

'79- # 296- # 7418

1978 Geochemical & Geological Mapping
Assessment Report

TITLE Hoodoo Creek Property
CLAIMS BZT #1-9 Inclusive
COMMODITY Cu-Mo
LOCATED 32 km N of the head of Knight Inlet
Latitude 51°21'N Longitude 125°30'W
Vancouver Mining Division 92N/5E
BY C.J. Hodgson, P.Eng. (B.C.)
FOR AMAX Potash Limited
WORK PERIOD August 27 - September 6, 1978

AMAX VANCOUVER OFFICE

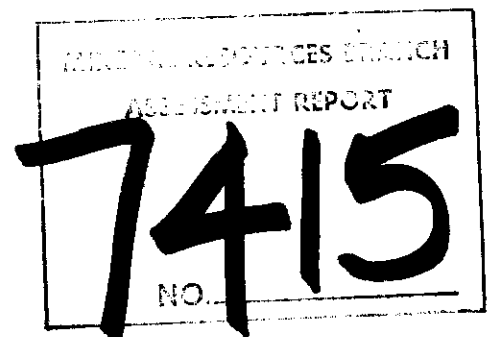


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SUMMARY

This report presents the results of geological mapping and geochemical soil sampling on claims BZT 3, 5-8 of the Hoodoo Creek property conducted between August 27 and September 6, 1978. The property consists of BZT 1-9 claims totalling 103 units wholly owned by AMAX Potash Limited. It is located on Hoodoo Creek, 32 km north of the head of Knight Inlet in British Columbia's Coast Range Mountains.

The claims cover Cu-Mo prospects associated with a high level, acid intrusive/extrusive complex of Miocene age. The Miocene complex, superimposed on much older gneissic and coarse grained intrusive rocks of the Coast Plutonic Complex, consists chronologically of lapilli tuff, a quartz-feldspar-biotite (QFB) porphyry stock, dacite dykes, a pyritic quartz porphyry stock, quartz-feldspar porphyry dykes, lahar breccias, andesite dykes and a feldspar porphyry stock.

All intrusive phases emplaced after the lapilli tuff and before the lahar breccias have mineralization associated with them, namely: chalcopyrite and molybdenite in fracture and quartz vein stockworks in the QFB porphyry stock; disseminated chalcopyrite in dacite dykes; abundant disseminated pyrite in pyritic quartz porphyry and base metal veins associated with quartz-feldspar porphyry dykes. An intense pyritic fracture stockwork zone of annular shape, best exposed along Main Gully contains molybdenite and chalcopyrite. It is not directly related to any of the mapped intrusive phases.

Systematic soil and talus fines sampling over the complex revealed five anomalous environments.

- 1) Soils over QFB porphyry are highly anomalous with respect to Cu and Mo.

- 2) Soils over pyritic quartz porphyry are highly anomalous in Au and moderately anomalous in Cu and Mo.
- 3) Intense Mn, Pb, Zn and Ag soil anomalies coincide with late quartz-feldspar porphyry dykes.
- 4) Anomalous Cu and Zn in soils at the south end of East Gully are thought to be related to mineralized dacite dykes in this area.
- 5) Soils overlying an annular pyritic stockwork zone on BZT 6 contain anomalous Mo.

INTRODUCTION

General Statement

This report presents the results of 1978 geological mapping and soil sampling on claims BZT 3, 5-8 of the Hoodoo Creek property, conducted during the period August 27 to September 6 by C.J. Hodgson and B.W. Kyba, assisted by B.J. Paul and J.R. Candy.

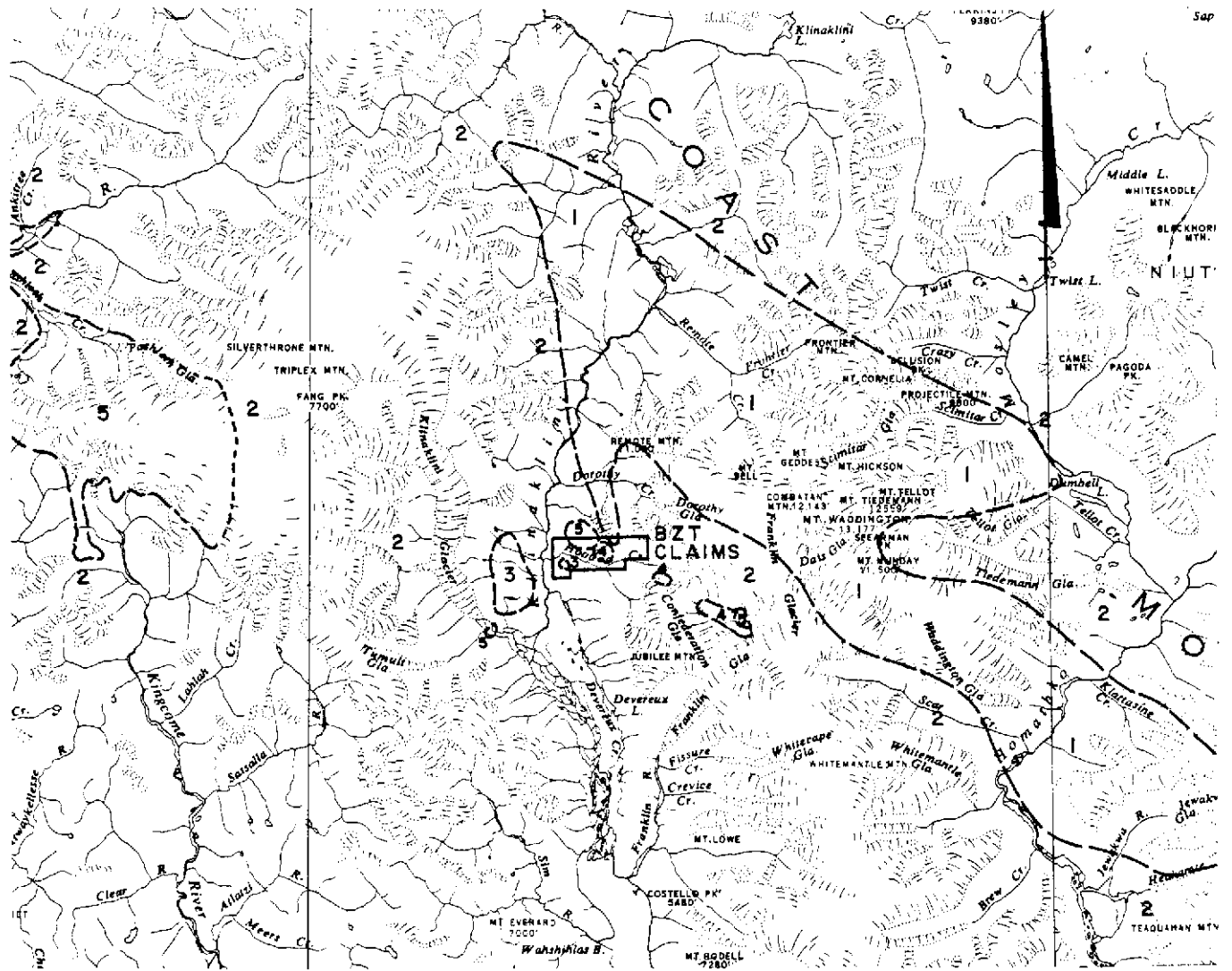
Location, Topography

The Hoodoo Creek Mo-Cu property consists of nine claims (BZT 1-9) totalling 103 units centred on Hoodoo Creek, an eastern tributary of the Klinaklini River which drains the Mt. Waddington Range of the Coast Mountains (Figure 1). Hoodoo Creek is located approximately 32 km north of the head of Knight Inlet at latitude $51^{\circ}21'N$, longitude $125^{\circ}39'W$.

The property lies in rugged terrain near the heart of the Coast Range Mountains. Relief is 1800 m (6000 feet); elevations range from 300 metres (1000 feet) on lower Hoodoo Creek to 2150 metres (7000 feet) on the ridge near the north-eastern corner of the property. Hill slopes and tributary streams are precipitous, and the lower reaches of Hoodoo Creek are incised to form an inaccessible canyon.

Tree line is about 1700 m elevation with mature stands of fir and spruce at lower elevations. On north-facing slopes, permanent snow and icefields extend down as far as 1400 m elevation.

Total precipitation has been estimated as 150 cm per year rain equivalent. Snowfall has been estimated as 500 cm per year above elevation 1000 m, making snow conditions a major hazard at higher elevations.



L E G E N D

TERTIARY (MIOCENE - PLIOCENE).

5 Volcanic flows, ash, breccia.

4 Quartz monzonite porphyry.

JURASSIC - CRETACEOUS

3 Coarse grained quartz monzonite.

2 Foliated quartz diorite, diorite.

Geology from unpublished G. S. C. map by Woodsworth.

PALEOZOIC AND/OR MESOZOIC

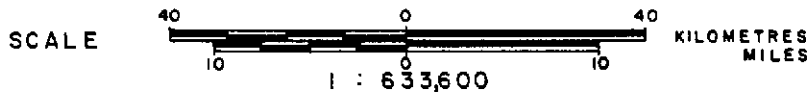
1 Gneiss, amphibolite, schist.

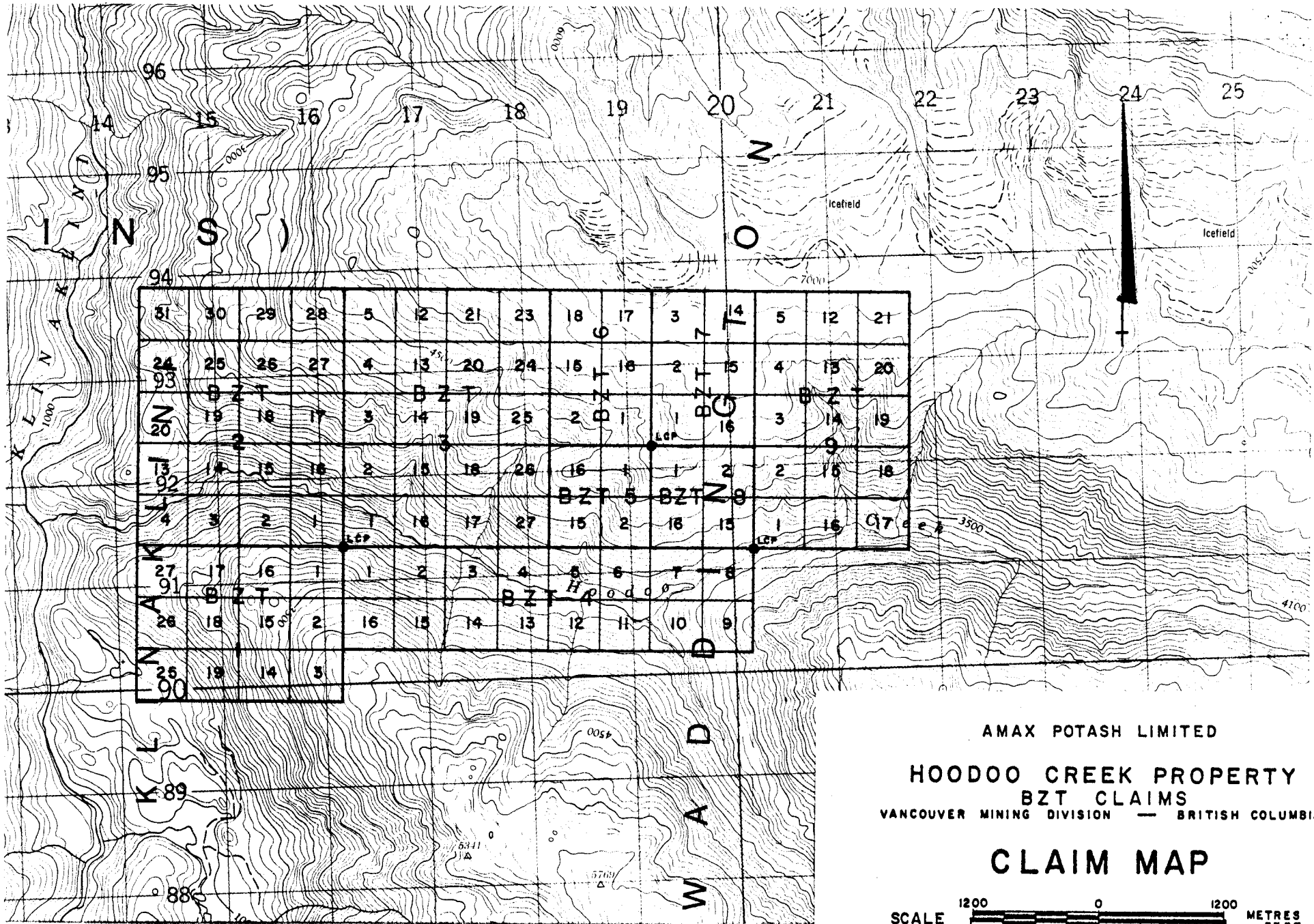
AMAX POTASH LIMITED

**HOODOO CREEK PROPERTY
BZT CLAIMS**

VANCOUVER MINING DIVISION — BRITISH COLUMBIA

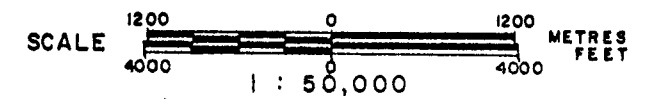
LOCATION AND REGIONAL GEOLOGY





AMAX POTASH LIMITED
 HOODOO CREEK PROPERTY
 BZT CLAIMS
 VANCOUVER MINING DIVISION — BRITISH COLUMBIA

CLAIM MAP



N. T. S. Ref. 92 N 5
 FIG. 2

Logistics

Access to the property is gained by fixed wing from Vancouver (Air West, West Coast Air) to Percy Logging camp at the head of Knight Inlet, then by helicopter to the claims. Helicopters are available at Port McNeil (Okanagan), Port Hardy (Vancouver Island Helicopters) and Bella Coola (Transwest), all 120-140 km distant. A logging road extends 30 km from Percy Logging camp to the southwestern part of the property.

Very few camp sites are available. A site used by AMAX at elevation 1650 m is most central (see Figure 3) and has a good helipad but no water.

Other possible campsites are shown on Figure 3. The former Kennco campsite at elevation 1760 m is not recommended as it lacks water and is very exposed. The ridgetop is equally exposed but has meltwater ponds.

Water for drilling is available from the Main Gully anywhere below 1800 m elevation. An entrapment pond at elevation 1580 m near the legal corner post below the AMAX campsite may be adequate.

July 1 - September 30 is the effective work season on BZT 5-9; it is May to October on BZT 1.

Claim Data

Claims and units are shown on Figure 2. Pertinent claims data are tabulated on Table I.

TABLE I

CLAIM	UNIT NUMBERS	TOTAL NUMBER NO. OF UNITS	LOCATION DATE	DATE RECORDED	EXPIRY DATE
BZT #1	1-3,14-19, 25-27	12	July 2/77	July 28/77	July 28/78
2	1-4,13-20, 24-31	20	July 2-4/77	July 28/77	July 28/78
3	1-5,12-21 23-27	20	July 2-4/77	July 28/77	July 28/78
4	1-16	16	July 2/77	July 28/77	July 28/78
5	1,2,15,16	4	July 2-5/77	July 28/77	July 28/78
6	1,2,15-18	6	July 2-5/77	July 28/77	July 28/78
7	1-3,14-16	6	July 2-6/77	July 28/77	July 28/78
8	1,2,15,16	4	July 2-5/77	July 28/77	July 28/78
9	1-5,12-21	<u>15</u>	July 1-2/77	July 28/77	July 28/78

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REGIONAL GEOLOGY

The property lies near the centre of the Coast Crystalline Belt, a tectonic belt of gneisses, schists and granitoid rocks emplaced during the Mesozoic and Early Tertiary.

