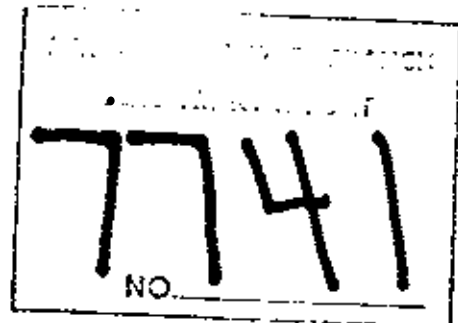


79-11 5000 7741

HELICOPTER MAGNETIC SURVEY  
GAMBIER ISLAND, BRITISH COLUMBIA  
VANCOUVER MINING DIVISION  
on behalf of  
20th CENTURY ENERGY CORPORATION



Claims: MB4 - MB8  
MB13- MB16

Location: About 30 kilometers NW of  
Vancouver, B.C.  
123° 24' 49" 30' NTS 92/G

Date of Survey: December 4, 1979

January 2nd, 1980  
Vancouver, British Columbia

Apex Airborne Surveys Ltd.  
Ronald F. Sheldrake, B.Sc.

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CERTIFICATION: FOLLOWS APPENDIX IV

1.     SUMMARY

A helicopter borne magnetic survey of 402 linear kilometers was flown over Gambier Island, December 4th, 1979. An interpretation of the geophysical data has outlined two areas that may host rocks suitable for porphyry-type mineralization. Prospecting and an induced polarization survey has been recommended to test these areas.

