2878

92I/11W, 13E, 14W

REPORT ON AIRBORNE GEOPHYSICAL SURVEYS SALAL CREEK, MOLYBDENITE PROPERTY BRITISH COLUMBIA ON BEHALF OF SILVER STANDARD MINES LTD.

by

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

March 1, 1971

CLAIMS:

Name	
STAR	1-66 inclusive
STAR	101-124 inclusive
STAR	128, 130, 132, 140, 142

LOCATION:

About 110 miles north of Vancouver, B. C.
Lillooet Mining Division
50° 134° NE

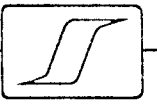
DATES:

December 20, 1970 to January 3, 1971

TABLE OF CONTENTS

SUMMARY

A helicopter-borne magnetometer survey was executed over approximately 26 square miles in the Salal Creek area, British Columbia. The survey has revealed an area of intense magnetic relief over which geological and geochemical reconnaissance is recommended. Other magnetic features have been found to coincide with known mineralized outcrops and therefore similar features under alluvium or glacial cover should be investigated.



REPORT ON
AN AIRBORNE GEOPHYSICAL SURVEY
SALAL CREEK, MOLYBDENITE PROPERTY
BRITISH COLUMBIA
ON BEHALF OF
SILVER STANDARD MINES LTD.

INTRODUCTION

During the period December 20, 1970 to January 3, 1971, an airborne geophysical survey was executed on behalf of Silver Standard Mines Ltd. in the Pemberton area, British Columbia covering approximately 26 square miles (see Plate 1). Centre of the area is located 50°47'N, 124°25'W. Basic compilation of the data was carried out between January and February 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 Bell Jet Ranger helicopter, on charter from Okanagon Helicopters, was employed as the basic transport vehicle.

The survey traverses were flown at a nominal 1000' line interval along lines oriented northwest-southeast at a mean terrain clearance of 300'. Flight navigation and flight path recovery have been based upon photomosaics on the scale of approximately 1" = 1000'.

The magnetometer sensor was flown 60' below the helicopter.

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

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

The value of the earth's total magnetic field in the survey area is approximately 58,200 gammas. The inclination is 73°.

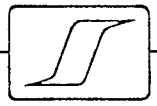
GEOLOGY

The property is dominated by a large texturally zoned quartz monzonite stock which consists of a coarse grained envelope and a fine grained core. However a large portion of the property is covered by overburden and glaciers, much is leached and some is inaccessible due to steep terrain. The property is described in the Mines and Petroleum Resources Report, 1966. Various types of acidic and basic dykes occur widely on the property.

Mineralization is widespread and is related to shears, veins and fractures which locally make stockworks and breccias. Most of the structures dip steeply and trend easterly or northeasterly. Magnetite is disseminated in some of the altered rocks and may be a product of mineralization. Some silicification and silication are also recognized. The geology is considered favourable for the formation of a major molybdenite ore body.

PRESENTATION OF DATA

The results of the geophysical survey are presented on Plates 2 and 3 on the scales of 1" = 660' and 1" = 1320' respectively. Some topographic features and flight lines are shown on the plates. These plates show the magnetic contours at an interval of 100 gammas or less, according to the relief, and Plate 3 also shows the claim locations.



The magnetometer data are presented together with altimeter and fiducial recording on analog recorder traces.

The original traces are on a scale of 1" = 100 gammas with automatic steps of 500 gammas.

DISCUSSION OF RESULTS

The observed magnetic relief is a total of 3200 gammas and occurs primarily in the northwestern and southeastern quarters of the survey area. The magnetic relief over the remaining half of the survey area is of the order of a few hundreds of gammas. The most prominent feature of the aeromagnetic results is a contorted area of 1300 to 2100 gammas of relief lying in the vicinity of mineral claims 1 to 5 inclusive and 7, 9 and 50 in the southeast quarter of the survey area. Examination of available geological coverage as furnished by Silver Standard Mines Ltd. indicates that this anomalous region is underlain by Tertiary-Recent lavas, dykes, necks, etc., predominately basalt, but also including acid types. The magnetics in this case suggest an absence of acid rocks. Another prominent anomalous zone located immediately northwest of mineral claims 110, 111 and 112 is underlain by similar rocks.

The contour map shows a high degree of correlation between the magnetic "grain" and the geologic map, allowing probable geologic contacts to be projected under the glacial or alluvial cover, especially in the central part of the area.

