ARIS SUMMARY SHEET

District Geologist, Smithers — Off Confidential: 90.03.23

ASSESSMENT REPORT 18646 — MINING DIVISION: Atlin

PROPERTY: Mount Vaughan
LOCATION: LAT 59 43 00 LONG 133 30 00
UTM 08 6620604 584379
NTS 104N11W 104N12E

CAMP: 053 Atlin Camp

CLAIM(S): Silver Fox,Black Fox,Red Fox,White Fox,Blue Fox,Cross Fox
Hopeful 1-3,WB 1-8,Hopeful Fr.,Hopeful No.1 Fr.,Mineral Lease 22
OPERATOR(S): Homestake Min. Dev.
AUTHOR(S): McIvor, D.F.
REPORT YEAR: 1989, 373 Pages
COMMODITIES
SEARCHED FOR: Gold,Silver,Copper,Lead,Zinc,Tin
KEYWORDS: Jurassic,Fourth of July Creek Batholith,Cretaceous
Suprise Lake Batholith,Granite,Diorite,Galena,Sphalerite
Chalcopyrite,Arsenopyrite

WORK
DONE: Geological,Geochemical,Geophysical,Physical
EMAB 256.0 km;VLF
Map(s) - 3; Scale(s) - 1:10 000
EMGR 2.8 km;VLF
Map(s) - 1; Scale(s) - 1:2000
GEOL 3400.0 ha
Map(s) - 17; Scale(s) - 1:500,1:2000,1:10 000
LINE 237.5 km
MAGA 256.0 km
Map(s) - 3; Scale(s) - 1:10 000
MAGG 2.4 km
RADG 26.1 km
Map(s) - 1; Scale(s) - 1:2000
ROCK 531 sample(s) ;ME
SAMP 187 sample(s) ;ME
SOIL 733 sample(s) ;ME
Map(s) - 11; Scale(s) - 1:2000
TREN 120.0 m 4 trench(es)
MINFILE: 104N

1988 SUMMARY REPORT

THE RESULTS OF A MINERAL EXPLORATION PROGRAM ON THE MOUNT VAUGHAN PROPERTY

(BLACK FOX, SILVER FOX, WHITE FOX, RED FOX, BLUE FOX, CROSS FOX, HOPEFUL 1 - 3, HOPEFUL FR., HOPEFUL 1 FR., WB 1-8, AND ML22(L4660,L4661) CLAIMS)
ATLIN MINING DIVISION,
BRITISH COLUMBIA

NTS: 104N/11W, 104N/12E
LATITUDE: 59,43N
LONGITUDE: 133,30W
OWNERS: WILLIAM WALLIS, JOHN BYRNE, CECIL MCLENNAN
OPERATOR: HOMESTAKE MINERAL DEVELOPMENT CO. LTD.
DATE: MARCH, 1989
AUTHOR: DUNCAN MCIVOR

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1. SUMMARY AND RECOMMENDATIONS

1.1 SUMMARY

The Mount Vaughan Property, comprised of 21 claims totalling 3400 hectares, is located 20 kilometers northeast of the town of Atlin, in northwestern British Columbia. The property surrounds but does not include a package of 28 Crown Grants that cover the Atlin-Ruffner Ag-Pb deposit.

The property is situated within the northwest trending Atlin Terrane, a package of predominantly Upper Paleozoic oceanic crustal rocks, which have been extensively intruded by younger (Jurassic to Tertiary) granitoid plutons.

The Mount Vaughan Property itself is underlain almost exclusively by Jurassic to Cretaceous granitoid intrusive rocks. The majority of the claim block is underlain by the Fourth of July Creek Batholith, a zoned or multiphase intrusion ranging compositionally from granite to hornblende diorite. The easternmost margin of the property is underlain by granitic rocks of the younger Surprise Lake Batholith. Both intrusive bodies are extensively cut by younger (Cretaceous to Tertiary) dykes ranging in composition from aplite/granite to diabase/gabbro.

Exploration work in the vicinity of the property began as early as 1899, and has continued on a sporadic basis since. The majority of work to date has concentrated on the Atlin-Ruffner deposit. That deposit consists of a series of mineralized vein/shear/dyke systems cutting medium to coarse grained granodiorites of the Fourth of July Creek Batholith. The veins are developed in widely spaced fault zones, which generally trend at 060 to 080 degrees, and dip steeply to the north at 060 to 080 degrees. Some of the fault zones have been traced for strike lengths in excess of 2000 meters, with equally persistant vertical continuity. The zones exhibit a close spatial association with intermediate to mafic dykes, ranging compositionally and texturally from andesite to diabase/gabbro. The dykes themselves often host the shear/fault zones, as well as the mineralization, which consists of varying amounts of sphalerite, galena,

arsenopyrite, pyrite, pyrrhotite, chalcopyrite, pyrargyrite, tetrahedrite, molybdenite, scheelite, and cassiterite, in a quartz calcite gangue. The mineralized vein/shear/dyke systems are typically one to two meters in width. Four major zones have been identified to date, with underground development and production having taken place on two of them. Total past production from the deposit is 3,771 grams Au, 2,066,484 grams Ag, 920 Kg Cu, 135,999 Kg Pb, and 13,540 Kg Zn. Reserves from the two zones on which the development has taken place are 113,638 tonnes grading approximately 600 grams per tonne Ag, 5% Pb, and trace Zn.

On ground that now constitutes the Mount Vaughan Property, sporadic exploration has also occurred since 1899. At that time, two parallel vein systems were discovered on the Big Canyon claims (Mclennan Option), where to date work has outlined proven reserves of 8,387 tonnes grading at 792 grams per tonne Ag, 4.9% Pb, and 3.1% Zn, with an additional 16,000 tonnes of possible ore of similar grade. Strike extensions of these two vein systems were discovered in 1981, when Cyclone Development Ltd. completed a nine hole diamond drilling program 1000 meters east of the Big Canyon veins. Drill results from both veins were reported as uneconomic.

Homestake Mineral Development Co. Ltd acquired the property in early 1988, and through the 1988 exploration season completed programs of airborne and ground geophysics, detailed and reconnaissance scale geological mapping, lithogeochemical sampling, soil geochemical sampling, and trenching over various portions of the property.

The results of the airborne geophysical (total field magnetics, calculated vertical gradient magnetics, VLF-EM) surveys over the property were inconclusive. None of these geophysical techniques definatively identified the areas of known mineralization, nor were any new targets identified as a result of the survey. Most variations observed in both the magnetic and electromagnetic fields are thought to be attributable to topography and/or variations in the depth of overburden cover.

Approximately 240 line-kilometers of grid controlled geological mapping was completed on the property, during the course of which 531 rock samples were collected and analyzed for gold and a suite of thirty additional elements. The geological mapping indicated that the vast majority of the property is underlain by felsic intrusive rocks of the Late Jurassic to Early Cretaceous Fourth of July Creek Batholith. These rocks range in composition from granititic through to dioritic, the majority being true granodiorites. A crude

zonation can be seen crossing the property, from west to east, from more granitic, K-feldspar rich rocks, to quartz and Kspar poor, hornblende rich diorite. In intrusive contact with these rocks are the more granitic lithologies of the Surprise Lake Batholith, which outcrop along the extreme eastern margin of the property.

Cutting both of these felsic intrusive bodies are several types of dykes. Most common are thin, leucocratic "alaskite" dykes, composed entirely of feldspar and quartz. These dykes appear to fill prominant fracture sets within the granitoid intrusive rocks, and are probably related to a late stage magmatic pulse associated with emplacement of the Surprise Lake Batholith.

Also relatively common throughout the property are "mafic" dykes, a broad map term used to describe dykes that range compositionally and texturally from an aphanitic, andesitic appearing lithology, to a coarser grained, diabasic to gabbroic appearing lithology. Varying degrees of alteration and shearing within the mafic dykes have produced a range of mineral assemblages, all believed to be related to a diabasic protolith. These dykes exhibit a property wide consistant orientation, of between 060 and 080 degrees, dipping northwards at 060 to 080 degrees. The majority of mineralization encountered on the property occurs in association with these types of dykes.

A third dyke lithology observed on the property, though rarely, is a megaporphyritic quartz-feldspar rich rock, exhibiting zoned, metasomatic growth features. Also present is a quartz-porphyritic siliceous dyke rock, which chemically appears to equate with the granitic rocks of the Surprise Lake Batholith, and may again be related to emplacement of that intrusive body.

Finally, in the east-central portion of the property, a large (approximately 800 meter by 800 meter) ovoid zone of intense brecciation within the granodioritic rocks of the Fourth of July Creek Batholith was located. The map term "volcanic graywacke to conglomerate/breccia" was used in describing the lithology, as its appearance was suggestive of an epiclastic rock in several locations.

Several zones of economic interest were delineated during the mapping and lithogeochemical sampling program on the property.

The historically known Big Canyon Numbers 1 and 2 Veins, and their strike extensions, the Number 6 and 7 Veins, were mapped and sampled in detail (1:500) over their exposed strike lengths. While both shear/dyke systems exhibit remarkable continuity, well developed quartz-sulphide veining within the zones is sporadic, and at only one location was economic grade mineralization returned over economic widths (L2+75E, 1+10S, Number 6 Vein Grid, where values to 6.86 gpt Au, 320.6 gpt Ag, 4.6% Zn, and @.1% Pb were returned from a one meter chip channel sample). The remaining samples from the vein/shear/dyke systems, while all carrying highly elevated base and precious metal values, failed to return ore grades over any appreciable widths. The sporadic nature of the mineralization within the vein/shear/dyke systems, then, indicates that the best that can be hoped for is local ore development in small shoots. A combination of geophysics, trenching, and diamond drilling will be employed in an effort to locate such shoots, in continueing to assess the strike extensions of the two vein systems.

In addition to these two major vein systems, some 40 showings carrying elevated precious and base metal values were located on the property during the mapping program. Complete descriptions of each of these areas appears in the text of the report. Most occurred in areas of poor exposure, in talus, or felsenmeer, and thus their size potential is currently unknown. A program of trenching and blasting the better occurrances is slated for the 1989 exploration season, as outlined in the following section of this report.

A soils geochemical survey was completed over a portion of the property (Number 6 Vein Grid), in an effort to delineate the strike extensions of the Big Canyon Numbers 1 and 2, and Numbers 6 and 7 Veins. The results of the survey were extremely encouraging, and somewhat surprising. A series of small bullseyes did define the Numbers 6 and 7 Veins immediately around their exposures in trenches. In the east-central portion of the property, the survey defined a large (500 meter by 500 meter) multi-element (Au,Ag,Cu,Pb,Zn,As,Sb,Mo) anomaly in an area flanking the aforementioned breccia zone within the granodiorites. This area, then, has potential for hosting large tonnage porphyry

style mineralization, and is slated for detailed evaluation in the upcoming year.

Ground geophysical surveys were completed over portions of the grid, in an attempt to delineate strike extensions of the Numbers 6 and 7 Veins. Neither total field magnetics, horizontal loop electromagnetics, or radiometrics were successful in defining a geophysical signature for the vein systems.

Nine diamond drill holes, completed by Cyclone Development Ltd. in 1981 on the Number 6 and 7 Vein systems, were logged and sampled in detail. Recovery through the mineralized sections appears to have been extremely poor, and as such the analytical results were equally as poor. No economic intersections from any of the nine holes were returned.

A small trenching program was completed over four target areas of the property. Two trenches exposed significant quantities of mineralization, from which elevated precious and base metal values were returned. Both areas warrant further attention, as outlined in the subsequent section of this report.

1.2 RECOMMENDATIONS

Outlined below are specific recommendations designed to continue evaluating the Mount Vaughan Property. They are grouped by type of work as opposed to specific areas. Map 18, in Appendix 3, illustrates the locations of the respective work proposals in relation to the property geology.

A. UNDERGROUND REHABILITATION AND SAMPLING

i) BIG CANYON NUMBER 1 VEIN, L7+25W, 1+30S, NUMBER 6 VEIN GRID

At this location, an exploration adit has been driven west into the Big Canyon Number 1 Vein. At this location, also, a large discrepency exists between the grades encountered by HMDC from surface sampling programs, and those reported by Interprovincial Silver Mines from surface sampling, diamond drilling, and underground

sampling. To resolve this discrepency, and complete the assessment of the Big Canyon Veins, an underground rehabilitation program, followed by detailed underground sampling, is proposed. Should those results prove to be uneconomic, no further work is recommended in this portion of the property, and the option agreement with Mr. Mclennan should be terminated.

ii) NUMBER 4 VEIN EXTENSION, L17+50E, 5+00N, NUMBER 6 VEIN GRID

At this location, an adit has been driven north into the Number 4 Vein. Samples of quartz-sulphide vein material from the dump at the adit portal returned analyses as high as 10.0 gpt Au, 299.3 gpt Ag, and 2.2% Pb. While the adit is located on the Crown Grants owned by Taywin-Trident, it is only 20 meters west of our property boundary, and undoubtadly the vein continues on to our ground. If permission can be obtained from Taywin-Trident, the adit should be re-opened and sampled, to determine the grades and widths of the Number 4 Vein at this location.

B. INDUCED POLARIZATION SURVEYS

Three areas of the property, totalling 19 line kilometers, should be covered by IP surveys, in an effort to delineate zones of known mineralization, and generate "best sulphide response targets" within those zones. Those generated targets should then be systematically drilled and/or trenched, as the budget allows.

AREA 1

Area One totals 13.7 line kilometers of coverage, and will screen:

- the presumed strike extensions of the Number 6 and 7 Vein systems.
- the area of intense brecciation within the granodiorites, and the strong multi-element soil geochemical anomaly that sits on its flank.

- several mineralized float occurrances, the most prominant of which is at L19+00E, 4+25S, where several intensely clay altered boulders contain chalcocite, galena, and arsenopyrite. Analyses of these boulders have returned values as high as 1.02 gpt Au, 361.8 gpt Ag, 3.5% Cu, and 2.0% Pb.

Several quality drill targets are expected to be generated as a result of this work.

AREA 2

Area Two totals 2.1 line kilometers of coverage, and is designed to delineate an extension of the Number 4 Vein on to our property.

AREA 3

Area Three totals 3.2 line kilometers of coverage. In this area, several trenches have exposed boulders of intensely clay - silica altered granodiorite, mineralized granodiorite containing disseminated sphalerite, galena, and arsenopyrite, and silicified and brecciated mafic dyke rock and associated quartz-sulphide veining. Analyses of these boulders have returned values as high as 1.07 gpt Au and 273.5 gpt Ag.

In late 1988, HMDC completed one trench in this area, exposing ten meters of strongly altered (clay-silica) granodiorite with appreciable quantities of disseminated sulphide mineralization. One sample from the zone returned an analysis of 2.03 gpt Au, 367.2 gpt Ag, 1.4% Pb, and 9.3% Zn.

The results of the IP work in this area is expected to yield some high quality drill targets.

C. TRENCHING/BLASTING PROGRAM

The following surface showings should be more fully evaluated, to ascertain the extent, continuity, and grade of mineralization encountered. Depending on their respective locations, trenching employing a backhoe, or a blasting program, should be utilized in the evaluation.

LOCATION	TARGET AND BEST ANALYSIS
L19+00E,5+00N, NUMBER 6 VEIN GRID	MINERALIZED FLOAT ALONG STRIKE EXTENSION OF NO. 4 VEIN, 10.0 GPT Au, 299.3 GPT Ag, 2.2% Pb
L19+00E,4+25S,	LOCAL MINERALIZED FLOAT IN BRECCIA ZONE, 1.02 GPT Au, 361.8 GPT Ag, 3.5% Cu, 2.0% Pb
L21+00E,0+50S-1+50N NUMBER 6 VEIN GRID	MINERALIZED DYKES, AND ABUNDANT MINERALIZED FLOAT, 1.06 GPT Au, 19.3 GPT Ag
L10+00E,5+00S NUMBER 6 VEIN GRID	MINERALIZED DYKE FLOAT 0.52 GPT Au, 39.3 GPT Ag
L23+60E,2+80S NUMBER 6 VEIN GRID	MINERALIZED DYKE FLOAT 1.86 GPT Au, 89.9 GPT Ag, 3.1% Zn
L24+00E,7+00S NUMBER 6 VEIN GRID	MINERALIZED BRECCIA FLOAT 1.4 GPT Au, 468.3 GPT Ag, 2.8% Pb
L22+55E,4+35S, NUMBER 6 VEIN GRID	MINERALIZED DYKE FLOAT 1.33 GPT Au, 75.4 GPT Ag, 5.1% Zn
L24+00E,6+60N, NUMBER 6 VEIN GRID	MINERALIZED MAFIC DYKE 0.64 GPT Au, 202.0 GPT Ag, 2.0% Pb
L14+00E,8+50N, HOPEFUL GRID	QUARTZ-SULPHIDE VEIN FLOAT 0.068 GPT Au, 352.9 GPT Ag, 2.4% Pb

L22+00E,10+50N, HOPEFUL GRID	SHEARED MAFIC DYKE 0.31 GPT Au, 320.9 GPT Ag, 1.1% Cu
L13+00E,6+35N, HOPEFUL GRID	QUARTZ-SULPHIDE VEINS IN SHEARED GRANODIORITE 10.36 GPT Au, 327.5 GPT Ag, 2.1% Pb
L22+00E,9+25N HOPEFUL GRID	MINERALIZED QUARTZ VEIN FLOAT 3.03 GPT Au, 87.0 GPT Ag, 2.2% Pb
L24+00E,8+00N, HOPEFUL GRID	MINERALIZED QUARTZ VEIN FLOAT 0.915 GPT Au, 297.4 GPT Ag, 1.2% Pb

In addition to these targets, any new quality sulphide response anomalies generated by the IP program should also be trenched, if ground conditions permit.

Finally, the highest quality targets generated as a result of the IP program, and the trenching/blasting program, should be diamond drilled, as the budget allows.

Total anticipated expenditures for the above program, exclusive of any diamond drilling, is approximately $70,000.00.

2. INTRODUCTION

2.1 SCOPE OF REPORT

This report serves to summarize all exploration activity completed by Homestake Mineral Development Co. Ltd. on the Mount Vaughan Property, during the period April through October, 1988.

2.2 PROPERTY DEFINITION

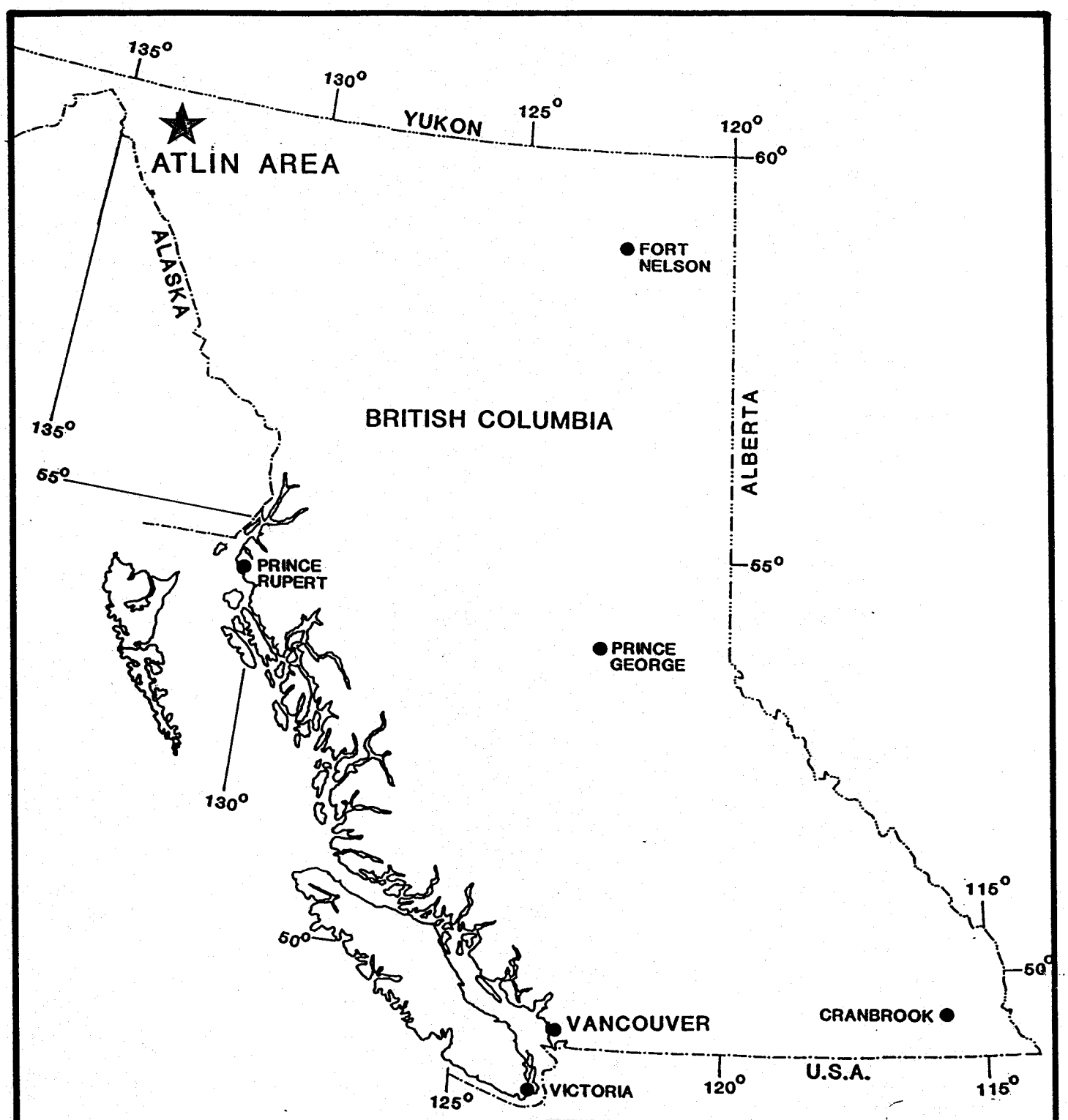
The Mount Vaughan Property is comprised of the following 21 claims, totalling approximately 3,400 hectares;

CLAIM NAME	REC. NO.	REC. DATE	NO. UNITS	EXPIRY DATE
SILVER FOX	2875	21/04/87	15	21/04/90
BLACK FOX	2876	21/04/87	12	21/04/90
RED FOX	2877	21/04/87	10	21/04/90
WHITE FOX	2878	21/04/87	10	21/04/90
BLUE FOX	2879	21/04/87	8	21/04/90
CROSS FOX	2884	21/04/87	10	21/04/90
HOPEFUL 1	3125	28/03/88	18	28/03/89
HOPEFUL 2	3127	28/03/88	18	28/03/89
HOPEFUL 3	3126	28/03/88	15	28/03/89
HOPEFUL FR.	3128	28/03/88	1	28/03/89
HOPEFUL 1 FR.	3129	28/03/88	1	28/03/89
WB1	3467	29/09/88	6	29/09/89
WB2	3468	29/09/88	6	29/09/89
WB3	3469	29/09/88	1	29/09/89
WB4	3470	29/09/88	1	29/09/89
WB5	3471	29/09/88	1	29/09/89
WB6	3472	29/09/88	1	29/09/89
WB7	3473	29/09/88	1	29/09/89
WB8	3474	29/09/88	1	29/09/89
L4660	ML22	-	1	02/02/2007
L4661	ML22	-	1	02/02/2007

All of the above claims, with the exception of those covered by Mining Lease 22, form a property optioned to Homestake Mineral Development Co. Ltd. by Mr. William Wallis and Mr. John Byrne. The two claims covered by Mining Lease 22 were optioned to Homestake Mineral Development Co. Ltd. by Mr. Cecil McLennan.

The property surrounds but does not include 28 Crown Grants that are commonly referred to as the Atlin-Ruffner Property, co-owned by Trident and Taywin Resources.

2.3 LOCATION, ACCESS, AND PHYSIOGRAPHY

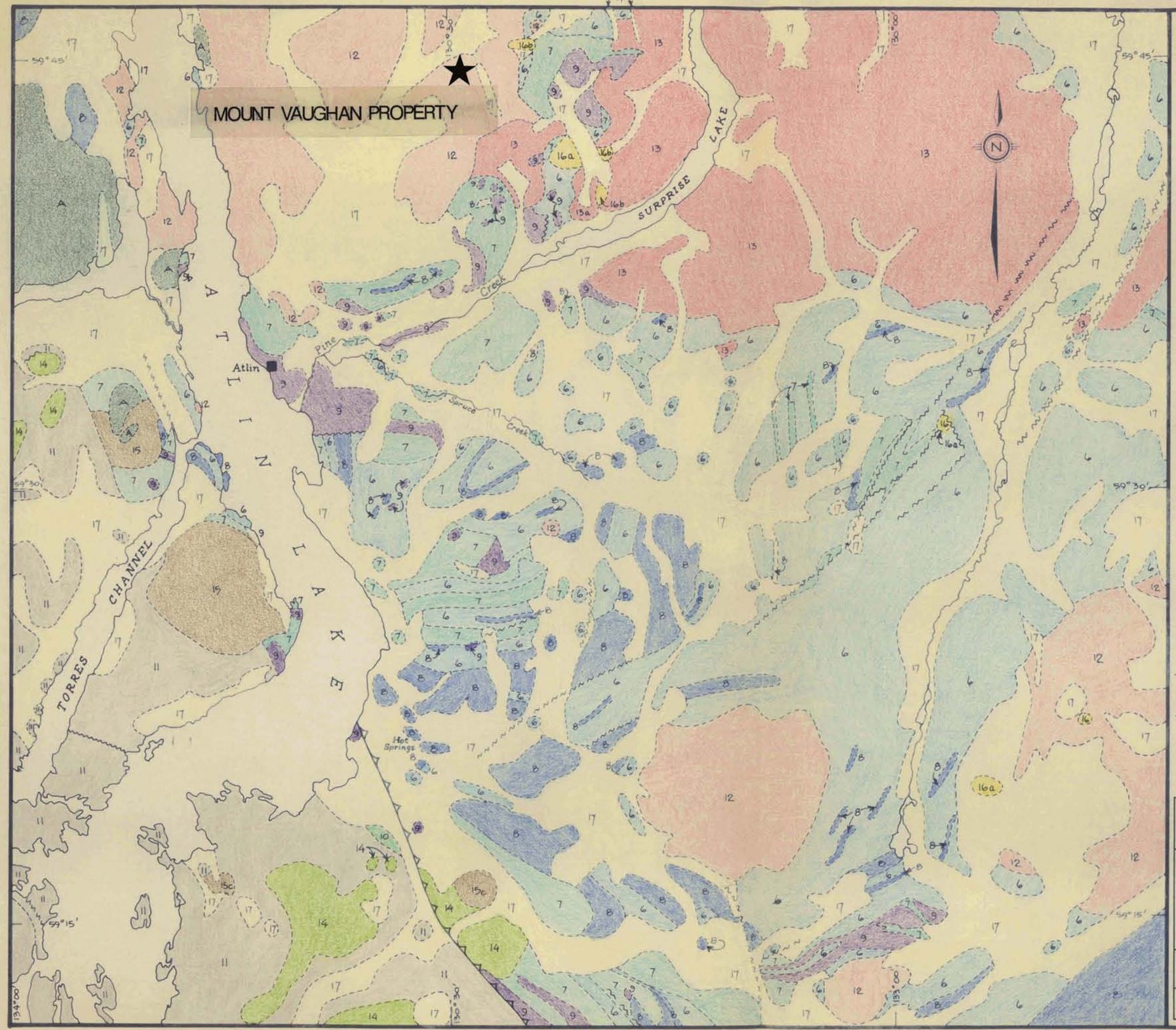


HOMESTAKE MINERAL DEVELOPMENT COMPANY

ATLIN PROJECTS BRITISH COLUMBIA

LOCATION MAP

DRAWN	DATE	FILE CODE	
KMc	11/87	104N/11&12	map 1
Revised			



LEGEND

CENOZOIC
QUATERNARY
PLEISTOCENE AND RECENT

17 GLACIAL DRIFT ; ALLUVIUM

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

9 ATLIN INTRUSIONS PERIDOTITE ; META-DIORITE AND META-GABBRO ; SERPENTINITE ; CARBONITIZED SERPENTINITE ; TALC-BEARING (STEATITIZED) ULTRAMAFIC ROCKS

CACHE CREEK GROUP
8 8. LIMESTONE AND LIMESTONE BRECCIA
7 7. GREENSTONE AND VOLCANIC GREYWACKE ; DERIVED AMPHIBOLITE ; MINOR 6 AND 8
6 6. CHERT, ARGILLITE, CHERT-PEBBLE CONGLOMERATE AND CHERT BRECCIA ; QUARTZITE AND SCHIST ; MINOR 7 AND 8

A UNDIFFERENTIATED, MAINLY VOLCANIC ROCKS OF UNCERTAIN, POSSIBLY SEVERAL, AGES.

