

MOUNTAINEER MINES LTD. - PAN OCEAN OIL LTD.

JOINT VENTURE

GEOLOGICAL REPORT

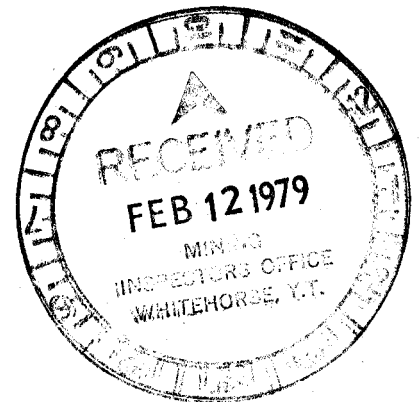
ON THE

ARCTOS 1-16 MINERAL CLAIMS

N.T.S. 106-D-16

64°56'N 134°21'W

YUKON TERRITORY



January, 1979

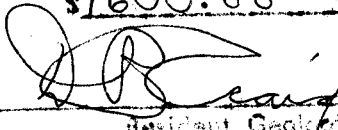
M.A. Stammers - Geologist

C. K. Ikona - P.Eng.

090422

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$1600.00

 22/2/79

Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under
Section 53 (4) Yukon Quartz Mining Act.


B. F. BAXTER

Supervising Mining Recorder


 Commissioner of Yukon Territory

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 LIST OF CLAIMS	1
3.0 LOCATION AND ACCESS.....	1
Fig. 1 Property Location Map	after page 1
Fig. 2 Claim Map	after page 1
4.0 TOPOGRAPHY AND VEGETATION	2
5.0 REGIONAL GEOLOGY	2
6.0 GEOLOGY	
6.1 Introcuton	5
6.2 Lithology	6
Fig. 3 Geology Map	after page 6
6.3 Structure and Stratigraphy	7
6.4 Mineralization	8
Fig. 4 Geology and Geochemistry Map... after page 8	
Table 6.4.1 - Showings	9
Table 6.4.2 - Assays 1976	10
Table 6.4.2 - Assays 1977	11
Table 6.4.2 - Assays 1978	11
7.0 GEOCHEMISTRY	12
8.0 TRENCHING	13
9.0 DISCUSSION AND CONCLUSIONS	13
10.0 RECOMMENDATIONS	14

LIST OF APPENDICES

APPENDIX I	-	Engineer's Certificate
APPENDIX II	-	Analysis Procedures
APPENDIX III	-	List of Personnel
APPENDIX IV	-	Affidavit of Expenditures
APPENDIX V	-	Statement of Expenditures
APPENDIX VI	-	Assay Certificates

1.0 INTRODUCTION

The ARCTOS 1-16 mineral claims were staked on September 15, 1976 by Harman Management Ltd. to cover copper, uranium, and cobalt showings discovered during a regional prospecting program carried out for Mountaineer Mines Ltd. A brief investigation of the property was conducted by Harman Management Ltd. subsequent to staking the ground.

Pan Ocean Oil Ltd. of Calgary acquired majority interest in the claims in the fall of 1976.

During the period July 18 to July 24, 1977, preliminary geologic mapping and detailed prospecting were carried out in the claims area by Pamicon Development Ltd.

During the period August 16 to September 5, 1978, continued property assessment work was carried out on the ARCTOS claims employing detailed geochemistry, prospecting, geological mapping and trenching by Pamicon Developments Ltd.

2.0 LIST OF CLAIMS

<u>Claim Name</u>	<u>Staking Date</u>	<u>Recording Date</u>	<u>Grant No.</u>
ARCTOS 1-16	September 15/76	September 24/76	YA7144-YA7159 incl.

Claim posts examined by the author appear to conform with the Yukon Quartz Mining Act regulations.

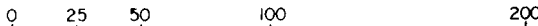
3.0 LOCATION AND ACCESS

The ARCTOS group is located 13 miles south of Quartet Lakes, 17 miles northwest of Gillespie Lake and 8 miles north-northwest of the Bear River airstrip in the northeastern Yukon Territory. The property is one hundred miles northeast of Mayo. Approximate co-ordinates of the claim

