

2367

REPORT ON THE
AERO MAGNETIC - ELECTROMAGNETIC
SURVEY
Houston Area, British Columbia

9347E on behalf of
Mr. Stanley Brooks
and
Frontier Explorations Ltd.

By

Philip P. Nielsen, B.Sc.
Edward O. Chisolm, P.Eng.

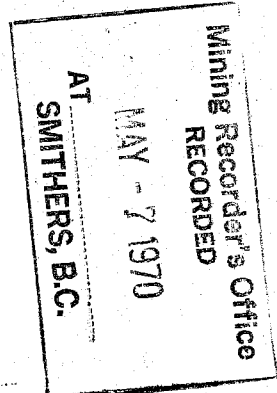
CLAIMS: See attached sheet

LOCATION: About eight miles south
of Houston, British
Columbia

126° - 54° SW

Ominica Mining Division

DATES: August 1 - October 30, 1969



RPT. 2367

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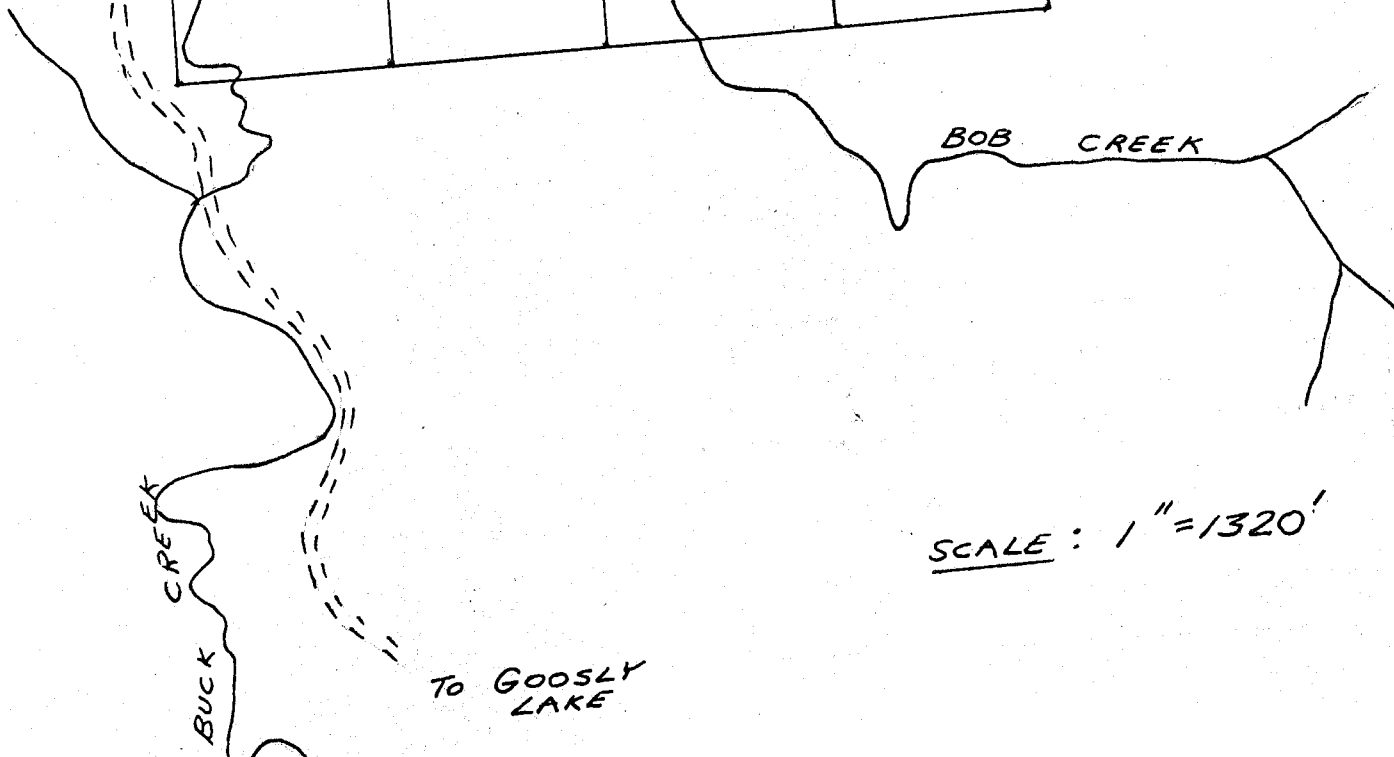
<p>Department of Mines and Petroleum Resources ASSESSMENT REPORT</p> <p>NO. <u>2367</u> MAP.....</p>
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INDEX MAP

