93K-2 "I" Area, Fraser Lake

812060

REPORT ON

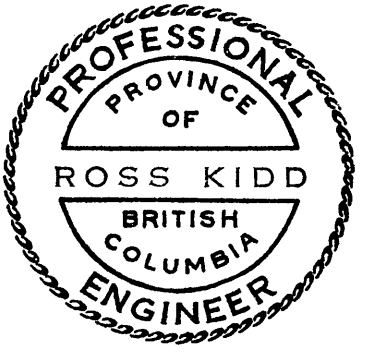
# AIRBORNE GEOPHYSICAL WORK

"I" AREA

FRASER LAKE

OMINECA MINING DIVISION

PROVINCE OF BRITISH COLUMBIA




ROSS KIDD
CONSULTING MINING ENGINEER

TORONTO, ONTARIO
APRIL 26TH, 1970

## INTRODUCTION

ELECTROMAGNETIC AND MAGNETIC SURVEYS WERE PERFORMED OVER THE "I" AREA DURING THE SUMMER OF 1969 BY LOCKWOOD SURVEY CORPORATION LIMITED.

THE RESULTS ARE DEPICTED ON TWO ACCOMPANYING MAPS, ENTITLED "ELECTROMAGNETIC MAP" AND "MAGNETOMETRIC MAP".

ON THE "MAGNETOMETRIC MAP" I HAVE SUPERIMPOSED THE OUTLINES OF THE AIRBORNE ELECTROMAGNETIC ANOMALIES. IN ADDITION I HAVE ADDED THE OUTLINES OF THE MAGNETIC SOURCE BODIES AS INDICATED BY SECOND DERIVATIVE STUDIES, AS WELL AS THE INFERRED LOCATION OF A FAULT AS SUGGESTED BY AIR PHOTOS AND THE AEROMAGNETIC RESULTS.

## LOCATION

THE "I" AREA LIES ABOUT HALF-WAY BETWEEN FRASER LAKE AND TAHULTZU LAKE, IN THAT REGION OF BRITISH COLUMBIA BETWEEN PRINCE GEORGE AND PRINCE RUPERT. IT IS ACCESSIBLE BY LOGGING ROADS FROM THE TOWN OF FRASER LAKE. THE ENDAKO MOLYBDENUM MINE LIES ABOUT 12 MILES TO THE WEST.

## GENERAL GEOLOGY

THE "I" AREA IS UNDERLAIN BY GRANODIORITE OF PROBABLE JURASSIC AGE, OF THE TYPE KNOWN IN THE REGION AS TOPLEY INTRUSIVE. THE ENDAKO MINE IS IN A SIMILAR INTRUSIVE. THE GENERAL GEOLOGY IS SHOWN ON MAP 971A OF THE GEOLOGICAL SURVEY OF CANADA.

## DETAILS OF AIRBORNE SURVEY WORK

READINGS OF THE IN-PHASE AND OUT-OF-PHASE COMPONENTS OF THE RESULTANT ELECTROMAGNETIC FIELD, AND ALSO OF THE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD, WERE TAKEN FROM A HELICOPTER PLATFORM.

THE RECEIVING COILS WERE CARRIED IN A 30 FOOT BIRD TOWED BY THE HELICOPTER. FLYING HEIGHT WAS MAINTAINED AT ABOUT 200 FEET ABOVE THE GROUND, AND THE BIRD TRAVELLED AT ABOUT 100 FEET ABOVE THE GROUND. A CONTINUOUS ALTIMETER RECORD WAS KEPT.

THE OPERATING ELECTROMAGNETIC FREQUENCY WAS 4300 CPS, AND THE MAGNETOMETER USED WAS A GULF FLUXGATE TYPE.

FLIGHT LINES WERE ORIENTED EAST-WEST, AND WERE FLOWN AT ABOUT $\frac{1}{2}$ MILE INTERVALS. A CONTINUOUS FILM RECORD WAS KEPT ALONG THE FLIGHT LINES. FLIGHT PATH RECOVERY WAS MADE FROM THIS FILM RECORD.