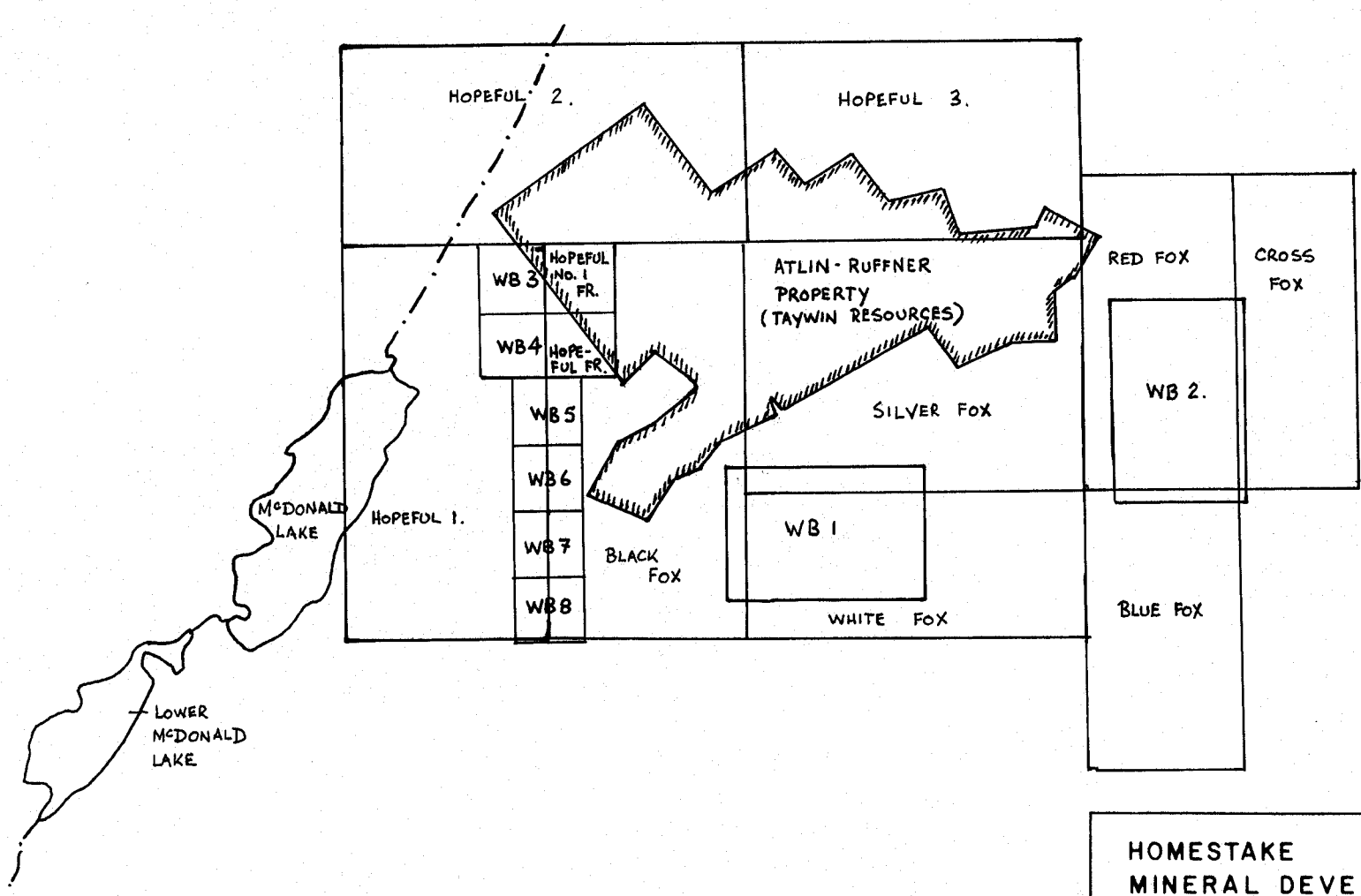
FAULT (ASSUMED, APPROXIMATE)
FAULT (DEFINED)
FAULT (THRUST)
GEOLOGICAL CONTACT

HOMESTAKE
MINERAL DEVELOPMENT COMPANY

ATLIN PROPERTIES
BRITISH COLUMBIA
REGIONAL GEOLOGY

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

DRAWN	DATE	FILE CODE	FIGURE 2
KMc		104N/12	
Revised			



HOMESTAKE MINERAL DEVELOPMENT COMPANY

MOUNT VAUGHAN PROPERTY

CLAIM LOCATION MAP

150,000

DRAWN	DATE	FILE CODE	FIGURE 3
Revised			

The Mount Vaughan Property is located approximately 20 kilometers northeast of the town of Atlin, in northwestern British Columbia. The claims are situated on NTS Map Sheets 104N/11W and 104N/12E, all within the Atlin Mining Division (see Figures 1,2, and 3).

Access to the property is via a series of 4WD bush roads that lead to the workings on the Atlin-Ruffner Property. Several secondary cat-trails provide ATV access to within an hours walk of most portions of the claim block.

The property lay, for the most part, on the steep northwest facing slope of Mount Vaughan, which rises 1200 meters above the Fourth of July Creek valley in the southwest corner of the property. McDonald Lake fills the valley at that location, and is the largest body of water on the property.

The mountain face itself is deeply incised by several northwest flowing streams that drain into Fourth of July Creek. At the base of the mountain, relief along these streams is often extreme, with near vertical canyon walls in excess of 100 meters. The majority of the property is above treeline, and sparsely vegetated, with a progression of buckbrush through to sphagnum with increasing elevation. The slopes rising immediately above Fourth of July Creek are heavily timbered, by a mixture of spruce, poplar, and pine.

Outcrop exposure on the property is poor, constituting less than 5% by area, and occurring primarily along stream valley walls. Above 1200M. ASL, talus and felsenmeer cover much of the ground. Below 1200M. ASL, a relatively thick till covers most of the property.

Portions of the property are snow covered year round, but most of the ground is free of snow from late June through to late September. As with all alpine regions at this latitude however, fresh snowfalls are common throughout the summer, and combined with the high winds that channel up the Fourth of July Creek Valley, serve to make working conditions on the upper slopes demanding.

2.4 GENERAL GEOLOGY

2.4.1 REGIONAL GEOLOGIC SETTING

The Mount Vaughan Property lies near the western edge of the northwest trending Atlin Terrane, which is underlain predominantly by Upper Palaeozoic oceanic crustal rocks. The Atlin Terrane is bounded to the west and southwest by the Stikine and Nisling Terranes, onto which it was thrust in the Mid to Late Jurassic (Bloodgood et al, 1989). The Nahlin Fault is the remnant suture reflecting that thrust faulting. The eastern boundary of the Atlin Terrane is the sub-vertical Thibert Creek Fault, which trends northwest into the Teslin lineament, and separates the generally sub-greenschist facies rocks of the Atlin Terrane from more severely deformed and metamorphosed rocks to the northeast.

Rocks of the Atlin Terrane have been correlated with those of the Cache Creek Group in the southern and central regions of British Columbia, and the term has been widely used and accepted in describing the rocks of the Atlin Terrane. Locally the Cache Creek Group consists of an intercalated sequence of andesitic to basaltic flows (with a minor flow-breccia and pyroclastic component),and cherts, limestones, and dolostones (with a minor epiclastic component, of graywackes to quartzites).

Within the Atlin Terrane, are numerous irregular bodies of ultramafic intrusive rocks, believed to be of Permian age. The ultramafic bodies are generally peridotitic in composition, although they range locally from dunitic to pyroxenitic. Serpentinization of the ultramafics is widespread, and often intense, throughout the Atlin area. These ultramafic bodies, once interpreted as having intruded, senso stricto, the local stratigraphy, are now thought to have been thrust emplaced (Bloodgood 1989, McIvor 1989). Evidence for thrust emplacement into the local stratigraphic package includes:

- the absence of chill margins within the individual ultramafic bodies, or evidence of contact metamorphism

within the host country rocks.

- the widespread presence of intense hydrothermal alteration along contacts between the ultramafic rocks and rocks of the Cache Creek Group. That alteration, an assemblage of silica-carbonate-mariposite, and silica-clay-carbonate, in the ultramafic and volcanic rocks respectively, indicates that the contact areas are structurally induced areas of permeability once accessed by circulating hydrothermal fluids.

- the relatively flat lying nature of the contacts, as defined by drilling at several locations in the Atlin area.

Also within the Atlin Terrane are several large discordant granitoid plutons, ranging in age from Late Jurassic to Tertiary. Some remnant Tertiary volcanics and sediments are also found within the area. Figure 4 illustrates the general geology of the Atlin area.

2.4.2 ECONOMIC GEOLOGY

Mineral deposits in the Atlin area can be divided into four categories (Bloodgood et al, 1989):

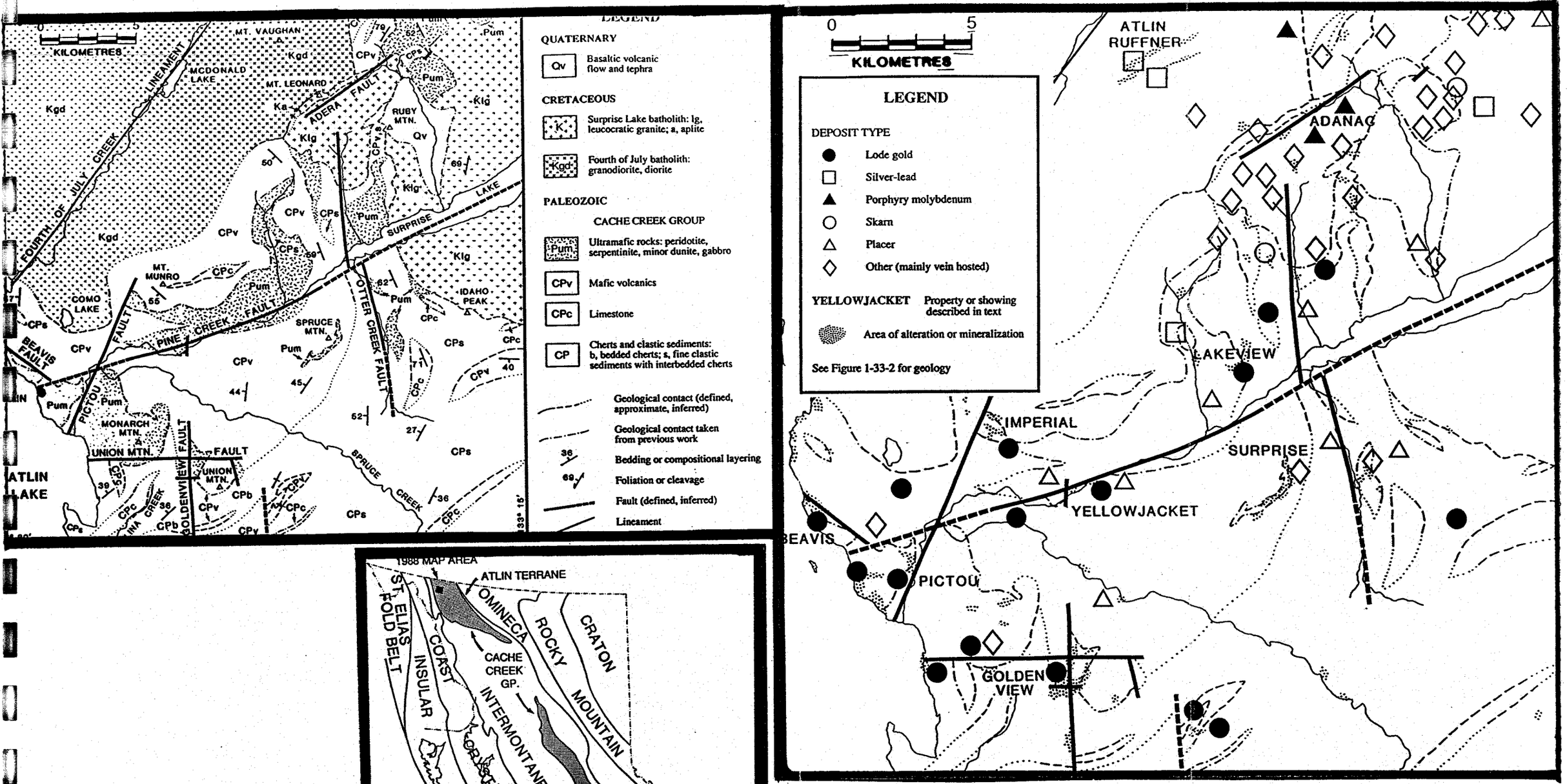
- lode gold deposits hosted by Cache Creek Group and associated ultramafic rocks.

- vein/shear hosted silver-lead systems with associated copper, zinc, and gold, spatially related to Cretaceous granitoid intrusions.

- skarn, vein and porphyry systems related specifically to the Cretaceous Surprise Lake batholith, and

- placer gold deposits.

Examples of lode gold occurrences associated with rocks of the Cache Creek Group and related ultramafic rocks include the Imperial, Yellowjacket, Lakeview, Surprise, Goldenview, Pictou, and Beavis (Bloodgood et al, 1989). Almost all are associated with intense hydrothermal



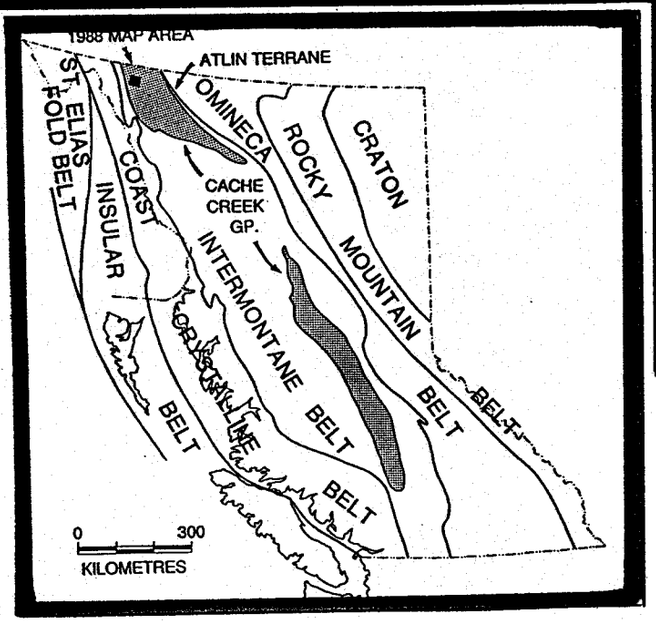


FIGURE 4 GENERAL AND ECONOMIC GEOLOGY OF THE ATLIN AREA

(FROM BLOODGOOD ET AL,1989)

alteration zones proximal to or around the tectonic contacts between the ultramafic rocks and rocks of the Cache Creek Group. Gold mineralization is almost exclusively hosted in quartz veins and vein stockworks, and the mineralization has a unique elemental association of gold-silver-lead-zinc-bismuth-antimony-tellurium-arsenic-nickel-cobalt-and carbon dioxide (Ballantyne and McKinnon, 1986).

The Atlin-Ruffner deposit is an example of the vein/shear hosted silver-lead system. A more complete discussion of this deposit appears in the following section of this report.

Examples of mineralization associated with the Surprise Lake Batholith are numerous, ranging from small locally developed skarn zones in limestones of the Cache Creek Group, proximal to the batholith, to the large Adanac porphyry molybdenum deposit (with current reserves of 152 million tonnes of 0.063% Mo). Most of the mineralized showings in and around the Surprise Lake Batholith contain a suite of diverse and characteristic elements, typically W,Sn,U,F,Pb,Co,Cu,Mo,and Ag.

Placer deposits in the Atlin area are derived from all of the above occurrence types.

2.4.3 PROPERTY GEOLOGY

The Mount Vaughan Property is underlain almost exclusively by Cretaceous granitoid intrusive rocks. The majority of the claim block is underlain by the Fourth of July Creek Batholith, a zoned or multiphase intrusion ranging compositionally from granodiorite to hornblende diorite. The easternmost margin of the property is underlain by the younger, more granitic Surprise Lake batholith. Both intrusives are cut by younger (Cretaceous to Tertiary) dykes, ranging in composition from aplite/granite to diabase/gabbro. As will be more thoroughly discussed in the subsequent sections of this report, several prominant and continuous dykes that occupy or are occupied by major shear zones host significant silver-lead-zinc (gold) mineralization.

2.5 EXPLORATION HISTORY

The area that now constitutes the Mount Vaughan Property, and the encompassed Atlin-Ruffner Property, first saw active exploration activity during the Atlin gold rush of 1899. At that time, the Atlin-Ruffner deposit was discovered, a deposit that has seen sporadic exploration and development work since.

Prior to discussing the details of the exploration history of the properties, below is a synopsis of the geology and mineralization at the Atlin-Ruffner deposit.

The deposit consists of a series of mineralized veins/shears cutting medium to coarse grained granodioritic rocks of the Cretaceous Fourth of July Creek batholith. The veins are developed in widely spaced fault zones, which generally trend east-northeast at 060 - 080 degrees, and dip steeply to the northwest at 060 - 070 degrees. Some of the fault zones have been traced for strike lengths of over 2000 meters. The fault/shear systems exhibit a close spatial association with intermediate to mafic dykes, ranging compositionally and texturally from andesitic to diabasic. The dykes usually host the mineralization, and clearly predate the mineralization, as in many cases brecciated dyke rock fragments are found in the quartz-carbonate-sulphide assemblages that constitute the ore. Mineralization includes varying amounts of sphalerite, galena, arsenopyrite, pyrite, pyrrhotite, chalcopyrite, pyrargyrite (with trace amounts of tetrahedrite, molybdenite, scheelite, and cassiterite) in a quartz-calcite gangue. Across the mineralized veins/shears, which typically are 1 to 2 meters in width, there is a crude segregation of sulphide mineralogy, from sphalerite rich hanging wall, through a galena rich core, to an arsenopyrite rich footwall. High grade silver values are commonly associated with galena rich zones, and gold values with arsenopyrite rich zones.

Four major vein/shear systems have been identified to date, with underground development and production having taken place on two of them.

RUFFNER #2 VEIN

meters

- from the 4A Tunnel (calculated average grade from samples taken along 67.0 meters of development work):

- 1.88 gpt Au, 503.9 gpt Ag, 13.7% Pb/1.14 meters

BIG CANYON NO. 2 VEIN

This vein is located approximately 450 meters southwest of the Ruffner No. 4 Vein, and consists of a 2.4 to 3.0 meter wide mafic dyke that has extensively sheared and fractured over its full width. Like the other veins, it strikes at approximately 070 degrees, but dips at a slightly shallower angle of 50 to 60 degrees to the northwest. Reported grades (Poillon and Poirer, 1928) are lower than those of the other veins, at approximately 255 gpt Ag, 1% Pb, and trace Zn.

BIG CANYON NO. 1 VEIN

This vein is located approximately 100 meters south of the Big Canyon No. 1 Vein, and is exposed along both sides of the main canyon of Crater Creek, over a vertical interval of 60 meters and horizontal distance of 100 meters. Published reserves from this vein, in 1967 (Dolmage, Cambell, and Associates, 1967), were 8388 tonnes at a grade of 792 gpt Ag, 4.9% Pb, and 3.1% Zn.

Below, now, is a chronological sketch of the exploration and development that has taken place in the vicinity of the Mount Vaughan Property.

As mentioned, the mineralization was first discovered in 1899, when what is now called the Big Canyon No. 2 Vein was seen outcropping in Crater Creek. Between 1899 and 1918, the Big Canyon No.1 and 2 Veins were sporadically worked, with short exploration adits being driven on the No. 2 Vein. No records of production exist from this period.

In 1918, M.J. Ruffner optioned the Big Canyon claims, and staked what is now the Atlin-Ruffner property. Work at that time exposed 4 mineralized veins, and all work since has

concentrated on two of those , now referred to as the Ruffner No. 2 and Ruffner No. 4 Veins. In 1923, Mr. Ruffner incorporated Atlin Silver Lead Mines, and began shipping hand cobbed small tonnage high grade loads to smelters in the United States. (A complete summary of past production from the deposit appears at the end of this section.)

In 1926, Atlin Silver Lead Mines drove the 2X adit to an open ore shoot, and continued shipping low tonnage volumes. Due to financial problems, however, the company ceased operation in 1928.

The property was acquired in 1928 by a C. Bob, of Chicago. He financed a long drift below the 2X adit (the 2D drift), but because the results were disappointing, exploration was discontinued. The property was sold to Bobjo Mines of Toronto, in 1934. Bobjo extended the 2X adit, and drove the 4E adit on the Number 4 Vein to the south. No records of any production exist from that work.

The property lay dormant until 1951, when a group from Toronto, on recommendations from D. Dolmage (Dolmage, Cambell and Associates, 1967) financed 4000 feet of surface drilling to test all of the known mineralized zones. All adits were also re-opened and sampled, and small hand sorted shipments sent to a smelter in the United States.

No work is reported to have taken place on the property again until 1966, when the property was acquired by Interprovincial Metals. Interprovincial, during 1966 and 1967, rehabilitated the adits on the Big Canyon claims, completed an extensive surface trenching program, and a surface drilling program totalling 2,764 meters. Upon completion of that program, calculated reserves on the Big Canyon claims were published as follows (Dolmage, Cambell, and Associates, 1967);

NO. 1 VEIN	PROVEN:	8,387 TONNES @ 792 GPT Ag, 4.9% Pb, 3.1% Zn/1.67 METERS
		POSSIBLE: 10,008 TONNES
		TOTAL: 18,395 TONNES

NO. 2 VEIN POSSIBLE: 5,945 TONNES @ 258 GPT Ag,1.0% Pb

Dolmage,Cambell and Associates also calculated ore reserves for the Ruffner No. 2 and 4 Veins, based on a review of existing data, as being;

NO. 2 VEIN PROVEN: 75,229 TONNES @ 604 GPT Ag, 5.5% Pb
POSSIBLE: 22,065 TONNES

NO. 4 VEIN PROVEN: 16,344 TONNES @ 901 GPT Ag, 2% Pb

TOTAL PROVEN AND POSSIBLE: 113,638 TONNES

Only sporadic work took place on the property through to 1969, including a limited soil geochemical survey on ground that now constitutes the Mount Vaughan Property. Interprovincial became Turismo Industries in 1970, and in 1971 the property was closed and all mining equipment removed from the property and sold.

In 1974, the property was acquired by the Atlin Silver Corporation. In 1975, that company established a trailer camp on the property, completed some stoping on the Ruffner No. 2 Vein, and began construction of a 50 ton/day mill. In 1976, the mill was completed, and 1610 tonnes of ore milled. A 64 tonne concentrate was shipped that year, though shortly afterwards operations were suspended due to lack of financing.

In 1980, the property was acquired by Trident Resources Inc. Through 1981, Trident rehabilitated the workings on the Ruffner No. 2 Vein, resampled all underground workings, and began revamping the mill. In 1981, 1,082 tonnes of ore were mined from the 2D workings, though mill problems prevented on-site concentration of the ore. The project was abandoned in late 1981, because of financial and mill related problems. Trident Resources Inc. last published reserves, as of June, 1981, were 52,715 Tonnes at 637.7 gpt Ag. It is not known whether this figure includes all vein systems on the

property, or only the Ruffner No. 2, where Trident last were actively mining.

Also in 1981, Cyclone Developments Ltd. acquired the ground immediately south of the Atlin-Ruffner deposit, in an area now covered by the Mount Vaughan Property. They completed a program of soil geochemical sampling, and after delineating several strong coincident Pb-Ag anomalies, began a 9 hole diamond drilling program, as well as a surface trenching program. Two previously unrecognized zones of mineralization were encountered, both apparent strike extensions of the Big Canyon No. 1 and 2 Veins. The apparent extensions are located approximately 1000 meters to the east of the exposed Big Canyon Veins. The southernmost vein, a probable extension of the Big Canyon No. 1 Vein, was called the Vulcan Vein. The northernmost claim, a probable extension of the Big Canyon No. 2 Vein, was called the New, or Ruff Vein.

Thirty eight samples cut in 9 trenches over 90 meters of strike length of the Ruff Vein Returned an average analysis of 0.63 gpt, 115 gpt Ag, 0.26% Pb, 0.37% Zn/1.78 meters. Four NQ drill holes through the vein averaged 1.0 gpt Au, 95.8 gpt Ag, 1.58% Zn, 0.215% Mo, 0.45% Pb/2.20 meters. Five NQ diamond drill holes were also completed on the Vulcan Vein, which returned an average analysis of 0.155 gpt Au, 45 gpt Ag, 0.3% Pb, and 1.74% Zn over an unspecified width.

