

MOUNTAINEER MINES LTD. - PAN OCEAN OIL LTD.

JOINT VENTURE

GEOLOGICAL AND GEOPHYSICAL REPORT

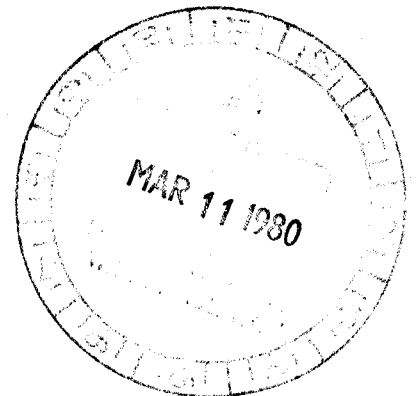
ON THE

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.

January, 1980

090585

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

\$ 4,000.00

J A Morin

Resident Geologist or
Resident Mining Engineer

Considered as representation work under
Section 53 (1) Yukon Quartz Mining Act.


B. R. BAXTER

Supervising Mining Recorder



Commissioner of Yukon Territory

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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 1977 and 1978 field seasons, geological, geochemical and prospecting programs were carried out under the supervision of Pamicon Developments Ltd.

From August 11, 1979 to September 23, 1979 a geophysical investigation of the property was done.

2.0 LIST OF CLAIMS

| <u>Claim Name</u> | <u>Staking Date</u> | <u>Recording Date</u> | <u>Grant Number</u> |
|-------------------|---------------------|-----------------------|---------------------|
| ELK 23-36 | November 21/76 | November 25/76 | YA14501-14514 |
| ELK 51-64 | November 21/76 | November 25/76 | YA14529-14542 |
| ELK 79-90 | November 21/76 | November 25/76 | YA14557-14568 |

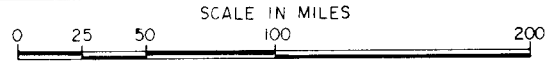
3.0 LOCATION AND ACCESS

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.

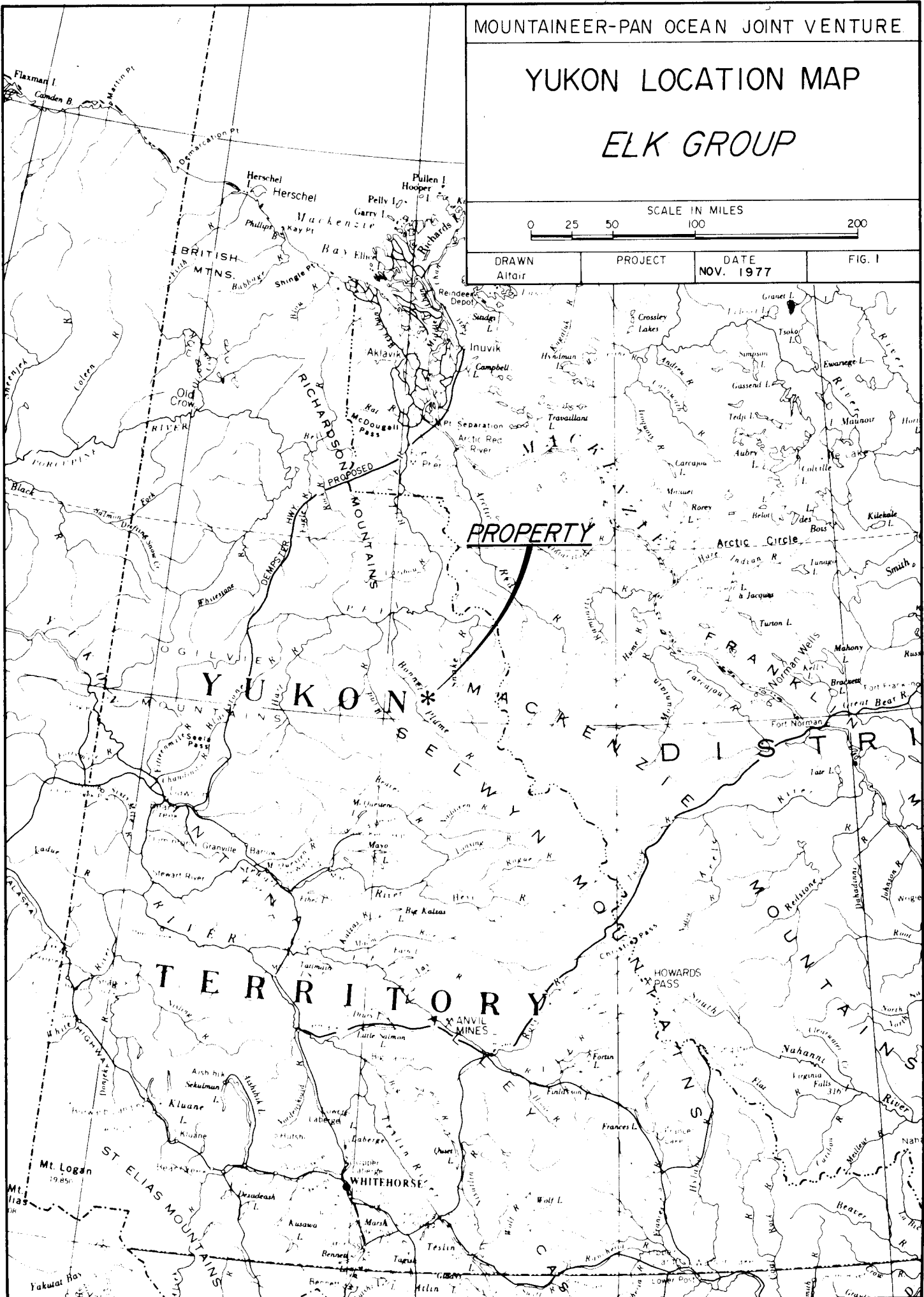
Access to the property is by wheel equipped, fixed wing aircraft from Mayo to the Dolores Creek airstrip, a distance of 120 miles, then by helicopter or on foot the 3 miles southwest to the property.

