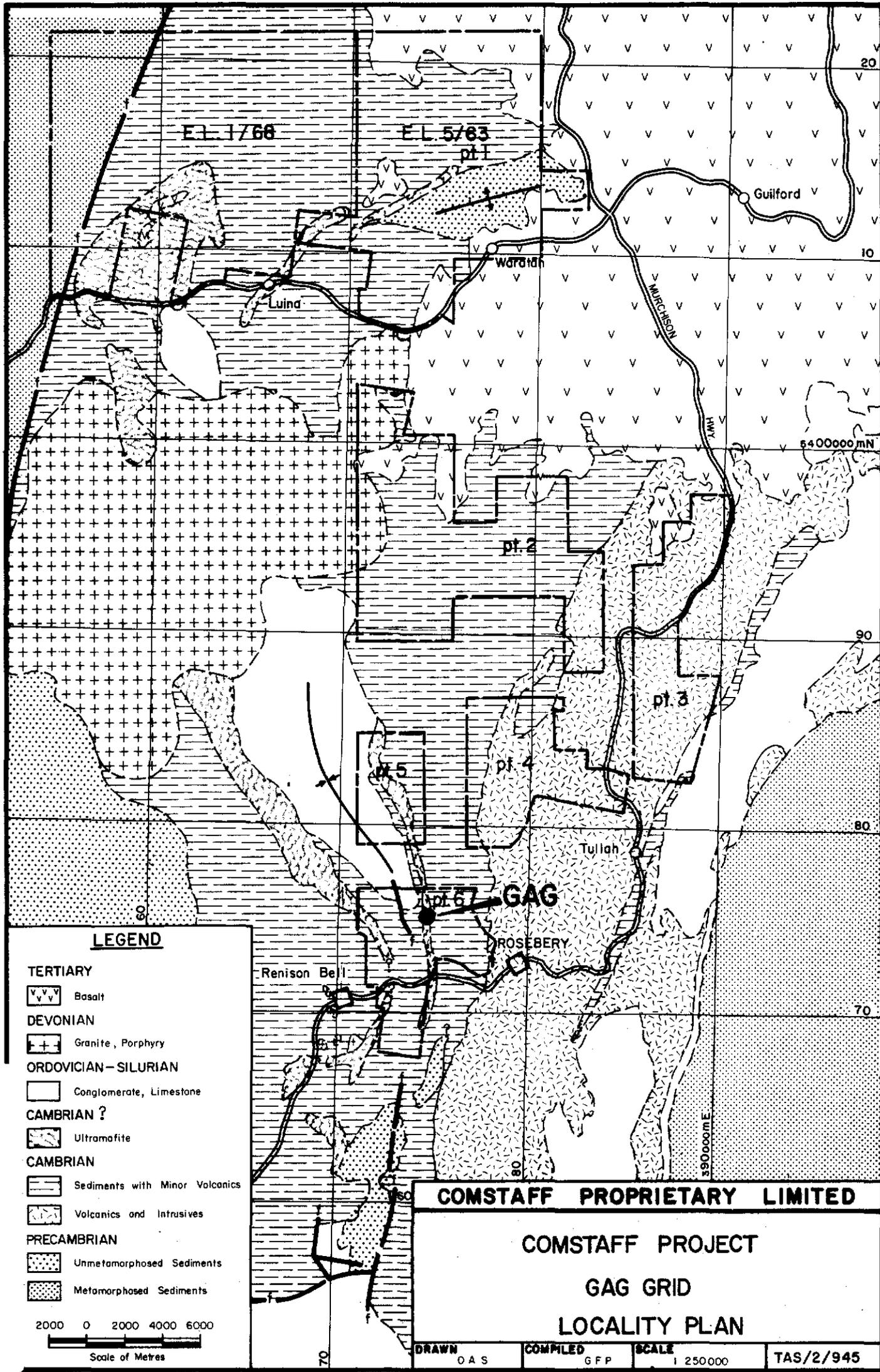
Approved by


R.J. Kernick
EXPLORATION MANAGER

APPENDIXLIST OF PLANS

1. TAS/2/945 Regional Geology and Location
2. TAS/2/889 Geology of GAG
3. TAS/2/890 Costean 1 - Line 5180N - Geology and Geochemistry
4. TAS/2/891 Costean 2 - Line 5180N
5. TAS/2/892 Costean 3 - Line 5000N
6. TAS/2/893 Soil Geochemistry - Copper
7. TAS/2/894 Soil Geochemistry - Nickel
8. TAS/2/895 Soil Geochemistry - Lead
9. TAS/2/896 Soil Geochemistry - Zinc
10. TAS/2/897 Soil Geochemistry - Tin
11. TAS/2/898 Crone E.M. Profile - 4760N
12. TAS/2/899 Crone E.M. Profile - 4880N
13. TAS/2/900 Crone E.M. Profile - 5000N
14. TAS/2/901 Crone E.M. Profile - 5120N
15. TAS/2/902 Crone E.M. Profile - 5180N
16. TAS/2/903 Crone E.M. Profile - 4680E
17. TAS/2/904 Crone E.M. Profile - 5320E
18. TAS/2/905 Crone E.M. Profile - 5480E

321011



LEGEND

TERTIARY

Basalt

DEVONIAN

Granite, Porphyry

ORDOVICIAN - SILURIAN

Conglomerate, Limestone

CAMBRIAN ?

Ultramafite

CAMBRIAN

Sediments with Minor Volcanics

Volcanics and Intrusives

PRECAMBRIAN

Unmetamorphosed Sediments

Metamorphosed Sediments

2000 0 2000 4000 6000

Scale of Metres

5 cm

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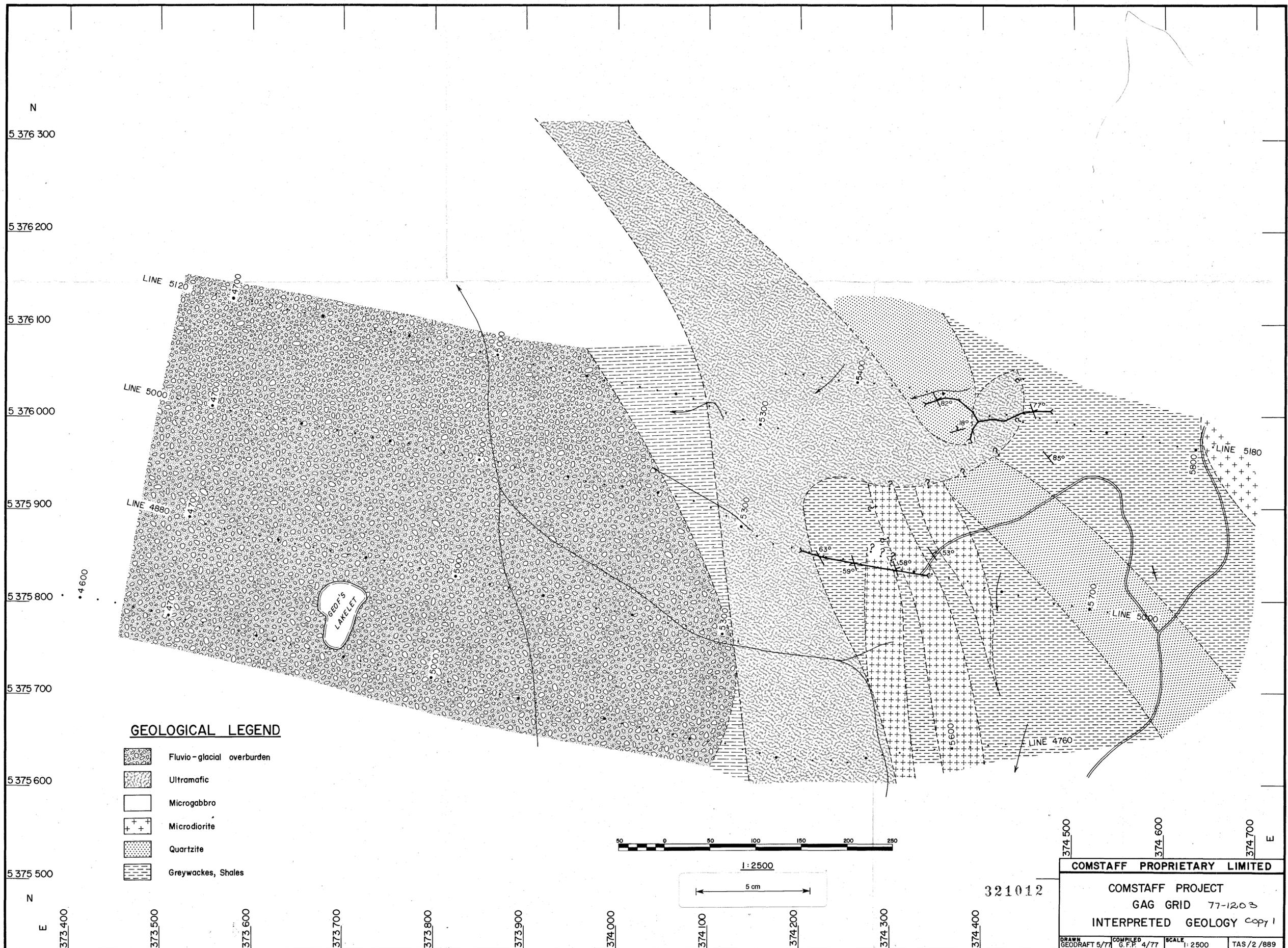
LOCALITY PLAN

DRAWN OAS

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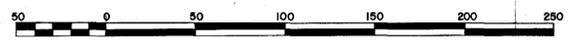
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TAS/2/945



GEOLOGICAL LEGEND

-  Fluvio-glacial overburden
-  Ultramafic
-  Microgabbro
-  Microdiorite
-  Quartzite
-  Greywackes, Shales



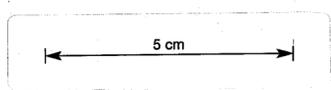
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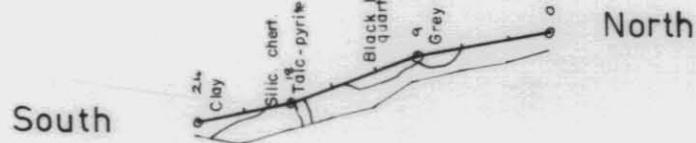


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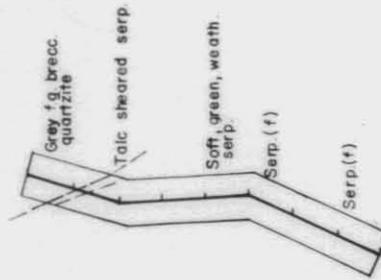


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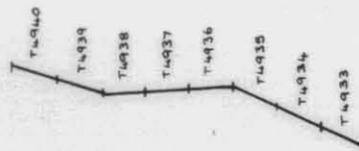
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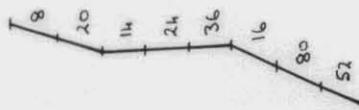
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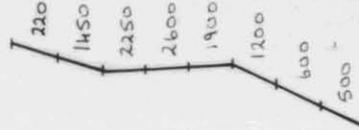
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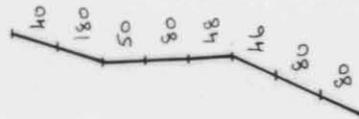
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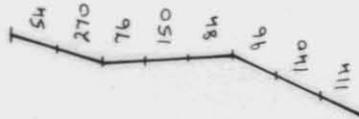
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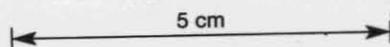
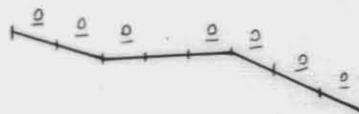
Pb



Zn



Sn



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A.M.

