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ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

West Coast Mines

Report on the Exploration Work Completed during 1972/73
on EL 2/62 MELBA FLAT LICENCE

by T. J. Lillicrap

August 1973

Report No. 111

669002

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SUMMARY

A detailed geochemical soil survey has confirmed the existence of Pb - Zn - Cu anomalies in the North Melba Flats - Argent Tunnel area. It has been recommended that the anomalous areas be costeanned and bedrock sampled. Diamond drilling should follow if warranted.

A magnetometer survey and mapping to date on the northern part of the licence adjacent to Renison Bell have not revealed the existence of pyrrhotite-cassiterite mineralisation.

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INTRODUCTION

It was recommended in a previous report (No. 109, March 1973) that more work be carried out in the northern part of Melba Flat licence EL 2/62. Four reasons were given:-

(a) A magnetometer survey carried out by consultants in 1967 did not cover the northern 2 square miles, which is adjacent to Renison Bell.

(b) A number of Pb - Zn anomalies outlined by a geochemical soil survey in 1967/68 were never tested.

(c) No detailed geological map of the northern part of the licence has been produced.

(d) The proximity of this part of the licence to Renison Bell makes it an area worthy of further investigation.

These have been the objectives of the work carried out in 1972/73.

The main body of this report is divided into 2 parts:

(a) geochemical survey carried out in the North Melba Flats - Argent Tunnel area.

(b) magnetometer survey and geological mapping in Melba Heights area.

LOCATION : PLATE 1

Work was confined to 2 areas:

(a) a small area approximately 800 feet x 500 feet west and adjacent to the Argent Tunnel.

(b) the Melba Heights or northern area of approximately 2 square miles.

Disused logging tracks provide access into the areas.

GEOLOGY

The stratigraphy in the licence area is tabled below:

AGE	FORMATION	LITHOLOGIES
Cambrian	Crimson Creek	brown, crimson, blue and grey argillites
Proterozoic	Oonah Slates and Shales	black slates and shales
	Oonah Quartzites	white, grey and pale green quartzites

The rocks are folded forming an anticlinorium, with the Renison Bell rocks on the Northern limb and Melba Flats rocks on southern limb. The axes of the folds strike NW-SE Contacts between Oonah quartzites and slates are gradational. The Crimson Creek formation appears to conformably overlie the Oonah formation. The Crimson Creek shales in the Melba Heights area commonly have a limonitic capping. To date this feature has not been found in North Melba Flats area.

Analysis of this gossanous material is shown below:

Pb	Zn	Cu	Ag	Au	Fe
<0.1%	0.1%	<0.01%	<0.1 ozs/ton	Nil	38.6%

It is almost certainly a result of the weathering of the Fe rich Crimson Creek formation.

Geological mapping is continuing.

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MINERALISATION : PLATE 1

Two distinct mineralisation types occur in the area:

(a) Pb - Zn - Ag vein type mineralisation in quartz-sideritegangue. Examples include the Lead Blocks and McKimmie mines within the Melba Flats licence and the Success, Owen Meredith, Bon Accord and the Success Extended in the Crimson Creek - Piemen River area.

(b) Cassiterite-pyrrhotite mineralisation such as Renison Bell.

(a) The Pb - Zn - Ag mineralisation occurs in both the Crimson Creek and Oonah formations. Mineralisation in the North Melba Flats - Argent Tunnel area if present would probably be this type. The geochemical soil survey was planned with this in mind.

(i) Lead Block and McKimmie Mines

The mineralisation at Lead Blocks exists as a number of small PbS-ZnS veins of limited lateral extent. The sulphides are gradually replaced at depth by quartz gangue. The lodes generally strike N-S. They are late Devonian in age and infill pre-existing fractures, predominantly in shales. Some quartz-siderite PbS-ZnS veins have been recorded from diamond drill core in the ultrabasics of the Cuni field. Production has been on a small scale with

2136 tons extracted (at a loss of £13,000)	1911-1914
35 tons extracted	1915-1916

No information has been made available on the McKimmie workings.

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(ii) Poseidon Mine

These workings are located south of Dunkley's Tramway and a steep jeep track now provides access from it. The country rock is Oonah quartzite striking NE and with shallow dips to the south. The lode which strikes at about 330° and dips almost vertical consists of stringers of siderite gangue with minor amounts of PbS infilling shears. A series of trenches exposed the lode. An adit below these exposed only trace mineralisation and it was assumed that the lode did not persist with depth.

(iii) Success and Owen Meredith Mines

These workings occur north of Dunkley's Tramway. Access was by way of a track from the tramway. The country rock is Crimson Creek argillites striking NW and dipping at approximately 60° NE. The workings straddle the Crimson Creek. The lodes consists of quartz and galena with minor siderite, pyrite and chalcopyrite. Antimony minerals were recorded in trace amounts. The strike was around N32°W (magnetic) with dips 50°-60° to the east.

One sample taken from a seam 3"-4" wide on the footwall of the lode was assayed at 19.9% Pb and 265 ozs Ag/ton. A bulk sample from a trench gave the following assay results.

4.1% Pb, 11 ozs 11 dwts Ag/ton, 7 oz Au/ton
The lodes were some of the largest recorded on the area. Only one part of the lode was stoped. A total of 405 tons 13 cwts of ore was produced.

(iv) Bon Accord and Success Extended Mines

Access was via a wooden tramway branching from Dunkley's Tramway

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shortly after the latter crosses the Crimson Creek. The country rock is Crimson Creek argillite. Mining has been by trenches and shallow shafts. A bulk sample recorded 14.8% Pb and 10 ozs 15 dwts Ag/ton. The lodes are the northern extensions of those in the Success and Owen Meredith workings. Excessive groundwater prevented the Bon Accord lodes from being mined at depth.

(b) The cassiterite-pyrrhotite mineralisation is best exemplified by Renison Bell. The stratigraphy both in the mine area and locally are as follows:

AGE	MINE UNITS	LOCAL CORRELATION
Cambrian	Argillite No. 1 Orebody Red Rock No. 2 Orebody	Crimson Creek Argillites
	Renison Bell Shales No. 3 Orebody	Oonah shales and Slates
Proterozoic	Renison Bell Shales	
	Dalcoath Quartzite	Oonah Quartzite

The boundary between the Upper Proterozoic and Cambrian is arbitrarily chosen as the top of the Renison Bell shales. Correlation between mine and field rocks is made only with some difficulty because of acute differences in appearance between the weathered and fresh rocks.

Two lodes types are present:-

(a) conformable lodes replacing carbonate beds.

(b) vein type lodes infilling faults and fractures.

NORTH MELBA FLATS - ARGENT TUNNEL AREA GEOCHEMICAL SURVEY:

PLATES 2 AND 3

In 1967-68 a geochemical soil survey was carried out over northern part of Melba Flat EL 2/62. Lines were spaced 500 feet apart with sampling at 100 feet intervals. In each case the "C" horizon was sampled. Eight significant Pb-Zn anomalies and one Cu anomaly were outlined. It was recommended that the geochemical anomalies be followed up by an R.E.M. survey. Results pointed to a number of probable and possible but no definite anomalies.

It was decided in late 1972 that further more detailed work was warranted in these anomalous areas. Subsequently the area 13S-15S, OOW-500W was chosen and 8 lines each 500 feet long cut at 100 feet spacings. "C" horizon soil samples were taken at 25 feet intervals and analysed for Cu, Pb, and Zn. Results indicate that the elements Pb and Zn would be the most useful for outlining future targets.

Anomalous results were separated from background results using Cumulative Frequency plots. This method, outlined by Wilding, Sampey and Erickson (1970) is appendixed. Plots and calculations are also appendixed and indicate that:

background values	Pb	$<$	3500	ppm
	Zn	$<$	500	ppm
	Cu	$<$	120	ppm

anomalous values	Pb $>$ 3500 ppm, 13% of all values
	Zn $>$ 500 ppm, 20% of all values
	Cu $>$ 120 ppm, 7% of all values

Plate 3 is a contour plan of the results. Five significantly anomalous areas have been outlined on basis of Pb and Zn results. Four of the five anomalies can be traced between lines. The fifth can be traced along the line. Cu values are not traceable between lines. The rocks (Crimson Creek shales) in the area contain large amounts of Mn along cleavage planes and fractures. This may explain some of the very high Pb and Zn values obtained. Each of the anomalous areas is discussed below:

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(1) Lines L & M; O-100W

Six amonalous Pb-Zn values are present ranging between 3900 ppm and 4800 ppm Pb and between 560 ppm and 1875 ppm Zn. One anomalous value of 265 ppm Cu is also present. This amomaly trends N-S.

(2) Lines M, L & K; 125W-200W

Only three anomalous Pb values are present ranging between 3600 ppm and 8500 ppm. The Zn anomalies are more scattered with values between 535 ppm and 705 ppm. Two anomalous Cu values each 150 ppm are also present. Poor correlation exists between Cu, Pb and Zn values.

(3) Lines J & I; 275W-400W

Pb values are significantly higher in this case with one value of 10,500 ppm. Correlation between lines for the Pb values is poor. Better correlation is obtained with Zn with anomalous values traceable between 4 lines, K, J, I and H. Cu values give a similar pattern to those of Zn.

(4) Lines L, K, J & I; 450W-500W

This is by far the most promising anomaly. Both Pb and Zn values give excellent correlation between 4 lines. One anomalous Cu value of 340 ppm is also present. This anomaly occurs at the end of the cut lines and hence the western limit not reached. The costeans will be extended further westward than 500W to completely cover the anomaly.

The higher mobility of Zn is obvious from the greater dispersion of values on the contour plan.

MELBA HEIGHTS MAGNETOMETER SURVEY: PLATES 4, 5, 6, 7

In 1965 a magnetic survey on the northern portion of EL 2/62 to locate any Renison Bell type mineralisation outlined two significant anomalies designated "A" and "B". A quantitative examination by Webster (1967) showed that both anomalies did not resemble in shape intensity, and extent those of Renison Bell or the Cuni field.

Subsequently a diamond drill hole M.F.P. 124 was sited at 5600W near line 2S to test anomaly "A" and intersect it at the point of maximum intensity. No recognizable magnetic source was intersected. However the rocks were extremely weathered to a depth of 200 feet and it was felt that no confident assessment of the rocks could be made. A second hole M.F.P. 125 was drilled to intersect fresh rocks at greater depth but no magnetic source was intersected.

A geochemical soil sampling survey followed, during which it was realised that the cut lines in many cases were misnumbered and off grid bearings. It was decided that a reassessment of the magnetic anomalies outlined in 1965 was needed.

In June 1969 further magnetometer readings were taken at 20 feet intervals over the anomalous portions of lines 1S and 2S. Allowing for a displacement of the pegs of 100 feet to the west on line 1S relative to those on line 2S it was found that magnetic profiles and contours planes compared favourably with those outlined earlier. These along with drill hole cross sections showed that M.F.P. 124 should have passed through the top of the magnetic source while M.F.P. 125 should have intersected it between 165 feet and 212 feet. The core was tested with a magnetometer and that giving the greater magnetic effect was sent to Amdel for petrographic and mineragraphic examinations and for magnetic susceptibility tests. It was found that the tuffacious sandstone units contained up to 12% magnetite accounting for the higher than normal magnetic susceptibility.

It was concluded that the magnetic source, anomaly "A" was of no economic value. Because of the similarities between anomaly "A" and anomaly "B" it was assumed that both were due to the same phenomenon and that further investigation of anomaly "B" was not necessary.

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The aim of the 1973 survey was again to locate, if present, any repetition of the Renison Bell pyrrhotite-cassiterite mineralisation on the licence. For this purpose approximately 58,000 feet of lines on the northern part of the licence were recut. No anomalies were recorded with results varying only between 440 gammas and 530 gammas. The instrument was standardised on 500 gammas at the same station at the start of each traverse. Diurnal corrections were made at the completion of each traverse. The survey was not completed because of the demand on the instrument by the mainland exploration department. There remains approximately 6000 feet of lines to be covered. However because of the lack of encouraging results in the area covered, it is felt that completion of the survey at a future date is not warranted.

The western side of line 1S was traversed to test the anomalous areas outlined in 1965. No anomalous values were recorded. Also anomaly "A" could not be reproduced on the western side of line OON.