TO HOUSTON



OZ #30	OZ #28	OZ #26	OZ #24	OZ #22
OZ #29	OZ #27	OZ #25	OZ #23	
OZ #31	OZ #38	OZ #36	OZ #34	



SCALE : 1" = 1320'

TO GOOSLY LAKE

LIST OF CLAIMS

<u>Claim No.</u>	<u>Record No.</u>
OZ #22	69076
OZ #23	69077
OZ #24	69078
OZ #25	69079
OZ #26	69080
OZ #27	69081
OZ #28	69082
OZ #29	69083
OZ #30	69084
OZ #31	69085
OZ #34	69088
OZ #36	69090
OZ #38	69092

ASSESSMENT ANNIVERSARY: April 18th

REGISTERED OWNER: Mr. Stanley Brooks,
Telkwa, B.C.

INTRODUCTION:

On August 1, 1969, an airborne electromagnetic-magnetic survey was executed by Lockwood Survey Corporation Ltd. on behalf of Nadina Explorations Ltd. covering approximately 8 square miles in the Buck Creek Area south of Houston, B.C.

Some claims presently held by Mr. Stanley Brooks for Frontier Explorations were included in the survey coverage.

The final maps were received by Nadina's geologist in October at which time Mr. Philip Nielsen, geophysicist, was commissioned by Frontier Explorations to visit the area, study the data, and make recommendations regarding possible further work.

A total of 28 line miles was flown in a northerly direction with a mean terrain clearance of 200 feet and mean line spacing of 660 and 1320 feet. The flight line direction was primarily determined by the steep, sometimes precipitous terrain.

LOCATION AND ACCESS

The Buck Creek property of Frontier Explorations is located at latitude $54^{\circ}16'$ N. and longitude $126^{\circ}35'$ W. The survey area adjoins and lies to the East of a gravel road which leads to Houston to the North and Sam Goosly Lake

to the South-east.

The airborne survey was mobilized out of Smithers, B.C. some 60 air miles distant. The survey was executed and completed on the same day.

GEOLOGY:

At the time of the writing of this report, little geological information was available concerning the Buck Creek area. The area was supposed to be underlain by Endako Plateau basalts and andesites. Intrusive rocks near the junction of Buck and Bob Creeks have been observed. Intrusive rocks are also known to exist on or near Dungate Creek to the East of the survey area.

SURVEY METHODS AND PROCEDURES:

The following equipment was installed in a helicopter FH-1100 with the registration of CF-XDF operated by Highland Helicopters Ltd. of Vancouver, B.C.

Basic geophysical equipment consisted of:-

- (a) A Gulf MK III Fluxgate Magnetometer which was housed in the centre section of the towed bird, the controls and recorder being housed in the helicopter.

Output from the magnetometer was recorded in analogue form in red ink on moving chart paper.

Operating range was 1200 gammas across a chart width of 10 inches. Chart speed was 3 inches per minute.

(b) A Lockwood In-phase/out-of-phase E.M. system which measures the in-phase and out-of-phase components of the secondary electromagnetic field, in terms of the induced primary field operating at a frequency of 4000 Hz. Receiving and transmitting coils are held vertical and coaxial in a towed bird, a distance of 30 feet apart and 100 feet below the helicopter. The sensitivity is approximately 8 parts per million. The mean bird height is 100 feet above the ground.