Persistent gradients and off-sets in anomalous patterns probably indicate extensive faulting and shearing. The most prominent directions are northwest-southeast, east-west and north-northeasterly and north-northwesterly.

The magnetic contours also exhibit a parallelism to the flight lines suggesting that a more northerly flight direction would have been preferred. This was realized prior to the flying, however due to the extremely rugged topography a more constant terrain clearance was maintained by this present direction.

CONSLUSIONS AND RECOMMENDATIONS

The airborne geophysical survey has indicated an area of intense magnetic relief. While it has been mapped as volcanic rocks, the area should be checked for evidence of skarn mineralization. Geological and geochemical reconnaissance is recommended in this area.

Known outcrops of granodiorite and mineralized zones coincide with magnetic features. Similar features under alluvial and glacial cover may result from similar conditions and will have to be checked. Detailed geological examination of magnetic features will determine areas warranting additional geophysical surveying and drilling.

Respectfully submitted,

SEIGEL ASSOCIATES LIMITED

Richard O. Crosby

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

Vancouver, B. C.
March 1, 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 radioaltimeter 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.

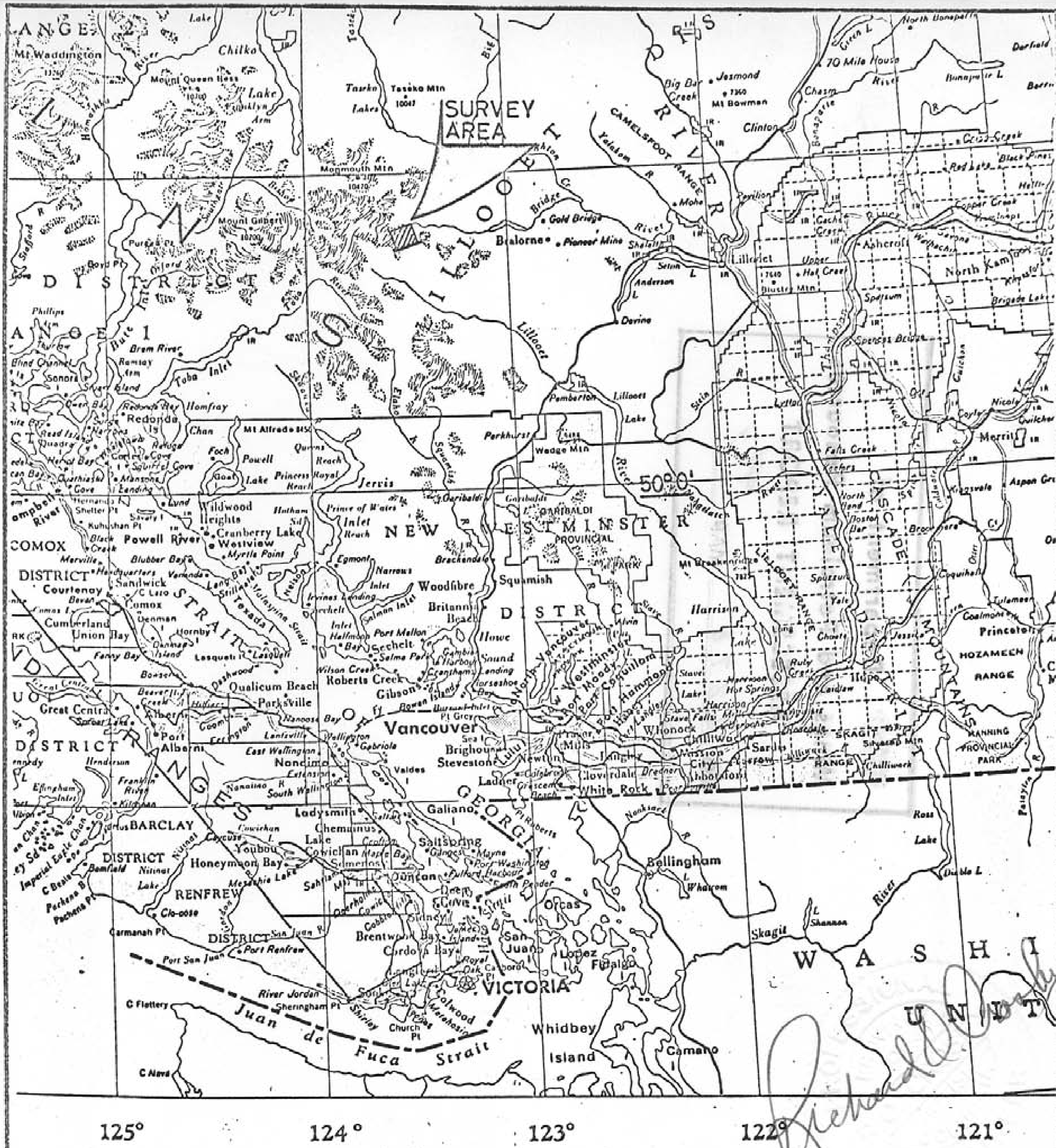
The output of the Bonzer may be expressed in analogue form on a suitable graphic recorder, or may be, for convenience, converted to a semi-digital form on a recorder side pen. In the latter event the altimeter record is a series of spaced pulses whose separation is proportional to the mean terrain clearance.

