

1698

GEOPHYSICAL REPORT

PART 1

on the

Airborne Magnetometer Survey

of the

Bea, Giant, P., and Mill Claim Groups

Situated in the Hope Area

New Westminster M.D.

Lat. $49^{\circ}27'1''$ N, Long. $121^{\circ}28'1''$ W

Airborne Field Work

July 29, 31 and August 1, 1967

on behalf of

Kelso Explorations Ltd.

by

D.R. Cochrane, P. Eng.

August ²²~~18~~, 1967

Vancouver, B.C.



604-685-4296
TELEX 04-50404

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

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INTRODUCTION

On July 29, 31 and August 1, 1967, a total of 92.58 line miles of coincident airborne magnetometer and aerial photography was flown on four claim groups in the Hope Area, by Geo-X Surveys Ltd., on behalf of Kelso Explorations Ltd.

This report describes the field procedure and discusses the results of the airborne survey.

LOCATION (See Figure 1)

The 102 full sized claims and 6 fractions form a contiguous block immediately west of the Fraser River. The south boundary of the property is just over one mile north of the town of Hope; and the north boundary is just north of Stulkawhits Creek, near Choate, and joins the property and mine operated by Giant Mascot Mines Ltd. The eastern claim group boundary is close to, and parallel to, Highway # 1, the Trans Canada Highway.

Much of the property is accessible via logging and secondary roads off Highway # 1.

CLAIMS AND OWNERSHIP

The property consists of located claims, in the New Westminster M.D., owned outright by Kelso Explorations Ltd. (N.P.L.), registered office at #411 - 470 Granville Street, Vancouver, B.C.