DISCUSSIONS AND RECOMMENDATIONS

(a) North Melba Flats - Argent Tunnel Area

The poor correlation of the anomalous geochemical values between lines in all but one case (lines L,K.J. & I; 450W-500W) renders the results less encouraging than would be hoped. However known mineralisation in the area is of limited lateral extent and discontinuous.

It is recommended that the anomalous areas be costeanned in order to expose the source of the high metal values. The locally rugged topography, high rainfall and thick vegetation necessitates the use of a medium to large bulldozer. This should be followed by sampling and analysis of bed rock for base metals. At this stage it would be advisable to extend bulldozing westward, in particular along line 14S to test the next anomaly outlined in 1968. If mineralisation is uncovered in either cases a diamond drill programme should be planned and commenced.

Unfortunately these areas are adjacent to a Scenic Reserve and by law, damage to fauna or flora is forbidden. The reserve extends for 5 chains either side of the Murchison Highway. This has placed some restrictions upon access tracks into the area but generally speaking should not cause any real difficulties if bulldozing is adequately supervised.

Six anomalous areas remain to be tested. The most promising appears to be that extending from line 11S to 6S, 0-1400W. To test this area lines should be cut at 100 feet spacings and samples taken at 25 feet intervals.

(b) Melba Heights

Magnetometer results were very discouraging. No follow up work is envisaged.

From all available records it appears that lines 8N and 10N have not been soil sampled. It is recommended that a geochemical soil survey be carried out over these lines and samples analysed for Pb, Zn, Cu and Sn. However before this work commences the cross-over line between these lines on their western end should be recut. It is expected that not more than 3000' (30 samples) of sampling could be achieved in one day. Both lines total approximately 18,000'.

APPENDIX

Wilding, I., Sampey, D., and Erickson, M., 1970 Use of Cumulative Frequency Plots to Facilitate Interpretation of Geochemical Data

Calculations of Geochemical Results

Log-Probability Plot of Cumulative Frequency for Cu, Pb and Zn

Budget Requirements 1973/74

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USE OF CUMULATIVE FREQUENCY PLOTS
TO FACILITATE INTERPRETATION OF GEOCHEMICAL DATA

by

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M.J. Erickson **

A contribution to the Second Seminar on Geochemical Prospecting Methods and Techniques.

10th to 24th September, 1970. - Peradeniya, Ceylon.

Abstract

This paper explains how the authors use cumulative frequency plots to facilitate data handling, interpretation of results and planning follow up in geochemical work carried out as part of mineral exploration programmes. No discussion on whether or not geochemical data are distributed lognormally is included, but from experience the view that the majority of geochemical data are distributed lognormally is supported. Emphasis is placed on the practical value of cumulative frequency plots and an example is discussed. Instructions for preparing cumulative frequency plots are included as an appendix.

* Geologist/Geochemist
** Mathematician

Introduction

On completion of the collection and analytical phases of a geochemical sampling programme, the geochemist is confronted with a set of data from, usually, a very large number of samples each of which will have been analysed for a number of elements. If the data are the results of the analysis of stream sediment samples they may be required to be plotted as plans of individual results for contouring or trend surface analysis. Alternatively, for each element, symbols signifying class intervals may be drawn on maps of the area as "spot" or "worm" maps. Whatever the method of presentation of results a contour or class interval has to be selected. This may be done arbitrarily or by inspection of the results. However, the maps would be all the more meaningful if the contour or class interval has a fundamental relationship to the statistical parameters of the data set, e.g. background threshold, twice threshold, four times threshold, etc., or at levels separating the different populations of a polymodal data set. If the data are the results of the analysis of soil samples they may be required to be plotted as contoured plans or plan (line) profiles. Here again a contour interval or base level may have to be selected. It would surely be of optimum significance if the contour interval or base level selected had a meaningful relationship to the statistical distribution of the data.

The authors believe that it is best to learn something about the parameters of the data set before commencing plotting in true plan position, and suggest that a convenient, practical and economical way of doing this is to start the interpretation by preparing cumulative frequency plots.

The method of preparation of cumulative frequency plots.

Cumulative frequency plots can be speedily prepared either manually or by the use of a computer. Included as an appendix are instructions for the manual preparation of plots of this type, together with an example. It took 75 minutes to prepare this plot manually. Using an IBM 1130 computer, coupled to a Calcomp plotter, the plot was prepared in 6 minutes from data on punched cards (punching time 25 minutes). Manifestly, the greater the number of samples and, in particular, the greater the number of elements determined on each sample the greater is the advantage of the computerised procedure over the manual procedure.

To prepare cumulative frequency plots no sophisticated equipment is essential and they can be prepared in the field by relatively untrained personnel, although their preparation is, as explained above, greatly facilitated by the use of a computer.

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Practical application of cumulative frequency plots

For a given set of samples, cumulative frequency plots are prepared for each element and then examined either individually or collectively. One plot (for a single element) shows at a glance the range of values in the set, the number of populations making up the set, and it gives an idea of the relative means and standard deviations of each population.

It is possible to separate out the individual populations in the manner described by Williams, 1967. However, to do this, more rigorous and time consuming mathematical treatment is required and in most situations encountered by the exploration geochemist this is not justified since a subjective examination of the cumulative frequency plots shows the salient features of the data set. The slopes of the plots and the points of inflection provide sufficiently close approximations of the standard deviations and population limits for most practical purposes. The recently published principle of an "atlas of nomograms" proposed by Bölviken (1970) should be of considerable value in practice.

One advantage of using the cumulative frequency plot that should be emphasized is that all parameters of the data set are displayed simultaneously, and far more readily seen than by scanning and computing from the actual data themselves. Figure 6 (in the appendix) shows a set of data in the range 10 to 1300 ppm comprising two populations, the first having a geometric mean of 80 ppm and the second having a geometric mean of 500 ppm. The first population makes up 75.5% of the total.

By laying out the cumulative frequency plots for each element analysed in a programme from a given area one above the other, it is possible to compare and contrast the behaviour of all the elements within the suite of samples without recourse to more sophisticated techniques, e.g. factorial analysis (for which a computer is essential).

Example

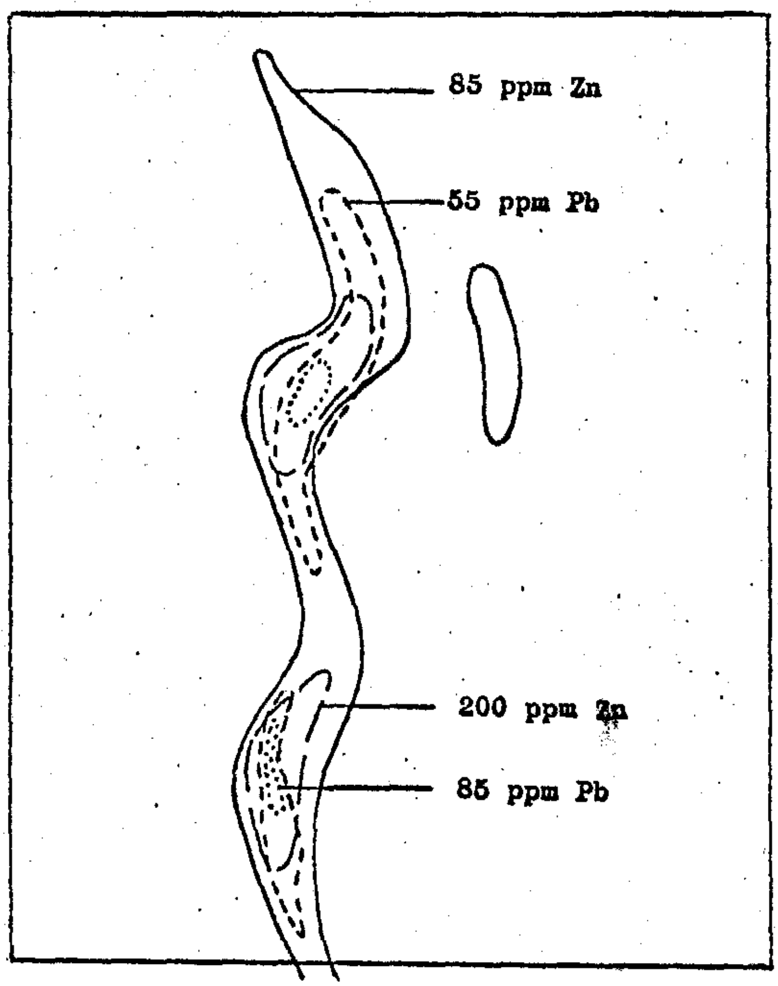
Figures 1 - 3 inclusive are cumulative frequency plots of the nickel, lead and zinc contents of 2,678 soil samples collected from a 1600' x 100' grid covering an area of about 10 square miles. The patterns of the plots for lead and zinc are very similar but differ from that for nickel. It may be inferred from this observation that the lead and zinc distribution patterns on the ground will be similar but that the nickel distribution pattern will be different.

In order to keep this paper as concise as possible no further discussion of the nickel data is included. However, it is interesting to note that the two points of inflection on the lead plot occur at higher percentiles than do the equivalent two points of inflection in the zinc plot. This may be taken to reflect a difference in mobility between lead and zinc which is consistent with the known geochemical behaviour of these two elements.

Attention is drawn to the fact that there appear to be three populations for both lead and zinc in this area. A possible interpretation of the zinc plot is that the largest population, i.e. in the range 10 to 85 ppm and comprising 91% of all values, reflects rock type A, and that the second population (85 to 200 ppm, 8.3%) reflects rock type B in which the tenor of zinc is higher than in A. The third population (>200 ppm, 0.7%, i.e. 19 results) perhaps represents unusually large concentrations of zinc within rock type A or B i.e. an anomalous population. The most significant contours for zinc in this area should, thus, be 85 and 200 ppm. Similarly for lead the most significant contours should be 55 and 85 ppm (Fig. 2). A contoured plan of these values is shown as Figure 4.

<u>Figure 4</u>

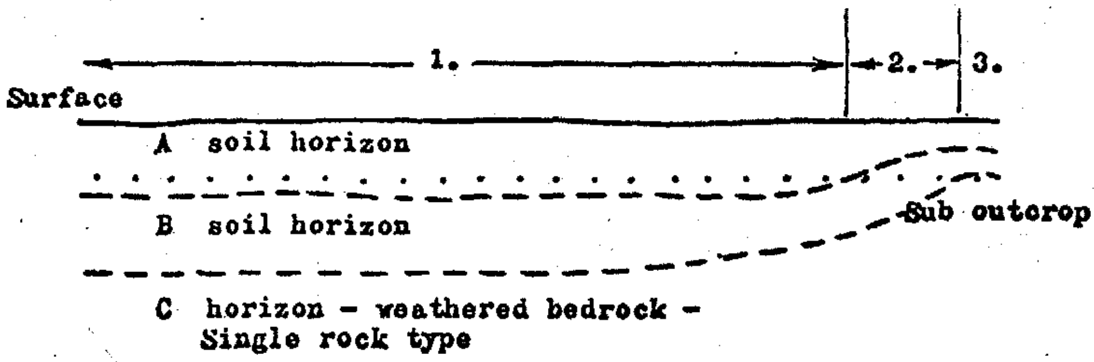
<u>Simplified geochemical contours for lead and zinc in area from which the example discussed in the text is taken.</u>



Of course not all populations will neatly distinguish between background and anomalous populations or between rock units of different geochemical characteristics. They could merely indicate that the sampling is bad. For example, an alternative explanation of Figure 3 is illustrated diagrammatically in Figure 5.

Figure 5

Diagrammatic representation of alternative interpretation of Figure 3.



• = Sample sites at constant depth (9in.) below surface

1. Range 10 to 85 ppm Zn, 91.0% of all samples in A horizon.
2. Range 85 to 200 ppm Zn, 8.3% of all samples in B horizon.
3. Range > 200 ppm Zn, 0.7% of all samples in C horizon.

In this case the geologists' attention is focused on a part of the area where only shallow excavations might be required to obtain geological information. Such information could be very useful, especially in areas devoid of outcrop.

