

ARIS SUMMARY SHEET

District Geologist, Smithers

Off Confidential: 89.02.01

ASSESSMENT REPORT 17084

MINING DIVISION: Atlin

PROPERTY: Cal  
LOCATION: LAT 59 34 46 LONG 133 32 47  
UTM 08 6605267 582104  
NTS 104N12E

CLAIM(S): Cal II  
OPERATOR(S): Homestake Min. Dev.  
AUTHOR(S): McIvor, D.F.  
REPORT YEAR: 1988, 12 Pages

COMMODITIES

SEARCHED FOR: Gold

GEOLOGICAL

SUMMARY: The claims are underlain by Permian-Pennsylvanian Cache Creek Group andesites and Permian ultramafic intrusives.

WORK

DONE: Geophysical  
EMGR 47.5 km; VLF  
Map(s) - 2; Scale(s) - 1:5000  
LINE 47.5 km  
MAGG 47.5 km  
Map(s) - 4; Scale(s) - 1:5000

LOG NO: 0205	RD.
ACTION:	
FILE NO:	

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VANCOUVER, B.C.	

SUMMARY REPORT

RESULTS OF GEOPHYSICAL SURVEYS  
(MAGNETOMETER AND VLF-EM) ON THE  
ON THE CAL II CLAIM,  
SOUTH GROUP OF CLAIMS  
ATLIN MINING DIVISION  
BRITISH COLUMBIA

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**17,084**

NTS: 104N.12E  
LATITUDE: 59° 35' NORTH  
LONGITUDE: 133°33' WEST  
OWNER: HOMESTAKE MINERAL DEVELOPMENT COMPANY LTD.  
OPERATOR: HOMESTAKE MINERAL DEVELOPMENT COMPANY LTD.  
BY: DUNCAN MCIVOR  
DATE: JANUARY 1988

FILMED

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## 1. SUMMARY

The Cal II property is located 8 kilometers east of the town of Atlin, in northwestern British Columbia. During the period October through December 1987, approximately 47.5 line-kilometers of cut-line grid were established on the property and total field magnetometer, vertical gradient magnetometer, and VLF-EM surveys were completed over the grid.

The magnetic surveys outlined an area of predominantly low magnetic relief, a signature consistent with the interpretation that the property is underlain by homogeneous andesitic volcanics. Two distinct magnetic highs, one broad feature in the northwest corner of the property, and one linear feature crossing the southern portion of the property, are believed to represent ultramafic intrusive and mafic dyke rocks respectively.

The VLF-EM survey outlined the general ENE-WSW trend to the underlying stratigraphy, with a few similarly oriented strong highs thought to represent dykes and/or structures controlling dyke emplacement.

No geophysical signatures indicative of structurally controlled hydrothermal alteration and potential gold mineralization were noted on the property.

## 2. INTRODUCTION

### 2.1 Scope of Report

This report serves to summarize the results of geophysical surveys completed on the Cal II claim during the period November 25 through December 5, 1987.

### 2.2 Location, Access and Physiography

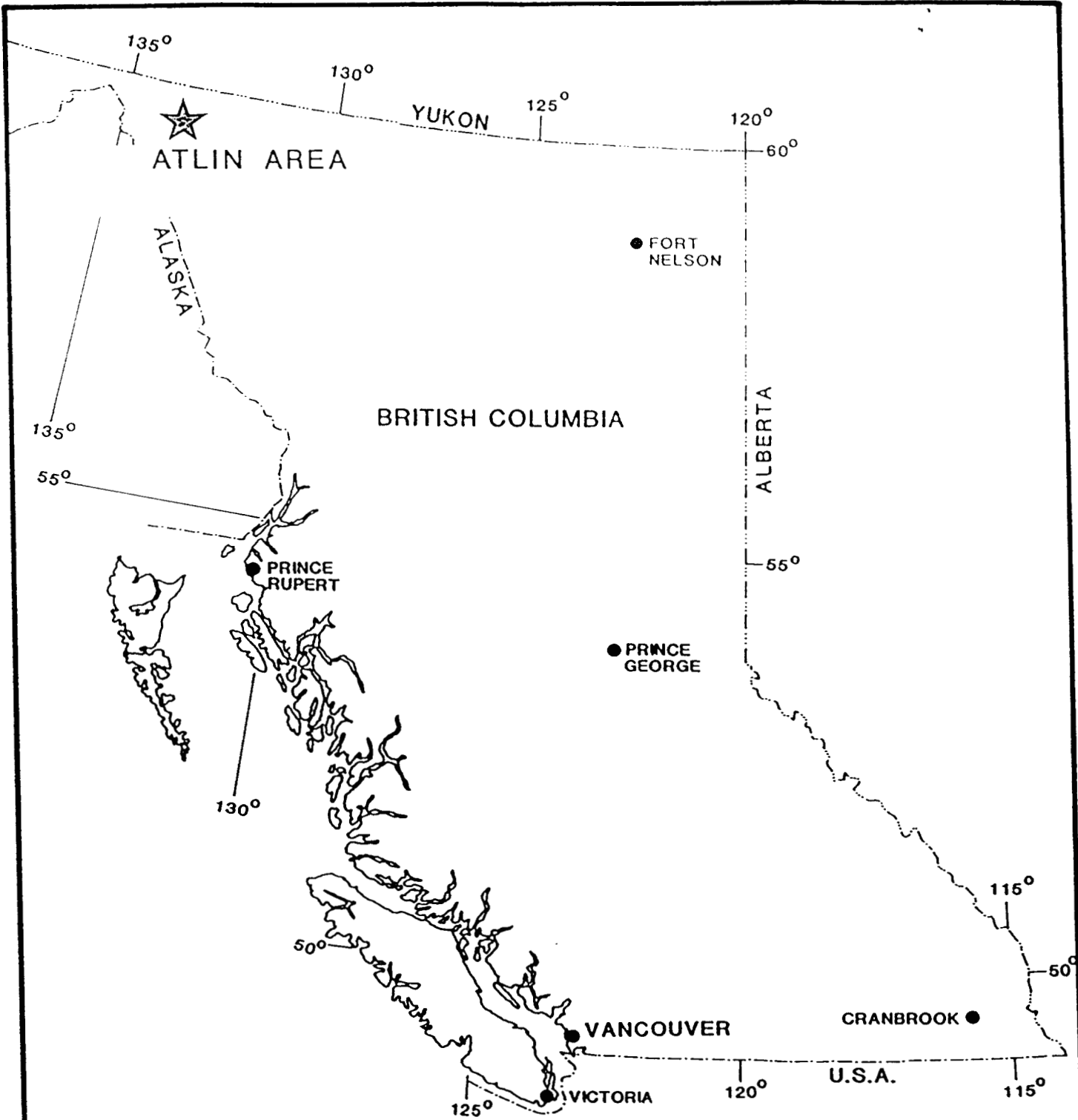
The Cal II claim, a 20 unit rectangular block 2 kilometers (east-west) by 2.5 kilometers (north-south), is located 8 kilometers due east of the town of Atlin, in northwestern British Columbia (see Figures 1 and 2).