Ancillary equipment consists of:

1. Radio altimeter - APN-1
2. Camera - C.A.R.L. MK. VIII
3. Magnetic Storm Monitor - Gulf MK I Fluxgate Magnetometer.

The compilation and final presentation of the survey data was carried out by Lockwood Survey Corporation Ltd. at their Toronto office from August to October, 1969.

The magnetic data is presented as contours of the total magnetic field intensity at a basic contour interval of 20 gammas. The scale of the map is 1" = 1320 feet.

In the reduction of the magnetic data, diurnal variation was compensated for by tying traverse line data to the data measured along the control lines at the intersections. A linear datum was extended along each traverse line. Magnetic field contours based on this datum were then intercepted and transferred to the base map, using the camera exposures or fiducials for positioning control.

Electromagnetic data includes instrumental drift and regional response variations in ground conductivity. These effects were removed from the data and the resulting in-phase values were contoured at intervals of 10 parts per million above the assumed datum lines. In addition, peak amplitudes of corresponding in-phase and out-of-phase anomalies were noted on the contour map. The scale of this map was also 1" = 1320 feet.

GEOPHYSICAL OBSERVATIONS:

Aeromagnetics: The isomagnetic contour map of scale 1" = 1320 feet consists primarily of high frequency, steep gradient magnetic responses in the north-east portion of the map. In this area the strike of the magnetic patterns (magnetic grain) is east to west. However, the western and far southern areas show a much flatter, lower amplitude response with a north-south strike direction.

A number of linear trends are noticeable throughout the map and a pronounced large magnetic low is partly apparent at the edge of the south-easternmost corner of the map area.

Electromagnetics: All electromagnetic contours above 50 parts per million were considered of possible importance. Those showing an in-phase to out-of-phase ratio greater than 1.2 with aeromagnetic correlation were given the highest priority or order of importance. All were assigned an identification number for the purpose of discussion.

ANOMALY NO.1 - has a peak in-phase amplitude of 110 ppm. and a ratio of about 1.85. It has a strike length of about 2500 feet and width of 1200 feet. A small aeromagnetic anomaly is coincident with this electromagnetic feature.

ANOMALY NO.2 - is in the same category as No.1 except that it occurs on the north-west flank of a large aeromagnetic low not completely covered by the survey.

ANOMALY NO.3 - is barely anomalous and occurs in the complexly variable magnetics discussed above.

ANOMALY NO.4 - is another weak anomaly of moderate ratio occurring at the junction of two and possibly three linear magnetic trends.

ANOMALY NO.5 - consists of three sub-highs along the flank of a small magnetic low not completely covered by the survey.

ANOMALY NO.6 - is of low amplitude occurring along a north-easterly trending magnetic linear.

GEOPHYSICAL INTERPRETATION:

Aeromagnetics: The high frequency magnetic texture in the north-east portion of the map area is interpreted to be caused by young volcanic flows striking east-west. A geologic contact and/or escarpment seems to be the cause of the sudden change in strike of the aeromagnetic pattern to the west of these volcanic rocks. Much of the magnetic variation no doubt conforms to topographic relief and no

quantitative study can be attempted due to the sub-parallel flight line direction in this western area of the survey.

Two magnetic features are of interest in themselves. The small tear shaped magnetic high of 5160 gammas near and immediately to the south-west of the junction of Buck and Bob Creeks appears to be caused by an acidic intrusive. Known outcroppings of altered rhyolite would support this theory.

Although insufficient data is available, the large low in the south-east corner of the map could also be due to an acidic rock type of substantial lateral extent perhaps connecting the known acidic rocks in the Dungate Creek area.

