MOUNTAINEER MINES LTD. - PAN OCEAN OIL LTD.

JOINT VENTURE

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

ELK 1-90 MINERAL CLAIMS

N.T.S. 106-C-14

64°53'N 133°20'W

YUKON TERRITORY

by

D. Yeager - Geologist

C. Ikona - P.Eng.

December, 1977

090283

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

$4000.00

Resident Geologist or
Resident Mining Engineer

Considered as representation work under Section 53 (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 ELK 1-90 mineral claims were staked on November 21, 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 9 to June 21, 1977 a geological, geochemical, and prospecting evaluation of the property was carried out by Pamicon Developments Ltd. under the field supervision of R. Darney.

2.0 LIST OF CLAIMS

CLAIM NAME	STAKING DATE	RECORDING DATE	GRANT NO.
ELK 1-90	November 21/76	November 25/76	YA14479-YA14568 incl.

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

3.0 LOCATION AND ACCESS

The ELK claims are located on NTS sheet 106-C-14, approximately 117 miles northeast of the community of Mayo in the northeastern Yukon Territory. Approximate co-ordinates of the claim group are 64°53' N. latitude, 133°20'W. longitude.

Access to the property is by wheel equipped, fixed wing aircraft from Mayo to the Dolores Creek airstrip, a distance of 120 miles, then by helicopter or on foot the 3 miles southwest to the property.

