

84-#645-12512

REPORT ON THE  
AIRBORNE GEOPHYSICAL SURVEY  
ON THE  
CARIBOO PROPERTY  
QUESNEL FORKS AREA, B.C.

*Cariboo, Surething, bit  
Most Likely, Short Stuff.*

E & B EXPLORATIONS INC.

52° 43' N      121° 44' W

N.T.S. 93 A 12

CARIBOO MINING DIVISION  
**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**

**12,512**

J.T. WALKER

J.T. WALKER MINING GEOPHYSICS

JULY 19, 1984

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AIRBORNE GEOPHYSICAL SURVEY  
on the  
CARIBOO PROPERTY  
E & B EXPLORATIONS INC.

INTRODUCTION

During the period June 6 and 11, 1984 J.T. Walker Mining Geophysics carried out an airborne geophysical survey in the Quesnel Forks Area, B.C. The survey area lies 4 kilometers northwest of Quesnel Forks, B.C. The area flown is outlined on the Location Map, which depicts the N.T.S. sheet 93 A 12 at a scale of 1:250,000. This map is located on the right side of Drawing No. 1.

The group of claims lying within the survey area are known as the Cariboo Property. E & B Explorations Inc. is the recorded owner of the claims. A list of the claim names and record numbers follows:

<u>CLAIM NAME</u>	<u>RECORD NO.</u>	<u>CLAIM NAME</u>	<u>RECORD NO.</u>
Sure Thing 1	3690	UTM 1	3698
Sure Thing 2	3691	UTM 2	3699
Sure Thing 3	3692	UTM 3	3700
Sure Thing 4	3693	UTM 4	3701
Sure Thing 5	3694	UTM 5	3702
Sure Thing 6	3695	UTM 6	3703
Sure Thing 7	3696	UTM 7	3704
Sure Thing 8	3697	UTM 8	3705
Most Likely 3	3706	Cariboo 1	3708
Most Likely 4	3707	Cariboo 2	3709
Short Stuff 2	3712	Cariboo 3	3710
Short Stuff 3	3713	Cariboo 4	3711

The purpose of the survey was to provide data for compiling a low level aeromagnetic contour map and to locate zones of conductivity at the VLF frequencies (21.4 kHz. - 24.8 kHz.).

Three measurements were recorded during the survey:

- (1) Total magnetic field intensity.
- (2) Relative Field Strength of the horizontal component of the VLF electromagnetic field, utilizing two transmitters simultaneously, located near:
  - (a) Seattle, Washington (24.8 kHz)
  - (b) Annapolis, Maryland (21.4 kHz)

A Bell 206 B helicopter, chartered from Highland Helicopters, Williams Lake, B.C. was used to fly the survey. Forty-three survey lines were flown in a north-south direction. A total of 370 line kilometers were flown covering an area of approximately 9,000 hectares. A line spacing of 250 meters was maintained throughout the survey. Terrain clearance was 60 meters. An air speed of 100 kilometers per hour was maintained where possible.

#### SURVEY PERSONNEL

Pilot: R. Huff (Highland Helicopters)

Navigator: R. Simpson (E & B Explorations Inc)

Operator: T. Walker (J.T. Walker Mining Geophysics)

Data reduction, compilation, drafting and interpretation: J.T. Walker

## SURVEY PROCEDURE AND NAVIGATION

A flight line base map of the survey area was prepared by enlarging a 1:50,000 N.T.S. topographic map to a scale of 1:20,000. Proposed flight lines and topographically located control points were plotted and numbered prior to flying the survey. During the survey, flight line path deviations were noted and corrected on the flight line base map. Flight line and control point information was announced by the navigator and recorded on magnetic tape. This information was also noted by the operator directly on the magnetic and VLF-EM analog charts during the course of the survey to provide correlation between the flight line control points and the recorded data.

## INSTRUMENTATION

The following instruments are installed in the helicopter for measuring and recording the geophysical data:

(a) Proton Magnetometer (ELSEC - Type 595)

The magnetometer was manufactured by the Littlemore Scientific Engineering Co., Oxford, U.K. The magnetometer measures the total magnetic field at a one second cycle rate. The measurement is displayed digitally to one gamma and has an analog output of 100, 1000, or 10,000 gammas full scale. The 1000 gamma full scale output was used for the survey. The Toroidal wound detector was installed in a fibreglass "bird", towed beneath the helicopter on a 12 meter cable.

