

3050

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3050 MAP

REPORT ON
AN AIRBORNE GEOPHYSICAL SURVEY
PRINCE GEORGE AREA, BRITISH COLUMBIA
ON BEHALF OF
RIO TINTO CANADIAN EXPLORATION LIMITED

93F/4E48W

by

Richard O. Crosby, B.Sc., P. Eng.

and

John P. Steel, B.Sc.

May 6, 1971

CLAIMS:

<u>Name</u>	<u>Record Numbers</u>
C-1-44	64044 - 64087
C-45-66	75637 - 75658
C-67-70	76219 - 76222
C-71-94	75761 - 75784
C-95-126	76223 - 76254
C-131-140	79244 - 79253
C-145-180	81706 - 81741
Z-1-44	82379 - 82422
Z-45-56	94742 - 94753

LOCATION:

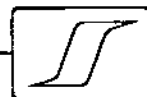
About 70 miles southwest of Prince George, B.C.
Omineca Mining Division
124° 53' SW

DATES:

April 1 to April 3, 1971

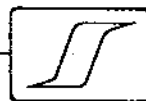
TABLE OF CONTENTS

	<u>Page No.</u>
SUMMARY	
INTRODUCTION	1
GEOLOGY	2
PRESENTATION OF DATA	3
DISCUSSION OF RESULTS	3
CONCLUSIONS AND RECOMMENDATIONS	5
APPENDIX 'A'	
PLATES:	
(in text)	
#1 Plate 1 - Location Map	1 inch = 32 miles
(in envelope)	
#2,3 Plate 2 - Magnetometer Contour Plan	1 inch = 1/4 mile
#4,5 Plate 3 - Magnetometer Contour Plan and Geophysical Interpretation	1 inch = 1/4 mile
#6,7 Plate 4 - Compilation Map and Claim Location	1 inch = 1/4 mile



SUMMARY

The airborne geophysical survey has revealed several zones of differing magnetic character. These have been interpreted as origination from a large acidic intrusive body in the southwest, smaller intermediate composition intrusives in the west-central and south-central parts of the survey area, a zone of basic rocks northeast of the intrusive and several zones of more basic rocks in the northeast. Many probable fault traces have been delineated intersecting these bodies.



REPORT ON
AN AIRBORNE GEOPHYSICAL SURVEY
PRINCE GEORGE AREA, BRITISH COLUMBIA
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INTRODUCTION

During the period April 1 to April 3, 1971, an airborne geophysical survey was executed on behalf of Rio Tinto Canadian Exploration Limited in the Prince George area, British Columbia west of Chutanli Lake. The survey covered approximately 122 square miles (see Plate 1). The centre of the area is located at 53°27'N, 124°35'W. Basic compilation of the data was carried out between April and May 1971.

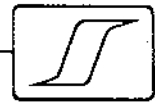
The airborne survey included magnetometer measurements using a Scintrex NPM-1 magnetometer system measuring the earth's total magnetic field.

Appendix 'A' attached, gives full details of the airborne geophysical equipment and the ancillary equipment employed, as well as the treatment of data resulting from these surveys. In the case of the present survey a Jet Ranger helicopter, on charter from Okanagan Helicopters was employed as the basic survey vehicle.

The survey traverses were flown at a nominal 600 feet line interval along lines oriented north-south at a mean terrain clearance of 300 feet. Flight navigation and flight path recovery have been based upon photomosaics on the scale of approximately 1 inch = 1/4 mile.

The magnetometer sensor was flown 50 feet below the helicopter.

The purpose of the present programme was to map the earth's total magnetic field in the survey area. The anomalies recorded on the survey flights were due primarily to the distribution of magnetic



material in the underlying rocks. By means of these anomalies various rock types and/or structural features may be revealed.

The value of the earth's total magnetic field in the survey area is approximately 58,500 gammas. The inclination is 74 degrees.

GEOLOGY

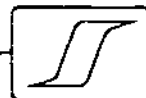
The geophysical surveys were conducted over an area in the southern part of the Nechako Mountain Range in the central part of the Nechako River map area. The Nechako Range consists of middle and upper Jurassic rocks called the Hazelton Group. These rocks are intruded by granitic masses of upper Jurassic or Cretaceous age.

The Hazelton Group contains both volcanic and sedimentary rocks. In the Nechako Range this group is characterized by chert-pebble conglomerate; orthoquartzites, shales and greywackes. The conglomerates are interbedded with andesites and basalts as well as finer clastic sediments. The northern part of the survey area is believed to be underlain by both metasedimentary and volcanic members of the group.

Rocks of granitic to intermediate composition intrude the Hazelton Group in the Nechako Range. The southern section of the survey area is believed to be underlain by granodioritic rocks of this kind. Some of the border phases of this intrusive are gneissic.

Folding and faulting are evident within the Hazelton Group. The folds are generally broad with dips up to 45 degrees. Faults are zones of intensive shearing and are narrow and steep.

The geology of the area including and surrounding the survey area has been discussed in G.S.C. Memoir 324, "Nechako River Map - Area" by H. W. Tipper, 1963.



PRESENTATION OF DATA

The results of the geophysical survey are presented on Plates 2 and 4 on the scales of 1 inch = 1/4 mile. Some topographic features and flight lines are shown on the plates. These plates shows the magnetic contours at an interval of 20 gammas. Plate 4 also shows the claim locations.

The magnetometer data are presented together with altimeter and fiducial recording and fiducial recording on analog recorder traces. The original traces are on a scale of 1 inch = 100 gammas with automatic steps of 500 gammas.

DISCUSSION OF RESULTS

The results of the aeromagnetic survey are shown on Plate 2. Several zones of differing magnetic character have been revealed. These have been interpreted as resulting from rocks of different composition. The boundaries of these interpreted rock units are shown on Plate 3.

The magnetic pattern in the southwestern section of the survey area is characterized by isolated highs and lows of approximately 150 gammas relief. This pattern is bounded to the north and east by a gradient of approximately 300 gammas and probably results from acidic rocks of the Post-Middle Jurassic intrusive body mapped in this area. A series of magnetic lows bounded by a 200 gamma gradient probably reflects an alteration zone within the intrusive. To the north lie five approximately circular features of similar magnetic character which probably overlie a second intrusive body with four satellite stocks. As well, two similar features lie in the southwestern half of Sheet 2 which probably reflect similar intrusive bodies.



Adjacent, on the east, to the large intrusive body is a zone characterized by many sharp, approximately circular magnetic highs and lows. The magnetic relief is approximately 400 gammas within this zone. These features probably originate in basic rock units of the Hazelton series. Depth calculations on these features imply that the rocks are near surface.

In the northeast corner of Sheet 1 and in the northeastern half of Sheet 2 long and narrow magnetic features of magnetic relief as great as 1400 gammas have been revealed. The causative sources of these features are more basic than others within the area. They dip at approximately 80 degrees to the southwest and in several places they are probably fault bounded.

Persistent gradients and offsets in anomalous patterns probably reflect faulting and shearing. Several such features have been interpreted and are shown on Plate 3. These faults exhibit both lateral and vertical movement. The more basic bodies in the northeast half of Plate 2 show right lateral motion along the faults. The basic body in the northwestern half of Plate 1 has been drawn faulted on its northern end as the interpreted depth north of the fault is greater than the depth south of the fault. The prominent fault directions are northeast-southwest, northwest-southeast, and east-west.

The zones of magnetic activity are surrounded by zones of low magnetic relief which probably reflect sedimentary units of the Hazelton Group.

Rio Tinto Canadian Exploration Limited has conducted induced polarization surveys over the central part of Sheet 1. These



surveys have been interpreted by Seigel Associates Limited in reports dated August 14, 1970 and October 26, 1970. The large intrusive body in the southwestern part of Plate 1 is characterized by low chargeability and high resistivity while the Hazelton Group rocks exhibit high chargeability and low resistivity. Three smaller zones of low chargeability and high resistivity appear to coincide with the three small satellite stocks in the central part of Plate 1. These surveys have not delineated areas suitable for further exploration.

CONCLUSIONS AND RECOMMENDATIONS

The airborne geophysical survey has revealed several zones of differing magnetic character. These have been interpreted as originating from a large acidic intrusive body in the southwest, smaller intermediate composition intrusives in the west-central and south-central part of the survey area, a zone of basic rocks northeast of the intrusive and several zones of more basic rocks in the northeast. Many probable fault traces have been delineated intersecting these bodies.

