

GEOLOGY AND GEOCHEMISTRY
OF THE
BORDER-ALLEN CLAIMS



Claim Sheets 104-O/15E - 105B/2

Lat.: 60°00'N
Long.: 130°40'W



Claims: BORDER 1 - 8

Watson Lake Mining District
Yukon Territory

ALLEN # 1 - Units 1 - 15
ALLEN # 2 - Units 1 - 15

Liard Mining Division
British Columbia

090 631

by:

Eric James Sacks, M.Sc.

Work Completed July 8 and 15, 1979

The report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representing the amount of \$ 1225

W. H. [Signature]
Geologist or
Mining Engineer

considered as representation work under section 53 (4) Yukon Quartz Mining Act.

Commissioner of Yukon Territory

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SUMMARY

The BORDER-ALLEN Claims were staked on June 26th, 1979 to cover a multi-site, Geological Survey of Canada stream sediment Pb-Zn-Ag-Cu-U anomaly released in Open Files 561 and 563. On July 15th, 1979 Canadian Oxy conducted geological and geochemical surveys over the claims.

The claims are underlain by a differentiated, muscovite-biotite quartz-monzonite intrusive belonging to the Mid-Cretaceous, Cassiar batholith. The intrusive is foliated and brecciated and is cut by 150T fracture zones which have been chloritized, limonitized, kaolinized and which contain quartz-pyrite veining. Rocks over the claims contain anomalous amounts of Pb, Zn, Ag and U, especially within the fracture zones.

Strong and persistent soil, stream sediment and heavy mineral Pb-Zn-Ag-U-W-Mo anomalies originate particularly in ALLEN 1 and 2.

Potential mineralization is likely to be of hydrothermal and structurally controlled nature and include Pb-Zn-Ag veining in fracture zones, U-Mo-W stockworks and possibly Pb-Zn-Ag-U-Mo-W skarns in included metasedimentary material.

I. INTRODUCTION

The BORDER-ALLEN Claims were staked on June 26, 1979 to cover a multi-site Geological Survey of Canada stream sediment Pb-Zn-Ag-Cu-U anomaly released in Open Files 561 and 563 on June 8th and 15th, 1979 respectively. On July 15th, 1979

Canadian Oxy conducted geological and geochemical surveys over the property. This report presents the results of those surveys.

II. LOCATION AND ACCESS

The BORDER-ALLEN Claims are located at 60°00'N, 130°40'W straddling the Yukon - British Columbia border. The BORDER Claims lie within N.T.S. 105B/2E, Yukon Territory, while the ALLEN Claims lie within N.T.S. 104-O/15E, British Columbia.

The claim group lies approximately 6 miles (9.6 km) south of Rancheria at mile 710 (km 1136) on the Alaska Highway and immediately west of Alan Creek. Access to the claims is via helicopter. A washed out dirt road runs up Alan Creek from the Alaska Highway to within 1 mile (1.6 km) east of the claims.

III. PHYSIOGRAPHY AND VEGETATION

Relief over the BORDER-ALLEN Claims is approximately 2100 ft. (640 m) between elevations of 6500 ft. and 440 ft. (1980 m and 1340 m) above sea-level. Topography is disorganized and consists of steep, loose, scree slopes, dropping from rocky crags in the western parts of the claims to Alan Creek valley in the eastern part of the claims. The entire claim group lies above the treeline.

IV. PREVIOUS WORK

To the author's knowledge, no previous work has been done on the BORDER-ALLEN Claims. Numerous nearby Pb-Zn-Ag-Au showings

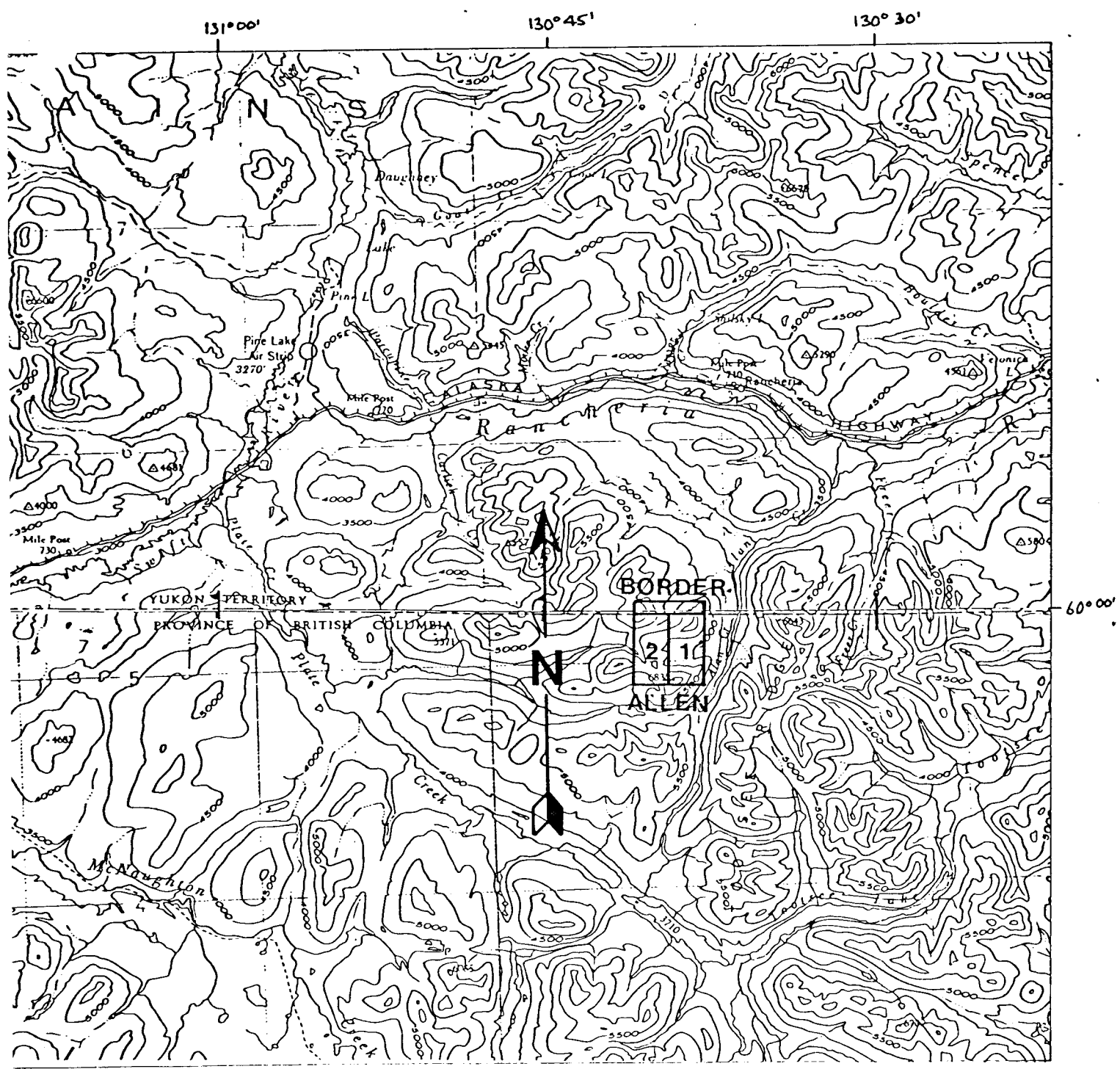


Figure 1
Location and Access of BORDER/ALLEN Claims
N.T.S. 104-O/15E-105B/2
SCALE: 1:250,000

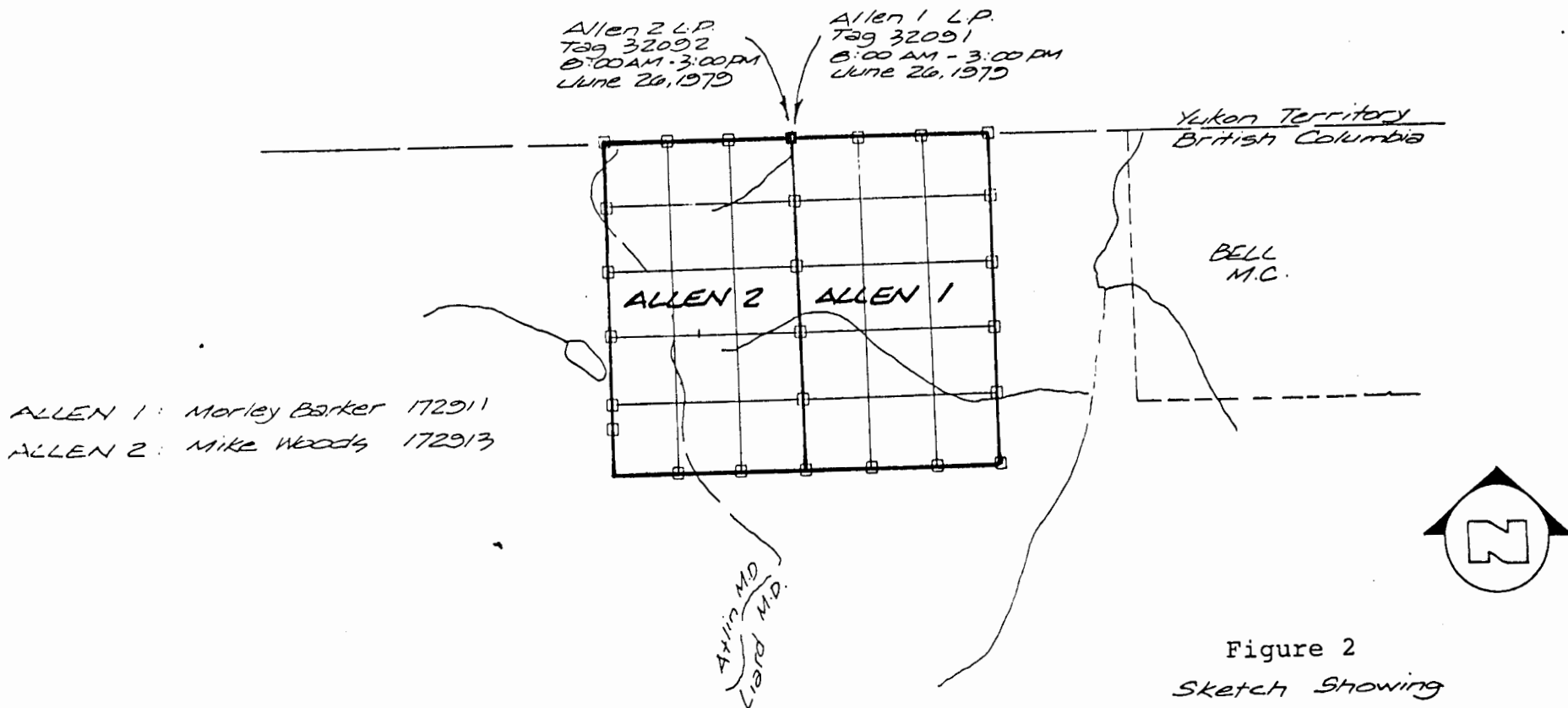
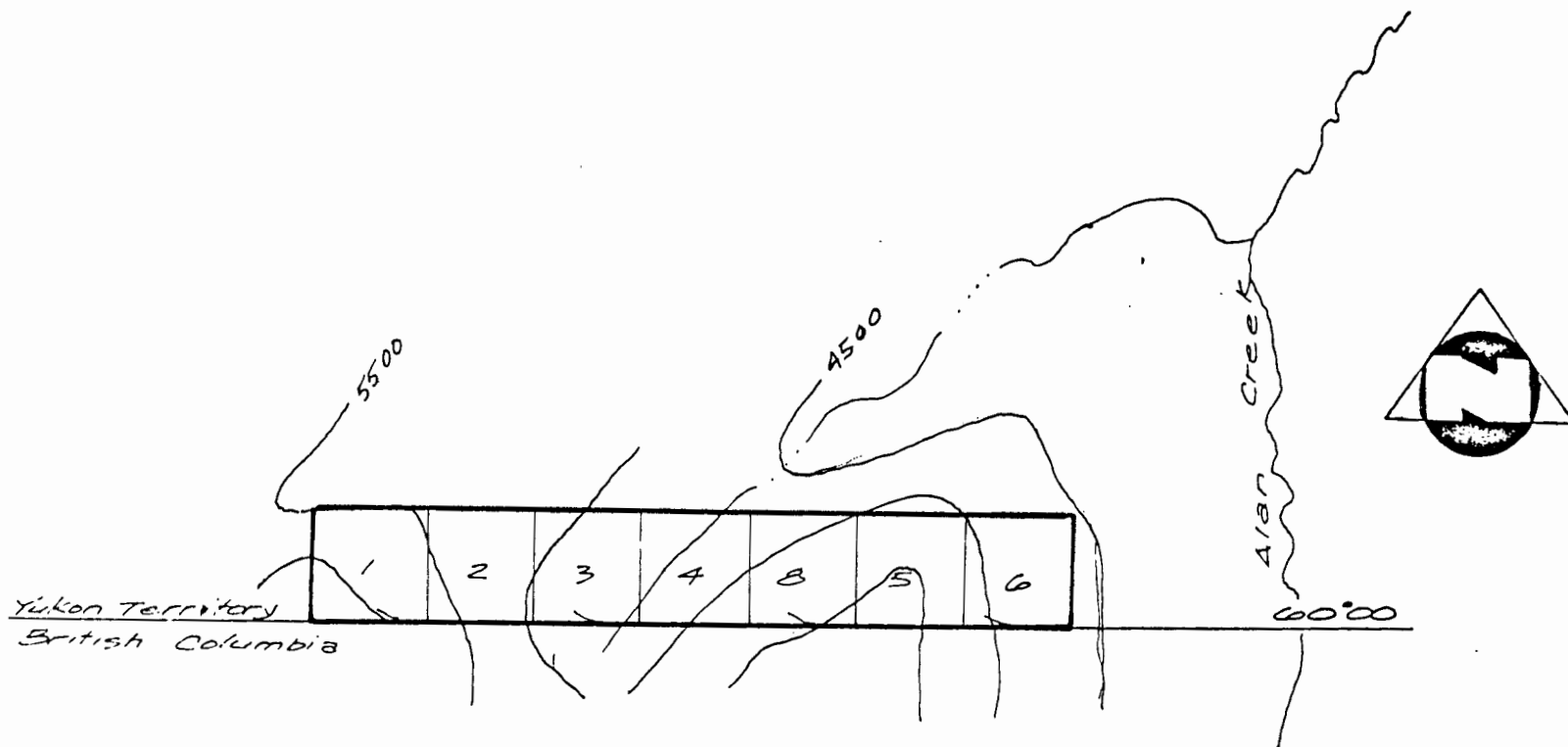


Figure 2
Sketch Showing
ALLEN 1 AND 2
MINERAL CLAIMS
Map Sheet 104 0/15 E
Liard Mining Division
Scale 1:50,000

- Legal Post
- Identification / Corner Post



- 5 -

Figure 3

Staking Sketch Showing
BORDER 1-B
MINERAL CLAIMS

Watson Lake Mining District
 Map sheet 105 B/2,
 SCALE 1" = 2640'

Border 1-B Morley Barker June 26 1979

of possible skarn type have been located. The Jennings River (104-0) map sheet was mapped by the Geological Survey of Canada from 1944 to 1967. (Gabrielse, 1968). The Wolf Lake (105 B) map sheet was mapped by the G.S.C. from 1951-1959 (Poole, et al, 1960). In 1978 the G.S.C. conducted reconnaissance stream sediment and water sampling over both map sheets. Results for Jennings River (104-0) were released on June 8th, 1979 as Open File 561. Results for Wolf Lake (105 B) were released on June 15th, 1979 as Open File 563. The claims were staked on June 26th, 1979 to cover a multi-site stream sediment Cu-Pb-Zn-Ag-U anomaly (26 ppm Cu, 72 ppm Pb, 200 ppm Zn, 1.0 ppm Ag, 68.7 ppm U).