(b) Electromagnetic Receiver (VLF-EM)

The two frequency VLF-EM receiver was manufactured by Sabre Electronic Instruments Ltd., Burnaby, B.C. Two omni-directional antenna arrays, (mounted in the fibreglass "bird", which also carries the magnetometer detector) are used. The antenna arrays are designed to detect the total horizontal magnetic component of the VLF fields.

VLF signals originating from U.S. Navy transmitters near Seattle, Washington (24.8 kHz), and Annapolis, Maryland (21.4 kHz) were utilized for this survey. Two signals are measured simultaneously. The amplitudes of the horizontal component of the fields are measured continuously and displayed as relative field strengths. Two analog outputs are provided for recording.

(c) Recording System

Two chart recorders and a magnetic tape Frequency Modulated system are employed simultaneously during the survey.

(1) A one-pen chart recorder, (Hewlett Packard - Model 7155 B) is used to record the aeromagnetic data in profile. The recorder is calibrated to provide a full scale deflection of 1000 gammas.

(2) A two-pen chart recorder (Soltec - Model VP6723S) is used to record the VLF-EM field strength data from two transmitters.

(3) The tape recording system utilizes a stereo cassette recorder (Marantz Superscope -Model 330) and a frequency modulator (Sabre Electronic Instruments Ltd.). All in-flight conversation between navigator, pilot and operator was recorded on the right stereo channel. The VLF-EM data, in addition to being recorded on strip charts, is recorded, after frequency modulation, on the left stereo channel. The tape recorded voice and VLF-EM data is used as a back-up system only. The playback system utilizes the Marantz stereo tape recorder and speaker for voice information. A frequency demodulator provides analog outputs of the two VLF-EM signals which may be recorded on the two-pen Soltec recorder or digitized for computer application.

(d) Radar Altimeter

A radar altimeter (Mark 10 - Bonzer Inc.) was installed to measure and display the helicopter terrain clearance during the survey. The visual meter display assists the pilot in maintaining a constant aircraft-ground clearance.

DATA REDUCTION AND PRESENTATION

All survey data is presented on one plan map at a scale of 1:20,000. Corrected flight lines and control points are plotted and numbered. Flight line direction is indicated by an arrow at the beginning of each line.

(a) Aeromagnetic Data (Drawing No. 1)

The aeromagnetic data is presented as an aeromagnetic Contour Map (Drawing No. 1). The contour values are referenced to a base of 57,000 gammas total magnetic field. The results were not corrected for diurnal variation. The magnetic data was transferred manually from the strip charts to the flight lines using a standard graphic method, whereby magnetic contour interval points are transcribed to the plan map on the appropriate flight line. Contour lines were drawn through points of equal magnetic intensity. Contour intervals of 500 gammas, 100 gammas and 50 gammas were used.

(b) Electromagnetic Data (VLF-EM) Drawing No. 1)

The VLF-EM data is recorded as a continuous profile of the relative field strength. A significant anomaly is a definitive increase in the relative field strength. The VLF-EM anomalies are shown on Drawing No. 1 by an anomaly symbol and bar along the flight lines. The length of the bar corresponds to the anomalous profile width at the half height. The number enclosed within the anomaly symbol represents the percent increase of the field strength at the maximum profile height. The anomalous locations are transcribed to the flight lines using the graphic method described under Aeromagnetic Data. Anomalous responses

from the Transmitter near Seattle are plotted with the anomaly symbol left of the flight line. Responses from the Transmitter near Annapolis are plotted right of the flight line. The location of the flight lines is shown by the screened topographic contour map printed as an underlay on the drawing. Also, a location map, with the survey area outlined, is located at the right side of the drawing. The Location Map covers the 93 A 12 map area at a scale of 1:250,000.