Electromagnetics: The survey area appears to be underlain with a great deal of conductive rocks or overburden. The six anomalies mentioned above are considered to be of possible economic importance in view of their correlation with the magnetics.

ANOMALY NO.1 - could be due to a highly porous saturated acidic rock containing disseminated sulphide mineralization. It appears to be a small intrusive plug.

ANOMALY NO.2 - is the second anomaly in priority and could be due to contact type mineralization provided some prospecting could confirm the presence of acid rock in the area bound by the aeromagnetic low to the south-east.

ANOMALY NO.3 - occurs in the volcanics and is therefore given a very low rating of importance. No explanation is attempted to explain its presence.

ANOMALY NO.4 - is interesting in that it seems to occur at the intersection of a geological contact and a postulated fault and could be a suitable environment for mineral deposition.

ANOMALY NO.5 - is caused by a weak conductor and possibly occurs along a geologic contact between the young volcanics to the west and an intrusive rock to the east.

ANOMALY NO.6 - like No.4, this appears to be related to a contact fault intersection.

CONCLUSIONS AND RECOMMENDATIONS:

Although insufficient lines were flown for a full comprehensive study of the area, it appears that attention should be restricted to the areas described as Anomaly No.1 and No.2 for the possible occurrence of copper mineralization within or incontact with intrusive rocks. Geochemical soil surveys and ground magnetics are recommended on these two areas. Should results be favourable, the remaining anomalies can be investigated.

APPENDIX (A)

AUTHOR'S CERTIFICATE

I, PHILIP P. NIELSEN, of North Vancouver, British Columbia, HEREBY CERTIFY that:

- (1) I am a geophysicist residing at 785 Premier Street, North Vancouver, British Columbia.
- (2) I am a graduate of the University of British Columbia, and received the Bachelor of Science degree in the Department of Geophysics.
- (3) I am a member of the Society of Exploration Geophysicists and the Canadian Institute of Mining & Metallurgy.
- (4) I have actively engaged in mineral exploration in Western Canada for the past five years.
- (5) I am the author of this report.

DATED at North Vancouver, British Columbia, this 4th day
of MAY, 1970.

Philip P. Nielsen

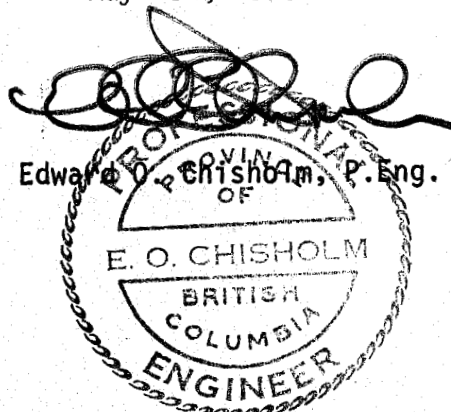
APPENDIX "B"

ENGINEER'S CERTIFICATE

I, Edward O. Chisholm of the City of Vancouver
in the Province of British Columbia, hereby certify that:

- 1) I am a geologist with offices at 821-602 West Hastings Street, Vancouver, B.C.
- 2) I am a graduate of the University of Toronto, Ontario, Master of Arts, 1945.
- 3) I am a member of the Professional Engineers of Ontario and British Columbia.
- 4) I have no direct interest or indirect interest in either the property or securities of Frontier Explorations Ltd. (NPL) or its affiliates, nor do I expect to receive any such interest.
- 5) This report is based on an examination of company records, maps and sections and also on a visit to the property for several days in October, 1967.

DATED AT VANCOUVER, BRITISH COLUMBIA
May 1st, 1970



APPENDIX (C)

CONTRACTORS AND PERSONNEL

Contractors:

Highland Helicopters Ltd.
1409 West Pender Street
Vancouver, B.C.

Lockwood Survey Corporation Ltd.
1450 O'Connor Drive
Toronto 16, Ontario.