## SUMMARY OF RESULTS OF AIRBORNE SURVEYS

FOUR ELECTROMAGNETIC ANOMALIES WERE LOCATED IN THE CENTRAL PART OF THE AREA FLOWN, AND ANOTHER FIVE EM ANOMALIES OCCUR IN THE SOUTHEAST END OF THE AREA.

MOST OF THESE EM ANOMALIES SEEM TO BE IN ASSOCIATION WITH MAGNETIC LOWS ON THE FLANKS OF HIGHS, AS SEEN ON THE MAGNETOMETRIC MAP.

SUMMARY OF RESULTS (CONT'D)

HOWEVER, IF THE SECOND DERIVATIVE IS TAKEN OF THE MAGNETIC READINGS, AND THE RESULTS PLOTTED, THE LOCATIONS OF THE SOURCE BODIES CAUSING THE MAGNETIC INTENSITY HIGHS ARE BETTER OUTLINED, AND THE MAJOR EM ANOMALIES IN THE CENTRAL SECTION THEN ARE SEEN TO BE CLUSTERED ON THE RIM OF A STRONGLY MAGNETIC BODY.

THE SOURCE BODY, AS WELL AS ANOTHER MAGNETIC SOURCE BODY TO THE WEST AND ANOTHER TO THE SOUTHWEST, ALL STRIKE N $45^{\circ}$E, WHILE THE FOUR EM ANOMALIES CAN BE LINED UP IN THE N $25^{\circ}$E DIRECTION.

THESE FEATURES ARE ALL SHOWN ON THE ACCOMPANYING MAGNETOMETRIC MAP.

IT IS PROBABLE THAT THE FIVE EM CONDUCTORS TO THE SOUTHEAST ARE ALSO CLUSTERED AROUND A MAGNETIC BODY, BUT THE SECOND DERIVATIVE STUDY IN THIS SECTION CANNOT BE COMPLETED WITHOUT FURTHER MAGNETIC DATA, AND SO THIS CANNOT YET BE SAID WITH CERTAINTY, ALTHOUGH THE INITIAL RESULTS SUGGEST IT IS SO.

DISCUSSION OF RESULTS

THE RESULTS SUGGEST THAT THERE IS A NORTH-EASTERLY STRUCTURAL DIRECTION IN THE VICINITY, WHICH HAS HAD SOME CONTROL OF THE DIRECTION OF MAGNETIC INCREASE, AND ALSO OF THE FLOW OF CONDUCTIVE MATERIAL.

THE MOST LIKELY EXPLANATION WOULD SEEM TO BE A SHEAR DIRECTION ALONG WHICH MAGNETITE INCREASE HAS

DISCUSSION OF RESULTS (CONT'D)

DEVELOPED, OR POSSIBLY BODIES OF MORE BASIC INTRUSIVE HAVE BEEN INTRODUCED. PERHAPS THIS POSTULATED SHEAR IS A SUBSIDIARY OF THE FAULT SUGGESTED BY AIR PHOTOS AND THE VERTICAL AEROMAGNETICS.

THE CONDUCTIVE MATERIAL INDICATED BY THE AIRBORNE WORK WOULD SEEM TO BE RELATED TO THE SAME STRUCTURAL DIRECTION, AND PERHAPS TO THE SAME SHEAR. AS SUCH IT IS MORE LIKELY TO BE DUE TO SULFIDE MINERALIZATION THAN TO OVERBURDEN EFFECTS, ESPECIALLY SINCE THE GLACIAL DIRECTION IN THE REGION IS EAST-WESTERLY AND THE EM ANOMALIES LIE ACROSS THIS DIRECTION RATHER THAN ALONG IT.

OTHER THAN GENERAL OBSERVATIONS SUCH AS THOSE IN THE FOREGOING PARAGRAPHS, IT IS DIFFICULT TO DECIDE ON THE AIRBORNE RESULTS ALONE WHETHER THE INDICATED CONDUCTIVE ZONES ARE LIKELY TO BE DUE TO SULFIDES OF ECONOMIC INTEREST. HOWEVER, SOME GEOLOGICAL MAPPING AND GEOCHEMICAL SOIL SAMPLING HAS BEEN DONE WITHIN THE AREA, AND THE RESULTS OF THIS WORK WILL HELP TO BETTER ASSESS THE AIRBORNE RESULTS.