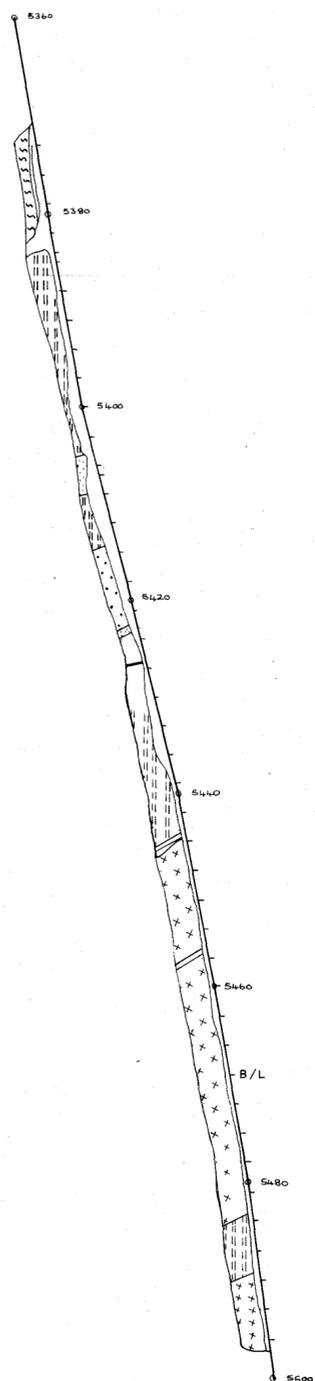
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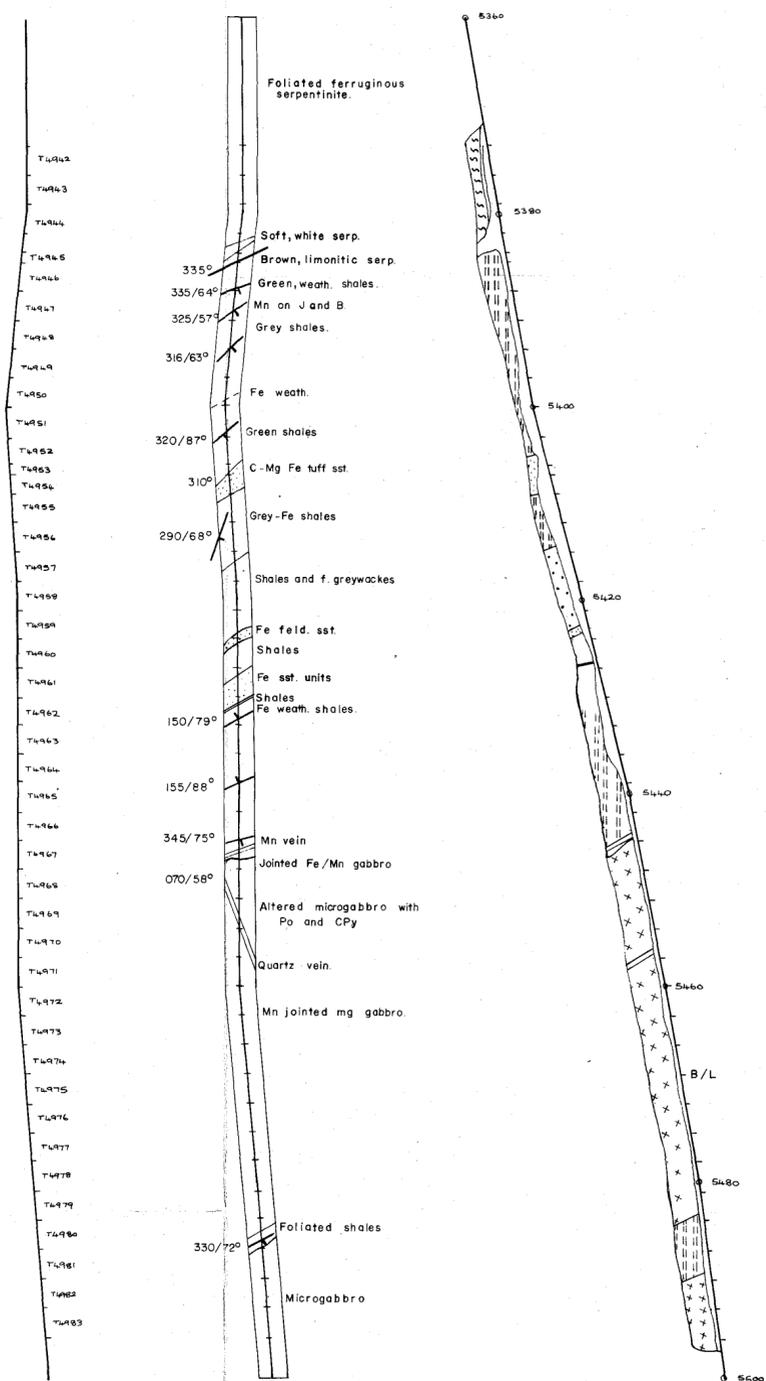
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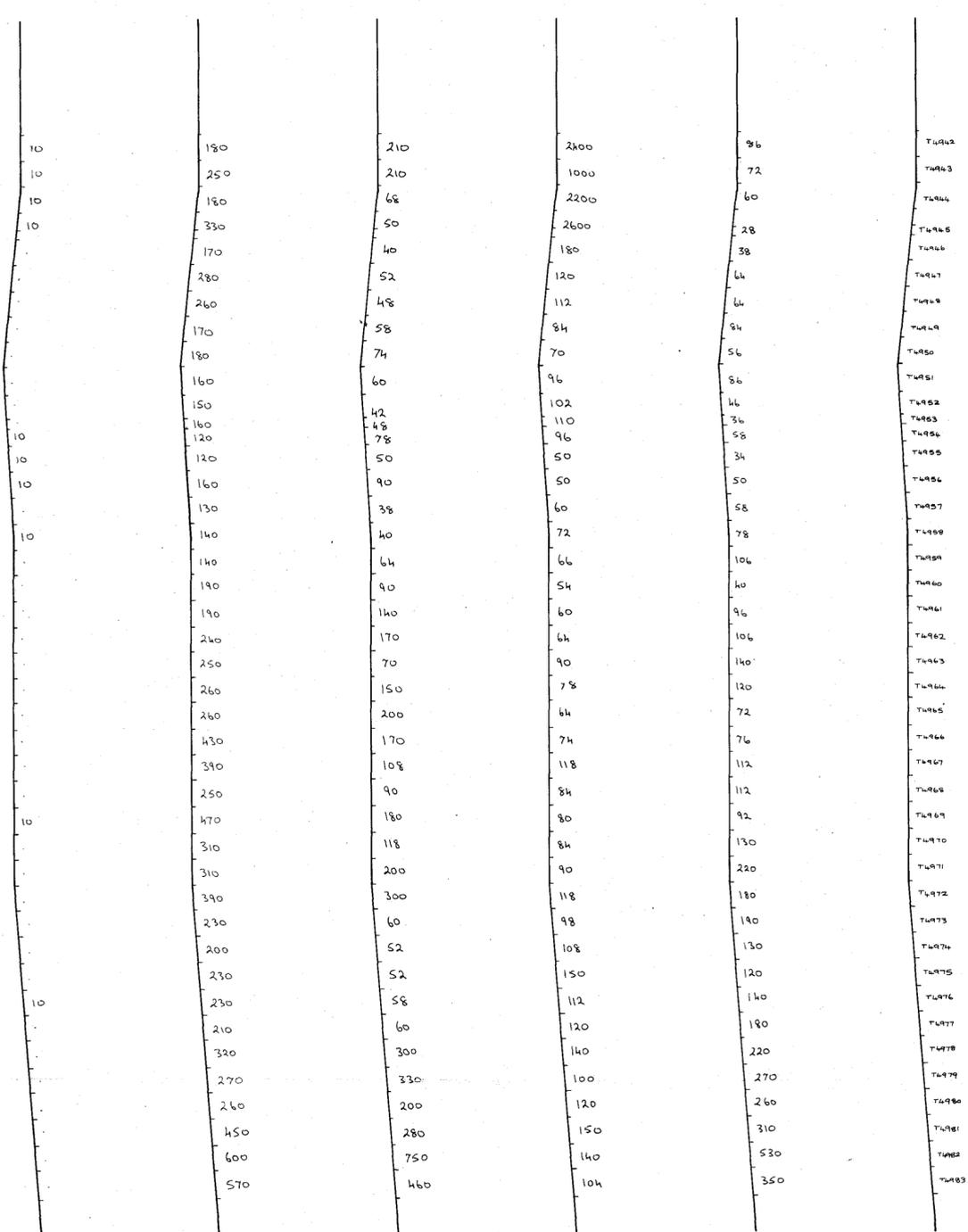
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Plan