At Hoodoo Creek, an intrusive/extrusive complex of Miocene age is superimposed on the older Coast Crystalline Belt. This complex lies within a 70 km long northwesterly trending belt of Miocene-Pliocene rocks which extends from Franklin Glacier to Mt. Silverthrone. At Franklin Glacier, 16 km to the southeast, a quartz monzonite stock (6.9 m.y.) and younger porphyry dykes (3.2 m.y.)¹ intrude comagmatic rhyolitic and feldspar porphyry tuffs, agglomerates and flows². In the Mt. Silverthrone area, 50 km northwest of Hoodoo Creek, updated but obviously pre-glacial columnar basalt and ash flows occur over an area of 300 sq km and attain a maximum thickness of 1000 m.

-
1. G. Woodsworth, G.S.C., pers. comm.
 2. B. McKnight, 1965, Tertiary igneous activity in the Franklin Glacier area; B.Sc. Thesis, Univ. of B.C.

PROPERTY GEOLOGY

General Statement

Mapping was conducted on BZT 3 and BZT 5-8 claims covering the Miocene intrusive/extrusive complex north of Hoodoo Creek. Ground control in this area was provided by a metric contoured orthophoto at 1:5,000 scale (Figure 3).

Rock Units

Thirteen mappable units in the area of Figure 3 are described below in order of apparent age.

Units 1-3 are all members of the Coast Plutonic Complex and are unrelated to mineralization. Coarse grained garnet-quartz-feldspar-biotite gneiss (Unit 1) of Mesozoic or earlier age occurs in restricted areas in the northeast and southwest quadrants of Figure 3.

Hornblende diorite and quartz diorite (Unit 2) is coarse grained, equigranular and unfoliated to gneissic. It forms massive outcrops near the ridgetop in the northeast corner of Figure 3, but is highly fractured and rubbly weathering in the gullies down below.

Quartz monzonite (Unit 3) has been identified in only one outcrop near the western edge of the map-area. It is coarse grained, leucocratic and massive-weathering.

Lapilli tuff (Unit 4) is the earliest Miocene unit on the property. It occupies a roughly circular area 1 km in diameter, with a "tail" to the southwest down Candy Gully. Its circular shape suggests that it was

intruded as a pipe. The rock has an over all greenish-grey cast, and consists of 3-50 mm diameter subangular fragments of diorite, gneiss, felsic volcanics, rare quartz porphyry and purple volcanics, in a grey clastic matrix. Near its margins the unit is commonly intensely pyritized. Pyrite tends to surround fragments, suggesting that the rock was largely unconsolidated at the time of pyritization.

Quartz-feldspar-biotite porphyry (hereinafter abbreviated to QFB porphyry) of Unit 5 outcrops over much of East Gully, and parts of South and Main Gullies. The stock is believed to post-date lapilli tuff, but evidence is inconclusive. It consists for the most part of prominent quartz, feldspar and biotite phenocrysts in a fine grained, pale green groundmass. Lower down in East Gully the unit is sub-porphyrific, with minor quartz and/or feldspar phenocrysts in a grey, medium-grained, groundmass (Unit 5a). Porphyry and subporphyritic phases are distinguished on Figure 3, although the presence of gradational contacts between them implies that they are simply textural variants and not separate intrusions. Both are granodiorite in overall composition.

Dacite dykes (Unit 6) form a prominent swarm in South Gully and below elevation 1600 m in Main Gully. These dykes are characteristically dark blue-grey, with feldspar and rare quartz phenocrysts in a flinty, siliceous matrix. Minor pyrite and chalcopyrite occur as disseminations and on fractures in most dacite dykes.

On the ridge top above Main Gully, a blue-grey feldspar porphyry stock (flow?) is tentatively correlated with the dacite dykes. Correlation is far from certain, since the stock is some distance away from the dyke swarm, and in contrast to the dykes, contains no sulphides.

Dacite breccia (Unit 7) of variable description outcrops in a number of small isolated areas. It is characterized by the presence of

angular diorite fragments in a blue dacite groundmass. The largest occurrence, in South Gully, contains very large diorite blocks surrounded by pyritic dacite matrix. The breccia in Main Gully also contains abundant pyrite (10-15%). The two lower breccias in East Gully contain traces of disseminated pyrite and chalcopyrite. The upper breccia contains no sulphides and no apparent intrusive matrix (possibly a fault breccia?). The breccia in Candy Gully also carries disseminated sulphides (3-4% pyrite).

Rusty weathering, sericitic quartz porphyry (Unit 8) forms a stock on the ridgetop above Main Gully and a small satellite stock at elevation 1850 - 1900 m on Main Gully. Detailed mapping in an unnamed gully between Main and West Gullies indicates that pyritic quartz porphyry dykes are fairly abundant in lapilli tuff near the intrusive contact. The rock contains 5% 2-3 mm quartz eyes, and 5% disseminated pyrite in a fine grained sericitic groundmass. The rock is largely leached of pyrite on surface.

"Bughole" quartz porphyry dykes (Unit 9) are the most distinctive dykes on the property. Six or eight such dykes form a northwesterly-trending swarm 500 m wide and at least 2 km in strike length. Individual dykes are remarkably continuous along strike. Dips range from 55°N to vertical, and widths from 2 to 10 m. The dykes consist of large, prominent quartz phenocrysts and blebs of leached kaolinite after feldspar in a creamy rhyolitic matrix. Up to 1% disseminated pyrite is present. Surface manganese staining is characteristic.

Feldspar-hornblende-(quartz) porphyry dykes (Unit 10) post-date bughole quartz porphyry dykes and form a dense swarm in the same general area. These dykes trend predominantly northwest with moderate

to steep northeasterly dips. A subordinate dyke trend is northeast and vertical. Widths range from 1 to 50 m. The dykes are somewhat variable in composition and texture. Most consist of feldspar±hornblende±quartz phenocrysts in a feldspathic groundmass. Narrow dykes commonly consist of fine grained, buff felsite and display slabby jointing parallel to the contacts. Clay alteration of feldspars (though not as intense as in bughole porphyries) and chlorite alteration of mafics is usually present. Mn staining varies from weak to intense. No sulphides are present in these dykes.

Lahar breccia (Unit 11) forms a prominent unit capping the ridge north of claims BZT 3 and 6. It is roughly 600 m thick and covers an oval-shaped area of some 4 sq km. Its eastern contact is essentially vertical, whereas crude stratification within the unit is subhorizontal,

Localization of the breccia within a collapse caldera structure is suggested. The unit consists of subrounded cobble to boulder-sized fragments of quartz diorite, gneiss, and lesser amounts of rock units 4 through 10, in a poorly consolidated clastic matrix. Near the eastern margin conspicuous cobbles of pyritic quartz porphyry make up $\frac{1}{2}\%$ of the fragments.

Shingly weathering bands of grey, fine grained, air-fall tuff up to 5 - 10 m thick are locally present. They are not shown on Figure 3, but one such band was found in talus at elevation 1640 m, and another was seen in a cliff face at elevation 2050 m. These bands are probably quite continuous along strike.

Andesite dykes (Unit 12) are observed to cut all units except a late feldspar porphyry stock. These dykes are generally narrow, no more than 1 m wide, but very continuous along strike. In contrast to

earlier dykes, their predominant trend is north-south. In contrast to dacite dykes, which they superficially resemble, these dykes are unmineralized and are granular rather than flinty.

Feldspar porphyry (Unit 13) forms a small stock in lahar breccia. It consists of feldspar (+minor biotite) phenocrysts in a grey-green fine grained groundmass. Epidote blebs and Coast Range quartz monzonite fragments are common in the vicinity of Candy Gully. Feldspar porphyry dykes in the vicinity of West Gully were mapped as Unit 13 but may belong to Unit 10.

Age Dates

Two samples of intrusive rock were submitted for age dating to Geochron Laboratories, Cambridge, Massachusetts. The samples selected were from the earliest and youngest recognized intrusive phases. Results are as follows:

- Sample #78HKT94 QFB porphyry from elevation 1650 m at western edge of East Gully. K/Ar age determination on a highly chloritized biotite separate gave 13.9 ± 1.5 m.y.
- Sample #H163 Feldspar porphyry from elevation 1800 m near the northwest corner of Figure 3. A whole rock age gave 10.0 ± 0.7 m.y.

GEOCHEMISTRY

General Statement

Some 439 samples of soil, talus fines, and minor silts were collected at a sample spacing of 100 m on traverses which followed every 100 m contour line (Figure 4). In areas of greater interest, sample spacing was reduced to 50 m both horizontally and vertically.

Some 79 rock chip samples representative of the various rock types and mineral showings were collected.

All samples were submitted to Roszbacher Laboratories, Burnaby and analyzed by atomic absorption methods for Mo, Cu, Ni, Co, Mn, Fe, Ag, Au, Zn and Pb. Selected rock chips were analyzed additionally for W, F and Be. Analytical methods are described in Appendix I.

Results

Results for individual samples are tabulated in Appendix I and are plotted for each anomalous element in soil, silt and talus fine samples on 1:10,000 scale anomaly summary maps (Figures 5-11).

Strong soil anomalies were registered in the following metals.

	<u>Threshold</u>	<u>Peak Values</u>
Cu	250 ppm	2740 ppm
Mo	10	142
Mn	4000	+10000
Pb	100	1340
Zn	500	14200
Ag	4	13
Au	100 ppb	600 ppb

Threshold values were arbitrarily selected, but are considerably higher (by factors of 5 to 10) than average metal content of the surrounding Coast Plutonic Complex. Thirty rock chip samples analyzed for tungsten and fluorine



