MOUNTAINEER MINES LTD. - PAN OCEAN OIL LTD.

JOINT VENTURE

PRELIMINARY GEOCHEMICAL REPORT

ON THE

FOX 1-36 MINERAL CLAIMS

N.T.S. 106-E-2

65°11'N 134°47'W

YUKON TERRITORY

by

D. A. Yeager - Geologist

C. K. Ikona - P.Eng.

December, 1977

090285

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

$3600.00

Resident Geologist or
Mining Engineer

Considered as representation work under Section 32 (4) Yukon Quartz Mining Act.

B. R. BAXTER
Supervising Mining Recorder

for Commissioner of Yukon Territory

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APPENDICES

1.0 INTRODUCTION

The FOX 1-36 mineral claims were staked on November 19, 1976 by the Mountaineer Mines Ltd. - Pan Ocean Oil Ltd. joint venture to cover favourable geologic targets in the Quartet/Fairchild uranium belt.

During the period June 17 to August 27, 1977, a visual and geochemical prospecting program was carried out in the claims area by Pamicon Developments Ltd., under the field supervision of R. Darney.

2.0 LIST OF CLAIMS

CLAIM NAME	STAKING DATE	RECORDING DATE	GRANT NO.'S
FOX 1-32	November 19/76	November 25/76	YA14443-YA14478 incl.

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

3.0 LOCATION AND ACCESS

The FOX claims are located on N.T.S. sheet 106-E-2, approximately 115 miles north-northeast of Mayo in the northeastern Yukon Territory. Approximate co-ordinates of the claim groups are 65°11'N. latitude, 134°47'W.longitude.

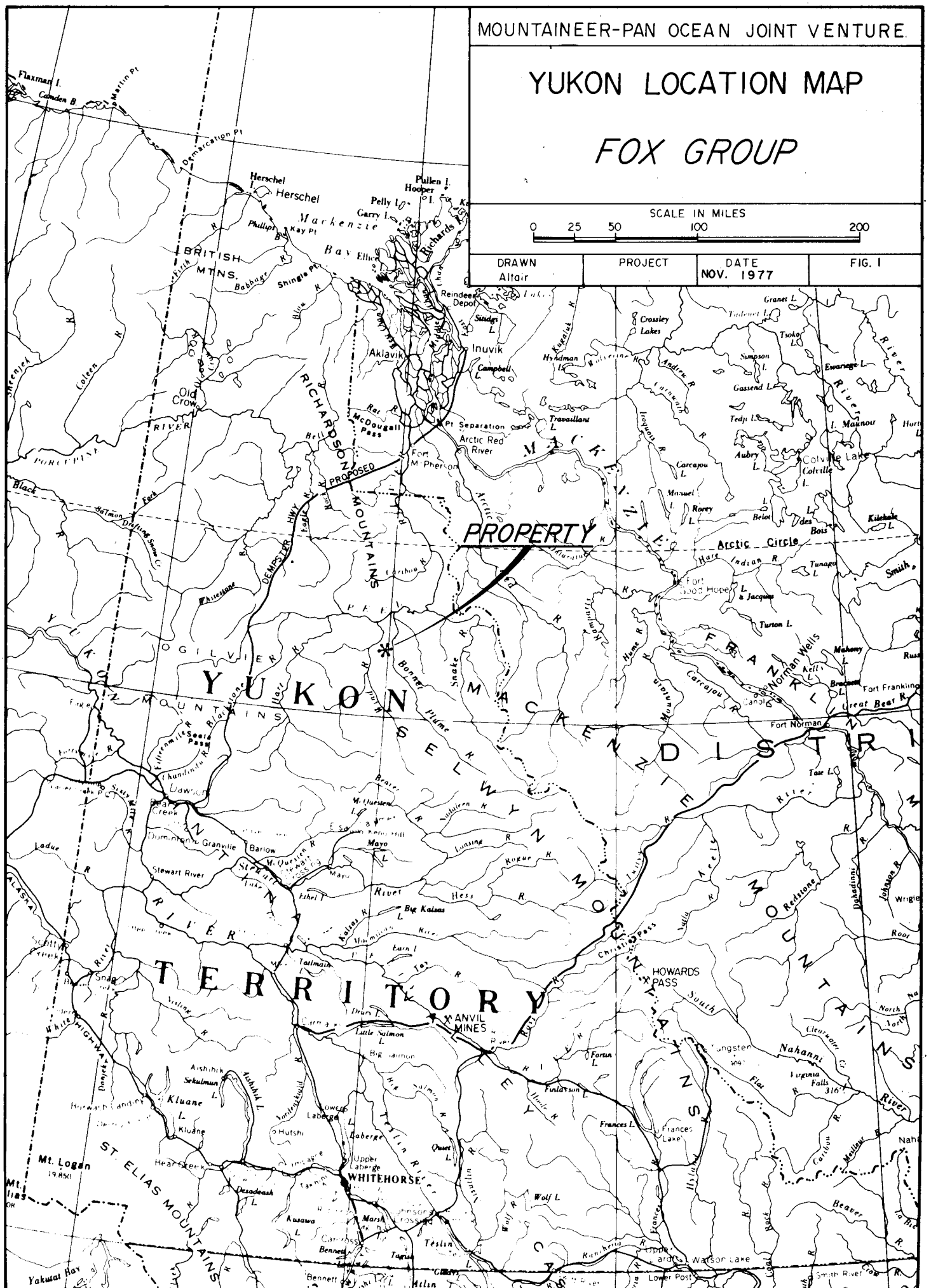
Access to the property is by fixed wing aircraft from the community of Mayo to Kiwi Lake, a distance of 120 miles, then by helicopter or on foot the five miles southwest to the property.