The claim is readily accessible from Atlin, as an all-weather gravel road (the Spruce Creek Road) cuts through the southwest corner of the claim.

A 4WD bush road extends east from the Spruce Creek Road to cross the northwest corner of the claim, immediately south of Pine Creek.

Pine Creek flows west towards Lake Atlin across the northern corner of the claim. The claim covers the high ground between Pine Creek to the north, and Spruce Creek to the south, and maximum elevation above these creeks is approximately 50 meters.

Outcrop exposure constitutes approximately 5% of the property, the remaining ground being overlain by a thick mantle of glacial and fluvial sediments. A large spruce swamp covers most of the northern part of the property, while jackpine is predominant in the south.



HOMESTAKE MINERAL DEVELOPMENT COMPANY			
ATLIN PROJECTS BRITISH COLUMBIA			
<b>LOCATION MAP</b>			
DRAWN KMc	DATE 11/87	FILE CODE 104N/11;12	map 1
Revised _____			

### 2.3 Claim Status

The Cal II claim, part of the "South Group", is currently in good standing until February 6, 1989.

### 2.4 General Geologic Setting

The Cal II claim lies near the western edge of the northwest trending "Atlin Terrane", which is underlain by Upper Paleozoic oceanic crustal rocks (Monger, 1975). These rocks are correlated with the Cache Creek Group rocks of southern and central British Columbia.

Within the Atlin Terrane, andesitic to basaltic flows are overlain by cherts and thick shallow water carbonate rocks. Discordant granitic plutons, ranging in age from Late Jurassic to early Tertiary, locally intrude the stratigraphy. Some remnant Tertiary volcanics and sediments are found within the area.

Also within the Atlin Terrane, and co-eval or immediately post dating the Cache Creek group rocks, are large ultramafic bodies which define a discordant belt trending west across the tectonic fabric of the terrane. The ultramafic bodies are commonly intensely serpentized, and in places extensively hydrothermally altered to a silica-carbonate-mariposite/fuchsite "listwanite" like assemblage.

The Cal II claims is underlain predominantly by andesitic volcanics of the Cache Creek Group, and ultramafic intrusive bodies. Figure 3, illustrates the general geology of the Atlin area, and the location of the Cal II claim within that geologic setting.

### 2.5 Preliminary Economic Assessment

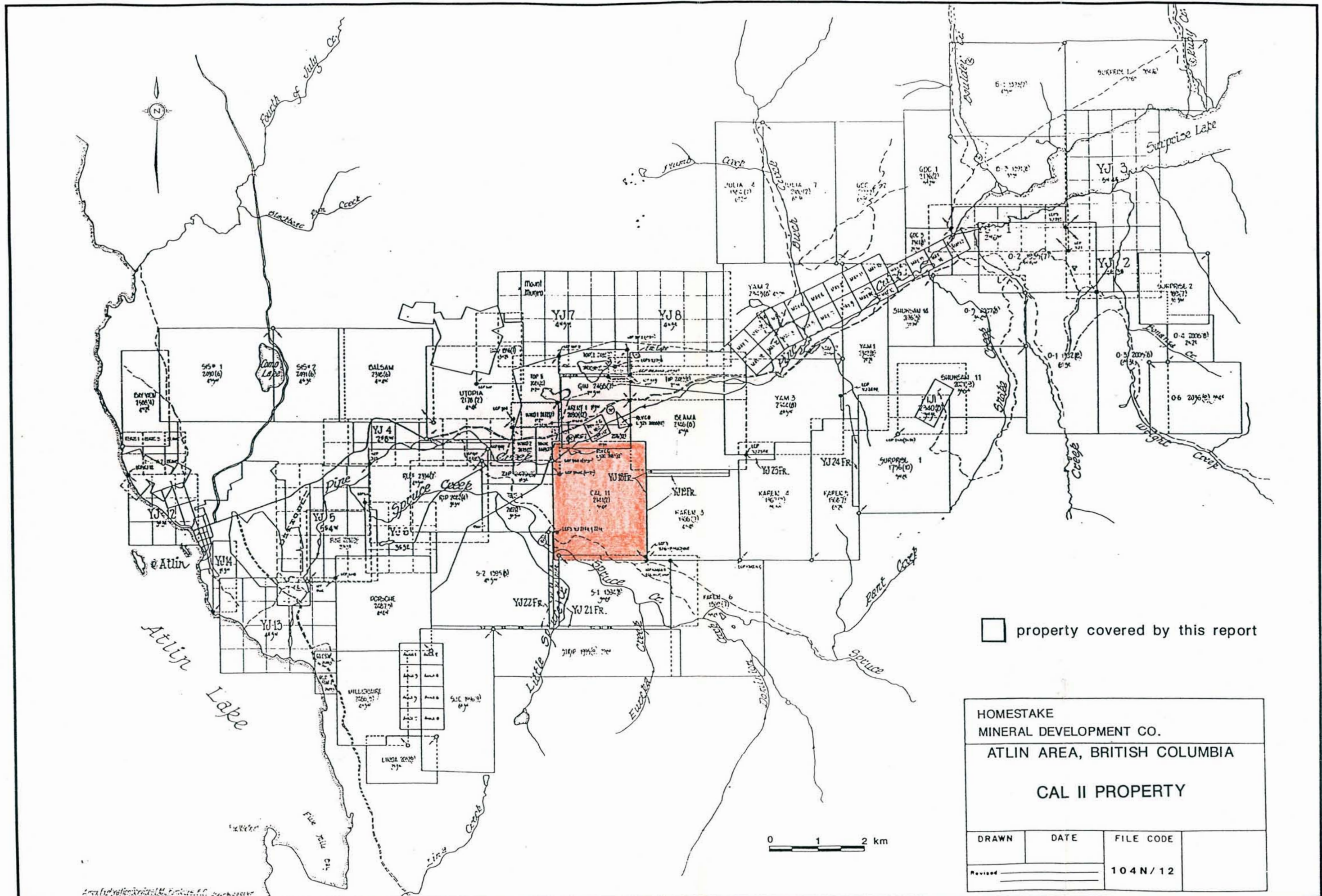
The majority of known lode gold mineralization within the Atlin Camp is associated with intensely altered (silica-carbonate-mariposite) ultramafic rocks proximal to their fault bounded or intrusive contact with rocks of the Cache Creek Group.