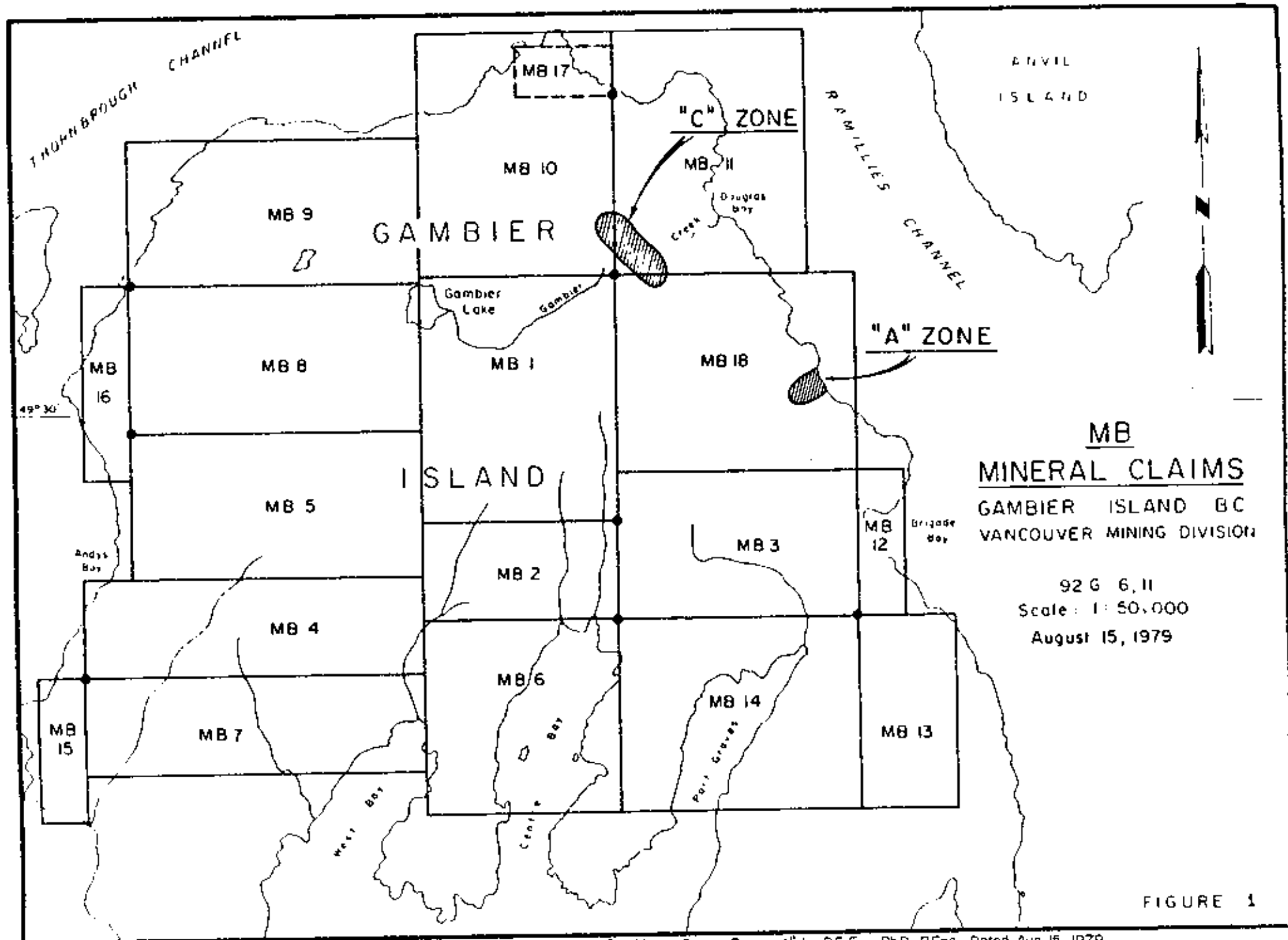


FIGURE 1

Taken from "Geological Report on the Gambier Is Copper Prospect" by P.E. Fox, PhD, P.Eng., Dated Aug. 15, 1979

## 2. INTRODUCTION

This report describes the results of a helicopter-borne magnetometer survey that was flown December 4th, 1979 on behalf of 20th Century Energy Corporation.

The purpose of the survey was to assess the magnetic environment of the known mineralized area on Gambier Creek and to identify extensions or similarly characterized areas on the island.

The magnetometer system was a Geometrics G803 total field precession instrument which measures the magnetic field strength with a sensitivity of two gammas ( $10^{-5}$  oersted).

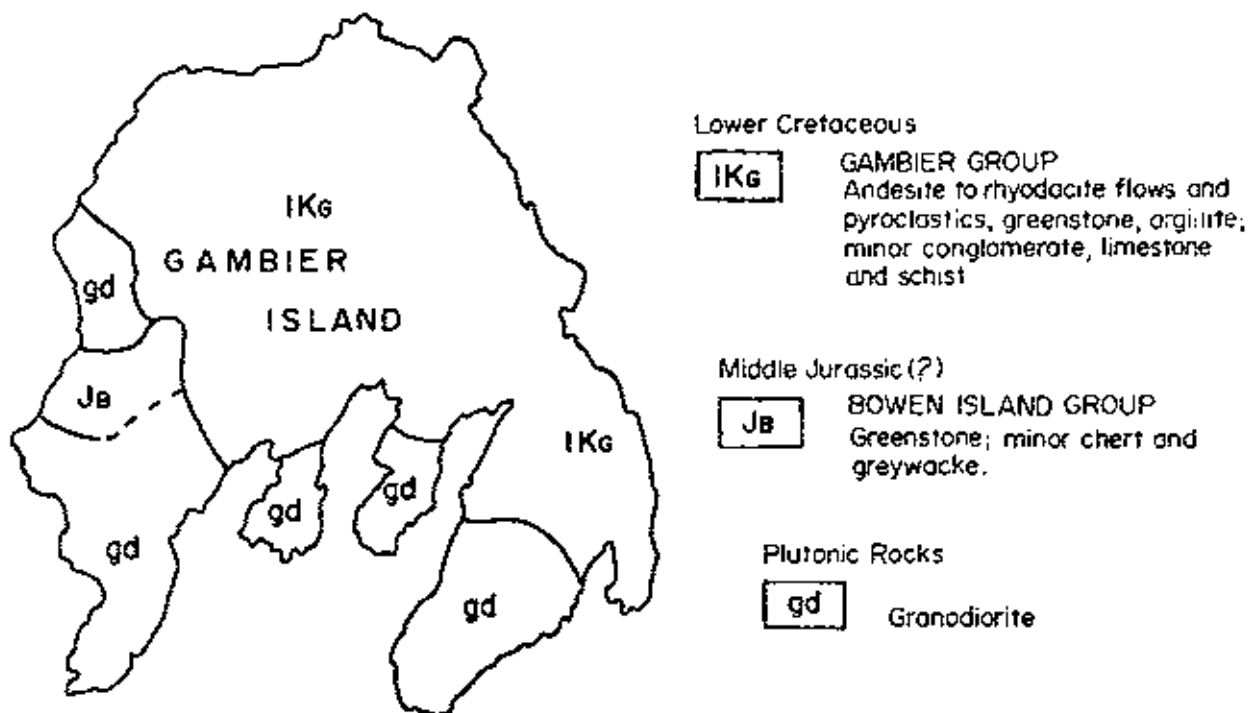
The measuring technique of the proton magnetometer can be understood by making the proton analogous to a tiny bar magnet spinning about its longitudinal axis, which has the properties of both a magnetized needle and a gyroscope. The spinning magnet tries to align itself along the lines of force but the gyroscope properties oppose this and the spinning magnet gyrates. The essential characteristic of the system is that the rate of gyration is proportional to the ambient magnetic intensity. This rate is measured electronically, multiplied by a suitable factor then it is displayed on the analogue chart.

