

GEOPHYSICAL/GEOCHEMICAL REPORT

ON

MAGNETIC, VLF-EM & SOIL GEOCHEMISTRY SURVEYS

OVER THE

LUCKY TODD CLAIM GROUP

VUICH CREEK AREA

SIMILKAMEEN M.D., B.C.

LUCKY TODD CLAIM GROUP : 35 km due east of Princeton, B.C.
 at confluence of Vuich and
 Railroad Creeks

: 49° 121° NW

: N.T.S. 92H/6E and 7W

WRITTEN FOR : ROYALON PETROLEUM CORP.
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 V6C 2T7

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DATED : May 28, 1981



GEOTRONICS SURVEYS LTD.
 Engineering & Mining Geophysicists
 VANCOUVER, CANADA



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SUMMARY

In October and November, 1980, magnetic, VLF-EM and soil geochemistry surveys were carried out over part of the Luck Todd Claim Group, owned by Royalon Petroleum Corp. of Vancouver, B.C. The eight claims in the group are located at the confluence of Vuich and Railroad Creeks, about 35 km east of Princeton, B.C.; good secondary roads provide access to the property.

The geology comprises Cretaceous grits and shales, within an embayment of granodiorite intrusives. A 1937 Mines Department report records the driving of over 600 feet of adits, presumably looking for mineralization in altered sediments (greenstones) near the granodiorite contacts. Some intermittent zones of copper sulphides (chalcopyrite, bornite, tetrahedrite) were located, with some silver and traces of gold.

A grid system was laid out over the property, comprising lines 100 m apart. Magnetic and VLF-EM readings were taken over the southern half of this grid (at 25 m intervals), and soil samples collected from the whole of the grid. These samples were later analyzed for copper and silver. Magnetic readings were diurnally corrected, plotted and contoured; VLF-EM readings were Fraser-filtered, plotted and contoured; the copper and silver values were plotted and contoured.

CONCLUSIONS

1. Magnetic anomalies were generally small scale. The positive anomalies' (magnetic highs) tended to fall in a different region to the negative ones. This may reflect a change in underlying lithology. There was no actual co-incidence of geochemical anomalies with magnetic ones, although the

more interesting copper and silver values tended to fall in the area of magnetic lows.

2. A pronounced VLF-EM anomaly probably reflects underlying structure, eg. a shear or fault zone.

3. There was some correlation of high copper and high silver values. An elongated zone of high copper values, parallel to the strike of the large VLF-EM anomaly, is the most significant geochemical anomaly. High copper concentrations were recorded close to Vuich Creek.

RECOMMENDATIONS

1. The magnetic and VLF-EM grid should be completed over the northern half of the property.

2. If possible, the geochemical grid should be extended east, towards, and perhaps over, Vuich Creek, to try to follow the distribution of high copper values recorded at the ends of some of the existing lines.

3. A detailed program of geological mapping should be undertaken.

GEOPHYSICAL/GEOCHEMICAL REPORT

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VUICH CREEK AREA

SIMILKAMEEN M.D., B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the instrumentation, theory, field procedures and results of magnetic, VLF-EM and Cu and Ag soil geochemistry surveys carried out over part of the Lucky Todd Claim Group, Similkameen M.D., B.C.

The survey work was completed during the period October 18th to November 7th, 1980, under the direction of David G. Mark, geophysicist, and the field supervision of Roland Wood and two assistants.

A grid system, with lines 100 m apart, was set up over the easily accessible parts of the property. About 4 line kilometers of magnetic and VLF-EM readings were then carried out over the southern half of the grid. A total of 424 soil samples were taken over the whole of the grid system; these were subsequently analyzed for copper and silver.

The purpose of the geophysics was to assist in mapping geological structure and lithology on the property, and the aim of geochemistry was to locate any likely areas of sulphide mineralization.

PROPERTY AND OWNERSHIP

The Lucky Todd Group comprises eight contiguous claims, as shown on Figure 2, and described below. They were staked under the old center claim line method.

<u>CLAIM NAME</u>	<u>RECORD NO.</u>	<u>EXPIRY DATE</u>
ALB 1 - 8	897 - 904	December, 1986

(The expiry date is dependent on the work described in this report being accepted for assessments credits).

The property is owned by Royalon Petroleum Corp. of Vancouver, British Columbia.

LOCATION AND ACCESS

The Lucky Todd Group is located 35 km due east of Princeton at the confluence of Vuich and Railroad Creeks, and 1 km SW of the junction of Vuich Creek with Tulameen River.

The geographical coordinates are $49^{\circ} 27'$ N latitude and $121^{\circ} 00'$ W longitude.

A good secondary road along Tulameen River and Vuich Creek provides access to the property. Poor secondary roads also exist to old working on the claims.

PHYSIOGRAPHY

The property lies in the Bedded Range of the Cascade Mountains which form part of the Coast Mountain Area of the Canadian Cordillera.

The terrain is moderate to steep, rising from the valleys of Vuich and Railroad Creeks. Elevations over the site range from 1050 to 1450 m.

HISTORY OF PREVIOUS WORK

Some mining was undertaken on the property prior to 1937, however we do not know of any recent activity.

GEOLOGY AND MINERALIZATION

The following is quoted from L. Sookochoff's geological report on the property:

"The property is situated to the west of the western periphery of the Nicola Belt of rocks containing numerous mineral showings and including the productive Craigmont and Similkameen deposits.

"A northerly trending zone of Coast Intrusives occurs adjacent to the western border of the Nicola Group for approximately six km to the area of the ALB claim group.

"The ALB claims are underlain by the Cretaceous Pasayten Group of mainly grits and shales which are within an embayment of granodiorite intrusives.

"The granodiorite in the vicinity of the showings is locally porphyritic with variable propylitic alteration. The showings

occur within a greenstone which may be locally heavily silicified."

GEOPHYSICAL SURVEY

INSTRUMENTATION AND THEORY

a) Magnetometer

The magnetic survey was carried out with a Model EM 220 proton precession magnetometer, manufactured by Urtec Limited of Markham, Ontario. This instrument reads out the total earth's magnetic field in gammas, on a LCD display. It has an operating temperature range of -35° to $+60^{\circ}$ C and a gradient tolerance of up to 5,000 gammas/meter.

