

elc

4584

geophysics Ltd.

250 NORTH GROSVENOR, VANCOUVER, CANADA TELEPHONE: (604) 295-9619

This is ELC GEOPHYSICS LTD. Report No. 73-307
on the Magnetometer and Geochemical Surveys
For Highland Chief Mines Ltd.
Approx. four miles north and east of Clapperton, B.C.
121° W - 50° N - Kamloops M.D.
July 9, 1973 to Augst 28, 1973

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Department of
Mines and Non-Metallic Resources
ASSESSMENT REPORT
NO. 4584 M.P.



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ELC GEOPHYSICS LTD.
 250 N. Grosvenor Ave.
 Burnaby 2, B.C.

298-9619

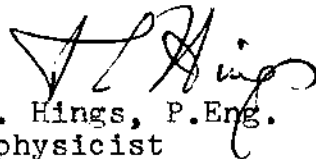
Conclusions arrived at from report No. 73-307
Highland Chief Mines Ltd.
Highland Valley Property.

Conclusions:

The geochem anomaly GC-1B on claims EGG-10, 19 and KG-35 is the major interest developed by the surveys.

The other anomalies warranting a close geological investigation are GC-1A, GC-5B, GC-1C and GC-1D.

It is recommended that access roads be the first consideration as the terrain is severe and only a few trails exist.


D.L. Hings, P.Eng.
Geophysicist

CB

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250 NORTH GROSVENOR, VANCOUVER, CANADA TELEPHONE: (604) 298-8619

ELC GEOPHYSICS LTD. REPORT NO. 73-307
ON THE MAGNETOMETER & GEOCHEMICAL SURVEYS
FOR HIGHLAND CHIEF MINES LTD.
APPROXIMATELY FOUR MILES NORTH AND EAST OF CLAPPERTON, B.C.
121° W - 50° N - KAMLOOPS MINING DIVISION
JULY 9, 1973 to AUGUST 28, 1973

Purpose:

The magnetometer and geochemical surveys are a continuation of development on this Highland Valley property as recommended by F.J. Hemsworth, P. Eng. April 22, 1971.

A previous reconnaissance EM geophysical survey was made over this area in September, 1970 and reference to this work may be found in the report ELC-70-107.

The magnetometer and geochemical surveys are shown on the plans with station spacing approximately 100 feet and line spacing 250 feet. The original grid lines and base line of the previous survey were utilized and interlacing grid lines were added covering four areas within the previous survey.

Location:

The Highland Valley property is located approx-

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imately four miles due east of Clapperton, B.C. 121° W-50° N., Kamloops, MD.

Presentation:

The magnetometer profiles and interpreted anomalies are shown on two plans wherein the A and B areas are on plan No. 73-307-1-M and the areas C and D are shown on plan No. 73-307-2-M.

The geochem determinations in ppm of copper and the contoured anomalies having a low value of 100 ppm and a second anomaly with values in excess of 200 ppm, are shown for areas A and B on plan No. 73-307-1-GC and for areas C and D on plan No 73-307-2-GC.

The related claims and topographical plans are No. 73-307-1-C and No. 73-307-2-C. The location plan is No. 73-307-L. A small claims layout plan is shown for convenient claims reference, on plan no. 73-307-R.

Personnel:

W. Mather-soil determinations, K. Pettersen-gridlines, E. Wiggins-magnetometer, S.Pranzl and J. Krygs-veld- grid lines.

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Extent of Survey:

The grid lines traversed a total of 155,100 feet, approximately 29.4 miles with magnetometer readings at 100 foot intervals. Soil geochemical determinations total 1,572 and correspond to the locations of the magnetometer stations.

Instrumentation:

Geochem - The geochem samples were taken from the B horizon first by removal of any overlaying debris, then digging a hole, using a round mouthed spade, approx. 15 inches below the surface. A sample from the hole was packaged using a standard kraft soil bag. The bags and sample determinations were supplied by Acme Analytical Laboratories Ltd. Burnaby, B.C.

Magnetometer - The magnetometer survey was conducted with a vertical field fluxgate self levelling instrument model M110 manufactured by Sabre Electronics of Vancouver.

Geological Reference:

Department of Mines and Technical Surveys Map 1010A. Previous history of work on property refer report on Highland Chief Mines Ltd. April 22, 1971, F.J. Hamsworth, P. Eng.

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Magnetometer Results:

Area A:

Referring to plan No. 73-307-1-M, the southern area A profile plan shows the interpreted linear strikes predominantly northwest-southeast, with a single linear strike D1 nearly perpendicular to the fracture pattern. The strongest anomalous features extend to the north up through L6A and L5A, following very closely to the ridge in the local terrain.

The apparent contact anomaly C2MA follows closely the east side of the valley ridge in the northern direction.

Area B:

The contact anomaly C2MB appears to be a continuation of the C2MA from the south and follows closely to the east side of the valley as far north as coordinate 20+00 S where the strike continues north of the valley. The linear anomaly L10B coincides more closely with the valley contour. The most prominent anomalies extend along the strike of L1B, L9B and L4B. Secondary anomalies of importance are L5B, L7B and L8B.

Geochemical Results:

Area A:

Refer to plan 73-307-1-GC. The two principal

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anomalies GC-1A and GC-2A having values in excess of 100 ppm of copper show a northwest-southeast trend on each side of the ridge area. The GC-2A anomaly shows a high in the area of coordinate 60+00 S which coincides closely with the west valley drainage. The northern half of the GC-2A anomaly is on the eastern slope of the ridge, with the highest enrichment in a slide area.

The GC-1A anomaly follows along the west slope of the ridge and appears to be offset at coordinate 60+00 S.

Area B:

The GC-1B is the main anomaly having two areas of enrichment with values in excess of 200 ppm, and values in excess of 100 ppm. The lower value anomaly extends northeast-southwest for approximately 1200 feet and shows a width of approximately 600 feet. The GC-1B anomaly covers in part a major slide area and converging valleys.

The geochem anomaly GC-5B to the northwest also shows values of higher enrichment and striking southeastward into the larger GC-1B anomaly.

The GC-2B and the GC-3B anomalies follow a northwest-southeast trend confirmed by geophysics. The GC-4B anomaly on the southern line shows a wider area of enrichment and appears to have the same strike trend.

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Magnetometer Results:

Area C:

Magnetometer profiles and anomalies for areas C and D are shown on plan 73-307-2-M. The principal anomalous profiles exist in the northern half of the C area, or north of the apparent fault F1C. The strong anomaly L1C and the associated anomalies L2C, L3C, L4C and L9C show the general fracture pattern for this area. The north-south trending D1C appears to be a dyke formation and L5C may be associated with a change in the rock formation. L2C and L8C form a continuation of the formation change.

Area D:

The D area extends from coordinates 25+00 N for nearly 8000 feet with an average width of approximately 1000 feet. The area was chosen for the north-south anomalous features that were predominant in previous geophysical surveys. The apparent contact C1-D extending into C2-D and then into L5D is nearly continuous from south to north and a general fracture pattern of branching linear anomalies to the northwest are prevalent, with the exception of L6D and L7D which correspond in strike with anomaly L1C of the C area.

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Geochemical Results:

Area C:

The geochemical determinations and anomalies for the C and D areas are shown on plan 73-307-2-GC. The highest area C enrichment is in the northwest corner within the anomaly GC-1C. A more linear type of anomaly is GC-2C to the east and appears to be closely related to GC-4C with both anomalies showing enrichment on the north end. The only other anomaly of significance is GC-3C which confines the significant geochem anomalies to the northern third of the C area.

Area D:

The geochem anomalies in the D area throughout the southern half are small and spotty. In the northern half the principal anomaly is GC-1D in the extreme northern portion. Two anomalies directly south are GC-2D and GC-3D both showing a northwest-southeast trend. The line 80+00 N shows an enrichment within the anomaly GC-4D and a small anomaly to the south GC-5D also shows a northwest-southeast trend.