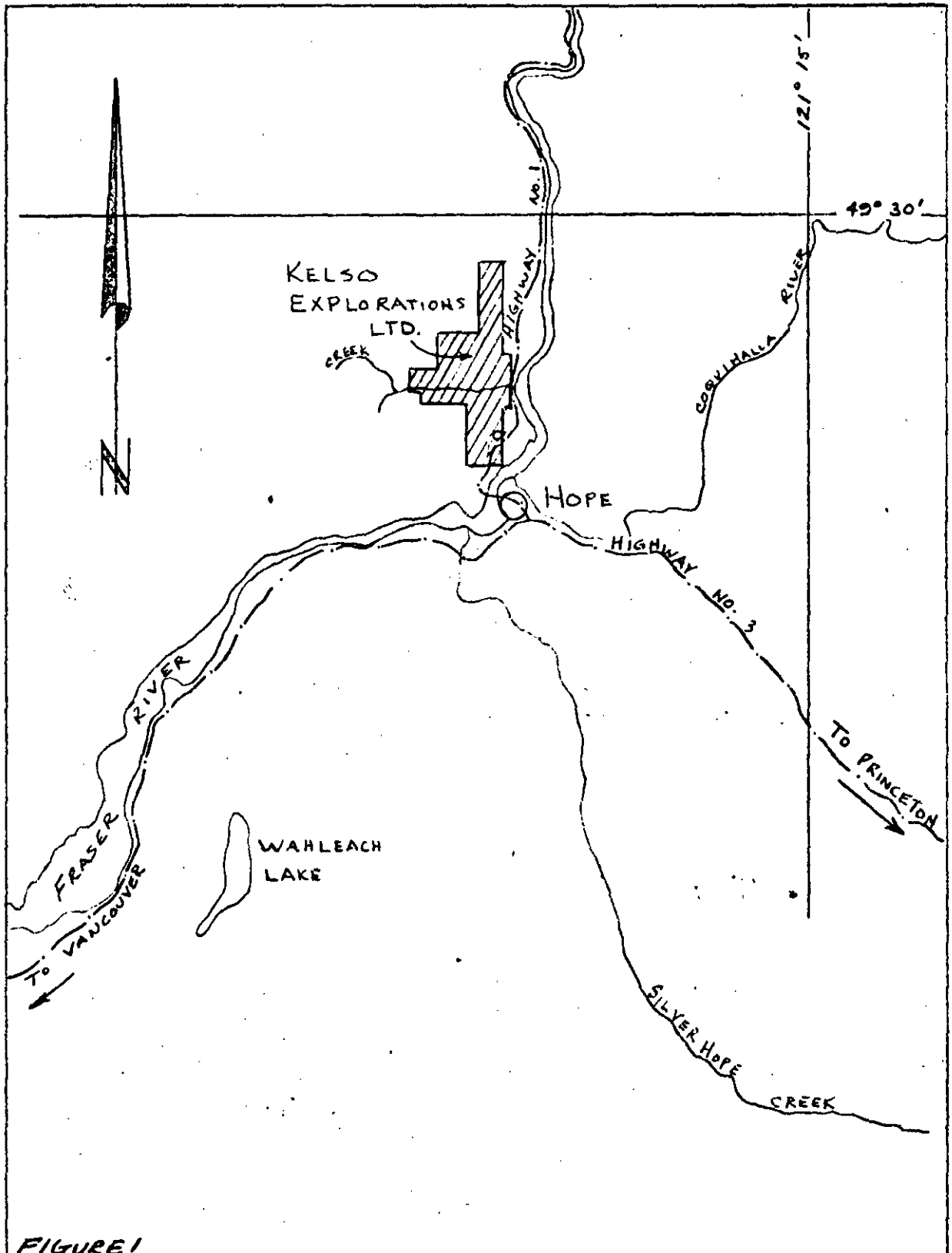


FIGURE 1

TITLE: LOCATION MAP - JOB No. 1009
 PROPERTY: KELSO EXPLORATION LTD (NPL)
 DRAWN: D.M.F. DATE: AUGUST 17, 1967
 CHECKED: D.R.C. DATE: AUGUST 22, 1967



GEO-X SURVEYS LTD.

