

COMINCO LTD.

EXPLORATION  
N.T.S. 104N/14W

WESTERN DISTRICT

GEOLOGICAL AND GEOCHEMICAL

ASSESSMENT REPORT

VOL CLAIM, ATLIN M.D.

59°46'N 133°25'W

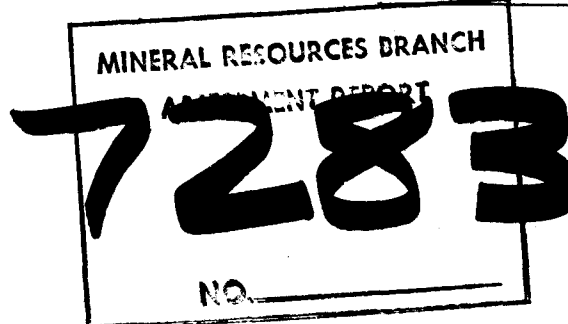
Owned by Cominco Ltd.

Work Performed

August 24 to 27, 1978

November, 1978

U. DAS GUPTA



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EXPLORATION  
N.T.S. 104N/14W

WESTERN DISTRICT  
2 APRIL 1979

GEOLOGICAL AND GEOCHEMICAL ASSESSMENT REPORT

VOL CLAIM

ATLIN MINING DIVISION

INTRODUCTION

Four days (August 24 to 27, 1978) were spent in the field to carry out geological mapping in conjunction with geochemical sampling of stream sediments and rocks. The principal aim during this initial phase was to evaluate the terrain for uranium potential of possible Pleistocene gravels underlying basaltic cover and to provide a basis for further work in 1979. Geologist in the field was U. Das Gupta assisted by D.A. Perkins. Mapping was carried out with the help of 1:15,000 airphotographs and a 1:12,500 enlargement of a 1:250,000 topographical map.

SUMMARY

The Vol claim was staked to cover an area underlain by Pleistocene(?) basalts and scoria near the headwaters of Volcanic Creek approximately 15 airmiles northeast of Atlin. Mapping indicates that the area is underlain by metasediments of the Cache Creek group intruded by a Jurassic(?) granitic body. Pleistocene volcanics cover most of the older rock types. Some indication of gold values in recent channel gravels were obtained in shafts sunk in the northwestern part of the claims. The basalt-granite contact is exposed at two locations on the property. No channel gravels were observed at either of these locations and whether the basalt covers older channel gravels is yet to be determined.

PROPERTY

Date Recorded	:	June 8, 1978
Date Due	:	June 8, 1979
Vol Claim	:	18 Units 100% Cominco through staking.

LOCATION

N.T.S.	:	104N/14W
Latitude	:	59°46'N
Longitude	:	133°25'W
Mining Division:		Atlin Mining Division, B.C.

The claim is located at the headwaters of Volcanic Creek approximately 15 airmiles northeast of Atlin in northern B.C. Access to the area is either by helicopter from Atlin or by road from Atlin to the point where Volcanic Creek enters the Fourth of July Creek. A fairly good trail, 3.5 miles long, leads from this junction to an old cabin on the northwestern corner of the property.

The property lies in an area of moderate relief at elevation between 4500 feet and 5200 feet. Outcrop is limited to the southeastern part of the area and to sections along the creeks.

### HISTORY

The southern and central parts of the claim area have been held previously by a number of operators presumably to cover molybdenite mineralization along the intrusive-metasediment contact. In addition old channel gravels were worked in the northwestern part of the claim for placer gold.

### GEOLOGY

The southeastern half of the area is underlain by metasediments assigned to the Cache Creek group by Aitken (1959). These metasediments have been intruded by a quartz monzonite stock. Basaltic flows and scoria of probable Pleistocene age cover the central and northwestern parts of the property.

#### Cache Creek Group

These metasediments consist of an interbedded sequence of dark grey cherty argillite with calcareous bands, rusty weathering siltstone and cream coloured quartzite. Tremolitic hornfels probably representing original calcite-cemented sandstones also occur along the contact with the intrusive. Greenish weathering amphibole-rich rocks, probably representing meta-greywackes, occur interbedded with cherty argillites in the southern part of the claim.

#### Intrusive

The intrusive consists primarily of a rusty weathering quartz monzonite varying to a granodiorite. It is generally sub-equigranular in texture, medium to coarse-grained and contains up to 20% quartz and 20% hornblende. Biotite is the other common mafic mineral present. Accessories include tourmaline, apatite, sphene and zircon.