YUKON LOCATION MAP

ARCTOS GROUP

SCALE IN MILES



DRAWN

Altair

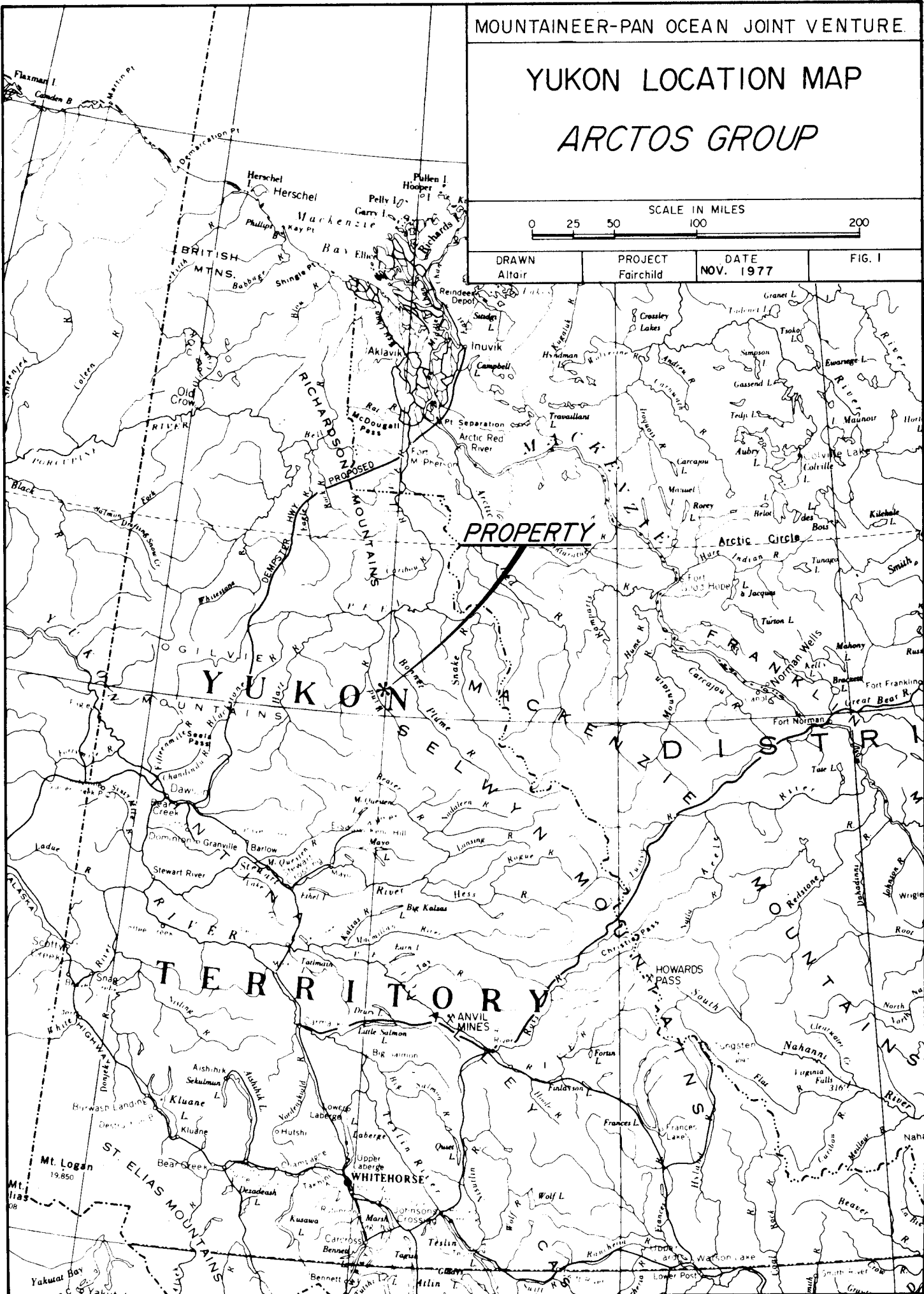
PROJECT

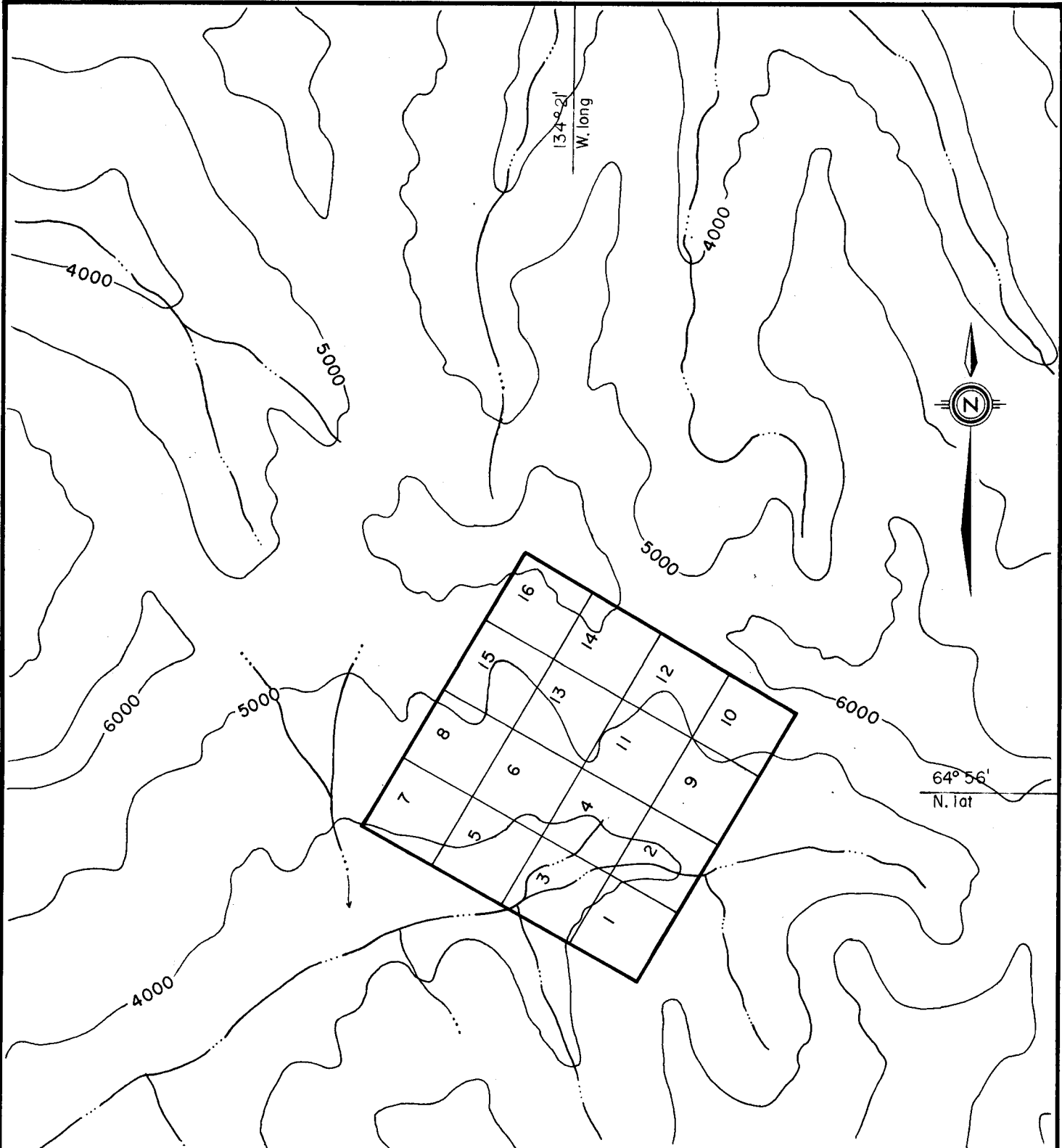
Fairchild

DATE

NOV. 1977

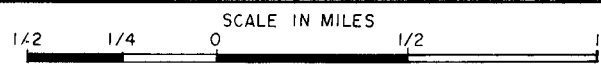
FIG. 1





MOUNTAINEER-PAN OCEAN JOINT VENTURE

ARCTOS CLAIMS
 CLAIM LOCATION MAP
 QUARTET LAKES AREA
 YUKON TERRITORY



DRAWN Altair	PROJECT Fairchild	DATE	FIG. 2
-----------------	----------------------	------	--------

group are 64°56'N. latitude and 134°21'W. longitude.

Access to the property is recommended by float equipped, fixed winged aircraft to either Gillespie Lake or Quartet Lakes. Wheeled aircraft may use the serviceable Bear River airstrip. Helicopter transport from any of the three fixed winged landing locations is required to reach the property.

Both helicopter and fixed wing aircraft as well as full expediting services are available in Mayo.

4.0 TOPOGRAPHY AND VEGETATION

Elevations on the property range from 3,600 feet to 6,600 feet and topography is rugged over most parts of the area. Outcrops are found mainly along ridge lines and along eroded stream banks. The entire claim group lies above tree line so vegetation consists entirely of low grasses and moss.

5.0 REGIONAL GEOLOGY