The Gambier Island survey consisted of 53 traverse lines oriented N - S at a flight line spacing of 200 meters for a total of 402 linear kilometers. The survey covers most of the island except for the peninsula south of New Brighton.

Navigation of the helicopter was from an uncontrolled photomosaic at a scale of 1:12,000. The flight path was identified by the instrument operator in the helicopter and was later verified from 35 mm film with fiducials taken at an interval of 2.5 seconds. The helicopter terrain clearance of 100 meters was recorded on the analogue chart at a scale of 1 cm = 30 meters.

### 3. GEOLOGY

The general geology of Gambier Island as compiled by \* J.A. Roddick and G.J. Woodsworth is outlined on the sketch below.



\* Geology compiled by J.A. Roddick and G.J. Woodsworth 1979  
"Geology of Vancouver West Half and Mainland Part of Alberni,  
 O.F. 611"

The other source of geology available to the writer is a report by G.E. Fox, Ph.D., P.Eng. titled "Geological Report on the Gambier Island Copper Prospect", dated August 15, 1979. The porphyry intrusion described by Dr. Fox is contiguous with dioritic plutonic rocks and volcanic and sedimentary rocks of the Gambier Group. Major faulting structures are evident in NW - SE and N - S directions.

#### 4. INTERPRETATION

The interpretation of a magnetic map is based on recognizing geologic features and rock types from variations in the magnetic content in the underlying rocks. In general, extrusive rocks will have a more convolute contour pattern than intrusive or sedimentary rocks. Faults may be indicated along lineaments inferred by distortions in the contour pattern or by low magnetic values (because the density of the rock, and therefore the magnetic density decreases due to fracturing).

The Gambier Island magnetic survey does not show a convincing correlation between the magnetic features and the geology as mapped by Roddick and Woodsworth. (Roddick and Woodsworth's geology has been outlined on Plate 2) for example the magnetic intrusive rocks on the NE corner of the island appear to extend farther north than the mapping indicates. (See L 34 to L 50). As well there is no indication from the magnetic map that intrusive rocks exist on the peninsula of Gambier Point although they are evidently outcropping there. (See the south end L 23 N)

The approach taken in the interpretation is to identify the magnetic parameters of the known mineralized zone and to search the map sheet for areas where these parameters are matched as closely as possible. The key words in the interpretation are ROCK TYPE, CONTACTS, STRUCTURE.

- 1) ROCK TYPE: The host rock type is relatively non-magnetic as evidenced by the ground magnetometer and airborne surveys;\*
- 2) CONTACTS: The mineralization is associated with contact zones between the intrusive stock and the adjacent volcanic sedimentary rocks;
- 3) STRUCTURES: Major structural weaknesses are associated with the intruded rock mass.

Two areas have been outlined on Plate 2 that are interpreted as target areas. These areas encompass magnetic embayments and are apparently neighbouring intrusive and Gambier Group rocks.

ZONE 1:

This target lies immediately east of a large magnetic zone centered on Mt. Killan and lies near the headwaters of Whispering Creek. The target zone lies along two major structural trends; the first sub-parallel to the Gambier Creek fault and the second runs approximately N-S along the west side of Gambier Lake (see Plate 2). This target zone has first priority.

ZONE 2:

This target lies between Mt. Liddell and Gambier Lake and is centered on a magnetic embayment of about 50 gammas. See L38, 39, Plate 1). There is no clear evidence of faulting associated with this target zone.

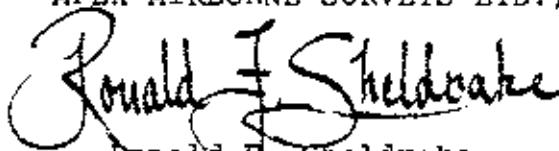
\* See Figure 5 - MAGNETOMETER SURVEY. " Geological Report on the Gambier Island, Copper Prospect" by P. E. Fox, Ph.D., P.Eng.



CONCLUSIONS AND RECOMMENDATIONS

The magnetic survey has indicated two areas where further exploration for Gambier Creek type mineralization is recommended. These two areas should be prospected and if mineralization or alteration is evident, further geophysical investigation, probably induced polarization, is warranted.