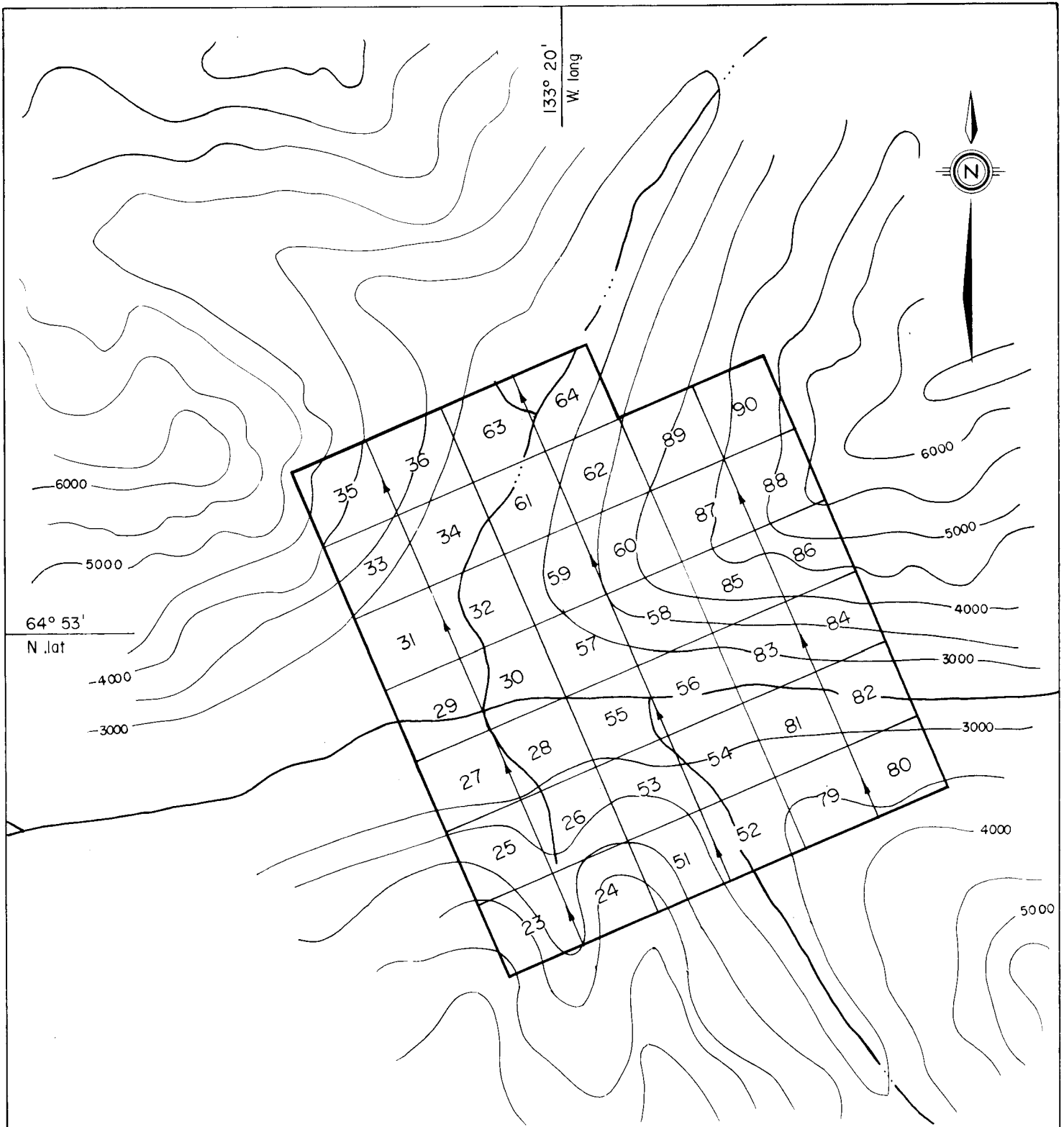
YUKON LOCATION MAP

ELK GROUP



| | | | |
|-----------------|---------|-------------------|--------|
| DRAWN Aitair | PROJECT | DATE NOV. 1977 | FIG. 1 |
|-----------------|---------|-------------------|--------|





| | | | |
|--|-----------------------|---------------------|--------------|
| MOUNTAINEER-PAN OCEAN JOINT VENTURE | | | |
| ELK MINERAL CLAIMS DOLORES CREEK AREA CLAIMS MAP NTS 106 C 14 YUKON TERRITORY | | | |
| | | | |
| PAMICON DEVELOPMENTS LIMITED | | | |
| DRAWN: Altair | PROJECT: Fairchild | DATE: Jan., 1979 | FIGURE: 2 |

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 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 $134^{\circ}00'W$ and Latitude $65^{\circ}00'N$.

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.

