

ARIS SUMMARY SHEET

District Geologist, Smithers

Off Confidential: 89.06.16

ASSESSMENT REPORT 17494

MINING DIVISION: Atlin

PROPERTY: Balsam  
LOCATION: LAT 59 36 19 LONG 133 37 58  
UTM 08 6608039 577166  
NTS 104N12E

CLAIM(S): Balsam  
OPERATOR(S): Homestake Min. Dev.  
AUTHOR(S): McIvor, D.F.  
REPORT YEAR: 1988, 17 Pages

GEOLOGICAL

SUMMARY: Permo-Pennsylvanian Cache Creek Group andesites are intruded by Permian ultramafics and Cretaceous granites. The contact between andesites and ultramafics is structural and is the site of hydrothermal alteration (silicification/carbonatization) containing weak gold and associated trace element anomalies.

WORK DONE: Geological  
GEOL 400.0 ha  
Map(s) - 2; Scale(s) - 1:2000  
ROCK 22 sample(s) ;ME

LOG NO: 0627

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ACTION:

FILE NO:

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SUMMARY REPORT OF MINERAL EXPLORATION  
ACTIVITY ON THE BALSAM CLAIM,  
(WEST CLAIM GROUP)

ATLIN MINING DISTRICT,  
BRITISH COLUMBIA

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**17,494**

NTS: 104N.12E

LATITUDE: 59° 36' NORTH

LONGITUDE: 133°38' WEST

OWNER: LEAR OIL AND GAS CORPORATION

OPERATOR: HOMESTAKE MINERAL DEVELOPMENT COMPANY LTD.

BY: DUNCAN MCIVOR

DATE: JANUARY, 1988

TABLE OF CONTENTS

	<u>PAGE</u>
1. SUMMARY	1
2. INTRODUCTION	1
2.1 SCOPE OF REPORT	1
2.2 LOCATION, ACCESS, AND PHYSIOGRAPHY	1
2.3 CLAIM STATUS	2
2.4 GENERAL GEOLOGIC SETTING	2
2.5 PRELIMINARY ECONOMIC ASSESSMENT	2
2.6 EXPLORATION HISTORY	3
2.7 WORK COMPLETED	3
3. DETAILED TECHNICAL DATA	3
3.1 GEOLOGIC MAPPING	3
3.1.1. METHODS EMPLOYED	3
3.1.2. RESULTS AND INTERPRETATION	4
3.2 LITHOGEOCHEMICAL SAMPLING	6
3.2.1. METHODS EMPLOYED	6
3.2.2. RESULTS AND INTERPRETATION	6
4. ITEMIZED COST STATEMENT AND ALLOCATION OF EXPENDITURES	
SELECTED BIBLIOGRAPHY	
AUTHOR'S QUALIFICATION	

LIST OF FIGURES

FOLLOWS  
PAGE

- |    |  |   |
|----|--|---|
| 1. | LOCATION MAP, ATLIN AREA AND BALSAM PROPERTY | 1 |
| 2. | LOCATION MAP, BALSAM CLAIM                   | 1 |
| 3. | GENERAL GEOLOGY OF THE ATLIN AREA.           | 2 |

LIST OF APPENDICES

- |    |  |
|----|--|
| 1. | 1:2000 GEOLOGICAL PLAN MAP, BALSAM PROPERTY (EAST AND WEST SHEETS) |
| 2. | ICP LITHOGEOCHEMICAL DATA  |

## 1. SUMMARY AND RECOMMENDATIONS

The Balsam Claim is located 5 kilometers northeast of the town of Atlin, in northwestern British Columbia. During the period of June through October 1987, detailed geological mapping and lithogeochemical sampling was carried out on the property by Homestake Mineral Development Company Ltd. as part of a large exploration program in the Atlin area.

The mapping indicated that the property was underlain predominantly by intermediate volcanics of the Cache Creek Group, which had locally been intruded by ultramafic rocks in the northeast sector of the property, and granitic rocks in the western sector of the property.

Gold mineralization in the Atlin area is often associated with hydrothermally altered (silica-carbonate-mariposite) ultramafic rocks proximal to their intrusive and thrust faulted contact with volcanics of the Cache Creek Group. As such, the results of the mapping indicated that the northwest sector of the property is one of favourable geology with regards to gold potential. Only one small outcrop of hydrothermally altered outcrop was exposed, however, and it failed to return any significant gold anomalies. The result of the other lithogeochemical sampling on the property were equally disappointing, with no significant gold values. Weakly elevated values of certain "pathfinder" trace elements (Ag, As) were noted in the hydrothermally altered ultramafic exposure on the property, and this area warrants a more vigorous sampling program.

Should the results of that work provide any encouragement, a detailed total field and vertical gradient magnetometer survey is recommended for the northeast section of the property. These surveys should aid in delineation of the alteration horizon, and should help in selecting potential drill targets along its strike extension.