FIG. 6 HOODOO CREEK PROPERTY — Cu DISTRIBUTION IN SOIL

SCALE 1: 10,000

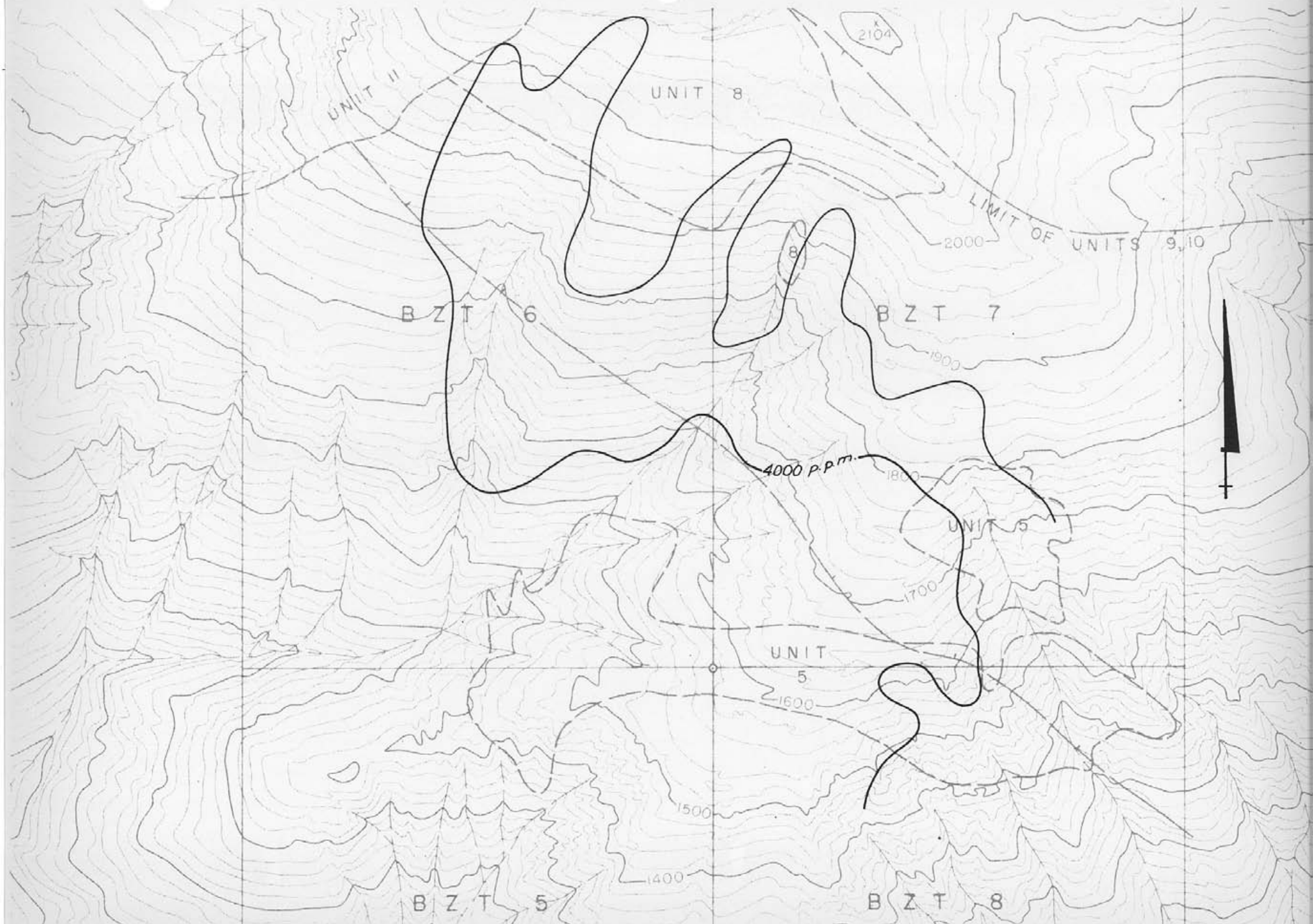


FIG. 7 HOODOO CREEK PROPERTY — Mn DISTRIBUTION IN SOIL

SCALE 1 : 10,000

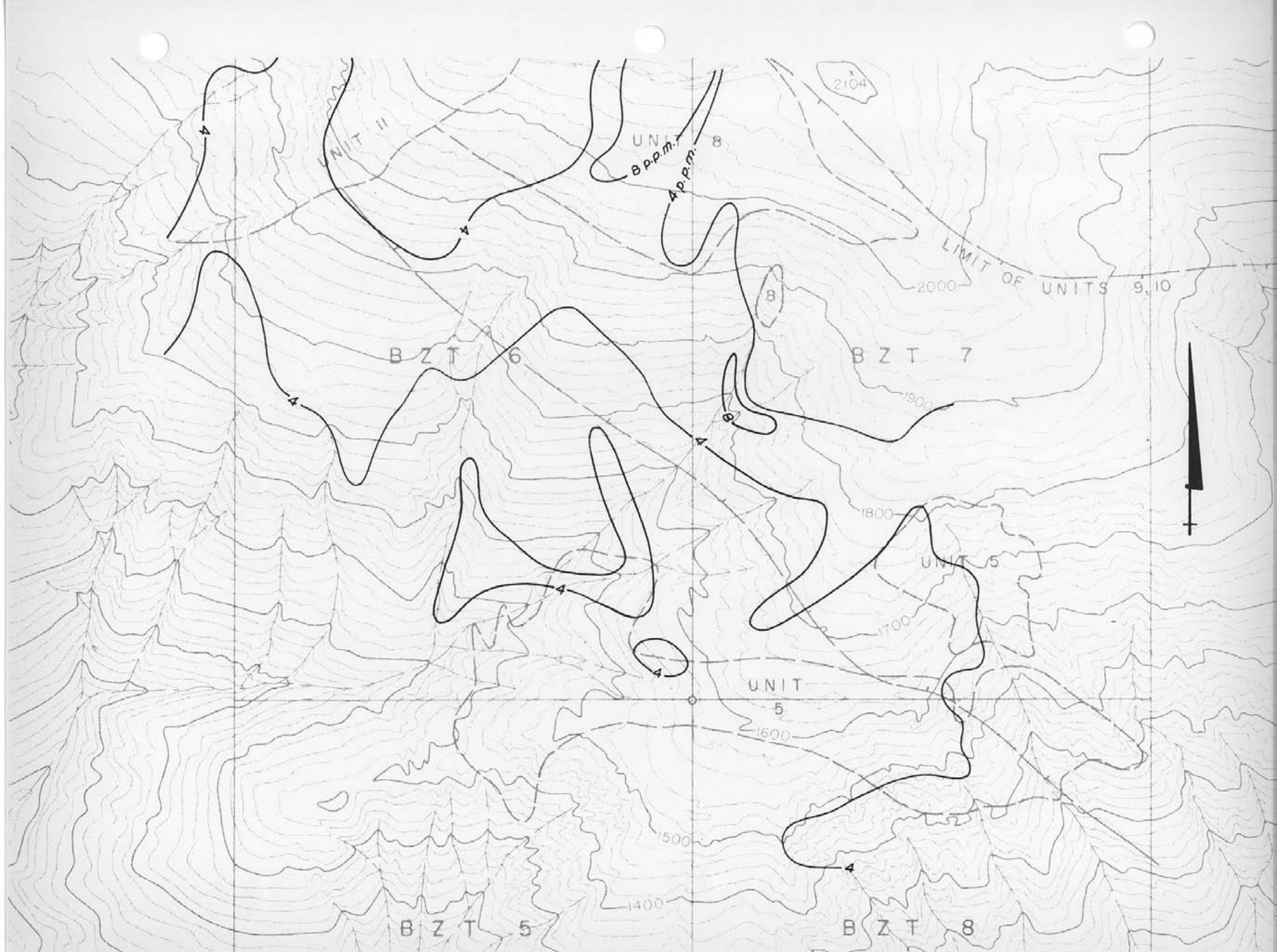
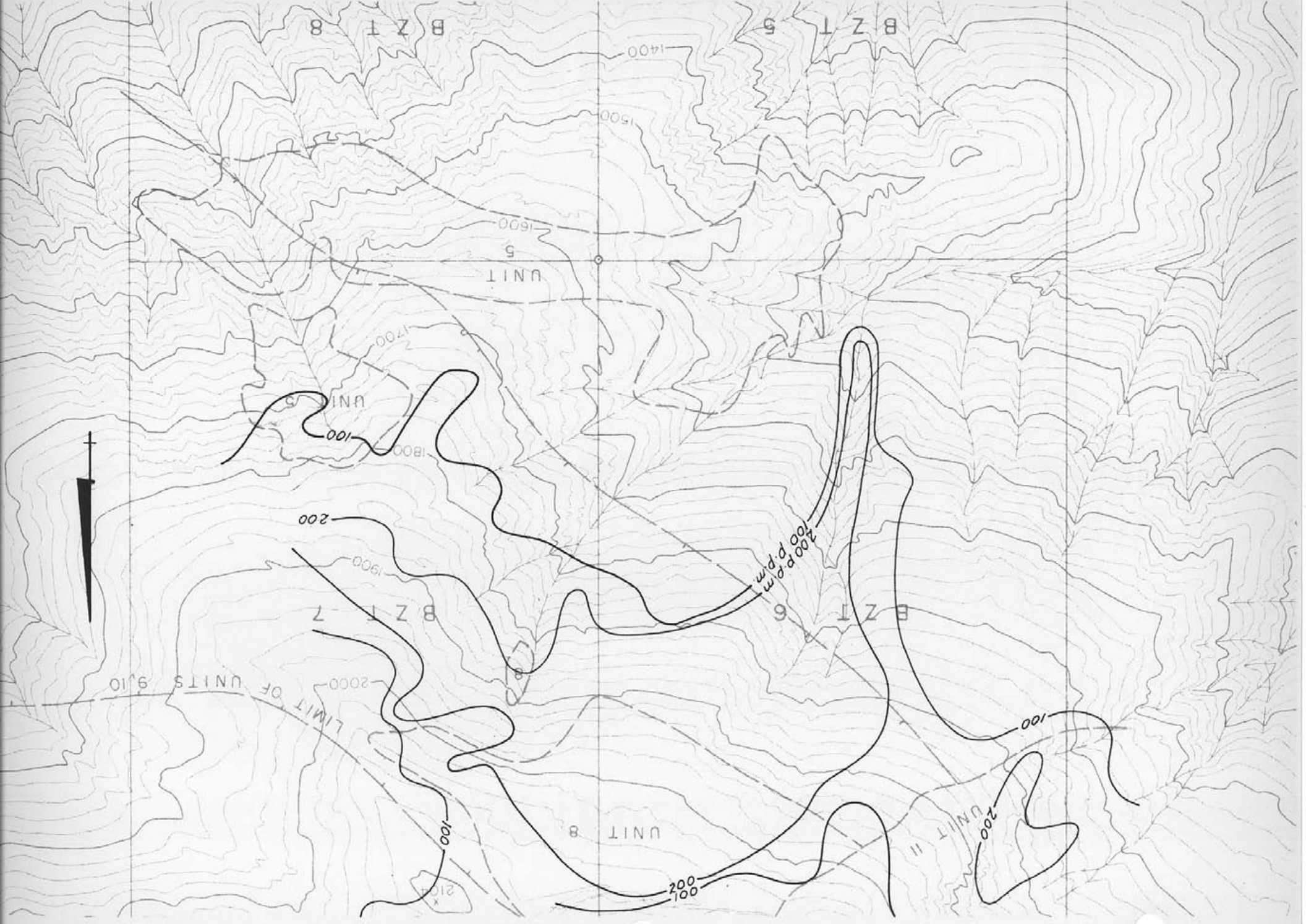


FIG. 8 HOODOO CREEK PROPERTY — Ag DISTRIBUTION IN SOIL

SCALE 1:10,000



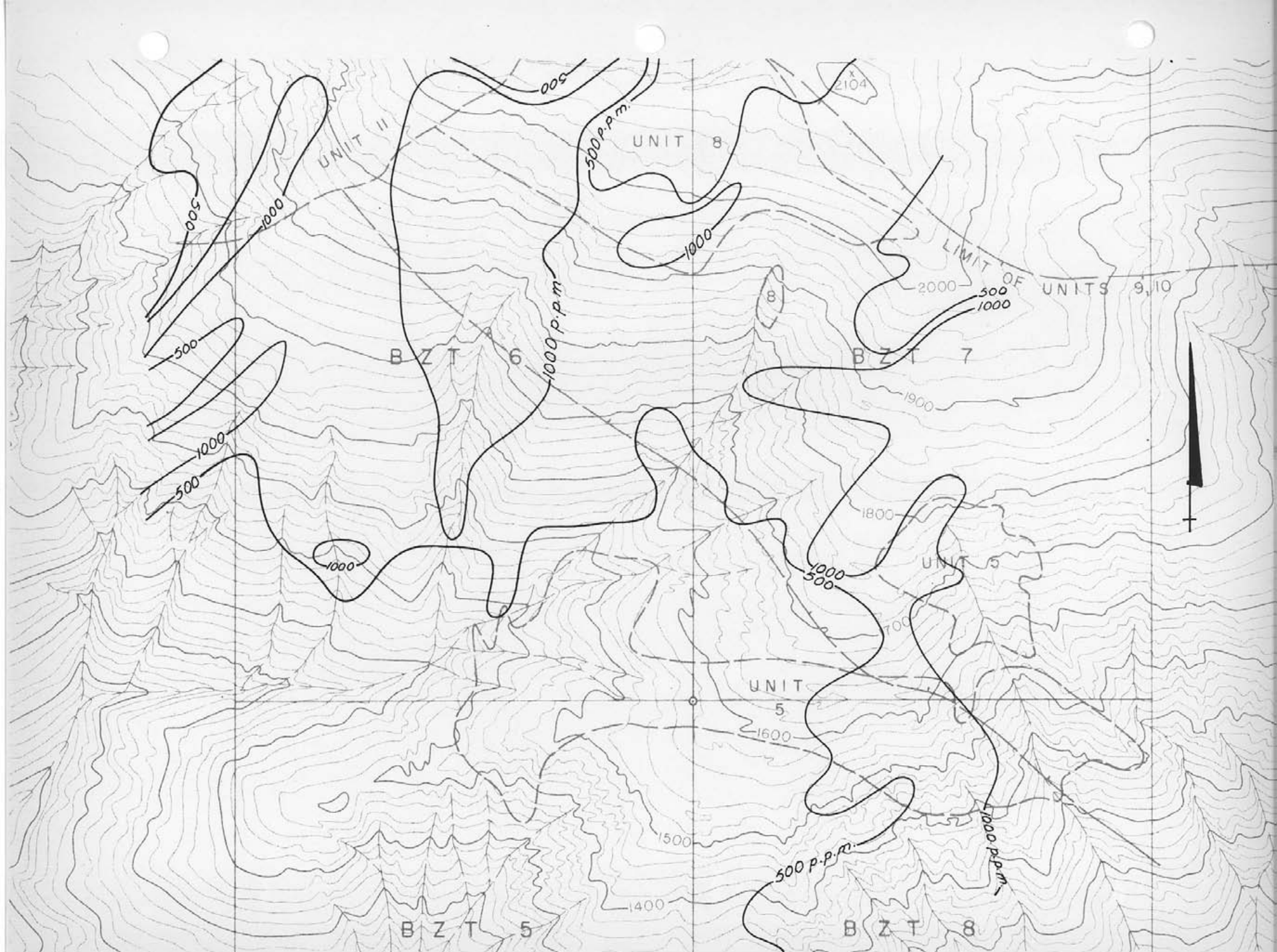
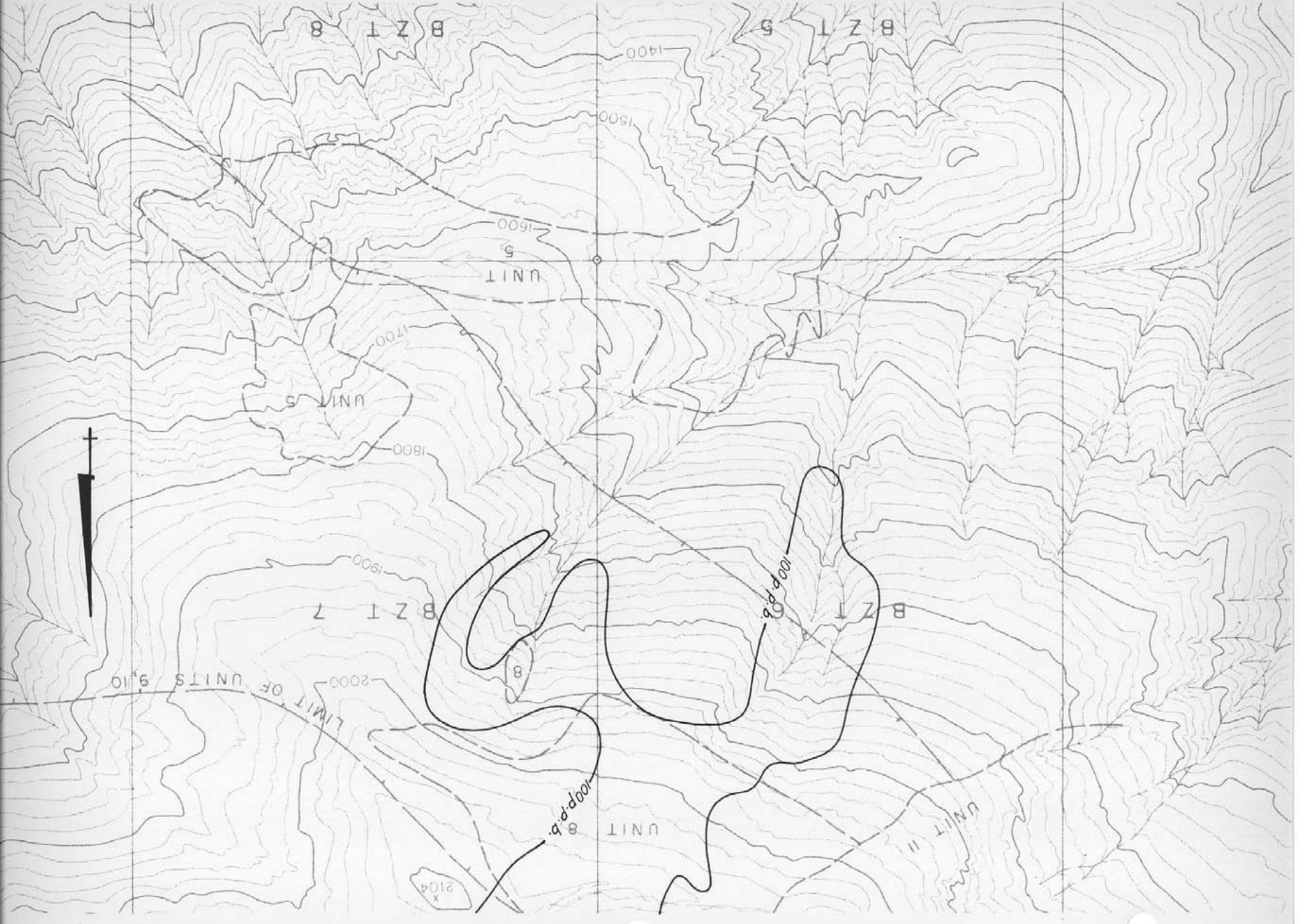


FIG. 10 HOODOO CREEK PROPERTY — Zn DISTRIBUTION IN SOIL

SCALE 1 : 10,000

FIG. 11 HOODOO CREEK PROPERTY — An DISTRIBUTION IN SOIL

SCALE 1 : 10,000

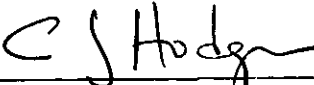


returned peaks of 1200 ppm W (Sample 8HCT 123 from a quartz-pyrite shear vein) and 500 ppm F (sample 8HKT51 of pyritic QFB porphyry).

A selected suite of 35 rock chip samples were analyzed for Bi⁽¹⁾. Of these, 3 exceeded 10 ppm and peak value was 44 ppm. An inconsistent association of Bi with Au was noted in the rock chips.

Five anomalous environments are indicated:

1. The QFB porphyry stock (Unit 5) in East and Main Gullies is highly anomalous with respect to Cu and Mo.
2. The pyritic quartz porphyry (Unit 8) is anomalous in Au and moderately anomalous in Cu and Mo.
3. Prominent Mn, Pb, Zn and Ag soil anomalies coincide with the distribution of late acid dykes (Units 9, 10). The source of these anomalies is believed to be both the dykes themselves and late base metal shear veins which cut the dykes.
4. The annular pyritic stockwork zone outlined on Figure 3 is characterized by soils which are anomalous with respect to molybdenum, particularly along Main Gully and at the head of West Gully.
5. The dacite dyke swarm (Unit 6), has Cu and Zn soil anomalies associated with it at the south end of East Gully.