CONCLUSIONS

It is concluded that the cumulative frequency plot is a simple, inexpensive tool that can be used to advantage in deciding how to present geochemical results, in initiating interpretation of geochemical data and planning follow up work.

References

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2. Bölviken, B. 1970 A Statistical Approach to the problem of Interpretation in Geochemical Prospecting. Third International Geochemical Exploration Symposium, Toronto, Canada, April.

3. Williams, X.K. 1967 Statistics in the Interpretation of Geochemical Data. N.Z. Jour. Geol. and Geophysics, Vol. 10, No. 3.

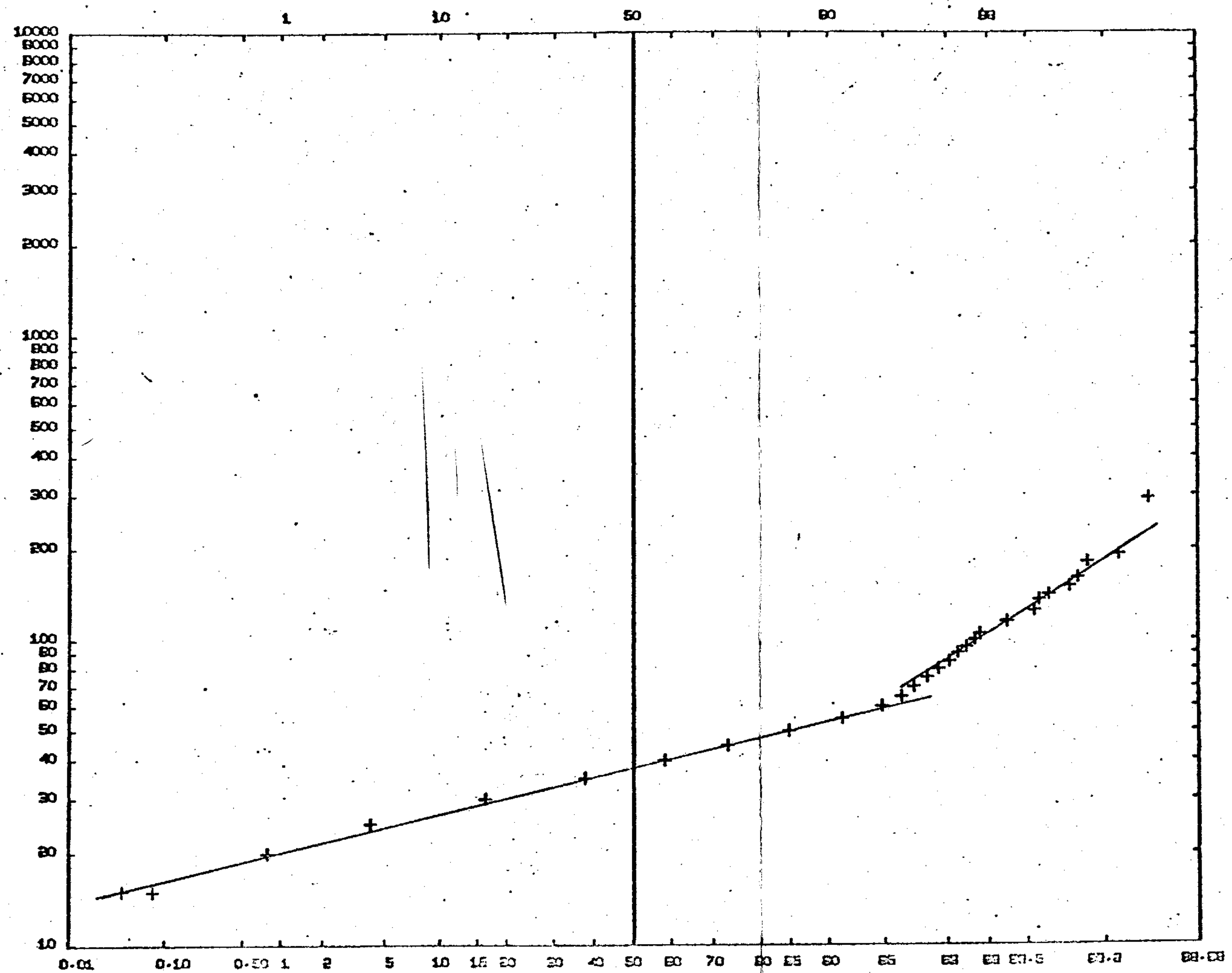

FIGURE 1.

LOG-PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR NICKEL

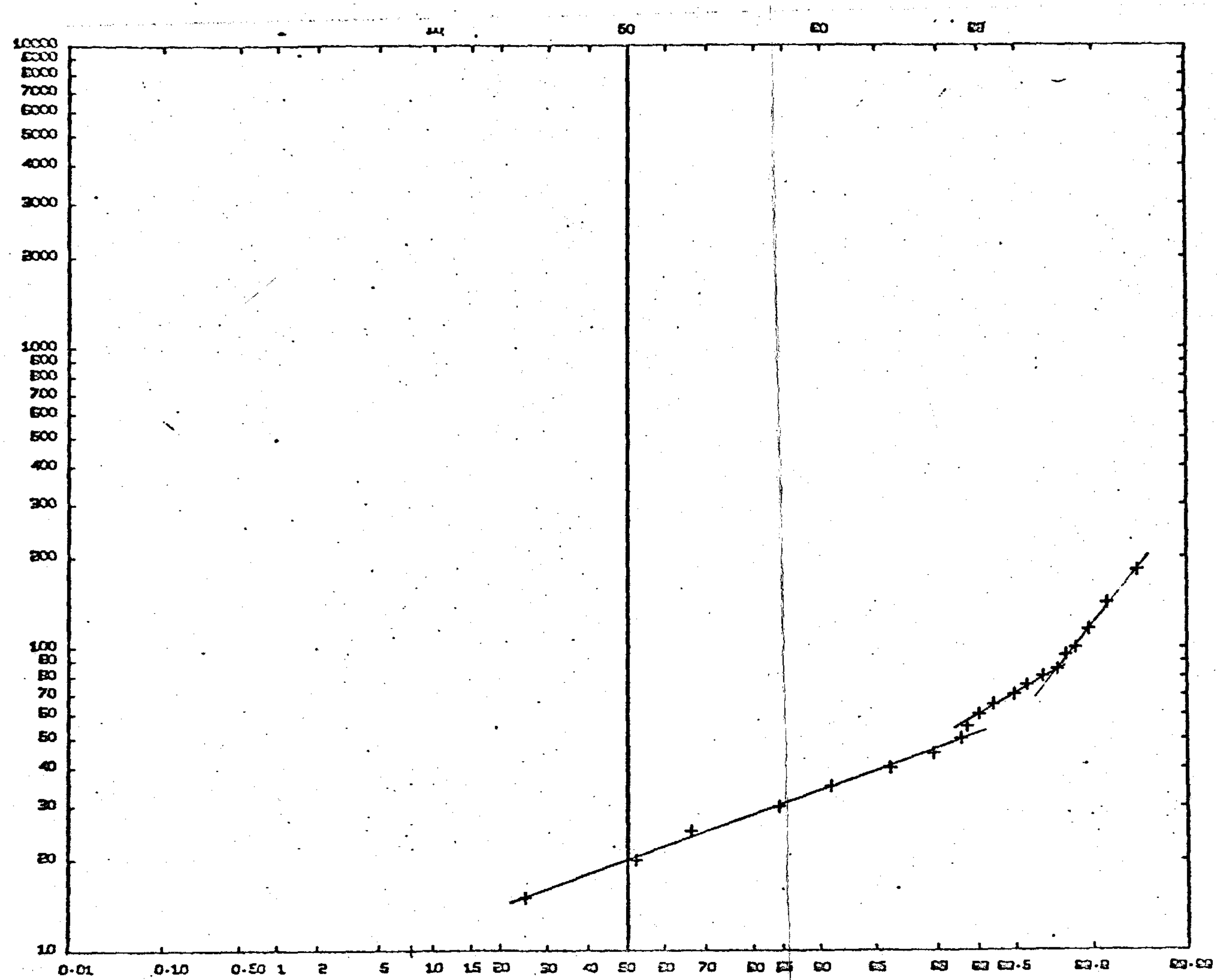

FIGURE 2.

LOG-PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR LEAD

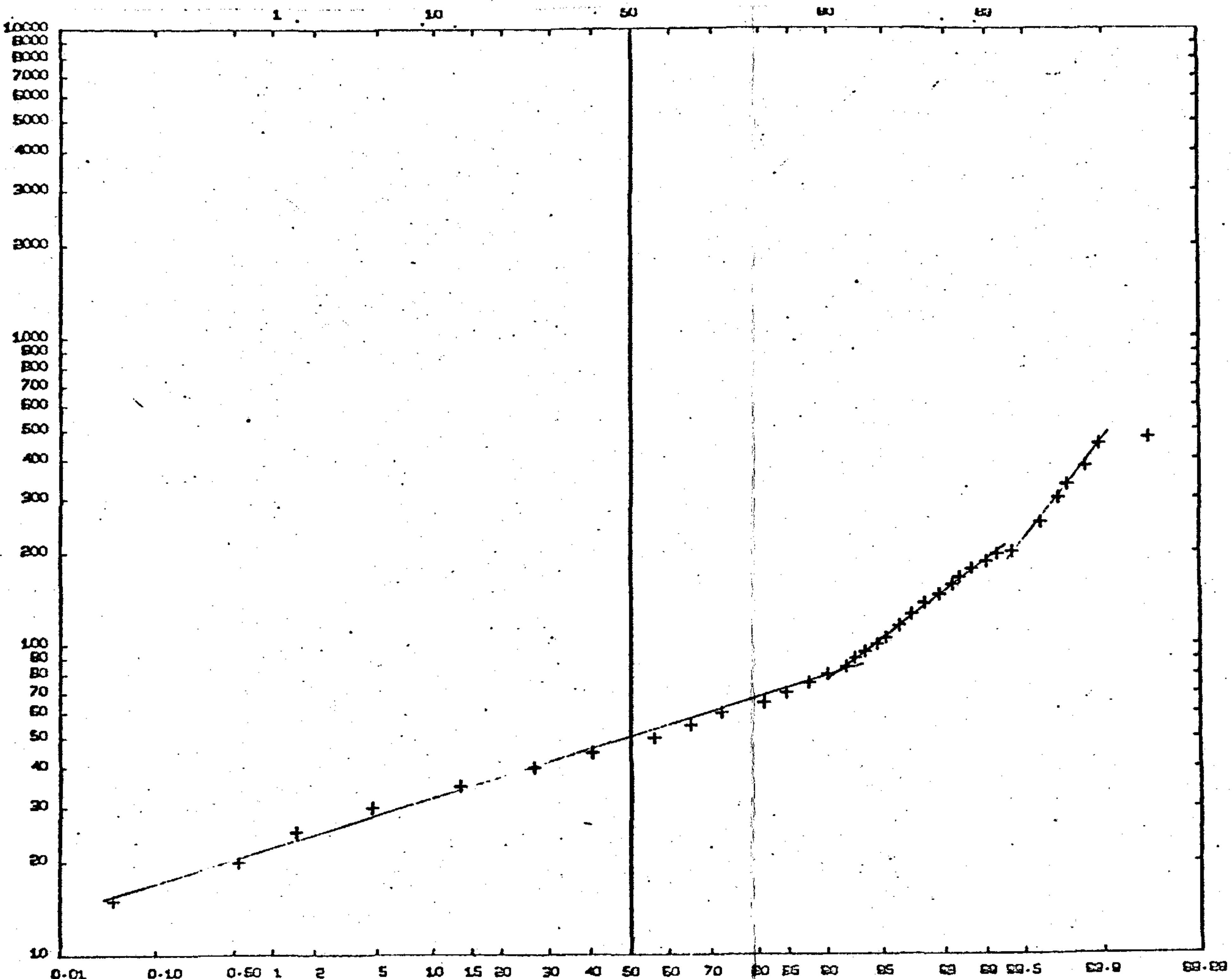

FIGURE 3.