In 1984, Trident Resources Inc. completed soil geochemical surveys on ground that is now covered by the Hopeful No. 1 and 2 claims of the Mount Vaughan Property. While sampling was sporadic, and the quality of reporting poor, a large area of coincident enrichment in Ag, As, Pb, and Zn was defined immediately north of the McDonald Lake Indian Reserve. The validity of these anomalous values is questionable, however, as the area appears to be overlain by a thick cover of glacial and glaciofluvial sediments.

Also in 1984, Daiwan Engineering completed soil geochemical surveys over ground that is now covered by White and Blue Fox claims of the Mount Vaughan Property. That work delineated a series of coincident Ag-As-Pb-Zn anomalies that to date remain untested.

W

E

ASSAYS
Ag Pb Zn
Ft.

FW 640 22.2 / 3' (14')
HW 535 5.3 / 12'
Trench 1W
581
A
D
A12 30 3.8 / 4
A1
A2 Lost 75%
A9 15 1.4 / 2
A3 Lost 80% 206 81 2.0 / 6
A13 6.2 5 1.8 / 4
OPEN
A8 15 3 3 / 7
A6 16.6 2.7 3.1 / 3
A4 14.0 7.0 2.9 / 7
B
No vein
Off vein
16.2 3.0 / 6
140 5.0 / 6
23.6 12.1 / 3
50 2.0 4.0 / 6.5
23 4.0 8.0 / 7
C
A5 0.5 / 3
A10 1.8 / 4
A7 3.3 / 5 Lost 50%
E
Crater Cr.
slide
Blocked adit ?
OPEN
Proposed drift
OPEN

INDICATED ORE

			Ag	Pb	Zn
BLOCK A	1847 tons	6 ft	55.5	3.3	-
B	2610 "	5.5 ft	17.82	6.5	2.6
C	4770 "	5 ft	17.71	4.7	4.5
TOTAL	9227 tons	5.5 ft	25.3	4.9	3.1

POSSIBLE ORE

BLOCK D	7650
E	3360
TOTAL	11010

DOLMAGE CAMPBELL & ASSOCIATES CONSULTANTS
VANCOUVER, CANADA

INTERPROVINCIAL METALS LTD.
VANCOUVER, B.C.

LONGITUDINAL ORE SECTION
NO. 1 VEIN ZONE

BIG CANYON PROPERTY

SCALE 1" = 100' | June 19, 1967 | FIG. 5

The ground that constitutes most of the Mount Vaughan Property fell open in 1986. In April of 1987, two local prospectors, William Wallis and John Byrne, staked six claims around the Atlin-Ruffner property. That ground was optioned to Homestake Mineral Development Co. Ltd. in early 1988. Through 1988, Homestake staked an additional 13 claims around the original land package, which under the terms of the option agreement with Wallis-Byrne became part of the same property. In 1988, Homestake also optioned the two original Big Canyon claims, from Cecil Mclennan. The total land package now constitutes the Mount Vaughan Property.

TABLE 1

PAST PRODUCTION FROM THE ATLIN-RUFFNER DEPOSIT

YEAR	TONNES MINED	TONNES MILLED	Au (g)	Ag (g)	Cu (Kg)	Pb (Kg)	Zn (Kg)
1916	2	--	31	--	--	--	--
1922	12	--	0	80863	--	5897	--
1923	11	--	31	31352	85	4891	--
1924	27	--	156	69982	--	7886	--
1925	9	--	342	62113	--	579	280
1926	147	--	778	705572	--	23510	730
1927	49	--	156	127927	--	6169	--
1951	40	--	280	166183	--	16419	2644
1974	33	--	62	52720	16	1975	--
1975	137	--	607	313518	--	18386	--
1976	698	1610	678	429843	376	34455	4017
1981	1082	--	250	26405	443	15832	5869
TOTALS:	2247	1610	3371	2066483	920	135999	13540

2.6 WORK COMPLETED

During the period of May 1 through October 1, 1988, Homestake Mineral Development Co. Ltd. completed the following work on the Mount Vaughan Property:

- completion of an airborne total field magnetics, calculated vertical gradient magnetics, and VLF-EM survey over the entire property, totalling approximately 256 flight line-kilometers.

- establishment of 41.5 kilometers of topographically corrected, picketed grid over the central portion of the property, and subsequent detailed 1:2000 scale geological mapping.

- establishment of an additional 196 kilometers of flagged line grid over the remainder of the property, utilizing three picketed topographically controlled baselines totalling approximately 12 kilometers. All grids were subsequently mapped at a reconnaissance level, and scale of 1:2000.

- in the course of the above geological mapping programs, 531 rock samples were collected, and analyzed for Au, and a suite of 30 additional elements.

- completion of a soil geochemical survey over portions of the picketed, central grid, totalling 733 samples. All samples were analyzed for Au, and a suite of thirty additional elements.

- completion of a total count radiometrics survey, totalling 26.1 kilometers, over portions of the central, picketed grid.

- completion of orientation ground magnetics and Horizontal Loop E.M. surveys over portions of the central, picketed grid, totalling 2.4 and 2.8 line-kilometers respectively.

- a small trenching program over four separate target

areas.

- recovery, detailed logging, and sampling of 9 diamond drill holes, totalling 476.11 meters, from core racks located on the property. A total of 187 samples were split and analyzed for Au, and a suite of thirty additional elements.

The following sections of this report review in detail the results of this work.

3. DETAILED TECHNICAL DATA

3.1 AIRBORNE GEOPHYSICAL SURVEYS

3.1.1 METHODS EMPLOYED

On May 1, 1988, Aerodat Ltd. completed an airborne total field magnetics, calculated vertical gradient magnetics, and VLF-EM survey over the entire Mount Vaughan Property, on behalf of Homestake Mineral Development Co. Ltd.

The survey totalled 256 line-kilometers. Flight lines were oriented at 165/345 degrees, and flight line spacing was approximately 125 meters.

Survey equipment consisted of a Cesium magnetometer, a VLF-EM system, a tracking camera, and a radar altimeter, all mounted in and on an Aerospatiale A-Star 350 helicopter. The survey aircraft was flown at a mean terrain clearance of 60 meters.

Appendix 1 contains a survey specifications report prepared for HMDC by Aerodat Ltd., entitled "Logistics Report on a Combined Helicopter-borne Magnetic and VLF-EM Survey, Atlin, British Columbia". The report contains specific details of all aspects of survey methodology, to which the reader is referred more information.

3.1.2 RESULTS AND INTERPRETATION

The airborne survey was flown in an attempt to:

- delineate the strike extensions of known mineralized zones on the property, and,

- assess the remainder of the property for hosting a similar type of mineralization, or a previously unrecognized target type.

It was initially believed that both the magnetics and VLF-EM surveys would successfully outline the mineralized zones, based on the following rationale:

- given the good strike continuity of the vein-shear systems, and their association with intermediate to mafic dykes of appreciable thickness, the zones should appear as distinct "breaks" in an otherwise homogeneous magnetic signature reflecting the underlying granitoid terrain.

- similarly, a strong VLF-EM cross-over response was expected to define the vein-shear systems, as they represent potentially strong conductors in an otherwise barren terrain. Even where the shears host insufficient sulphide mineralization to be conductive, or non-conductive sulphide species, the zones themselves are probably water-saturated with respect to the surrounding granitoid terrain, and should exhibit a conductive signature.

Unfortunately, neither of the aforementioned assumptions proved to be correct. Below is a discussion of the survey results. Appendix 2 contains the following maps, which are referred to in the subsequent review:

MAP 1 1:10,000 AERIAL PHOTOGRAPH MOSIAC MAP
MAP 2 1:10,000 CONTOURED TOTAL FIELD MAGNETICS
MAP 3 1:10,000 CONTOURED, CALCULATED VERTICAL GRADIENT MAGNETICS
MAP 4 1:10,000 CONTOURED VLF-EM TOTAL FIELD RESPONSE
MAP 5 1:10,000 CLAIMS OVERLAY, AND GEOLOGICAL COMPILATION MAP
MAP 6 1:10,000 GEOPHYSICAL FEATURES COMPILATION AND OVERLAY

TOTAL FIELD MAGNETICS

The total field magnetics map illustrates the extremely low magnetic relief on the property, with a range of only 545 nT over the entire survey area (from a minimum of 57,570 nT to a maximum of 58,115 nT).

The majority of the property lay in the 57,800 to 58,850 nT range, a very flat relief indicative of the homogeneity of the underlying granitoid rocks.

There is some relief however, and in attempting to understand the subtle changes in magnetic signature, three terrains were identified in the total field data, and appear outlined on the 1:10,000 Geophysical Features Compilation.

Terrain 1 >57,850 nT

These weak magnetic "highs" occur in several locations on the property, most notably along the eastern portion of the property. There, the entire area exhibits an elevated, albeit weakly, magnetic signature to as high as 58,115 nT. The anomaly may reflect an underlying, subtle lithological change, although the most prominant highs correspond with a steep ridge top, and the anomaly may be a function of poor topographic correction during the survey procedure. Field mapping has indicated that the extreme corner of the property and survey area is underlain by the younger, Cretaceous Surprise Lake Batholith, in intrusive contact with the Fourth of July Creek Batholith. The magnetic anomaly covers this contact area, but also extends northwards, well into the Fourth of July Creek Granitoids. What the high may represent is a contact related, low intensity "skarnification" of the Fourth of July Creek Batholith proximal to the contact with the Surprise Lake Batholith, with introduction of sufficient pyrrhotite, still only as a minor constituent of the granodiorite, to cause the anomaly.

Within the Fourth of July Creek Batholith itself, there is also a crude zonation, from west to east, from

granodioritic rocks to more hornblende rich, dioritic appearing rocks, which may account for some of the subtle anomalies. Alternatively, along the eastern margin of the property, the Fourth of July Creek Batholith may be shallowly overlying the westward dipping, more strongly magnetic rocks of the Surprise Lake Batholith.

Other areas of the property in which a Terrain 1 magnetic signature appears are:

- in the south-central portion of the map sheet, where a large, irregularly shaped high to 58,000 nT sits. At this location, there is no apparent lithological change, and the subtle change may be reflecting either a previously unrecognized zonation within the Fourth of July Creek Batholith, the presence of an unrecognized or shallow but non-outcropping intrusion of a higher magnetic signature, or possibly, again, depth of overburden cover and poor topographic correction in-flight.

- two prominant anomalies occur as small ovoid shaped highs sitting in a distinct broad low that defines the Fourth of July Creek valley. These two highs may be real reflections of lithological change, either zonation within the Fourth of July Creek Batholith, or small epizonal intrusions, or they may reflect sub-surface bedrock topography. No outcrop exists in the area to allow definitive identification of the cause of the magnetic highs.

Terrain 2 57,800 - 57,850 nT

This terrain, typical of most of the property, is an extremely flat, homogeneous signature reflecting the homogeneity of the underlying granodioritic rocks of the Fourth of July Creek Batholith in areas of relatively uniform depth of overburden cover. The mineralized showings identified on surface all lay within this terrain, and clearly have no magnetic signature.

Terrain 3 <57,800

A prominant magnetic depression, to as low as 57, 570 nT, trends northeast-southwest across the northwest corner of the map sheet, and corresponds with the Fourth of July Creek Valley. This feature is one of the few regional scale magnetic anomalies present in the area, and while it undoubtedly is a reflection of a much deeper overburden cover in the swamp filled creek valley, the valley itself may be following a major structural feature. With no outcrop in the area, a precise explanation of the low is not possible at this time.

The results of the total field magnetics survey, then, were disappointing, as the survey failed to define or delineate the known shear-vein systems on the property. The data may become increasingly useful however, if the numerous magnetic features discussed above prove to be related to subtle zonations within the granitoid intrusions, if those zonations prove to be metallogenically important.

CALCULATED VERTICAL GRADIENT MAGNETICS

Measured or calculated vertical gradient magnetic data (in nanoTeslas/meter) is a useful exploration tool in that it accentuates areas of high magnetic relief, and can therefore define geologic features such as lithological contacts, or structural zones associated with a significant magnetic signature (high or low).

Because of the very flat total field magnetic data, the vertical gradient data, by definition, is also extremely flat, ranging from only -11 to +18 nanoTeslas/meter. The data does serve to accentuate the contact area between terrains 1 and 2 (discussed in the Total Field Magnetics section), and the northeast-southwest trending low associated with the Fourth of July Creek valley. The data, however, does not definitively outline the known zones of mineralization, or outline any new linear features that may reflect underlying structures.

It is interesting to note a small strong vertical gradient high proximal to the breccia zone delineated during mapping (See Map 5), the significance of which is not

understood at this time.

VLF-EM DATA

The VLF-EM data, which appears in this report as total field response, is useful in identifying conductive bodies, be they zones of contiguous sulphide mineralization, graphitic mineralization, or poorer conductors, such as water saturated shear zones, faults, or breccias.

Conductive horizons oriented perpendicular or sub-perpendicular to flight lines, and parallel to the direction towards the VLF transmitting station, appear as strong positive responses in the total field data.

In looking at the total field response contoured plan map, the most prominant features are three very strong, linear, total field lows.

Along the western margin of the survey area, a northeast-southwest trending linear low defines the northwest edge of the Fourth of July Creek valley. This low corresponds with a relatively strong magnetic low, and undoubtedly reflects the increased depth of overburden in the creek valley. This deep cover, in turn, may reflect a structurally downfaulted or recessive zone, and this feature, regional in scale, is most probably a fault.

Along the southern edge of the survey area, and trending southeast across the map sheet, is a very prominant, linear VLF low, corresponding with the location of the Vulcan Creek valley. The valley, again, has a much deeper overburden cover than the surrounding ridges, and thus the low VLF response. The feature, however, is very linear in nature, which may suggest a structurally controlled topographic low, either via downfaulting, or through shearing, development of a zone of recessive weathering.

Approximately 1.5 kilometers north of this feature, is another, parallel, strong linear low. This feature has no apparent topographic association, though it is in an area of very poor outcrop exposure, and may reflect an infilled

topographic depression, and structure.

Several very strong VLF-EM highs occur throughout the survey area. None correspond with known zones of mineralization, most occurring along prominant ridges with better bedrock exposure. The strongest and most linear feature is the one bracketed by the two southeast-northwest trending lows discussed above, and may reflect a zone of local shearing between two major fault zones.

No distinctly linear, thin, definitive responses signifying a true sulphide conductive response were defined on the property.

Of interest is the association between the isolated magnetic highs in the Fourth of July Creek valley, and relatively isolated VLF-EM highs. These anomalous zones may reflect an area of less overburden cover over an undulating subsurface bedrock topography, or perhaps an epizonal intrusion into the Fourth of July Creek Batholith.

3.2 GEOLOGICAL MAPPING AND LITHOGEOCHEMICAL SAMPLING

3.2.1 METHODS EMPLOYED

A. GRID ESTABLISHMENT

In an effort to assess the very large property in a cost effective manner, the majority of geological mapping on the claim group utilized flag line grids located by HMDC personnel employing compass, hip chain, and clinometer. One picket grid was erected on the property, over an area known to host mineralization.

Map 7, in Appendix 3, is a 1:10,000 GRID LOCATION MAP, illustrating the locations of all grids established on the property in relation to claim boundaries, and the areas covered by the 14 geological maps that constitute the results of the mapping program on the property. Below is a brief description of each of the grids, with regards to their location and mode of emplacement.

NUMBER 6 VEIN GRID

This grid was erected over the central portion of the property, and designed to cover the strike extensions of the mineralized Big Canyon No.1 and No. 2 Veins, and their eastern equivalent No. 6 and No. 7 Veins.

An arbitrary 0+00 point was selected, from which a baseline extended due east for 2100 meters, and due west for 1000 meters. Pickets were established at 25 meter intervals along the baseline, and all interstation distances were corrected for topographically induced variance employing clinometer measurements and a trigonometric correction table.

Cross-lines were established at 100 meter intervals, and extended north and south of baseline for an average of 600 meters.

Pickets were established on all cross-lines at 25 meter intervals, and again corrected for any topographic variance in interstation distance. This picketed grid consists of 41.5 line-kilometers, over which detailed geologic mapping, at a scale of 1:2000, was completed. More detailed mapping, at a scale of 1:500, was completed over all mineralized showings, as exposure allowed. The results of the mapping appear in Appendix 3, as:

- MAP 8A, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, NUMBER 6 VEIN GRID, L10W-L21E (WEST SHEET)

- MAP 8B, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, NUMBER 6 VEIN GRID, L10W-L21E (EAST SHEET)

- MAP 8C, 1:500 DETAILED GEOLOGY AND GOLD GEOCHEMISTRY INSET MAPS

NUMBER 6 VEIN GRID EXTENSIONS

The Number 6 Vein Grid baseline was extended from 21+00 East to 35+00 East, again with pickets established at 25

meter intervals , the interstation distances corrected for topography.

From this baseline, flagged cross-lines were established at 100 meter intervals, extending northward for between 1000 and 600 meters, and to the south for 700 meters. Stations were established at 25 meter intervals. Reconnaissance type 1:2000 scale geological mapping was completed over the 22.0 line-kilometers of grid, with results appearing in Appendix 3 as:

- MAP 9, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, NUMBER 6 VEIN GRID EXTENSION, L21E-L35E, SOUTH OF BASELINE

- MAP 10, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, NUMBER 6 VEIN GRID EXTENSION, L21E-L35E, NORTH OF BASELINE

SOUTH BASELINE GRIDS

A second major picket baseline was established approximately 600 meters south of the Number 6 Vein Baseline, and extended east- west across the entire length of the property. An arbitrary 0+00 point was selected, from which the baseline extended 1000 meters to the east, and 4400 meters to the west, with all interstation distances corrected for topographically induced variance.

Flagged cross-lines were established at 100 meter intervals, and extended variable distances both north and south of baseline. Stations on all cross-lines were established at 25 meter intervals.

Reconnaissance type 1:2000 scale geological mapping was completed over the 91 line-kilometers of grid, and the results appear in Appendix 3 as the following maps:

- MAP 11, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, SOUTH BASELINE GRID, L0-L10E, SOUTH OF BASELINE

- MAP 12A, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, SOUTH BASELINE GRID, L0-L12W, SOUTH OF BASELINE (NORTH SHEET)

- MAP 12B, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, SOUTH BASELINE GRID, L0-L12W, SOUTH OF BASELINE (SOUTH SHEET)

- MAP 13, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L12W-L24W, SOUTH OF BASELINE

- MAP 14, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L25W-L44W, SOUTH OF BASELINE

- MAP 15, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L31W-L44W, NORTH OF BASELINE

HOPEFUL BASELINE GRIDS

A third major picketed grid was established across the northern portion of the property, as illustrated on Map 7, Appendix 3. A 0+00 point was arbitrarily established, from which the baseline was extended 2800 meters due west and 2200 meters due east. Stations were established at 25 meters intervals along the baseline, with all interstation distances corrected for topography. Cross-lines were established at 100 meter intervals, and extends north from baseline for 1500 meters. Stations were established at 25 meter intervals along all crosslines, again all topographically corrected. Reconnaissance type geological mapping over the 83 line-kilometers of grid, the results of which appear in Appendix 3 as maps:

- MAP 16A, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, HOPEFUL BASELINE GRID, L0-L28W (EAST SHEET)

- MAP 16B, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, HOPEFUL BASELINE GRID, L0-L28W (WEST SHEET)

- MAP 17A, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, HOPEFUL BASELINE GRID, L0-L22E (WEST SHEET)

- MAP 17B, 1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP,

HOPEFUL BASELINE GRID, L0-L22E (EAST SHEET)

Total grid coverage on the property, as outlined above, is 237.5 line-kilometers.

B. GEOLOGICAL MAPPING TECHNIQUES

Geological mapping on the property consisted of physically locating all outcrops on the respective grids, and tieing them in to grid reference points, using a hip chain and compass for control. At each outcrop, detailed notations as to lithology, pertinent structural information, and the presence or absence of alteration and mineralization were made. These descriptive notes appear on all the geology plan maps. In addition to mapping all outcrops, which comprised only approximately 5% of the ground, detailed descriptions of felsenmeer, and talus, were made, as any transport distances of this material was thought to be minimal.

All physiographic features encountered during mapping, such as roads, trails, streams, claim posts, etc., also appear on the enclosed geology plan maps.

C. LITHOGEOCHEMICAL SAMPLING TECHNIQUES

In the course of the geological mapping programs, 531 rock samples were collected. These samples were forwarded to Bondar Clegg and Co. Ltd., in Vancouver, for Au geochemical analysis employing a fire assay technique, with an atomic absorption finish.

The pulps from all samples were then forwarded to Acme Analytical Laboratories, also of Vancouver, for 30 element analysis employing an ICP technique. In addition to the 30 element package, all samples were analyzed for tin via atomic absorption.

Samples were routinely taken whenever any significant mineralization or alteration were encountered on the property. In addition to the obvious rationale behind the Au analysis, the purpose of the 30 element ICP and Sn analyses

were to:

- ascertain the Ag-Cu-Pb-Zn values for all mineralized zones in a cost effective way. While the results of these analyses by ICP are not as accurate as an assay, they do semi-quantitatively provide an indication of the metal present.

- attempt to define subtle trace element halos around known zones of mineralization, and use that information in locating new similar zones.

- gain an understanding of the genesis of the mineralizing systems on the property, through understanding their chemistry.

All gold geochemical values and sample locations appear plotted on the enclosed geology maps. All trace-element ICP data, and the Sn analyses, appear in Appendix 6. Also enclosed in that Appendix is a table of gold equivalent values, equating the Au-Ag-Cu-Pb-Zn content of each sample to a grams per tonne Au value, based on current metal prices. The formula employed in the conversion is:

gpt Au + (gpt Ag*0.015) + (ppm Cu*0.00013) + (ppm Pb*0.000028) + (ppm Zn* 0.00011) = GOLD EQUIVALENT VALUE

This exercise was useful in illustrating the relative metal contents of each sample, though obviously the gold equivalent values cannot be taken as valid in an economic sense, as no consideration of smelting or recovery costs were employed in the calculation.

3.3 RESULTS AND INTERPRETATION

Prior to a map by map discussion of the results of the geological mapping and lithogeochemical sampling programs on the property, below is an overview of the encountered geology, followed by detailed descriptions of the various lithological units.

GEOLOGICAL OVERVIEW OF THE MOUNT VAUGHAN PROPERTY

The vast majority of the property is underlain by felsic intrusive rocks of the Late Jurassic to Early Cretaceous Fourth of July Creek Batholith. These rocks range in composition from granitic through to dioritic, although the majority are true granodiorites. A crude zonation can be seen crossing the property from more granitic, K-feldspar rich rocks, to quartz and K-spar poor, hornblende rich dioritic appearing rocks.

Cutting the felsic intrusive rocks of the Fourth of July Creek Batholith are several types of dykes. Most common are thin, leucocratic "alaskite" dykes, composed entirely of feldspars and quartz. These dykes appear to fill prominent fracture sets within the granodiorite, and are probably related to the Surprise Lake Batholith, a younger granitic intrusion outcropping in the extreme eastern portion of the property.

Also relatively common throughout the property are "mafic" dykes, a broad map term used in describing dykes ranging texturally and compositionally from an aphanitic to very fine grained andesitic appearing lithology, to a coarser, diabasic to gabbroic appearing lithology. Varying degrees of alteration and shearing within the mafic dykes have produced a range of mineral assemblages, all believed to be related to a diabasic protolith. These dykes host the majority of the mineralization encountered on the property, as will be discussed in detail in the subsequent sections of this report.

A third dyke lithology observed on the property, though rarely, is a megaporphyritic quartz-feldspar rich rock, exhibiting zoned, metasomatic growth features.

Finally, a quartz porphyritic siliceous dyke rock was also noted on the property, which may also be related to the adjacent Surprise Lake Batholith.

The most intriguing lithologies encountered on the property were those rocks contained within a large, intense breccia zone, located in the west-central portion of the

claim group.

Granitic rocks of the Surprise Lake Batholith were encountered in the extreme eastern portion of the claim group.

LITHOLOGIES

Moving down through the legend that appears on all of the enclosed geology maps, below are general descriptions of the lithological units encountered on the property.

CRETACEOUS

7. SURPRISE LAKE BATHOLITH
7A. GRANITIC INTRUSIVE ROCKS (UNDIFFERENTIATED)
7B. QUARTZ (FELDSPAR) PORPHYRITIC GRANITE

Noted in outcrop along the extreme eastern edge of the property, these rocks of the Cretaceous Surprise Lake Batholith typically consist of a fine grained, equigranular granitic groundmass, composed of predominantly quartz, K-feldspar, and minor amounts of biotite. Within the groundmass are a highly variable phenocryst content, ranging from 10 to 30%. Phenocrysts are predominantly quartz "eyes", with a few K-feldspar laths. The rock is characteristically white to pink, and its leucocratic nature renders it readily distinguishable from the more ferromagnesian mineral rich rocks of the Fourth of July Creek Batholith. Unit 7B is the most common, though at some locations only weakly porphyritic granitic rocks were classified as Unit 7A.

POST JURASSIC

6. QUARTZ PORPHYRITIC SILICEOUS ROCK

This lithology occurs as dykes throughout the property. Rarely seen in outcrop, it was observed at several locations in felsenmeer and talus. At one location, it was observed cutting rocks of the Fourth of July Creek Batholith.

The rock typically consists of a white to yellow,

aphanitic to very fine grained, very siliceous groundmass, that in places exhibits a sugary, almost quartzitic texture, and elsewhere a cherty, rhyolitic appearance.

Within the groundmass are up to 30%, but more commonly 5 - 10% small, 3 to 5 mm. spherical, gray to blue quartz eyes. Very rarely, ghosts of small feldspar laths can be seen, indicating that the rock has undergone a pervasive alteration (silicification).

Because most of the occurrences were observed in talus and felsenmeer, no indications of dyke size or preferred orientations were noted during mapping. These dykes may be related to the Surprise Lake Batholith, as chemically, they appear to be very similar.

5. METASOMATIC QUARTZ-FELDSPAR PORPHYRY

This lithology occurs as thin dykes, common in talus and felsenmeer in the western portion of the property. The rock is comprised of a black to dark green, intensely siliceous (or silicified), aphanitic to very fine grained groundmass. Within that groundmass are large (to 3 cm.) rounded, zoned, potassium feldspar phenocrysts. In many places, the cores of the phenocrysts a coarse crystalline hornblende - K-Spar assemblage that resemble brecciated granodioritic wallrock fragments, around which the metasomatic alteration and subsequent phenocryst growth occurred. Similarly, small scale breccia textures noted in the groundmass indicate that these "dykes" may in fact be zones of intense brecciation and subsequent alteration (silica, potassium) within the granodiorites of the Fourth of July Creek Batholith.

The dykes often occur in spatial association with both mafic dykes and quartz porphyritic siliceous dykes, possibly indicative of multiple phases of intrusive activity along long lived structures cutting the granodiorites.