Respectfully submitted,  
APEX AIRBORNE SURVEYS LTD.,

A handwritten signature in cursive script that reads "Ronald F. Sheldrake". The signature is written in dark ink and is positioned above the typed name and title.

Ronald F. Sheldrake  
Geophysicist

APPENDIX IInstrumentationMAGNETOMETER

Manufacturer: Exploranium-Geometrics Corp, U.S.A.

Type: Proton precession - total field magnetometer  
toroidal coil.

Cycling Time: 1 second

Unit of  
Measurement: Gammas ( $10^{-5}$  oersted)

Sensitivity: 2 gammas

RECORDER

McPhar Instruments Ltd - six channel analogue recorder

INTERVELOMETER

McPhar Instruments Ltd.

CAMERA

Aeroflex 35 mm tracking camera

HELICOPTER

206B registration GGFXX supplied by Apex Helicopters Ltd.

APPENDIX II

The Analogue Chart and Flight Path Recovery

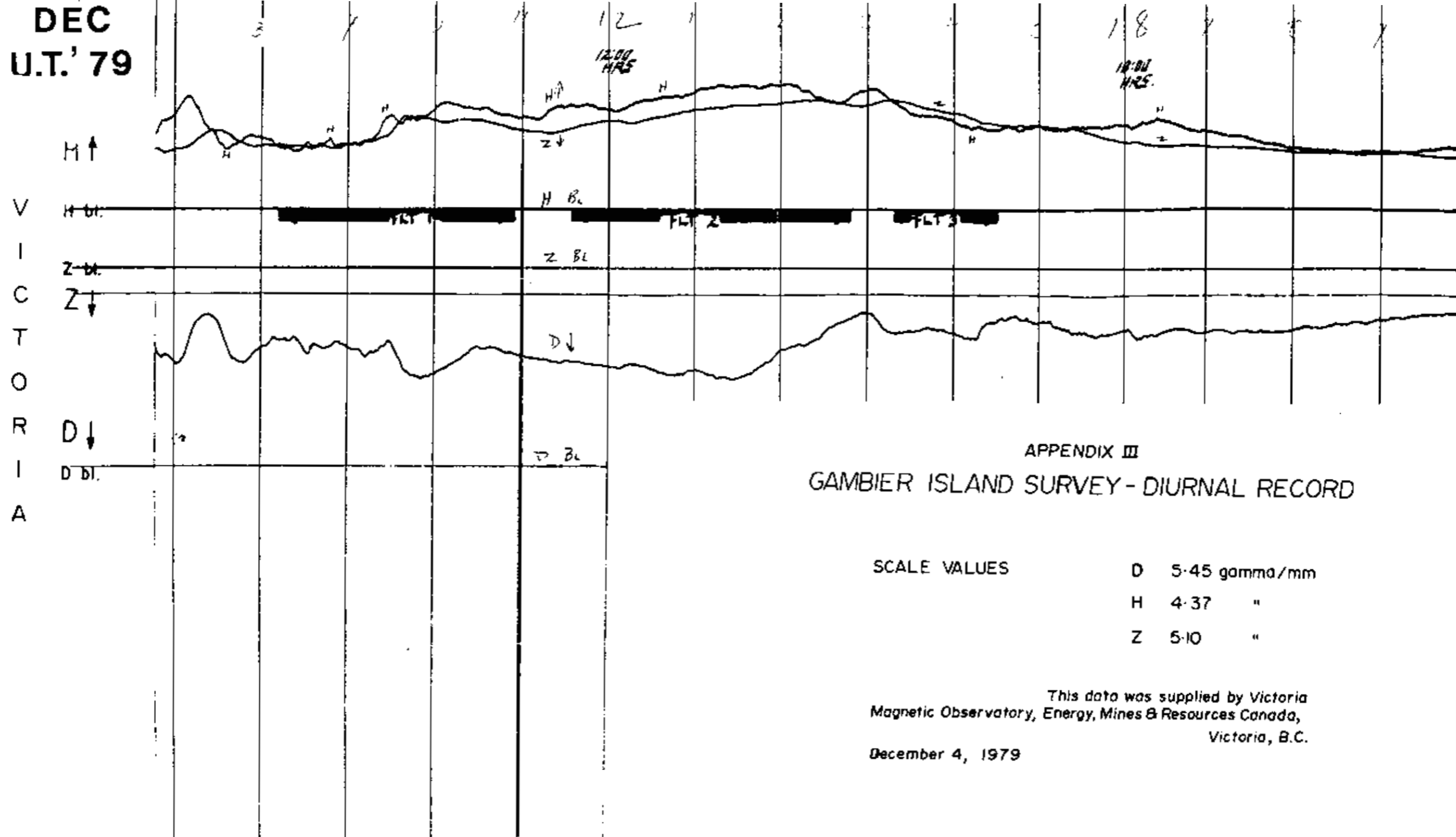
The flight tape is a roll of chart paper. It moves through the recorder console at a speed of 1.5 mm/sec. The flight tape consists of six channels of information, as follows:

		<u>Time Constant</u>	<u>Scale Units/mm</u>	<u>Noise</u>
1.	Radar altitude	1.0 sec	10 feet	10 feet
2.				
3.	Magnetometer	1.0 sec	1 gamma	2 gammas
4.	Magnetometer	1.0 sec	10 gamma	2 gammas
5.				
6.				

In addition a fiducial marker is used between the channels and occurs regularly at 2.5 sec intervals along every line.

The helicopter flight path is recovered from 35 mm film, which is exposed at 2.5 second intervals during the flight traverses. After processing and anotating, recognizable fiducials are pin-pointed on the photomosaic.

DEC  
U.T.' 79



APPENDIX III  
GAMBIER ISLAND SURVEY - DIURNAL RECORD

SCALE VALUES

D	5.45 gamma/mm
H	4.37 "
Z	5.10 "

This data was supplied by Victoria  
Magnetic Observatory, Energy, Mines & Resources Canada,  
Victoria, B.C.  
December 4, 1979

## APPENDIX IV

## APEX AIRBORNE SURVEYS

## FLIGHT REPORT

DATE DEC 4/74 HELI CO APEX OPERATOR CFG PILOT J. S. ...  
 FLT# 1 HELI REG C-6-FXX LENS ADJUST S-~~5308~~ PROGRAM ...  
 SLR CAMMETER IS TIME DWN ... FRAME RATE 2.5 CLOUD COVER ...  
 AREA VANCOUVER TIME UP ... FRAME START 0000(1) WIND SPEED ...  
 PROCV BC ELAP TIME ... FRAME END 1991(1) WIND DIR ...  
 INSTRUMENTS MAG C-803 SPEC ... ALT MM 10 EM ... V. ...  
 COARSE 1000 TOTAL ... F/S 500' FREQ ... ...  
 FINE 100 U ... K ... Th ... F/S ...

LINE NO.	FID START	FID END	NOTES	LINE NO.	FID START	FID END	...
1-N	13	93		20-S	1871	1991	MAN 22
2-S	93	131					
3-N	000	33					
4-S	34	120					
5-N	121	121					
6-S	122	210					
7-N	211	280					
8-S	281	321	Reslown Pt's				
9-N	322	446					
10-S	447	551					
11-N	552	652					
12-S	653	768					
13-N	769	875					
14-S	876	986					
15-N	987	1092					
16-S	1093	1209					
17-N	1210	1344					
18-S	1345	1474					
19-N	1475	1600					
20-S	1601	1729					
21-N	1730	1870					

# APEX AIRBORNE SURVEYS

FLIGHT REPORT

DATE DEC 4/79 HELI CO APEX OPERATOR CFB FIELD J. L. 1100  
 FLT# 3 HELI REG# CAYX LENS APERT S-S GROUND SP. 1:1  
 SLK CAK/BIEC IS TIME DWN \_\_\_\_\_ FRAME RATE 0.25 CLOS. G. 1:1  
 AREA YANCOUVER TIME UP \_\_\_\_\_ FRAME START 000(1) WIND SPEED 20  
 PROC EC ELAP TIME \_\_\_\_\_ FRAME END 2794(1) WIND DIR 250  
 INSTRUMENTS MAG 6-803 SPEC \_\_\_\_\_ ALT 14610 EM \_\_\_\_\_ V \_\_\_\_\_  
 COARSE 1000 TOTAL \_\_\_\_\_ F/S 500' FREQ \_\_\_\_\_  
 FINE 120 U \_\_\_\_\_ K \_\_\_\_\_ Th \_\_\_\_\_ F/S \_\_\_\_\_