### DISCUSSION OF RESULTS

The results of the airborne magnetometer survey are plotted as an Aeromagnetic Contour Map, using a 50 gamma contour interval. The 100 gamma and 500 gamma contours are accentuated by heavier lines. The values of the contours are referenced above 57,000 gammas, total magnetic field.

Magnetic relief is limited to less than 300 gammas over most of the survey area, with a regional variation increasing to the north-east.

A pronounced magnetically low trough, striking south-east separates the area of low magnetic relief to the north-east and an area of high relief to the south-west. The high value of the magnetics suggests the area to be underlain by basic volcanics. The 3000 gamma high in the south-west corner of the survey area defines the diorite intrusive to the south of Dome Mines Q.R. deposit.

The results of the airborne VLF-EM survey are plotted using anomaly symbols. Fourteen anomalies are plotted. The percent increase of the Relative Field Strength is shown within the anomaly symbol. The anomalies are tabulated in Appendix A which also shows R.F.S. intensity and the transmitter producing the anomaly. The anomaly number defines the location by referring first to the flight line number - second, control point number. The number following the decimal indicates the distance in tenths, between consecutive control points. Numbering is in the direction of flight.



The VLF-EM responses over the survey area are weak. Five anomalies have R.F.S. increase over 10% and of these, anomaly 33 - 2.8 (10/14%) coincides with a flight line directional correction and may be a turbulence induced response.

The VLF-EM anomalies 31 - 2.4 (16%) and 32 - 3.5 (12%) provide the strongest responses of the survey, suggesting a conductor paralleling the magnetic gradient just south of the magnetic trough along Maud Creek.

#### CONCLUSIONS AND RECOMMENDATIONS

The Airborne Geophysical survey has provided data for the compilation of a low level Aermagnetic Contour Map. The VLF-EM Relative Field Strength data has indicated fourteen weak anomalous responses.


In areas of sparse outcrop the magnetic features provided by the survey should assist in the development of a detail geological map over the survey area.

Although the VLF-EM responses are weak, anomalies 31 - 2.4 and 33 - 3.5 should be investigated on the ground.

The small magnetic highs (1500 gammas) on flight line 4 and flight line 13 warrant investigation.

Since the VLF-EM anomalies are weak, they should be located using VLF-EM methods on the ground before other geophysical techniques are applied.

July 19, 1984

  
J.T. Walker  
J.T. WALKER MINING GEOPHYSICS

APPENDIX A

LIST OF AIRBORNE VLF-EM ANOMALIES

Anomaly No.	% Increase of R.F.S.	Transmitter S - Seattle A - Annapolis
3 - 4.8	6/10	S/A
3 - 5.1	10	A
4 - 1.4	6	A
4 - 3a.7	5	A
4 - 4.2	10	A
6 - 0a.4	12	A
7 - 4.3	10	A
23 - 1.2	12	A
25 - 0.2	6/8	S/A
27 - 1.3	8	A
31 - 2.4	16	A
32 - 3.5	12	A
33 - 2.8	10/14	S/A
34 - 4.8	8/10	S/A

STATEMENT OF EXPENDITURES

AIRBORNE GEOPHYSICAL SURVEY

ON THE

CARIBOO PROPERTY

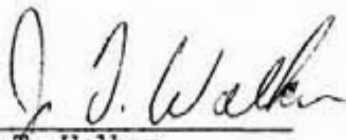
FIELD WORK: June 6 - 11, 1984

LINE KILOMETERS SURVEYED - 370

LINE KILOMETER CHARGE - \$24.00  
(Exclusive of Helicopter Charges)

TOTAL LINE CHARGE - 370 km X \$24.00 = \$ 8,880.00

JULY 19, 1984

  
J.T. Walker  
J.T. WALKER MINING GEOPHYSICS

STATEMENT OF EXPENDITURES

Airborne Geophysical Survey on the Cariboo Property

(Work period - June 6 to June 22, 1984)

GEOPHYSICAL CONSULTANT

- Airborne geophysical survey carried out during the period June 6-11, 1984 by J.T. Walker Mining Geophysics		
- Line kilometres surveyed	370	
- Line kilometre charge (exclusive of helicopter)	\$24.00/km	
- Total line charge	\$8880.00	\$8880.00