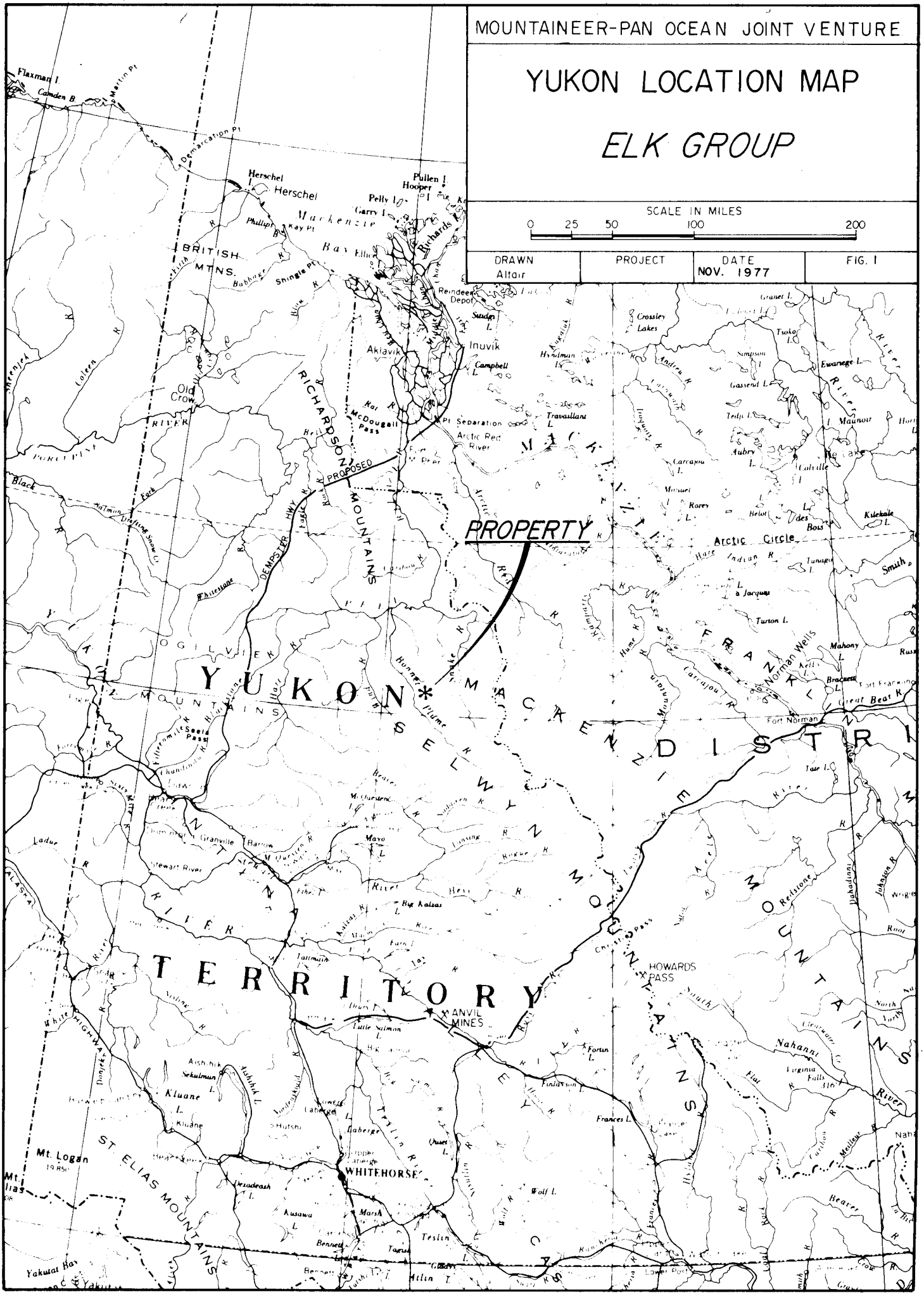
MOUNTAINEER-PAN OCEAN JOINT VENTURE

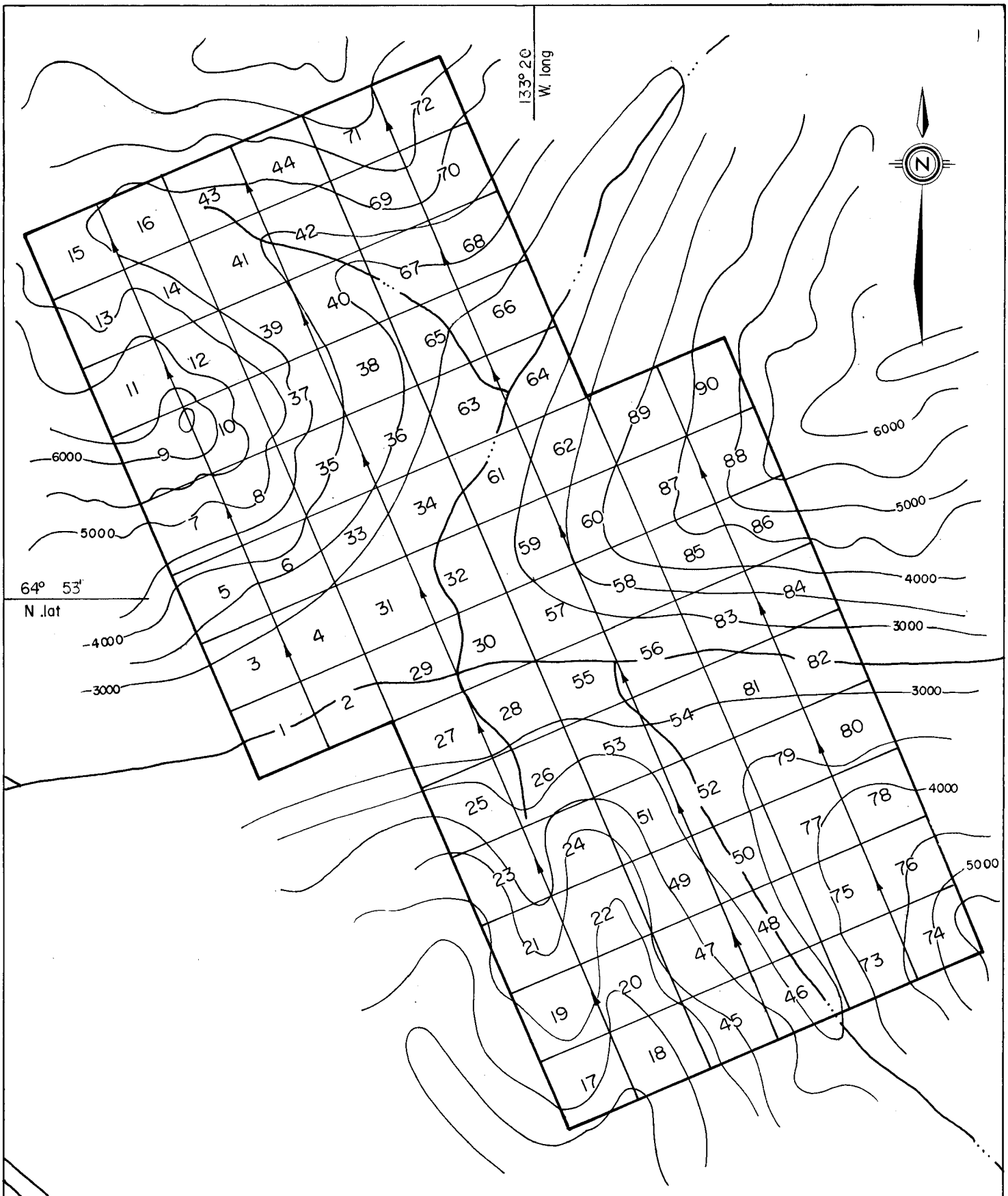
YUKON LOCATION MAP

ELK GROUP

SCALE IN MILES
0 25 50 100 200

DRAWN	PROJECT	DATE	FIG. 1
Altair		NOV. 1977	





MOUNTAINEER-PAN OCEAN JOINT VENTURE

ELK 1-90 CLAIM GROUP

DOLORES CREEK AREA

64°53N. & 133°20W.

SCALE : 1" = 1/2 MILE

NOVEMBER 1977

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 3,000 to 6,500 feet A.S.L. and topography is extreme in most of the area. Exposure is good at higher elevations, however approximately 50% of the ground is covered by talus and overburden.