 C.J. Hodgson, P.Eng. (B.C.)

(1) Andre Panteleyev (pers. comm.) reported the presence of the bismuth telluride tetradymite ($\text{Bi}_2\text{Te}_2\text{S}$), confirmed by x-ray diffraction, in quartz porphyry near the former Kennco campsite.

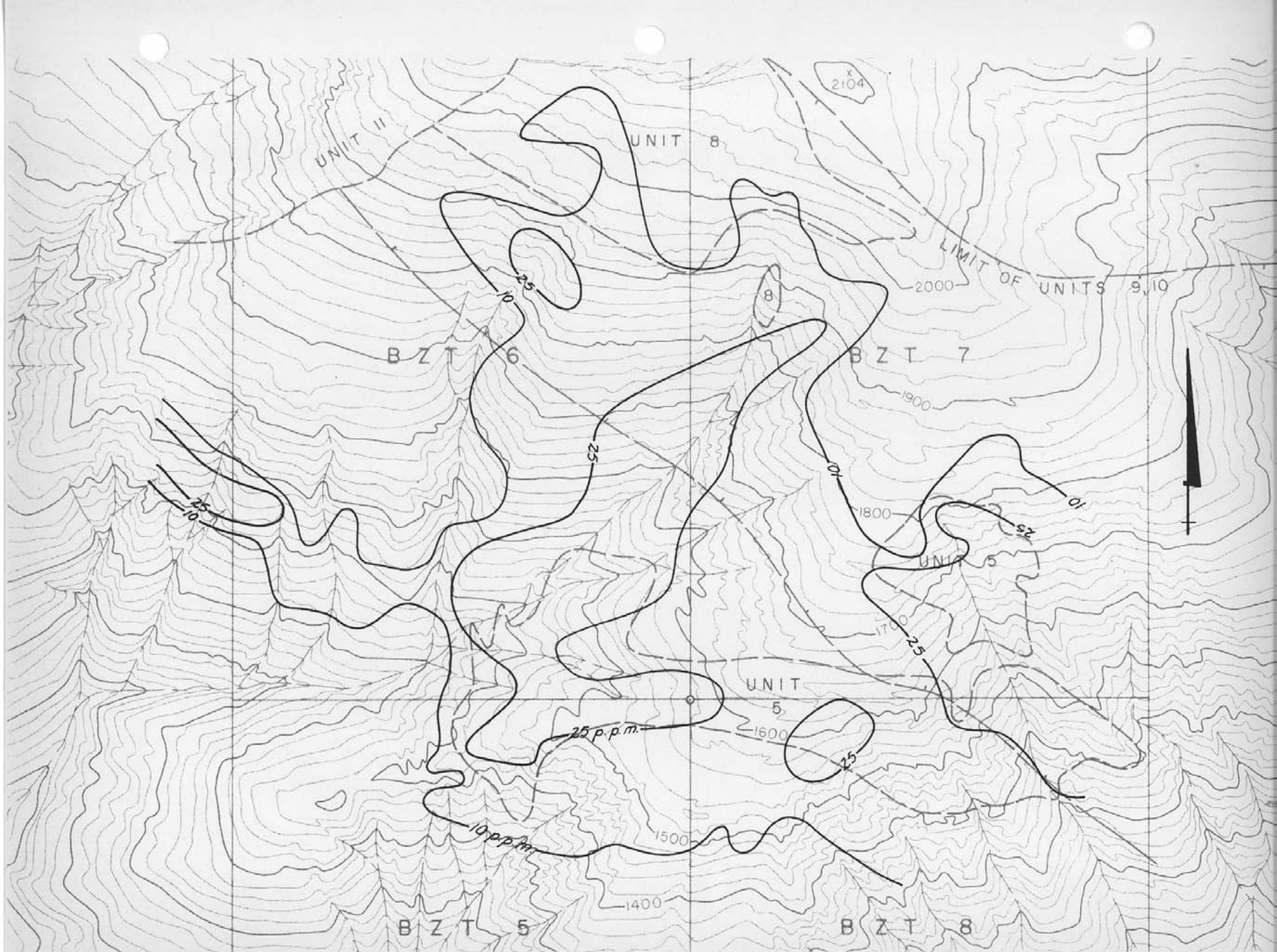


FIG. 5 HOODOO CREEK PROPERTY — Mo DISTRIBUTION IN SOIL

SCALE 1:10,000

Kosbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

CERTIFICATE OF ANALYSIS

BURNABY, B. C.
CANADA
TELEPHONE: 299-0910
AREA CODE: 604

CERTIFICATE NO. 8141

INVOICE NO.

DATE ANALYSED NOV 1978

PROJECT: *Handwritten: 335 Dundas Street Vancouver B.C.*

Sample	PH	Mo	Cu	Ni	Co	Mn	Pb	As	Ag	Au	Pb	W	Bi	Fe	ppb
78-1107-0		3	118	18	30	540	47	8	90	14	C				80
101		2	18	22	18	720	20	4	110	12	0				420
102		2	30	22	30	680	22	4	540	16	0				80
103		14	301	20	20	820	25	130	860	34	0				290
104		20	540	32	24	7300	45	34	1100	56	0				900
105		4	254	30	18	1350	21	6	880	26	C				310
106		2	196	22	120	1260	22	6	460	22	0				260
107		12	88	22	22	160	22	4	76	50	2				240
108		8	24	28	18	60	08	2	44	12	C				80
109		4	42	22	22	820	14	4	190	14	2				310
110		0	42	22	22	820	14	4	190	14	2				80
111		6	920	22	18	1350	12	7	2000	530	C				180
112		2	1140	24	30	20000	48	6	4800	28	0				80
113		16	82	32	20	200	20	360	180	220	0				100
114		10	470	80	32	760	54	18	168	10	0				60
115		14	580	40	34	950	55	380	500	200	10				170
116		50	140	40	36	1660	47	50	240	23	0				40
117		16	200	18	14	240	22	6	50	14	5				250
118		4	154	42	18	420	22	2	80	10	4				80
119		10	154	42	18	420	22	2	80	10	4				350
120		22	74	30	18	140	10	2	52	6	0				80
121		8	120	42	21	540	15	8	1800	28	2				320
122		2	282	62	38	780	37	6	130	18	10				40
123		10	420	52	38	400	40	4	170	38	120				80
124		100	222	28	26	300	16	8	78	18	18				230
125		46	1220	38	32	3700	96	42	1100	50	0				140
7126		22	3200	42	28	40	20	300	32	26	0				40
127		2	100	20	16	320	16	6	280	16	5				250
128		40	28	30	32	48	48	48	26	28	2				160
129		4	46	22	14	140	18	8	44	140	266	2			450
130		4	4200	32	18	1440	15	280	1100	182	2				400
131		6	86	28	18	80	18	280	180	200	10				100
132		11	230	28	20	140	42	520	580	560	2				180
133		10	68	22	12	100	20	8	120	20	5				80
134		4	20	24	14	40	18	86	136	100	100				80
135		4	170	14	16	160	57	18	870	25	10				80

APPENDIX I

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-0910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: *Amor Minerals Exploration*
535 Shubert St Van B.C.
PROJECT *Rooster Creek #2*

CERTIFICATE NO. *8141*

INVOICE NO.

DATE ANALYSED *OCT/78*

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Pb	Zn	Pb	²⁰⁸ Pb Au	W	F
01	78HKS 1		4	102	40	40	300	3.4	.8	112	28	20		
02			2	96	72	38	1940	4.8	.8	1440	40	20		
03	T 3		30	202	50	50	320	9.2	7.8	320	80	1300		
04	S 4		3	112	34	28	1700	4.4	1.2	250	48	20		
05	T 5		24	2060	66	42	1340	4.0	5.0	1500	50	40		
06	S 6		4	130	26	24	1500	4.2	1.2	388	42	20		
07	7		4	46	26	14	420	3.3	.8	264	34	20		
08	L 8		2	126	34	26	1480	3.9	1.2	740	52	60		
09	S 9		3	240	90	86	2400	10.0	1.2	1720	150	20		
10	L 10		1	106	34	28	1300	3.9	1.6	1300	70	140		
11	T 11		10	1240	44	62	320	10.0	28.0	780	248	200		
12	S 12		60	1020	42	68	1000	7.2	1.8	1280	92	60		
13	T 13		14	46	30	24	3300	1.0	.4	340	26	20	0	220
14	T 14		12	170	18	18	4400	1.3	.6	560	24	20	0	350
15	15		10	102	24	16	200	1.7	.4	134	16	20		
16	S 16		24	660	48	52	4200	5.8	4.2	1000	100	40		
17	T 17		14	118	32	22	1320	3.3	5.2	600	96	120		
18	S 18		2	940	50	36	1000	4.5	4.0	2600	80	60		
19	19		40	390	18	18	4600	3.5	4.8	700	42	20		
20	20		7	256	24	18	720	3.2	3.0	440	32	20		
21	21		126	1340	40	96	800	9.6	5.2	1320	82	20		
22	T 22		16	46	30	26	280	2.0	2.0	100	20	20		
23	23		10	72	22	20	100	1.3	22.0	96	78	20		
24	S 24		22	740	34	42	5400	7.0	2.2	880	80	20		
25	T 25		10	70	22	18	80	1.6	.6	74	20	20		
26	26		10	138	30	30	2100	0.7	.4	560	32	20	0	300
27	S 27		18	920	24	64	1000	4.8	2.6	800	186	20		
28	T 28		11	384	30	24	520	1.6	0.8	96	18	20		
29	S 29		1600	9800	26	140	8500	9.5	4.2	600	80	20		
30	T 30		104	54	16	12	40	0.8	2.0	16	32	20		
31	S 31		32	1240	22	52	6300	5.6	10.0	1420	120	40		
32	T 32		16	54	22	20	40	1.0	1.0	28	38	20	0	380
33	S 33		16	520	42	40	1860	8.5	1.4	800	92	20		
34	34		26	120	46	32	1220	1.2	1.6	800	66	20		
35	T 35		154	1140	48	58	300	3.7	1.6	68	18	20		
36	36		1	30000	186	32	1560	4.2	.6	3100	26	20		
37	37		12	260	42	26	1840	2.4	.8	520	26	20		
38	38		26	256	44	24	500	2.8	.6	120	20	20		
39	39		32	10	24	18	100	2.0	.4	44	22	20		
40	40		32	120	30	10	120	0.9	.4	80	80	20		

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-0910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: *Amor Minerals Exploration*
535 Shubert St Van. B.C.
PROJECT *Rooster Creek #2*

CERTIFICATE NO. *8141*

INVOICE NO.

DATE ANALYSED *OCT/78*

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Pb	Zn	Pb	Au	W	F
01	78HKS 40		48	1280	44	48	400	6.6	3.4	1180	48	20		
02	41		18	500	32	22	1100	4.7	2.0	620	30	20		
03	42		4	660	52	18	1240	6.7	4.6	240	32	20		
04	43		16	480	22	26	600	6.0	1.2	168	22	20		
05	T 44		11	60	38	26	640	1.5	.6	66	12	20	5	310
06	S 45		9	580	50	48	980	4.5	1.8	300	30	20		
07	46		9	680	46	34	820	4.2	1.8	1460	40	60		
08	T 47		12	290	60	34	480	2.0	1.0	620	22	20	5	310
09	48		6	2140	26	22	3800	1.3	1.6	2480	18	20		
10	49		13	580	30	26	880	1.6	1.5	2400	76	300		
11	S 50		18	500	54	74	7500	8.7	3.0	3000	250	20		
12	T 51		9	58	22	18	1140	4.8	7.0	300	180	20	40	500
13	S 52		22	400	30	26	3200	5.4	1.8	540	66	20		
14	53		26	420	32	30	4800	4.6	5.0	1740	60	20		
15	L 54		96	1820	70	82	5000	9.5	7.0	8000	120	80		
16	T 55		46	190	34	26	120	2.4	13.0	1680	72	160		
17	S 56		7	360	38	26	6900	7.6	3.0	5200	136	20		
18	57		7	580	40	40	7000	7.8	3.0	5000	132	20		
19	58		10	480	46	30	4700	6.5	1.6	1360	112	20		
20	59		12	374	34	42	7180	8.3	3.2	2200	720	260		
21	60		6	104	24	20	1480	4.8	1.2	360	56	20		
22	61		7	106	26	16	840	5.0	1.6	400	60	20		
23	62		6	214	30	22	1320	4.7	3.6	1040	108	20		
24	63		6	138	28	24	1600	5.3	1.8	720	60	20		
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40	67		72	210	34	11	400	1.7	1.0	760	220	20		

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GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
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AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: *Amor Minerals Exploration*
535 Harbor St Van B.C.
PROJECT *Harbor Creek #82*

CERTIFICATE NO. *8141*
INVOICE NO.
DATE ANALYSED *NOV, 1978*

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Pb	Zn	Pb	Au	F	No.
01	78HKT 64		10	232	32	20	1220	2.2	1.0	420	18	20		01
02	61		24	42	36	26	200	1.4	7.0	122	86	140		02
03	66		6	700	24	26	1820	4.1	.8	500	22	20		03
04	67		28	150	42	28	2260	7.5	3.2	1060	50	520		04
05	L 68		18	1120	30	40	8100	7.6	6.6	2940	722	50		05
06	T 69		6	24	26	22	2100	2.3	.6	350	12	20		06
07	70		10	58	30	46	1140	0.8	1.0	190	22	20		07
08	571		22	222	32	40	1460	21.0	4.0	500	46	20		08
09	L 72		6	150	30	26	2020	4.7	2.4	840	40	20		09
10	T 73		14	290	46	34	500	2.4	2.0	142	82	60		10
11	574		3	90	16	16	380	3.9	1.0	196	36	20		11
12	75		8	46	20	10	340	4.2	1.8	174	38	20		12
13	76		8	680	30	56	1660	8.0	2.4	700	38	20		13
14	77		24	362	32	20	1500	9.5	4.2	480	50	20		14
15	77A		12	194	56	32	680	1.9	1.8	200	16	20		15
16	79		76	112	36	24	980	1.4	22.0	540	46	80		16
17	580		10	196	56	20	1620	8.8	3.2	440	62	20		17
18	T 81		60	130	30	36	740	1.7	1.8	120	102	40		18
19	82		32	2000	20	24	740	1.8	11.2	130	14	20		19
20	83		44	320	18	20	1020	1.3	1.0	242	10	20		20
21	84		44	410	16	22	140	1.7	3.3	58	50	40		21
22	85		22	90	28	72	1220	3.4	3.2	182	30	80		22
23	586		116	2140	26	60	1740	21.0	7.8	1040	74	240		23
24	L 87		28	740	24	44	7600	5.6	5.0	1580	66	40		24
25	588		10	252	22	28	1460	21.0	2.8	620	72	20		25
26	L 89		20	840	36	120	3800	21.0	7.2	1240	52	80		26
27	T 90		32	1380	50	90	680	2.0	5.8	126	38	40		27
28	591		12	880	46	156	5400	28.0	2.6	860	58	20		28
29	92		18	460	44	50	3140	6.9	1.4	460	78	20		29
30	93		20	640	46	136	4200	8.5	2.6	520	38	20		30
31	T 94		12	116	20	20	720	2.3	1.2	98	1320		200	31
32	91		6	98	20	18	180	2.2	3.6	58	54	140		32
33	96		8	98	18	16	660	2.4	.6	344	50	20		33
34	97		6	12	12	12	360	1.8	.4	190	40	20		34
35	98		6	24	18	16	1220	1.3	.2	186	18	20		35
36	95		12	26	24	20	140	2.5	1.8	22	46	40		36
37	5100		50	118	20	12	260	5.6	.6	50	22	20		37
38	T 101		48	178	32	32	820	3.4	.4	72	14	20		38
39	T 102		16	130	24	24	660	1.8	.4	50	14	30		39
40	5100		20	138	20	14	560	4.1	.6	86	14	20		40

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
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AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: *Amor Minerals Exploration*
535 Harbor St Van B.C.
PROJECT *#82 Harbor Creek*

CERTIFICATE NO. *8141*
INVOICE NO.
DATE ANALYSED *OCT / 78*

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Pb	Zn	Pb	Au	F	No.
01	78 HKT 104		12	142	24	14	440	2.0	1.0	48	12	20		01
02	105		98	220	30	22	500	2.6	.4	62	14	20		02
03	106		10	36	28	18	520	2.2	.2	60	16	20		03
04														04
05														05
06														06
07														07
08														08
09														09
10														10
11														11
12														12
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27														27
28														28
29														29
30														30
31														31
32														32
33														33
34														34
35														35
36														36
37														37
38														38
39														39
40	G6			370	268	24	380	1.7	3.6			400		40

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S SPRINGER AVE.
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AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 8141

INVOICE NO.

