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FIMISTON MINERALS

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E.L. 47/70 - MT. LYELL AREA  
PROGRESS REPORT - ORIENTATION GEOCHEMISTRY

1971:11

**MICROFILMED**

By: W.D. ROOTS

17th February, 1971.

71-0730

**LIST OF MAPS**

1. Geochemical Data – Pillinger A
2. Geochemical Data – Pillinger C
3. Geochemical Data – Strahan D
4. Geochemical Data – Olga map, Gordon River

PROGRESS REPORT - ORIENTATION GEOCHEMISTRYSUMMARY

A geochemical orientation programme has been completed, covering areas adjacent to the King River, Kelly Basin and Gordon River.

Mean, standard deviation and anomaly thresholds have been determined for copper, lead and zinc, but these values will need re-examination in the light of further sampling, and different methods of sample treatment.

Problems likely to be encountered in geochemical sampling have been evaluated and recommendations are made for future procedure.

INTRODUCTION

Background geological knowledge and literature research indicated the north of E.L. 47/70 as an exploration object. The main target being the Cambrian rocks.

The area presents difficulties to routine exploration techniques, because outcrop is poor and vegetation extremely dense. The streams often provide exception to this and it was therefore decided to direct initial effort to geological mapping and stream sediment sampling, coupled with contract laboratory analysis by atomic absorption spectrometry.

Before this could proceed however, it was necessary to conduct an orientation survey to permit interpretation of the results in perspective and to reveal errors in procedure which could reduce the effectiveness of the major programme.

The object then of this project was to provide such a framework from three principal stream systems in the licence area; the King River, the Kelly Basin feed streams, and the Gordon River.

A second objective was to study possible contamination from the old Crotty tramway, along part of the Bird River, and to determine if this was affecting the copper values already determined in the Kelly Basin sediments.

Most of the sampling was carried out by D. Morris and J. Crook with P. Lavers assisting initial work.

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W.D. Roots and R. Goodwin collected samples along the Gordon River.

Progress worked out at about 20 miles of stream coverage in thirteen days, i.e. about 1½ miles per day, an excellent rate in this area.

METHODS

A wet strong geochemical paper bag, 3" x 5" was filled with fine stream sediment at localities approximately 400 yards apart. An unpainted steel trowel was used to dig the finest available sediments from the stream bed at each location. As the stream gradient increased, Morris and Crook reported increasing difficulty in locating fine material. Sediment was mostly collected from the "shadow" of obstructions in the stream bed, and at times fifteen minutes was needed to locate enough to fill a bag.

Samples from along the Gordon River were collected from tributaries at locations removed from the influence of the Gordon itself.

The wet samples were delivered to Geochemical and Mineralogical Laboratories Pty. Limited in Sydney, who dried and sieved them, and then performed the base metal extraction and measurements on the -80 mesh fractions.

Their analysis results are attached.

PROCESSING OF RESULTS

Due to the small number of samples gathered (84) a valid statistical analysis was not possible without prior vetting of the results.

The following samples were not included in the calculation of the mean values for reasons stated below.

	<u>Lead</u>	<u>Zinc</u>	<u>Copper</u>
No. 2	124	114	32
No. 13	-	118	-
No. 15	-	116	-
No. 17	76	200	-
No. CH 1	48	36	22
No. J 5	-	-	86
No. K 1	36	100	32
K 2	30	90	26
K 5	34	104	32
K 3	42	122	34
K 4	30	92	28

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Samples 2, 13, 15, 17 and J 5 exceeded the calculated mean value, for the elements listed above, by an amount at least numerically equal to the total number of samples. Each would have raised the mean therefore, by one or more numbers.

Sample CH 1 was obtained at Coal Head from a Tertiary pyritic shale bed, not from a stream bed and was excluded as atypical.

Samples K 1 to K 5 were obtained from the south side of the King River in a stream which flows in Middle Cambrian Dundas Group sediments, mainly interbedded volcanics and fine siltstones. These rocks contain small pyritic inclusions and are intrinsically more mineralised than the Silurian Eldon Group rocks on the north side of the King River.

These five values (K1 to K5) were excluded from the calculation as, due to their atypical geological position, they should be viewed as part of a separate sample population.