The Quartet-Fairchild region lies in the Wernecke Mountains of the north eastern Yukon Territory. In the general area, the Werneckes consist of local ranges which include the Rackla Range, Bonnet Plume Range and Knorr Range. Topography is normally moderate to rugged with elevations ranging from 2,000 to 6,500 feet. The major river valleys are broad, timbered and extensively overburden covered, while most mountain slopes present greater than 60% outcrop above the 4,000 foot level.

The entire area has been mapped by the Geological Survey of Canada and three separate publications are presented. The following memoir and open file reports give 1" = 4 miles geological coverage of the Nash Creek, Nadaleen River, Wind River and Snake River map areas.

- (1) Geology of Nash Creek, Larsen Creek and Dawson Map-Area, Yukon Territory by L.H. Green 1972 (Memoir 364).
- (2) Open File 205 (Geology of Nadaleen River and Bonnet Plume Lake Map sheets by S. Blusson) 1975.
- (3) Open File 279 (Geology of Snake River and Wind River sheets by D.K. Norris) 1975.

In the Quartet-Fairchild-Gillespie Lakes region Helikian rocks are exposed over an area of some 1,500 sq. miles in a roughly circular fashion centered near Longitude 134°00'W and Latitude 65°00'N.

These rocks have been described as Units 1 & 2 by L. Green on the Nash Creek Sheet.

Recent G.S.C. stratigraphic work by Bell and Delaney (1976) has redesignated Units 1a, 1 and 2 (Green 1972) as Units A, B, and C respectively. The unit designations as established by Bell and Delaney will be used in this report.