LOG-PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR ZINC

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EXAMPLE OF MANUAL PREPARATION OF A CUMULATIVE FREQUENCY PLOT

CLASS INTERVAL Lower Upper Limit Limit	COUNT	TOTAL	CUMULATIVE TOTAL at upper limit of class interval	CUMULATIVE at upper li of class interval
0 - 10		0	0	
11 - 20	1	1	1	0.4
21 - 30	~~1111~~ 111	8	9	3.4
31 - 40	~~1111~~ 1111	9	18	6.8
41 - 50	~~1111~~ ~~1111~~ ~~1111~~ 111	18	36	13.6
51 - 60	~~1111~~ ~~1111~~ ~~1111~~ ~~1111~~ 111	23	59	22.3
61 - 70	~~1111~~ ~~1111~~ ~~1111~~ 111	18	77	29.1
71 - 80	~~1111~~ ~~1111~~ ~~1111~~ ~~1111~~ 11	22	99	37.4
81 - 90	~~1111~~ ~~1111~~ ~~1111~~ 11	17	116	43.8
91 - 100	~~1111~~ ~~1111~~ ~~1111~~ 1111	19	135	50.9
101 - 120	~~1111~~ ~~1111~~ ~~1111~~ ~~1111~~ 1111	24	159	60.0
121 - 140	~~1111~~ ~~1111~~ ~~1111~~ 1	16	175	66.0
141 - 160	~~1111~~ ~~1111~~ 11	12	187	70.6
161 - 180	~~1111~~ ~~1111~~	10	197	74.3
181 - 200	1111	4	201	75.8
201 - 250	~~1111~~ 1	6	207	78.1
251 - 300	~~1111~~ 1	6	213	80.4
301 - 350	~~1111~~ 111	8	221	83.4
351 - 400	111	3	224	84.5
401 - 450	11	2	226	85.3
451 - 500	1111	4	230	86.8
501 - 550	111	3	233	87.9
551 - 600	~~1111~~ 1	6	239	90.2
601 - 650	11	2	241	90.9
651 - 700	11	2	243	91.7
701 - 750	111	3	246	92.8
751 - 800	1111	4	250	94.3
801 - 850	111	3	253	95.5
851 - 900	11	2	255	96.2
901 - 950	111	3	258	97.4
951 - 1000		0	258	97.4
1001 - 1050	1	1	259	97.7
1051 - 1100	111	3	262	98.9
1101 - 1150		0	262	98.9
1151 - 1200	11	2	264	99.6
1201 - 1250		0	264	99.6
1251 - 1300	1	1	265	100
		265		

For instructions, see ov rle

APPENDIX

INSTRUCTIONS FOR PREPARING A CUMULATIVE FREQUENCY PLOT OF GEOCHEMICAL DATA

1. Divide the data into approximately forty convenient classes. As the majority of geochemical data appear to lognormally distributed or at least positively skewed (Ahrens 1954), there is a greater proportion of data in the lower concentration ranges. For this reason it is practical to choose class intervals of increasing width, for example intervals of 10 ppm in the range 0 to 100, 20 ppm from 100 to 200 and 50 ppm above 200 (e.g. Example Column 1).

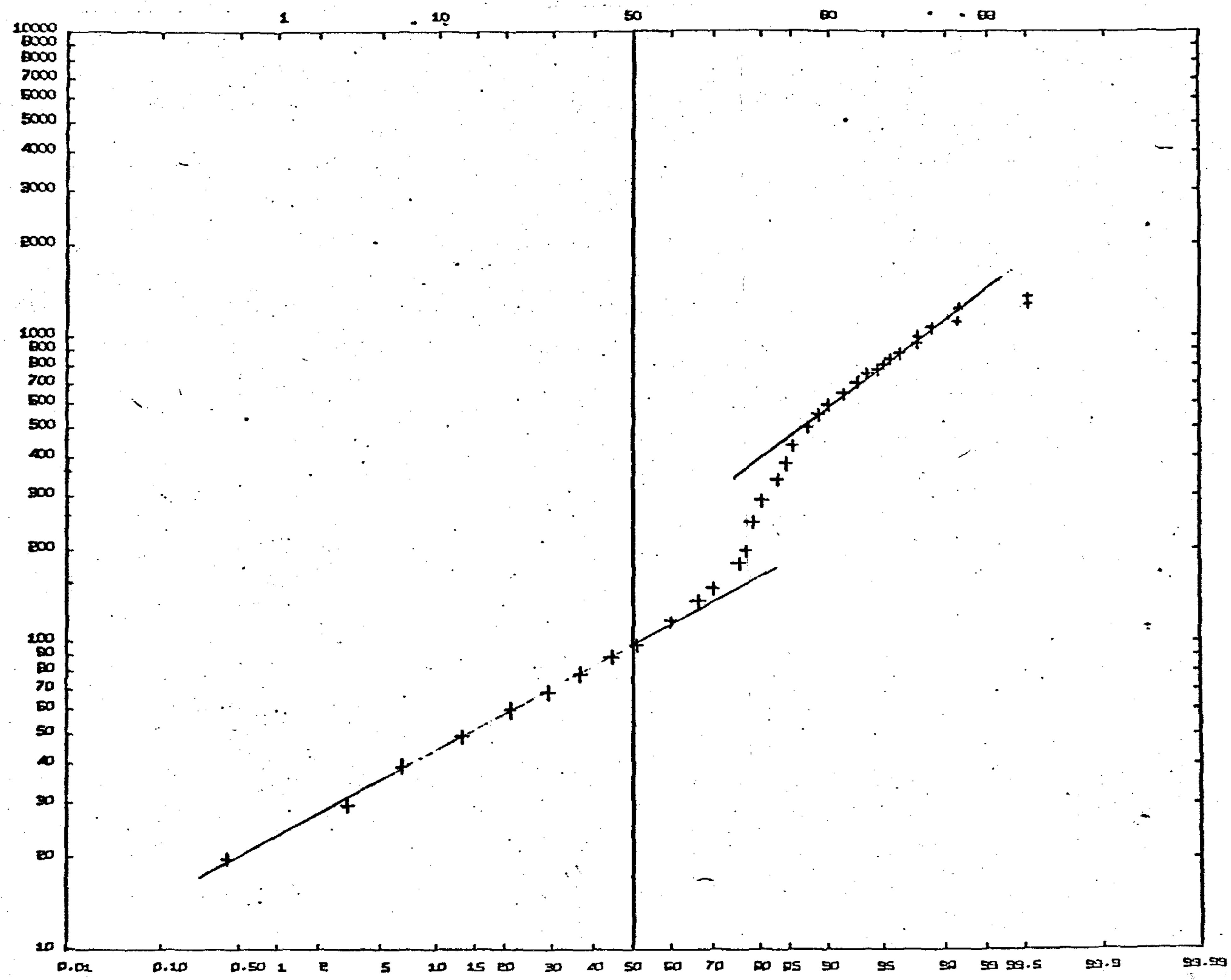
2. Count the number of values in each class interval. (Example Column 2).

3. Calculate the cumulative total for each class interval. (Example Column 3).

4. Calculate the cumulative total for each class interval as a percentage of the total number of observations (Example Column 4).

5. Plot the cumulative percentage on a log probability scale against the upper limit of the class interval on a two or three cycle logarithmic scale (Figure 6).

NOTE: The count column in the Example is, in effect, a histogram and gives a graphical representation of the distribution of the results.



APPENDIX - Figure 6.

LOG-PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR COPPER

Class Interval	Total Cu	Total Zn	Total Pb	Cumulative Total Cu	Cumulative Total Zn	Cumulative Total Pb	Cumulative % Cu	Cumulative % Zn	Cumulative % Pb
0-10	1			1			0.6		
11-20	2			3			1.8		
21-30	6			9			5.4		
31-40	12			21			12.6		
41-50	13			34			20.4		
51-60	25			59			35.3		
61-70	23			82			49.1		
71-80	22			104			62.3		
81-90	26			130			77.8		
91-100	16	1		146	1		87.4	0.6	
101-120	10	3	2	156	4	2	93.4	2.4	1.2
121-140	1	3	3	157	7	5	94.0	4.2	3.0
141-160	2	4	8	159	11	13	95.2	6.6	7.8
161-180	2	6	3	161	17	16	96.4	10.2	9.6
181-200		9	2	161	26	18	96.4	15.6	10.8
201-250		16	7	161	42	25	96.4	25.2	15.0
251-300	1	15	4	162	57	29	97.0	34.1	17.4
301-350	1	15	5	163	72	34	97.6	43.1	20.4
351-400		25	8	163	97	42	97.6	58.1	25.2
401-450		17	6	163	114	48	97.6	68.3	28.7
451-500		16	11	163	130	59	97.6	77.8	35.3
501-550		5	5	163	135	64	97.6	80.8	38.3
551-600		7	6	163	142	70	97.6	85.0	41.9
601-650		3	3	163	145	73	97.6	86.8	43.7

Class Interval	Total Cu	Total Zn	Total Pb	Cumulative Total Cu	Cumulative Total Zn	Cumulative Total Pb	Cumulative % Cu	Cumulative % Zn	Cumulative % Pb
651 - 700		5	4	163	150	77	97.6	89.8	46.1
701 - 750		2	4	163	152	81	97.6	91.0	48.5
751 - 800		1	2	163	153	83	97.6	91.6	49.7
801 - 850		2	6	163	155	89	97.6	92.8	53.3
851 - 900			4	163	155	93	97.6	92.8	55.7
901 - 950		1	1	163	156	94	97.6	93.4	56.3
951 - 1000		3	1	163	159	95	97.6	95.2	56.9
1001 - 1050		1	3	163	160	98	97.6	95.8	58.7
1051 - 1100	1	1	3	164	161	101	98.2	96.4	60.5
1101 - 1150		1	1	164	162	102	98.2	97.0	61.1
1151 - 1200		1	2	164	163	104	98.2	97.6	62.3
1201 - 1250				164	163	104	98.2	97.6	62.3
1251 - 1300			2	164	163	106	98.2	97.6	63.5
1301 - 1350		1	2	164	164	108	98.2	98.2	64.7
1351 - 1400			2	164	164	110	98.2	98.2	65.9
1401 - 1450	1		2	165	164	112	98.8	98.2	67.1
1451 - 1500	1		3	166	164	115	99.4	98.2	68.9
1501 - 1550			1	166	164	116	99.4	98.2	69.5
1551 - 1600			1	166	164	117	99.4	98.2	70.1
1601 - 1650			1	166	164	118	99.4	98.2	70.7
1651 - 1700			2	166	164	120	99.4	98.2	71.9
1701 - 1750	1		2	167	164	122	100.0	98.2	73.1
1751 - 1800			1		164	123		98.2	73.7
1801 - 1850					164	123		98.2	73.7
1851 - 1900		1	3		165	126		98.2	75.5
1901 - 1950					165	126		98.2	75.5