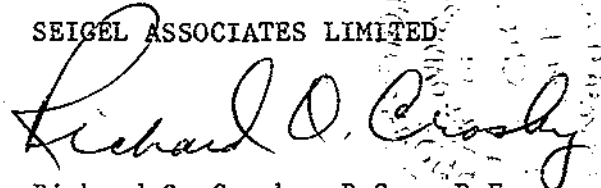
Further magnetic surveying should be limited to tracing these magnetic features on the ground to determine geologically their origin. The faults and the intersections of faults with each other and with the basic rocks are favourable locations for



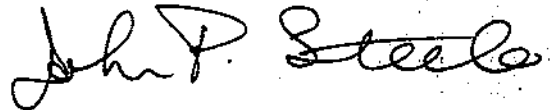
further study geologically. Geochemical surveys have proven to be definitive in this area and should be conducted in these locations as well.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

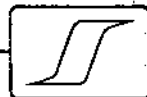


Richard O. Crosby, B.Sc., P.Eng.
Geophysicist



John P. Steele, B.Sc.
Geophysicist

Vancouver, B. C.
May 6, 1971



APPENDIX 'A'

MAGNETOMETER - SCINTREX NPM-1

The Scintrex NPM-1 nuclear resonance airborne magnetometer is based on a Newmont modification of a Varian Associates magnetometer and is produced under license to both companies. It is a very light weight, solid state unit, especially designed for use in a helicopter or light fixed-wing aircraft where weight is an important consideration.

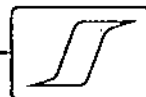
Its cycle period is 1.1 seconds. Each cycle it measures the total intensity of the earth's magnetic field and this quantity, in gammas, is recorded, in analogue form, on a suitable graphic recorder. The full scale sensitivity is usually 1000 gammas and the recorder automatically steps each 500 gammas. In very active areas a full scale sensitivity of 5000 gammas with steps of 2,500 gammas may be employed. Only the magnetic variations are actually recorded although the absolute base level may be established from the NPM-1 as well.

The magnetic sensing head may be on a cable as much as 100 ft. below the aircraft or, in some installations, may be rigidly attached to the aircraft on a suitable boom.

The intrinsic noise level of each reading is about 5 gammas.

Where it is intended to contour the NPM-1 information it is customary to fly tie lines across the survey grid. A fixed magnetic field monitor is often used as well, on the ground, primarily to indicate periods of magnetic storms during which the aeromagnetic data should be considered as unreliable.

The aeromagnetic data may be contoured if desired, using a contour interval of 25 gammas or up, depending on the amount of magnetic relief. Alternatively they may be used simply for purposes of correlation with simultaneously obtained electromagnetic data to determine which conductor zones are appreciably magnetic.



ANCILLARY EQUIPMENT

1. Altimeter

A Bonzer, high frequency solid state radio altimeter is employed to continuously indicate the mean terrain clearance of the helicopter or other transporting aircraft. The altimeter is installed in the aircraft (unless otherwise indicated) so that the elevation of the sensing birds (electromagnetic or magnetic) will be less by the usual vertical displacement of these birds below the aircraft.

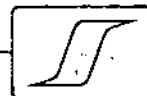
The output of the Bonzer may be expressed in analogue form on a suitable graphic recorder, or may be, for convenience, converted to a semi-digital form on a recorder side pen. In the latter event the altimeter record is a series of spaced pulses whose separation is proportional to the mean terrain clearance.

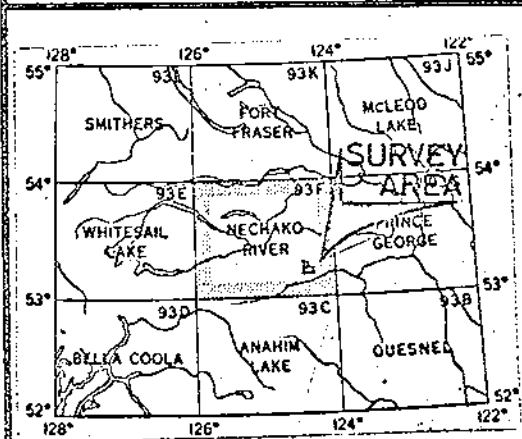
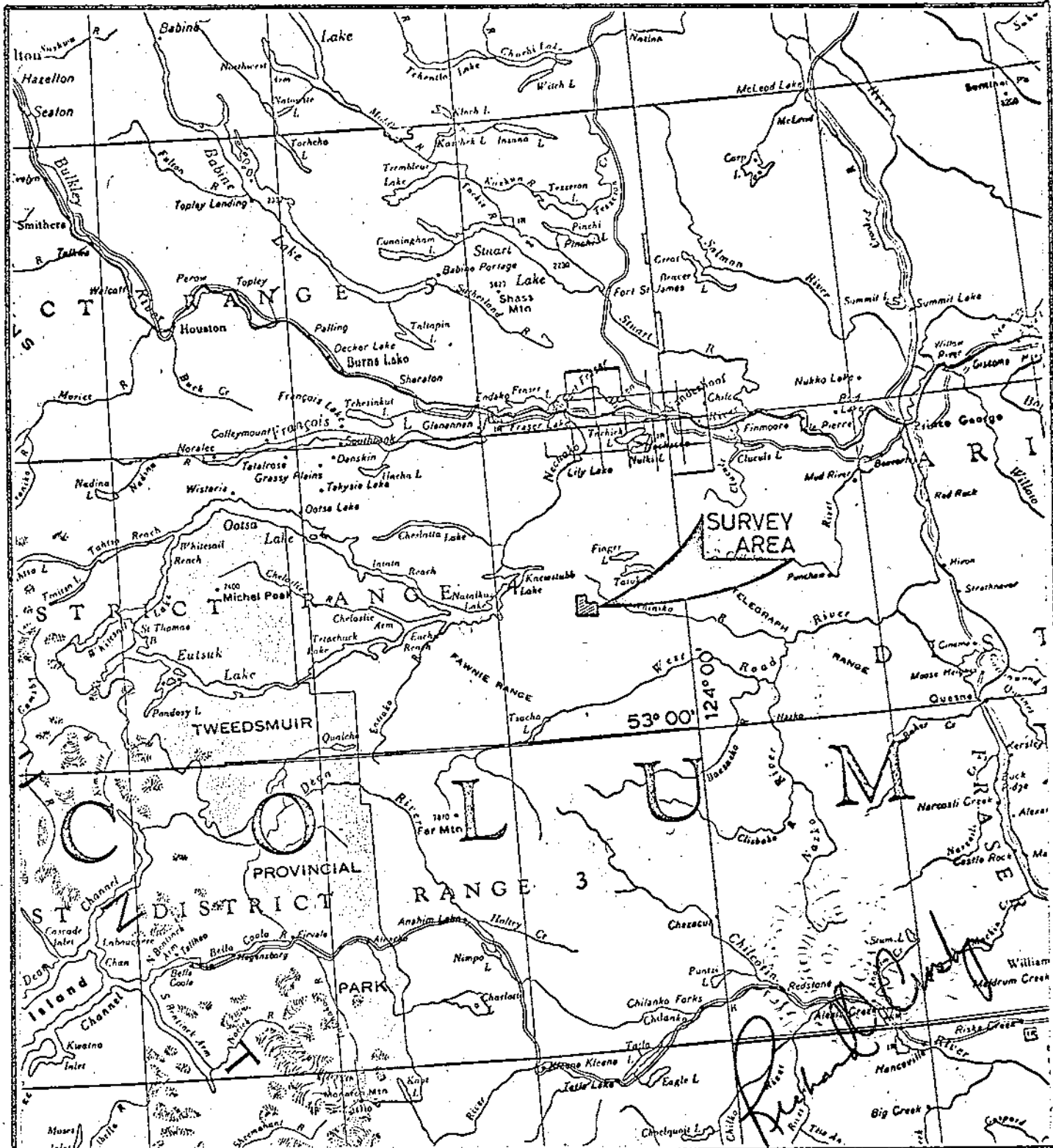
2. Positioning Camera

A Vinten Mark 3 16 mm positioning camera is employed with a wide angle lens. Photographs of the ground are taken with sufficient frequency to give a complete record of the flight path of the aircraft or helicopter. The frequency of exposure is controlled by the intervalometer referred to below.

3. Intervalometer

A Scintrex IA-2 intervalometer provides regularly spaced timing pulses which drive the positioning camera exposure mechanism and produces synchronous "fiducial marks" on the side pen of the geophysical graphic recorder or recorders. Because of the synchronization of the geophysical traces and the positioning camera it is then possible to relate the geophysical events of interest to their proper ground location. The timing pulse frequency may be adjusted in accordance with the ground speed of the aircraft so that an adequate flight path record is obtained.





RIO TINTO CANADIAN EXPLORATION LTD.