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

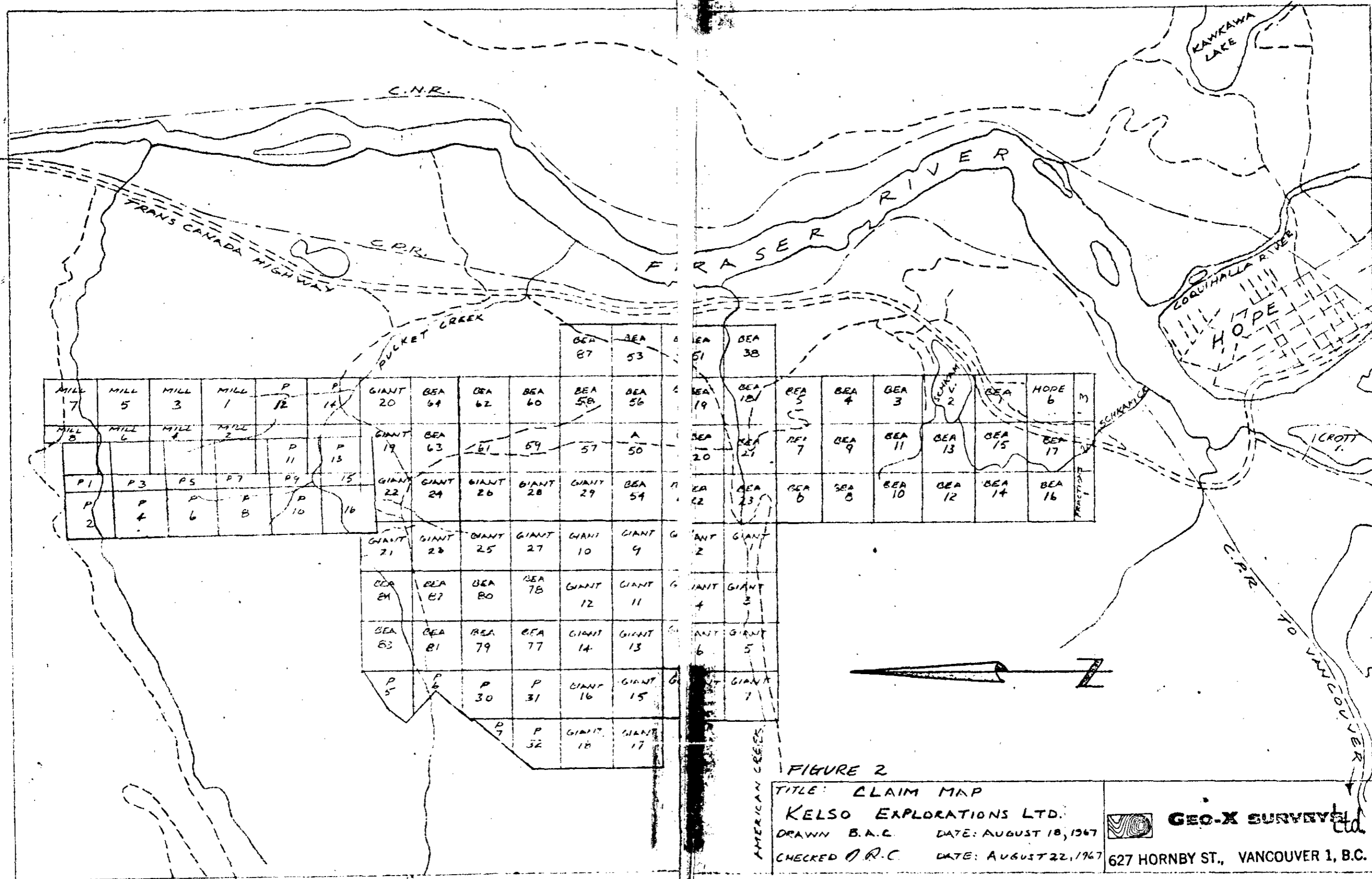



FIGURE 2

TITLE: CLAIM MAP
 KELSO EXPLORATIONS LTD.
 DRAWN B.A.C. DATE: AUGUST 18, 1967
 CHECKED O.R.C. DATE: AUGUST 22, 1967

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

The following table summarizes pertinent claim data:

<u>NAME</u>	<u>RECORD NO.</u>
Bea #1 to #4, incl	13160 to 13163, incl.
Bea #5 to #17, incl.	14243 to 14255, incl
Bea #18 to #23, incl.	14420 to 14425, incl
Bea #38	14569
Bea #50A	14570
Bea #51	14571
Bea #53	14572
Bea #54	14598
Bea #56 to #62, incl.	14573 to 14579, incl
Bea #63 and #64	14599 to 14600
Bea #77 to #84, incl.	14758 to 14765, incl.
Bea #87	14780
Giant #1 to #29, incl.	16087 to 16115, incl.
P #1 to #16, incl	16854 to 16869, incl.
P. 5, 6, 7 fractions	19050, 19060, 19064
P. 30, 31, 32 full sized	19061 to 19063 incl.
Mill #1 to #8, incl.	15861 to 15858, incl.

GEOMORPHOLOGY

The property is situated in the Pacific Ranges of the Coast Mountain Physiographic Division. It lies immediately north of the east corner of the Fraser Lowland, and is bounded on the east by the Skagit Ranges and the Fraser River - Lineament.

The Hope Area is characterized by high, often rugged peaks with deeply incised stream valleys and obvious glacial erosion. Mountains rise abruptly from the Fraser River Channel, to heights of just over 4000 feet on the property. Stream valleys are strongly influenced by the bedrock geology and regional structure. The west portion of the claim groups, underlain dominantly by the Coast Range Batholith, exhibits trellis-type drainage patterns.

On the central and eastern portions, drainage is regulated by north trending bands of basic intrusives, younger sediments and joints and fractures parallel to the Fraser Canyon.

A well developed east-west cross trend is superimposed in the regional north lineaments. Several creeks occupy east-west valleys, the largest of which is American Creek, which bisects the lower half of the property.

In general, the claim groups are well forested, often with heavy underbrush.

GENERAL GEOLOGY

The geology of the area is described in Geological Survey of Canada, Summary Report, Part A, 1924, by C.E. Cairnes, and in G.S.C., Memoir 190, 1936, by H.C. Horwood. The following summary is based on the above reports.

The Bea, P., Giant and Mill claim groups are underlain by the Coast Range multiphase batholith, consisting dominantly of diorite, granodiorite and granite. These rocks have been intruded by stocks and plugs of ultrabasics, along north preferred trends, parallel to the north-south Fraser lineament.

There are outcrops of metasediments, volcanics and schists that are enclosed in intrusive rocks and represent roof pendants and country rocks, and are possibly of paleozoic age. The above sequence is overlain by triassic sediments. The largest areal extent of sediments on the property is an Upper Triassic conglomerate which forms

several hills on the east portion of the Bea Group.