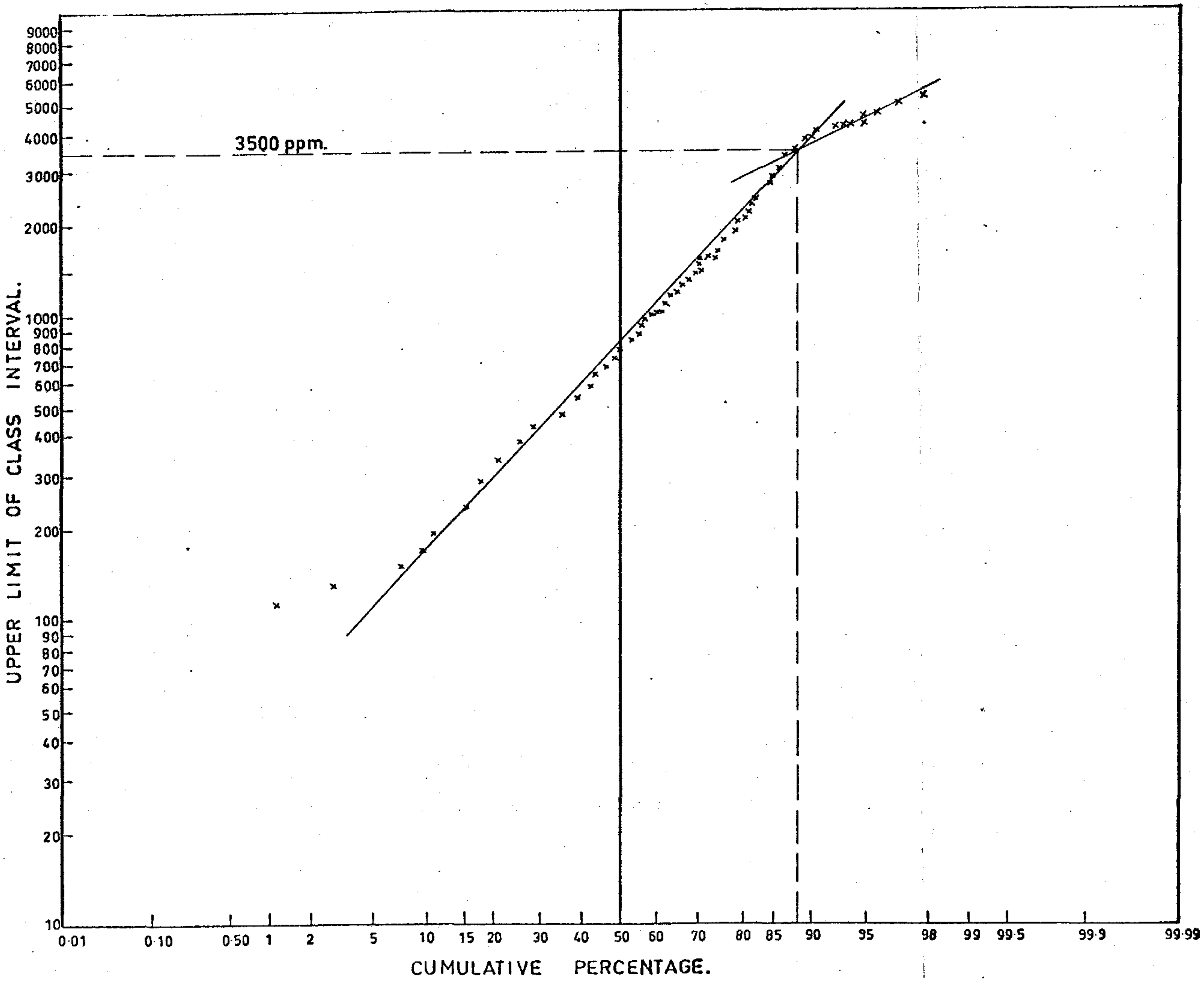
Class Interval	Total Cu	Total Zn	Total Pb	Cumulative Total Cu	Cumulative Total Zn	Cumulative Total Pb	Cumulative % Cu	Cumulative % Zn	Cumulative % Pb
							669031		
1951 - 2000			3		165	129		96.8	77.3
2001 - 2050					"	129		"	77.3
2051 - 2100			1		"	130		"	77.8
2101 - 2150					"	130		"	77.8
2151 - 2200			3		"	133		"	79.6
2201 - 2250					"	133		"	79.6
2251 - 2300			1		"	134		"	80.2
2301 - 2350					"	134		"	80.2
2351 - 2400					"	134		"	80.2
2401 - 2450					"	134		"	80.2
2451 - 2500			3		"	137		"	82.0
2501 - 2550					"	137		"	82.0
2551 - 2600			2		"	139		"	83.2
2601 - 2650					"	139		"	83.2
2651 - 2700					"	139		"	83.2
2701 - 2750					"	139		"	83.2
2751 - 2800					"	139		"	83.2
2801 - 2850					"	139		"	83.2
2851 - 2900			1		"	140		"	83.8
2901 - 2950					"	140		"	83.8
2951 - 3000			1		"	141		"	84.4
3001 - 3050					"	141		"	84.4
3051 - 3100					"	141		"	84.4
3101 - 3150					"	141		"	84.4
3151 - 3200			2		"	143		"	85.6
3201 - 3250					"	143		"	85.6
3251 - 3300					"	143		"	85.6
3301 - 3350					"	143		"	85.6

669032

Class Interval	Total Cu	Total Zn	Total Pb	Cumulative Total Cu	Cumulative Total Zn	Cumulative Total Pb	Cumulative % Cu	Cumulative % Zn	Cumulative % Pb
3351 - 3400					165	143		98.8	85.6
3401 - 3450					"	143		"	
3451 - 3500					"	143		"	
3501 - 3550					"	143		"	
3551 - 3600			2		"	145		"	86.8
3601 - 3650					"	145		"	86.8
3651 - 3700			1		"	146		"	87.4
3701 - 3750					"	146		"	
3751 - 3800					"	146		"	
3801 - 3850					"	146		"	
3851 - 3900			2		"	148		"	88.6
3901 - 3950					"	148		"	88.6
3951 - 4000			1		"	149		"	89.2
4001 - 4050					"	149		"	89.2
4051 - 4100			1		"	150		"	89.8
4101 - 4150					"	150		"	89.8
4151 - 4200			2		"	152		"	91.0
4201 - 4250					"	152		"	91.0
4251 - 4300			2		"	154		"	92.2
4301 - 4350					"	154		"	92.2
4351 - 4000			1		"	155		"	92.8
4401 - 4450					"	155		"	92.8
4451 - 4500			1		"	156		"	93.4
4501 - 4550					"	156		"	93.4
4551 - 4600			1		"	157		"	94.0
4601 - 4650					"	157		"	94.0

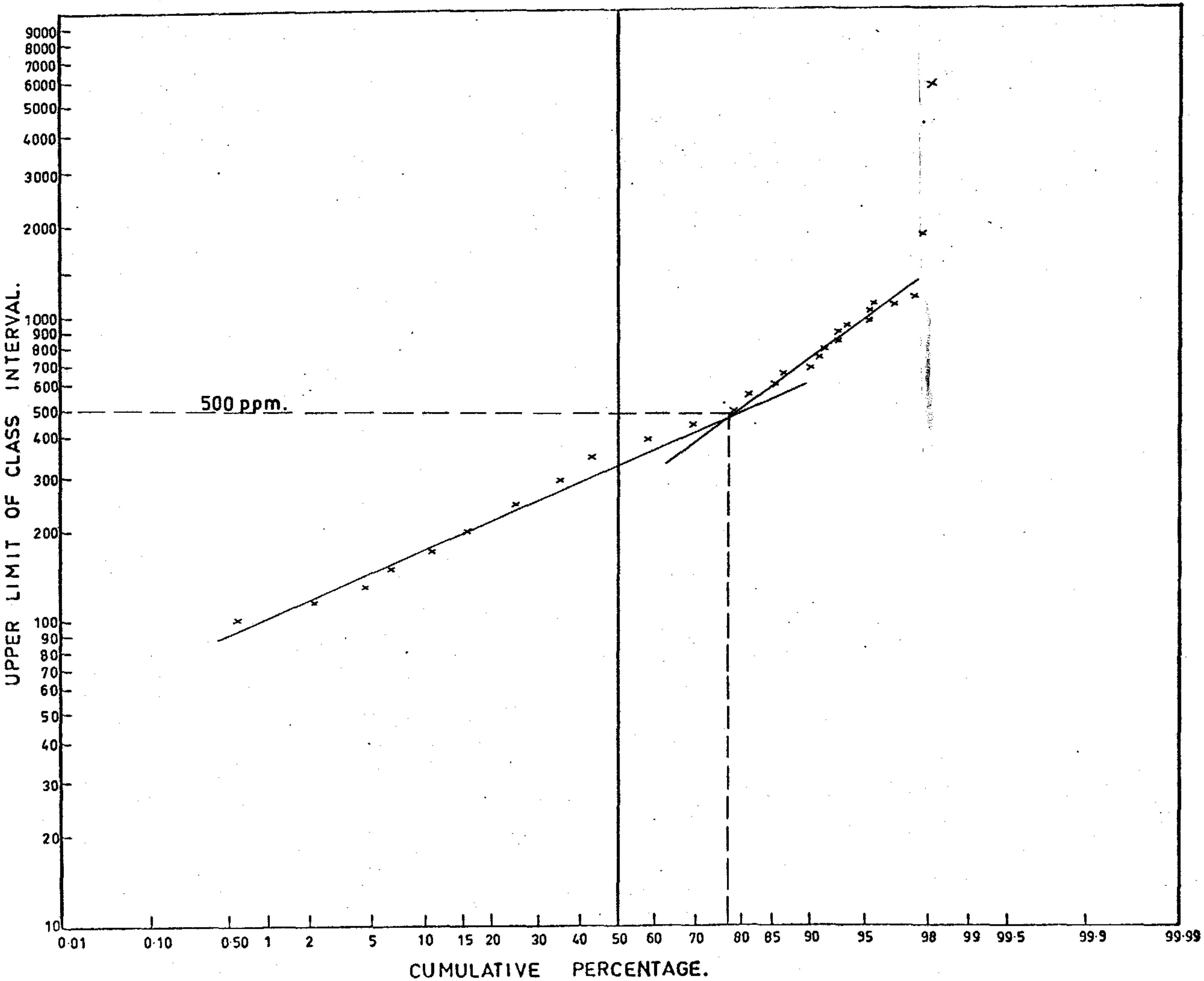
669033

CLASS INTERVAL	TOTAL Cu	TOTAL Zn	TOTAL Pb	CUMULATIVE TOTAL Cu	CUMULATIVE TOTAL Zn	CUMULATIVE TOTAL Pb	CUMULATIVE % Cu	CUMULATIVE % Zn	CUMULATIVE % Pb
4651 - 4700			1		165	158		96.8	94.6
4701 - 4750					"	158		98.8	
4751 - 4800			2		"	160		"	95.8
					"	160		"	95.8
5251 - 5300			1		"	161		"	96.4
					"	161		"	96.4
5551 - 5600			1		"	162		"	97.0
					"	162		"	97.0
5751 - 5800			1		"	163		"	97.6
					"	163		"	97.6
5951 - 6000		1			166	163		99.4	97.6
					"	163		"	97.6
6851 - 6900			1		"	164		"	98.2
					"	164		"	98.2
8451 - 8500			1		"	165		"	98.8
					"	165		"	98.8
10451 - 10500			1		"	166		"	99.4
					"	166		"	99.4
12451 - 12500		1			167	166		100	99.4
						166			99.4
14451 - 14500			1			167			100



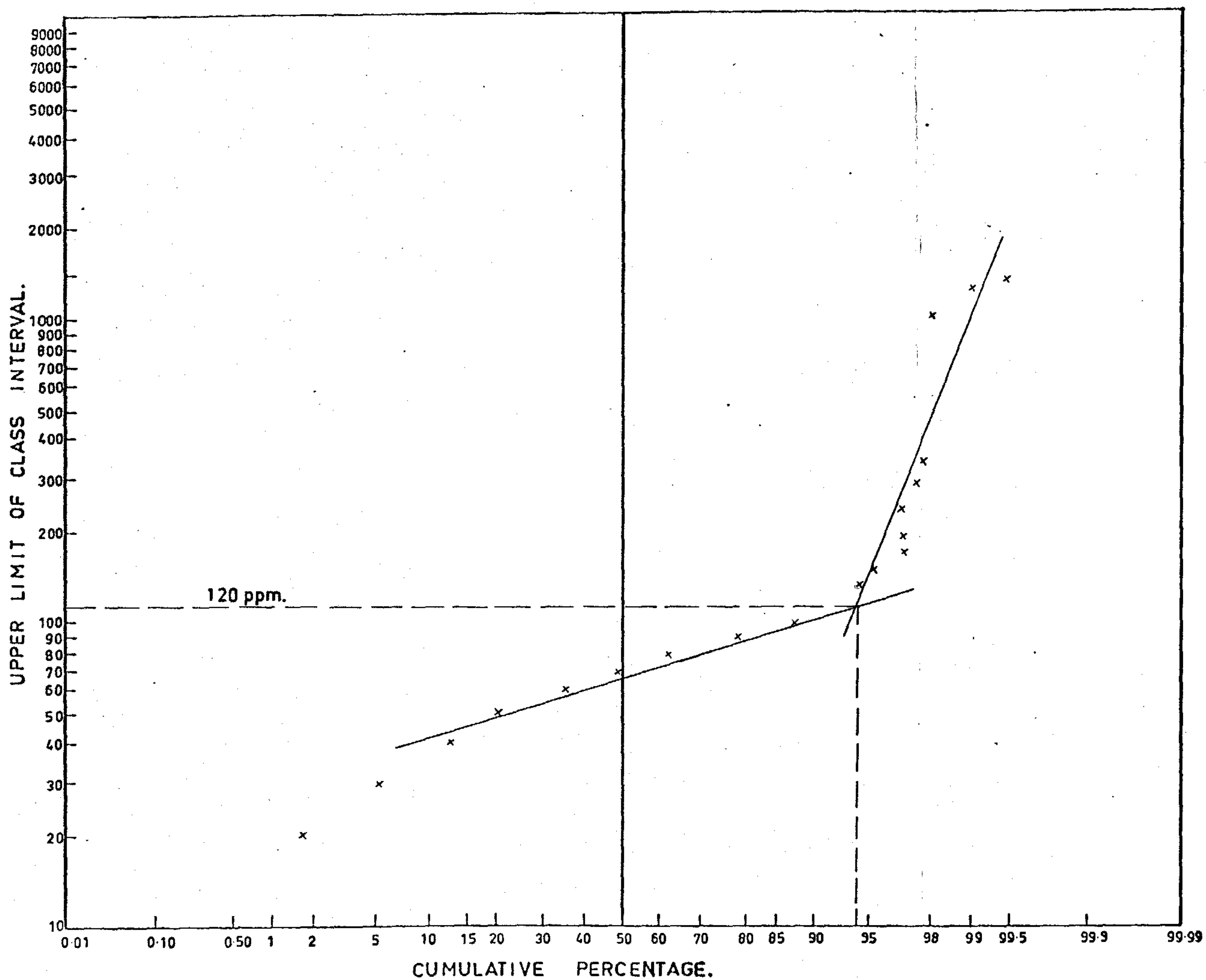
E.L. 2/62 MELBA FLAT.
ARGENT TUNNEL AREA.