Summary:

Area A:

The geochem anomaly GC-1A follows closely to

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the hill slope to the southwest on the claim EGG-6 and follows closely to the magnetic anomalies L2A, L3A and L3A1. The apparent offset coincides with the D1 linear fault anomaly. This would suggest the GC-1A geochem anomaly showed good correlation with the magnetic linear anomalies L2A, L3A, L3A1 and L4A1, as the latter three are on the high side of the sloping anomaly.

The anomaly GC-2A shows enrichment as it crosses the drainage pattern on line 62+50 S and again in the slide area on line 50+00 S. The anomaly is chiefly on the eastern slope towards the drainage pattern but is not supported throughout by a prominent magnetic anomaly. The D1 anomaly extending across the GC-2A appears to cover the anomalous area of greatest width. Smaller anomalies to the south showing a northwest-southeast alignment and drainage alignment indicate the general existence of copper enrichment in the area.

Area B:

The B area magnetometer anomalies, topographical anomalies and drainage pattern are quite complex, however the geochem anomalies are relatively confined to a northwest-southeast strike pattern with the exception of the chief anomaly GC-1B that extends over drainage patterns, slide area and outcropping slopes. Within the GC-1B anomaly at coordinates 20+00 S and 35+00 E at a

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point of high enrichment in the soil determinations, old workings exist, and sulfides were found. This is on the slope just north of the slides.

The apparent contact C2MB extends through the enriched portion of this anomaly and the fractures L1B, L2B, L5B and L7B correlate closely with this large area of enrichment. It should be noted that the enrichment does not favour the drainage pattern and must therefore be considered valid.

Area C:

Geochemical anomalies in the northern portion of the C area are small but show high enrichment. The GC-1C anomaly shows enrichment crossing the drainage pattern and extending beyond the survey to the north. This is perhaps the most interesting anomaly in the C area and further work to the north of line 45+00 N is warranted.

The GC-2C geochem correlates closely with the magnetic anomaly L4C and L7C. This anomaly is on the western slope and appears to be valid.

The geochem anomaly GC-3C correlates closely with the magnetic linear anomalies L1C and L9C. These are strong anomalies and appear to validate the geochem anomaly.

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Area D:

The geochemical anomalies on area D are characterized by their northwest-southeast strike but with the exception of geochem anomaly GC-1D and GC-2D the enrichment within the anomalies is not as high as elsewhere. The GC-1D in the north follows the drainage pattern from line 100+00 N to 105+00 N but the southern half of the anomaly striking to the southeast follows closely to the magnetic linear anomaly L5D. The drainage and the L6D magnetic anomaly correlate closely in the area of the geochem anomaly. There is sufficient enrichment in the GC-1D geochem anomaly to warrant geological investigation.

Both the geochem GC-2D and GC-3D are supported by linear anomalies L3D and L4D indicating their validity.

The GC-4D geochemical anomaly follows an east-west trend across the valley which is a converging point for drainage from the north, this casts some doubts on its validity.

The GC-5D is in a similar type location where the drainage is entering from the east into the valley, so this anomaly may also be a result of the drainage pattern.

D.L. Wings, P. Eng.

A statement of Costs for ELC Geophysics Ltd. Report No. 73-307
 Over the Highland Valley Property
 Approximately 4 miles north & East of Clapperton, B.C.
 121° W - 50° N. Kamloops M.D.
 For Highland Chief Mines Ltd.
 July 9 to August 28, 1973.

Field Crew:

K. Pettersen	23 days @ 60.00	\$ 1380.00	
W. Mather	17 days @ 60.00	1020.00	
E. Wiggins	17 days @ 45.00	765.00	
S. Pranzl	23 days @ 40.00	920.00	
D. Cramer	3 days @ 60.00	180.00	
J. Krygsveld	8 days @ 45.00	<u>360.00</u>	
			\$ 4625.00

Transportation

1/2 ton pickup	17 days @ 12.00	204.00	
4 x 4 truck	23 days @ 18.00	414.00	
1400 miles @ 12¢		<u>168.00</u>	
			\$ 786.00

Living Costs

90 mandays @ 10.00			\$ 900.00
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Instrument & Equipment

Magnetometer	23 days @ 10.00	230.00	
Misc. Supplies	23 days @ 5.00	<u>115.00</u>	
			\$ 345.00

Plotting & Drafting

R. Reece	15 days @ 60.00	900.00	
D.A. Cramer	5 days @ 60.00	<u>300.00</u>	
			\$ 1200.00

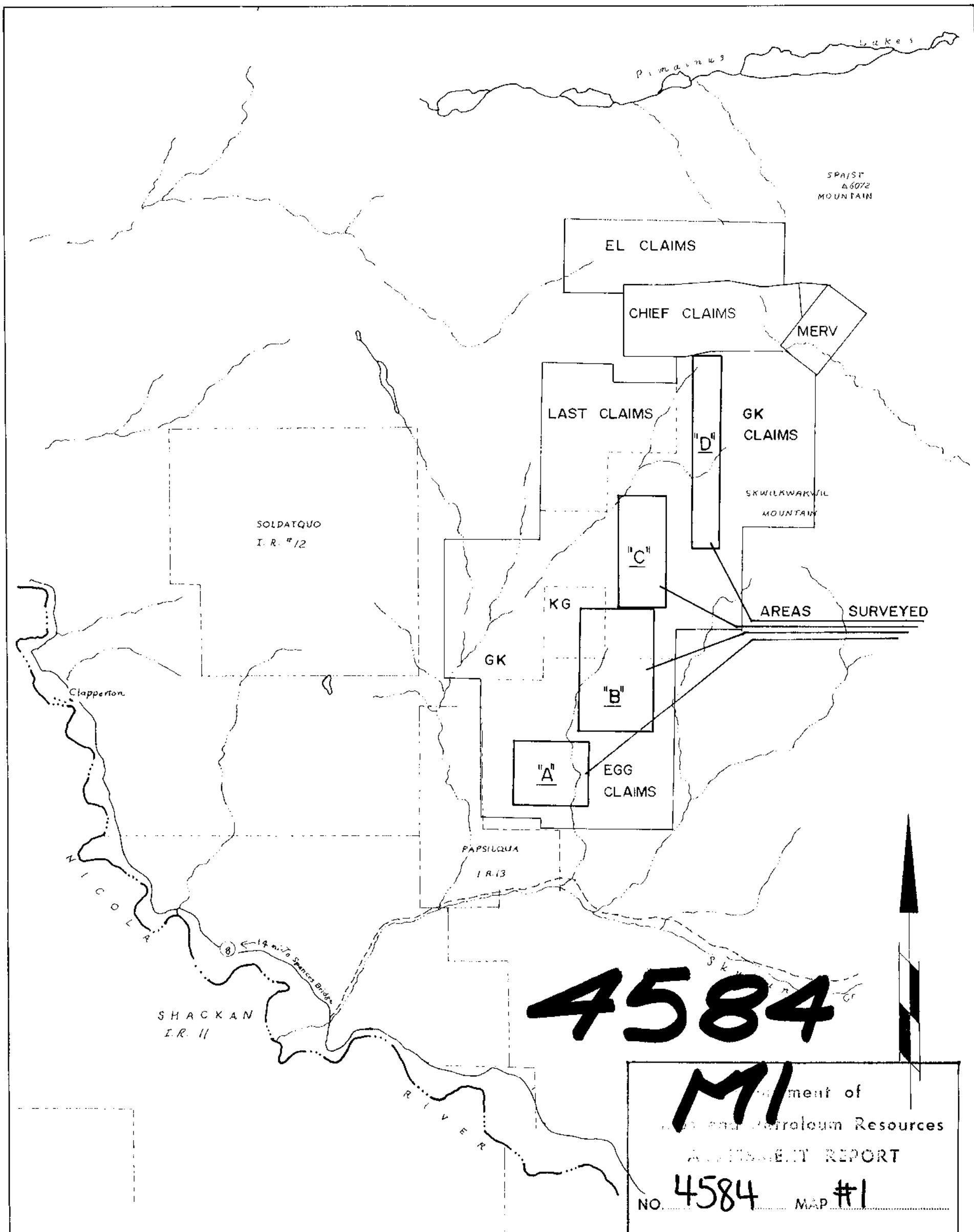
Interpretation & Report

D.L. Hings, P.Eng.	5 days @ 125.00	625.00	
C. Bowman	2 days @ 30.00	<u>60.00</u>	
			\$ 685.00

Soil Determinations

1500 samples @ 1.00			\$ <u>1500.00</u>
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Total Costs			\$ <u><u>10,041.00</u></u>
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ELC GEOPHYSICAL SURVEY

LAST, GK, KG & EGG CLAIMS CLAPPERTON B.C. AREA

HIGHLAND CHIEF MINES LTD.