DATE ANALYSED NOV 17/75

TO: Simon Maxwell Exploration
515 Huron St. Vancouver B.C.
PROJECT: Hudson Creek #2

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Ag	Zn	Pb	PPB Au	No.
01	78 HPS230		6	500	48	44	1660	6.8	1.8	460	30	20	01
02	231		26	330	36	30	1180	7.6	1.8	270	28	20	02
03	232		10	264	34	20	740	6.1	.8	158	22	20	03
04	233		6	394	40	40	1500	7.3	1.4	260	26	20	04
05	234		4	280	34	26	920	6.1	1.0	156	20	20	05
06	235		10	296	32	24	740	5.7	1.0	184	26	20	06
07	236		14	231	32	28	1000	5.6	1.2	176	24	20	07
08	T 237		6	5800	40	24	340	2.3	.4	384	10	20	08
09	S 238		18	420	24	20	600	4.8	.8	222	24	20	09
10	239		26	224	32	20	700	2.7	1.0	116	24	20	10
11	T 240		2200	42	20	10	60	1.7	.4	10	10	20	11
12	S 241		26	368	26	20	620	7.6	1.8	158	32	20	12
13	242		20	220	22	14	520	5.6	.8	90	18	20	13
14	243		8	242	32	14	740	6.1	.8	112	18	20	14
15	244		20	302	30	16	740	7.6	1.2	154	22	20	15
16	245		2	366	44	22	780	6.2	1.2	176	22	20	16
17	246		100	640	52	64	3100	6.2	1.8	284	38	20	17
18	247		6	440	32	28	1240	6.6	1.6	294	20	20	18
19	248		8	118	20	20	820	6.0	1.0	142	18	20	19
20	249		6	78	16	12	660	7.9	.8	98	12	20	20
21	250		6	102	22	16	580	5.9	.8	178	20	20	21
22	251		16	74	12	8	340	3.5	.8	60	10	20	22
23	252		20	82	14	26	620	4.8	.8	138	12	20	23
24	253		14	64	18	12	480	3.4	.6	98	10	20	24
25	254		10	54	14	12	420	5.5	.6	58	10	20	25
26	255		2	132	12	6	180	1.1	1.0	62	8	20	26
27	256		20	314	32	32	1380	6.1	1.0	310	22	20	27
28	257		18	192	26	30	1220	6.3	.8	330	20	20	28
29	258		6	90	12	8	340	4.0	.8	86	38	20	29
30	259		4	154	22	12	1500	7.9	2.6	400	56	20	30
31	260		70	170	26	20	220	1.0	.4	50	10	20	31
32	261		60	560	26	36	380	1.0	1.0	60	14	20	32
33	262		32	660	26	26	280	1.4	2.2	112	14	20	33
34	263		22	340	24	20	400	1.2	1.2	88	16	20	34
35	264		46	214	34	20	400	1.5	1.0	62	14	20	35
36	265		58	174	24	18	480	2.1	1.2	90	14	20	36
37	266		20	224	28	22	380	1.0	.8	74	14	20	37
38	S 267		6	520	32	100	2540	7.7	1.2	360	34	20	38
39	T 268		8	126	28	20	420	3.1	2.0	222	218	20	39
40	269		12	400	24	34	640	7.0	2.0	1660	76	20	40

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.
BURNABY, B.C.
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TELEPHONE: 299-8910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: *Arcon Minerals Exploration*
535 *Shunloy St.* Van B.C.

PROJECT *Horner Ck.*

CERTIFICATE NO. *8141*
INVOICE NO.

DATE ANALYSED *SEPT/78*

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Ag	Zn	Pb	Au	No.
01	78 HUS1461	3	114	36	34	1820	5.6	1.2	336	50	40		01
02	HUS1462	2	160	42	38	1560	5.2	1.6	380	50	80		02
03	63	2	120	46	38	980	4.2	1.2	410	94	40		03
04	64	1	120	52	34	1540	6.2	1.8	520	158	40		04
05	65	2	216	46	40	1180	6.0	1.6	580	94	20		05
06	66	5	190	44	40	1240	5.6	1.4	620	82	20		06
07	67	1	182	24	24	2400	6.0	1.6	680	142	40		07
08	68	4	138	36	32	2400	6.6	1.2	560	82	20		08
09	69	3	158	32	70	2060	5.5	1.2	400	122	20		09
10	70	3	480	36	34	3740	7.1	4.0	810	170	180		10
11	71	7	160	22	18	380	5.7	2.0	140	132	40		11
12	72	5	362	18	24	5000	12.0	1.90	342	400			12
13	73	6	1020	22	38	5200	8.0	11.4	1800	390	160		13
14	74	12	740	30	34	4400	7.0	4.2	700	234	240		14
15	75	3	64	20	22	3020	4.0	1.0	320	42	40		15
16	76	1	76	26	32	2060	4.4	1.4	360	58	40		16
17	77	1	96	48	44	2260	5.5	1.4	340	58	20		17
18	78	1	82	36	30	1960	4.0	2.0	300	74	20		18
19	79	5	190	26	30	1840	3.2	1.0	330	42	20		19
20	80	10	170	16	14	840	3.4	4.0	200	26	20		20
21	81	7	150	20	22	1940	4.0	1.8	310	32	40		21
22	82	13	262	38	30	1580	5.5	1.8	460	42	20		22
23	83	16	540	38	40	5100	6.0	1.6	380	54	20		23
24	84	20	316	30	24	7000	7.6	1.8	260	46	40		24
25	85	68	1060	48	64	5200	9.0	4.0	900	88	60		25
26	86	74	940	38	100	6100	10.0	3.2	470	70	40		26
27	87	70	1060	34	80	71000	7.8	4.2	1200	190	40		27
28	88	16	294	20	28	8700	5.0	1.4	780	96	20		28
29	89	12	236	20	24	3660	5.7	2.0	760	94	20		29
30	90	15	460	18	72	7600	1.8	3.8	1260	210	300		30
31	91	13	500	30	42	71000	5.8	3.2	2800	202	20		31
32	92	4	1960	40	38	71000	5.5	12.0	3600	316	300		32
33	93	3	142	12	12	820	4.4	2.4	400	102	240		33
34	94	2	114	12	16	1080	3.4	4.6	430	92	20		34
35	95	4	122	14	20	3600	4.6	4.4	320	66	20		35
36	96	4	226	20	22	2220	4.2	6.0	610	66	20		36
37	97	6	102	14	20	3260	4.2	5.6	1040	54	20		37
38	98	9	104	16	18	1420	4.6	1.6	410	52	20		38
39	1497	10	68	12	14	1060	3.6	3.4	160	52	20		39
40	G 6	48	360	270	22	3200	1.8	4.0	340	340	240		40

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.
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AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: *Arcon Minerals Exploration*
535 *Shunloy St.* Van B.C.

PROJECT *Horner Ck. #2*

CERTIFICATE NO. *8141*
INVOICE NO.

DATE ANALYSED *SEPT/78*

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Ag	Zn	Pb	Au	No.
01	78 HUS1500	20	700	44	30	1300	7.2	4.6	540	42	20		01
02	01	9	98	32	20	1900	5.6	1.0	480	22	20		02
03	02	8	282	30	24	1380	5.8	2.4	1180	40	20		03
04	03	8	248	24	26	2460	5.0	8.0	2400	54	40		04
05	04	6	106	20	20	1060	4.2	1.4	660	46	50		05
06	05	7	210	14	20	2340	3.2	1.0	790	40	40		06
07	06	5	166	18	28	2260	3.6	5.8	820	94	60		07
08	07	3	140	16	16	540	2.8	2.2	560	106	40		08
09	08	3	264	24	28	71000	4.0	2.0	3100	88	20		09
10	09	7	520	24	70	7800	5.5	6.6	2600	380	160		10
11	10	8	198	16	18	1100	4.2	1.6	600	70	20		11
12	11	11	220	20	24	4800	5.2	2.2	860	384	40		12
13	12	11	270	24	24	2800	5.6	1.6	1020	86	40		13
14	13	6.5	1220	26	76	6500	8.4	4.2	700	114	140		14
15	14	6.2	940	48	64	2480	7.0	6.0	500	56	80		15
16	15	7.6	420	28	28	7100	7.0	5.8	180	42	40		16
17	16	3.3	182	16	16	580	4.0	1.4	240	38	40		17
18	17	1.4	186	24	20	500	5.7	2.4	240	38	20		18
19	18	1.1	580	36	26	1380	4.2	5.2	810	40	40		19
20	19	2.8	600	32	30	940	5.8	2.0	260	26	160		20
21	20	1.7	242	28	24	2320	5.5	2.2	190	26	40		21
22	21	1.3	198	30	24	840	6.4	3.0	200	30	20		22
23	22	2.6	420	42	38	1160	6.5	1.8	400	58	20		23
24	23	2.8	196	36	20	660	6.2	1.0	130	20	20		24
25	24	1.6	148	18	14	540	5.0	1.2	86	24	20		25
26	25	2.6	170	20	22	580	5.9	1.4	130	30	20		26
27	26	2.0	200	26	18	780	5.8	1.8	130	18	20		27
28	27	1.42	222	14	16	300	6.6	1.4	64	26	20		28
29	28	3.2	480	28	20	1540	6.7	5.8	390	78	20		29
30	29	1.00	660	28	26	940	9.0	3.6	450	84	20		30
31	30	4.0	440	32	26	1140	8.0	4.2	590	48	20		31
32	31	5.7	660	30	24	1000	7.2	4.4	330	62	20		32
33	32	1.8	640	22	38	6000	6.4	5.0	1600	290	20		33
34	33	6	110	12	12	380	3.6	1.0	290	90	20		34
35	34	8	370	36	24	1100	5.9	1.8	500	36	20		35
36	35	1.8	356	26	76	2140	4.5	3.0	420	46	20		36
37	36	7	96	20	20	1260	4.7	1.2	1180	26	20		37
38	37	4.0	500	40	22	940	6.8	3.0	480	42	20		38
39	8 HUS1538	5.0	440	40	26	920	7.6	2.4	290	32	20		39
40	G 7	2.9	156	220	10	140	1.0	0.2	70	64			40

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Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.
BURNABY, B. C.
CANADA
TELEPHONE: 299-8910
AREA CODE: 604

CERTIFICATE OF ANALYSIS

TO: AMAX MINERALS EXPLORATION
535 THURLOW ST. VAN. B.C.

CERTIFICATE NO. 8141

INVOICE NO.

DATE ANALYSED SEPT 18/77

PROJECT 882 Hoodoo Creek

No.	Sample	pH	Mo	Co	Ni	Ca	Mn	Fe	Mg	Zn	Pb	Au	No.
01	8 HUS1596	12	29	46	28	1020	6.1	1.2	2.4	26	20		01
02	1597	15	382	18	42	1440	6.6	1.0	3.4	30	20		02
03	1598	5	420	36	74	1260	4.7	1.8	4.20	32	20		03
04	1599	9	420	74	56	3080	7.7	1.8	2.84	26	20		04
05	1600	12	680	24	28	2540	1.0	2.6	6.60	42	60		05
06	1601	26	1260	44	44	1600	7.0	1.2	7.00	34	20		06
07	1602	14	460	54	50	1380	6.5	1.0	6.60	42	20		07
08	1603	11	334	34	24	820	6.3	2.4	2.70	38	20		08
09	1604	11	340	34	26	780	6.4	1.8	2.60	40	20		09
10	1605	14	192	28	16	780	6.2	1.0	1.60	26	20		10
11	1606	24	236	38	20	1040	6.1	1.2	2.20	30	20		11
12	1607	25	182	20	12	380	6.7	0.6	7.8	26	20		12
13	1608	25	176	18	12	500	6.0	2.6	120	28	20		13
14	1609	24	202	20	12	820	6.5	5.2	1.46	28	20		14
15	1610	19	148	14	14	640	6.5	2.0	2.02	36	20		15
16	1611	33	136	14	12	780	6.0	4.2	1.42	32	20		16
17	1612	62	302	26	18	700	7.7	9.0	3.0	58	20		17
18	1613	37	226	16	12	660	6.4	3.4	1.90	50	20		18
19	1614	17	204	64	24	2580	6.0	1.8	2.42	34	20		19
20	1615	13	146	16	10	440	6.0	2.0	2.12	38	20		20
21	1616	24	190	26	16	1080	6.7	3.8	1.98	34	20		21
22	1617	28	318	12	18	620	6.5	2.6	2.40	34	20		22
23	1618	19	370	18	14	700	6.2	2.4	1.76	28	20		23
24	1619	13	254	26	20	660	6.3	1.8	2.66	30	20		24
25	1620	17	162	22	14	660	6.1	0.8	2.12	30	20		25
26	1621	37	740	40	20	1880	6.5	1.6	5.40	32	20		26
27	1622	58	860	58	44	5500	7.0	1.0	5.60	42	20		27
28	1623	23	720	14	18	3700	4.1	2.0	2.20	42	20		28
29	1624	60	2740	20	46	10,000	7.4	13.0	2020	130	60		29
30	1625	27	700	28	34	4700	6.1	1.8	1300	52	40		30
31	1626	34	660	42	50	6200	6.5	1.0	15.40	62	120		31
32	1627	22	374	34	26	1500	6.3	2.0	2.60	46	60		32
33	1628	23	308	22	20	820	6.2	1.2	4.40	42	20		33
34	1629	18	580	30	2	1380	6.0	2.8	3.50	38	60		34
35	1630	8	262	14	30	1700	6.0	2.0	5.00	68	20		35
36	1631	30	640	60	46	2780	6.0	3.2	7.20	90	60		36
37	1632	6	130	16	16	1980	6.0	2.4	5.00	134	20		37
38	1633	6	74	12	12	5000	6.1	1.2	3.40	156	20		38
39	1634	4	42	10	10	1240	6.0	1.0	1.6	54	20		39
40	-	6	36	12	2	220	6.4	0.4	1.0	24	20		40

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INVOICE NO.