Inclusions of diorite are common in places. The rusty nature of the rocks is usually due to the weathering of pyrrhotite. A light cream to buff weathering quartz monzonite (containing abundant smoky quartz and up to 5% hornblende) occurs near the northeastern boundary of the property.

#### Extrusives

Basaltic flows and scoria cover much of the claim and were probably extruded from a centre lying near the eastern part of the property. Presence of multiple flows are evidenced by multiple lobes and tongues. At least two sets of flows separated by scoria can be seen in the section exposed along the northern tributary of Volcanic Creek. Over most of the area the extrusives overlie granitic basement.

#### Basalt-Granite Contact

The contact between the extrusives and the intrusives is exposed at two locations on the property (see Plate 4). At location 1 the distance bet-

ween the exposed top of the quartz monzonite and the exposed base of the flow is approximately 2 metres. The contact itself is covered by vegetation. This contact appears to be steep (average dip of near 20° towards west) and wavy and is reminiscent of glacial topography. In addition, the intrusive appears to be relatively unweathered. Hence, any gravels, if present on the property, are of the order of 2 metres in thickness. The geometry of the present landform and the geometry of the extrusives suggests that during the Late Tertiary (before the extrusion of the basaltic flows), Volcanic Creek and its main tributary flowed along glaciated valleys as shown in Plate 4.

### STRUCTURAL GEOLOGY

Absence of structural features in the metasediments and vicinity of in situ outcrops makes it impossible to intersect the structural geometry of the area.

### GEOCHEMISTRY

A total of 17 water samples, 12 stream sediment samples, and 1 rock sample were collected from the claim. The water samples were analysed for cobalt, uranium, and fluorine, the stream sediments were analysed for cobalt, uranium, molybdenum, mercury, and tungsten, and the rock samples were analysed for molybdenum, tungsten, and uranium (see Appendix D for analytical techniques). The water samples have uranium and fluorine values below the threshold level. However, sediment samples from streams draining the southwestern part of the property have highly anomalous cobalt, uranium, molybdenum and mercury values. Sample D-62 taken from a creek draining the area to the north near the northwestern corner of the property is also anomalous in cobalt, uranium and molybdenum values. However, organics present in the sample could account for these high values. The rest of the samples have cobalt and uranium values near the threshold level suggesting a higher than average background in the intrusive. The high molybdenum and moderately high tungsten values reflect the observed molybdenite and scheelite mineralization in the intrusive and in the metasediments near the intrusive-metasediment contact.

### MINERALIZATION

Disseminated molybdenite is present in the intrusive near the south boundary of the claim in the vicinity of contact with metasediments. Associated minerals include pyrite, chalcopyrite, arsenopyrite and rare scheelite. Grades, however, appear to be extremely low and selected grab samples from a 0.5 metre wide zone analysed 300 ppm W and 18 ppm Mo.

### CONCLUSIONS

No mineralization of note was found in the Vol claim. The 1978 field work was undertaken to study the geometry of basements to Late Tertiary

volcanic flows and to delineate possible paleochannels below the basaltic cover. Study shows that two such stream channels (a main creek and its tributary) are probably present below the basalt cover.

Report by: R.J. Nicholson  
for Udayan Das Gupta

Supervised by: R.J. Nicholson  
R.J. Nicholson, P. Eng.

Endorsed for  
Release by: G. Harden  
G. Harden, Manager  
Western District

UDG/pc1

REFERENCE

Aitken, J.D., 1959, Atlin Map area, British Columbia: G.S.C. Memoir  
307, 89 p.

Distribution

Mining Recorder (2)  
Western District  
RJN

APPENDIX "A"

STATEMENT OF EXPENDITURES

VOL CLAIM

SALARIES

U. Das Gupta	: August 24 to 27, 1978; 4 days @ \$88.70/day	\$354.80	
D.A. Perkins	: August 24 to 27, 1978; 4 days @ \$71.13/day	284.52	
R.J. Nicholson:	August 10, 1978; 1 day organization @ \$99.36/day August 17, 1978; 1 day field supervision @ \$136.40/day	<u>235.76</u>	\$ 875.08

FOOD AND ACCOMMODATION

9 man-days, apportioned cost during period August 14 to September 12, 1978			182.63
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TRANSPORTATION

Truck rental: apportioned cost during period August 14 to September 12, 1978	37.55		
U-Drive: apportioned cost during period August 14 to September 12, 1978	17.39		
Helicopter: apportioned cost of Hughes 500 helicopter during period August 14 to September 12, 1978 @ \$255/hour plus fuel	463.12		
Mobilization: apportioned costs during period August 14 to September 12, 1978	<u>132.79</u>	650.85	