4. VOLCANIC GRAYWACKE TO CONGLOMERATE/BRECCIA

The most intriguing lithological unit on the property, these rocks were found in a large 800 meter by 800 meter area in the west-central portion of the claim block.

Observed in both outcrop and as extensive zones of felsenmeer, the rocks vary widely in appearance and composition. The term volcanic graywacke to conglomerate was first employed in describing the occurrences seen in felsenmeer. Not until the unit was seen outcropping did it become apparent that the unit was a product of intense brecciation.

The rock is comprised of a light to medium green, predominantly chloritic/chloritized rock flour. Within that matrix are brecciated fragments of granodiorite and quartz porphyritic siliceous dyke rock, indicating that the brecciation is a relatively late stage event. The fragments range in size from monomineralic constituents of the granodiorite (small quartz and feldspar grains) to blocks several meters in diameter. Granodioritic fragments usually exhibit strong rounding, in some cases to perfect spheres, leading initially to the epiclastic terminology used in their description. This rounding is now thought to be a result of milling during the brecciation process.

Noted in some locations too is the presence of crude graded bedding in large blocks of felsenmeer, where a gradation from small monomineralic fragments through to small rounded granodiorite fragments through to larger more angular fragments can be seen. Originally interpreted as further evidence of an epiclastic origin for the rock, this phenomenon is now thought to be the result of some local settling within the breccia.

The realization that the unit was a breccia came when a large outcrop exposure was encountered, where one could walk through the varying intensities of brecciation, seen cutting both granodiorites, and younger dyke lithologies.

3. MAFIC DYKES

3A. MINERALIZED MAFIC DYKES

The variability of mineralization and alteration found within the predominantly diabasic mafic dykes was such that a general description would serve little purpose. Certain characteristics, however, were common to all zones, those

being:

- evidence of very strong shearing within the dykes wherever mineralization was encountered.

- introduction of large amounts of silica, as both pervasive alteration of the dyke rock, and as distinct shear conformable quartz veins.

- introduction of a complex suite of sulphides, including galena, sphalerite, arsenopyrite, pyrite, pyrrhotite, and chalcopyrite, with minor pyrargyrite, acanthite, friebergite, tennantite, marcasite, covellite, stannite, and bismuthinite, and occasionally free silver and gold.

- evidence of a temporal sequence in the introduction of the sulphide assemblage, based on observed textures in both hand sample and polished section, as illustrated in Figure 15.

- a preferred orientation to mineralized dykes/structures, of a 70 - 90 degree strike and 60 to 80 degree northward dip.

3B. UNMINERALIZED MAFIC DYKES

Unmineralized mafic dykes were located throughout the property, both in outcrop and in felsenmeer-talus. Thicknesses ranged from a few centimeters to up to ten meters, the majority in the 1 to 2 meter range.

The dykes exhibit a variety of textures, ranging from aphanitic to very fine grained, massive, andesitic appearing lithologies, to coarser, medium grained, diabasic to gabbroic appearing lithologies. For the most part, where unmineralized, the dykes are massive, and exhibit little in the way of alteration. In some cases, however, particularly in dykes that at some point along their strike length carry mineralized zones, the dykes exhibit conformable shearing and strong chloritization. In rare instances, a significant quantity of biotite is present, that historically has resulted in an interpretation of the dykes as being

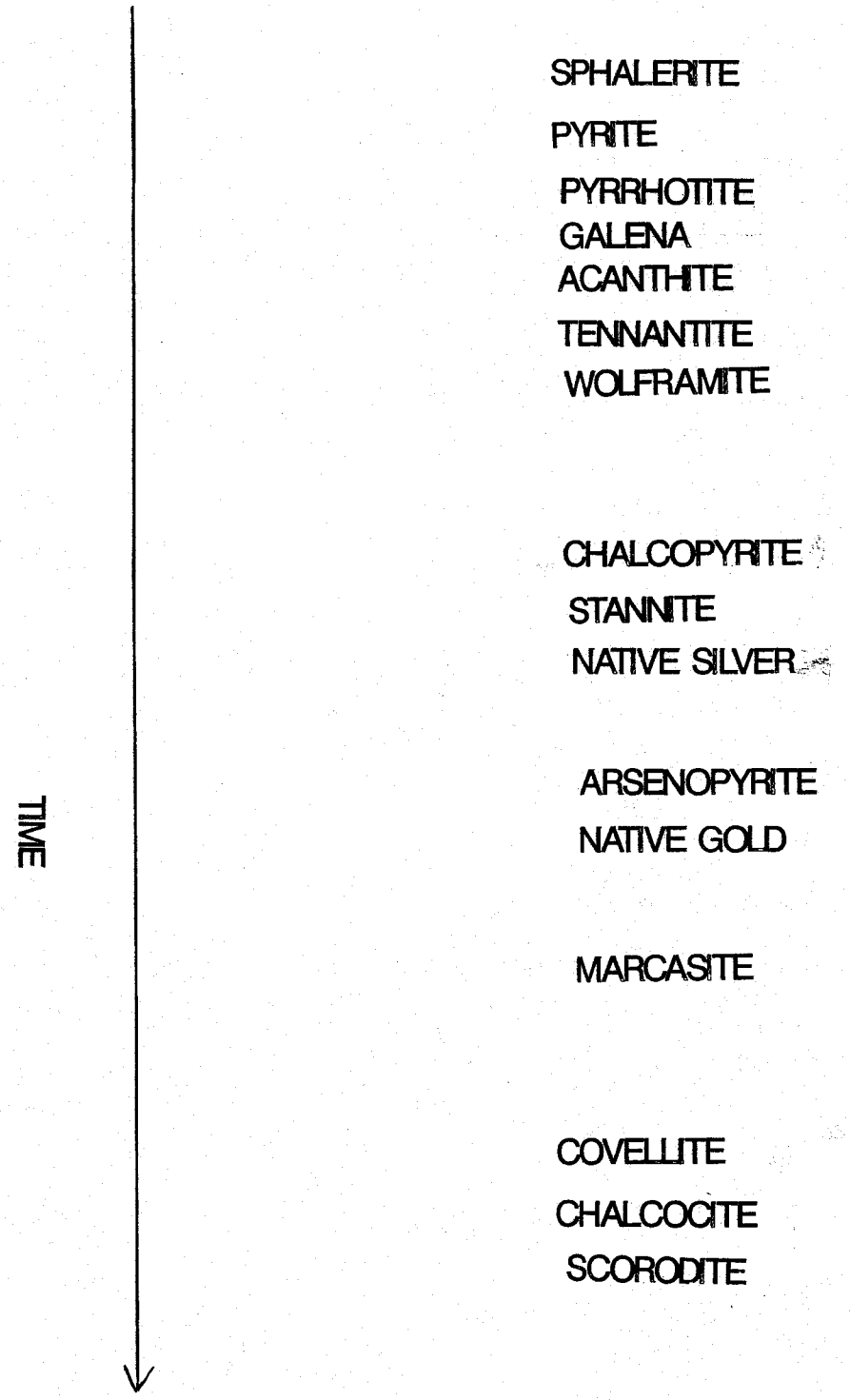


FIGURE 15 SULPHIDE PARAGENESIS

lamprophyric.

Around the larger mafic dykes, there is a distinct alteration in the granodiorites, seen best in drill core. That alteration is described later in this section.

2. ALASKITE DYKES

Alaskite dykes were noted throughout the property, increasing in frequency moving east across the claim block towards the Surprise Lake Batholith. The dykes rarely exceeded a meter in width, and appeared for the most part to be occupying fracture sets within the Fourth of July Creek Batholith rocks. The dykes are characteristically white, and composed almost entirely of quartz and feldspar. Well developed very fine grained chill margins give way to quartz-feldspar porphyritic to pegmatitic cores. There is little doubt that these dykes are related to the younger Surprise Lake Batholith, having been injected into available open spaces during the intrusion of that body.

JURASSIC (TO EARLY CRETACEOUS)

1. FOURTH OF JULY CREEK BATHOLITH

1A. UNDIFFERENTIATED

A self explanatory term, rarely used in mapping the property.

1B. GRANITE

Granite was observed only in the extreme western and northern portions of the property. The map term was used when the felsic intrusives carried large phenocrysts of Kspar in an quartz-felspar rich, hornblende poor (less than 10%) rock.

1C. GRANODIORITE

Granodiorite is the most common lithology on the property, comprising most of the exposed Fourth of July Creek Batholith. The rock is generally composed of between 15 and 20% hornblende, 15 and 20% quartz, 40% plagioclase,

and 20% Kspar, though these percentages vary locally.

The granodiorite is usually medium to coarse grained, inequigranular, and hypidiomorphic. In some places a crude porphyritic texture was noted, with small phenocrysts of plagioclase to 5 millimeters.

Fabric development within the granodiorites is extremely rare, with usually fracture sets being the only measurable structural feature.

1D. DIORITE

In the eastern portion of the property, several areas of the Fourth of July Creek Batholith appear dioritic in composition., with an increase in hornblende and plagioclase, at the expense of quartz and Kspar. Generally, those rocks described as dioritic contain >30% hornblende and >50% plagioclase, with minor amounts of both quartz and Kspar. These rocks represent the end member of the previously discussed zonation across the property from granitic to dioritic.

One other "lithology" is worth discussing at this point, that being the map term "hybrid granodiorite". This term was coined to describe alteration noted in granodiorites proximal to mineralized mafic dykes noted in drill core (See Section 3.5 of this report). The term refers to a distinct halo around the dykes, where free quartz becomes less than 5% of the rock, replaced by feldspars (both plag and Kspar). Hornblende is usually at least partially altered to chlorite, and in some cases to biotite, and the entire rock acquires an intensely shattered appearance. These alteration zones appear to be the result of dynamic metamorphism, occurring during brittle shearing, as opposed to a hydrothermal alteration assemblage.

Below now is a map by map discussion of the encountered geology, emphasizing zones of mineralization located during the mapping program.

MAPS 8A, 8B, 8C

1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, NUMBER 6 VEIN GRID LINE 10W TO 21E (EAST AND WEST SHEETS)
1:500 GEOLOGY AND GOLD GEOCHEMISTRY (INSETS)

Mapping over this portion of the property indicated that the majority of the ground is underlain by granodioritic rocks of the Fourth of July Creek Batholith. There is, from west to east, a crude zonation from granitic rocks to dioritic rocks, with rocks of granodioritic composition the most prevalent.

These granitoid rocks are extensively cut by thin dykes ranging in composition from diabasic, to quartz-feldspar (metasomatic) porphyry, to quartz porphyritic siliceous rock, to alaskite. Most common are diabasic dykes, the majority of which exhibit a common orientation of 65 to 85 degrees, dipping northwards at 65 to 85 degrees.

While most of the observed dykes were unmineralized, several zones of mineralization were encountered, including the historically known Big Canyon Number 1 and 2 Veins, and their eastern strike extensions, the Number 6 and 7 Veins.

BIG CANYON NUMBER 1 VEIN

This vein/shear/dyke system, exposed in the valley walls of Crater Creek, was the first mineralization discovered in the Mount Vaughan area, and led to the staking and subsequent exploration of the property in the early 1900's (See Section 2.5 of this report).

The "vein" is exposed on the property in a series of 4 trenches and one adit, over a strike length of almost 300 meters, between Line 9+70W, at 2+15S, to Line 7+10W, at 1+25S. From west to east, below are descriptions of each exposure:

LINE 9+70W, 2+15S (INSET F, MAP 8C)

At this location, a trench exposes a 50 meter section of outcrop across the envisioned strike extension of the vein. A 5 meter wide, strongly sheared, chloritized, brecciated

mafic dyke, trending at 80 degrees, and dipping to the north at 75 degrees, is exposed. Five one meter chip channel samples across the zone failed to return any notable precious or base metal values, the highest being only 0.018 gpt Au, 10.1 gpt Ag, and 1.1% Zn.

On either side of the dyke, hybrid granodiorite is strongly brecciated and in places sheared, with localized quartz veining. Sampling of these zones also failed to return any significantly elevated precious or base metal values. Immediately south of the hybrid granodiorite are a few 1 to 3 meter wide fresh diabasic dykes, parallel to the sheared dyke at 75 - 80 degrees, dipping 75 degrees north. Weak silicification and bleaching at the contacts with the granodiorite were observed, but no mineralization was observed.

This exposure of the vein/shear/dyke system was very sulphide poor, and as a result the analytical results were disappointing.

LINE 8+15W, 1+50S (INSET F, MAP 8C)

One hundred and seventy meters east and along strike, a trench exposes a 25 meter section across the zone and host granodiorite. Within that exposure is a eight meter section of rock so intensely sheared, brecciated, and oxidized, that its protolith is difficult to determine. Fragments of both clay altered granodioritic material, and silicified mafic dyke material, were observed in the zone, which is probably best described as a fault melange. For the most part, sulphide mineralization was minimal through the zone, but for a 1 meter section at the footwall contact with hybrid granodiorite. There, thin quartz-galena-sphalerite stringers to 5% were noted, conformable to the shearing at 75 degrees/80 degrees north. A 1 meter chip channel sample across the zone returned values of 0.362 gpt Au, 373.8 gpt Ag, 2.6% Pb, and 1.1% Zn. Chip channel samples across the rest of the zone failed to return any significant values.

Three meters south of the shear zone, a 3 meter wide mafic dyke parallels the major shear zone. The dyke is

unaltered, but a 1 meter gossan stained zone marks the footwall contact with the dyke. A 1 meter ccs (chip channel sample) across that zone returned values of 0.043 gpt Au, 183.6 gpt Ag, and 2.02% Pb.

Again, while the trench exposed appreciable widths of shearing, the analytical results were poor.

LINE 7+50W, 1+40S (INSET H, MAP 8C)

At this location, 50 meters further east, a trench exposes 25 meters of strike on the vein/shear/dyke, down the steep Crater Creek canyon wall.

The exposure consists of a 2 to 5 meter wide, intensely brecciated, sheared, and sporadically altered mafic dyke, in contact with hanging wall hybrid granodiorites to the north. Within the dyke are zones of local intense silicification, quartz and quartz-calcite stringers, and varying amounts of disseminated sphalerite-galena-arsenopyrite mineralization, rarely exceeding 5%.

A series of 11 1 meter chip channel samples were taken across the zone, the results of which indicated base metal and silver enrichment, but very little gold potential. Average analyses for the 11 samples taken from the exposure were 0.068 gpt Au, 177.4 gpt Ag, 1.4% Pb, and 1.72% Zn. These grades, while highly anomalous, are uneconomic at current metal prices.

LINE 7+25W, 1+30S (INSET I, MAP 8C)

At this location, 25 meters further east, an exploration adit has been driven into the vein. Because of unsafe appearing conditions at the portal, no attempt was made to explore or sample underground. Figure 5 is a longitudinal section through the Big Canyon Number 1 Vein, illustrating the location of the adit, and the results of some underground sampling completed by Interprovincial Metals, in 1967.

From the adit portal, the vein/shear/dyke system is

exposed for 17 meters east to Crater Creek. The 3 meter wide dyke, trending at 80 degrees and dipping to the north at 75 degrees, is predominantly fresh, to very weakly silicified. There are sporadic pockets, however, that exhibit intense silicification and brecciation, and carry sphalerite-galena mineralization to 15%. Chip channel samples across the dyke returned extremely poor results, with only weakly anomalous gold-silver values. The best results came from a 60 centimeter quartz sulphide vein within the dyke, which across its width carried 94.9 gpt Ag, 10.0% Zn, and 0.8% Pb.

Nine meters south of the main vein/shear/dyke system, exposed in the canyon wall of Crater Creek, a 1 meter quartz-sulphide vein filled shear zone was noted cutting the granodiorite at 60 degrees/ dipping 75 degrees to the north. A 1 meter chip channel sample across that zone returned values of 0.191 gpt Au, and only 21.2 gpt Ag.

On the east side of Crater Creek, where historical reports of workings on an extension of the Big Canyon Number 1 Vein have been reported, a portion of the bank has sluffed to cover any potential vein exposure. The sluff sits in a prominent linear topographic low that appears to be the projected strike extension of the vein, and is probably occupying the recessively weathered zone.

In general, the results of the mapping and sampling program at the Big Canyon Number 1 Vein were extremely disappointing, with no evidence of substantial Au enrichment in the system, and non-economic Ag-Pb-Zn grades.

The results of this work are significantly different than that illustrated in Figure 5, where in 1968 Dolmage Cambell blocked out 9227 tons grading 834 gpt Ag, 4.9% Pb, and 3.1% Zn. These figures, based on drill intersections, underground sampling, and some surface sampling, may reflect a problem with metal depletion in surface exposures, or may be a function of the relative inaccuracy of the ICP analytical technique in dealing with metal quantities of this magnitude. An effort will be made in 1989 to further assess the vein system by accessing the underground workings. Unless there are substantial increases in grades returned

from that program, the vein system at this location will be assessed as uneconomic, as even using the grades reported by Dolmage Cambell, smelting costs, recovery problems, and low tonnages/widths render the zone unattractive at current metal prices.

BIG CANYON NUMBER 2 VEIN

One hundred and thirty meters north of the Big Canyon Number 1 Vein, in the vicinity of Line 6+50W, at Baseline, a trench exposes the Big Canyon Number 2 Vein over a strike length of approximately 50 meters. There, a fault bounded, 2 meter wide, intensely sheared, brecciated, and oxidized, gossanous "melange" of mafic dyke and granodioritic material trends at 65 to 70 degrees, dipping to the north at 60 degrees. Sulphides are intensely oxidized, but where observed, appear to be predominantly arsenopyrite. Secondary scorodite is common throughout the zone.

Ten 1 meter chip channel samples were taken in the zone along strike, and the average analyses from those samples is 0.657 gpt Au, 321.6 gpt Ag, 1.07% Pb, and 0>5% Zn. The Big Canyon Number 2 Vein, then, is a much more Au-Ag rich system, though unfortunately the grades remain uneconomic at this location.

NUMBER 6 VEIN

Approximately 900 meters east of the Big Canyon Number 1 and 2 Veins, several trenches expose two parallel vein/shear/dyke systems that appear to be eastern strike extensions of the Big Canyon Veins.

Between Lines 2+00E and 3+00E, at 0+80N, an east-west trending trench exposes a 2 meter wide mafic dyke trending at 80 degrees and dipping 75 degrees to the north. (See Inset 8C.) A 40 meter portion of that dyke is strongly silicified, and carries a quartz-sulphide (arsenopyrite, pyrite, with minor galena and sphalerite) vein to 75 centimeters in thickness. Arsenopyrite is the dominant sulphide, often constituting 15% of the vein, while galena, sphalerite, and pyrite rarely exceed 1%.

An average of 9 samples taken from across the zone (both 1 meter chip channel samples, and representative grab samples in zones of poor exposure) along the 40 meters of exposed mineralization, returned values of 2.01 gpt Au, and 166.4 gpt Ag. Base metal values were consistently less than 1% across the zone.

The Number 6 Vein is similar, mineralogically, to the Big Canyon Number 2 Vein, in that it is an arsenopyrite rich system carrying strongly anomalous Au-Ag values. The vein lay in the approximate area where any strike extension of the Big Canyon No. 2 Vein would be expected, and the similar separation distances between the Big Canyon No. 1 and 2 Veins, and the Number 6 and 7 Veins, suggests that the two vein sets are in fact equivalent. The higher gold grades in the Number 6 Vein may be reflecting a metallogenic zoning within the system, with increased gold either further east or at a higher level. Again, however, the grades encountered on surface at the Number 6 Vein are currently uneconomic.

NUMBER 7 VEIN

A series of trenches between Line 1+00E and 7+00E, along and immediately south of baseline, sporadically expose a vein/shear/dyke system over 550 meters of strike length. Moving from west to east:

Inset C (Map 8C, Appendix 3) details a trench exposing portions of the vein/shear/dyke system between Lines 1+25E and 2+75E. A prominant fault, trending at 80 degrees and dipping to the north at 65 degrees, marks the contact between hybrid (altered, quartz free) granodiorite to the north, and a mafic dyke exhibiting varying degrees of shearing, alteration, and mineralization.

Through most of the exposure, two thin mineralized zones occur within the dyke, one at the fault bounded contact with the hybrid granodiorite, and one approximately 3 meters to the south., hosted in diabase. Both zones pinch and swell dramatically, from less than 20 centimeters to 2 meters in width. Mineralization occurs in zones of intense

silicification and brecciation within the dyke, with healing by quartz-sulphide material. Distinct, linear, continuous quartz-sulphide "veins" are rare, and only observed at Line 2+75E, 0+10S, where a 1.6 m wide banded qtz-sulphide vein returned some of the best chip channel sample results. Two 1 meter samples carried:

- 2.33 g/T Au, 179.2 g/T Ag, 2.02% Pb, 6.8% Zn,
- 6.86 g/T Au, 320.6 g/T Ag, 2.1% Pb, 4.6% Zn.

At this location, economic grades over an economic width were returned, one of the few instances on the property.

All samples from the mineralized zones, however, did return very strongly anomalous gold, silver, and base metal values, over chip channel widths to 1 meter. Gold values were notably high, commonly in the gpt range, and this area appears to be a higher grade zone that may have potential as an ore grade "shoot" within the vein/shear/dyke system.

Between Line 2+75E and 4+00E, exposure is very poor, but trenches do expose local shear and gossanous oxidized zones within a mafic dyke. Grab samples from some of this material returned values as high as 0.803 g/T Au, 131.4 g/T Ag, 1.9% Pb, and .1% Zn.

Inset B details, at 1:500, a trench cut between Lines 4+00E and 4+50E. The trench exposed an intensity sheared "fault melange" of clay altered granodiorite, chlorite to silica altered mafic dyke, and boudinaged to brecciated quartz-sulphide veins, in places to 3 m wide. Chip channel samples across the zone returned, for the most part. Strongly anomalous gold, silver, and base metal values. Only where discrete, preserved quartz-sulphide veins were encountered did grades approach economic values. Notably, at the eastern end of the trench, a 50 centimeter quartz-sulphide (arsenopyrite, pyrite, galena, sphalerite) returned values of 8.68 gpt Au, 113.8 g/T Ag, 0.3% Pb and 0.2% Zn. At this location, arsenopyrite, while common throughout the vein/shear systems encountered on the property as semi-massive, large euhehedral to subhedral blebs, occurred as extremely finely disseminated needles, rarely observed on

the property. The intense shearing at this location, while generally trending at a conformable orientation to the dyke, at 80 degrees/70-75 degrees N, did exhibit some strong, late, crosscutting shear slips, trending at 35 degrees/80 degrees NW. This area may be the site of a crosscutting fault, that warrants further investigation. In looking at the plan map of the trench locations and exposed mineralization, it is apparent that there must be some local southward offsets of the dyke/shear/vein system.

At Line 4+80E, a trench exposed a 5 meter thick sheared, altered mafic dyke trending locally at 065 degrees/75 degrees N. The dyke is sporadically silicified and bleached, and carries a few thin conformable quartz-sulphide (arsenopyrite, sphalerite, pyrite, galena) stringers, as well as 1-2% disseminated sulphide mineralization. Two 2.5 meter chip channel samples returned values of:

- 1.89 g/T Au, 69.9 g/T Ag, 0.4% Pb, 1.1% Zn,
- 1.89 g/T Au, 271 g/T Ag, 2.1% Pb, 1.3% Zn.

At the same location, two samples of rip rock, both quartz-semi-massive sulphide boulders, returned values of;

- 1.92 g/T Au, 243.0 g/T Ag, 0.7% Pb, 3.1% Zn,
- 3.64 g/T Au, 254.4 g/T Ag, 2.3% Pb, 7.8% Zn.

The sheared dyke here is of considerable width, and is locally carrying sub-economic gold-silver grades. This area warrants further attention, as it may reflect proximity to an ore grade shoot within the vein/shear/dyke system.

Just east of the trench discussed above, at Line 5+20E, a small trench failed to reach bedrock, but does expose several ripped up quartz-sulphide boulders. A grab from one such boulder returned an analyses of 2.846 g/T Au, 118.9 g/T Ag, 0.57% Pb, and 0.95% Zn.

At Line 5+60E, another trench failed to expose bedrock, but again several quartz-sulphide vein boulders were ripped up, analyses from one of which returned values as high as 1.06 g/T Au, 72.8 g/T Ag, 1.3% Pb and .13% Zn.

At Line 6+50E, a trench exposed a 4 m wide fresh, unaltered diabase dyke trending at 80 degrees/80 degrees N.

The Number 7 Vein, then, exhibits continuity of mineralization over 450 meters. While for the most part encountered grades-widths are uneconomic, there are zones within that strike extent that have potential as ore grade shoots within the vein/shear/dyke system. These should be investigated by diamond drilling, as outlined in Section 1 of this report. The true extent of the Number 7 Vein remains unknown. It most probably is a strike extension of the Big Canyon Number 1 Vein, a kilometer to the west, and probably continues to the east. The potential strike extensions of the vein will be investigated using IP, in an effort to generate strong sulphide response targets, followed by a program of trenching and diamond drilling.

Several other areas of the Number 6 Vein Grid hold economic potential. The extent to which mafic dykes cut the granodioritic terrain is much more frequent than the limited exposure suggests, as illustrated by the results of the mapping up the Crater Creek and Vulcan Creek valleys. There, where bedrock exposure is semi-continuous, over 70 dykes were noted cutting the granodiorite over approximately 1200 meters of exposure. The vast majority of the dykes exhibit a common orientation, of between 65 to 80 degrees/65 to 80 degrees N. The vast majority, also, are unmineralized, though several carried thin quartz-sulphide veins that returned anomalous gold values in the 100 to 500 ppb rang. None of the encountered dykes, however, exhibited sufficient width or mineralization to warrant a more detailed investigation in the immediate vicinity of the creek valley walls.

Zones of potential economic interest encountered on the grid include:

STRIKE EXTENSIONS, NUMBER 4 VEIN

The Number 4 Vein, discussed in Section 2.5 of this report, for the most part is located on the Crown Grants that constitute the Ruffner Property of Taywin-Trident. An

eastern extension of the vein system, however, in all probability crosses onto our property in the northeast section of the Number 6 Vein Grid.

At Line 17+50E, 5+00N, a collapsed adit drives north into the Number 4 Vein. Samples of quartz-sulphide boulders taken from the dump at the foot of the adit returned values of as high as 10.0 g/T Au, 299.3 g/T Ag, 0.2% Cu, 2.2% Pb, and 0.4% Zn. This adit is only 20 meters west of the boundary with our property, and the vein/shear/dyke system undoubtedly continues onto our ground. This area warrants investigation, through a blasting program, to delineate the extension of the Number 4 Vein, where historically the highest gold values were returned from underground workings. Several grab samples taken from the Number 4 Vein exposures along the workings returned values to as high as 4.7 g/T Au, and the target is a good one. There is also some potential for extremely high grade gold pockets within the Number 4 Vein.