DATE ANALYSED SEPT 18/77

PROJECT 882 Hoodoo Creek

No.	Sample	pH	Mo	Ni	Ca	Mn	Fe	Mg	Zn	Pb	Cu	Au	No.
01	8 HUS1635	3		22	22	1460	3.7	1.2	5.40	134	80	20	01
02	1636	5	8	10	40	3.3	2.6	1.12	70	44	20		02
03	1637	5	18	18	1660	5.0	1.8	3.46	90	76	20		03
04	1638	1	26	26	1880	4.3	2.8	5.80	120	106	20		04
05	1639	3	6	10	980	4.4	3.0	3.06	94	82	20		05
06	1640	3	10	10	360	4.0	4.0	1.60	60	46	20		06
07	1641	3	22	24	3220	4.0	3.2	9.80	160	132	700		07
08	1642	1	106	50	10000	4.2	3.4	14200	70	5200	20		08
09	1643	15	70	42	4000	5.3	5.2	2.460	114	390	20		09
10	1644	6	16	14	1300	4.5	4.2	8.60	66	182	20		10
11	1645	4	28	32	4700	4.7	5.0	10.00	282	146	60		11
12	1646	5	18	18	2620	4.4	6.0	8.40	142	110	20		12
13	1647	2	24	26	3560	4.6	5.8	9.40	226	184	240		13
14	1648	4	18	18	2620	4.7	4.2	6.80	160	182	20		14
15	1649	5	16	16	1600	5.1	2.8	2.41	88	62	20		15
16	1650	2	10	8	600	3.5	0.8	1.98	70	46	20		16
17	1651	3	10	16	1340	3.8	0.6	1.90	74	48	20		17
18	1652	1	16	18	1180	4.5	2.8	2.70	122	60	20		18
19	1653	3	12	8	500	3.6	1.6	2.22	92	62	20		19
20	1654	3	18	14	840	7.9	1.0	4.60	72	38	20		20
21	1655	3	18	16	1000	4.4	2.0	2.74	84	62	20		21
22	1656	2	18	18	800	4.0	2.2	3.06	84	74	20		22
23	1657	2	20	18	1920	4.2	1.8	2.80	154	128	20		23
24	1658	2	26	26	3460	4.8	6.0	10.20	222	200	40		24
25	1659	3	20	22	3200	4.5	0.6	1300	300	226	80		25
26	1660	1	42	22	2120	5.0	3.8	6.20	114	146	20		26
27	1661	1	20	20	2060	4.3	3.8	6.00	134	106	20		27
28	1662	5	20	20	2580	4.3	2.8	8.60	106	126	20		28
29	1663	5	22	30	5100	6.0	3.0	1860	230	314	40		29
30	1664	12	12	22	4800	7.0	4.0	2000	400	500	120		30
31	1665	12	22	30	7800	7.3	4.4	2420	540	460	20		31
32	1666	6	16	12	6700	6.7	2.8	1740	174	282	40		32
33	1667	6	24	20	2820	5.2	3.0	1040	150	184	40		33
34	1668	6	24	22	1880	5.0	2.2	6.60	94	132	20		34
35	1669	4	20	24	1820	5.4	2.8	6.80	114	146	20		35
36	1670	3	36	38	2860	5.5	2.8	6.40	90	120	20		36
37	1671	2	14	16	2800	4.3	2.2	1140	122	108	20		37
38	1672	3	30	26	7600	4.8	3.2	2200	130	176	20		38
39	1673	11	10	10	3600	6.9	2.4	1340	230	400	20		39
40	-	4.7	20	20	340	1.8	2.8	3.70	70	70	20		40

Procedures for Collection and Processing
of Geochemical Samples

Analytical Methods for Ag, Mo, Cu, Pb, Zn,
Fe, Mn, Ni, Co and W in sediments and soils;
Mo, Cu, Zn, Ni and SO_4^{--} in waters.

Amax Exploration, Inc.
Vancouver Office.

September 1970

SAMPLE COLLECTION

Soil

Horizon material is sampled and thus organic rich topsoil and leached upper subsoil are avoided. Occasionally organic rich samples have to be taken in swampy depressions.

Samples are taken by hand from a small excavation made with a cast iron mattock. Approximately 200 gms of finer grained material is taken and placed in a numbered, high wet-strength, Kraft paper bag. The bags are closed by folding and do not have metal tabs.

Observations as to the nature of the sample and the environment of the sample site are made in the field.

Drainage Sediments

Active sediments are taken by hand from tributary drainages which are generally of five square miles catchment or less. Composite samples are taken of the finest material available from as near as possible to the centre of the drainage channel thus avoiding collapsed banks. More than one sample is taken if marked mineralogical or textural segregation of the sediments is evident.

Some 200 gm of finer material is collected unless the sediment is unusually coarse in which case the weight is increased to 1 kg. Samples are placed in the same type of Kraft paper bag as are employed in soil sampling. Water samples are taken at all appropriate sites. Approximately 100 ml are sampled and placed in a clean, screw sealed, polythene bottle. Observations are made at each site regarding the environment and nature of the sample.

Rock Chips

Composite rock chip samples generally consist of some ten small fragments broken from unweathered outcrop with a steel hammer. Each fragment weighs some 50 gms. Samples are placed in strong polythene bags and sealed with non-contaminating wire tabs. Samples are restricted to a single rock type and obvious mineralization is avoided.

Soil, sediment and rock samples are packed securely in cardboard boxes or canvas sacks and dispatched by road or air.

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

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April 30, 1974

SUMMARY OF SOME ANALYTICAL TECHNIQUES CURRENTLY IN USE AT ROSSBACHER LABORATORY

A ANALYTICAL TECHNIQUES FOR GEOCHEMICAL SAMPLES

SAMPLE PREPARATION

Packages of samples are opened as soon as they arrive at the laboratory and the bags placed in numerical sequence in an electrically heated sample drier (maximum temperature 70°C).

After drying soil and sediment samples they are lightly pounded with a wooden block to break up aggregates of fine particles and are then passed through a 35 mesh stainless steel sieve. The coarse material is discarded and the minus 35 mesh fraction replaced in the original bag providing that this is undamaged and not excessively dirty.

Rock samples are exposed to the air until the outside surfaces are dry; only if abnormally wet are rocks placed in the sample drier. Rock samples are processed in such manner that a fully representative 1/2 g. sample can be obtained for analysis. The entire amount of each sample is passed through a jaw crusher and thus reduced to fragments of 2 mm. size or less. A minimum of 1 kg. is then passed through a pulverizer with plates set such that 95% of the product will pass through a 100 mesh

screen. Where samples are appreciably heavier than 2 kg the material is split after jaw crushing by means of a Jones splitter. After pulverizing the sample is mixed by rolling on paper and is then placed in a Kraft paper bag.

SAMPLE DIGESTION

Digestion tubes (100 x 16 mm) are marked at the 5 ml level with a diamond pencil. Tubes are cleaned with hot water and concentrated HCl. 0.5 g samples are weighed accurately, using a Fisher Dial-O-Gram balance, and placed in the appropriate tubes.

To each of the samples thus prepared are added 2 ml of an acid mixture comprising 15% nitric and 85% perchloric acids. Racks of tubes are then placed on an electrical hot plate, brought to a gentle boil ($\frac{1}{2}$ hour) and digested for $4\frac{1}{2}$ hours. Samples unusually rich in organic material are first burned in a porcelain crucible heated by a bunsen burner before the acid mixture is added. Digestion is performed in a stainless steel fume hood.

After digestion tubes are removed from the hot plate and the volume is brought up to 5 ml with deionized water. The tubes are shaken to mix the solution and then centrifuged for one minute. The resulting clear upper layer is used for Cu, Mo, Pb, Zn, Ag, Fe, Mn, Ni and Co determination by a Perkin-Elmer 230B atomic absorption spectrophotometer. Analytical procedures are given on the following pages.

ANALYTICAL PROCEDURESSilver

1. Scope - This procedure covers a range of silver in the sample from less than .5 to 1000 ppm
2. Summary of Method - The sample is treated with nitric and perchloric acid mixture to oxidize organics and sulphides. The silver then is present as perchlorate in aqueous solution. The concentration is determined by atomic absorption spectrophotometer.
3. Interferences - Silver below 1 gamma/ml is not very stable in solution. Maintaining the solution in 20% perchloric prevents silver being absorbed on the glass container. Determination must be completed on the same day as the digestion.

Samples high in dissolved solids, especially calcium, cause high background absorbance. This background absorbance must be corrected using an adjacent Ag line.

Silver AA Settings P.E. 290

Lamp - Ag

Current 4 ma position 3

Slit 7 A

Wavelength 3281A Dial 287.4

Fuel - acetylene - flow - 14

Oxidant - air - flow - 14

Burner - techtron AB_51 in line

Maximum Conc. 3 to 4x

Calibration

1. Set 1 gamma/ml to read 40 equivalent to 20 gamma/gm
Factor $\frac{1}{2}$ x meter reading
Check standards
4, 10, 20, 40 ppm Ag in sample
2. Set 15 gamma/ml to 100 equivalent to 100 ppm
Check standards
40, 100 ppm
Factor directly in ppm Ag
3. Rotate burner to maximum angle
Set 10.0 gamma/ml Ag to read 100
Check standards
100, 200, 400, 1000 ppm Ag
Factor 10x scale reading
4. Samples higher than 1000 ppm should be re-analyzed by assay procedure
5. Background correction for sample reading between 1 to 5 ppm
Calibrate AA in step 1
Dial wavelength to 300 (peak)
Read the samples again
Subtract the background reading from the first reading

Standards

1. 1000 gamma/ml Ag - 0.720 gm Ag_2SO_4 dissolved in 20 mls Hx10_3
and dilute to 500 mls
2. 100 gamma/ml Ag - 10 mls of above + 20 mls HClO_4 , dilute to
100 mls

3. Recovery spiked standard

5 gamma/ml Ag - 5 mls 100 gamma/ml dilute to 100 mls with
"mixed" acid

Working AA Standards

Pipette .2, .5, 1, 2, 5, 10 mls of 100 gamma/ml and 2, 5 mls 1.000 gamma/ml dilute to 100 mls with 20% HClO₄. This equivalent to 4, 10, 20, 40, 100, 200, 400, and 1000 ppm Ag in the sample .50 gm diluted to 10 mls.

Recovery Standard

Pipette 2 mls of 5 gamma/ml Ag in mix acids into a sample and carry through the digestion. This should give a reading of 20 ppm Ag + original sample content.

Follow the general geochemical procedure for sample preparation and digestion.

For low assay Ag, the same procedure is used. Ag is then calculated in oz/ton.

$$1 \text{ ppm} = .0292 \text{ oz/ton}$$

conversion factor

$$\text{oz/ton} = .0292 \times \text{ppm Ag}$$

Zn Geochemical AA Setting

Lamp Zn

Current 8 #3 Slit 20A

Wave length 2133 Dial 84.9

Fuel - Acetylene Flow 14

Oxidant - Air Flow 14

Burner - P.E. short path 90°

Range

0 - 20 gamma/ml Factor 4x - 0 to 400 ppm

0 - 50 gamma/ml Factor 10x - 0 to 1000 ppm

For Waters - Burner AB- 51 in line 1 gamma/ml read 100 to give 0
to 1000 ppb

High Zn Burner Boling in line. Wavelength 3075. Dial 250 Slit 7A

Fuel 14 Air 14.5

0 to 1000 gamma/ml read 0 to 20 Factor 400 x

Pure Standard 10,000 gamma/ml

1 gm Zn dissolved, H₂O, HCl, HNO₃, HClO₄, fumed to HClO₄ -
make up to 100 mls H₂O

1000, 100 gamma/ml and 100 ml by dilution in 20 % HClO₄

0 to 200 gamma/ml Zn use combined Cu, Ni, Co, Pb, Zn standards

Pipette

1, 2, 3, 5, 8, 10 mls of 10,000 gamma/ml - dilute to 100 mls
with 20% HClO₄ to give

100, 200, 300, 500, 800, 1000 gamma/ml Zn for high standards

Co Geochemical AA Setting

Lamp - 5 multi element

Current 10 #4 Slit 2A

Wavelength 2407 Dial 133.1

Fuel - Acetylene Flow 14

Oxidant - Air Flow 14

Burner - AB 51 in line

Range

0 - 10 gamma/ml read 100 Factor 2 x reading to 200 ppm

0 - 20 gamma ml read 100 Factor 4 x reading to 400 ppm

Burner at maximum angle

0 - 100 gamma/ml read 100 Factor 20 x reading to 2000 ppm

0 - 200 gamma/ml read 100 Factor 40 x reading to 4000 ppm

Standards - 1000 gamma/ml

1.000 gm cobalt metal dissolved in HCl, HNO₃, and fumed into
HClO₄, dilute to 1 liter

Pipette

1, 2, 10, 20 mls into 100 ml vol flasks diluted to mark
with 20% HClO₄

This gives

10, 20, 100, 200 gamma/ml Co

Mixed - combination standards of Cu, Ni, Co, Pb, Zn

of

1, 2, 5, 10, 20, 30, 50, 80, 100, 150, 200 gamma/ml are used
for calibration

Mn Geochemical AA Setting

Lamp Multi element Ca, Ni, Co, Mn Cr

Current 10 #4 Slit 7A

Wave length 4030.8 Dial 425.2

Fuel - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner - P.E. short path (or AB 50)

Range

0 - 100 gamma/ml Factor 20x - 0 to 2000 ppm

0 - 200 gamma/ml Factor 40x - 0 to 4000 ppm

Burner 90°

0 - 1000 gamma/ml Factor 200x - 0 to 20,000 ppm

0 - 2000 gamma/ml Factor 400x - 0 to 40,000 ppm

EDTA Extraction - use AB 51 in line

0 - 20 gamma/ml Factor 4x - 0 to 400 ppm

Standards

Fisher 10,000 gamma/ml (ml)

10x Dilution 1000 gamma/ml

Pipette

.5, 1, 2, 3, 5, 8, 10, ml of 1000 gamma/ml

2, 3, 5, 8, 10, 15, 20 ml of 10,000 gamma/ml dilute to 100

mls with 20% HClO₄. This gives

5, 10, 20, 30, 50, 80, 100, 200, 300, 500, 800, 1000, 1500,

2000 gamma/ml.