LOG – PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR LEAD.



E.L. 2/62 MELBA FLAT.
ARGENT TUNNEL AREA.

LOG – PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR ZINC.



E.L. 2/62 MELBA FLAT.

ARGENT TUNNEL AREA.

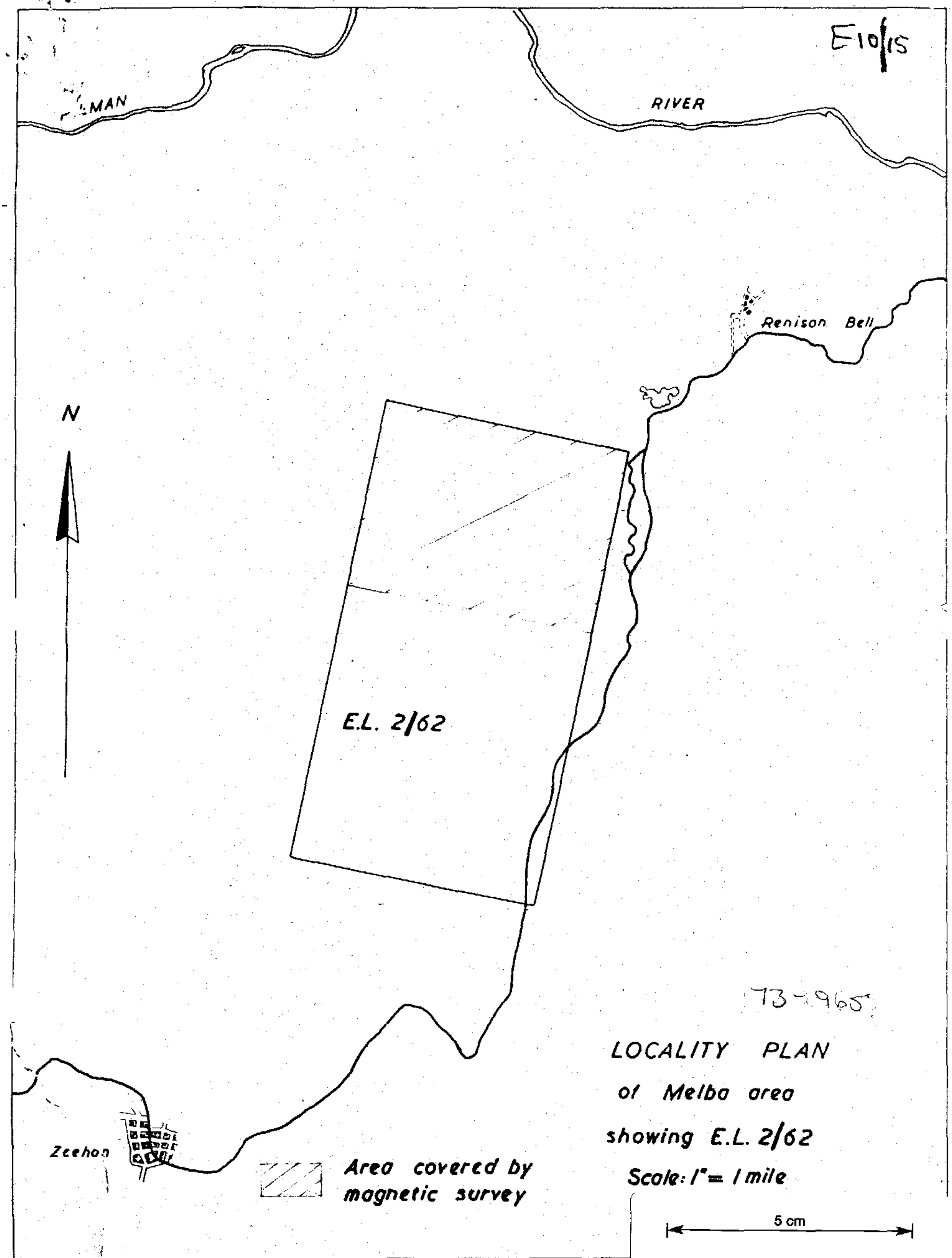
LOG – PROBABILITY PLOT OF CUMULATIVE FREQUENCY FOR COPPER.

BUDGET REQUIREMENTS 1973/1974

(a)	North Melba Flats - Argent Tunnel Area	
	1. Costeanning in Argent Tunnel Area	
	4000 feet, 5-6 days work D9 Caterpillar $45-00 per hour estimated cost	$2,000
	Supervision by Geologist	$ 100
	2. Analysis of rock chip samples	
	30 at $3-00	$ 90
	3. Line cutting	
	20,000 feet at $4-00 per 100 feet	$ 800
	Soil sample analysis 800 at $1-50	$1,200
	Labour 2 field assistants	$ 500
	Sub-Total	$4,690
(b)	Melba Heights Area	
	1. Cutting access tracks/blaze trails	
	1000 feet at $2-50 per 100 feet	$ 25
	2. Soil sample analysis	
	180 at $1-50	$ 270
	3. Labour 2 field assistants	$ 180
	Sub-Total	$ 475
	TOTAL	$5,165

669038

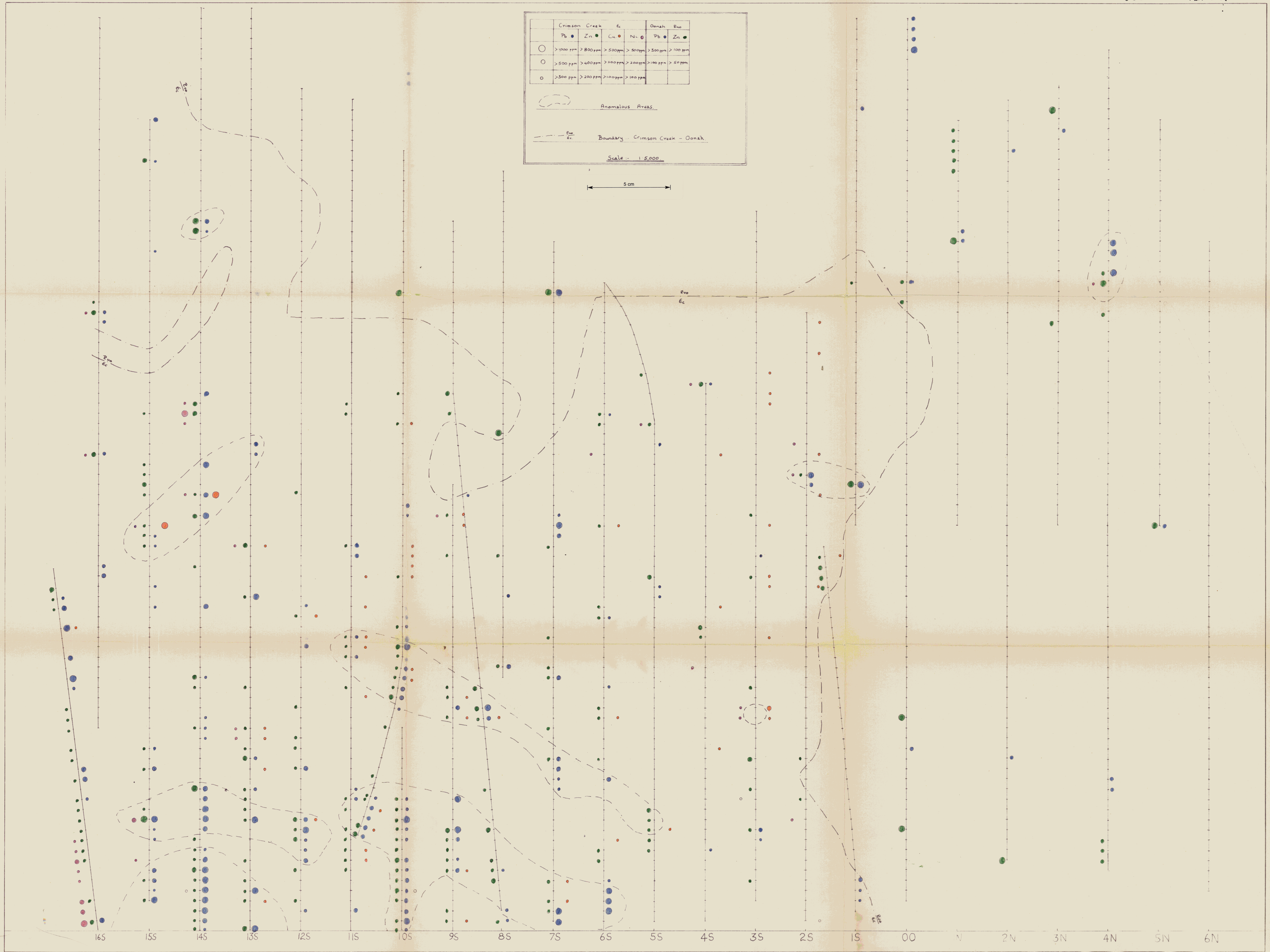
E10/15



E.Z.Co. W.C.D. Geol. Dept. 20.261.

PLATE 1

669039 PLATE 2



	Crimson Creek Єc				Oonah Ruo	
	Pb ●	Zn ●	Cu ●	Ni ●	Pb ●	Zn ●
◯	> 1000 ppm	> 800 ppm	> 500 ppm	> 500 ppm	> 300 ppm	> 100 ppm
○	> 500 ppm	> 400 ppm	> 200 ppm	> 200 ppm	> 100 ppm	> 50 ppm
∘	> 300 ppm	> 200 ppm	> 100 ppm	> 100 ppm		

73-965

E.L. 2/62 MELBA FLAT

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2039 GRAPHIC PLOT TO SHOW GEOCHEMICAL ANOMALIES.

PLATE 3

E.L. 2/62. MELBA FLAT.