V. WORK COMPLETED - 1979

5.1 Staking

The BORDER and ALLEN Claim groups were staked on June 26, 1979 by MBW Surveys of Whitehorse, Y.T. for Canadian Oxy. The BORDER Claims comprise 8 claims covering an area of 413 acres or 0.6 mi² (1.6 km²). The ALLEN Claims comprise a total of 30 units covering an area of 1854 acres or 2.9 mi² (7.5 km²). Anniversary date for the BORDER Claims is July 6th. Anniversary date for the ALLEN Claims is July 16th.

5.2 Geological Mapping

Wallis, Sacks and Hooper visited the BORDER-ALLEN Claims on July 8th, 1979. Sacks and Hooper conducted geological mapping and prospecting traverses over the claims on July 15th, 1979. A total of 2.4 man-days of work were performed.

5.3 Geochemistry

A total of 2 heavy mineral, 21 stream sediment, 21 stream water and 14 soil samples were collected by Jermakowicz, Pelletier and Zayachivsky, all of Canadian Oxy. A total of 22 rock samples were collected during the mapping survey. All samples were sent to Chemex Labs Ltd., North Vancouver, B.C. for geochemical analysis. Analytical results are listed in Appendix I. A total of 3.0 man-days of work were performed.

5.4 Summary of Work Completed

<u>Type of Work</u>	<u>Man Days</u>	<u>No. Samples</u>	<u>No. Analyses</u>												
			<u>Cu</u>	<u>Mo</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag</u>	<u>Au</u>	<u>U</u>	<u>Th</u>	<u>Sn</u>	<u>W</u>	<u>F</u>	<u>As</u>	<u>Total</u>
Geological Mapping	2.4														
Geochemistry	3.0														
i) Rock		22	-	-	22	22	22	-	22	-	-	-	-	-	88
ii) Heavy Min.		2	2	2	2	2	2	2	2	2	2	2	-	-	20
iii) Sediment		21	21	21	21	21	21	-	21	21	21	21	-	-	189
iv) Water		21							21				21	21	63
v) Soil		14	14	14	14	14	14	-	14	14	14	14	-	-	126
Helicopter Hrs. (Bell 206-B)	2.6														
TOTAL	5.4	80													486

(2.6 hrs)

5.5 Names and Addresses of Personnel

Dr. R.H. Wallis Canadian Occidental Petroleum Ltd., Minerals Division, 311 - 215 Carlingview Drive, Rexdale, Ontario M9W 5X8	Chief Geologist
E.J. Sacks, M.Sc. Same address as above.	Project Geologist
J. Hooper Same address as above.	Senior Assistant
E. Jermakowicz Same address as above.	Junior Assistant
C. Pelletier Same address as above.	Junior Assistant
B. Zayachivsky Same address as above.	Junior Assistant
Dr. C.F. Gleeson C.F. Gleeson and Associates, Ottawa, Ontario	Consulting Geochemist

VI. GEOLOGY

6.1 General Geology

Mapping by Gabrielse (1968) and Poole et al. (1960) shows the BORDER-ALLEN Claims to be underlain by Mid-Cretaceous, biotite quartz-monzonite and granodiorite of the Cassiar batholith.

Mapping by Canadian Oxy geologists shows the BORDER-ALLEN Claims to be underlain by variously brecciated and generally foliated, biotite + muscovite quartz-monzonite and granodiorite cut by

chloritized, sausseritized, kaolinized and limonitized fracture zones containing quartz-pyrite veining. The degree of brecciation and fracturing, which are accompanied by augen development, appears to increase northwards over the claim group.

6.2 Table of Formations (PLAN 1)

<u>Unit</u>	<u>Description</u>
Di	Diorite, diabase
V	Andesite
mbQM	Muscovite-biotite granodiorite, quartz-monzonite

6.3 Description of Rock Units

Unit mbQM - Muscovite-biotite granodiorite, quartz-monzonite.

This unit comprises fine to medium-grained, white, foliated and locally brecciated rock, containing plagioclase (20 - 40%), K-feldspar (30 - 60%), quartz (10 - 30%), biotite (1 - 10%) and muscovite (trace to 10%). Alteration is minor except in the vicinity of several 150T fracture zones in which augen texture develops and the rock is pervasively chloritized, limonitized, sausseritized and kaolinized, and which contain quartz-pyrite veining. The rock is locally K-feldspar megacrystic.

Unit V - Andesite

Occurring in one outcrop in the extreme southern part of the claims, this unit comprises a fine-grained rock containing quartz eyes and rounded feldspar grains. Contacts with the quartz-monzonite are sharp and margins are not chilled in either unit.

Unit Di - Diorite, diabase

This unit is volumetrically negligible and is scattered over the claims. The rock consists of acicular, white, plagioclase crystals suspended in an aphanitic pyroxene and/or hornblende groundmass. The groundmass is generally highly chloritized.

6.4 Structure

Foliation is common and is due to alignment of micas, particularly muscovite, and to flattening and stretching of quartz and feldspar grains. Foliation occurs at 130T to 150T/subvertical.

Strong jointing occurs at 150T and 060T. The 150T set includes the altered fracture zones in which pervasive chloritization, limonitization, kaolinization, brecciation, development of augen texture and introduction of quartz-pyrite veining occur. Brecciation occurs throughout the claims, however, appears to be strongest in the northern portions of ALLEN 1 and 2, especially in the vicinity of the fracture zones.

6.5 Metamorphism and Alteration

Metamorphism appears to be primarily cataclastic in nature, however, the development of foliation implies some plastic stress during or post-intrusion. i.e. Mid-Cretaceous or later.

Alteration is primarily confined to that mentioned above within the fracture zones. Some minor chloritization of biotite outside of these zones may be related to weathering.

6.6 Economic Geology

Possibilities for economic mineralization would likely involve hydrothermal, structurally controlled types including; Ag-Pb-Zn-U sulphides within the fracture zones, stockwork U-Mo-W veining and Pb-Zn-Ag-U skarns developed in included meta-sediments (speculation only).

VII. GEOCHEMISTRY

Mean, possibly anomalous and probably anomalous levels for each element in stream sediment, stream water and heavy mineral samples were determined at the 50th, 84th and 97th percentile levels of cumulative frequency distributions constructed from the combined Project WATSU regional follow-up data. In the case of soil samples, the combined data from all claim groups examined during Project WATSU were used. In the case of rock samples, data pertaining to trace element contents for various rock types published by Levinson (1974 - Table 2-1) was used. Analytical results are listed in Appendix I. Sampling and laboratory procedures are listed in Appendix III.

7.1 Rock Geochemistry (PLAN 2)

All samples were crushed and then analysed for Pb, Zn, Ag and U.

- a) 11.5 ppm U, 2.2 ppm Ag and 198 ppm Zn occur in brecciated, muscovite-biotite quartz-monzonite and quartz veining from a 150T fracture zone in west-central ALLEN 1.

- b) Muscovite-biotite granodiorite elsewhere over the claims contains 0.5 to 4 ppm U, up to 148 ppm Zn and up to 58 ppm Pb.

7.2 Heavy Mineral Geochemistry (PLAN 3, 4, 5)

Samples were analysed for Cu, Pb, Zn, Ag, Mo, Au, U, Th, Sn and W.

- a) 128 ppm Cu, 24 ppm Mo, 1700 ppm Pb, 312 ppm Zn, 6.4 ppm Ag and 40 ppm U occur in the northern part of the claims in a stream draining muscovite-biotite quartz-monzonite.

- b) 112 ppm U, 440 ppm Th (U/Th = .3) and 150 ppm W occur in the southeast corner of ALLEN 1.

7.3 Stream Sediment Geochemistry (PLAN 3, 6, 7, 8)

Samples were collected at 1000 ft. (350 m) intervals and the -80 mesh fractions analysed for Cu, Mo, Pb, Zn, Ag, U, Th, Sn and W.

- a) 52 to 60 ppm Pb, 154 to 230 ppm Zn, 24 to 76 ppm U and 2 to 15 ppm W occur in the northern part of the claims.

- b) 44 to 68 ppm Pb, 140 to 275 ppm Zn, 10 to 130 ppm U, 20 to 26 ppm Th, 0.2 to 2.0 ppm Ag and up to 5 ppm W occur in central ALLEN 1 and 2.

7.4 Stream Water Geochemistry (PLAN 3, 9)

Water samples were collected at each sediment site and analysed for pH and specific conductivity (S.C.) in the field, as

TABLE 1

Mean, Possibly Anomalous and Probably Anomalous Levels -
Soils, Sediments, Waters, Heavies.

Note: levels chosen from cumulative frequency curves at 50th, 84th and 97th percentiles, respectively.

A. Heavy Minerals

	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Mo	ppb Au	ppm Sn	ppm W	ppm U	ppm Th
Mean	24	17	75	.05	1.5	<10	2.3	15	3.8	44
Poss. Anom.	63	89	200	.38	3.5	19	38	60	26	330
Prob. Anom.	165	280	440	.95	8.5	3150	300	160	120	1200

B. Stream Sediments

	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Mo	ppm Sn	ppm W	ppm U	ppm Th
Mean	11	5	58	<.1	<1	<1	<1	2.5	13
Poss. Anom.	28	21	115	<.1	3	2	5	17	29
Prob. Anom.	54	59	320	1	11	5	16	38	50

C. Soils

	ppm Cu	ppm Pb	ppm Zn	ppm Ag	ppm Mo	ppm Sn	ppm W	ppm U	ppm Th
Mean	8	8	48	<.1	<1	<1	<1	2	14
Poss. Anom.	22	32	115	.1	2.5	1	7.5	7	36
Prob. Anom.	120	150	270	.8	5	2	40	30	75

D. Stream Waters

	ppb U	ppb F	m.mhos/cm S.C.
Mean	.25	19	18
Poss. Anom.	.85	100	46
Prob. Anom.	2.5	210	100

well as U, F and As in the laboratory.

- a) High background U (0.6 to 1.0 ppb) occurs over the claims.
- b) pH is high for a granitic terrain (8.2 to 9.9), suggesting significant alteration, possibly involving some carbonate.

7.5 Soil Geochemistry (PLAN 3, 10, 11, 12)

Soils were collected from talus fines along one traverse through the claims at 1000 ft. (350 m) intervals. -80 mesh fractions were analysed for Cu, Mo, Pb, Zn, Ag, U, Th, Sn and W.

- a) 64 to 92 ppm Pb, 146 to 250 ppm Zn, 4 to 34 ppm U and one 24 ppm Cu high occurs over 5000 ft. (1525 m) in east-central ALLEN 2.
- b) 25 ppm W, 26 and 36 ppm Pb; 108 and 120 ppm Zn occur in two adjacent samples in northeastern ALLEN 1.

VIII. CONCLUSIONS

1. The BORDER-ALLEN Claims are underlain by a differentiated, muscovite-biotite quartz-monzonite intrusive of Mid-Cretaceous age. The intrusive is foliated, pervasively brecciated and is cut by altered 150T fracture zones containing quartz-pyrite veining.

2. Rocks over the claims contain anomalous Pb, Zn, Ag and U, especially within fracture zones.

3. Strong and persistent soil, sediment and heavy mineral Pb-Zn-Ag-U-W-Mo anomalies originate in the claims, particularly in ALLEN 2 and southern ALLEN 1.

4. Potential mineralization would likely involve structurally controlled, hydrothermal Pb-Zn-Ag veins in fracture zones, U-W-Mo stockworks and Pb-Zn-Ag-U skarns within included metasediments.

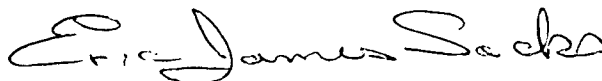
IX. RECOMMENDATIONS

1. Systematic geological mapping and prospecting should be conducted using airphoto blow-up bases.

2. Systematic rock, soil geochemical and scintillometer surveys should be conducted.

3. Airphoto interpretation to delineate structure should be carried out prior to fieldwork.

Respectfully submitted,



Eric James Sacks, M.Sc.