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. An event marker scribes each photo exposure occurrence on the chart recorder. The elevation above ground is maintained by use of a Pulsed Radar System Altimeter. Airphotos are assembled and a mosaic prepared showing the precise flight path. Each magnetic profile is processed, integrated with the juxaposed profiles, and a magnetic plan presented.

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

Frequency Response: DC to 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

Altimeter: Bonzer Category II VME Pulsed Radar Type Frequency 1600 MC; accuracy 5% at 500 feet.

FIELD PROCEDURE AND DATA PROCESSING

The rugged nature of the Hope Area presents special problems in aerial surveying. These were minimized in the first instance by using an experienced instrument operator and pilot, and in the second instance by accurate base maps and special equipment such as the Bonzar Pulse Radar Altimeter.

Flight lines were selected to transect the regional geomorphological trends, however several sections were not covered because of the precipitous nature of the country. The areas that were flown are believed to contain magnetic information indicative of bedrock magnetic susceptibility in preference to topographic effects.

Three flight directions were employed, a northeast direction in the south and northwest corners, a due west direction in the south central portion, and a north-south direction in the north portion of the property. A total of 45 lines were flown, average length approximately 1.5 miles. The flight line positions were determined by matching flight line aerial photography with an enlarged government air photo mosaic. Aerial photography resolution was excellent and as a result ground control is very good.

The instruments were installed in a chartered Bell GB - 5 helicopter, and the pilot maintained an elevation of approximately 600 feet by visual inspection of the radioaltimeter, and a speed of 60 m.p.h. The chart record scale was set at ± 1500 gammas.

The highest amplitude of the vertical component of the earth's magnetic field was encountered on flight line 36, value +1210 gammas. The lowest value recorded was on line 55, value -1020 gammas.

The Chart records (see Figure 6) were co-ordinated with flight line data (Figure 3) and three classes of magnetic trends were investigated. Class A (strong or high) is greater than 500 gamma amplitude, Class B (moderate) is less than 500 gammas, and greater than 300 gammas; Class C (weak) is less than 300 gamma amplitude. Anomalies are sub-classified as magnetic highs (positive) or lows (negative).

AIRBORNE RESULTS

The results of the airborne magnetometer survey are presented in profile as Figure 6, and in plan as Figure 5.

Figure 5 is a magnetic plan of Class A anomalies only. These anomalies are usually flanked by Class B and C, and many individual and isolated B and C class anomalies are not presented on Figure 5.

In general the area is magnetically complex, with many bands, and isolated patches of greater than 500 gamma amplitude.

Between line correlation on west, and northeast, flown lines was definitive, however correlation on the south directed lines is necessarily tentative due to the obliqueness of structure and trends.

The magnetic trends, in general, strike approximately

north north west, with several major trend deflection zones, noticeably in and around Schkam Lake, along Puckat Creek and at the west end of Area 2.

In Area 1, a large complex magnetic high is situated immediately southwest of Schkam Lake. A number of north-east striking +500 gamma bands merge on lines 4 and 6 to form anomaly 1 - A. Anomaly 1 - B is parallel to and east of 1 - A. Anomaly 1 - C is located northwest of Schkam Lake, on the west end of Lines 9 and 10 and strikes northwest. The zone actually consists of three parallel highs, becoming progressively weaker to the east.

A fourth complex magnetic high zone is designated anomaly 2 - A and is situated at the west end of area 2 near American Creek, and on claims Giant 5, 6, 7 and 8. Anomaly 2 - A actually consists of several parallel, north-west trend +500 gamma magnetic highs.

Anomaly 2 - B is north and east of 2 - A, on the north side of American Creek, in and about Mill Creek.

Area 3, contains several narrow magnetic highs and lows, in parallel and an echelon patterns, tentatively correlated as striking north-northwest.

Area 4 contains several wide bands of positive magnetic anomalies, most of which strike north.

SUMMARY AND CONCLUSIONS

On July 29, 31 and again on August 1, 1967, a total of 92.58 line miles of coincident airborne magnetometer and aerial photography was completed on the Bea,

Giant, Mill and P. claim groups, The property, owned by Kelso Explorations Ltd., is located just north of the town of Hope.