Sample points



Cu Ni Pb Zn Sn



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5 cm

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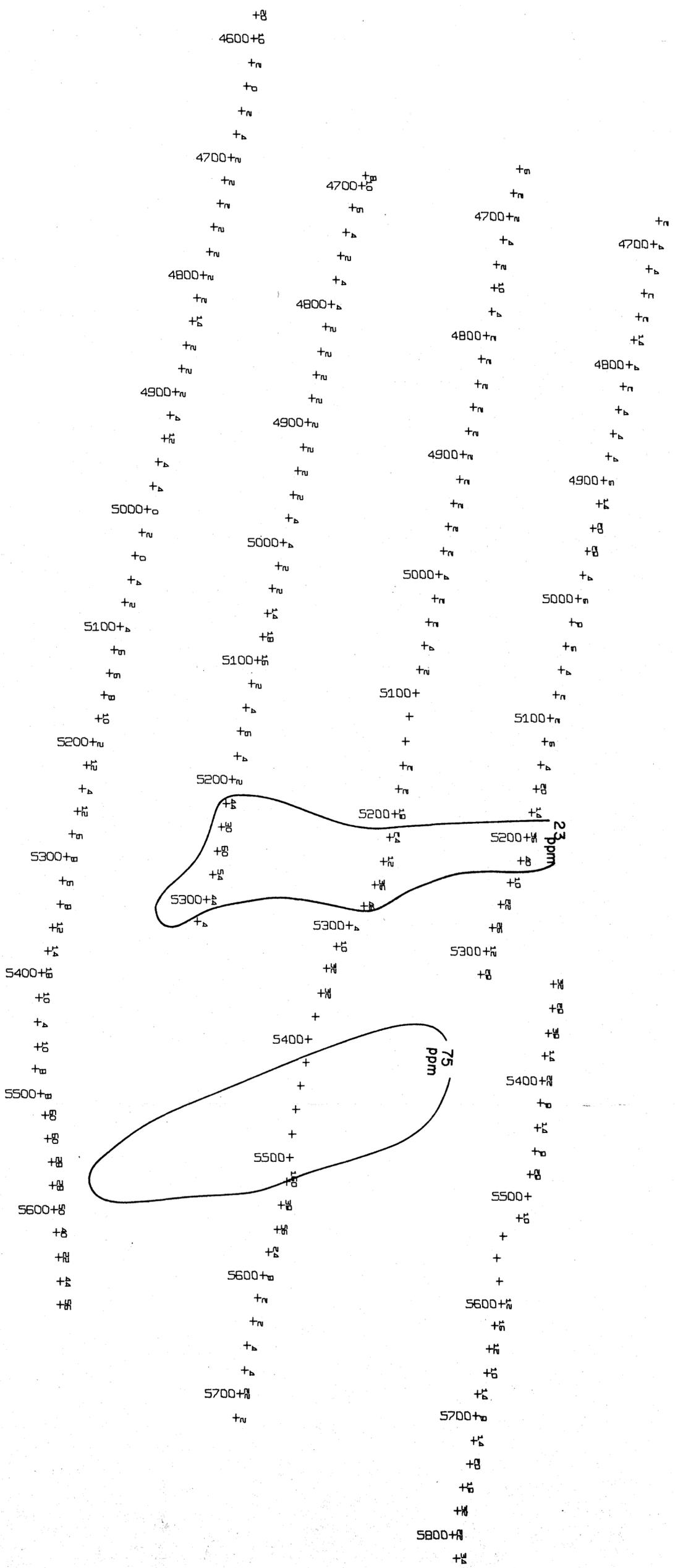
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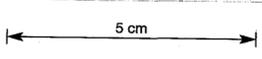
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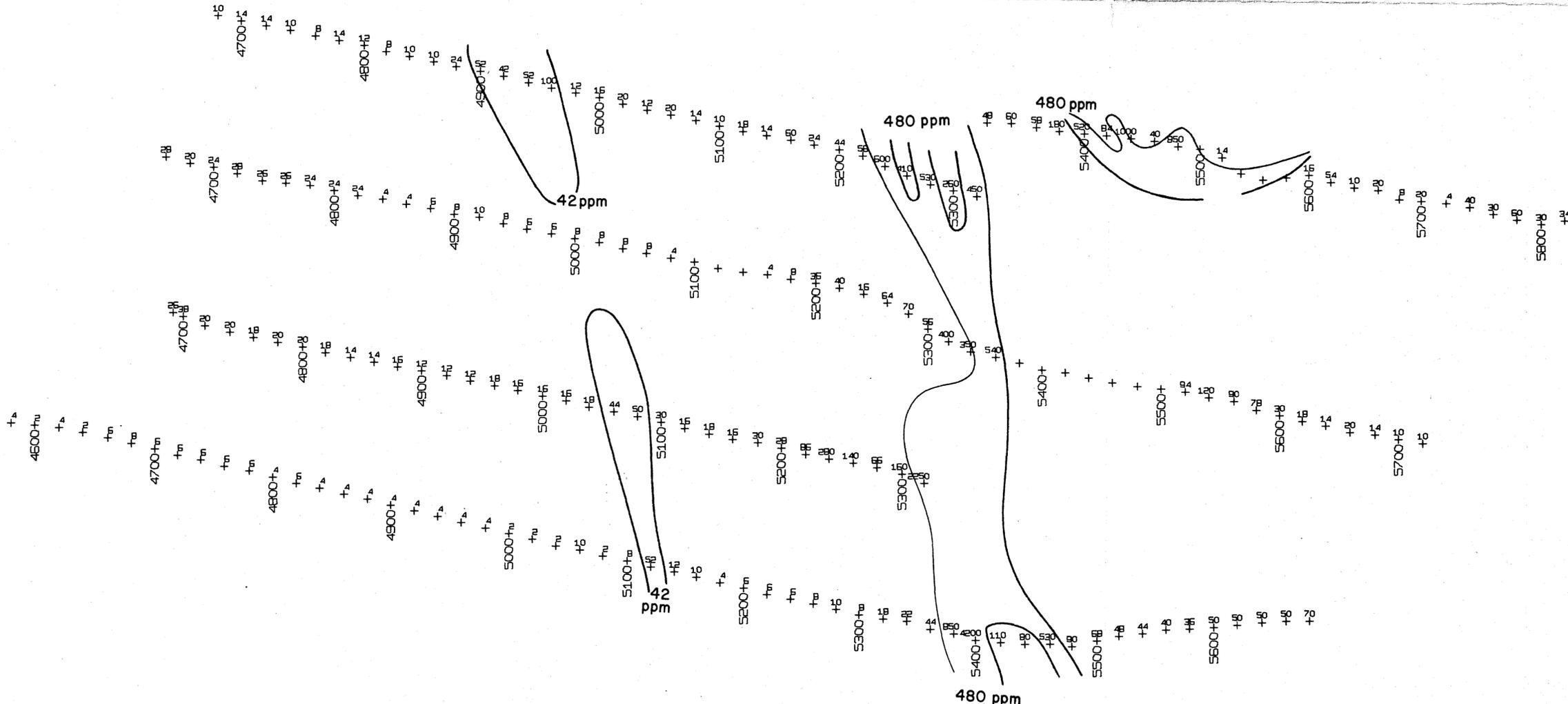


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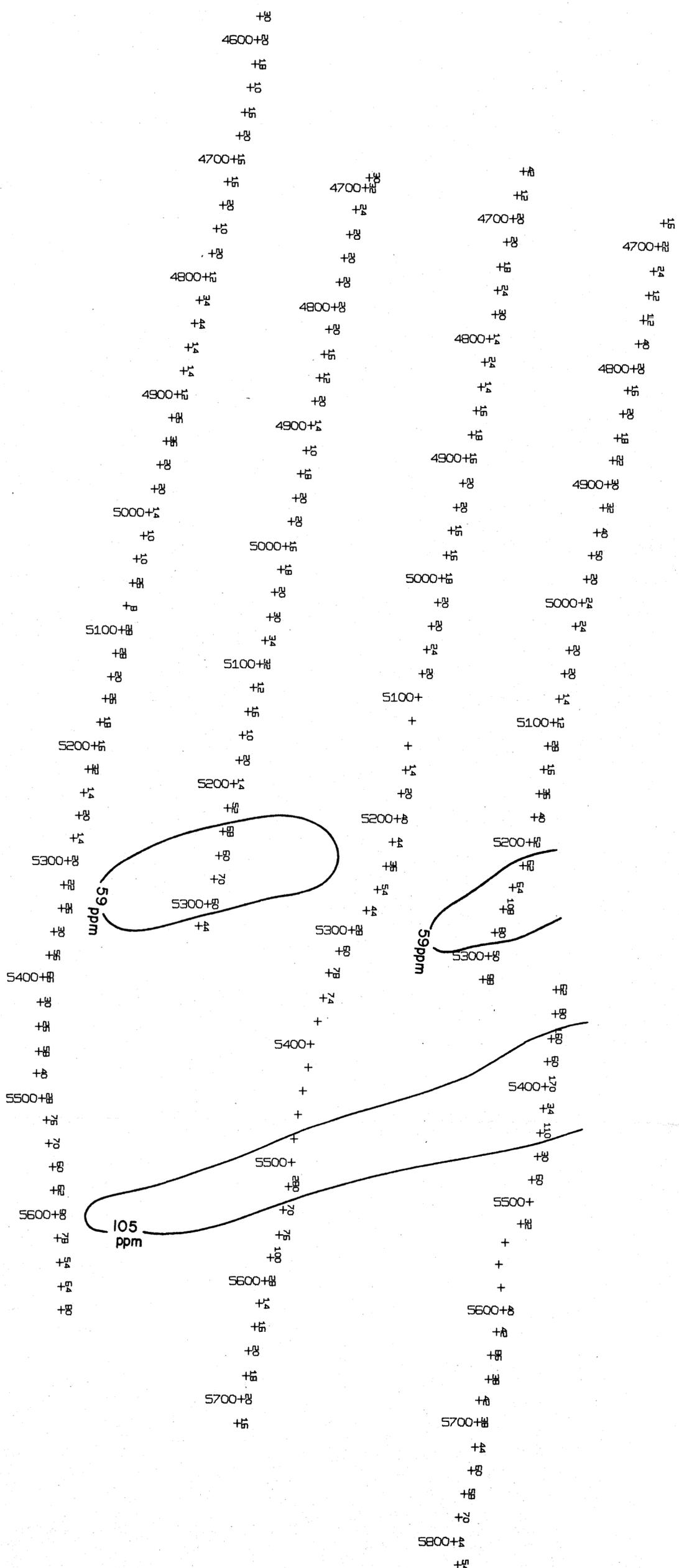
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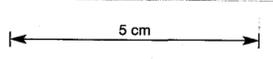
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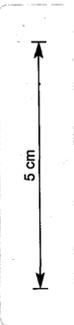
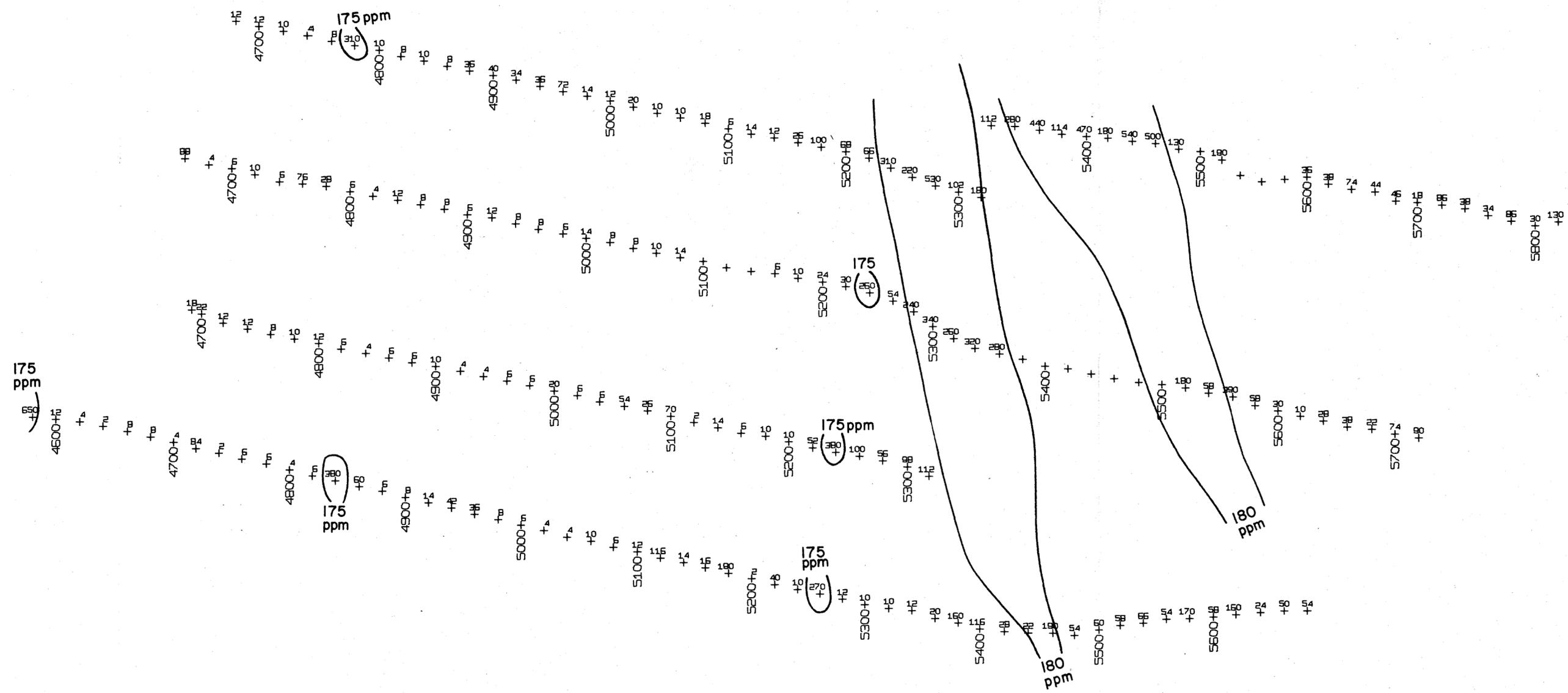