SHOWING

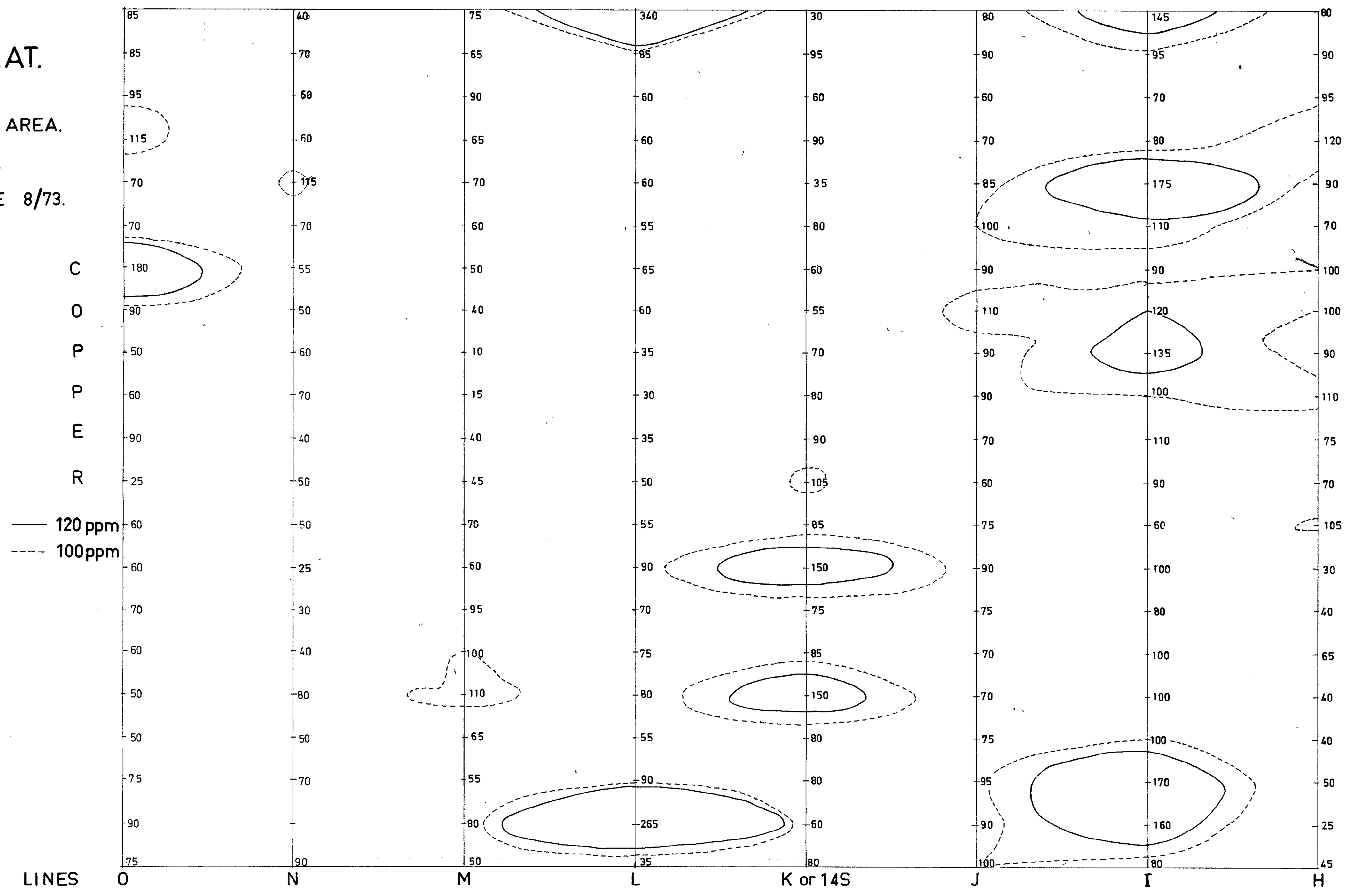
NORTH MELBA FLATS — ARGENT TUNNEL AREA.

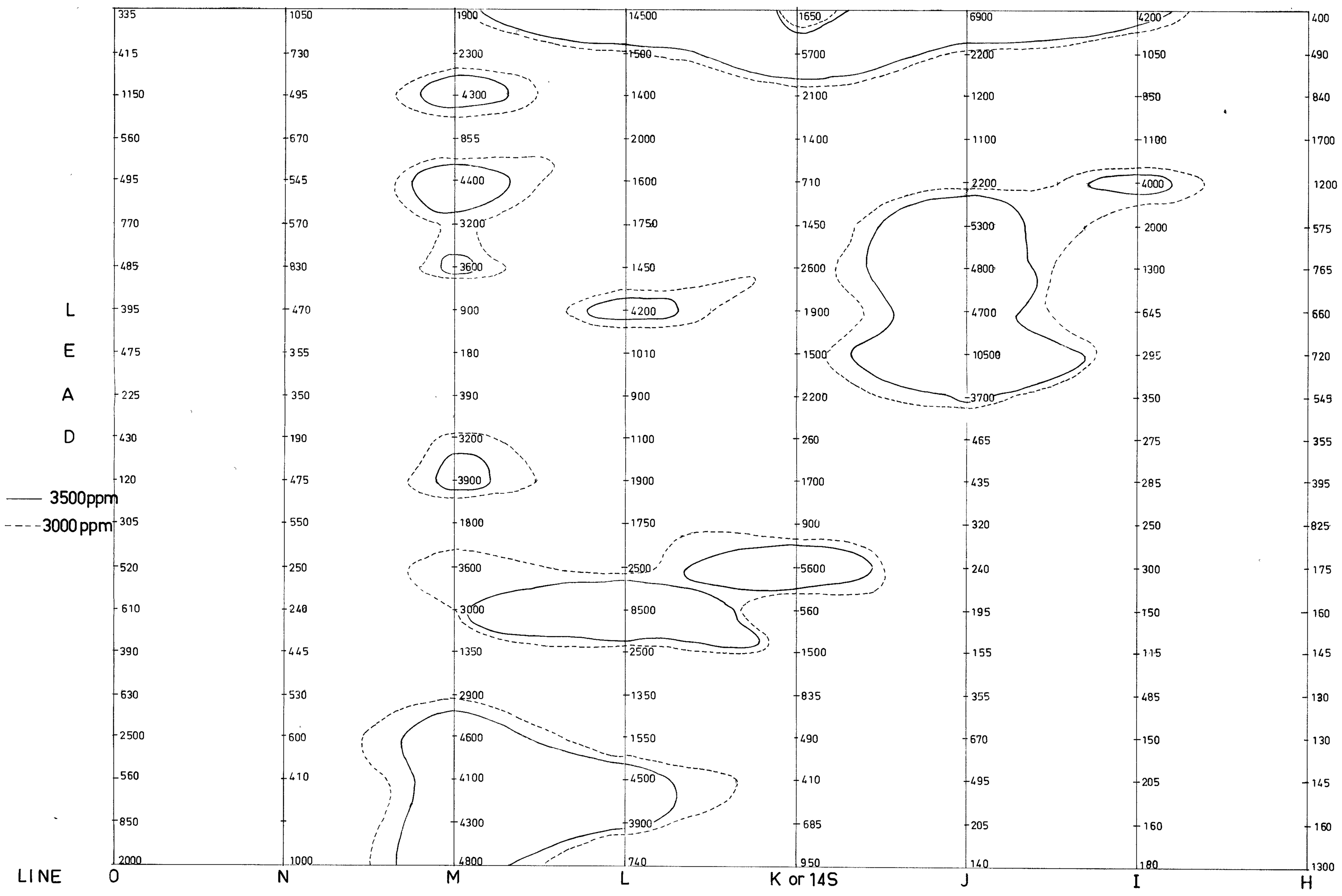
GEOCHEMICAL SOIL ANOMALIES.

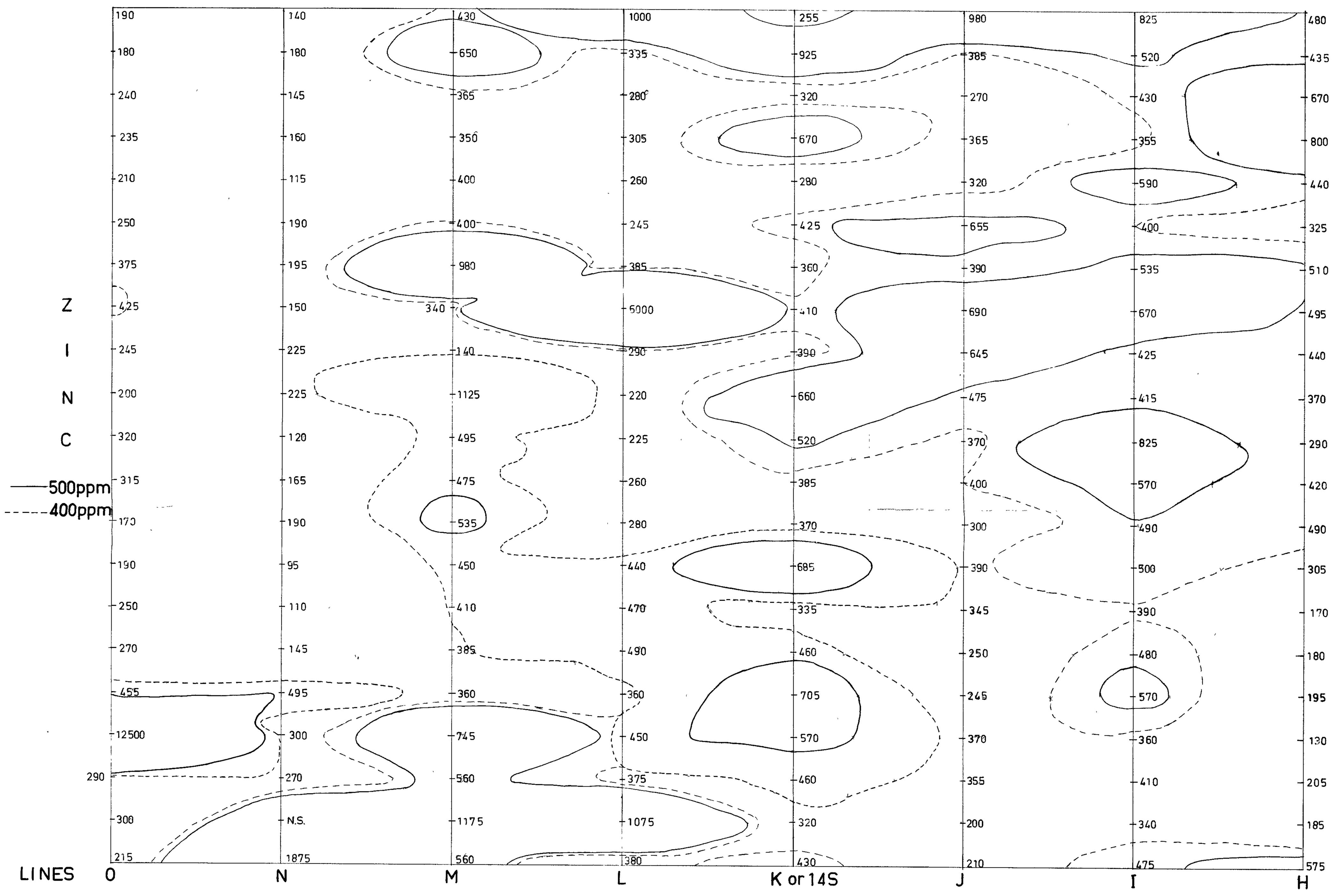
SCALE 1"- 40'   DATE 8/73.

669040

5 cm







73-965

2040

E.L. 2/62. MELBA FLAT.

SHOWING

MELBA HEIGHTS GRID AND MAGNETOMETER RESULTS (gammas).

SCALE 1 : 5000   5 cm   DATE 7/73.