Personnel:

R.H. Biggs (pilot)	-	Highland Helicopters
D. Steele (engineer)	-	Highland Helicopters
H. Sandau (instrument operator/ navigator)	-	Lockwood Survey Corp.
D. Webb (field data editor)	-	Lockwood Survey Corp.

APPENDIX D

STATEMENT OF EXPENDITURES

Mobilization-Demobilization	...	\$300
Equipment and operator rental .5 days @ \$605/day	...	\$303
Rental of data editor .5 days @ \$50/day	...	\$ 25
Expenses of operator and editor	...	\$ 15
Data compilation 10 line miles @ \$16/line mile	...	\$160
Helicopter Charges	...	\$150
Consulting	...	\$400
		<hr/>
	TOTAL	\$1353
		<hr/>

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA:
To Wit:

In the Matter of

I, PHILIP P. NIELSEN

of ~~xxx~~ 785 Premier St., North Vancouver, B.C.

in the Province of British Columbia, do solemnly declare that

- A. The number of days worked were as follows;
 - I. Survey Crew - Aug. 1, 1969.
 - Pilot - 0.5 days
 - Operator/Navigator - 0.5 days
 - Field Data Editor - 0.5 days
 - II. Data Compilation - Aug. 15, 1969 to Oct. 1, 1969.
by Lockwood Survey Corporation Limited.
 - III. Consulting - Oct. 15, 1969 to Dec. 19, 1969
for a total of 4 days.

B. The expenditures were as per Appendix D of accompanying report.

C. The direct costs related to the assessment work for which credit is claimed are as follows;

I. Lockwood Survey Corp. Ltd. -----	\$803.00
II. Highland Helicopters Ltd. -----	\$150.00
III. Consulting	
4 days @ \$75 per day -----	\$300.00
Expenses plus 10% -----	\$100.00
TOTAL AMOUNT	<u>\$1353.00</u>

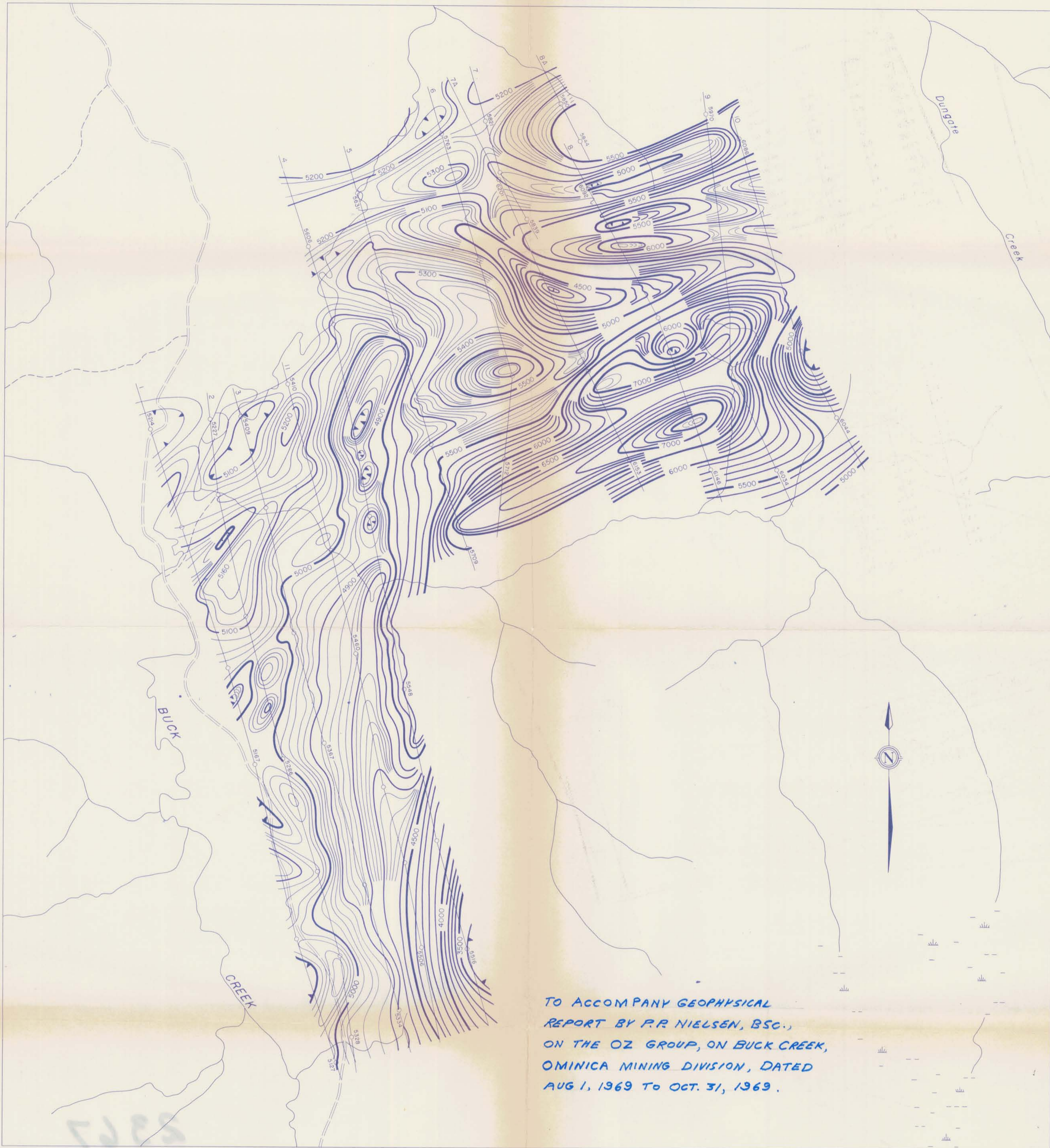
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the *City*
of *Vancouver*, in the
Province of British Columbia, this *5th*
day of *May* 1970, A.D.