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GAG GRID
SOIL GEOCHEMISTRY - LEAD

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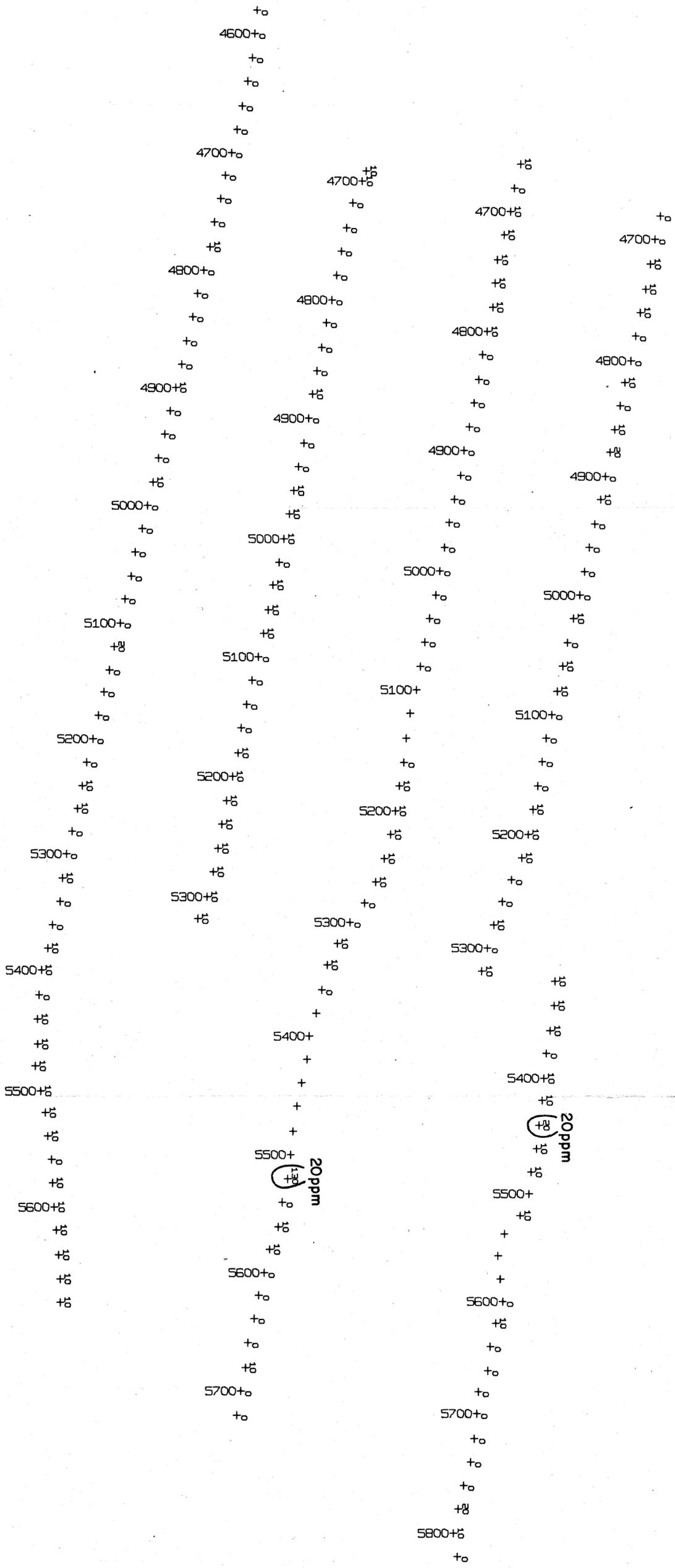


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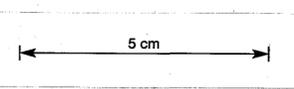
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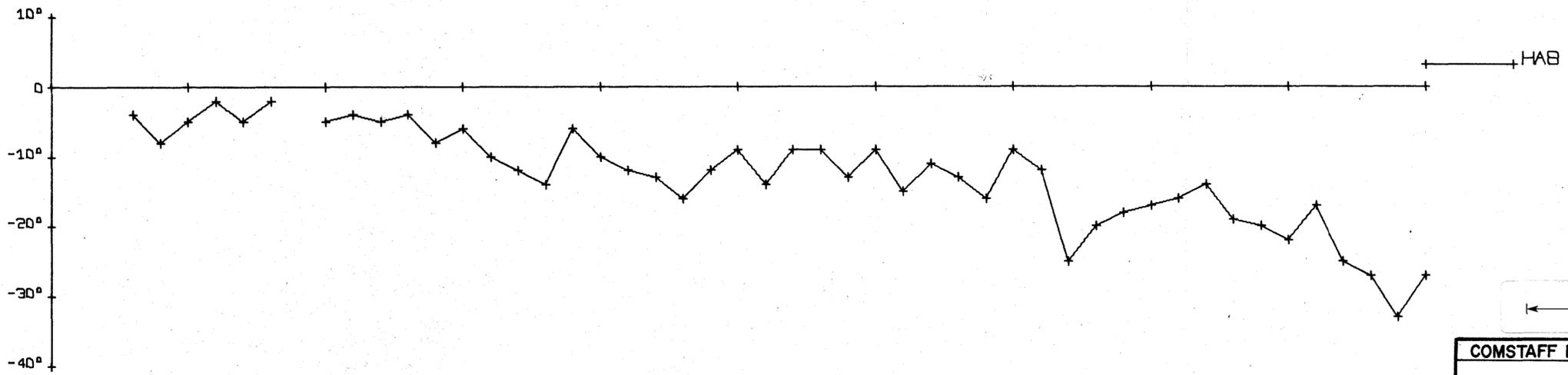
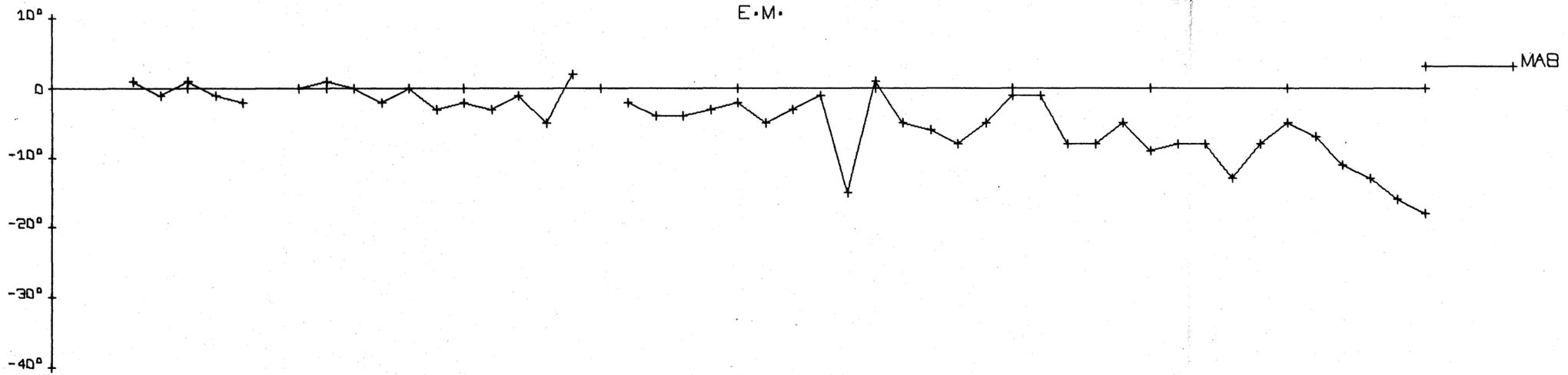