The mineralization is almost exclusively hosted in quartz/quartz-carbonate veins and vein stockworks, occurring either as often spectacular free gold, or in intimate association with sulphides and sulfosalts such as pyrite, chalcopyrite, sphalerite, galena, arsenopyrite, pyrrargyrite and tetrahedrite.

The Cal II property, in as much as it covers a major contact between ultramafic rocks in the north, and Cache Creek rocks in the south, may host areas of hydrothermally altered rock along this contact, which in turn may host potentially auriferous quartz/quartz-carbonate vein stockworks.

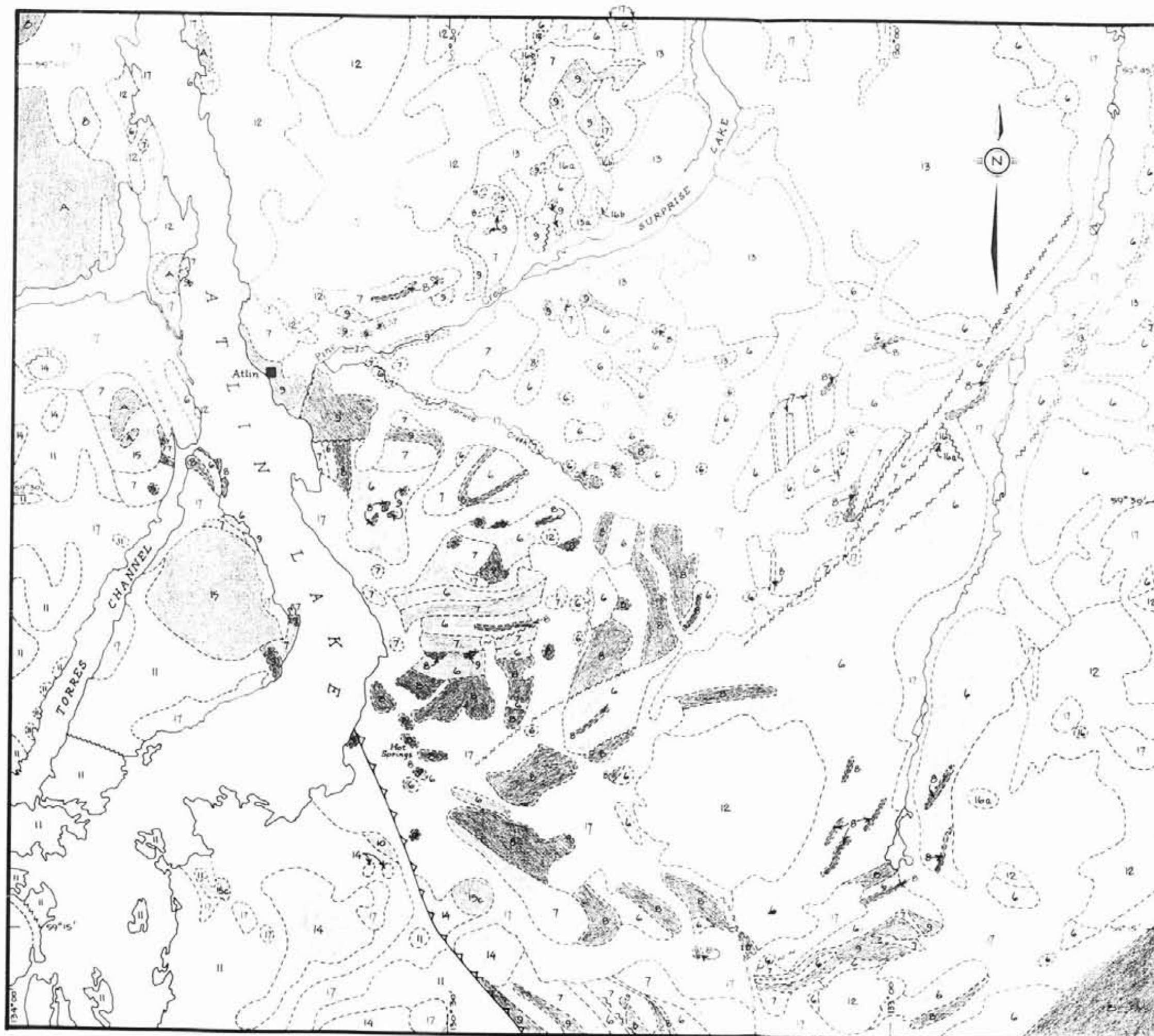
### 2.6 Exploration History

In the immediate area of the Cal II claim, placer miners working creek gravels in Pine Creek, in 1899, discovered outcropping quartz veins carrying spectacular free gold. The Nimrod Syndicate tied up the discoveries, and shallow shafts were reported sunk on the Yellowjacket discovery (B.C. Dept.



