

PART A - INTRODUCTION

Geophysical Report on
Airborne Magnetometer Surveys on the
Mon, Ton, Big, East, Gibb, Clin, Chin,
W.C. and Caley Option Groups

situated in the Clinton Creek - Yukon River
area, North of Dawson City, Yukon Terr.

Dawson Mining District

Lat. $64^{\circ}15'$ to $30'N$; Long. $140^{\circ}00'$ to $141^{\circ}00'W$

Airborne Field Work Completed

between June 27 and 30; July 8 and 13, 1967

on behalf of

Sphere Development Corporation Ltd. (N.P.L.)

by

D. R. Cochrane, P.Eng.

August 10, 1967

Vancouver, B.C.



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

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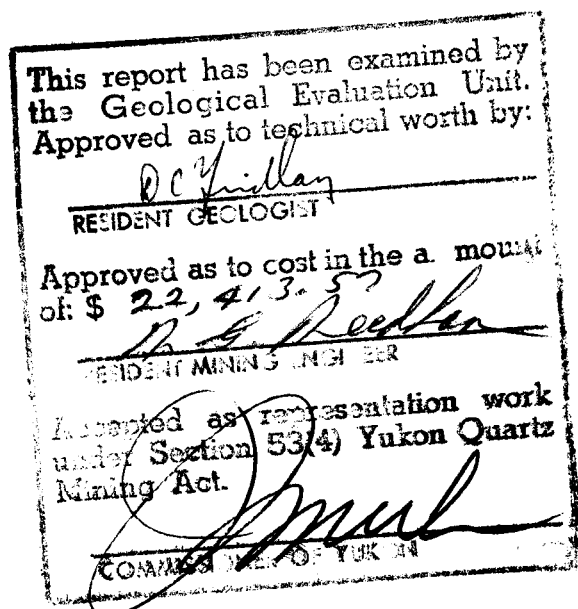
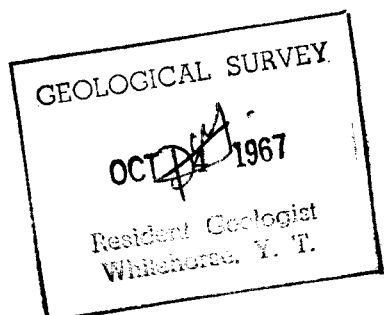
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A - 1 General Introduction

Between June 27 and 30, and ^{July} August 8 and 13, 1967, Geo-X Surveys Ltd., conducted airborne magnetometer surveys on ~~seven~~ claim groups situated in the Clinton Creek - Yukon River area of the Yukon. The surveys, on behalf of Sphere Development Corp., involved ~~six~~ ^{seven} separate areas, which, for report purposes are described in ~~six~~ ^{seven} separate report sections.

Report Section	Title	No. Claims	Proc'd Line Miles	Re-run & Detail Miles
A	General Introduction	-	-	-
B	Ton Group	15	15.20	0
C	Chin and Clin Groups	17	15.90	0
D		12	13.08	11.0
E	W.C. Group	44	25.15	0
F	Big, Gib and East Groups	50	56.06	53.0
G	Caley Option, Joe, Leslie and Ida Groups	24	27.95	22.90

Part A of this report describes the field procedure, instruments, specifications and data processing techniques. Subsequent report parts discuss the results of the aeromagnetic surveys of each individual area.

The vertical component fluxgate magnetometer unit contains a standard data capturing system (chart recorder, automatic camera) as described in sections A - 4 and A - 5. However, the data processing technique is somewhat unique in that the magnetic information is digitized and custom processed by a computer (discussed in section A - 6). The relatively new computer processing methods are extensively discussed in various technical publications tabulated in Appendix A - IV, bibliography.

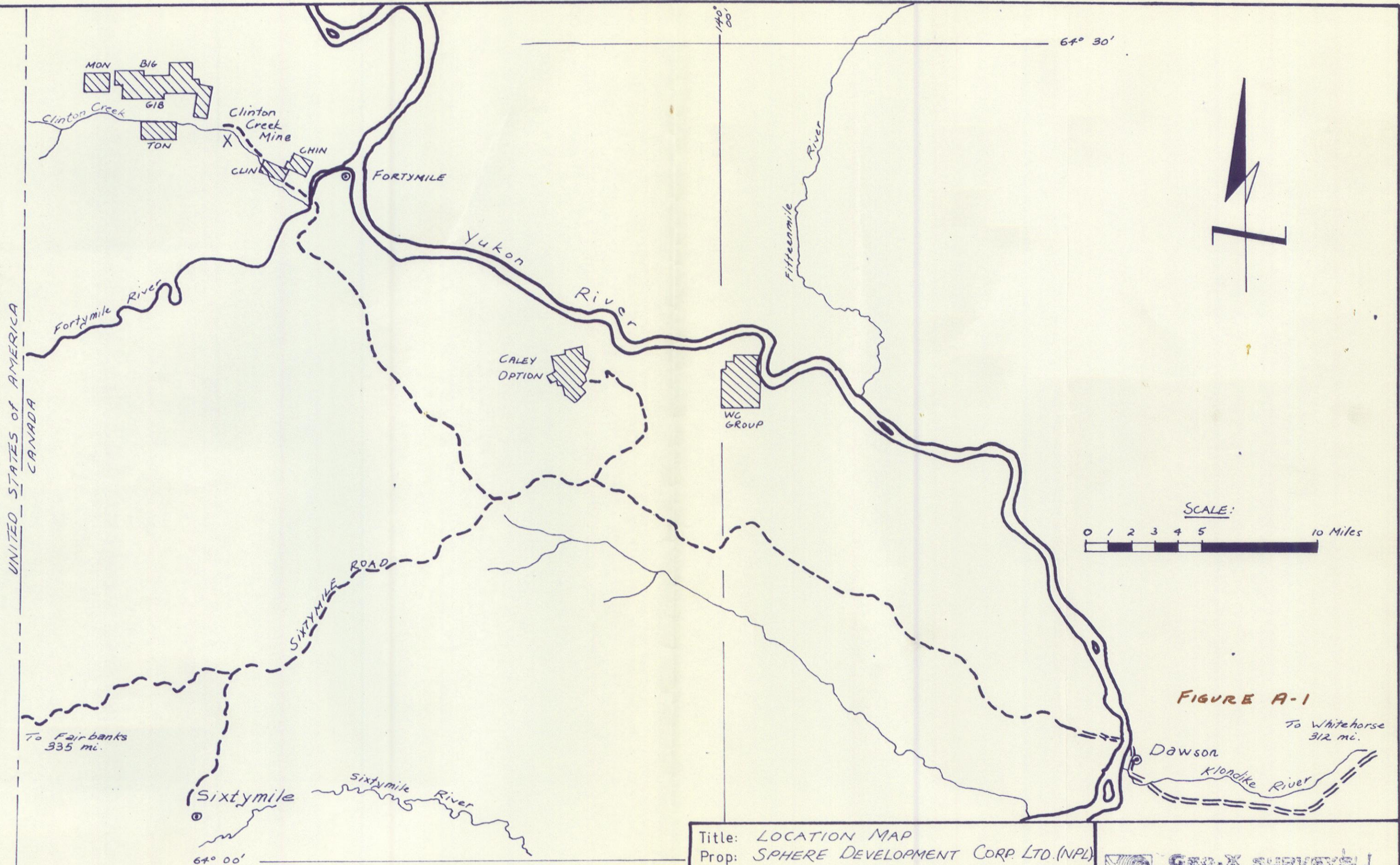
A - 2 General Location

Each of the six areas surveyed is located in the Forty Mile - Yukon River area of northwestern Yukon. The claim groups are between 25 and 55 airmiles north west of Dawson City. Each area is accessible by road, and the Clinton Creek Asbestos Mine road lies no further than 5 air miles from each of the areas flown.

An airport has been constructed immediately northwest of the Clinton Creek Mine open pit.

(See general location map)

The accurate location of each separate group will be discussed in their respective report sections.



Title: LOCATION MAP
 Prop: SPHERE DEVELOPMENT CORP. LTD. (NPL)
 Drawn: D.R.C.
 Checked: D.R.C.

Date: July 31, 1967.
 Date: Aug 10/67



GEO-X SURVEYS LTD.

627 HORNBY ST., VANCOUVER 1, B.C.

A - 3 Geomorphology

All of the claims lie within the Yukon Plateau province of the Interior Physiographic system. It is characterized by northwest terrain trends, and a gently rolling peneplained surface sloping towards the northwest, often with sharply incised river and stream channels. The area surveyed ranged from just over 1000 feet to under 3000 feet in elevation. The greatest majority of the area surveyed is forest clad, timber line approximately 3000 feet, however tree growth exists in protected draws up to 3500 feet. The south and west slopes are considerably better forested than north and east slopes. Forest cover is dominantly spruce and pine.

A - 4 Field Procedure

Preflight ground control projects consisted of preparing aerial photographs and base maps suitable for navigation and plotting; and setting out markers on claim lines and boundaries. Governmental air photographs, of each specific area, were enlarged from originals (flown in 1961 and 1963, scale 1" : 4200') to a scale of 1" : 1135'. Preliminary reconnaissance type contour plans were prepared from these photos by McElhanney Surveying and Engineering Ltd., of Vancouver, B.C. These base maps, at a scale of 1" : 500' were used for flight line plotting after scaled transfer from the enlarged aerial photographs.

Ground control markers were constructed with 6 mil blaze orange sheet plastic, placed at strategic intervals in each area. Between two and eight markers were set out on each area by a field crew under the direction of Mr. A. Burton, P. Eng., of Alrae Exploration.

Airborne equipment was installed on June 11, in a chartered Bell G - 3 - BI. Installation, checking and calibration of the equipment was supervised by Mr. D. M. Fritz. (see Appendix A - I, Certificates). Each area was surveyed by orientating the aircraft by the field markers and with the use of the air photographs, and flown at constant velocity and elevation above surface. Flight data and the operators report is contained in Appendix I of each section.

A - 5 INSTRUMENTS AND SPECIFICATIONS

The Geo-X Airborne Mag is mounted in an oil dampened gimbol, attached to an aluminum boom and fastened to an aircraft. The magnetometer continuously records the amplitude of the vertical field, utilizing a chart recording system. Ground control is maintained by an automatic camera which photographs at regular, specified intervals along the flight path.

SPECIFICATIONS:

Sensitivity: Four scales give full-scale reading of ± 150 ; ± 500 ; ± 1500 ; ± 5000 gammas. Readings $\pm 2\%$ of the full scale.

Frequency Response: DC or 0.5 cycles per second.

Chart Recorder: Bausch & Lomb VOM6 - self balancing potentiometer type.

Camera: Robot Recorder 24; 35 mm with large film magazine, regulated by a timing device.

Readout: Monitor meter on amplifier unit, and graphic chart recorder.

Power Supply: Vibrator converter that is operated by the aircraft battery, or power pack.

Sensing Head: Fluxgate element in oil dampened gimbal assembly.

A - 6 Data Processing

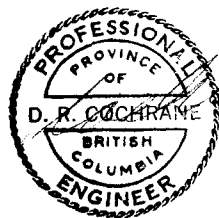
The relative amplitude of the vertical component of the earth's magnetic field was digitized at regular intervals from the chart records. Each value, termed z (gammas), is the amplitude of the field at that elevation and position. The position of each line is determined from the airborne photo mosaics and base maps. The location of each point is defined from an arbitrary origin and $x - y$ axis. For example, the first point on line 1 of the Mon Group was defined by $x = 5470$; $y = 000$; $z = + 40$, i.e. 5,470 feet due east of and 0 feet due north of the arbitrary origin, and the vertical was $+ 40$ gammas.

The digitized information is finally presented in tabulated form, and key punched on to computer cards. The computer processing is conducted by General Engineering Company Limited of Vancouver, on a Univac 1108 located in Richland, Washington. Its programme consisted of plotting the original z values (gammas) of each point; calculating the fourth degree approximation of each point; plotting and contouring the fourth degree trend surface; subtracting the calculated (approximation) value of each point from the original value, (called the residual value); and finally plotting and contouring the residual data.

Trend surfaces are mathematically computed gently curving surfaces that represent general, regular, regional trends. They are described in terms of $z = f(x,y)$ by a power series. First degree surfaces are planes that contain only linear terms; second degree surfaces contain both linear and quadratic terms and are bowl shaped; third degree surfaces contain linear, quadratic and cubic terms, etc. As previously mentioned the difference between the computed value of the actual surface, and trend surface at any point is termed the residual value.

The residual values may also be analyzed and contoured by trend surfaces. In aeromagnetometer surveys, residual surfaces represent areas differing from the regional magnetic trends of the area, and therefore represent local magnetic anomalies.

Respectfully submitted,

D. R. Cochran
A circular professional seal for D. R. Cochran, a Professional Engineer in the Province of British Columbia. The seal features the text "PROFESSIONAL ENGINEER" around the perimeter, "PROVINCE OF" at the top, and "D. R. COCHRANE" and "BRITISH COLUMBIA" in the center. A signature is written across the seal.

D. R. Cochran, P. Eng.

August 10, 1967.

APPENDIX A - I CERTIFICATES

The following Geo-X Surveys Ltd. personnel were employed on the project:

D. M. Fritz, instrument operator, superintendent, engaged in geophysical surveys for 5 years.

R. Robillard, instrument operator, engaged in airborne magnetometer work for 3 years.

B. Cochrane, college student, draftsman, employed since June 1967.

T. Hunt, graduate of B. C. Institute of Technology, data processing, employed since June 1967.

D. R. Cochrane, M.Sc. (Eng.), P. Eng., supervision of project.

APPENDIX A - II

BATES WORKED BY PERSONNELL

Field Work

Name	Occupation	Dates
D. M. Fritz	Instrument operator	June, 26, 27, 28, 29, 30.
R. Robillard	Instrument operator	July 8, 9, 10, 11, 12, 13, 14.

Data Processing

B. A. Cochrane	Draftsman, data process.	July 13. July 19 to Aug. 11.
D. M. Fritz	Layout, data process	June 20 to 23 July 4 to 14, July 18 to Aug. 8
T. Hunt	Data process	July 17 to Aug. 9.
D. R. Cochrane	Report preparation, supervision.	July 14, 24, 26 to Aug4, Aug. 10 to 13.

Appendix A-III - COST BREAKDOWN

Two contracts exist between Geo-X Surveys Ltd., 627 Hornby Street, Vancouver, B.C. and Sphere Development Corporation Ltd., 848 West Hastings Street, Vancouver, B.C. The contracts are summarized below.

Contract #1 - Geo-X agreed to conduct airborne magnetometer surveys, approximate line spacing of 500 feet, including photographic control on the following areas:

Ten Group	15 claims
Mon Group	12 claims
W. C. Group	45 claims
Chin and Clin Groups	17 claims
Big, Gib and East Groups	49 claims
Total:	138 claims

Total price of Contract #1 - \$13,580.00

Contract #2 - Geo-X agreed to conduct a magnetometer survey approximate line spacing of 500 feet, including photographic control on the following property:

Caley Option,

Joe, Leslie and Ida Groups total of 24 claims

Total price of Contract #2 - \$2,450.00

The terms and agreement s of the two above contracts have been fulfilled.

Ground control markers were set out by Alrae Exploration personnel, on behalf of Sphere Development.

Appendix A-III con't

The total cost of ground control and airborne costs of each area are summarized below:

<u>Claim Name:</u>	<u>No. of Claims</u>	<u>Airborne Appropriation</u>	<u>Ground Control</u>	<u>Total</u>
Ten Group	15	\$1,476.08 ✓	\$ 570.52 ✓	\$2,046.60 ✓
Chin & Clin	17	1,672.90 -	971.23 ✓	2,644.13 ✓
Mon Group	12	1,180.87 ✓	545.76 ✓	1,726.63 ✓
W.C. Group	45	4,428.27 ✓	1,544.77 ✓	5,973.04 ✓
Big, Gib & East	<u>49</u>	<u>4,821.88</u> ✓	<u>1,642.11</u> ✓	<u>6,463.99</u> ✓
Total:	<u>138</u>	<u>\$11,580.00</u>	<u>\$5,274.39</u>	<u>\$18,854.39</u>
 Caley Option, Ida, Leslie, Joe	 24	 \$2,450.00	 \$1,109.18	 \$3,559.18

APPENDIX A - IV BIBLIOGRAPHY

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PART B

Geophysical Report on the
Airborne Magnetometer Survey
of the

TON Group of Claims
Yukon Territory
Dawson Mining District

Latitude $64^{\circ}30'$ N, Longitude $142^{\circ}00'$ W

Airborne Field Work Completed July 12, 1967

on behalf of

Sphere Development Corporation Ltd.

by

D. R. Cochrane, P. Eng.

August 10, 1967
Vancouver, B.C.



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

PART B, The TON Group

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Appendix

B-I	Flight Data and Operators Report
B-II	Cost Appropriation

B-1 INTRODUCTION

On July 12, 1967, 15.20 line miles of an airborne magnetometer survey with coincident air photography were completed on the Ton Group of 15 claims, situated in the Clinton Creek area of the Yukon. Subsequent data processing of the information took place between July 13 and August 13. The survey and processing was conducted by Geo-X Surveys, on behalf of Sphere Development Corporation Ltd. This report discusses the results of the survey.

B-2 LOCATION

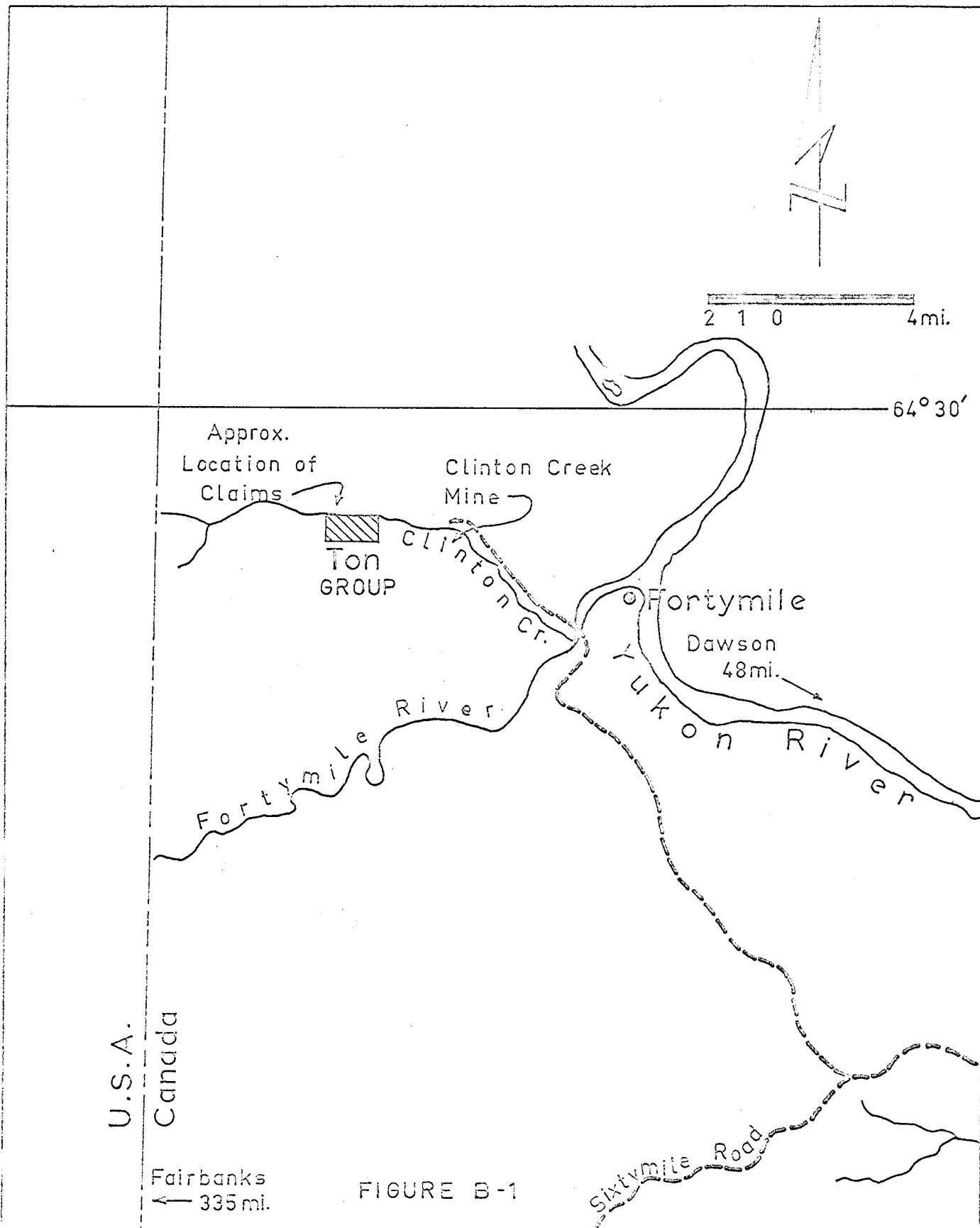
The property is centred on Clinton Creek, approximately two miles due west of the Clinton Creek Asbestos Mine. It is six miles east of the Yukon-Alaska Border, and fifty air miles northwest of Dawson City. (See Figure B-1)

B-3 CLAIMS AND OWNERSHIP

The Ton No. 1 to No. 15 claims are owned outright by Sphere Development Corporation Ltd., registered office 848 West Hastings Street, Vancouver. The following table summarizes pertinent claim data:

Claim Name	Record No.	Group	Group No.	G.R. No.
Ton 1 to 8 Incl.	87737 to 87744 Incl.	G	149	Y287829
Ton 9 to 15 Incl.	87558 to 87664 Incl.	G	149	Y287829

The anniversary date of Ton 1 to 8 inclusive is July 30, and Ton 9 to 15, July 25. The claims lie in the Dawson Mining District. (See Figure B-2)



Title: Location Map Ton Group
 Prop: Sphere Devel't Corp. Ltd.(NPL)

Drawn: B.A.C.

Date: August 3, 1937.

Checked: B.A.C.

Date: 2/20/47



Geo-X SURVEYING CO.

627 HORNBY ST., VANCOUVER 1, B.C.



750' 0 1500'

9	7	5	3	Ton 1
$\frac{2}{2}$	$\frac{12}{12}$	$\frac{12}{12}$	$\frac{12}{12}$	$\frac{12}{12}$
10	8	6	4	2
$\frac{2}{2}$	$\frac{12}{12}$	$\frac{12}{12}$	$\frac{12}{12}$	$\frac{12}{12}$
15	14	13	12	11

FIGURE B-2

Title: Claim Map Ton Group
 Prop: Sphere Devlp't Corp. Ltd. (NPL)
 Drawn: B.A.C. Date: August 7, 1967.
 Checked: *D.H.* Date: *Aug 10/67*



Geo-X SURVEYING *DL*

227 HORNBY ST., VANCOUVER 1, B.C.

B-4 GEOMORPHOLOGY

The Ton Group is divided into two roughly equal halves by the easterly flowing Clinton Creek. The creek bed, elevation 1400 feet is the lowest point on the property, and a partially forested hill on the southeast corner, elevation 2300 feet, is the highest point. A small north flowing tributary of Clinton Creek is fairly rapid, falling 700 feet in just under a mile, and has a reasonably deeply incised V shaped valley. Most of the property is forested. (see Figure B-3)

B-5 FIELD PROCEDURE

The Ton Group was flown from east to west, at an elevation of 600 feet above ground and at a speed of 60 miles per hour. Flight line spacing (see Map B-3) varied from a maximum of 900 feet to a minimum of 300 feet. Ground control and air photo coverage was very good and both ground markers were located. Ten lines were completed and these varied in length from 1.35 to 1.65 line miles. (See Appendix I, Flight Data and Operators Report and Figure B-3)

B-6 INSTRUMENTS AND SPECIFICATIONS (See Part A-5)

B-7 AEROMAGNETIC DATA AND DISCUSSION

(a) Original Data

A Total of 617 combined x, y and z points were tabulated and processed on the Ton Group. The dx interval (along line digitizing interval) was 132 feet. The maximum z value encountered

B-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

was + 900 gammas on line 7, and the minimum value, -885, occurred on the same line. Figure B-5, The Isomagnetic Contour Plan of Original Data, shows a large magnetically positive area in the north central and northwest corner, containing several discrete +500 gamma areas. The positive plateau is flanked to the south and west by a series of negatives. The largest and most consistent positive area, on claims Ton No. 7 and No. 8 and is named anomaly B-1. This anomaly is flanked to the east by a smaller +500 gamma area, and also to the west. These are the only extensive positive areas. The broad horseshoe shaped negative centred on claim Ton No. 2 and a diffuse negative to the south on claim Ton No. 11 are named anomalies B-2 and B-3 respectively.

(b) Trend Surface

A fourth degree trend surface was calculated and contoured by the Univac 1108. The coefficient of correlation of the surface was very good at 0.436. The surface is presented as Figure B-6. The surface was contoured at a 40 gamma interval, scale of 1 in:500 feet. The fourth degree trend surface has defined a large +360 gamma area, elliptical in plan, with the major axis east-west. The magnetic high, named anomaly B-1, is centred on the mutual corners of Ton No. 5, 6, 7, and 8.

Trend analysis featured anomaly B-3 in preference to B-2 (original data anomaly B-2 is calculated as background only),

B-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

and B-3 has been extrapolated and amplified to the southeast.

A third negative anomaly has been extrapolated onto Claim Ton No. 15. This anomaly may or may not be a real situation and is named anomaly B-4.

(c) Residual Surface

The contoured surface of the difference between the actual (or original) data and calculated data, is the residual surface and often represents local anomalies. This contoured plan is presented as Figure B-7, and is the fourth degree surface of the fourth degree residuals. The surface is contoured at 20 gamma intervals, on a scale of 1 in.:500 feet. The residual contours have featured three anomalies. Anomaly B-1 is close to original data, and original trend surface anomalies B-1, but is displaced several hundred feet north. Due to the excellent fit of the trend surface, it is suggested here that the anomaly termed B-1 is a large, broad, regional anomaly, which has been too well fitted by the trend analysis, therefore leaving minimal residuals. The displacement of the residual from the original trend anomaly may in fact be real, but should in any event, be investigated.

The residual trend surface has featured negative anomaly B-3, and shifted this anomaly due south. It has amplified anomaly B-4 to an extreme value of +440 gammas, 340 gammas above the regional trend.

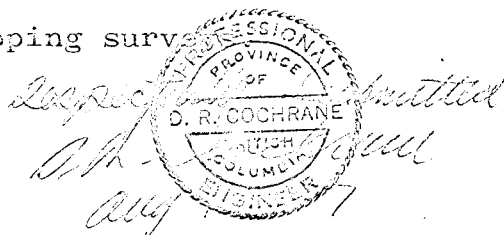
6-8 SUMMARY AND CONCLUSIONS

On July 12, 1967, 15.20 line miles of coincident airborne magnetometer and aerial photography was completed on the Ton Group of claims, Dawson Mining District. The fifteen Ton claims are owned outright by Sphere Development Corporation, and airborne work was conducted on their behalf by Geo-X Surveys Ltd.

Ten Lines, approximately 500 feet apart and between 1.35 and 1.65 miles long were flown. Ground control and aerial photographic coverage was excellent. A total 617 combined x,y (geographic co-ordinates) and z (gamma values) were digitized and processed by a Univac 1108 computer. Three original data anomalies were outlined, anomaly B-1 being positive and B-2 and B-3 negative. The contoured fourth degree trend surface of original data displayed "good fit qualities" (coefficient of correlation 0.436) and the trend surface indicated a fourth negative anomaly, named B-4.

The fourth degree residuals were contoured with a fourth degree trend surface. Apparently, because of the goodness of the fit, and broad general nature of anomaly B-1, this anomaly was not outlined. However, negative anomalies B-3 and B-4 were well featured.

Because of the proximity of the Ton Group of claims, and the Clinton Creek Asbestos Mine, and the association of the latter with basic intrusives with high magnetic susceptibility, it is recommended that anomaly B-1, situated on or near claim numbers Ton 5, 6, 7 and 8, be investigated on the ground by ground magnetometer and normal geological mapping surveys.



APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: TON GROUP Job: 1002 (B) Date: JUNE 28/67
 Operator: R. ROBILLARD Flight elevation: 600 FEET
 Direction flown: WEST Air speed: 60 M.P.H. Chart scale: 1:15000
 Weather: +60° CLEAR - INTERMITTANT CLOUDS - VISIBILITY GOOD

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gammas	Min. Z gammas
	X	Y	X	Y			
1	528	0	9240	130	1.65	600	-230
2	170	130	8618	830	1.60	780	-240
3	240	260	8688	1250	1.60	700	-285
4	240	570	8160	2120	1.50	450	-790
5	1480	1915	8608	2645	1.35	705	-450
6	0	2235	7920	3090	1.50	385	-510
7	0	2630	7788	3363	1.47	900	-885
8	290	2950	8210	3545	1.50	410	-570
9	550	3294	8206	3865	1.45	360	-620
10	460	3750	8644	4500	1.55	670	-430

Total number of X, Y, Z points 617

Total number on line miles 15.20

Signed R. Robillard.

Appendix II - COST APPROPRIATION

**As per contract for airborne surveys between
Geo-X Surveys Ltd., and Sphere Development Corporation Ltd.**

Survey of Ton Group	\$ 1,476.08
Ground Control (see following page)	<u>570.52</u>
Total	<u><u>\$ 2,046.60</u></u>



ALRAE EXPLORATION LTD.

202 - 846 WEST HASTINGS STREET, VANCOUVER 1, B.C. TELEPHONE 681-9381

Sphere Development Corp. Ltd.
848 West Hastings Street
Vancouver 1, B. C.

RE: TON 1 - 15 incl.

Re: Location and marking claims for Aerial Magnetometer Survey

Personnel

Days	Name	Occupation	Dates	Gross Wages
2	B. Smollman	Line Cutter	June 17, 26/67	\$ 67.34
1	P. Cumberbirch	Line Cutter	June 17/67	33.67
1-1/2	B. Garner	Asst. Geol.	June 20, 28/67	66.29
1-1/2	D. V. Preston	Asst. Geol.	June 26, 28/67	66.29
1	A. Burton	Geologist	June 28/67	113.28
7				\$ 346.87
	Topographic mapping - McIlhenny Ltd.			82.65
	Transportation - truck and Honda rental field supplies and hardware			141.00
				\$ 570.52

ALRAE EXPLORATION LTD.
846 W. HASTINGS ST.
VANCOUVER 1, B. C.

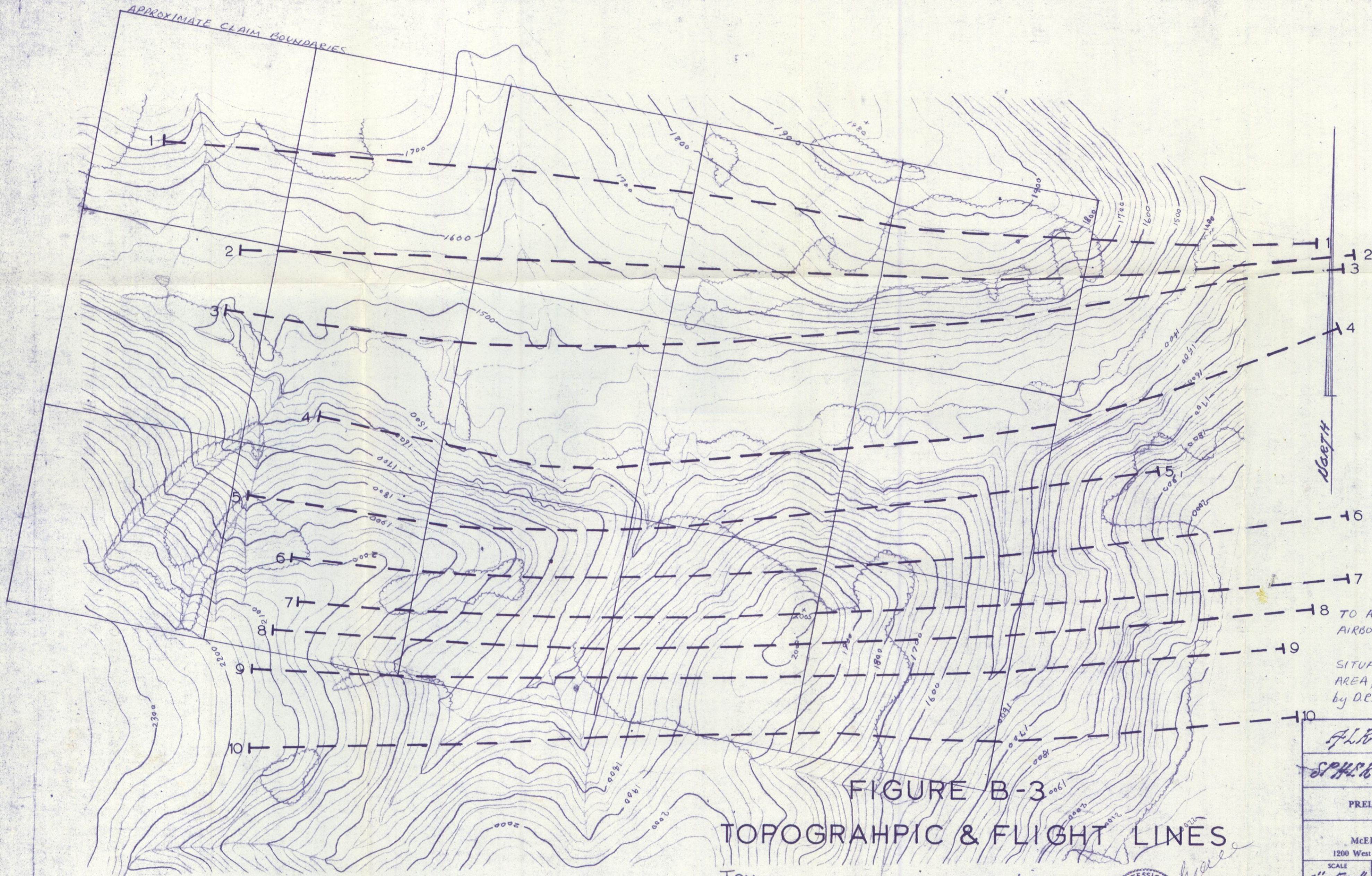
[Handwritten signature]

*Paid in Full
A. Burton*

GEOLOGY
Exploration

CONSULTANTS
Development

MINING
Production



TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
TON GROUP
SITUATED IN THE CLINTON CR.-YUKON R.
AREA, NORTH OF DAWSON CITY, YUKON TERR.
by D.R. COCHRANE, P.ENG. dated AUG 10, 1967
VANCOUVER, B.C.

ALPAC EXPLORATION LTD.
SPHERE DEVELOPMENT CORP. LTD.

PRELIMINARY RECONNAISSANCE TYPE MAPPING

Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

SCALE 1" = 500'	CONTOUR INTERVAL 35'	DATE JUNE 1967	JOB NO. R152	SHEET NO. 2 of 4
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SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL
RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY
COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE
OF 1" INCH EQUALS 4200 FEET FLOWN IN 1961 & 63

GEO-X SURVEYS Ltd.