LOCATION MAP

AIRBORNE GEOPHYSICAL SURVEY

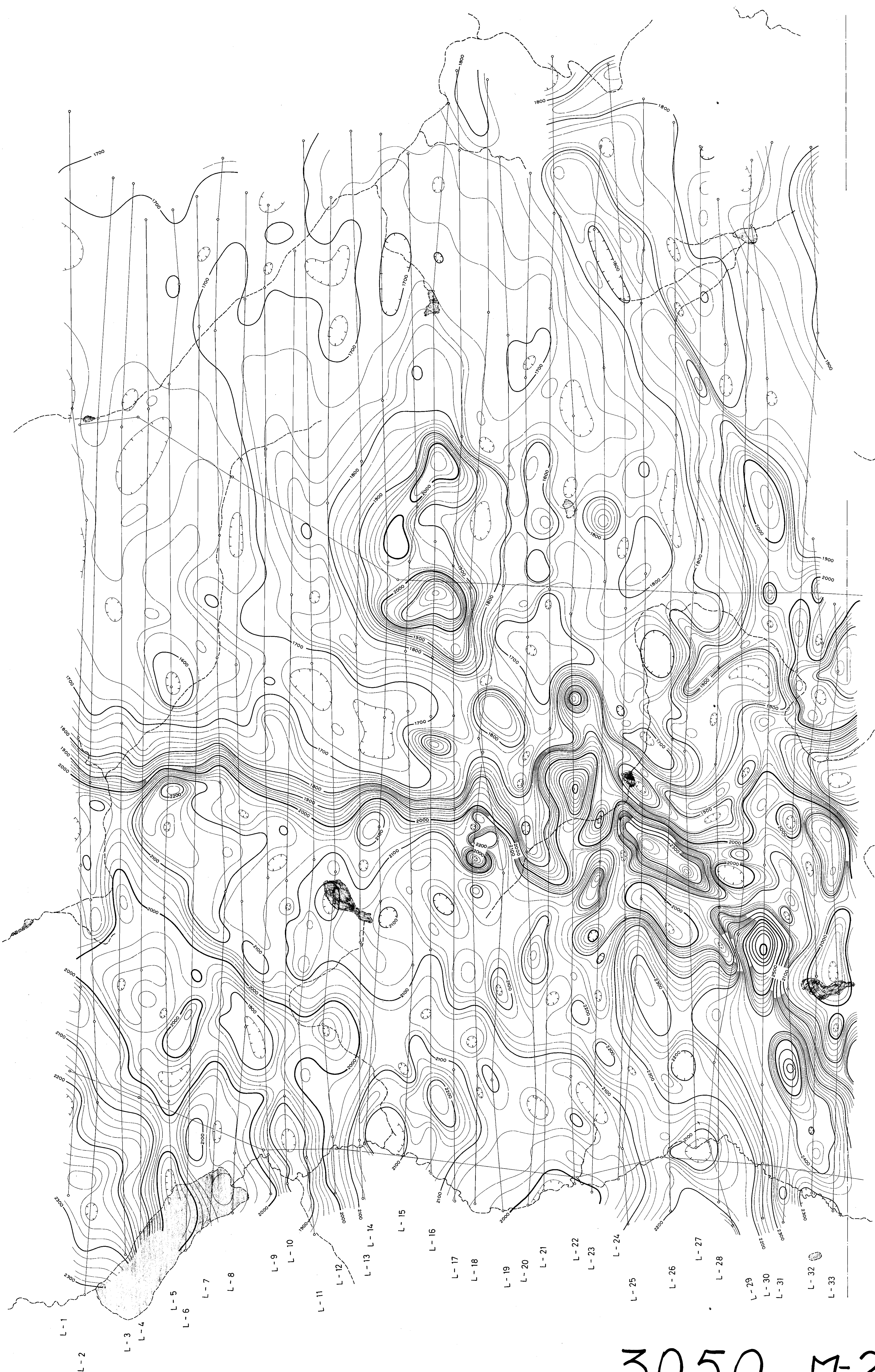


SEIGEL ASSOCIATES LIMITED
APRIL 1971

PLATE 1

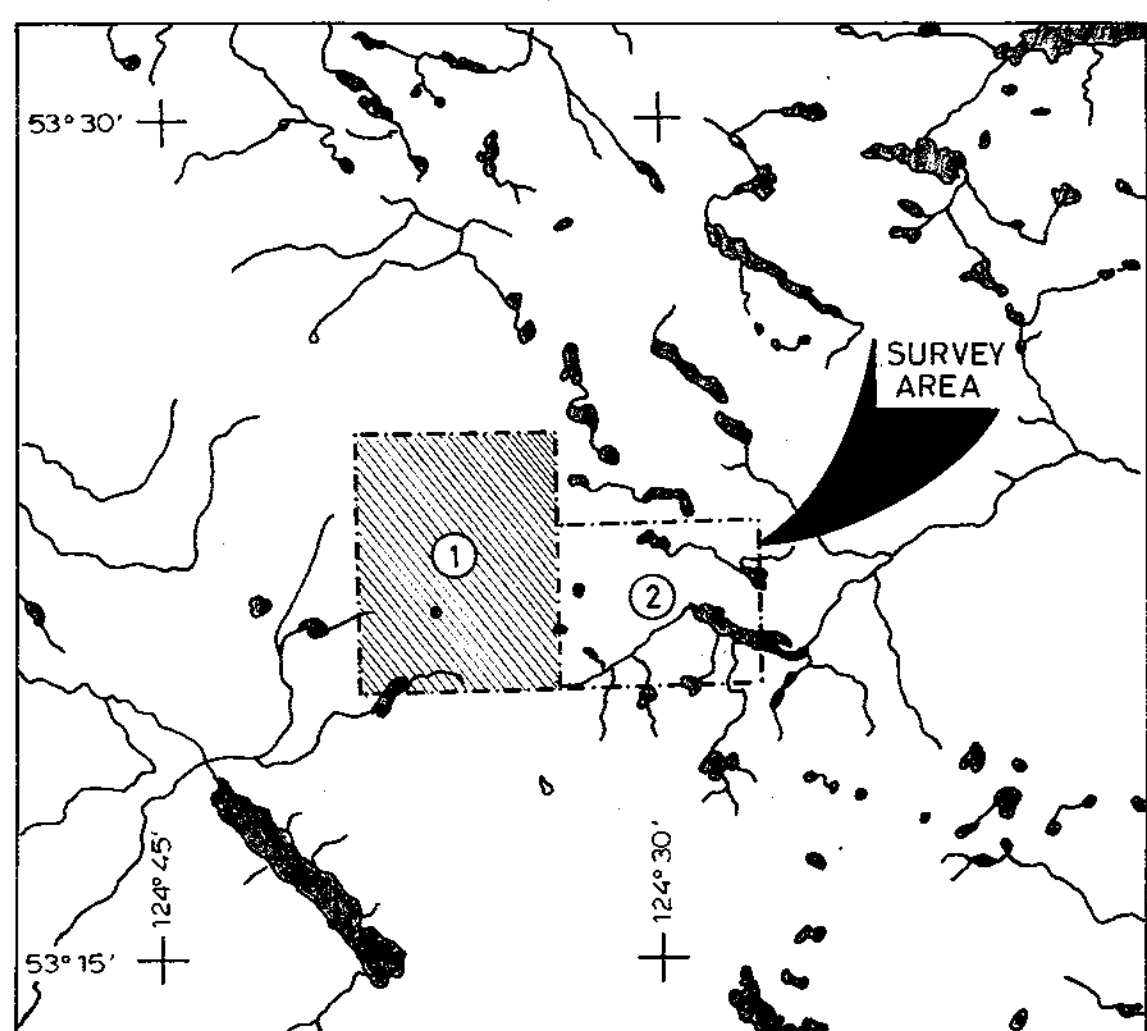
DEPARTMENT OF
MINES AND PETROLEUM RESOURCES
ASSESSMENT REPORT
NO. 3050 MAP 1

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3050 MAP 1



3050 M-2

LOCATION MAP
SCALE 1" = 4 MILES



LEGEND

- L-2 FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINTS
- 500 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- 100 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- 20 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- MAGNETIC LOW
- AIRCRAFT TERRAIN CLEARANCE 300 FEET
- FLIGHT LINE SPACING 1000 FEET
- BASE INTENSITY 57,000 GAMMAS
- DRAINAGE

TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY AND JOHN P. STEELE DATED: 6 MAY 1971

PLATE 2
RIO TINTO CANADIAN EXPLORATION LTD.
PRINCE GEORGE AREA, B.C.