Toronto, Ontario

January, 1980

APPENDIX I

ANALYTICAL RESULTS



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NORTH VANCOUVER, B.C.
CANADA V7J2C1
TELEPHONE: 984-0221
AREA CODE: 604
TELEX: 04-352587

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49029B

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division,
Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ontario M9W 5X8

INVOICE NO. 32460

RECEIVED July 24/79

ANALYSED Sept. 7/79

ATTN: PROJECT: Watsu-Alan HEAVY MINERALS CC: Sacks

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM Sn	PPM W	PPB Au	PPM U
79WT0951	128	24	1700	312	6.4	NSS	NSS	NSS	40
79WT0116	4	3	84	32	0.2	9	150	<10	112

	Total	-10 Fraction	Mag. Heavies	Non Mag. Heavies
79WT0951	798	241	0.14	0.30
79WT0116	497	441	5.70	20.26



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CANADIAN TESTING
ASSOCIATION

CERTIFIED BY:

Hart Biddle



212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: 984-0221
AREA CODE: 604
TELEX: 043-52597

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CERTIFICATE NO. 49030

TO: Canadian Occidental Petroleum Ltd.,
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Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ont.

INVOICE NO. 31610

RECEIVED July 24/79

ATTN: WATSU-ROCKS

CC. E. Sacks

ANALYSED Aug. 3/79

SAMPLE NO.	PPM Pb	PPM Zn	PPM Ag	PPM U	PPM F
ES-LICK-1A	4	48	0.1	2.5	440
1B	4	26	0.6	10.0	225
1C	8	72	0.1	4.0	450
2	4	36	0.1	1.5	380
3A	8	102	0.1	5.0	530
3B	6	74	0.1	2.0	430
4	6	20	0.1	3.0	510
ES-LICK-5	4	58	0.1	1.5	610
JH-LICK-1	4	72	0.1	1.5	520
2	24	52	0.2	1.5	350
3	14	70	0.2	3.5	770
4	4	40	0.2	1.5	490
5	30	110	0.2	1.5	305
6	6	12	0.1	1.0	145
7	8	32	0.1	2.5	220
JH-LICK-8	10	60	0.1	2.5	560
JH-BA -1	1	42	0.1	2.5	
2	10	54	0.1	0.5	
3	2	46	0.1	4.0	
4	1	76	0.1	1.5	
5	12	92	0.1	0.5	
6	1	74	0.1	1.5	
7	6	78	0.1	2.0	
8	2	26	0.1	4.0	
8A	1	20	0.1	3.5	
8B	54	148	0.1	0.5	
JH-BA -9	2	56	0.2	1.5	
ES-BA -1	10	36	0.1	1.5	
2	10	28	0.1	5.5	
3	8	34	0.1	1.5	
4	6	22	0.1	1.0	
5A	10	114	0.4	5.0	
5B	4	68	0.1	6.5	
5C	4	76	2.2	1.0	
5D	26	94	1.2	11.5	
ES-BA -5E	6	198	2.2	1.0	
JH-PLATE-1	2	6	0.4		
2	12	12	0.6		
3	2	18	0.2		
-PLATE-4	4	4	0.1		

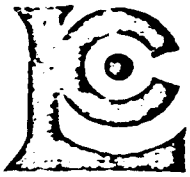
ES BA -6 further.



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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49032

TO: Canadian Occidental Petroleum Ltd.,
 Minerals Division,
 Ste. 311-215 Carlingview Dr.,
 Rexdale, Ont.

INVOICE NO.

RECEIVED July 24/79

ATTN: WATSU-ROCKS

CC. E. Sacks

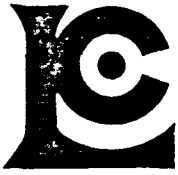
ANALYSED

SAMPLE NO. :	PPM Cu	PPM Pb	PPM Zn	PPM Ag	PPM U	PPM Th	PPM F	PPM W
ES-SHAR(5)-4	36				1.0		770	1
5A	720				89		1250	7
5B	555				77		970	2
ES-SHAR(5)-6	120				38		1200	1
JH-SHAR(7)-1	22				3.5		470	
1A	54				0.5		40	
2	6				2.0		450	
3	20				2.0		400	
4	6				2.5		440	
5	2				2.5		410	
6	4				1.5		410	
JH-SHAR(7)-7	2				2.5		470	
ES-SHAR(7)-1	2				1.5		355	
J RAN -1		6	48	0.1	2.0			
2		2	80	0.1	1.5			
3		4	46	0.1	2.0			
4		10	60	0.1	3.5			
5		30	64	0.1	3.5			
JH-RAN -6		4	42	0.1	2.0			
ES-RAN -1A		34	110	0.1	3.0			
1B		36	58	0.2	1.0			
2		6	56	0.1	3.5			
3		1550	200	> 20	0.5			
4		58	116	0.2	2.5			
ES-RAN -5		14	78	0.1	7.0			
ES-BA -6		4	74	0.1	1.5			



MEMBER
 CANADIAN TESTING
 ASSOCIATION

CERTIFIED BY: *Heidi Buehler*



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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 48996

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division,
Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ont.

INVOICE NO. 31609

RECEIVED July 24/79

ATTN: WATSU-ALLEN-SOIL

CC. E. Sacks

ANALYSED Aug. 3/79

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM Sn	PPM W	PPM U	PPM Th N.A.
79 WT 0470	10	1	50	102	0.1	1	5	4.5	30
0471	12	1	26	102	0.1	1	4	3.0	25
0472	18	1	36	120	0.1	1	25	5.5	25
0473	14	1	26	108	0.1	1	22	2.5	24
0474	10	1	24	78	0.1	1	2	3.5	22
0475	16	1	20	98	0.1	1	2	4.0	22
0476	10	1	18	72	0.1	1	2	3.0	16
0477	26	1	92	250	0.2	2	3	16.5	22
0479	24	1	68	152	0.2	1	2	14.5	21
0480	20	1	64	148	0.1	1	2	34	25
0482	12	1	68	146	0.6	1	3	12.0	30
0483	6	1	22	76	0.2	1	2	5.0	27
0484	4	1	18	38	0.1	1	2	3.5	16
79 WT 0485	8	1	44	120	0.6	1	3	4.0	24



MEMBER
CANADIAN TESTING
ASSOCIATION

CERTIFIED BY:

Hart Biddle



CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: ~~604-291-1111~~
AREA CODE: 604
TELEX: 043-52597

884-0221

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 49002

TO: Canadian Occidental Petroleum Ltd.,
Minerals Division,
Ste. 311 - 215 Carlingview Dr.,
Rexdale, Ont.

INVOICE NO. 31616
34007 - Th only
RECEIVED July 24/79
ANALYSED Aug. 6/79

ATTN: WATSU-ALAN-STREAM SILT CC. E. Sacks

SAMPLE NO. :	PPM Cu	PPM Mo	PPM Pb	PPM Zn	PPM Ag	PPM Sn	PPM W	PPM U	PPM Th
79 WT 0478	22	1	66	270	0.4	1	5	10.0	21
0481	16	2	56	178	1.0	1	3	15.5	25
0104	10	1	44	148	0.6	1	2	32	22
0105	8	1	58	230	0.8	1	1	130	20
0106	8	1	68	245	1.0	1	1	79	23
0107	8	2	68	265	1.2	1	3	83	23
0108	10	2	56	230	1.4	1	2	102	20
0109	16	1	68	275	1.0	1	7	82	26
0110	16	2	64	260	2.0	1	5	98	21
0111	16	2	62	250	1.0	1	4	89	26
0112	14	2	60	230	1.0	1	3	85	22
0113	14	1	56	200	0.4	1	3	78	22
0114	12	2	46	190	0.2	1	2	84	15
0115	10	2	48	168	0.4	1	5	52	24
0116	10	2	52	188	0.2	2	3	62	21
0946	10	1	56	154	0.1	1	2	24.0	23
0947	10	1	54	156	0.2	1	3	28	21
0948	16	2	60	190	0.6	1	3	40	22
0949	16	2	52	184	0.4	2	5	38	23
0950	22	1	54	230	0.2	2	15	76	22
79 WT 0951	18	2	56	200	0.2	1	11	45	23



MEMBER
CANADIAN TESTING
ASSOCIATION

CERTIFIED BY: *J. F. Mabbam*

APPENDIX II

ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

APPENDIX II - ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

SAMPLE NO. (Scint cps URTEC TCI)	NAME	% COMPOSITION						Description	ANALYSIS			
		Plag	Ksp	Qtz	Bi	Ms	Other		ppm Pb	ppm Zn	ppm Ag	ppm U
BORDER-1	Biotite muscovite quartz- monzonite	30	40	25	1-2	1-2	-	Medium-grained, white, hypidiomorphic granular, slightly foliated.	4	34	0.1	4
ES-BA-1 (250-275)	Brecciated biotite quartz- monzonite	25	40	15	10	-	-	Medium-grained, brec- ciated, Kspar larger than plag. + qtz (1/2 cm vs. 1/4 cm), biotite gdmass slightly chloriti- zed.	10	36	0.1	1.5
ES-BA-2 (290)	Brecciated and foliated biotite quartz- monzonite	25	50	15	5- 10	-	limonite stain	Medium-grained, K-feld- spar megacrystic, foliated and brecciated pervasive limonite stain turns fspar orange.	10	28	0.1	5.5
ES-BA-3 (290)	Brecciated and foliated biotite quartz- monzonite	20	50	10	5- 10	-	-	Medium-grained, perthite- megacrystic, foliated and brecciated, fresh biotite gdmass.	8	34	0.1	1.5

APPENDIX II - ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

SAMPLE NO. (Scint cps URTEC TC1)	NAME	% COMPOSITION						Description	ANALYSIS			
		Plag	Ksp	Qtz	Bi	Ms	Other		ppm Pb	ppm Zn	ppm Ag	ppm U
ES-BA-4 (250)	Foliated muscovite biotite quartz- monzonite	30	30	15- 20	2- 5	10	-	Fine to medium-grained, hypidiomorphic granular, even-grained, foliated, muscovite-biotite gdmass is fresh.	6	22	0.1	1
ES-BA-5a (230)	Foliated biotite muscovite (augen ?) quartz- monzonite	40	30	15	5	5	-	Medium-grained, perthite- megacrystic with foliated and brecciated bi-ms-qtz- plag gdmass.	10	114	0.4	5
ES-BA-5b (230)	Foliated muscovite -biotite quartz- monzonite	30	60	10	1-2	5	Trace lim- onite	Fine to medium-grained, hypidiomorphic granular, foliated, cut by quartz stringers; limonite stain on fspars, qtz.	4	68	0.1	6.5

APPENDIX II - ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

SAMPLE NO. (Scint cps URTEC TCl)	NAME	% COMPOSITION						Description	ANALYSIS			
		Plag	Ksp	Qtz	Bi	Ms	Other		ppm Pb	ppm Zn	ppm Ag	ppm U
ES-BA-5C (230)	Muscovite biotite quartz- monzonite in contact with pyritic quartz vein.	30	50	10	1-2	1-2	-	Fine to medium-grained, hypidiomorphic granu- lar, slightly foliated; in sharp contact with quartz vein containing fragments of above plus pods + stringers of cubic to massive pyrite.	4	76	2.2	1
ES-BA-5d (230)	Brecciated and foliated biotite quartz- monzonite.	30	50	10	1-2	-	-	Fine grained, hypidio- morphic granular, foliated, brecciated, limonite stain.	26	94	1.2	11.5
ES-BA-5e (230)	Quartz vein.							Bull quartz with perfectly terminated quartz crystals in vuggy sections; limonite stain dark orange.	6	198	2.2	1

APPENDIX II - ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

SAMPLE NO. (Scint cps URTEC TC1)	NAME	% COMPOSITION						Description	ANALYSIS			
		Plag	Ksp	Qtz	Bi	Ms	Other		ppm Pb	ppm Zn	ppm Ag	ppm U
ES-BA-6 (140)	Chloritic pyroxene- hornblende diorite or diabase							Fine-grained, chloritic, euhedral plag. in pyroxene-hornblende gdmass, orange weather- ing.	4	74	0.1	1.5
JH-BA-1	Foliated muscovite -biotite quartz- monzonite	30	30	30	1-2	1-2	-	Fine to medium-grained, hypidiomorphic granular, foliated.	1	42	0.1	2.5
JH-BA-2	Foliated and brec- ciated muscovite -biotite quartz- monzonite	30	20	30	1-2	5	-	Fine-grained, foliated, slightly brecciated, slight chlorite altera- tion of mafics.	10	54	0.1	0.5
JH-BA-3	Foliated biotite quartz- monzonite	25	50	20	2-3	-	-	Medium-grained, Kspar- megacrystic, foliated.	2	46	0.1	4

- 30 -

APPENDIX II - ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

SAMPLE NO. (Scint cps URTEC TCI)	NAME	% COMPOSITION						Description	ANALYSIS			
		Plag	Ksp	Qtz	Bi	Ms	Other		ppm Pb	ppm Zn	ppm Ag	ppm U
JH-BA-4	Brecciated and foliated biotite quartz- monzonite	30	30	30	5	-	Trace Sphene	Medium-grained, Kspar- megacrystic, brecciated and foliated.	1	76	0.1	1.5
JH-BA-5	Diabase contacting biotite- fspar- qtz- epidote breccia						Epidote chlorite	Fine-grained chloritic diabase contacting brecciated fspar- biotite-epidote-quartz rock; gradational contact.	12	92	0.1	0.5
JH-BA-6	Foliated biotite grano- diorite	10	40	30	10- 5	tr	-	Fine-grained, foliated, hypidiomorphic granular.	1	74	0.1	1.5
JH-BA-7	Biotite quartz- monzonite contacting basic volcanic	30	50	20	1-2	-	-	Medium-grained, Kspar- megacrystic intrusive in sharp contact with dark grey basic volcanic.	6	78	0.1	2

APPENDIX II - ROCK SAMPLE DESCRIPTIONS, TRACE ELEMENT CONTENTS

SAMPLE NO. (Scint cps URTEC TC1)	NAME	% COMPOSITION						Description	ANALYSIS			
		Plag	Ksp	Qtz	Bi	Ms	Other		ppm Pb	ppm Zn	ppm Ag	ppm U
JH-BA-8	Muscovite biotite quartz- monzonite	30	40	20	1-2	1-2	-	Medium-grained, hypidiomorphic granu- lar.	2	26	0.1	4
JH-BA-8a	Muscovite -biotite quartz- monzonite	30	40	20	1-2	1-2	-	Medium-grained, hypidiomorphic granu- lar, foliated.	1	20	0.1	3.5
JH-BA-8b	Diabase							Very dark grey, few acicular crystals of plagioclase in aphan- itic groundmass.	54	148	0.1	0.5
JH-BA-9	Foliated biotite- quartz- monzonite	30	40	20	2-3	-	-	Medium-grained, foliated, even-grained.	2	56	0.2	1.5

APPENDIX III

SAMPLING AND LABORATORY PROCEDURES

Appendix III - Sampling and Laboratory Procedures

I. SAMPLING PROCEDURES

A) Heavy Minerals

1. A sample site is selected which exhibits maximum sorting of stream bed material. Active (below water) or previously active (dry now but previously below water) sites may be chosen. Leading edges or sides of gravel bars with large boulders are most attractive. In practice, the ideal case is rare and one chooses the best possible site.