Only two commonly occurring minerals are strongly magnetic, magnetite and pyrrhotite; magnetic surveys are therefore used to detect the presence of these minerals in varying concentrations. Magnetic data are also useful as a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

b) VLF-EM

A Sabre Electronics, Model 27 receiver was used to take readings of the magnetic component of the very low frequency (18.6 KHz) electromagnetic field transmitted by the U.S. Navy submarine transmitter located near Seattle, Washington.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by passing a strong alternating current usually through a coil of wire. If a con-

ductive mass such as a sulphide body is within this magnetic field, a secondary alternating electric current is induced within it which in turn induces a secondary magnetic field that distorts the primary field. It is this distortion that is measured by the VLF-EM receiver.

Most EM instruments employ frequencies ranging from a few hundred to a few thousand Hertz. The VLF-EM method uses a frequency range from 16 to 24 KHz and is therefore more sensitive to bodies of lower conductivity. VLF-EM anomalies are therefore often caused by one or more of the following: electrolyte-filled fault or shear zones, clay beds, porous horizons, carbonaceous sediments (eg graphitic), low conductivity sulphide bodies and lithological contacts. The precise cause of an anomaly is consequently difficult to determine and VLF-EM surveys preferably should not be interpreted without a good geological knowledge of the property and/or the assistance of other geophysical and geochemical surveys.

SURVEY PROCEDURE

a) Magnetism

Readings were taken every 25 m on east-west oriented lines 100 m apart. The magnetic diurnal change was monitored in the field by the closed loop method and double checked by a series of base stations.

b) VLF-EM

Readings of the dip angle of the field were taken on the same grid as that used for the magnetic survey.

COMPILATION OF DATA

a) Magnetics

The magnetic readings are shown on Sheet 1 at a scale of 1:2,500.

The values were grouped into arithmetic intervals of 100 gammas. The cumulative frequency for each interval was then calculated and plotted against the corresponding interval to obtain the arithmetic cumulative frequency graph, shown in Figure 3. The statistical parameters taken from the graph are as follows:

Anomalous low threshold	(97½% level)	56,700 gammas
Sub-anomalous low threshold	(84% level)	56,980 gammas
Mean background	(50% level)	57,250 gammas
Sub-anomalous high threshold	(16% level)	57,540 gammas
Anomalous high threshold	(2½% level)	57,800 gammas

The sub-anomalous and anomalous levels are 1 and 2 standard deviations away from the mean background level, respectively. From this analysis, the contour interval was chosen to be 100 gammas (approximately ½ standard deviation) and solid contours drawn in for values above 57,500 gammas, and dashed contours drawn for values below 57,000 gammas.

b) VLF-EM

The dip angle readings were reduced by applying the Fraser-filter; this is essentially a 4-point difference operator which transforms zero crossing into peaks, and a low pass smoothing operator which reduces the inherent high frequency noise in the data, enabling it to be contoured. Using this filter it is often found that a conductor that does not show

up as a cross-over on the unfiltered data, will be apparent from the filtered results.

After filtering, the readings were plotted between the reading stations, at a scale of 1:2,500 (Sheet 2). The positive values above 4° were then contoured at a 4° interval.

RESULTS

a) Magnetics

Readings varied from 56,698 to 57,690 gammas, giving a range of about 1,000 gammas over the site. Considerable high frequency noise is apparent in the readings, with high or low values occurring in isolation from their neighbours. It is possible that a magnetic storm took place during the survey and it's therefore recommended that some of the readings be checked during the next phase of the work.

The magnetic highs and magnetic lows tend to fall in different areas of the property - the highs are found mainly along lines 50S and 60S (anomalies A, B, C and D), and the lows along lines 60S, 70S and 80S (anomalies E, F, G and H). This zoning may reflect different underlying country rock. The anomalies tend to be small and intense; the most significant is anomaly G, which measures approximately 200 m by 200 m.

b) VLF-EM

There are three anomalies (J, K and L) all trending approximately NE-SW. This is the optimum orientation to be recorded by the Seattle transmitter, which lies southwest of the property. It should be noted that any conductors striking at a large angle to the transmission direction may not be recorded, unless highly conductive.

The most significant anomaly (K), is a long, narrow (600 m by 100 m) feature which can be traced across lines 50S and 100S. Its linearity suggests a structural cause, such as a conductive shear or fault zone.

GEOCHEMICAL SURVEY

SURVEY PROCEDURE

The soil samples were taken at the 25-meter stations used for the magnetic and VLF-EM surveys, plus a northerly extension of the same grid. The samples were picked up with a D-handled shovel at about a 15-centimeter depth. The horizon sampled was B except where it could not be obtained, then horizon C was sampled. Samples were placed in brown wet-strength paper bags marked with grid co-ordinates.

LABORATORY TESTING PROCEDURE

All samples were tested by Acme Analytical Laboratories Ltd. of Burnaby, B.C. The sample is first thoroughly dried and then sifted through a -80 mesh screen. A measured amount of the sifted material is then put into a test tube with subsequent measured additions of aqua regia. This mixture is next heated for a certain length of time. The parts per million (ppm) copper or silver is then measured by atomic absorption.

TREATMENT OF DATA

COPPER The values, in ppm, were grouped into a logarithmic interval of 0.1 and the cumulative frequency for each interval calculated and plotted to form the logarithmic cumulative frequency graph (Figure 4). From this graph the mean threshold value was seen to be 16 ppm, the sub-anomalous

threshold value 31 ppm, and the anomalous threshold value 60 ppm. The mean threshold value is the 50% level, the sub-anomalous threshold value is the 16% level (one standard deviation), and the anomalous threshold is the 2½% level (two standard deviations). The sub-anomalous threshold is a term used to denote the minimum value that although not considered anomalous, may still be important as an indicator of mineralization. Contours were drawn for values above 60 ppm, at intervals of approximately one-half standard deviation.