2. Positioning Camera

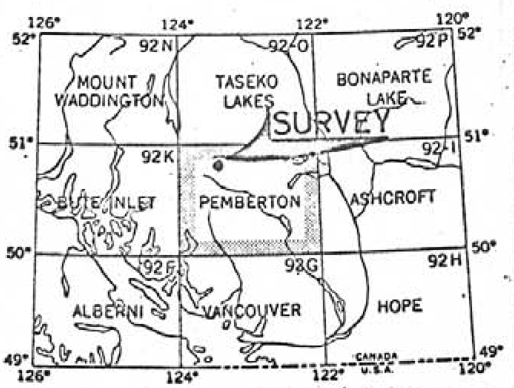
A Vinten Mark 3 16 mm positioning camera is employed with a wide angle lens. Photographs of the ground are taken with sufficient frequency to give a complete record of the flight path of the aircraft or helicopter. The frequency of exposure is controlled by the intervalometer referred to below.

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.



SILVER STANDARD MINES LTD.



LOCATION MAP

AIRBORNE GEOPHYSICAL SURVEY

0 32 64 96 MILES

SURVEY BY
SEIGEL ASSOCIATES LIMITED
DEC. - JAN. 1970 - 1971

PLATE 1

Richard D. [signature]

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
TO WIT:

In the Matter of a geophysical survey on behalf of Silver Standard Mines Ltd.

I, L. A. Merrifield for Seigel Associates Limited

of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that an airborne magnetometer survey has been executed on some STAR claims Pemberton area, British Columbia between December 20, 1970 to January 4, 1971. The following expenses were incurred:

(1)	Wages:			
	C. Mohagen	15 days @ $40.00/day	$600.00	
	R. Sheldrake	15 days @ $35.00/day	525.00	
	A. Trachsler	15 days @ $35.00/day	525.00	
			$1,650.00	$1,650.00
(2)	Food & living expenses			67.50
(3)	Use of geophysical equipment 15 days @ $150.00/day			2,250.00
(4)	Paid to Seigel Associates Limited to cover geophysicist's supervision, calculating, plotting and fairdrawing data and preparation of final reports.			5,718.53
				$9,686.03