2. Gravel and cobble material is shoveled into a large (18" to 24") gold pan into which 1/4" holes have been drilled. The material is vigorously shaken in still water so that - 1/4 in. material passes the screen into a second, matching pan. Enough -1/4 in. material is collected to fill an 18" x 24" poly bag (usually one large pan or two smaller ones). The -1/4" material is returned to camp.

3. The - 1/4 in. material is panned to achieve a concentrate of heavy minerals and aggregates containing heavy minerals. Approximately 80% of the original material (20 - 25 lbs) is discarded while a 1 - 2 lb. concentrate is obtained. The concentrate is sealed in a plastic or cloth bag (cloth is preferred as it allows

the sample to dry, thus reducing shipping weight) and then sent to the laboratory for geochemical analysis.

B) Stream Sediment

1. A presently or previously active stream site is selected which exhibits minimum sorting ie. quiet water, and accumulation of fine sandy and silty material. If the stream is too active, material can be obtained from bank-moss which acts as a trap, or by digging out the lee of large boulders.
2. Three to four handfuls of material is collected and after squeezing to remove excess water is placed in high wet-strength, heavy duty, prenumbered kraft envelopes. The samples are dried in the field and then sent to the laboratory for geochemical analysis.

C) Stream Water

1. A 4 oz. poly bottle is rinsed with the sample site water at least three times then filled fully and tightly capped. The sample is tested in the field for pH and specific conductivity, then sent to the laboratory for geochemical analysis.
2. Care should be taken to avoid contamination by always collecting waters up-stream from a heavy mineral or sediment sample site.

D) Soil

1. 'B' horizon or talus fine material is sampled.
2. Three to four handfuls of material are collected into heavy duty, high wet-strength kraft envelopes which are dried in the field and then sent to the laboratory for analysis.

E) Sample Site Information Card

1. At each soil or stream sample site, an 80 column field data card is completed. The sampler records such information as sample number, location and type, depth of stream, sample composition, vegetation, drainage, etc. Separate cards are used for stream and soil samples in order to record pertinent information.

II. Laboratory Procedures

A. Sample Preparation

i) Heavy Minerals

1. Samples dried and weighed.
2. Screen - 10 mesh material from sample and weigh; weigh and retain +10 mesh material left on screen.
3. Use -10 mesh fraction for heavy liquid separation.
4. Transfer -10 mesh (fine) fraction into a 1000 ml. separatory funnel containing 200 mls. of tetrabromoethane (S.G. 2.96)
5. Shake sample gently in heavy liquid. Particles of fines adhering to sides of the separatory funnel can be washed into the heavy liquid by slowly rotating the funnel at an oblique angle. The "heavies" (S.G. >2.96) will slowly settle to the bottom of the heavy liquid.
6. Drain the "heavies" into a small filter funnel. Drain excess heavy liquid and light materials into a separate filter funnel. Collect all heavy liquid into a waste receiving bottle.
7. Save light minerals (S.G. <2.96). Wash "heavies" fraction with methanol to remove residual tetrabromoethane. Use the same procedure on light minerals fraction. Dry both fractions and weigh. Retain the "lights" in a suitable sealed container. Save 0.5 gm of "heavies" in a plastic vial for visual examination.
8. Pulverize the remaining "heavies" in an agate mortar and pestle and homogenize before weighing for analyses.

9. Analyse the "heavies" powder for appropriate elements. The number of elements analysed for is determined by the amount of "heavy" material obtained in separation.

ii) Stream Sediments

1. Samples are sorted and dried at 50^oc for 12 to 16 hours.
2. Dried material is then screened to obtain the -80 mesh (177 micron) fraction. The rest of the material is discarded.
3. -80 mesh fraction material is weighed and analysed for appropriate elements.

iii) Soils

Same procedure as for stream sediments.

iv) Rocks

1. Entire sample is crushed.
2. If necessary (>250 gms.). The sample is split on a Jones splitter, the reject is retained for a short period.
3. The split fraction is pulverized in a ring grinder such that 90% passes a 200 mesh (74 micron) sieve.
4. The -200 mesh material is weighed and analysed for the appropriate elements.

v) Waters

See individual element descriptions for U and F.

B. Elemental Analyses

i) ppm Copper, Lead, Zinc, Silver, Molybdenum (Atomic Absorption)

1. A 1.0 gm portion of -80 mesh soil or stream sediment or -200 mesh rock flour or pulverized "heavies" is digested in concentrated, hot, perchloric - nitric acid (HClO₄-HNO₃) for 2 hours.

2. Digested sample is cooled and made up to 25 mls. with distilled water.

3. Solution is mixed and solids allowed to settle.

4. Cu, Pb, Zn Ag and Mo are determined by atomic absorption, using background correction for Pb and Ag analyses.

<u>Element</u>	<u>Bkgd. Corr.</u>	<u>Flame Type</u>	<u>Wave Length hm</u>	<u>Detection Limit</u>	<u>Chemex Standard</u>	<u>+ 1 Std. Deviation</u>
Cu	No	A	324.7	1 ppm	71 ppm	+ 3
Pb	Yes	A	217.0	1 ppm	59 ppm	+ 1
Zn	No	A	213.8	1 ppm	52 ppm	+ 3
Ag	Yes	A	328.1	0.2 ppm	8.5 ppm	+ 0.5
Mo	No	N	313.3	1 ppm	25 ppm	+ 1

A = Air acetylene flame.

N = Nitrous oxide - acetylene flame.

ii) ppm Tin (Sn) (Atomic Absorption)

1. A 1.0 gm sample of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is scinttered with ammonium iodide.

2. The resulting tin-iodide is leached with a dilute HCl - ascorbic acid solution.

3. The TOPO complex is then extracted into MIBIC (Methyl isobutyl ketone) and analysed via atomic absorption.

4. Detection limit: 1 ppm Sn

iii) ppm Tungsten (W) (Colourimetric)

1. 0.5 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is fused with potassium bisulfate and leached with HCl.

2. The reduced form of W is complexed with toluene 3, 4 dithiol and extracted into an organic phase.

3. The resulting colour is visually compared to similarly prepared standards. (Colourimetric method)

4. Detection limit: 2 ppm W

iv) ppb Gold (Au) (Atomic Absorption)

1. A 5 gm sample of -200 mesh rock flour or pulverized "heavies" is ashed at 800^oc for 1 hour.

2. Ashed material is digested with aqua regia twice to dryness.

3. Digested material is taken up in 25% HCl.

4. Au is extracted as the bromide into MIBK and analysed via atomic absorption.

5. Detection limit: 10 ppb Au

v) ppm Thorium (Th) (Neutron Activation)

1. 1 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is weighed into a polyethelene vial and heat sealed.

2. Samples, along with standards, are then irradiated

for sufficient periods to receive a neutron dose of $1-3 \times 10^{10}$ to $10^{15}/\text{cm}^2$.

3. Following irradiation, samples are cooled for at least one week and thorium determined by the measurement of its characteristic gamma ray, using a semiconductor (Ge (Li)) detector.

4. Detection limit: 1 ppm Th

vi) Uranium (U) (Fluorimetry)

A) Uranium in soils, stream sediments, "heavies", rocks.

1. 1 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is digested with hot, $\text{HClO}_4\text{-HNO}_3$ to strong fumes of HClO_4 for approximately 2 hours.

2. The digest is diluted to volume and mixed.

3. An aliquot is extracted into MIBK with the acid of an aluminum nitrate-tetrapropyl ammonium hydroxide salting solution. (TPA)

4. Uranium in the MIBK is determined by evaporating a portion of the MIBK in a platinum dish and fusing with a mixture of $\text{Na}_2\text{CO}_3\text{-K}_2\text{CO}_3\text{-NaF}$.

5. The fluorescence of the fused flux is measured to determine the uranium content.

6. Detection limit: 0.5 ppm U

B) Uranium in Water

1. A portion of the sample is filtered to remove sediment (if necessary), is acidified and then evaporated to dryness.

2. Residue is leached with a small volume of HCO_3 .

3. Uranium in the leachate is extracted into MIBK, with the aid of TPAN salting solution.

4. Uranium is determined as for solid materials, above by fluorimetry.

5. Detection limit: 0.2 ppb U

vii) Fluorine (F) (Specific Ion Electrode)

A) F in soils, stream sediments, rocks, "heavies".

1. 0.25 gm of -80 mesh soil or stream sediment, -200 mesh rock flour or pulverized "heavies" is fused with a 2:1 $\text{NaCO}_3\text{-KNO}_3$ mixture.

2. The melt is leached with water and citric acid, adjusted to pH 5.5 and the activity measured with a fluoride specific ion electrode.

3. Detection limit: 10 ppm F

B) F in Waters (Potentiometric)

1. An aliquot of the sample is filtered and treated with an equal volume of Total Ionic Strength Adjustment Buffer (TISAB) consisting of glacial acetic acid, sodium chloride and cyclohexanediamine tetraacetic acid.

2. The resulting solution is stirred for 3 minutes to allow the fluoride electrode to stabilize.

3. The F concentration is read from a specific ion meter which is calibrated frequently with freshly prepared standard fluoride solutions.

4. Detection limit: 0.02 ppb F

viii) ppb Arsenic (As) (Atomic Absorption)

a) As in waters

1. An aliquot of water is acidified with HCl and then reduced with potassium iodine to reduce As (V) to As (III).

2. A portion of this solution is further reduced with sodium borohydride to arsine, AsH_3 .

3. The volatile arsine is swept into a heated cell in an atomic absorption spectrophotometer and decomposed to free arsenic to determine the arsenic concentration.

4. Detection limit: 2 ppb As

ix) pH

1. pH in waters was determined in the field, using a portable pH meter.

2. The meter was standardized by means of buffer solutions, every 10th sample to minimize meter drift.

x) Specific Conductivity (S.C.)

1. S.C. in waters was determined in the field, using a portable S.C. meter.

2. The electrode was washed in a standard water, after each determination, to minimize and standardize contamination.

APPENDIX IV

Comments of R.H. Wallis -

Examination of BORDER-ALLEN Claims

<u>ALAN AND BORDER CLAIMS</u>	105B 2 E 1/2	July 7th, 1979
Commodity (U+Pb+Ag)	104 O 15 E 1/2	RHW and E.S.

Landed at 5500' in south part of Border Claims. All claims above treeline, fairly rugged scree/talus slopes, "unorganized" granitic terrain.

No need for cut lines, just need blow-up of 1:50,000 and airphotos.

There is a washed out 4 X 4 road up Alan Creek from Alaska Hwy., passes within 1 mile east of claims.

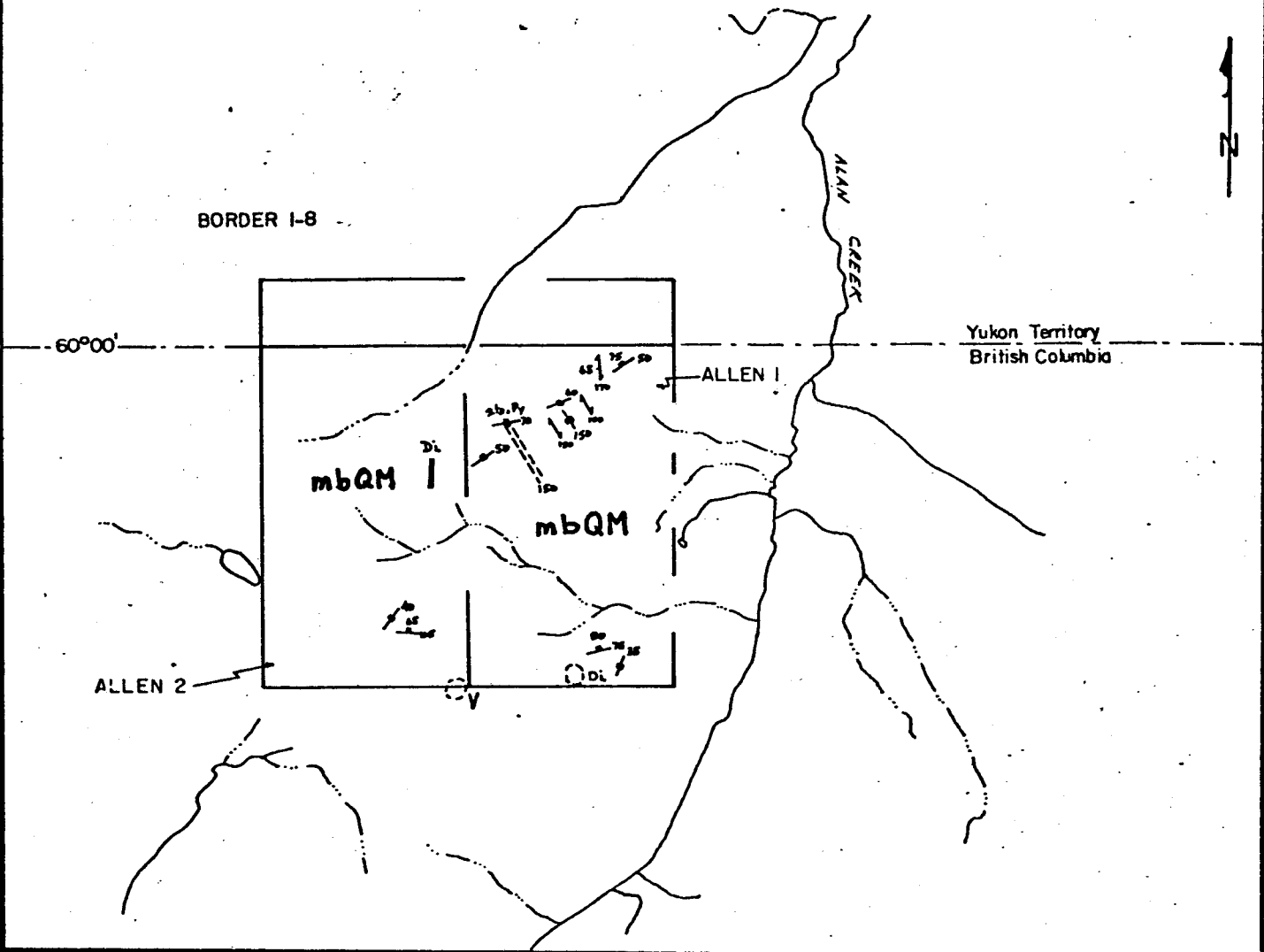
Rocktype - very even-grained biotite-muscovite granodiorite, with little to commend it in economic terms.