Of the other streams sampled, the Bird and Nora Rivers drain Ordovician June Group, limestones, siltstones and conglomerates and Silurian Eldon Group, sandstone, siltstone and shale. The Clarke River flows generally in Tertiary sediments but drains both Cambrian and Ordovician rocks toward its source. The Gordon River drains rocks of all ages. All these samples form a more uniform population.

Values calculated from the assay results are as follows:-

	<u>Copper</u>	<u>Lead</u>	<u>Zinc</u>
<u>Mean</u>	4	20	32
<u>Standard Deviation</u>	8	11	6
<u>Anomaly Threshold</u>	12	31	38

Anomaly thresholds, based on the recommendations of the Tasmanian Department of Mines, are Mean plus one Standard Deviation.

These values provide a basis for future geochemical exploration (subject to the points discussed in the conclusion of this report). They will have to be recalculated however, to improve statistical integrity as more results become available.

Some anomalous values were revealed in this preliminary survey and these are colour coded on the attached maps, which give also the absolute values measured in parts per million.

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Histograms and Cumulative Frequency Curves are attached. *not so*

A complete geological map, based on published reports and a recent unpublished report by the B.H.P. Co. has been compiled as a basis for further mapping, and the planning of interpretation of future geochemical surveys.

#### DISCUSSION

- (1) A concentration of apparent anomalous values occurs along the Bird River where this parallels the old Crotty Railway Line, but only where both trend east-west. The cessation of the anomalies coincides with an increase in stream bed gradient from 50 ft. per mile to 250 ft. per mile. This suggests that removal of the clay fraction may be responsible for the lower up-stream values, and this is supported by the difficulties experienced in obtaining fine material in this region.

A study will be conducted to determine the size range of samples from both zones so that this variable may be excluded from further sampling programmes. The results will be reinterpreted in the light of this further study of the samples.

- (2) Samples K1 to K5 anomalous in the present context, but were collected from a different geological setting from the bulk of samples. They should therefore only be considered in relation to an orientation survey in their own setting.
- (3) There is a trend of increasing values up the Clarke River and further work should be carried out to extend this pattern.
- (4) Samples J4 and J5 on the Gordon River fall outside our exploration licence area, in ground not now held.
- (5) The influence of the Crotty Line on the Kelly Basin sediments does not appear to be great, as the copper content of sediments in the Basin exceeds that adjacent to the Crotty Line by some 100 times. This suggests that the Kelly Basin copper values are natural, but further work on the stream sediments, as outlined above, may modify this conclusion.

#### CONCLUSION

It appears likely that this programme has revealed mainly the extent to which the clay minerals content of active stream sediments is gradient dependant.

Sieving to -80 mesh may permit a high percentage of quartz-rich silt-size particles to dilute the base metal-ion carrying clay fraction.

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Sieving to -200 mesh appears necessary to ensure that only the clay fraction is presented for A/A analysis.

None of the "anomalies" outlined should be considered real until representative samples from both high and low gradient areas have been resieved and the -200 mesh fraction re-presented for A/A analysis.

It is expected that when new values for Mean and Standard Deviation are then calculated, the Mean will be higher, the Standard Deviation smaller and a new pattern of anomalous values will emerge.

Future geochemical operators in this area should be instructed to either -

- (a) Sieve all samples at the point of collection until sufficient -200 sample is collected to permit A/A analysis on the clay fraction only, or
- (b) collect a large sample, enough to permit such sieving later.

Dr. Baker of the Tasmanian Department of Mines reports "We have not found significant chemical differences between active and lateral (stream) sediments".

It seems unnecessary then to restrict sampling to active sediments, when fine sediments are more readily available in stream banks. It would be wise to confirm this during future orientation surveys.

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EXPENDITURE

Expenditure of \$2,895.77 was entailed, as shown in the following detailed break-up.