SILVER Most of the silver values were 0.1 ppm, with only a few higher readings. A statistical analysis was therefore impractical and the sub-anomalous and anomalous values were determined by "eyeballing", at levels of 0.4 and 0.7 ppm respectively.

RESULTS

a) Copper

In the south of the property there are several irregularly-shaped sub-anomalous areas (eg anomalies a and b). Elsewhere there are some isolated very high values, especially along the eastern boundary near the stream. The most pronounced anomaly is in the north of the property, running across lines 10S to 20N (anomaly c). Its dimensions are approximately 400 m by 50 m.

b) Silver

Only isolated, sub-anomalous values were recorded over the claims, except for the southwest boundary, where some higher values occur (anomalies d, e and f).

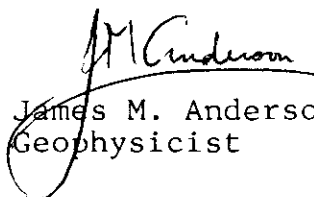
DISCUSSION OF RESULTS

There is no obvious correspondence between the magnetic and VLF-EM anomalies, nor between either of the geophysical surveys and the geochemistry.

Some correlation is evident between Cu and Ag anomalies - Cu anomaly "a" is centered at the same location as Ag anomaly "e", although the strike is different, and there are sub-anomalous Ag values along Cu anomaly "c". This latter anomaly is parallel to the major VLF-EM anomaly "K", and therefore is probably structurally controlled. There were no high Ag values evident close to Vuich Creek, where the high Cu concentrations were recorded.

A fuller appraisal of the relative significance of the various anomalies will, of course, be possible when the magnetic and VLF-EM grid is completed.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.


James M. Anderson,
Geophysicist

May 28, 1981

SELECTED BIBLIOGRAPHY

Ministry of Mines Report, 1937

Monger, J.W.H., Hope Map Area, West Half, B.C., Geological Survey of Canada, Paper 69-47, 1970

Rice, H.M.A., Geology and Mineral Deposits of the Princeton Map Area, British Columbia, Geological Survey of Canada, Memoir 243, 1960

Sookochoff, L., Geological Report on the Lucky Todd Property, Similkameen M.D., B.C., 1980

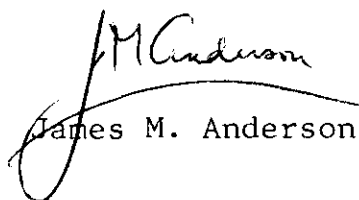
GEOPHYSICIST'S CERTIFICATE

I, JAMES M. ANDERSON, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify:

1. That I am a graduate of the University of Tasmania (1971), and hold a B.Sc. degree in Geophysics.
2. That I have been practising my profession for the past ten years.
3. This report is compiled from data obtained from VLF-EM, magnetic and soil geochemistry surveys carried out under the direction of David G. Mark, geophysicist, and the field supervision of R. Wood, in October and November, 1980. *Geophysical Technician with several years experience.*
4. I have no direct or indirect interest in the Lucky Todd Claims, nor in Royalon Petroleum Corp., nor do I expect to receive any interest as a result of writing this report. *T.K.*


James M. Anderson

May 28, 1981

AFFIDAVIT OF EXPENSES

This is to certify that combined VLF-EM, magnetic and soil geochemistry surveys were carried out on the ALB 1-8 claims, grouped as the Lucky Todd Group, from the 18th of October, 1980 to the 7th of November, 1980 to the value of the following;

FIELD

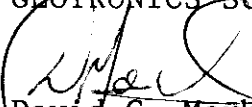
2 geophysical technicians, 170 hours @ \$37.50/hour	\$ 6,375
Room and board	1,923
Truck rental and gas	1,084
Survey supplies	74
Instrument rental	400
Laboratory analysis on soil samples	880
	<u>\$10,736</u>

OFFICE

Geophysicist, 27 hours @ \$35/hour	\$ 945
Geophysical technician, 16 hours @ \$25/hour	400
Drafting and printing	433
Report compilation	100
	<u>\$ 1,878</u>

GRAND TOTAL	<u><u>\$12,614</u></u>
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Respectfully submitted,
GEOTRONICS SURVEYS LTD.