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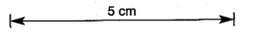
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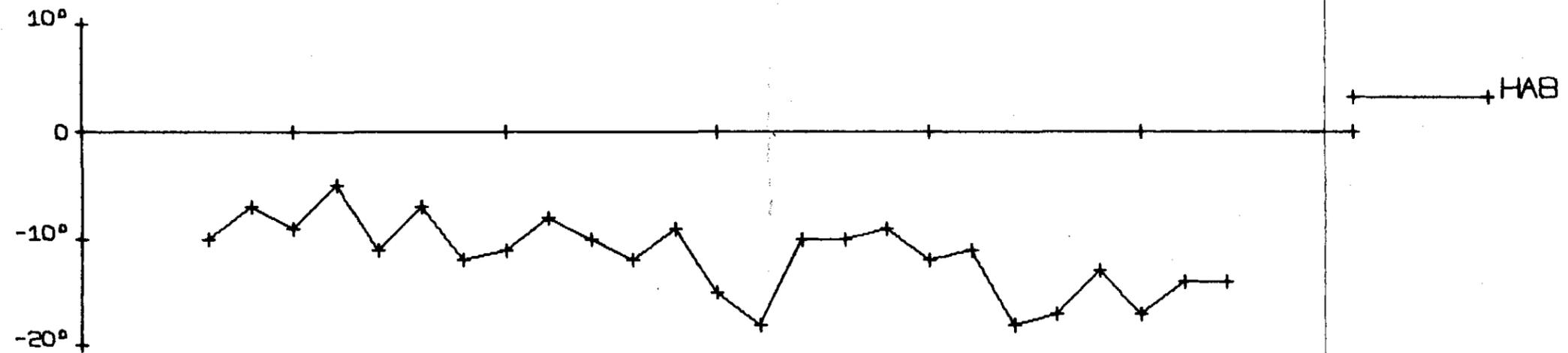
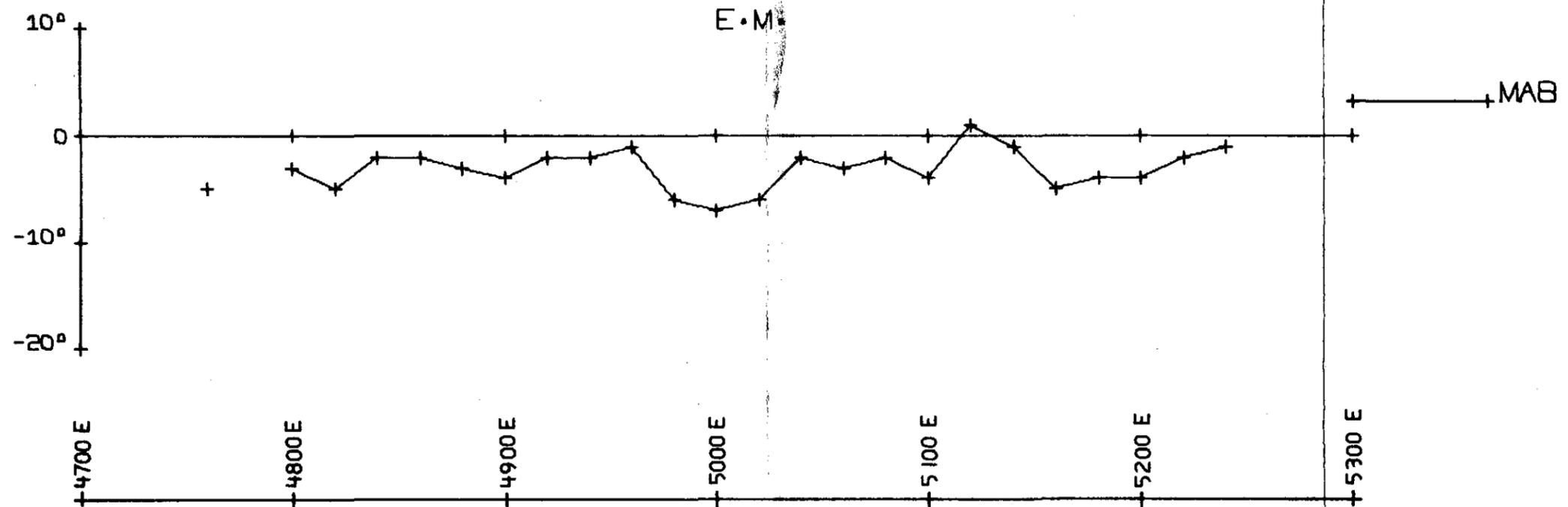


321021



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GAG GRID			
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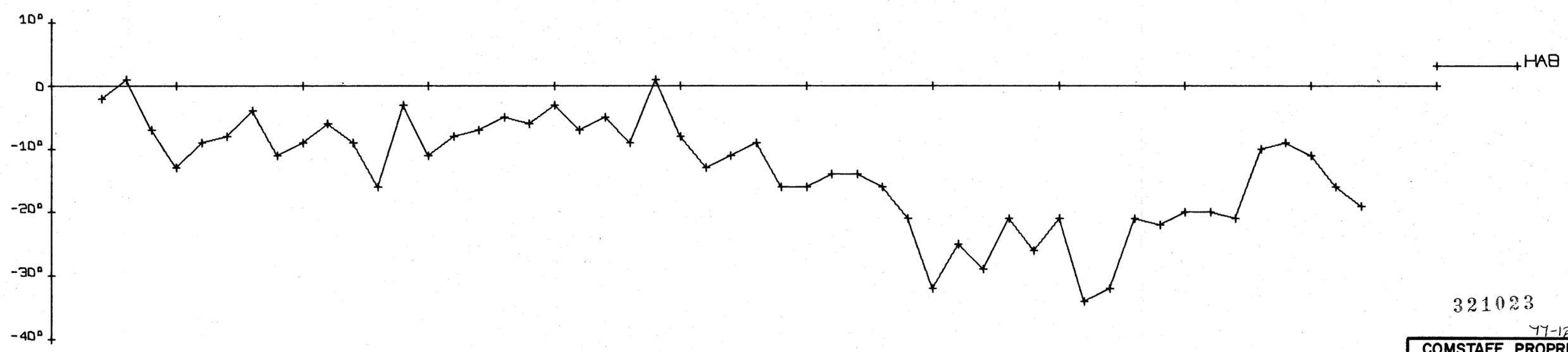
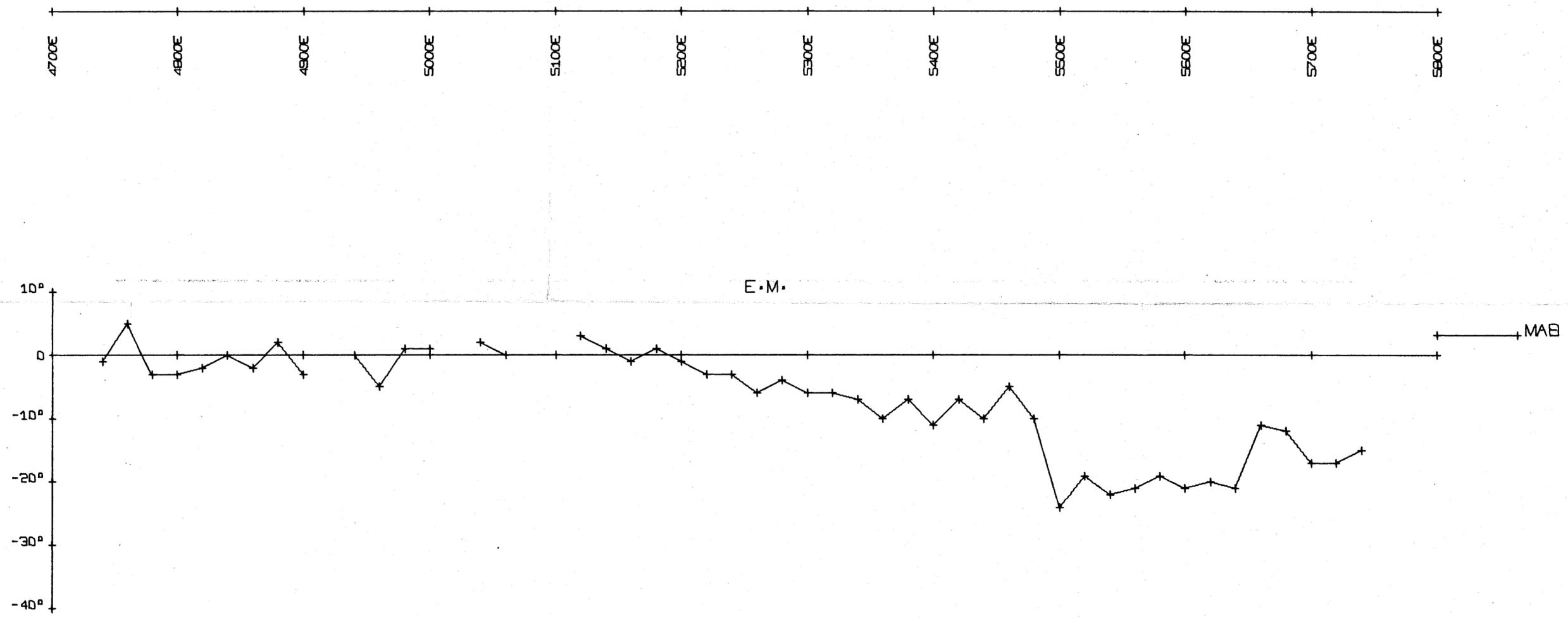
COMSTAFF PROPRIETARY LIMITED