□ property covered by this report

HOMESTAKE MINERAL DEVELOPMENT CO.			
ATLIN AREA, BRITISH COLUMBIA			
CAL II PROPERTY			
DRAWN	DATE	FILE CODE	
Revised		104N/12	



LEGEND

- CENOZOIC**  
**QUATERNARY**  
 PLEISTOCENE AND RECENT  
 17 GLACIAL DRIFT & ALLUVIUM
- TERTIARY AND QUATERNARY**  
 16 OLIVINE BASALT AND Diorite; 16a TERTIARY 16b PLEISTOCENE
- TERTIARY (T)**  
 15 15a QUARTZ MONZONITE 15b GRANODIORITE 15c GABBRO AND DIORITE
- CRETACEOUS OR TERTIARY**  
 14 FLOOD GROUP ANDHESITE BASALT ALBITE TRACHITE ALBITE RHYOLITE DACITE AND RELATED PYROCLASTIC ROCKS; CONGLOMERATE SANDSTONE
- CRETACEOUS**  
 13 ALASKITE
- JURASSIC (MAY BE IN PART OLDER OR YOUNGER)**  
 12 COAST INTRUSIONS UNDIFFERENTIATED GRANITIC ROCKS
- JURASSIC**  
 11 LABERGE GROUP VOLCANIC GREYWACKE SILTSTONE MUDSTONE SHALE CONGLOMERATE
- TRIASSIC**  
 10 GREYWACKE, CHERT, ARGILLITE, CONGLOMERATE, TUFF, SLATE, GREENSTONE, IMPURE LIMESTONE, JASPER
- PALEOZOIC**  
**PENNSYLVANIAN AND PERMIAN**  
 ATLIN INTRUSIONS PERIDOTITE; META-DIORITE AND META-GABBRO; SERPENTINITE; CARBONITIZED SERPENTINITE; TALC-BEARING (STEATITIZED) ULTRAMAFIC ROCKS  
 CACHE CREEK GROUP  
 B. LIMESTONE AND LIMESTONE BRECCIA  
 7. GREENSTONE AND VOLCANIC GREYWACKE; DERIVED AMPHIBOLITE; MINOR 6 AND B  
 6. CHERT, ARGILLITE, CHERT-PEBBLE CONGLOMERATE AND CHERT BRECCIA; QUARTZITE AND SCHIST; MINOR 7 AND B  
 UNDIFFERENTIATED, MAINLY VOLCANIC ROCKS OF UNCERTAIN, POSSIBLY SEVERAL, AGES.  
 N, W FAULT (ASSUMED, APPROXIMATE)  
 W W W FAULT (DEFINED)  
 ▲▲▲ FAULT (THRUST)  
 - - - - - GEOLOGICAL CONTACT

**HOMESTAKE MINERAL DEVELOPMENT COMPANY**

ATLIN PROPERTIES  
 BRITISH COLUMBIA  
 REGIONAL GEOLOGY

0 20 40 60 80 100km  
 1:253,440

DRAWN KMc	DATE	FILE CODE
Revised		104N/12



Mines Annual Reports: 1902, p. 984; 1903, p. H38; 1904, p. H44, and 1933, p. A78-79), the Rock of Ages discovery (B.C. Dept. Mines Annual Reports: 1903, p. H38, and 1905, p. G78), and the Red Jacket discovery (B.C. Dept. Mines Annual Reports: 1901, p. 759, and 1905, p. G77-78).

Since that time, surface features related to early lode mine development have been obliterated by hydraulic mining of gravels along Pine Creek, and the exact locations of the three lode gold discoveries along Pine Creek are now known.

The Red Jacket discovery is believed to be located on the Cal II Claim, based on historical reports. The only description of Red Jacket mineralization comes from the B.C. Dept. Mines Annual Report of 1904 (p. 79);

"- values appear to be in a decomposed quartzose dyke, but from the dump it would appear that the work done followed a quartz vein in serpentine rock. In the quartz on the dump, free gold was visible -"

In December of 1984, Tri-West Resources Ltd. intersected spectacular free gold in a drill hole in the area of the original Yellowjacket discovery on the Arent claim lying north of the Cal II claim. Homestake Mineral Development Company subsequently acquired the ground, and have extensively drill tested what is believed to be the original Yellowjacket Discovery.

On the Cal II claim itself, 25.4 kilometers of line-cutting was completed over the northern portion of the claim by Pan Island Resources Corp., who acquired the claim in 1985. Magnetometer and VLF-EM surveys were completed on the grid that same year.

Homestake Mineral Development Company Ltd. acquired the Cal II claim in 1986, and during the 1987 summer field season, completed geologic mapping and lithochemical sampling programs over portions of the claim.

## 2.7 Work Completed to Date

During the period October 18 through November 13, 1987, 47.3 kilometers of cut-line grid were established on the property.

During the period November 25 through December 5, 1987, 47.5 line kilometers of vertical gradient magnetometer, total field magnetometer and VLF-EM surveys were completed on the property.

## 3. DETAILED TECHNICAL DATA

### 3.1 Methods Employed

As mentioned, 47.3 line-kilometers of cut-line grid were established on the property to facilitate and provide control for the geophysical surveys.

Gordon Clarke and Associates of Whitehorse, Y.T., were contracted to complete the line-cutting.

Cross-line orientation was 340°-160°, to conform with other grids established by HMDC on claims north and west of the Cal II claim, and in fact the lines cut on the property were southern extensions of a grid established on the Arent claims north of the Cal II claim.

Cross-lines were established at 100 meter intervals, and stations were established at 20 meter intervals along all grid lines.

Scott Geophysics of Vancouver was contracted to complete total field magnetometer, vertical gradient magnetometer and VLF-EM surveys over the cut grid on the claim.

Both total field and vertical gradient magnetometer readings were taken at 20 meter intervals. All values were corrected for diurnal variation using a fixed base station sampling at 6 second intervals. Station NPM, Lualualei, Hawaii was used for the VLF-EM survey. Readings of horizontal field strength in phase and quadrature were taken at 20 meter intervals.

Instrumentation used in the survey was a Scintrex IGS configured to operate as a total field and vertical gradient magnetometer, and as a VLF-EM receiver. A Scintrex MP4, served as the base station magnetometer and cycled at 6 second intervals. Both units record all measurements in internal memory.

All magnetometer measurements were corrected for diurnal variation with reference to the base station.