P. Nielsen

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

FRONTIER EXPLORATIONS LIMITED
AIRBORNE GEOPHYSICAL SURVEY

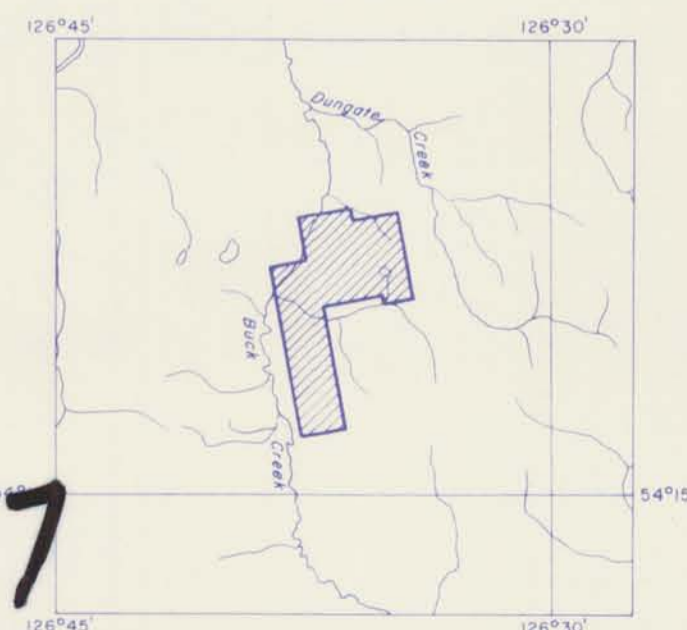


TO ACCOMPANY GEOPHYSICAL
REPORT BY P.R. NIELSEN, BSC.,
ON THE OZ GROUP, ON BUCK CREEK,
OMINICA MINING DIVISION, DATED
AUG 1, 1969 TO OCT. 31, 1969.