COMSTAFF PROJECT

GAG GRID

CRONE E.M. PROFILE - 4880N

DRAWN GEODRAFT 6/77 COMPILED COMPUTER SCALE 1:2500 TAS/2/899

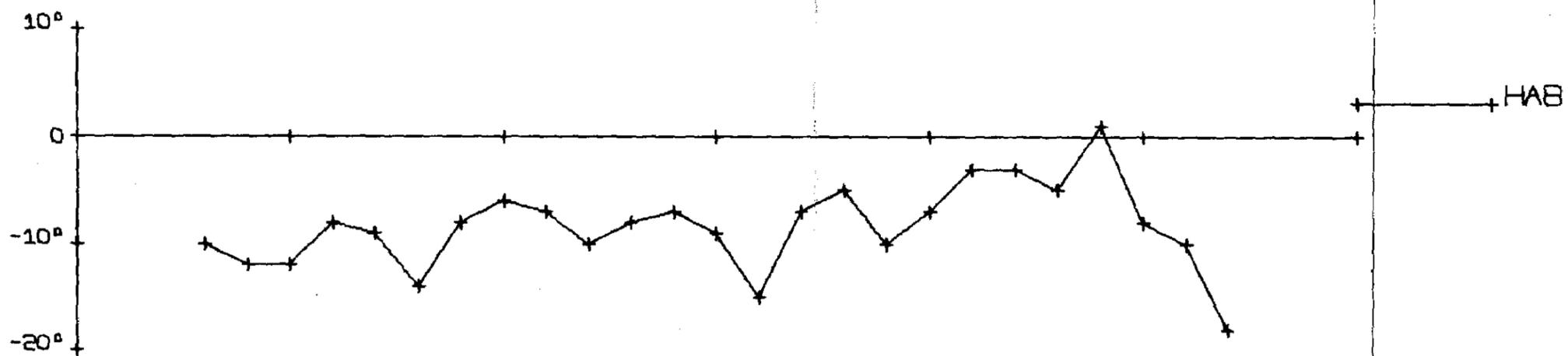
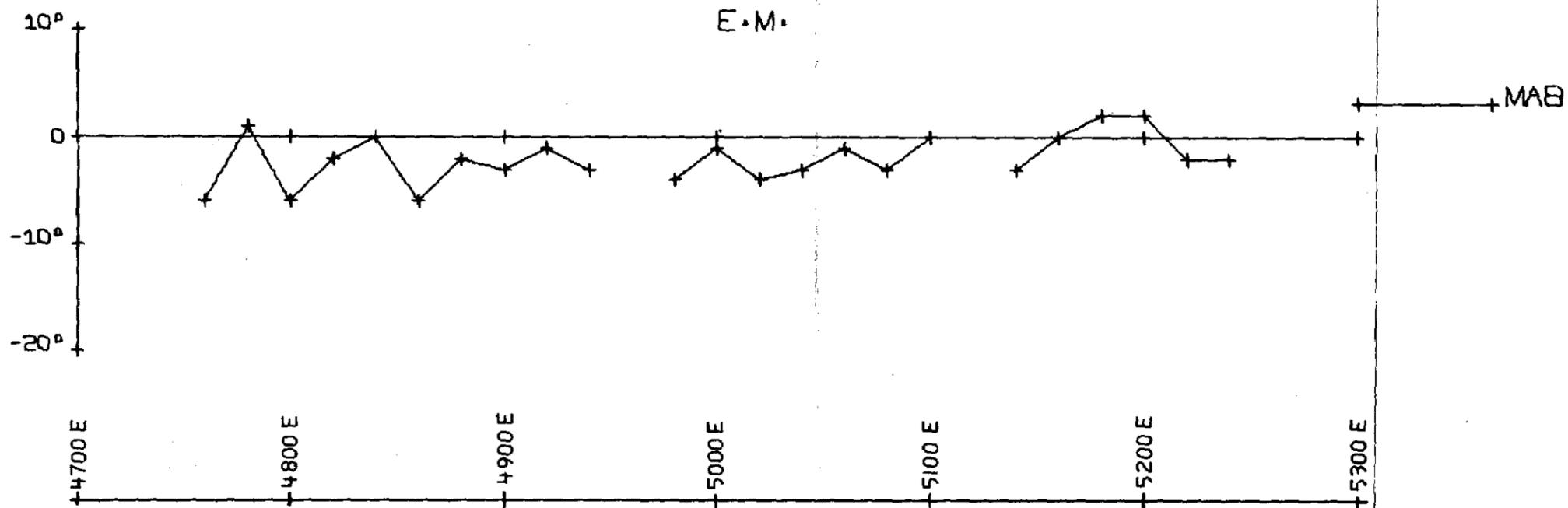


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77-1203 copy 1.

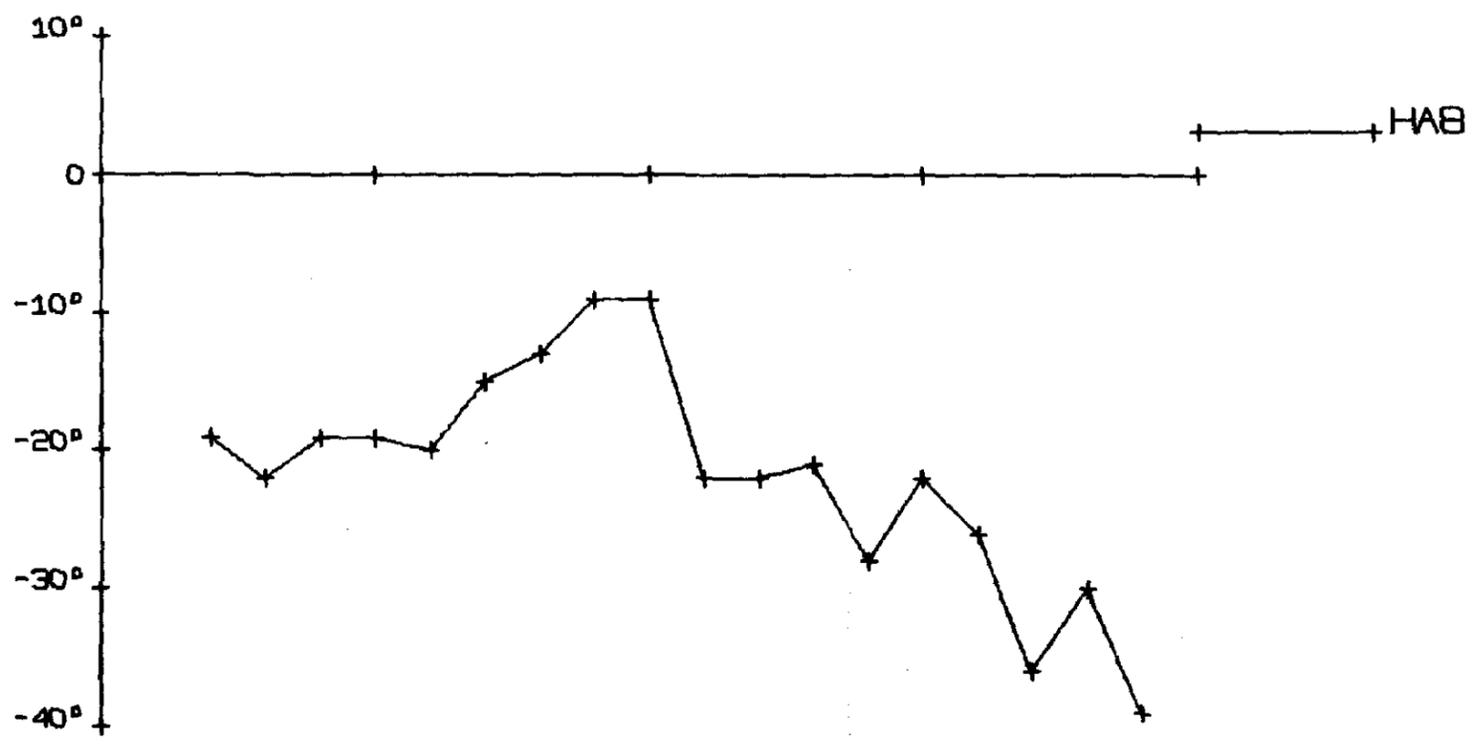
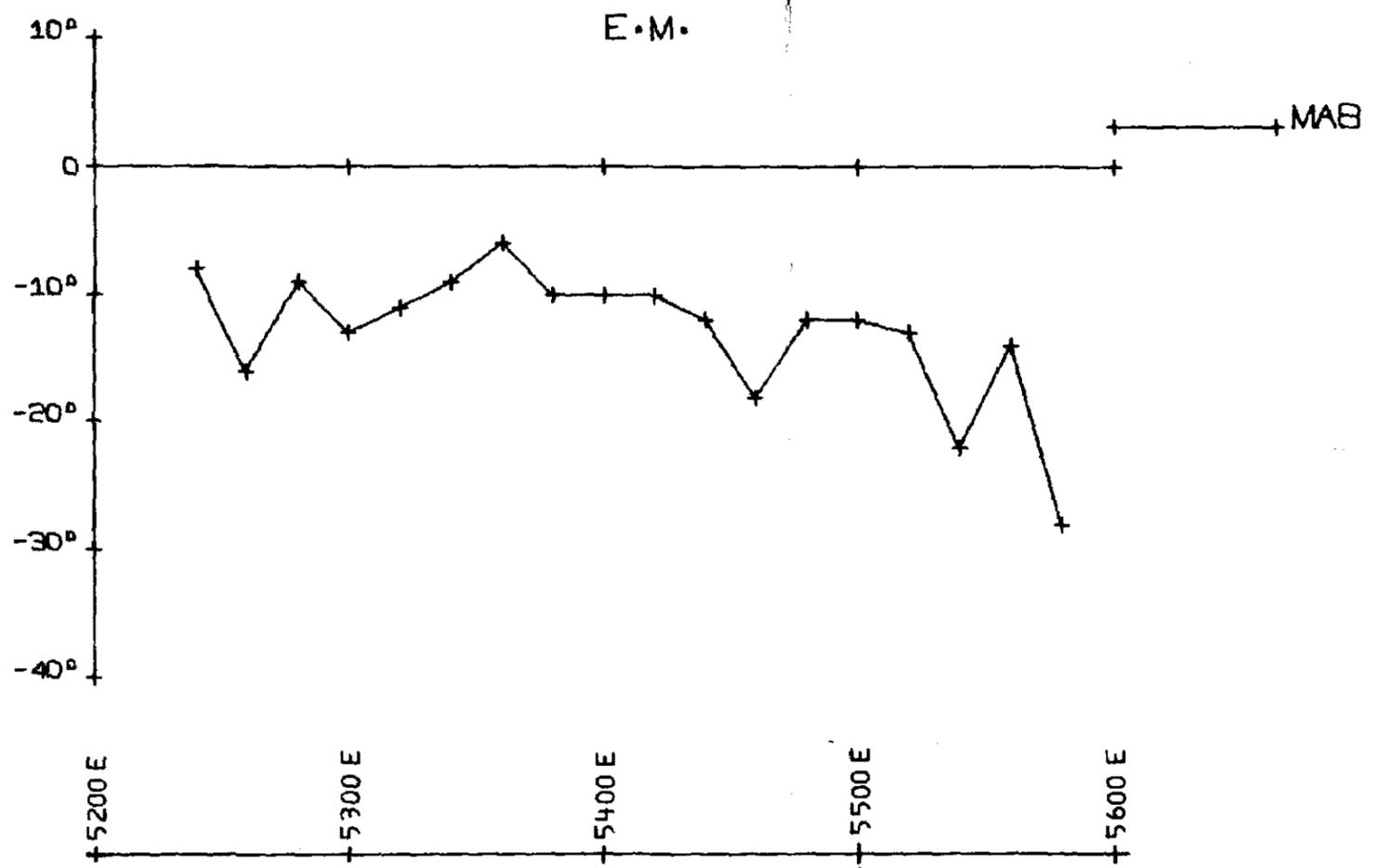
COMSTAFF PROPRIETARY LIMITED			
COMSTAFF PROJECT			
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CRONÉ E.M. PROFILE - 5000 N			
DRAWN GEDDRAFT 6/77	COMPILED COMPUTER	SCALE 1:2500	TAS/2/900