The survey data was archived, processed and plotted using a Corona PPC 400 microcomputer, running Scintrex IGS applications software and Scott Geophysics proprietary software.

Appendix 1 contains 1:5000 scale total field magnetometer data and contoured data plan maps.

Appendix 2 contains 1:5000 scale vertical gradient magnetometer data and contoured data plan maps.

Appendix 3 contains 1:5000 scale VLF-EM line profile plots and contoured fraser filter plan maps.

The results of this work is discussed in the following section of this report.

### 3.2. Results and Interpretation

#### i) Total Field Magnetometer Survey

As can be seen from the enclosed contoured plan map, the majority of the property has a very flat, low magnetic signature, consistent with the interpretation of underlying homogeneous andesitic volcanics.

Two prominent magnetic highs occur on the property. In the northwest corner, a broad high to 58,500 gammas defines an ultramafic intrusive body, as seen in outcrop at that location.

Across the southern portion of the property, a linear east-northeast to west-southwest trending magnetic high to 58,500 gammas cuts across the magnetically flat andesites, and is thought to represent, based on the morphology of the feature, a mafic and strongly magnetic dyke.

No magnetic signatures thought to represent attractive targets for gold exploration, i.e. distinct strong linear magnetic lows, were noted on the property.

ii) Vertical Gradient Magnetometer Survey

Vertical gradient magnetic data is very useful in interpreting and delineating structural trends and sharp contacts between lithologies of contrasting magnetic signature, as it greatly accentuates areas of strong magnetic relief. As can be seen from the enclosed contoured vertical gradient magnetic map, the previously discussed magnetic highs stand out in what otherwise is a flat homogeneous magnetic signature. The interpretation of these features is consistent, based on the vertical gradient data, with those offered in the discussion of total field magnetometer results.

iii) VLF-EM Survey

Interpretation of the VLF-EM survey data is based on the Fraser filtered contour plan map.

The VLF-EM survey data exhibits, in general a strong east-northeast to west-southwest trend, reflecting the underlying structural and stratigraphic orientation of the andesites.

Two prominent and similarly oriented strong VLF conductors (highs) reflect and coincide with the magnetic highs that represent ultramafics in the north and mafic dykes in the south.

Other prominent linear VLF highs trend parallel to the ENE-WSW high in the southern portion of the property, and may represent non-magnetic dyked or previously unrecognized structures that may be controlling dyke emplacement.

4. ITEMIZED COST STATEMENT AND ALLOCATION OF EXPENDITURES

4.1 Itemized Cost Statement

The following expenses were incurred directly as a result of the exploration work described in this report.

1) Line-Cutting Costs

- as invoiced by Gordon Clarke  
and Associates  
47.3 kilometers x \$400.00/kilometer.... \$18,920.00

2) Geophysical Survey Costs

- as invoiced by Scott Geophysics
  - Mobilization-Demobilization  
3 days @ \$500.00/day..... 1,500.00
  - 47.5 line kilometers of VLF-EM  
total field magnetometer and vertical  
gradient magnetometer survey,  
@\$150.00 per line kilometer..... 7,125.00
  - Computer processing and plotting of  
all geophysical data..... 2,054.20
- TOTAL GEOPHYSICAL COSTS                    \$10,679.20
- TOTAL COSTS                                    \$29,599.20

4.2 Allocation of Expenditures to Claims

All work herein described was performed on the Cal II claim, part of the South Group of claims.

<u>CLAIM NAME</u>	<u>REC. NO.</u>	<u>REC. DATE</u>	<u>UNITS</u>	<u>ALLOCATED EXPENDITURES</u>
Cal II	2141	06/02/84	20	\$29,599.20

DMc/mm

SELECTED BIBLIOGRAPHY

Aitken, J.D.

1959: Atlin map area, B.C. Geological Survey of Canada, Memoir 307.

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1902, p. 984  
1903, p. H38  
1904, p. H44  
1905, p. G77 - 78  
1933, p. A78 - A79

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McIvor, D.F.

1987: Summary report of mineral exploration activity on the Pictou Property, Atlin Mining District, British Columbia - Homestake Mineral Development Company Ltd. in-house report.

Monger, J.W.H.

1975: Upper Paleozoic rocks of the Atlin Terrane, Northwestern British Columbia and South-Central Yukon; Geological Survey of Canada, Paper 74-7.

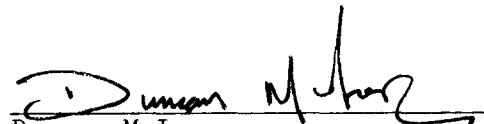
Ronning, P.A.

1986: Summary Report; Diamond Drilling and Geophysical work, Arent 1 and Arent 2, Beama and Adjacent Claims, North and South Claim Groups, Yellowjacket Property, Atlin Mining Division. HMDC assessment report on file at the B.C. Ministry of Mines.

AUTHOR'S QUALIFICATIONS

I, Duncan Forbes McIvor, do hereby state that;

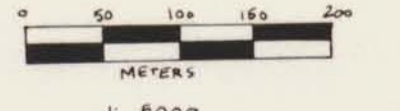
- I am a graduate of the University of Waterloo, and hold an Honours Bachelor of Applied Science degree.
- I have been practising my profession as an exploration geologist on a full time basis since 1982.
- I have personal knowledge that all information presented in this report is true and accurate.