David G. Mark, Geophysicist
Manager

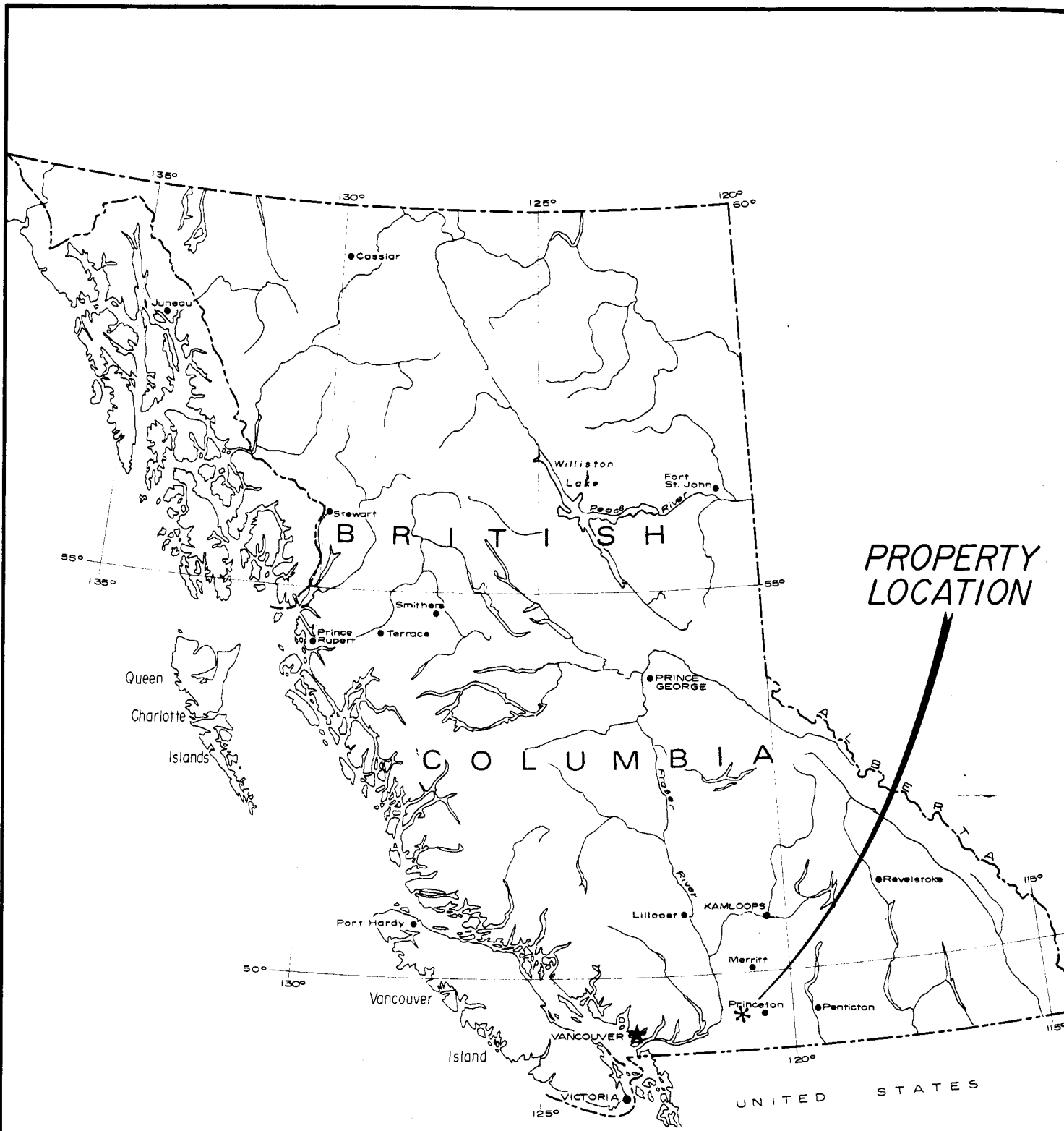
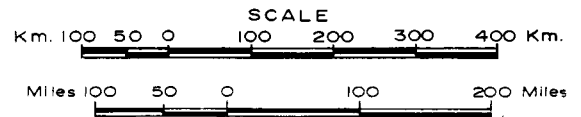
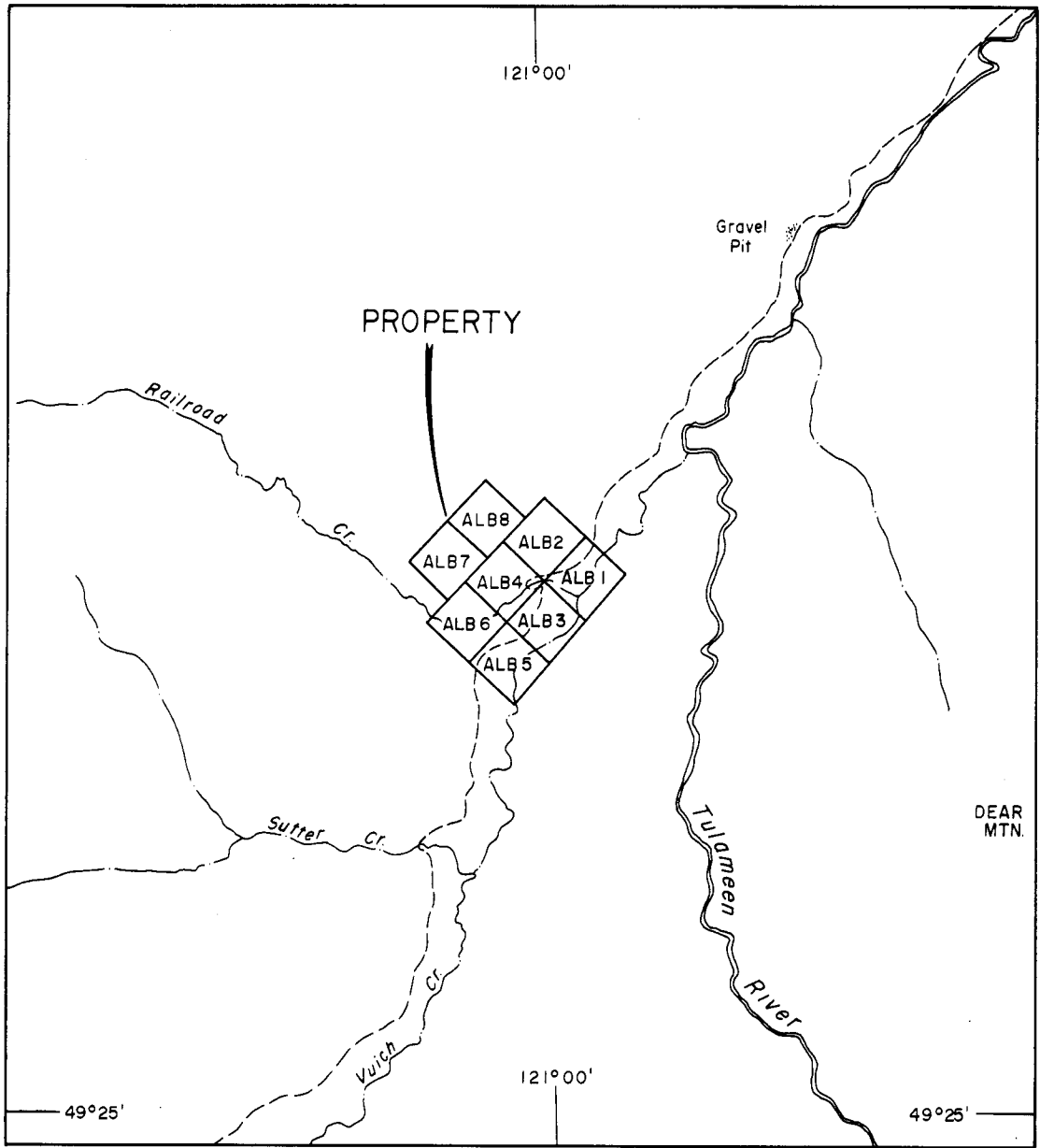