Unit A whose base is not exposed, is composed of a thick succession of moderately metamorphosed fine grained clastic sediments with interbedded carbonates. The overlying Unit B consists of thinly interbedded slates and argillites with occasional quartzite beds.

Unit C, which conformably overlies the uppermost slate-quartzite section of Unit B, consists mainly of thickly bedded orange weathering dolomites. The base of the unit is marked by a series of transitional beds of alternating buff weathering dolomites and interbedded slates and quartzites.

Erratically distributed throughout the Proterozoic metasediments are irregularly shaped breccia bodies. The breccia zones vary from tens of feet to several thousand feet in size and appear as cross cutting pipe-like features at all levels in the stratigraphic column. Several varieties exist, but all exhibit an assortment of angular clasts derived from rock types common to the area. Hornfels margins observed at several localities indicate an intrusive origin.

A common association with many of the breccia bodies are zones of veining or locally pervasive feldspar alteration seen as internal features within the breccias or in host rocks adjacent to them.

The alteration zones are pink in colour due to either K-spar or strong hematization and in some instances contain varying amounts of specularite, chalcopyrite and minor uranium mineralization.

5.1 Structure

Two major periods of deformation have taken place within the Wernecke Mountain region. During the first period or Racklan Orogeny, the Proterozoic rocks of Units A, B, and C underwent intense folding and faulting. Folds are tight to isoclinal with the development of strong axial plane

cleavage and commonly an almost vertical foliation.

A major unconformity of Lower Hadrynian age forms the upper contact of Unit C. In many localities, erosion beneath this unconformity has resulted in the complete removal of Unit C and the strong angular relationship between the relatively flat lying Cambrian and younger rocks directly overlying Units A and B is apparent.

Further unconformities near the Upper Hadrynian, Lower Cambrian and Upper Cambrian margins leave Devonian carbonates directly over the Helikian section.

The second period of deformation, which involves both Paleozoic and Proterozoic strata, is weak compared to the first. This is particularly evident in the younger Carbonate sections to the west and southwest where deformation consists mainly of broad open folding and minor overthrusting.

6.0 GEOLOGY

6.1 Introduction

The ARCTOS 1-16 mineral claims are underlain by Proterozoic sedimentary rocks belonging to map units B and C. The rocks have undergone intensive structural reshaping and Unit B rocks are abundantly metasomatized. A related intrusive/tectonic period of brecciation is evidenced in the region. Uranium, cobalt and copper mineralization appears to be related to structural and metasomatic events. Light grey

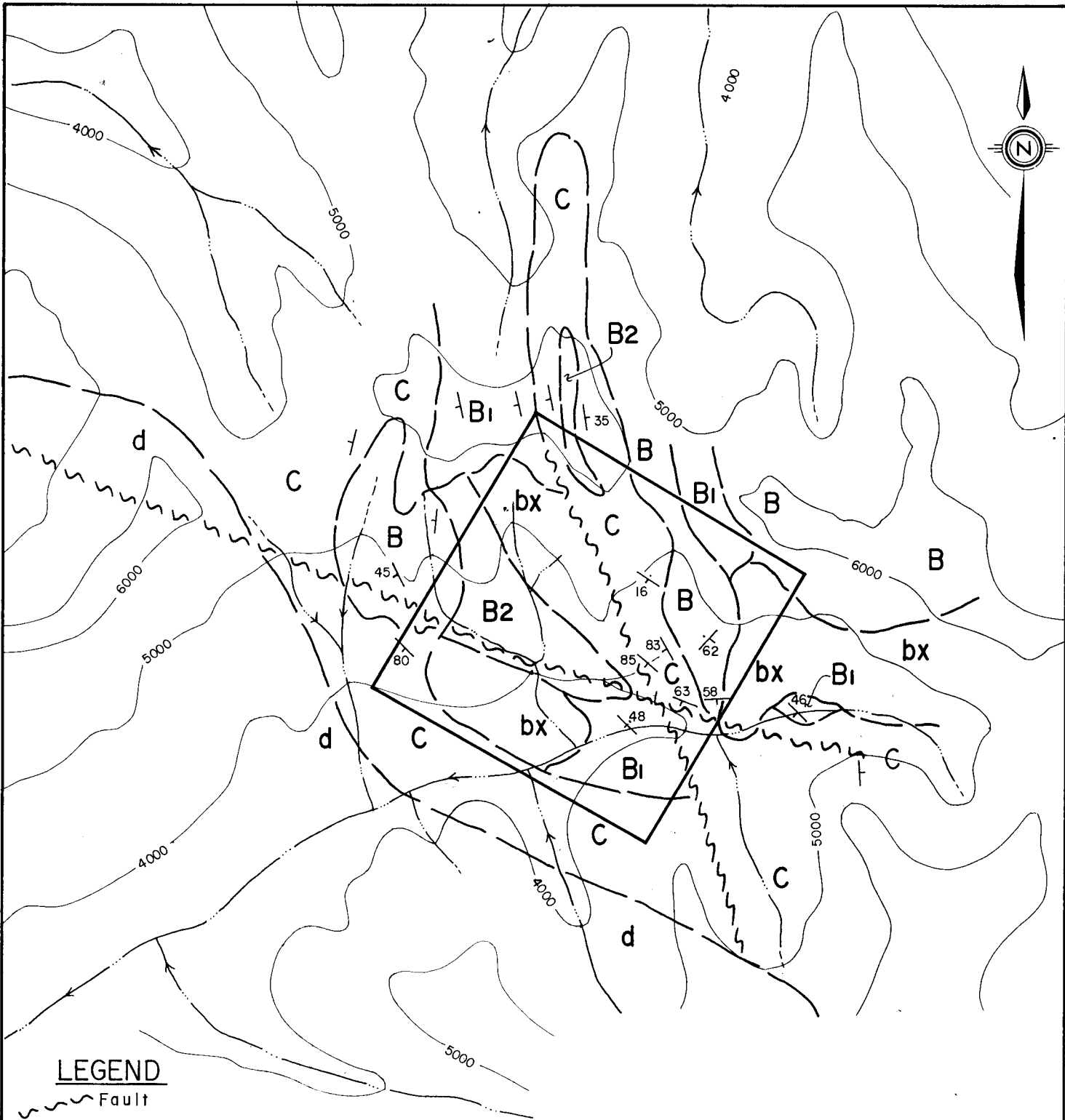
weathering Devonian dolomites are found to the south and west of the property.