## 2. INTRODUCTION

### 2.1 Scope of Report

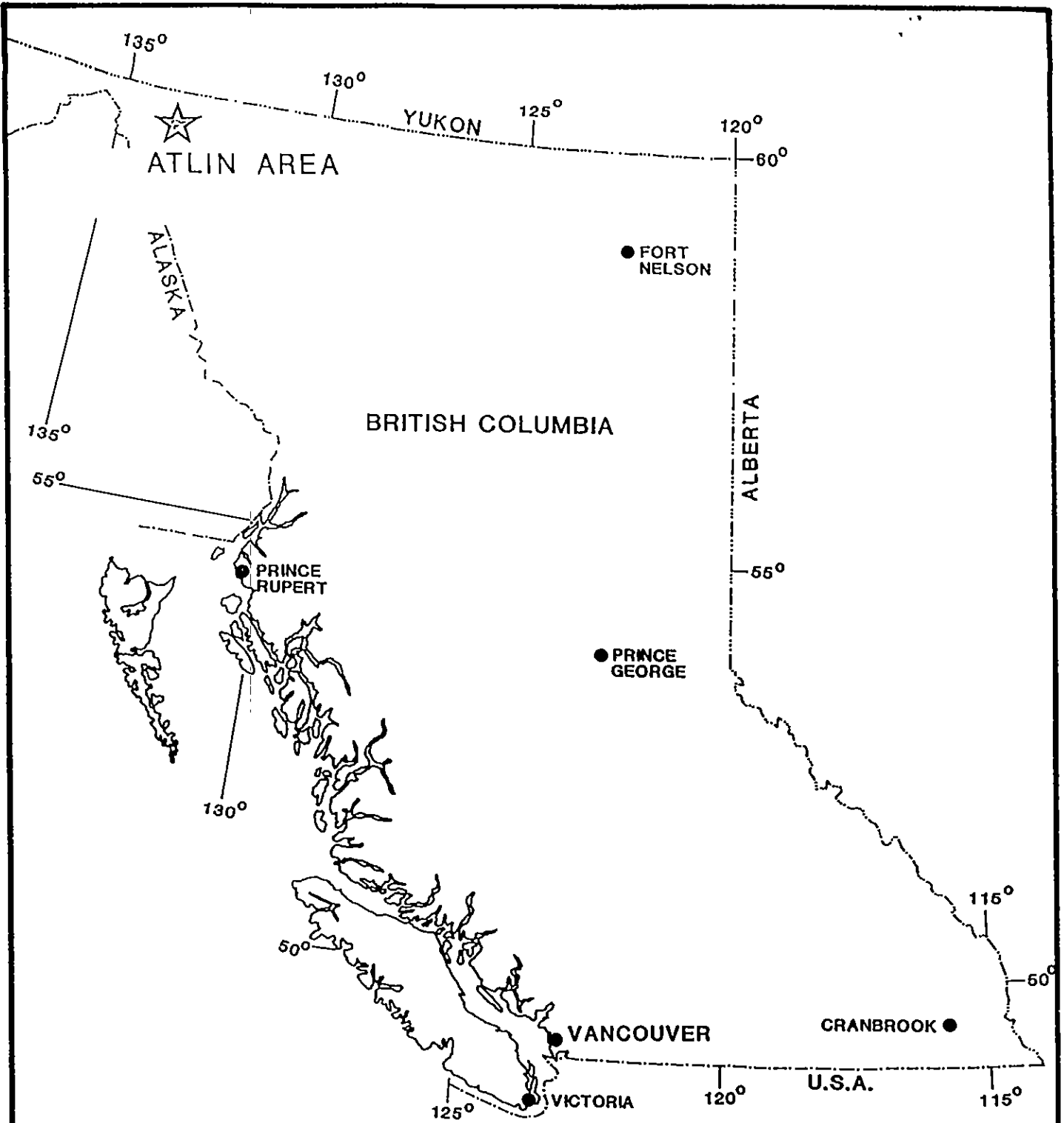
This report covers all exploration activity conducted on the Balsam claim by Homestake Mineral Development Company Ltd. during the period June through October 1987.

### 2.2 Location, Access and Physiography

The Balsam Property, a 16 unit (4 x 4) claim, is located 5 kilometers northeast of the town of Atlin, in northwestern British Columbia (see Figures 1 and 2).

Access to the property is good, with a 2WD dirt road extending east from the Whitehorse Highway, across the northern half of the property, and adjoining the Surprise Lake Road southeast of the property.

Outcrop exposure on the property is poor, only approximately 5% of the property area. The majority of exposure outcrops along the northern edge of the property, on the south face of Mt. Munro, which rises 500 meters above the property to form its northern boundary. Good exposure also outcrops along an east-west trending ridge in the western portion of the property.



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

The majority of the claim is overlain by a thick cover of fluvial and glaciofluvial sand and gravel, and vegetation is predominantly jack pine and spruce.

### 2.3 Claim Status

The claim was originally staked in 1984 by Lear Oil and Gas, a Vancouver based junior resource company. The property was optioned to Homestake Mineral Development Company in 1987, as part of a larger package of ground including the "Imperial" group of Crown Grants, north and northeast of the property. The claim is currently in good standing until June of 1988.

### 2.4 General Geologic Setting

The Balsam Property 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 intruded 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 listwanite-like assemblage of silica, carbonate and mariposite/fuchsite.

The Balsam property is underlain predominantly by rocks of the Cache Creek Group (andesitic to basaltic flows), intruded by late Jurassic granites in the west, and ultramafic and associated dioritic-gabbroic rocks in the north. Figure 3 illustrates the general geology of the Atlin area, and the location of the Balsam claim within that geological setting.