AUGUST 1973 SCALE-8"=1 Mi. DWG. NO.: -ELC-73-307--L.

LOCATION PLAN

J.H. King

EL 10	EL 8	EL 6	EL 4	EL 2	
EL 11	EL 9	EL 7	EL 5	EL 3	EL 1

Chief 11	Chief 9	Chief 7	Chief 5	Chief 3	Chief 1	Why 21	Merv 18	Merv 20
Chief 12	Chief 10	Chief 8	Chief 6	Chief 4	Chief 2	Merv 17	Merv 19	

Last 8	Last 7			GK 2	GK 1	GK 14	GK 13
Last 6	Last 5	Last 12	Last 11	GK 4	GK 3	GK 16	GK 15
Last 4	Last 3	Last 10	Last 9	GK 6	GK 5	GK 18	GK 17
Last 2	Last 1	GK 25	GK 24	GK 8	GK 7	GK 20	GK 19
GK 40	GK 41	GK 27	GK 26	GK 10	GK 9	GK 22	GK 21

GK 50	GK 49	GK 48	GK 38	GK 39	GK 29	GK 28	GK 12	GK 11
GK 52	GK 47	GK 46	KG 36	KG 37	GK 31	GK 30	GK 35	GK 34
GK 51	GK 45	GK 44	KG 34	KG 35	GK 33	GK 32	GK 37	GK 36
GK 53	GK 43	GK 42	EGG 9	EGG 10	EGG 19	EGG 20		
	EGG 1	EGG 2	EGG 11	EGG 12	EGG 21	EGG 22		
	EGG 3	EGG 4	EGG 13	EGG 14	EGG 23	EGG 24		
	EGG 5	EGG 6	EGG 15	EGG 16	EGG 25	EGG 26		
	EGG 7	EGG 8	EGG 17	EGG 18	EGG 27	EGG 28		
					EGG 29	EGG 30		

4584
M2

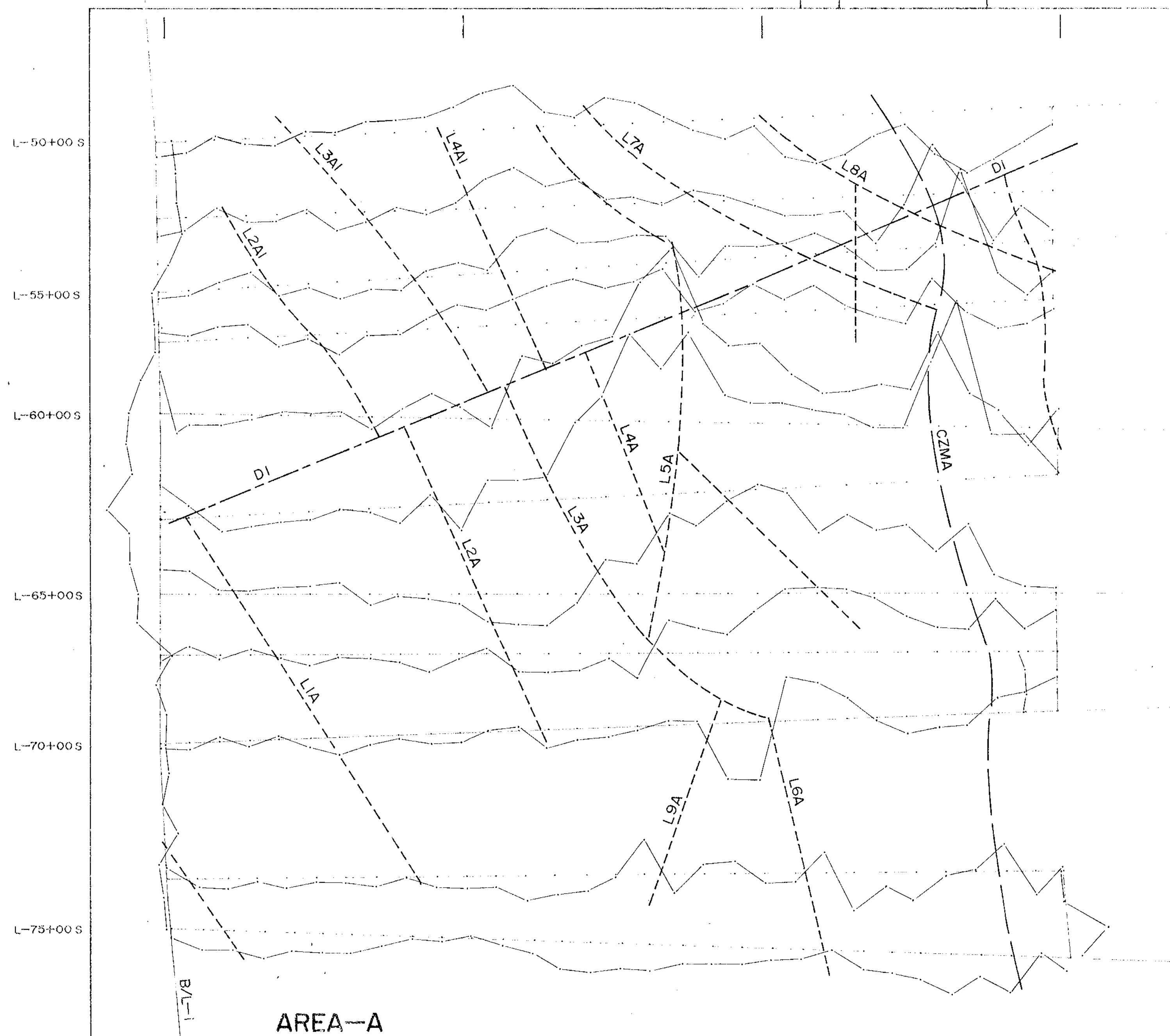
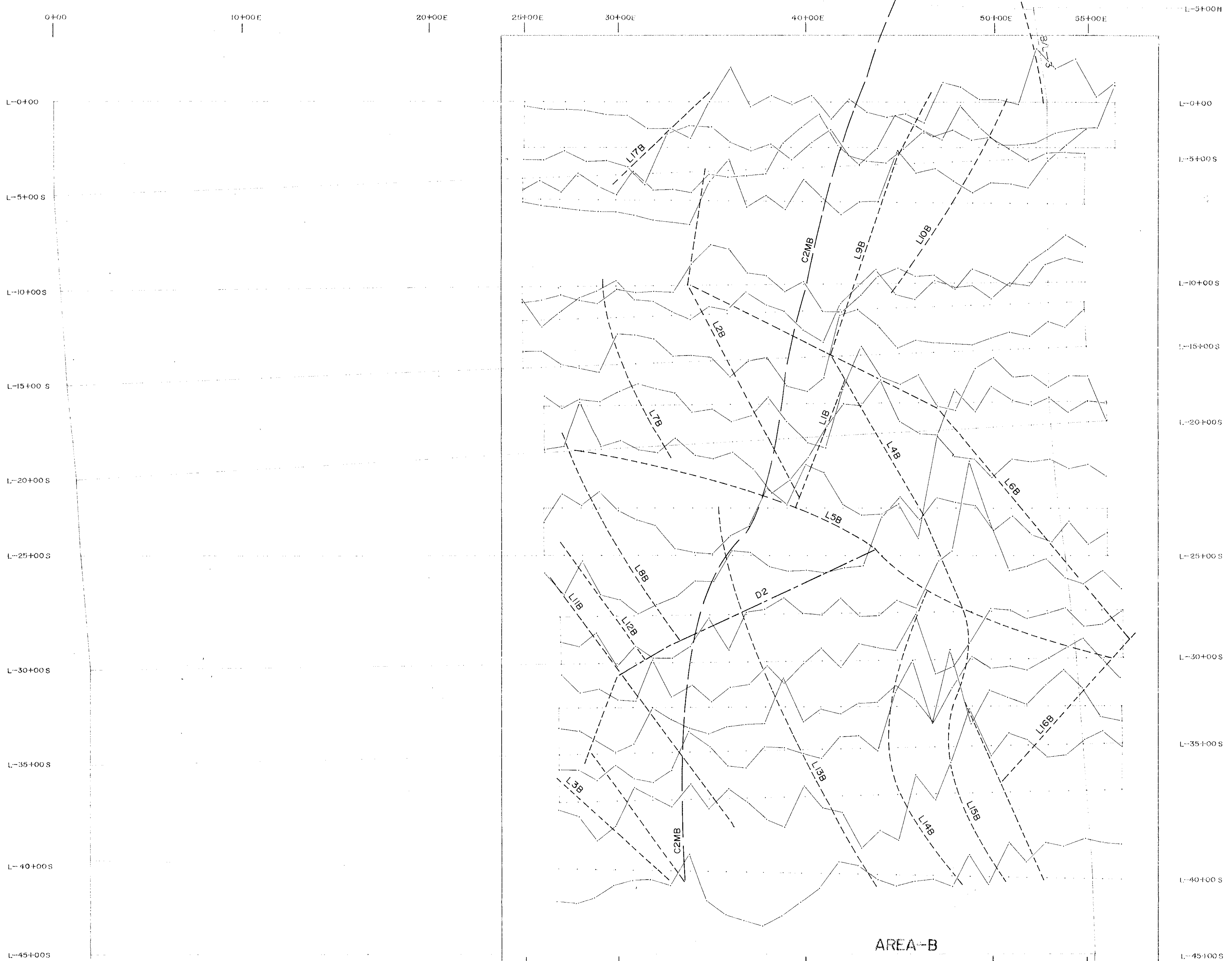
SCALE: - 1" = 3000'