This area of British Columbia is characterized by moderately high mountain peaks and deeply incised valleys. Much of the property contains north trending linears, with a few well developed perpendicular cross trends.

Field flight line procedure was scheduled to transect the dominant north-south trend, however the north part of the property was, by topographic necessity, flown north-south, and therefore cross line correlation of the magnetic data is necessarily tentative.

Four flight line directions were utilized in an effort to maintain a constant elevation above surface, and these directions have been designated Area 1 to 4 inclusive.

Area 1, situated at the south end of the Bea Group, contains three large +500 gamma magnetic anomalies.

Area 2, in the centre of the property contains two large +500 gamma anomalies.

Area 3, the north end of the property, features narrow, parallel, and an echelon bands of positives and negatives.



Area 4, to the west of the P. Group, outlines several large +500 gamma magnetic highs.

In view of the proximity of the Bea, Giant, P and Mill Claim Groups, to the nickel mine operated by Giant Mascot, a "follow up" ground programme to investigate

magnetic anomalies 1 - A; 1 - B; 1 - C; 2 - A and 2 - B
is recommended.

Reconnaissance-type ground fluxgate magnetometer
traverses with coincident geochemical soil sampling (testing
for Ni and Cu) in magnetically high areas would be expedient.

Respectfully submitted,

D. R. Cochrane, P.Eng.

August 22, 1967.

APPENDIX A - I CERTIFICATES

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

D. M. Fritz, 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 II - DATES WORKED

The following personnel were employed on the Kelso project on the dates set out below.

<u>Name</u>	<u>Occupation</u>	<u>Dates</u>
D. M. Fritz	Data processing	July 27 to 31 incl. August 1 to 4 incl. August 9 to 18 incl.
R. Robillard	Instruments operator	July 29 to 31 incl. August 1 and 2
T. Hunt	Data processing	July 28 to 31 incl. August 9 and 10.
R. Pitre	Field supervisor	July 29, 30.
S. Sandner	Field supervisor	July 29, 30.
B. Cochrane	Data processing	August 22, 23.
D. R. Cochrane	Project supervisor, interpretation	August 10, 17, 18, 19, 21 and 22.

APPENDIX III - COST BREAKDOWN

As per agreement between Geo-X Surveys Ltd., and Kelso Explorations Ltd., dated the 28th of July, 1967:

GEO-X agrees to conduct an airborne magnetometer survey on the Bea group of mineral claims, Cost to include air photographs of flight paths, interpretation and report outlining anomalous areas.

KELSO agrees to pay Geo-X a total price of \$4,724.00 for said work.

The terms and conditions described in the agreement have now been fulfilled.



S. L. Sandner,
President,
Geo-X Surveys Ltd.

APPENDIX IV

FLIGHT DATA AND OPERATORS REPORT

Property: BEA-GIANT-MILL & P Group Job: 1009 Date: July 29 - Aug. 1/67

Operator: R. ROBILLARD Flight Elevation APPROX 600 FEET.

Direction flown: SEE BELOW Air speed: 60 MPH Chart Scale ± 1500'

Weather: CLEAR & WARM - LIGHT WIND

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gammas	Min. Z gammas
	X	Y	X	Y			
1					1.89	600	-500
2					1.05	790	-110
3					1.20	320	-540
4					1.36	560	-500
5					1.33	510	-730
6					1.41	760	-210
7					2.44	550	-280
8					1.65	500	-270
9					1.50	690	-270
10					1.57	930	-140
21					2.70	480	-790
22					3.01	430	-730
23					3.10	1240	-380
24					3.48	900	-760
25					2.93	910	-880
26					2.91	600	-910
27					2.97	810	-730
28					2.04	380	-850
29					1.92	580	-780
30					2.01	930	-450
31					2.00	1030	-410
32					2.07	590	-890