### 2.5 Preliminary Economic Assessment

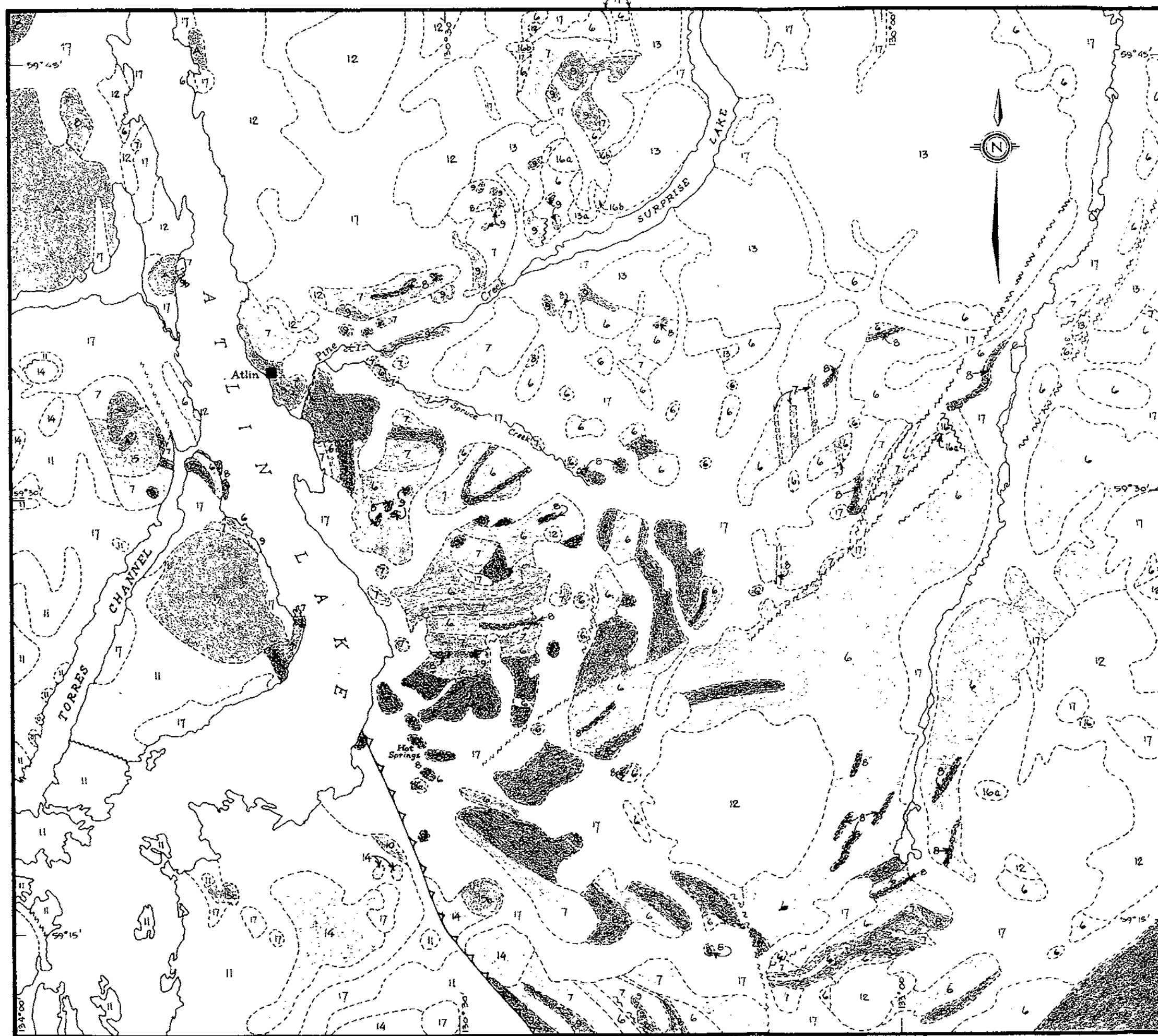
The majority of known lode gold mineralization within the Atlin Camp is associated with intensely altered (silica-carbonate-mariposite/fuchsite) ultramafic rocks proximal to their fault bounded or intrusive contacts with rocks of the Cache Creek Group.

The mineralization is almost exclusively hosted in quartz-carbonate veins and vein stockworks within these altered packages of rocks, occurring either as often spectacular free gold, or in intimate association with gangue sulphides such as pyrite, chalcopyrite, arsenopyrite, sphalerite, galena, and sulfosalts (pyrargyrite, tetrahedrite).

The Balsam property, in as much as it covers a contact between ultramafic rocks in the north and Cache Creek Group rocks in the south, may host





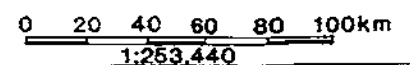


LEGEND

- CENOZOIC**  
**QUATERNARY**  
 PLEISTOCENE AND RECENT  
 17 GLACIAL DRIFT ; ALLOVIUM
- TERTIARY AND QUATERNARY**  
 16 OLIVINE BASALT AND SCORIA ;  
 16a TERTIARY 16b PLEISTOCENE
- TERTIARY (?)**  
 15 15a QUARTZ MONZONITE 15b GRANOPHYRE  
 15c GABBRO AND DIORITE
- CRETACEOUS OR TERTIARY**  
 14 SLOKO GROUP  
 ANDESITE 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  
 8. LIMESTONE AND LIMESTONE BRECCIA  
 7. GREENSTONE AND VOLCANIC GREYWACKE ;  
 DERIVED AMPHIBOLITE ; MINOR 6 AND 8.  
 6. CHERT, ARGILLITE, CHERT-PEBBLE CONGLOMERATE AND CHERT BRECCIA ;  
 QUARTZITE AND SCHIST ; MINOR 7 AND 8
- 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



DRAWN KMc	DATE	FILE CODE
Revised		104N/12

areas of hydrothermally altered ultramafics along this contact, which in turn may host potentially auriferous quartz and quartz-carbonate vein stockworks.

There is also some potential for "Atlin Ruffner" style mineralization. Located 20 kilometers northeast of Atlin, the Ruffner deposit consists of a series of mineralized veins that cut medium to coarse grained granite of the Jurassic-Cretaceous, Fourth of July Creek Batholith. These veins are developed in widely spaced fault zones that can be traced for up to 2,000 meters of strike length. Mineralization includes varying amounts of sphalerite, galena, tetrahedrite, arsenopyrite, pyrite, pyrrhotite, chalcopyrite and minor molybdenite in quartz-calcite gangue. Silver, and minor amounts of gold, is closely associated with lead and zinc. Past production from the deposit totals 1,610 tonnes at a grade of 2.1 g/t Au, 1284 g/t Ag, 0.37 kg/t Cu, 34.4 kg/t Pb, and 8.4 kg/t Zn.

Published reserves as of 1981 were 52,715 tonnes grading 637.6 g/t Ag.

## 2.6 Exploration History

Prior to acquisition by Homestake Mineral Development Company Ltd., no recorded work has been performed on the claim.

## 2.7 Work Completed to Date

During the period June through October 1987, the following work was completed by Homestake Mineral Development Company Ltd. on the Balsam claim;

- 24 kilometers of flagged line grid were established on the property, to facilitate geological mapping.
- detailed geological mapping, at a scale of 1:2000 was completed on the property.
- 22 samples were collected from the property, and analyzed for 30 elements via ICP, and Au via standard fire assay and A.A. methods.

The details of this work are outlined in the next section of this report.

## 3. DETAILED TECHNICAL DATA

### 3.1 Geological Mapping

#### 3.1.1. Methods Employed

Approximately 24 kilometers of flagged line grid were established on the property, employing compass and hip chain, to provide control for geological mapping. A 2 kilometer east-west trending baseline was established across the centre of the property, from which cross lines at 200 meter intervals extended north and south for 1,000 meters.