Skuhun Creek

CLAIMS SKETCH PLAN

To accompany report no: ELC-73-307 AUGUST 1973 for HIGHLAND CHIEF MINES LTD.

JCA



NOTE:--
 - - - - - SURVEY LINES & STATIONS
 + - - - - ZERO LINE=55,500 GAMMAS
 - - - - - 1"= 1,000 GAMMAS
 - - - - - CONTACT ANOMALY
 - - - - - LINEAR ANOMALY
 - · - · - LINEAR FAULT ANOMALY (DYKE P)

4584
M3

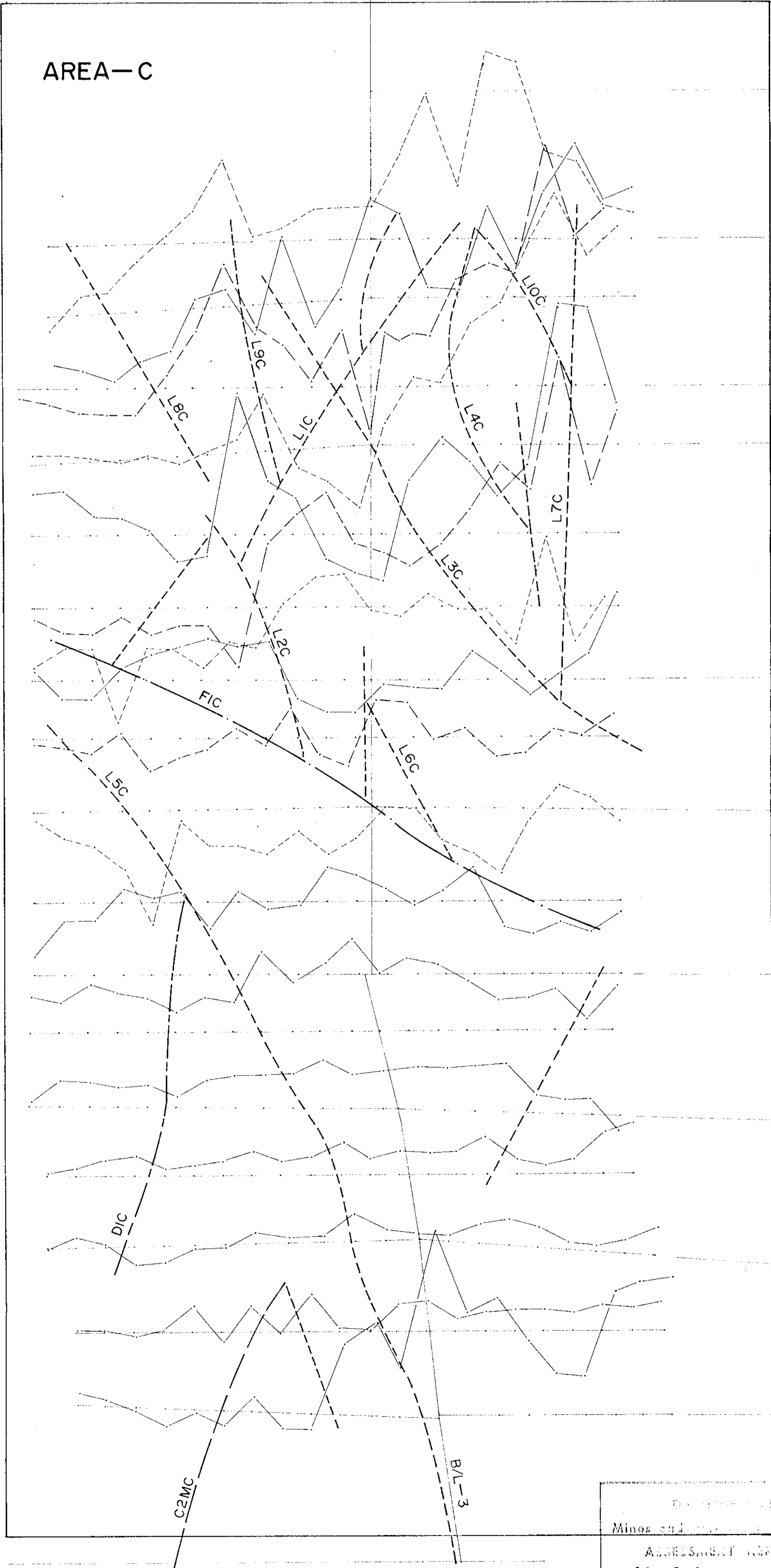
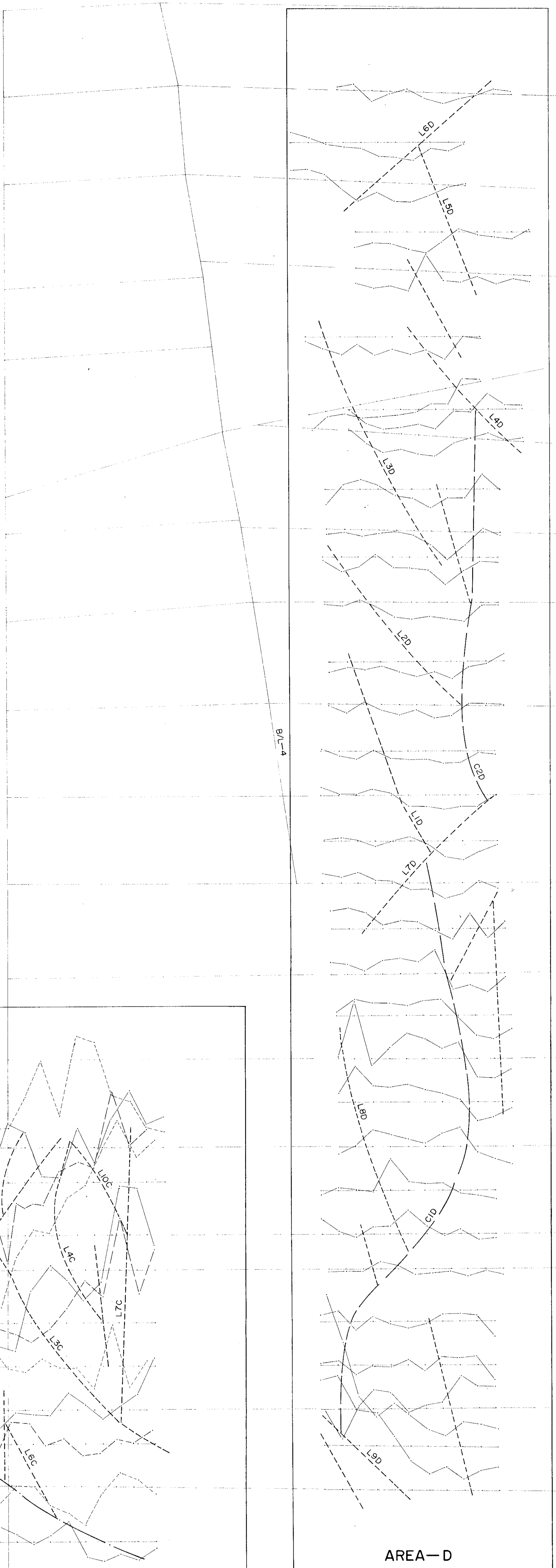
Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 4584 MAP #3