We did not visit cirques at head of G.S.C. anomalous creeks.

APPENDIX V - REFERENCES

- Gabrielse, H. (1968): Geology of Jennings River Map-Area, British Columbia (104-0); G.S.C. Paper 68-55.
- G.S.C. (1979): Stream Sediment Reconnaissance Sampling Survey, Jennings River, 104-0; O.F. 561.
- G.S.C. (1979): Stream Sediment Reconnaissance Sampling Survey, Wolf Lake, 105-B; O.F. 563.
- Levinson, A. (1974): Introduction to Exploration Geochemistry; Applied Publishing, Calgary, Table 2-1.
- Poole, W., Roddick, J., and Green, L. (1960): Geology, Wolf Lake, Yukon Territory, 105-B; G.S.C. Map 10-1960, Preliminary Series.

.



Legend

- Di Diorite, diabase
- V Andesite
- mbQM Muscovite-biotite granodiorite, quartz monzonite
- Geological contact (assumed)
- |—|—| Foliation (undefined dip, inclined)
- |—|—| Jointing (vertical, inclined)
- ~~~~~ Fracture zone
- Py Pyrite
- Qtz Quartz vein

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

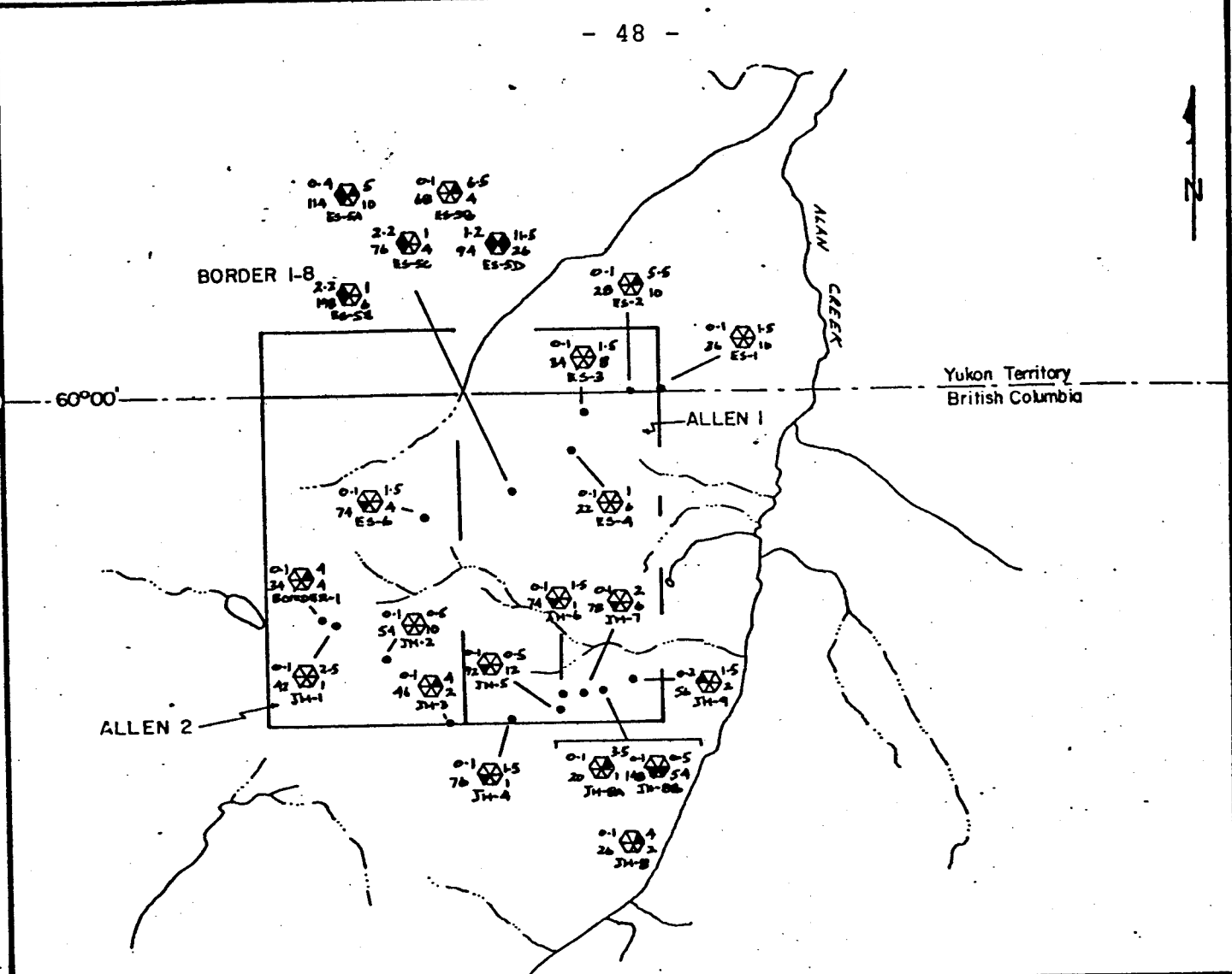
PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

GEOLOGY

Scale: 1:50,000

September 1979

PLAN 1



Legend

ppm Ag ppm U
ppm Zn ppm Pb
Sample No.

	U	Pb	Zn	Ag
Poss. Anomalous		-	-	-
Prob. Anomalous		3.5	20	70

PLAN 2

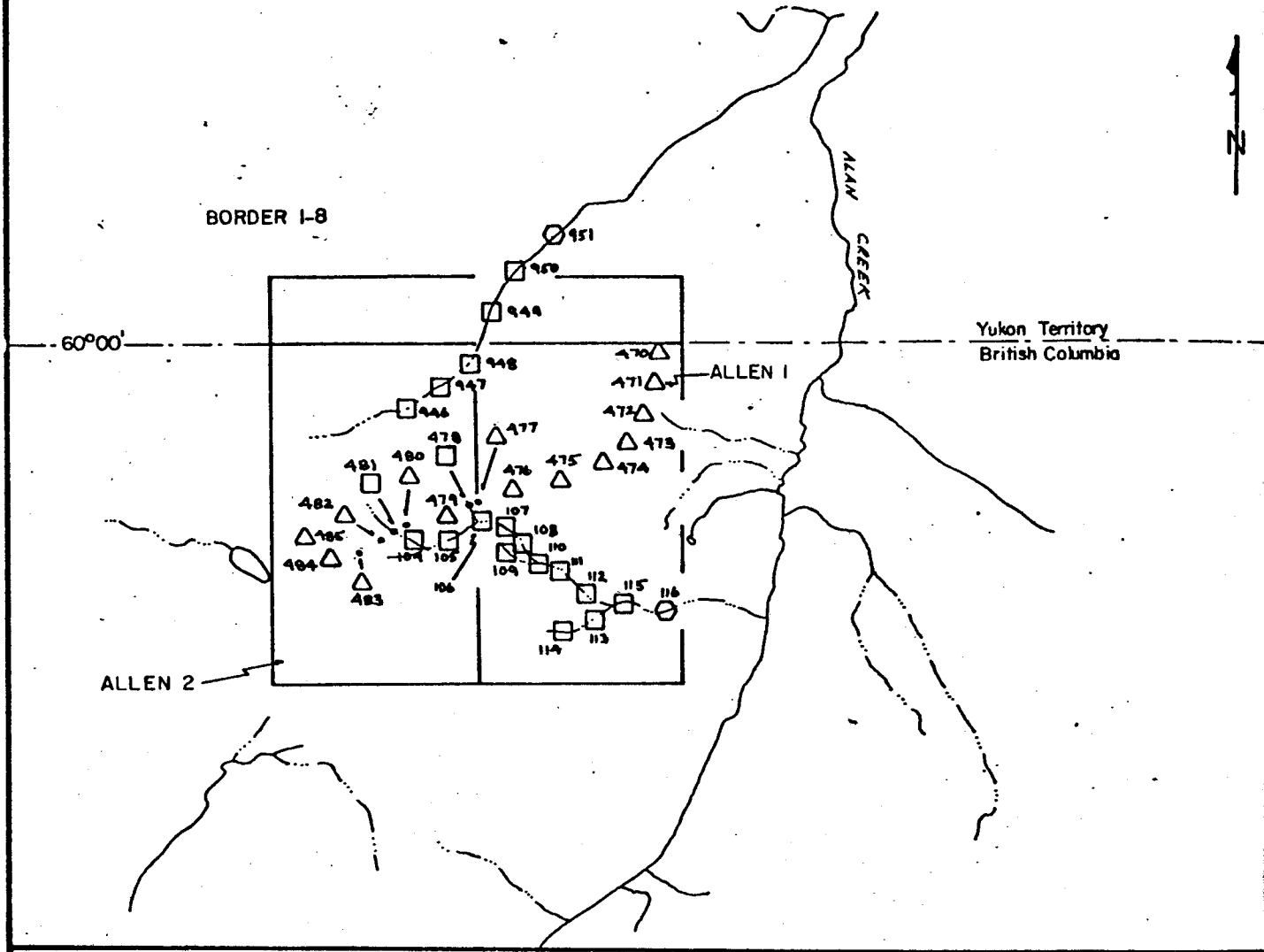
CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

ROCK GEOCHEMISTRY

Scale: 1:50,000

September 1979



LEGEND

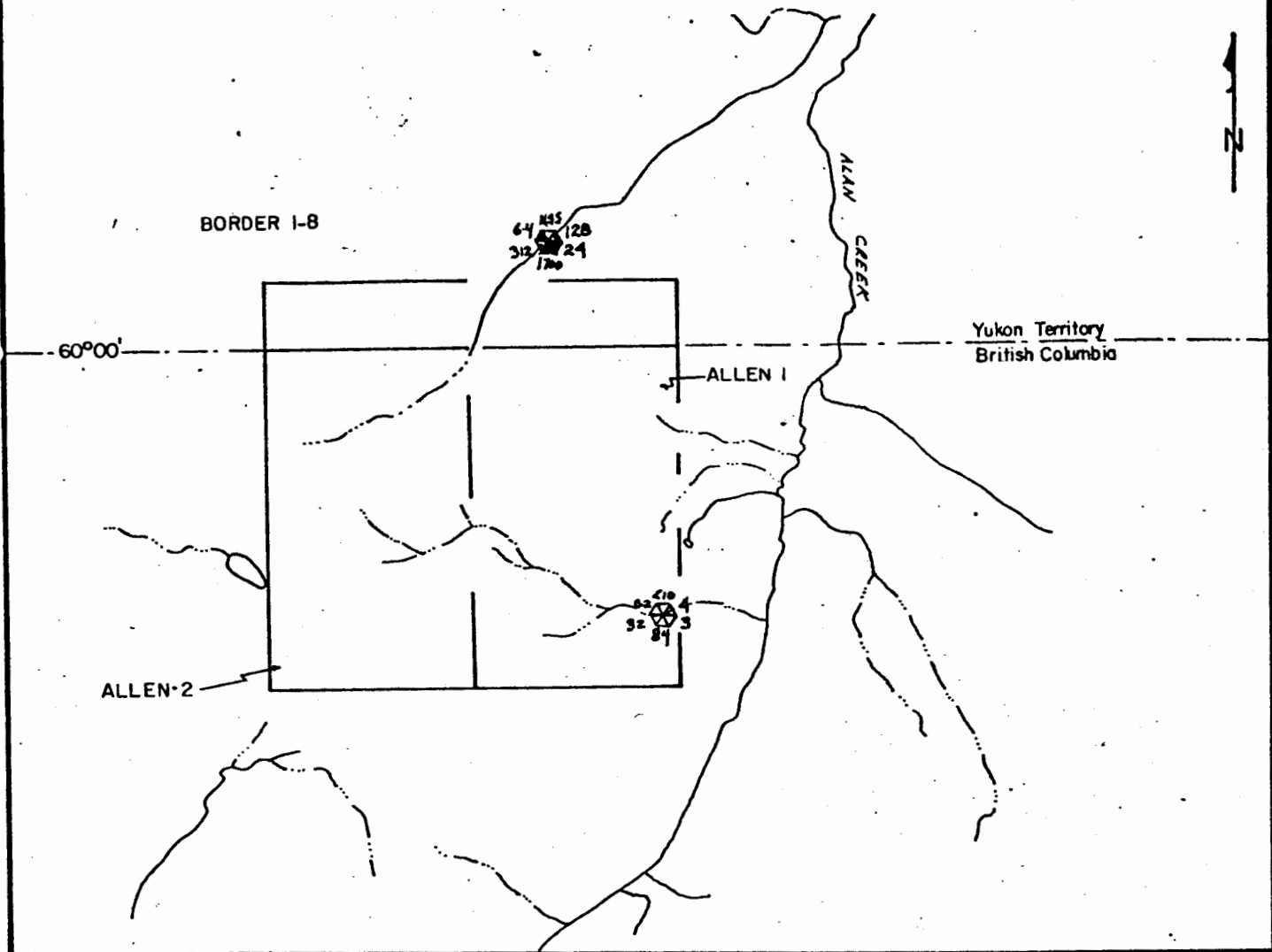
- Silt & Water
- △ Soil
- Heavy mineral & Silt & Water

All sample numbers prefixed 79-WT

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

SAMPLE LOCATIONS



BORDER 1-8

60°00'

Yukon Territory
British Columbia

ALLEN 1

ALLEN-2

LEGEND

ppb Ag
ppm Ag ppm Cu
ppm Zn ppm Mo
ppm Pb

	Cu	Mo	Pb	Zn	Ag	Au
Poss. Anomalous	63	35	89	200	38	19
Prob. Anomalous	165	85	280	440	95	3150

PLAN 4

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

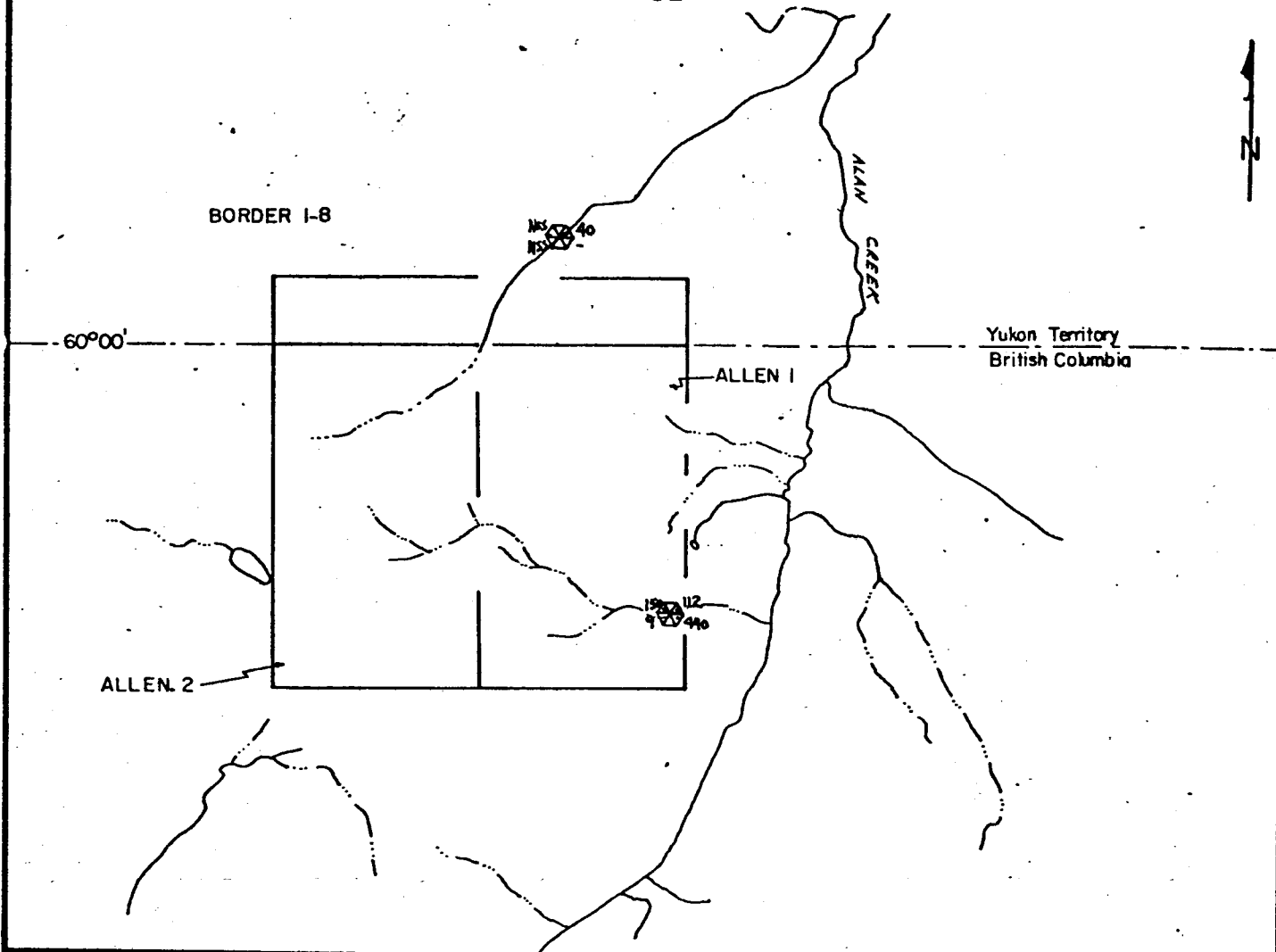
PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

HEAVY MINERAL GEOCHEMISTRY



Cu - Mo - Pb - Zn - Ag - Au



Scale: 1:50,000

September 1979



LEGEND

ppm W  ppm U
ppm Sn  ppm Th

	U	Th	Sn	W		
Pass. Anomalous		24	33C	38	60	
Prob. Anomalous		120	120C	300	160	

PLAN 5

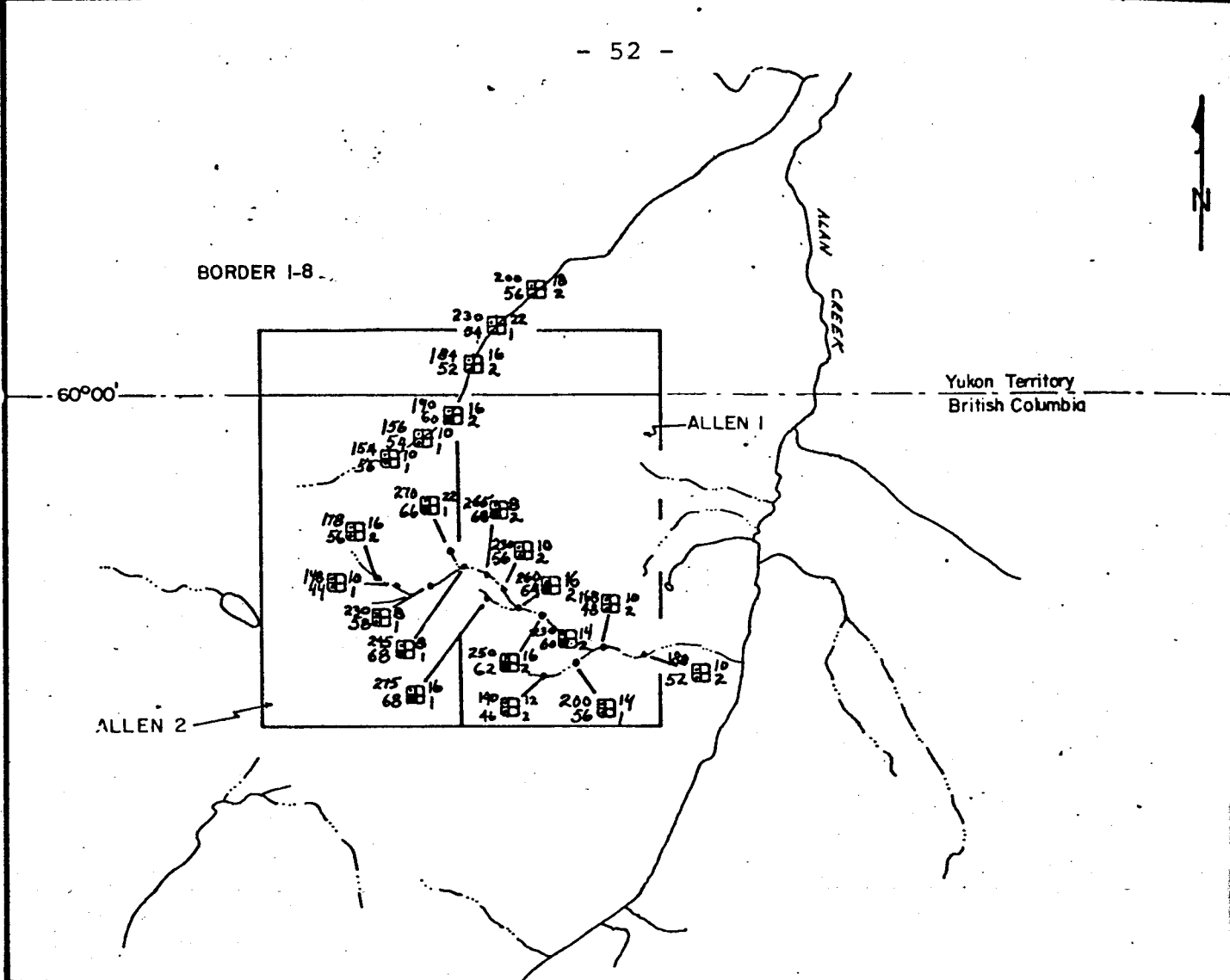
CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

HEAVY MINERAL GEOCHEMISTRY
U - Th - Sn - W

Scale: 1:50,000

September 1979



LEGEND

ppm Zn □ ppm Cu
ppm Pb □ ppm Mo

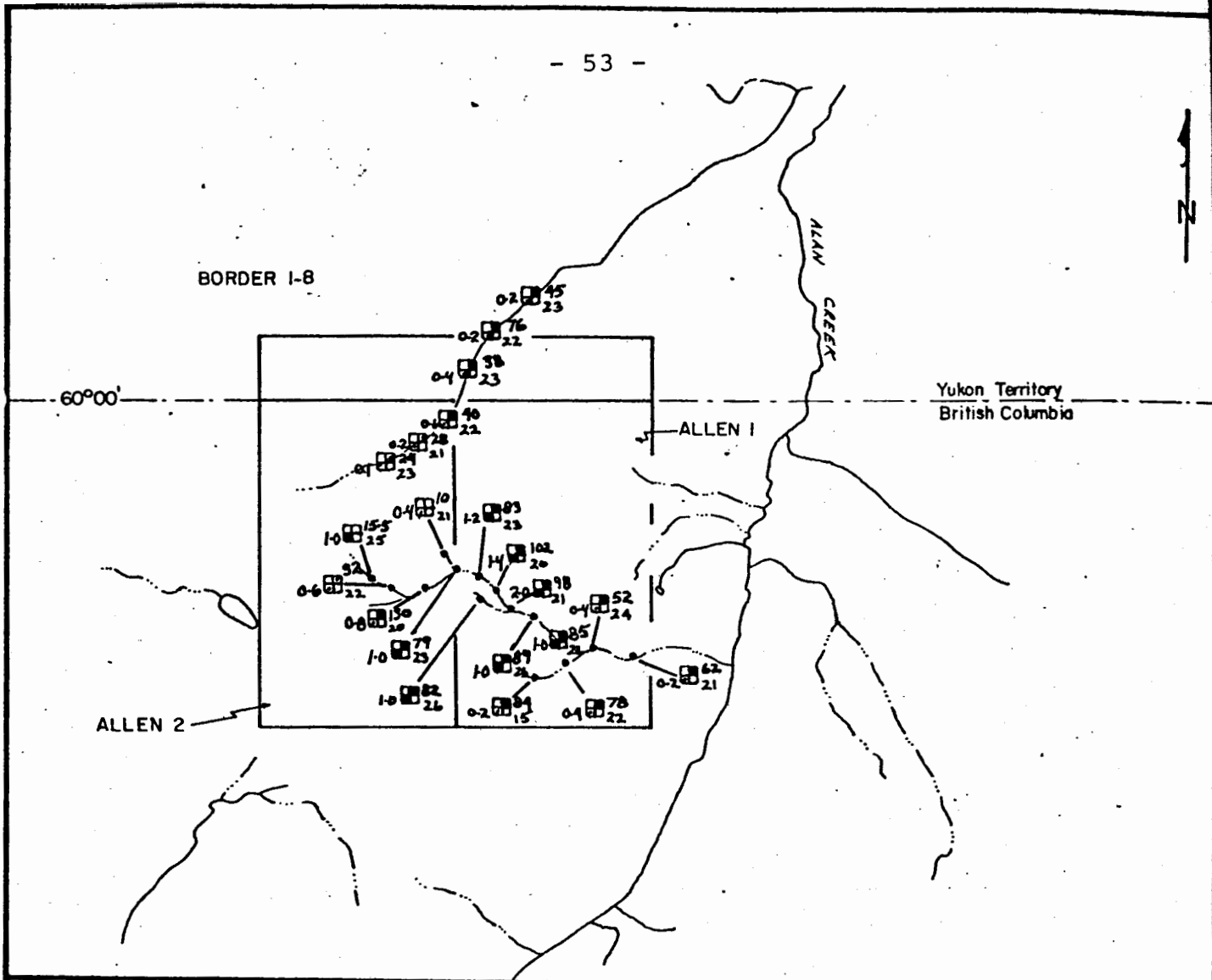
	Cu	Mo	Pb	Zn		
Poss. Anomalous	28	3	21	115		
Prob. Anomalous	54	11	59	320		

PLAN 6

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

STREAM SEDIMENT GEOCHEMISTRY
Cu - Mo - Pb - Zn



LEGEND

ppm Ag ppm U
ppm Th

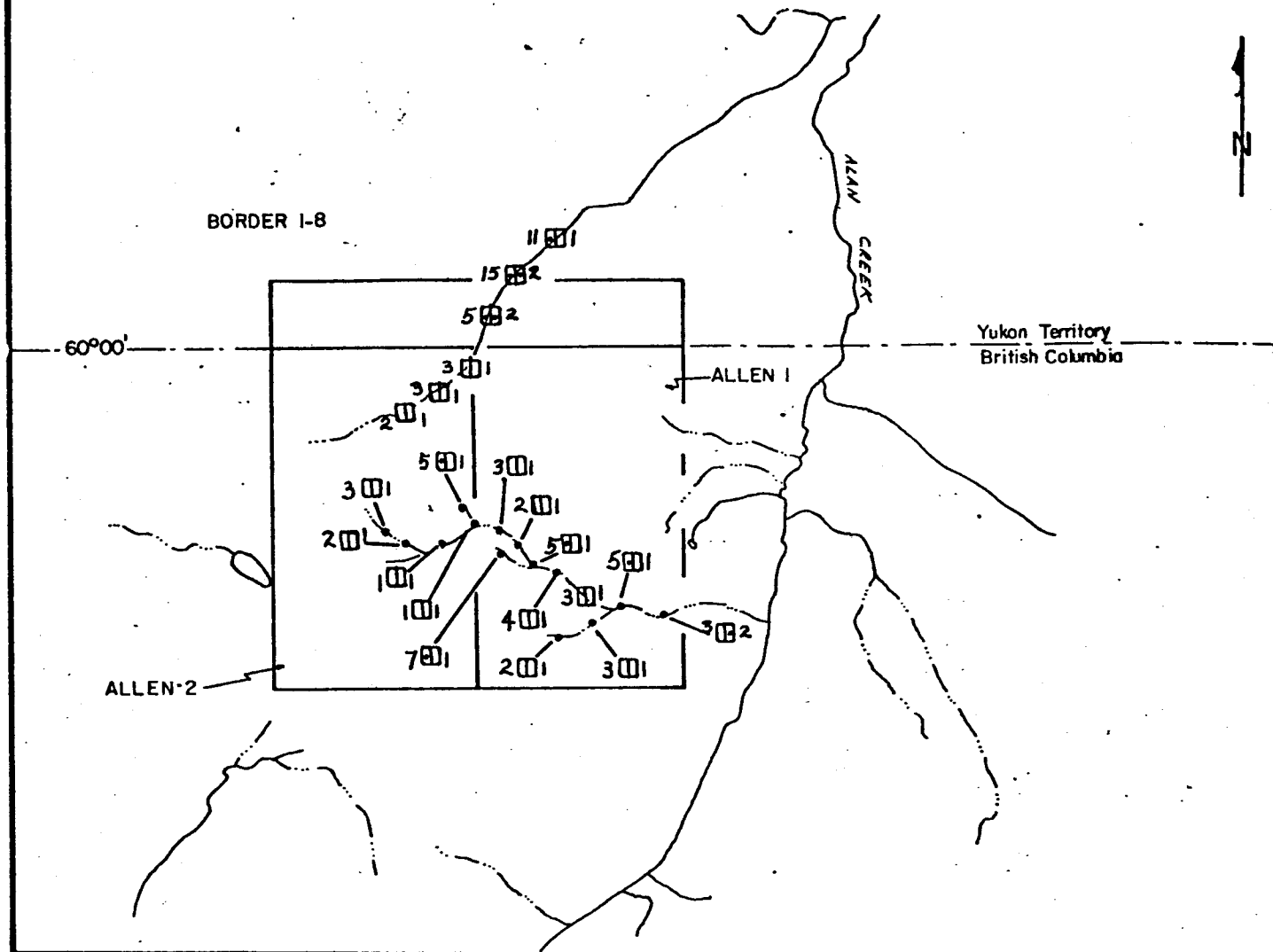
	U	Th	Ag		
Poss. Anomalous	17	29	<.1		
Prob. Anomalous	38	50	1		

PLAN 7

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