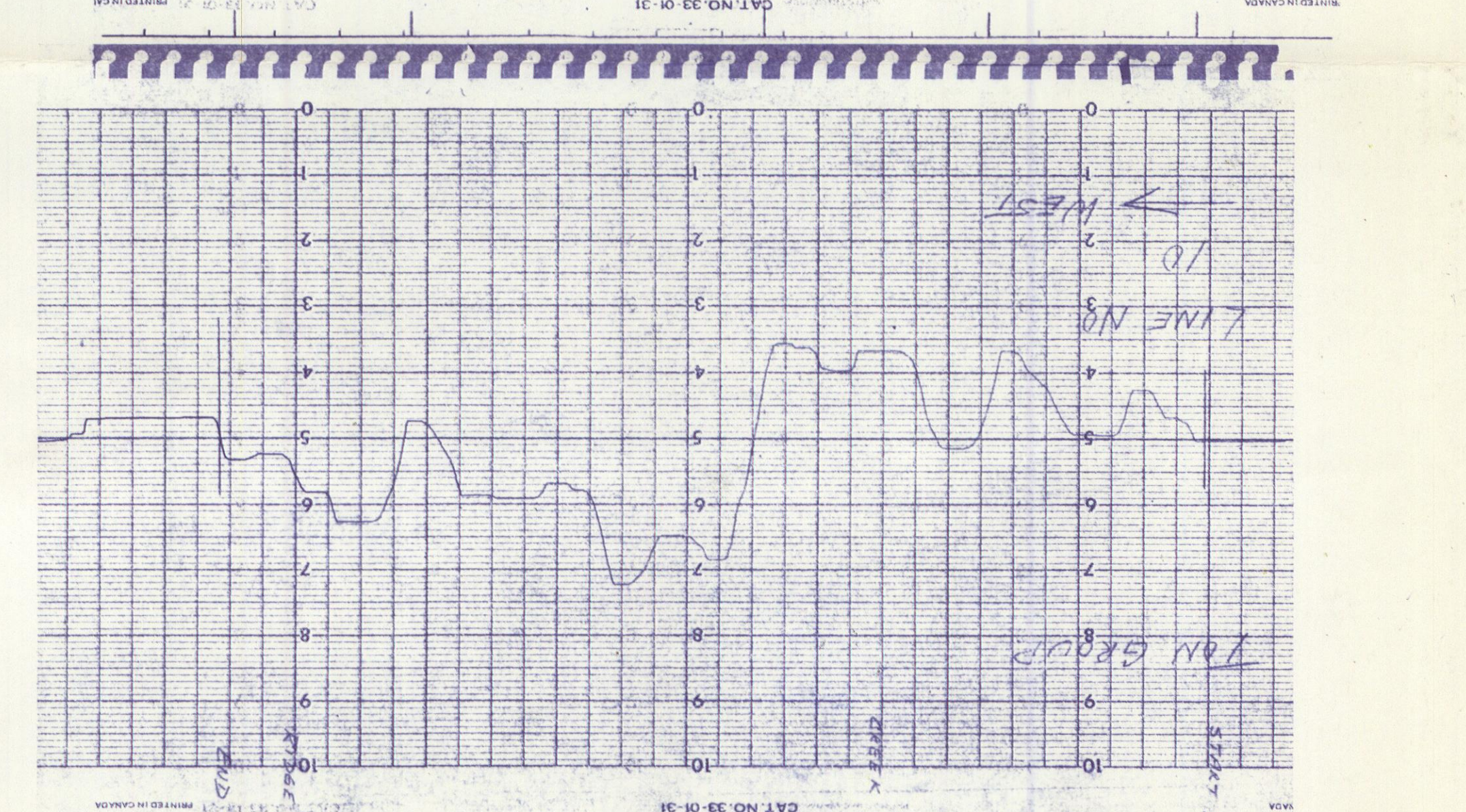
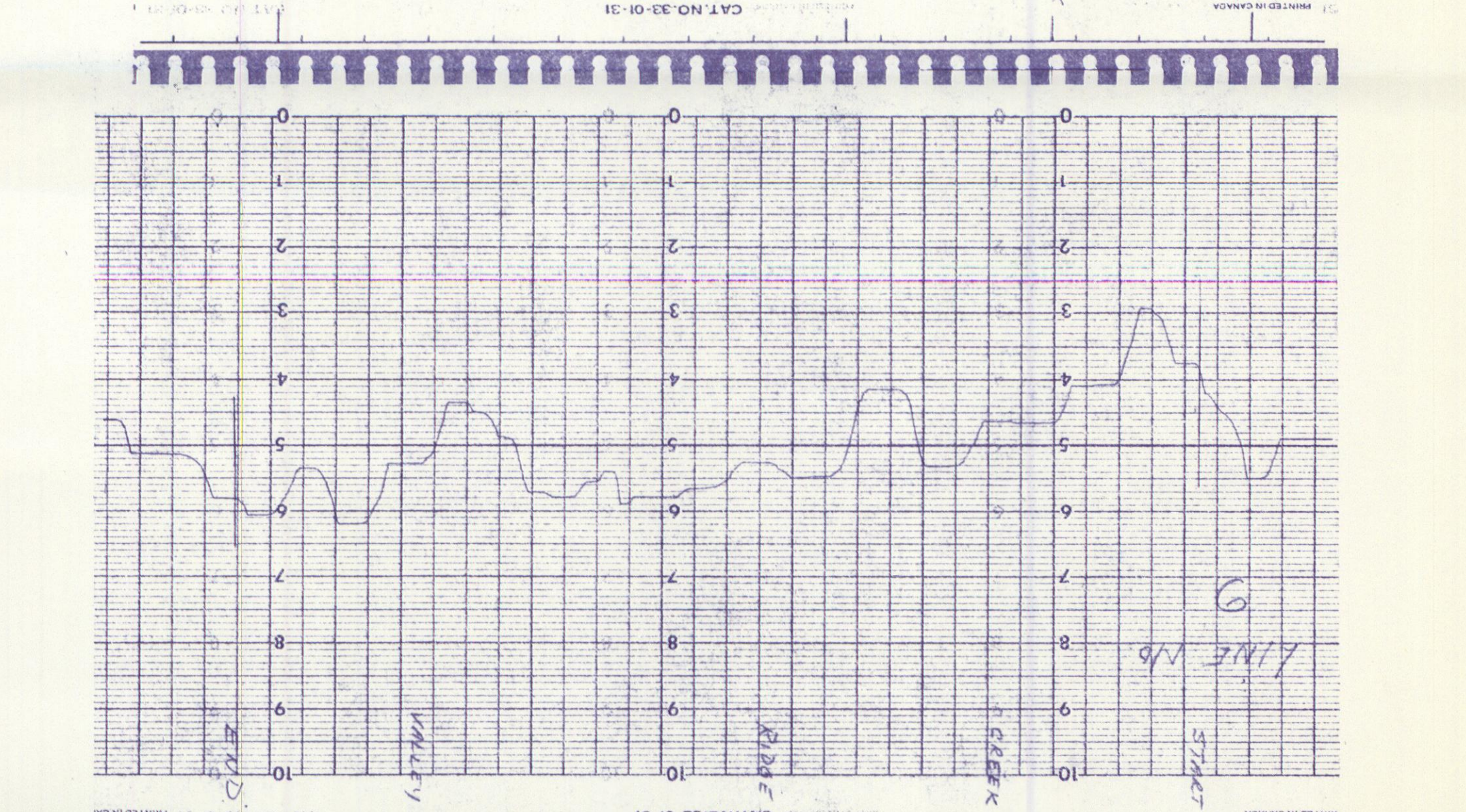
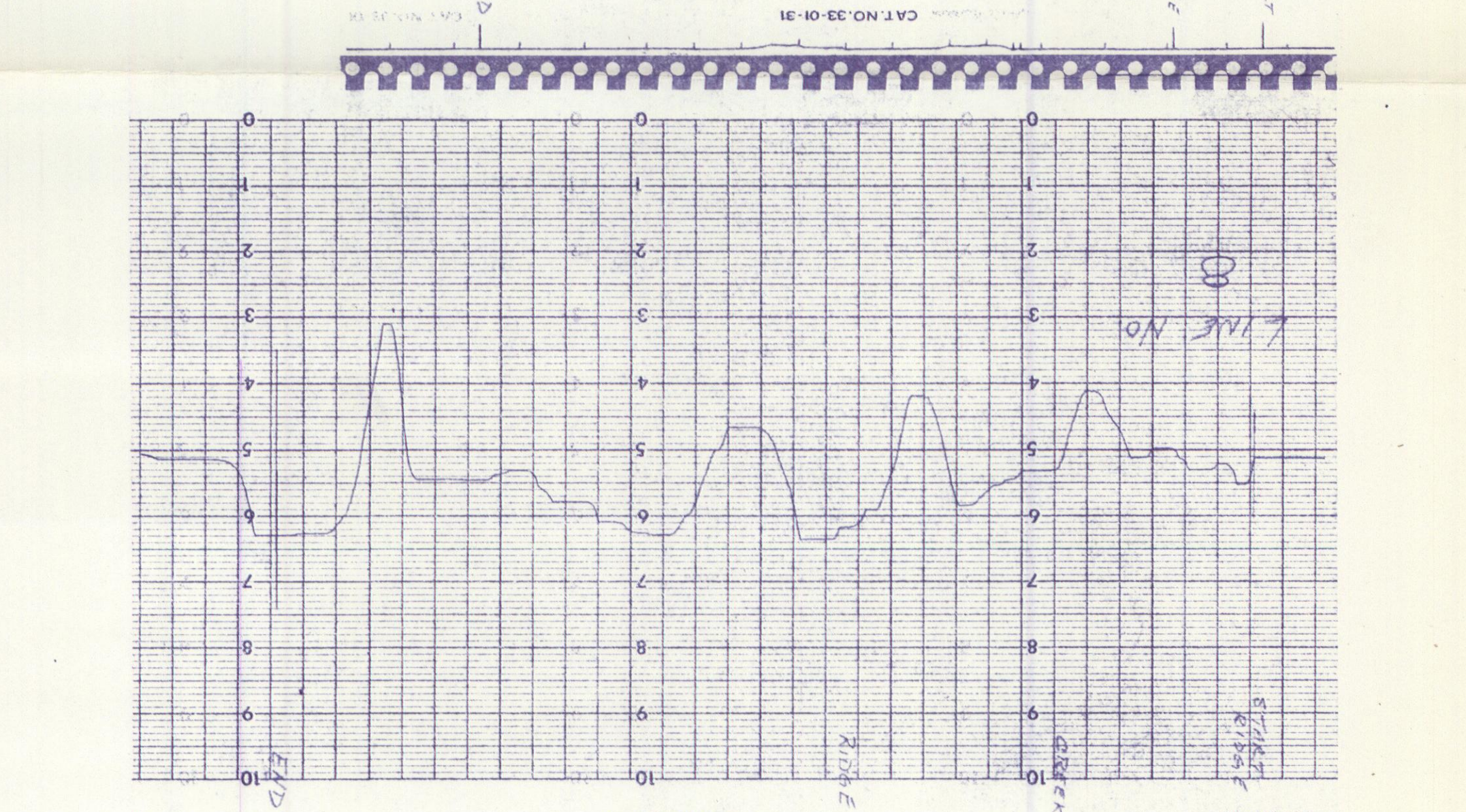
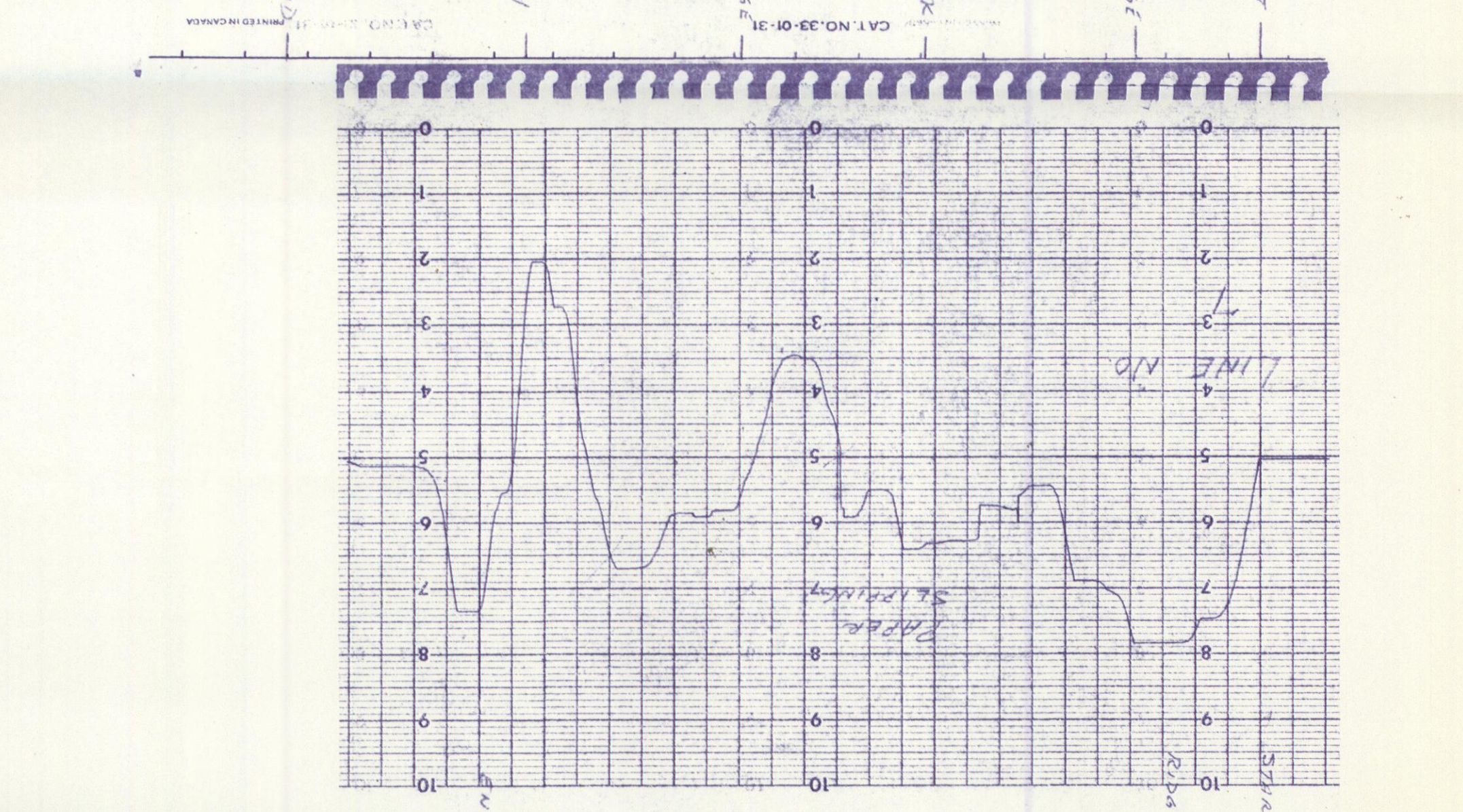
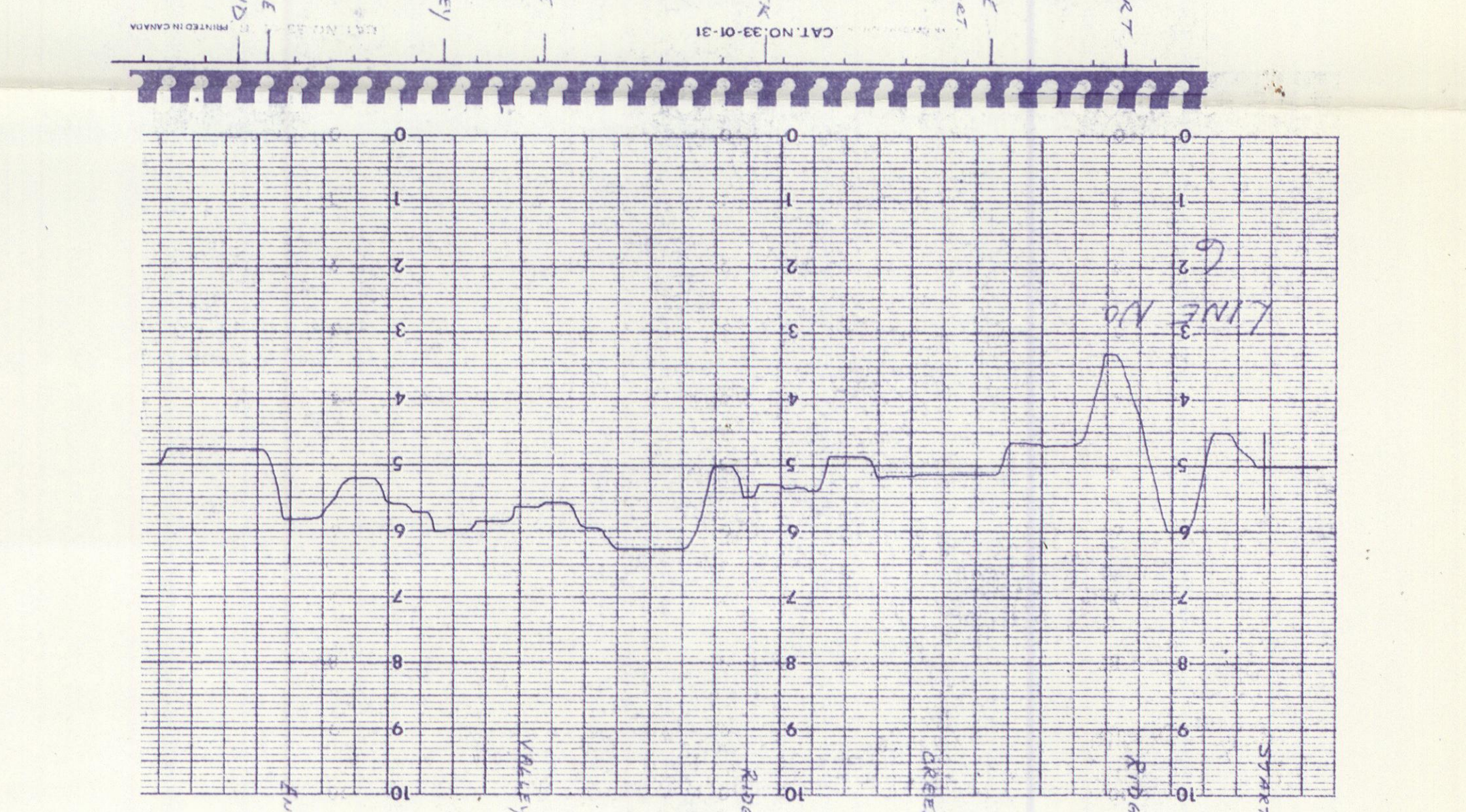
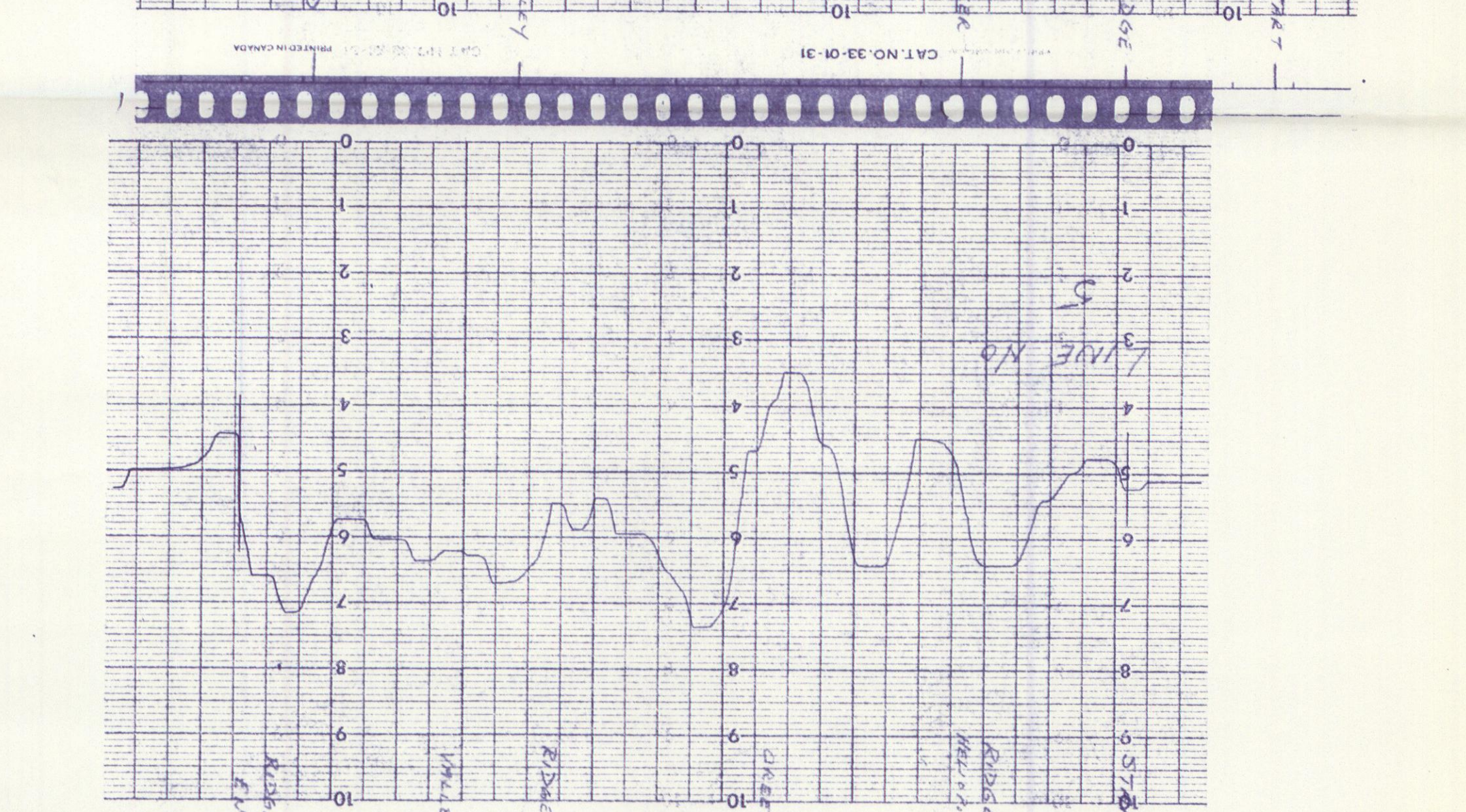
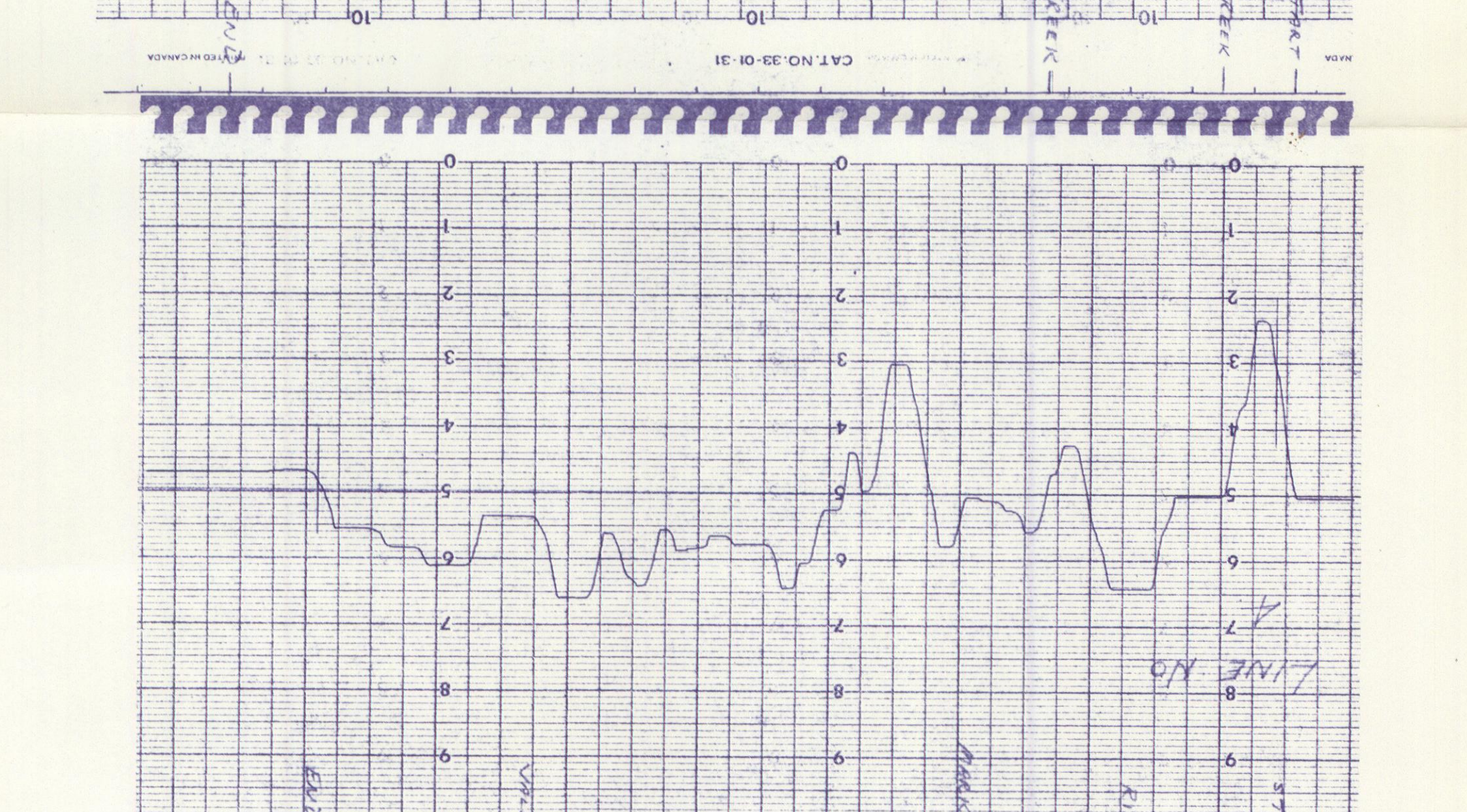
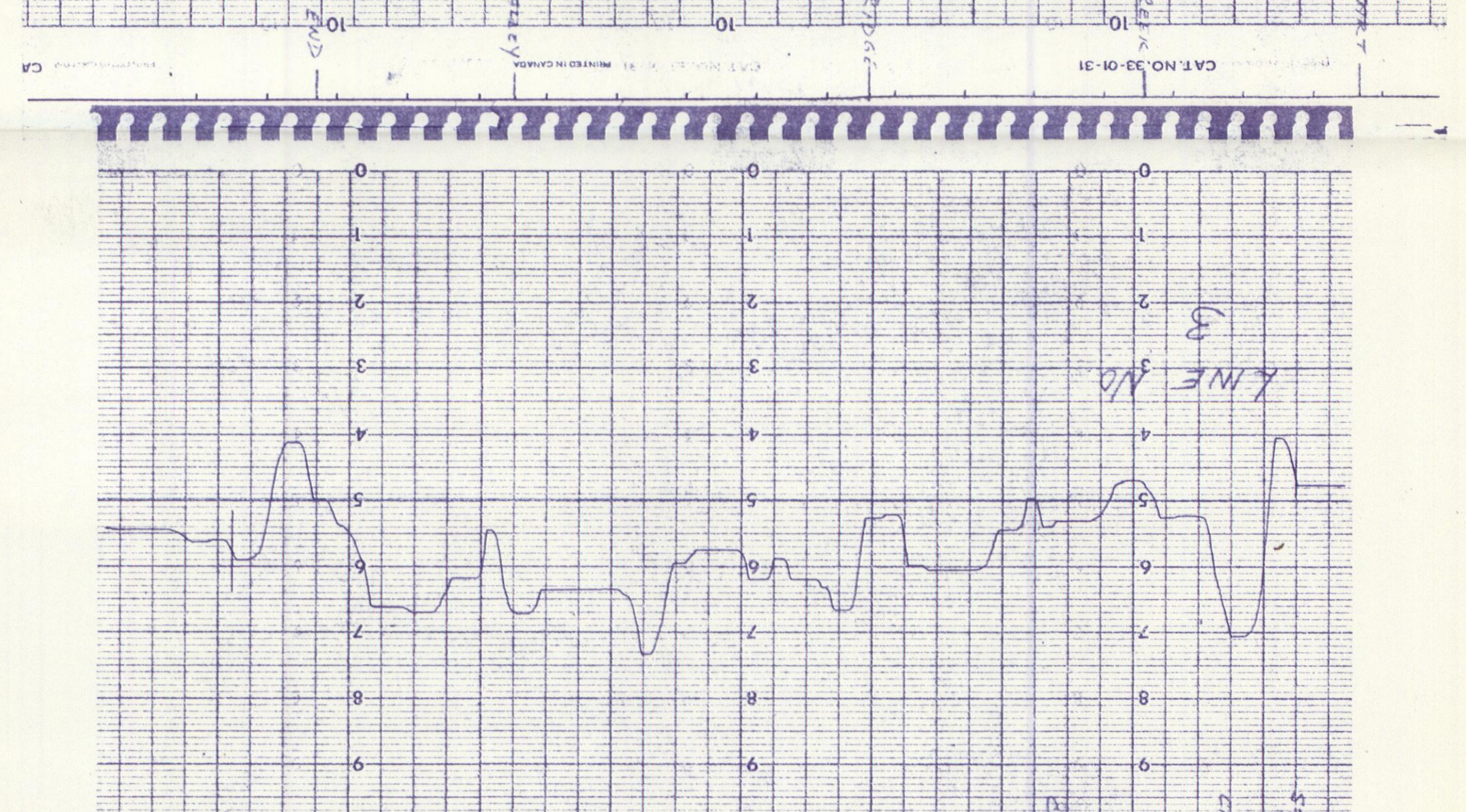
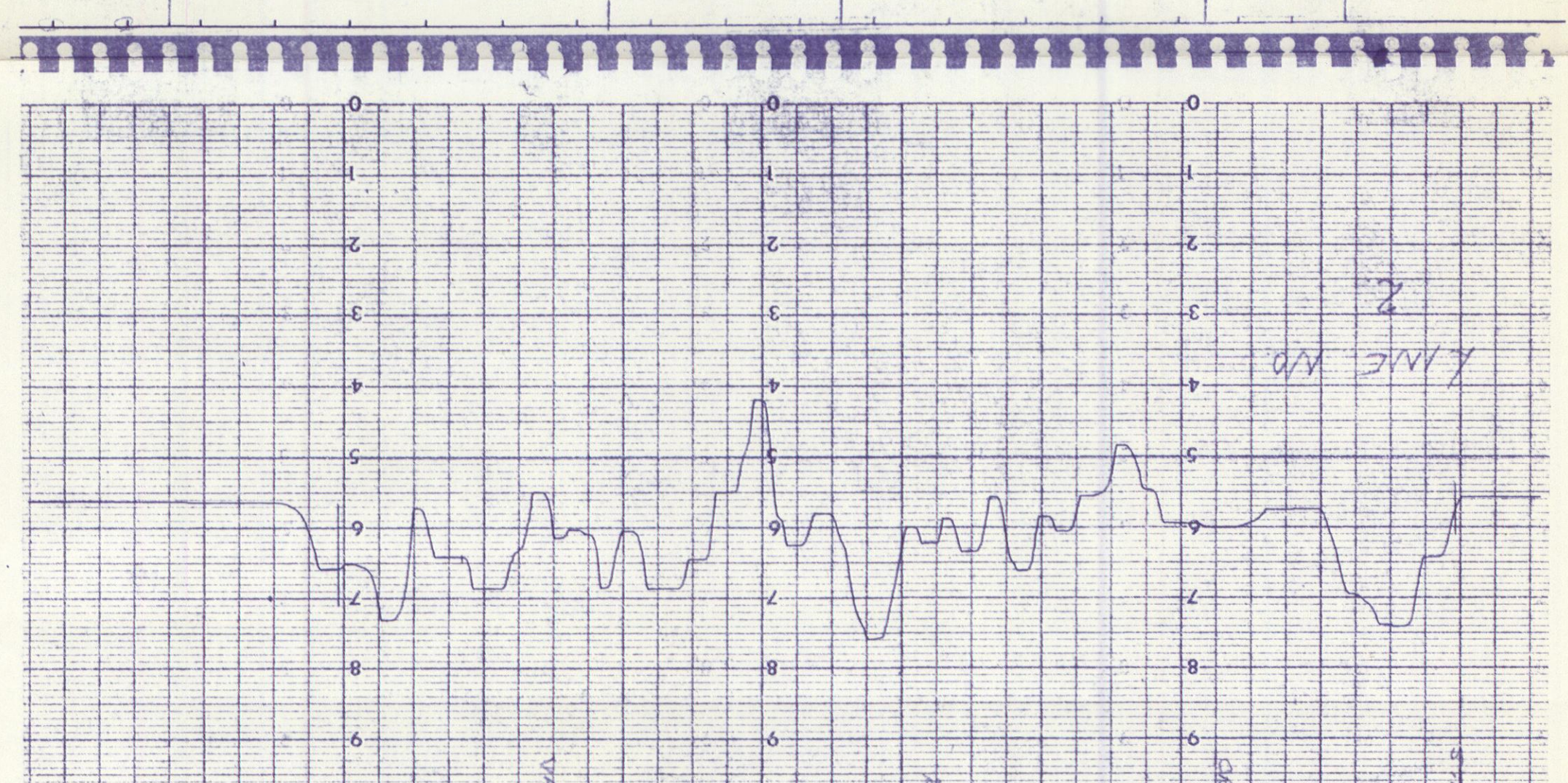
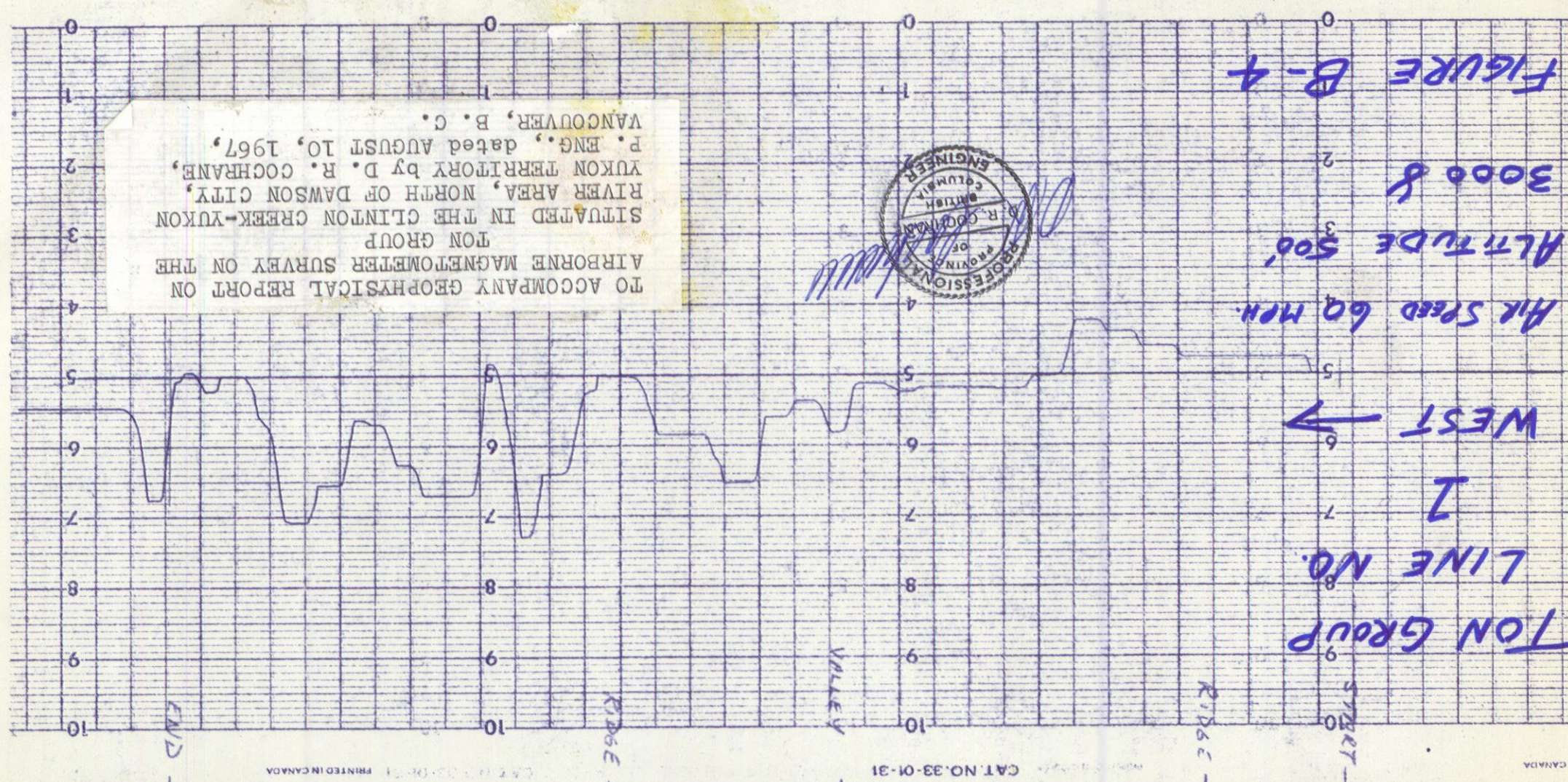
627 HORNBY ST., VANCOUVER 1, B.C.

Drawn: T.K.H. Date: Aug 9, 1967.



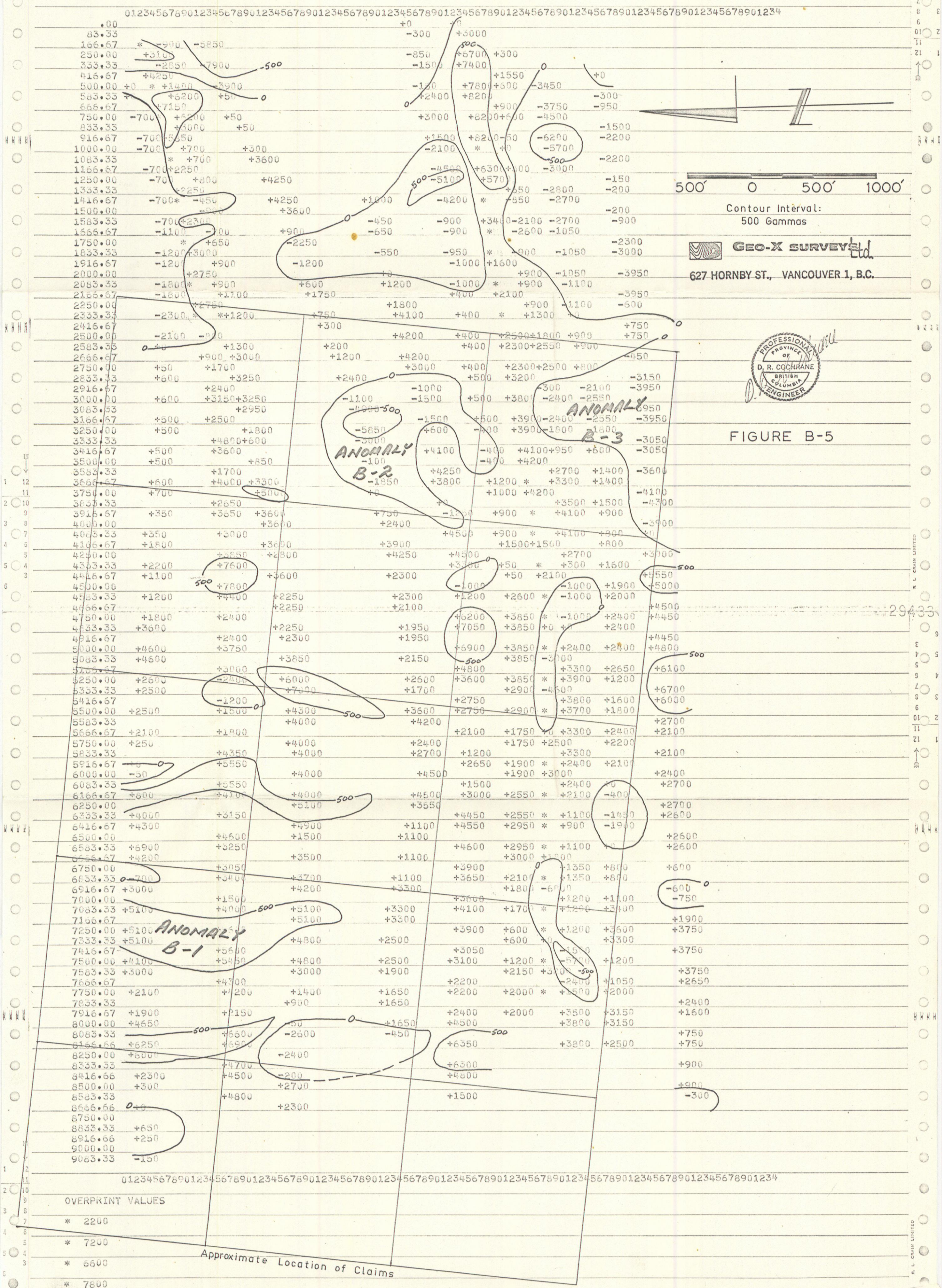
FIGURE B-4
3000 ft
ALTITUDE 500
AIR SPEED 60 MPH
WEST
2
LINE NO.
TON GROUP

TO ACCOMPANY GEOGRAPHICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
TON GROUP
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY BY D. J. COOKE,
VANCOUVER, B.C., dated AUGUST 10, 1967.



X-SCALE IS VERTICAL

SPHERE DEVELOPMENT CORP LTD (NPL)
Ton Group



CONTOURED FOURTH DEGREE SURFACE

PLOTTING LIMITS

PLOTTING LIMITS			
MAXIMUM X =	9100.000000	MINIMUM X =	.000000
MAXIMUM Y =	5000.000000	MINIMUM Y =	.000000

Y-SCALE IS HORIZONTAL
Y-VALUE = .00 + 50.0000 X (SCALE VALUE)

X-SCALE IS VERTICAL

CONTOUR INTERVAL = 40.00
REFERENCE CONTOUR (.....) = .00

TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
TON GROUP

SITUATED IN THE CLINTON CREEK-YUKON RIVER AREA, NORTH OF DAWSON CITY, YUKON TERRITORY by D. R. COCHRANE, P. ENG., dated AUGUST 10, 1967, VANCOUVER, B. C.

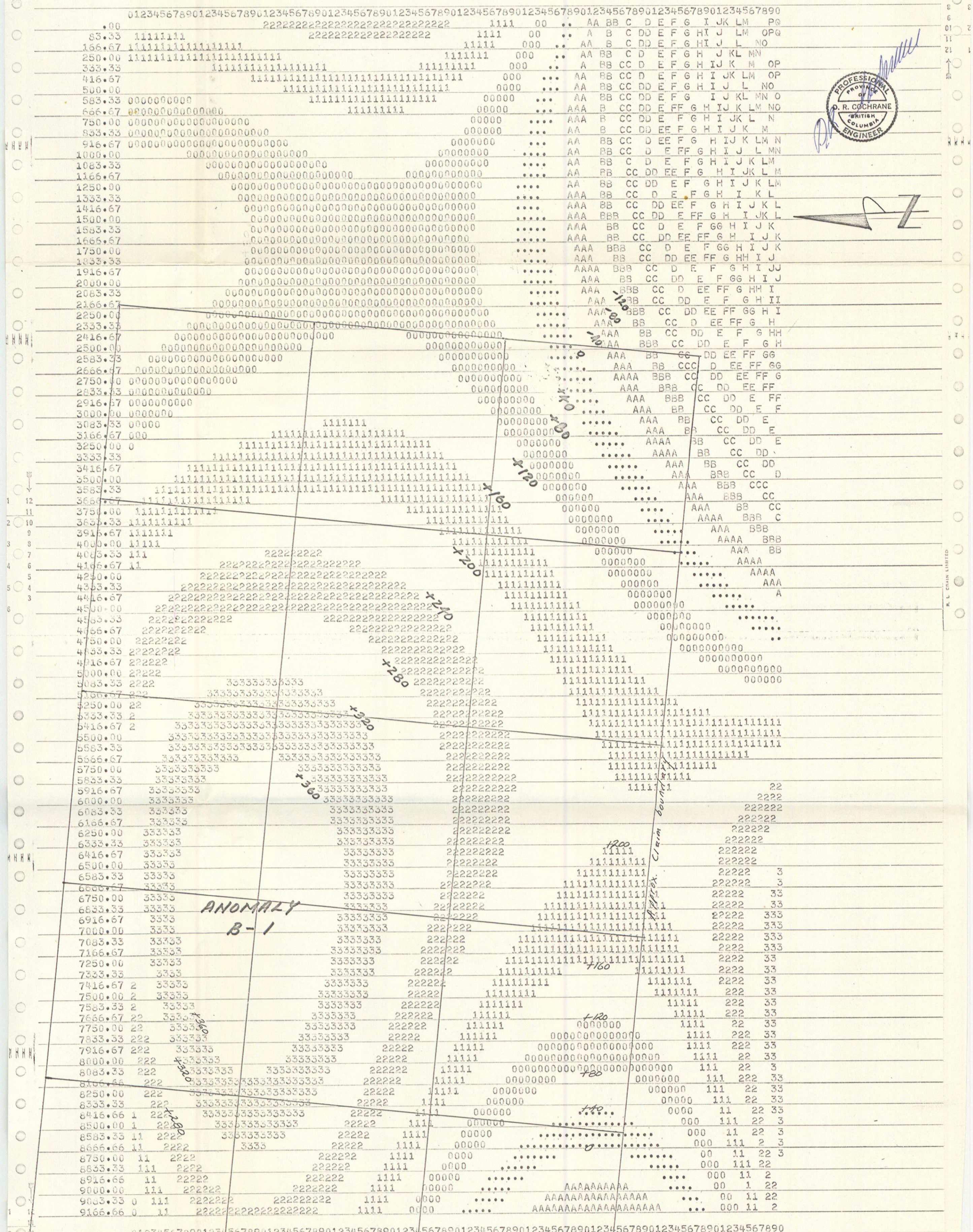


GEO-X SURVEYS

627 HORNBY ST., VANCOUVER 1, B.C.

500' 0 500' 1000'

SPHERE DEVELOPMENT CORP. LTD.(NPL)
Ton Group Figure B-6



TON GROUP

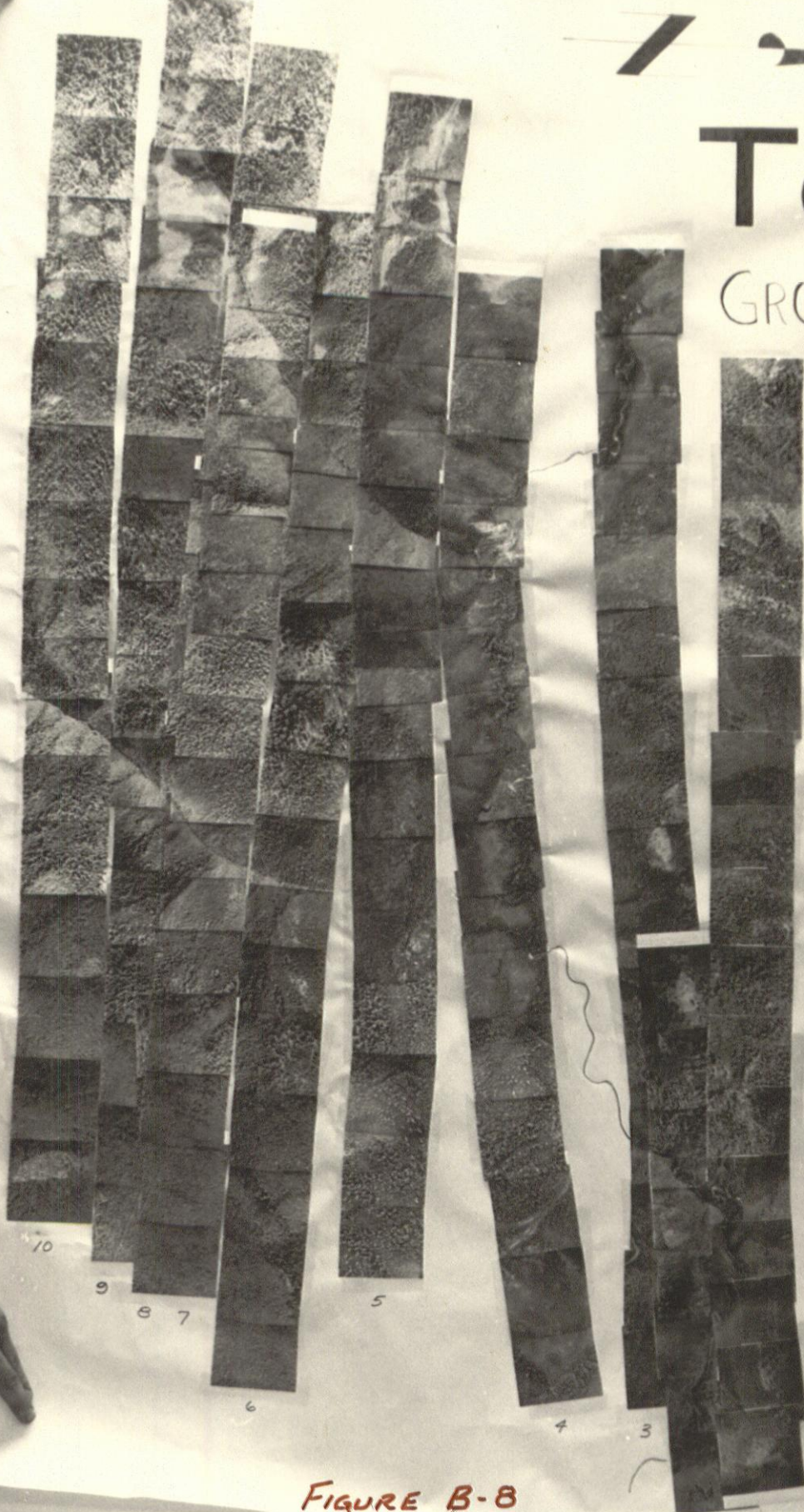


FIGURE B-8

PART C - CHIN and CLIN Groups

Geophysical Report

on the

Airborne Magnetometer Survey

of the

Chin and Clin Group of Claims

Situated in the Clinton Creek Area

Yukon Territory

Dawson Mining District

Latitude $64^{\circ}24'$ N; Longitude $140^{\circ}45'$ W

Airborne Field Work Completed June 28, 1967

on behalf of

Sphere Development Corporation Ltd.

by

D. R. Cochrane, P. Eng.

August 10, 1967
Vancouver, B.C.



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

PART C, The CHIN and CLIN Claim Groups

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C-4	Geomorphology	3
C-5	Field Procedure	3 & 5
C-6	Instruments and Specifications (see Part A-5)	
C-7	Aeromagnetic Data and Discussion	
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	(b) Trend Surface analysis of Original Data	6
	(c) Trend Surface analysis of Residual Data	6 & 7
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C-3	Topographic and Flight Line Plan)	
C-4	Chart Records	} In Map Pocket
C-5	Isomagnetic Contour Plan	
C-6	Trend Surface Plan	
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Appendix

C-I	Flight Data and Operators Report
C-II	Cost Appropriation, Chin and Clin Groups

C-1 INTRODUCTION

On June 23, 1967, 15.9 line miles of coincident aeromagnetic and aerial photographic surveys were completed on the Chin and Clin Group of claims. The property is situated on Clinton Creek, Yukon Territories and work was conducted by Geo-X Surveys on behalf of Sphere Development Corporation Ltd. This report discusses the results of the June survey, and subsequent data processing.

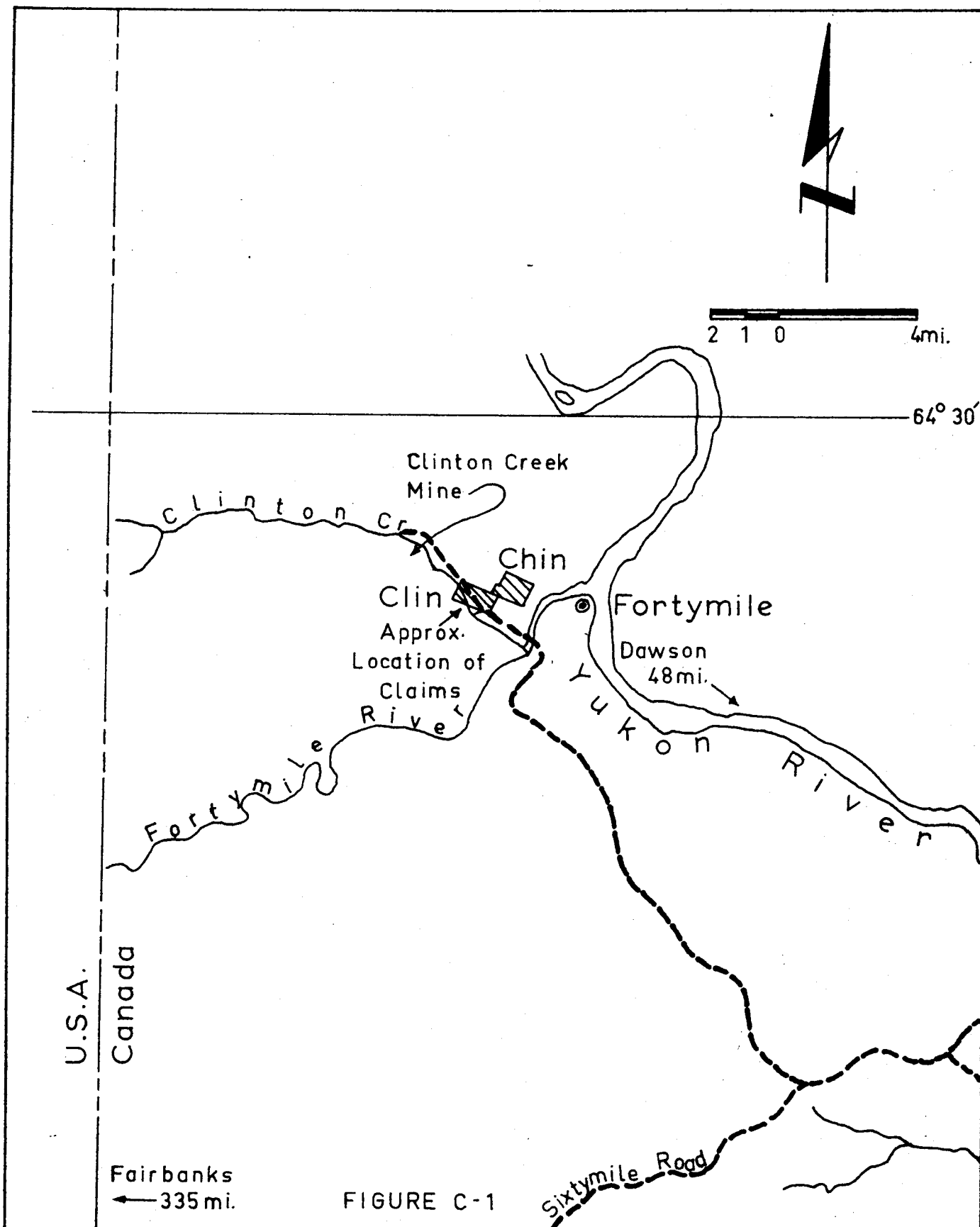
C-2 LOCATION

The Chin and Clin claim groups are contiguous and lie immediately north of Clinton Creek, two miles due west of the settlement of Fortymile, 44 air miles northwest of Dawson City, Yukon Territory. The Clin Group is accessible via the Clinton Creek road. (see Figure C-1)

C-3 CLAIMS AND OWNERSHIP

The Chin numbers 1 to 9 inclusive, and Clin numbers 1 to 3 inclusive, are owned outright by Sphere Development Corporation Ltd., registered office 348 West Hastings St., Vancouver. The following table summarizes pertinent claim data.

Name	Record No.	Group	Group No.	G. R. No.
Chin 1 to 8	87538 to 87645	D	146	Y287829
Chin 9	87586	D	146	Y287829
Clin 1 to 3	87530 to 87537	E	147	Y287829



Title: Location Map Clin & Chin Grps
 Prop: Sphere Devlp't Corp Ltd (NPL)
 Drawn: B.A.C. Date: August 3, 1967.
 Checked: *D.A.C.* Date: *Aug 10/67*



GEO-X SURVEYS Ltd

627 HORNBY ST., VANCOUVER 1, B.C.

C-3 CLAIMS AND OWNERSHIP (cont.)

The anniversary date of Chin No. 1 to No. 8 is July 14, of Chin No. 9 is July 18, and of Clin No. 1 to 8 is July 13. The property is situated in the Dawson Mining District. (see Figure C-2)

C-4 GEOMORPHOLOGY

The Clin claims are diagonally bisected by Clinton Creek, which is the lowest elevation in the area (1050 feet above sea level). The creek valley is fairly steep and U shaped, rising 500 feet within a claim length.

The Chin Group, north and east of Clin is located on a fairly gently northerly rising plateau with a maximum elevation of 2430 feet on the north boundary of Chin No. 8. (see Figure C-3 in Map Pocket).

The main Clinton Creek Valley, and tributary valleys are well forested, but the higher sections of the property contain only scattered scrub ground cover.

C-5 FIELD PROCEDURE

The Chin and Clin Groups were flown on a north 30° east bearing, at an elevation of 600 feet above surface, ground speed of 60 miles per hour. Flight line spacing varied from a minimum of 100 to a maximum of 800 feet.

Ground control on the Chin and Clin claims was fair to good, and three of the four markers set out were located and used in ground control. Eighteen flight lines were surveyed and

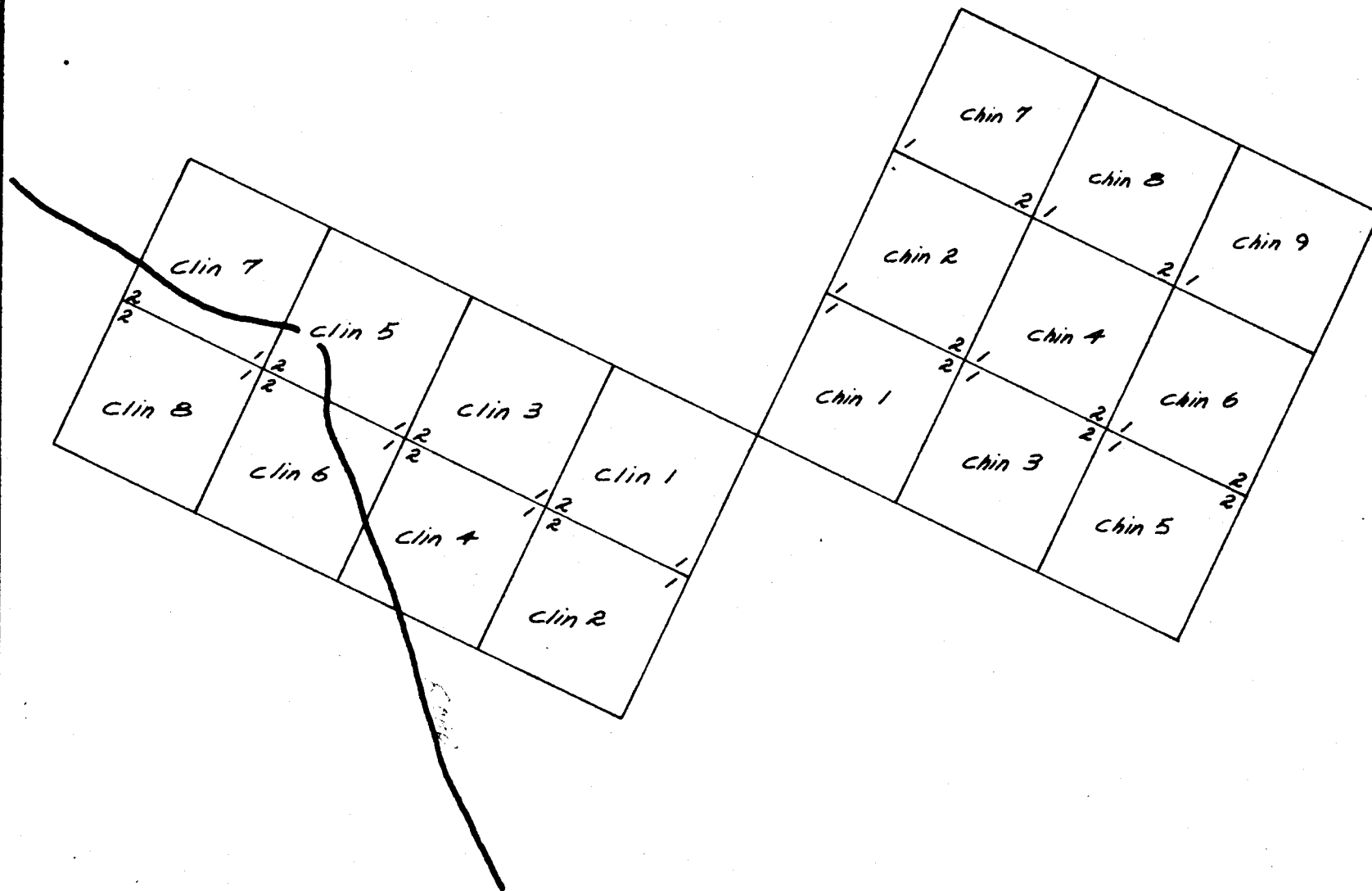


FIGURE C-2

SPHERE DEVELOPMENT CORP.
CHIN & CLIN GROUPS CLAIM SKETCH

Scale 1" : 1500'
Drawn D.R.C. Date: July 31/67



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

C-5 FIELD PROCEDURE (cont.)

photographed. The shortest line was 0.71 line miles and the longest 1.53 line miles. (See Appendix C-1, Operators Report)

C-6 INSTRUMENTS AND SPECIFICATIONS (See Part A-5)

C-7 AEROMAGNETIC DATA AND DISCUSSION

(a) Original Data

A total of 662 combined x,y (geographic co-ordinates) and z (gammas) points were tabulated and computer processed on the Clin and Chin claim groups. The dy interval (along flight line digitizing interval) ranged from 120 to 130 feet. The maximum z value encountered was +1290 gammas on line 3, and the minimum -620 gammas on line 8. The isomagnetic contour plan of original data (Figure C-5 in Maps Pocket) outlines a large magnetically positive area on the west half of the Clin claims. There are a number of local +1000 gamma area named anomalies C-1 (a), C-1 (b), and C-1 (c) respectively. Anomaly C-1 is flanked to the east and north by a narrow magnetic trough, complex in plan, convex west and extending northeast to the Chin Group.

Anomaly C-2 is just south of the south Chin Group boundary, and has a maximum amplitude of +1230 gammas.

Anomaly C-3, the third positive anomaly is just northwest of the center of the Chin Group and has a maximum amplitude of +1030 gammas.

Several smaller, and lower amplitude positive and negative areas are not named.

C-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

(b) Trend Surface Analysis of Original Data

The fourth degree trend surface of the original data is presented as Figure C-6. The "goodness of fit" of the surface was fair with a coefficient of correlation of 0.358. The surface was contoured at 100 gamma intervals at a scale of 1 in.:500 feet.