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

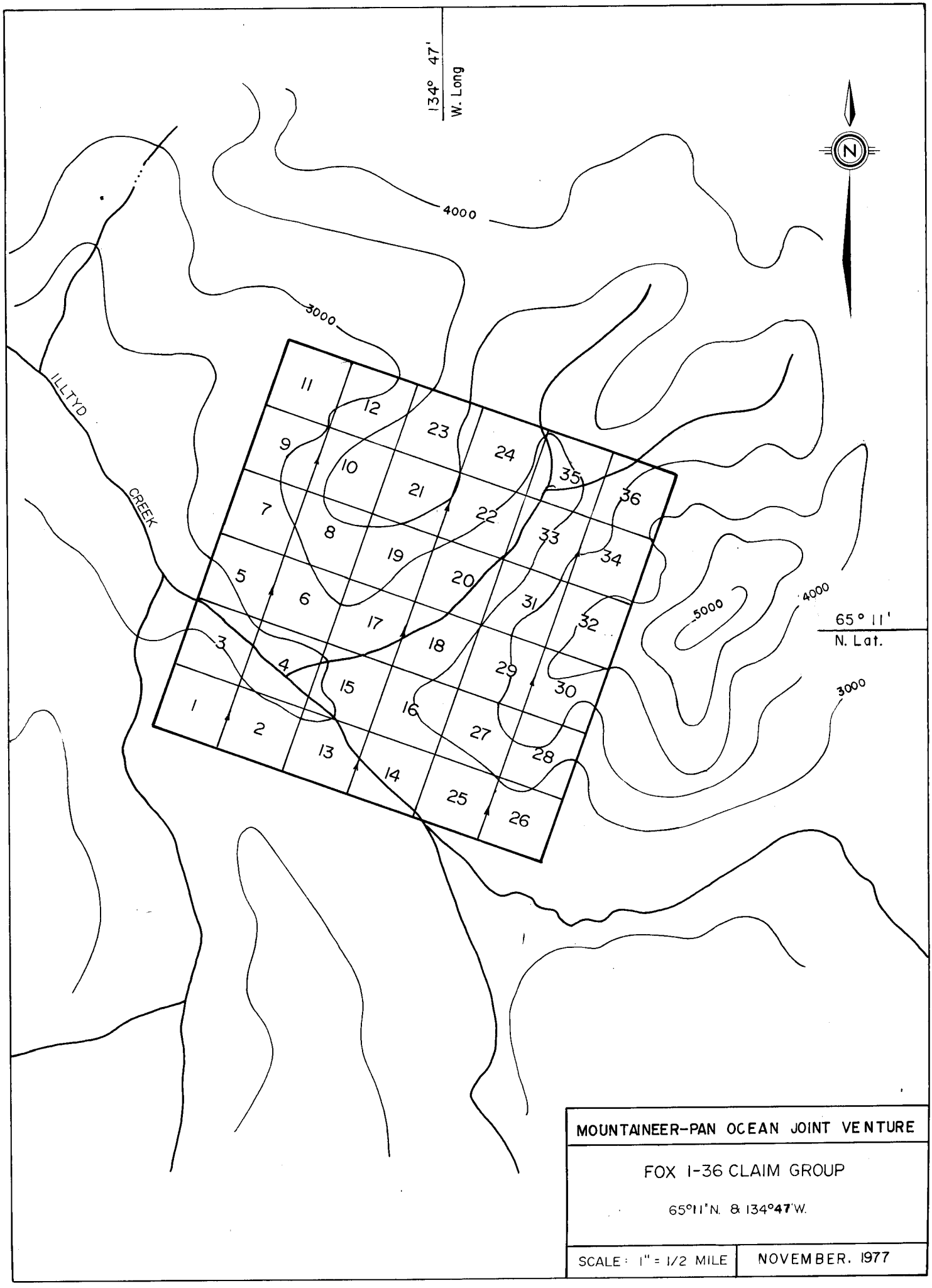
MOUNTAINEER-PAN OCEAN JOINT VENTURE.