  
Duncan McIvor

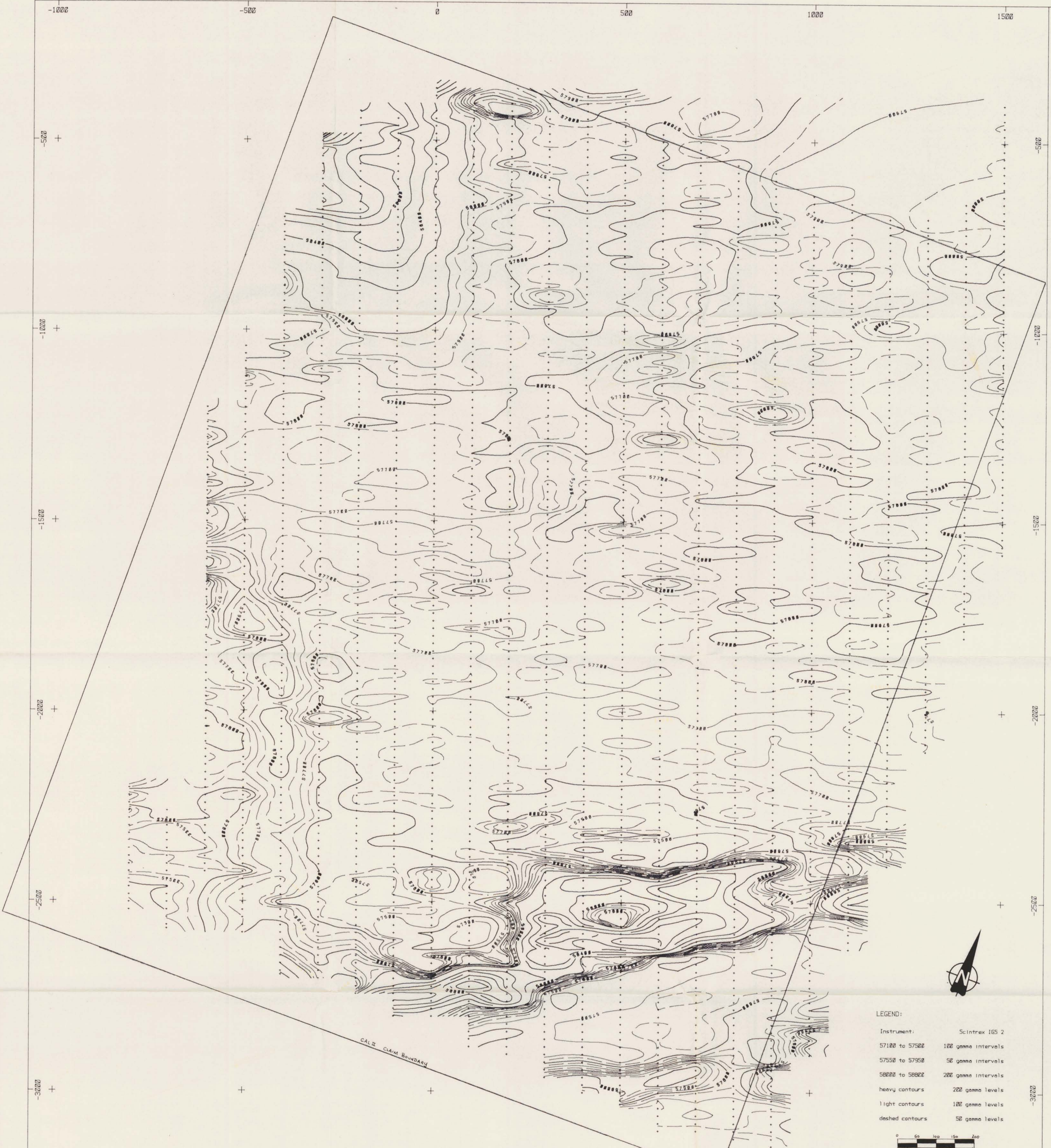


Instrument: Scintrex IG5 2  
 GEOLOGICAL BRANCH  
 ASSESSMENT REPORT

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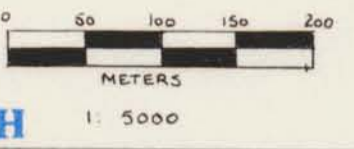


HOMESTAKE MINERAL DEVELOPMENT COMPANY  
 YELLOWJACKET PROPERTY  
 AthIn Area, B.C.  
 Total Field Magnetometer  
 DRAWN BY: ars DATE: December, 1987  
 SCOTT GEOPHYSICS LTD.



LEGEND:

Instrument:	Scintrex 165 2
57100 to 57500	100 gamma intervals
57550 to 57950	50 gamma intervals
58000 to 58800	200 gamma intervals
heavy contours	200 gamma levels
light contours	100 gamma levels
dashed contours	50 gamma levels