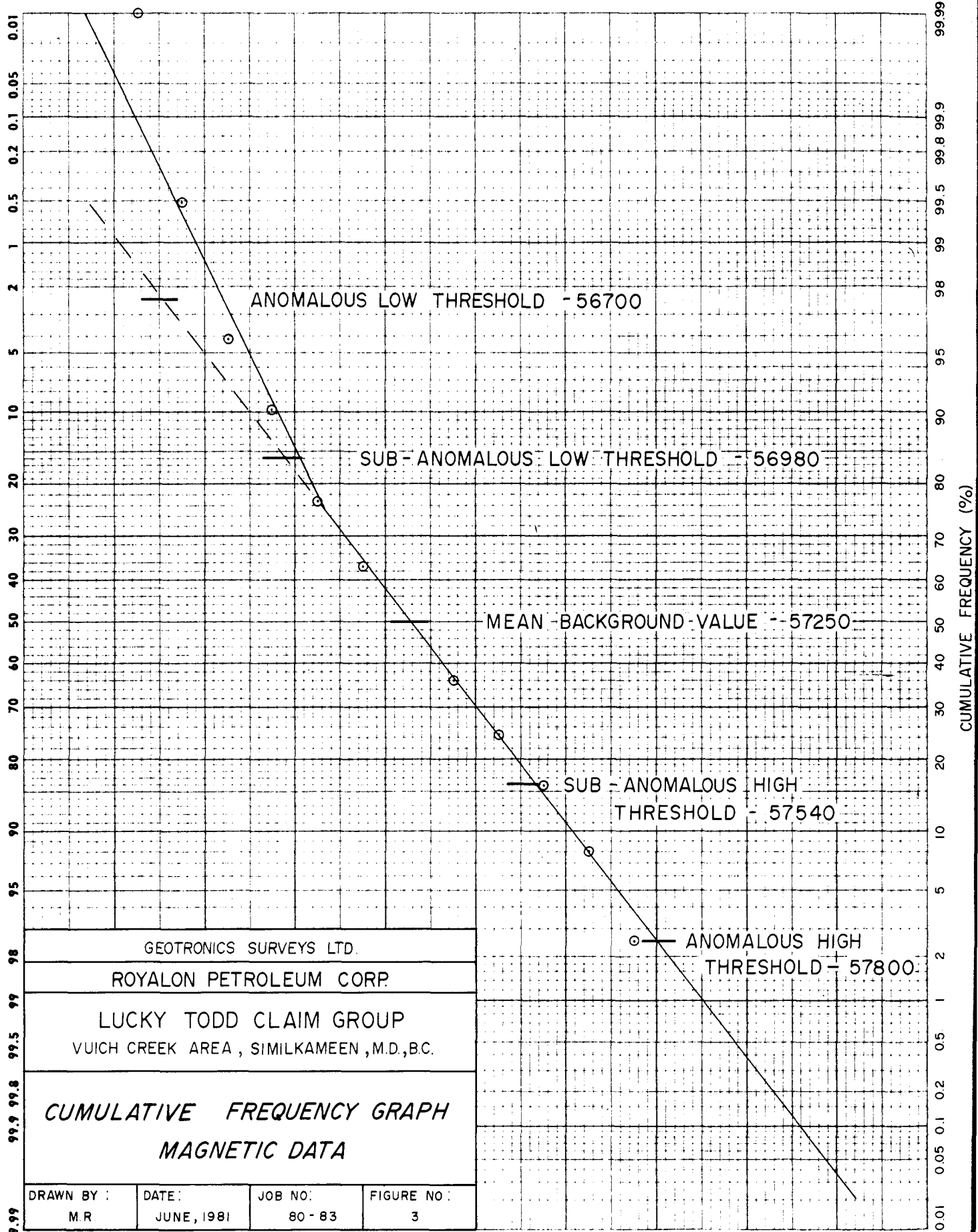
Fig. no. 1
 GEOTRONICS SURVEYS LTD.
 ROYALON PETROLEUM CORP.
 LUCKY TODD CLAIM GROUP
 VUICH CREEK AREA, SIMILKAMEEN, M.D., B.C.

LOCATION MAP





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ROYALON PETROLEUM CORP.				
LUCKY TODD CLAIM GROUP				
VUICH CREEK AREA , SIMILKAMEEN , M.D., B.C.				
<i>CLAIM MAP</i>				
SCALE	DATE	JOB NO.	DRAWN BY:	FIG. NO.
1 : 50,000	JUNE, 1981	80 - 03	M.R.	2



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 ROYALON PETROLEUM CORP.
 LUCKY TODD CLAIM GROUP
 VUICH CREEK AREA, SIMILKAMEEN, M.D., B.C.