In the course of mapping, all encountered outcrops were physically tied into the grid, and their perimeters followed by hip-chain and compass. This provided very accurate establishment of outcrop locations.

Detailed notations as to outcrop lithology and the presence or absence of any significant alteration, veining, and mineralization were made in the field.

All pertinent topographic and geomorphic features were also accurately tied into the grid.

The detailed geology map of the property, at a scale of 1:2000, appears in Appendix 1 of this report.

### 3.1.2. Results and Interpretation

#### Lithologies

Six lithological types, five really, two being different alteration assemblages of the same protolith, outcrop on the property. Below are brief descriptions, their numbers corresponding with those of the map legend in Appendix 1.

#### Unit 2 - Serpentinized Ultramafic

This unit, outcropping the northeast corner of the property, occurs as a very fine grained to aphanitic, massive bright green to black and very strongly serpentinized rock, the serpentine content ranging from approximately 30% to 100%. The rock weathers a characteristic tan to buff colour, and is generally very strongly magnetic. The unit is often porphyritic, with small 2-3 mm weakly steatized pyroxene crystals which stand out in relief on weathered surfaces.

While predominantly massive, a few locations exhibit a very weak foliation, with thin (1-2 mm) bands of magnetite to up to 30% of the rock. Directions are highly variable, and no regional foliations were observed in outcrop.

A few zones of weak talc alteration were observed, on an insignificant scale.

#### Unit 3 - Totally Altered (Silica-Carbonate-Mariposite) Rock

Only one very small outcrop of this unit was observed on the property, in the extreme northeast corner of the property. The rock is intensely altered to carbonate, predominantly magnesite with lesser ferroan dolomite and ankerite, and contains only 1% small disseminated mariposite blebs. Pervasive silification is weak, but the rock contains 10% thin (on the millimeter scale) quartz-carbonate stringers that appear to represent late stage fracture infilling. The outcrop is massive. No sulphide mineralization was observed.

#### Unit 4 - Intermediate to Mafic Intrusive Rock

Rocks of this unit outcrop extensively in the northeast corner of the property, and occur throughout the property as thin dykes. The rocks have highly variable textural and compositional features, ranging from very fine grained diabasic appearing dykes, to coarse grained gabbroic appearing "plugs", and from andesitic/dioritic appearing to gabbroic appearing compositions. No attempt was made to sub-divide the unit, as these textural and compositional features are gradational within individual outcrops, and probably all are genetically related to one magma source.

There is a remote possibility that the coarse diorite-gabbro in the northwest corner of the property are differentiated equivalents of the ultramafic intrusive rocks, as suggested in the literature, but the author feels this highly unlikely, as distinct intrusive contacts have been observed elsewhere in the camp.

#### Unit 5 - Feldspar Porphyry

This unit outcrops as large dykes in both the northeast and western portions of the property. The rock is characteristically comprised of a light green, aphanitic, felsic to intermediate, dacitic appearing groundmass with 25 to 40% feldspar (plagioclase) phenocrysts, often as sub-hedral to euhedral laths to 3-5 mm. In places a few small quartz and ferromagnesian (hornblende) phenocrysts are also present, rarely exceeding 10% by volume of the rock. The dykes are locally massive, and may contain trace amounts of very fine disseminated pyrite.

The feldspar porphyry is very young, as it is seen cutting all other lithological groups on the property, including the Jurassic-Cretaceous granitic rocks outcropping on the western part of the property. They may be related genetically to the Cretaceous "alaskike" intrusions that outcrop extensively in the Surprise Lake Area.

#### Unit 9 - Andesite

This unit is believed to underlie the majority of the property, although rarely outcropping. Where it does outcrop, in the southeast corner of the property, it is characteristically massive, dark green, aphanitic and uniformly unspectacular.

#### Unit 13 - Granite

Granitic rocks of the Jurassic-Cretaceous Footh of July Creek Batholith outcrop extensively in the western portion of the property. The granite is characteristically porphyritic, with 25-40% large 3-5 cm. lath shaped Kspar phenocrysts in an inequigranular coarse grained quartz-feldspar-hornblende groundmass. Where observed, the granite was massive, and no significant alteration was observed. The one quirk exhibited by these granitic rocks was a pervasive weak to moderate magnetism, although magnetite was rarely observed, even as a minor accessory mineral, in outcrop.

## Structure/Stratigraphic Relationships

The paucity of outcrop on the property precludes the possibility of a detailed understanding of local stratigraphy and structure. Based on what outcrop is present, and the regional airborne magnetic data, the following is a brief summary of the interpreted structural and stratigraphic aspects of the property geology.

The majority of the claim is underlain by a thick sequence of intermediate (andesitic) volcanics of the Pennsylvanian "Cache Creek Group". This package of volcanics is invariably massive and homogeneous, and thus interpretation of its stratigraphic orientation is difficult. Regionally, the volcanics trend approximately east-west, with vertical to sub-vertical dips, and that orientation is believed to hold true on the Balsam claim. "Intruding" the thick pile of intermediate volcanics are;

- in the northwest corner, ultramafic rocks of Pennsylvanian-Permian age. These "intrusions" are more probably in-thrusted slices of already cool or cold ultramafic bodies, as opposed to true intrusions rising diapirically through the volcanic package. While no empirical evidence for a thrust-fault contact exists on the property, as no contacts were observed in outcrop, this relationship is seen elsewhere throughout the Atlin area.
- intruding the ultramafic bodies in the northwest corner of the property, are younger "plugs" of diorite-gabbro. These rocks are possibly late stage differentiates of the ultramafics, that were already emplaced and inthrust with the ultramafic rocks. More probably, however, they are genetically separate intrusions that have utilized existing zones of structural weakness for emplacement. The "plugs" or sills, in general, have an east-west trend with vertical to sub-vertical dips.
- in the western portion of the property, the granitic Fourth of July Creek Batholith (Jurassic in age) intrudes the volcanics. No intrusive contacts were observed on the property, and the nature of that contact and style of intrusion is at present unclear.
- throughout the property, very young dykes of diabase and feldspar porphyry intrude all lithologies. The dykes generally exhibit an east-west orientation with vertical to sub-vertical dips.