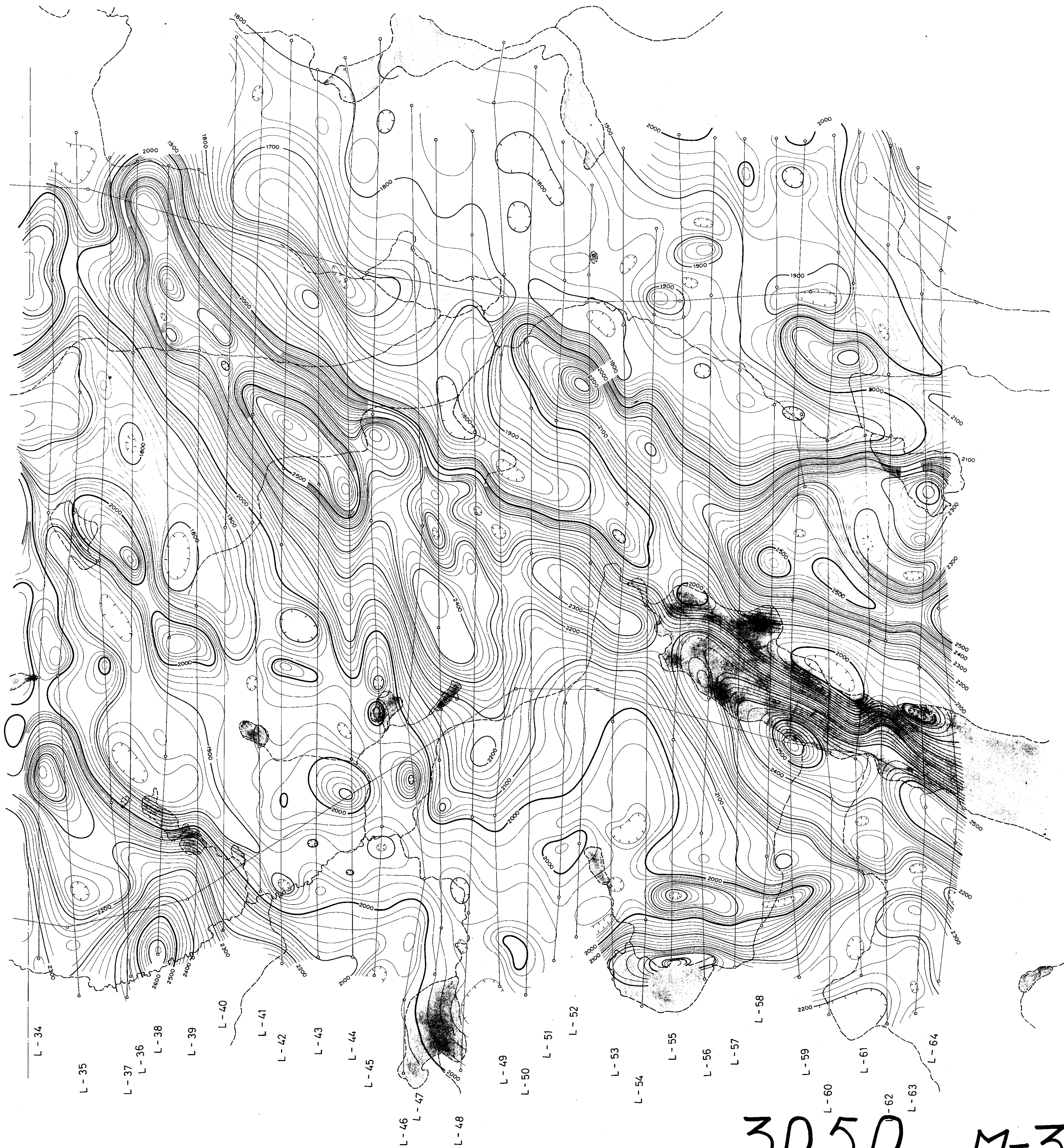
AIRBORNE GEOPHYSICAL SURVEY
MAGNETOMETER CONTOUR PLAN

APPROX. SCALE 1" = 1/4 MILE



Department of
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ASSESSMENT REPORT
NO. 3050 MAP M-2