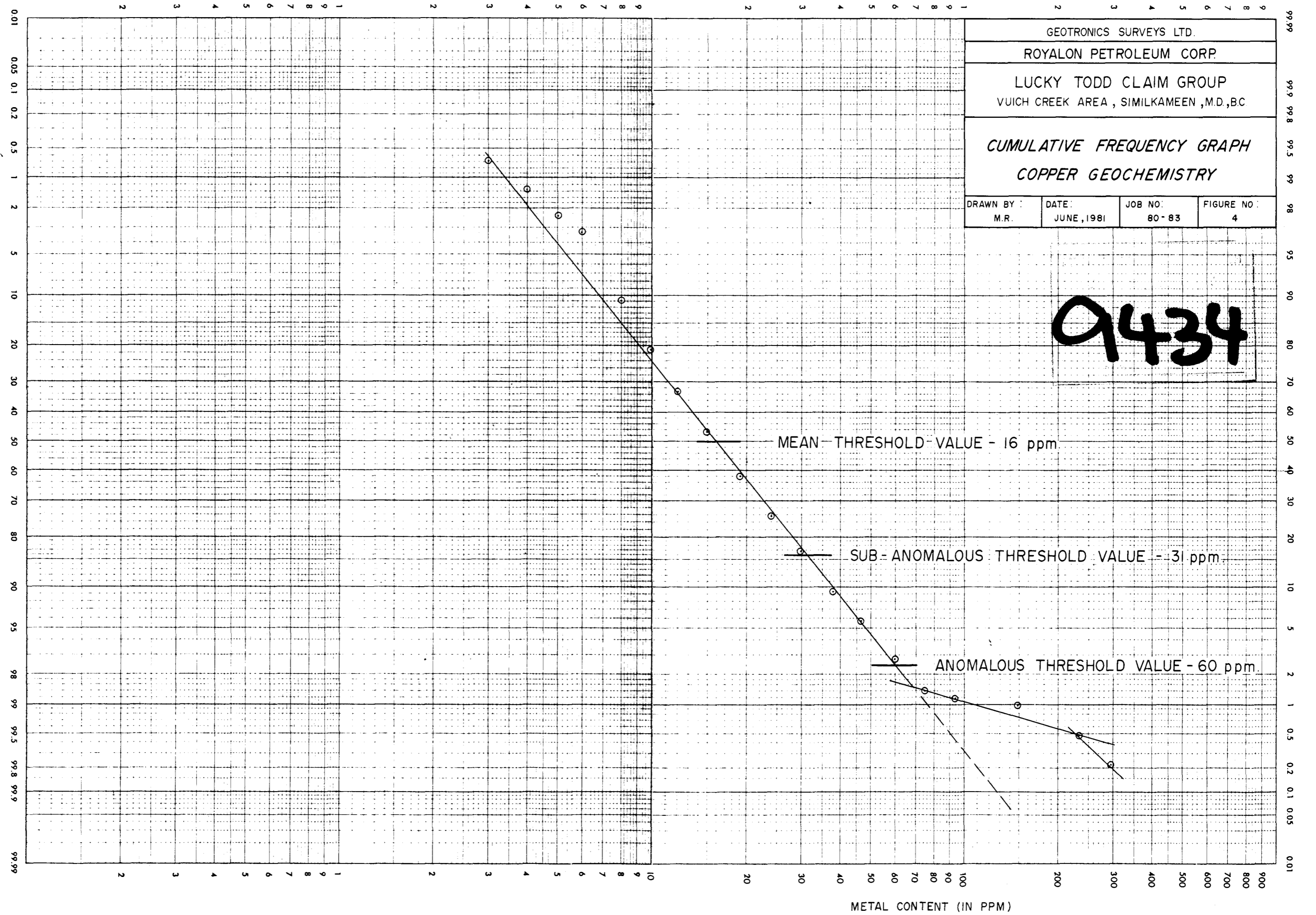
**CUMULATIVE FREQUENCY GRAPH
 MAGNETIC DATA**

DRAWN BY : M.R.	DATE : JUNE, 1981	JOB NO. : 80 - 83	FIGURE NO. : 3
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MAGNETIC READING (GAMMAS)

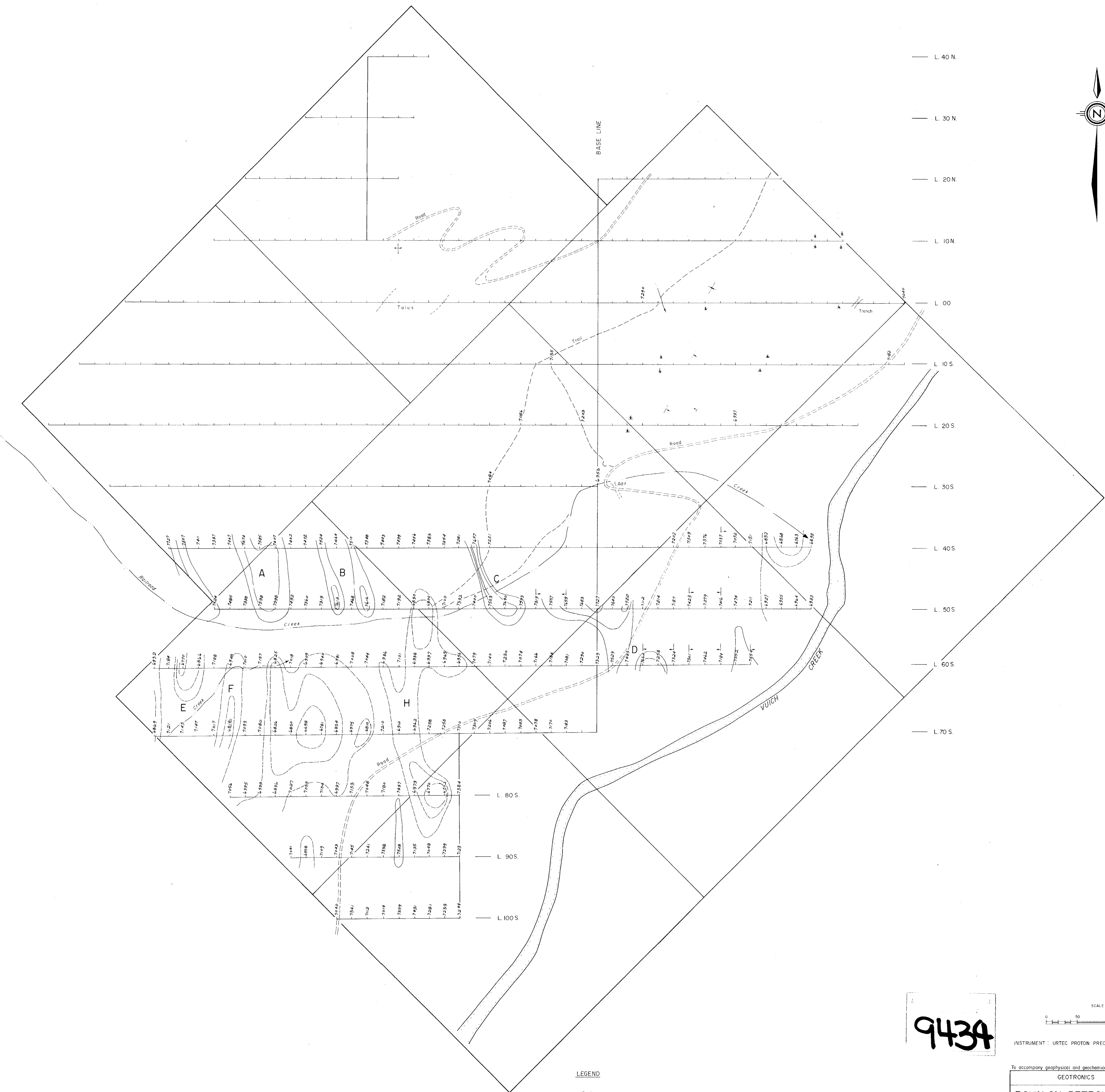
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ROYALON PETROLEUM CORP.			
LUCKY TODD CLAIM GROUP VUICH CREEK AREA, SIMILKAMEEN, M.D., BC			
CUMULATIVE FREQUENCY GRAPH COPPER GEOCHEMISTRY			
DRAWN BY: M.R.	DATE: JUNE, 1981	JOB NO: 80-83	FIGURE NO: 4