GEOCHEMICAL SUPPLIES & ANALYSES

17 water samples analysed for U and F; 12 stream sediment samples analysed for Co, U, Mo, Hg and W; and one rock sample analysed for U, Mo and W. Total cost -			306.93
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MISCELLANEOUS

Field Supplies: apportioned costs of air- photos, flagging, hip chain thread, sample bags, etc.	39.85		
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MISCELLANEOUS CONTINUED

39.85

Communication: apportioned radio rental and  
long distance telephone charges

36.19

76.04

REPORT PREPARATION

U. Das Gupta : 6 days writing and draughting  
@ \$76.12/day

456.72

R.J. Nicholson: 1 day @ \$99.36 per day

99.36

556.08

\$2,647.61

APPENDIX "B"

IN THE MATTER OF THE B.C. MINERAL ACT AND IN THE MATTER OF A GEOLOGICAL AND GEOCHEMICAL PROGRAM CARRIED OUT ON THE DAM, BOU AND LEO MINERAL CLAIMS OF THE DAMBOULEO PROPERTY (NTS 104N/11W), ON THE PER AND EYE MINERAL CLAIMS OF THE PEREYE PROPERTY (NTS 104N/11W), ON THE VOL MINERAL CLAIM (NTS 104N/14W), ON THE HIR MINERAL CLAIM (NTS 104N/10W), ON THE CAP MINERAL CLAIM (NTS 104N/7W), ON THE TAY MINERAL CLAIM (NTS 104N/7W), ON THE ROB MINERAL CLAIM (NTS 104N/10E) AND ON THE FAR MINERAL CLAIM (NTS 104N/10W) ALL LOCATED IN THE ATLIN MINING DIVISION OF THE PROVINCE OF BRITISH COLUMBIA.

S T A T E M E N T

I, ROBERT JOHN NICHOLSON, OF THE DISTRICT OF NORTH VANCOUVER IN THE PROVINCE OF BRITISH COLUMBIA, HEREBY DECLARE:

1. THAT I am employed as a Project Geologist by Cominco Ltd. and, as such, have a personal knowledge of the facts to which I hereinafter depose;
2. THAT annexed hereto and marked as Appendix "A" to this statement is a true copy of expenditures incurred on a geological and geochemical program carried out on the Vol mineral claim;
3. THAT the said expenditures were incurred for the purpose of mineral exploration of the above noted mineral claim between the 14th of August and 12th of September, 1978.

Signed: \_\_\_\_\_

  
R.J. NICHOLSON, P.Eng.

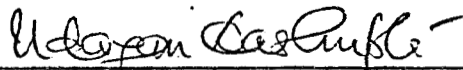
APPENDIX "C"

STATEMENT OF QUALIFICATIONS

I, UDAYAN DAS GUPTA, OF THE CITY OF VANCOUVER, BRITISH COLUMBIA  
HEREBY CERTIFY:

1. THAT I AM A GEOLOGIST PRESENTLY RESIDING AT 1361 ROBSON STREET, VANCOUVER, BRITISH COLUMBIA, WITH A BUSINESS ADDRESS AT 700-409 GRANVILLE STREET, VANCOUVER, BRITISH COLUMBIA.
2. THAT I GRADUATED WITH BSc (HONOURS) AND MSc DEGREE IN GEOLOGY FROM THE UNIVERSITY OF CALCUTTA, INDIA, IN 1967 AND 1970 RESPECTIVELY.
3. THAT I GRADUATED WITH A PhD DEGREE IN GEOLOGY FROM THE UNIVERSITY OF TORONTO, ONTARIO, IN 1978.

DATED THIS 15<sup>TH</sup> DAY OF NOVEMBER 1978 AT  
VANCOUVER, BRITISH COLUMBIA.



UDAYAN DAS GUPTA, PhD.

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT  
2 APRIL 1979

APPENDIX "D"

1. All analyses done by Cominco Lab in Vancouver.
2. All water samples were filtered and acidified in the field using 5 ml. HNO<sub>3</sub> (25%) and sent for analyses.
3. All silt samples were screened and the -80 mesh fraction sent for analyses.
4. Water samples were analysed for U and F by fluorimetric method, and for F by fusion and specific ion method.
5. Silt samples were analysed for Co, U, Mo, W, Hg.
  - (a) Uranium analyses by fluorimetric method.
  - (b) Co analyses by hot acid digestion and atomic absorption.
  - (c) Mo and W by fusion and colorimetry.
  - (d) Hg by acid digestion, vapour evolution and atomic absorption.
6. The rock samples were analysed for Mo, W and U.
  - (a) Uranium analyses by fluorimetric method.
  - (b) Mo and W by fusion and colorimetry.