AIRCRAFT CHARTER

- Charter of Bell 206-B from Highland Helicopters Ltd.		
6.35 hours @ \$415.00	\$2635.25	
Fuel	467.64	
Air crew expenses	52.06	
	<u>3154.95</u>	\$3154.95

PERSONNEL

R.G. Simpson - Project Geologist 5 days @ \$220.00/day	\$1100.00	\$1100.00
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ACCOMMODATION AND MEALS

R.G. Simpson 5 days @ \$60.00/day	\$ 300.00	\$ 300.00
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FIELD SUPPLIES

Miscellaneous field equipment	\$ 100.00	\$ 100.00
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. . . /2

TRANSPORTATION

Rental of 4WD pickup  
from Rentway Leasing

5 days @ \$33.33/day

\$ 166.65      \$ 166.65

COMMUNICATIONS

\$ 25.00      \$ 25.00

DRAFTING AND REPORT PREPARATION

\$ 200.00      \$ 200.00

TOTAL PROJECT EXPENDITURES

\$13926.60

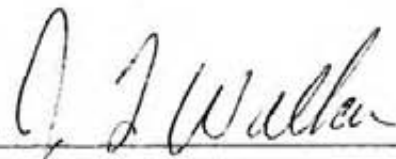
TOTAL COST PER LINE KILOMETRE

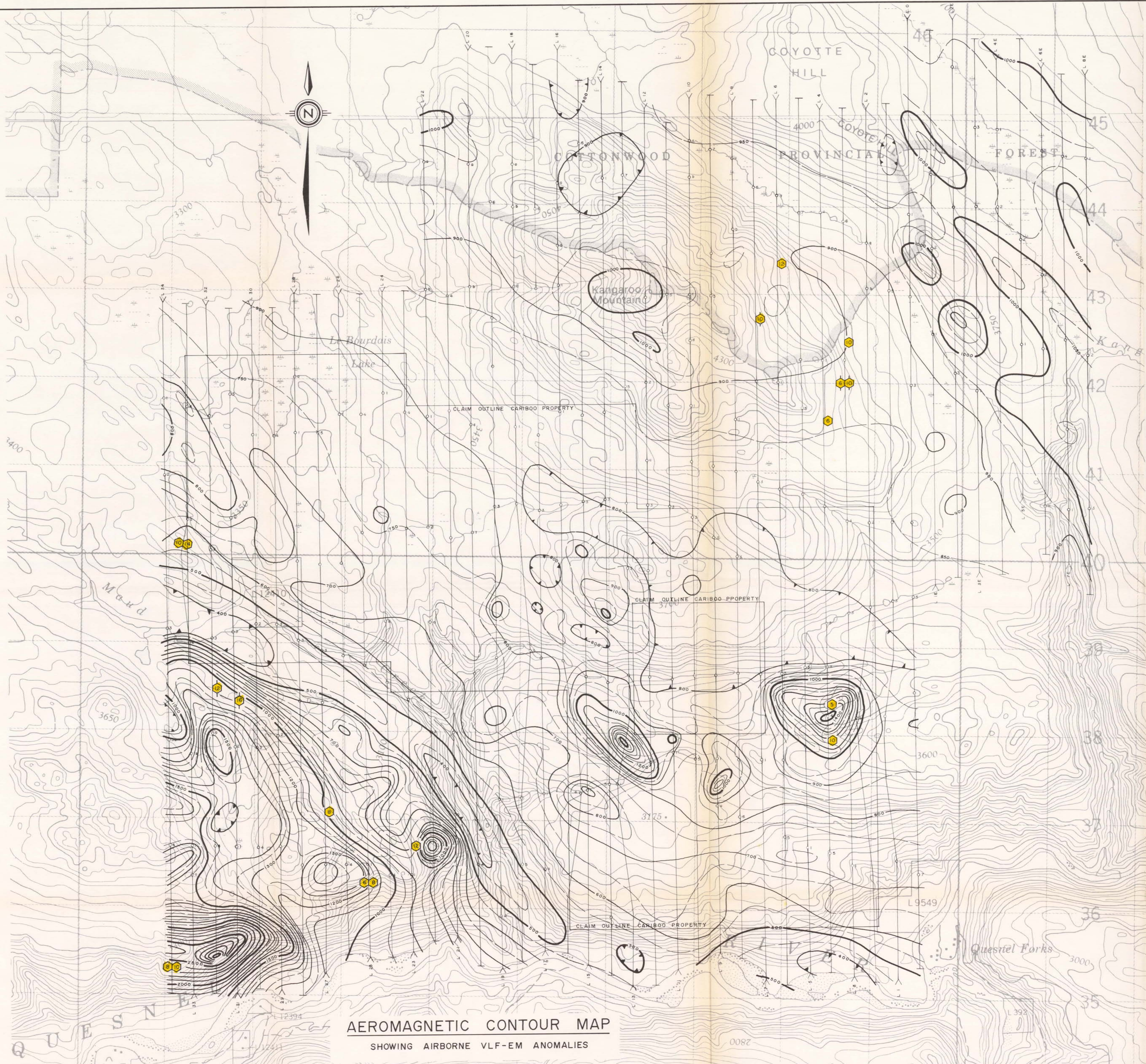
\$ 37.64

STATEMENT OF QUALIFICATIONS

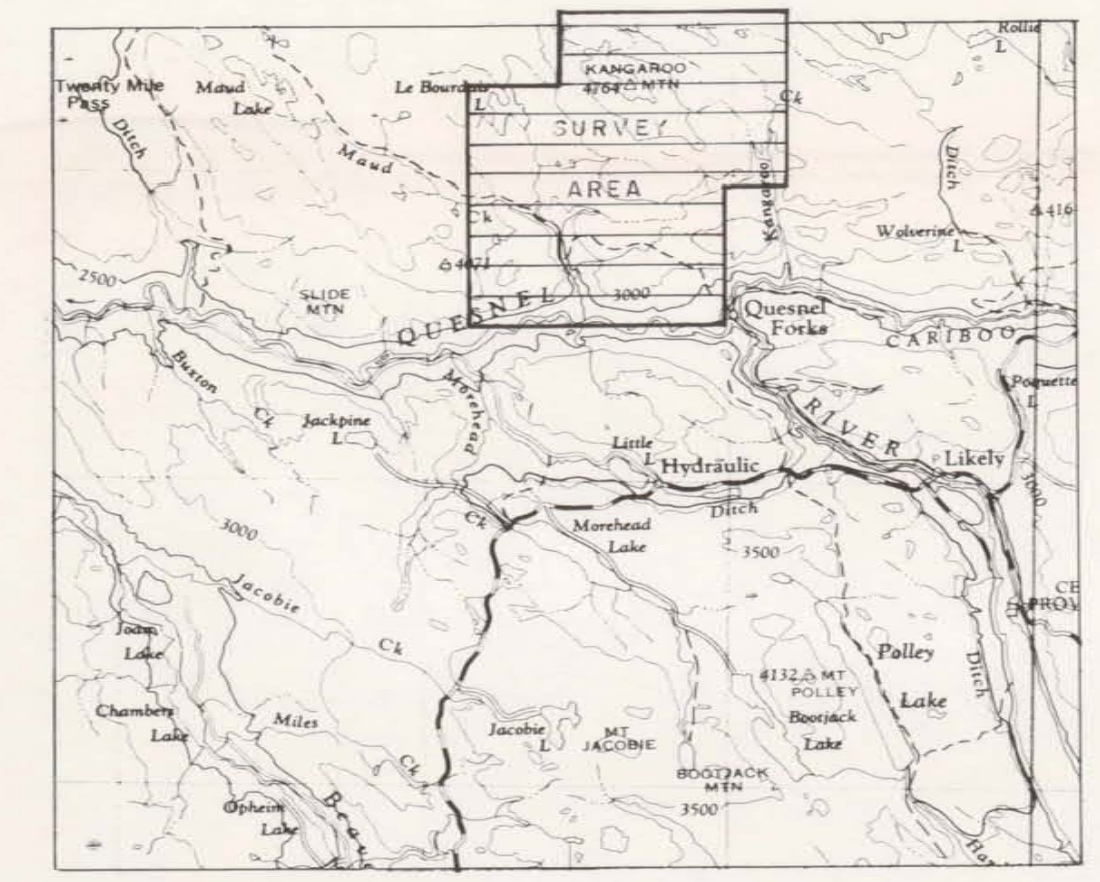
I, James T. Walker of the Municipality of Richmond,  
Province of British Columbia do certify that:

1. I have been engaged in Mining Geophysics since  
June, 1965.
2. I have been engaged in Airborne Geophysical surveying  
since April, 1973.
3. I am a member of the Canadian Institute of Mining and  
Metallurgy.
4. I am a member of the British Columbia Geophysical Society.
5. I am a member of the Society of Exploration Geophysicists.

  
\_\_\_\_\_  
J.T. Walker  
J.T. WALKER MINING GEOPHYSICS



**AEROMAGNETIC CONTOUR MAP**  
SHOWING AIRBORNE VLF-EM ANOMALIES



93 A 12 **LOCATION MAP** 1:250,000

**LEGEND**

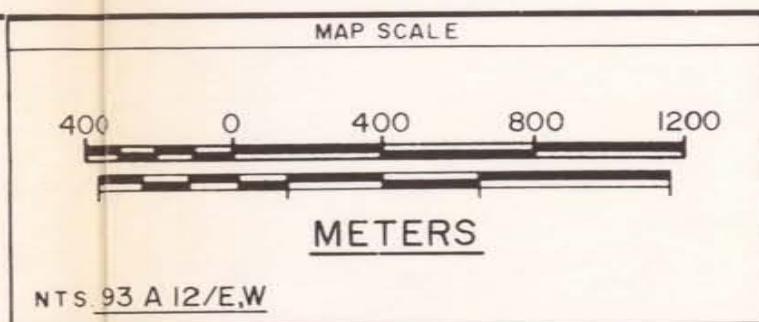
- L 12 — Flight line number and direction, numbered control point.
- Magnetic measurement — Total Field.
- Reference Level — 57,000 gammas
- Contour Interval
  - 500 gammas
  - 100 gammas
  - 50 gammas
- VLF-EM Measurement — Relative Field Strength (horizontal component)
- VLF-EM Transmitters — Seattle, Washington. (24.8 kHz.)  
Annapolis, Maryland. (21.4 kHz.)
- ⊙ — VLF-EM Anomaly showing % increase in R.F.S.  
— bar indicates anomaly length along flight line.
- Helicopter-terrain clearance — 60 meters.
- Flight line spacing — 250 meters.

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**12,512**

To accompany Airborne Geophysical Report  
by J. Walker (J.T. Walker Mining Geophysics)  
on the CARIBOO PROPERTY and adjacent area,  
Cariboo Mining Division  
dated July 19, 1984.

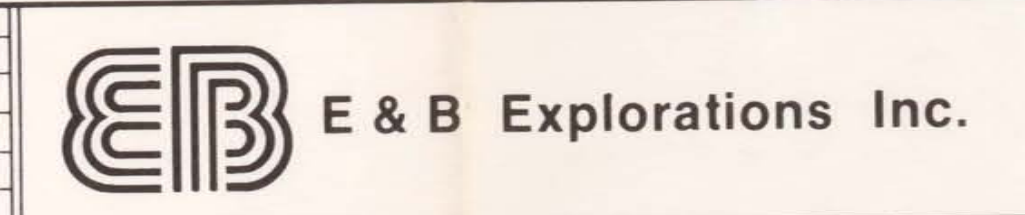
*J. Walker*



NTS 93 A 12/E/W

No.	Date	MADE BY	DESCRIPTION
1			
2			
3			
4			
5			

DATE	DRAWN BY	CHECKED	APPROVED
July 9/84	J.T. Walker		



**CARIBOO PROPERTY**  
AIRBORNE GEOPHYSICAL SURVEY  
J.T. WALKER MINING GEOPHYSICS

MAP INDEX NUMBER	SCALE	DRAWING NUMBER
	1:20,000	1