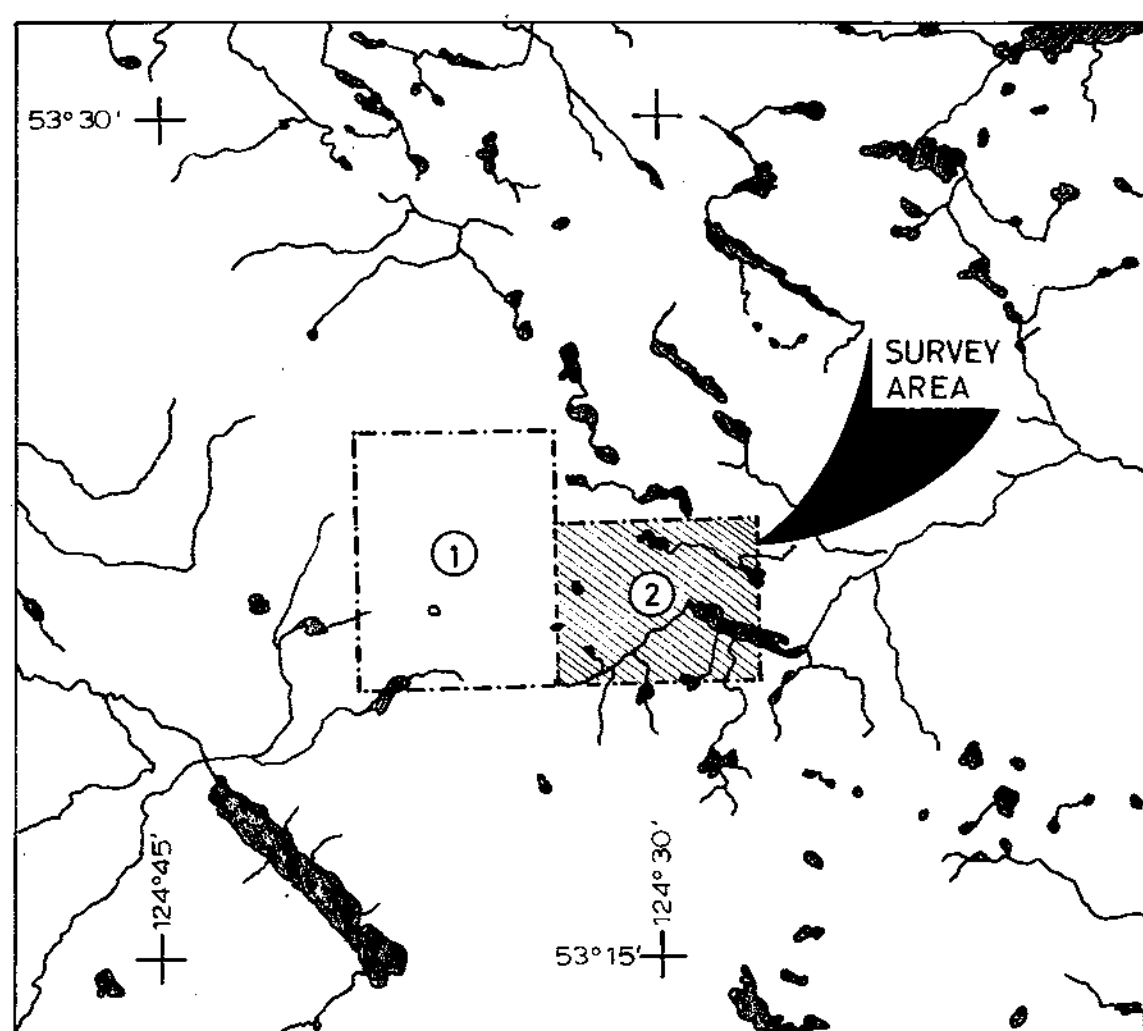
SURVEY BY SEIGEL ASSOCIATES LIMITED
FLOWN AND COMPILED APRIL 1971



3050 M-3

LOCATION MAP

SCALE 1" = 4 MILES



LEGEND

- L-2 ———— FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINTS
- ~~~~~ 500 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- ~~~~~ 100 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- ~~~~~ 20 GAMMA ISOMAGNETIC CONTOUR INTERVAL
- MAGNETIC LOW
- AIRCRAFT TERRAIN CLEARANCE 300 FEET
- FLIGHT LINE SPACING 1000 FEET
- BASE INTENSITY 57,000 GAMMAS
- DRAINAGE

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 BY RICHARD O. CROSBY AND JOHN P. STEELE
 DATED: 6 MAY 1971

PLATE 2
 RIO TINTO CANADIAN EXPLORATION LTD.
 PRINCE GEORGE AREA, B.C.

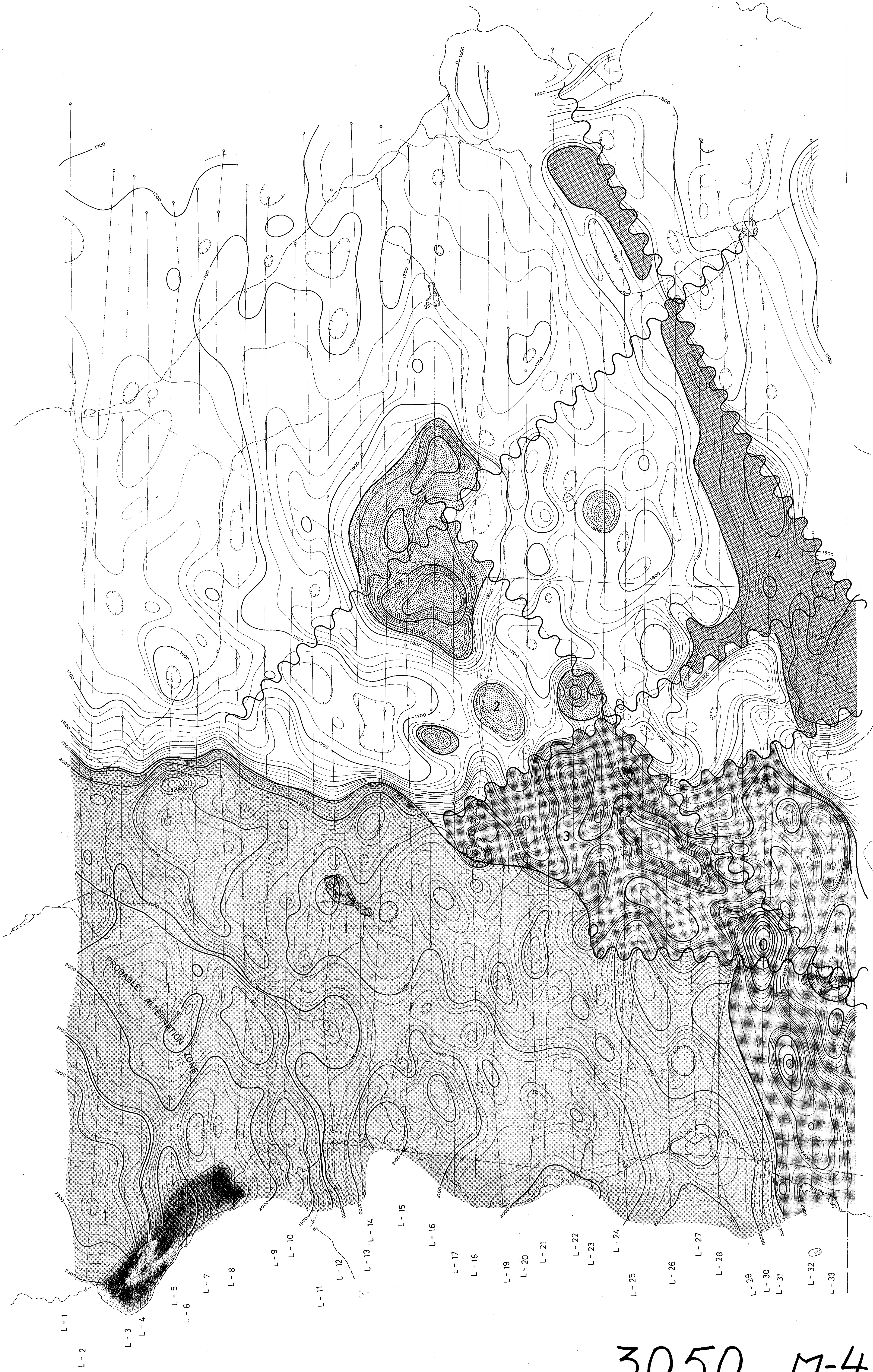
AIRBORNE GEOPHYSICAL SURVEY
 MAGNETOMETER CONTOUR PLAN

APPROX. SCALE 1" = 1/4 MILE
 0 1/2 1 MILE

SURVEY BY SEIGEL ASSOCIATES LIMITED

FLOWN AND COMPILED APRIL 1971

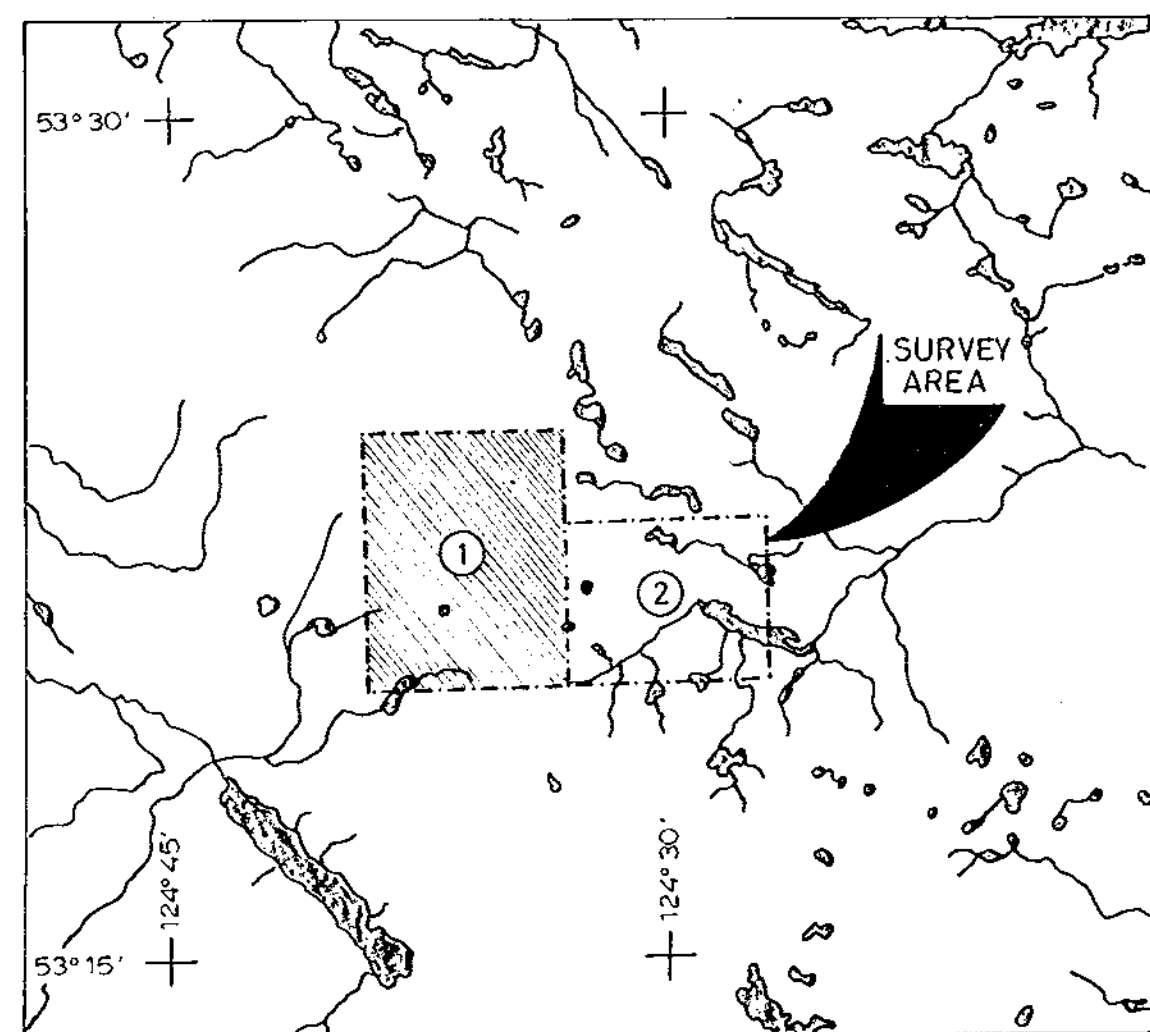
Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 3050 MAP



3050 M-4

LOCATION MAP

SCALE 1" = 4 MILES