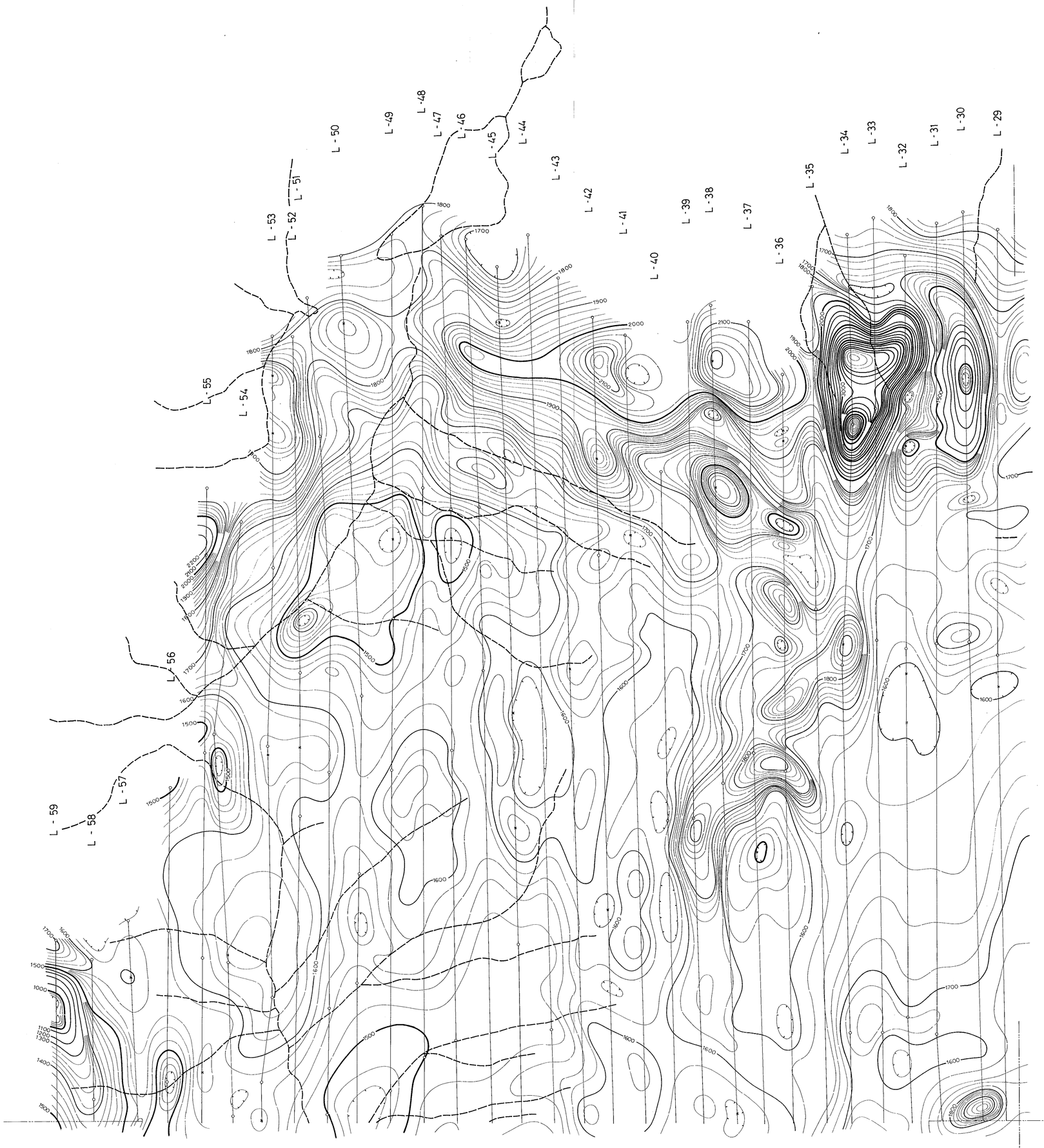
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 3rd day of March, 1971, A.D.

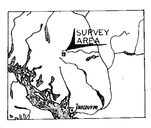
L. A. Merrifield

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

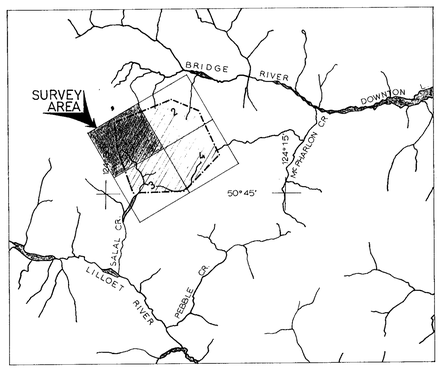
A Mining Recorder



2878 M-2



LOCATION MAP



TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY DATED: 1. MARCH 1971

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'

FLIGHT LINE SPACING 1/8 MILE

BASE INTENSITY ARBITRARY

DRAINAGE

PLATE 2

SILVER STANDARD MINES LTD. NPL.