At Line 0+00E, 5+75N, along strike and approximately 450 meters west of the last exposed workings on the Number 4 Vein, several pieces of semi-massive galena-sphalerite-arsenopyrite float were found in a small creek, with abundant dyke material, indicative of a local source.
Two samples of the float vein material returned spectacular assays of:

- 93.99 g/T Au, 247.2 g/T Ag, 2.0% Pb, 5.6% Zn,
- 17.83 g/T Au, 298.1 g/T Ag, 1.9% Pb, 2.5% Zn.

Subsequent examination of polished sections from this float material identified abundant free gold on fractures in the sulphides, and as inclusions in late stage arsenopyrite.

L19+00E, 4+25S (SEE INSET A, MAP 8C)

At this location, a trench exposed a thick "quartz-porphyritic siliceous rock" dyke, exhibiting varying degrees of silica and clay alteration. Exposure was insufficient to determine orientation of the dyke. Within the altered dyke rip rock along the margins of the trench, several small but

angular, v. local appearing boulders of a bright green intensely oxidized clay altered material were located, with corroded but recognizable galena-chalcocite-arsenopyrite fragments. An analysis of this material returned values of 1.019 g/T Au, 361.8 gpt Ag, 3.5% Cu and 2.0% Pb. This intriguing looking material was not located in place, but again, appears to be of very local origin. Its proximity to the clay and silica altered dyke, and intense brecciation in the surrounding granodiorites, (Unit 4 is exposed immediately west and north of the occurrence) indicates a potential for a large tonnage source of this type of material. The extremely strong multi-element soil geochemical anomaly northwest of the occurrence also indicates potential in the area, as outlined in subsequent sections of this report. This area is slated for further evaluation employing IP geophysical surveys and trenching.

L21+00E, 0+50S TO 1+50N

In this vicinity, several samples returned anomalous precious and base metal values.

At Line 21+00E, 0+40S, a thin 30 cm strongly silicified dyke, trending at 040 degrees/60 degrees SE, carried 1-2% disseminated pyrite-arsenopyrite, and a few thin 5 cm qtz-arsenopyrite veins. A continuous grab sample across the dyke returned values of 1.06 g/T Au, 19.3 g/T Ag, .16% Pb and .12% Zn.

At Line 21+00E, 0+40N, numerous silicified mafic dyke boulders in talus carried up to 10% disseminated arsenopyrite. A grab sample of one such boulder returned an anomalous Au value of 143 ppb.

Just west of L21+00E, between 0+75N and 1+00N, a 5 meter wide zone in granodiorite, trending at 030 degrees/60 degrees SE, exhibits strong silicification, with 1-2% disseminated arsenopyrite, pyrite, and pyrrhotite. Samples from the zone, however, returned only very weak (< 100 ppb) gold values.

Immediately north of this zone, several boulders of

silicified, arsenopyrite bearing mafic dyke rock were located in talus, a sample of which returned values of 300 ppb Au. This area is intriguing for the presence of widespread arsenopyrite mineralization, and warrants further evaluation employing blasting techniques.

L14+2SE, 1+50N

At this location, several mineralized volcanic graywacke boulders carrying up to 5% pyrrhotite, returned anomalous gold values to as high as 130 ppb. This is an area that exhibits a very strong multi-element soil geochemical anomaly, as discussed in the subsequent sections of this report, and will see a detailed evaluation in 1989.

L10E-12E, 5+00S TO 3+00S

At this location, a prominent linear topographic depression, trending at 040 degrees is occupied by a creek bed. Within that creek bed, several small exposures of granodiorite host thin mineralized shear zones, trending predominantly at 040 degrees/70 degrees SE. The shears, which rarely exceed 30 cm, carry minor pyrrhotite, pyrite, chalcopyrite, galena, sphalerite, and arsenopyrite. Only weak Au anomalous values (< 100 ppb) were returned from the shears, but they may be indicative of a proximal, major vein/shear/dyke system. At the southwest end of the zone, several diabase boulders, and mineralized quartz-carbonate vein boulders were observed in float. A sample from a mineralized boulder returned an analyses of 0.52 gpt Au, 39.3 gpt Ag, .3% Pb and .5% Zn. Again, there is evidence for a larger shear/fault/vein system here, at an orientation not usually associated with the mineralized dykes to the north. This area warrants further investigation, using a combination of IP, and trenching/blasting.

L7+00E, 3+00S

At this location, thin (10 cm) mineralized, silicified fracture sets trending at 040 degrees/80 degrees SE were located in granodiorite. Samples from the thin zones carried weakly anomalous gold values to 144 ppb. These

fracture zones may be indicative of proximity to a larger vein/dyke/shear system. It is interesting to note at this location the presence of a quartz-porphyritic siliceous dyke, also trending northeast, at 040 degrees/70 degrees NW.

L5+00E, 1+00N

At this location, numerous boulders at quartz-arsenopyrite vein material were located as float, with abundant silicified mafic dyke boulders. A grab sample from one of the quartz-arsenopyrite boulders returned an analysis of 22.3 g/T Au. This location is immediately east and along strike from the Number 6 Vein, and may reflect a continuity to that vein/shear/dyke system. This area is slated for IP coverage, and if warranted, trenching and diamond drilling.

Several very promising looking areas were discovered as a result of the mapping and lithogeochemical sampling programs on the Number 6 Vein Grid. The areas discussed above will see the brunt of a major 1989 exploration program on the property, as outlined in Section 1 of this report.

MAP 9
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY MAP, NUMBER 6 VEIN EXTENSION, L21E-L35E, SOUTH OF BASELINE

Geological mapping indicated that this portion of the property is underlain predominantly by medium grained diorite of the FJCB.

In the extreme southeast corner of the map sheet, a few isolated outcrops of quartz-porphyritic fine grained granite were identified. Minor occurrences of Unit 4 (Volcanic Graywacke/Conglomerate/Breccia) were noted on L21E at 2+75S.

All dyke lithologies, including metasomatic quartz-feldspar porphyry, quartz-porphyritic siliceous rock, alaskite, and mafic dykes, were located on the map sheet. Most prevalent were a series of thin, generally east-west trending mafic (diabasic) dykes cutting FJCB rocks, most of which were unmineralized.

Several zones of mineralization were identified however, predominantly in talus and felsenmeer.

L23+60E, 2+80S

At this location, mineralized (sphalerite-arsenopyrite-pyrite-chalcopyrite) quartz vein float returned assays as high as 1.86 g/T Au, 89.9 g/T Ag, 0.68% Pb and 3.1% Zn. Immediately adjacent to that occurrence, grab samples from altered mafic dyke float returned anomalous values of as high as 0.43 g/T Au, 336.5 g/T Ag, 1.3% Cu, 0.9% Zn. The presence of this mineralized float indicates proximity to a vein/shear/dyke system locally. Downslope movement in the area is thought to be minimal, and this target is slated for a more detailed evaluation employing blasting.

L24+00E, 7+00S

At this location, a sample of mineralized (galena -arsenopyrite) silicified volcanic graywacke/breccia was discovered in talus, which returned analyses of 1.4 g/T Au, 468.3 g/T Ag, and 2.8% Pb. This sample indicates that locally the volcanic graywacke/conglomerate/breccia unit is present, and that it is carrying significant Au-Ag mineralization. No previous samples of Map Unit 4 has returned values of this magnitude, and there may be potential for a bulk mineable target hosted in large breccia zones.

While the sample was located in talus, the area will see a more detailed evaluation employing blasting, and continued mapping and sampling.

L22+55E, 4+35S

At this location, several large, angular, and local boulders of mineralized quartz vein material were noted, a sample of which returned analyses of 1.33 g/T Au, 75.4 g/T Ag, and 5.1% Zn. Fifty meters west of this location, weakly mineralized but strongly silicified mafic dyke boulders were discovered, one sample of which returned analyses of 0.056 g/T Au, 70.5 g/T Ag, and 1.2% Pb.

One hundred and twenty-five meters east of the original

location, a prominent talus filled depression, with remnants of mafic dyke material at the margins, was encountered, trending east-west. This depression in all probability represent a recessively weathered sheared dyke, and is the potential source of the mineralized float. This area is slated for further evaluation via a blasting program, as it may represent a previously unrecognized major structure.

L22+00E, 6+75S

In this immediate area, several pieces of mineralized, strongly gossan stained diorite float were located, carrying up to 182 ppb Au. This float lay 200 meters west of the previously discussed float occurrence on L24E at 7+00S, and may be defining a previously unrecognized east-west trending dyke/shear/vein system. The area is slated for more detailed mapping and sampling.

L21+00, 23+00E, 0+00-1+00S

In this vicinity, several showings of mineralized float material, both quartz vein and dyke, were identified, carrying up to .352 g/T Au and 38.2 g/T Ag. The area is slated for more detailed mapping and sampling.

L24+30E, 1+00S

At this location, a grab sample of gossan stained diorite in talus carried 131 ppb Au.

L32E, 6+50S

At this location, a thin shear zone hosted in diorite carried 461 ppb Au. Locally several mafic dykes cut the diorite, which is strongly gossan stained. This area warrants a second look.

L32E-33E, 0+00-1+00S

In this region, several thin northeast trending silicified shear zones cut granites of the Surprise Lake Batholith, carrying values as high as 0.383 g/T Au, 361.3

g/T Ag, 1% Pb, 0.7% Zn, and 0.3% Sn. This area may hold significant tonnage potential, and is slated for a more detailed mapping and sampling program.

L29+80E, 1+10S

At this location, an old pit contains numerous quartz-arsenopyrite vein boulders, though no exposed bedrock. Samples of vein material returned values as high as .394 g/T Au. This area may be further investigated via a blasting program.

L26+00E, 3+40S

At this location, a sample of mineralized dyke float returned an analysis of .818 g/T Au. This area may be further investigated via a blasting program.

L27+00E, 2+15S

A sample of altered dyke talus, returned an analyses of .460 g/T Au, 113 g/T Ag, and 1.4% Cu.

L27+00E, 5+80S

A grab from a thin east-west trending altered, mineralized mafic dyke carried .110 g/T Au, 157.4 g/T Ag, 2.9% Sn, and 0.05% Sn.

Several mineralized showings were identified as a result of the mapping and sampling program on this portion of the property. The apparent increase in frequency of showings here is probably a function of close proximity to the Surprise Lake Batholith, as well as a better than usual exposure. Several of the showings may be reflecting the presence of major mineralized shear zones, and warrant further attention, as has been discussed.

MAP 10
NUMBER 6 VEIN BASELINE, L21+00E-L35+00E, NORTH OF BASELINE

Mapping over this portion of the property encountered

almost exclusively diorites of the FJCB. Several thin mafic dykes were observed cutting the diorite, and in felsenmeer and talus, predominantly trending east-northeast at 70 degrees to 90 degrees. A few zones of weak alteration and mineralization were encountered:

L27+00E, 4+30N

At this location, several samples of mineralized (pyrite, arsenopyrite) quartz vein float, and altered, silicified mafic dyke float returned anomalous values to 665 ppb Au. This area will be remapped and sampled in more detail, in an attempt to define the source of the float.

L26+30E, 3+00N

At this location, a thin mineralized mafic dyke is sporadically exposed, cutting diorites of the FJCB. The dyke trends at 070 degrees and dips to the north at 70 degrees. Several samples from the weakly mineralized dyke carried anomalous gold values to .126 g/T. This area will be more fully evaluated during a blasting program.

L24+00E, 6+60N

At this location, a strongly gossan stained mafic dyke is sporadically exposed, trending at approximately 065 degrees. Samples from the weakly mineralized dyke returned values as high as .638 g/T Au, 202 g/T Ag, and 2% Pb. This area, too, will be more fully evaluated during the 1989 field season, employing a blasting program.

This area, then, also contains evidence of the presence of mineralized structures. This map sheet was completed by relatively junior contract personnel, and as such a re-evaluation of much of the ground, and all of the showings, is slated for 1989.

MAP 11
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L0-L10E, SOUTH OF BASELINE

Mapping over this portion of the property indicated that much of the ground is underlain by fine grained quartz-feldspar porphyritic granite of the Surprise Lake Batholith, more specifically the southern half and eastern margin of the map sheet. The north and west portions of the map sheet are underlain by dioritic rocks of the FJCB.

A few altered and unaltered mafic (diabasic) dykes were observed cutting diorites of the FJCB. Several strongly gossanous zones were also located throughout the map sheet, in both diorites of the FJCB and granites of the SLB. Much of the gossan staining lay in close proximity to the interpreted contact between the two intrusives, and may be related to that feature.

A few zones returned anomalous precious and base metal values, as outlined below:

L10+00E, 1+80S

At this location, numerous talus boulders, thought to be of very local origin, of strongly altered (silicified) mafic dyke rock were located, some carrying mineralized quartz veins. Two samples of this material returned the following significant analyses:

- 1.536 g/T Au, 104.4 g/T Ag, 1.4% Pb,
- 1.07 g/T Au, 1.7% Zn.

The talus/float was located in an area of strongly gossan stained diorite, which may be indicative of proximity to a major mineralized dyke/shear/vein system. This area is slated for a more detailed evaluation, via a blasting program.

L9+50E, 2+85S

At this location, two thin (to 0.5 m) shears were located in diorite, both carrying thin mineralized mafic dykes. Both trended at approximately 080 degrees, though poor exposure made dip determination impossible. Grab samples from each of the dyke/shear/vein systems returned

significant values of:

- .759 g/T Au, 411.4 g/T Ag, 1.2% Pb, 1.2% Zn,
- .119 g/T Au, 0.53% Sn.

L9+50, 4+00S

At this location, a piece of silicified mafic dyke float, carrying a mineralized quartz vein, returned significantly anomalous values of 0.717 g/T Au, 71.4 g/T Ag, and 1.0% Zn. This may be downslope dispersion from the shear/dyke/vein system described above, or represent a previously unrecognized zone. Both of the above areas will be examined more carefully during the 1989 program.

L10+60E, 14+30S

In the extreme southeast corner of the map sheet, a hand pit within a zone of sheared silicified granite of the SLB had several intensely gossan stained, oxidized boulders. Two samples of the oxide material returned analyses of:

- .450 g/T Au, 244.3 g/T Ag, 2.3% Pb,
- .360 g/T Au, 397.5 g/T Ag, 0.7% Cu, 0.6% Pb, 0.8% Zn, and 0.26% Sn.

This area warrants a more detailed evaluation, probably employing a blasting program.

The results of the mapping and sampling program on this map sheet were encouraging, with the discovery of at least three new mineralized showings. Again, proximity to the contact between the FJCB and SLB appears to be a zone of relative metal enrichment, and represents an exciting target for future work.

MAP 12A AND 12B
12A - SOUTH BASELINE GRID, L0-L12W, SOUTH OF BASELINE (NORTH SHEET)
12B - SOUTH BASELINE GRID, L0-L12W, SOUTH OF BASELINE (SOUTH SHEET)

Mapping indicated that this portion of the property is underlain predominantly by granodiorites to diorites of the Fourth of July Creek Batholith. It is interesting to note, however, that the Vulcan Creek Valley floor is covered with boulders, the majority of which, on this map sheet, are quartz-feldspar porphyritic granites of the Surprise Lake Batholith. A natural assumption is that fluvial processes are responsible for movement of these boulders from the creek headwaters, where granites of the SLB have been observed in outcrop. There is, however, a remote but very real possibility that, as speculated in Section 3.1 of this report, Vulcan Creek is following a major structure, along which local emplacement of the younger SLB has taken place. Also interesting in this area, is the high proportion of metasomatic quartz-feldspar porphyritic dykes, notable on the south sheet.

A broad area of mineralization was encountered on the map sheet, in a series of four trenches cut in the vicinity of Lines 2W to 3W, 7+00S to 8+00S. None of the trenches successfully exposed the bedrock source of the mineralization, in a manner as to allow interpretation of its setting and orientation. All trenches did, however, rip up boulders of both intensely altered (silica to clay) sheared, mineralized diorite-granodiorite, carrying disseminated sphalerite-galena-arsenopyrite, and silicified mafic dyke rock and associated quartz-sulphide veins. This area then, is extremely attractive, as it holds potential for larger tonnage low grade mineralization, not strictly vein hosted deposits. Some 27 samples of rubble-crop, talus, and float were sampled. Below are some of the better analyses returned from the area (see map for locations):

- 1.073 g/T Au, 88.5 g/T Ag, 0.98% Zn
- 0.968 g/T Au, 57.3 g/T Ag
- 0.424 g/T Au, 139.1 g/T Ag
- 0.192 g/T Au, 275.3 g/T Ag
- 0.650 g/T Au, 273.5 g/T Ag
- 0.450 g/T Au, 203.0 g/T Ag, 1.7% Pb, 1.2% Zn
- 0.494 g/T Au, 188.3 g/T Ag, 2.1% Pb, 1.2% Zn
- 0.979 g/T Au, 90.4 g/T Ag

- 0.525 g/T Au, 102.5 g/T Ag

This area was the site of a limited trenching program in the fall of 1988 (see Section 3.6 of this report), and is slated for detailed work (IP surveys, trenching, diamond drilling) in 1989.

Other areas of mineralization encountered on these map sheets include:

L43+00W, 10+25S

At this location, a grab sample from a 10 cm quartz-arsenopyrite vein, proximal to the contact between a 4 m diabase dyke and granodiorite, carried .940 g/T Au and 367 g/T Ag.

L5+00W, 4+15S

At this location a grab from a thin quartz vein hosted in an east-northeast trenching mafic dyke returned an analysis of .280 g/T Ag.

L6+00W-L7+00W, 21+00S-22+00S

At this location, a series of trenches expose as rip rock several galena-quartz veins in strongly sheared, clay altered granodiorite to diorite, proximal to a mafic but unmineralized dyke. Grab samples of the vein material returned analyses as high as .129 g/T Au, 241.5 g/T Ag, 2.6% Pb, 4.6% Zn, and .2% Sn. This area will be more fully investigated during the 1989 exploration program.

L6+00W, 23+75S

At this location, a trench exposes several mineralized (galena, sphalerite, chalcopyrite) quartz vein boulders, hosted in altered granodiorite. Samples of the vein material returned analyses as high as .209 g/T Au, 342.9 g/T Ag, 2.2% Pb and 6.3% Zn.

L3+00W, 24+25S-24+75S

In this area, several samples of mineralized quartz vein float and silicified mafic dyke float were located. Analyses from grab samples returned values as high as 0.226 g/T Au, 233.8 g/T Ag, 0.7% Pb, 1.3% Zn and 0.12% Sn. Both of the above areas will be investigated more fully during the 1989 exploration season.

The results of the mapping and lithogeochemical sampling program over this portion of the property resulted in the discovery of several very promising zones, none of which have seen any concerted evaluation. Work on these showings will constitute a major proportion of the 1989 exploration program, employing a combination of geophysics, trenching, and diamond drilling.

MAP 13
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L12+00W-L24+00W, SOUTH OF BASELINE

Very little outcrop exposure was located on this map sheet, the majority occurring along Crater and Vulcan Creeks. The mapping indicated that the property is underlain predominantly by granodiorite of the FJCB. In a few locations, mafic and quartz-porphyritic siliceous dykes were observed cutting the granodiorites. Significant sulphide mineralization and alteration were only observed at two locations. In the vicinity of L13+25W, 3+60S, several float boulders of mineralized (galena, chalcopyrite, arsenopyrite) quartz vein material and silicified mafic dyke material were located. Samples from this float material returned analyses as high as .353 g/T Au, 296.9 g/T Ag, 1.9% Pb, 2.7% Zn, and 0.1% Sn.

Seventy meters due south of this location, a trench exposed rubble crop, including quartz-sulphide vein material in intensely clay altered, oxidized granodiorite. Grab samples from the mineralized material returned values as high as 0.524 g/T Au, 437.1 g/T Ag, 2.1% Pb, 2.0% Zn, and 0.9% Sn.

Both of the above areas represent potentially significant

new shear/vein/dyke systems, and will be evaluated in detail during the 1989 exploration program. Because there is so little outcrop exposure in this portion of the property, a reconnaissance IP survey line should also be completed down one of the grid lines.

MAP 14
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L25W-L44W, SOUTH OF BASELINE

Only very limited outcrop exposure was located on this map sheet, all of it granodiorite of the FJCB. No significant alteration of mineralization was noted in what limited exposure there was. No work is slated for this portion of the property in the 1989 exploration season.

MAP 15
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, SOUTH BASELINE GRID, L31W-L44W, NORTH OF BASELINE

Mapping in this portion of the property encountered predominantly porphyritic granite to granodiorite of the FJCB. In the vicinity of L33W, 7+50 to 8+50N, several mafic dykes were observed cutting the granitic rocks, although none exhibited significant alteration or mineralization in outcrop.

Immediately north of that location, however, along the bank of Crater Creek, an old pit contains numerous boulders of quartz-sulphide (arsenopyrite) and silicified mafic dyke material. This material is also prevalent in a pile of dump rock beside the deep, water filled pit (which may in fact be an old shaft). Samples from the mineralized vein and dyke material returned analyses as high as 1.437 g/T Au, 231.6 g/T Ag, 2.2% Pb, 1.4% Zn, and .12% Sn.

This showing is within the limits of the Crown Grants not owned by Homestake Mineral Development Co. Ltd., and as such no additional work will take place in the area. No other zones of economic interest were discovered on the map sheet.

MAP 16A AND 16B
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, HOPEFUL BASELINE GRID,

L0-L28W, NORTH OF BASELINE (EAST AND WEST SHEETS)

The only outcrop encountered in mapping this portion of the property was situated in the extreme northwest corner, where porphyritic granite to granodiorite of the Fourth of July Creek Batholith was exposed. The majority of this portion of the ground is believed to be similarly underlain by rocks of the FJCB, although Section 3.1 of this report discusses the potential significance of some of the airborne geophysical features defined in the area. No zones of economic interest were located in the area.

MAP 17A AND 17B
1:2000 GEOLOGY AND GOLD GEOCHEMISTRY, HOPEFUL BASELINE GRID, L0-L22E, NORTH OF BASELINE (EAST AND WEST SHEETS)

Mapping indicated that this portion of the property is underlain predominantly by rocks of the Fourth of July Creek Batholith, exhibiting a crude zonation from granitic in the northwest sections of the sheets through granodiorite to diorite in the southeast portion of the map sheet.

All three lithologies are cut by dykes ranging in composition from metasomatic quartz-feldspar porphyritic to mafic diabasic appearing dykes. Most of the observed dykes trend northeast, dipping steeply to the northwest, although local variations were observed.

Two major dykes and implied associated faults were delineated on the map sheet.

One trends of approximately 070 degrees from L12E, at 7+25N, to L16E, at 9+50N, where it appears to be offset 75 meters to the south before continuing east-northeast across the property. The actual dyke is only sporadically exposed, and for the most part appears unaltered and unmineralized. At two locations, however, the dyke appears to be weakly mineralized. At L14E, 8+50N, strongly oxidized quartz-sulphide vein felsenmeer was exposed in a pit sunk in the dyke. Samples of that material returned analyses as high as

0.068 g/T Au, 352.9 g/T Ag, and 2.4% Pb.

Eight hundred meters east of that zone, in the vicinity of L22+00E, 10+50N, a sheared gossan stained zone within the dyke returned analyses of 0.309 g/T Au, 320.9 g/T Ag, 1.1% Cu, and 0.7% Pb. This structure/dyke will be mapped and sampled in more detail during the 1989 program, to more fully assess its potential.

The second major dyke/fault trends at 050 degrees from L15+00E at baseline to L22+00E at 4+25N. The actual dyke is rarely observed, except as remnant pockets along the walls of a prominent topographic depression cutting granodiorite. In the vicinity of L20+60E, 3+40N, a shear zone in granodiorite proximal to the contact with the mafic dyke carried 0.061 g/T Au. South of the interpreted fault, and quite possibly the up-dip extension of the shear/dyke/vein system, a gossanous zone of rubble, composed of clay altered granodiorite, mineralized quartz vein material, and altered silicified mafic dyke material, was located in the vicinity of L19E, at 1+75N. A sample of mineralized quartz vein material from that location returned values of 0.366 g/T Au, 101.8 g/T Ag, and 0.8% Pb. This feature will also be more thoroughly evaluated during the 1989 exploration program.

Mineralization was located in several other areas of the map sheet, including:

L10+00E, 4+75N

At this location, samples of mineralized quartz-arsenopyrite-galena vein float carried values of 0.390 g/T Au, 73.0 g/T Ag, and 1.7% Pb.

L11+50E, 5+50N

At this location, thin quartz-galena veins within clay altered granodiorite carried values as high as 0.051 g/T Au, 278.5 g/T Ag, and 2.5% Pb.

L13+00E, 6+35N

At this location, a pit within strongly gossan stained and clay altered granodiorite exposed quartz-galena-arsenopyrite veins which carried up to 10.36 g/T Au, 327.5 g/T Ag, and 2.1% Pb. Also at this location, samples of very local silicified mafic dyke float carried up to 0.200 g/T Au, even where no visible sulphides were observed.

L22+00E, 9+25N

In this vicinity, a sample of mineralized quartz vein float, in an area of abundant altered and unaltered mafic dyke float, returned analyses of 0.637 g/T Au, 42.0 g/T Ag, and 1% Pb. Eighty meters due east of this location, quartz vein float material returned analyses of 3.03 g/T Au, 87.0 g/T Ag, and 2.2% Pb. These occurrences may be from a previously unrecognized shear/vein/dyke system, and will be further investigated during the 1989 field season.

L24+00E, 8+00N

In this vicinity, an area of strongly gossanous, clay altered granodiorite talus, mineralized oxidized quartz-sulphide vein talus, and altered mafic dyke talus, was located. Samples from the zone carried values as high as 0.915 g/T Au, 297.4 g/T Ag, and 1.2% Pb. This, and all the above discussed zones of economic interest detected on these map sheets, will be more fully evaluated through the 1989 program, employing blasting and trenching, more detailed geological mapping and sampling, and diamond drilling, if warranted.

3.3 SOIL GEOCHEMICAL SAMPLING PROGRAM

3.3.1 METHODS EMPLOYED

A soils geochemical survey was completed over portions of the Number 6 Vein Grid, in an effort to delineate the known mineralized vein/shear systems on that grid (Numbers 6 and 7 Veins), and an attempt to locate previously unrecognized but similar zones of mineralization.

Samples were taken at 25 meter station intervals along Lines 0 through 20+00E, from 4+00N to approximately 4+00S, as ground conditions allowed. On many lines, the amount of coarse talus cover made sampling impossible. Where samples were collected, the medium was predominantly talus fines, usually rotted, exfoliated granodiorite fragments of < #10 mesh. No true soil development was noted anywhere on the grid where the survey was carried out.