- CONTOUR INTERVAL 20 GAMMA
- MEAN FLIGHT LINE SPACING 660 & 1320 FEET
- MEAN TERRAIN CLEARANCE 200 FEET
- 500 GAMMA CONTOUR [Symbol]
- 100 GAMMA CONTOUR [Symbol]
- 20 GAMMA CONTOUR [Symbol]
- MAGNETIC LOW [Symbol]
- FIDUCIAL POINTS [Symbol]
- FLIGHT LINES [Symbol]

TOTAL FIELD INTENSITY MAGNETIC MAP
BUCK CREEK AREA
BRITISH COLUMBIA

SCALE: 1 Inch to 1320 Feet
[Scale bar showing 0, 1000, 2000, 3000, 4000, 5000 FEET]



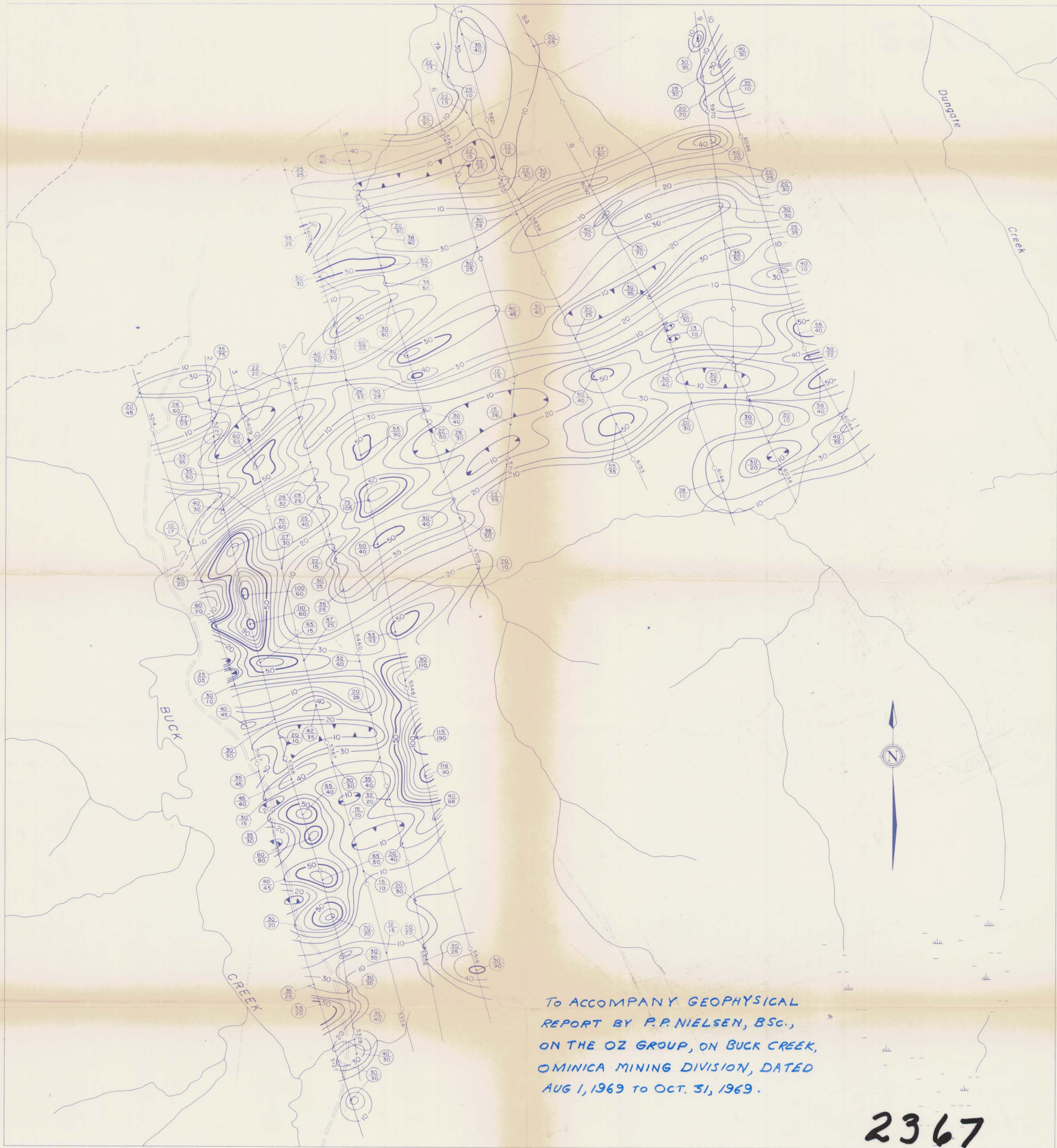
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **2367** MAP #1