### 3.2 Lithogeochemical Sampling

#### 3.2.1. Methods Employed

In the course of mapping, 22 bedrock samples were collected from the property, and forwarded to Acme Analytical Laboratories in Vancouver for 30 element ICP. In addition, all samples were analyzed for gold by atomic absorption methods.

Obviously, the purpose of the sampling program was to evaluate the economic potential of the property, and all exposures containing any form of alteration, mineralization or veining were sampled. In addition to the gold analyses, the wide spectrum of elements analyzed for by the ICP method provides some very useful trace element geochemical data. Gold mineralization in the Atlin camp often occurs with associated highly elevated contents of Cu, Zn, Pb, Sb, As, Cd and Ag, all of which are part of the 30 element ICP analytical package. Elevated contents of these elements even in the absence of anomalous gold values, may serve as "pathfinders" to gold mineralization.

The ICP geochemical data appears in Appendix 2. All sample locations are plotted on the enclosed geology plan map in Appendix 1, followed by the sample gold content in ppb, as determined by atomic absorption.

### 3.2.2. Results and Interpretation

Of the 23 samples collected from the property, only 2 returned even weakly anomalous gold values. They were;

#### Sample PL-36340

A sample of quartz-carbonate (vein) boulder in talus, from the northeast corner of the property, which carried 57 ppb Au, with 11.0 ppm Ag, 228 ppm Pb, 106 ppm Zn, and 175 ppm Cu. The source of this boulder is not known, and as such the anomaly is of little merit.

#### Sample PL-36406

A grab sample from a feldspar porphyry dyke hosted in granite, from the west-central portion of the property, which carried 12 ppb Au, with 0.4 ppm Ag. While interesting, the anomaly is insignificant in terms of economic potential.

All other samples returned gold values of 1 or 2 ppb. Only one sample, in addition to the two above, carried significantly elevated "trace-element" contents, and it was;

#### Sample PL-36336

A grab sample from the sole outcrop of intensely carbonatized ultramafic rock, in the northeast corner of the property, which carried 0.5 ppm Ag and 112 ppm As.

These slightly elevated values may be indicative of proximity to auriferous quartz-carbonate veins within the altered ultramafic, as elsewhere in the camp numbers of this magnitude (particularly the arsenic) represent subtle halos around veins/vein systems. Additional sampling of this exposure, and where possible a soils geochemical survey around the exposure, are probably warranted to further evaluate this alteration zone.

#### 4.0 ITEMIZED COST STATEMENT AND ALLOCATION OF EXPENDITURES

4.1 The following expenses were incurred as a direct result of the exploration work on the Balsam claim.

1) Salaries and Wages

Duncan McIvor:	(Including Report Preparation Costs)	
July 7-15/87	9 days	
Jan. 8/88	1 day	
	<u>10 days @ \$115.00/day</u>	\$1,150.00
Joanne Bozek:		
July 7-15/87	9 days @ \$85.00/day	\$ 765.00
Phil Southam:		
July 7-15/87	9 days @ \$85.00/day	\$ 765.00
	SUB TOTAL	\$2,680.00
	+20% BENEFITS, ETC.	<u>536.00</u>
	TOTAL	<u>\$3,216.00</u>

2. Analytical Costs

22 samples, 30 elements ICP analysis and geochemical Au analysis @\$14.25/sample	\$ <u>313.50</u>
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3. Food and Accommodation Costs

@\$35/day per man x 28 man days	\$ <u>980.00</u>
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4. Transportation Costs

Fuel and Maintenance on 2 trucks @\$25/day x 9 days	\$ <u>225.00</u>
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5. Miscellaneous Field Equipment Costs

- consumables: e.g. flagging tape, topofil, sample bags, mylar, etc.	\$ <u>100.00</u>
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TOTAL EXPENDITURES	<u>\$4,834.50</u>
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#### 4.2 Allocation of Expenditures to Claims

All costs were incurred and are allocated to the Balsam claim (Rec. No. 2318, 16 units). These costs are to be applied to claims as outlined in the Statement of Exploration and Development.

DMc/mm

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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