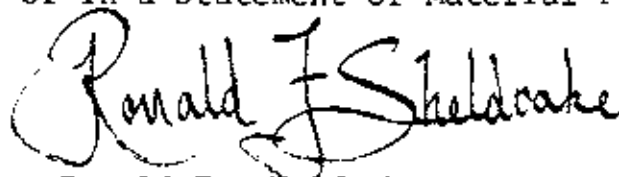
LINE NO.	FID START	FID END	NOTES	LINE NO.	FID START	FID END	NOTES
<del>22-N</del>	001	024	RUN OFF FID (NOT)	40-S	1837	1939'	
23-N	25	116		41-N	1940	2067'	
24-S	<del>177</del>	217	BRK	42-S	2068	2183	
	218	240		43-N	2184	2294'	
25-N	<sup>241</sup> 250	337'		44-S	2295	2393'	
26-S	338	425'		45-N	2394	2497'	
27-N	426	515'		46-S	2498	2593'	
28-S	516	632'		47-N	2594	2685'	
29-N	633	738'		48-S	2686	2794' <small>min 50</small>	
30-S	739	851'				2772	
31-N	852	963'					
32-S	964	1100'					
33-N	1101	1212'					
34-S	1213	1303'	BRK				
34-1S	1304	1341'					
35-N	1342	1438'					
36-S	1439	1448	AR				SCRUB.
	1449	1524'					
37-N	1525	1626'					
38-S	1627	1728					
39-N	1729	1836					



CERTIFICATION

I, Ronald F. Sheldrake, of the City of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am Manager-Geophysicist of Apex Airborne Surveys Ltd. a company incorporated under the laws of the Province of British Columbia.
2. The Vancouver Office of Apex Airborne Surveys Ltd. is located at Suite 420-890 West Pender Street, Vancouver, British Columbia.
3. I received my B.Sc. in geophysics from the University of British Columbia in May 1974.
4. I have practised my profession since that date.
5. I did not examine the claims area, but I am not aware of any conflict and believe that the data presented herein is reliable.
6. I have no interest, direct or indirect in the mineral claims discussed in this report, 20th Century Energy Corporation or its affiliates, nor do I expect to receive any.
7. I consent to the use of this report in or in connection with a prospectus or in a Statement of Material Facts.



Ronald F. Sheldrake  
Geophysicist

January 2nd, 1980



**C. DRILLING**

(Details in report submitted as per section 8 of regulations.)  
(The itemized cost statement must be part of the report.)

COST

**D. GEOLOGICAL, GEOPHYSICAL, GEOCHEMICAL**

(Details in report submitted as per section 5, 6, or 7 of regulations.)  
(The itemized cost statement must be part of the report.)  
(State type of work in space below.)

Airborne Magnetometer Survey (Apex Airborne Surveys)

402 km. at \$50.00 per km.

report to follow in 3-4 weeks.

TOTAL OF C AND D

20,100.00



**AIRBORNE SURVEYS LTD.**

420 - 890 W Pender Street  
Vancouver B.C. V6C 1J9  
Canada  
PHONE (604) 683-3934

Mr. L. C. Zrnic  
20th Century Energy Corporation  
729-355 Burrard Street,  
VANCOUVER, B.C.  
V6C 2G8

January 16th, 1980

Dear Mr. Zrnic:

Further to your request to have the details of the survey specified please note the following:

1. Type of survey - helicopter magnetometer;
2. Date of survey - December 4, 1979;
3. Date of report - January 2nd, 1980
4. Total linear kilometers flown - 402 km.
5. Total cost of survey - \$20,100.00.