(a) Professional Personnel

P.S. Lavers	- 6½ days @ \$100	\$ 650.00
W.D. Roots	2 days @ \$ 70	140.00

Skilled Operators

D. Morris	- 17 days @ \$ 30	510.00
J. Crook	14 days @ \$ 30	420.00

(b) Access & Housing

Fares	257.50
Accommodation	129.74
Food and Meals	74.00
Car Hire	274.41
Petrol	25.34
Boat Hire	130.00
Freight Charges	6.00

(c) Surveys & Mapping

Air photographs, maps	56.42
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(d) Geochemical

No invoices yet

(e) Other Expenses

Taxis, Phone calls, Postage, etc.	5.70
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(f) Administrative

Sydney Office, W.H. Jones, etc.	<u>216.66</u>
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\$ 2,895.77

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GEOCHEMICAL AND MINERALOGICAL LABORATORIES PTY. LTD.

76 McLACHLAN AVE., RUSHCUTTERS BAY, N.S.W. 2011 TEL. 31 9011 TELEX: 21757 TELEGRAMS: "GEOCHEM" SYDNEY.

007

REGISTERED LABORATORY NUMBER 743



This laboratory is registered by the National Association of Testing Authorities, Australia.

The test(s) reported herein have been performed in accordance with its terms of registration.

Company Sydney Geological & Geophysical Date Received 24/12/70.

Day Book and Sheet No.

Batch No. Services Pty Ltd. Date Despatched 15/1/71. 11891/1.

Analyst's Remarks: Cu Pb Zn = Precision 10%\* at 500nm level. Tyniat. S. Collins.

Analyst	E.T.	G.S.	F.B.
Method	AAS HClO <sub>4</sub>	AAS HClO <sub>4</sub>	AAS HClO <sub>4</sub>
Limit of detection	2	2	2
Precision ± %	10%*	10%*	10%*
Sample No.	<b>Cu</b>	<b>Pb</b>	<b>Zn</b>
22	4	22	32
23	4	22	28
24	6	20	24
25	2	16	14
26	4	14	22
27	2	14	18
28	2	16	20
29	18	28	78
30	2	20	14
31	2	14	10
Geological Standard	200	40	102
32	14	16	20
33	4	18	18
34	2	16	14
35	2	12	20
36	2	16	20
37	2	8	6
38	2	14	22
39	2	16	18
40	4	24	38
41	2	18	24

↑  
STREAMS  
BASIN  
KELLY  
↓

All results in parts per million unless otherwise indicated.  
 "X" indicates that the content of the element sought is below the limit of detection.  
 "Tr" indicates element detected but too low a concentration to be measured.  
 "-" means not determined.

*P. Tyniat. S. Collins*  
 N.A.T.A. SIGNATORY

↑ STREAMS  
KELLY BASIN  
↓ KING RIVER

Analyst	E.T.	F.B.	C.E.
Sample No.	Cu	Pb	Zn
42	2	10	14
43	2	12	14
44	2	14	16
45	2	18	24
46	2	10	10
47	2	16	24
48	2	18	28
49	4	14	20
50	4	16	28
51	10	22	36
52	10	22	26
53	12	26	40
54	10	20	30
Standard	92	78	94
55	2	12	28
56	14	26	50
57	4	18	50
58	6	22	50
59	2	12	30
K 1	32	36	100
2	26	30	90
3	34	42	122
4	28	30	92
5	32	34	104
6	8	20	48
7	6	16	38
K 8	2	14	24

All results in parts per million unless otherwise indicated.  
 "X" indicates that the content of the element sought is below the limit of detection.  
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*[Signature]*  
 N.A.T.A. SIGNATORY



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Company Sydney Geological & Geophysical Services Pty. Limited Date Received 23.12.70 Day Book and Sheet No. 11883/1  
 Batch No. T/F = To Follow Date Despatched 18.1.71

Analyst's Remarks: Precision = 10% @ 500ppm level

KELLY BASIN STREAMS

Analyst	E.T. AAS HClO <sub>4</sub>	C.E. AAS HClO <sub>4</sub>	C.E. AAS HClO <sub>4</sub>
Limit of detection	2	2	2
Precision ± %	10%	10%	10%
Sample No.	Cu	Pb	Zn
1	22	50	48
2	32	124	114
3	4	16	52
4	2	14	38
5	4	16	54
6	2	16	32
7	24	40	66
8	10	24	28
9	26	58	94
10	14	52	60
Geological Standard	108	73	110
11	4	24	34
12	4	16	30
13	16	44	118
14	8	32	74
15	22	52	116
16	16	33	86
17	46	76	200
18	6	26	56
19	10	26	46
20	10	30	92

All results in parts per million unless otherwise indicated.  
 "X" indicates that the content of the element sought is below the limit of detection.  
 "Tr" indicates element detected but too low a concentration to be measured.  
 "-" means not determined.