HOME-STAKE MINERALS PROJECT-RW-5710 FILE # W7-282R

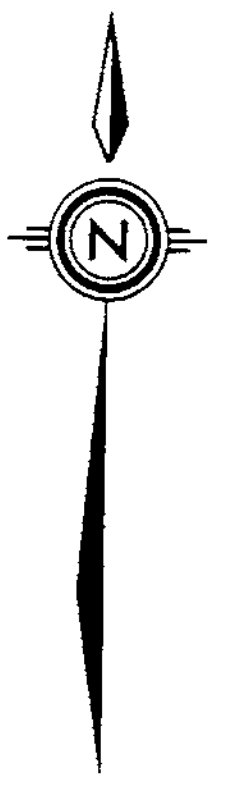
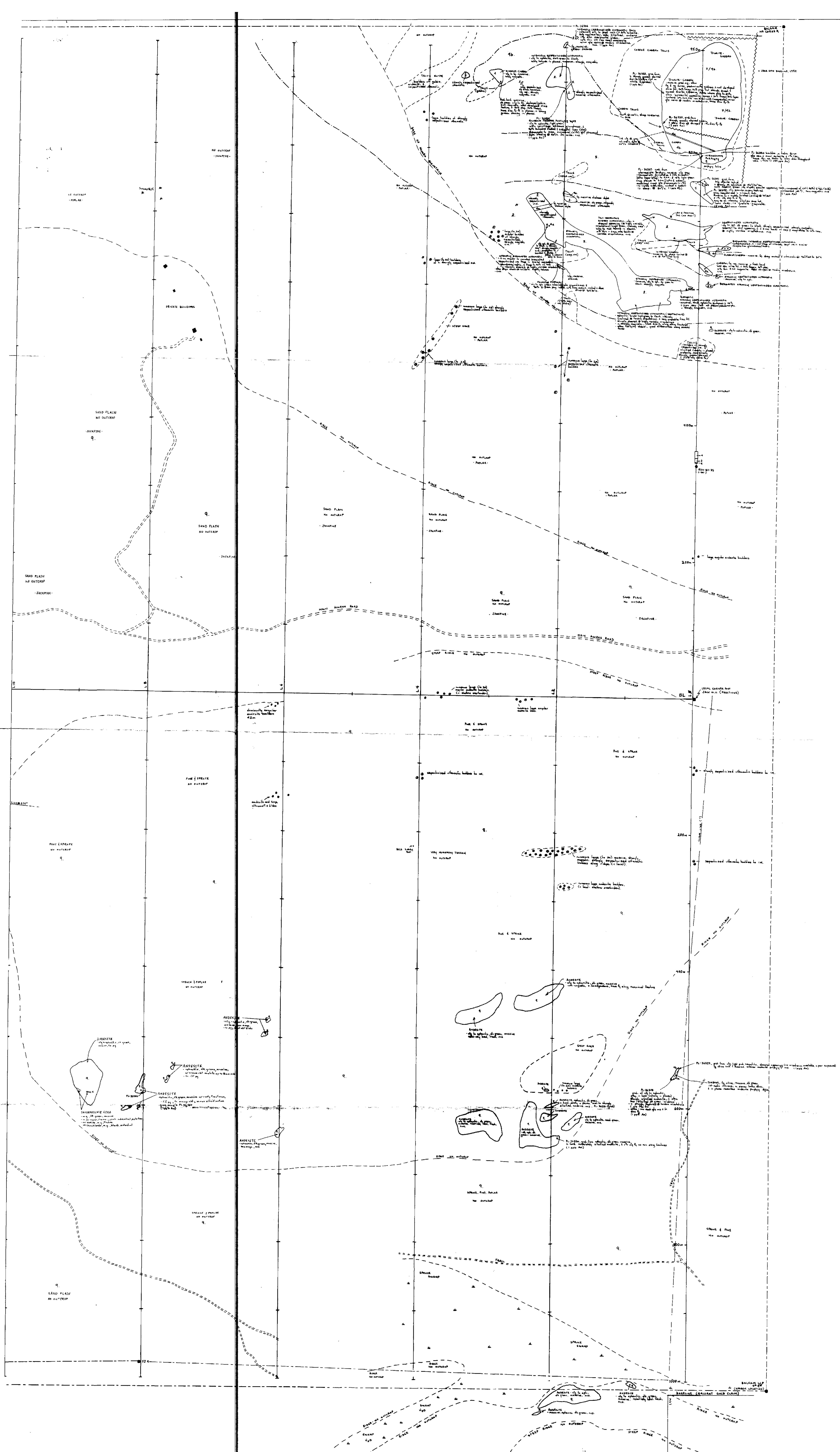
BALSAM  
ADAMISTRY

SAMPLE#	NO	CU	PR	ZK	AG	NI	CO	MM	FE	AS	U	AU	TH	SR	CD	SD	BT	V	CA	P	LA	CR	MG	BA	TI	M	AL	HA	X	N	AUT
PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	PPH	
PA-01-1-34463	1	28	7	45	.1	36	5	157	1.68	3	5	NO	4	4	1	2	2	9	.05	.010	9	13	.44	265	.06	2	.62	.02	.33	2	
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PA-01-1-34471	1	38	3	33	.2	19	9	236	2.41	4	5	NO	1	38	1	2	2	87	1.06	.064	4	4	.77	.88	.26	2	1.12	.09	.32	1	
PA-01-1-34475	1	41	2	16	.1	15	6	121	1.13	6	5	NO	1	62	1	2	3	43	1.03	.069	4	44	.32	53	.33	2	1.12	.09	.32	1	
PA-01-1-34476	88	64	11	196	.5	88	8	551	3.74	8	5	NO	8	42	2	2	2	264	.86	.077	5	70	2.16	138	.25	2	3.54	.16	1.03	1	
PA-01-1-34477	1	38	2	49	.4	31	6	223	1.87	2	5	NO	5	12	1	2	2	27	.22	.011	10	26	.78	293	.08	2	1.08	.03	.51	1	
PA-01-1-34478	1	38	2	34	.1	14	7	228	2.18	3	5	NO	1	25	1	2	2	60	.57	.087	7	45	.69	744	.21	2	.94	.12	.50	1	
PA-01-1-34479	1	14	2	21	.1	8	4	92	1.33	2	5	NO	9	5	1	2	2	28	.43	.065	19	4	.79	186	.11	2	.64	.12	.29	1	
PA-01-1-34480	2	49	6	31	.3	5	13	220	3.12	5	5	NO	2	28	1	2	2	82	.81	.148	8	2	.79	308	.26	2	1.17	.15	.66	1	
PA-01-1-34481	1	7	4	74	.1	184	23	224	4.52	5	5	NO	2	4	1	2	2	111	.44	.122	10	271	2.90	730	.44	2	2.36	.11	2.03	1	
PA-01-1-34482	1	17	2	32	.3	26	6	287	2.02	4	5	NO	8	56	1	2	2	37	2.06	.234	31	44	1.03	206	.23	2	1.41	.13	.42	1	
PA-01-1-34483	1	11	2	23	.1	942	27	153	1.44	155	5	NO	1	4	1	2	2	19	.23	.003	2	644	2.75	31	.01	4	.78	.01	.01	1	
PA-01-1-34484	1	21	2	34	.1	56	11	405	1.66	10	5	NO	2	95	1	2	2	15	4.57	.038	6	105	3.65	39	.01	4	.46	.01	.06	1	
PA-01-1-34489	2	3	2	53	.2	87	20	603	3.78	15	5	NO	2	185	1	12	2	28	1.92	.038	6	105	3.65	39	.01	4	.34	.03	.18	1	
PL-01-1-34530	1	71	2	18	.1	20	10	159	1.78	4	5	NO	1	51	1	2	2	42	2.03	.035	2	18	.47	26	.18	2	2.40	.41	.10	1	
PL-01-1-34531	1	45	2	23	.1	21	10	213	2.09	2	5	NO	1	23	1	2	2	67	1.44	.035	2	30	.74	18	.26	2	1.37	.19	.15	1	
PL-01-1-34535	1	4	2	3	.2	4	1	56	.35	2	5	NO	1	12	1	2	2	4	4.89	.013	3	2	.11	10	.06	2	.17	.08	.02	1	
PL-01-1-34536	1	96	7	25	.5	1287	65	401	2.94	112	5	NO	1	291	1	2	3	11	11.80	.003	2	114	8.70	9	.01	2	.19	.22	.01	1	
PL-01-1-34537	1	111	4	36	.1	22	19	360	4.40	7	5	NO	1	22	1	2	2	150	1.92	.005	2	4	1.54	7	.09	2	2.81	.44	.03	2	
PL-01-1-34538	1	197	2	14	.1	22	10	182	3.25	3	5	NO	1	17	1	2	2	174	1.59	.016	2	8	.73	2	.07	2	1.98	.23	.02	1	
PL-01-1-34539	1	21	14	58	.4	41	10	484	3.25	2	5	NO	7	33	1	2	2	67	1.15	.078	19	81	1.91	169	.29	3	1.14	.07	.11	1	
PL-01-1-34540	3	175	228	106	11.0	18	4	195	1.10	20	5	NO	1	55	2	2	16	8	1.67	.004	2	13	.56	13	.01	2	.17	.01	.03	1	
PL-01-1-34541	1	2	4	39	.3	481	27	826	4.30	5	5	NO	1	49	1	2	5	95	3.72	.007	2	870	6.96	6	.01	2	3.00	.01	.01	2	
PL-01-1-34542	1	36	2	12	.1	54	15	119	2.37	5	5	NO	1	4	1	2	2	53	.18	.024	2	29	.94	5	.05	2	.71	.09	.01	1	
PL-01-1-34604	1	4	2	27	.1	7	3	275	2.08	2	5	NO	15	30	1	2	2	38	.43	.069	24	14	.37	50	.10	2	.37	.05	.06	1	
PL-01-1-34605	1	11	6	31	.2	8	5	343	2.34	6	5	NO	15	40	1	2	2	44	.90	.068	40	13	.51	82	.03	2	.52	.03	.08	1	
PL-01-1-34606	1	9	7	50	.4	7	8	589	3.24	6	5	NO	6	101	1	2	2	57	2.33	.067	19	17	1.28	397	.06	2	.93	.01	.25	1	
PL-01-1-34607	1	5	8	37	.2	8	6	467	2.49	4	5	NO	17	211	1	2	2	36	1.98	.074	39	9	.59	16.73	.01	2	.68	.01	.09	1	
PL-01-1-34608	1	19	6	52	.3	17	17	488	4.05	7	5	NO	15	171	1	2	2	91	3.38	.288	43	55	1.73	366	.18	2	1.28	.03	.10	1	
STD C/MOR	19	60	41	131	7.4	70	28	223	1.08	42	5	NO	2	109	1	2	2	11	1.70	.035	10	4	.41	697	.01	2	.52	.02	.12	1	