LEGEND

- L-2 ———— FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINTS
- 1 ACIDIC INTRUSIVE
- 2 INTERMEDIATE INTRUSIVE
- 3 BASIC ROCKS
- 4 MORE BASIC ROCKS
- — — — — PROBABLE FAULT
- - - - - PROBABLE GEOLOGICAL CONTACT
- - - - - DRAINAGE

TO ACCOMPANY A GEOPHYSICAL REPORT
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 AND JOHN P. STEELE
 DATED: 6 MAY 1971

PLATE 3
 RIO TINTO CANADIAN EXPLORATION LTD.
 PRINCE GEORGE AREA, B.C.

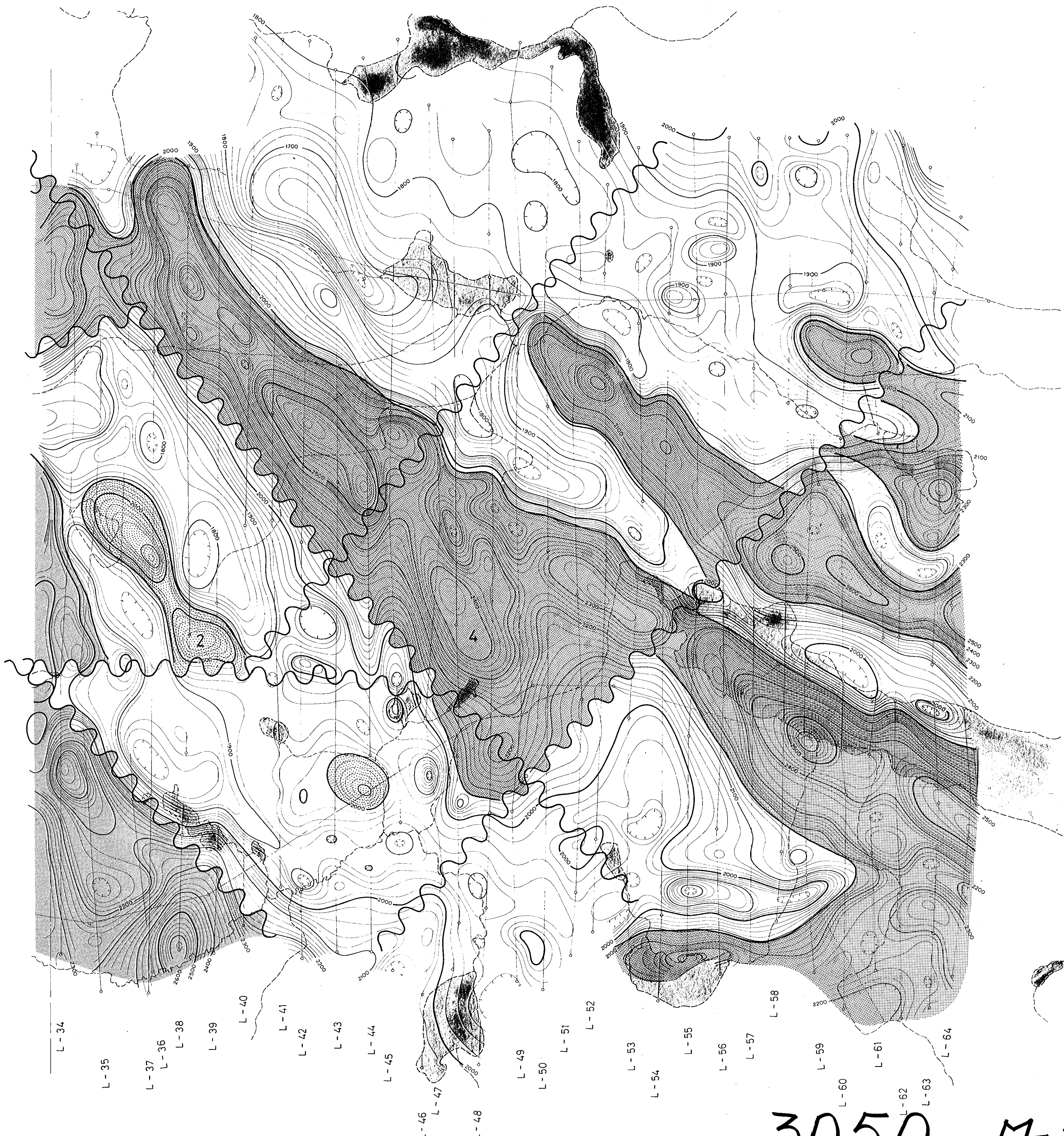
AIRBORNE GEOPHYSICAL SURVEY
 MAGNETOMETER CONTOUR PLAN
 AND GEOPHYSICAL INTERPRETATION

APPROX. SCALE 1" = 1/4 MILE



SURVEY BY SEIGEL ASSOCIATES LIMITED

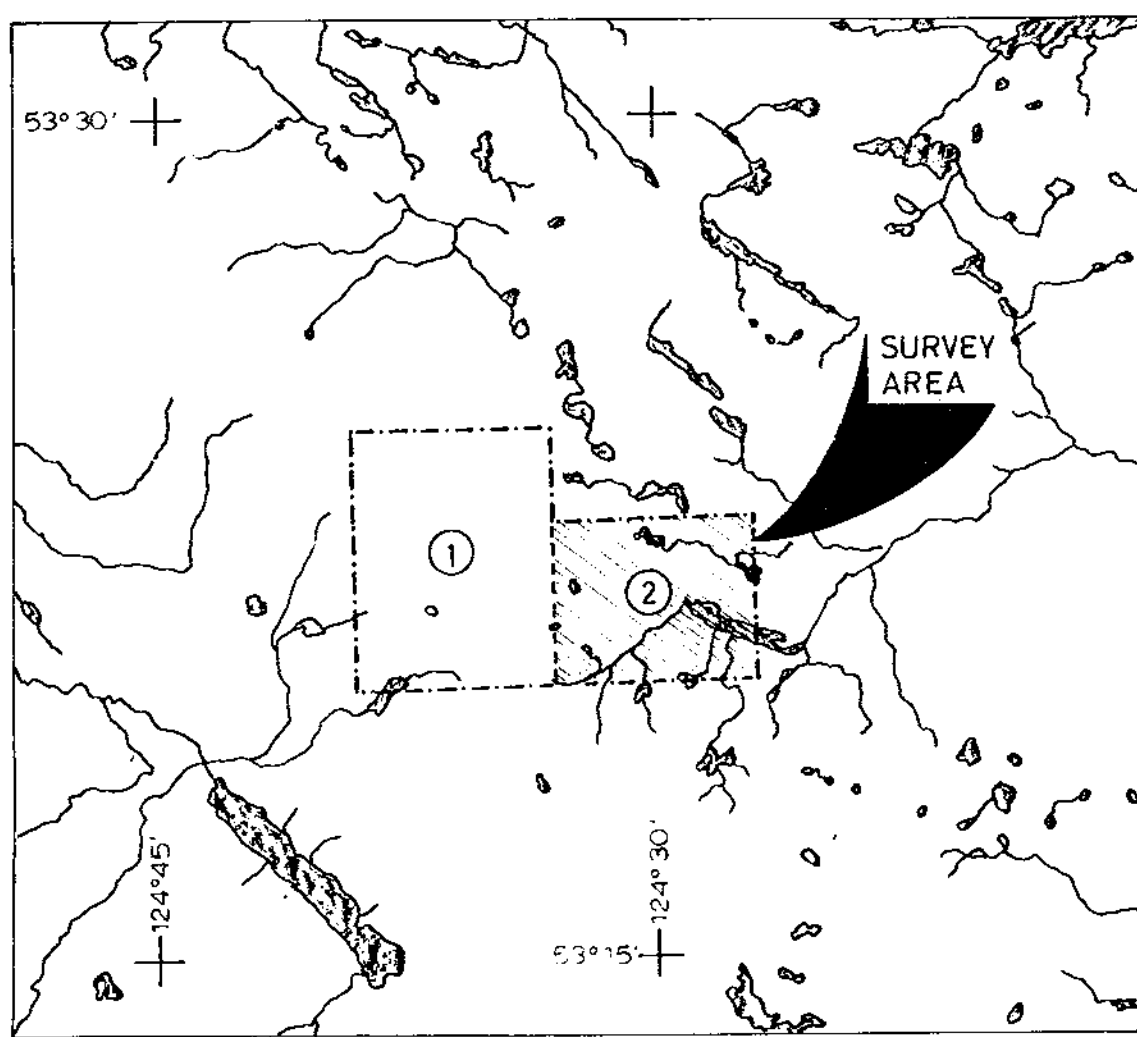
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3050 M-5

LOCATION MAP

SCALE 1" = 4 MILES



LEGEND

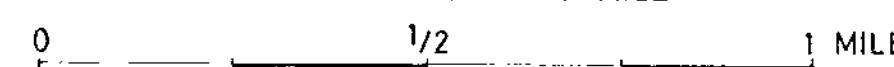
- L-2 ——— FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINTS
- 1 ACIDIC INTRUSIVE
- 2 INTERMEDIATE INTRUSIVE
- 3 BASIC ROCKS
- 4 MORE BASIC ROCKS
- ~~~~~ PROBABLE FAULT
- - - - - PROBABLE GEOLOGICAL CONTACT
- - - - - DRAINAGE