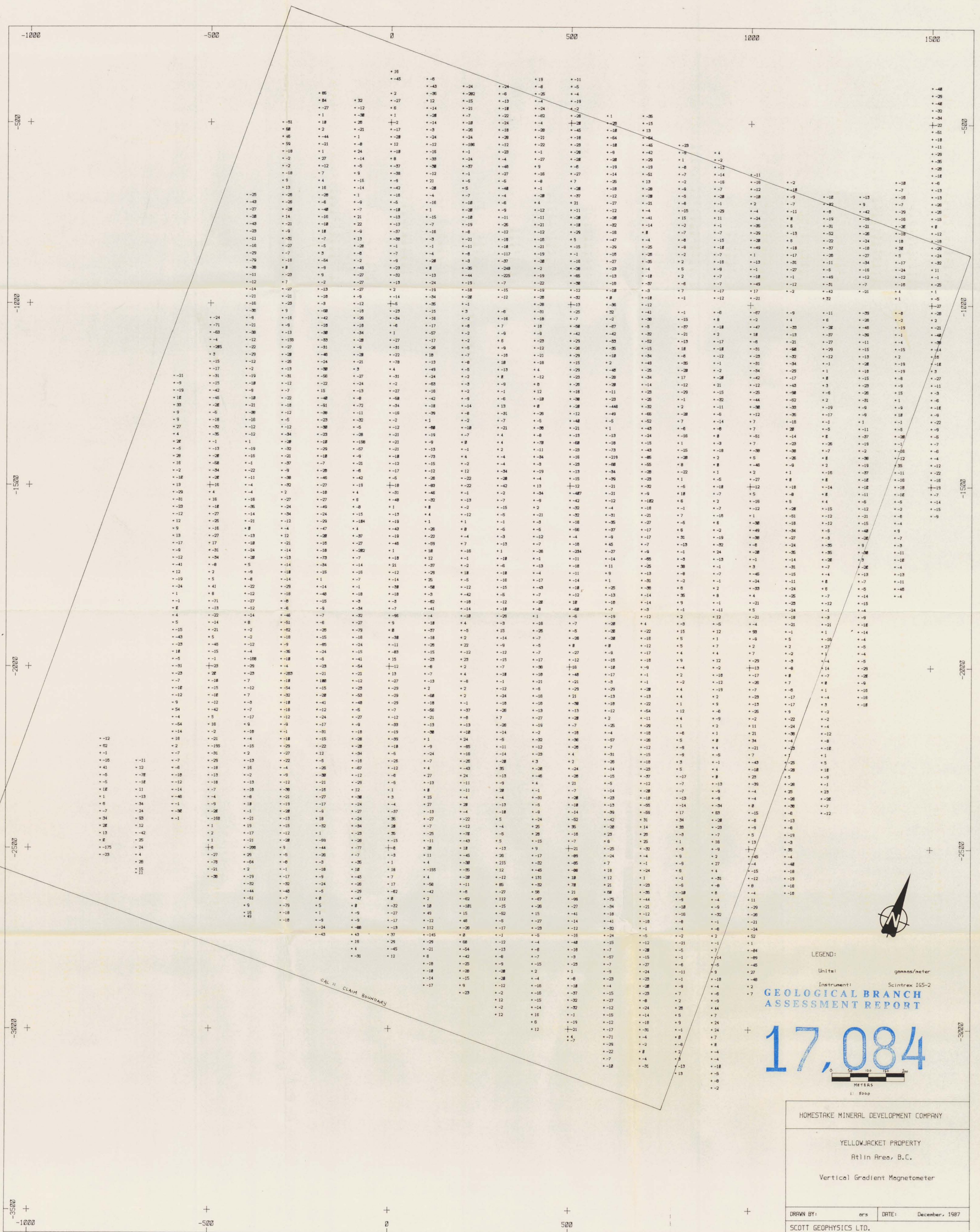


**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**  
HOMESTAKE MINERAL DEVELOPMENT COMPANY

**17,084** YELLOWJACKET PROPERTY  
Atlin Area, B.C.  
Magnetometer Contour Plan

DRAWN BY: ors DATE: December, 1987  
SCOTT GEOPHYSICS LTD.

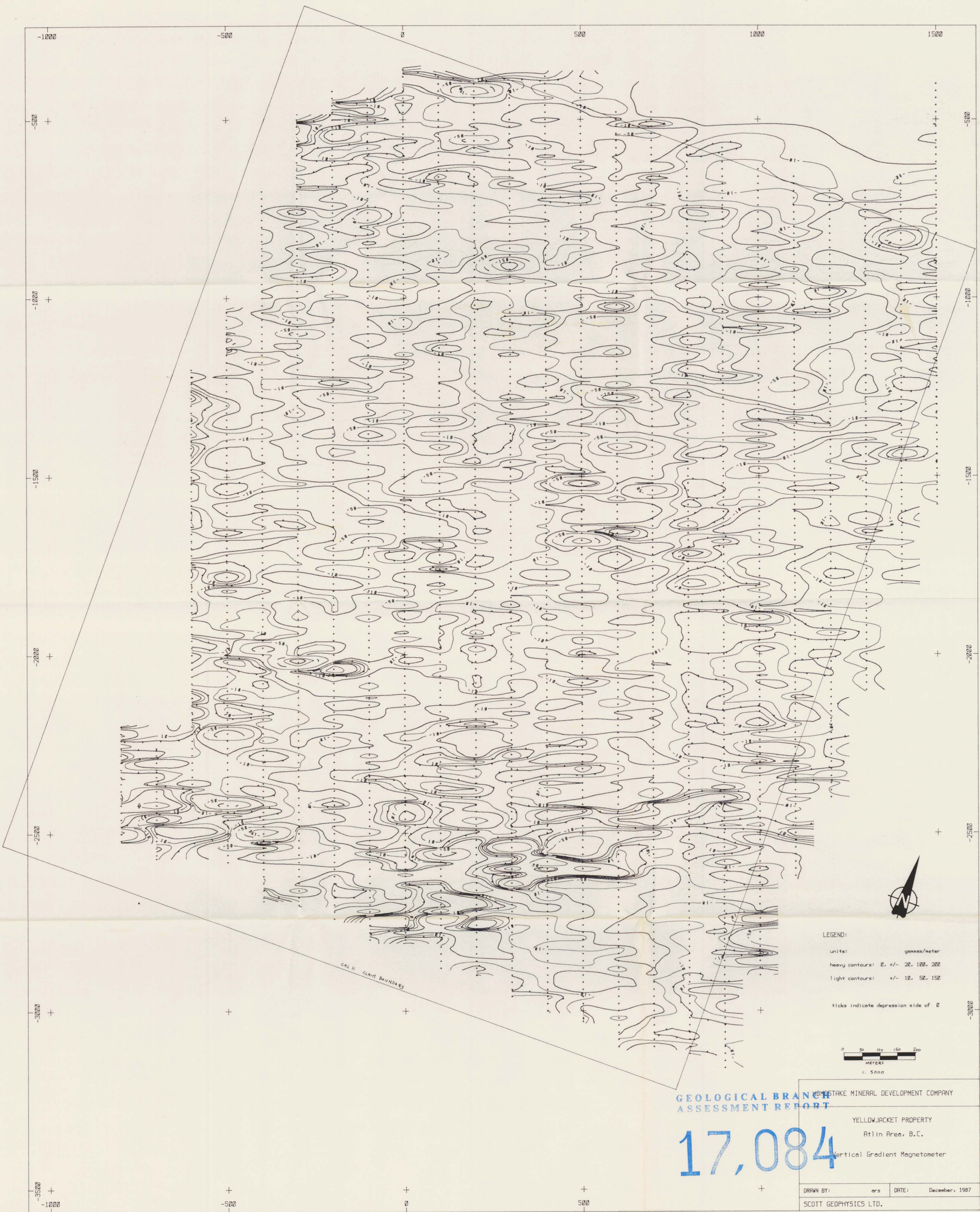




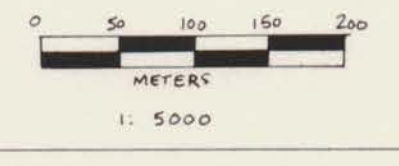
LEGEND:  
 Units: gammas/meter  
 Instrument: Scintrex IG5-2  
**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**

**17,084**  
 METERS  
 1:5000

HOMESTAKE MINERAL DEVELOPMENT COMPANY  
 YELLOWJACKET PROPERTY  
 Atlin Area, B.C.  
 Vertical Gradient Magnetometer  
 DRAWN BY: ars DATE: December, 1987  
 SCOTT GEOPHYSICS LTD.