The trend surface calculations have shown a broad +200 gamma magnetic plateau trending northeast across the Clin and Chin groups. To the east of this low amplitude, broad positive area, on the west portion of the Clin Group, anomaly C-1 has been outlined as north-south trending bands up to +800 gammas in amplitude. The trend programme has featured anomaly C-2, presenting it as an elliptical area, of +500 gammas. The lower half of anomaly C-3 was captured on the trend analysis, on the north end of the flight lines in central Chin Group.

(c) Trend Surface Analysis of Residual Data

The contoured surface of the difference between the actual (original) and calculated value and surface of all points, is the residual surface and often indicates local anomalies.

(i.e. areas differing significantly from the regional trend)

The contoured residual data surface is presented as Figure C-7.

(in Map Pocket) The residual data was fitted by a fourth degree surface, and the "goodness of fit" was fair (coefficient of correlation 0.345) Residual data was contoured at 10 gamma intervals from a reference contour of +200 gammas. (i.e. the absolute value of the residuals was contoured)

C-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

Figure C-7 is complex, mainly a result of the small contour interval. However, the wide northeast trending zone between the Chin and Clin groups is quite apparent, as is an extrapolated very high (+ 350 gamma) residual anomaly, named anomaly C-4, located north of the Clin and west of the Chin group.

The residual surface has displaced anomaly C-1 to the south and east, and has presumed anomaly C-2 as more anomalous to the south of the original data high. Original and trend anomalies C-3 are calculated as low residual areas, suggesting anomaly C-3 is well fitted and probably regional in nature.

C-8 SUMMARY AND CONCLUSIONS

On June 28, 1967, 15.9 line miles of coincident airborne magnetometer and aerophotographic surveys were completed on two claim groups situated in the Clinton Creek area of the Yukon Territory. The two groups, Clin No. 1 to 9 and Chin No. 1 to 8 are owned by Sphere Development Corporation Ltd.

Eighteen flight lines were completed, each on a bearing of north 30° east, and at an elevation of 600 feet above surface.

A total of 662 combined x, y (geographic co-ordinates) and z values (vertical intensity of the earth's magnetic field) were tabulated and processed by a Univac 1108 computer.

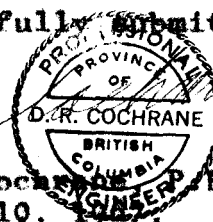
Three original data, magnetically positive anomalies are discussed. The largest is situated on the west half of the Clin Group. The fourth degree trend surface of the original data readily outlined anomalies C-1 to C-3. The fourth degree trend

C-3 SUMMARY AND CONCLUSIONS (cont.)

surface of the residual data, displaced the center of anomaly C-1, and minimized anomaly C-3, and extrapolated and calculated a hypothetical anomaly, named residual anomaly C-4, north of the Chin Group.

It is recommended that anomalies C-1, C-2, and C-3 be investigated by a ground magnetometer survey, and geological mapping. Several of the smaller, positive original data magnetic highs may be prospected.

Respectfully submitted,



D. R. Cochrane, Eng.
August 19, 1947.

APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: CHIN-CLIN GROUP Job: 1002(C) Date: JUNE 28/67
 Operator: R. ROBILLARD Flight elevation: 600 FEET
 Direction flown: NORTH 30° EAST Air speed: 60 MPH Chart scale ± 1500 ft
 Weather: +60° CLEAR - INTERMITTANT CLOUDS - VISIBILITY GOOD

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gammas	Min. Z gammas
	X	Y	X	Y			
1	0	1850	1640	5850	.80	1060	0
2	840	1630	2430	5390	.78	1170	-200
3	1180	820	2780	4470	.76	1290	-190
4	1860	1550	3680	5150	.78	1180	-500
5	2570	1190	4060	4580	.70	1300	-220
6	2770	290	4220	3890	.71	830	-440
7	2660	0	4070	3430	.71	1070	-435
8	3130	470	4570	4000	.70	1000	-620
13	3640	170	5520	7820	1.53	1185	-210
14	4370	1450	5550	6490	.97	500	-75
15	5280	2390	6630	7400	.97	770	-230
16	6000	2380	7350	7250	.93	1030	180
17	6520	2270	8000	7140	.93	400	-10
18	7050	2510	8180	6470	.81	860	-260
19	7550	2520	9080	7320	.93	740	-110
20	8000	2120	9360	7090	.96	740	-30
21	8760	2150	10160	7500	1.03	1230	0
22	9650	3080	10290	7870	.80	1070	-110

Total number of X, Y, Z points 662

Total number of line miles 15.9

Signed

R. Robillard

ALRAE EXPLORATION LTD.

202 - 846 WEST HASTINGS STREET, VANCOUVER 1, B.C. TELEPHONE 681-9381

Sphere Development Corp. Ltd.
948 West Hastings Street
Vancouver 1, B. C.

RE: CHIN 1 - 9 incl., CHIN 1 - 9 incl.

RE: Location and marking for aerial magnetometer survey

Personnel:

<u>Days</u>	<u>Name</u>	<u>Occupation</u>	<u>Dates</u>	<u>Gross Wages</u>
2	D. Smallman	Line Cutter	June 18, 19/67	\$ 67.34
2	P. Cumberbirch	Line Cutter	June 18, 19, 24, 26/67	101.01
4	B. Garner	Asst. Geol.	June 21, 24, 26, July 10/67	176.76
1	D.V. Preston	Asst. Geol.	June 21/67	43.30
3	A. Burton	Geologist	June 17, 18, 19/67	339.84
13				\$ 729.15
	Topographic mapping - McElhanney Ltd.			92.28
	Transportation, truck and Honda rental,			159.30
	Field supplies and hardware			\$ 971.23

ALRAE EXPLORATION LTD.
846 W. HASTINGS ST.
VANCOUVER 1, B. C.

R. J. Garner

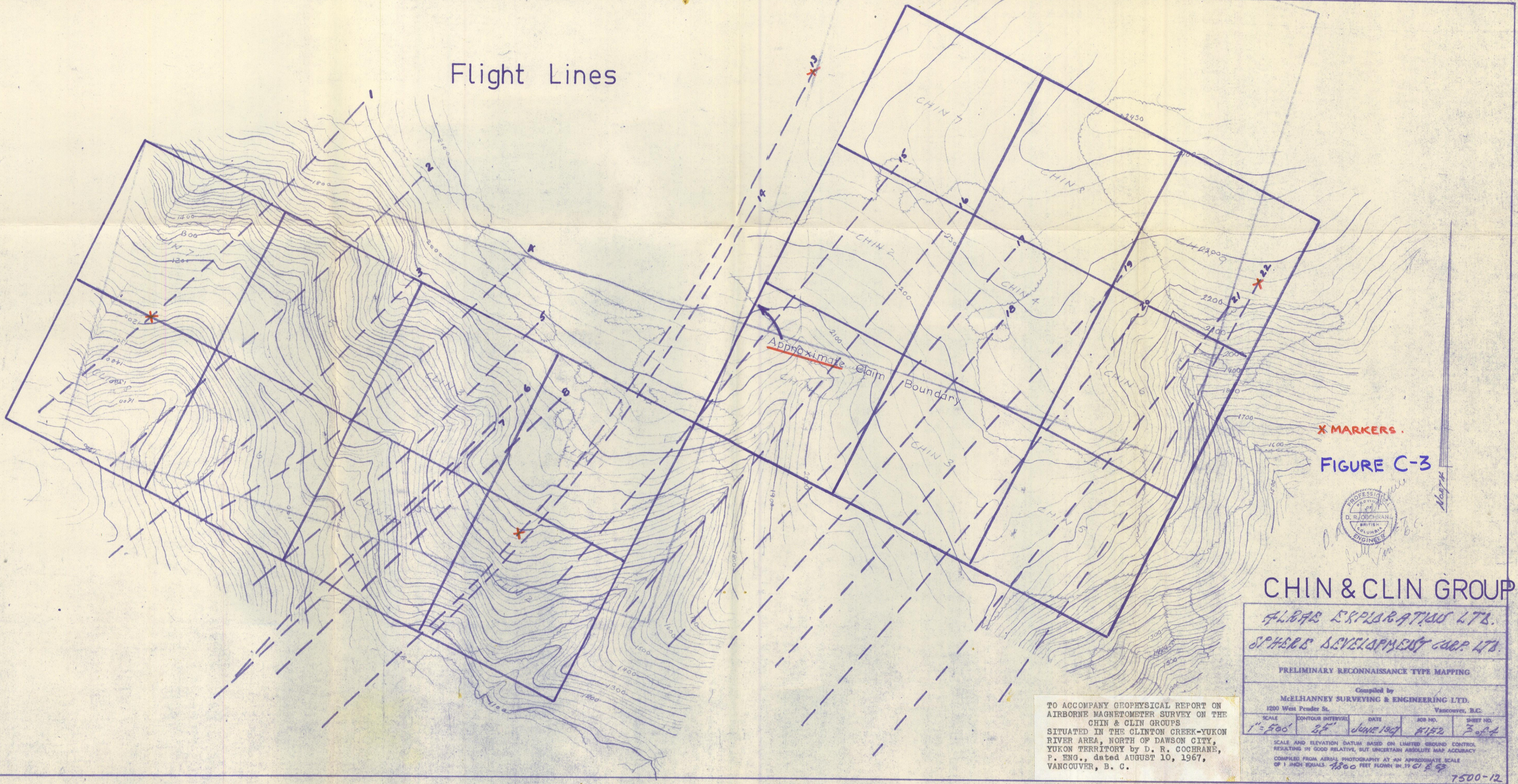
*Paid in Full.
A. Burton*

GEOLOGY
Exploration

CONSULTANTS
Development

MINING
Production

Flight Lines



X MARKERS.

FIGURE C-3



CHIN & CLIN GROUP

ALBAE EXPLORATION LTD.

SPHERE DEVELOPMENT CORP. LTD.

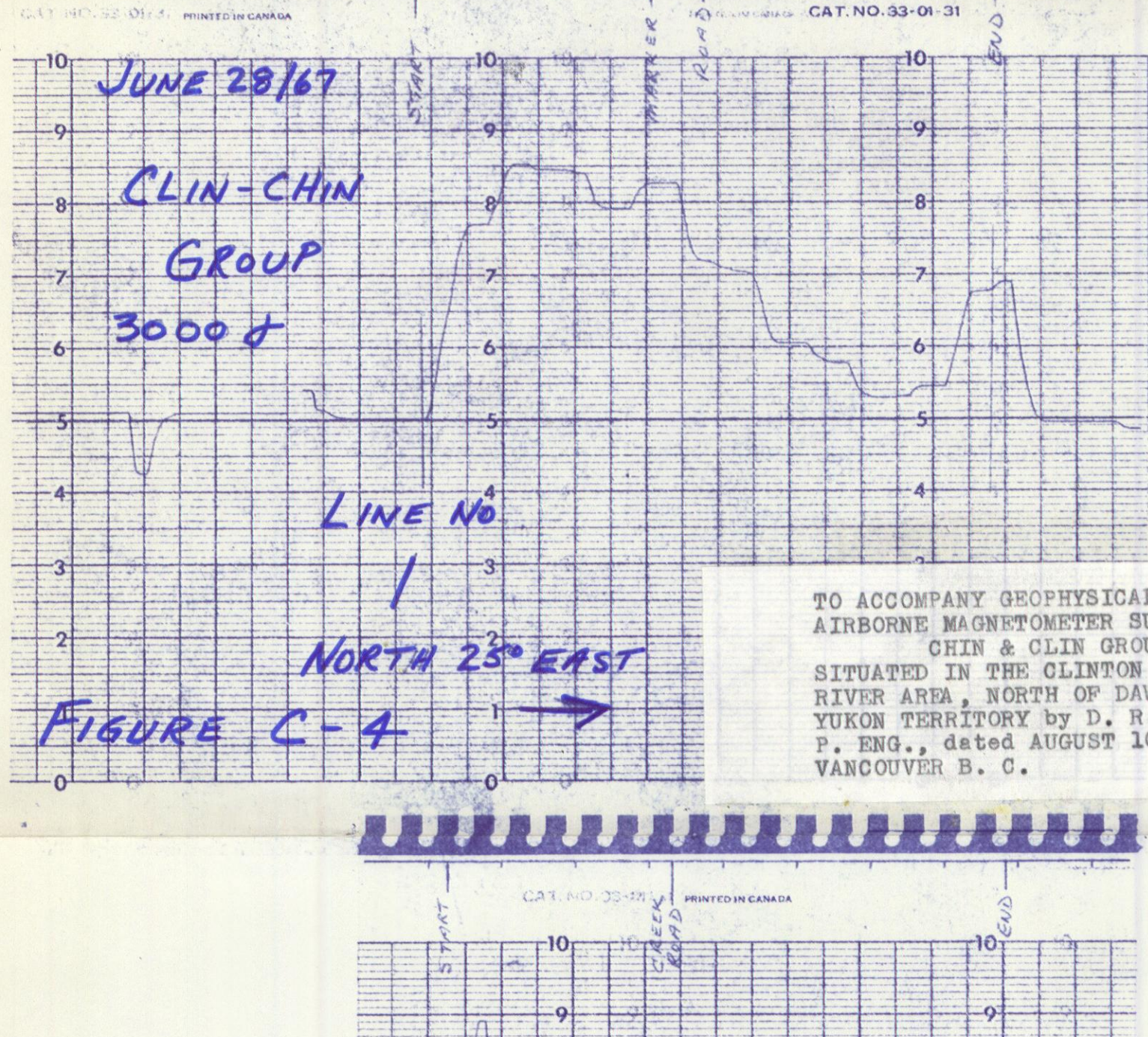
PRELIMINARY RECONNAISSANCE TYPE MAPPING

Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

SCALE	CONTOUR INTERVAL	DATE	JOB NO.	SHEET NO.
1" = 500'	25'	JUNE 1967	5152	3 of 4

TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
CHIN & CLIN GROUPS
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY by D. R. COCHRANE,
P. ENG., dated AUGUST 10, 1967,
VANCOUVER, B. C.

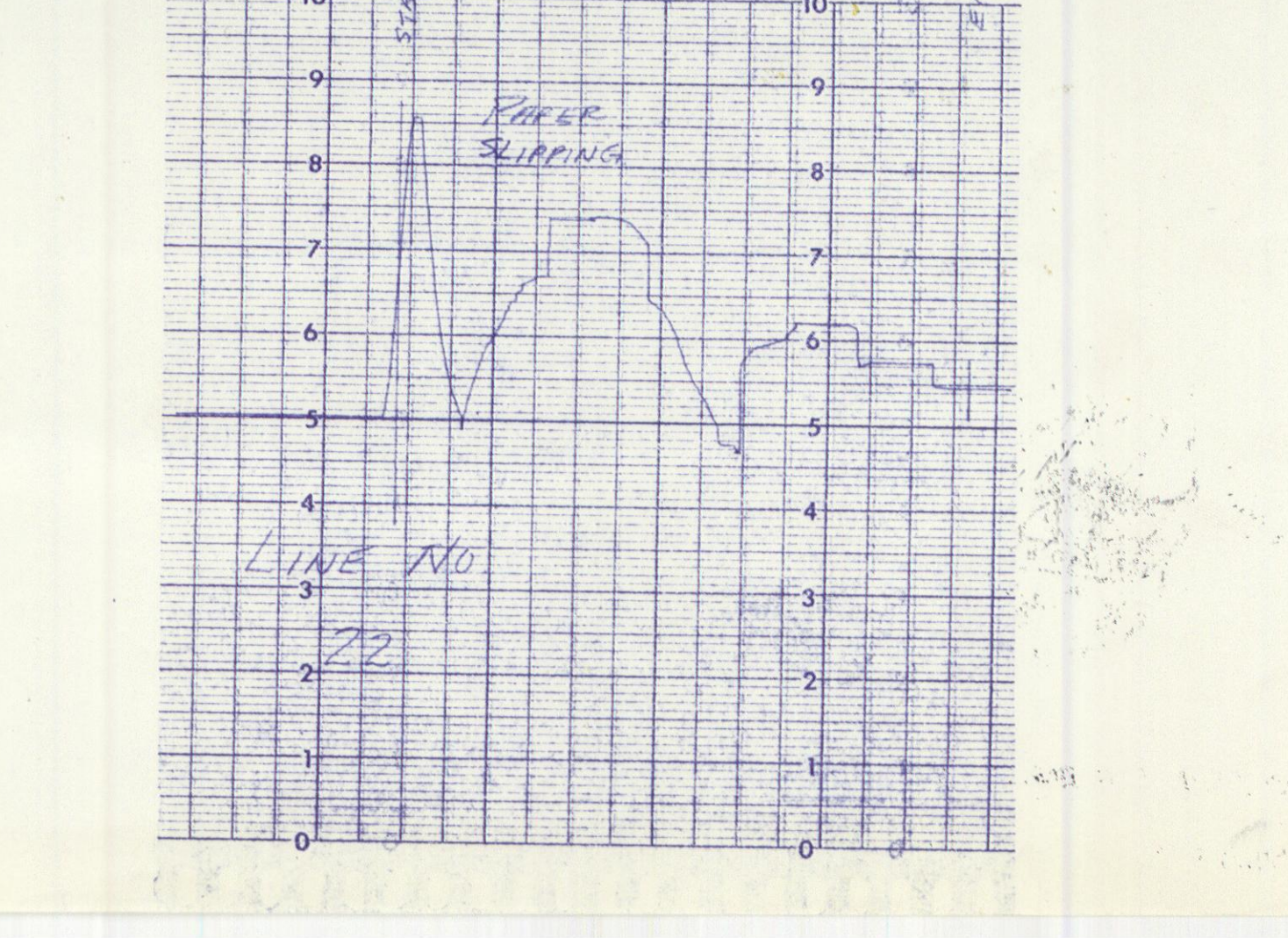
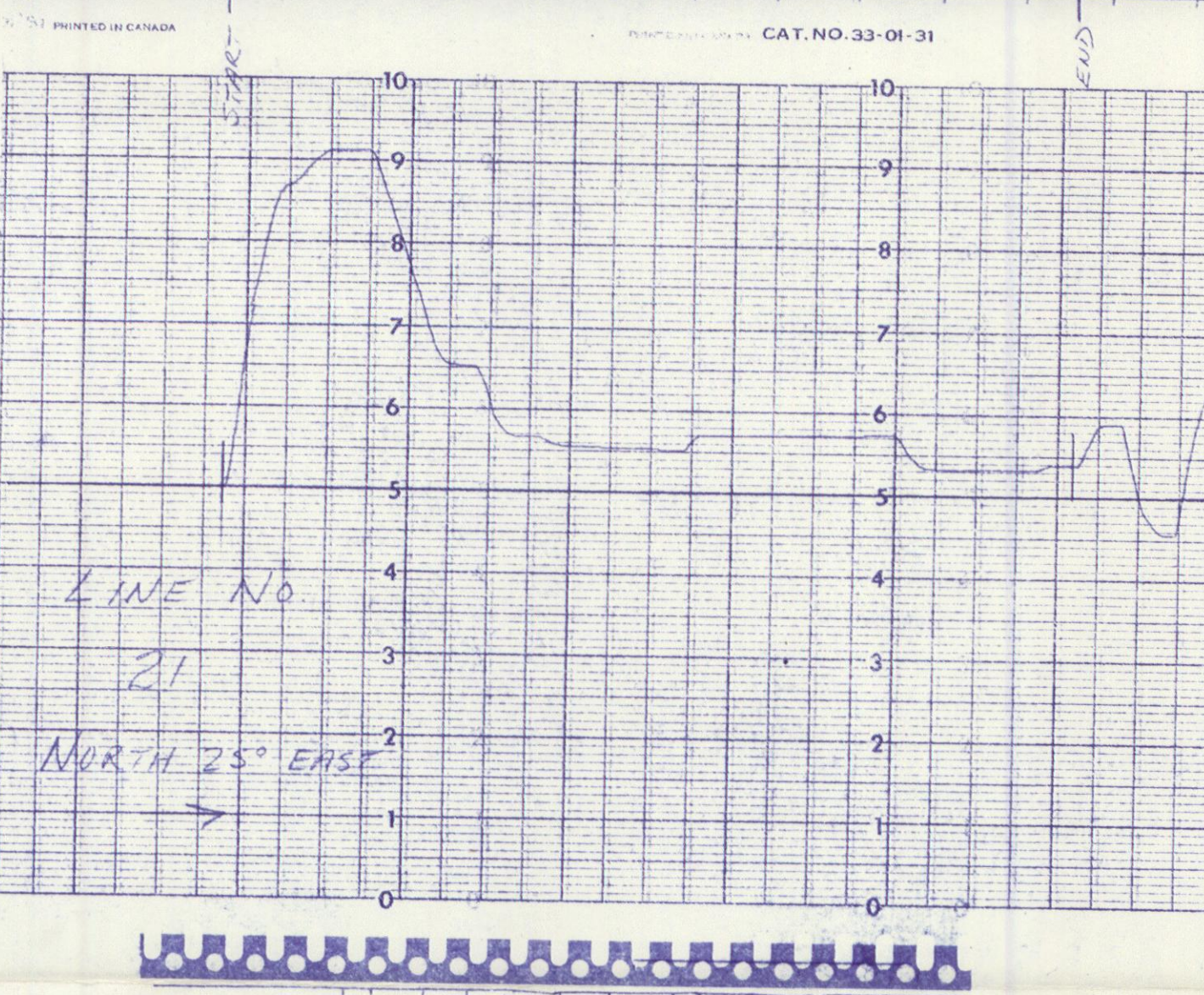
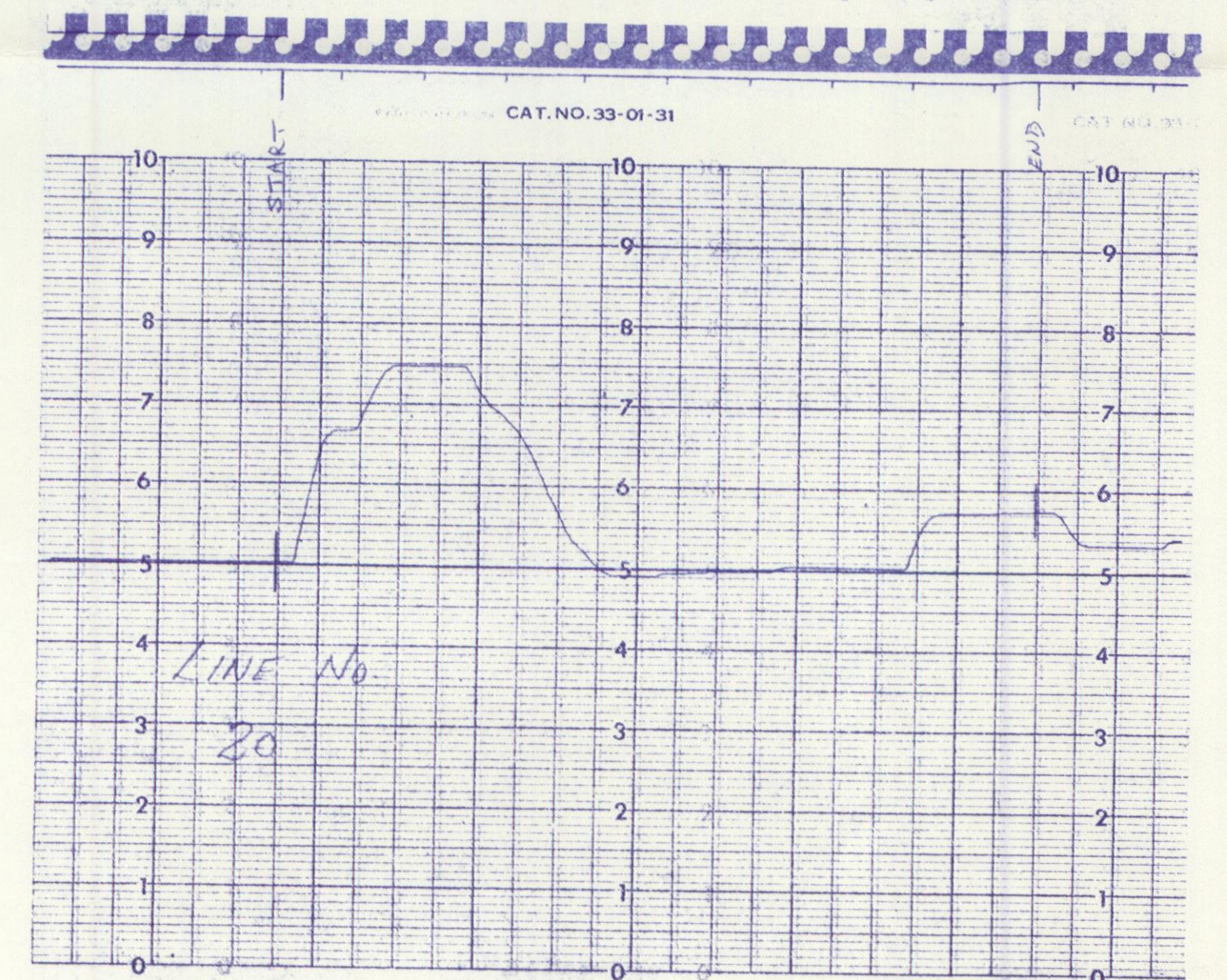
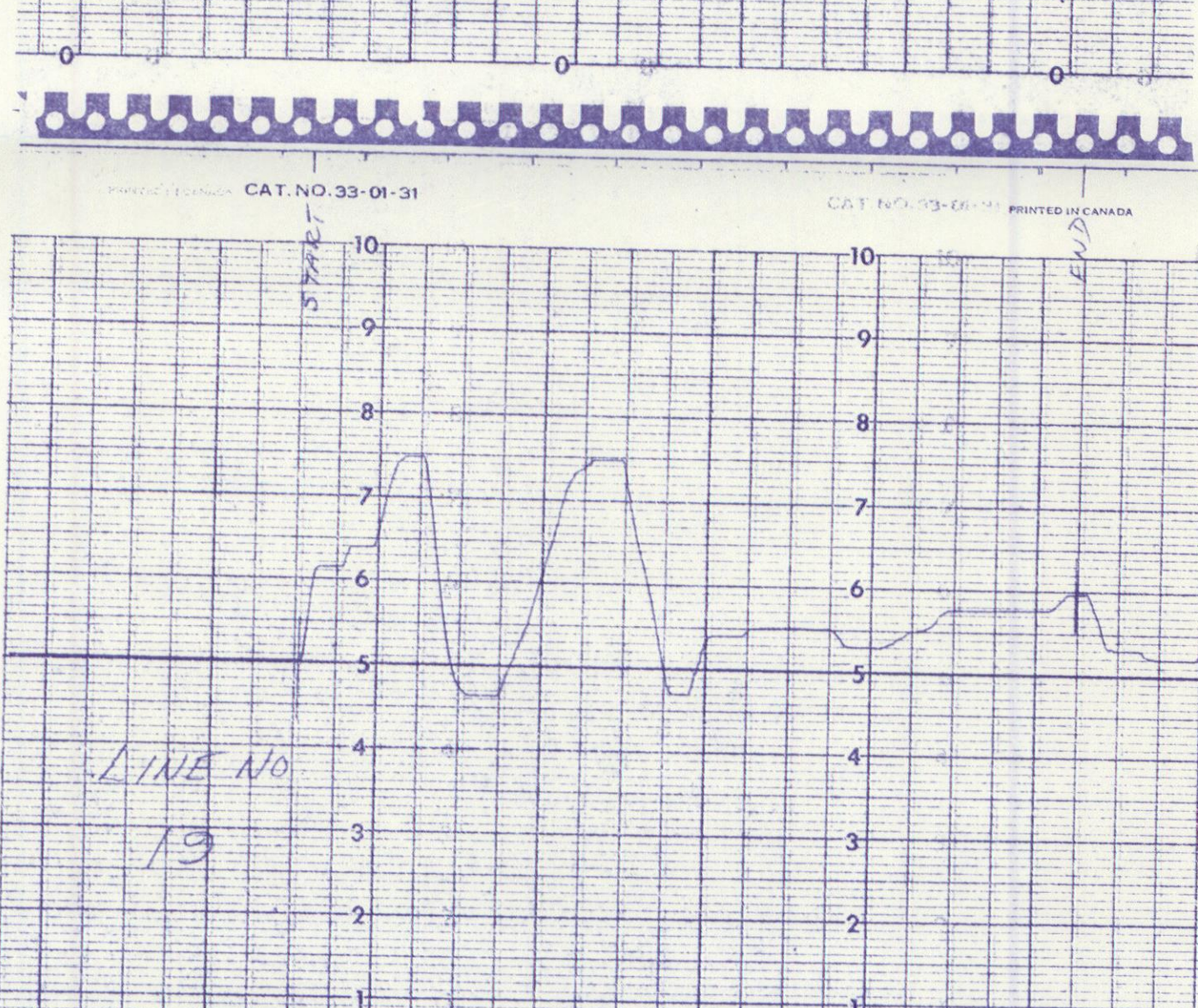
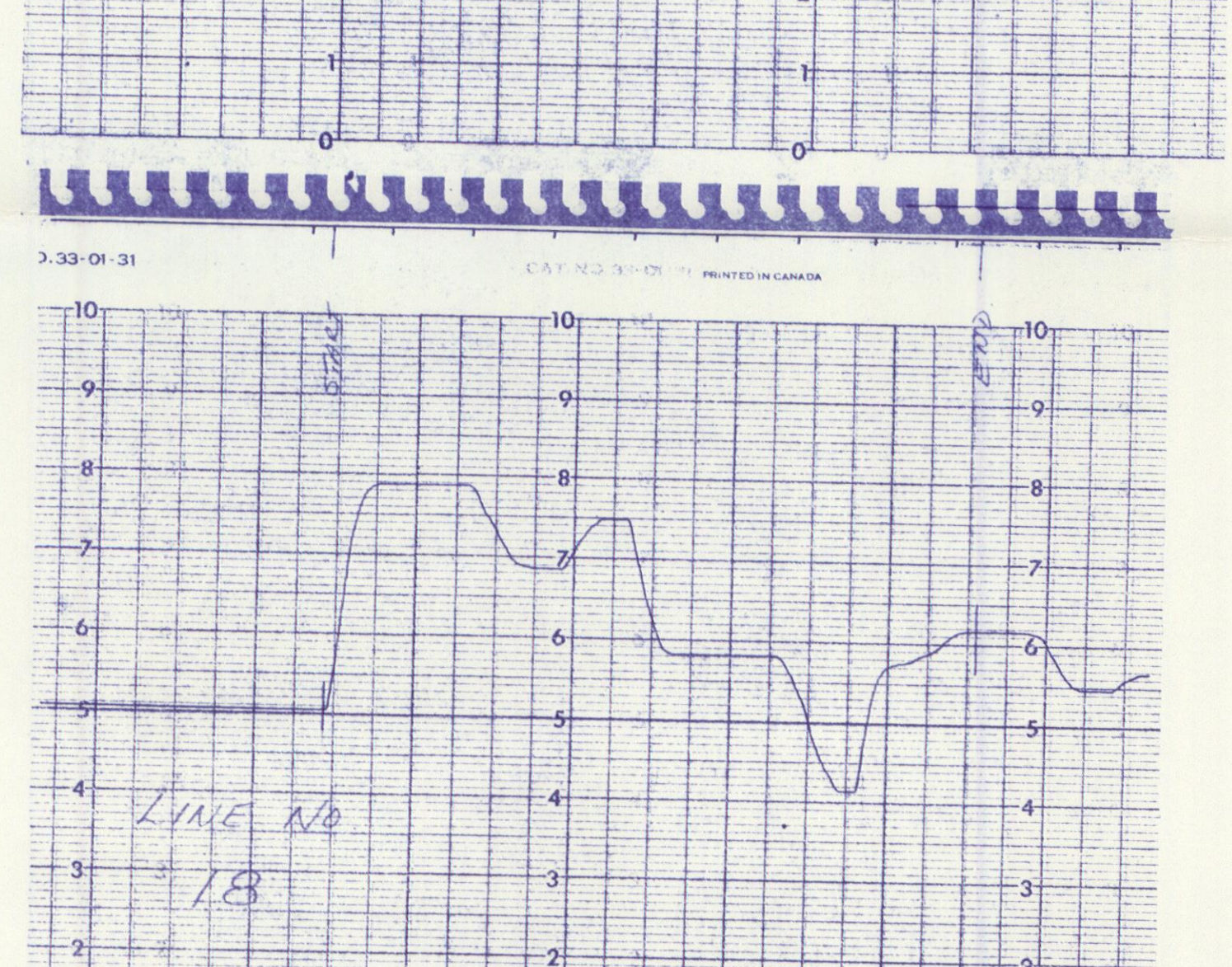
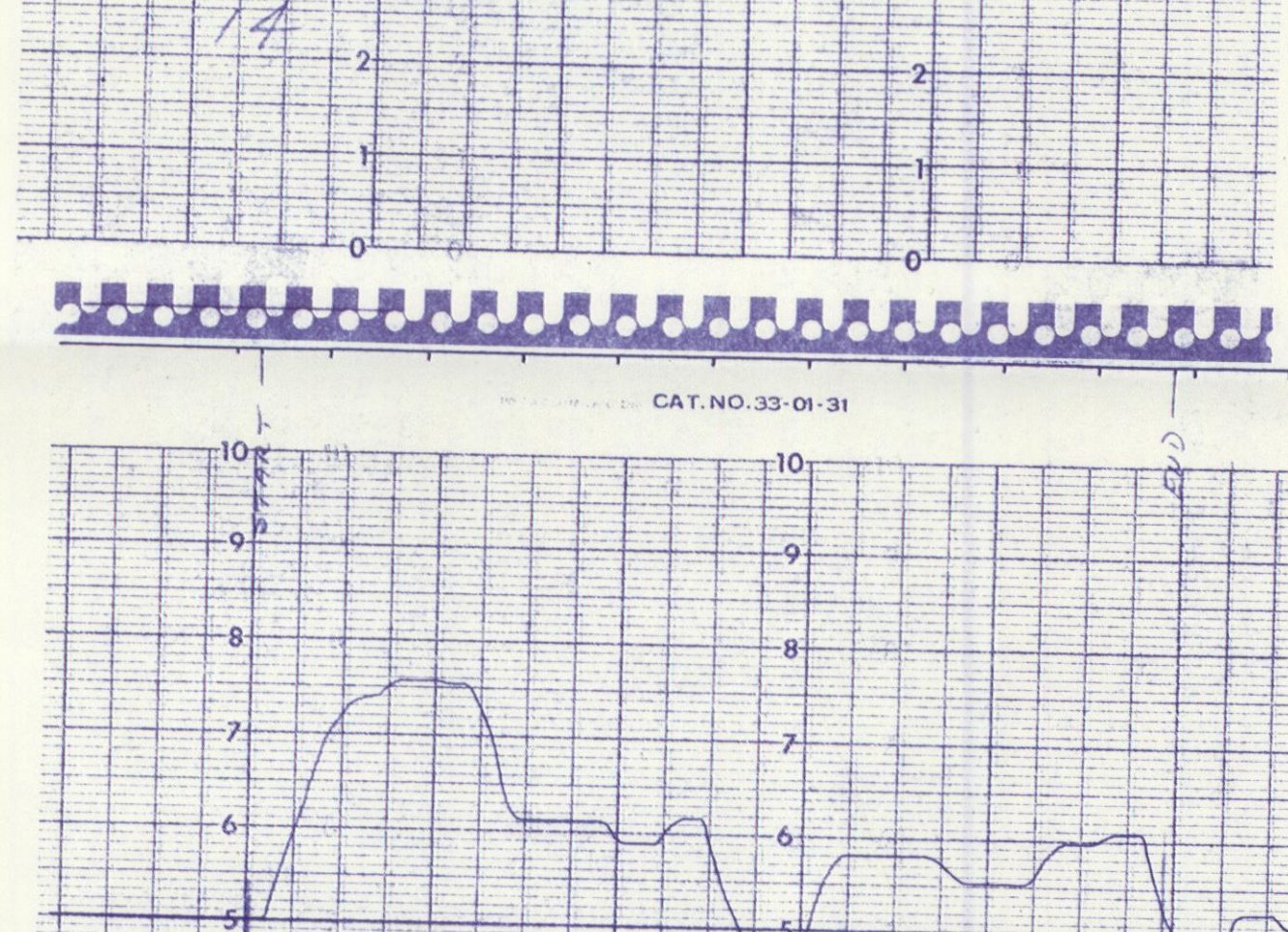
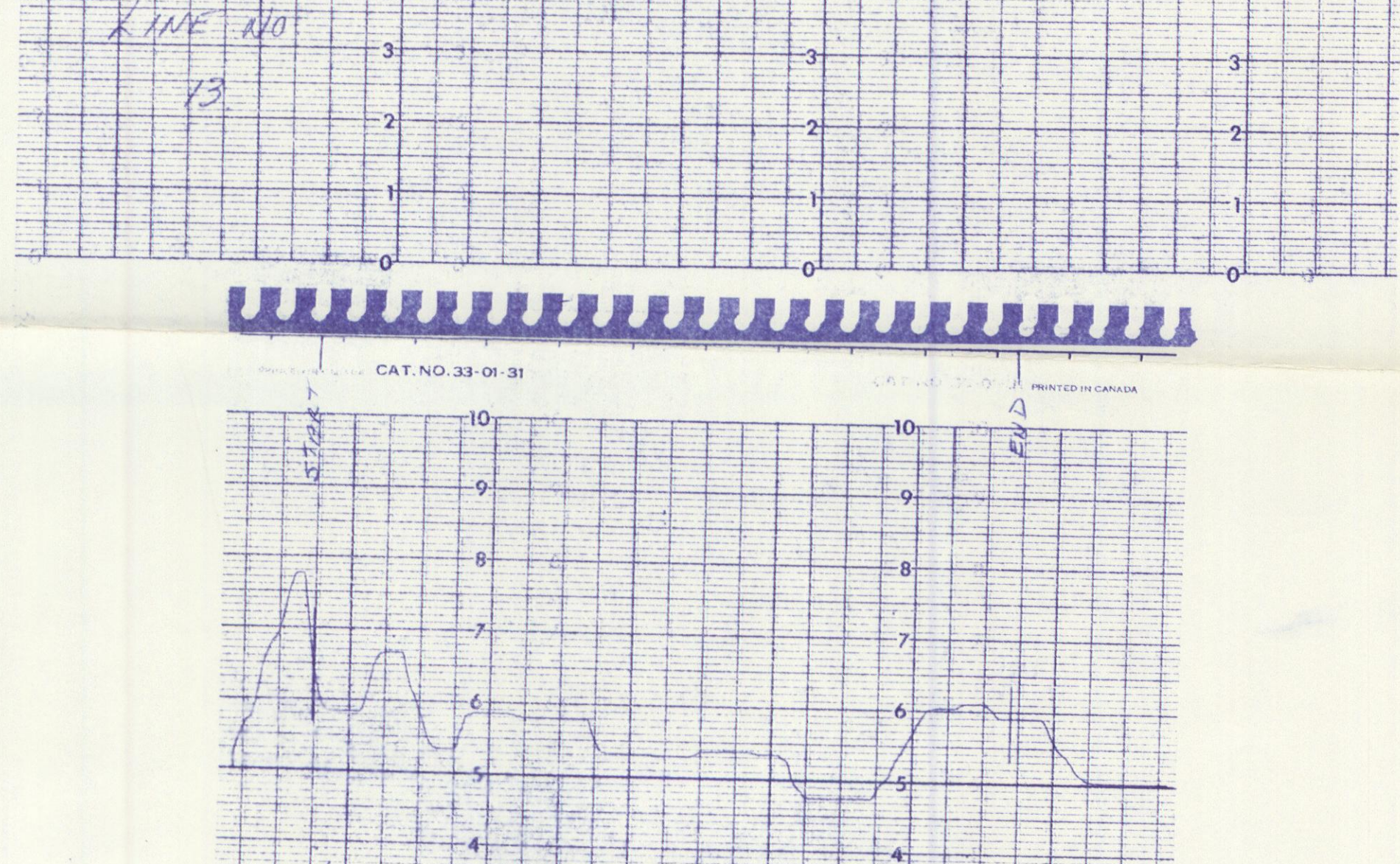
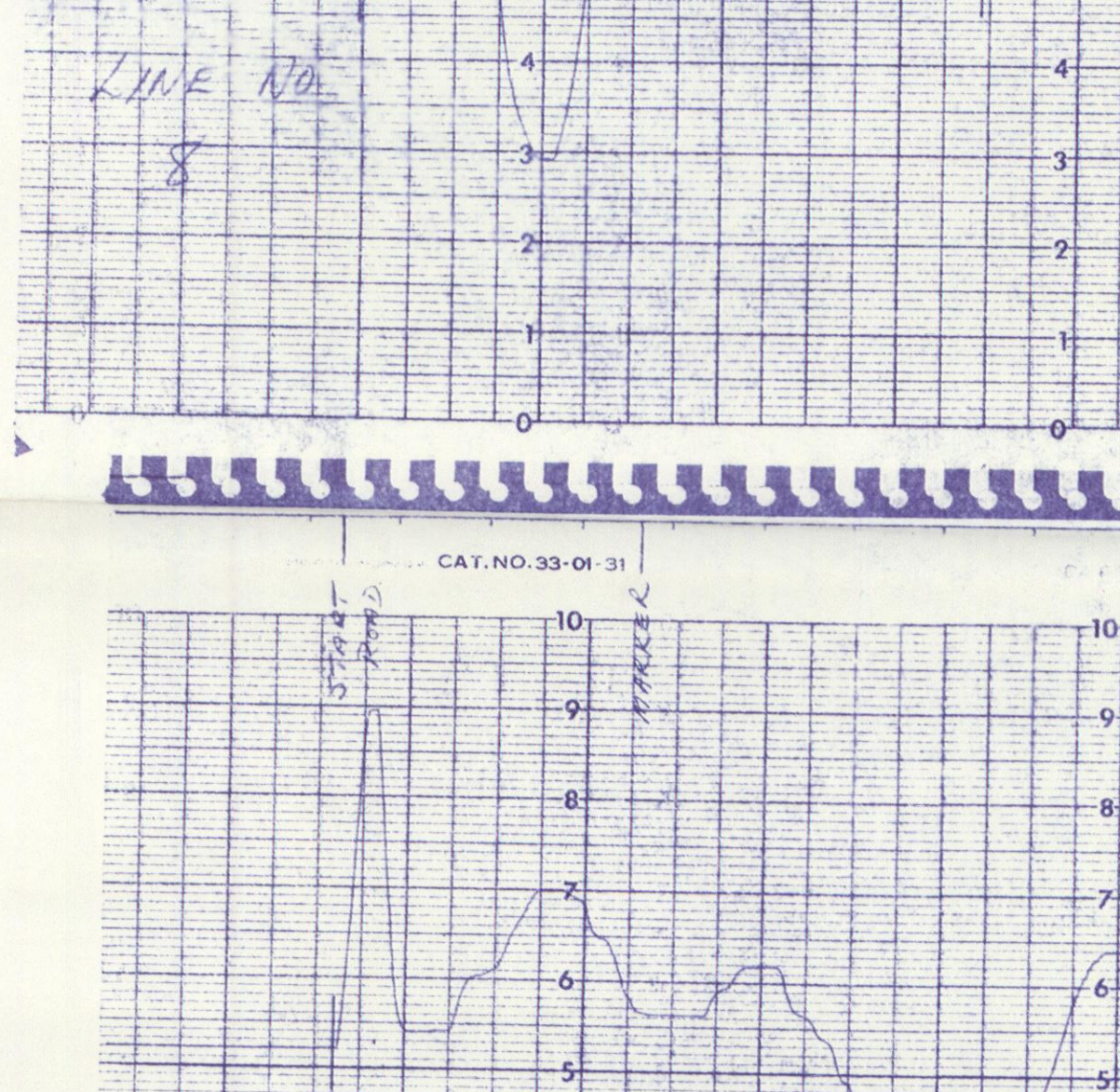
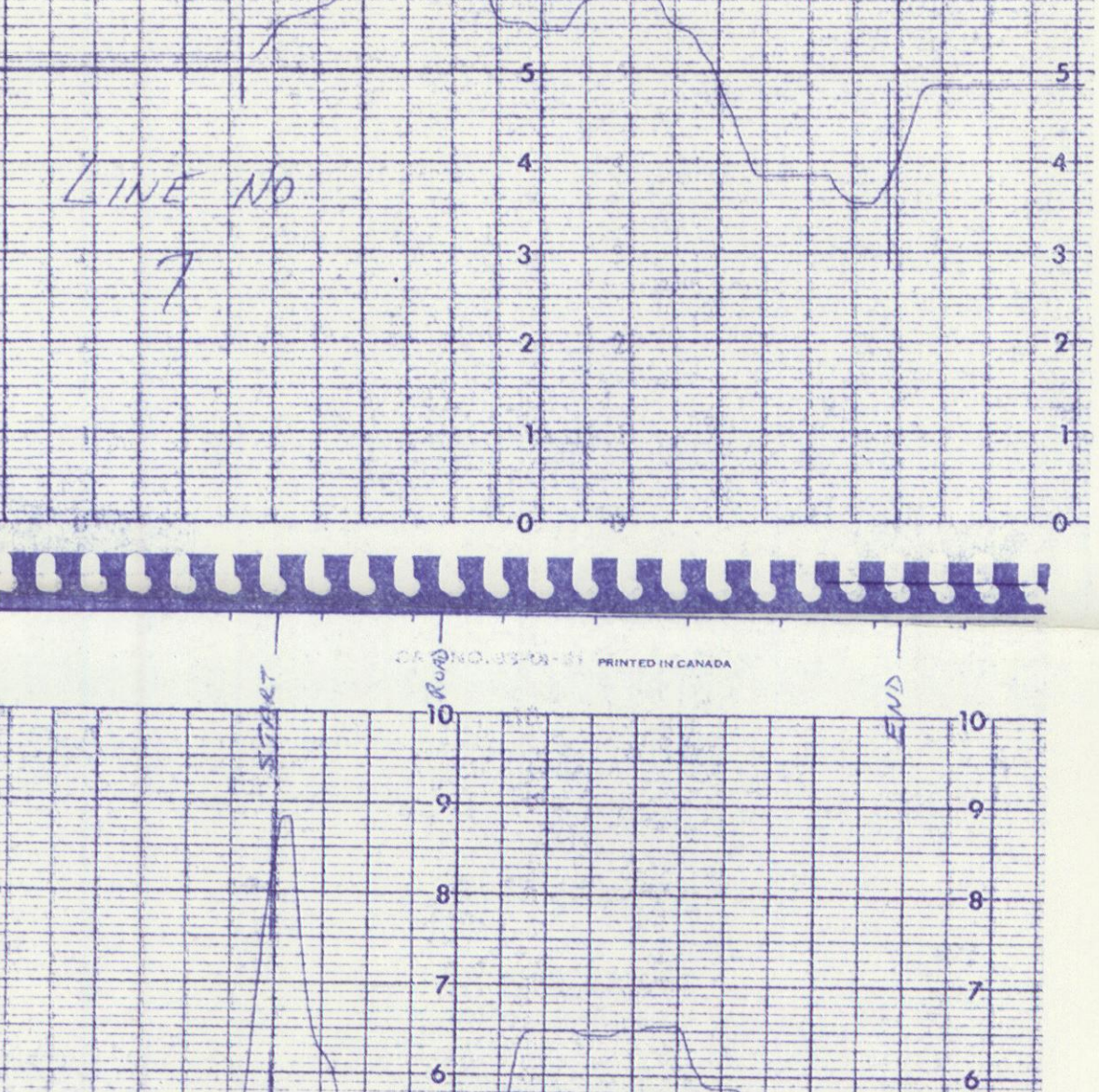
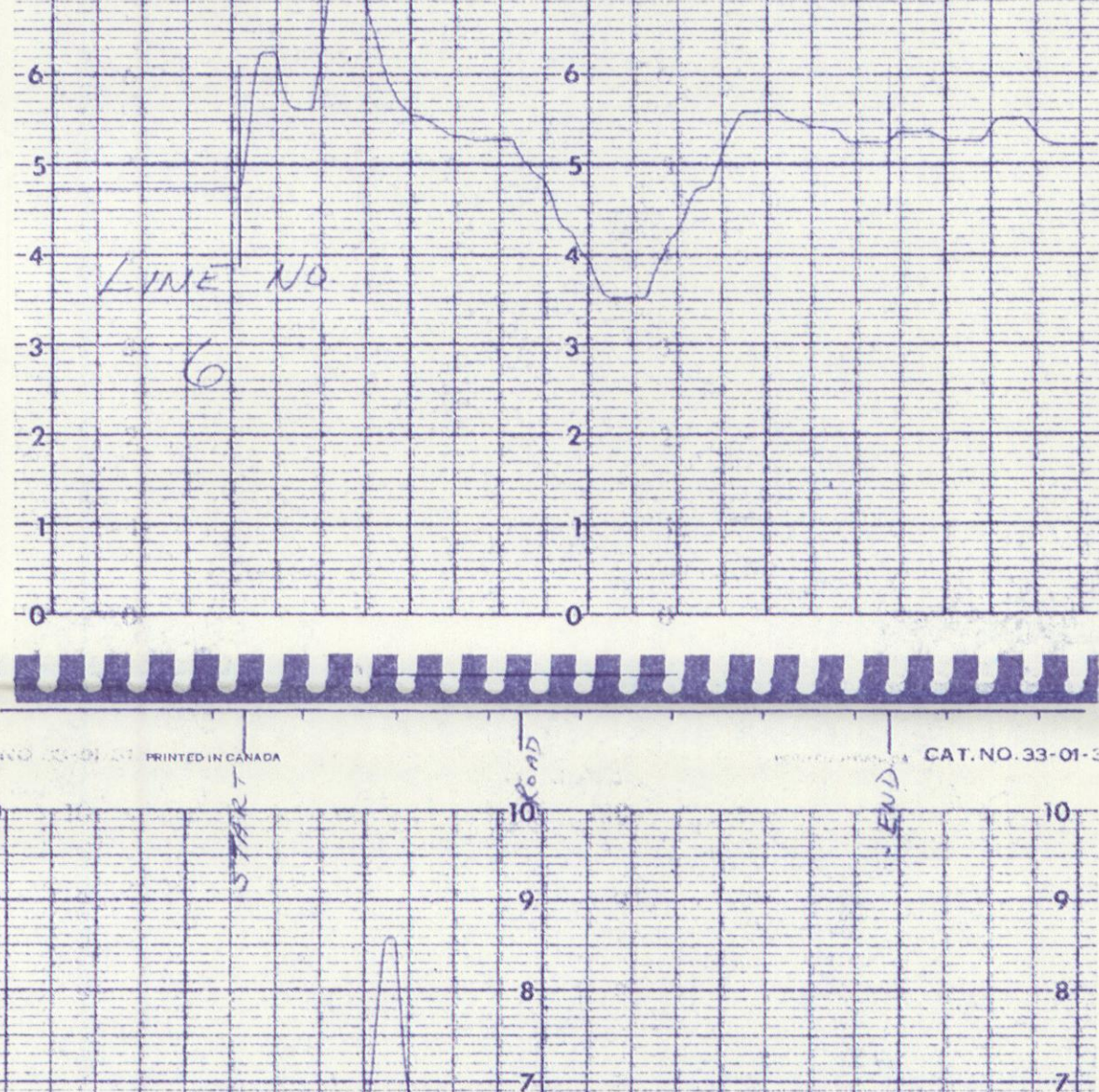
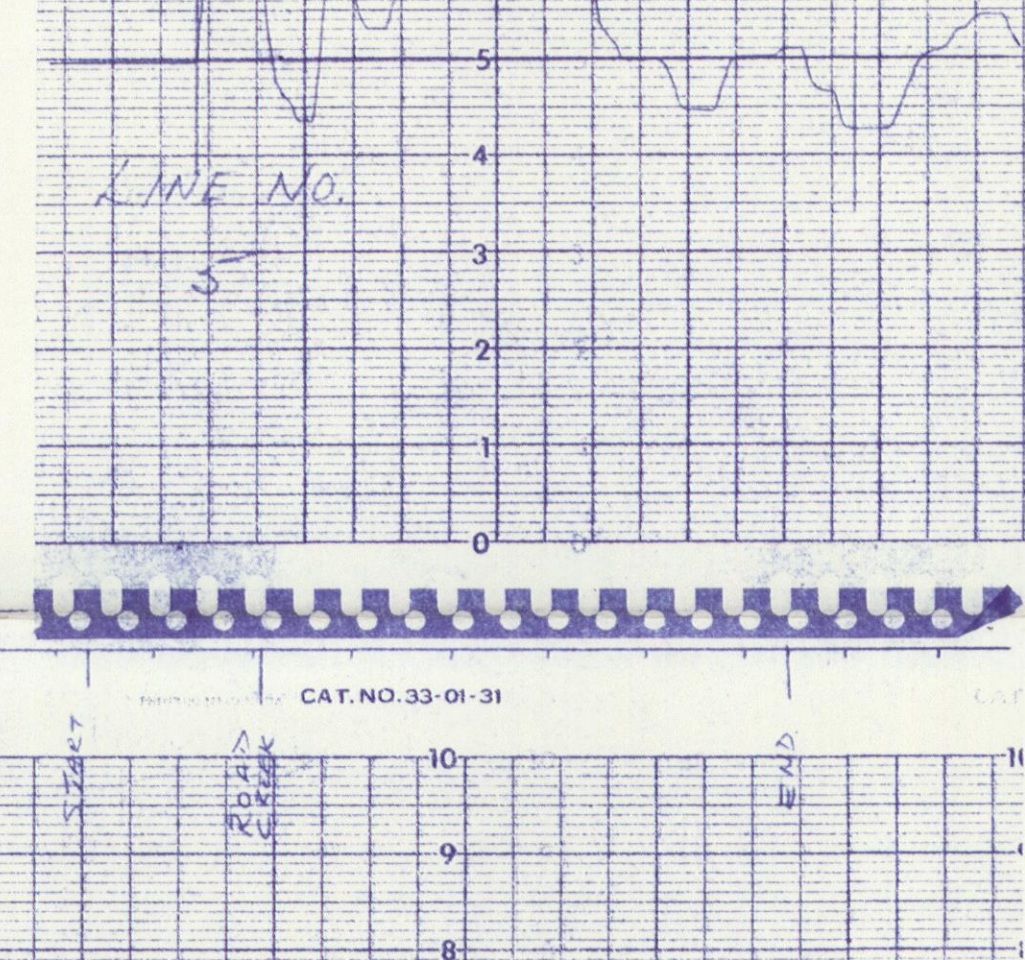
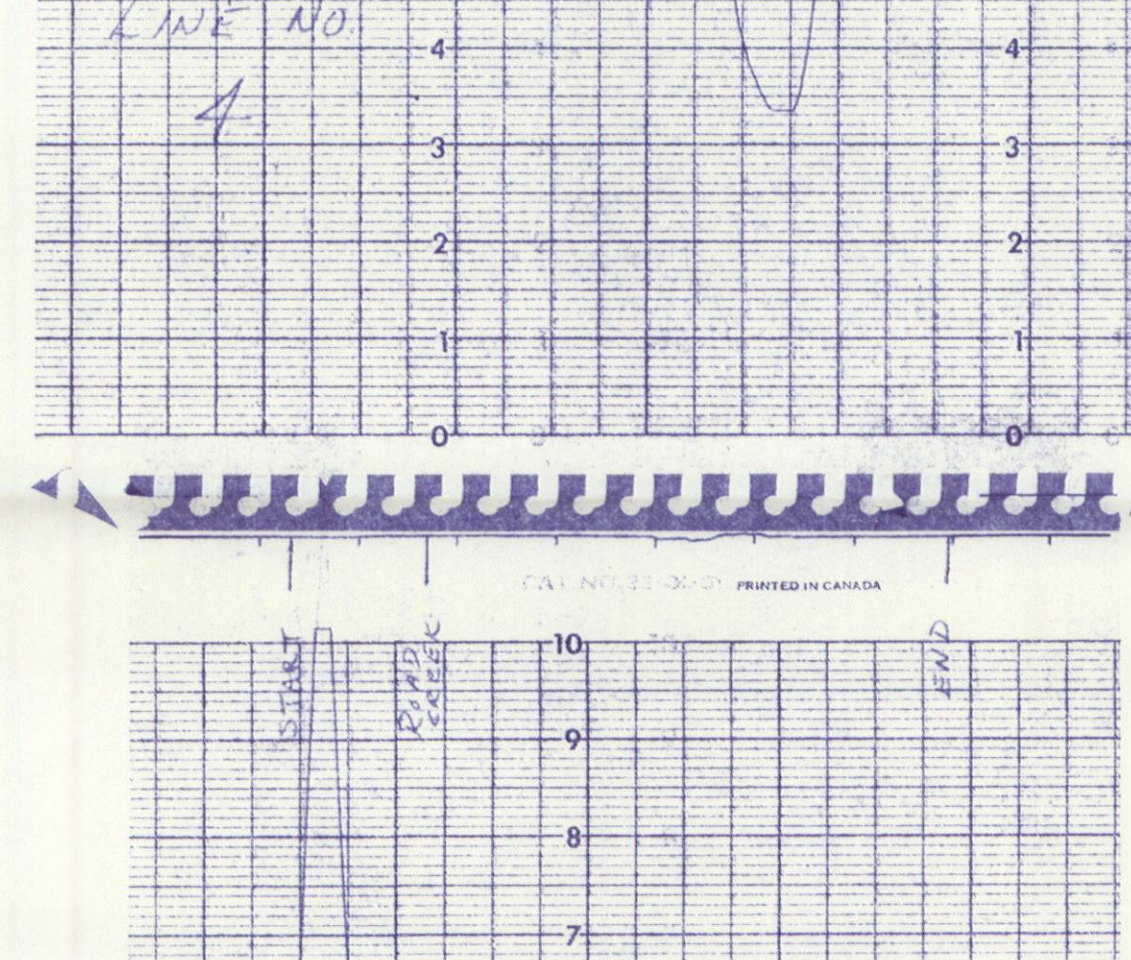
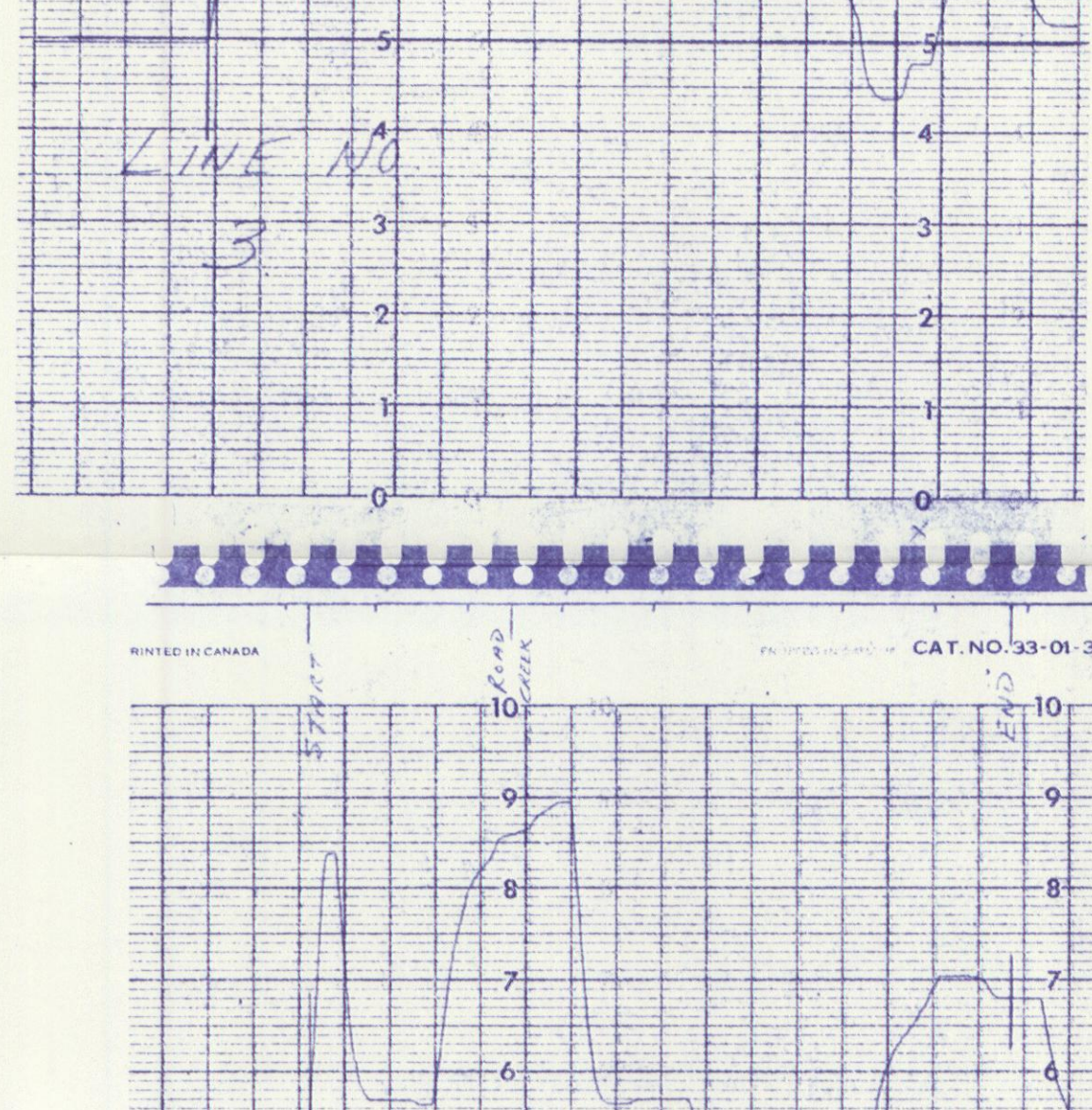
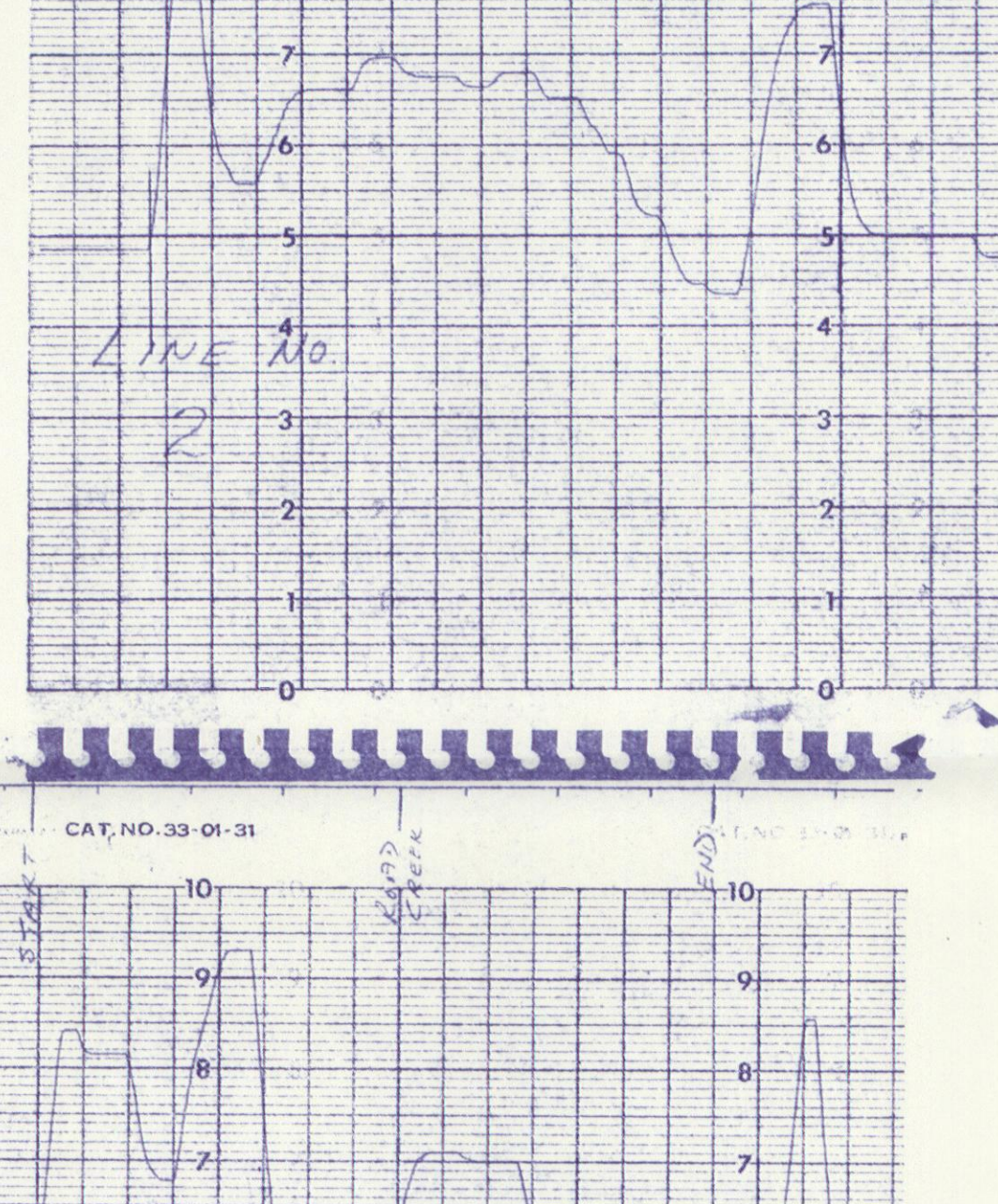
SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL
RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY
COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE
OF 1 INCH EQUALS 1000 FEET FLOWN BY 19 67 & 68