STREAM SEDIMENT GEOCHEMISTRY
U - Th - Ag



LEGEND

ppm W □ ppm Sn

	Sn		W			
Poss. Anomalous	2	5				
Prob. Anomalous	5	16				

PLAN 8

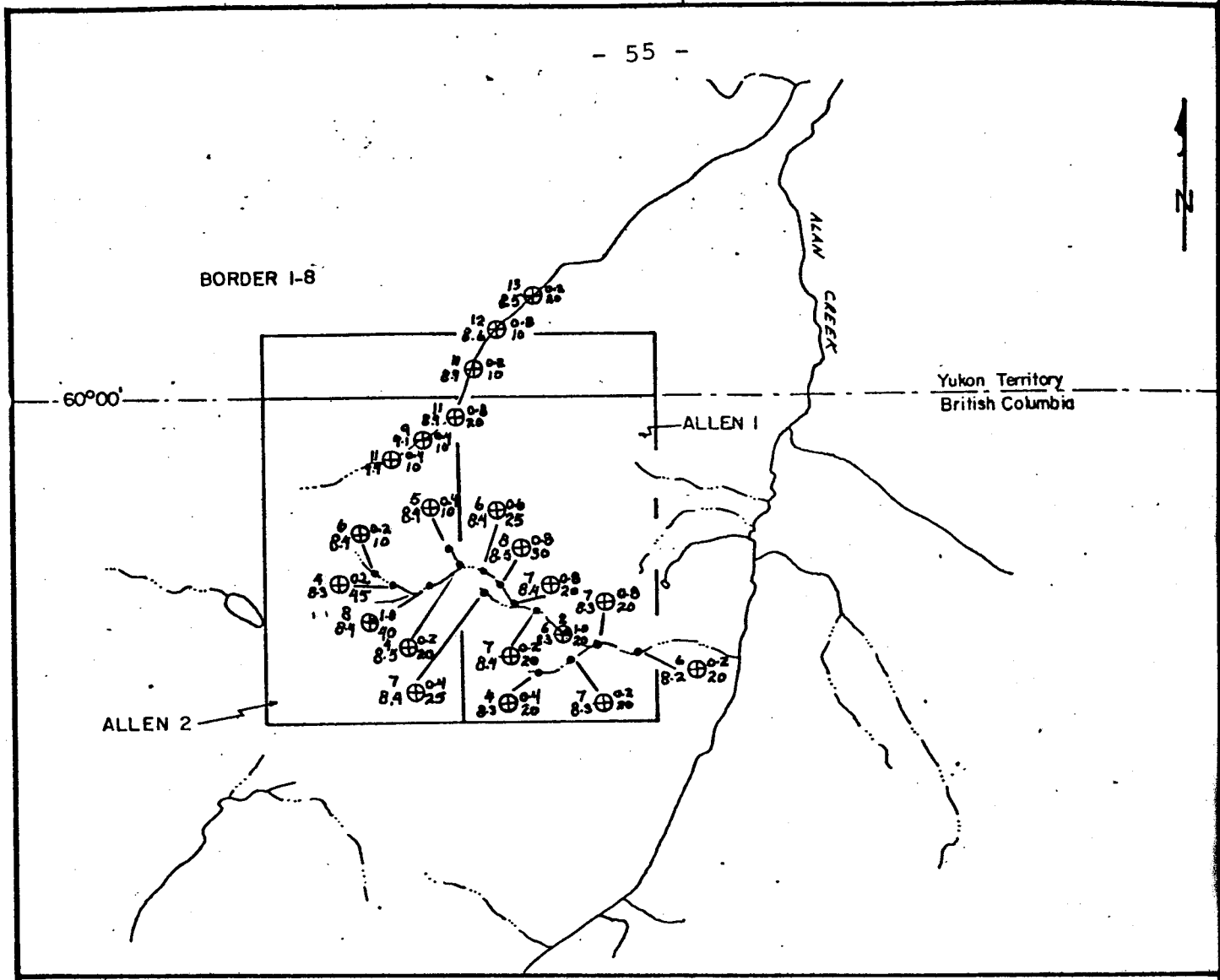
CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

STREAM SEDIMENT GEOCHEMISTRY
W - Sn

Scale: 1:50,000

September 1979



LEGEND

S.C. ⊕ ppb U
 pH ⊕ ppb F; A_c < 2ppb
 ppb As
 S.C. ⊗ ppb U
 pH. ⊗ ppb F

	U	F	S.C. ²		
Poss. Anomalous	0.85	100	46		
Prob. Anomalous	2.5	210	100		

→ S.C. units are μmols/cm

PLAN 9

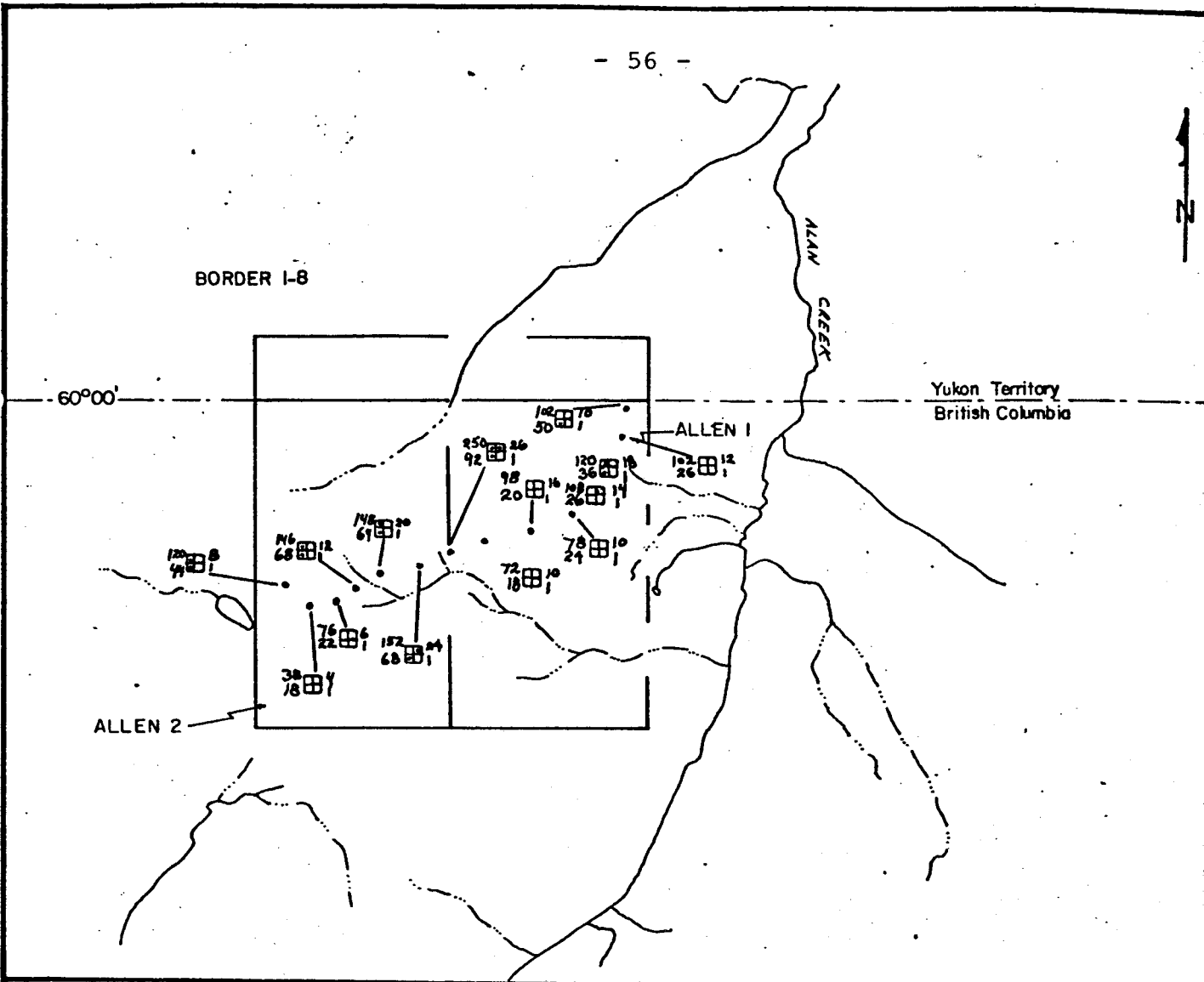
CANADIAN OCCIDENTAL PETROLEUM LIMITED
 MINERALS DIVISION

PROJECT WATSU
 BORDER-ALLEN CLAIMS
 BRITISH COLUMBIA - YUKON TERRITORY

STREAM WATER GEOCHEMISTRY

Scale: 1:50,000

September 1979



LEGEND

ppm Zn ppm Cu
ppm Pb ppm Mo

	Cu	Mo	Pb	Zn		
Poss. Anomalous	22	2.5	32	115		
Prob. Anomalous	120	5	150	270		

PLAN 10

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

SOIL GEOCHEMISTRY
Cu - Mo - Pb - Zn

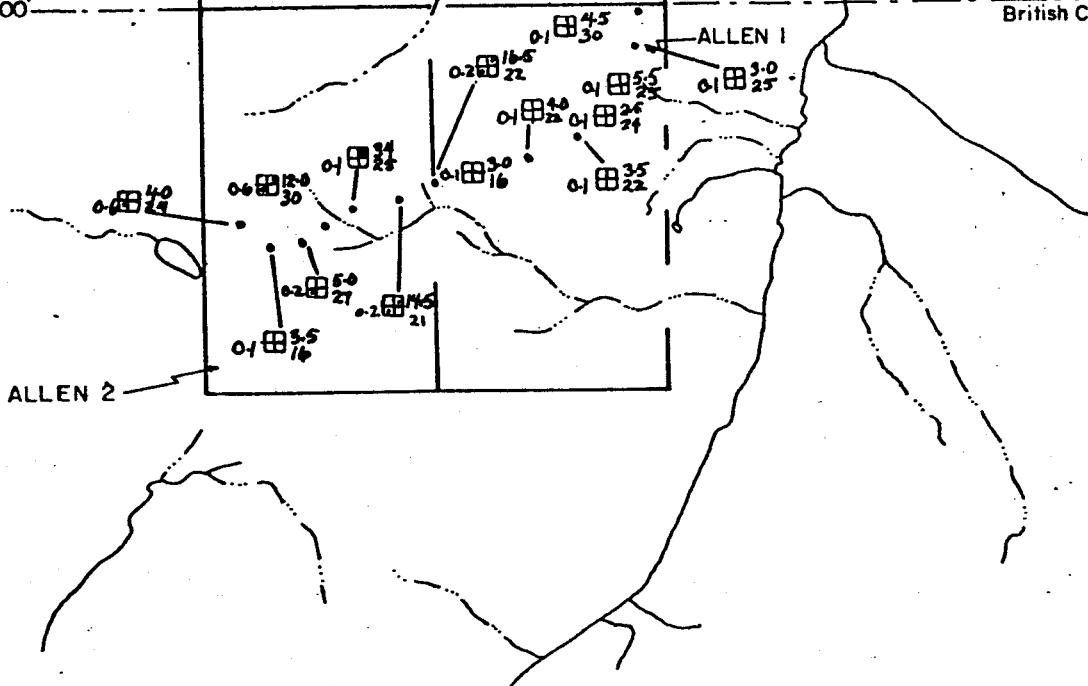


BORDER I-8

ALAN CREEK

60°00'

Yukon Territory
British Columbia



LEGEND

ppm Ag  ppm U
 ppm Th

	U	Th	Ag		
Poss. Anomalous	7	36	1		
Prob. Anomalous	30	75	8		

PLAN 11

CANADIAN OCCIDENTAL PETROLEUM LIMITED
MINERALS DIVISION

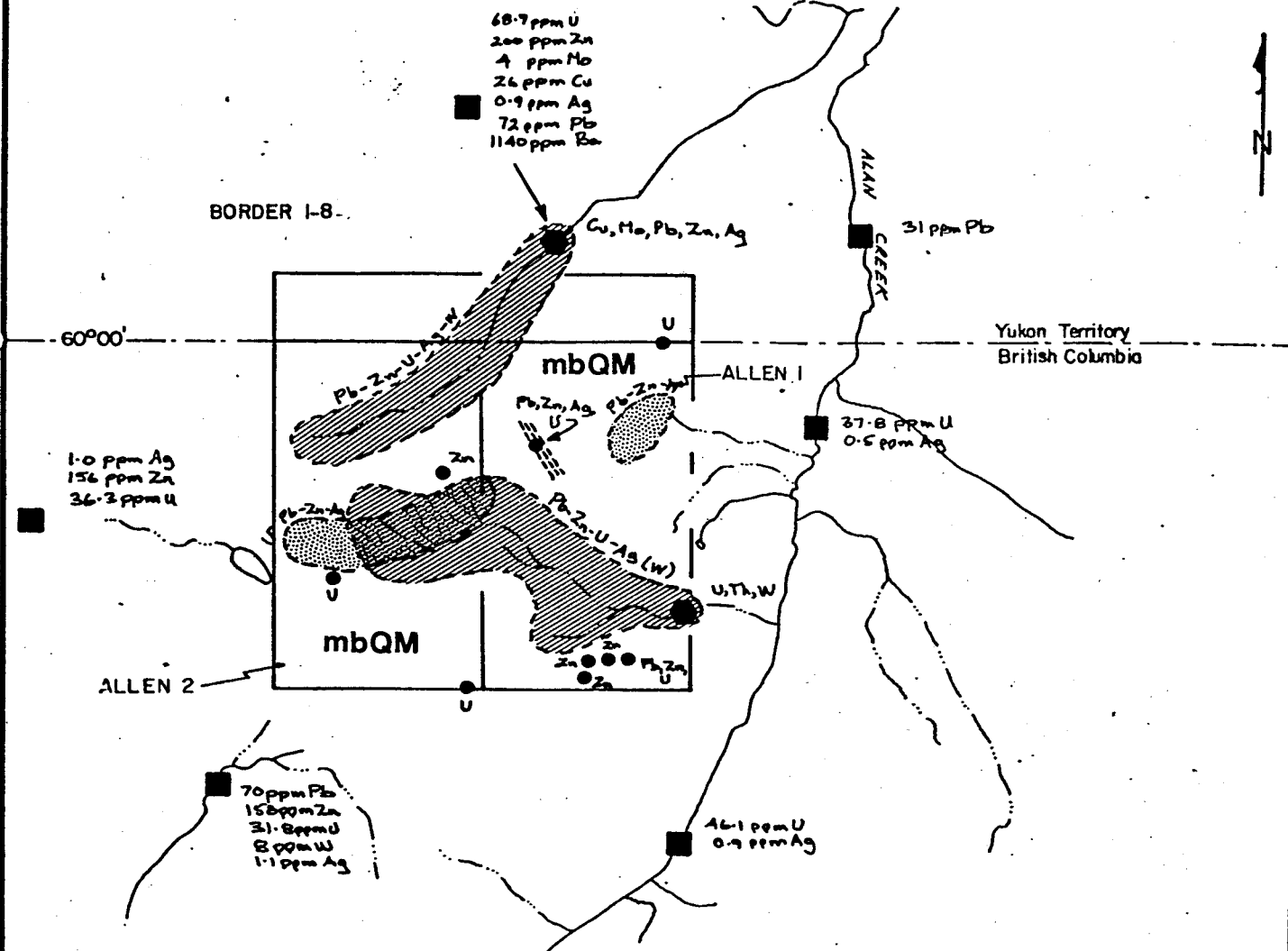
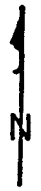
PROJECT WATSU
BORDER-ALLEN CLAIMS
BRITISH COLUMBIA - YUKON TERRITORY

SOIL GEOCHEMISTRY

Th - Ag - U

Scale: 1:50,000

September 1979



LEGEND

- Geology
mbQM : Muscovite-biotite quartz monzonite
 --- : Feature zone
- Geochemistry
- Stream sediment anomaly
 - Soil anomaly
 - Rock anomaly
 - Heavy mineral anomaly
 - 1975 G.S.C. - U.R.P. site

CANADIAN OCCIDENTAL PETROLEUM LIMITED
 MINERALS DIVISION

PROJECT WATSU
 BORDER-ALLEN CLAIMS
 BRITISH COLUMBIA - YUKON TERRITORY

COMPILATION OF GEOLOGY & GEOCHEMISTRY

Author's Qualifications

Eric J. Sacks

- Education - Graduated Queen's University,
Kingston, Ontario
M.Sc. in Geology, 1978
- Graduated University of Toronto,
Toronto, Ontario
B.Sc. in Geology, 1977

Work Experience - Employed as field exploration geologist
with Canadian Occidental Petroleum Ltd., Minerals Division,
Toronto, Ontario since 1978. Carried out and supervised
mineral exploration programs in B.C. and Yukon.

Statement of Expenditures

Claims BORDER 1-8

Record Numbers YA 44635 - YA 44641

		<u>Pro-rated¹ Costs</u>
Salaries and Benefits		\$ 324.15
Travel and Accommodation		197.58
Drafting and Reproduction		69.42
Consultant		97.40
Camp costs and Supplies		222.50
Rental of Equipment		37.08
Other Work		94.81
	Sub-total	<u>\$1,042.94</u>
Helicopter 0.6 hr. at \$340/hr.	\$ 204.00	²
Geochemical 101 analyses	<u>165.16</u>	³
		<u>\$ 369.16.</u>
	Total	<u>\$1,412.10</u>

Notes