ELC GEOPHYSICAL SURVEY
 LAST, GK, KG & EGG CLAIMS CLAPPERTON BC AREA
 HIGHLAND CHIEF MINES LTD.
 AUGUST 1973 SCALE: 1"=250' DWG NO: ELC-73-307-1-M
 MAGNETOMETER PROFILES & INTERPRETED ANOMALIES

APPROVED: *[Signature]*

0+00 10+00E 20+00E 30+00E 40+00E 50+00E 60+00E

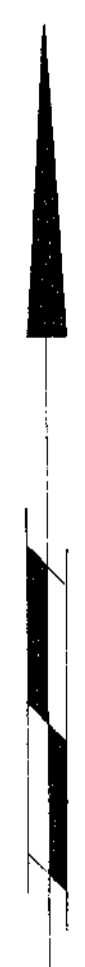
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L-105+00 N
L-100+00 N
L-95+00 N
L-90+00 N
L-85+00 N
L-80+00 N
L-75+00 N
L-70+00 N
L-65+00 N
L-60+00 N
L-55+00 N
L-50+00 N
L-45+00 N



AREA-D

AREA-C

- NOTE:-
- SURVEY LINES & STATIONS
 - + ZERO LINE=55,500 GAMMAS
1"= 1,000 GAMMAS
 - CONTACT ANOMALY
 - - - LINEAR ANOMALY
 - - - LINEAR FAULT ANOMALY (DYKE?)
 - FAULT



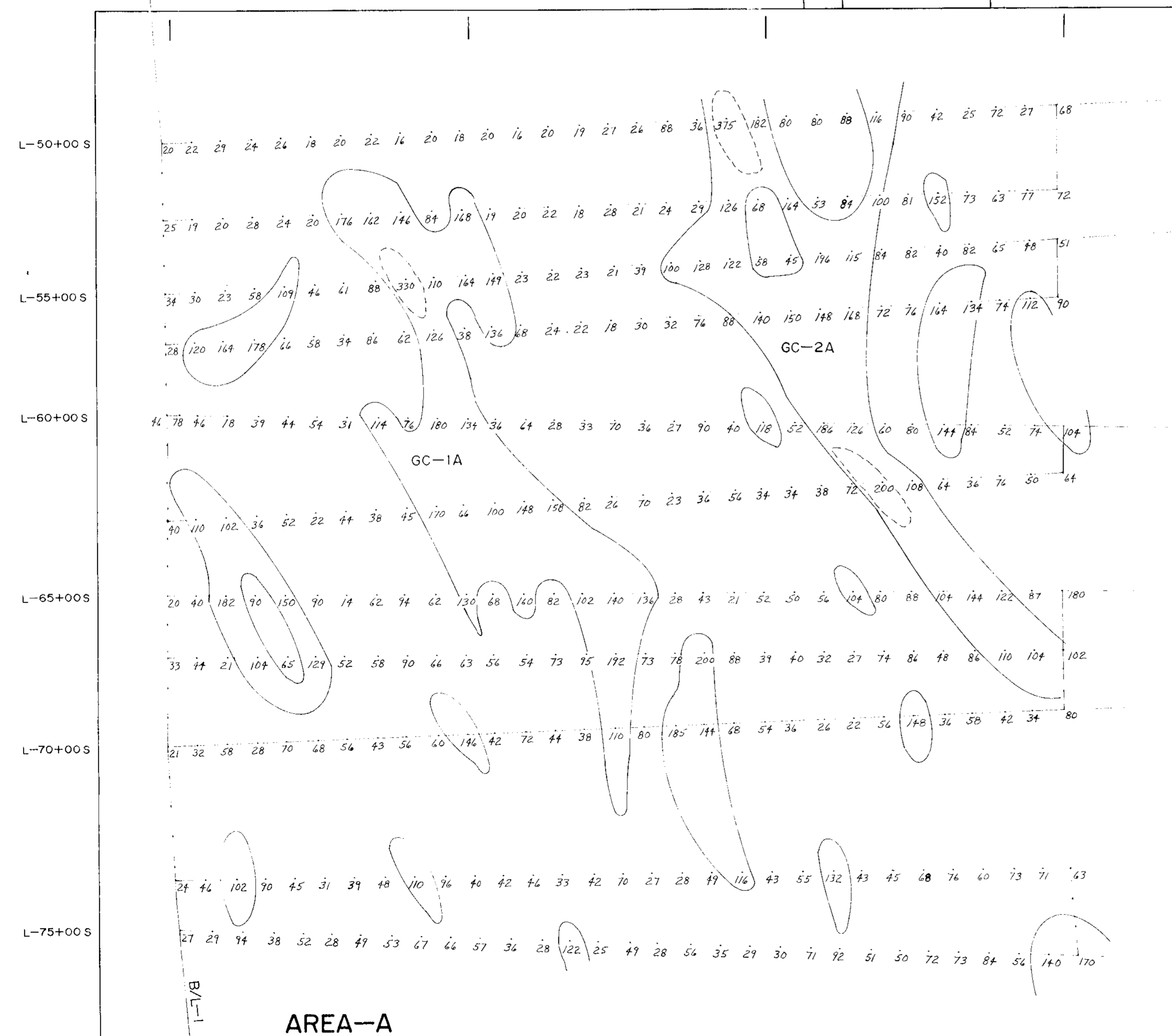
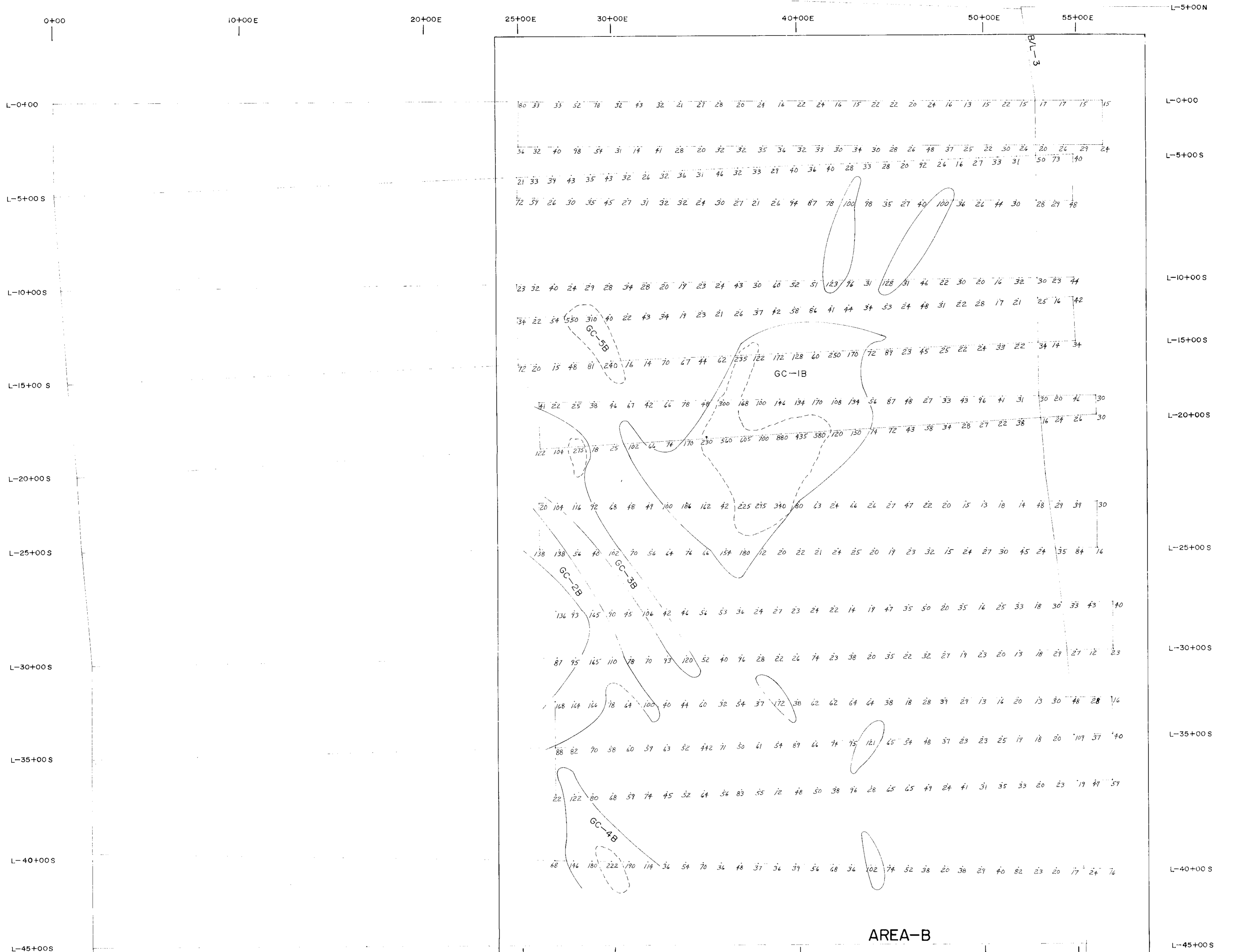
ELC GEOPHYSICAL SURVEY
ADDRESS REPORT
NO. 4584 MAP #4