GEO-X SURVEYS Ltd.
627 HORNBY ST., VANCOUVER 1, B.C.

PROFESSIONAL
PHYSICIAN
S. COCHRANE
ENGINEER

TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
CHIN & CLIN GROUPS
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY by D. R. COCHRANE,
P. ENG., dated AUGUST 10, 1967,
VANCOUVER B. C.



PLOT OF ORIGINAL DATA (Z-COORDINATES)

PLOTING LIMITS			
MAXIMUM X =	5000.000000	MINIMUM X =	.000000
MAXIMUM Y =	8000.000000	MINIMUM Y =	.000000

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X-VALUE = .00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

SPHERE DEVELOPMENT
CHIN & CLIN GROUPS
CONTOURED ORIGINAL DATA

PLOT OF ORIGINAL DATA (Z-COORDINATES)

PLOTING LIMITS			
MAXIMUM X =	10000.000000	MINIMUM X =	
MAXIMUM Y =	8000.000000	MINIMUM Y =	

X-SCALE IS HORIZONTAL
X-VALUE = 5000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

SCALE 1" = 500'

CONTOUR INTERVAL 500 GAMMAS FROM

DATUM of 0 (background)

PLOT OF ORIGINAL DATA (Z-COORDINATES)

PLOTING LIMITS			
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MAXIMUM Y =	8000.000000	MINIMUM Y =	-8000000

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X-VALUE = 10000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

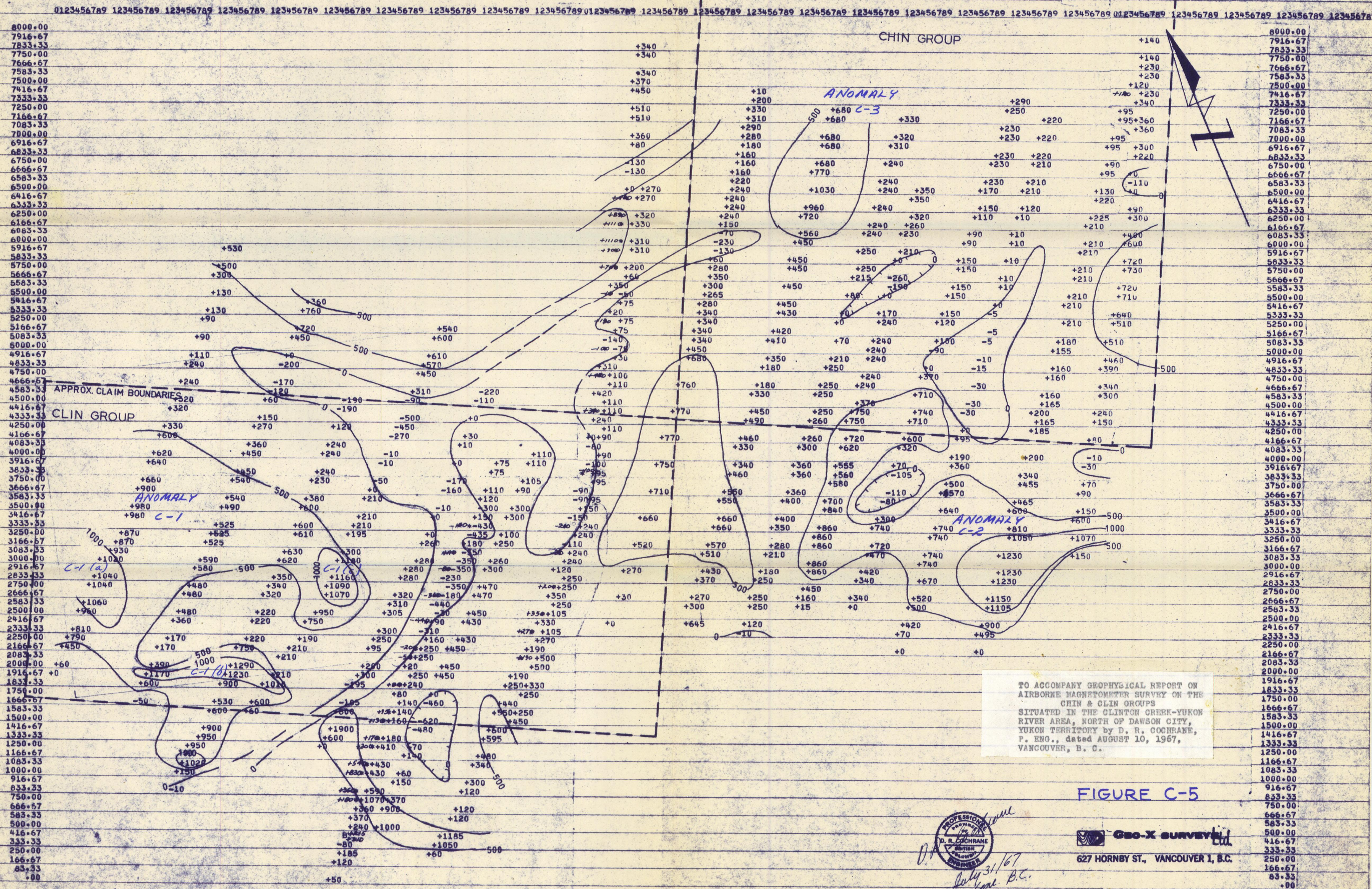




FIGURE C-6

PROFESSIONAL
D. R. COCHRANE
JULY 31/67
VANCOUVER BC

CONTOURED FOURTH DEGREE SURFACE

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MAXIMUM Y =	8000.000000	MINIMUM Y =	.000000

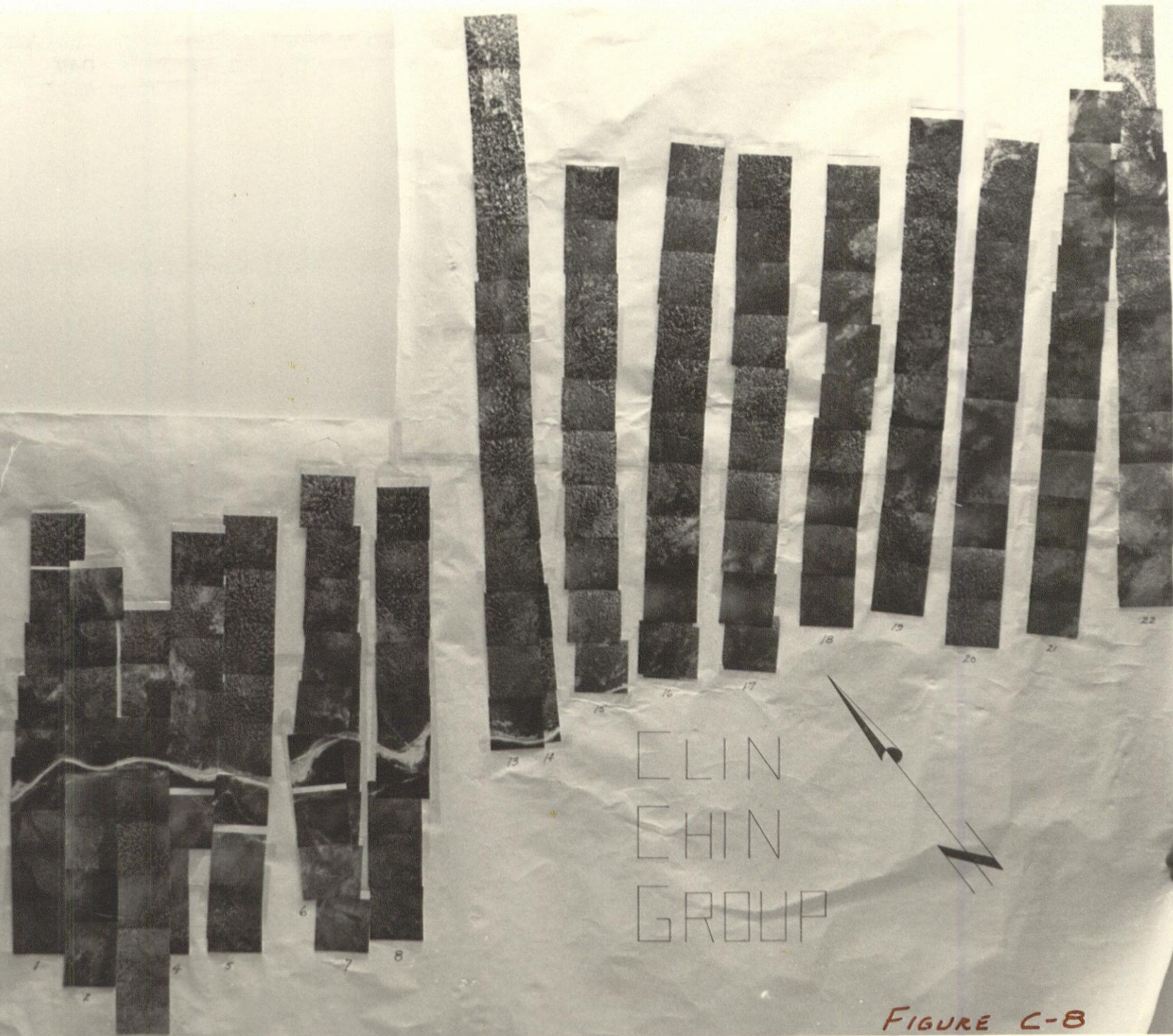
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X-VALUE = 10000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

CONTOUR INTERVAL = 10.00
REFERENCE CONTOUR (... ..) = 200.00

[illegible]

GEO-X SURVEYS Ltd.
7 HORNBY ST., VANCOUVER 1, B.C.



PART D - MON GROUP

Geophysical Report
on the
Airborne Magnetometer Survey
of the

MON Group of 12 Full Sized Claims

Situated in the Clinton Creek Area

Yukon Territory

Dawson Mining District

Latitude $64^{\circ}30' N$; Longitude $141^{\circ}00' W$

Airborne Field Work Completed

July 12, 1967

on behalf of

Sphere Development Corporation Ltd.

by

D. R. Cochrane, P.Eng.

August 11, 1967

Vancouver, B.C.



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

PART D - The MON claim group

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Appendix

D-I	Flight Data and Operators Report
D-II	Cost Appropriation, Mon Group

D-1 INTRODUCTION

On July 12, 1967, 13.03 line miles of coincident airborne magnetometer and aerial photography was completed on twelve Mon Claims. The property is situated in the Clinton Creek area, Yukon Territory and work was conducted by Geo-X Surveys on behalf of Sphere Development Corp. Ltd. This report discusses the results of the July survey, and the subsequent data processing.

D-2 LOCATION

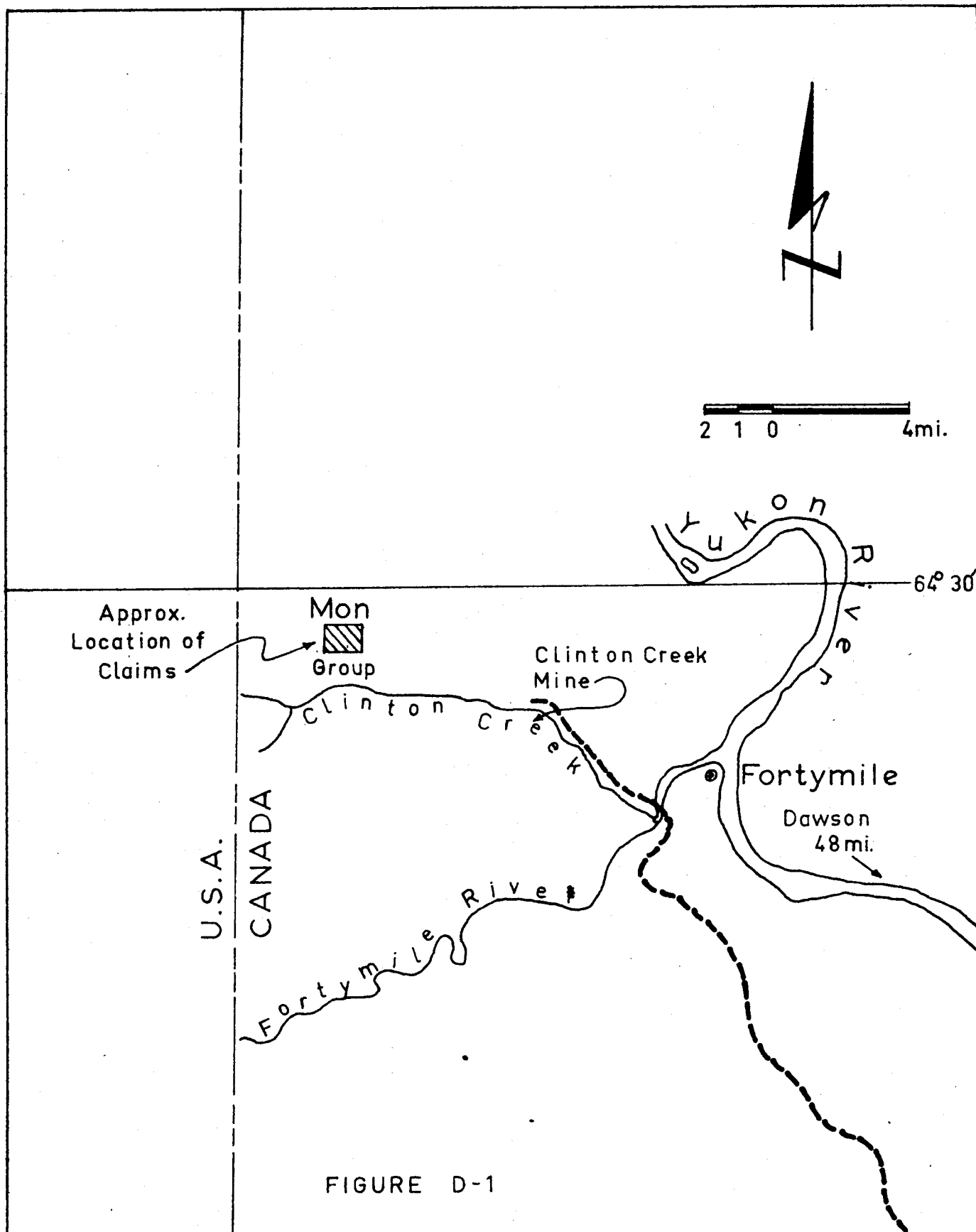
The Mon Group of claims are located 12 air miles west of the settlement of Fortymile, which is situated at the confluence of the Yukon River and Clinton Creek. Fortymile is approximately 42 air miles northwest of Dawson City, Yukon. (See Figure D-1, Location Map)

D-3 CLAIMS AND OWNERSHIP

The Mon Claims, numbers 1 to 12 inclusive, are owned outright by Sphere Development Corporation Ltd., registered office 848 West Hastings St., Vancouver, B.C. The following table summarizes pertinent claim data.

Name	Record No.	Group	Group No.	Anniv. Date
Mon 1 to 8	87646 to 87653	F	148	July 18
Mon 9 to 12	87717 to 87720	F	148	July 19

The claims are located in the Dawson Mining District, Yukon Territory. (See Figure D-2)



Title: Location Map Mon Group
 Prop: Sphere Devlp't Corp. Ltd. (NPL)
 Drawn: B.A.C. Date: August 3, 1967.
 Checked: J.R.C. Date: Aug 10/67



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

D-4 GEOMORPHOLOGY

The area covered by the Mon claims is a south sloping, (approximately 10 percent grade) plateau, between the elevation limits of 2100 feet in the south and +2500 feet in the north. A south flowing tributary of Clinton Creek has cut a "V" shaped channel in Mon No. 1 and No. 3 claims. Most of the ground is well forested but several patches of open scrub brush land are present. (see Figure D-3)

D-5 FIELD PROCEDURE

Thirteen flight lines were completed over the claim group, of minimum length 0.93 miles and maximum 1.12 miles. Lines were flown from south to north at an elevation of 500 feet above ground, and at an average ground speed of 60 miles per hour.

Ground control was fair, with one of the two ground markers located, by the operator, and aerial photography to base map correlation was distinct. Lines 6 and 7, however, were flown over a relatively featureless section of the property and therefore may have minor errors in positioning. Very little lateral photographic overlap occurred.

The claim group was flown with full scale deflection of 3000 gammas of the fluxgate magnetometer recording system.

D-6 INSTRUMENTS AND SPECIFICATIONS

(See Part A-5)

D-7 AEROMAGNETIC DATA AND DISCUSSION

(a) Original Data

A total of 529 combined x, y (geographic co-ordinates) and z (relative vertical component of the earth's magnetic field) were digitized and computer processed on the Mon Group. The dy interval varied from 116 to 142 feet (along line digitizing interval). The maximum z value encountered was +425 gammas on line 13, and the minimum -915 gammas on line 10. The Isomagnetic Contour Plan of Original Data is presented as Figure D-5. (In Map Pocket) In general, the Mon Group is characterized by negative intensities, with three reasonably large areas of positive magnetic relief. The three positive, and one negative magnetic anomalies are named and discussed.

Anomaly D-1, located on Mon No. 3 and extending onto Mon No. 4 is positively anomalous, with a maximum amplitude of 340 gammas above 0 datum. Anomaly D-2 extends north-south, close to the west claim group boundary, through claims No. 1, 2 and 9. Maximum intensity of D-2 was +425 gammas on south central Mon No. 2. Anomaly D-3 is also positive in sign and roughly arcuate in shape through Mon No. 10 and 11. This anomaly is low amplitude ranging up to +385 gammas. Anomaly D-4 is a negative area, with two central lobes of -500 gammas. It is wedged between anomalies D-1 and D-3, and is centred on Mon No. 4.

(b) Trend Surface Analysis of Original Data

A Fourth degree trend surface was calculated and contoured by a Univac 1108 digital computer. The "goodness of fit" of the surface was excellent, with a coefficient of correlation

D-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

of 0.443. Fifth and sixth degree surfaces were prepared, however correlation did not increase, then diminished with coefficients of 0.443 and 0.339 respectively. The contoured trend surface is presented as Figure D-6. (In Map Pocket) The map is contoured at 50 gamma intervals with an X - Y scale of 1 in.:500 feet. The best fit surface has an extremely symmetrical form, with a minor low negative center, and four well positioned higher amplitude negative corners. This system is enclosed by a rim of positive trends. Trend anomaly D-2 is depicted in north-south bands of up to +200 gammas.

Original anomaly D-2 was displaced to the south by trend analysis, and anomaly D-3 is represented as a broad, weak 0 to -50 gamma circular zone. Original data anomaly D-4, a negative anomaly, was displaced a few hundred feet southwest with computer analysis.

The trend surface outlined a fifth trend anomaly, centred on the north boundary of Mon No. 7; maximum amplitude of over -250 gammas. This area is designated as anomaly D-5.

(c) Residual Data Trend Surface

A sixth degree trend surface was computed from the fourth degree residual data on the Mon group, and is presented as Figure D-7. The coefficient of correlation of this surface was excellent at 0.455. The contour interval is 10 gammas and the X-Y scale is 1 in.:500 feet. The residual surface has outlined only one

D-7 AEROMAGNETIC DATA AND DISCUSSION (CONT.)

area of abnormality, and it is centred on Claim Mon No. 4 and has an intensity of just over 60 gammas. The residual anomaly D-4 coincides with original and trend anomalies D-4.

D-8 SUMMARY AND CONCLUSIONS

On July 12, 1967, 13.03 line miles of airborne magnetometer surveys, complete with coincident aerial photography, was flown on the twelve Mon claims, located near Clinton Creek, Yukon Territory. The claims are owned by Sphere Development Corporation Ltd. of Vancouver, B.C.

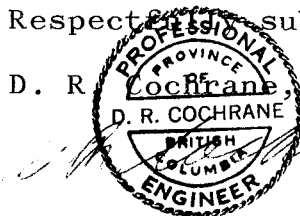
A total of 13 north-south lines at an elevation of 500 feet above ground, averaged approximately 1 mile long and 500 feet apart.

A total of 529 values of the vertical magnetic component with corresponding positioning coefficients, were processed by a Univac 1108 computer. Four original data anomalies were located, and a fifth was outlined on a "very good fit" fourth degree trend surface analysis of the original data. A sixth degree trend surface was completed on the fourth degree residual data, and because of the "good fit" qualities of the trend programme on the original data, and low amplitude of the vertical intensity original data, only one residual anomaly was outlined. This anomaly, D-4 coincides spacially with original data and trend anomaly D-4.

Ground followup magnetometer surveys on anomalies D-1 through D-4, in conjunction with geological mapping is recommended for the Mon Group.

Respectfully submitted,

D. R. Cochrane, P. Eng.



APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: MON GROUP Job: 1002 (D) Date: JULY 12/67
 Operator: R. ROBILLARD Flight elevation: 500 FEET
 Direction flown: NORTH Air speed: 60 MPH Chart scale 1/500
 Weather: +65° SOME SMOKE HAZE - VISIBILITY GOOD.

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gammas	Min. Z gammas
	X	Y	X	Y			
1	5470	0	5509	5940	1.12	40	- 460
2	5140	80	4890	5370	1.00	60	- 390
3	4610	450	4680	5540	.96	0	- 350
4	4430	220	3800	5320	.98	40	- 780
5	3750	270	3530	5450	.98	170	- 355
6	3330	590	2970	6070	1.03	95	- 575
7	2715	675	2370	5930	1.00	90	- 340
8	1980	1250	1930	6530	1.00	385	- 860
9	1675	980	1675	6370	1.01	340	- 540
10	1120	790	500	5640	.93	190	- 915
11	960	775	175	6090	1.01	220	- 610
12	650	910	60	6240	1.01	285	- 465
13	270	1020	0	6230	1.00	425	- 265

Total number of X, Y, Z points 529

Total number on line miles 13.03

Signed R. Robillard

Appendix II - COST APPROPRIATION

As per contract for airborne surveys between
Geo-X Surveys Ltd. and Sphere Development Corporation Ltd.

Survey of Mon Group	\$ 1,180.87
Ground Control (see following page)	<u>545.76</u>
Total	<u><u>\$ 1,726.63</u></u>



ALRAE EXPLORATION LTD.

202 - 846 WEST HASTINGS STREET, VANCOUVER 1, B.C. TELEPHONE 681-9381

Sphere Development Corporation Ltd.
848 West Hastings Street
Vancouver 1, B. C.

RE: Location and marking claims for aerial magnetometer survey
MON 1 - 12 incl.

Personnel:

<u>Days</u>	<u>Name</u>	<u>Occupation</u>	<u>Dates</u>	<u>Gross Wages</u>
3	D. Smallman	Line Cutter	June 13, 25, 26/67	\$ 100.98
1/2	B. Garner	Asst. Geol.	June 19/67	20.10
1	D. V. Preston	Asst. Geol.	June 19/67	44.20
1	A. Burton	Geologist	June 28/67	113.28
1	J. Mackie	Geologist	July 11/67	88.28
6-1/2				\$ 366.84
	Topographic mapping			66.12
	Transportation, truck and Honda rental, field supplies and hardware			112.80
				\$ 545.76

ALRAE EXPLORATION LTD.
846 W. HASTINGS ST.
VANCOUVER 1, B. C.

R. J. [Signature]

*Paid in. Field
A. Burton*

GEOLOGY
Exploration

CONSULTANTS
Development

MINING
Production

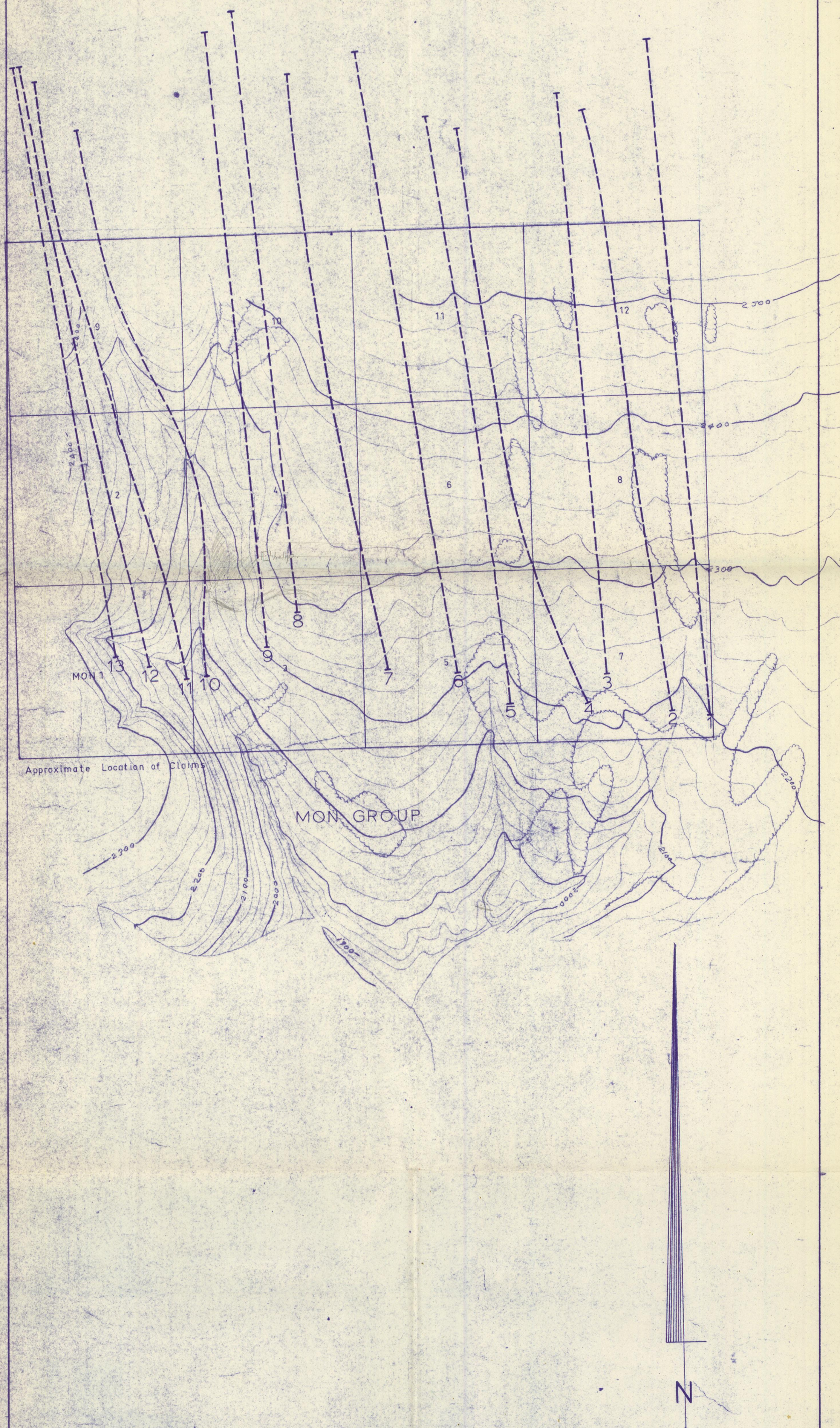


FIGURE D-3
TOPOGRAPHIC & FLIGHT LINES

GEO-X SURVEYS LTD.
627 HORNBY ST., VANCOUVER 1, B.C.
Drawn: B.A.C. Date: Aug. 9, 1967



TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
MON GROUP
SITUATED IN THE CLINTON CREEK-YUKON RIVER
AREA NORTH OF DAWSON CITY, YUKON TERRITORY
by D.R. COCHRANE BENG. AUG. 10, 1967, VANCOUVER B.C.