9434

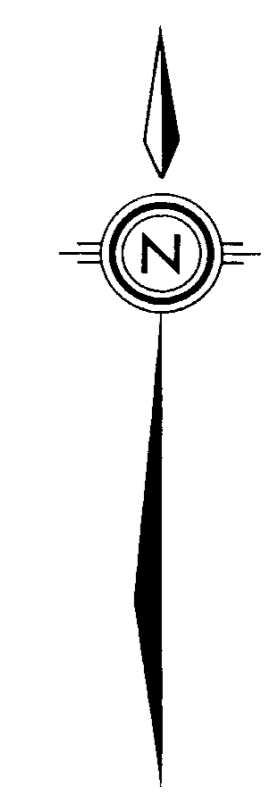


METAL CONTENT (IN PPM)

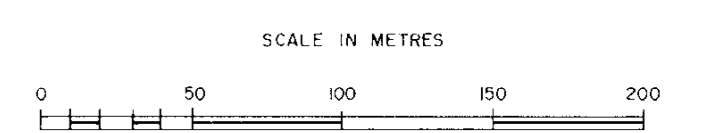
CUMULATIVE FREQUENCY (%)



L. 40 N.
 L. 30 N.
 L. 20 N.
 L. 10 N.
 L. 00
 L. 10 S.
 L. 20 S.
 L. 30 S.
 L. 40 S.
 L. 50 S.
 L. 60 S.
 L. 70 S.



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INSTRUMENT : URTEC PROTON PRECESSION MAGNETOMETER

LEGEND

711-2 MAGNITUDE OF EARTH'S TOTAL FIELD, LESS 50,000 GAMMAS.

CONTOUR INTERVAL : 500 GAMMAS

CONTOURS, 57,500 GAMMAS AND ABOVE

CONTOURS, 57,000 GAMMAS AND BELOW.

B INTERPRETED ANOMALIES (see text).

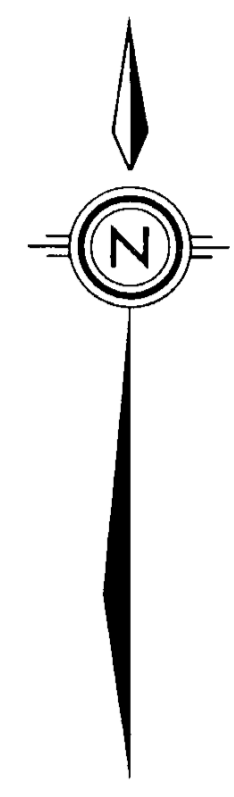
To accompany geophysical and geochemical report by J.M. Anderson, geophysicist.

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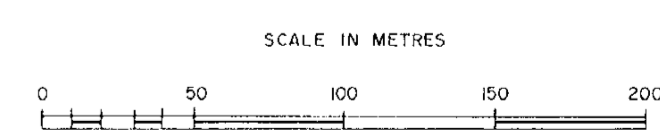
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 LUCKY TODD PROPERTY
 VUICH CREEK, SIMILKAMEEN M.D., B.C.

MAGNETIC SURVEY
 DATA & CONTOURS

DRAWN: R.W.	JOB No: 80-83	DATE: MAY, 1981	SCALE: 1:2500	SHEET: 1
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L 40 N
L 30 N
L 20 N
L 10 N
L 00
L 10 S
L 20 S
L 30 S
L 40 S
L 50 S
L 60 S
L 70 S



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- LEGEND**
- 3 DIP OF RECORDED FIELD, IN DEGREES
 - 2 NEGATIVE DIPS
 - CONTOURS OF EQUAL DIP ANGLE, AT INTERVALS OF 4°
 - J INTERPRETED ANOMALIES

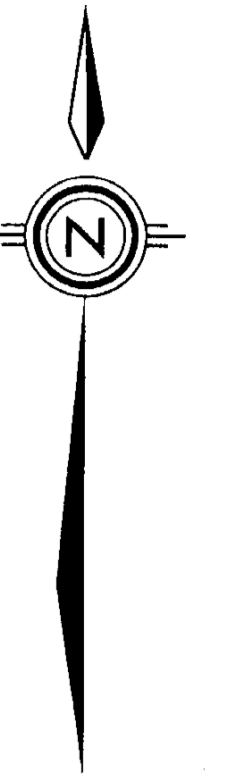
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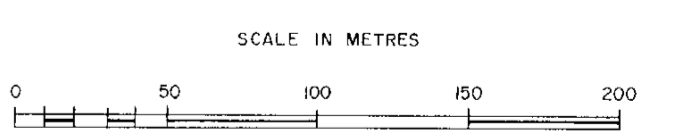
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LUCKY TODD PROPERTY
VOUCH CREEK, SIMILKAMEEN M.D., B.C.

VLF-EM SURVEY
FRASER FILTERED
DATA & CONTOURS

DRAWN R.W.	JOB No. 80-83	DATE May, 1981	SCALE 1:2500	SHEET 2
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9434



LEGEND

- 30 COPPER VALUES, IN ppm.
- SUB-ANOMALOUS CONTOURS
- ANOMALOUS CONTOURS
- CONTOURS AT 60, 85, 110, 160, 220, 300 AND 420 ppm.