5 cm

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COMSTAFF PROJECT
GAG GRID
CRONE E.M. PROFILE - 5120 N
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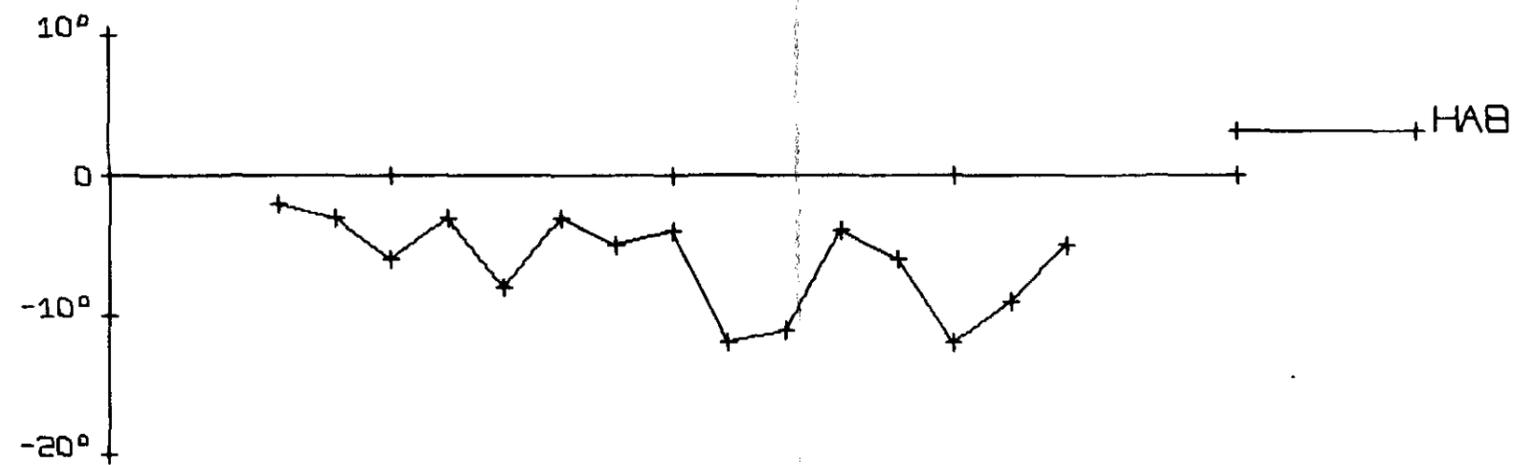
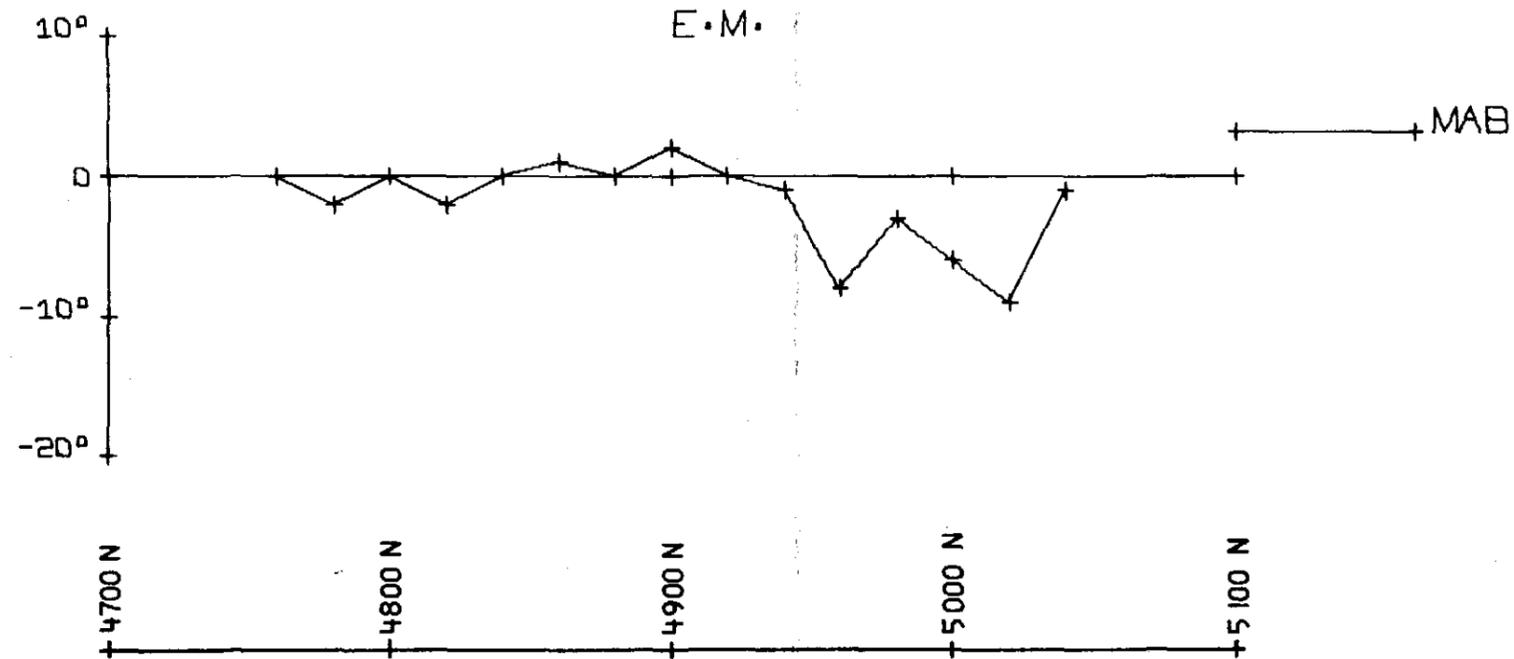


5 cm

COMSTAFF PROPRIETARY LIMITED

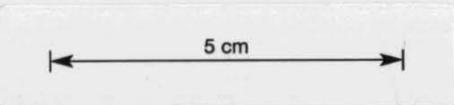
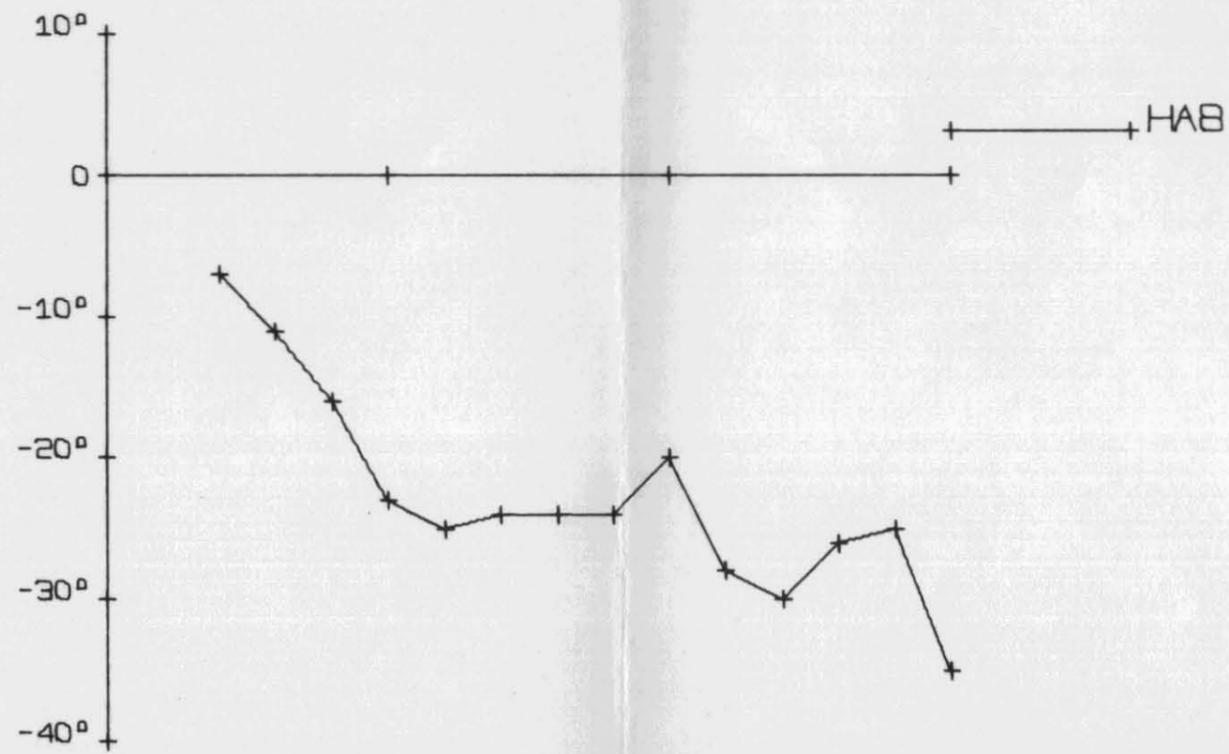
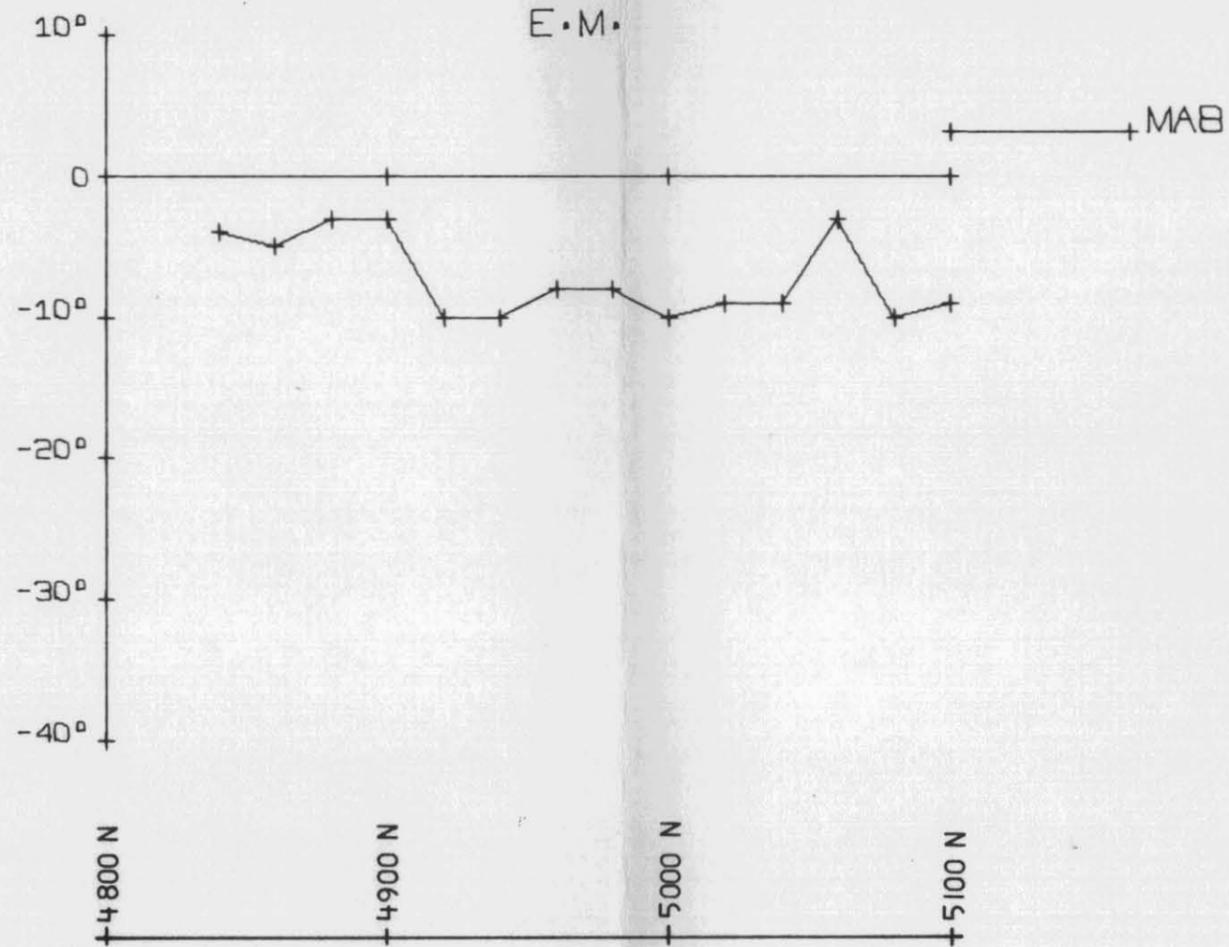
COMSTAFF PROJECT
GAG GRID
CRONE E.M. PROFILE - 5180 N