LEGEND:  
 units: gammas/meter  
 heavy contours: 2, +/- 20, 100, 200  
 light contours: +/- 10, 50, 150  
 ticks indicate depression side of 0



GEOLOGICAL BRANCH  
 ASSESSMENT REPORT

**17,084**

YELLOWJACKET PROPERTY  
 Atlin Area, B.C.

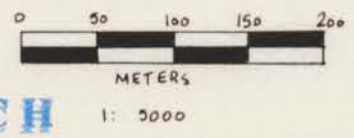
Vertical Gradient Magnetometer

DRAWN BY: ars DATE: December, 1987  
 SCOTT GEOPHYSICS LTD.



LEGEND:

- Station NPH (Haveli) at 23.4 kHz
- X In Phase values at 281 / cm
- ◊ Quadrature values at 281 / cm
- Zero I at the line
- Positive values west (left) of the line



**GEOLOGICAL BRANCH  
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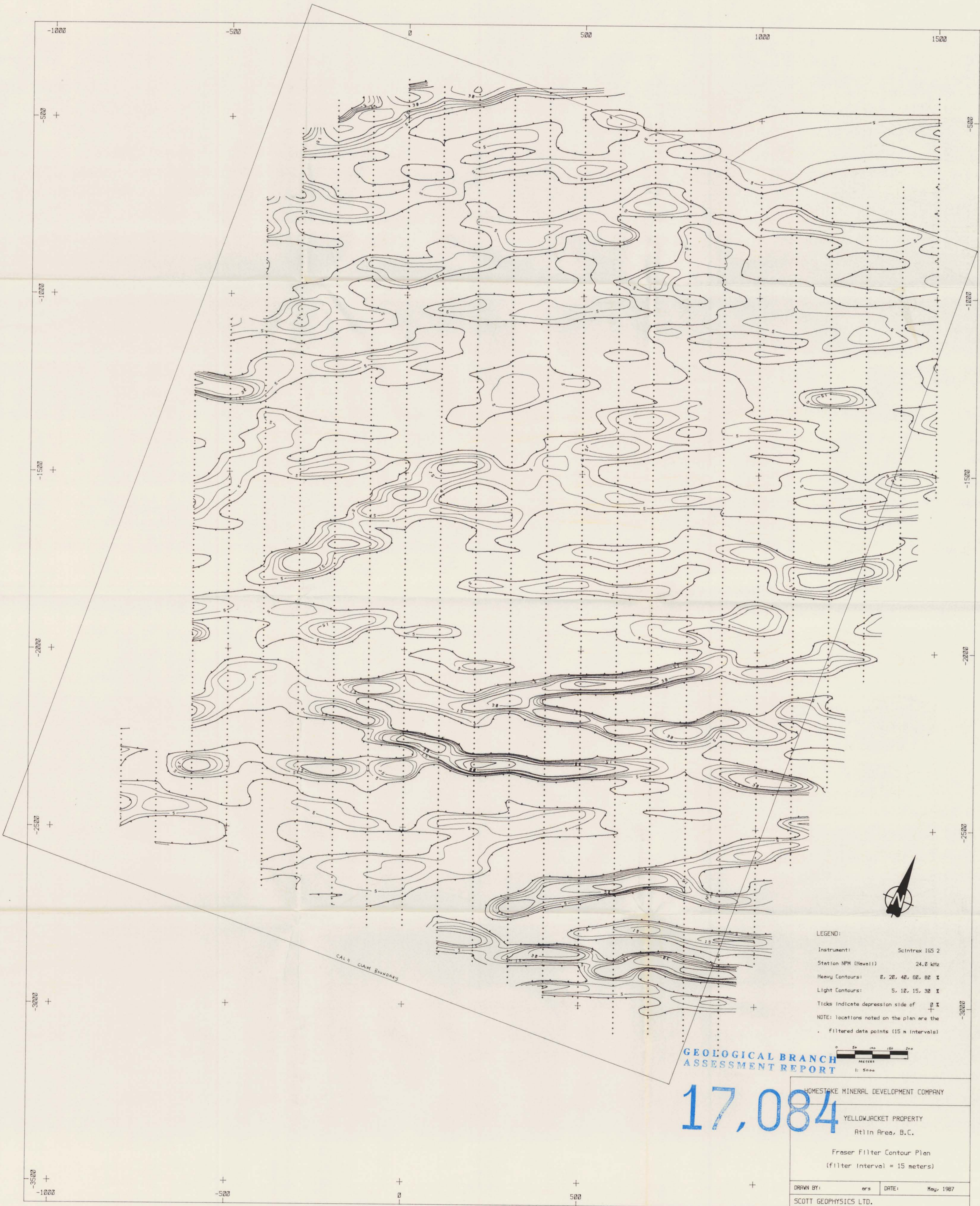
HOMESTAKE MINERAL DEVELOPMENT COMPANY

**17,084**

YELLOWJACKET PROPERTY  
Atlin Area, B.C.

VLF Survey

DRAWN BY: ers DATE: December 1987  
SCOTT GEOPHYSICS LTD.



**LEGEND:**  
 Instrument: Scintrex IGS 2  
 Station NPM (Hawaii) 24.0 kHz  
 Heavy Contours: 0, 20, 40, 60, 80 %  
 Light Contours: 5, 10, 15, 30 %  
 Ticks indicate depression side of 0 %  
 NOTE: locations noted on the plan are the  
 filtered data points (15 m intervals)

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**17,084**

HOMESTAKE MINERAL DEVELOPMENT COMPANY  
 YELLOWJACKET PROPERTY  
 Atlin Area, B.C.  
 Fraser Filter Contour Plan  
 (filter interval = 15 meters)

DRAWN BY: ars      DATE: May, 1987  
 SCOTT GEOPHYSICS LTD.