YUKON LOCATION MAP

FOX GROUP



DRAWN	PROJECT	DATE	FIG. 1
Altair		NOV. 1977	


134° 47'
W. Long
N
4000
3000
ILLTYD
CREEK
11
12
23
24
9
10
21
35
36
7
8
22
33
34
5
6
19
20
31
32
3
4
17
18
29
30
1
2
15
16
27
28
13
14
25
26
5000
4000
65° 11'
N. Lat.
3000
MOUNTAINEER-PAN OCEAN JOINT VENTURE
FOX 1-36 CLAIM GROUP
65°11'N. & 134°47'W.
SCALE: 1" = 1/2 MILE
NOVEMBER. 1977

4.0 TOPOGRAPHY AND VEGETATION

Elevations on the property range from 2,500 feet to 4,000 feet A.S.L. and topography varies from gentle in the creek valleys in the southern part of the property to extreme in the mountains along the eastern boundary. Good bedrock exposure is limited to the mountainous terrain in the eastern part of the claims while the remaining 60% of the area is covered by overburden and vegetation.

Vegetation consists of black spruce and willow thickets at low elevations giving way to dwarf birch, grasses, and moss at about the 3,000 foot level.

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 consists 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 particularily evident in the younger Carbonate sections to the west and southwest where deformation consists mainly of broad open folding and minor overthrusting.

6.0 PROPERTY GEOLOGY

6.1 Introduction

No detailed geologic mapping was done on the FOX group, however, mapping at 1 inch to 4 miles was carried out by the Geological Survey of Canada (Norris 1974) and 1:50,000 reconnaissance mapping was done by Pamicon Developments Ltd. in the claims area. A compilation of this work is presented in Figure 3 of this report at a scale of 1 inch to 1,000 feet.

6.2 Lithology

The lowermost rocks exposed on the property are Proterozoic sediments and metasediments thought to be Helikian in age. These have been subdivided in Figure 3 to Unit H (undivided Helikian), Ha (Unit A), and Hb (Unit B). The Unit A rocks are mainly grey weathering siltstones, and where exposed are often very phyllitic. The Unit B rocks are black weathering, interbedded black slates and argillites. The uppermost rocks are grey weathering clastics and carbonates thought to be of Cambrian age.

6.3 Stratigraphy and Structure

The Unit A siltstones and phyllites are the oldest rocks present on the property. They are presumed to be overlain conformably by the Unit B slates and argillites exposed to the south of the claims, however, the two units may come in fault contact somewhere in the overburden covered Illtyd Creek valley.

The flat lying Cambrian carbonates and clastics exposed on the property lie unconformably on the Proterozoic section. Although the contact is not well exposed on the FOX claims, its angular nature is evident at many localities in the Quartet-Fairchild region.

A system of east-westerly trending faults separates the Cambrian and Proterozoic sediments underlying most of the claim group from a block of Unit A siltstones and phyllites lying to the north.