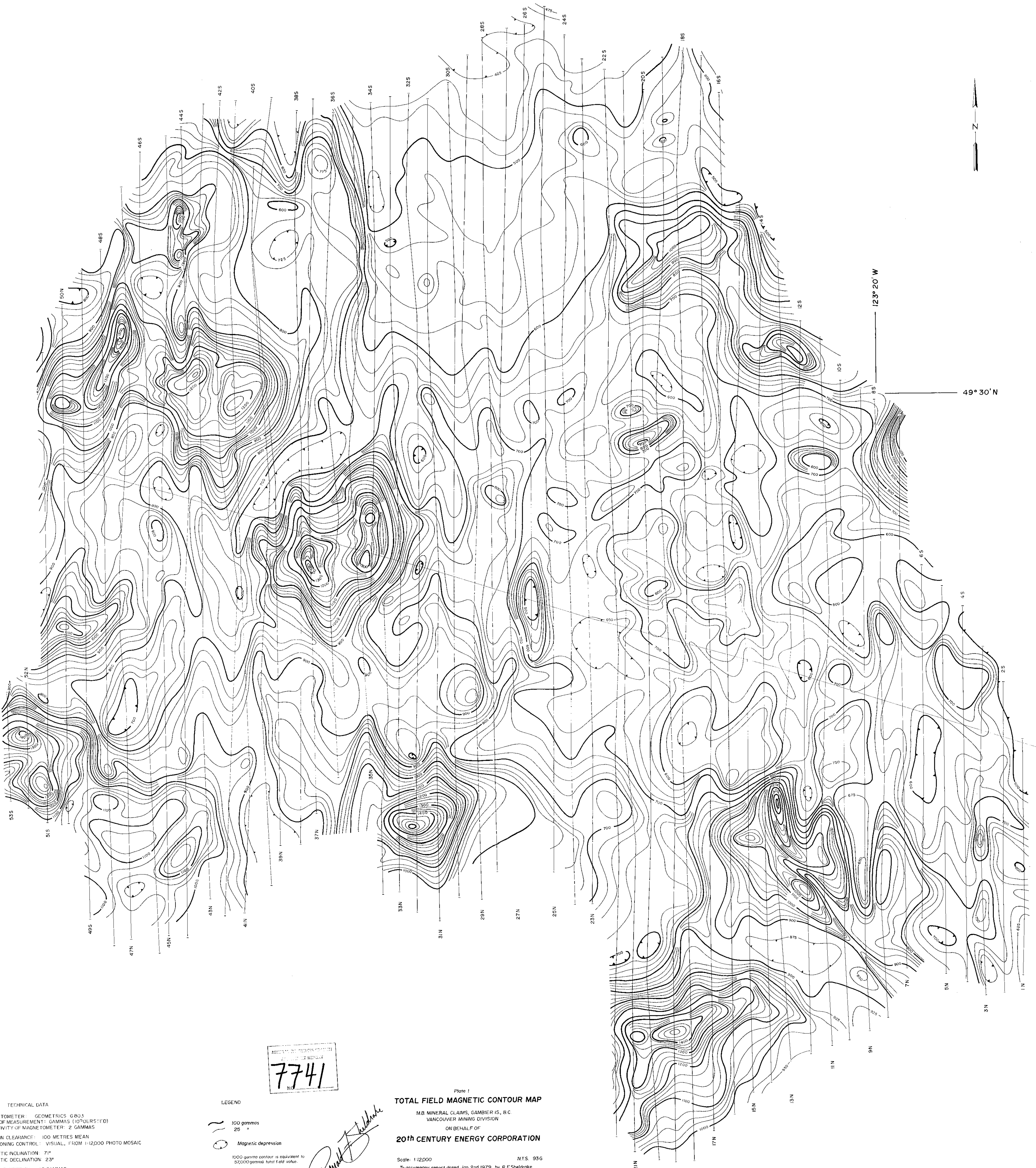
I anticipate this will satisfy your requirements.