GEOCHEMICAL RESULTS

A. Water Samples

<u>Sample No.</u>	<u>U (ppb)</u>	<u>Co (ppm)</u>	<u>F (ppb)</u>
AU-D-43	<.05	<10	9.0
AU-D-48	<.05	<10	10
AU-D-49	<.05	<10	7.8
AU-D-50	<.05	<10	21
AU-D-51	<.05	<10	26
AU-D-52	<.05	<10	9.2
AU-D-53	<.05	<10	26
AU-D-54	<.05	<10	2.8
AU-D-55	<.05	<10	11.0
AU-D-56	<.05	<10	16
AU-D-57	<.05	< 1	17
AU-D-58	<.05	<10	27
AU-D-59	<.05	<10	20
AU-D-60	<.05	<10	18
AU-D-61	<.05	<10	21
AU-D-62	<.05	<10	30
AU-D-63	<.05	<10	20

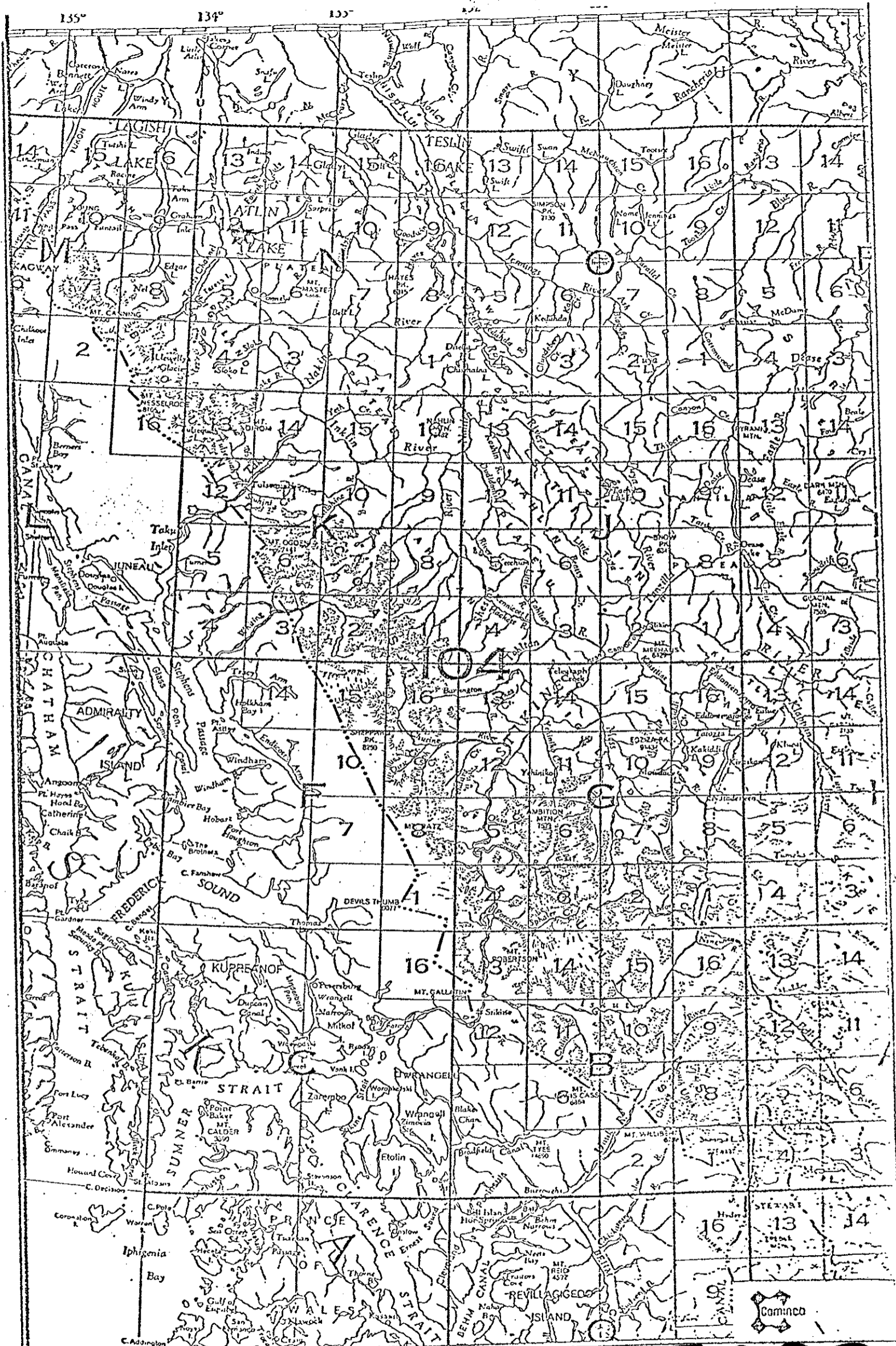
B. Silt Samples

<u>Sample No.</u>	<u>Co (ppm)</u>	<u>U (ppm)</u>	<u>Mo (ppm)</u>	<u>Hg (ppb)</u>	<u>W (ppm)</u>
AU-D-48	17	.26	35	33	25
AU-D-49	16	1.8	2	29	8
AU-D-50	21	1.9	40	35	20
AU-D-52	18	0.9	4	29	5
AU-D-53	27	0.8	8	43	5
AU-D-54	27	0.8	4	36	4
AU-D-55	14	2.0	2	39	4
AU-D-56	18	2.0	2	32	3
AU-D-57	14	3.2	3	19	4
AU-D-61	12	20.0	45	114	10
AU-D-62	12	8.6	10	18	30
AU-D-63	47	13.0	35	70	8

<u>Background</u>	<u>U(water) ppb</u>	<u>U(silt) ppm</u>	<u>Co(ppm)</u>	<u>Mo(ppm)</u>	<u>Hg(ppb)</u>	<u>W(ppm)</u>	<u>F(ppb)</u>
	0.4	5.0	10	5	65	2	300

C. Rock Samples

<u>Sample No.</u>	<u>Au (ppb)</u>	<u>Mo (ppm)</u>	<u>W (ppm)</u>	<u>U (ppm)</u>	<u>Th (ppm)</u>
AU-UR-6	<10	18	300	20	20



Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

LOCATION MAP  
Atlin, Northern B.C., NTS 104N

**7283**

Scale: 1:900,800      Date: Nov. 1978      Plate:



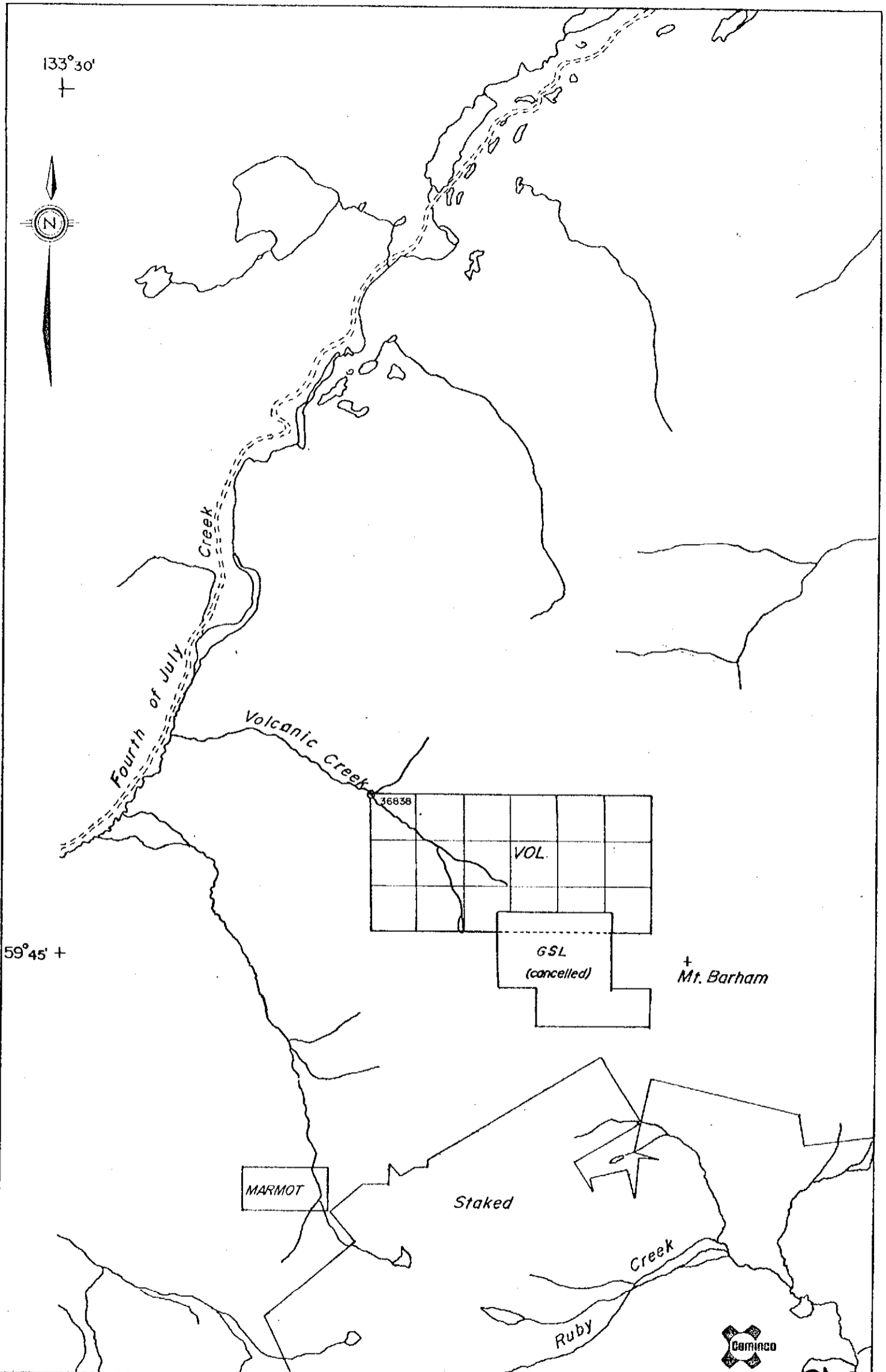
7283

**Gomco**

Drawn by: U.D.G.		Traced by:	
Revised by	Date	Revised by	Date

LOCATION MAP OF PROPERTIES  
ATLIN MINING DIVISION, B.C. (N.T.S. 104N)

Scale: 1:250,000	Date: NOVEMBER 1978	Plate: 2
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Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

CLAIM MAP  