6.2 Lithology

Shaley, siliceous siltstones with minor sandstone interbeds of upper Unit B outcrop in the northern end of the property. A thick (approx. 100 feet) series of thinly bedded black shales are found in the uppermost part of the Unit B section. The majority of Unit B rocks on the claim group appear to be heavily altered or metasomatized to either a purple-red weathering "metasomatite" or a medium green weathering chloritic metasiltstone.

The purple-red weathering unit contains several recognizable rock lithologies ranging in colour from purple-red to purple-brown. Crude bedding is generally preserved. Minor brecciation or weakly developed brecciation may be present. Shaley beds and occasional brick red chert bands are found throughout the unit.

The medium green weathering metasiltstone is fine grained and contains mainly quartz and chlorite. The unit is massively bedded, showing only weak bedding features. The possibility of an igneous origin should not be ruled out. Petrographic and/or geochemical analysis is recommended for composition determination. No uranium or copper mineralization were identified within this unit. Occasional specular hematite is present.



LEGEND

- Fault
- Geologic Contact
- Bedding attitude

LITHOLOGY

- bx** Breccia
- d** Grey weathering Devonian Dolomites.
- C** Orange weathering Dolomites
- B2** Chloritic Metasiltstone
- B1** Metasomatized UNIT B: "Metasomatite"
- B** Shales, Siltstones, Sandstones

MOUNTAINEER-PAN OCEAN JOINT VENTURE			
ARCTOS CLAIMS NTS 106 E 1			
GEOLOGY			
YUKON TERRITORY			
PAMICON DEVELOPMENTS LIMITED			
DRAWN: Altair	PROJECT: Fairchild	DATE: DEC. 1977	FIGURE: 3

A fairly thick sequence of interbedded shales and dolomites are found off the western claim boundary and are designated as the B/C transition map unit.

The orange-brown weathering Unit C dolomites are generally massively bedded with a medium grey, finely crystalline appearance on the fresh surface. The majority of Unit C occurs in two bands on the property; one to the south and one running diagonally to the south-east from the northwest corner of the property.

The common form of breccia occurring on the claim group weathers purple-brown and contains distinguishing blood-red clasts of altered silicified siltstones. The matrix is strongly chloritized, hematized and fine-grained. Observed mineralization in the breccia unit includes hematite, chalcopryrite, pyrite, and brannerite.

Light grey weathering, medium-grained, massively bedded dolomites of probable Devonian age are found to the south and west of the ARCTOS claim group.

6.3 Structure and Stratigraphy

Stratigraphically, the Unit B clastic sediments are the oldest rocks exposed on the property. Unit C dolomites overlie Unit B and a 200' thick zone of B/C transition zone lithology separates the two principal rock groups. Overall strike is along a northwest trend with bedding dipping to the southwest. Locally bedding attitudes may vary with structural disturbances.

Two major regional faults intersect on the property. The north-northwest trending fault appears to have uplifted Unit C dolomites into what was previously mapped as a synclinal fold belt, however structural examination of strata lying in this dolomite belt indicates an uplifted thrust wedge as opposed to a synclinal fold. A second major fault trending west-northwest intersects the aforementioned fault in ARCTOS mineral claim #2. The fault trace displaces all lithological boundaries. However, brecciation and metasomatism appear to intensify in the proximity of the faulting.