Mo Geochemical AA Setting

Lamp ASL H/C Mo

Current 5 #5 Slit 7A

Wavelength 3133 Dial 260.2

Fuel - Acetylene Flow 12.0 to give 1" red feather

Oxidant - Nitrous oxide Flow 14.0

Burner - AB 50 in line

Caution read the operation using N₂O and acetylene flame at
end of general AA procedure

Range

0 - 10 gamma/ml Factor 2x - 0 to 200 ppm

Rotate burner to max. angle

0 - 50 gamma/ml Factor 10 x 0 to 1000 ppm

0 - 100 gamma/ml Factor 20 x 0 to 2000 ppm

Standards 1000 gamma/ml

Dissolve .750 gms MoO₃ (acid molybdic) with 20 mls H₂O, 6
lumps NaOH, when all dissolved, add 20 mls HCl, dilute to 500 mls
100 gamma/ml - 10 x dilution

Pipette

.2, .5, 1, 2, 3, 5, 8, 10 mls of 100 gamma/ml

2, 3, 5, 8, 10 mls of 1000 gamma/ml add 5 mls 10% AlCl₃and dilute to 100 mls with 20% HClO₄

This gives

.2, .5, 1, 2, 3, 5, 8, 10, 20, 30, 50, 80, 100 gamma/ml Mo

Fe Geochemical AA Setting

Lamp - Fe

- Do not use multi element Fe

Current 10 #4 Slit 2A

Wavelength 3440.6 Dial 317.5

Fuel - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner - PE Short Path 90°

Range

0 - 5000 gamma/ml 0.1 x % - 0 to 10.0%

0 - 10,000 gamma/ml 0.2 x % - 0 to 20.0%

Higher Fe - 10 x dilution

Standards 10,000 gamma/mlWeigh 5.000 gms iron wires, into beaker, add H₂O, HCl, HNO₃,HClO₄, heat to HClO₄ fumes. Add HClO₄ to 100 mls + 100 mlsH₂O, warm, dilute to 500 mls

Pipette

1, 5, 10, 20, 30, 50, 80 mls 10,000 gamma/ml dilute to 100
mls with 20% HClO₄ to give100, 500, 1000, 2000, 3000, 5000, 8000 gamma/ml to be
equivalent to .2, 1.0, 2.0, 4.0, 6.0, 10.0%, 16.0% Fe in geochem
sample

Ni Geochemical AA Setting

Lamp P.E. H/C. Ni or multi element Cu, Ni, Co, Mn, Cr

Current 10 #4, Slit 2A

Wave length 3415 Dial 312.5

Fule - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner AB 51 in line

Range

0 - 20 gamma/ml Factor 4x - 0 - 400 ppm

0 - 100 gamma/ml Factor 20x - 0 - 2000 gamma

45° 0 - 200 gamma/ml Factor 40x - 0 - 4000 ppm

0 - 500 gamma/ml Factor 100x - 0 - 10,000 ppm

Ni in waters and very low ranges

Wave length 2320 Dial 113

Range 0 - 5 gamma/ml Factor 1x - 0 - 100 ppm

Standards 10,000 gamma/ml

1.000 gm pure Ni metal dissolved in HCl, HNO₃, HClO₄ to perchloric fumes, dilute to 100 ml H₂O

1000 gamma/ml and 100 gamma/ml Successive 10x dilutions in 20% HC

1, 2, 5, 8, 10 mls of 100 gamma/ml

2, 5, 8, 10 mls 1000 gamma/ml

2, 5, 8, 10 mls 10,000 gamma/ml - dilute to 100 mls in 20%

HClO₄. This gives

1, 2, 5, 8, 10, 20, 50, 80, 100, 200, 500, 800, 1000 gamma/ml

Combined Standards - Cu, Ni, Co, Pb, Zn is used as a working standard

Cu Geochemical AA Setting

Lamp Single Cu or

5 multi element

Current 10 for multi element #4 Slit 7A

4 for single #3 Slit 7A

Wavelength 3247 Dial 280

Burner Techtron AB 51 (For Cu in natural waters)

P.E. Short Path (For geochem)

Fuel Acetylene Flow 14

Oxidant Air Flow 14

Range

0 - 5 gamma/ml Factor 1x to 100 ppm (for low Cu)

0 - 20 gamma/ml Factor 4x to 400 ppm

Burner 90°

0 - 200 gamma/ml Factor 40x to 4000 ppm

Wavelength 2492 Dial 147

Burner in line

Range

0 - 1000 gamma/ml Factor 200x to 20,000 ppm

0 - 2000 gamma/ml Factor 400x to 40,000 ppm

Higher range than 40,000 ppm requires 10x dilution

Standards

10,000 gamma/ml

1.000 gm metal powder, H₂O, HCl, HNO₃ until dissolved, add

HClO₄, fume dilute to 100 mls

1000 gamma/ml 10x dilution above in 20% HClO₄

2000 gamma/ml 20 mls 10,000 gamma/ml - dilute to 100 mls in
20% HClO₄

100 gamma/ml 10x dilution 1000 gamma/ml dilute to 100 mls in
20% HClO₄

200 gamma/ml 10x dilution 2000 gamma/ml dilute to 100 mls in
20% HClO₄

Pipette

1, 2, 3, 5, 8, 10 mls 100 gamma/ml - dilute to 100 mls with
20% HClO₄ to give 1, 2, 3, 5, 8, 10 gamma/ml

Combined standards Cu, Ni, Co, Pb, Zn

1, 2, 5, 10, 20, 30, 50, 80, 100, 150, 200 gamma/ml

Pb Geochemical AA Setting

Lamp ASL H/c Pb

Current 5 ma Slit 7A

Wave length 2833 Dial 208

Fuel - acetylene Flow 14

Oxidant - air Flow 14

Burner AB 51 in line

Range

0 - 20 gamma/ml to read 0 to 80. Factor 5x 0 to 500 ppm

0 - 200 gamma/ml to read 0 to 80. Factor 50x 0 to 5000 ppm

Standards - 10,000 gamma/ml

1.000 pure metal, dissolved in HNO₃, fumed to HClO₄ make up to 100 mls in 20% HClO₄

1000 gamma/ml and 100 gamma/ml Successive 10x dilutions in 20% HClO₄

Pipette

1, 2, 5, 8, 10 mls 100 gamma/ml

2, 5, 8, 10, 20 mls 1000 gamma/ml dilute to 100 mls in 20%

HClO₄ this gives

1, 2, 5, 8, 10, 20, 50, 80, 100, 200 gamma/ml

Combined Standards Cu, Ni, Co, Pb, Zn, are used as working standards

W in Soils and Silts

Reagents and apparatus

Test tubes - pyrex disposable

Test tubes - screw cap

Bunsen Burner

Flux - 5 parts Na_2CO_3

4 parts NaCl

1 part KNO_3 pulverized to -80 mesh

7% SnCl_2 in 70% HCl

20% KSCN in H_2O

Extractant - 1 part tri-n-butyl phosphate

9 parts carbon tetrachloride

Standards

1000 gamma/ml W

.18 gms $\text{Na}_2\text{WO}_4 \cdot 2\text{H}_2\text{O}$ dissolved in H_2O , make up to 100 mls

100 gamma/ml, 10 gamma/ml by dilution

Standardization

Pipette .5, 1, 2, 3, 5, 8, 10 ml of 10 gamma/ml

and 1.5, 2 mls of 100 gamma/ml - dilute to 10 mls

continue from step #4

Artificial colors - Nabob pure Lemon Extract, dilute with 1:1 ethanol and water to match. Tightly seal these for permanent standards

Procedure

1. Weigh 1.0 gram sample, add 2 gm flux, mix

2. Sinter in rotary for 2 to 3 minutes (Flux dull red for one minute)
3. Cool, add 10 mls H_2O , heat in sand bath to boiling, cool, let sit overnight
4. Stir, crush, and mix. Let settle
5. Take 2 ml aliquot into screw cap test tube
6. Add 7 mls $SnCl_2$, heat in hot water bath for 5 minutes ($80^\circ C$)
7. Cool to less than $15^\circ C$
8. Add 1 ml 20% $KSCN$, mix (if lemon yellow; compare color standard 10x)
9. Add $\frac{1}{2}$ ml extractant, cap, shake vigorously 1 minute
10. Compare color

Molybdenum in Water Samples

1. Transfer 50 mls to 125 separatory funnel
2. Add 5 ml .2% ferric chloride in conc HCl
3. Add 5 mls of mixed KSCN and SnCl₂
4. Add 1.2 mls isopropyl ether, shake for 1 minute, and allow phases to separate
5. Drain off water
6. Compare the color of extractant

Standardization

Pipette 0, .2, .5, 1, 2, 3, 4, 5, mls of 1 gamma/ml and 1, 1.5, 2, mls of 10 gamma/ml dilute to 50 mls with demineralized H₂O, continue step #2.

This equivalent to

1, 4, 10, 20, 40, 60, 80, 100, 200, 300, 400 ppb Mo

Artificial color - Nabob orange extract dilute with 1:1 H₂O to methanol to match. Seal tightly

SnCl₂ - 15% in 15% HCl

300 gm SnCl₂ · 2H₂O + 300 mls HCl, until SnCl₂ dissolved
dilute to 2 liters

KSCN - 5% in H₂O

Mixed SnCl₂ - KSCN

3 parts SnCl₂ to 2 parts KSCN

Water Samples Run for AA

1. Cu - 2 gamma/ml reads 30 scale therefore 1 unit = 25 ppb
2. Zn - 1 gamma/ml reads full scale therefore 1 unit = 10 ppb
3. Ni - 2.5 gamma/ml reads 50 scale therefore 1 unit = 50 ppb

Burner: long slot techtron burner in line

xxi

Sulphate in Natural Waters

1. Pipette 0.5 ml sulphate reagent mix into a colorimetric tube
2. Add 5 ml water sample and mix
3. Read at 343 *mμ* against a demineralized water blank
4. Read again at 400 *mμ* and subtract from sulphate reading
5. Calculate ppm sulphate from the graph

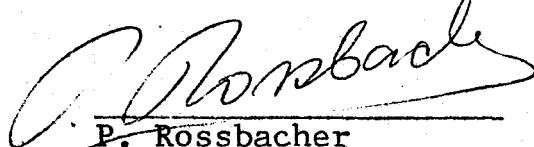
Reagent

Dissolve 54 grams red mercuric oxide (J.T. Baker 2620- Can Lab) in 185 ml 70% perchloric acid and 20 ml H₂O, shake for one hour. Add 46.3 grams ferric perchlorate [Fe(ClO₄)₃ · 6H₂O] (GFS 39) and 47 grams aluminum perchlorate [Al (ClO₄)₃ · 3H₂O] (GFS 2) Add 400 ml water to dissolve, let settle overnight, decant into bottle and make to 1 liter

pH MEASUREMENTS

Soil and drainage sediment samples are dampened with water in a glass beaker to a pasty consistency. Demineralized water is used for this purpose as it has a low buffer capacity and thus does not influence the pH of the sample. Measurement is made with a Fisher Acument pH meter. Electrodes are stored in buffer overnight. A 30 minute warm up time is allowed for the instrument each morning. A 10 ml aliquot is taken from water samples for pH measurement.

ROSSBACHER LABORATORY



P. Rossbacher

APPENDIX II
STATEMENT OF COSTS

Hoodoo Creek BZT 1-9

Summary of Work - Geochemical Sampling & Geological Mapping

Period of Work - August 27 - September 6, 1978

Personnel

C.J. Hodgson, P.Eng., 601 - 535 Thurlow Street Vancouver, B.C. 11 days @ \$138.43/day	\$1,522.73
B.W. Kyba, Geologist, 601 - 535 Thurlow Street Vancouver, B.C. 11 days @ \$101.00/day	1,111.00
B.J. Paul, Senior Assistant, 7 - 503 Corydon Avenue Winnipeg, Manitoba 11 days @ \$ 53.25/day	585.00
J.R. Candy, Junior Assistant, 2426 Lawson Avenue West Vancouver, B.C. 11 days @ \$ 37.57/day	413.27

Room and Board

44 days @ \$ 25.00/man day 1,100.00

Geochemical Analyses - Rossbacher Laboratory - Burnaby, B.C.

Analysis for Mo, Cu, Ni, Co, Mn, Fe, Ag, Zn, Pb, W, Bi, Au
Inv. #9013, including freight 1,678.20

Transportation

Vancouver Island Helicopters Ltd. - Sidney, B.C. Inv. #15678, 15689, 15690, 12715	4,158.00
West Coast Air Services Ltd. - Vancouver, B.C. Inv. #35631	576.00

K/Ar Age Determinations

Krueger Enterprises, Inc. - Cambridge, CT.
Inv. #6127 (2 samples) 575.00

Drafting and Report Preparation

400.00

TOTAL \$12,119.20
=====

Work to be applied - BZT #1-9 inclusive - 1 Year

C.J. Hodgson

APPENDIX III
CONTRACTOR'S INVOICES

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
 BURNABY, B. C.
 CANADA
 TELEPHONE: 299-6910
 AREA CODE: 604

~~AMAX MINERALS EXPLORATION~~
~~601-535 Thurlow St.~~
~~Vancouver, B.C.~~
~~Project 882, Hoodoo Creek, order #2563~~

DATE Nov 15, 1978

INVOICE NO. 9013

CERTIFICATE NO. 8111

ITEM	DESCRIPTION	SUB-TOTAL	TOTAL
381	Geochem analysis, 9 elements @ \$ 3.50	\$ 1,333.50	
36	Geochem analysis for Au 2.50	90.00	
36	Geochem analysis for Bi 0.25	9.00	
28	Geochem analysis for W 2.00	56.00	
318	Soil prep. 0.20	63.60	
63	Rock prep 1.00	63.00	
	Freight	63.10	
			<u>\$ 1,678.20</u>

Journal 871100000
11/22/78

882	-	-	8091	-	1,678.20

NOV 22 1978

TERMS - NET 30 DAYS

7415

HELICOPTERS LTD.

MBIA VBL 356 TELEPHONE 656-3987

MEMBER

DATE _____

In Account With _____

MAX MINERALS EXPLORATION
 612 - 576 HURLOW STREET
 VANCOUVER, B.C. V6E 2L6

AMAX
 SEP 14 1978
 VANCOUVER OFFICE

REFERENCE INVOICE # 1567

FLYING SERVICE FOR MONTH OF SEP 27, 1978 1978
 AS PER ATTACHED FLIGHT INVOICES

HELICOPTER TYPE PIRELLA REG No CF

BASE OF OPERATION PORT MORTIMER, B.C.

BALANCE FORWARD																							
_____ HOURS	@ \$ _____ PER HR	\$ _____																					
<u>2.0</u> HOURS V.I.H. FUEL	@ \$ <u>25.00</u> PER HR	\$ _____																					
_____ HOURS	@ \$ _____ PER HR	\$ _____																					
_____ HOURS V.I.H. FL	APPROVES <u>[Signature]</u> PER HR <u>9/14/78</u>	\$ _____																					
MINIMUM CHARGES	<table border="1"> <thead> <tr> <th>Project</th> <th>Group</th> <th>Activity</th> <th>Account</th> <th>Sub</th> <th>Phase</th> <th>Amount</th> </tr> <tr> <th>NUMBER</th> <th>PROG A</th> <th>BLD/DE</th> <th>Class</th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>882</td> <td>-</td> <td>-</td> <td>8684</td> <td>-</td> <td>-</td> <td>1,512.00</td> </tr> </tbody> </table>	Project	Group	Activity	Account	Sub	Phase	Amount	NUMBER	PROG A	BLD/DE	Class				882	-	-	8684	-	-	1,512.00	
Project	Group	Activity	Account	Sub	Phase	Amount																	
NUMBER	PROG A	BLD/DE	Class																				
882	-	-	8684	-	-	1,512.00																	
CREW EXPENSES																							
ADDITIONAL CHARGES																							
TOTAL CHARGES		\$ 1,512.00																					

TERMS: 30 DAYS NET
 Interest at 1 1/2% per month (18 per cent per annum) charged on overdue accounts.

This company complies with the CODE OF ETHICS of the Helicopter Association of America.

VANCOUVER ISLAND HELICOPTERS LTD.

P.O. BOX 2095 SIDNEY, BRITISH COLUMBIA V8L 3S6 TELEPHONE 656-3987

MEMBER

DATE SEP 14 1978 **AMAX**

In Account With

AMAX MINERALS EXPLORATION	
601 - 535 HINCHIN STREET	
VANCOUVER, B.C. V6E 2L6	

REFERENCE INVOICE # 15619, 15620, 12015

FLYING SERVICE FOR MONTH OF SEPT 1, 3, 6, 1978 19
AS PER ATTACHED FLIGHT INVOICES

HELICOPTER TYPE BELL 206B REG. No. C.F. LTD

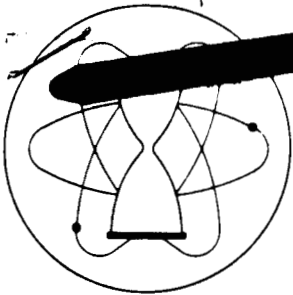
BASE OF OPERATION PORT HASTY, B.C.