ELC GEOPHYSICAL SURVEY
LAST, GK, KG & EGG CLAIMS CLAPPERTON B.C. AREA
HIGHLAND CHIEF MINES LTD.
AUGUST 1973 SCALE=1"=250' DWG NO:-ELC-73-307-2-M
MAGNETOMETER PROFILES & INTERPRETED ANOMALIES

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M4

APPROVED *[Signature]*

40+00E 50+00E 60+00E 70+00E 80+00E



NOTE:—
 — SURVEY LINES & STATIONS
 32 22 97 102 PPM Cu
 — GEOCHEM CONTOURS (100+PPM Cu)
 - - - GEOCHEM CONTOURS (200+PPM Cu)

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Department of
 Mines and Technical Resources
 ASSESSMENT REPORT
 NO. 4584 MAP #5

ELC GEOPHYSICAL SURVEY
 LAST, GK, KG & EGG CLAIMS CLAPPERTON BC. AREA
 HIGHLAND CHIEF MINES LTD.
 AUGUST 1973 SCALE=1"=250' DWG. NO.—ELC-73-307-1-GC
 GEOCHEMICAL RESULTS

APPROVED *[Signature]*

0+00 10+00E 20+00E 30+00E 40+00E 50+00E 60+00E

L-110+00 N

L-105+00 N

L-100+00 N

L-95+00 N

L-90+00 N

L-85+00 N

L-80+00 N

L-75+00 N

L-70+00 N

L-65+00 N

L-60+00 N

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L-40+00 N

L-35+00 N

L-30+00 N

L-25+00 N

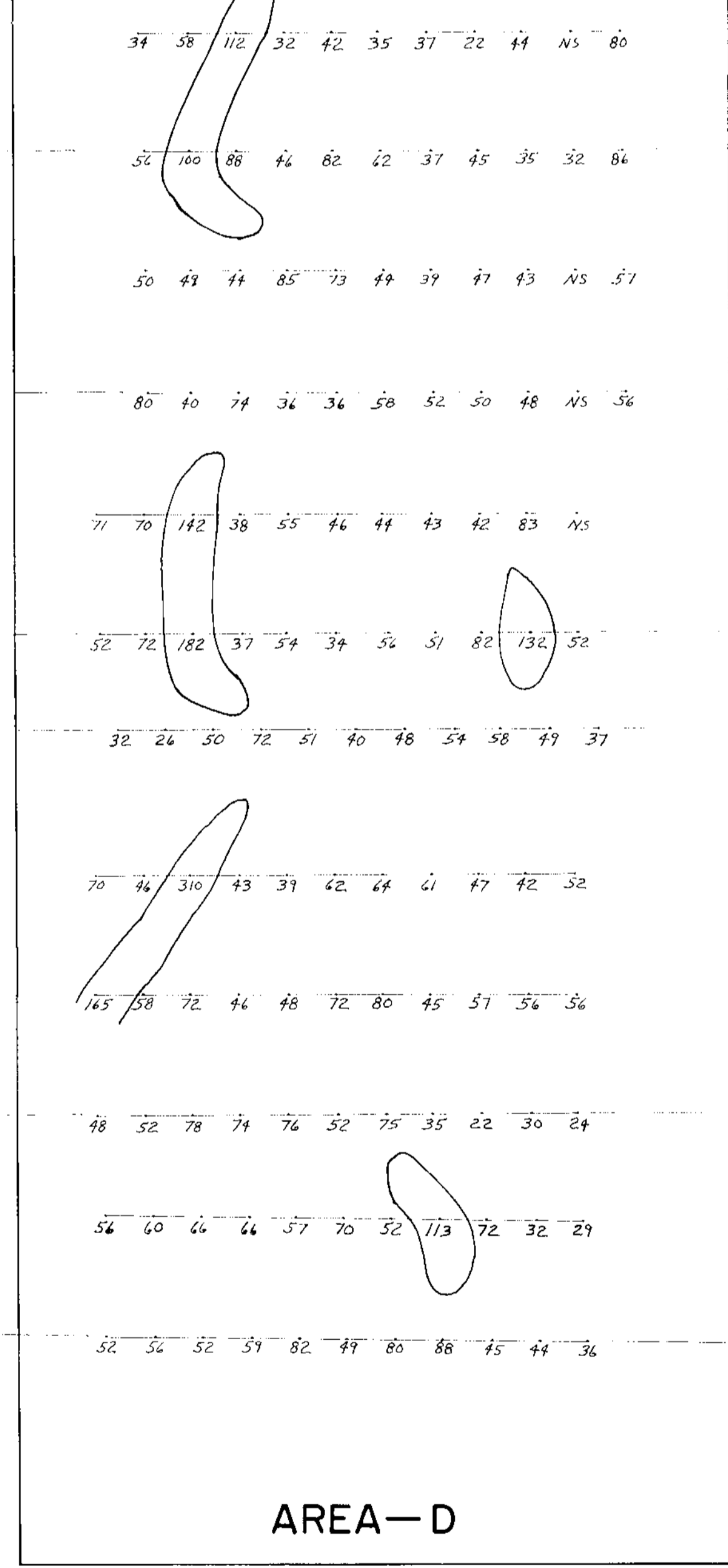
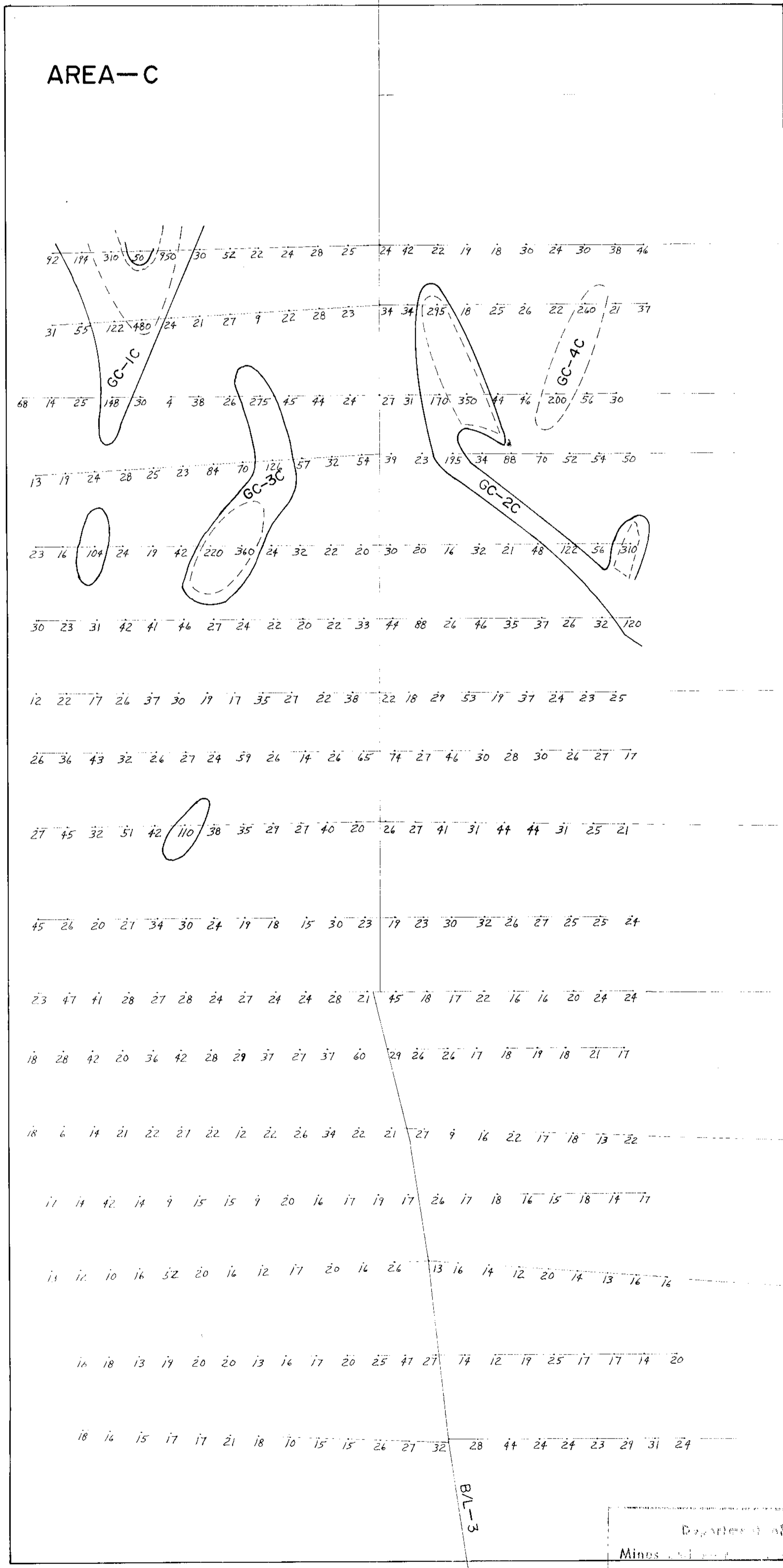
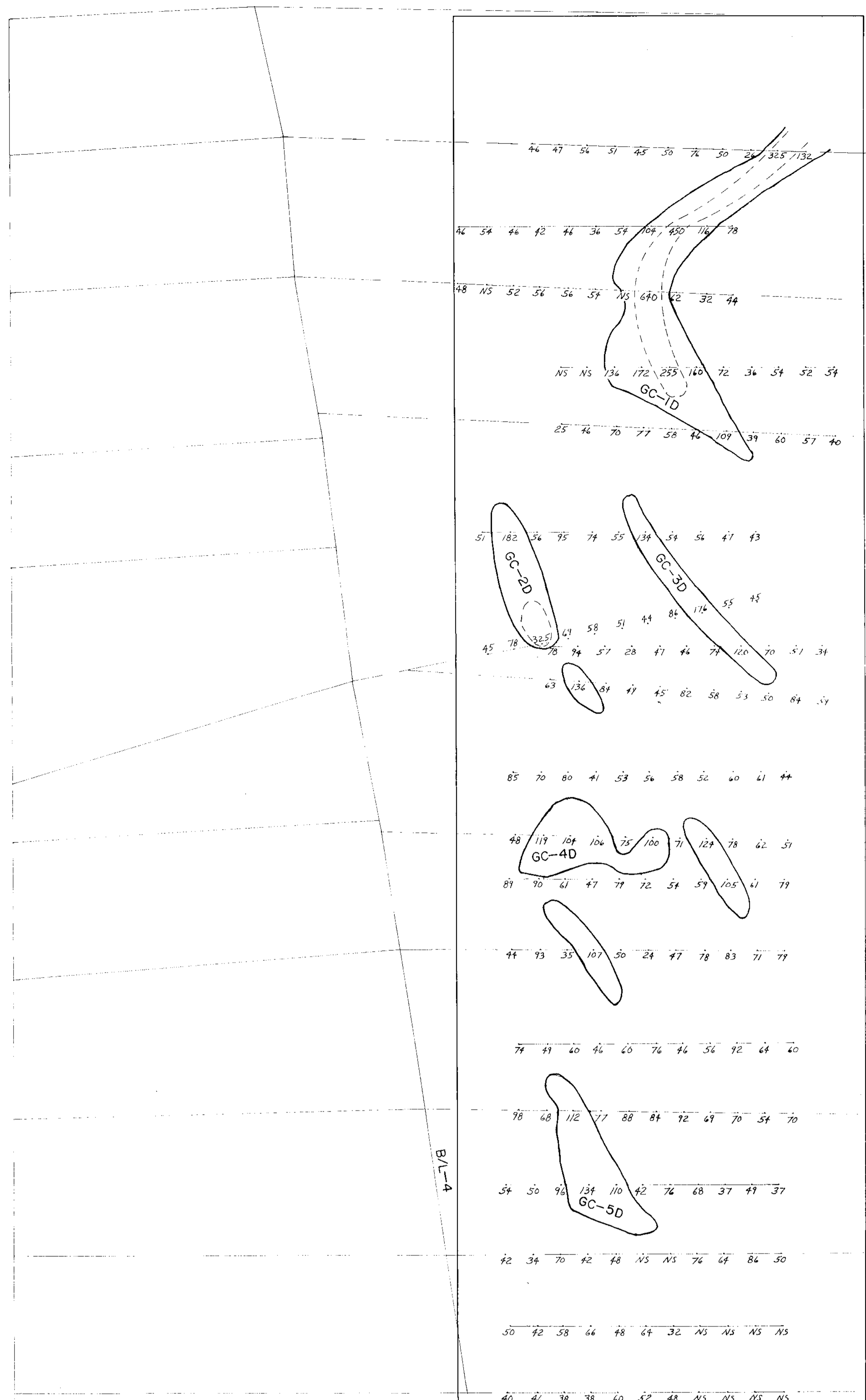
L-20+00 N