¹ Pro-rated on basis of 1.1 man-days worked on claims conducting geological/geochemical/geophysical surveys out of a total of 115.6 man-days spent on these surveys during Project Watsu (see attached breakdown on following sheet).

² Helicopter flying completed by Associated Helicopters Ltd.

³ Geochemical analyses completed by Chemex Labs, Vancouver, B.C. (see attached Cost Breakdown).

PROJECT J

BC CLAIM GROUPS	TOTAL NO. OF MAN DAYS	PRO-RATED COSTS							SUB-TOTAL "A"	REAL COSTS				SUB-TOTAL "B"	TOTAL "A" + "B"
		SALARIES & BENEFITS	TRAVEL & ACCOMMODATION	DRAFTING & REPRODUCTION	CONSULTANTS	CAMP COSTS & SUPPLIES	EQUIPMENT RENTAL	OTHER WORK		HELICOPTER		GEOCHEMISTRY			
										at \$310/hr	hrs.	cost	# ana		
ALLEN	4.3	1267.12	772.36	271.35	380.75	869.78	144.96	370.63	4076.95	620.00	2.0	617.80	385	1237.80	5314.75
ASP	5.0	1473.40	898.10	315.53	442.73	1011.38	168.56	430.97	4740.67	682.00	2.2	627.28	396	1309.28	6049.95
COT	3.0	884.04	538.86	189.32	265.64	606.83	101.13	258.58	2844.40	620.00	2.0	378.24	201	998.24	3842.64
KAZ	5.0	1473.40	898.10	315.53	442.73	1011.38	168.56	430.97	4740.67	527.00	1.7	854.64	454	1381.64	6122.31
MAR	1.0	294.68	179.62	63.11	88.55	202.28	33.71	86.20	948.15	310.00	1.0	62.40	18	372.40	1320.55
NEED	5.0	1473.40	898.10	315.53	442.73	1011.38	168.56	430.97	4740.67	837.00	2.7	966.36	560	1803.36	6544.03
PLATE	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	961.00	3.1	793.24	464	1754.24	6874.15
RAN	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	1209.00	3.9	775.28	524	1984.28	7104.19
SHAR 162	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	1023.00	3.3	639.36	402	1662.36	6782.27
SHAR 364, 9	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	1488.00	4.8	480.04	619	2268.04	7387.95
SHAR 566	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	899.00	2.9	750.36	469	1649.36	6769.27
SHAR 768	5.4	1591.27	969.94	340.77	478.15	1092.29	182.04	465.45	5119.91	837.00	2.7	749.28	460	1586.28	6706.19
SUB-TOTAL (1)	55.7	16413.66	10004.78	3514.99	4932.03	11266.77	1877.72	4801.02	52810.97	10013.00	32.3	7994.28	4952	18007.28	70818.25
YUKON CLAIM GROUPS										at \$340/hr					
BIG OX	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.69	5309.54	1020.00	3.0	879.76	541	1899.76	7209.30
BORDER	1.1	324.15	197.58	69.42	97.40	222.50	37.08	94.81	1042.94	204.00	0.6	165.16	101	369.16	1412.10
CLO	3.9	1149.25	400.52	246.11	345.33	788.87	131.47	336.16	3697.71	1224.00	3.6	316.96	185	1540.96	5238.67
CO	2.2	648.30	395.16	138.83	194.80	445.01	74.16	189.63	2085.89	918.00	2.7	535.24	372	1453.24	3539.13
GOAT	5.5	1620.74	987.91	347.08	487.01	1112.51	185.41	474.07	5214.73	782.00	2.3	1266.48	807	2048.48	7263.21
ICE	4.2	1237.66	754.40	265.04	371.90	848.56	141.59	362.32	3982.47	782.00	2.3	798.64	351	1280.64	5263.11
LICK	5.2	1532.34	934.02	328.15	460.44	1051.83	175.30	448.21	4930.29	748.00	2.2	920.36	546	1668.36	6598.65
MOX	5.9	1738.61	1059.75	372.32	522.43	1193.42	198.90	508.54	5593.97	1292.00	3.8	1205.04	705	2497.04	8091.01