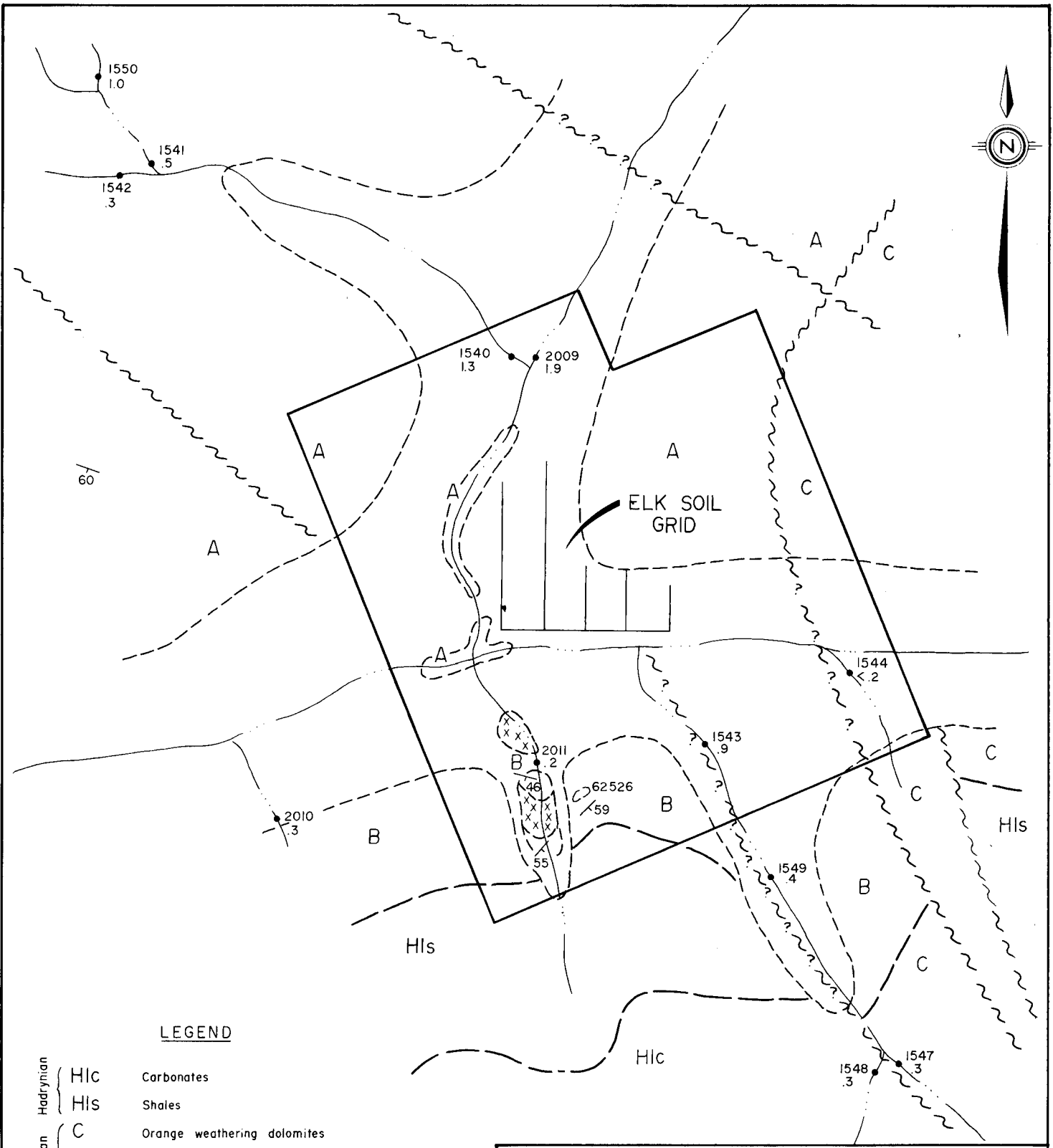
6.0 PROPERTY GEOLOGY

6.1 Introduction

No detailed geologic mapping was done on the ELK claims, however, 1:250,000 mapping has been done 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 1/2 mile.

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 units A, B, and C. The Unit A rocks on the ELK claims are made up mainly of



LEGEND

- Hadrnyian { H1c Carbonates
- { H1s 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 Water sample number
- .3 Value in parts per billion uranium

MOUNTAINEER-PAN OCEAN JOINT VENTURE

ELK MINERAL CLAIMS

PRELIMINARY GEOLOGICAL MAP

NTS 106 C 14

YUKON TERRITORY

0 1/4 1/2 MILES 1 1 1/2

0 0.5 1 1.5 2.0 2.5

KILOMETRES

PAMICON DEVELOPMENTS LIMITED

| | | | |
|------------------|----------------------|--------------------|-------------|
| DRAWN: Altair | PROJECT Fairchild | DATE Jan., 1979 | FIGURE 3 |
|------------------|----------------------|--------------------|-------------|

brown to grey weathering siltstones, 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 siltstones 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.

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 block faulting style. The relative ages of the fault structures on the property are uncertain as insufficient detailed mapping has been done to determine the age relationships.

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 dolomitic siltstone to very small particles, accompanied 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 or 6 times background in the central core. In this central core, measuring approximately 10 feet by 10 feet, chalcopyrite and brannerite 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 GEOPHYSICS

7.1 Altimeter Survey

A portion of the 1978 geochemical grid was used for control purposes. Lines are spaced 150 meters apart with stations at 150 meter intervals. The grid was reflagged from 0+00 N to 4+50 N; and from 0+00 E to 6+00 E for a total of 2850 meters of line.

An altimeter survey was done using a Thommens hand held pocket altimeter, the results of which are presented in Figure 4 of this report. A contour interval of 20 meters was used.

7.2 Spectrometer Survey

A spectrometer survey was carried out using an Exploranium DISA 300 discriminating spectrometer. Sixty second readings were taken at each station for total counts per minute