SALAL CREEK MOLYBDENITE PROPERTY

LILLOOET MINING DIVISION — BRITISH COLUMBIA

AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER CONTOUR PLAN

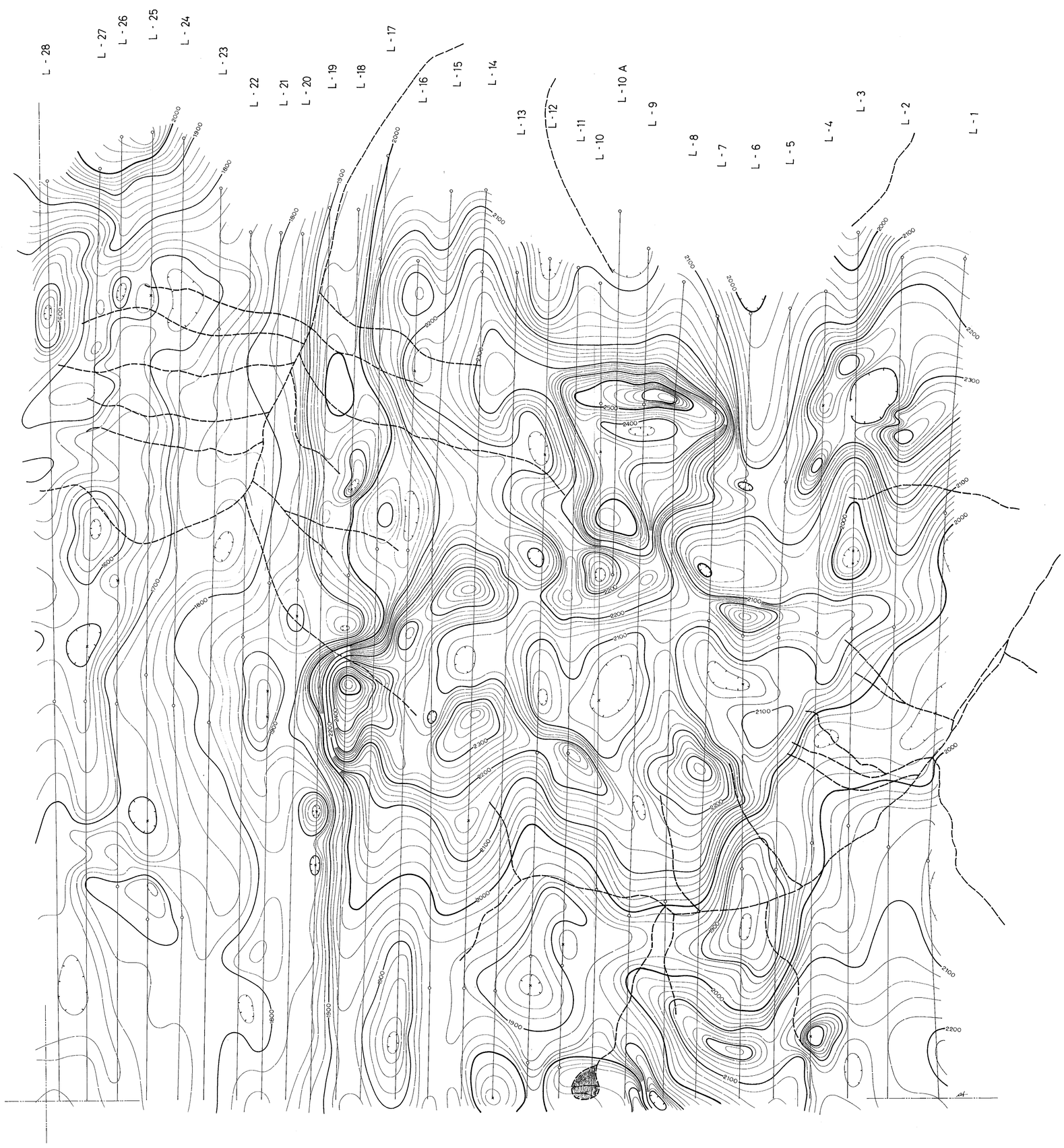
APPROX SCALE 1"= 660 FEET

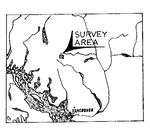
0 — ½ MILE

SURVEY BY SEIGEL ASSOCIATES LIMITED

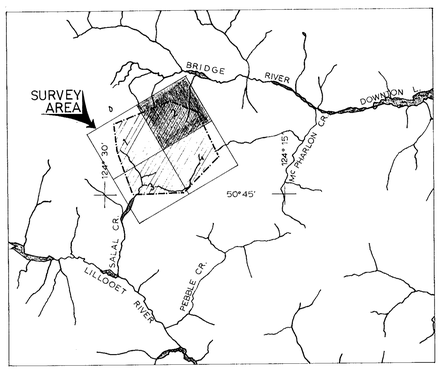
FLOWN AND COMPILED DEC.- JAN. 1970-1971

SHEET 1 OF 4





LOCATION MAP



TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY DATED: 1. MARCH 1971

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'
- FLIGHT LINE SPACING 1/8 MILE
- BASE INTENSITY ARBITRARY
- DRAINAGE

PLATE 2

SILVER STANDARD MINES LTD. NPL.