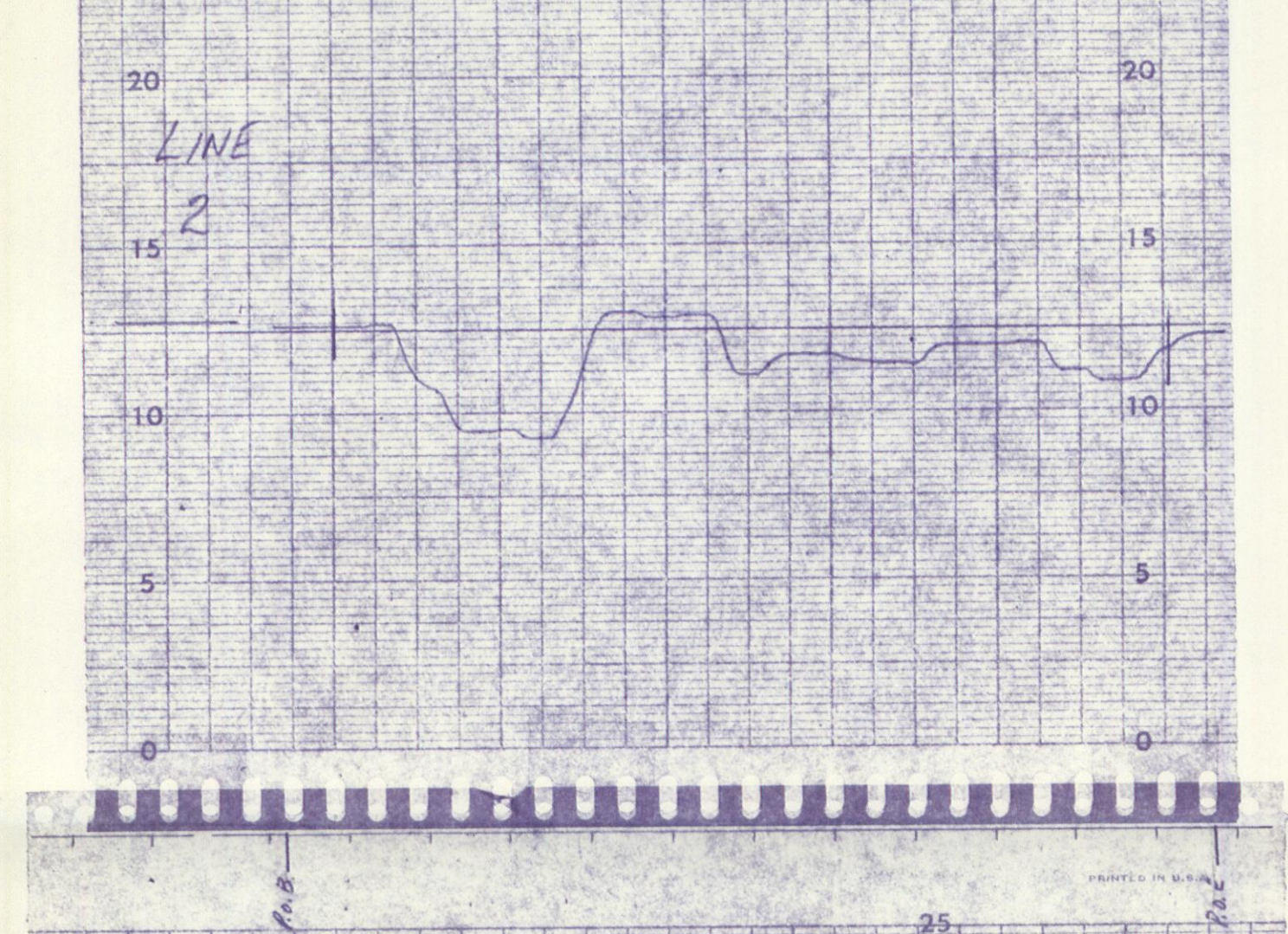
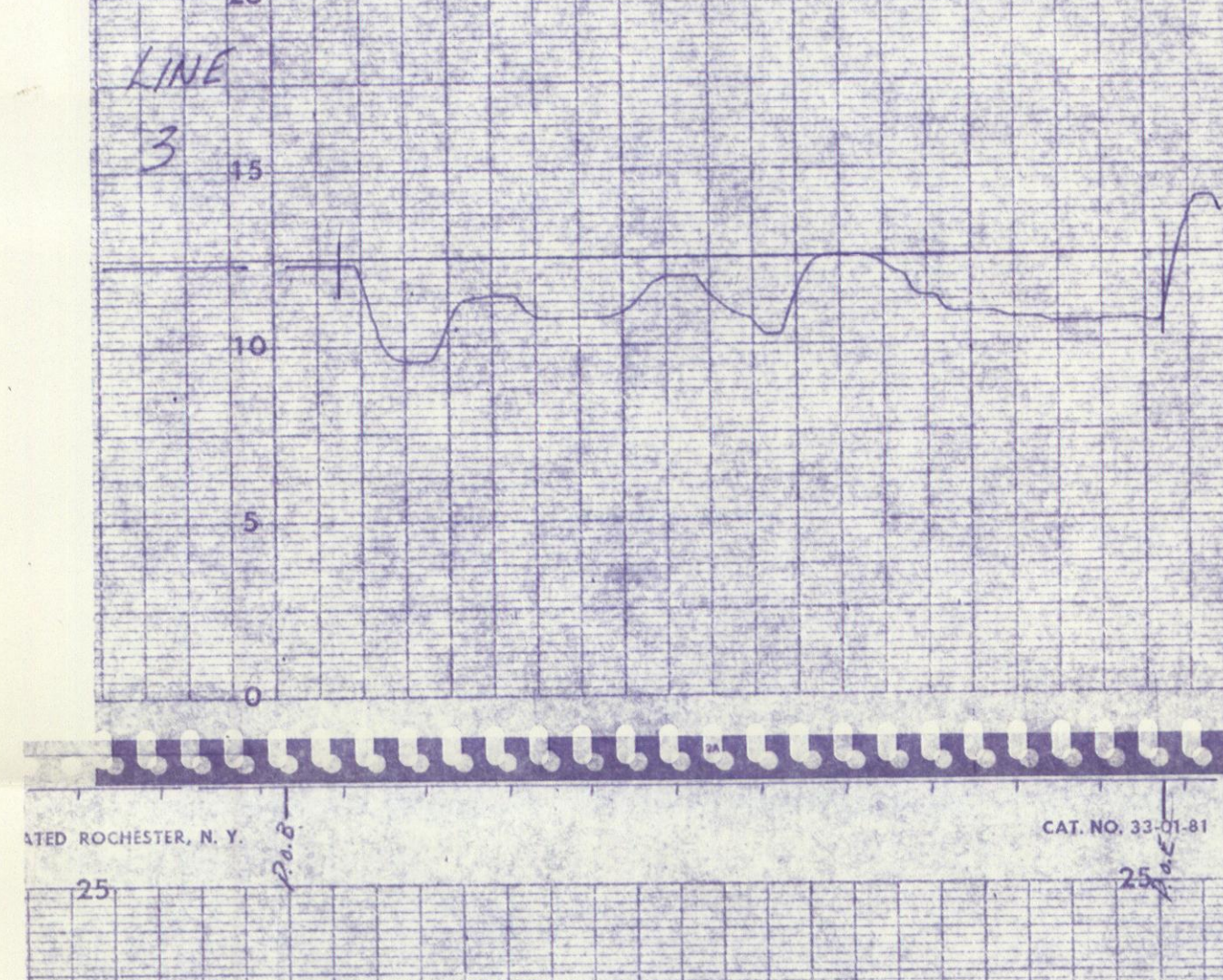
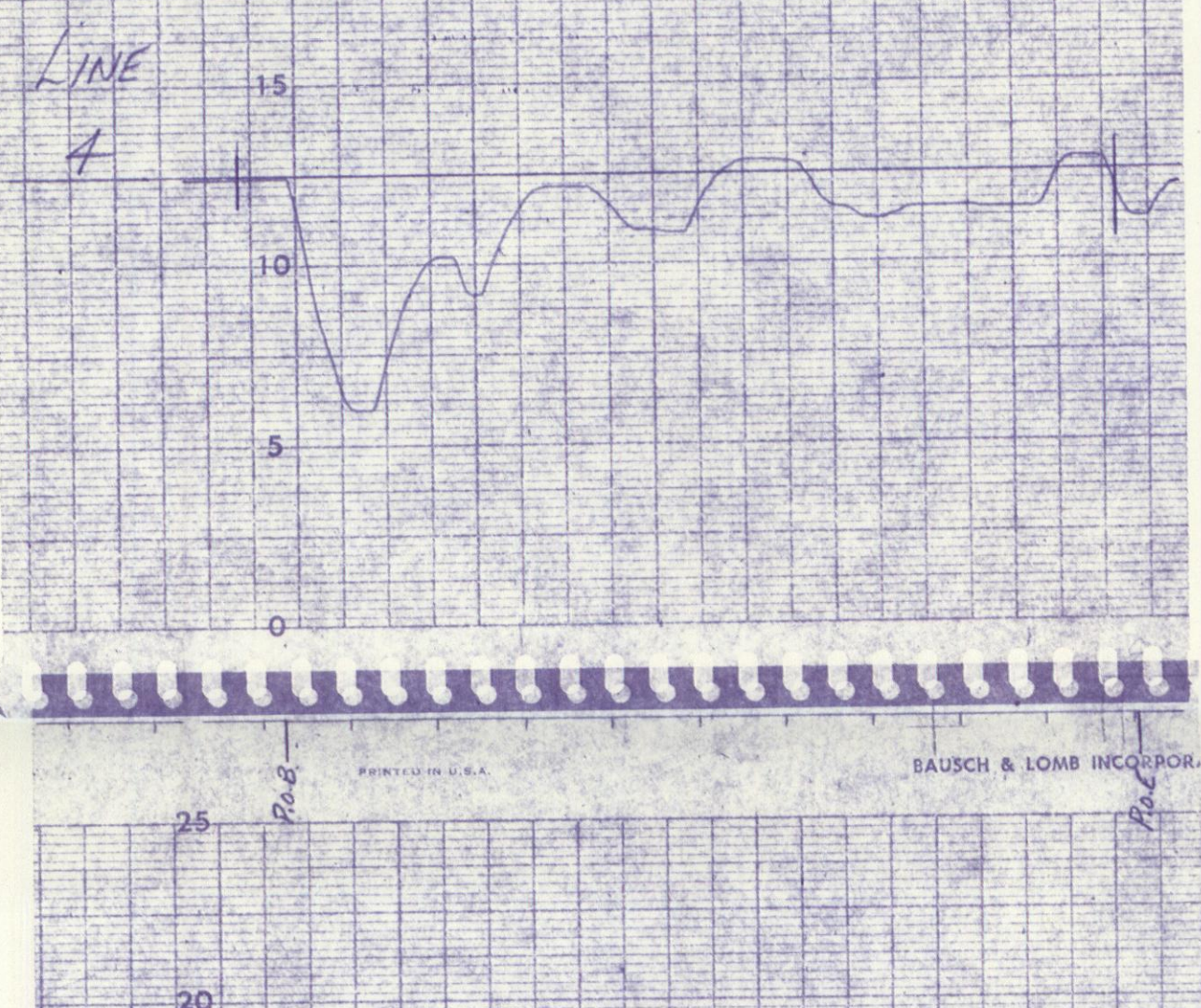
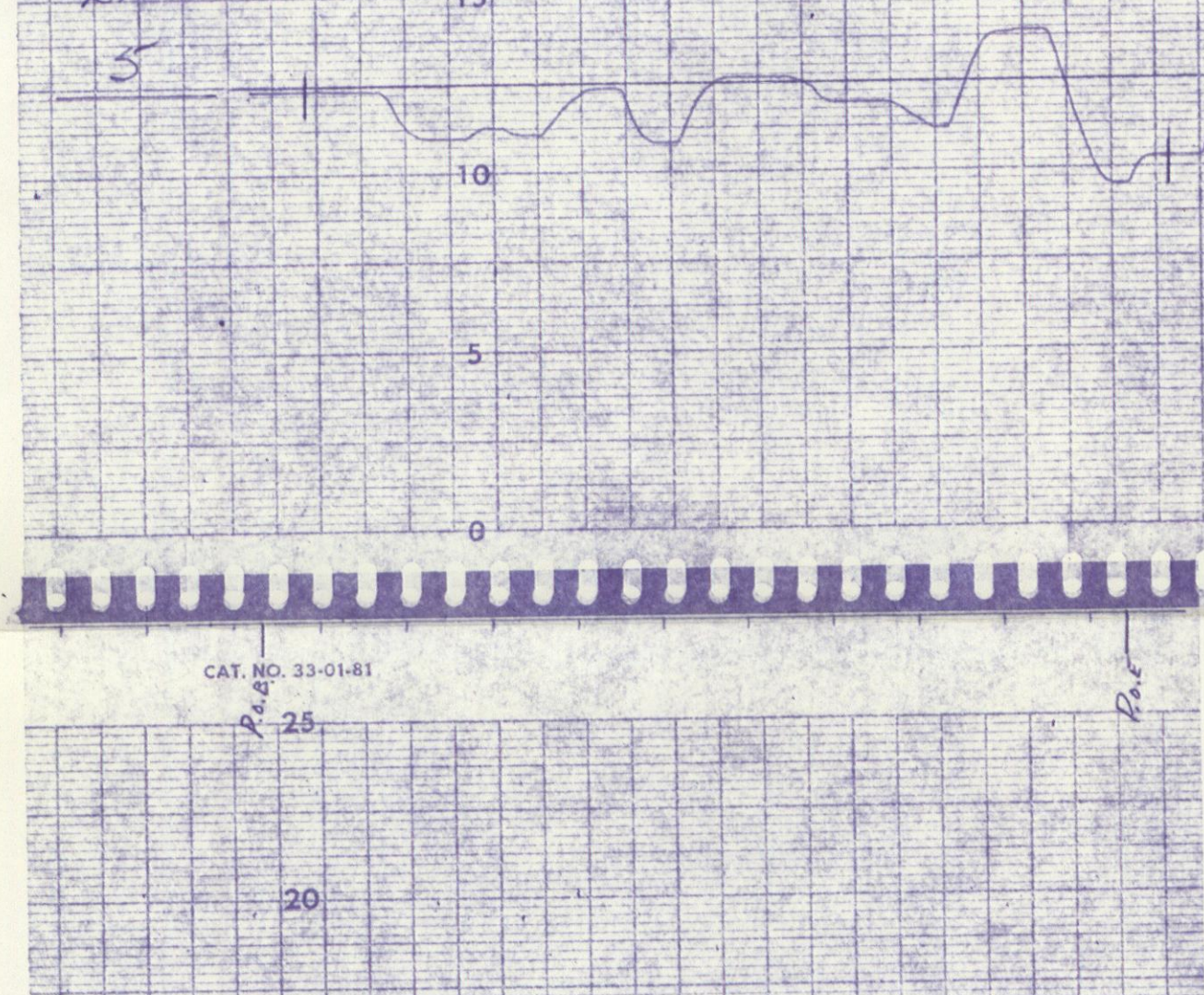
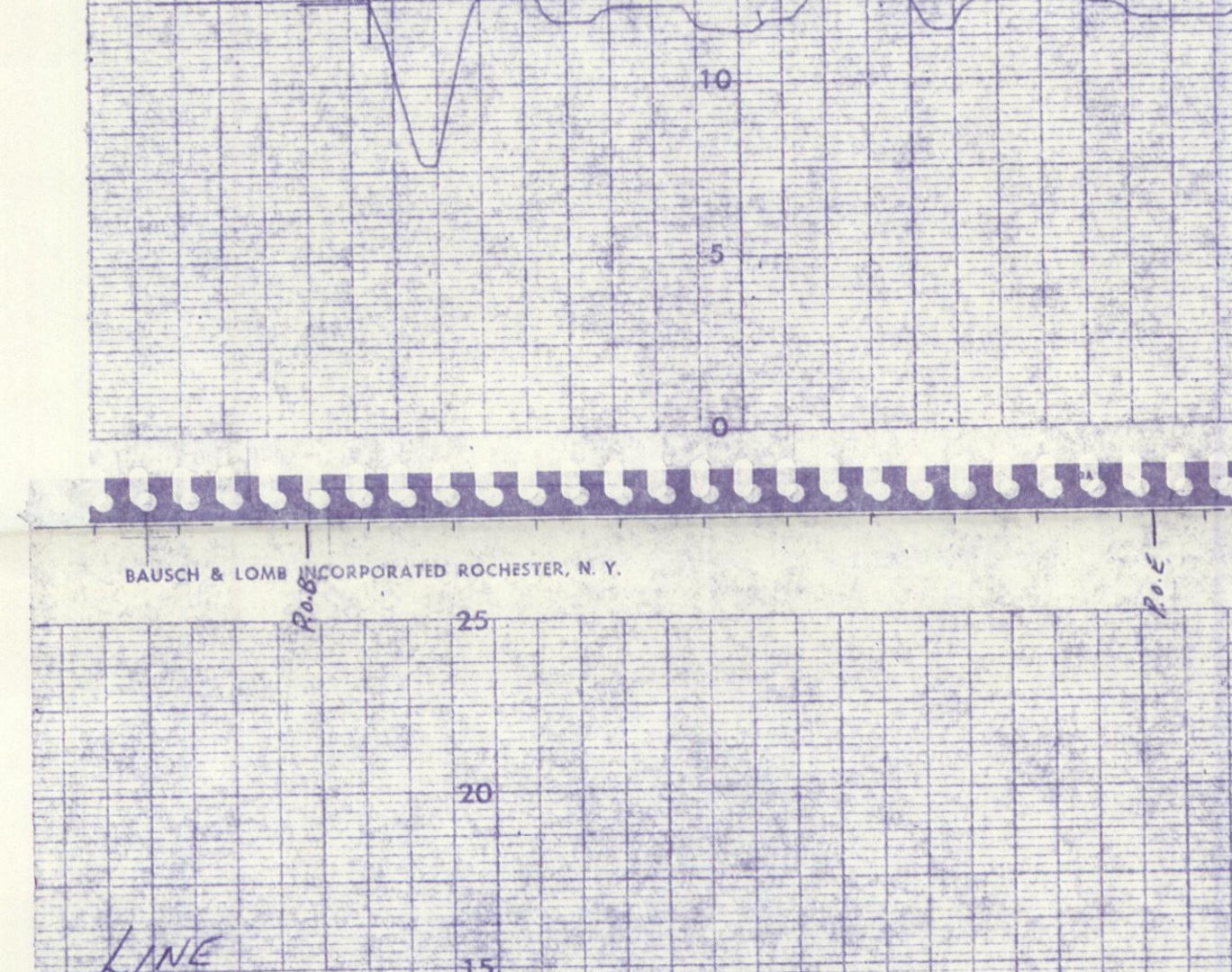
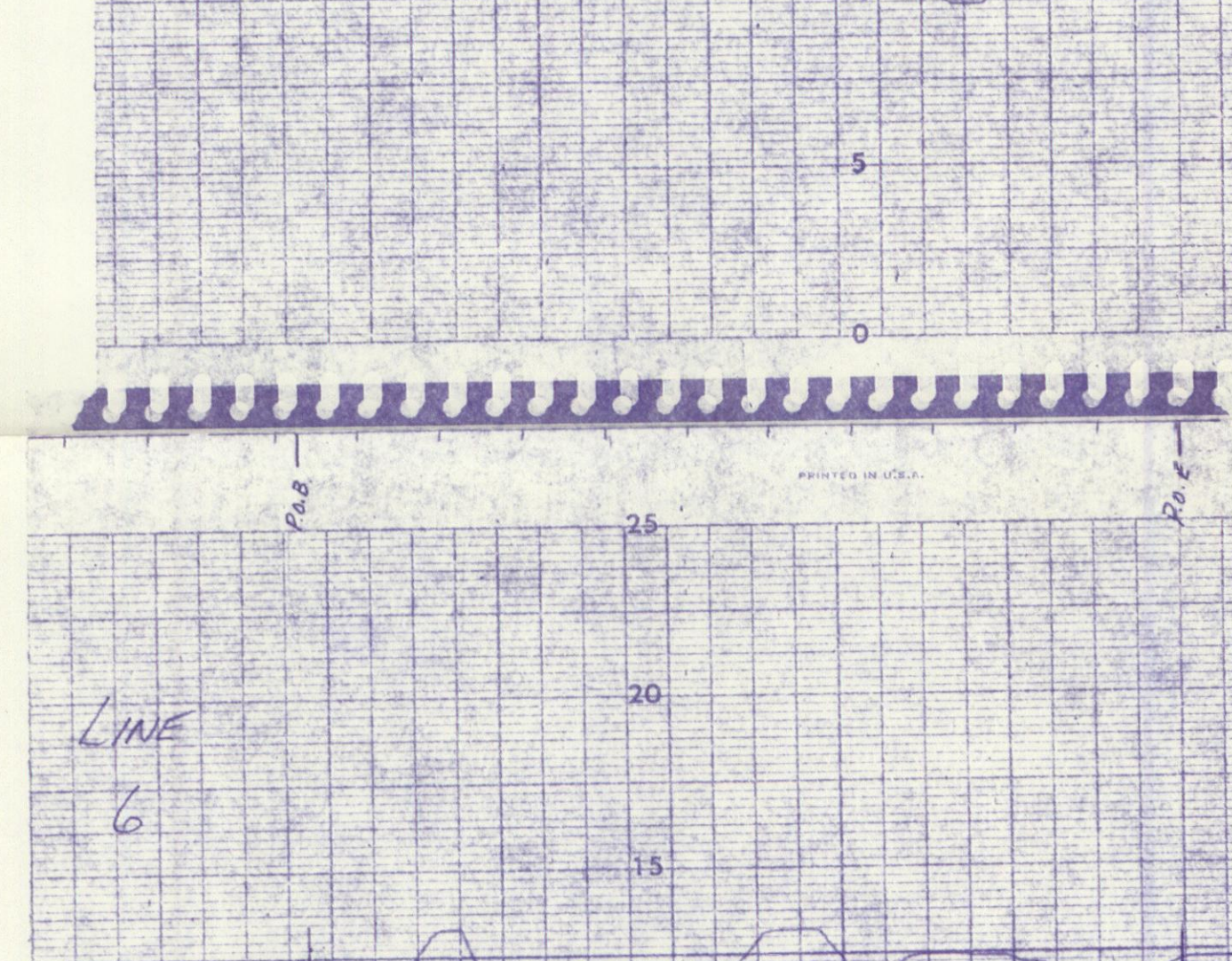
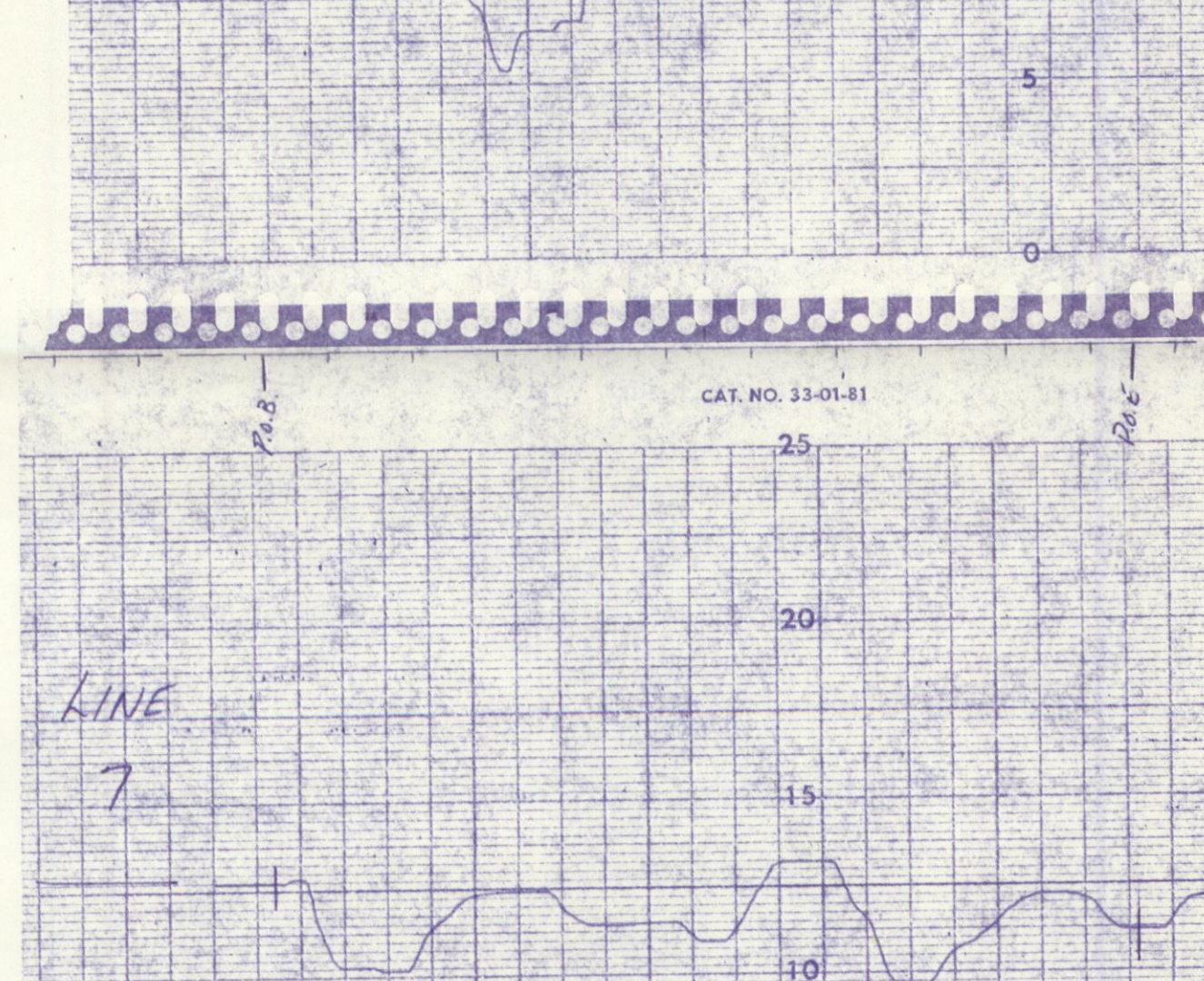
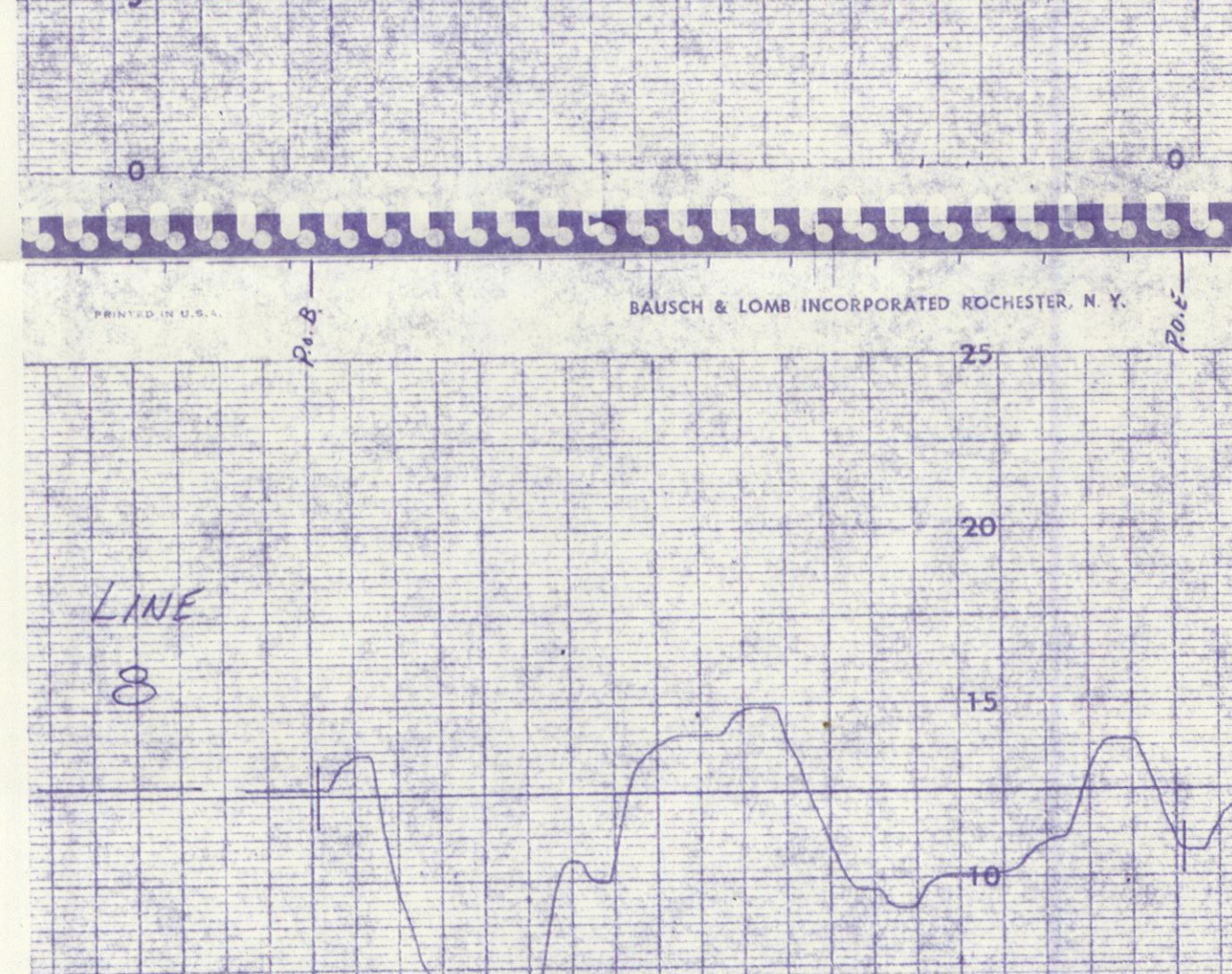
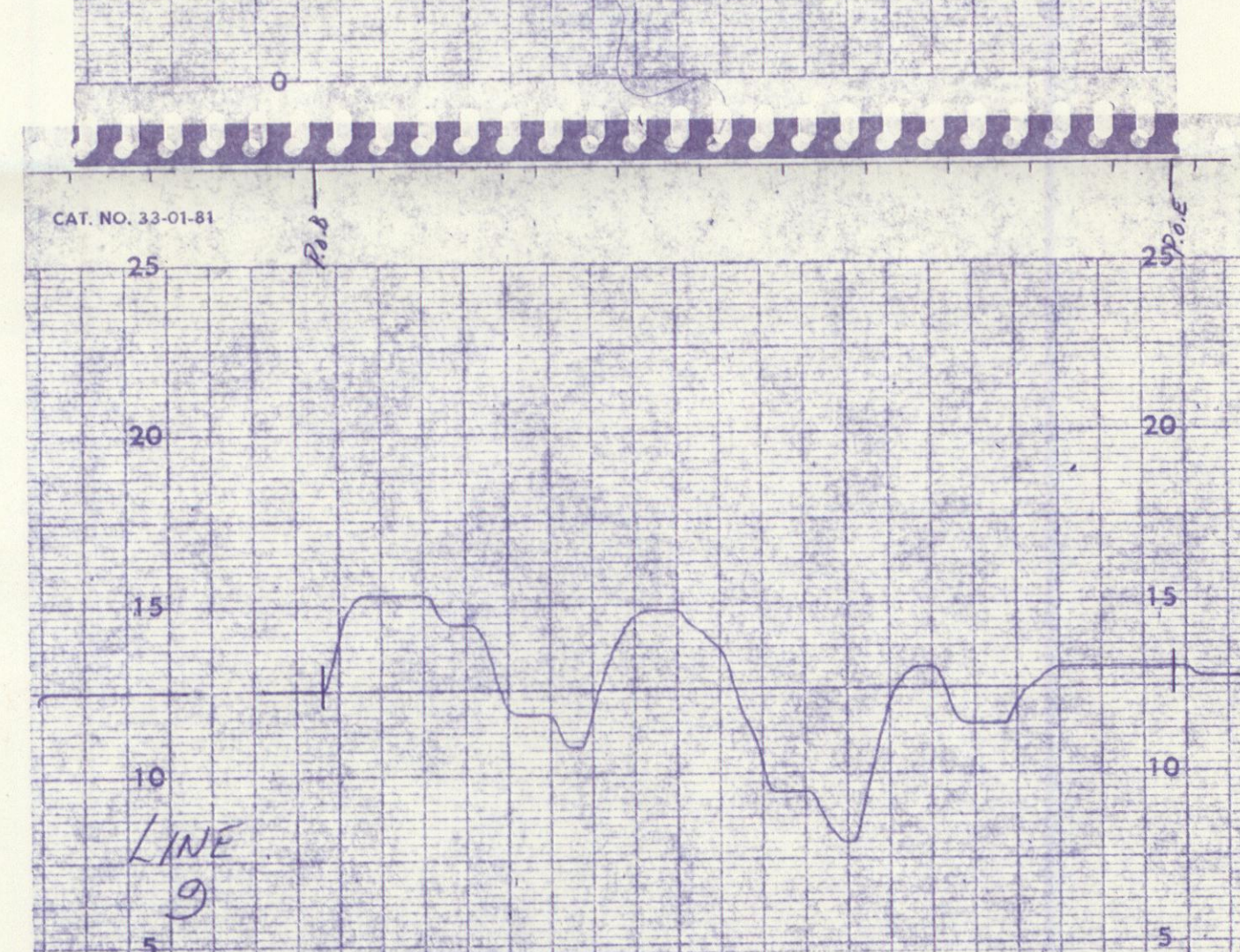
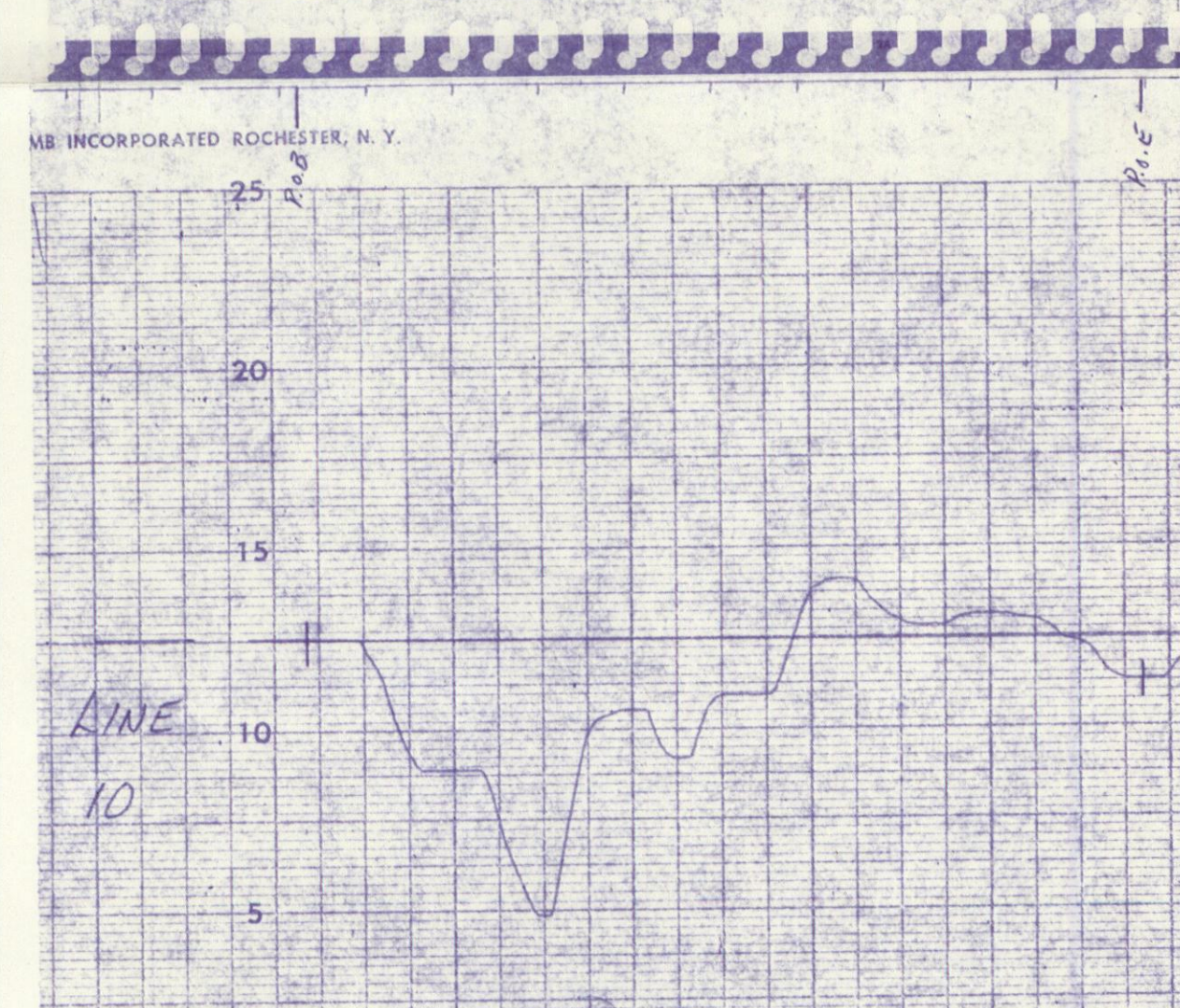
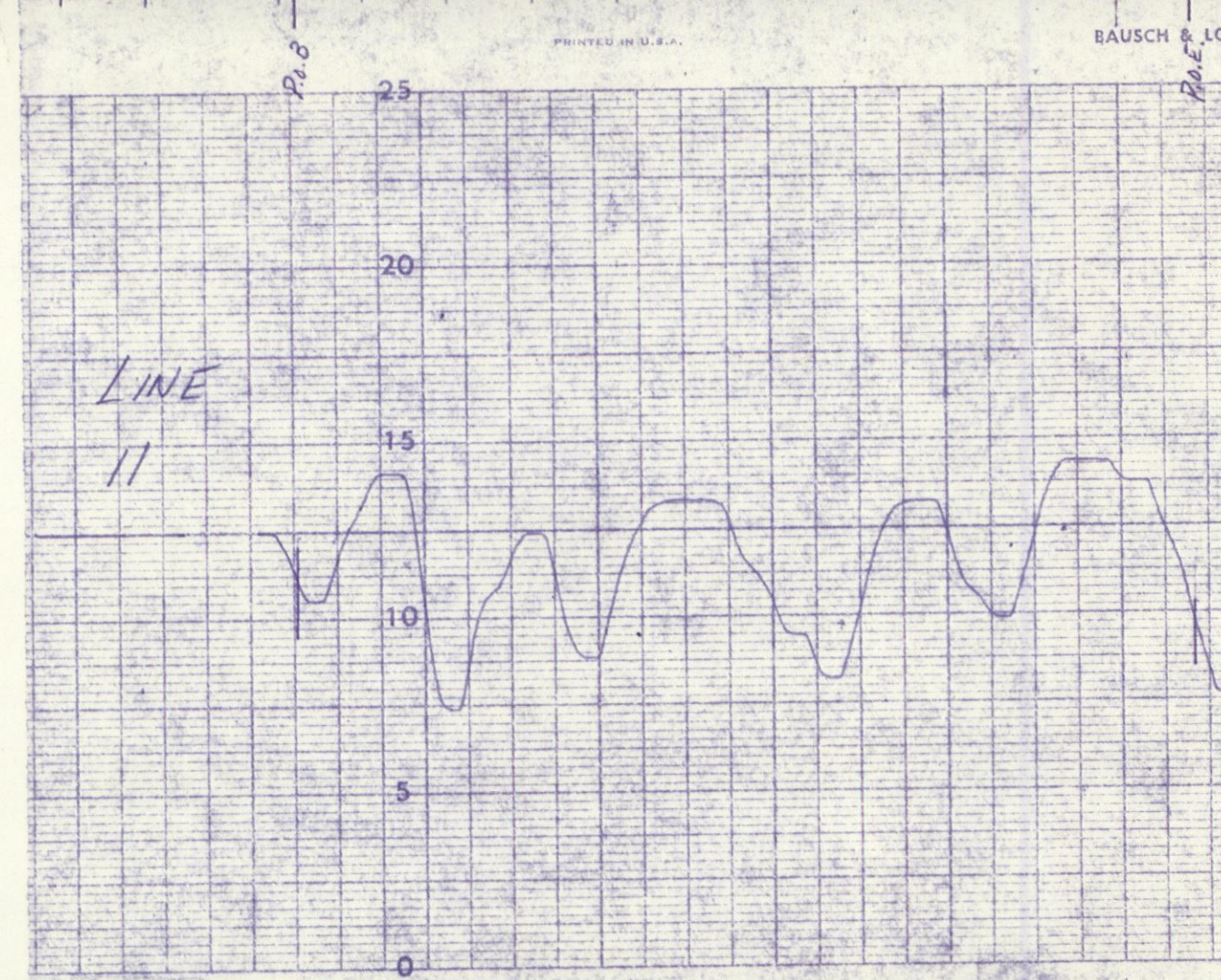
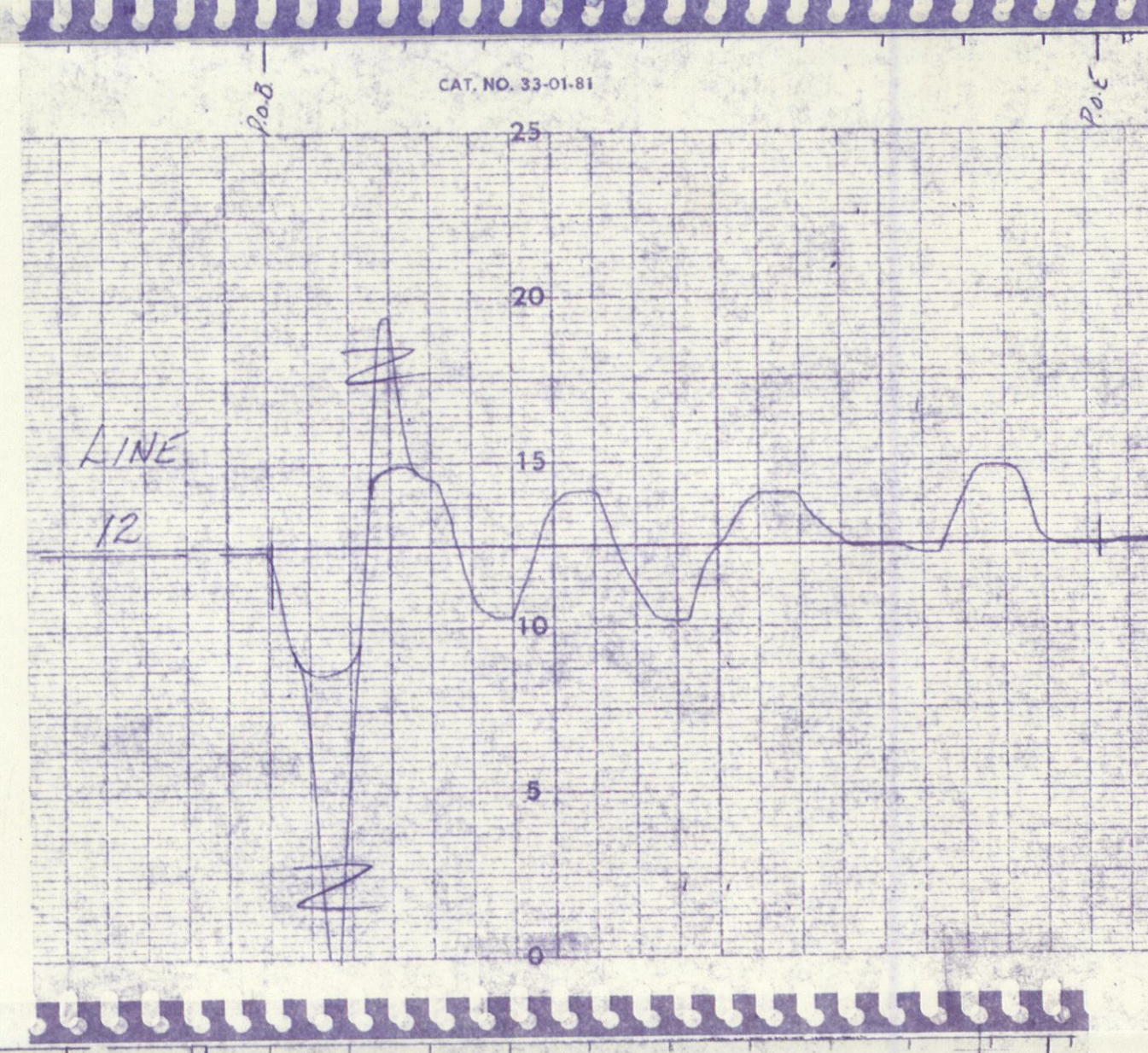
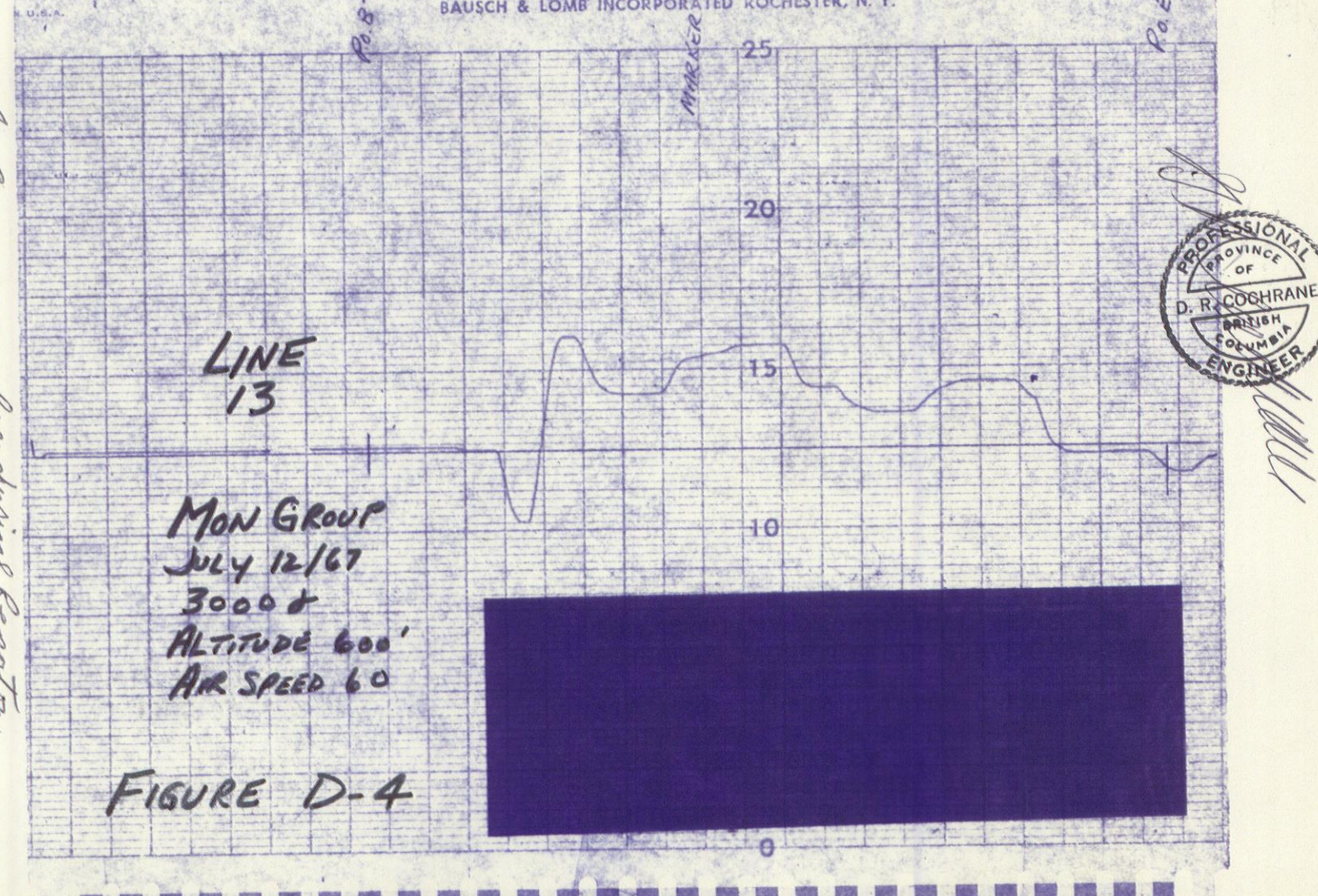
SPHERE DEVELOPMENT
CORP. LTD. (NPL)

Ajoins Figure F-3

Scale: 1" = 500'

Contour Interval: 25'

To Accompany Loghouse Report
Re: Mine Mayfield, Survey on the
District in the Clinton West Union
Line area, North of Lawson City, York
County, U. S. & Canada, P. 1947,
dated August 10, 1947, Vancouver, B.C.



SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY by F. R. GOCHANEK,
F. ENG., dated AUGUST 10, 1967,
VANCOUVER, B. C.

CONTOURED FOURTH DEGREE SURFACE

PLOTTING LIMITS

MAXIMUM X =	5999.999900	MINIMUM X =	5000.000000
MAXIMUM Y =	7000.000000	MINIMUM Y =	.000000

X-SCALE IS HORIZONTAL

$$X\text{-VALUE} = 5000.00 + 50.0000 X \text{ (SCALE VALUE)}$$

Y-SCALE IS VERTICAL

CONTOUR INTERVAL =

REFERENCE CONTOUR (.....) = .00

PLOTTING LIMITS

MAXIMUM X =	5000.000000	MINIMUM X =	.000000
MAXIMUM Y =	7000.000000	MINIMUM Y =	.000000

X-SCALE	IS HORIZONTAL
---------	---------------

$$X\text{-VALUE} = .00 \div 50.0000 \times (\text{SCALE VALUE})$$

Y-SCALE IS VERTICAL

CONTOUR INTERVAL =

REFERENCE CONTOUR (.....) =

50.00d

• 00

SPHERE DEVELOPMENT CORP. LTD. (NPL)

Mon Group

Figure D-6

[illegible][illegible][illegible]

GEO-X SURVEYS Ltd

627 HORNBY ST., VANCOUVER 1, B.C.

CONTOURED SIXTH-DEGREE SURFACE

MAXIMUM X =	5999.999900	MINIMUM X =	5000.000000
MAXIMUM Y =	7000.000000	MINIMUM Y =	.000000

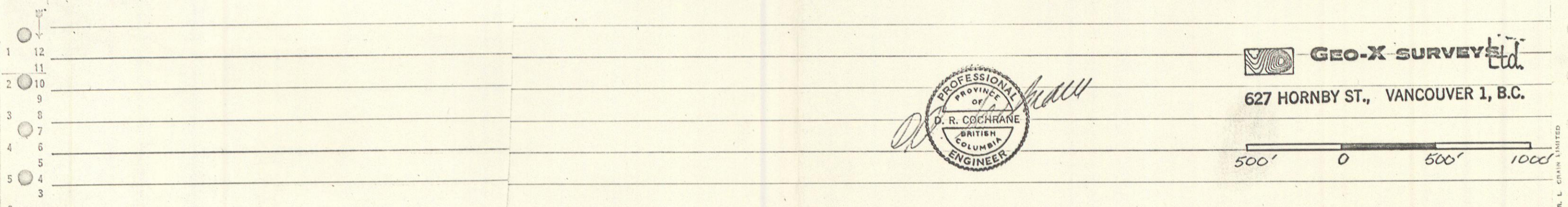
X-SCALE IS HORIZONTAL
X-VALUE = 5000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

CONTOUR INTERVAL =	10.00
REFERENCE CONTOUR (.....) =	200.00

[illegible]

0123456789 123456789 123456789 123456789 123456789 123456789 123456789 123456789 123456789 123456789 0123456789 123456789 123456789 123456789 123456789



MONI
Group



FIGURE D-8

PART E

W. C. CLAIM GROUP

Geophysical Report

on the

Airborne Magnetometer Survey

of the

W. C. Group of 45 Full-Sized Claims

Situated in the Yukon River Area

Yukon Territory,

Dawson Mining District

Latitude 64°20'N, Longitude 140°00'W

Airborne Field Work Completed

July 12th, 1967

on behalf of

Sphere Development Corporation Ltd.

by

D. R. Cochrane, P. Eng.

August 11th, 1967



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

PART E - The W.C. Claim Group

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E-4	Geomorphology	4
E-5	Field Procedures	4
E-6	Instruments and Specifications (See Part A-5)	
E-7	Aeromagnetic Data and Discussion	
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	(b) Trend Surface Analysis of Original Data	6
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E-4	Chart Records)	
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E-7	Trend Surface of Residual Data)	
E-8	Air Photo Mosaic)	

Appendix

E-I	Flight Data and Operators Report
E-II	Cost Appropriation, W. C. Group

E-1 INTRODUCTION

On July 12, 1967, 25.15 line miles of an airborne vertical component fluxgate magnetometer survey with coincident aerial photography, was completed on the W.C. group of claims, on the Yukon River. Surveys were conducted by Geo-X Surveys Ltd. in a chartered Bell helicopter, and on behalf of Sphere Development Corporation Ltd.

This report describes and discusses the results of the W. C. Group survey.

E-2 LOCATION (Latitude 64°20'N; Long. 140°00'W)

The property is situated immediately southwest of the Yukon River, 5 miles west of its confluence with Fifteenmile River. The W. C. Group is twenty-three air miles northwest of the town of Dawson City, Yukon Territory, and is accessible from Dawson on a secondary road.