SURVEY PARAMETERS

- MEAN BACKGROUND VALUE 16 PPM.
- SUB-ANOMALOUS THRESHOLD VALUE 31 PPM.
- ANOMALOUS THRESHOLD VALUE 60 PPM.

To accompany geophysical and geochemical report by J.M. Anderson, geophysicist

GEOTRONICS SURVEYS LTD.

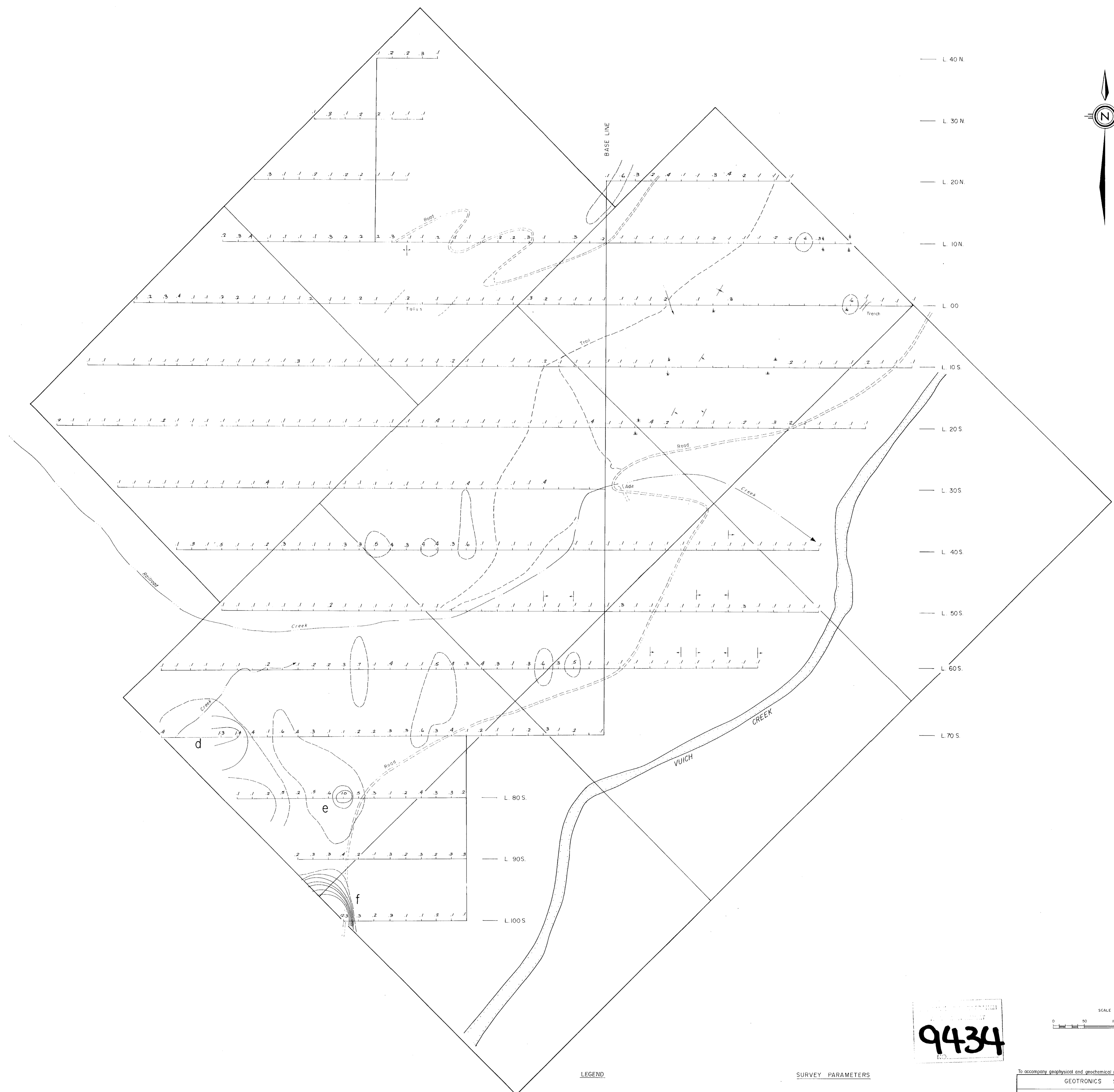
ROYALON PETROLEUM CORPORATION
LUCKY TODD PROPERTY
VUICH CREEK, SIMILKAMEEN M.D., B.C.

**SOIL GEOCHEMISTRY SURVEY
COPPER
DATA & CONTOURS**

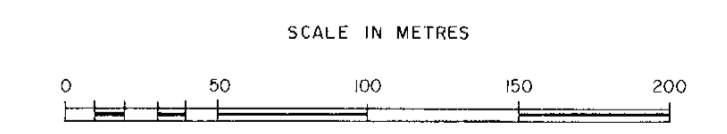
DRAWN: R.W.	JOB No: 80-83	DATE: MAY, 1981	SCALE: 1: 2500	SHEET: 3
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L 40 N
L 30 N
L 20 N
L 10 N
L 00
L 10 S
L 20 S
L 30 S
L 40 S
L 50 S
L 60 S
L 70 S



9434



LEGEND

- SILVER VALUES IN ppm.
- - - SUB - ANOMALOUS CONTOURS
- ANOMALOUS CONTOURS, DRAWN AT VALUES OF 0-7, 1-1, 1-7, 2-7, 4-3, 6-7, AND 11 ppm.

SURVEY PARAMETERS

- SUB - ANOMALOUS THRESHOLD VALUE 0.4 PPM.
- ANOMALOUS THRESHOLD VALUE 0.7 PPM.

To accompany geophysical and geochemical report by J.M. Anderson, geophysicist.

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LUCKY TODD PROPERTY
VUICH CREEK, SIMILKAMEEN M.D., B.C.

SOIL GEOCHEMISTRY SURVEY
SILVER
DATA & CONTOURS

DRAWN R. W.	JOB NO. 80-83	DATE MAY, 1981	SCALE 1:2500	SHEET 4
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