6.4 Mineralization

No mineralization was encountered in the exposed rocks on the property.

7.0 GEOCHEMISTRY

7.1 Introduction

The geochemical program on the FOX claims consisted of reconnaissance water sampling of all the drainages, springs and seepages encountered during prospecting, silt sampling of all streams at 500 foot or 1,000 foot intervals depending on the availability of sediments, and reconnaissance soil

Ha

Ha

€

H

€

€

H

FOX CREEK

Ha

5000

3000

€

ILLTYD CREEK

FOX CLAIMS BOUNDARY

€ Hb

N

LEGEND

Cambrian — € Carbonates

Protorozoic — H
- Hb - UNIT B argillites and slates
- Ha - UNIT A siltstones and phyllites

Fault

Geologic Contact

○ silt sample —— values in ppm U

□ water sample —— values in ppb U

• soil sample —— " " ppm U

MOUNTAINEER-PAN OCEAN JOINT VENTURE

FOX 1-36 CLAIM GROUP

NTS 106 E2

GEOLOGY & GEOCHEMISTRY SURVEY

YUKON TERRITORY

FEET 0 500 1000 2000 3000

METRES 0 200 400 600 800

PAMICON DEVELOPMENTS LIMITED

DRAWN:	PROJECT:	DATE:	FIGURE:
Altair	Quartet - Fairchild	DEC. 1977	

sampling along two contour lines at approximately 200 foot intervals. Sample locations and values are presented in Figure 3 of this report. Complete descriptions of analysis procedures and certificates of analysis are included in Appendix II and Appendix VI respectively.

7.2 Water Geochemistry

Eighteen water samples were collected during the survey. Samples were taken in numbered, acid cleansed, plastic sample bottles and sent for analysis to Chemex Labs. Ltd. in North Vancouver, B.C. Upon receipt at Chemex, the samples were analysed for uranium using standard fluorometric procedures.

Values ranged from less than 0.2 to 0.4 parts per billion uranium. Compared to regional water sampling results, all these values fall within background limits.

7.3 Stream Sediment Geochemistry

Forty-seven silt samples were collected during the survey. Samples of silt size sediments were taken from active streams and placed in numbered kraft envelopes. The samples were partially dried in camp then sent for analysis to Chemex Labs Ltd. in North Vancouver, B.C. Upon receipt at Chemex, the samples were analysed for uranium using standard fluorometric procedures.

Values ranged from less than 0.5 to 55 parts per million uranium. A statistical analysis of silt sample results from a regional survey carried out by Pamicon Developments Ltd. in the area indicates that values below

5 ppm can be considered background, values between 5 ppm and 35 ppm can be considered anomalous, and values above 35 ppm can be considered highly anomalous. Applying these figures to the FOX claims survey, 27 samples fall within background limits, 19 samples are anomalous, and 1 sample is highly anomalous.

7.4 Soil Geochemistry

Fifty-one soil samples were collected during the survey. The samples were taken from the B soil horizon and placed in numbered kraft envelopes. They were partially dried in camp then sent for analysis to Chemex Labs. Ltd. in North Vancouver, B.C. Upon receipt at Chemex the samples were analysed for uranium using standard fluorometric procedures.

Values ranged from less than 0.5 to 90 parts per million uranium. A statistical analysis of soil sample results from a regional survey carried out in the area by Pamicon Developments Ltd. indicates that values below 0.8 ppm can be considered background, values between 0.8 ppm and 3.3 ppm can be considered anomalous, and values greater than 3.3 ppm can be considered highly anomalous. Applying these figures to the FOX claims survey, 29 samples fall within background limits, 7 samples are considered anomalous, and 15 samples are considered highly anomalous.

8.0 DISCUSSION AND CONCLUSIONS

All but two of the silt samples taken from Fox Creek

exhibit anomalous concentrations of uranium. Both forks of Fox Creek, in the northern part of the claims, also exhibit anomalous values, with the highest concentrations occurring near the northern claim boundary in the east fork. All side creeks and seepages flowing into Fox Creek from the east exhibit background uranium values as does the main body of Illtyd Creek to the southwest.