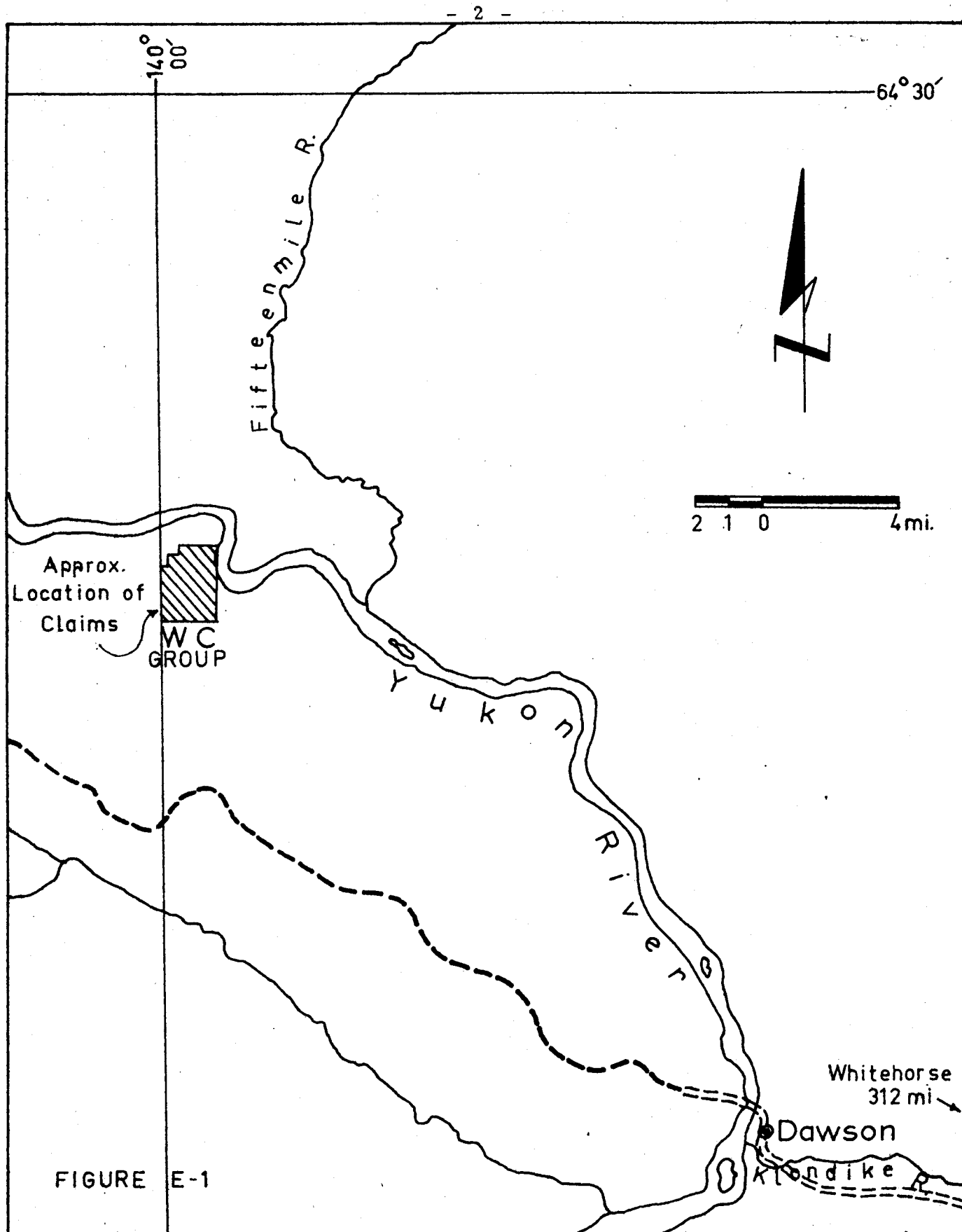
E-3 CLAIMS AND OWNERSHIP

The W. C. group of 45 full sized claims named W.C. No. 1 to 45 inclusive, are owned outright by Sphere Development Corporation Ltd., registered office 848 West Hastings Street, Vancouver, B.C.

The following table summarizes pertinent claim data.

Claim Name	Record No.	Group	Group No.	Anniv. Date
W.C. 1 to 8 inc.	87638-87645	A	142	July 18
W.C. 9 to 16 inc.	87681-87688	A	142	July 21
W.C.17 to 32 inc.	87609-87624	B	143	July 18
W.C.33 to 40 inc.	87630-87637	C	144	"
W.C.41 to 45 inc.	87625-87629	C	144	"

The claims are situated in the Dawson Mining District.



Title: Location Map WC Group
 Prop: Sphere Devlp't Corp. Ltd.(NPL)
 Drawn: B.A.C. Date: August 3, 1967.
 Checked: B.A.C. Date: Aug 10/67



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

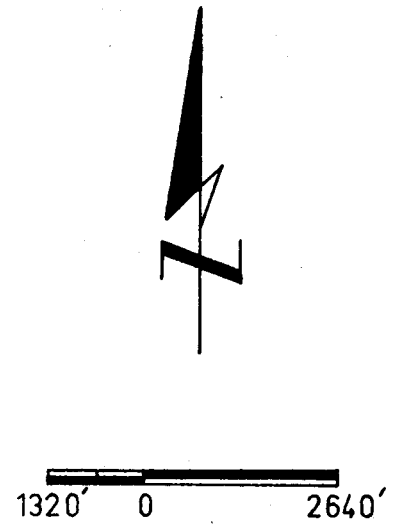
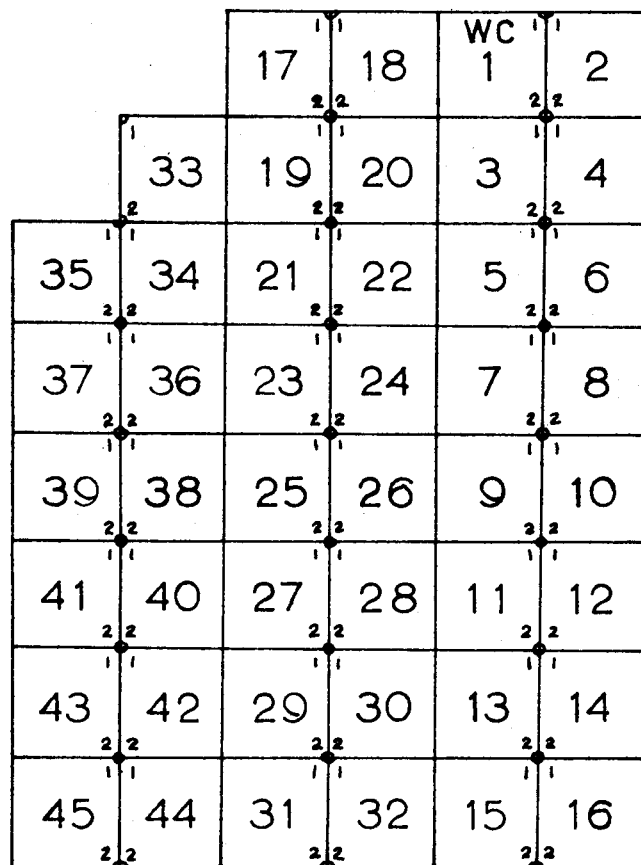


FIGURE E-2

Title: Claim Map WC Group
 Prop: Sphere Devlp't Corp. Ltd. (NPL)
 Drawn: B.A.C. Date: August 7, 1967.
 Checked: *B.A.C.* Date: *Aug 15, 1967*



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

E-4 GEOMORPHOLOGY

The W. C. Group is bounded on the east by the Yukon River, (elevation approximately 1000 feet in this area) which has cut a wide valley with steep banks up to 1000 feet high in some areas. The west portion of claims is dissected by a north flowing tributary which occupies a "U" shaped valley just less than one mile wide and approximately 1000 feet deep. The highest point in the area is just south of claim W.C. No. 15, an elevation of 2790 feet. The central eastern two rows of claims are located on a gently northerly sloping surface between 2700 feet in the south, and 1400 feet on the north. Most of the area is tree and brush clad, with only a few small open patches.

E-5 FIELD PROCEDURE

A total of 20 flight lines cross the property at an average bearing of north 70° west. Lines vary in length from 0.80 to 1.55 miles. Air speed was kept constant at 60 miles per hour during flight, and the pilot maintained an elevation of 600 feet above the ground.

Flight line positioning on the project was straightforward with the use of local topographic features and availability of ground markers. The P.O.B. (beginning) and P.O.E. (end) of each flight line was determined with good accuracy from air photos and base maps.

The air photographs exhibited lateral overlap on the south part of the claim group. (See Figure E-8)

E-6 INSTRUMENTS AND SPECIFICATIONS (See Part A-5)

E-7 AEROMAGNETIC DATA AND DISCUSSION

(a) Original Data

A total of 1019 combined x-y (co-ordinate geographical positioning) and z values (intensity of the vertical component of the magnetic field) were tabulated from the chart records and flight line data. The dy (along line digitizing interval) averaged 130 feet. The maximum relative z value recorded was +1140 gammas, on line No. 9, and the minimum -1500 gammas on line No. 7. The tabulated variables were keypunched onto cards and processed by computer. Figure E-5, the Isomagnetic Contour Plan or Original Data is the computer printout of the original data on the respective flight lines. The original data is complex with several areas of above +500 gamma intensity and several below -500 gamma. However the dominant trend is north to northwest with a minor east-west subtrend.

Four original data anomalies are named and will be discussed.

Anomaly E-1 is situated near the mutual corner of claims W.C. 40, 41, 42 and 43, on the west side of the property. This area is a low amplitude, widespread positive anomaly, maximum amplitude of +580 gammas. Anomaly E-2 is a +500 gamma magnetic high centred on claim W.C. 15. It has a maximum intensity of 1060 gammas. Anomaly E-3 is a narrow, north trending +500 gamma band close to the northern and along the eastern claim boundary. Maximum intensity is +1090 gammas. Anomaly E-4 is a magnetic basin situated between anomalies E-2 and E-4. It is north oriented, maximum intensity -1066 gammas. Several smaller and less distinct

E-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

anomalies were encountered, and are shown on Figure E-5. (In Map Pocket)

(b) Trend Surface Analysis of Original Data

A fourth degree trend surface of best fit was computed, plotted and contoured by the computer. The "goodness of fit" was fair with a coefficient of correlation of 0.34109. In an effort to increase the coefficient, the fifth and sixth degree surfaces were computed; however, the fit increased only slightly on the fifth (c. of c. of 0.34127) and then collapsed on the sixth (c. of c. of -1.4965). The fourth degree surface is contained in the map pocket and labeled Figure E-6. It is plotted on a scale of lin.:500 feet and the contour interval is 500 gammas.

Generally, the surface exhibits north and northwest lineation, with two areas of background intensity.

Original data anomaly E-1 is presented as north-south isomagnetic bands of maximum intensity +500 gammas along the west claim boundary. Anomaly E-2 is presented as a subdued northwest nose of +100 gamma values. Anomaly E-3 is similar to E-1, only located on and along the east claim boundary with an amplitude of +600 gammas.

Anomaly E-4 is very well featured as an elliptical area of -250 gamma values, with the major axis trending north.

A fifth anomaly, a negative area, was outlined with the trend programme. It is located in the northwest corner of the property. Anomaly E-5 is parabolic in shape, open to the north-northwest, and increases in amplitude in this direction.

E-7 AEROMAGNETIC DATA AND DISCUSSION (cont.)

(c) Trend Surface Analysis of Residual Data

A fourth degree surface of the difference between the original data and the computed fourth degree trend values of original data was prepared and is presented as Figure E-7. The residual data represents areas differing significantly from the general regional magnetic trends and it amplifies sharp, local anomalies. This surface is plotted at 1 in.:500 feet, contour interval 10 gammas. The "goodness of fit" of the surface was excellent with a coefficient of correlation of 0.46. The residual data trend surface minimized the value of anomaly E-1, presenting this area as a well fitted, regional magnetic zone. Anomaly E-2 was computed to be definitely anomalous with amplitudes of between 30 and 40 gammas above the trend surface of original data. Anomaly E-3 is characterized, by residual programming, as a background section, however anomaly E-4 is quite anomalous. The surface displaced the center of E-4 easterly with a very high central core of +270 gammas above the regional trend surface.

A fifth anomaly, designated E-5 coincides with original data trend surface negative anomaly E-5.

E-8 SUMMARY AND CONCLUSIONS

On July 12, 1967, 25.15 line miles of airborne magnetometer work was completed on the W. C. group of claims situated in the Yukon-Fifteenmile River area of the Yukon.

1019 points were tabulated from the analog data and processed by a Univac 1108 computer.

E-8 SUMMARY AND CONCLUSIONS (cont.)

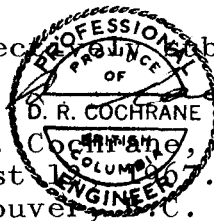
Four original data anomalies are discussed and the trend surface analysis of the original data indicated a fifth.

A trend surface analysis was also performed on the residual data. The programme suggests that anomalies E-1 and E-3 are regional in nature, and E-2, E-4, and E-5 are distinct, local magnetic anomalies.

A ground magnetometer survey, and geologic mapping is recommended on magnetically positive anomalies E-1, E-2, and E-3.

Respectfully submitted,


D. R. Cochrane, P. Eng.
August 1967
Vancouver, B.C.



APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: W.C. GROUP Job: 1002 (E) Date: JULY 12/67
 Operator: R. ROBILLARD Flight elevation: 600 FEET
 Direction flown: NORTH 70° WEST Air speed: 60 MPH Chart scale: ±1500 ft
 Weather: +65° SOME SMOKE HAZE - VISIBILITY GOOD

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gammas	Min. Z gammas
	X	Y	X	Y			
3	70	1000	280	7230	1.18	590	- 540
4	980	0	895	7180	1.36	270	- 445
5	1670	120	1705	8375	1.55	1060	- 760
6	2135	590	2110	7845	1.38	430	- 675
7	2235	62	2295	7895	1.32	555	- 1500
8	2700	690	2920	7920	1.32	840	- 870
9	2900	930	3155	7610	1.26	1140	- 960
10	3035	300	3560	7600	1.32	840	- 1460
11	3570	1375	3200	2230	1.30	220	- 1065
12	3780	1290	4050	8550	1.38	120	- 740
13	4310	1530	4630	8660	1.38	510	- 670
14	4700	1350	4950	8620	1.38	220	- 800
15	5290	1800	5630	8900	1.36	300	- 450
16	5600	2200	5900	8520	1.18	150	- 1235
17	6420	2250	6680	9890	1.44	180	- 1020
18	7075	2190	7500	8130	1.08	1090	- 390
19	7850	2550	8080	7940	1.02	330	- 165
20	8490	2470	8740	7650	.98	735	- 610
21	9125	2775	9350	7960	.98	625	- 855
22	9990	3250	10250	7480	.80	650	- 450

Total number of X, Y, Z points 1019Total number on line miles 25.15

Signed

R. Robillard

Appendix II - COST APPROPRIATION

As per contract for airborne surveys between
Geo-X Surveys Ltd. and Sphere Development Corporation Ltd.

Survey of W.C. Group	\$ 4,428.27
Ground Control (see following page)	<u>1,544.77</u>
Total	<u>\$ 5,973.04</u>



ALRAE EXPLORATION LTD.

202 - 846 WEST HASTINGS STREET, VANCOUVER 1, B.C. TELEPHONE 681-9381

Sphere Development Corporation Ltd.
848 West Hastings Street
Vancouver 1, B. C.

RE: Location and Marking Claims for Aerial Magnetometer Survey
Re: W. C. 1 - 45 incl.

Personnel:

<u>Days</u>	<u>Name</u>	<u>Occupation</u>	<u>Dates</u>	<u>Gross Wages</u>
1	D. Smallman	Line Cutter	June 20/67	\$ 33.67
1	P. Cumberbirch	Line Cutter	June 20/67	33.67
1/2	B. Garner	Asst. Geol.	June 22/67	22.10
3-1/2	D.V. Preston	Asst. Geol.	June 22, July 10, 11, 12/67	154.70
4	A. Burton	Geologist	June 29, 30, July 1, 2/67	453.12
<u>2</u>	J. Mackie	Geologist	July 10, 12	<u>176.56</u>
12				873.82
	Topographic mapping - McElhanney Ltd.			247.95
	Transportation - truck and Honda rental equipment and hardware			<u>423.00</u>
				\$ <u><u>1,544.77</u></u>

ALRAE EXPLORATION LTD.
846 W. HASTINGS ST.
VANCOUVER 1, B. C.

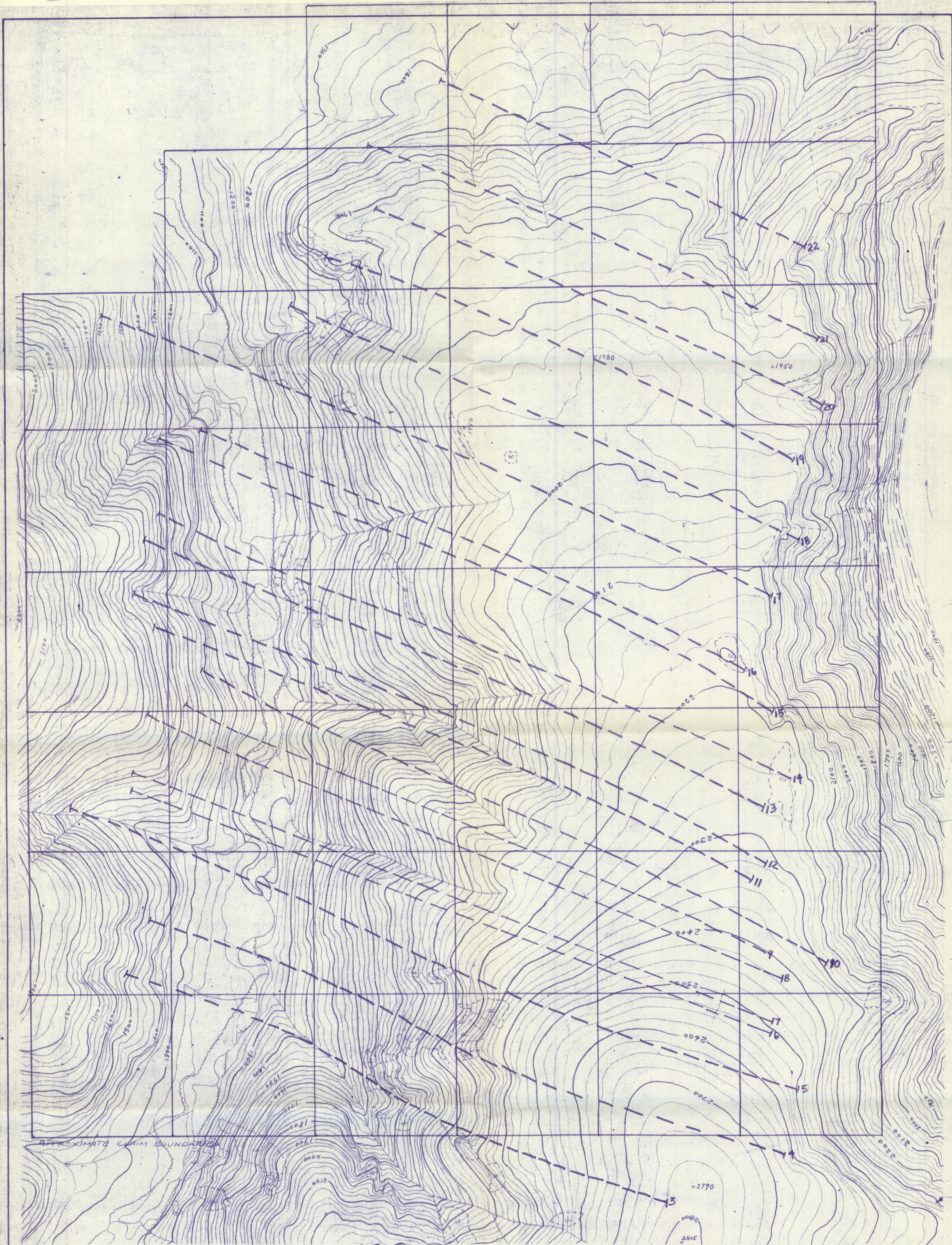
R. J. Burton

*Paid in Fall.
A. Burton*

GEOLOGY
Exploration

CONSULTANTS
Development

MINING
Production



W.C. GROUP

FIGURE E-3

TOPOGRAPHIC & FLIGHT LINES

TO ACCOMPANY GEOPHYSICAL REPORT
ON AIRBORNE MAGNETOMETER SURVEY ON THE
W.C. GROUP
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY by DR. COCHRANE,
P. ENG., dated AUG. 10, 1967,
VANCOUVER, B.C.



GEO-X SURVEYING LTD.

627 HORNBY ST., VANCOUVER 1, B.C.



W.C. GROUP

ALPHA EXPLORATION LTD.
SPHERE DEVELOPMENT CORP. LTD.

PRELIMINARY RECONNAISSANCE TYPE MAPPING

Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

SCALE	CONTOUR INTERVAL	DATE	JOB NO.	SHEET NO.
1" = 500'	25'	JUNE 1967	5152	4 of 4

SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL
RESULTS IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY
COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE
OF 1 INCH EQUALS 4800 FEET FLOWN IN 1961 & 65

7500-10

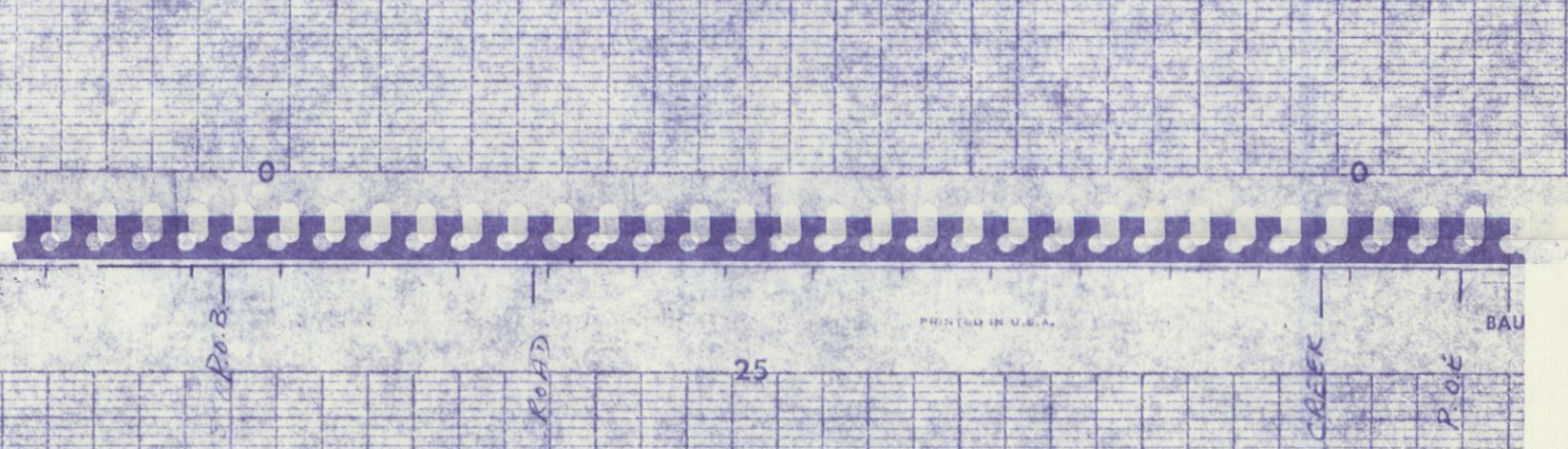
LOMB INCORPORATED ROCHESTER, N.Y.

CAT. NO. 33-01-81

25

W.C. GROUP
JULY 12/1967
ALT. 600
AIR SPEED 60
3000ft
LINE 3

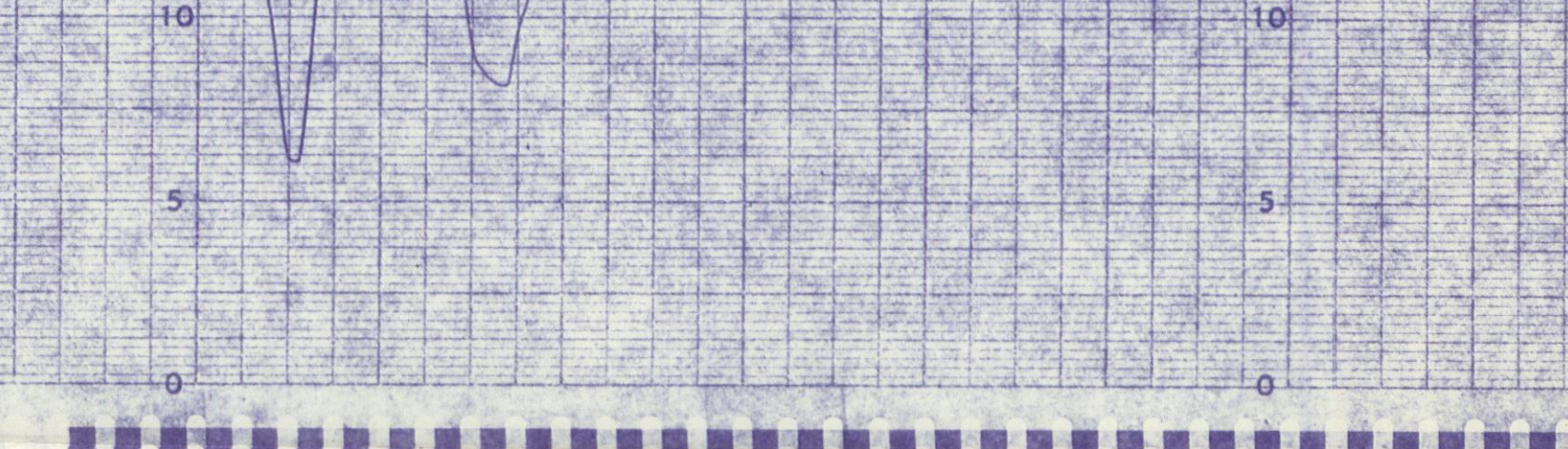
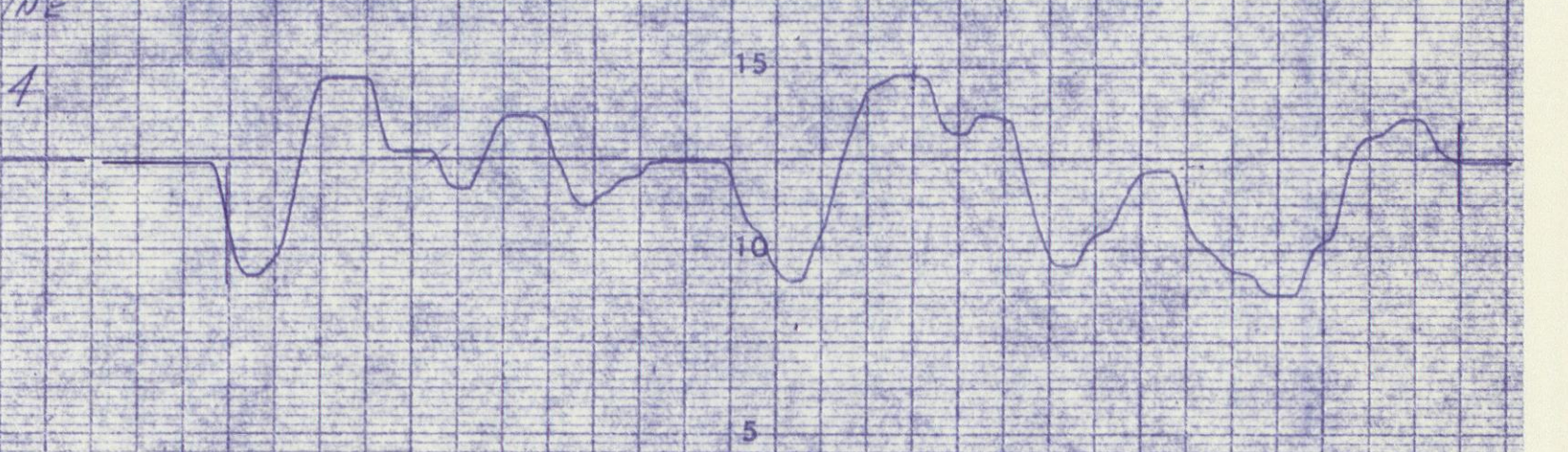
FIGURE E-



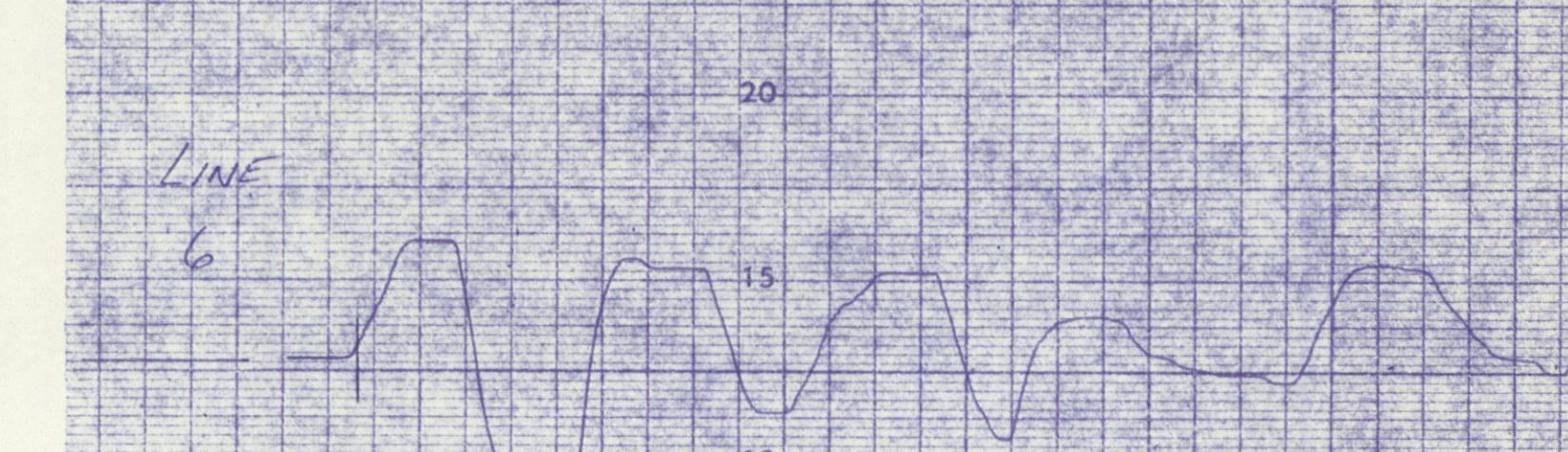
To Accompany the following Report on the Airline W.C. Young, Inc. which was situated on the Old Fort Creek Indian Reservation, West of Union City, Indian Territory, Muskogean, P.C., sent by S. R. Robinson, P.C., dated August 10, 1907. Vancouver, B.C.



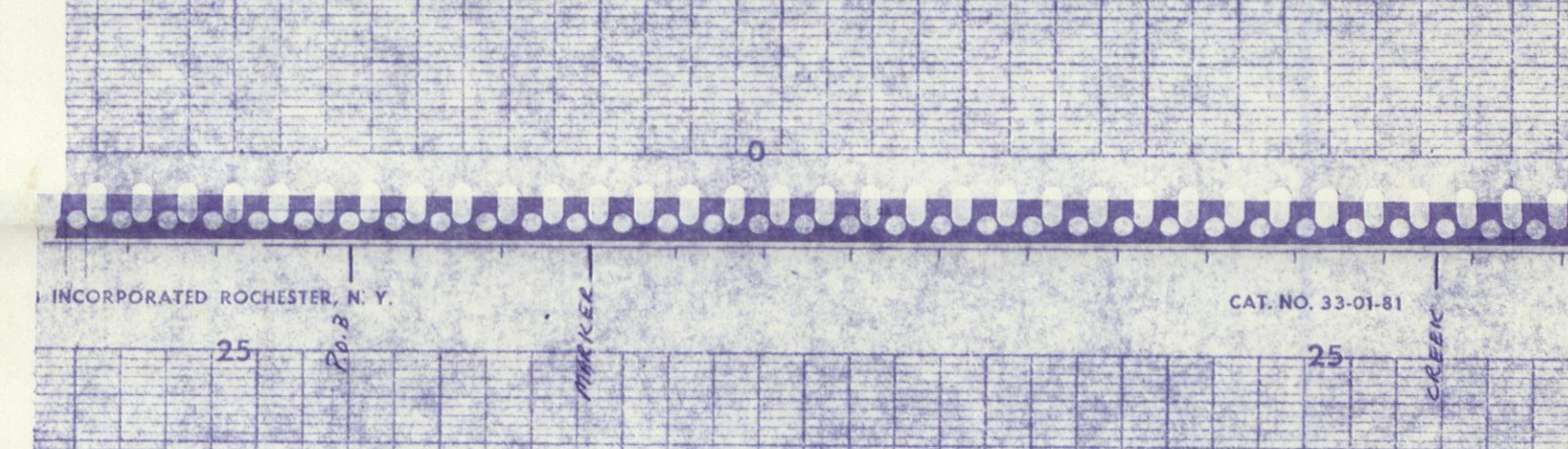
A blank sheet of graph paper with a grid pattern. The grid consists of small squares formed by thin black lines. There are no margins or other markings on the page.



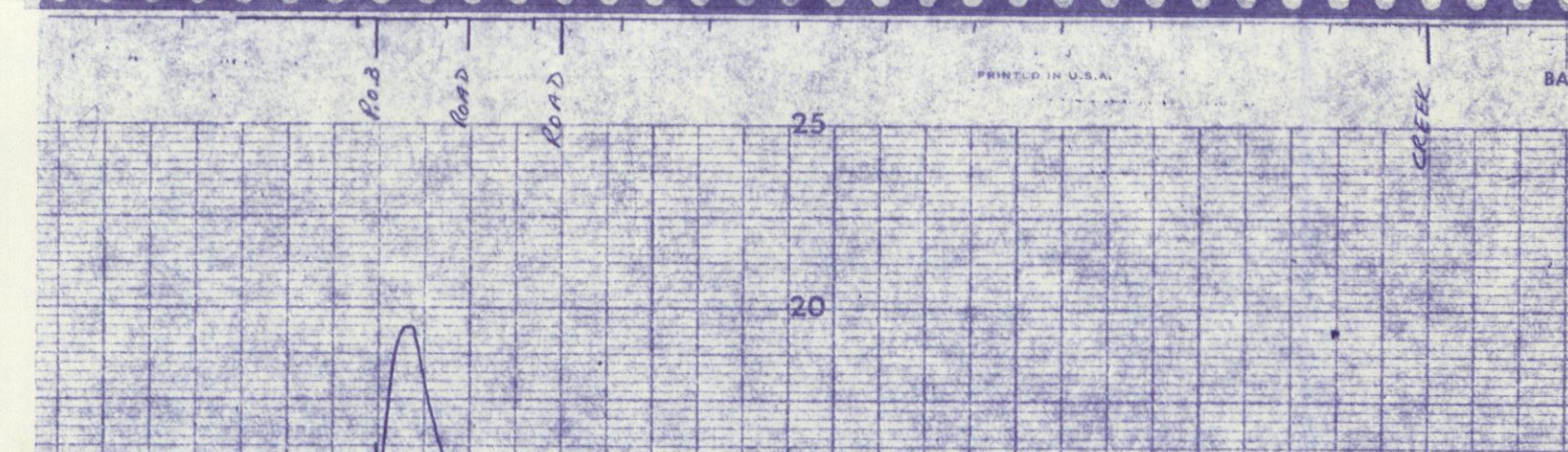
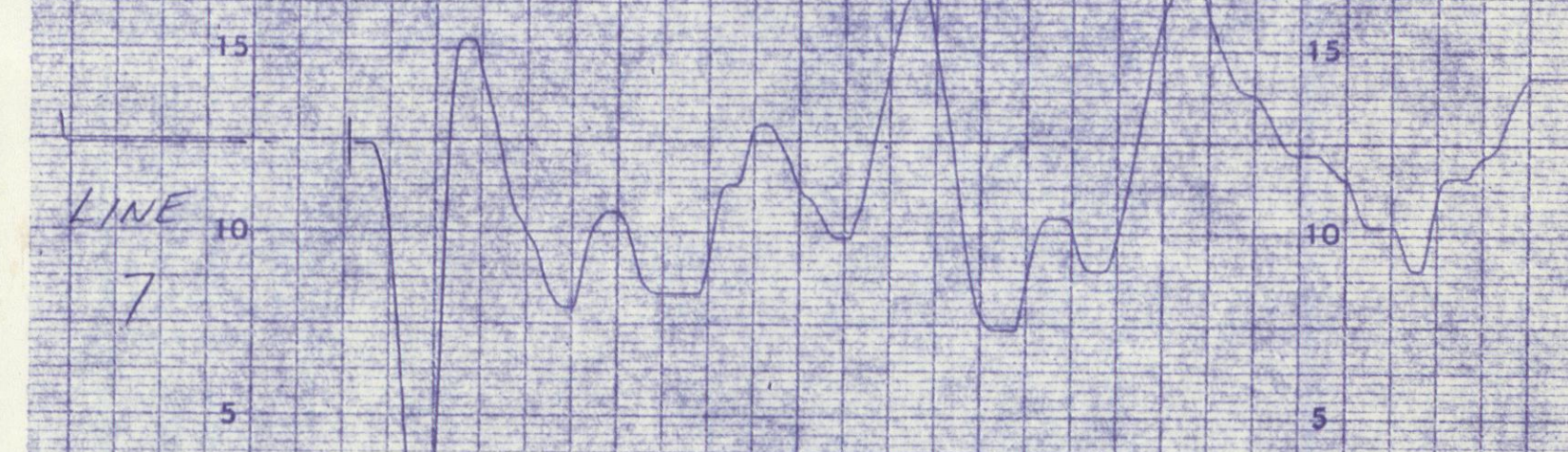
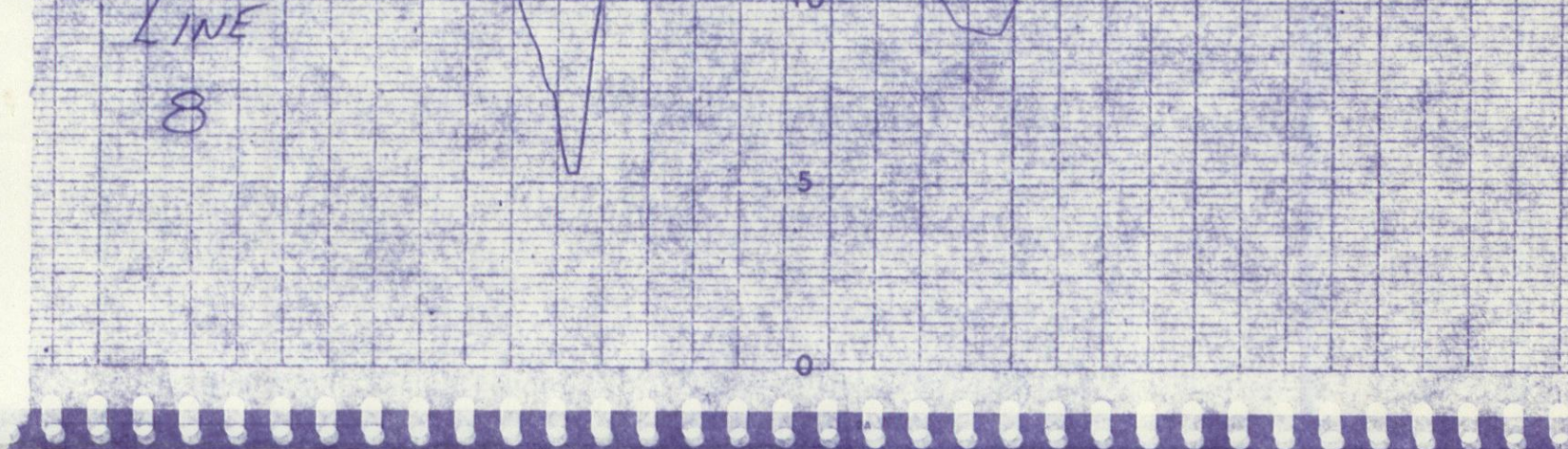
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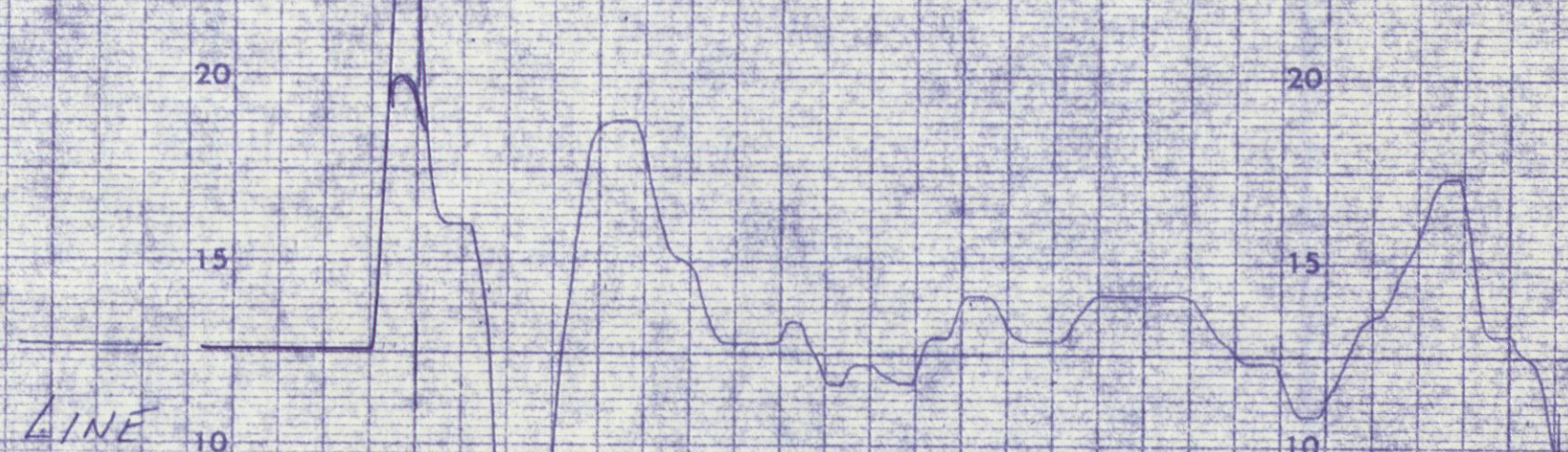
Abstract—The purpose of this study was to determine the effect of a 12-week training program on the heart rate (HR) and heart rate reserve (HRR) of sedentary middle-aged men. The subjects were divided into two groups: a control group and a training group. The control group consisted of 10 men who did not exercise regularly, and the training group consisted of 10 men who exercised regularly. The training program consisted of a 12-week aerobic exercise program. The HR and HRR were measured at rest and during maximal exercise at the beginning and end of the 12-week training program. The results showed that the training program had a significant effect on the HR and HRR of the training group. The HR at rest decreased significantly from 72.5 ± 5.5 bpm to 68.5 ± 5.5 bpm, and the HRR at rest decreased significantly from 27.5 ± 5.5 bpm to 23.5 ± 5.5 bpm. The HR during maximal exercise increased significantly from 175.5 ± 5.5 bpm to 185.5 ± 5.5 bpm, and the HRR during maximal exercise increased significantly from 103.5 ± 5.5 bpm to 115.5 ± 5.5 bpm. The control group showed no significant changes in HR and HRR. The results suggest that a 12-week training program can improve the HR and HRR of sedentary middle-aged men.