(104-N14)

**7283**

Scale: 1:50,000

Date:

Plate: 3

LEGEND

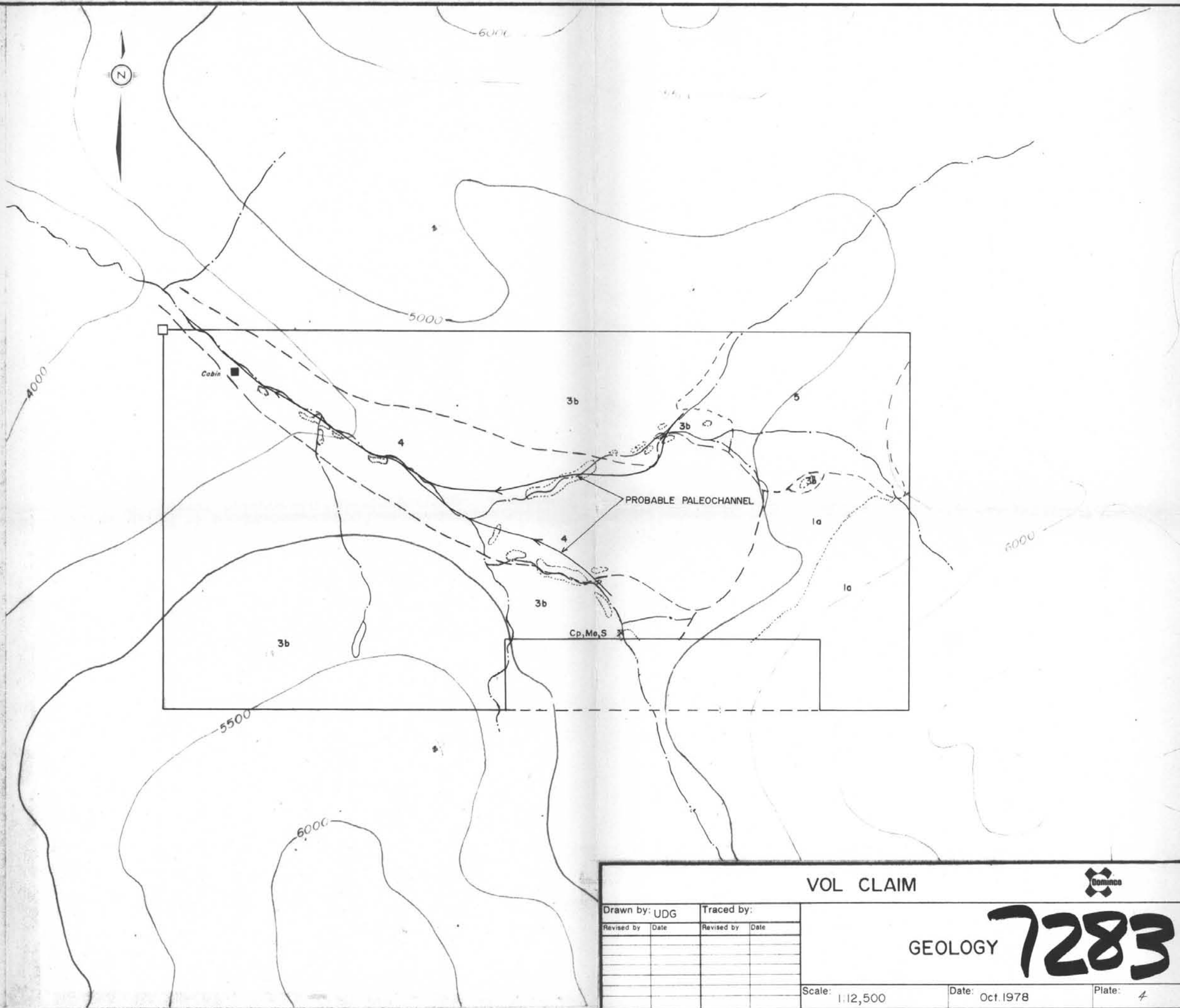
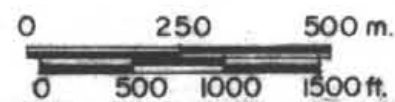
- 5 Glacial drift and alluvium Quaternary
- 4 Olivine basalt and scoria Tertiary and Quaternary
- 3b Alaskite Cretaceous
- 3a Granitoid Intrusives
- 2 Ultramafics Pennsylvanian and Permian
- 1 Cache Creek Group:

- 1a undifferentiated metasediments
- 1b chert pebble conglomerate
- 1c Grey chert and argillite
- 1d Grey marble
- 1e Dark grey "ribbon" chert
- 1f Buff to light grey chert, quartzite

- foliation: strike/dip
- bedding: strike/dip
- fault: observed, inferred
- fold axis: plunge
- axial trace: antiform, synform
- outcrop
- claim boundary
- legal corner post
- sample site: water, silt, rock, soil

S,W,Cp,Sp,F,Zu Scheelite, wolframite, chalcopyrite, sphalerite, fluorite, zeunerite  
 Mo Molybdenite

Scale



VOL CLAIM



Drawn by: UDG		Traced by:	
Revised by	Date	Revised by	Date

GEOLOGY **7283**

Scale: 1:12,500

Date: Oct. 1978

Plate: 4

LEGEND

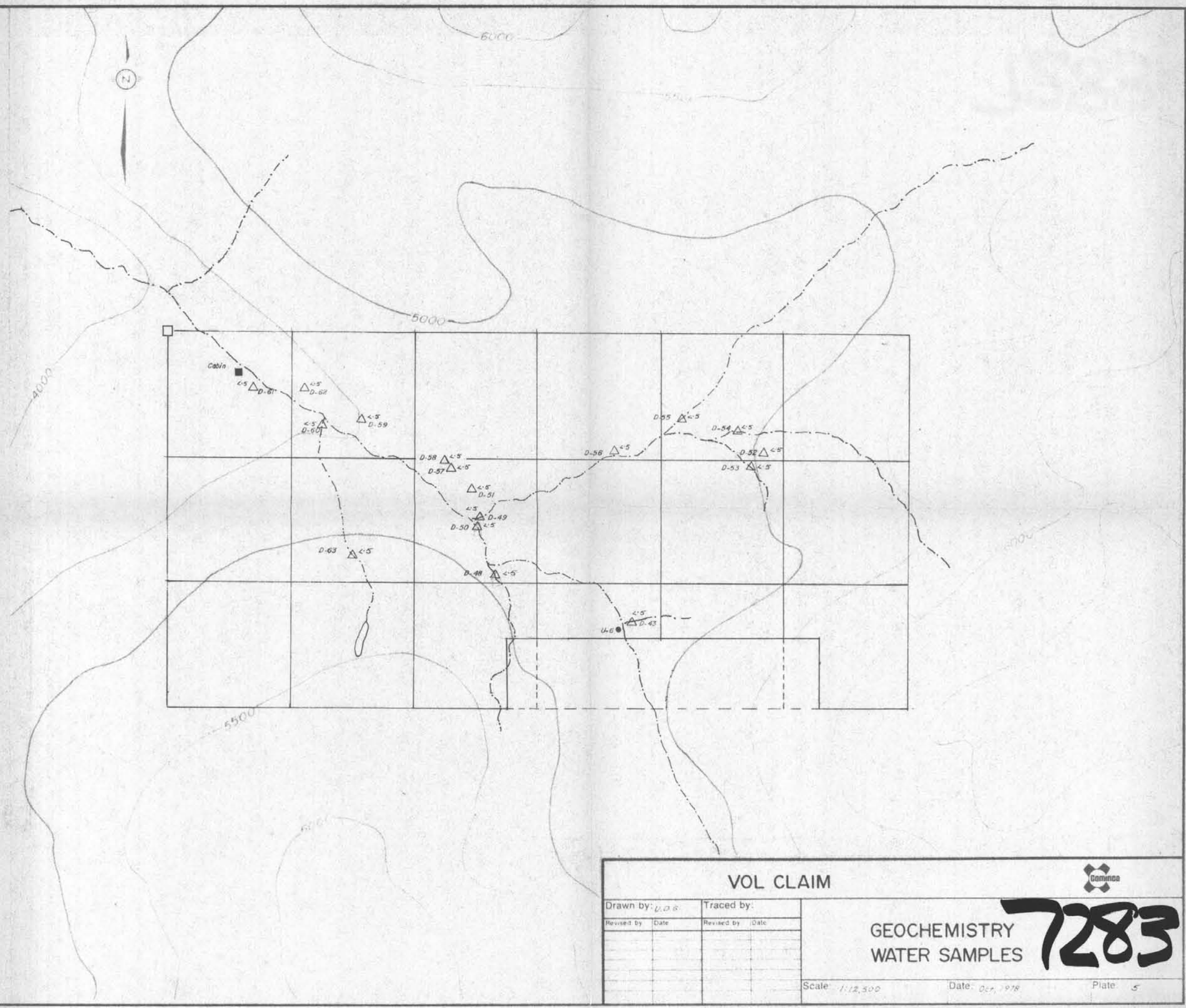
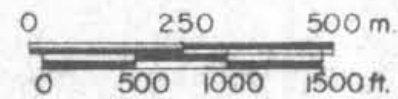
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- 1 Cache Creek Group:
  - 1a undifferentiated metasediments
  - 1b chert pebble conglomerate
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  - 1d Grey marble
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- foliation: strike/dip
- bedding: strike/dip
- fault: observed, inferred
- fold axis: plunge
- axial trace: antiform, synform
- outcrop
- claim boundary
- legal corner post