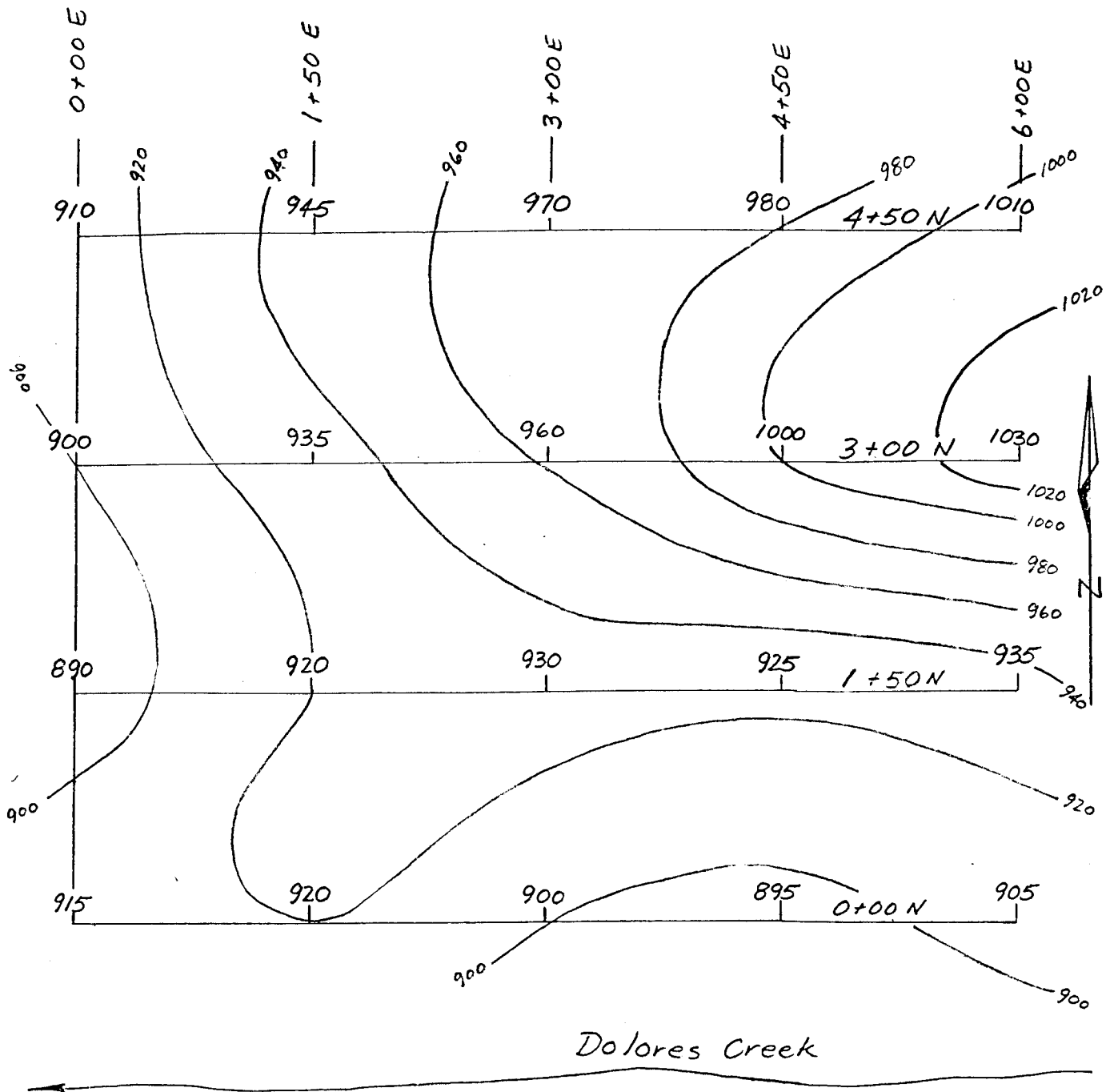
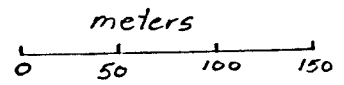


Fig. 4

ELK MINERAL CLAIMS
 NTS 106-C-14 MAYO
 YUKON TERRITORY M.D.