DRAWN GEODRAFT 6/77	COMPILED COMPUTER	SCALE 1:2500	TAS/2/902
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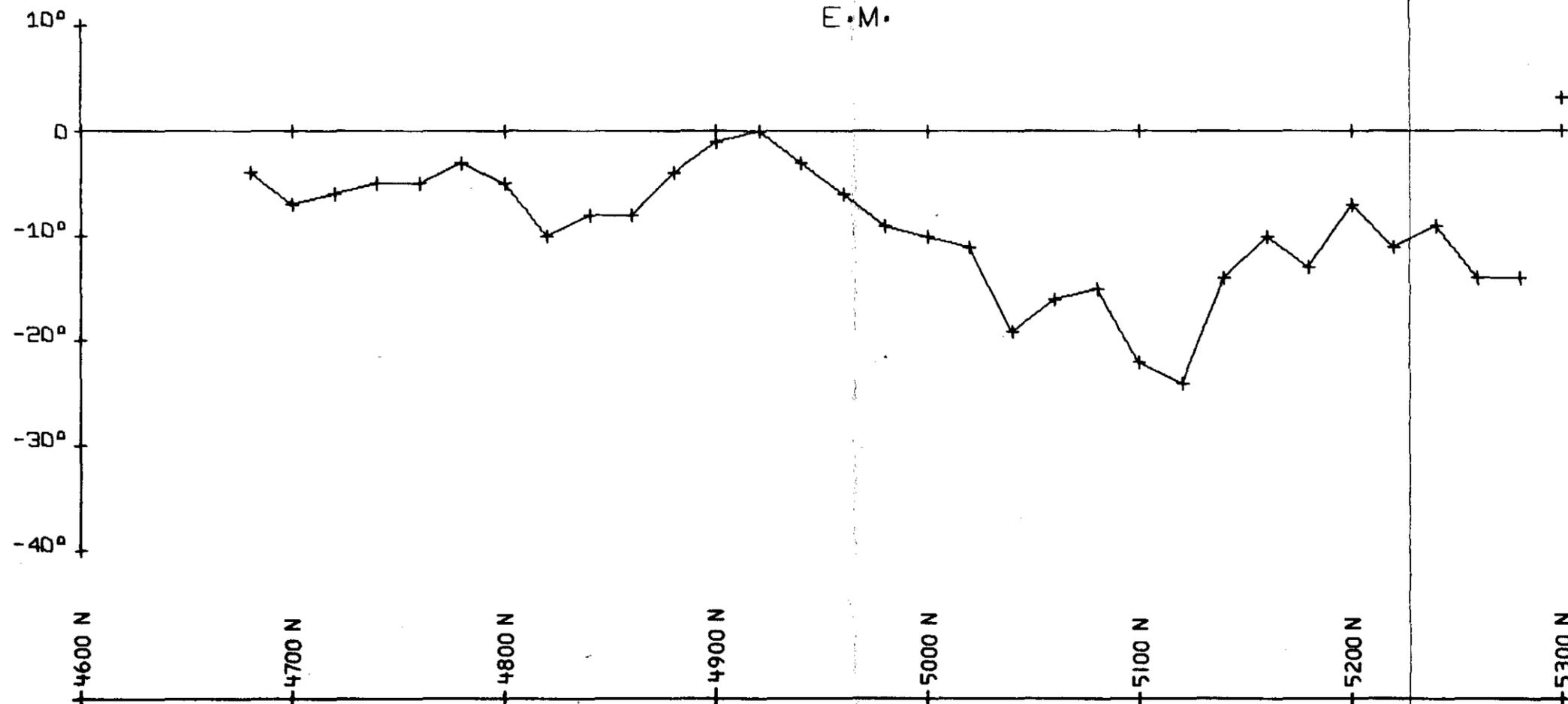
5 cm

COMSTAFF PROPRIETARY LIMITED			
COMSTAFF PROJECT			
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DRAWN GEODRAFT 6/77	COMPILED COMPUTER	SCALE 1:2500	TAS/2/903

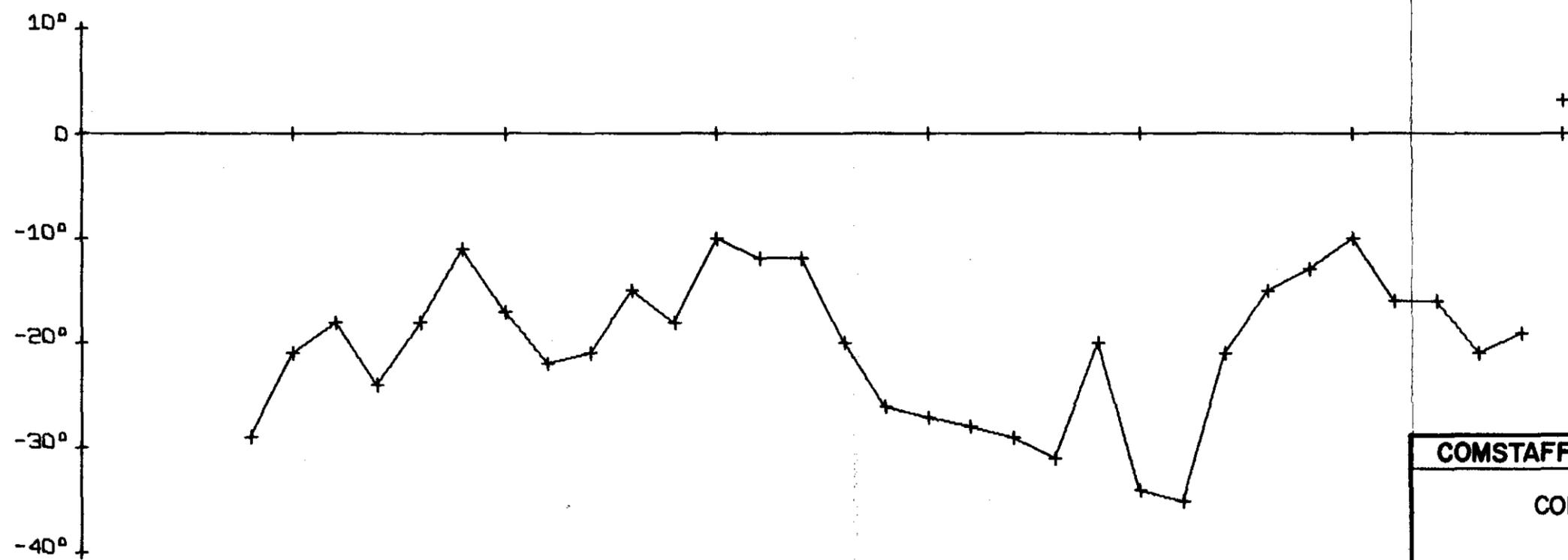


COMSTAFF PROPRIETARY LIMITED
COMSTAFF PROJECT
GAG GRID
CRONE E.M. PROFILE - 5320E
DRAWN GEODRAFT 6/77 COMPILED COMPUTER SCALE 1:2500 TAS/2/904

E.M.



MAB



HAB

5 cm

COMSTAFF PROPRIETARY LIMITED			
COMSTAFF PROJECT			
GAG GRID			
CRONE E.M. PROFILE - 5480 E			
DRAWN GEODRAFT 6/77	COMPILED COMPUTER	SCALE 1 2500	TAS/2/905