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 spearate 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.

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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 uncofnormity 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 ELK claims, however, 1:250,000 mapping has beendone by the Geological Survey of Canada (Blusson, 1975) 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 Helikain in age. These have been subdivided in Figure 3 to units A, B, and C. The Unit A rocks on the ELK claims are made up mainly of

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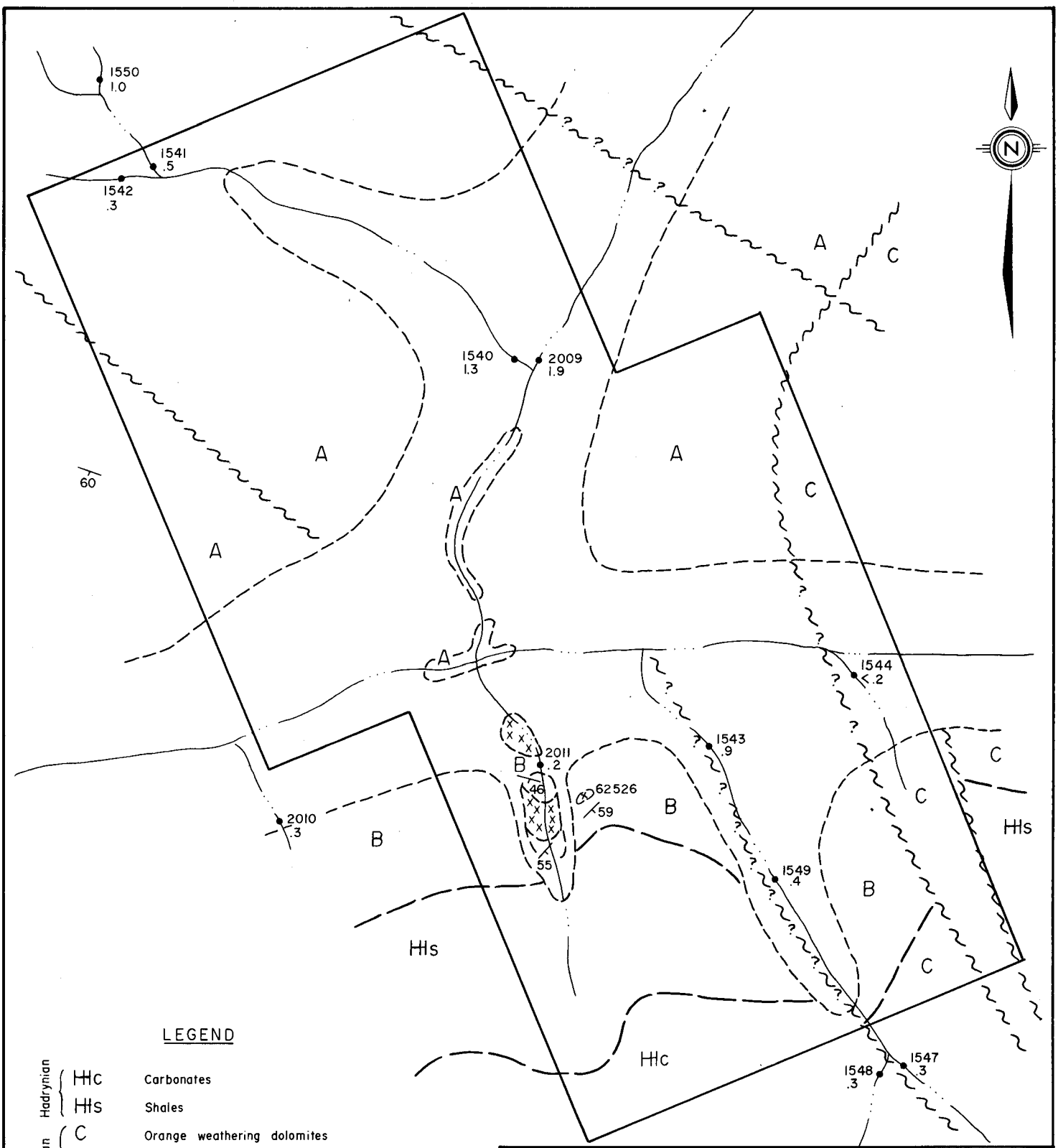