Stratigraphically, the metasomatic rocks lie within Unit B strata; also, they invariably occur adjacent to the breccia group. The actual lithological boundary between these three defined units is vague and highly transitional. When combined, the three units cover 70% of the property's ground.

6.4 Mineralization

Several vein and pod-type occurrences of uranium, copper, cobalt and barium mineralization were located and investigated. All occurrences were found in either the breccia group or the Unit B metasiltsstones. Preliminary investigation indicates a crude lineation of mineralization along two observed fault linears. Nine mineralized zones have been located to date.

Uranium mineralization occurs in pods within the purple-brown breccia group and in the purple-red metasiltsstones. Identification of localities was made with hand-held scintillometers and by visual recognition of the red albitized alteration zones.

Table 6.4.1 demonstrates the approximate size and strength of uranium occurrences. Table 6.4.2 lists assay results for selected sample locations.

Table 6.4.1

Showings: ARCTOS claims

<u>Showing No.</u>	<u>Scintillometer Readings (cps BGS-ISL)</u>	<u>Size</u>	<u>Associated Minerals</u>	<u>Host Unit</u>
1	500-1000	2 pods @ 1'x2'	Cu, Fe	B
2	500-1000	1 pod @ 1'x10'	Cu, Fe	B
3	3000-10,000	1 pod @ 3'x3'	Cu, Fe, Co, Ba	bx
4	3000-10,000	1 pod @ 2'x2'	Cu, Fe, Ba	bx
5	3000-10,000	1 pod @ 1'x1'	Cu, Fe	bx
6	1000-3000	4 pods @ 2'x3'	Cu, Fe	bx
7	1000-3000	several pods, ~ 1'x3'	Cu, Fe	bx
8	copper only	1'x12'	Fe	bx
9	1000-3000	several pods, ~ 1'x3'	Cu, Fe	bx

Copper occurs as disseminated and podiform chalcopyrite, disseminated bornite and secondary malachite. One large pod (showing #8) approximately 12'x1' of massive

chalcopyrite was reported by the prospector. Most of the copper showings are associated with the two main faults and occur within the breccia group or in the Unit B metasiltstone.

Cobalt occurs as finely disseminated silver grey cobaltite and secondary pink erythrite in a small vein in showing location number 3. Coarsely crystalline barite (BaSO_4) is present in bedding plane veins. Total barite found to date is minor.

Table 6.4.2

Assays (1976)

<u>Sample No.</u>	<u>%U₃O₈</u>	<u>% Cu</u>	<u>Description</u>
50657	<0.001		Sample across 2'-3' wide chert band in chloritic metasiltstone 1700' NW of showing #3.
50658	0.002	0.14	Random rock chip sample across 10' of altered siltstones adjacent to chert bed in showing #3.
50659	0.007	0.82	Grab sample of float material from shear zone on SE side of creek in showing #3 area.
50688	0.005	3.85	Continuous rock chip sample across 5' of middle section of chert bed, taken approximately halfway up showing #3.
50689	0.011	0.31	Continuous rock chip sample across 10' of chert bed, sample taken at top of showing #3.
50691	0.237		Chip sample from lower 2' of chert bed, sample taken halfway up showing #3.

Table 6.4.2 (Cont'd)

1977

<u>Sample No.</u>	<u>% U₃O₈</u>	<u>% Cu</u>	<u>Description</u>
62551	0.094	0.52	Grab sample from outcrop, showing #4.
62552	1.20	0.26	Grab sample from outcrop, showing #4.
62553	0.957	0.87	Grab sample from outcrop, showing #4
62554	0.080	0.79	Grab sample from outcrop showing #3. Also assayed 0.27% Co.
62555	0.034	0.51	Grab sample from outcrop showing #9.

1978 (See Figures 4 and 5 for assay locations)

<u>Sample No.</u>	<u>Showing No.</u>	<u>%U₃O₈</u>	<u>% Cu.</u>	<u>Description</u>
64702	4	0.024	2.75	1 metre chip sample located in Arctos main showing Trench No.1
64703	4	0.160	0.27	1 metre chip sample located in the Arctos main showing Trench No. 1
64704	3	0.022	0.17	1.5 metre chip sample located in the Arctos main showing. Trench No.2
64712	8	0.020	42.2	1 metre chip sample from quartz-chalcopyrite-barite vein. Gold assay 0.007 oz/t
64713	6 south	0.008	0.179	2 metre chip sample from U-mineralized outcrop located 200 metres south of showing No. 6.
64714	6	0.160	0.27	1.75 metre chip sample from mineralized outcrop

7.0 GEOCHEMISTRY

During prospecting on the property (1977) eight water geochemistry samples were taken from active streams. Samples were collected in numbered, acid cleansed, plastic sample bottles. Samples were sent for analysis to Chemex Labs Ltd. in North Vancouver, B.C. and upon receipt were analysed for uranium using standard fluorometric procedures. (See Appendix II for complete descriptions of procedures.)