20

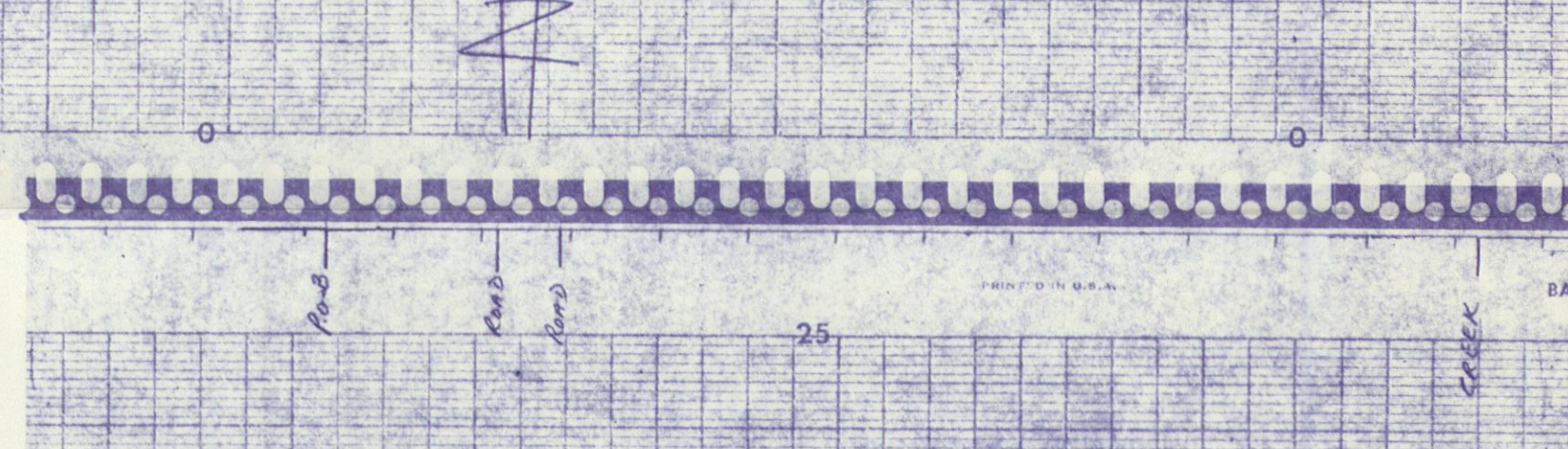
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25



9

5



LINE
10

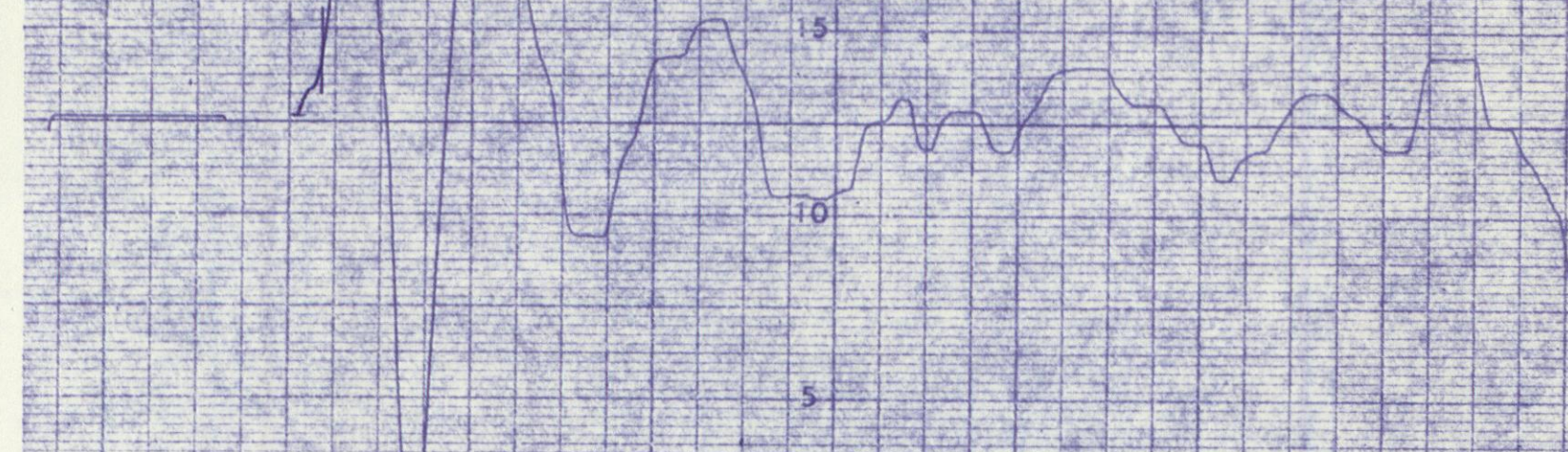
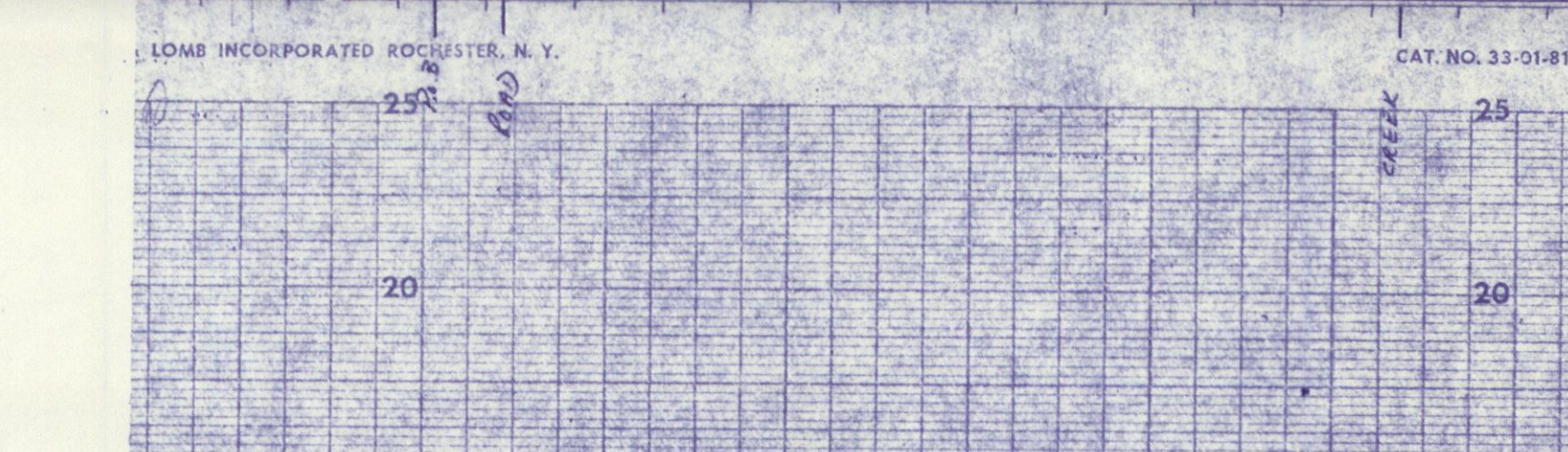
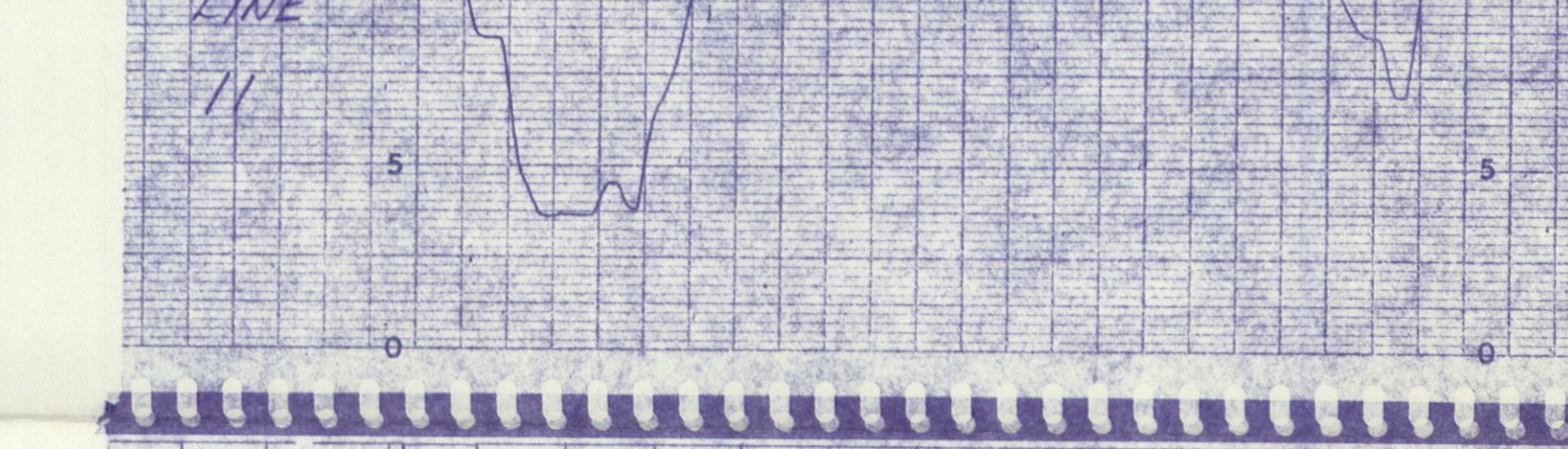
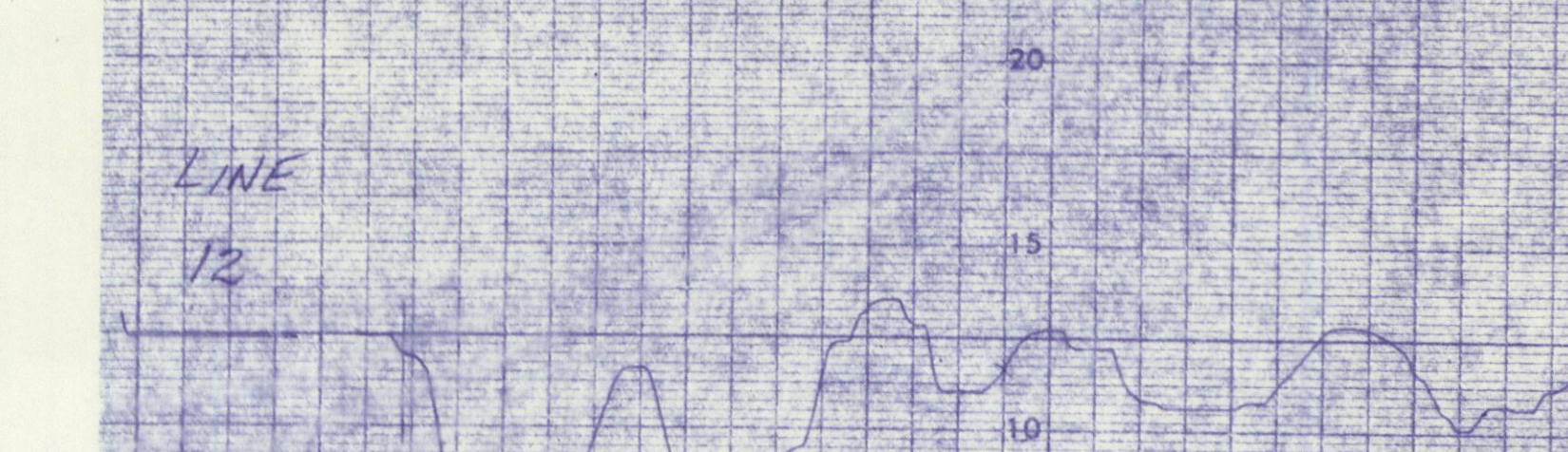
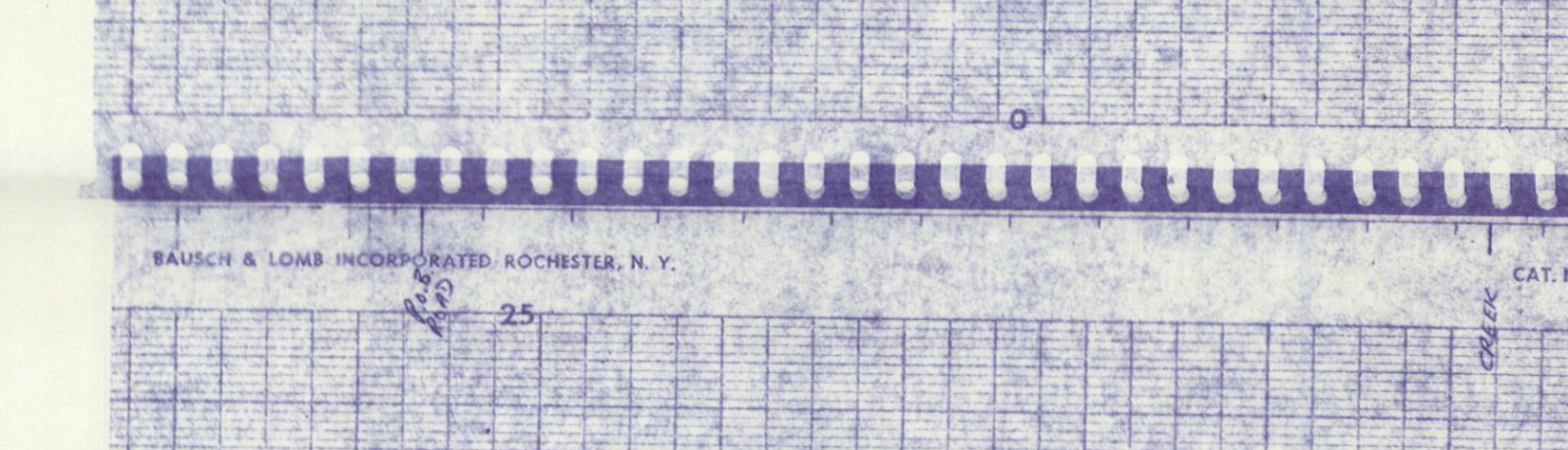


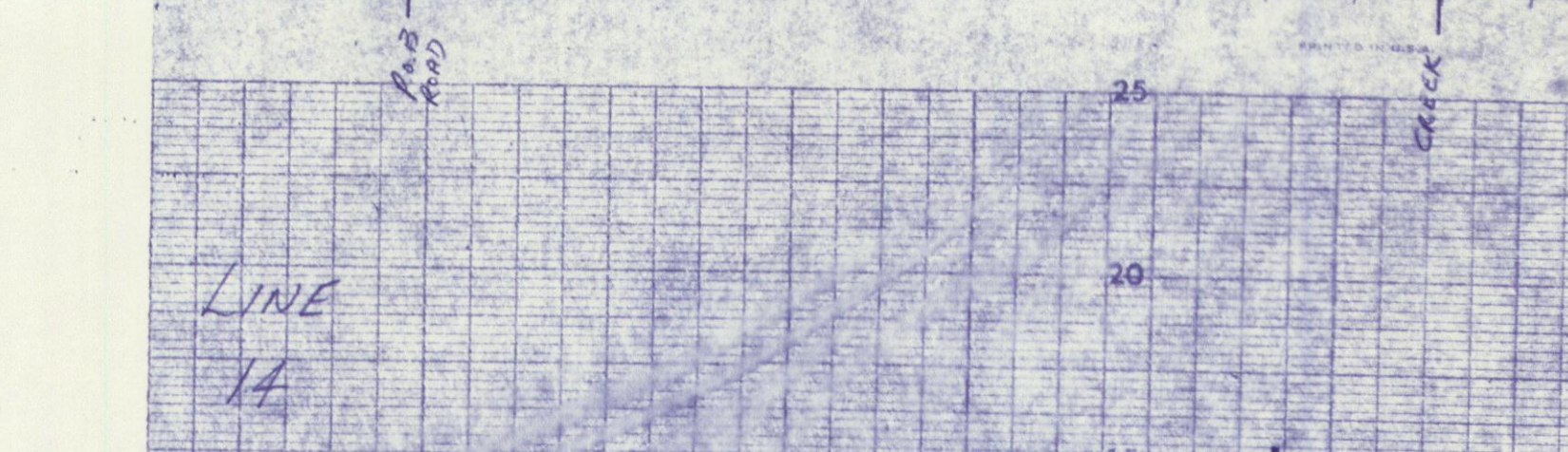
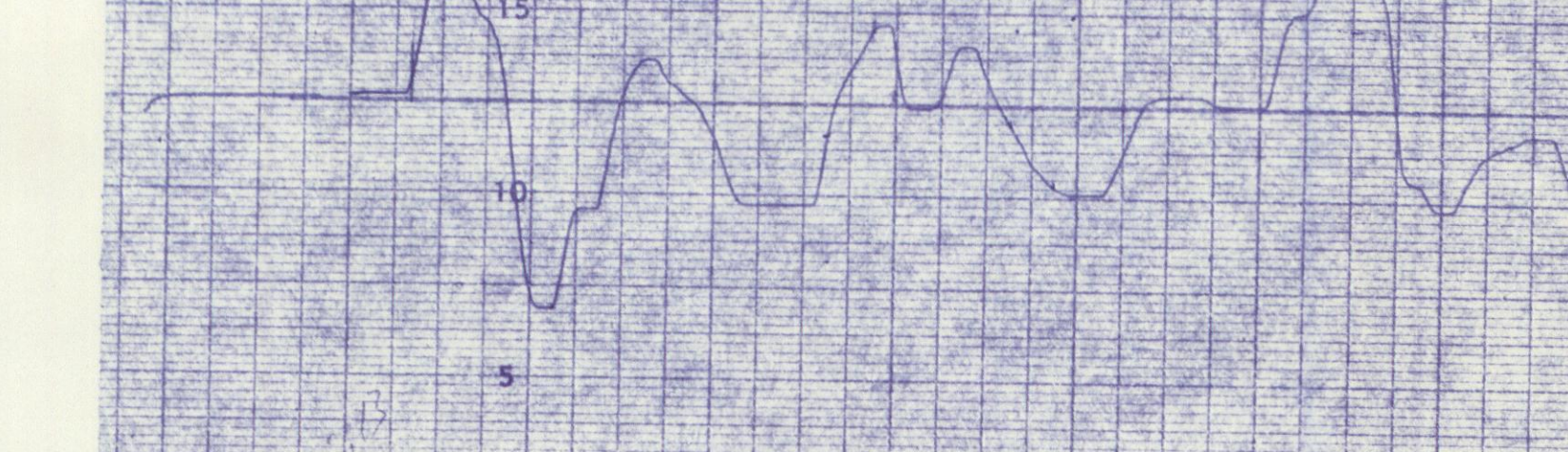
Figure 1 consists of two rows of five micrographs each, labeled (a) through (e) for the top row and (a) through (f) for the bottom row. The top row shows control (a), streptomycin (b), gentamicin (c), ampicillin (d), and tetracycline (e). The bottom row shows the same compounds at 100 μg/ml (a-f). The images show bacterial growth on agar plates, with the bottom row showing significantly reduced growth compared to the top row.

[illegible][illegible]

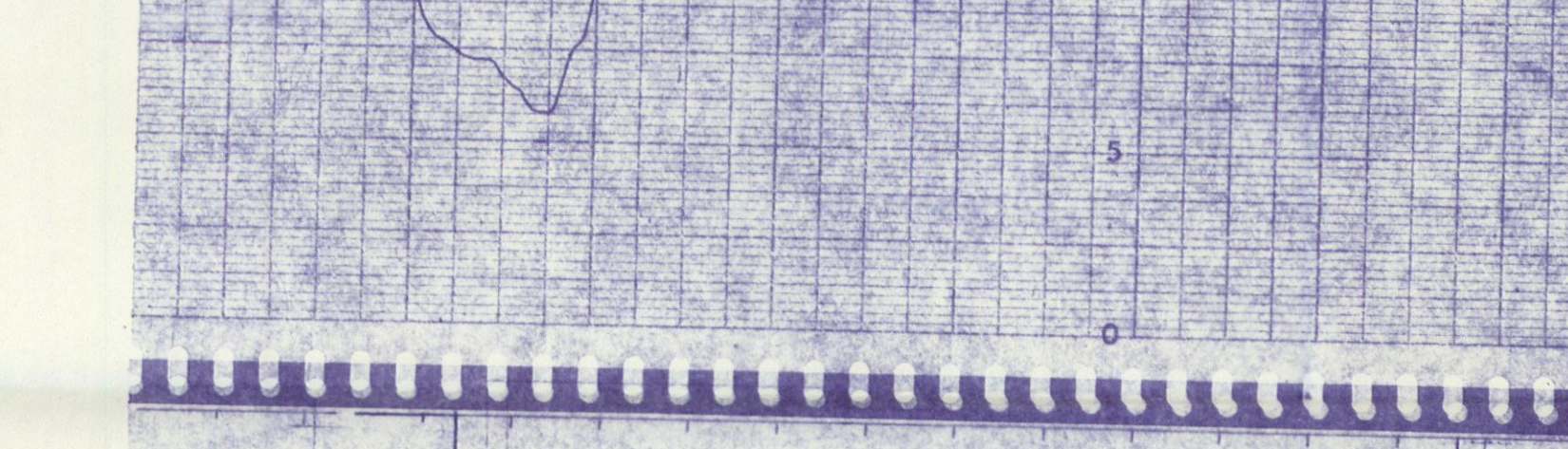
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	



411
13



...the ...

[illegible][illegible]

PLOT OF ORIGINAL DATA (Z-COORDINATES)

PLOTTING LIMITS
MAXIMUM X = 5000.000000 MINIMUM X = .000000
MAXIMUM Y = 10000.000000 MINIMUM Y = .000000

X-SCALE IS HORIZONTAL
X-VALUE = .00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

SPHERE DEVELOPMENT CORP. LTD. (NPL)
W.C. Group
Figure E-5

PLOT OF ORIGINAL DATA (Z-COORDINATES)

PLOTTING LIMITS
MAXIMUM X = 10000.000000 MINIMUM X = 5000.000000
MAXIMUM Y = 10000.000000 MINIMUM Y = .000000

X-SCALE IS HORIZONTAL
X-VALUE = 5000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETRIC SURVEY ON THE
W.C. GROUP
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY BY D. R. COCHRANE,
P. ENG., dated AUGUST 10, 1967,
VANCOUVER, B. C.

PLOT OF ORIGINAL DATA (Z-COORDINATES)

PLOTTING LIMITS
MAXIMUM X = 10959.999900 MINIMUM X = 10000.000000
MAXIMUM Y = 10000.000000 MINIMUM Y = .000000

X-SCALE IS HORIZONTAL
X-VALUE = 10000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL



GEO-X SURVEYS LTD.
627 HORNBY ST., VANCOUVER 1, B.C.

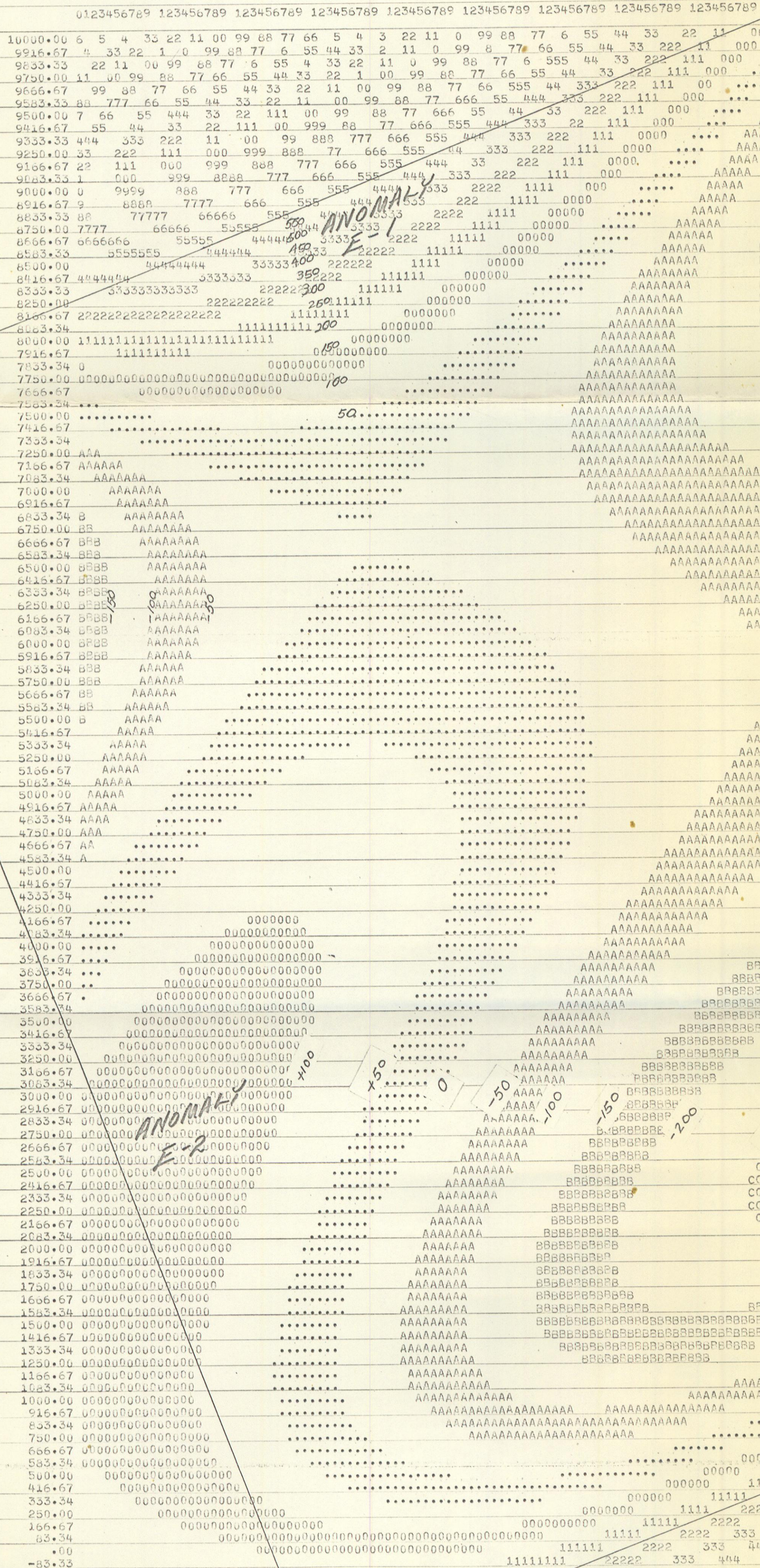
500' 0 500' 1000'

CONTOURED FOURTH DEGREE SURFACE

PLOTING LIMITS

MAXIMUM X = 5000.000000 MINIMUM X = .000000
MAXIMUM Y = 10000.000000 MINIMUM Y = .000000X-SCALE IS HORIZONTAL
X-VALUE = .00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

CONTOUR INTERVAL = 50.00
REFERENCE CONTOUR (.....) = .00SPHERE DEVELOPMENT CORP. LTD. (NPL)
W.C. Group Figure E-6

CONTOURED FOURTH DEGREE SURFACE

PLOTING LIMITS

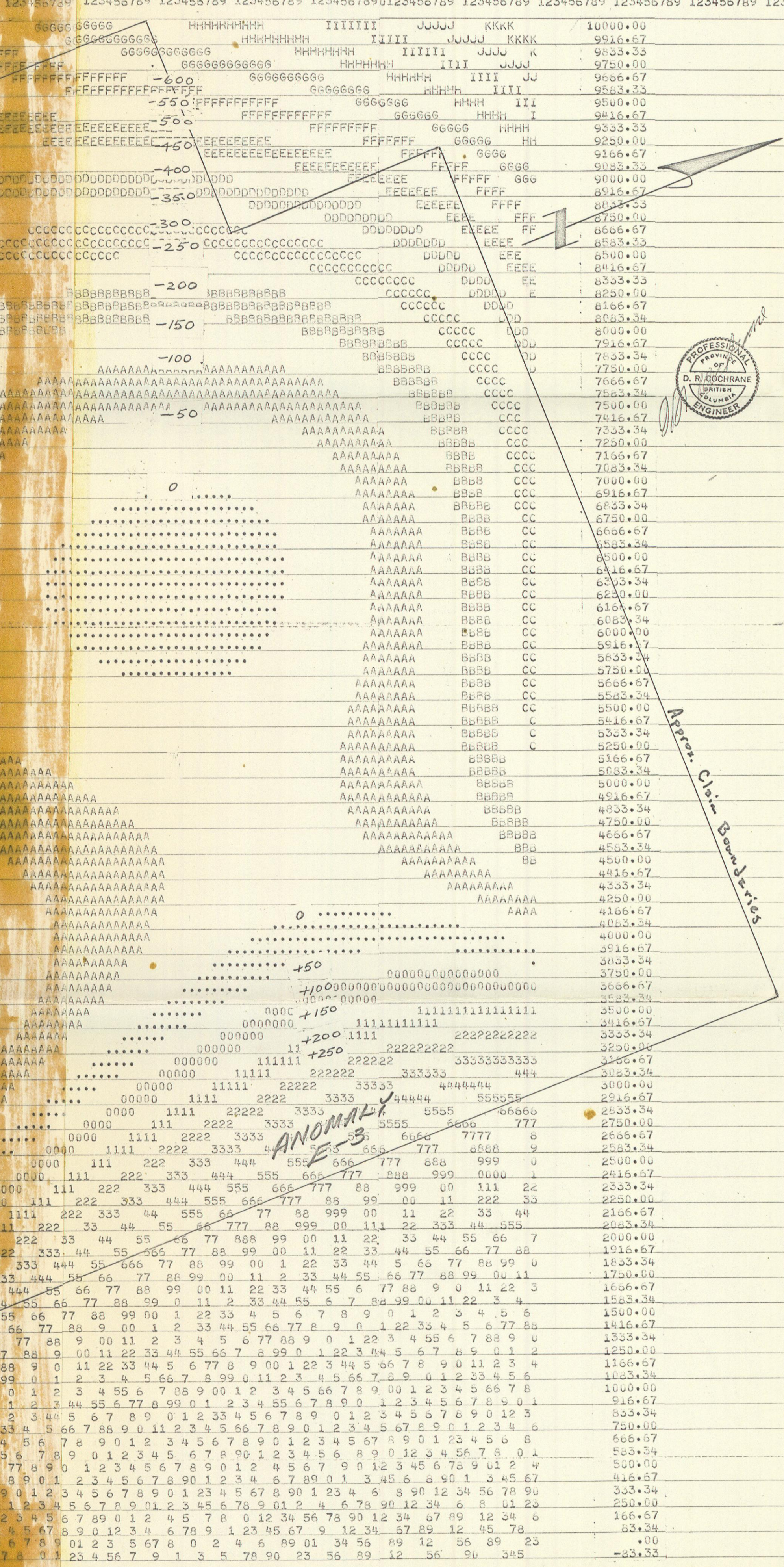
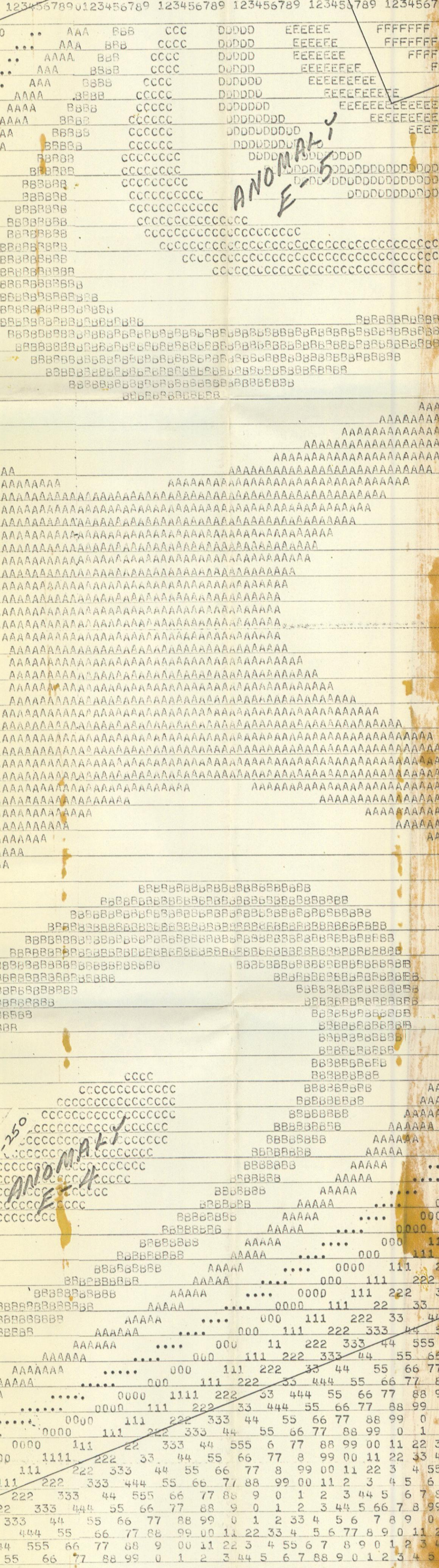
MAXIMUM X = 10000.000000 MINIMUM X = 5000.000000
MAXIMUM Y = 10000.000000 MINIMUM Y = .000000X-SCALE IS HORIZONTAL
X-VALUE = 5000.00 + 50.0000 X (SCALE VALUE)

Y-SCALE IS VERTICAL

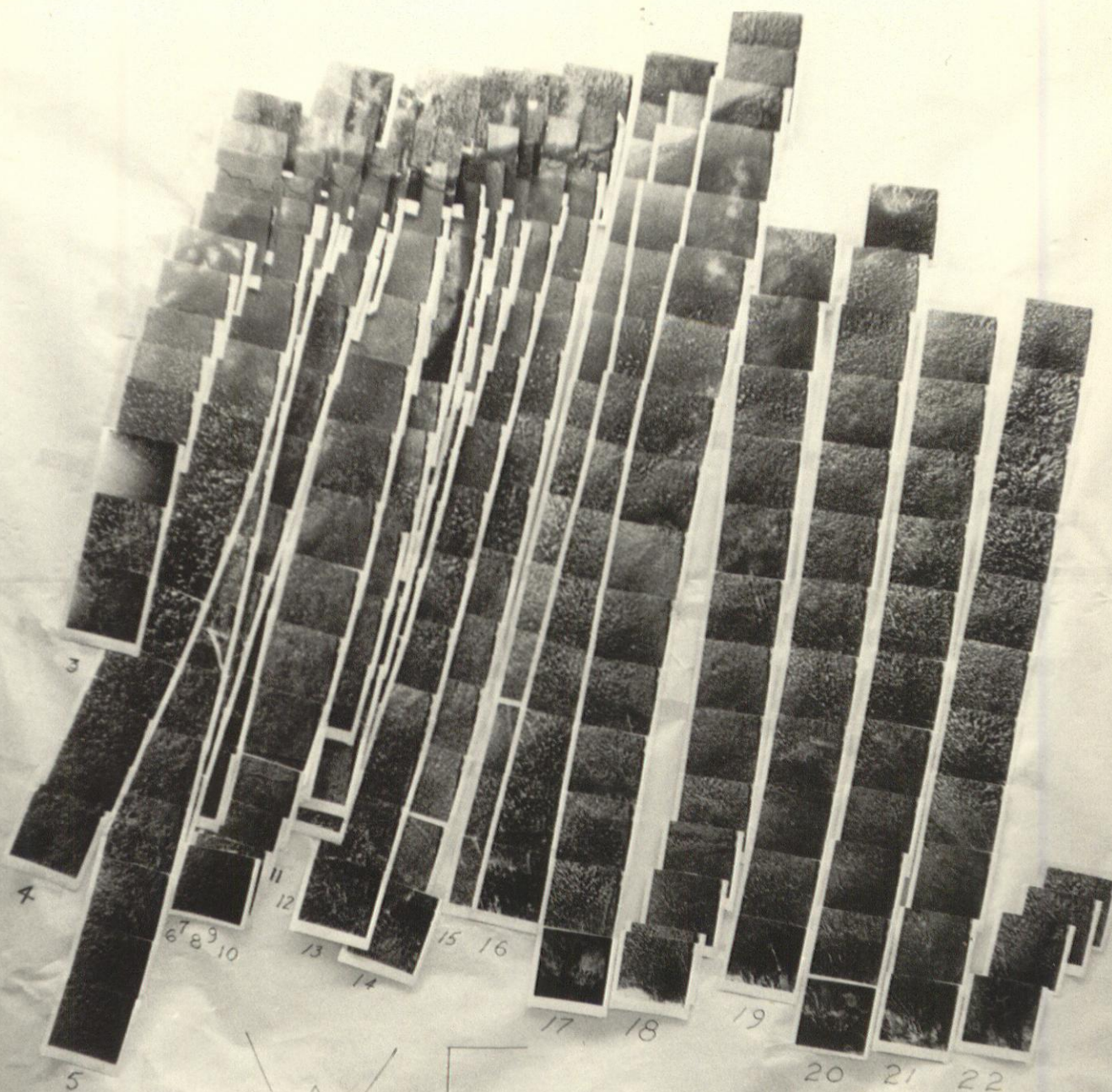
CONTOUR INTERVAL = 50.00
REFERENCE CONTOUR (.....) = .00TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
W.C. GROUP
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DAWSON CITY,
YUKON TERRITORY BY D. R. COCHRANE,
P. ENG., dated AUGUST 10, 1967,
VANCOUVER, B. C.

GEO-X SURVEYS LTD.

627 HORNBY ST., VANCOUVER 1, B.C.

PROFESSIONAL
OF
D. R. COCHRANE
ENGINEER

Approx. Claim Boundaries



W. C.
GROUP



FIGURE E-8

PART F

BIG, GIB AND EAST CLAIM GROUPS

Geophysical Report

on the

Airborne Magnetometer Survey

of the

Big, Gib and East Claim Groups

Situated in the Clinton Creek Area,

Dawson Mining Division

Yukon Territory

Latitude $64^{\circ}30'N$, Longitude $140^{\circ}50'W$

Airborne Field Work June 28th and July 12th, 1967

on behalf of

Sphere Development Corporation Ltd.

by

D. R. Cochrane, P. Eng.

August 14th, 1967



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

TABLE OF CONTENTS

PART F - GENERAL INTRODUCTION

<u>Section</u>	<u>Title</u>	<u>Page</u>
F - 1	General Introduction	1
F - 2	General Location	1
F - 2	Claims and Ownership	1 & 4
F - 1	Location Map: Big, Gib & East Groups	2
F - 2	Claim Map: Big, Gib & East Groups	3
F - 3	Topographic and Flight Lines	Map Pocket
F - 4	Chart Records	Map Pocket
F - 5	Isomagnetic Contours	Map Pocket
F - 6	Trend Surface of Original Data	Map Pocket
F - 4	Geomorphology	4
F - 5	Field Procedure	5
F - 6	Instruments and Specifications	5
F - 7	Aeromagnetic Data and Discussion	
	a. Original Data	6
	b. Trend Surface Analysis of Original Data	7
	c. Trend Surface Analysis of Residual Data	8
F - 8	Summary and Conclusions	9 & 10

Appendix

F I	Flight Data & Operators Report	11 & 12
F II	Cost Appropriation	13 & 14

F-1 INTRODUCTION:

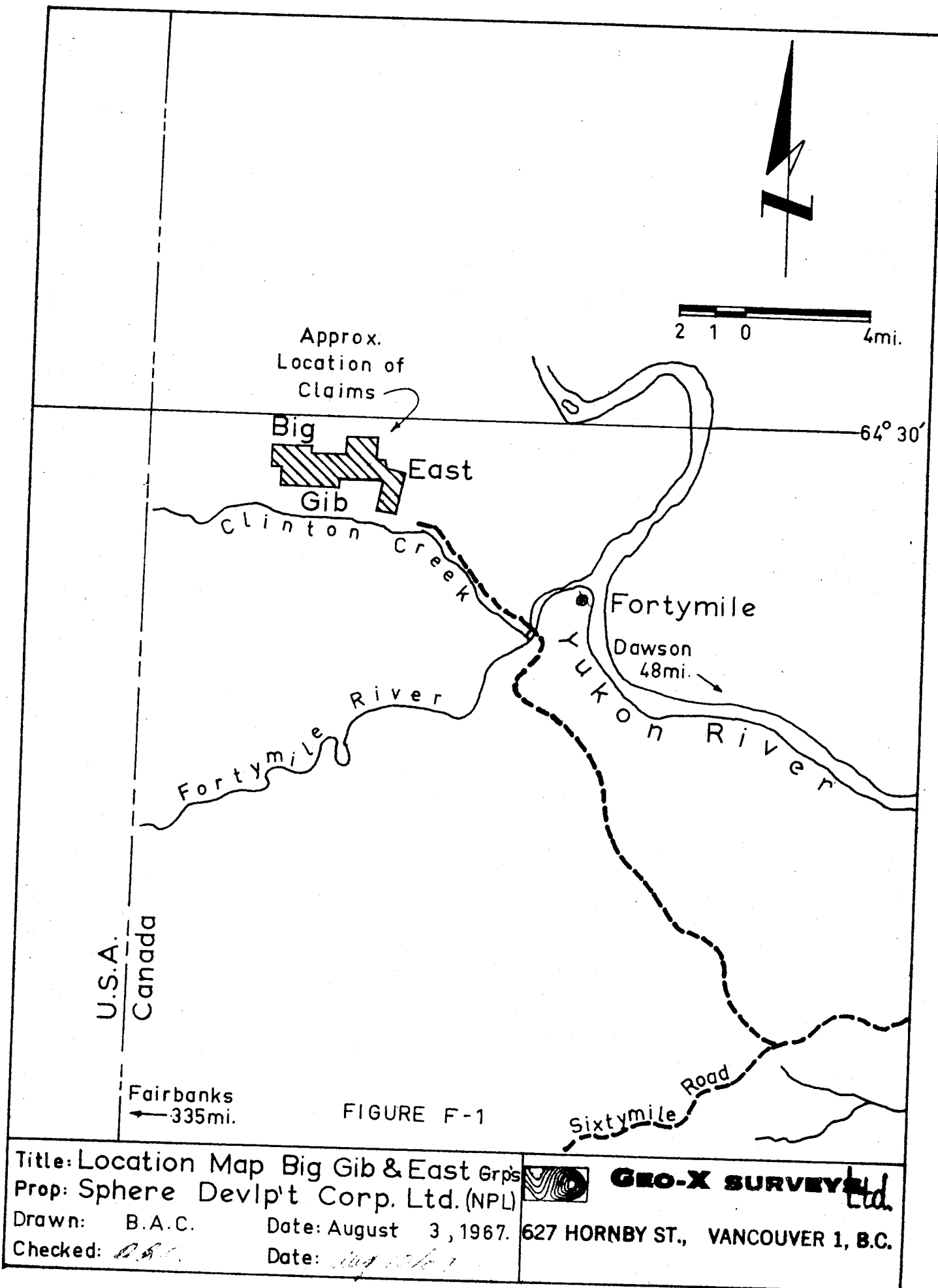
On June 28th, 53 line miles of airborne magnetometer was flown on the Big, Gib and East Claim groups, in the Clinton Creek area, Yukon Territory. The entire survey was rechecked with 56.06 line miles of magnetometer with coincident aerial photographic coverage on July 12th, 1967. Subsequent data processing of the second survey information took place in July and August. This report describes and discusses the results of the survey.

F-2 LOCATION:

The property is situated just north of Clinton Creek, a tributary of the Yukon River, ten air miles north west by west from the settlement of Forty Mile. The Big, Gib and East Groups are 50 airmiles northwest of Dawson City, and may be reached via the Clinton Creek secondary Road (see Figure F-1).

F-2 CLAIMS AND OWNERSHIP:

The Big, Gib and East claim groups, totalling 49 full-sized claims, are owned outright by Sphere Development Corporation Ltd., registered office at 848 West Hastings Street, Vancouver, B.C. Claims are located in the Dawson Mining District. Pertinent claim data is tabulated on the following page.



Title: Location Map Big Gib & East Grp's
 Prop: Sphere Devlp't Corp. Ltd. (NPL)

Drawn: B.A.C.

Date: August 3, 1967.

Checked: *B.A.C.*

Date: *Aug 1967*



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

Claim Data:

<u>Claim Name:</u>	<u>Record No.:</u>	<u>Group:</u>	<u>Group No.:</u>	<u>Ann.Date:</u>
East#1 to 8 inc.	87705-87712	H	150	July 21
Gib#1 to 8 inc.	87587-87594	H	150	July 18
Gib#9 & 10	87595,87696	I	151	July 18
Gib#11 to 18 inc.	87597-87604	J	152	July 18
Gib#19 to 22 inc.	87605-87608	K	153	July 18
Big#1 to 8 inc.	87689-87696	I	151	July 21
Big#9 to 11 inc.	87697-87699	J	152	July 21
No #12 claim exists		-	-	-
Big#13 & 14	87700, 87701	J	152	July 21
Big#15 to 20 inc.	87702, 87703 87713-87716	K	153	July 21

F-4 GEOMORPHOLOGY:

The Big, Gib and East Groups are situated on a rolling peneplain between 1800 and 2500 feet in elevation, north of the Clinton Creek Valley. Three south-flowing tributaries of Clinton Creek dissect the rolling upland with deep valleys. The largest valley is located on the East Group, and forms a steep valley approximately 600 feet deep. The other two valleys are less deeply incised. The property contains only scrub bush cover, with a few patches of larger tree development in and along the stream valleys (see figure F-3).

F-5 FIELD PROCEEDURE:

The property was flown from south to north, at an elevation between 500 and 600 feet above ground, at a speed of 60 mph. A total of 42 flight lines cross the claim groups, the shortest line was 0.62 miles and the longest line was 2.20 miles.

Ground control on the project was adequate, and eight out of ten ground markers were located and utilized for flight line positioning. The resolution on the coincident aerial photography was only fair due to the smoke haze present during flight. Consequently, several air photographs were not printable, and the negatives had to be used for positioning. The average line spacing was 500 feet and some lateral overlap occurred on several of the lines. A total of 56.02 line miles of survey was completed.

F-6 INSTRUMENTS AND SPECIFICATIONS:

(See section A-5)

F-7 AEROMAGNETIC DATA AND DISCUSSION:

(a) Original Data:

A total of 2,299 combined x-y (coordinate geographical positions) and z (vertical component of earth's magnetic field in gammas) points were tabulated, keypunched and computer processed. The d y (along flight line digitizing interval) average approximately 130 feet. The maximum z value encountered was +1080 gammas on line 21, and the minimum -1185 gammas on line 42.

The computer printout of original data is presented in figure F-5, Isomagnetic Contour Plan of Original Data.

The property is, magnetically, quite complex, with considerable vertical component amplitude. The dominant trends on the Big and Gib claims is east-west, to northeast-southwest, and on the East group, and east portion of the Big group, trends are northwest.

Original data anomaly F-1 is situated on the south end of the Eas group of claims. The anomaly contains three +500 gamma centers within an irregular zone of +250 gamma values. The maximum amplitude of anomaly F-1 is +725 gammas.

Anomaly F-2 is an irregular "Y" shaped zone containing several small +500 gamma lobes, and situated in and around claims Big #9 and #10. The center of the anomalous area is at an intersection of two magnetic high trends, the first striking north and the second northeast. Maximum amplitude

of anomaly F-2 is +775 gammas.

Original data anomaly F-3 is centered near the mutual corner of claims Big 11, 14, 15 and 17. F-3 is an irregular zone of +250 gamma value, with two small +500 gamma centers.

(b) TREND SURFACE ANALYSIS OF ORIGINAL DATA:

The fourth degree trend surface analysis of the original data is presented as figure F-6. Because of the number of x, y, z points (2,299), two separate trend surface maps had to be prepared and matched. Panel one of the map is the west side of the property, and panel two, the east side. The match was quite good, with some displacement of the central anomaly F-2 and F-3 area. The trend programme readily outlined anomaly F-1 on the south end of the East Group. This anomaly is presented as an elliptical +100 gamma zone, major axis trending northwest.

Anomalies F-2 and F-3 are similarly presented as an elliptical +100 gamma area, major axis east-west.

A fourth anomalous area was outlined with the trend surface plan~~d~~. This anomaly, numbered F-4, is located in the northeast corner of the Big group on Big #1 claim. It is featured as increasing in amplitude to the northeast.

F - 7 (c) TREND SURFACE ANALYSIS OF RESIDUAL DATA:

Residual data is defined as the difference between the original data, and the computed trend data. High residuals represent areas differing significantly from the regional values, and often indicate local anomalies. A fourth degree trend surface was fitted to the fourth degree residuals on the Big, Gib and East group data, and is presented as figure F - 7. The surface is a combination of two independent analyses, with overlap, and the fit is adequate for interpretation.

Trend analysis of the residual data readily outlined, but displaced, anomaly F - 1 to the northwest.

Anomaly F - 2 has been displaced northward in residual data analysis to a circular shaped +80 gammas anomaly.

Anomaly F - 3 is presented as a background zone suggesting regional affinities.

A fifth anomaly was uncovered in residual programming, and this anomaly, F - 5, is located on Gib #22. It is elliptical in plan and +60 gammas above normal regional trend.

F - 8 SUMMARY AND CONCLUSIONS

On June 28, 53 line miles of airborne magnetometer were flown on the Big, Gib and East claim groups, in the Clinton Creek area of the Yukon. The entire section was reflight with 56.06 line miles on July 12, 1967. Subsequent data processing of the second set of flight data took place in July and August, and is discussed in this report.

The eight East claims, twenty-two Gib claims and nineteen Big claims are owned by Sphere Development Corporation Ltd.

A total of forty-two flight lines were flown from south to north at an elevation of between 500 and 600 feet above ground. Ground control was adequate, however air photo resolution was affected by smoke haze.

A total of 2299 combined x, y and z points were tabulated from the chart records and flight line positioning. The computer printout of original data is presented in figure F - 5 and outlines three interesting magnetically positive anomalies. A fourth degree trend surface was computed, plotted and contoured by a Univac 1108, and the printout is designated figure F - 6. The best fit contoured surface readily outlined anomaly F - 1, indicating an elliptical area of +100 gamma amplitude. Anomalies F - 2 and F - 3 were combined by trend programming, and featured as an elliptical +100 gamma zone. A fourth anomaly, F - 4 was outlined in trend analysis. It is a parabolic zone located in the northeast

corner of the Big group.

A fourth degree trend surface was fitted to the fourth degree residual data and is presented as figure F - 7. Three residual anomalies (areas differing significantly from regional magnetics) were outlined: these are named: F-1, F-2 and F-5.

Positive anomalies F-1, F-2, F-3, trend anomaly F-4 and residual anomaly F-5 are interesting magnetic anomalies. It is recommended that they be checked on the ground with a ground magnetometer, and coincident geological mapping.

Respectfully submitted,



D. R. Cochrane, P.Eng.
August 14, 1967
Vancouver, B.C.

APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property; BIG GIB. EAST GROUP Job; 1002 (F) Date; JULY 12, 1967
 Operator; R. ROBILLARD Flight elevation; 500-600 FEET
 Direction flown; NORTH Air speed; 60 MPH Chart scale; 1:15000
 Weather; +65° SLIGHT SMOKE HAZE - VISIBILITY GOOD.

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gamma's	Min. Z gamma's
	X	Y	X	Y			
1	20230	0	19760	5270	1.00	335	-260
2	19760	1600	19180	8670	1.37	220	-270
3	19370	2090	18590	10460	1.63	470	-380
4	19130	1520	16930	12400	2.13	655	-290
5	18380	1710	16460	12690	2.08	285	-360
6	17870	1800	15670	13740	2.20	370	-340
7	17550	1540	15460	12310	1.80	725	-690
8	16860	1860	15090	11620	1.88	330	-455
9	16420	1250	14050	14800	2.63	115	-300
10	15020	6340	13840	12690	1.21	565	-510
11	14570	6460	13520	12720	1.21	330	-240
12	14200	6610	13170	12540	1.13	340	-480
13	13830	6130	12770	12270	1.18	260	-360
14	13320	6460	12370	12400	1.13	225	-740
15	12850	6730	11910	12990	1.20	200	-445
16	12430	6100	11550	11760	1.08	200	-585
17	11850	6820	10870	12890	1.17	290	-365
18	11500	7000	10720	12510	1.11	175	-420
19	11080	6320	10350	12840	1.23	290	-340
20	10600	6440	10270	13430	1.22	160	-505
21	10110	6130	10050	15120	1.70	1080	-1035

Total number of X, Y, Z points _____

Total number on line miles _____

Signed R. Robillard

APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: BIG, GIB, EAST GROUP Job: 1002 (F) Date JULY 12/67
 Operator: R. ROBILLARD Flight Elevation 500-600 FEET AVG.
 Direction flown: NORTH Air Speed: 60 M.P.H. Chart scale ±1500 ft
 Weather: +65° LIGHT SMOKE HAZE - VISIBILITY GOOD

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max Z gammas	Min. Z gammas
	X	Y	X	Y			
22	9620	6360	9570	13650	1.38	270	-710
23	9170	6630	9060	13300	1.26	435	-300
24	8700	6130	8450	13200	1.34	380	-210
25	8190	5900	7910	13210	1.38	775	-675
26	7770	6470	7260	13760	1.38	430	-540
27	7230	6210	7170	13530	1.38	900	-310
28	6760	6710	6930	13540	1.28	215	-810
29	6230	6340	6160	13310	1.31	510	-760
30	5630	6690	5500	13670	1.31	450	-820
31	5220	7080	4970	13350	1.17	370	-525
32	4830	6560	4540	12730	1.18	570	-570
33	4520	6720	4150	12850	1.17	345	-435
34	4070	6190	3690	12730	1.23	485	-960
35	3640	6560	3190	12770	1.19	960	-320
36	3120	6620	2490	12880	1.17	290	-930
37	2720	6590	1870	12320	1.11	540	-510
38	2170	6890	1690	13110	1.18	380	-315
39	1650	7020	1600	14120	1.34	370	-670
40	1050	9920	990	13210	.62	190	-630
41	540	9700	490	13410	.70	10	-690
42	000	9760	000	13450	.70	380	-1185

Total number of X, Y, Z points 2299

Total number on line miles 56.02

Signed R. Robillard

Appendix II - COST APPROPRIATION

As per contract for airborne surveys between
Geo-X Surveys Ltd. and Sphere Development Corporation Ltd.

Survey of Big, Gib and East Groups	\$ 4,821.88
Ground Control (see following page)	<u>1,642.11</u>
Total	<u>\$ 6,463.99</u>



ALRAE EXPLORATION LTD.

202 - 846 WEST HASTINGS STREET, VANCOUVER 1, B.C. TELEPHONE 681-9381

Sphere Development Corp. Ltd.
848 West Hastings Street
Vancouver 1, B. C.

RE: BIG 1 - 11, 13 - 20 incl., GIB 1 - 22 incl., EAST 1 - 8 incl.
Re: Location and marking claims for aerial magnetometer survey.

Personnel:

<u>Days</u>	<u>Name</u>	<u>Occupation</u>	<u>Dates</u>	<u>Gross Wages</u>
5-1/2	D. Smallman	Line Cutter	June 14, 15, 16, 22, 23, 24/67	\$ 185.18
5	P. Cumberbirch	Line Cutter	June 14, 15, 16, 22, 24, 28/67	168.30
3-1/2	B. Garner	Asst. Geol.	June 20, 22, 23/67	154.69
4	D.V. Preston	Asst. Geol.	June 20, 21, 22, 24/67	176.78
<u>2</u>	A. Burton	Geologist	June 16, 27/67	<u>226.56</u>
20				\$ 911.51
	Topographic mapping - McElhanney Ltd.			270.00
	Transportation - Truck and Honda rental field supplies and hardware			<u>460.60</u>
				<u>\$ 1,642.11</u>

ALRAE EXPLORATION LTD.
846 W. HASTINGS ST.
VANCOUVER 1, B. C.