HOMESTAKE MINERALS PROJECT-MR-5710 FILE # 87-2928

2-21-87  
JAMES W. STICKNEY

SAMPLE	NO	CU	PB	ZN	AG	NI	CO	MN	FE	AS	U	AU	TR	SR	CD	SR	BT	V	CA	P	LA	CR	MG	BA	TI	B	AL	NA	K	N	AUT
	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
PL-01-1-34410	1	4	2	33	.1	10	5	375	2.44	3	5	ND	17	29	1	2	2	41	.30	.081	44	12	.64	96	.01	2	.83	.07	.00	1	1
PL-01-1-34411	1	8	13	68	.3	8	8	638	3.20	4	5	ND	6	124	1	2	2	58	2.31	.072	20	14	1.15	550	.06	2	1.27	.01	.28	1	1
PL-01-1-34412	1	48	12	47	.3	103	17	447	2.83	2	5	ND	16	324	1	4	2	62	2.65	.300	58	261	3.02	1010	.26	2	1.80	.24	.18	1	1
PL-01-1-34413	1	20	8	24	.2	41	8	273	2.20	6	6	ND	14	106	1	2	2	40	1.11	.127	31	45	1.28	285	.17	3	.96	.07	.26	1	1
PL-01-1-34450	1	65	5	42	.2	60	18	281	3.03	3	5	ND	1	53	1	3	2	75	1.46	.041	2	82	1.02	241	.30	2	1.46	.15	.50	1	1



- LEGEND**
- LITHOLOGIES**
- 1 BASALT
  - 2 SERPENTINIZED ULTRAMAFIC (ALTERED ULTRAMAFIC INTERLUVE)
  - 3 COMPLETELY ALTERED (SILICEOUS CARBONATE, MARGARITE AND/OR HYDROXIDES)
  - 4 MAFIC INTERLUVE (DIOBASE, GABBRO)
  - 5 FELSOPHANE AMPHIBOLITES
  - 6 GNEISS
  - 7 DIORITE
  - 8 GNEISS/GNANITE
  - 9 ANDESITE (SILICEOUS CARBONATE, MARGARITE AND/OR HYDROXIDES)
  - 10 PORPHYRY
  - 11 GNEISSIC GNEISS
  - 12 AMIBOLITE
  - 13 GRANITE
  - 14 LIMESTONE
- SYMBOLS**
- GEOPHYSIC CONTACT (OBSERVED/ASSUMED)
  - GEOSYNCLINITY
  - BEDDING
  - DIPPING
  - QUARTZ VEIN
  - BRECCIATION
  - FAULT
  - SAMPLE POINT
  - TPOGRAPHICAL/GEOMORPHOLOGICAL FEATURE
  - ROAD/RAIL
- Scale: 0m 50m 100m  
1:5000