A very strong uranium soil sanomaly exists on the northwest side of Fox Creek. Highly anomalous soil values were encountered over a distance of 3,000 feet, with peak values of 90 and 65 ppm. A more subdued anomaly with peak values of 1.5 ppm occurs on the knoll between the two forks of Fox Creek just off the northern claim boundary.

It is felt that the encouraging results of the geochemical survey indicate a need for further work on the FOX claims. The geochemical anomalies should be completely delineated and a better understanding reached of the geology in the area. In particular, efforts should be concentrated on the Cambrian-Helikian unconformity as anomalous soil values on the northwest side of Fox Creek appear to be associated with this feature.

9.0 RECOMMENDATIONS

Additional staking has resulted in the FOX 1-36 claims being incorporated into a large claim block in the Fox Creek area held by the Mountaineer Mines Ltd. - Pan Ocean Oil Ltd. joint venture. A program for the entire claim block is

proposed and will encompass the additional work warranted on the FOX claims.

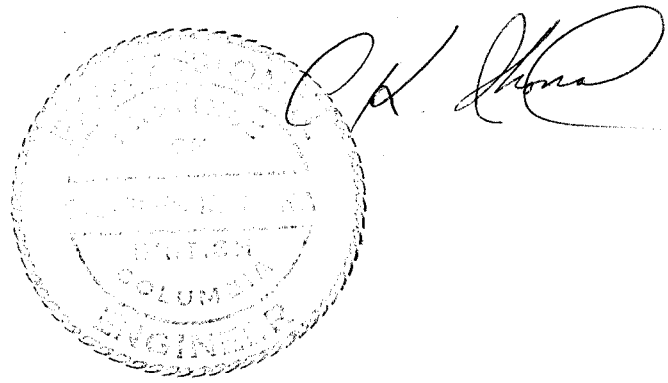
The proposed program includes further detailed geological mapping, prospecting, geochemical sampling, ground radiometrics and possible trenching.

Respectfully submitted,

David A. Yeager

D. A. Yeager - Geologist

C. K. Ikona - P.Eng.



URANIUM

Analytical methods for uranium presently in use at Chemex have been modified from procedures developed by the USGS and GSC. For uranium at PPB and PPM level, fluorometric methods of analyses are highly acceptable in terms of accuracy, cost and turn around time.

The following methods are used extensively to determine uranium potential in a variety of material.

(a) Water Samples - By Fluorescence Analysis

Clean 100 or 200 ml plastic bottles are provided for field use. If a portion of the water is to be stored we require a 200 ml sample.

A 75 ml aliquot is transferred to a clean 100 ml pyrex beaker. 3 ml of concentrated HNO_3 is added and the solution is evaporated to dryness at low uniform temperature. The dry residue after ashing is dissolved in 3 ml of warm 4M HNO_3. An aliquot of the dissolved residue is transferred to a small platinum dish, dried, and fused with an 0.50g tablet of carbonate-fluoride flux at 650° C. The fused disc is removed from the platinum dish and uranium fluorescence is determined using a G. K.Turner III Fluorometer or Jarrell-Ash 26-000 Fluorometer. Detection limit is 0.20 PPB U. Analytical capability approx. 200 samples per day including check samples and quality control standards.

(b). Soil, Silt, Lake Bottom Sediments & Rocks - By Fluorescence Analysis

These materials normally arrive unprepared. Preparation requires drying @ 60° C and screening to obtain the -80 mesh fraction. Coarse material is retained if the screened fraction is small. A 0.25 gm sample of -80 mesh material is weighed into a 100 ml pyrex beaker. The sample is ashed at 550° C to remove organics. The ashed residue is digested in 5 mls 4M HNO_3 and taken to dryness twice. The residue is leached in 50 mls 1% HNO_3. The solution is swirled and allowed to settle. A few microlitres of

. . . .

the clear solution is transferred by micropipette to a platinum dish. The sample is evaporated to dryness and an 0.50 gm tablet of carbonate - fluoride flux is added to the sample dish. Fusion and fluorometric determination of uranium is as described for water samples. Detection limit is 0.50 PPM U. Analytical volume approx. 400 samples per day including duplicates and quality control standards. Upper limit of analytical method - 400 PPM U.