SALAL CREEK MOLYBDENITE PROPERTY
LILLOOET MINING DIVISION — BRITISH COLUMBIA

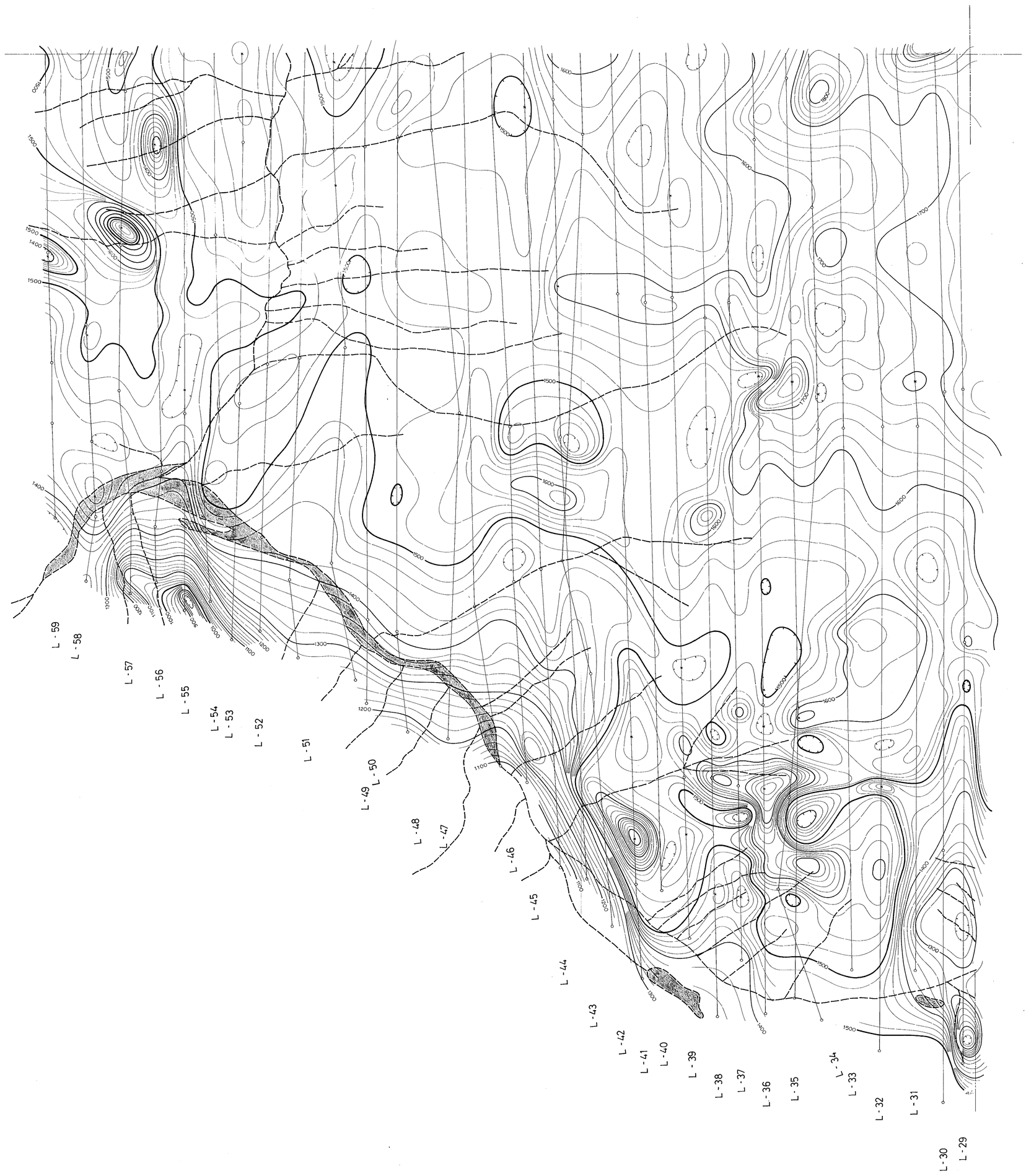
AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER CONTOUR PLAN