-elevations in meters above sea level
 -contour interval: 20 meters

ALTIMETER SURVEY



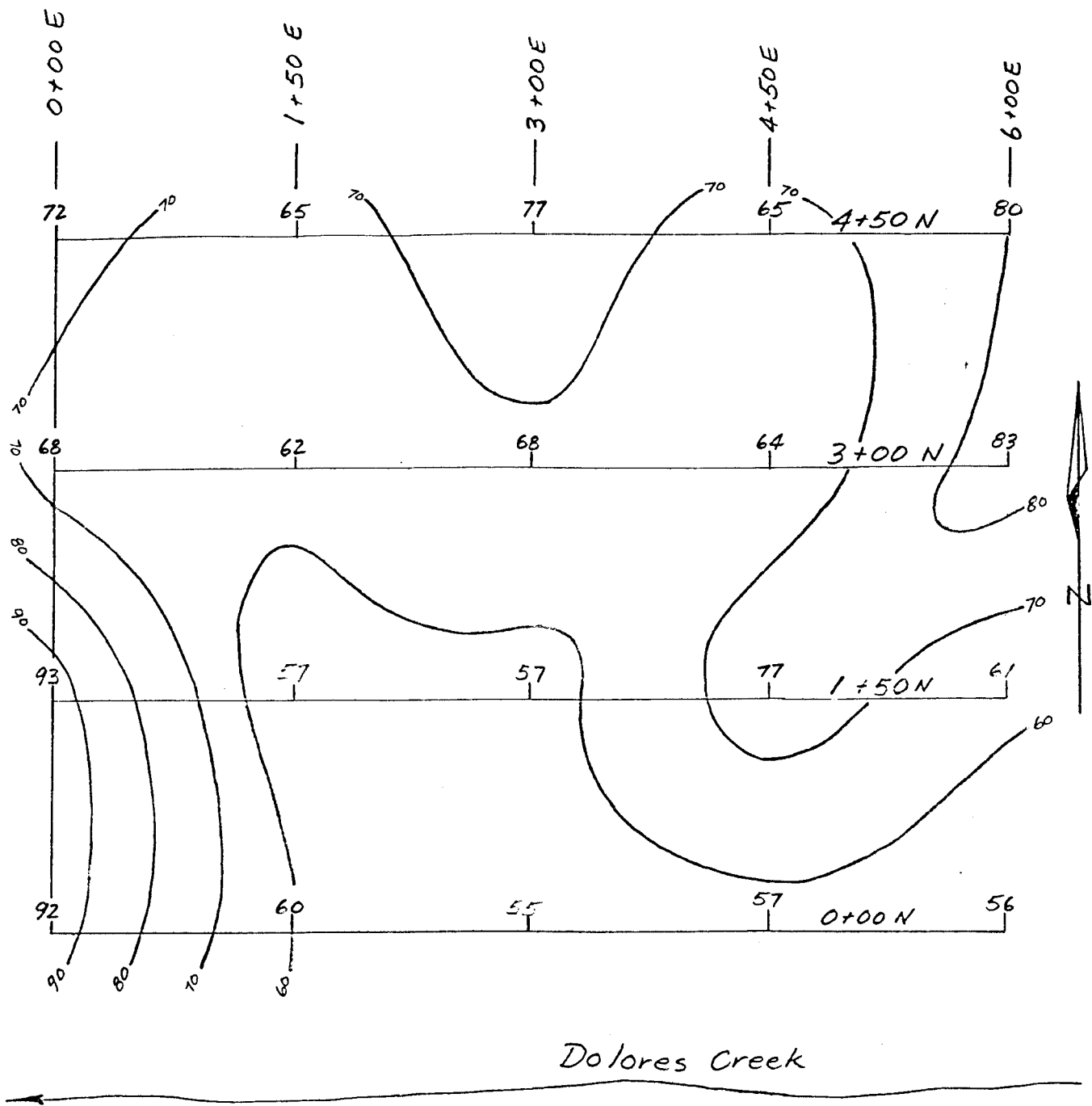


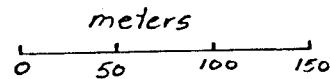
Fig. 5

ELK MINERAL CLAIMS

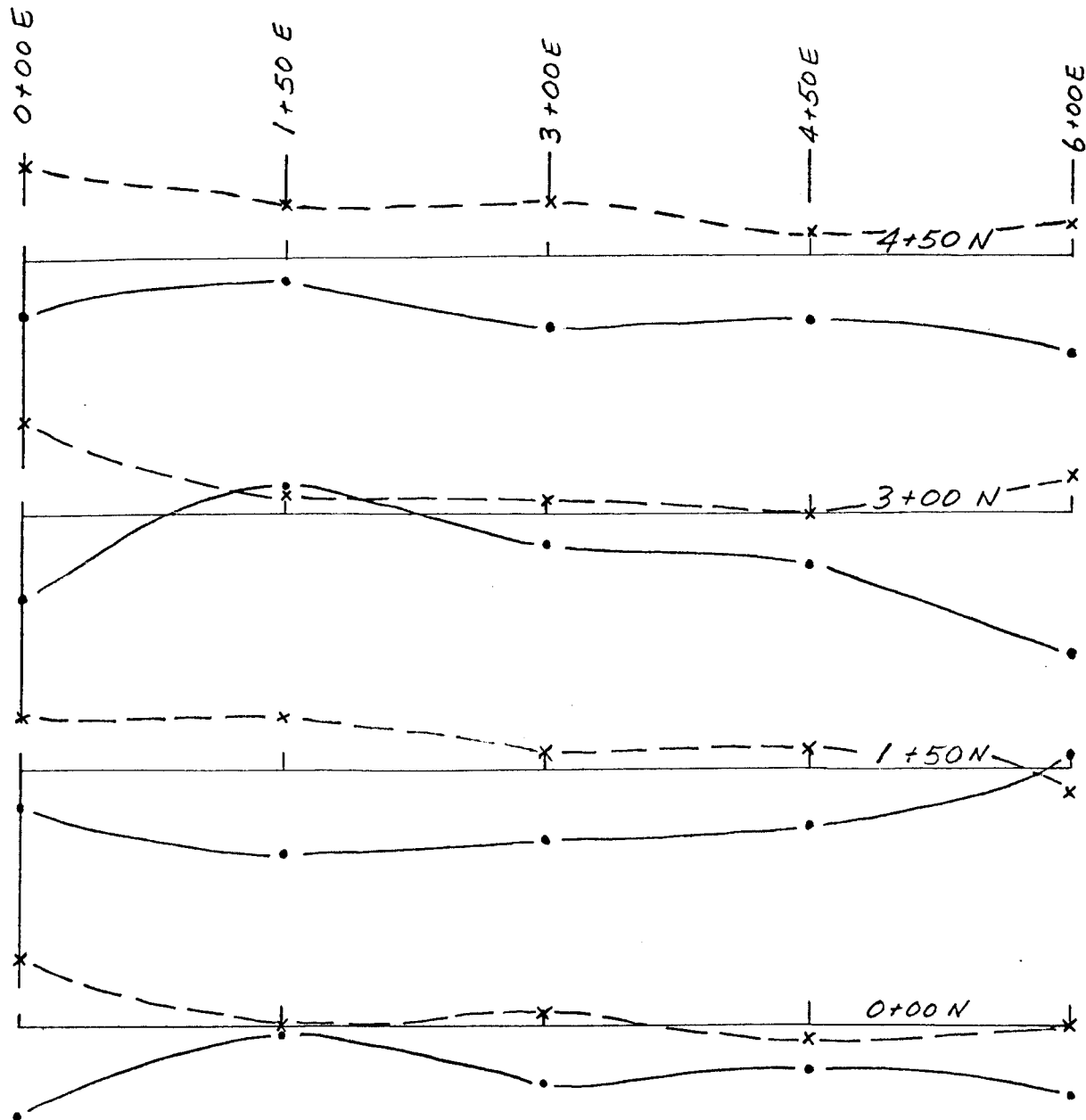
NTS 106-C-14 MAYO
YUKON TERRITORY M.D.

SPECTROMETER SURVEY

- values in total counts per second
- contour interval 10 cps.



Direction of Readings →



Dolores Creek

Seattle
Washington

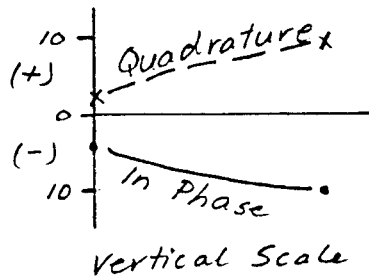
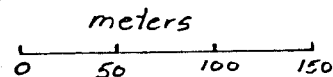


Fig. 6

ELK MINERAL CLAIMS

NTS 106-C-14 MAYO
YUKON TERRITORY M.D.

EM-16 PROFILES



as well as counts per minute uranium, thorium and potassium. Total counts per second were derived from the counts per minute data. Ratios of equivalent parts per million uranium to equivalent parts per million thorium proved to be extremely erratic which is felt to be the result of rapid temperature changes which occurred during the survey. The ratio data was not presented for this reason.

Two total count "high" areas were outlined in the survey; in the northeast and southwest corners of the grid. The northeast anomaly is part of a southwest - northeast linear trend probably reflecting an underlying structural feature. The southwest anomaly is felt to be caused by the presence of a diatreme breccia body of which there are a number in the area.

7.3 Electromagnetic Survey

An electromagnetic survey was conducted over the grid area using a Geonics EM-16 VLF-EM unit. The 18.6 kHz transmitter in Seattle, Washington was used as a signal source. A number of peaks and crossovers were detected; however, there is very little correlation between lines. This is felt to be due to the rather long distance between readings and lines.

8.0 DISCUSSION AND CONCLUSIONS

The geophysical surveys carried out were intended as preliminary studies to determine the feasibility of using these instruments to assess the overburden covered areas of the

property. As a number of anomalies were indicated that crossed adjacent lines; i.e., were not "single line" or "single station" highs, it is felt that electromagnetics and radio-metrics would be helpful in assessing the property.

The grid spacing as it exists at the present is too large. Any future surveys should utilize a closer spaced grid.