Total number of X, Y, Z points _____

Total number on line miles _____

Signed R. Robillard

APPENDIX IV

FLIGHT DATA AND OPERATORS REPORT

Property: BEA-GIANT-MILL P Group Job: 1009 Date: JULY 29-AUG 1/67

Operator: R. ROBILLARD Flight Elevation APPROX. 600 FEET

Direction flown: SEE BELOW Air speed: 60 MPH Chart Scale: ±1500 ft

Weather: CLEAR & WARM LIGHT WIND

LINE Number	P.O.B. (feet)		P.O.E. (feet)		Length Miles	Max. Z gammas	Min. Z gammas
	X	Y	X	Y			
33					2.10	580	-650
34					2.53	490	-460
35					2.00	770	-620
36					2.23	1210	-510
37					2.01	960	-780
38					2.04	710	-570
39					2.25	810	-710
40					1.21	1550	-480
41					1.09	320	-420
42					2.20	560	-600
43					2.23	550	-750
44					2.33	710	-630
45					2.31	690	-450
46					2.32	930	-680
47					2.25	790	-710
48					2.08	970	-600
49					1.91	600	-800
50					1.93	760	-920
51					1.92	510	-780
52					1.96	260	-740
53					1.85	580	-830
54					2.12	470	-1020
55					2.17	690	-1020

Total number of X, Y, Z points _____

Total number on line miles 92.58

Signed R. Robillard.

KELSO

EXPLORATIONS LTD

TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
BEA, GIANT, P. & MILL CLAIM GROUPS
SITUATED IN THE HOPE AREA, NEW WEST-
MINSTER M.D. ON BEHALF OF KELSO
EXPLORATIONS LTD., BY D.R. COCHRANE,
P. ENG., DATED AUGUST 18, 1967,
VANCOUVER, B.C.

FIGURE 4
AREA 1



TO ACCOMPANY GEOPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
BEA, GIANT, P. & MILL CLAIM GROUPS
SITUATED IN THE HOPE AREA, NEW WEST-
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VANCOUVER, B.C.

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FIGURE 4
AREA 2

TO ACCOMPANY GOEPHYSICAL REPORT ON
AIRBORNE MAGNETOMETER SURVEY ON THE
BEA, GIANT., P. & MILL CLAIM GROUPS
SITUATED IN THE HOPE AREA, NEW WEST-
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P. ENG., DATED AUGUST 18, 1967
VANCOUVER, B.C.



FIGURE 4
AREA 3

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TO ACCOMPANY GEOPHYSICAL REPORT ON
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BEA, GIANT, P. & MILL CLAIM GROUPS
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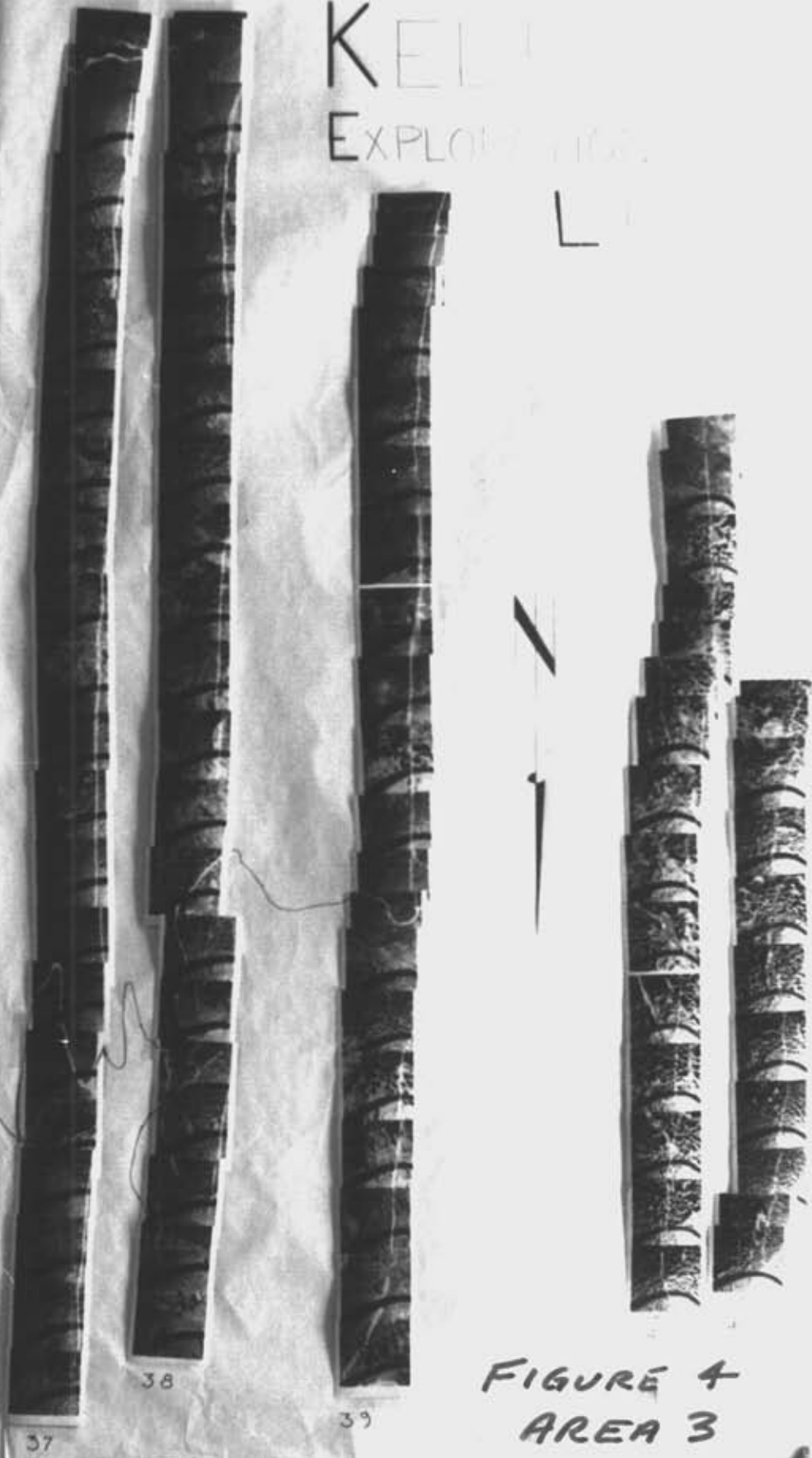