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LOCKWOOD SURVEY CORPORATION LIMITED
1969

2367

FRONTIER EXPLORATIONS LIMITED

AIRBORNE GEOPHYSICAL SURVEY



*To ACCOMPANY GEOPHYSICAL
REPORT BY P. P. NIELSEN, B.Sc.,
ON THE OZ GROUP, ON BUCK CREEK,
OMINICA MINING DIVISION, DATED
AUG 1, 1969 TO OCT. 31, 1969.*

2367

MEAN FLIGHT LINE SPACING ----- 660 & 1320 FEET
 MEAN TERRAIN CLEARANCE ----- 200 FEET
 FIDUCIAL POINTS ----- ○ 3690
 FLIGHT LINES -----
 ELECTROMAGNETIC CONTOURS 50-100 etc. -----
 10-20 etc. -----

THE CONTOURS REPRESENT THE ELECTROMAGNETIC RESPONSE
 OF THE IN PHASE COMPONENT OF THE SECONDARY FIELD IN
 UNITS OF 10 PARTS PER MILLION.

REPRESENTS IN PHASE COMPONENT OF SECONDARY FIELD
 REPRESENTS OUT OF PHASE COMPONENT

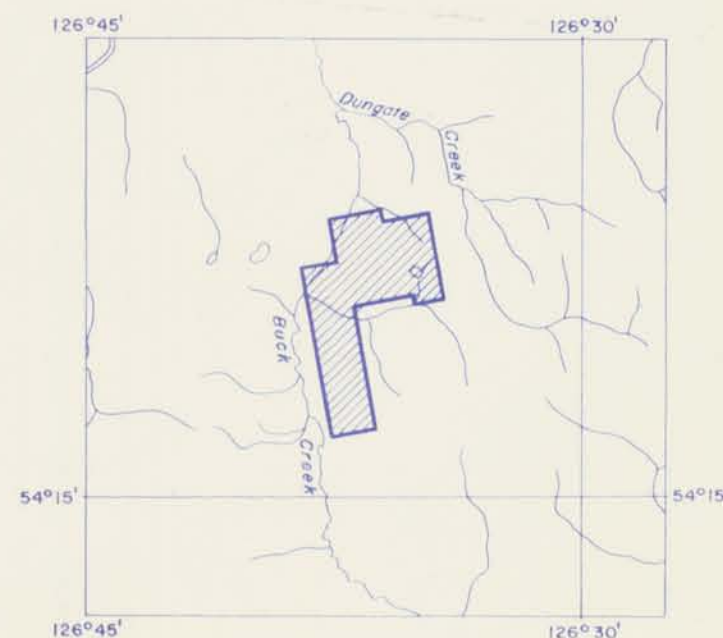
ELECTROMAGNETIC MAP BUCK CREEK AREA BRITISH COLUMBIA



SCALE 1 Inch to 1320 Feet



Flown and Compiled by
LOCKWOOD SURVEY CORPORATION LIMITED
1969



**Department of
Mines and Petroleum Resources
ASSESSMENT REPORT**

NO. **2367** MAP **#2**