Initially, 579 samples were collected over the grid, and analyzed for Au and a suite of 30 additional elements. The Au analysis, completed by Bondar Clegg Ltd., was by fire assay with an atomic absorption finish. The 30 element analysis, completed by Acme Analytical Laboratories Ltd., was by an ICP technique.

After the initial results were returned, an additional 154 samples were collected at tighter intervals (12.5 m station spacing, 50 meter line spacing) around areas identified as carrying significantly anomalous gold values.

As discussed in the preceding section of this report, the vein/shear hosted mineralization on the Mount Vaughan Property, and specifically in the Numbers 6 and 7 Veins, consists of varying amounts of galena, sphalerite, arsenopyrite, pyragyrite, tetrahedrite, chalcopyrite, pyrite, and pyrrhotite. Elementally the zones are marked by a strong enrichment in Cu, Pb, Zn, As, Ag, and a lesser but distinctive enrichment in Au, Sb, Cd, and Mo, and to some degree W-Sn.

In attempting to trace the mineralized zones, then, and discover new zones of a similar nature, the analytical results for Au, Ag, As, Cu, Pb, Zn, Sb, Cd, and Mo were plotted on 1:2000 scale grid maps, and contoured at appropriate intervals.

Appendix 4 contains the following maps, which will be reviewed below:

MAP 19 1:2000 Slope Direction, Survey Area

MAP 20 1:2000 Contoured Au Soil Geochemistry, No. 6 Vein Grid

MAP 21 1:2000 Contoured Ag Soil Geochemistry, No. 6 Vein Grid

MAP 22 1:2000 Contoured Cu Soil Geochemistry, No. 6 Vein Grid

MAP 23 1:2000 Contoured Pb Soil Geochemistry, No. 6 Vein Grid

MAP 24 1:2000 Contoured Zn Soil Geochemistry, No. 6 Vein Grid

MAP 25 1:2000 Contoured As Soil Geochemistry, No. 6 Vein Grid

MAP 26 1:2000 Contoured Sb Soil Geochemistry, No. 6 Vein Grid

MAP 27 1:2000 Contoured Cd Soil Geochemistry, No. 6 Vein Grid

MAP 28 1:2000 Contoured Mo Soil Geochemistry, No. 6 Vein Grid

MAP 29(A and B) 1:2000 Multi-element Soil Geochemical Anomaly Location Map

Appendix 7 contains the raw soil geochemical data.

3.3.2 RESULTS AND INTERPRETATION

GOLD

The enclosed gold soil geochemistry map is contoured at a 25 ppb interval. Gold values range from < 5 ppb to a high of 268 ppb, though most are < 25 ppb and considered of no real significance.

The largest and most prominent anomaly on the grid trends northeast at approximately 050 degrees, from L12+00E, 0+00, to L15+00E, 3+00N. This broad horizon, up to 100 meters in width, carries consistently elevated gold values, from 25 to as high as 153 ppb. Within the large area are several, smaller bullseye type targets of more significant gold enrichment in the soil/talus fines. The anomaly occurs in an area mapped as being underlain by severely gossan stained granodiorites and volcanic graywacke-conglomerate (breccia). Several boulders in the area carried significant concentrations of pyrite, pyrrhotite, and chalcopyrite, and up to 130 ppb Au. The area then, warrants additional testing, and is slated for IP coverage and a trenching/diamond drilling program in 1989.

A second prominent anomaly is centred around L19+00E, at 2+25N. The anomalous area, measuring approximately 150 by 100 meters, carries elevated gold values to as high as 107 ppb. The anomaly is located in an area of poor exposure, and the source of the anomaly enigmatic. The Ruffner Number 4 Vein is located 200 meters north and up-slope from the anomaly, and it is not known if dispersion from that vein system is responsible for the local gold enrichment. This area is slated for IP coverage, and testing of any quality generated targets.

A third prominent anomaly lay centred around the baseline between Lines 3+00E and 5+00E. The anomaly directly overlay the mineralized Number 7 or Vulcan Vein, as a tight bullseye carrying up to 268 ppb Au.

Several smaller, bullseye type targets are scattered across the property. Most are weak, carrying in the order of 25 to 50 ppb Au. Three stronger bullseyes were, however, defined by the survey.

At L9+00E, 3+25S, a single sample returned a gold value of 197 ppb. Subsequent infill sampling around this location failed to delineate an anomalous horizon, and resampling of the original location yielded only 20 ppb Au. The anomaly, therefore, is not considered to be of any significance.

At L13+00E, 4+25S, a single sample returned a gold value of 129 ppb Au. Resampling of the location, and infill sampling around the station, failed to define a consistently anomalous zone, and again, the anomaly is considered to be unimportant.

At L12+00E, 1+00S, a sample returned an anomalous value of 207 ppb Au. Infill sampling around that location detected anomalous gold concentrations to as high as 255 ppb Au, 50 meters to the west. This area is slated for more extensive sampling, and if warranted, a limited amount of IP work.

SILVER

The enclosed silver soil geochemistry map is contoured at 2 ppm intervals to 10 ppm, above which the data set is contoured at 10 ppm intervals.

Figure 6 illustrates the frequency distribution of Ag in soils for the sample population.

In general terms, the survey indicated property wide weak enrichment in silver, from between 0.5 to 2.0 ppm Ag. Several very strong anomalies were also defined. Most notable is an extremely large area of strong enrichment, trending northeast at approximately 45 degrees from L11+00E at 3+00S, to L15+00E at 3+00N. This area of enrichment, measuring almost 700 meters by 400 meters, carries consistently elevated values of > 20 ppm Ag, with several smaller strongly anomalous "bullseye" type zones carrying up to 42.9 ppm Ag.

This anomalous zone is coincident with though slightly larger than the area carrying highly elevated gold values. The larger size may be a function of the more soluble nature of Ag, but clearly the two anomalies appear to be related to the same source. As previously discussed, the area is underlain both by breccia zones and gossanous granodioritic zones, where samples of float have returned values up to 130 ppb Au and 10 ppm Ag. The area is slated for a detailed evaluation employing IP surveys, trenching, and diamond drilling.

A second prominent area of strong silver enrichment lay centred around the baseline, between Lines 2+00E and 5+00E, directly overlying the trenches and pits exposing the Number 7 or Vulcan Vein. This was also an area of gold enrichment in soils, reflecting coincident dispersion of metals from the vein/shear system.

Two other strong anomalies were delineated on the grid. On Lines 0+50E and L1+00E, at 1+50N, a anomalous horizon carrying up to 12.1 ppm Ag was defined. Between Lines 3+00E and 5+00E, at approximately 1+00N, an anomalous zone carrying up to 13.2 ppm was defined. Both areas warrant further investigation, utilizing IP and trenching and/or diamond drilling.

Numerous weaker anomalies, in the 2.0 to 4.0 ppm Ag range, are scattered throughout the sampled area. These anomalies may warrant further attention, but on a lower priority basis.

COPPER

The enclosed copper soil geochemistry map is contoured at a 200 ppm interval to 1,000 ppm, above which the data is contoured at a 1,000 ppm interval.

Figure 7 illustrates the frequency distribution of Cu in soils for the sample population.

The copper values returned from the survey range from a low of 20 ppm to a high of 1,719 ppm, the majority of the survey area carrying in the 50 to 100 rpm range. Several prominent very strong anomalies (of > 400 ppm) were delineated by the survey.

The largest and most prominent anomaly coincides with the previously discussed zone of Au-Ag enrichment, trending northeast at approximately 45 degrees from L12+00E at 2+00S to L15+00E at 3+00N. This broad anomaly, measuring almost 600 meters by 300 meters, carries consistently elevated copper values of > 200 ppm, with several zones carrying > 1,000 ppm. Again, this area is slated for a detailed evaluation in 1989.

A second smaller, strong anomaly of up to 1,719 ppm Cu is centred around L16+00E, at 1+00S. This anomaly has no associated Au-Ag signature, but may be an important leader to Au-Ag mineralization, and is worth a more detailed evaluation.

A bullseye anomaly of 662 ppm Cu is situated at L17+00E, 3+00S. This anomaly occurs in the vicinity of locally intensely brecciated zones with the granodiorite, and proximal to locally mineralized veins carrying up to 1,019 ppb Au, 362 ppm Ag, and 34,612 ppm Cu. This area is slated for a more detailed evaluation, employing a combination of geophysics, trenching, and/or diamond drilling.

Notable in the Cu soil geochemical results is the absence of a significant anomaly along the baseline between Lines 2+00E and 5+00E, around the Vulcan or Number 7 Vein. Recall that there was a strong coincident Au-Ag anomaly at this location.

LEAD

The enclosed lead soils geochemical map is contoured at 100 ppm intervals to 400 ppm, 200 ppm intervals from 400 to 1,000 ppm, and at 1,000 ppm intervals above 1,000 ppm.

Figure 8 illustrates the frequency distribution of Pb in soils for the sample population.

Values range from as low as 10 ppm to a high of 3,030 ppm, with the majority of the sample population in the 10 to 100 ppm range.

Two areas of strongly anomalous lead enrichment in soils were delineated on the grid.

The most prominent coincides with the previously discussed area of coincident Au-Ag-Cu enrichment, trending northeast at approximately 050 degrees from Line 12+00E at 1+50S to Line 15+00E at 3+25N. This broad area, measuring approximately 500 meters by 300 meters, carries consistently elevated lead values of > 200 ppm, with several smaller zones carrying in excess of 1,000 ppm Ag.

The second prominent anomaly lay centred around the baseline between Lines 2+00E and 5+00E, directly overlying the mineralization exposed by pits and trenches in the Number 7 or Vulcan Vein. This anomalous area carries coincident Au-Ag enrichment.

A few scattered bullseye type anomalies of > 200 ppm are scattered throughout the northern portion of the grid. The strongest, at L2+00E, 1+25N, carries 401 ppm Pb.

All of the aforementioned anomalous areas are slated for further evaluation, employing a combination of geophysics (IP), trenching, and diamond drilling.

ZINC

The enclosed zinc soil geochemistry map is contoured at a 200 ppm interval to 1,000 ppm, above which the contour interval is 1,000 ppm.

Figure 9 illustrates the frequency distribution of Zn in soils for the sample population.

The values range from a low of 94 ppm, to a high of 5,869 ppm Zn. The majority of the sample population falls in the 200 to 400 ppm range, indicating property wide weak enrichment in the metal.

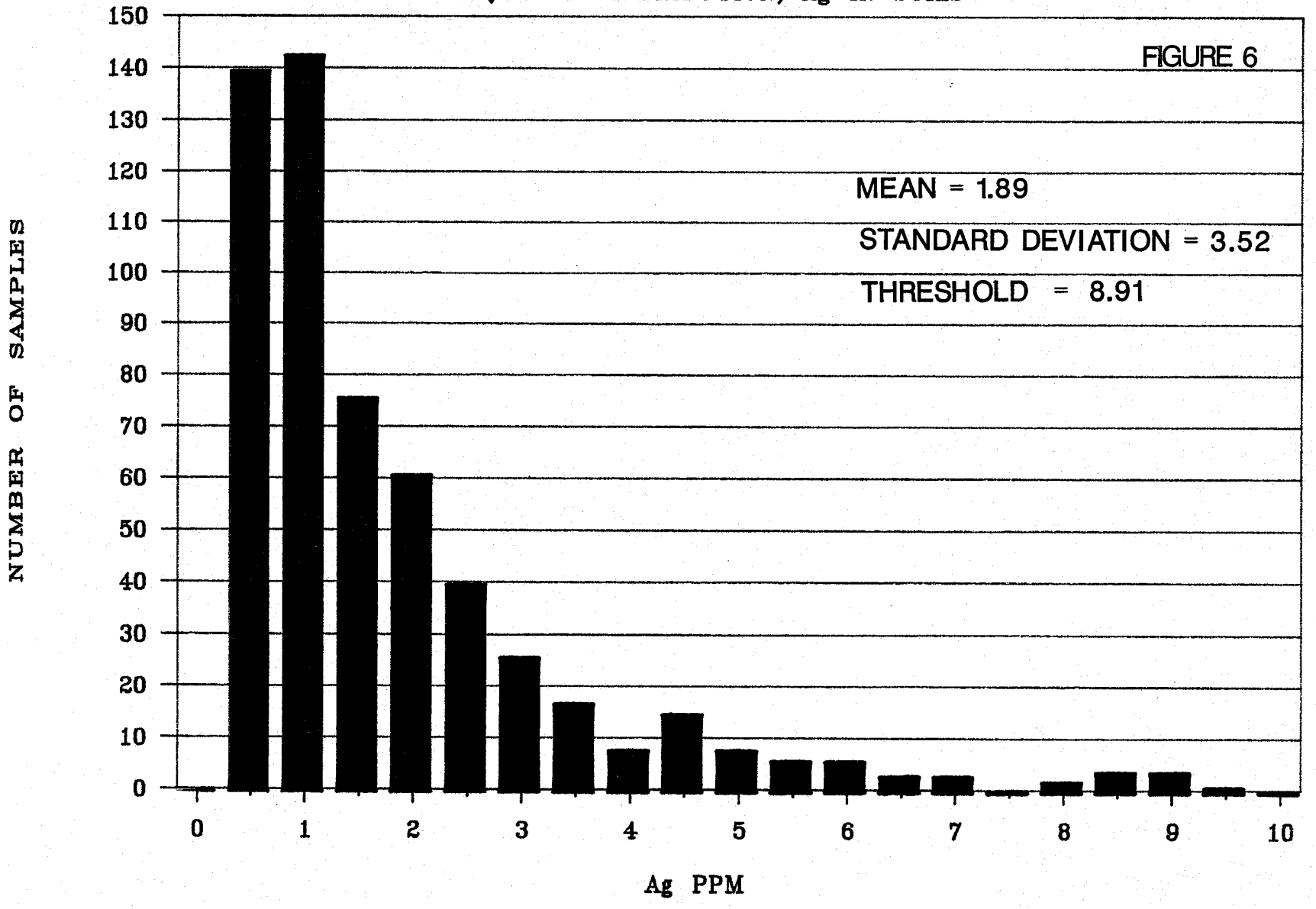
Several strongly anomalous areas of zinc enrichment (> 600ppm) were noted on the property, including much of the eastern half of the grid. Notable anomalies include:

A broad northeast trending anomaly, from L12+00E at 1+75S, to L15+00E at 2+25N. This anomalous horizon, measuring almost 500 by 250 meters, carries consistently elevated zinc values of > 600 ppm, with several, smaller localized in excess of 1,000 ppm. This anomaly exhibits coincident Au-Ag-Cu-Pb enrichment, and is a high priority target for further evaluation in 1989.

In the southeast corner of the grid, a large very strong anomaly extends from 0+50N to 4+00S over Lines 16+00E to 20+00E. Within the broad area of strong enrichment,