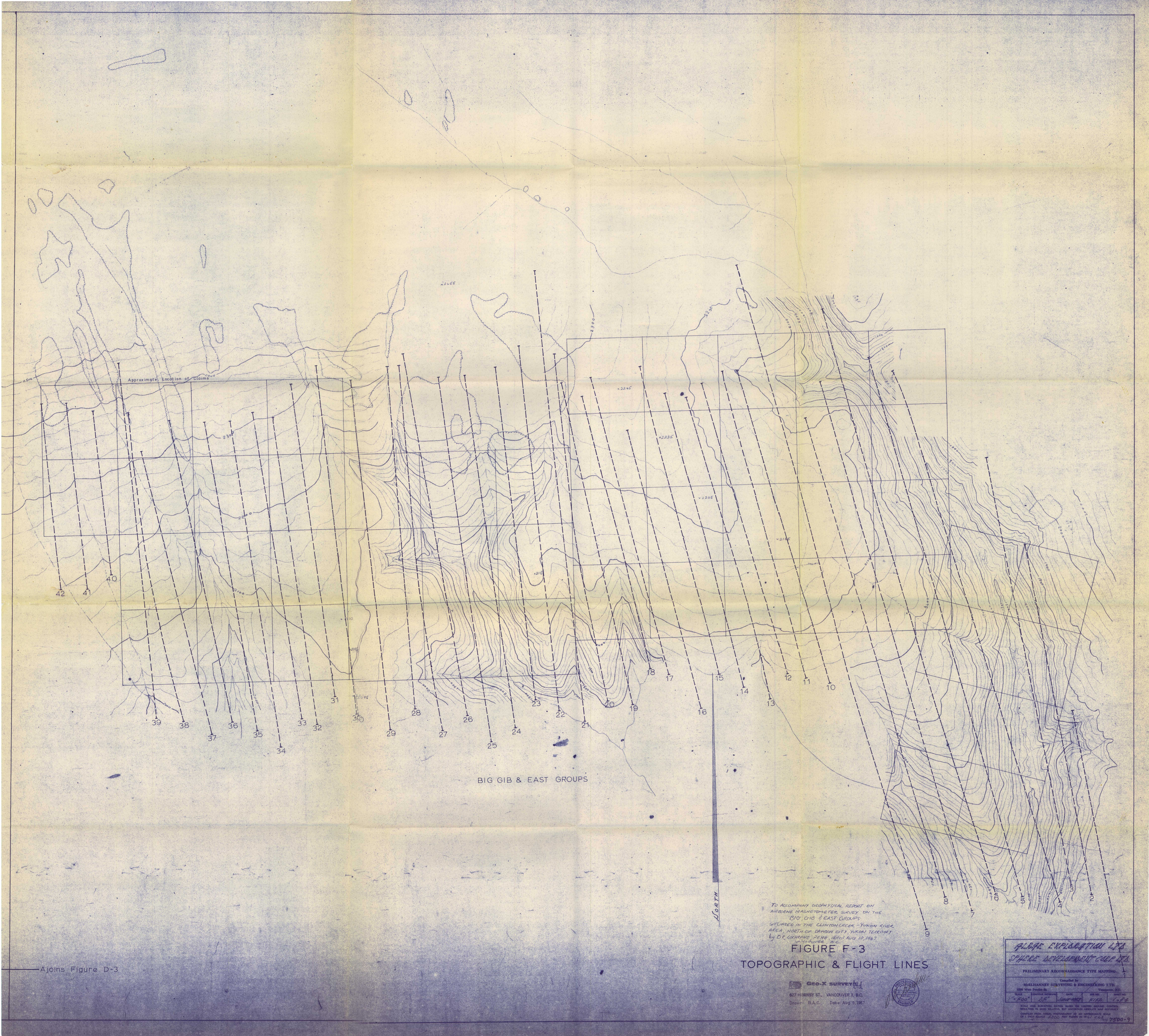
R. J. Burton

*Paid in Full
A. Burton*

GEOLOGY
Exploration

CONSULTANTS
Development

MINING
Production



Joins Figure D-3

TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
BIG GIB & EAST GROUPS
STATIONED IN THE CLINTON CREEK - YUKON RIVER
AREA, NORTH OF DAWSON CITY, YUKON TERRITORY
by DR. GEORGE PERRY, dated Aug. 10, 1967
VANCOUVER, B.C.

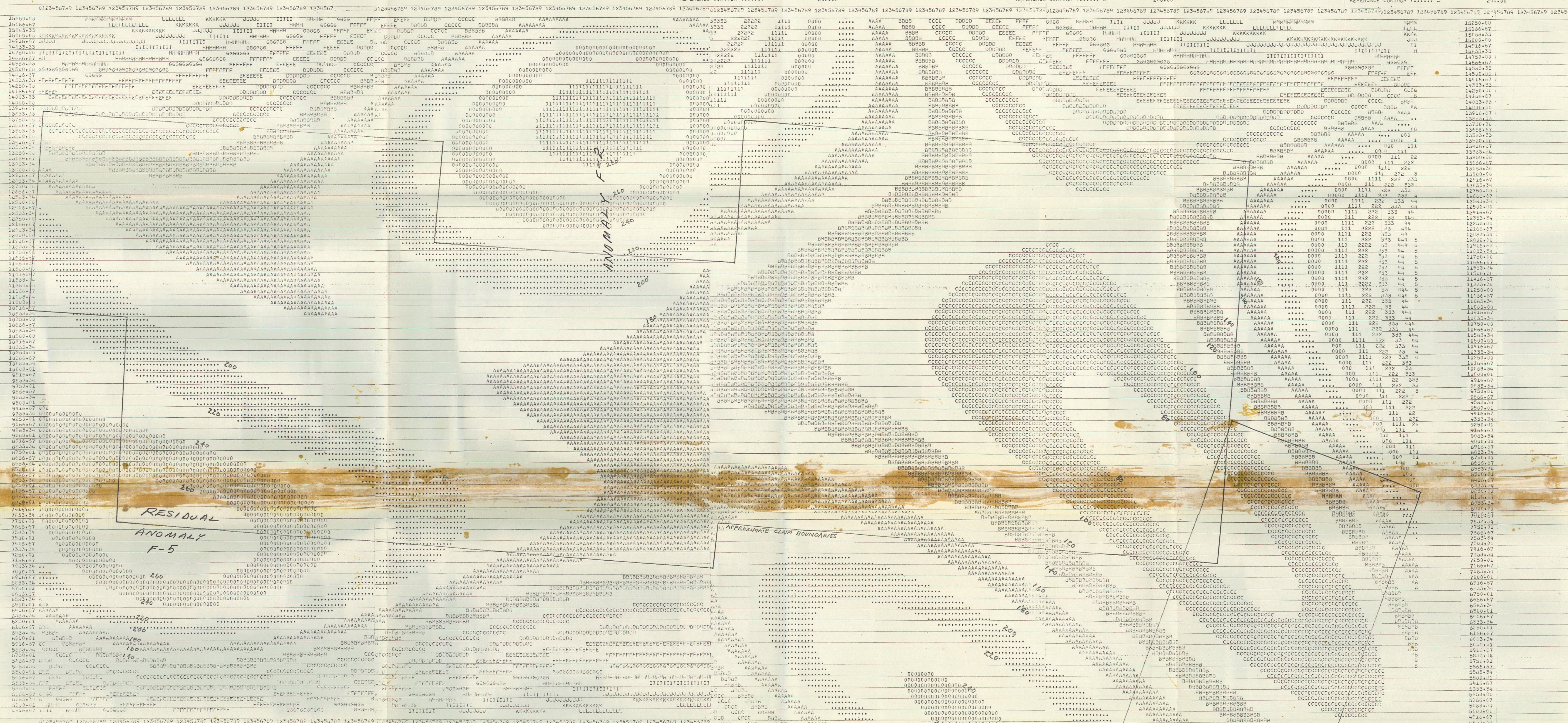
FIGURE F-3
TOPOGRAPHIC & FLIGHT LINES

GEO-X SURVEYS LTD.
627 HURMBY ST., VANCOUVER 1, B.C.
Drawn: B.A.C. Date: Aug. 9, 1967



ALPHE EXPLORATION LTD.			
SPARK DEVELOPMENT CORP. LTD.			
PRELIMINARY RECONNAISSANCE TYPE MAPPING			
Contracted by MAGLIANNEY SURVEYING & ENGINEERING LTD. 1000 West Pender St. Vancouver, B.C.			
Scale 1"=500'	Station 215	Date 8/15/67	Sheet 1 of 4
Scale and Elevation datum based on limited ground control. Reliable in good relative, but accuracy absolute may vary. Derived from aerial photography as of approximately 1964. On 1 inch equals 2200 feet flown in 1967. SCS 7500-9			

SPHERE DEVELOPMENT CORP. LTD. (NPL) BIG, GIB & EAST GROUPS



TO ACCOMPANY GEOGRAPHICAL REPORT ON
ATHEMATIC MAGNETIC SURVEY OF THE
BIG, GIB, & EAST GROUPS
SITUATED IN THE CLINTON CREEK-YUKON
RIVER AREA, NORTH OF DUBOIS CITY,
YUKON TERRITORY, BY D. C. O'NEILL,
P. 810, dated August 14, 1967,
VANCOUVER, B. C.

GEO-X SURVEY LTD.
627 HORNBY ST., VANCOUVER 1, B.C.

1000' 500' 0 500' 1000'

PART G - CALEY OPTION
Jo, Leslie and Ida Claim Groups
GEOPHYSICAL REPORT
on the
Airborne Magnetometer Survey
of the
Jo 1 to 8, Leslie 1 to 8, Ida 1 to 8 Claims
Situated in the Clinton Creek Area
Yukon Territory
Dawson Mining District
Latitude 64°20'N : Longitude 140°00'W

Airborne Field Work Completed
July 12th, 1967
on behalf of
SPHERE DEVELOPMENT CORPORATION LTD.

by:
D. R. Cochrane, P. Eng.
September 13th, 1967
Vancouver, B.C.



GEO-X SURVEYS

VANCOUVER, CANADA

Ltd.

Part G - Caley Option

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Appendix

I	Flight Data and Operator's Report
II	Cost Appropriation, Caley Option

G-1 INTRODUCTION:

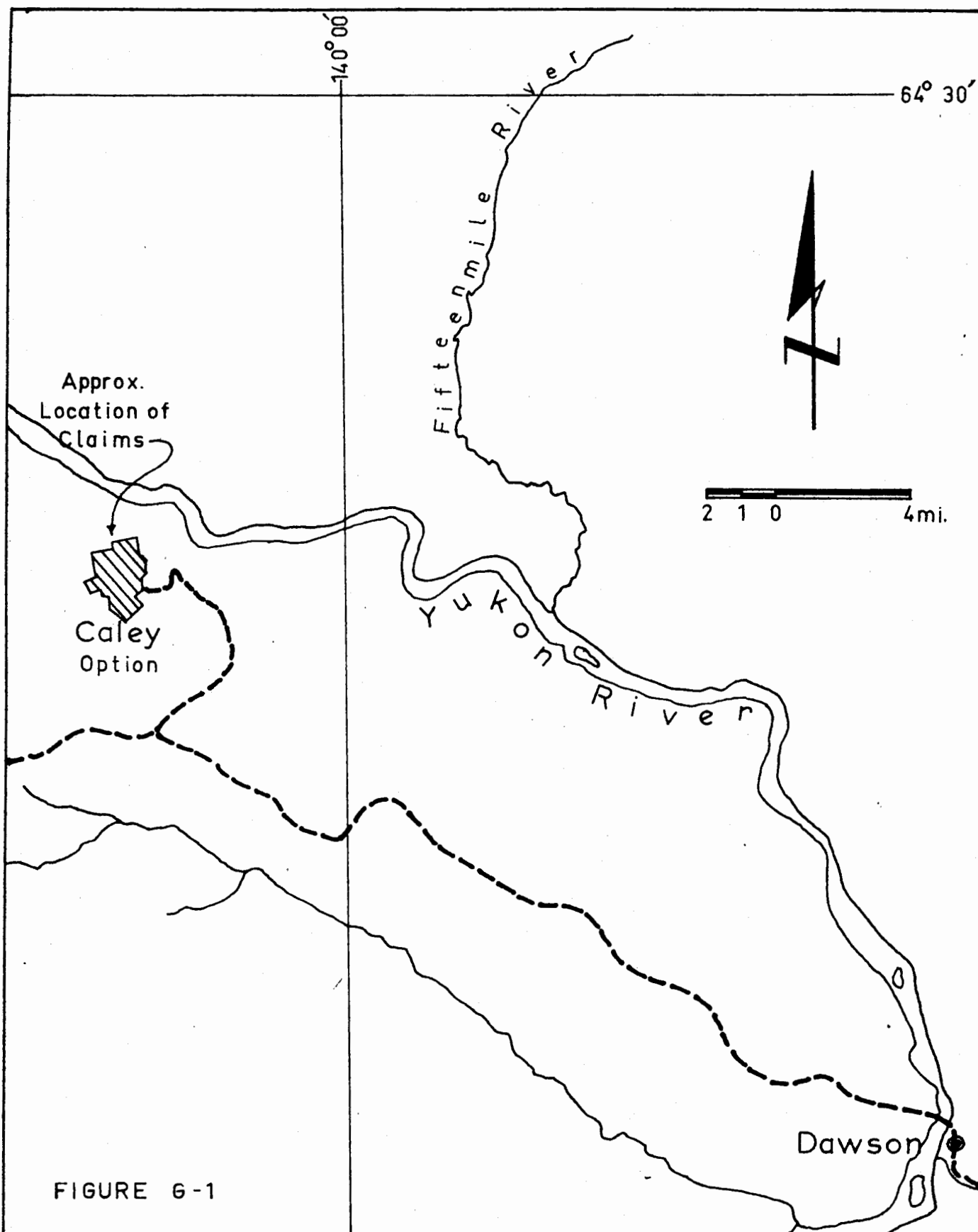
On July 12th, 1967, a total of 32.68 line miles of coincident airborne magnetometer and aerial photography was completed on the Ida, Leslie and Jo claims, situated near Clinton Creek, Yukon Territory. The work was conducted by Geo-X Surveys Ltd., on behalf of Sphere Development Corporation Ltd. This report describes the field procedure and discusses the data processing techniques and final results.

G-2 LOCATION AND ACCESS:

The Caley Option claims are situated 30 air miles northwest of Dawson City, Yukon Territory. Claims are just south of the Yukon River and between Happy and Cassiar Creeks, tributaries of the Yukon. The property may be reached via the Clinton Creek Mine access road, from which a north directed side road may be taken to the center of the claims. (see Figure G-1, Location map).

G-3 CLAIMS AND OWNERSHIP:

The claims were optioned by Sphere Development Corporation Ltd., registered office 848 West Hastings Street, Vancouver, B.C. from Mr. Caley, a businessman of Dawson City. The following table summarizes pertinent claim data.



Title: Location Map Caley Option
 Prop: Sphere Devlp't Corp. Ltd. (NPL)
 Drawn: B.A.C. Date: August 3, 1967.
 Checked: *B.A.C.* Date: *Aug 10/67*



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

<u>Claim Name:</u>	<u>Record No.:</u>	<u>Group:</u>
Jo 1 to 8 incl.	15100 to 15107 inc.	L
Leslie 1 to 8 incl.	15116 to 15123 incl.	L
Ida 1 to 8 incl.	15108 to 15115 incl.	M

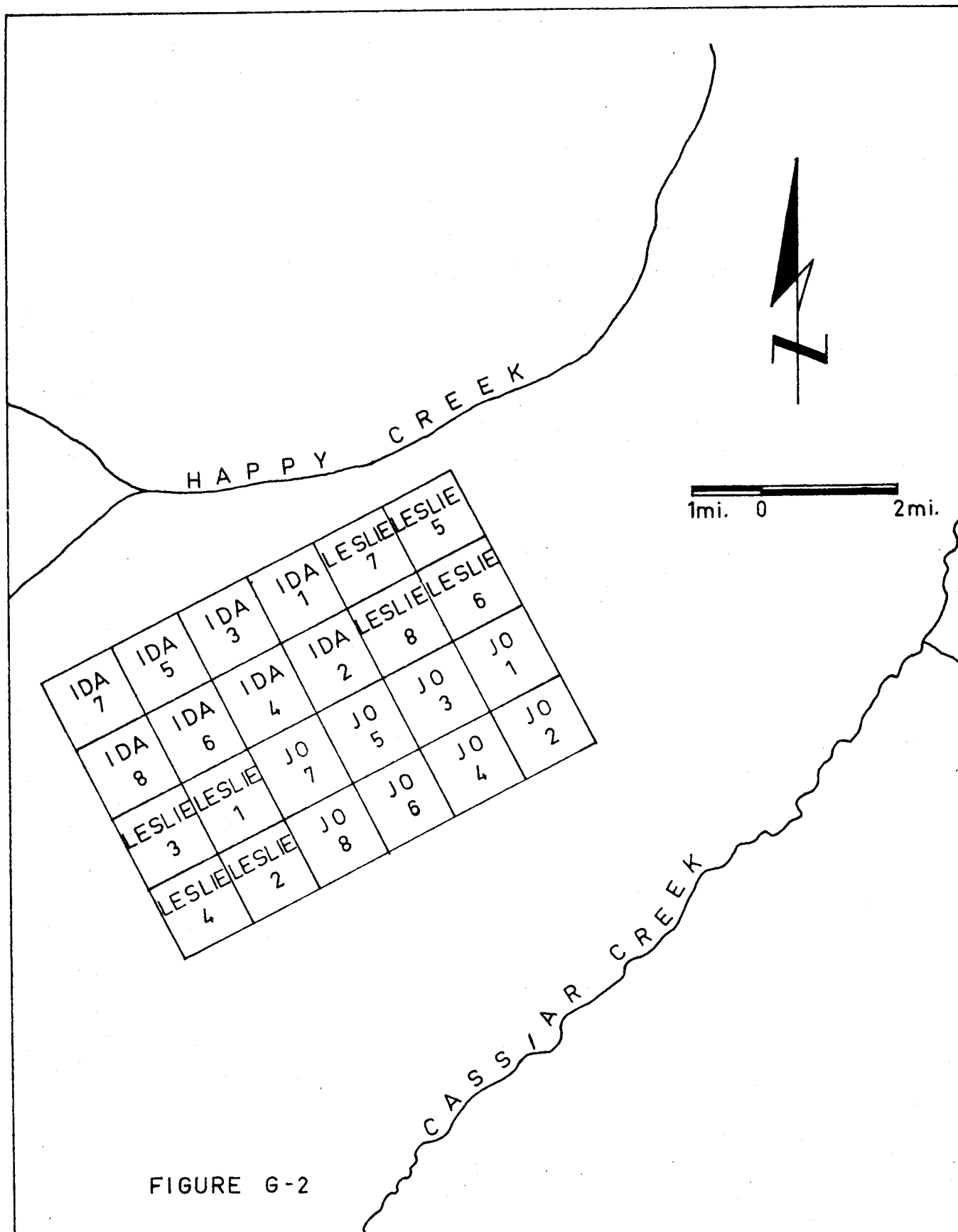
G-4 GEOMORPHOLOGY:

The claims straddle a north-east trending ridge (approximately 3500 feet in elevation) between the fairly deeply incised valleys of Happy and Cassiar Creeks. The Happy Creek valley, immediately to the north of the property, is a deep V-shaped valley, approximately 1000 feet below the ridge summit. Several north flowing tributaries of Happy Creek combine to make the extreme north section of the property fairly rugged, whereas just south the slope becomes fairly gentle, slightly rolling.

The claim groups are only sparsely forested, with more vegetation existing on southeast slopes relative to the almost barren north slopes.

G-5 FIELD PROCEEDURE:

Nineteen flight lines were directed north, averaged 1.5 miles in length and 400 feet apart. Three test lines were flown east over the Hardluck, Rainbow and Dig claims.



Title: Claim Map Caley Option
 Prop: Sphere Devlp't Corp. Ltd. (NPL)
 Drawn: B.A.C. Date: August 7, 1967.
 Checked: *[Signature]* Date: *[Signature]*



GEO-X SURVEYS Ltd.

627 HORNBY ST., VANCOUVER 1, B.C.

The pilot maintained an elevation of 500 feet during the survey, and the magnetometer chart scale was set at ± 1500 gammas.

Ground control was good on the north end of the 19 north-directed flight lines, due to local topographic features. The south end of the flight lines may have minor errors in positioning due to the featureless nature of the country. Test line ground control was quite adequate.

G-6 INSTRUMENTS and SPECIFICATIONS:

See Section A-5

G-7 AEROMAGNETIC DATA and DISCUSSION:

The data processing techniques employed on the Caley data varied slightly from those employed on previous surveys. The chart records were digitized by Computrex of Calgary, using a Calcomp analog to digital converter. The output from the converter in x, y (geographic coordinates) and z (gammas) is captured on magnetic tape. The tape is utilized to punch cards which are fed into a computer. The computer calculates the fourth degree trend value of each point, and the residual value. These computed values are fed into a Calcomp Plotter and contoured at an appropriate scale.

G-7 (A) Original Data:

An isomagnetic plan of the Jo, Leslie and Ida claims is presented as Figure G-5. The maximum value encountered was 1300 gammas, on line 8, and the minimum -1380 on lines 10 and 11.

A total of 1328 combined x, y and z values were digitized. The original data contour interval is 100 gammas, scale 1":500 feet. A series of magnetic lows exist from the southeast corner of the Leslie group, through the south portion of the Jo Group and apparently disappears on the Hardluck Group. These magnetic lows are flanked to the east and south on the Hardluck and Dig Groups by a series of +500 gamma highs (named anomaly G-1) and to the north, on the Joe Group by a number of highs (G-2 and G-3). The central and west portion of the Leslie Group and the east portion of the Ida Group, lie within a magnetic plain, with only small magnetic amplitude. The series of lows and anomaly G-1 trend east, with a well developed north trend featured along the mutual boundary of Leslie-Keith, and Jo-Hardluck.

G-7 (B) Trend Surface Analysis:

A fourth degree trend surface of the original data was computed and contoured, and is presented as Figure G-6. The coefficient of correleation of the surface was quite good at 0.4038, and the standard deviation 258.81.

The trend surface shows east to north east trending magnetic zones, the best developed being a magnetic low centered on the south boundary of the Jo Group. A similar low, with less amplitude, is centered on the north boundary of the Ida Group. A magnetic high is outlined on the Rainbow and Dig groups, and has been extrapolated north and east to higher values. A second, high has been assumed by trend analysis on the south east corner of the map sheet.

G-7 (c) Residual Data:

The residual data (difference between the original data and trend analysis data at each point) was plotted and contoured, and is presented as Figure G-7. In many ways, it resembles the original data contour plan, however, residual analysis has the advantage of amplifying local elements (i.e. those differing significantly from the trend surface).

The series of negatives is well defined by residual contouring and these trend through the lower half of the Jo Group. Original data anomaly G-1 has been outlined by residual processing. The residual anomaly is slightly larger, and of a different configuration. In addition, anomalies G-2 and G-3 have been outlined, reaffirming the previous indication that these magnetic highs are significant changes from the regional

magnetic background and therefore represent true anomalies. Another series of magnetic highs, not quite so obvious on original data, has been outlined north of the series of negatives and is designated G-4. This magnetic high zone may in fact be an extension of anomaly G-1. Several apparently isolated highs on the east Leslie and west Jo Groups are also featured on the residual map, and are indicated by an "H".

G-8 SUMMARY and CONCLUSIONS:

On July 12th, 1967, an airborne magnetometer survey was completed on the Caley Option, by Geo-X Surveys Ltd., on behalf of Sphere Development Corporation Ltd. The property is situated 30 air miles northwest of Dawson City, Yukon, and straddles a north-east trending ridge between Happy and Cassiar Creeks. Nineteen flight lines were flown north, and three test lines were flown east. Ground control was quite adequate.

The magnetic information was digitized and an isomagnetic contour plan, contoured fourth degree trend surface and residual data contour plan prepared by an A/D converter, and a computer and plotter.

Three original data magnetic highs and a series of magnetic lows were outlined. The trend surface shows east to northeast magnetic trends, and featured a high amplitude magnetic low, and a single mag high. A theoretical and second mag high has been assumed by trend analysis to the southeast of the property.

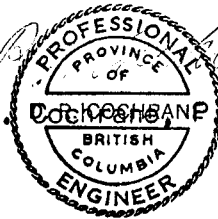
Residual data contouring has affirmed the local and significant nature of anomalies G-1, 2 and 3. In addition, residual information outlined another series of magnetic highs, designated G-4, not quite so obvious on the original data map.

A ground "follow up" magnetometer survey in conjunction with a geological survey is recommended on anomalies G-1, G-2, G-3 and G-4.

September 13th, 1967
Vancouver, B.C.

Respectfully submitted,

D. R. Doane
D. R. Doane, P. Eng.



APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: CALEY GROUP Job: 1002 (G) Date: JULY 12/67
 Operator: R. ROBILLARD Flight Elevation 500 FEET
 Direction flown: _____ Air Speed: 60 M.P.H. Chart scale ±1500'
 Weather: +65° CLEAR VISIBILITY GOOD.

LINE Number	P.O.B.(feet)		P.O.E.(feet)		Length Miles	Max Z gammas	Min.Z gammas
	X	Y	X	Y			
1	6930	3800	5990	10,320	1.26	+470	-350
2	6890	1800	5500	9660	1.50	+760	-1030
3	6100	1940	5580	9430	1.42	+360	-540
4	5690	1840	4910	9410	1.44	+480	-510
5	5180	1580	4580	9380	1.42	+390	-1120
6	4700	1900	5400	9700	1.42	+290	-760
7	4230	1730	4090	9530	1.48	+520	-1180
8	3750	1660	3710	9770	1.56	+340	-910
9	3200	1250	3330	9320	1.54	+1300	-390
10	2920	2030	2830	8820	1.28	+1010	-1380
11	2460	1320	2390	9010	1.50	+310	-1380
12	2210	1000	2190	8920	1.50	+270	-445
13	2040	0680	1920	8510	1.48	+240	-675
14	2000	0790	1780	8890	1.52	+160	-810
15	1620	0700	1300	8190	1.42	+370	-665

Total number of X, Y, Z points 1328

Total number on line miles 32.68

Signed R. Robillard

APPENDIX I

FLIGHT DATA AND OPERATORS REPORT

Property: CALEY GROUP Job: 1002 (G) Date: JULY 12/67
 Operator: R. ROBILLARD Flight Elevation: 500 FEET
 Direction flown: _____ Air Speed: 60 MPH Chart scale: 1:15000
 Weather: +65° CLEAR VISIBILITY GOOD

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max Z gammas	Min. Z gammas
	X	Y	X	Y			
16	1040	0570	0910	8920	1.58	+255	-750
17	0700	0980	0530	8800	1.46	+195	-735
18	0410	0390	0250	8050	1.46	+250	-270
19	000	000	000	8430	1.60	+580	-1030
1B	6550	5350	15820	6150	1.76	+500	-540
2B	6660	4840	14620	5560	1.46	+610	-265
3B	6720	4440	4610	5080	1.50	+360	-520

Total number of X, Y, Z points 1328

Total number on line miles 32.68

Signed R. Robillard

Appendix II - COST APPROPRIATION

As per contract for airborne surveys between
Geo-X Surveys Ltd. and Sphere Development Corporation Ltd.

Survey of Caley Option, Ida, Leslie, Joe Group	\$ 2,450.00
Ground Control (see following page)	<u>1,109.18</u>
Total	<u>\$ 3,559.18</u>

ALRAE EXPLORATION LTD.

202 - 846 WEST HASTINGS STREET, VANCOUVER 1, B.C. TELEPHONE 681-9381

Sphere Development Corp. Ltd.
848 W. Hastings Street
Vancouver 1, B. C.

Re: Location and marking for aerial magnetometer survey
Re: IDA 1 - 8 incl., LESLIE 1 - 8 incl., JO 1 - 8 incl.

Personnel:

Days	Name	Occupation	Dates	Gross Wages
4-1/2	D. Smallman	Line Cutter	June 21, 27, 29, 30, 31/67	\$ 151.52
6	P. Cumberbirch	Line Cutter	June 21, 23, 27, 28, 29, 30/67	202.02
5	B. Garner	Asst. Geol.	June 23, 25, 27, 29, 30/67	221.00
4	D.V. Preston	Asst. Geol.	June 27, July 7, 8, 9/67	176.80
19-1/2				\$ 751.34
	Topographic mapping - McIlhanney Ltd.			132.24
	Transportation - Truck and Honda rental field supplies and hardware			225.60
				<u>\$ 1,109.18</u>

ALRAE EXPLORATION LTD.
846 W. HASTINGS ST.
VANCOUVER 1, B. C.

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Development

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Production

DOMINION OF CANADA: }
PROVINCE OF BRITISH COLUMBIA. } **In the Matter of**
To Wit: }

I, Alex Burton, Professional Engineer

of 844 West Hastings Street, Vancouver 1, B. C.

in the Province of British Columbia, do solemnly declare that I have compiled the statement of costs as presented in this report "Geophysical Report on the Airborne Magnetometer Survey of the Jo 1-8, Leslie 1-8, Ida 1-8 claims in the Dawson Mining District".

That to the best of my knowledge and belief, the statement of costs as presented is true and an accurate expenditure to be applied on the Caley property.

This expenditure totals \$1,109.18

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

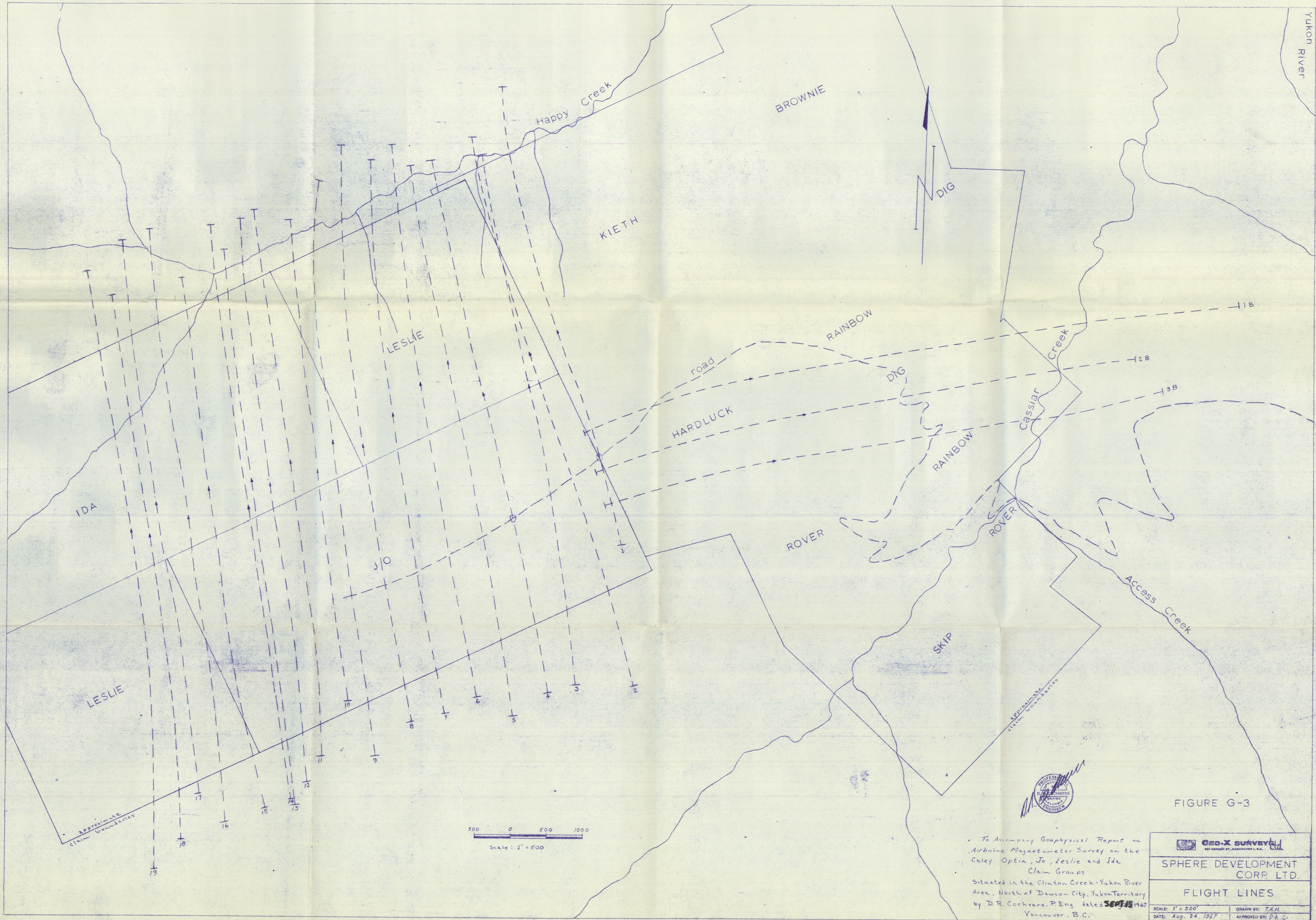
Declared before me at the city
of Vancouver, in the
of British Columbia, this 14TH
November 1967, A.D. }

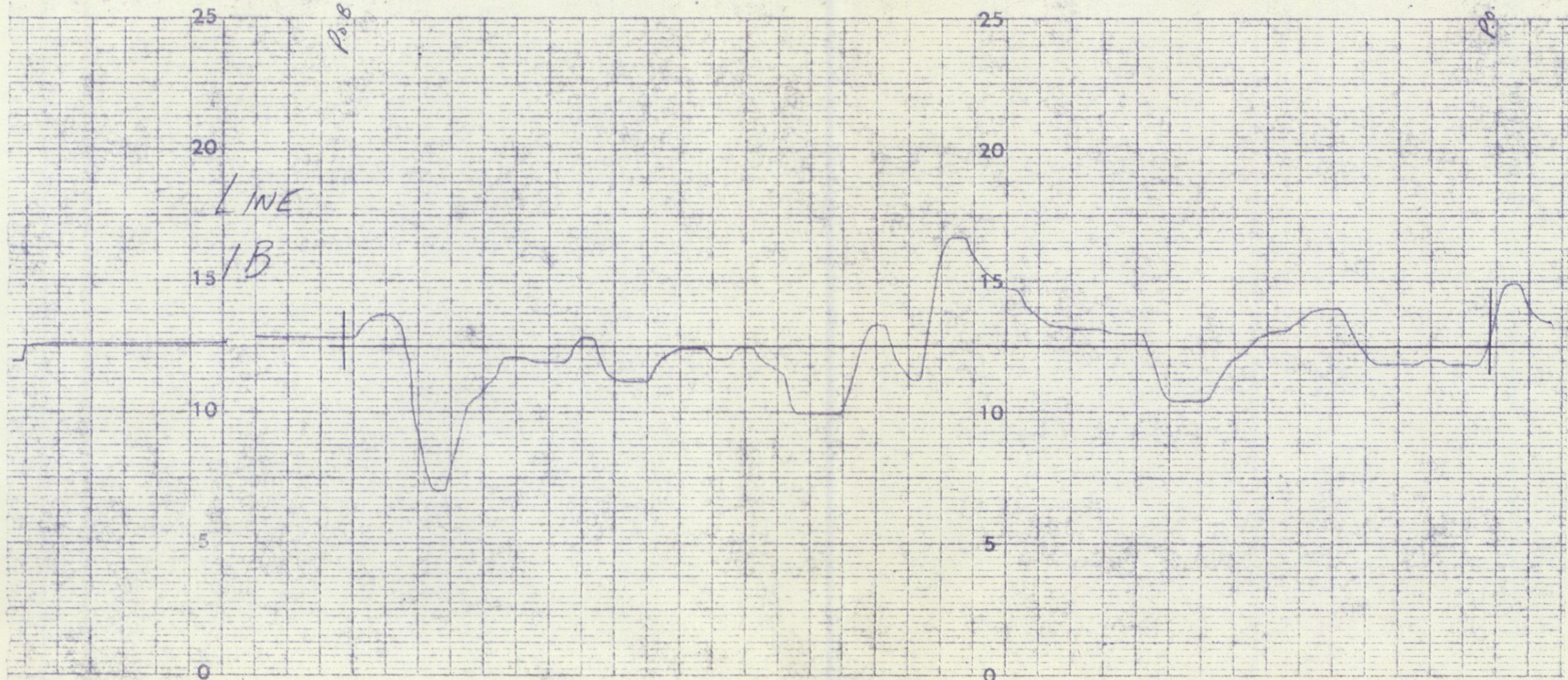


W. David Black

~~A Commissioner for taking Affidavits for British Columbia or~~
~~A Notary Public in and for the Province of British Columbia.~~

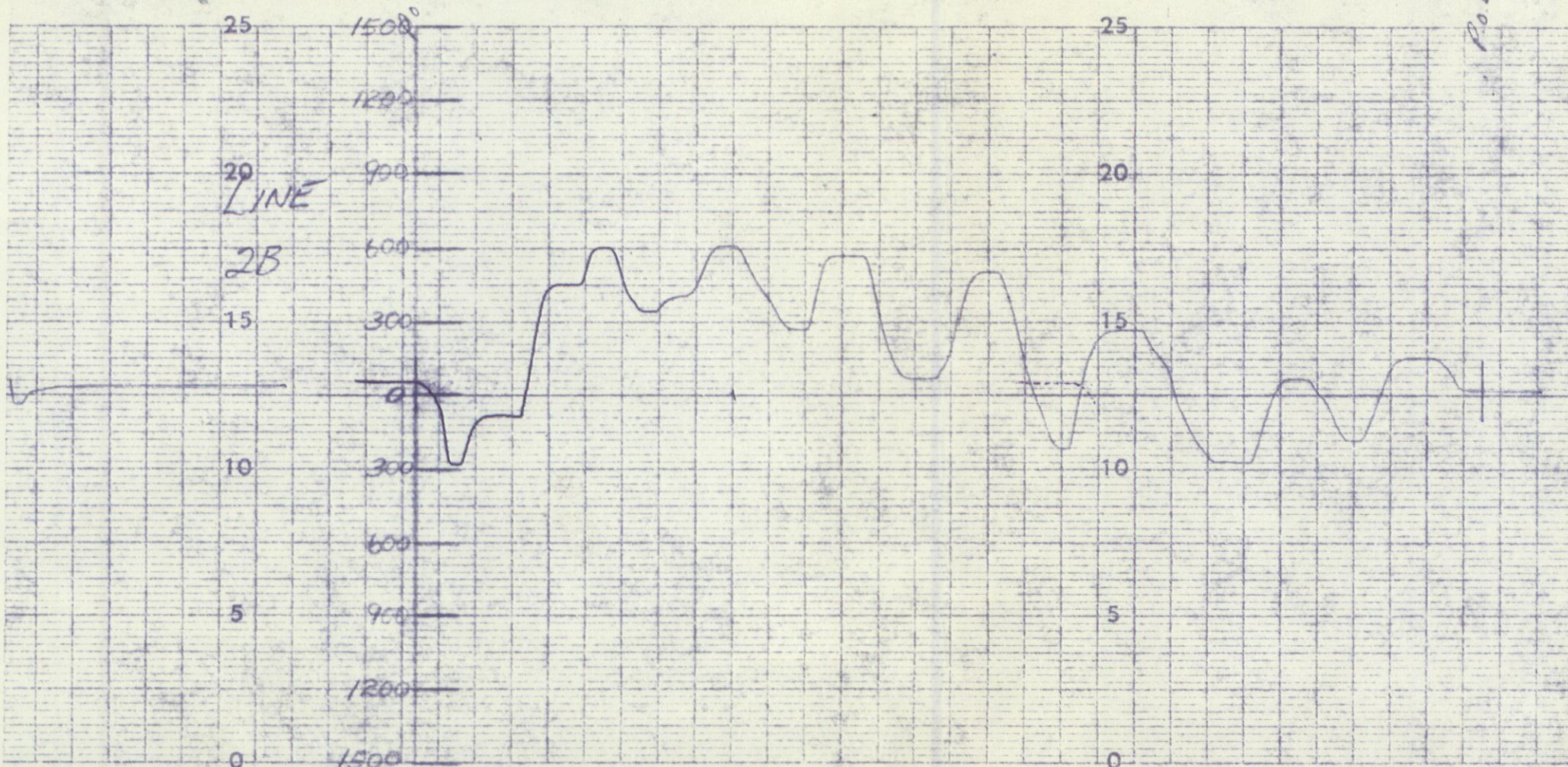
**A Notary Public in and for the
Province of British Columbia**





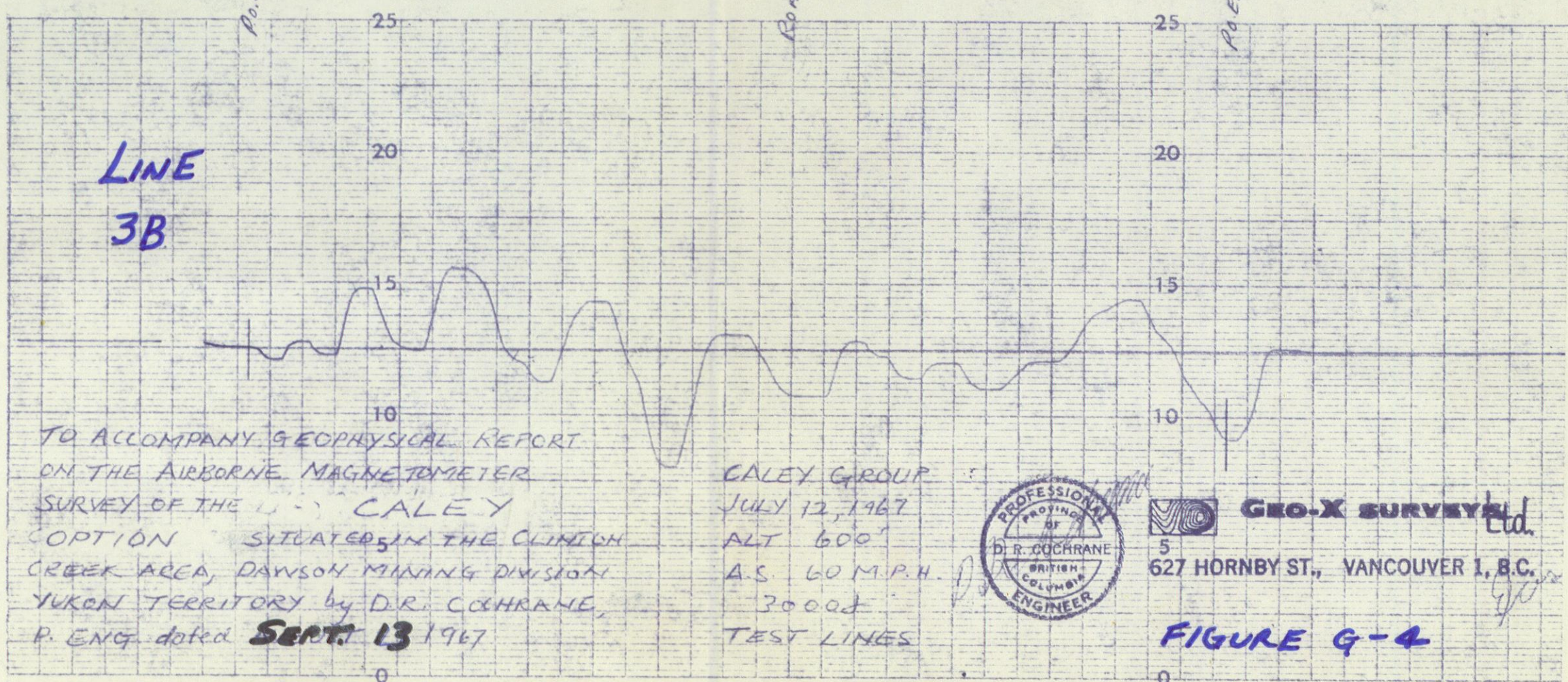
CAT. NO. 33-01-81

PRINTED IN U.S.A.



BAUSCH & LOMB INCORPORATED ROCHESTER, N. Y.

CAT. NO. 33-01-81



TO ACCOMPANY GEOPHYSICAL REPORT
ON THE AIRBORNE MAGNETOMETER
SURVEY OF THE CALEY
COPTION SITUATED IN THE CLINTON
CREEK AREA, DAWSON MINING DIVISION
YUKON TERRITORY by D.R. COCHRANE,
P. ENG. dated **Sept 13 1967**

CALEY GROUP
JULY 12, 1967
ALT 600'
A.S. 60 M.P.H.
30000
TEST LINES

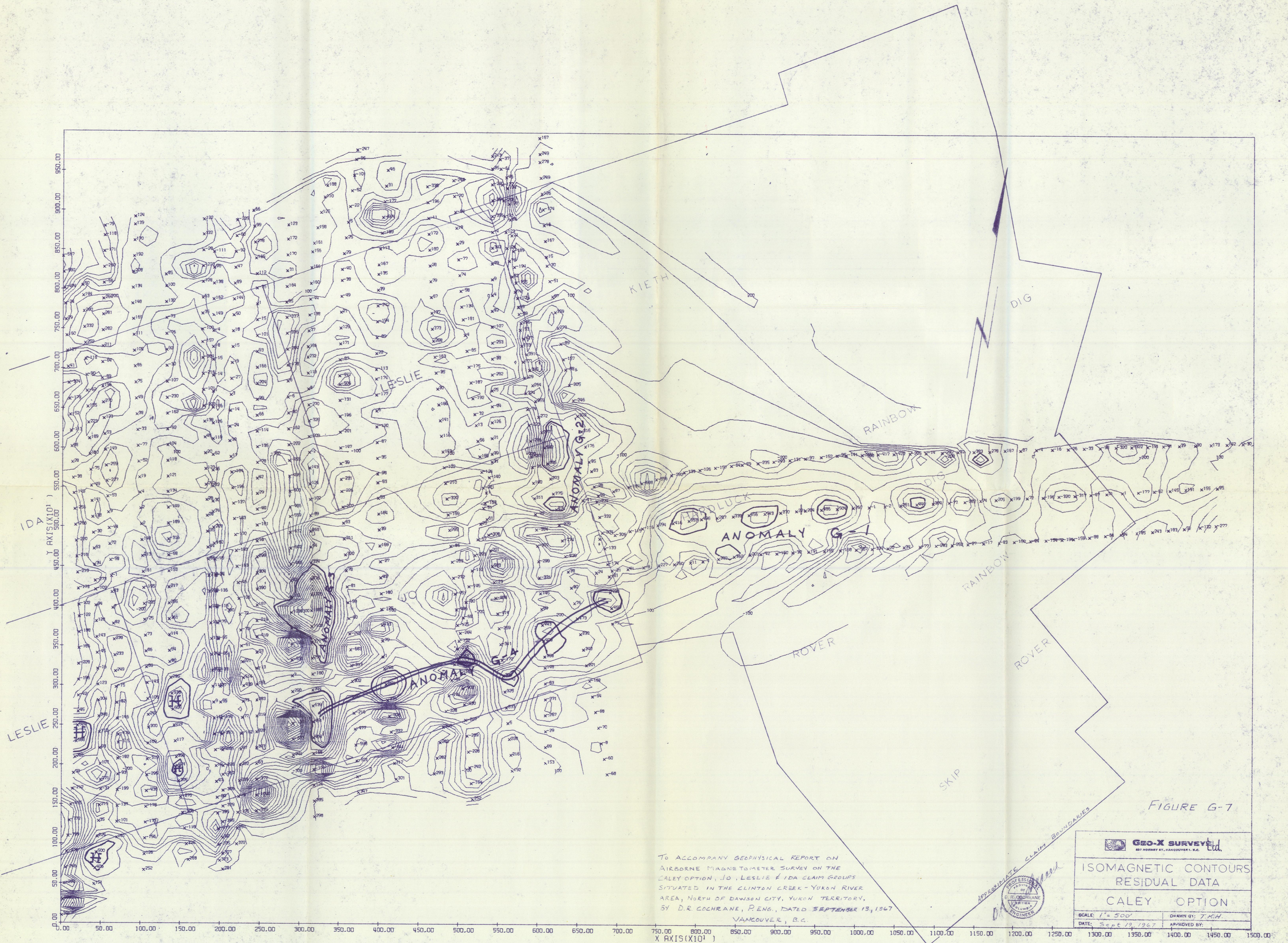


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FIGURE G-4





TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
CALEY OPTION, ID, LESLIE & IDA CLAIM GROUPS
SITUATED IN THE CLINTON CREEK-YUKON RIVER
AREA, NORTH OF DAWSON CITY, YUKON TERRITORY,
BY D.R. COCHRANE, P.ENG., DATED SEPTEMBER 13, 1967
VANCOUVER, B.C.

GEO-X SURVEYS Ltd. 837 HORNBY ST., VANCOUVER, B.C.	
ISOMAGNETIC CONTOURS RESIDUAL DATA	
CALEY OPTION	
SCALE: 1" = 500'	DRAWN BY: J.K.H.
DATE: Sept 19, 1967	APPROVED BY:

FIGURE

CALEY
OPTION

FIGURE 8

CALEY OPTION TEST LINES



FIGURE 9