TO ACCOMPANY A GEOPHYSICAL REPORT
 BY RICHARD O. CROSBY AND JOHN P. STEELE
 DATED: 6 MAY 1971

PLATE 3
 RIO TINTO CANADIAN EXPLORATION LTD.
 PRINCE GEORGE AREA, B.C.

AIRBORNE GEOPHYSICAL SURVEY
 MAGNETOMETER CONTOUR PLAN
 AND GEOPHYSICAL INTERPRETATION

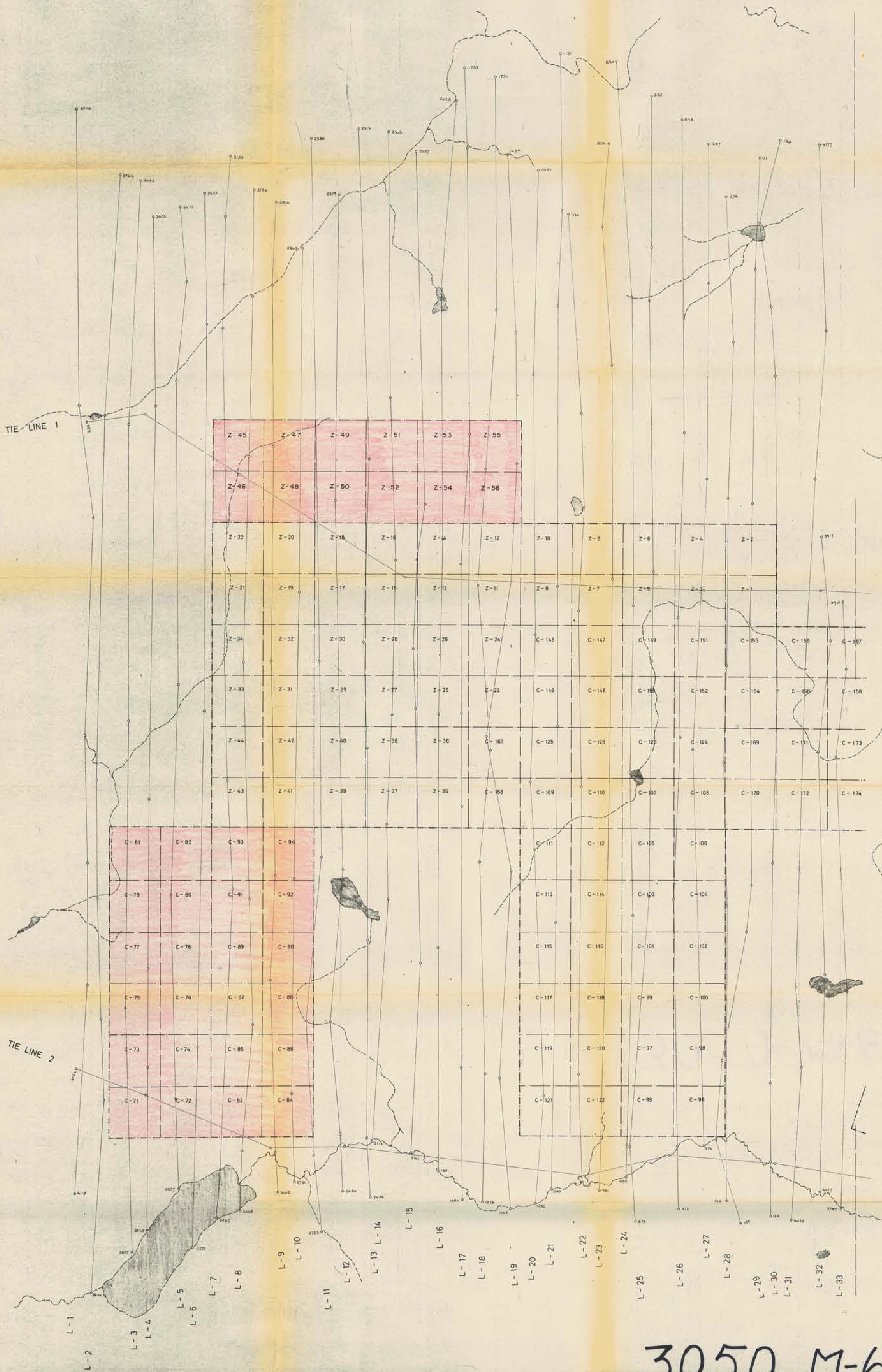
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SURVEY BY SEIGEL ASSOCIATES LIMITED

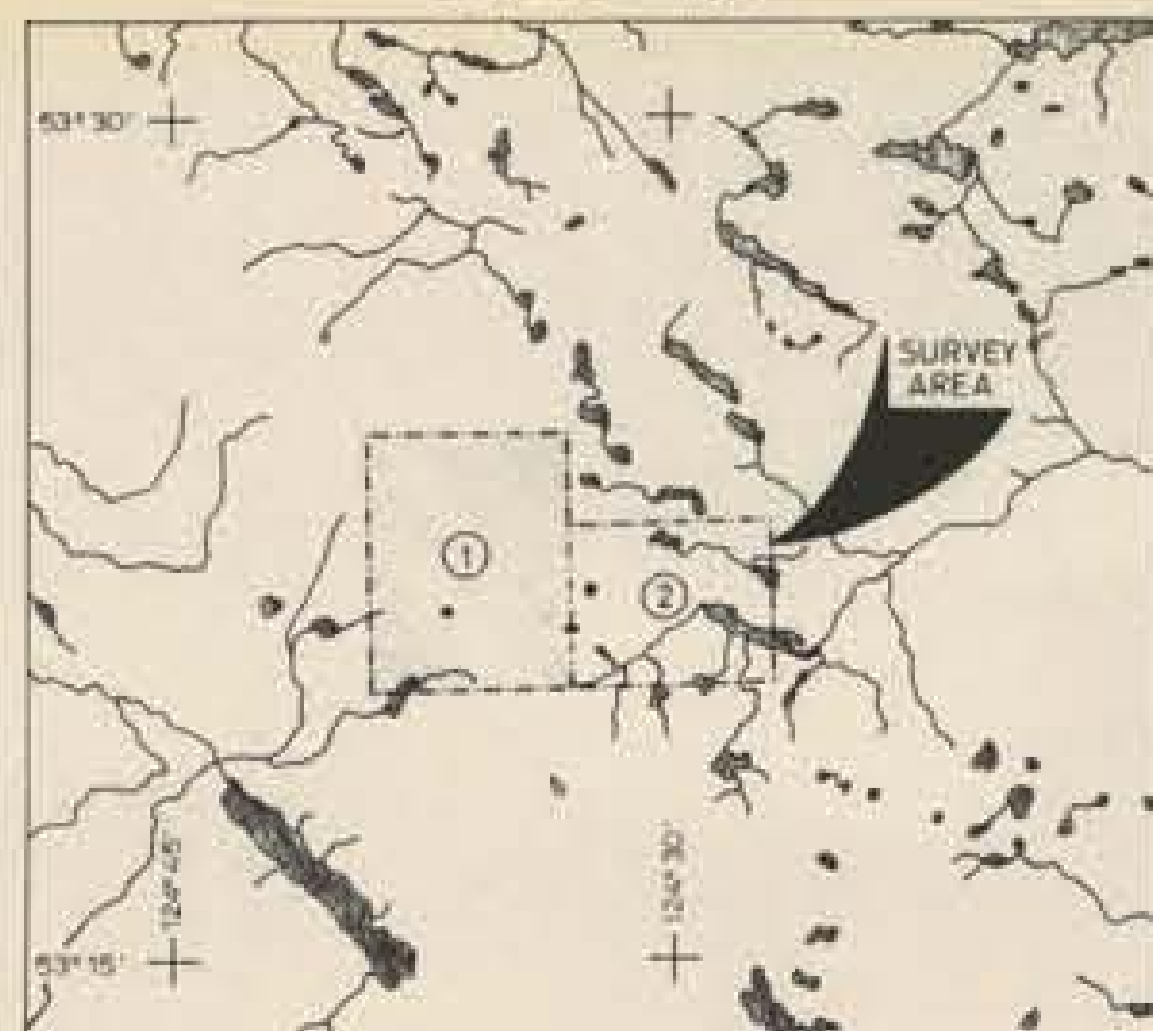
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 AIRBORNE REPORT
 NO. 3050 M-5



3050 M-6

LOCATION MAP
SCALE 1" = 4 MILES



LEGEND

- L-2 ———— FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINTS
- CLAIMS

PLATE 4
RIO TINTO CANADIAN EXPLORATION LTD.
PRINCE GEORGE AREA, B.C.