SHOULD THE GEOCHEMICAL RESULTS BE UNIFORMLY LOW AND THE GEOLOGICAL CONDITIONS ARE FOUND TO BE FEATURELESS, THEN THE AIRBORNE INDICATIONS ARE PROBABLY OF NO INTEREST.

## SECOND DERIVATIVE STUDIES

A SECOND DERIVATIVE MAP WAS PREPARED FROM THE RELEVANT SHEETS OF THE AEROMAGNETIC SERIES OF THE GEOLOGICAL SURVEY OF CANADA.

ONE MILE GRID CORNERS WERE USED TO PREPARE THE MAP, AND SO IT IS NOT OF THE FIRST ORDER OF PRECISION BUT IS PROBABLY REASONABLY ACCURATE.

A COPY OF THE SECOND DERIVATIVE MAP IS INCLUDED IN THIS REPORT.

THE 100 GAMMA/MILE/MILE CONTOUR IS TAKEN AS THAT CLOSEST TO THE MARGINS OF THE SOURCE BODY OR BODIES.

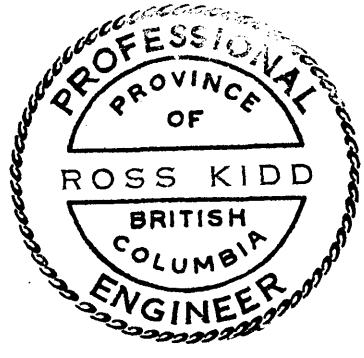
## COSTS

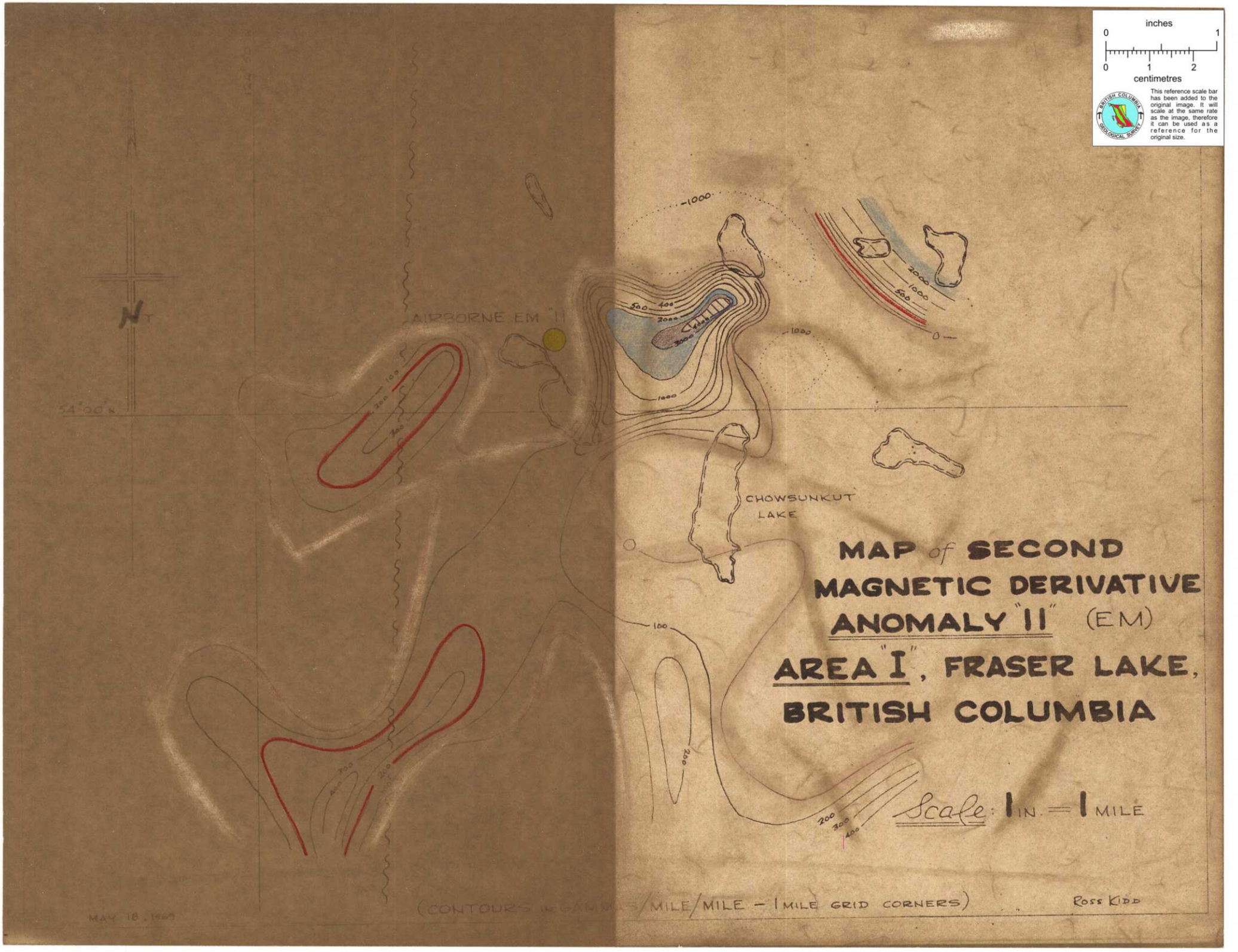
A STATEMENT OF COSTS, TOGETHER WITH COPIES OF THE VARIOUS INVOICES COVERING THE AIRBORNE WORK (AND OTHER FOLLOW-UP WORK) ARE INCLUDED IN THIS REPORT.