S,W,Cp,Sp,F,Zu Scheelite, wolframite, chalcocopyrite, sphalerite, fluorite, zeunerite  
 Mo Molybdenite

Scale



VOL CLAIM



Drawn by: *V.D.S.* Traced by:

Revised by: \_\_\_\_\_ Date: \_\_\_\_\_ Revised by: \_\_\_\_\_ Date: \_\_\_\_\_

GEOCHEMISTRY  
 WATER SAMPLES

**7283**

Scale: 1:12,500

Date: Oct, 1978

Plate: 5

LEGEND

- 5 Glacial drift and alluvium
  - 4 Olivine basalt and scoria
  - 3b Alaskite
  - 3a Granitoid intrusives
  - 2 Ultramafics
  - 1 Cache Creek Group:
    - 1a undifferentiated metasediments
    - 1b chert-pebble conglomerate, greywacke
    - 1c grey chert and argillite
    - 1d grey marble
    - 1e dark grey "ribbon" chert
    - 1f buff to light grey chert, quartzite
    - 1g skarn, amphibolite
- Quaternary  
Tertiary and Quaternary  
Cretaceous  
Jurassic  
Pennsylvanian and Permian
- foliation: strike/dip
  - bedding: strike/dip
  - fault: observed, inferred
  - fold axis: plunge
  - axial trace: antiform, synform
  - outcrop
  - contact: observed, inferred
  - claim boundary
  - sample sites: water, silt rock, soil
  - Mineralization: scheelite, wolframite, chalcocopyrite, sphalerite, fluorite, zinnerite, molybdenite
  - legal corner post
- 47,13,35,70,8 Co, U, Mo, Hg, W in silt