Results of the survey ranged from <0.2 to 15.0 parts per billion uranium. Four values of 15.0 ppb., 5.0 ppb., 3.9 ppb., and 2.9 were considered anomalously high in uranium content. The results were encouraging in that they confirm known zones of mineralization and indicate new zones in which uranium showings have not yet been encountered.

A follow-up program was carried out in 1978. The results again proved to be encouraging. The west branch was the most anomalous with values exceeding ten parts per billion uranium over the majority of the stream. Values on the east branch remain anomalous but average five parts per billion uranium. On the main stream values are slightly anomalous with an average of less than four parts per billion uranium.

Anomalous uranium in water values are found specifically in lithologic units B_1 , B_2 and bx. Putting those units in descending order of importance one finds the chloritic metasomatite (B_2) with values of 11.2, 12.3, 15.7, 9.6, 15.0 ppb,

the breccia (bx) with values of 12.2, 11.8, 10.4, 5.8, 4.5 and 3.5 ppb uranium and the purple-brown metasomatite with values of 6.6 and 6.9 ppb uranium.

8.0 TRENCHING

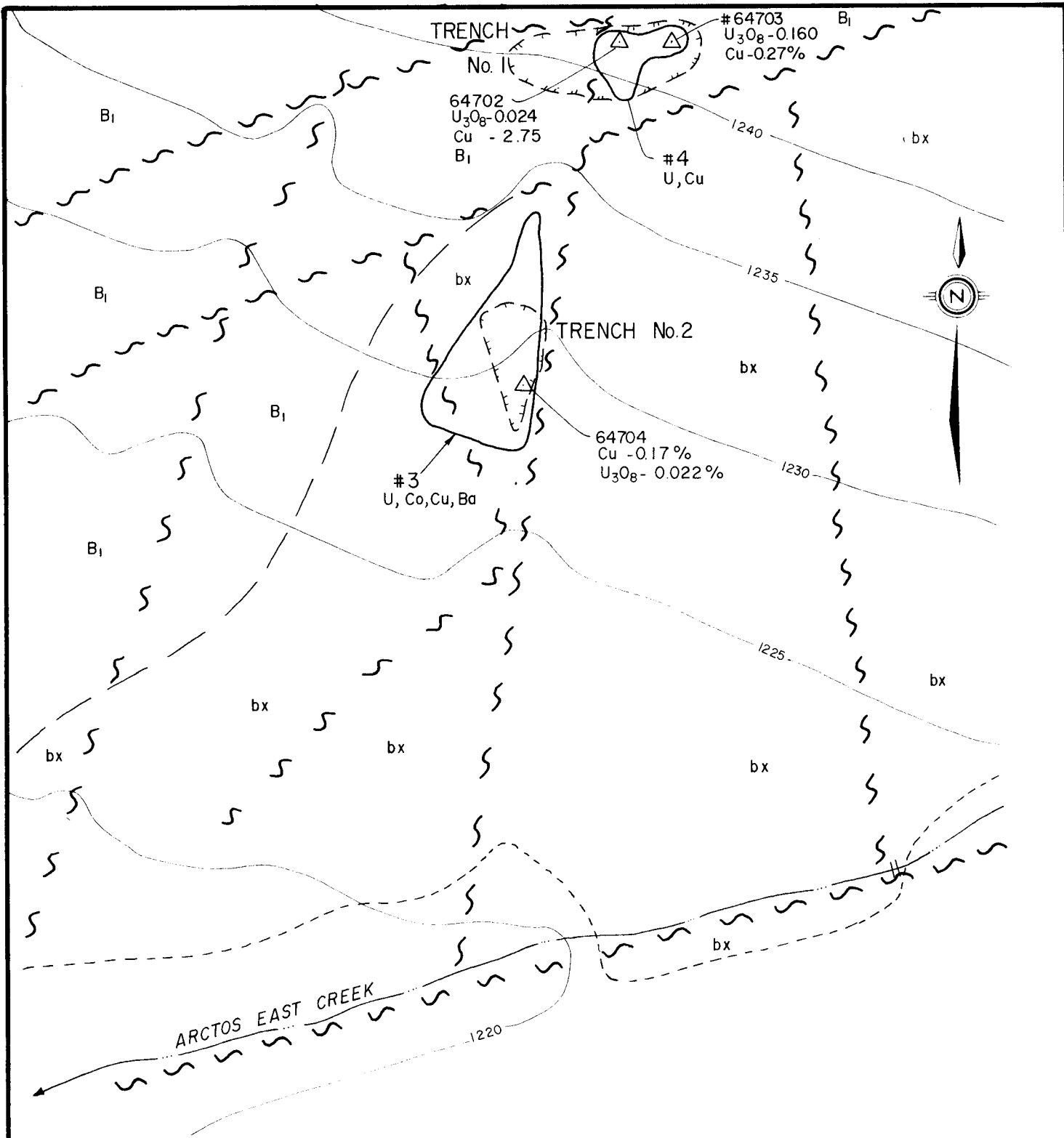
Preliminary trenching on the Arctos main showing area (showings 3 and 4) was carried out using explosives and hand tools on August 16, 1978 (See Figure 5).