APPROX. SCALE 1"= 660 FEET
0 — 1/2 MILE

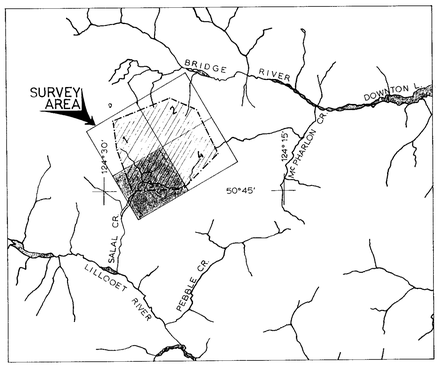
SURVEY BY SEIGEL ASSOCIATES LIMITED
FLOWN AND COMPILED DEC.- JAN. 1970 - 1971

Richard O. Crosby



N

LOCATION MAP



TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY DATED: 1. MARCH 1971

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'

FLIGHT LINE SPACING 1/8 MILE

BASE INTENSITY ARBITRARY

DRAINAGE

PLATE 2

SILVER STANDARD MINES LTD. NPL.

SALAL CREEK MOLYBDENITE PROPERTY

LILLOOET MINING DIVISION — BRITISH COLUMBIA

AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER CONTOUR PLAN

APPROX. SCALE 1"= 660 FEET

0 — 1/2 MILE

Department of Mines and Petroleum Resources ASSESSMENT REPORT NO. 2878 MAP #4

SURVEY BY SEIGEL ASSOCIATES LIMITED

FLOWN AND COMPILED DEC.- JAN. 1970 - 1971

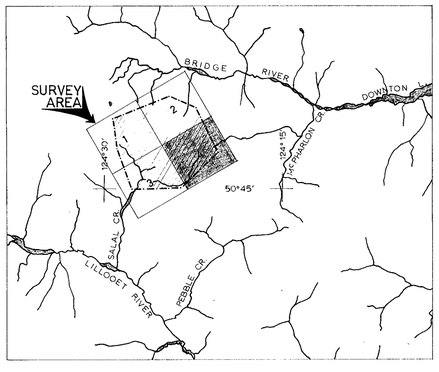
Richard O. Crosby

SHEET 3 OF 4

L-28 L-27 L-26 L-25 L-24 L-23 L-22 L-21 L-20 L-19 L-18 L-17 L-16 L-15 L-14 L-13 L-12 L-11 L-10 L-9 L-8 L-7 L-6 L-5 L-4 L-3 L-2 L-1

N

LOCATION MAP



TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY DATED: 1. MARCH 1971

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'

FLIGHT LINE SPACING 1/8 MILE

BASE INTENSITY ARBITRARY

DRAINAGE

PLATE 2

SILVER STANDARD MINES LTD. NPL.