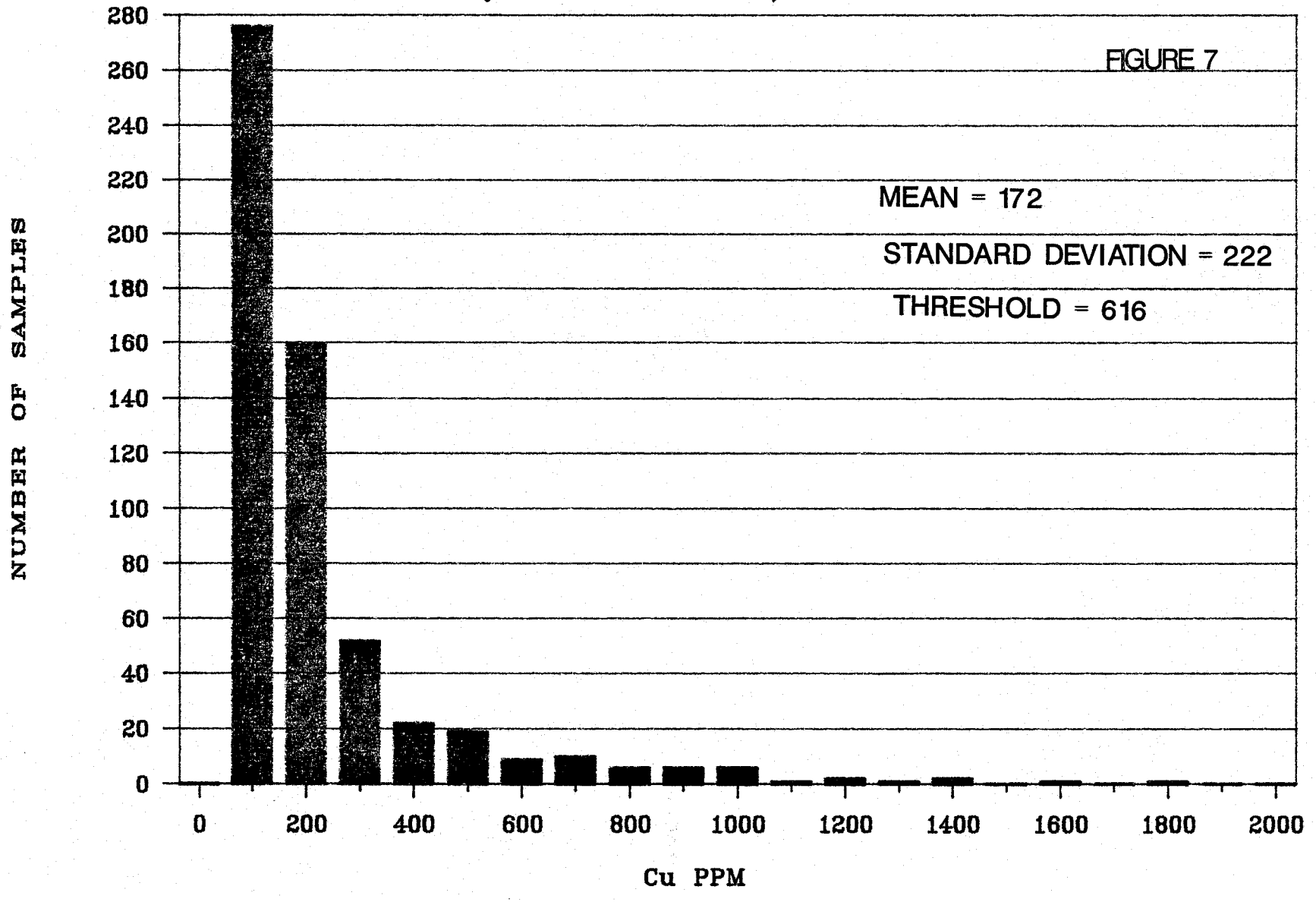
MOUNT VAUGHAN PROPERTY

FREQUENCY DISTRIBUTION, Ag IN SOILS



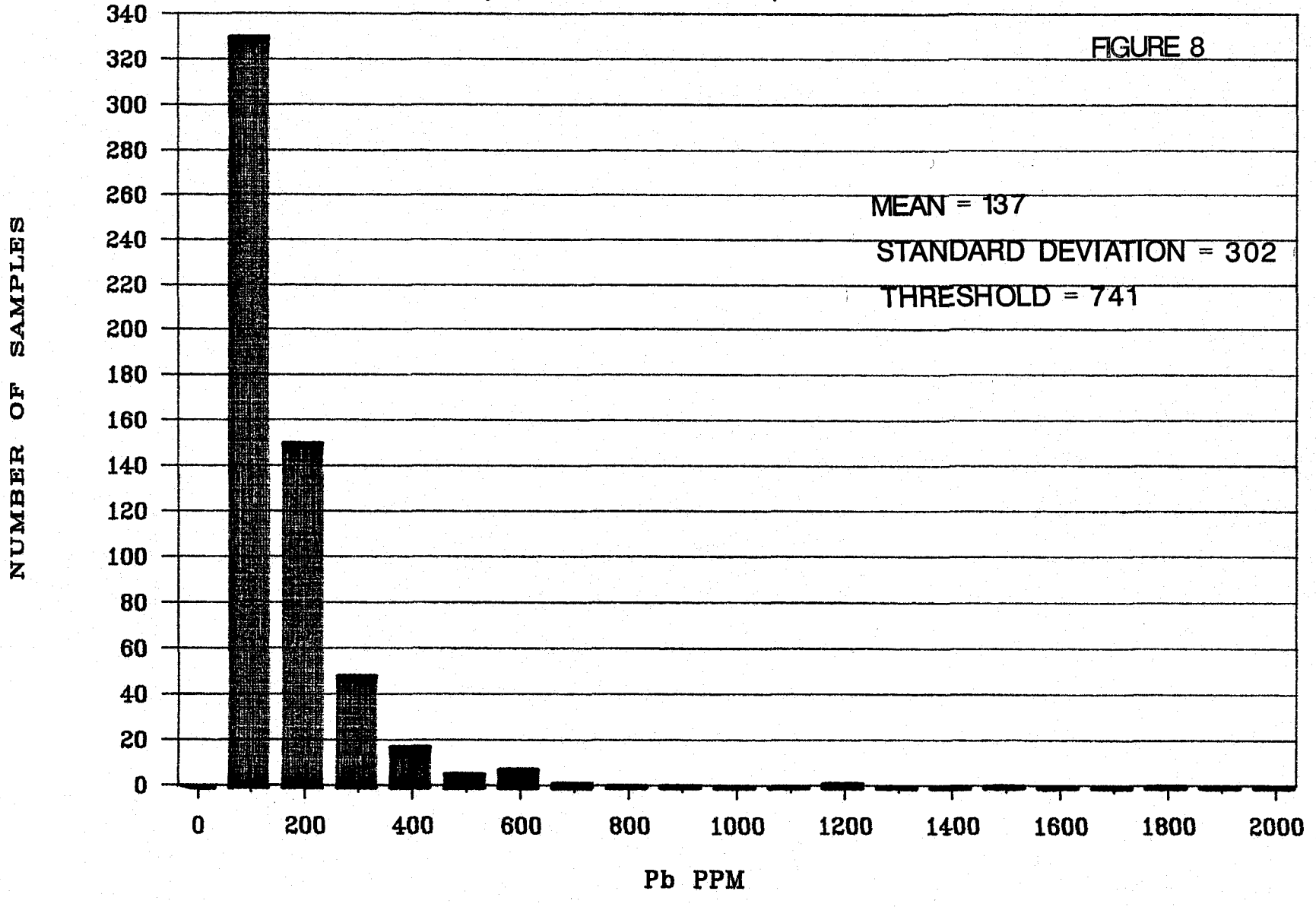
MOUNT VAUGHAN PROPERTY

FREQUENCY DISTRIBUTION, Cu IN SOILS



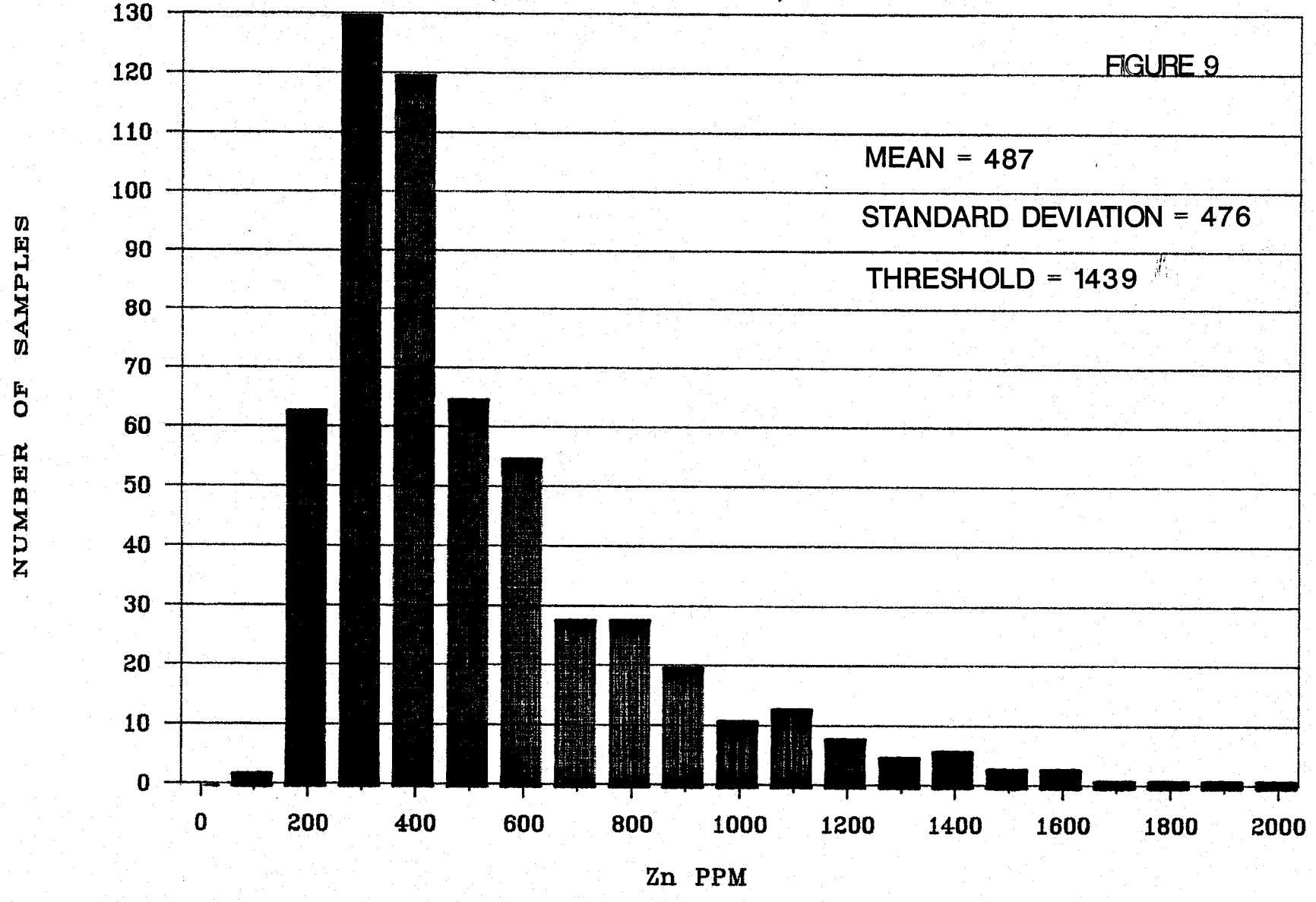
MOUNT VAUGHAN PROPERTY

FREQUENCY DISTRIBUTION, Pb IN SOILS



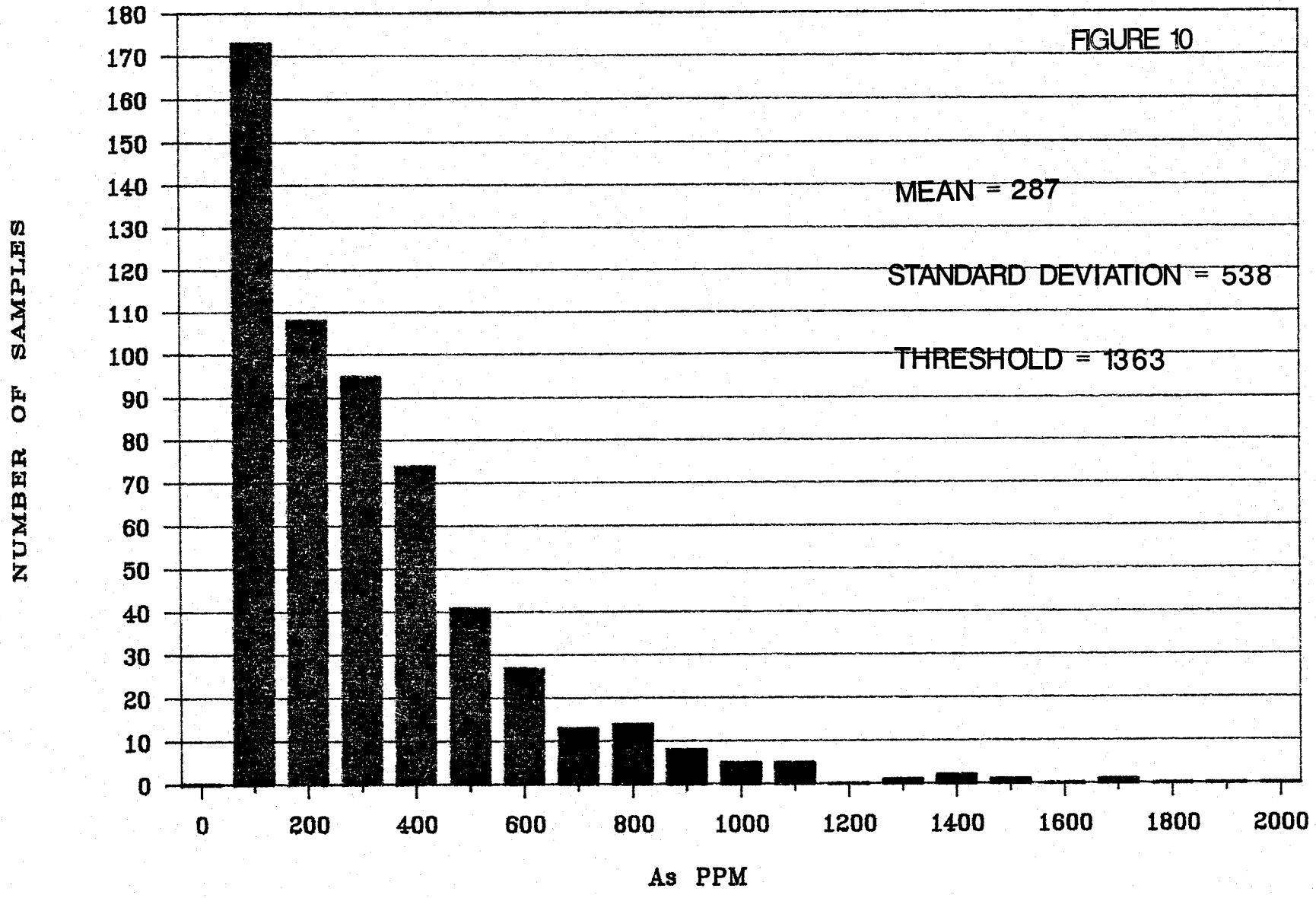
MOUNT VAUGHAN PROPERTY

FREQUENCY DISTRIBUTION, Zn IN SOILS



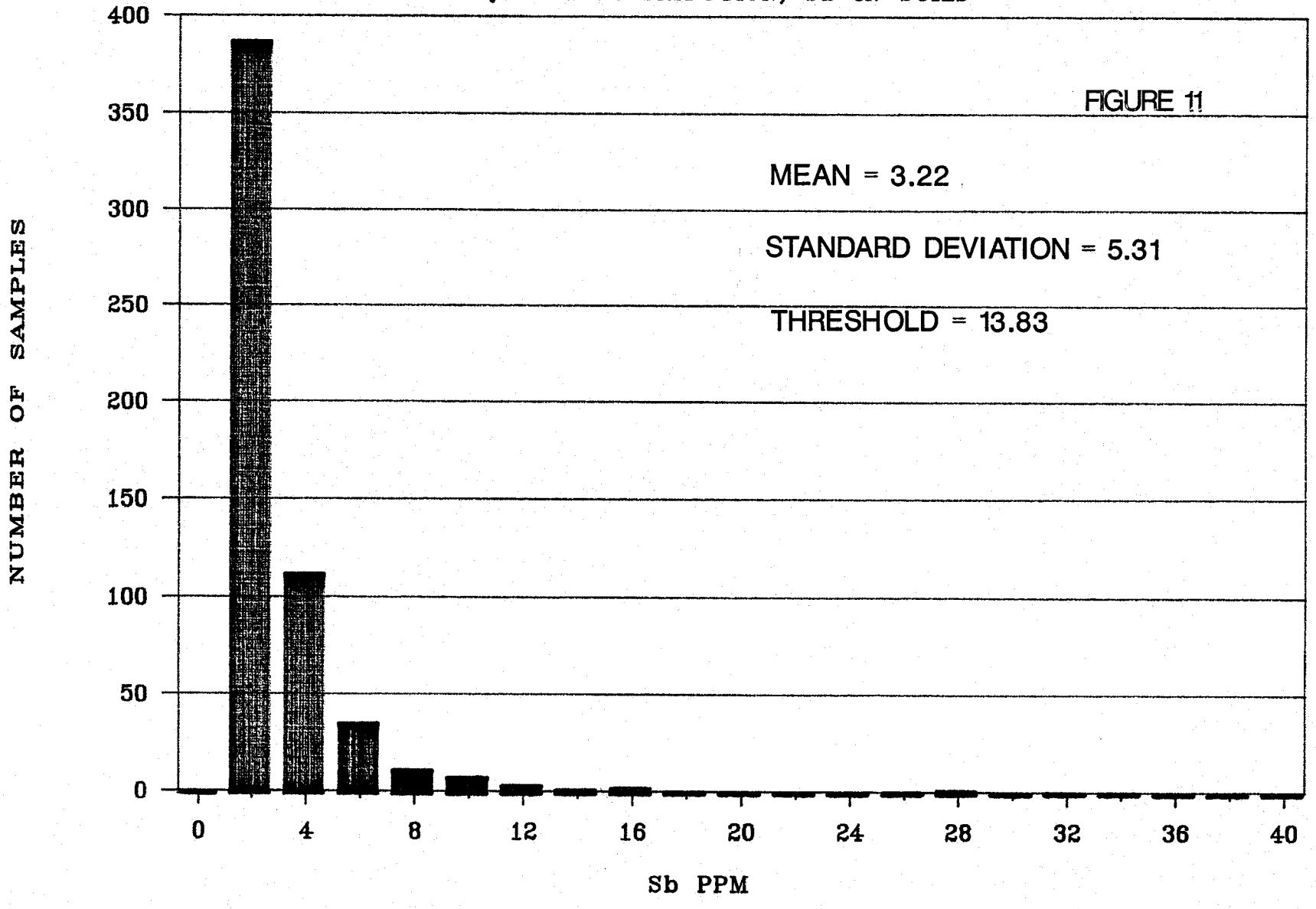
MOUNT VAUGHAN PROPERTY

FREQUENCY DISTRIBUTION, As IN SOILS



MOUNT VAUGHAN PROPERTY

FREQUENCY DISTRIBUTION, Sb IN SOILS



(consistently > 600 ppm Zn), are several smaller zones carrying Zn values well in excess of 1,000 ppm, to as high as 5,869 ppm Zn. The latter occurs in an area of intense brecciation within the granodiorites, and represents an exciting target for potential new mineralization.

A third very strong anomaly lay centred around the baseline, from Lines 1+00E to L5+00E, and reflects widespread dispersion around the mineralized Number 7 or Vulcan Vein, exposed in trenches at that location.

Several smaller but potentially significant zinc anomalies were defined by the survey from throughout the grid.

Between L2+00E and 3+00E, at 1+25N, an east-west trending zone carrying up to 874 ppm Zn was defined.

On Line 9+00E, at 1+75N, a bullseye anomaly of 1,149 ppm Zn was defined.

Also on Line 9+00E, at 4+25S, another bullseye anomaly of 958 ppm was defined.

All of the above anomalies warrant further attention, utilizing more detailed soil geochemical sampling, geophysics, and if justified, trenching and/or diamond drilling.

The widespread very strong zinc enrichment in soils throughout the grid area is partially a function of the relatively high mobility of the metal. The tenor of the anomalies, however, may be indicating a potential for large mineralized systems previously unrecognized on the property.

ARSENIC

The enclosed arsenic soils geochemistry map is contoured at a 200 ppm interval, to 1,000 ppm, above which the contour interval becomes 1,000 ppm. The values on the grid range from a low of 9 ppm to a high of 10,118 ppm. The majority of the sample population falls in the 50 to 150 ppm range.

Figure 10 illustrates the frequency distribution of As in soils for the sample population.

Several prominent strong anomalies of > 400 ppm were defined on the property.

The largest and most prominent anomaly trends northeast from L11+00E at 1+00S to L15+00E at 3+00N, a zone of coincident Au-Ag-Cu-Pb-Zn enrichment. As previously discussed, this area is slated for detailed evaluation in 1989.

A second prominent anomaly is centred around the baseline, between Lines 2+00E and 5+00E, and extends northwards for 150 meters, and to the south for 75 meters. This strong anomaly reflects the mineralization hosted in the Number 7, or Vulcan Vein, as well as the Number 6 Vein, some 100 meters further north.

Other significant anomalies occur between Lines 11+00 and 12+00E, at 2+50N, where As values reach 1,504 ppb. Between Lines 7+00E and 9+00E, a series of isolated highs to 720 ppb define an east-west trending linear zone of enrichment. At L19+00E, 1+50N, a bullseye anomaly of 1,001 ppm was identified. All of these anomalies warrant further attention, employing a combination of more detailed soil sampling, geophysics, trenching, and diamond drilling.

ANTIMONY

The enclosed antimony soils geochemical map is contoured at an interval of 2.0 ppm, to 10 ppm, above which the contour interval becomes 10 ppm.

Figure 11 illustrates the frequency distribution of Sb in soils for the sample population.

The values on the property range from the lower detection limit of 2 ppm, to a high of 68 ppm, with most values in the 2 to 5 ppm range.

Several prominent anomalies of > 6 ppm were delineated on the property. The most prominent is a large northeast trending zone from L10+50E at 2+25S to 16+00E at 2+25N. This broad zone of enrichment, measuring 600 meters in

length and up to 400 meters in width, defines an area also enriched in Au, Ag, Cu, Pb, Zn, and As. Within the zone, which almost consistently carries > 6.0 ppm Sb, several smaller zones carry Sb values to as high as 49 ppm.

A second prominent anomaly lay centred around the baseline between Lines 2+00E and 5+00E, where Sb values reach as high as 68 ppm. This anomaly defines a tight dispersion halo around the Number 7 or Vulcan Vein, exposed in a series of pits and trenches at that location.

A third prominent Sb anomaly lay centred about L19+00E, 2+50N, where a small zone carries up to 10 ppm Sb. This area has coincident Au enrichment, and warrants a more detailed evaluation.

MOLYBDENUM

The enclosed molybdenum soils geochemical map is contoured at 5 ppm intervals to 50 ppm, above which the contour interval is 50 ppm. The values range from the lower detection limit of 1 ppm, to a high of 105 ppm, with most of the sample population in the 1 to 5 ppm range.

The most notable anomaly on the property covers the extreme northwest portion of the grid, where a large east-west trending zone, from L1+00E to 9+00E, and from the vicinity of baseline to 2+00N, carries consistently elevated values ranging from 20 to 105 ppm. This anomaly lay slightly north of the zone of Au-Ag-Pb-Zn-As-Sb enrichment, and may reflect a metallogenic zonation around the mineralized veins noted on baseline at this location.

The only other significant anomalies defined on the grid are single sample point bullseyes, at L12+00E, 4+75S, L11+00E, 6+00S, and L16+00E, 3+75S. Note the lack of any significant Mo component to the large, strong, coincident Au-Ag-Cu-Zn-Pb-As-Sb anomaly centred in the L13+00E, 1+00N area.

CADMIUM

The enclosed cadmium soils geochemical map is contoured at an interval of 2 ppm, to 10 ppm, from which point the contour interval becomes 10 ppm. The values range from the lower detection limit of 1 ppm, to a high of 84 ppm, with most of the sample population falling in the 1 to 5 ppm range. Several significant anomalies of > 10 ppm Cd were defined on the property.

Trending northeast, from L12+50E at 0+00 to L14+50E at 3+75N, are a series of small anomalies to as high as 19 ppm, which define a linear zone of enrichment. This zone is one that also carries anomalous Au-Ag-Cu-Zn-Pb-As and Sb, and is slated for a more detailed evaluation in 1989.

A second prominant anomaly lay centered around the baseline between Lines 1+00 and 5+00E, reflecting the mineralization exposed in a series of trenches and pits at that location. Several smaller, bullseye type anomalies were also defined on the property;

On Line 16+00E at 2+25S, a bullseye anomaly of 13 ppm Cd was defined.

One Line 18+00E, at 2+00S, 3+00S, and 3+75S, anomalies of 22, 57 and 14 ppm Cd respectively were defined. The aforementioned 3 bullseye anomalies occur in an area of strong zinc enrichment, and the Cd-Zn association is a well documented metallogenic relationship.

One L9+00E, at 4+25S, an anomalous area carrying up to 84 ppm Cd was defined.

On L14+00E at 1+25S, a bullseye anomaly of 42 ppm Cd was defined.

In looking at the soil geochemical data as a whole, it is clear that the results very successfully defined a known zone of mineralization. The Vulcan Vein, or Number 7 Vein, which has been exposed in a series of trenches and pits from L1+00E to L5+00E, along baseline, had a very distinctive Au-Ag-Pb-Zn-As-Sb-Cd halo. The position of the geochemical halo is immediately overlying the downslope from the vein,

with dispersion distances ranging from a minimum of 25 meters to up to 75 meters from the vein.

In looking elsewhere on the property then, it is fair to assume that the other strong geochemical anomalies, particularly those that carry multi-element enrichment, reflect a relatively local, bedrock hosted source of mineralization. The most exciting geochemical results come from the large area between Lines 12+00E and 15+00E north of baseline, where very strong multi-element (Au-Ag-Cu-Pb-Zn-As-Sb-Cd) enrichment in soils defines an area measuring almost 600 by 400 meters. The size and intensity of this "anomaly" suggests the potential for a series of mineralized veins, and perhaps even widespread porphyry style mineralization. This area will see a concerted exploration effort in 1989.

Several other areas carry multi-element soil geochemical anomalies, all of which warrant testing. These areas will also see continued exploration activity in 1989, in an attempt to pinpoint the source or sources of the metals from which the dispersion is occurring.

3.4 GROUND GEOPHYSICAL SURVEYS

3.4.1 METHODS EMPLOYED

In an effort to delineate known zones of mineralization on the Number 6 Vein Grid (the Number 6 Vein and Number 7, or Vulcan Vein), various geophysical techniques were attempted both on an orientation scale, and grid scale.

i) RADIOMETRICS SURVEY

A total count (U + Th + K) radiometrics survey was completed over the Number 6 Vein Grid, in an effort to delineate the shear/vein systems hosting the mineralization noted in Veins 6 and 7. The rationale behind the survey was two-fold:

- If the vein/shear systems reflect deep-seated structures, there may be radon gas seepage/leaking from those structures. The adjacent Surprise Lake Batholith is documented as carrying significant quantities of Uz08, and if the shearing is genetically related to that cretaceous intrusion, there may also have been local remobilization or introduction of U3O8 into the shear systems.

- The vein/shear systems may have had a strong associated metapotassic alteration, not unusual in granitic host rocks. That alteration, and subsequent Kspar decay through exfoliation/weathering, may have resulted in a weak but definable K radiometric signature over the shear/vein systems.

The survey was carried out using a Scintrex GIS-5 Integrated Gamma-Ray Spectrometer. Readings were taken at station intervals of 25 meters along all grid lines, in the counts per 3 second mode. All readings appear plotted on Map 30, in Appendix 5,the 1:2000 Contoured Total Count Radiometrics, Number 6 Vein Grid Map, and are contoured at 25 3xCPS intervals.

ii) TOTAL FIELD MAGNETICS SURVEY

An orientation total field magnetics survey was completed over a portion of the Number 6 Vein Grid, over the exposed Number 6 and Number 7 (Vulcan) Veins.

The purpose of the survey was to determine if, by using closely spaced station readings, the vein/shear systems would exhibit a magnetic signature that would allow delineation of the veins along strike.

Instrumentation was Scintrex MP3 Proton Precession Magnetometer. Readings were taken at 12.5 meter intervals along Lines 0 to 5+00E, from 2+00N to 2+00S. All readings were corrected from diurnal drift employing a closed loop method. The results of the survey appear in Appendix 5, as Map 31, the 1:2000 Total Field Magnetics Orientation Survey (Number 6 and 7 Veins), Number 6 Vein Grid.

iii) HORIZONTAL LOOP ELECTROMAGNETIC SURVEY

An orientation Horizontal Loop Electromagnetic survey was completed over a portion of the Number 6 Vein Grid, over the exposed Number 6 and Number 7 (Vulcan) Veins.

The purpose of the survey was to determine if the sulphide mineralization present in the vein systems was of sufficient quantity, width, and contiguity to appear as a conductive horizon. If that proved to be the case, the delineation of the vein/shear systems employing an HLEM survey would be a relatively simple and cost effective proposition.

Instrumentation was an Apex Parametrics MaxMin 1 Horizontal Loop EM. Transmitter-receiver separation (cable length) was 50 meters, and in-phase and out-of-phase (quadrature) readings were taken at three frequencies (444 Hz, 1,777 Hz, and 3,333 Hz) for each station.

The results appear as line profile plots for Lines 0+00 to 3+00E, 2+00N to 2+00S, on Map 31 in Appendix 5.

3.4.2 RESULTS AND INTERPRETATION

i) RADIOMETRICS SURVEY

The results of the radiometric survey were inconclusive, as the data exhibited very little relief. The majority of the survey area returned readings in the 100 to 150 cps (x3) range, a low level of gamma radiation attributable primarily to potassium decay in the Kspar bearing granodioritic rocks. There is a very subtle gradational increase in cpsx3 moving eastwards, which may reflect an increasing proximity to the Surprise Lake Batholith. The survey failed, however, to delineate the known zones of mineralization, as presupposed and discussed in Section 3.4.1 of this report. Much of the relief in the data range is probably a function of varying depth of cover over the granodioritic rocks.

ii) TOTAL FIELD MAGNETICS

The results of the closely spaced total field magnetics survey over the known Number 6 and 7 Veins was also

inconclusive. The mineralized vein/shear systems appear as neither prominent magnetic highs or lows. The magnetic relief in the survey area was very flat, ranging only a maximum of 182 gammas, from 57,729 to 57,911 nT. The majority of the survey area lay in the 57,750 to 57,800 range.

It is interesting to note the presence of a relatively prominent linear high trending southeast across the property, and turning abruptly back to the southwest. The cause of this feature is at present enigmatic.

iii) HORIZONTAL LOOP ELECTROMAGNETIC SURVEY

The results of the Horizontal Loop EM survey were inconclusive. Nowhere on the surveyed lines did the out-of-phase response exhibit a strong negative deflection in association with those seen in the in-phase component. This indicates absence of a strongly conductive horizon.

The in-phase component did exhibit several very strong negative deflections, attributable to induced noise because of dramatic topographic changes.

While the results of the survey were disappointing, they were not a real surprise, given the disseminated to semi-massive nature of the sulphide mineralization associated with the Number 6 and 7 Veins. To generate a strong conductive response, it is necessary that the sulphides be contiguous as to allow transmission of the electromagnetic field.

A VLF-EM survey was not attempted on the grid, due to equipment problems. In light of the poor results obtained from the airborne VLF-EM survey, it is unlikely that a ground system will delineate the mineralized veins.

Perhaps the only geophysical method that is sure to successfully delineate the vein/shear systems is IP. The 1989 exploration program on the property will utilize IP over a significant portion of the Number 6 Vein Grid.

DRILL CORE RECOVERY PROGRAM

3.5.1 METHODS EMPLOYED

As discussed in Section 2.5 of this report, Cyclone Developments Ltd. drilled 9 diamond drill holes on the property in 1981, all targeting the Ruff, and Vulcan, or Numbers 6 and 7 Veins respectively.

In the course of geological mapping on the property, 8 of the 9 drill collar locations were located, though unfortunately only two contained legible picket markers identifying the hole number. As there is no assessment record of the drilling program, only these two hole collar locations are accurately known.

Also in the course of mapping, the core from the 9 drill holes was discovered. A cursory examination of the core indicated that very little had been split and analyzed. Even though only two of the nine hole locations were accurately known, it was known that all the holds targeted vein systems on our property, and thus a decision was made to complete detailed logs for all 9 holes, and more extensively sample the core. The following is a hole by hole discussion of the results.

Known drill collar locations appear on Geology Map 8A in Appendix 3.

Appendix 6 contains the detailed diamond drill logs, with pertinent cross-sections.

Appendix 7 contains all raw geochemical data generated by the drill core sampling program.

3.5.2 RESULTS AND INTERPRETATION

DDH WB-81-06

COLLAR: L2+80E, 0+25N (Number 6 Vein Grid)

AZIMUTH: 180 degrees
INCLINATION: -45 degrees
TOTAL DEPTH: 43.59 m
TARGET: Down dip extension of Vulcan or Number 7 Vein, exposed on surface 30 meters south of the drill collar.

HOLE SUMMARY:

0	- 8.0	m	Overburden
8.0	- 14.2	m	Granodiorite
14.2	- 23.77	m	Hybrid (Quartz Poor) Granodiorite-Diorite
23.77	- 25.3	m	Mineralized Hybrid Granodiorite-Diorite
25.3	- 27.0	m	Hybrid Granodiorite
27.0	- 27.5	m	"Greenstone" Dyke
27.5	- 29.9	m	Hybrid Granodiorite
29.9	- 31.0	m	Brecciated, Hybrid Granodiorite
31.0	- 32.2	m	Hybrid Granodiorite
32.2	- 38.0	m	Mineralized, Brecciated "Greenstone" Dyke
38.0	- 40.4	m	Hybrid Granodiorite
40.4	- 42.6	m	"Greenstone" Dyke
42.6	- 43.59	m	Granodiorite

EOH 43.59 m

The hole intersected the targeted mineralized intermediate to mafic dyke from 32.2 to 38.0 meters. The zone consisted of varying amounts of disseminated sulphides, to 30% in places, and in order of decreasing abundance, arsenopyrite-pyrite-sphalerite-galena and chalcopyrite, within an intensely silicified, often strongly brecciated intermediate to mafic dyke. Numerous secondary quartz-sulphide veins, to 10 cm, cut the dyke.

Twenty-eight samples were split and analyzed from the hole. The best results came from the mineralized dyke, where grades averaged 233 ppb Au, 62.9 ppm Ag, 1,015 ppm Cu, 1,699 ppm Pb, and 9,157 ppm Zn/5.8 meter intersection. While encouraging, these grades are still well below economic levels.

Two other holes were drilled from this set up, one at 180 degrees/-70 degrees, and one at 150 degrees/-45 degrees. It

is not known which of the holes these were.

DDH WB-81-09

COLLAR: L2+45E, 0+25N (Number 6 Vein Grid)
AZIMUTH: 180 degrees
INCLINATION: -45 degrees
TOTAL DEPTH: 42.06 m
TARGET: The down dip extension of the Vulcan or Number 7 Vein, exposed on surface 30 meters south of the drill collar. This hole is collared 35 west of Hole WB-81-06.

HOLE SUMMARY:

0	- 3.0	m	Overburden
3.0	- 17.9	m	Granodiorite
17.9	- 19.4	m	Altered (Hybrid) Granodiorite
19.4	- 22.25	m	Mineralized Hybrid Granodiorite
22.25	- 23.77	m	Caved - No Recovery
23.77	- 35.7	m	Granodiorite
35.7	- 36.0	m	Mafic Dyke
36.0	- 37.0	m	Hybrid Granodiorite
37.0	- 42.06	m	Mineralized Intermediate to Mafic Dyke

EOH 42.06 m

The hole intersected the targeted mineralized dyke from 37.0 to 42.06 m. The dyke, at this location, was only sparsely mineralized, carrying an average of 1% pyrite with trace amounts of arsenopyrite-galena-sphalerite and chalcopyrite. Analytical results were poor, the average grades in 5 samples over the 5.06 m interval being 77 ppb Au, 101.1 ppm Ag, 307 ppm Cu, 1,012 ppm Pb, and 2,688 ppm Zn.

A second hole was drilled from this set up, at the same orientation and a -70 degrees inclination. It is not known which of the remaining 7 holes that was.

Exact collar locations for the remaining 7 holes are not known, but below are summaries of the encountered

lithologies and geochemical results.

DDH WB-81-01

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?
TOTAL DEPTH: 61.87 m
TARGET: Presumably the down dip extension of the Vulcan Vein. As this is a deeper hole, it may be one of the -70 degrees set ups at sight WB-81-06 or WB-81-09.

HOLE SUMMARY:

0 - 2.44 m		Overburden
2.44 - 20.73 m		Granodiorite
20.73 - 37.1 m		Core Lost
37.1 - 47.5 m		Granodiorite
47.5 - 54.7 m		Hybrid Granodiorite
54.7 - 59.5 m		Mineralized, Brecciated Mafic Dyke
59.5 - 61.87 m		Granodiorite

The hole intersected a weakly mineralized mafic dyke between 57.4 to 59.5 meters. The dyke, though strongly silicified and brecciated in places, carried only 1% arsenophyrite, 1% pyrite, and trace to 1% galena, sphalerite, and chalcopyrite. Grades averaged 679 ppb Au, 42.4 ppm Ag, 189 ppm Cu, 20.49 ppm Pb, and 4,093 ppm Zn in 6 samples over the 4.8 meter interval. None of the intersections approached economic grade. Based on the similar depths of overburden, similar width of intersection of the mineralized dyke, and a depth of intersection that correlates well in section, this hole is believed to have been collared at the same set up as WB-81-09/06.

DDH WB-81-02

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?
TOTAL DEPTH: 57.3 m

TARGET: The down dip extension of either the Number 6 (Ruff) or Number (Vulcan) Vein.