Ross Kidd

ROSS KIDD, P. ENG.
CONSULTING MINING ENGINEER

TORONTO, ONTARIO
APRIL 26TH, 1970






CONTOUR INTERVAL ---------- 20 GAMMA
MEAN FLIGHT LINE SPACING ---------- 2640 FEET
MEAN TERRAIN CLEARANCE ---------- 200 FEET
500 GAMMA CONTOUR ----------
100 GAMMA CONTOUR ----------
20 GAMMA CONTOUR ----------
MAGNETIC LOW ----------
FIDUCIAL POINT ---------- 3690
FLIGHT LINES ----------

APPROXIMATE OUTLINE OF MAGNETIC SOURCE BODIES AS INDICATED BY SECOND DERIVATIVE MAGNETIC PLOTTING

AIRBORNE E.M. ANOMALY

FAULT AS SUGGESTED BY AIR PHOTOS AND AEROMAGNETIC RESULTS

# AIRBORNE GEOPHYSICAL SURVEY
## FRASER LAKE AREA, BRITISH COLUMBIA

MAGNETOMETRIC MAP

SCALE: 1 INCH TO 2640 FEET

2000 FEET 0 2000 4000 6000 8000 10000 FEET

inches 0 1 2
0 1 2 3 4 5 centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

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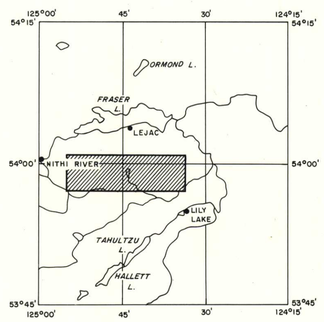