SALAL CREEK MOLYBDENITE PROPERTY

LILLOOET MINING DIVISION — BRITISH COLUMBIA

AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER CONTOUR PLAN

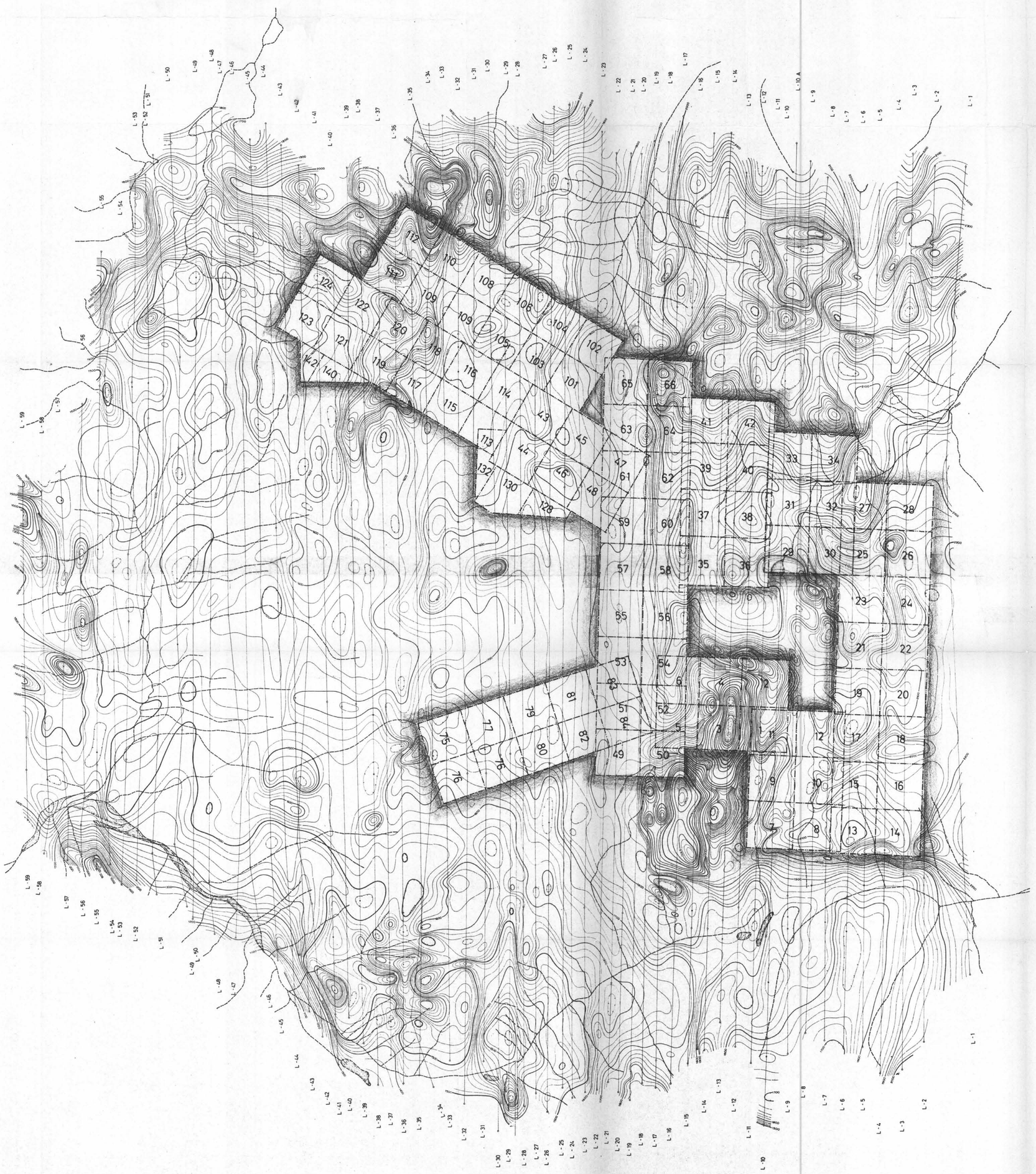
APPROX. SCALE 1"= 660 FEET

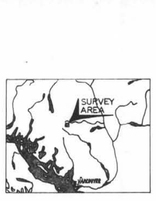
0 — ½ MILE

SURVEY BY SEIGEL ASSOCIATES LIMITED

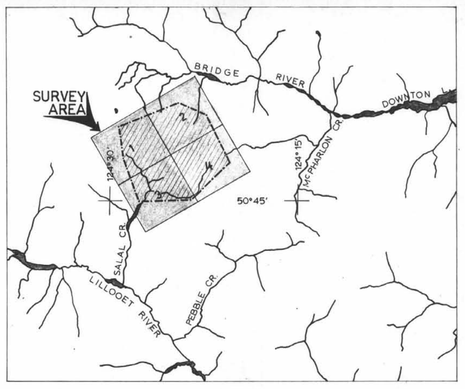
FLOWN AND COMPILED DEC.- JAN. 1970- 1971

Richard O. Crosby





LOCATION MAP



TO ACCOMPANY A GEOPHYSICAL REPORT
BY RICHARD O. CROSBY DATED: 1. MARCH 1971

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'

FLIGHT LINE SPACING 1/8 MILE

BASE INTENSITY ARBITRARY

DRAINAGE

STAR CLAIM GROUP

PLATE 3

SILVER STANDARD MINES LTD. NPL.

SALAL CREEK MOLYBDENITE PROPERTY

LILLOOET MINING DIVISION — BRITISH COLUMBIA

AIRBORNE GEOPHYSICAL SURVEY

MAGNETOMETER CONTOUR PLAN
CLAIM LOCATION

APPROX. SCALE 1"= 1320 FEET

0 — 1 MILE

SURVEY BY SEIGEL ASSOCIATES LIMITED

FLOWN AND COMPILED DEC.- JAN. 1970- 1971

Richard O. Crosby