*P. Laszlo*  
 N.A.T.A. SIGNATORY





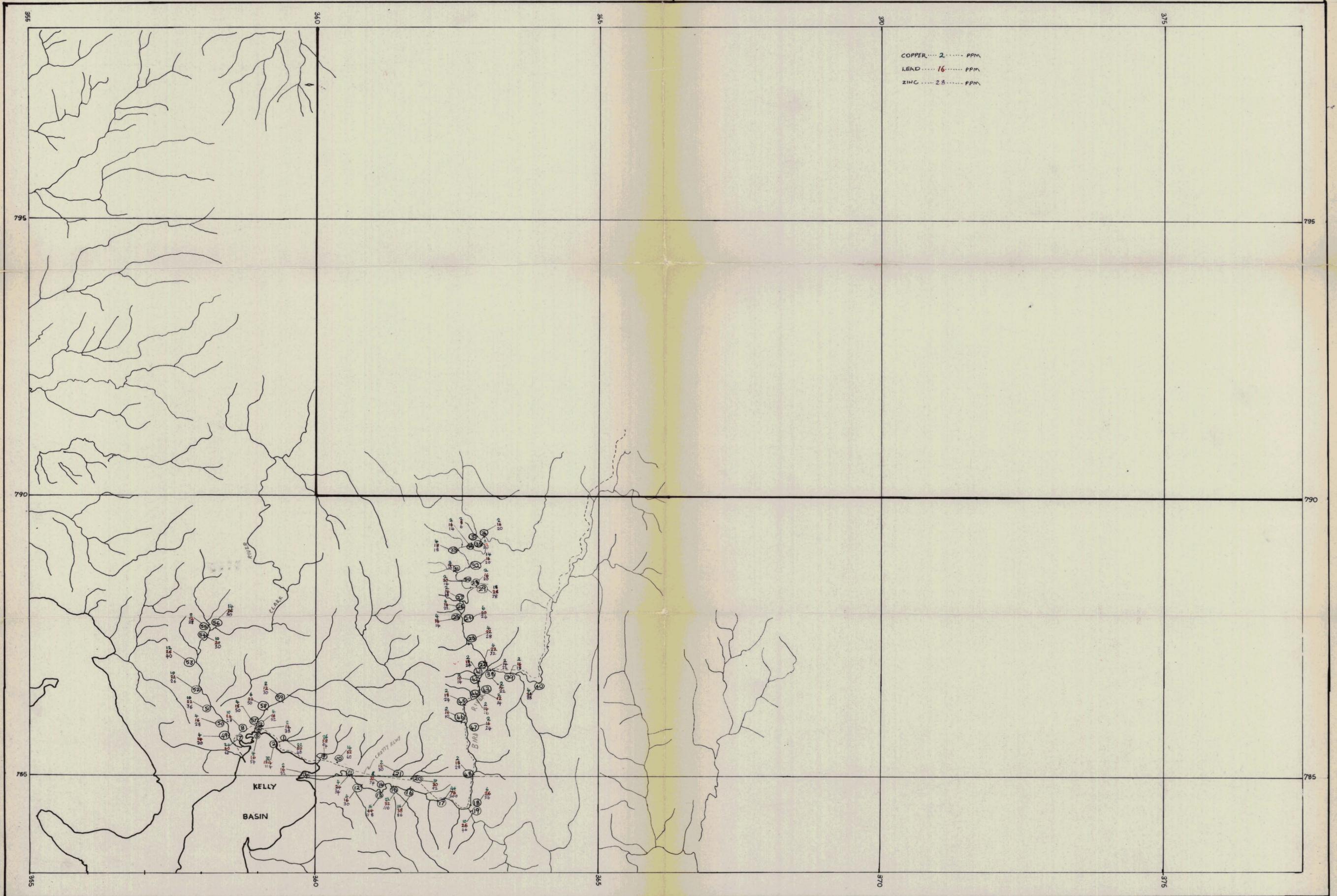
# PILLINGER A GEOCHEMICAL DATA

5 cm

SCALE 1:31,680

1114