BALANCE FORWARD																									
<u>2.4</u> HOURS @ \$ <u>200.00</u> PER HR	\$																								
<u>2.4</u> HOURS V.I.H. FUEL @ \$ <u>25.00</u> PER HR.																									
_____ HOURS @ \$ _____ PER HR																									
_____ HOURS V.I.H. FUEL @ \$ _____ PER HR.																									
APPROVED <u>Mark B McLean</u> <u>9/14/78</u>																									
<table border="1"> <thead> <tr> <th>Project Number</th> <th>Group Code</th> <th>Activity Code</th> <th>Account Class</th> <th>Sub Class</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>882</td> <td>-</td> <td>-</td> <td>8684</td> <td>-</td> <td>2646.00</td> </tr> <tr> <td colspan="6">MINIMUM CHARGES</td> </tr> <tr> <td colspan="6">ADDITIONAL CHARGES</td> </tr> </tbody> </table>		Project Number	Group Code	Activity Code	Account Class	Sub Class	Amount	882	-	-	8684	-	2646.00	MINIMUM CHARGES						ADDITIONAL CHARGES					
Project Number	Group Code	Activity Code	Account Class	Sub Class	Amount																				
882	-	-	8684	-	2646.00																				
MINIMUM CHARGES																									
ADDITIONAL CHARGES																									
CK 17933 SEP 14 1978 TOTAL CHARGES																									
	\$ 2,046.00																								

ISLAND BUSINESS FORMS

TERMS: 30 DAYS NET
Interest at 1 1/2% per month (18 per cent per annum) charged on overdue accounts.

This company complies with the CODE OF ETHICS of the Helicopter Association of America.



KRUEGER ENTERPRISES, INC.
 GEOCHRON LABORATORIES DIVISION

24 BLACKSTONE STREET • CAMBRIDGE, MASSACHUSETTS 02139 • (617) 876-3691

Date 4 December 1978

Invoice No. 6127

Customer Order No. letter of 20 October 1978

AMAZ Minerals Exploration
 #601-535 Thur'low Street
 Vancouver, British Columbia
 CANADA V6E 3L6

Attention:
 C. J. Hodgson

*Hoodoo Creek
 1 @ \$300 + 1 @ \$275
 = \$575*

5 E-47 isotope determinations on unprepared specimens requiring mineral separation @ \$300.00 each U.S. \$1500.00

1 E-47 isotope determination on unprepared specimen not requiring mineral separation @ \$275.00 each U.S. \$ 275.00

Product Number	Group Code	Entry Code	Account Code	Invoice Total
699	-	-	8691	1053.72
795	-	-	8691	351.23
882	-	-	8691	702.48
				2107.43

TOTAL DUE U.S. \$1775.00
 Exchange @ 1.1870 331.93
 Bank Charges 50
2,107.43
OK to [unclear]
C. J. Hodgson

Our fax nos.:
 M-4424, B-4425, B-4426, B-4427
 R-4428, B-4429

CK 1762 DEC 18 1978

IMPORTANT: All invoices are due and payable as of the date of issue. All balances outstanding after 30 days will incur interest charges of 1.5% per month (18% Annual rate) from the date of issue of the invoice. Accounts in arrears by 90 days or more will not be further serviced until paid and may be subject to collection procedures at our option.

co-operation.

Yours very truly,
 KNOWLTON REALTY LTD.
Ralph V. Kopp
 Ralph V. Kopp
 Property Manager

RVK/tl

Cancelled &

CC [unclear]
 [unclear]
 [unclear]
 [unclear]
 [unclear]

APPENDIX IV

STATEMENT OF QUALIFICATIONS

NAME J.R. Candy

ADDRESS 2426 Lawson Avenue
West Vancouver, B.C.

EDUCATION 1st & 2nd year Science leading for a biology major,
completed in May 1977
Capilano College

EXPERIENCE 1977 J.C. Stephens Exploration - prospector/expeditor
1977 AMAX Potash Limited - core splitter
1976 D.C. Syndicate - geologist assistant

STATEMENT OF QUALIFICATIONS

NAME B.J. Paul

ADDRESS 7 - 503 Corydon Avenue
Winnipeg, Manitoba

EDUCATION BSc. Geology 1976 - University of Western Ontario
MSc. Candidate in Geology - University of Manitoba -
expected date of completion May 1979

EXPERIENCE 1977 University of Manitoba - Graduate Assistant
1976 University of Manitoba - Graduate Assistant
1975 Union Carbide - Geologist
1974 Ontario Division of Mines - Junior Assistant
1973 Ontario Division of Mines - Junior Assistant

STATEMENT OF QUALIFICATIONS

NAME	B.W. Kyba
EDUCATION	Four year BSc in Geology University of Alberta
EXPERIENCE	Geologist, Brascan Resources - 1974 Geologist, Pechiney Development Ltd. - 1975-1976 Staff Geologist, AMAX Minerals Exploration, 1976 Present



LEGEND

MIOCENE

HOODOO CREEK COMPLEX

- 13 Feldspar porphyry
- 12 Andesite dykes
- 11 Lahar breccia
- 10 Feldspar-hornblende-quartz porphyry dykes
- 9 Bughole quartz porphyry dykes
- 8 Pyritic quartz porphyry
- 7 Dacite breccia
- 6 Dacite
- 5 Quartz-feldspar-biotite porphyry. 5a Subporphyritic granodiorite
- 4 Lapilli tuff

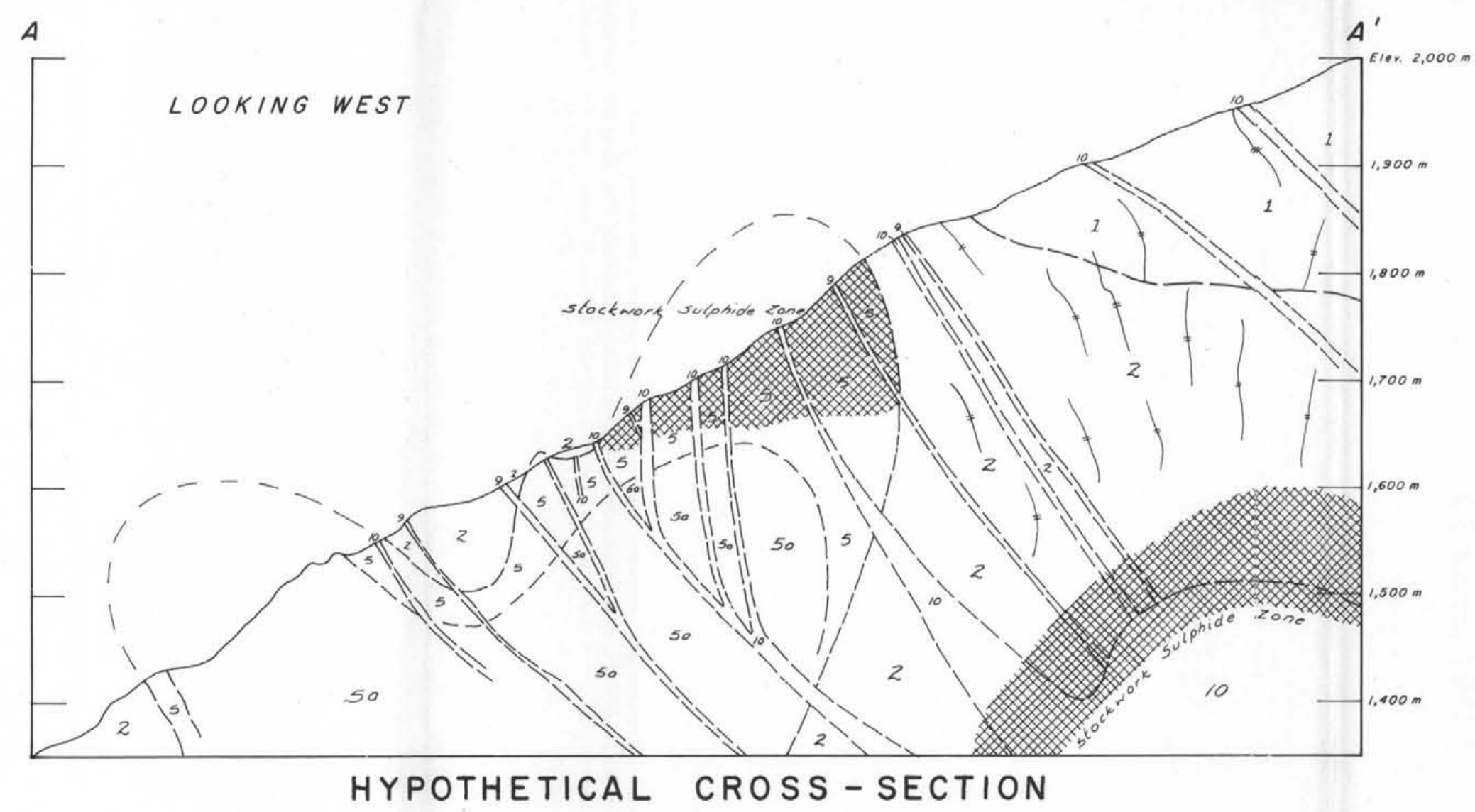
EOCENE (?) AND OLDER

COAST PLUTONIC COMPLEX

- 3 Quartz Monzonite
- 2 Diorite, quartz diorite
- 1 Gneiss

SYMBOLS

- Outcrop
- Float
- Geological contact (defined, approximate, assumed)
- ~ Fault (defined, approximate, assumed)
- Bedding attitude
- Dyke, with dip shown
- Gneissic foliation
- Vein; shear vein
- Boundary of 1% pyrite zone
- ◆ AMAX Campsite; other possible campsites
- Legal corner post (location established by chain and compass)
- Identification and/or corner post, claim boundary (located, unlocated)
- Limit of snow
- Stream
- Topographic Contour (contour interval 10 metres)



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
7415
NO.

AMAX POTASH LIMITED

HOODOO CREEK PROPERTY
VANCOUVER MINING DIVISION - BRITISH COLUMBIA

GEOLOGICAL MAP

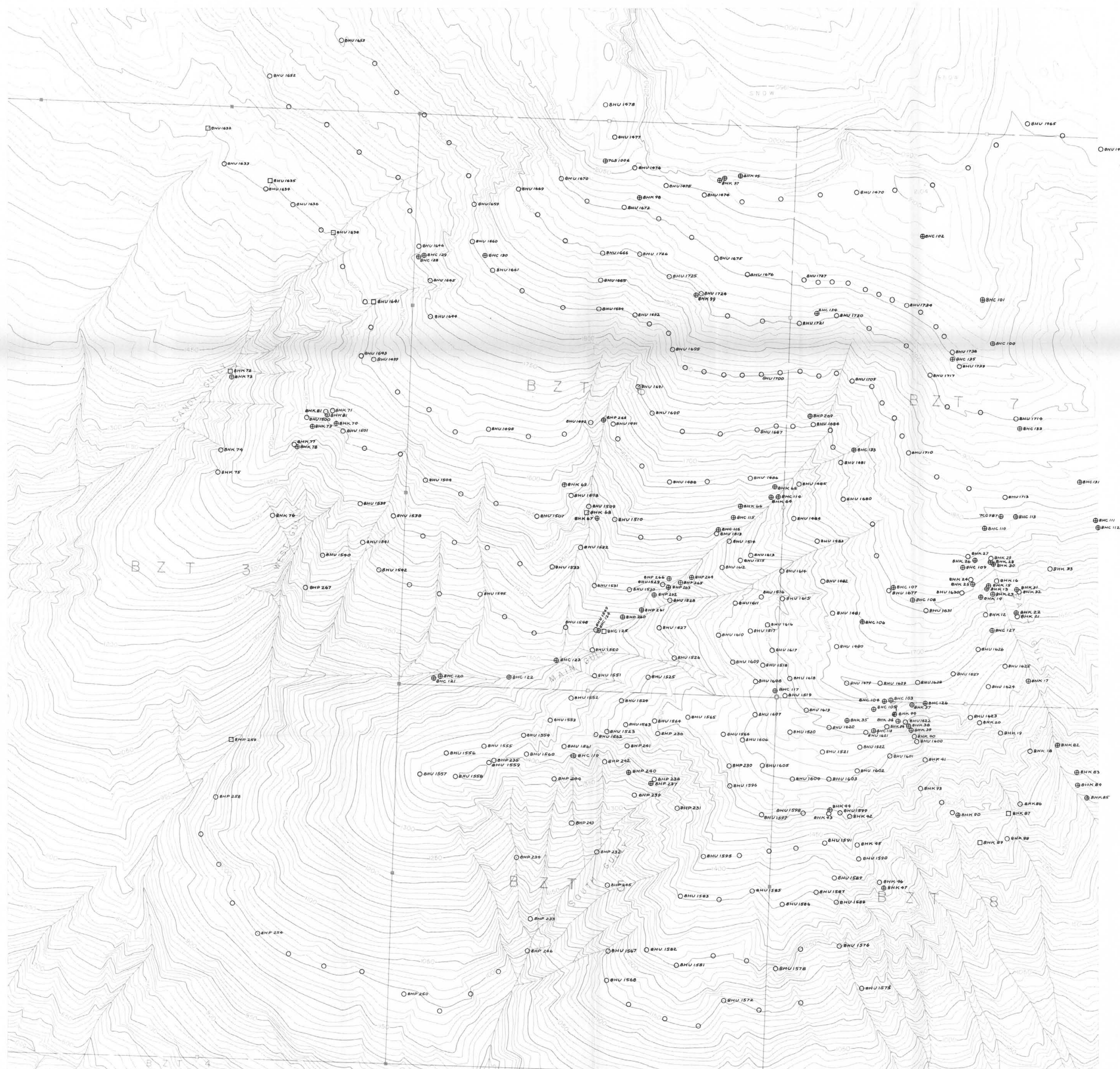
SCALE 1:5,000
METRES FEET

To accompany 1978 Assessment Report by: C. J. Hodgson.

C. J. Hodgson

Vancouver

C.H.H.P.



LEGEND

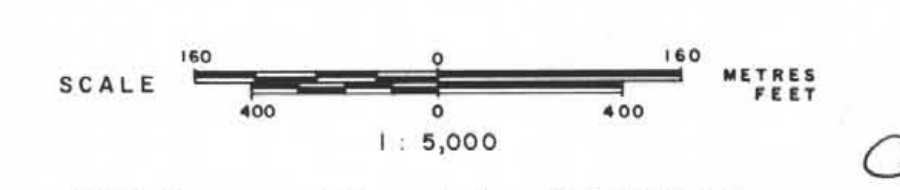
- BHU 1652 Soil
- BHC 125 Silt
- ⊠ BHP 260 Rock chip
- Legal corner post (location established by chain and compass).
- Identification and/or corner post, claim boundary (located, unlocated).
- Limit of snow.
- Stream.
- Topographic contour (contour interval 10 metres).

MINERAL RESOURCES BRANCH
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VANCOUVER MINING DIVISION - BRITISH COLUMBIA

**GEOCHEMICAL MAP
SAMPLE LOCATION**



To accompany 1978 Assessment Report by: C. J. Hodgson.

C. J. Hodgson

Vancouver —

A. B., H. P.