Yours sincerely,

  
Ronald F. Sheldrake

RFS:vsm





7741

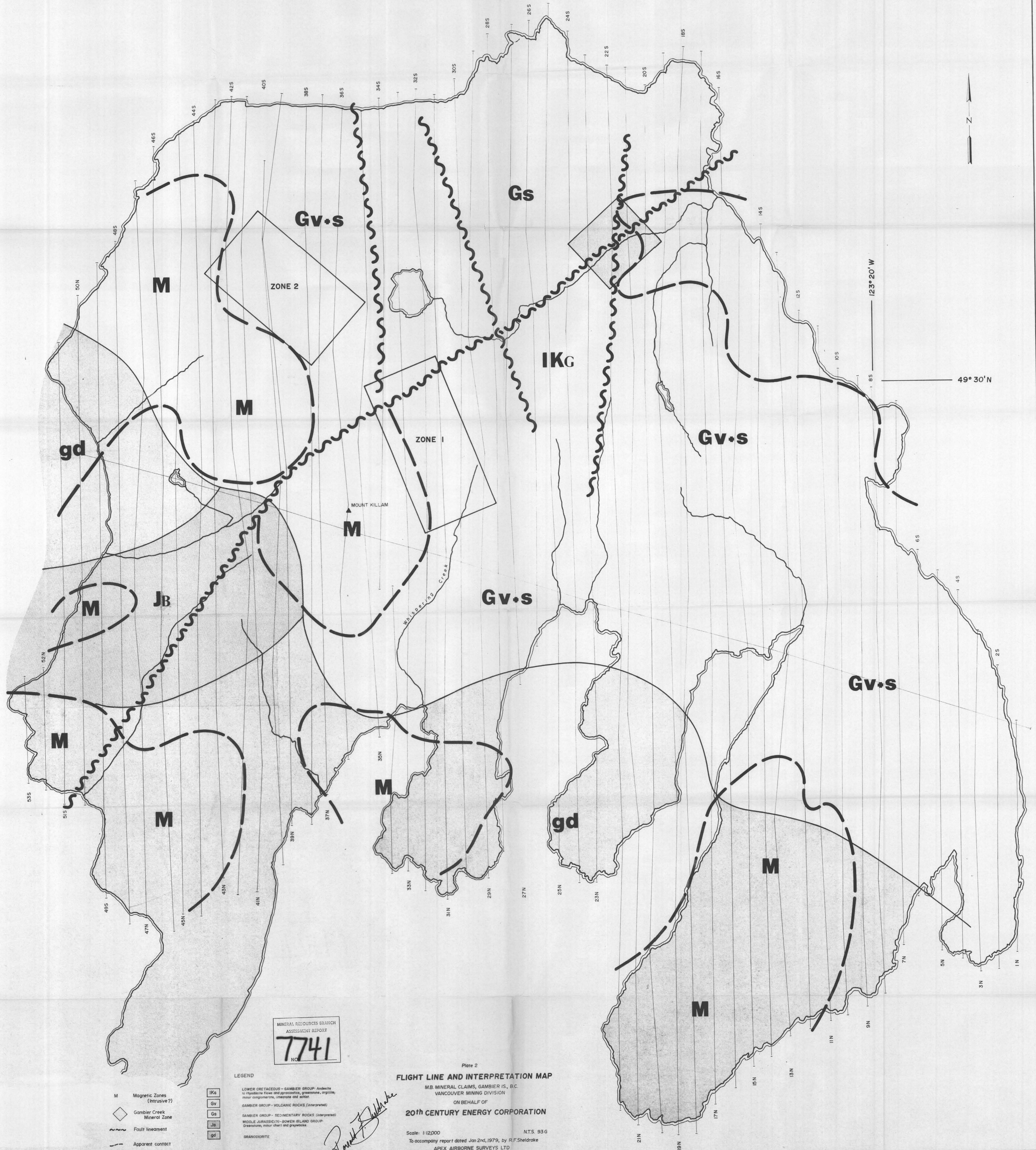
TECHNICAL DATA  
 MAGNETOMETER: GEOMETRICS G 80.3  
 UNITS OF MEASUREMENT: GAMMAS (10<sup>-5</sup> GAUSS) (10<sup>-5</sup> T)  
 SENSITIVITY OF MAGNETOMETER: 2 GAMMAS  
 TERRAIN CLEARANCE: 100 METRES MEAN  
 POSITIONING CONTROL: VISUAL, FROM 1:12,000 PHOTO MOSAIC  
 MAGNETIC INCLINATION: 71°  
 MAGNETIC DECLINATION: 23°  
 CONTOUR INTERVAL: 25 GAMMAS

LEGEND  
 ~~~~~ 100 gammas  
 25 " "  
 ( ) Magnetic depression

*R. F. Shelrake*

Plate 1  
**TOTAL FIELD MAGNETIC CONTOUR MAP**  
 MB MINERAL CLAIMS, GAMBIE IS., B.C.  
 VANCOUVER MINING DIVISION  
 ON BEHALF OF  
**20th CENTURY ENERGY CORPORATION**  
 Scale: 1:12,000 N.T.S. 936  
 To accompany report dated Jan 2nd, 1979, by R.F. Shelrake  
 APEX AIRBORNE SURVEYS LTD





MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
**7741**  
NO.

- M Magnetic Zones (Intrusive?)
- Gambier Creek Mineral Zone
- Fault lineament
- Apparent contact

- LEGEND
- IKG LOWER CRETACEOUS - GAMBIER GROUP. Andesite to rhyolite flows and pyroclastics, gneiss, argillite, minor conglomerate, limestone and schist.
  - Gv GAMBIER GROUP - VOLCANIC ROCKS (Interpreted)
  - Gs GAMBIER GROUP - SEDIMENTARY ROCKS (Interpreted)
  - JB MIDDLE JURASSIC(?) - BOWEN ISLAND GROUP. Greenstone, minor chert and greywacke.
  - gd GRANODIORITE.

*Ronald F. Sheldrake*

Plate 2  
**FLIGHT LINE AND INTERPRETATION MAP**  
M.B. MINERAL CLAIMS, GAMBIER IS., B.C.  
VANCOUVER MINING DIVISION  
ON BEHALF OF  
**20th CENTURY ENERGY CORPORATION**  
Scale: 1:12,000 N.T.S. 93 G  
To accompany report dated Jan 2nd, 1979, by R.F. Sheldrake  
APEX AIRBORNE SURVEYS LTD