FIGURE 4
AREA 3

TO ACCOMPANY GEOPHYSICAL REPORT ON
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EXPLORATIONS LTD., BY D.R. COCHRANE,
P. ENG., DATED AUGUST 15, 1967.
VANCOUVER, B.C.

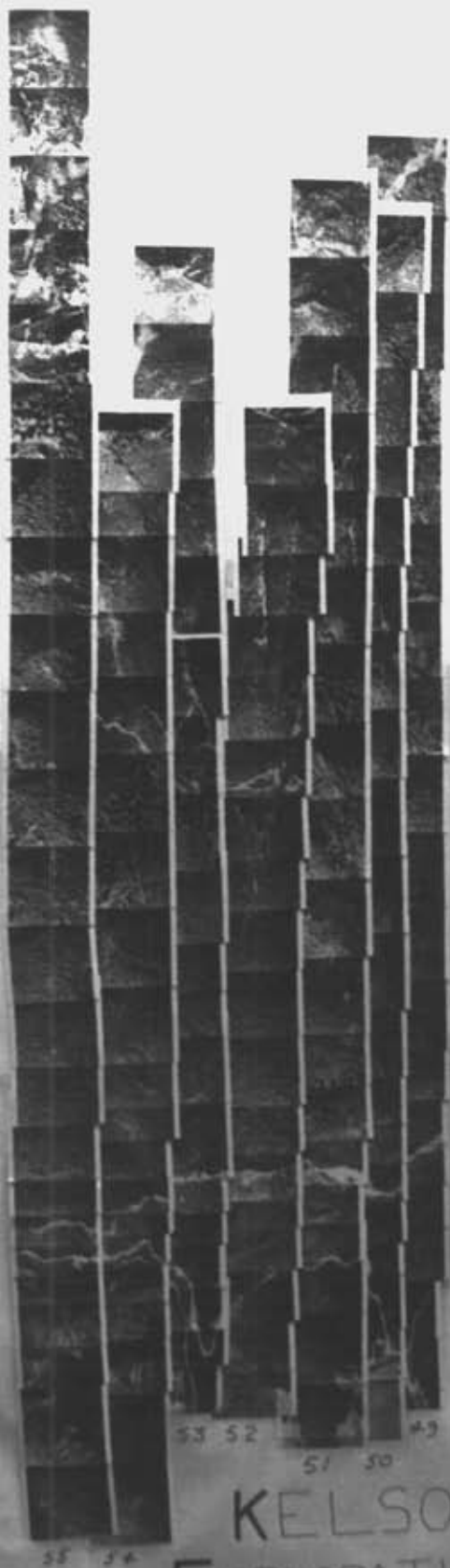
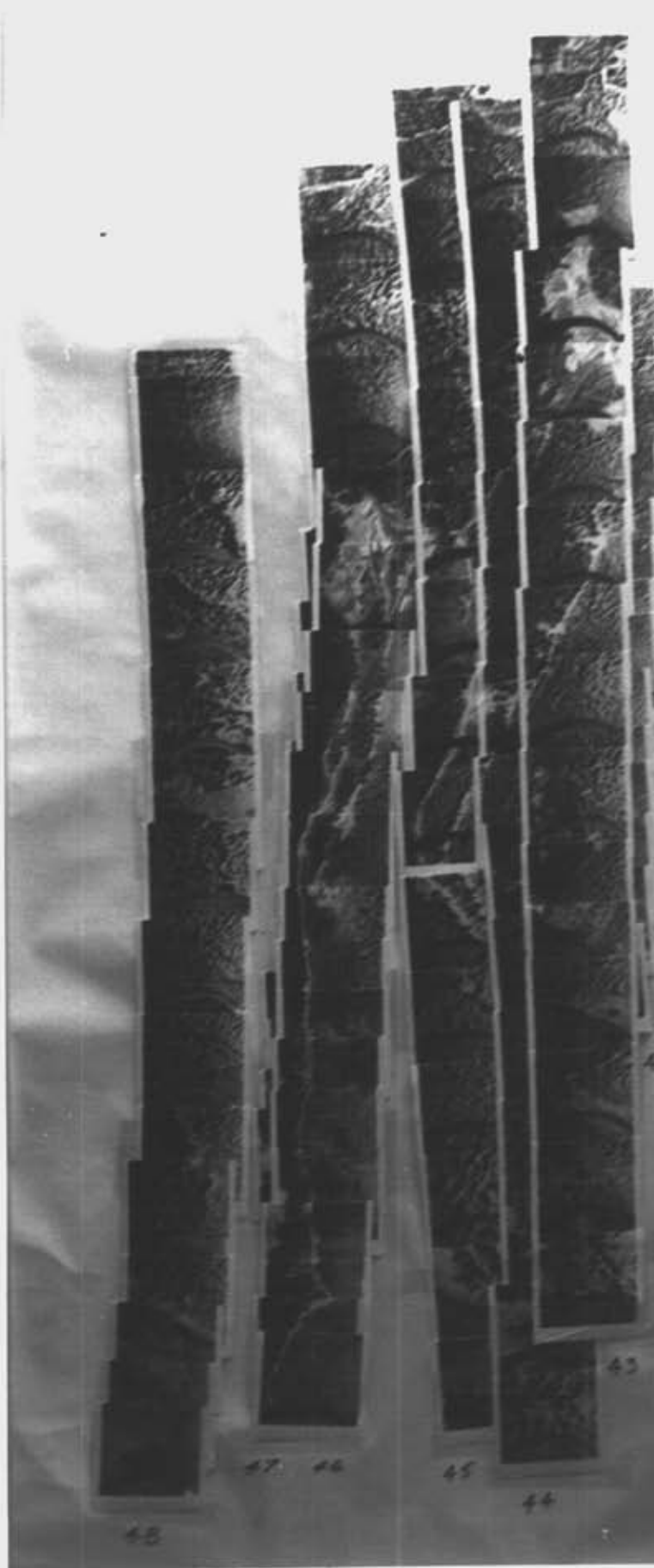


FIGURE 4
AREA 3

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TO ACCOMPANY GEOPHYSICAL REPORT ON
 AIRBORNE MAGNETOMETER SURVEY ON THE
 BEA, GIANT, P. & MILL CLAIM GROUPS
 SITUATED IN THE HOPE AREA, NEW WEST-
 MINSTER M.D. ON BEHALF OF KELSO
 EXPLORATIONS LTD., BY D.R. COCHRANE,
 P. ENG. DATED AUGUST 18, 1967,
 VANCOUVER. B.C.

FIGURE 4
 AREA 4