Trench No. 1 measures 3.5 x 2.4 metres and is underlain by altered shaley sediments. Significant copper and uranium mineralization appears to be related to faulting and fracturing.

Trench No. 2 was cut out of solid outcrop and measures 2.5 x 1 metre. Only minor uranium and copper mineralization is present.

9.0 DISCUSSION AND CONCLUSIONS

The ARCTOS mineral claims lie in a belt of structurally prepared and chemically altered Proterozoic sediments. Uranium mineralization occurs throughout the property in small podiform showings in breccia bodies and breccia related alteration zones. Due to the extent of overburden cover on most parts of the property, the showings seen to date have been limited in size. It is felt, however, that the degree of structural and chemical alteration combined with the encouraging assays and promising tenor of some of the showings seen, indicates a need for further work on the property.



LITHOLOGY

- bx Breccia Group
- B1 Metasomatite
- U Uranium Mineralization
- Cu Copper
- Ba Barium
- Co Cobalt

○ Mineralization Location
#3

LEGEND

- Geologic Contact
- - - Trench
- ~ ~ ~ Fault
- △ 64702 Rock Geochem. Sample Location
- - - Outcrop Limit
- ~ ~ ~ 1240 Contour(meters)

MOUNTAINEER-PAN OCEAN JOINT VENTURE

CENTRAL ARCTOS CLAIMS

NTS 106-D-16

ARCTOS MAIN SHOWING

ARCTOS #3 + 4
YUKON TERRITORY



PAMICON DEVELOPMENTS LIMITED

DRAWN: Altair	PROJECT: Fairchild	DATE: Nov. 1978	FIGURE 5
------------------	-----------------------	--------------------	-------------

Investigation of those areas of interest in which overburden cover is extensive would be facilitated by a soil sampling program using either a grid or a contour system of sample locations. The samples should be analysed for both copper and uranium.

Results of the 1978 water geochemistry sampling programme are very encouraging and indicate that the area is favourable for uranium mineralization. Retention of the property is advised with a follow-up programme in 1979.

10.0 RECOMMENDATIONS

1. A picket grid should be established on the overburden covered areas of interest. The grid should be run along the breccia/metasomatite contact between showings 4 and 6.
2. The following surveys should be carried out in the grid area:
 - A) Detailed prospecting and geologic mapping.
 - B) Spectrometer survey.
 - C) Radon gas survey.
 - D) Soil sampling.
3. Geologic mapping in areas of interest should be completed using air photo enlargements at a scale of approximately 1 inch = 1,000 feet.

4. Trenching should be continued in the Trench No.1 area and in any other areas indicated by the 1979 program.

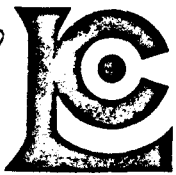
Respectfully submitted,

M. A. Stammers, Geologist

M. A. Stammers

C. K. Ikona, P.Eng.

C. K. Ikona



CHEMEX LABS LTD.

212 BROOKSBANK AVE.
NORTH VANCOUVER, B.C.
CANADA V7J 2C1
TELEPHONE: 985-0648
AREA CODE: 604
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ASSAY

TO: Pamicon Developments Ltd.,
610 - 850 W. Hastings St.,
Vancouver, B.C.
ATTN: V6B 1P1

CERTIFICATE NO. 34212
INVOICE NO. 27833
RECEIVED August 23, 1978
ANALYSED August 31, 1978

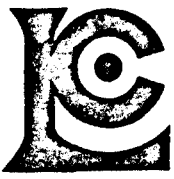
SAMPLE NO. :	% Cu	oz/t Ag	oz/t Au	% U ₃ O ₈
64702	2.75	✓		0.024
64703	0.62			0.044
64704	0.17			0.022



MEMBER
CANADIAN TESTING
ASSOCIATION

Stan Masini

REGISTERED ASSAYER, PROVINCE OF BRITISH COLUMBIA



CHEMEX LABS LTD.

212 BROOKSBANK AVE.
 NORTH VANCOUVER, B.C.
 CANADA V7J 2C1
 TELEPHONE: 985-0648
 AREA CODE: 604
 TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

TO: Pamicon Developments Ltd.,
 208 - 850 W. Hastings St.,
 Vancouver, B.C.
 ATTN: V6B 1P1

WATERS

CERTIFICATE NO. 45825
 INVOICE NO. 28183
 RECEIVED Sept. 13/78
 ANALYSED Sept. 21/78

SAMPLE NO. :	PPB	
	Uranium	✓
5620	1.7	
5621	4.2	
5622	4.2	ARCTOS
5623	9.6	
5624	15.7	
5625	12.3	
5626	11.2	
5627	10.4	



MEMBER
 CANADIAN TESTING
 ASSOCIATION

CERTIFIED BY: Hart Biddle