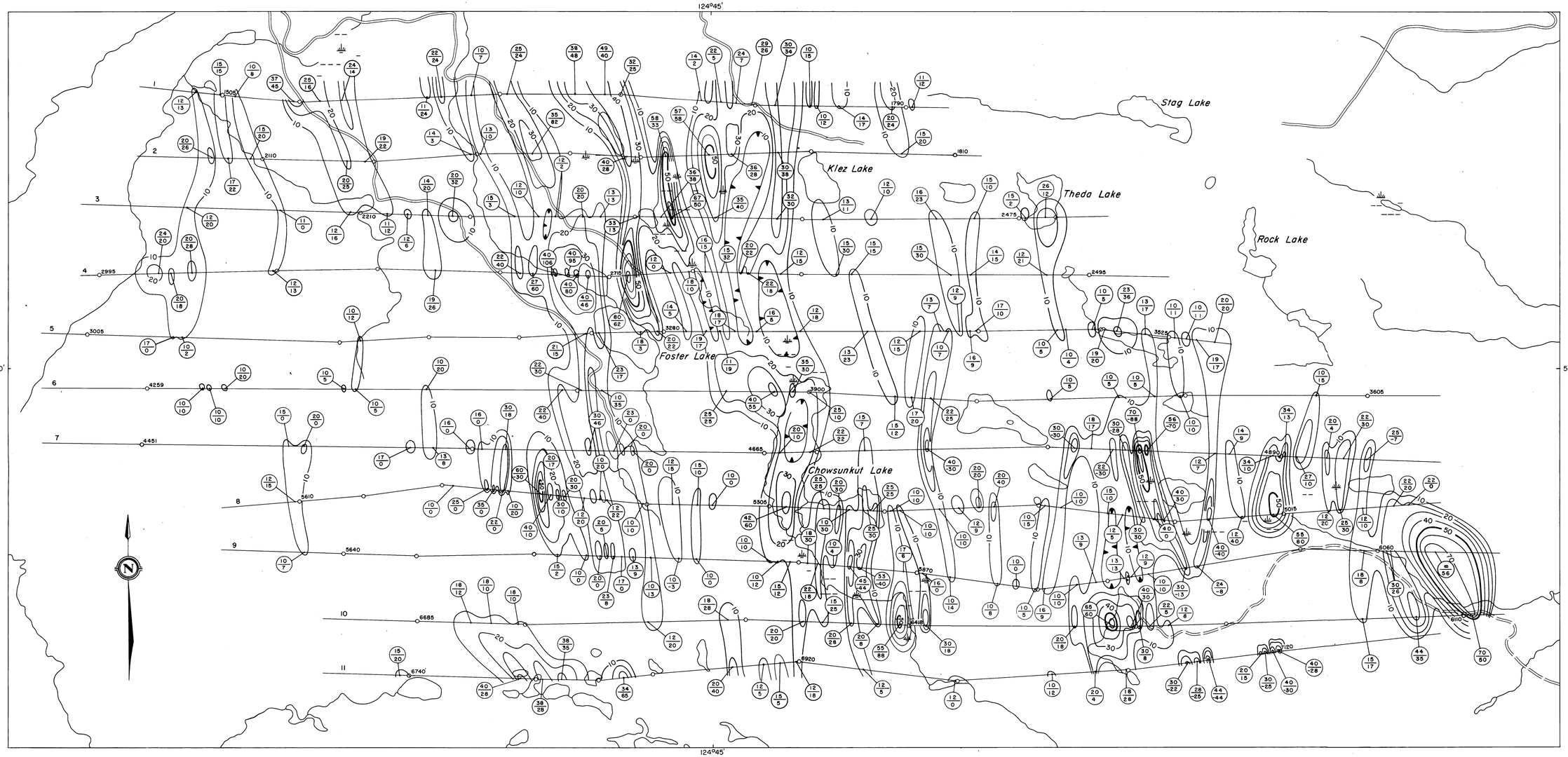
for
CYPRUS EXPLORATION CORPORATION LIMITED
by
LOCKWOOD SURVEY CORPORATION LIMITED
TORONTO, CANADA
1969






MEAN FLIGHT LINE SPACING ---------- 2640 FEET
MEAN GROUND CLEARANCE ---------- 200 FEET
FLIGHT LINES ----------
FIDUCIAL POINTS ---------- O 3690
ELECTROMAGNETIC CONTOURS 100, 200, 300, etc. ----
10, 20, 30, etc. ----

THE CONTOURS REPRESENT THE ELECTROMAGNETIC RESPONSE OF THE IN PHASE COMPONENT OF THE SECONDARY FIELD IN UNITS OF 100 PARTS PER MILLION.

(20/40) REPRESENTS $\frac{\text{IN PHASE COMPONENT}}{\text{OUT OF PHASE COMPONENT}}$ OF SECONDARY FIELD

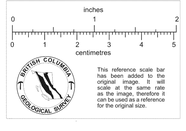
# AIRBORNE GEOPHYSICAL SURVEY

## FRASER LAKE AREA, BRITISH COLUMBIA

## ELECTROMAGNETIC MAP

SCALE: 1 INCH TO 2640 FEET

2000 FEET 0 2000 4000 6000 8000 10000 FEET

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