HOLE SUMMARY:

0	- 3.05	m	Overburden
3.05	- 51.2	m	Granodiorite
51.2	- 53.4	m	Mineralized, Silicified, Brecciated Mafic Dyke
53.4	- 57.3	m	Granodiorite

This hole intersected a thin dyke, from 51.2 to 53.4 meters, which was strongly silicified, brecciated, and moderately mineralized, with up to 3% arsenopyrite, 1% pyrite, and trace amounts of galena, sphalerite, chalcopyrite, and molybdenite. The dyke was hosted in relatively fresh, unaltered granodiorite, without the characteristic "hybrid granodiorite" halo around the dyke. Grades from the 2.2 meter wide mineralized dyke averaged 261 ppb Au, 41.1 ppm Ag, 404 ppm Cu, 2,064 ppm Pb, and 10,316 ppm Zn. Judging from the relatively thin intersection, and poor grades, this hole is though to have been drilled on the Number 6 or Ruff Vein.

DDH WB-81-03

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?
TOTAL DEPTH: 51.2 m
TARGET: Down dip extension of Number 6 (Ruff) or Number 7 (Vulcan) Vein.

HOLE SUMMARY:

0	- 2.43	m	Overburden
2.43	- 46.5	m	Granodiorite
46.5	- 48.8	m	Mineralized, Silicified, Brecciated Mafic Dyke
48.8	- 49.3	m	Silicified Granodiorite
49.3	- 51.2	m	Granodiorite

The hole intersected a thin, strongly silicified, brecciated dyke between 46.5 and 48.8 meters, carrying only

sporadic sulphide mineralizations (arsenopyrite-pyrite-chalcopyrite-sphalerite-galena) associated with thin concordant quartz veins. Grades across the 2.3 meter intersection averaged 516 ppm Au, 131.4 ppm Ag, 930 ppm Cu, 3,403 ppm Pb, and 4,149 ppm Zn in three samples. The poor grades and relatively thin width of the mineralized dyke suggest that this hole was drilled beneath the Number 6 or Ruff Vein.

DDH WB-81-04

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?
TOTAL DEPTH: 49.68 m
TARGET: Down dip extension of the Number 6 or Number 7 Vein.

HOLE SUMMARY:

0	- 3.66	m	Overburden
3.66	- 42.0	m	Granodiorite
42.0	- 45.2	m	Hybrid Granodiorite
45.2	- 47.0	m	Mineralized, Silicified, Brecciated Mafic Dyke
47.0	- 47.5	m	Hybrid Granodiorite
47.5	- 49.68	m	Granodiorite

EOH 49.68 m

The hole intersected a strongly silicified, brecciated, and mineralized mafic dyke between 45.2 and 47.0 m, carrying up to 10% arsenopyrite, 5% pyrite, 1% sphalerite, 1% galena, and trace chalcopyrite and molybdenite. Grades across the 1.8 meter intersection averaged 1,127 ppb Au, 146.0 ppm Ag, 1,066 ppm Cu, 5,818 ppm Pb, and 11,420 ppm Zn. This thin intersection is the highest grade returned from the 9 hole program, though still uneconomic.

DDH WB-81-05

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?

TOTAL DEPTH: 57.34 m
TARGET: Number 6 or Number 7 Vein.

HOLE SUMMARY:

0 - 2.44	m	Overburden
2.44 - 34.35	m	Granodiorite
34.35 - 47.05	m	Hybrid Granodiorite
47.05 - 54.75	m	Mafic Dyke
54.75 - 56.90	m	Hybrid Granodiorite
56.90 - 57.34	m	Granodiorite

EOH 57.34 m

The hole intersected a mafic dyke, from 47.05 to 54.75 m, but the dyke contained no appreciable alteration or mineralization. No significantly anomalous precious metal values were returned from the hole. Only weak base metal anomalies, to 2,273 ppm Zn, were returned from thin localized sphalerite bearing quartz veins.

DDH WB-81-07

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?
TOTAL DEPTH: 43.58 m
TARGET: Number 6 or Number 7 Vein.

HOLE SUMMARY:

0 - 5.79	m	Overburden
5.79 - 18.7	m	Granodiorite
18.7 - 20.7	m	Hybrid Granodiorite
20.7 - 21.5	m	Mineralized Hybrid Granodiorite
21.5 - 23.7	m	Granodiorite
23.7 - 24.2	m	Mineralized, Silicified Mafic Dyke
24.2 - 25.3	m	Mineralized Hybrid Granodiorite
25.3 - 25.8	m	Mineralized, Silicified Mafic Dyke
25.8 - 31.6	m	Granodiorite
31.6 - 32.1	m	Caved, No Core
32.1 - 33.7	m	Brecciated, Int-Mafic Dyke
33.7 - 35.3	m	Mafic Dyke
35.3 - 38.25	m	Mineralized, Silicified, Brecciated Mafic

	Dyke
38.25 - 43.58	Granodiorite
	EOH 43.58 m

The hole intersected a mafic dyke from 32.1 to 38.25 m, with a portion of that dyke, from 35.3 to 38.25 m, exhibiting significant alteration (silicification) and carrying up to 2% arsenopyrite, 1% sphalerite, and traces of pyrite, galena, and chalcopyrite. Grades across the 2.95 meters averaged 237 ppb Au, 57.3 ppm Ag, 321 ppm Cu, 4,443 ppm Pb, and 29,716 Zn.

Several thin, mineralized mafic dykelets were also intersected higher in the hole, notably between 23.7 to 24.2 m, and 25.3 to 25.8 meters. Both these thin zones carried weakly anomalous silver, lead, and zinc values, none approaching economic levels.

DDH WB-81-08

COLLAR: ?
AZIMUTH: ?
INCLINATION: ?
TOTAL DEPTH: 69.49 m
TARGET: Number 6 or Number 7 Vein.

HOLE SUMMARY:

0 - 2.44 m	Overburden	
2.44 - 44.7 m	Granodiorite	
44.7 - 52.85 m	Hybrid Granodiorite	
52.85 - 57.0 m	Granodiorite	
57.0 - 58.3 m	Int-Mafic Dyke	
58.3 - 63.8 m	Mineralized, Brecciated, Silicified Mafic Dyke	
63.8 - 69.49 m	Granodiorite	

This hole intersected a thick mafic dyke, portions of which were weakly mineralized, brecciated, and altered. From 58.3 to 63.8 meters, trace amounts of arsenopyrite, pyrite, galena, sphalerite, and chalcopyrite occurred as disseminated mineralization within a zone of weak

brecciation and silicification. Average grades across the 5.5 meters from six samples, were 81 ppb Au, 6.18 ppm Ag, 33 ppm Cu, 825 ppm Pb, and 1,579 ppm Zn.

GENERAL COMMENTS ABOUT THE DRILLING RESULTS

The results of the drill core recovery,logging,and sampling program were extremely disappointing, returning no economic intersections from the nine holes drilled on the Numbers 6 and 7 Veins.

Only one of the nine holes could even be considered as having intersected sub-economic mineralization, that being Hole WB-81-04.

These results, in addition to the results of surface sampling programs on the Numbers 6 and 7 Veins, indicate that, where exposed and drill tested, between Lines 1+00E and 3+00E of the Number 6 Vein Grid, the mineralization is of a discontinuous nature, and of insufficent grade and width to represent a valid exploration target.

3.6 TRENCHING PROGRAM

3.6.1 METHODS EMPLOYED

In late September, 1988, a small trenching program was completed over four target areas on the property. The program involved 27.5 hours of D8 Caterpillar time, contracted from Arctic Contractors, of Atlin, B.C.

The program was severely hampered by inclement weather conditions, with high winds and snow obscuring the trench geology almost as soon as it was exposed. The mapping and sampling results discussed below should be considered preliminary, as the work was completed very rapidly.

3.6.2 RESULTS AND INTERPRETATION

TRENCH 88-01

At this location (South Baseline Grid, L1+00W, 7+25S), several pre-existing trenches, while failing to reach bedrock, did expose numerous quartz-sulphide vein boulders that appears to be of a very local derivation. Samples of this float material returned analyses as high as 1.1 g/T Au, and consistently elevated Au values in the 100 ppb to 1,000 ppb range.

Figure 12 illustrates the geology encountered in the trench, as well as the geochemical results returned from the sampling program. Geology Map 12B, in Appendix 3, illustrates the location of the trench.

The trench recut an existing trench, exposing 27 meters of variably altered granodiorite. A 10 meter section exhibited intense clay-silica alteration, with significant quantities of disseminated pyrite, sphalerite, galena, arsenopyrite, and chalcopyrite mineralization.

Four samples from the trench returned significantly anomalous Au-Ag-base metal mineralization, as can be seen in Figure 12. These results are encouraging, indicating that there may be some potential for a disseminated sulphide low grade, high tonnage "porphyry" like system on the property. This area is slated for IP coverage in 1989, with additional trenching or diamond drilling of delineated targets.

TRENCH 88-02

At this location (South Baseline Grid, L3+00W, 7+00S), an attempt was made to deepen an existing trench that had failed to reach bedrock. The effort was unsuccessful. Geology Map 12B, in Appendix 3, illustrates the location of the trench.

TRENCH 88-03

At this location (Number 6 Vein Grid, L14+00E, 1+00N), a trench was cut over a strong multi-element (Au, Ag, Cu, Zn,

Pb, As, Sb) soil geochemical anomaly. Figure 13 illustrates the encountered geology, as well as the results of the geochemical sampling program. Geology Map 8B, in Appendix 3, illustrates the location of the trench.

The trench was only able to expose 15 meters of bedrock, the majority of which was massive, unaltered granodiorite. At the northern end of the trench, however, 1 meter of "breccia" was exposed as ripped up bedrock, indicating proximity to a contact with that unit. A sample of the breccia returned anomalous Ag, Cu, Zn, As, and Sb values, and the area immediately north of this trench warrants additional investigation.

Several samples from within the weakly mineralized and megascopically unaltered granodiorite also carried elevated Ag-Zn-As values, possibly indicative of proximity to a more strongly mineralized vein/shear system.

TRENCH 88-04

At this location (Baseline Number 6 Vein Grid, L13+50E, 1+50N), a trench was cut over a strong multi-element (Au-Ag-Cu,Zn-Pb-As-Sb) soil geochemical anomaly.

Figure 14 illustrates the geology uncovered by the trench, as well as the geochemical sampling results.

The trench exposed 50 meters of bedrock, the majority of which was "hybrid" granodiorite. This map term is used in describing altered granodiorites containing very little (< 10%) free quartz, and strong chlorite and/or biotite alteration of hornblende. This alteration style is usually found immediately adjacent to major shear/vein systems.

Also exposed in the trench was a 6 meter wide section of bright orange to yellow, gossanous clay. The clay zone weathered recessively, and was difficult to cut into. The clay zone was also frozen (permafrost), and thus very difficult to sample. Two grabs from the zone, however, returned highly anomalous Au-Ag-Cu-Pb-Zn-As-Sb values,

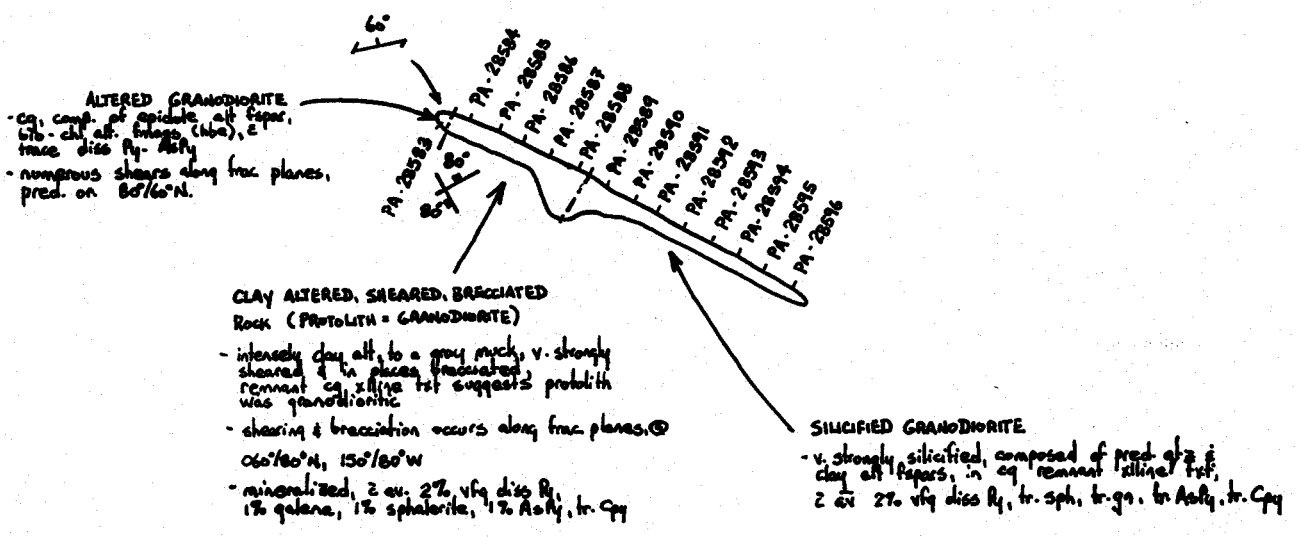
FIGURE 12

TRENCH 88-01

(FOR LOCATION SEE ENCLOSED GEOLOGY MAP 12A, APPENDIX 3)

N

1: 500



SAMPLE RESULTS

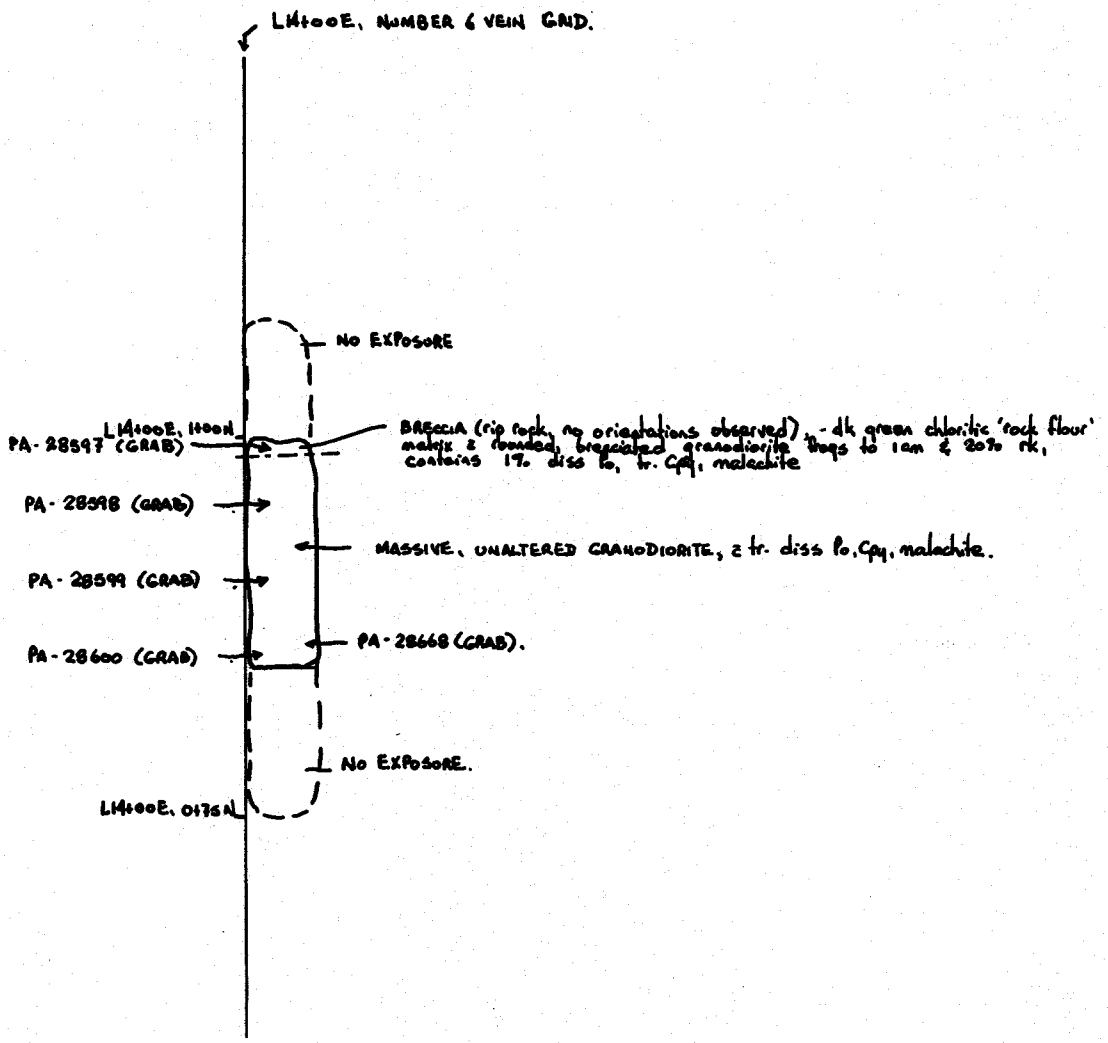
SAMPLE No.	TYPE	HOST ROCK	Au (PPB)	Ag (PPM)	Cu (PPM)	Pb (PPM)	Zn (PPM)	As (PPM)	Sb (PPM)
PA-28583	CCS/1-5M	ALT. GRANDR.	14	0.2	48	28	119	19	2
PA-28584	CCS/1.0M	CLAY ALT; SHEARED GRANODIORITE	17	17.0	111	1274	1095	258	26
PA-28585	CCS/1-0M	"	761	271.6	6355	24,050	14,786	17,976	3038
PA-28586	CCS/1.0M	"	1,447	428.8	4735	5486	5334	47,756	463
PA-28587	CCS/1-0M	"	485	104.1	265	3283	6167	10,569	131
PA-28588	CCS/1-0M	"	14	8.9	68	125	518	174	8
PA-28589	GRAB	SILICIFIED GRANDR.	2,081	367.2	854	14,374	92,998	45,969	907
PA-28590	GRAB	"	19	10.2	294	289	2161	348	16
PA-28591	GRAB	"	10	5.9	174	268	525	100	15
PA-28592	GRAB	"	15	3.1	100	407	3565	34	2
PA-28593	GRAB	"	14	53.4	1513	775	13,375	118	23
PA-28594	GRAB	"	"	9.5	346	1644	3064	57	8
PA-28595	GRAB	"	7	20.3	705	161	93	1989	5
PA-28596	GRAB	"	6	11.2	1113	145	1157	146	8

FIGURE 13

TRENCH 88-03

(FOR LOCATION SEE ENCLOSED GEOLOGY MAP 88, APPENDIX 3)

1: 500



SAMPLE RESULTS

SAMPLE NO.	Au (PPB)	Ag (PPM)	Cu (PPM)	Pb (PPM)	Zn (PPM)	As (PPM)	Sb (PPM)
PA-28597	22	6.2	701	66	859	1191	4
PA-28598	12	1.4	480	36	423	347	2
PA-28599	8	0.6	251	28	358	71	2
PA-28600	11	4.5	329	42	379	56	2
PA-28668	12	3.2	1576	48	626	372	2

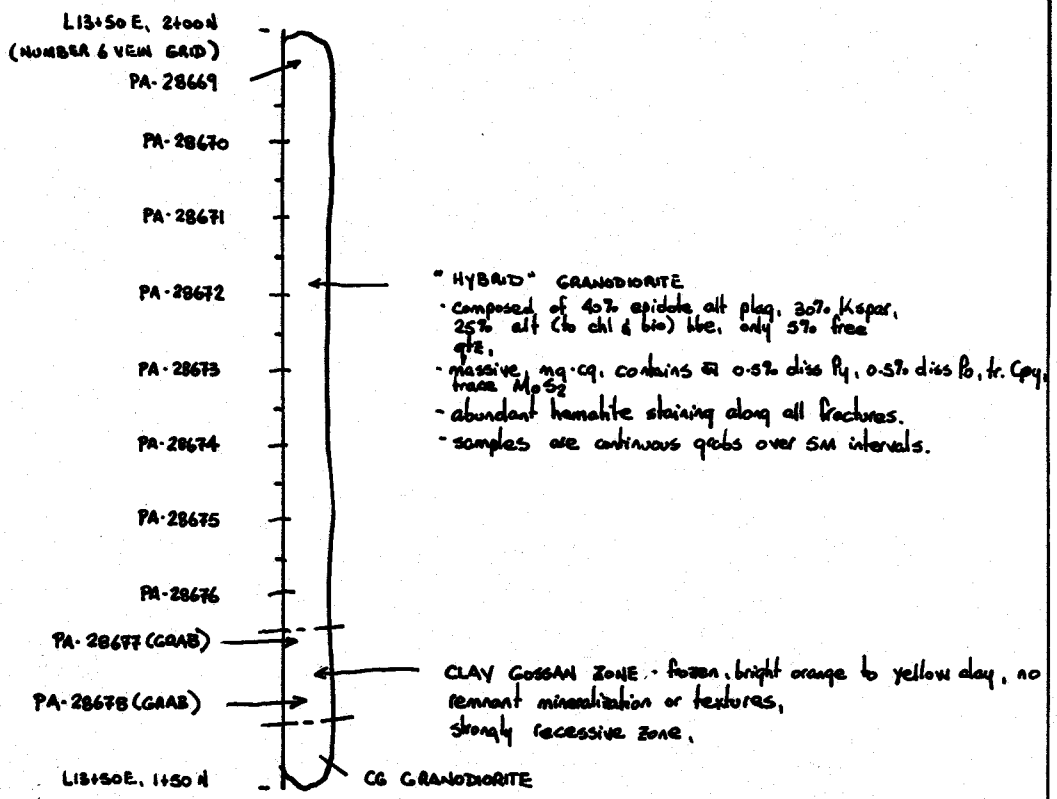
FIGURE 14.

TRENCH 88-04

(FOR LOCATION SEE ENCLOSED GEOLOGY MAP 88, APPENDIX 3)

1:500

N



SAMPLE RESULTS

SAMPLE No.	Au (PPB)	Ag (PPM)	Cu (PPM)	Pb (PPM)	Zn (PPM)	As (PPM)	Sb (PPM)
PA-28669	15	29.4	1329	51	807	590	6
PA-28670	10	2.1	410	48	803	109	3
PA-28671	14	2.1	346	135	385	185	4
PA-28672	17	4.3	706	46	539	820	4
PA-28673	23	9.6	488	381	599	1371	10
PA-28674	20	34.7	956	277	387	1082	17
PA-28675	120	12.6	1236	642	447	2656	15
PA-28676	16	7.7	610	348	517	1198	11
PA-28677	97	46.7	1270	2353	796	11,287	35
PA-28678	602	19.3	1586	903	1585	6023	78

indicating that this oxidized zone may be a major vein/shear system, and possible extension of the Vulcan or Number 7 Vein, situated 1,000 meters to the west.

Several samples within the hybrid granodiorite also carried elevated Au-Ag-Cu-Pb-Zn-As-Sb values, again indicative of proximity to a major shear/vein sytem. This area is slated for detailed testing in the 1989 exploration program.

5.0 ITEMIZED COST STATEMENT AND ALLOCATION OF EXPENDITURES

5.1 ITEMIZED COST STATEMENT

Itemized below are all expenses incurred by Homestake Mineral Development Co. Ltd. in completing the work described in this report.

A. SALARIES AND WAGES

DUNCAN McIVOR

June 15 - August 15 (fieldwork)	
61 days at $120 per day	$ 7,320.00
September 15 - October 1 (fieldwork)	
16 days at $120 per day	1,920.00
October 2 - October 15 (drafting)	
14 days at $120 per day	1,680.00
February 1 - February 28 (report preparation)	
28 days at $120 per day	3,360.00
Subtotal	14,280.00
Plus 20% benefits, administrative costs, etc.	2,856.00
	17,136.00

JOANNE BOZEK

June 15 - August 15 (fieldwork)	
61 days at $95 per day	5,795.00
September 15 - October 1 (fieldwork)	
15 days at $95 per day	1,425.00
October 15 - October 31 (drafting)	
17 days at $95 per day	1,615.00
Subtotal	8,835.00
Plus 20% benefits, administrative costs, etc.	1,767.00
	10,602.00

CHRIS MARTIN

June 15 - August 15 (fieldwork)	
61 days at $75 per day	4,575.00
September 15 - October 1 (fieldwork)	
16 days at $75 per day	1,200.00
Subtotal	5,775.00
Plus 20% benefits, administrative costs, etc.	1,155.00
	6,930.00

ROBERT BULGER

June 15 - July 10 (fieldwork)	
26 days at $105 per day	2,730.00
Plus 20% benefits, administrative costs, etc.	546.00
	3,276.00

PETER RONNING

Supervision, 20 days at $150 per day	3,000.00
Plus 20% benefits, administrative costs, etc.	600.00
	3,600.00

TOTAL SALARIES AND WAGES	**$41,544.00**

B. AIRBORNE GEOPHYSICAL SURVEY COSTS

As invoiced by Aerodat Ltd.	**$22,200.00**

C. LINE-CUTTING COSTS

11.5 line-kilometers at $400 per kilometer	**$4,600.00**

D. GEOCHEMICAL COSTS

718 Au analyses, RCK at $12.50 per analysis	$ 8,975.00
718 ICP analyses, RCK at $6.25 per analysis	4,487.50
718 Sn analyses, RCK at $4.00 per analysis	2,872.00
733 Au analyses, soil at $12.50 per analysis	9,162.50
733 ICP analyses, soil at $6.25 per analysis	4,581.25
TOTAL DIRECT ANALYTICAL COSTS	30,078.25
Plus shipping costs	1,500.00
TOTAL GEOCHEMICAL COSTS	**$31,578.25**

E. TRENCHING COSTS

As invoiced by Arctic Contractors, Atlin, B.C.	**$4,132.00**

F. EQUIPMENT RENTAL COSTS

Scintrex GIS-5 Gamma Ray Spectrometer	$ 736.42
Apex Parametrixs	756.00
TOTAL EQUIPMENT RENTAL COSTS	**$1,492.42**

G. FIELD SUPPORT COSTS

i)	Food and accommodation $30 per man day x 254 field man days	$ 7,620.00
ii)	Vehicle maintenance and fuel $25 per day x 76 days	1,900.00
iii)	Consumables (sample bags, topofil, flagging tape, drafting supplies, etc.)	2,000.00
TOTAL FIELD SUPPORT COSTS		**$11,520.00**

H. REPORT PREPERATION COSTS

Reproductions	**$500.00**

TOTAL EXPENDITURES	**$117,566.67**

These costs are to be applied as per the Statement's of Exploration, filed earlier in 1989.

6. **STATEMENT OF QUALIFICATIONS**

I, **DUNCAN FORBES MCIVOR**, do hereby state that;

- I am a graduate of the University of Waterloo, with an Honours Applied B.Sc in Earth Sciences.
- I have been employed in the mineral exploration industry since 1974, holding positions with Esso Minerals Canada, Utah Mines Ltd., Utah International, and Homestake Mineral Development Co. Ltd.
- I have personal knowledge that the information contained in this report is true, and accurate.

DUNCAN FORBES MCIVOR

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