OXY	4.6	1355.53	826.25	290.29	407.31	930.47	155.07	396.49	4361.41	884.00	2.6	732.44	449	1616.44	5977.85
PISA	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.68	5309.54	714.00	2.1	757.96	512	1471.96	6781.50
SAL	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.78	5309.54	1190.00	3.5	497.12	411	1687.12	6996.66
TIER	4.9	1443.93	880.15	309.21	433.91	991.10	165.18	422.71	4645.46	1156.00	3.4	750.76	438	1906.76	6552.60
WOX	5.6	1650.21	1005.87	353.39	495.86	1132.74	188.78	482.69	5309.54	952.00	2.8	841.08	579	1793.08	7102.62
SUB-TOTAL (2)	59.9	17651.35	10759.22	3780.01	5303.97	12116.23	2019.28	5162.98	56793.41	11866.00	34.9	9367.00	5997	21233.00	78026.41
TOTALS (1+2)	115.6	34065.00	20764.00	7295.00	10236.00	23383.00	3897.00	9964.00	109604.00	21879.00	67.2	17361.28	10949	39240.28	148844.66

THE BORDER CLAIM GROUP
GEOCHEMICAL COST BREAKDOWN

<u>INVOICE #</u> ¹	<u># OF SAMPLES</u>	<u>DESCRIPTION</u>	<u>COST</u> ²
32460	1	U, Cu, Mo, Pb, Zn, Ag, Sn, W, Au	\$ 29.10
31253	1	Pb, Zn, Ag, U	7.25
31610	3	Pb, Zn, Ag, U	21.75
31613	4	U, F, As	37.00
31609	3	Cu, Mo, Pb, Zn, Ag, Sn, W, U, Th	39.15
31616	4	Cu, Mo, Pb, Zn, Ag, Sn, W, U	52.20
34007	4	Th	20.00
		SUB-TOTAL	\$206.45 less 20%
		TOTAL	\$165.16

1 - all invoices from Chemex Labs unless otherwise noted
2 - cost includes preparation of samples

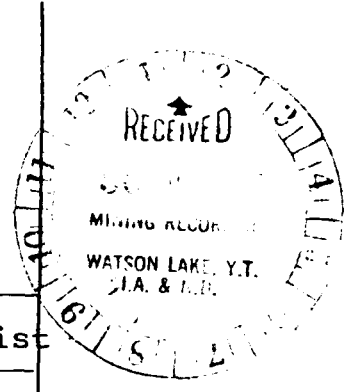


Department of Indian Affairs and Northern Development

YUKON QUARTZ MINING ACT

FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK

(This form required in duplicate with sketch showing location of work.)



I (Name) Roger H. Wallis	Occupation Chief Geologist
(Postal Address) 311 - 215 Carlingview Dr., Rexdale, Ont. M9W5X8	

OFFICE DATE STAMP

MAKE OATH AND SAY, THAT:-

1. I am the ~~XXXXXX~~ agent of the owner, of the mineral claim(s) to which reference is made herein.
2. I have done, or caused to be done, work on the following mineral claim(s):
(Here list claims on which work was actually done by number and name)

BORDER 1-8

YA44635-YA 44641

situated at 60°00'N 130°40'W Claim Sheet No. 104-0/15E - 105B/2E
 in the Watson Lake Mining District, to the value of at least 1,412.10
 dollars, since the 8th day of July 19 79.

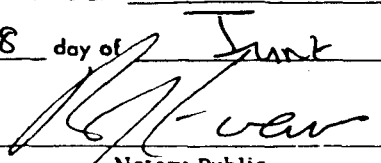
to represent the following mineral claims under the authority of Grouping Certificate No. _____
 (Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).


YA 44635-YA 44641 BORDER 1-8 Each claim to be renewed
 for a period of 1.75 years.

copy to M. Bowler

3. The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Geological survey, geochemical surveys.
 See report by E.J. Sacks referring to the claim group.
 See accompanying Statement of Expenditures and cost breakdowns.

Sworn before me at Toronto
 this 18 day of June 19 80

 Notary Public


 Applicant.