E.Z.CO. W.C.D. GEOL. DEPT.   PLATE 4   669041

73-965

2041

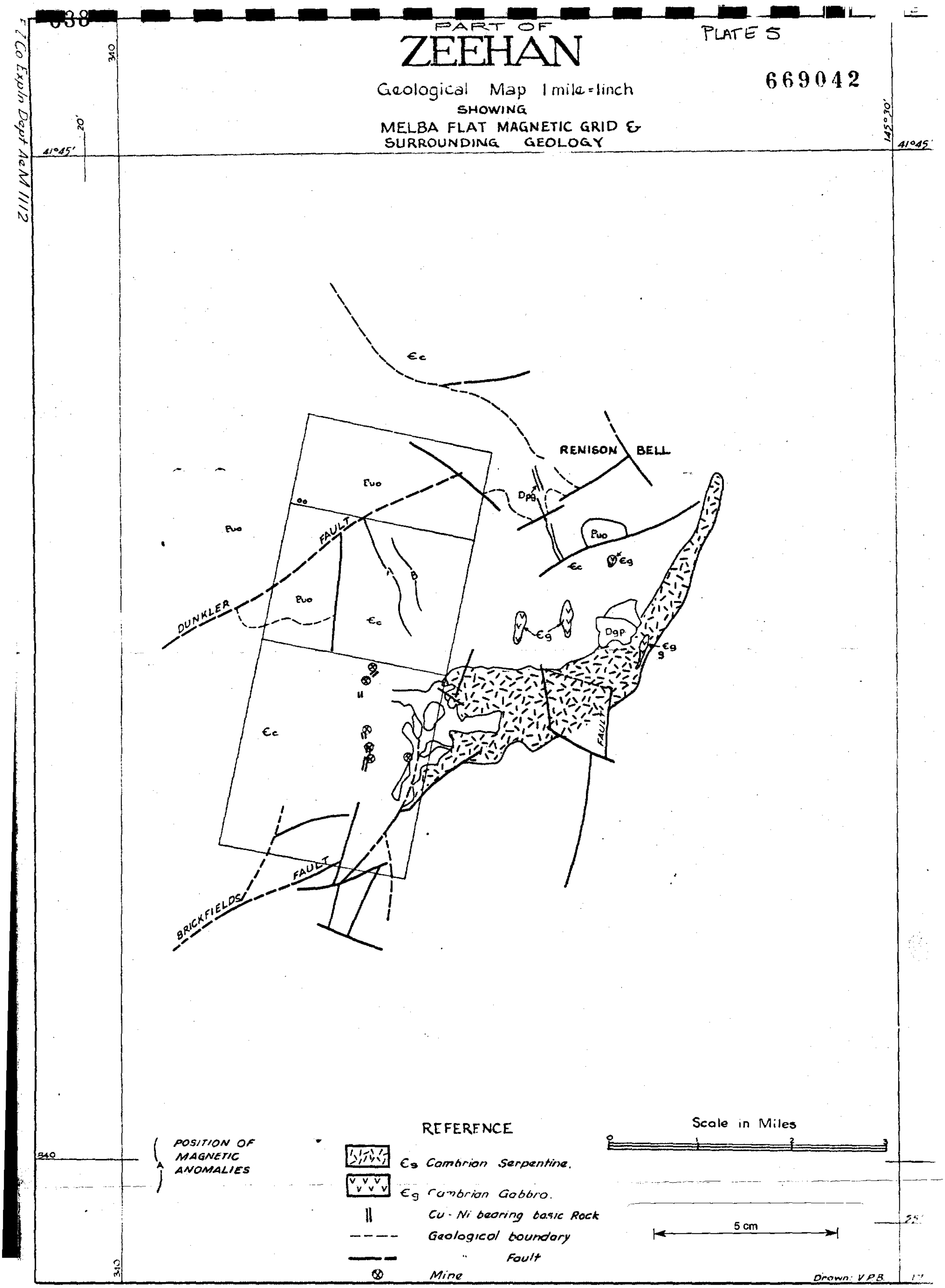
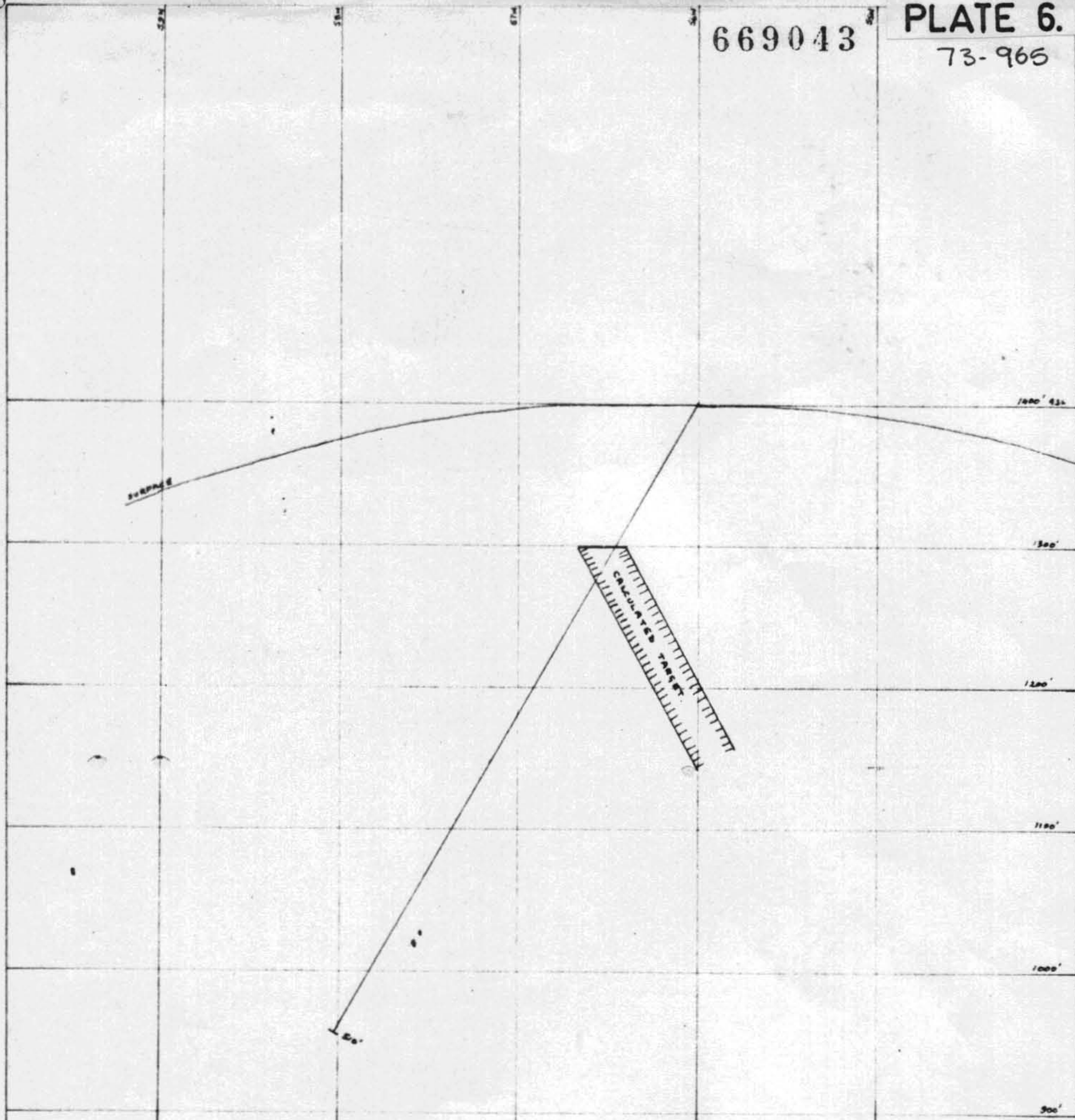


PLATE 5
669042
PART OF
ZEEHAN
Geological Map 1 mile=1inch
SHOWING
MELBA FLAT MAGNETIC GRID & SURROUNDING GEOLOGY
F.7 Co Expln Dept AeM 1112
340
20'
41°45'
145°30'
41°45'
RENISON BELL
DUNKLER FAULT
BRICKFIELDS FAULT
FAULT
€c
€g
Dgp
Puo
REFERENCE
POSITION OF MAGNETIC ANOMALIES
€s Cambrian Serpentine.
€g Cambrian Gabbro.
Cu - Ni bearing basic Rock
Geological boundary
Fault
Mine
Scale in Miles
0
1
2
3
5 cm
55'
340
Drawn: V.P.B.

669043

PLATE 6.

73-965



MELBA FLATS E.L. 2/62

CROSS-SECTION OF M.F.P. 124

DIRECTION 235°M.

INCLINATION -60°

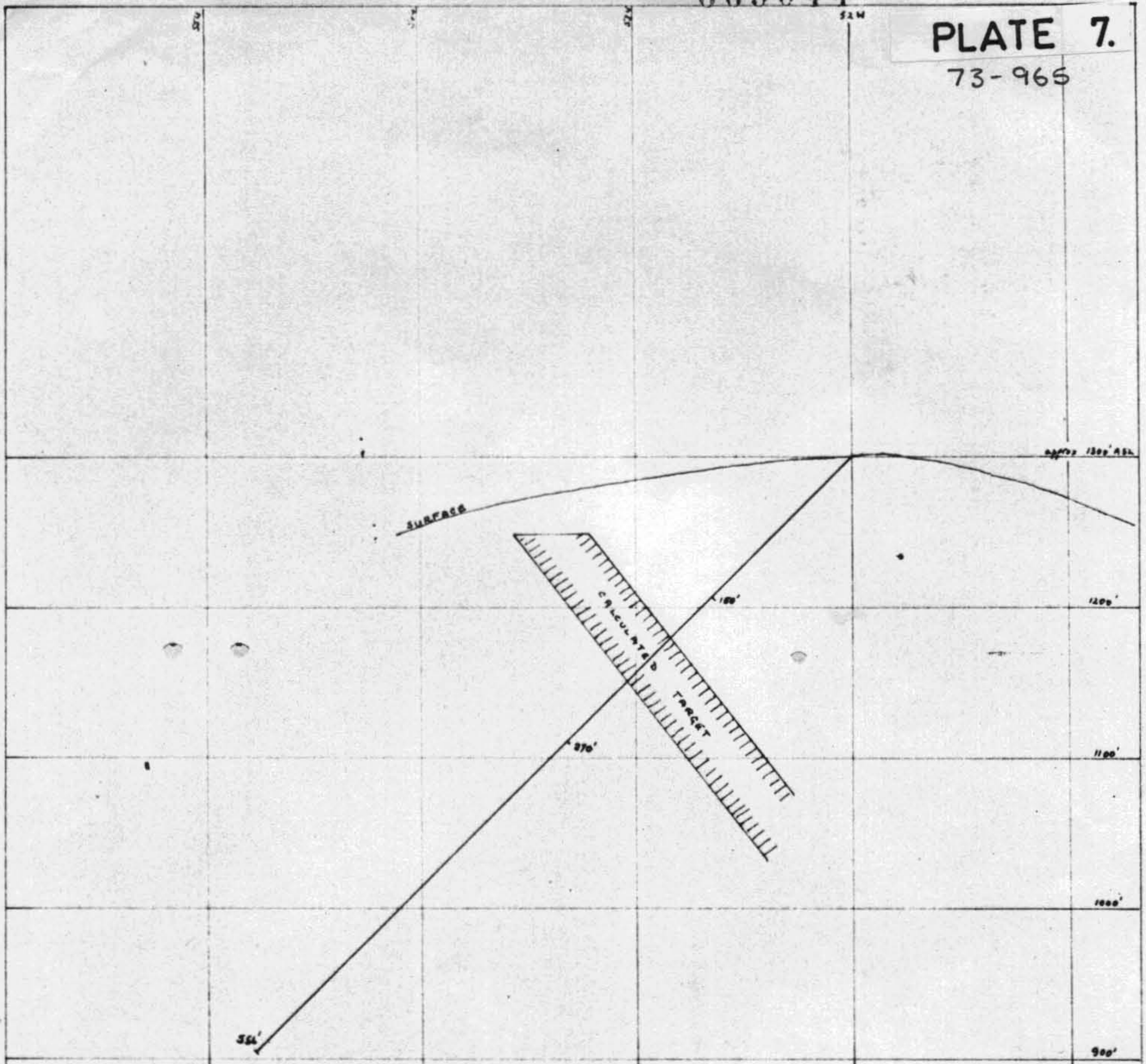
5 cm

E.Z.CO. W.C.M. GEOL DEPT. 20.280

669044

PLATE 7.

73-965



MELBA FLATS E.L.2/62

CROSS-SECTION OF M.F.P. 125

DIRECTION 225°M

INCLINATION -45°

ZONE OF GREEN TUFFACEOUS SANDSTONE WITH HIGH MAGNETIC SUSCEPTIBILITY

130' - 270'.

Scale :- 1" - 100'

5 cm

E. Z. CO. W. C. M. GEOL. DEPT. ZO 279.