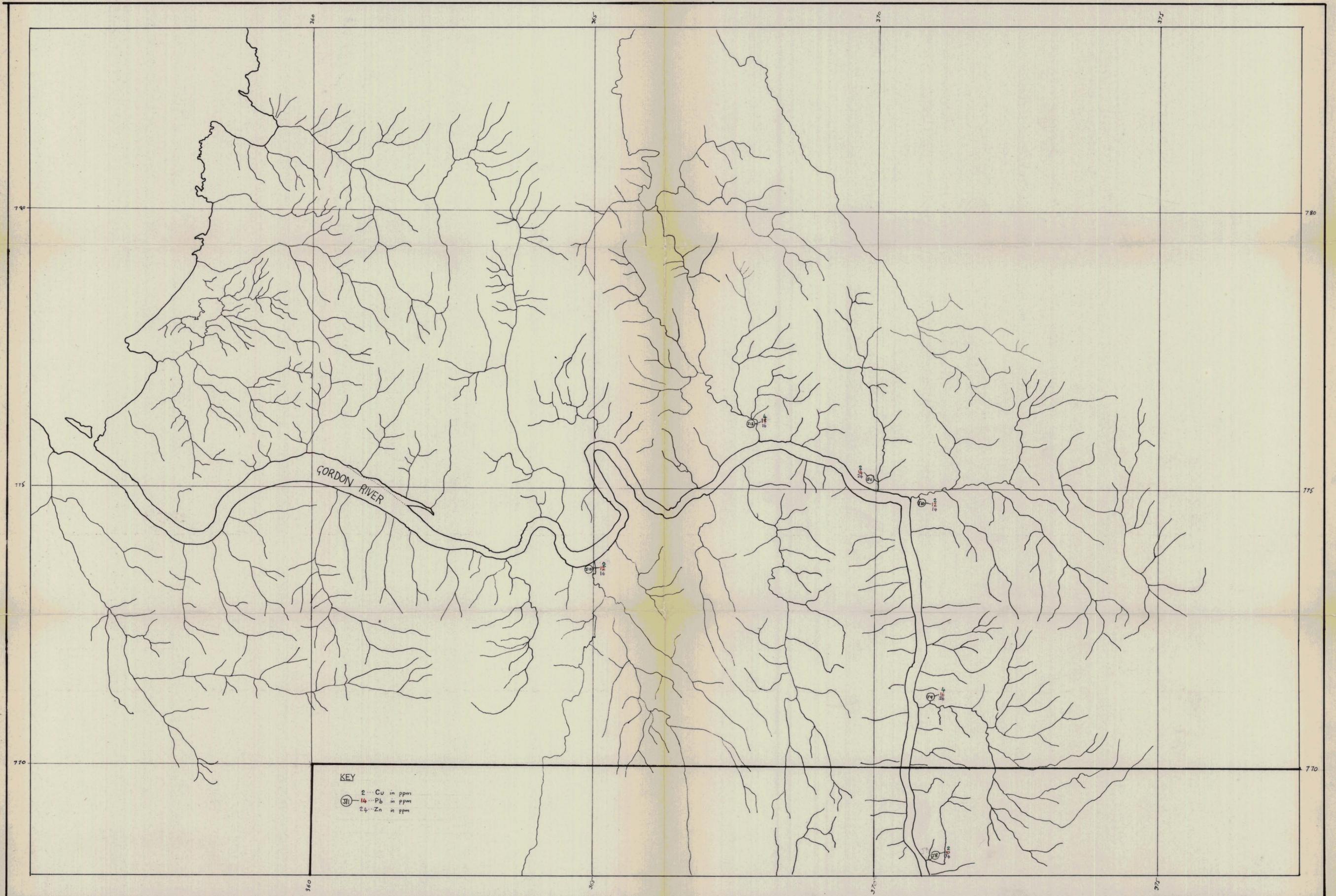
910015



0 1115  
910016

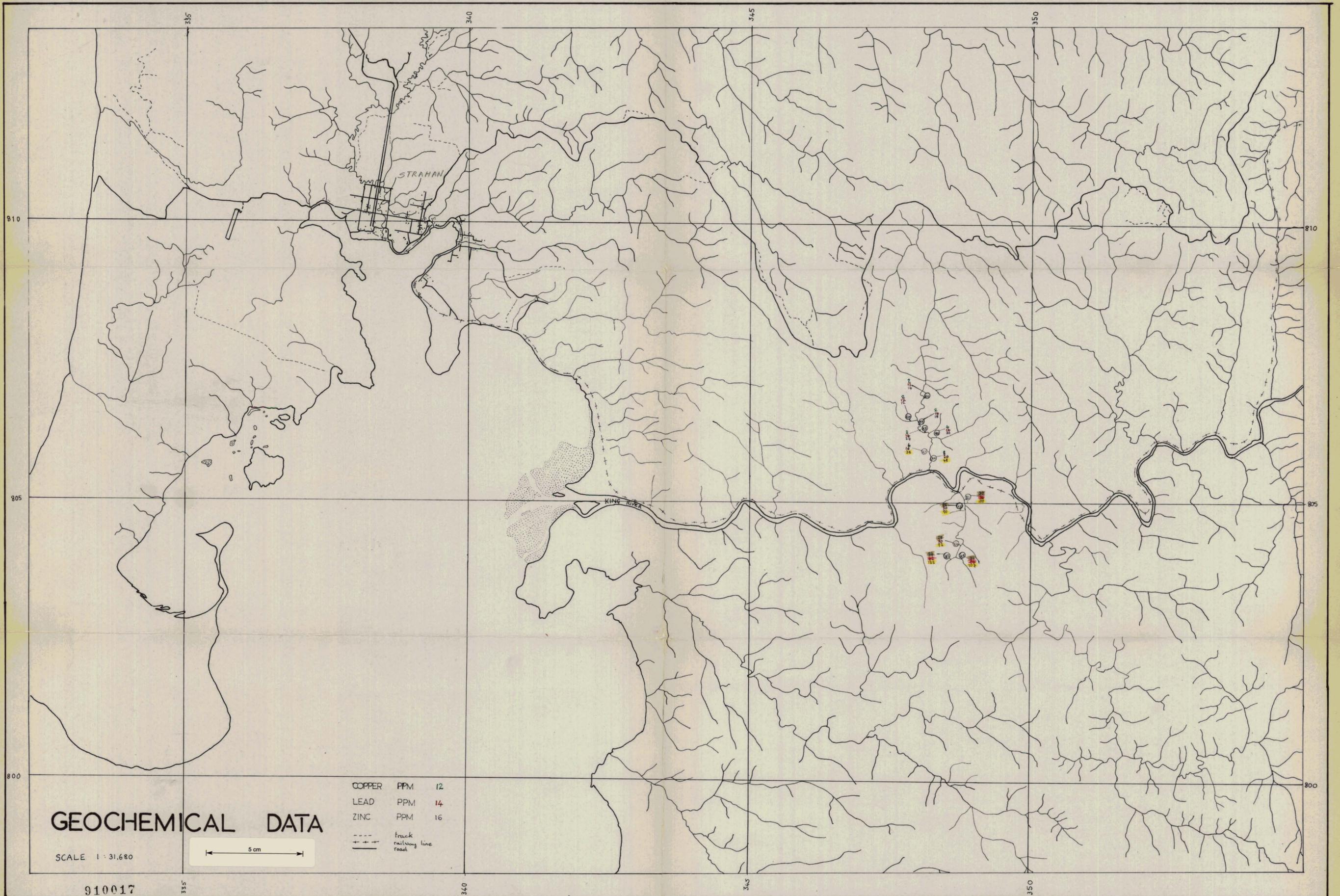
# PILLINGER, C

# GEOCHEMICAL DATA



# STRAHAN D

U. 1116