LEGEND

Hadrynian	Hlc	Carbonates
	Hls	Shales
Helikian	C	Orange weathering dolomites
	B	Argillites and shales
	A	Siltstones and carbonates
	(XX)	Diatreme breccia
		Geologic contact
		Fault
		Outcrop limit
	59	Bedding attitude
	1547 .3	Water sample number Value in parts per billion uranium

MOUNTAINEER-PAN OCEAN JOINT VENTURE

ELK 1-90 MINERAL CLAIMS
PRELIMINARY GEOLOGICAL MAP

NTS 106 C 14

YUKON TERRITORY

MILES: 0, 1/4, 1/2, 1, 1 1/2

KILOMETRES: 0, 0.5, 1, 1.5, 2.0, 2.5

PAMICON DEVELOPMENTS LIMITED

DRAWN:	PROJECT:	DATE:	FIGURE:
Altair	Quartet-Fairchild	DEC. 1977	3

brown to grey weathering silstones, dolomitic siltstones, and silty dolomites. The Unit B rocks consist of thickly to massively bedded, dark brown to grey argillites. Unit C is mainly orange weathering dolomites. Overlying the Proterozoic section, in the southern part of the property, is a thick sequence of Hadrynian sediments. These are subdivided into a lower shale unit, consisting of dark brown to black shales with interbedded siltstones; and an upper carbonate unit containing orange and grey weathering banded dolomites with occasional minor limestone interbeds.

Several breccia bodies were encountered on the claims. These are made up of clasts of grey to pink weathering siltstones ranging in size from microscopic to greater than 40 mm. suspended in a matrix of dolomite and/or specular hematite.

6.3 Structure and Stratigraphy

The Unit A silstones and dolomites are the oldest rocks present on the property. They are usually overlain conformably by the Unit B slates and argillites exposed in the southern part of the claims, however, in the case of the ELK group, a fault contact is suspected to pass in an east-westerly direction through the deep, overburden covered, Dolores Creek valley.

The Hadrynian shales and carbonates exposed in the southern part of the property lie unconformably on the Helikian rocks.

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Faulting is the most obvious structural feature in the area. Most of the faults trend in a northwesterly direction and appear to be of a high angle black faulting style. The relative ages of the fault structures on the property are uncertain as insufficient detailed mapping has been done to determine these age relationship.

6.4 Mineralization

The only mineralized showing found on the property occurs in a small breccia body at the 4,000 foot elevation level in the south central portion of the claims. Chalcopyrite and brannerite occur finely disseminated throughout a metasomatized siltstone/dolomite breccia.

The small pipe-like body is roughly elliptical in shape, measuring approximately 50 feet by 150 feet in size. The breccia body is both lithologically and mineralogically zoned. It occurs in a massively bedded, dark brown to grey weathering argillite in which chloritic alteration was noted for a distance of 50 to 60 feet away from the body itself. The outer rim of the pipe appears to be a shatter zone as up to 6 inch fragments of both the main pipe material and the surrounding host rock occur together in a coarse breccia zone. The main body of the pipe is a very finely crystalline reddish brown weathering metasomatite having an almost syenitic texture. A likely model of emplacement involves the brecciation of a domomitic siltstone to very small particles, accompanyed by albitization of the siltstone and remobilization of the dolomite to form the present crystalline

texture.

The breccia pipe exhibits above background radioactivity near the outer rim, which increases to a level 5 to 6 times background in the central core. In this central core, measuring approximately 10 feet by 10 feet, chalcopyrite and branneríte occur finely and evenly disseminated throughout the rock. Chip sample number 62526 from an area approximately 2 feet by 3 feet exhibiting the highest radioactivity assayed 0.38% Cu and 0.012% U_3O_8.