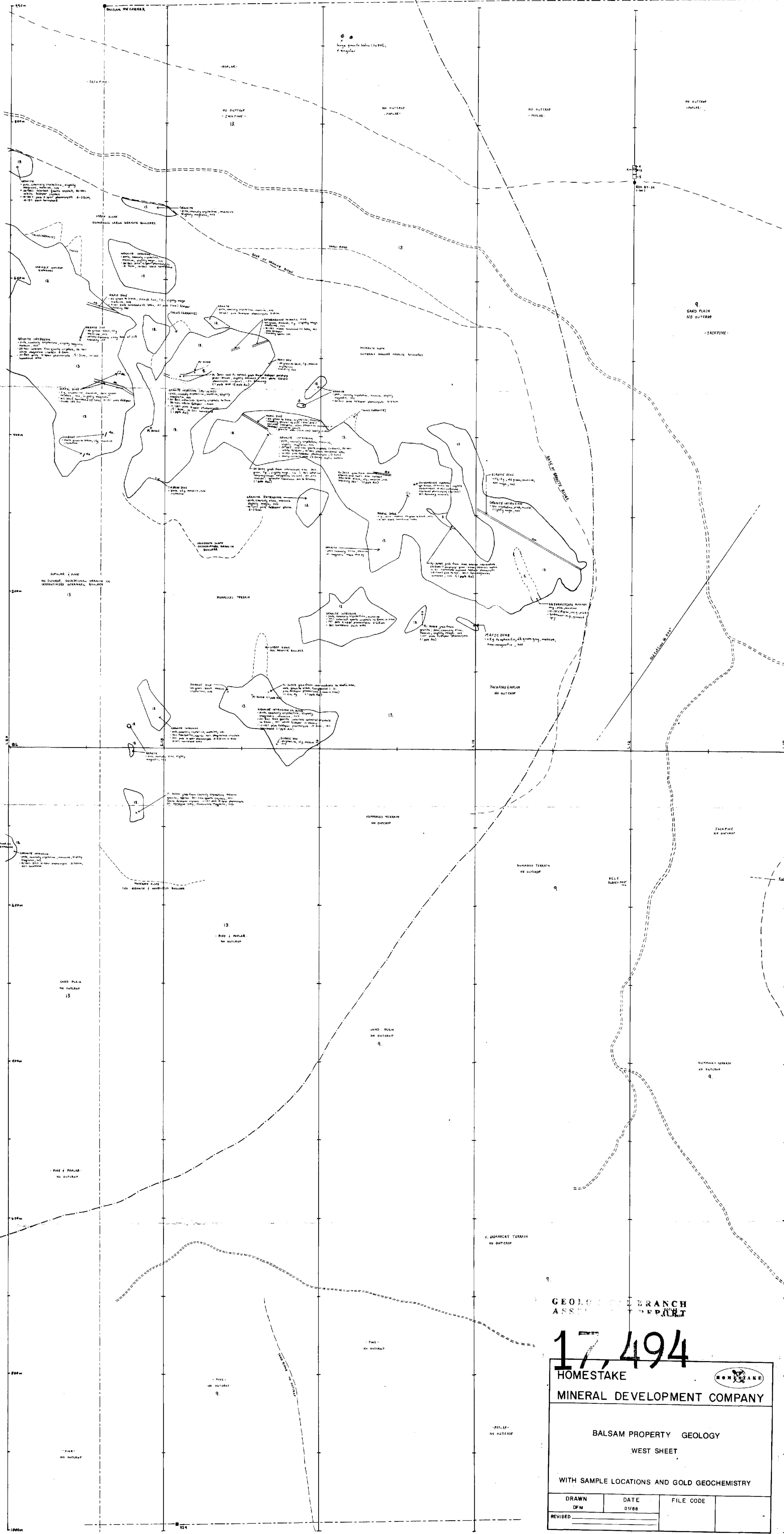
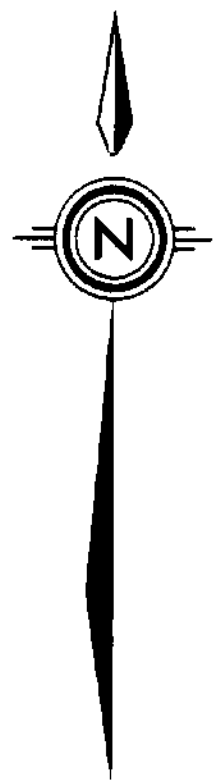
BRANCH  
REPORT  
**17,494**

**HOMESTAKE**  
MINERAL DEVELOPMENT COMPANY

**BALSAM PROPERTY GEOLOGY**  
EAST SHEET

WITH SAMPLE LOCATIONS AND GOLD GEOCHEMISTRY

DRAWN DM	DATE DM88	FILE CODE
REVISED		



- LEGEND**
- LITHOLOGIES**
- 1 BASALT
  - 2 SERPENTINIZED ULTRAMAFIC (ALTERED DIOBRASIC INTRUSIVE)
  - 3 COMPLETELY ALTERED (SILICA-CARBONATE-MARIPONITE ALTERED ULTRAMAFIC)
  - 4 MAGIC INTRUSIVE AS DUBOAGE GABBRIO
  - 5 FELDSPAR PORPHYRY
  - 6 SYENITE
  - 7 DIORITE
  - 8 GNEISS
  - 9 ANDESITE AS HORNBLENDE PORPHYRY FELDSPAR PORPHYRY
  - 10 PROTERITE
  - 11 GRAPHIC GNEISS
  - 12 ANLITE
  - 13 GRANITE
  - 14 LIMESTONE
- SYMBOLS**
- GEOLOGIC CONTACT (OBSERVED/ASSUMED)
  - GCHISTOSITY
  - BEDDING
  - JOINTING
  - QUARTZ VEIN
  - BRECCIATION
  - FAULT
  - SAMPLE POINT
  - TOPOGRAPHIC / GEOMORPHOLOGICAL FEATURE
  - ROAD / TRAIL



GEOLOGICAL BRANCH  
ASSISTANT DEPARTMENT

# 17,494

HOMESTAKE  
MINERAL DEVELOPMENT COMPANY

BALSAM PROPERTY GEOLOGY  
WEST SHEET

WITH SAMPLE LOCATIONS AND GOLD GEOCHEMISTRY

DRAWN DFM	DATE 0788	FILE CODE	
REVISED			