L-15+00 N

L-10+00 N

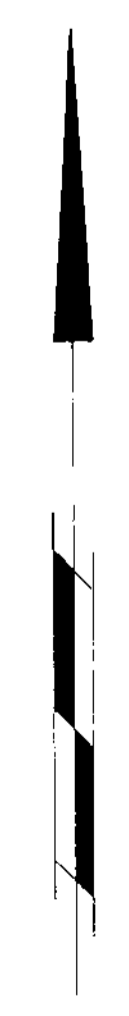
L-5+00 N

L-0+00



NOTE:-

- SURVEY LINES & STATIONS
- 20 32 113 24 PPM Cu
- △ GEOCHEM CONTOURS (100+PPM Cu)
- △ GEOCHEM CONTOURS (200+PPM Cu)



Department of
Mines and Geology
No. **4584** MAP #6

ELC GEOPHYSICAL SURVEY

LAST, GK, KG & EGG CLAIMS CLAPPERTON BC. AREA
HIGHLAND CHIEF MINES LTD.
AUGUST 1973 SCALE=1"=250' DWG. NO.-ELC-73-307-2-GC
GEOCHEMICAL RESULTS

4584
M6

APPROVED *[Signature]*

40+00E 50+00E 60+00E 70+00E 80+00E



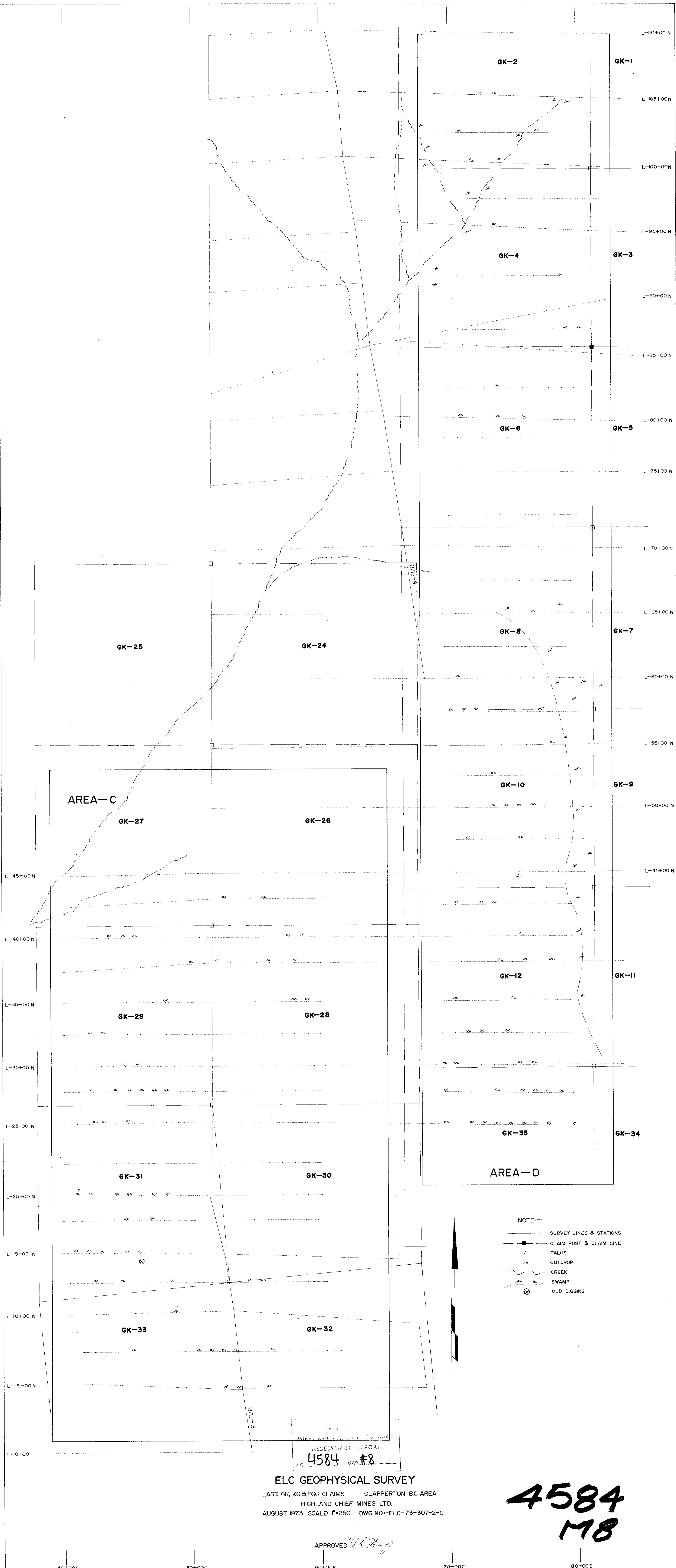
- NOTE--
- SURVEY LINES & STATIONS
 - CLAIM POST & CLAIM LINE
 - T TALUS
 - oc OUTCROP
 - ~ RAVINE
 - ⊗ OLD DIGGING

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **4584** MAP #7

ELC GEOPHYSICAL SURVEY
LAST, GK, KG & EGG CLAIMS CLAPPERTON BC. AREA
HIGHLAND CHIEF MINES LTD.
AUGUST 1973 SCALE=1"=250' DWG. NO.=ELC-73-307-I-C

APPROVED *[Signature]*

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L-110+00 N
L-105+00 N
L-100+00 N
L-95+00 N
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L-85+00 N
L-80+00 N
L-75+00 N
L-70+00 N
L-65+00 N
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L-50+00 N
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L-35+00 N
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L-0+00

GK-25

GK-24

GK-2

GK-1

GK-4

GK-3

GK-6

GK-5

GK-8

GK-7

AREA-C

GK-27

GK-26

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GK-28

GK-12

GK-11

GK-31

GK-30

GK-35

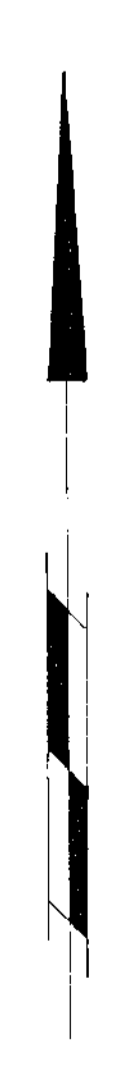
GK-34

GK-33

GK-32

AREA-D

- NOTE:-
- SURVEY LINES & STATIONS
 - CLAIM POST & CLAIM LINE
 - T TALUS
 - oc OUTCROP
 - ~ CREEK
 - sw SWAMP
 - ⊗ OLD DIGGING



ASSESSMENT REPORT
NO. 4584 MAP #8

ELC GEOPHYSICAL SURVEY
LAST, GK, KG & EGG CLAIMS CLAPPERTON B.C. AREA
HIGHLAND CHIEF MINES LTD.
AUGUST 1973 SCALE=1"=250' DWG. NO.-ELC-73-307-2-C

4584
M8

APPROVED *[Signature]*

40+00E 50+00E 60+00E 70+00E 80+00E