7.0 GEOCHEMISTRY

The geochemical program on the ELK claims consisted of reconnaissance water sampling of all the drainages in the claims area. Sample locations and values are presented in Figure 3 of this report. Samples were collected in numbered, acid cleansed, plastic sample bottles and sent for analysis to Chemex Lab. Ltd. in North Vancouver, B.C. Upon receipt at Chemex the samples were analysed for uranium using standard fluorometric procedures. Complete descriptions of analysis procedures are included in Appendix II.

Twelve water samples were collected during the survey. Values ranged from less than 0.2 to 1.9 parts per billion uranium. A statistical analysis of results of a regional water sampling program carried out by Pamicon Developments Ltd. in the area indicates that samples 1549, 1543, 1540 and 2009 exhibiting values of 0.4, 0.9, 1.3 and 1.9 ppb respectively can all be considered anomalous.

8.0 DISCUSSION AND CONCLUSIONS

Although the size and grade of the mineralized showing in the ELK breccia pipe appear to be subeconomic, it is felt that the encouraging water sample results indicate a need for further work in the area of the ELK claims. The area is considered promising for several reasons. The degree of faulting in the region is extreme, thus providing suitable channelways and traps for uranium mobilization and deposition. The number of breccia bodies encountered during the brief geologic investigation indicates that many more are likely to exist under the overburden covered parts of the property. Uranium mineralization is thought to be associated with the basal Hadrynian unconformity on several properties in the Dolores Creek area (RAM, PTERD); this same unconformity exists on the ELK claims and may help to provide a suitable geological environment for uranium deposition.

The reconnaissance water sampling program, while successfully outlining an area of interest in the central portion of the claims, has indicated that the ground at the extreme northern and extreme southern ends of the property is of less interest than the central area. It is felt that it is unnecessary to retain these parts of the group.

9.0 RECOMMENDATIONS

It is recommended that the ELK 23-36, 51-64, 79-90 claims be held on assessment credits and that a close spaced

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silt and water sampling program be conducted on the anomalous drainages on that portion of the property.

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

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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.

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

CERTIFICATE NO. 32611

INVOICE NO. 20757

RECEIVED July 4, 1977

ANALYSED July 13, 1977

TO: Pamicon Developments Ltd.,
612 - 850 W. Hastings St.,
Vancouver, B.C.
V6B 1P1

ATTN: Mr. Chuck Ikona c.c. Mr. R. Darney

SAMPLE NO. :		% Cu	% U_3O_8	% ThO_2	% K
62526	ELK	0.38	0.012		
62576	REG (B.G3)	0.13	0.125		
62577	DEER		1.71	0.30	0.045
62578	DEER		0.730	0.10	3.60
62579	DEER		0.176		

CTA MEMBER CANADIAN TESTING ASSOCIATION

REGISTERED ASSAYER, PROVINCE OF BRITISH COLUMBIA

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

CHEMEX LABS LTD.

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 40041

INVOICE NO. 20546

RECEIVED June 29, 1977

ANALYSED June 30, 1977

TO: Pamicon Developments Ltd.,
612 - 850 W. Hastings St.,
Vancouver, B.C.
V6B 1P1

ATTN: WATERS

c.c. R. Darney

SAMPLE NO. :		ppb U
✓ DF	1024	<0.2
✓	1025	<0.2
✓	1026	<0.2
✓	1027	<0.2
✓	1028	0.7
✓	1029	0.3
✓	1030	0.9
✓ DF	1031	1.3
✓ GB	1540	1.3
✓	1541	0.5
✓	1542	0.3
✓	1543	0.9
✓	1544	<0.2
✓	1545	0.2
✓	1546	0.3
✓	1547	0.3
✓	1548	0.3
✓	1549	0.4
✓	1550	1.0
✓	1551	<0.2
✓	1552	<0.2
✓	1553	<0.2
✓	1554	<0.2
✓	1555	0.2
✓	1556	<0.2
✓	1557	0.7
✓	1558	0.5
✓	1559	0.2
✓	1560	<0.2
✓	1561	0.3
✓	1562	0.8
✓	1563	1.2
✓ GB	1564	0.5
✓ GD	2008	1.6
* ✓	2009	1.9
✓	2010	0.3
✓ GD	2011	0.2
✓	2517	<0.2
✓	2518	0.3
✓	2519	1.2

CTA MEMBER CANADIAN TESTING ASSOCIATION

CERTIFIED BY: Hart Billa