(c). Assay Materials (% U_3O_8) By Colorimetric Methods

1 gram of homogenized sample pulp is weighed into a Teflon dish and digested with 10 mls 52% HF, 5 mls 70% $HClO_4$ and 5 mls conc. HNO_3 to dryness. The residue is dissolved in 25 mls 9M HCl. The uranium is separated from interfering elements by anion exchange procedures. The adsorbed uranium is eluted form the resin and a suitable portion of the uranium bearing solution is reduced, filtered and then complexed using Arsenazo III reagent. Absorbance is measured using "Spectronic 700" Spectrophotometer. The U_3O_8 concentration is evaluated by correlation with a standard reference curve. Analytical volume - 40 samples/day. Concentration range 0.001% U_3O_8 to 10.0% U_3O_8.

212 BROOKSBANK AVE.
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TELEPHONE: 985-0648
AREA CODE: 604
TELEX: 043-52597

CHEMEX LABS LTD.

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 40038

INVOICE NO. 20576

RECEIVED June 29/77

ANALYSED July 5/77

TO: Pamicon Developments Ltd.
612 - 850 W. HAstings St.
Vancouver, B.C.

ATTN: cc: R. Darney

SAMPLE NO. :	PPM Uranium
A 041	8.5
042	60
043	6.0
044	35
045	55
046	95
047	> 400
048	95
049	160
050	45
051	5.0
A 052	0.5
B 001	< 0.5
002	< 0.5
003	< 0.5
004	< 0.5
005	< 0.5
006	3.0
007	1.0
008	1.0
009	0.5
010	1.0
011	1.5
012	3.0
013	0.5
014	1.5
B 015	1.5
D 001	6.0
002	5.5
003	0.5
004	2.0
005	1.5
006	1.0
007	1.0
008	2.0
009	2.5
010	1.5
011	1.0
012	1.5
D 013	1.5
STD.	21

FROG

FOX

REG. of S.W. FOX

12

15

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: Hart Billes

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AREA CODE: 604
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CERTIFICATE OF ANALYSIS

FOP.

TO: Pamicon Developments Ltd.
612 - 850 W. Hastings St.
Vancouver, B.C.

CERTIFICATE NO. 40037
INVOICE NO. 20576
RECEIVED June 19/77
ANALYSED July 5/77

ATTN: cc: R. Darney

SAMPLE NO. :		PPM Uranium	
A 001	FOX	2.5	
002		1.5	4
003		1.5	
004		2.0	
005		4.0	
006		0.5	
007		3.5	
008		2.5	
009		2.5	
010		1.5	14
011	FROG	3.0	
012		1.5	
013		80	
014		120	
015		6.5	
016		3.5	
017		55	
018		21	
019	FOX	9.5	2
020		5.0	
021		22	
022		20	
023		18	
024		4.0	
025		7.0	
026		6.5	
027		8.0	17
028		17	
029	FOX	4.0	
030		8.0	
031		4.0	
032		1.5	
033		8.0	
034		6.5	
035		19	
036		20	
037		13	
038	FROG	6.5	
039		9.5	3
A 040		8.0	
STD..		24	

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: Hart Fuller

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AREA CODE: 604
TELEX: 043-52597

CHEMEX LABS LTD.

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CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 41797

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

INVOICE NO. 21829

RECEIVED Sept. 7/77

ATTN: cc: Mr. Darney

ANALYSED Sept. 12/77

SAMPLE NO. :	PPM Uranium
8429	< 0.5
8430	< 0.5
8431	< 0.5
8432	< 0.5
8433	< 0.5
8434	< 0.5
8435	< 0.5
8436	< 0.5
8437	< 0.5
8438	< 0.5
8439	< 0.5
8440	< 0.5
8441	< 0.5
8442	< 0.5
8443	4.5
8444	< 0.5
8445	2.0
8446	9.0
8447	< 0.5
8448	1.0
8449	11
8450	65
8451	3.5
8452	< 0.5
8453	24
8454	26
8455	26
8456	5.0
8457	13
8458	22
8459	< 0.5
8460	< 0.5
8461	7.0
8462	17
8463	< 0.5
8464	2.5
8465	20
8466	9.0
8467	0.5
8468	< 0.5
Std.	20

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: A.P. Shyer