## GEOCHEMICAL DATA

SCALE 1 : 31,680

5 cm

- COPPER PPM 12
- LEAD PPM 14
- ZINC PPM 16
- track
- + + + railway line
- road

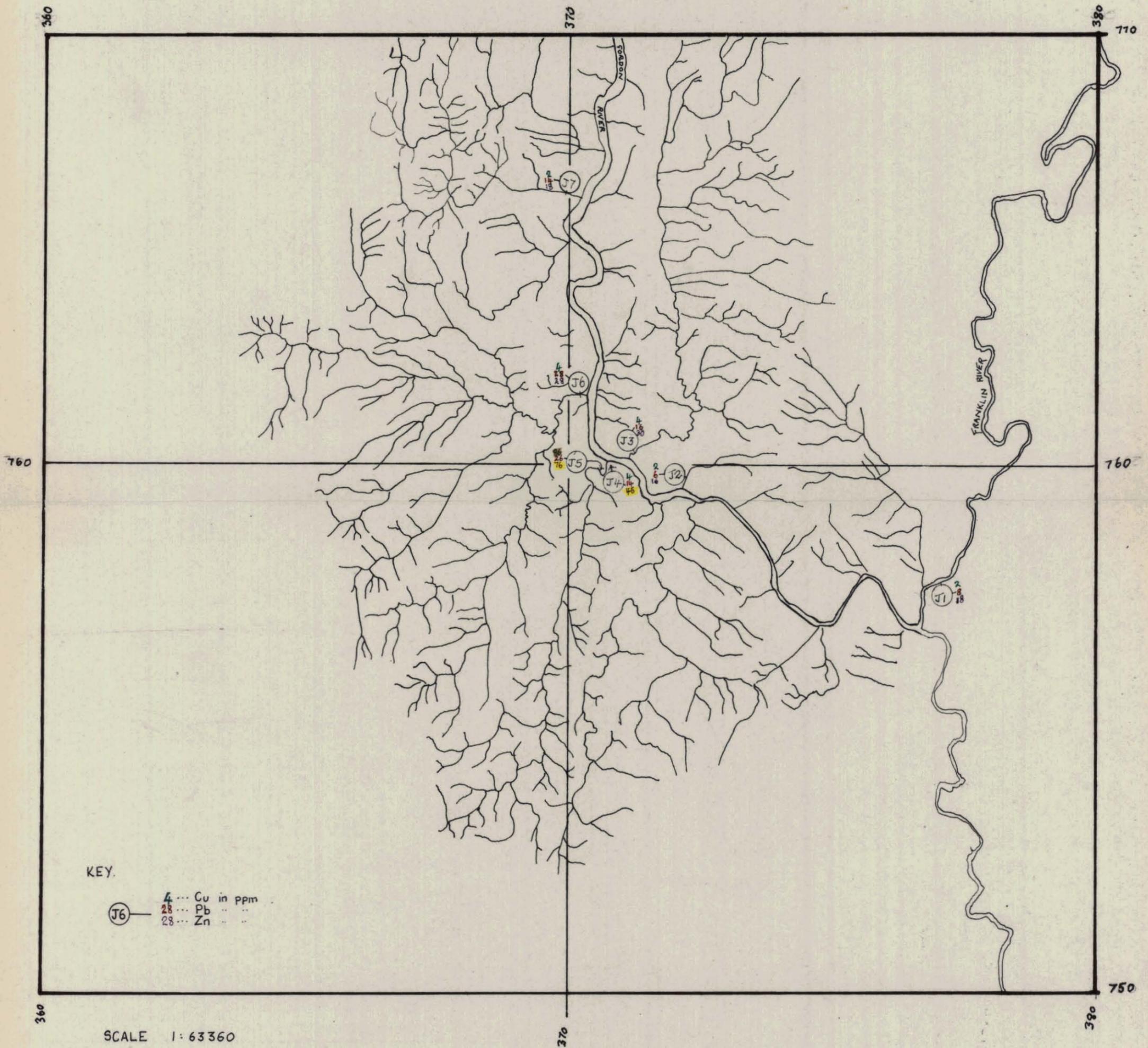
910017

1117

# OLGA MAP. GORDON RIVER.

71-730

910018



KEY.

(J6) — 4 ... Cu in ppm  
 28 ... Pb  
 28 ... Zn

SCALE 1:63360

5 cm

## GEOCHEMICAL DATA