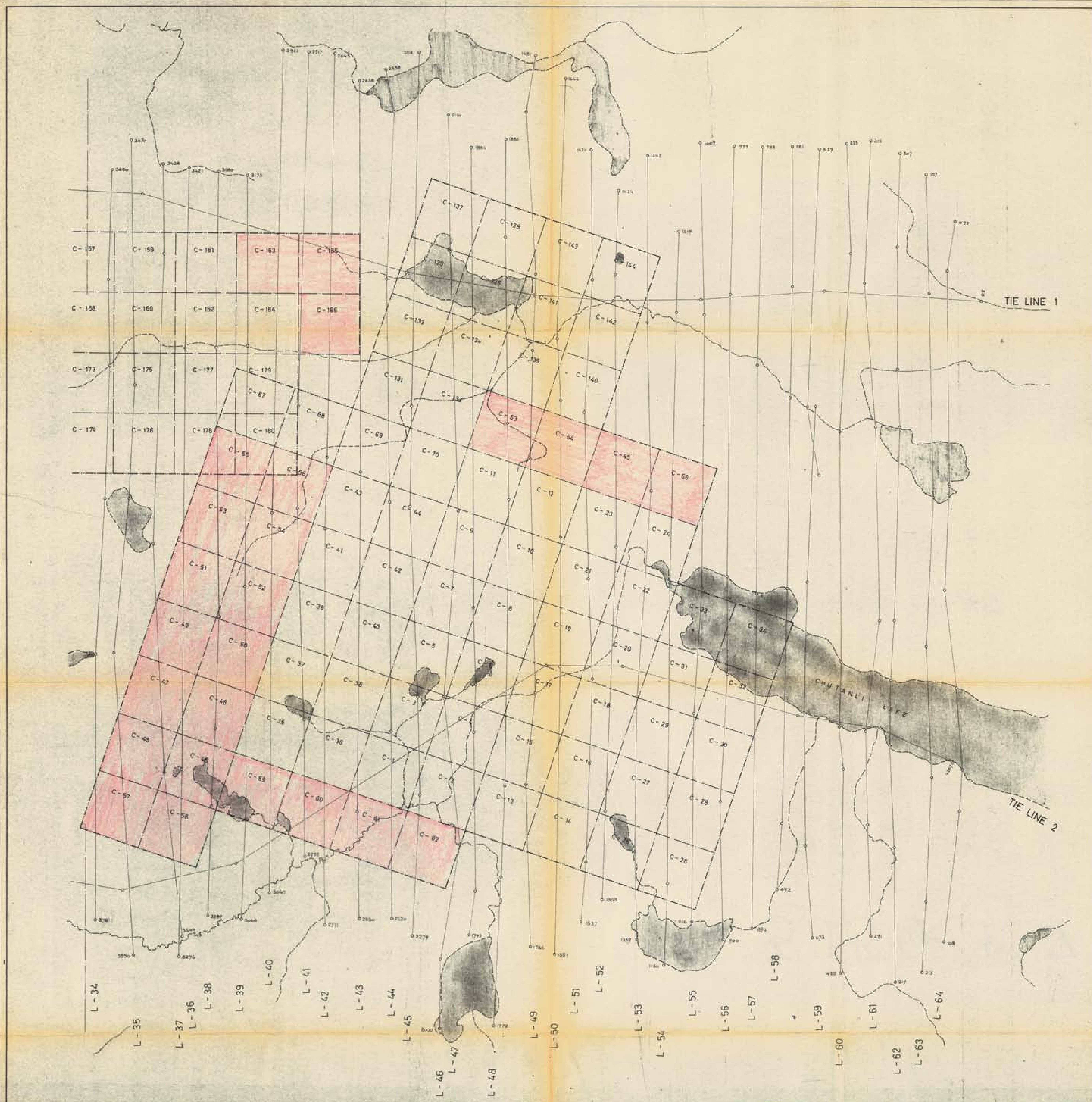
AIRBORNE GEOPHYSICAL SURVEY
FLIGHT LINES AND CLAIM LOCATION

APPROX. SCALE 1" = 1/4 MILE
0 1/2 1 MILE

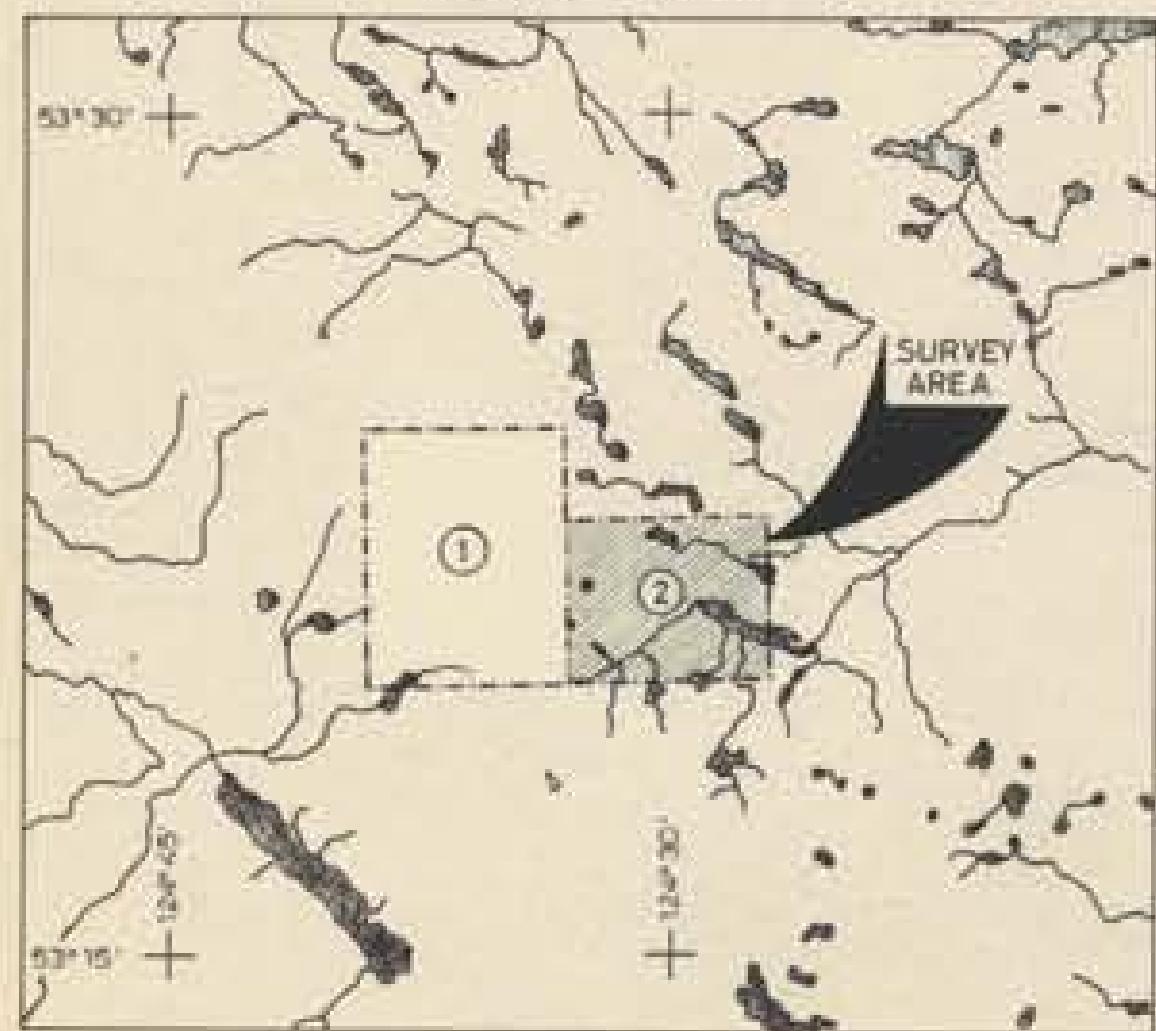
SURVEY BY SEIGEL ASSOCIATES LIMITED
FLOWN AND COMPILED APRIL 1971

TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY AND
JOHN P. STEELE DATED 6 MAY 1971

Department of
Natural Resources
Geological Survey of Canada
3050 MAP



LOCATION MAP
SCALE 1" = 3 MILES



LEGEND

- L-2 ———— 0.01 ———— FLIGHT LINE, FLIGHT LINE NUMBER AND NUMBERED FIDUCIAL POINTS
- CLAIMS

3050 M-7
PLATE 4

RIO TINTO CANADIAN EXPLORATION LTD.
PRINCE GEORGE AREA, B.C.

AIRBORNE GEOPHYSICAL SURVEY
FLIGHT LINES AND CLAIM LOCATION



SURVEY BY SEIGEL ASSOCIATES LIMITED
DRAWN AND COMPILED APRIL 1971

TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY AND JOHN P. STEELE
DATED: 5 MAY 1971

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ASSESSMENT REPORT
NO 3050 MAP 47