9.0 RECOMMENDATIONS

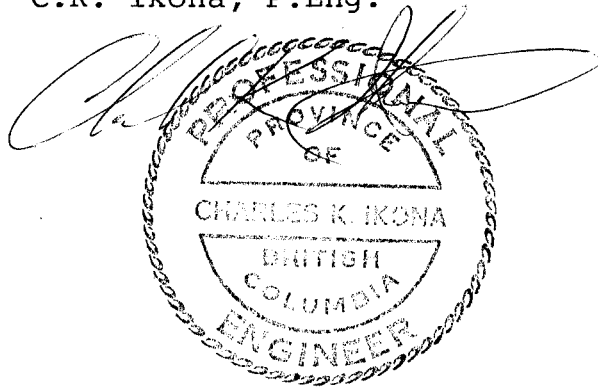
1. Follow-up geophysical surveys should be carried out in the grid area.
2. Prospecting and hand trenching should be done in the anomalous areas if overburden depths are not prohibitive.

Respectfully submitted,

David A. Yeager

D.A. Yeager, Geologist

C.K. Ikona, P.Eng.

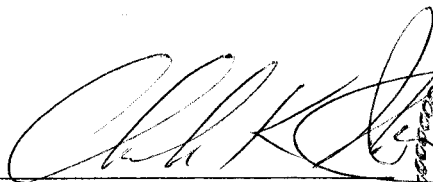


ENGINEERS CERTIFICATE

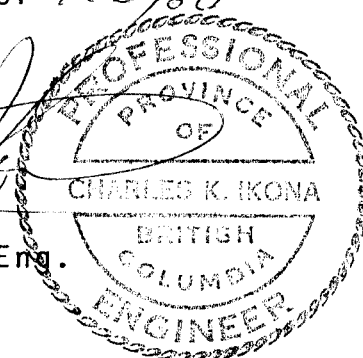
I, CHARLES K. IKONA, of 5 Cowley Court, Port Moody
in the Province of British Columbia DO HEREBY CERTIFY
that:

1. I am a Consulting Mining Engineer with offices at
208-850 W. Hastings St., Vancouver, B.C.
2. I am a graduate of the University of British Columbia
with a degree in Mining Engineering.
3. I am a member in good standing of the Association
Of Professional Engineers of the Province of
British Columbia.
4. The work reported heron was conducted during a
program under my supervision and under the supervision
of geologists with whom I have worked for a period
of years and of whom I have every confidence in.

Dated this 28th day of Feb/60



Charles K. Ikona, P. Eng.



LIST OF PERSONNEL
ELK 23-36, 51-64, 79-90
MINERAL CLAIMS
AUGUST 11 - SEPTEMBER 23, 1979

| | | |
|--|------------|-----------------------------------|
| D. Yeager 208, 850 West Hastings Street Vancouver, B.C. | Geologist | September 23 |
| N. Debock Clearwater, B.C. | Prospector | September 23 August 11, 12, 14 |
| B. Girling 3453 West 32nd Avenue Vancouver, B.C. | Prospector | August 11, 12 September 23 |
| T. Diamond 208, 850 West Hastings Street Vancouver, B.C. | Prospector | September 23 |
| G. Garrett 4516 Vegas Road N.W. Calgary, Alberta | Geologist | August 11, 12 |
| G. McArther 111 Chelsea Street N.W. Calgary, Alberta | Geologist | August 11, 12, 14 |

CANADA) In the matter of an evaluation program on the Elk 23-36,
) 51-64, 79-90 Mineral Claims.
)

TO WIT) On behalf of PAN OCEAN OIL LTD.

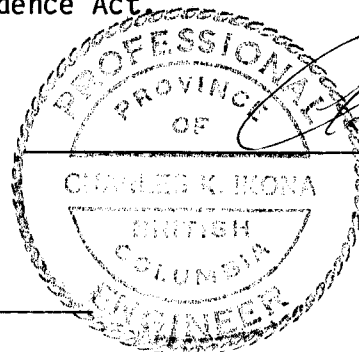
I, C. Ikona for Pamicon Developments Ltd., of 208, 850 West Hastings Street, Vancouver, B.C. do solemnly declare that a program consisting of geological mapping, geochemical surveying and prospecting was carried out on Elk 23-36, 51-64, 79-80 Mineral Claims during the period August 11 - September 23, 1979.

The following expenses were incurred during the course of this work and in the compilation and reporting of the results:

| | |
|-------------------------------|---------------------------------|
| Equipment Rentals | \$ 52.27 |
| Expendible Field Supplies | 14.59 |
| Office Supplies, Maps, Photos | 7.69 |
| Drafting and Reproduction | 2.25 |
| Equipment and Machinery | 30.71 |
| Supplies | 28.32 |
| Food | 184.50 |
| Expediting | 45.00 |
| Freight | 14.04 |
| Travel and Accommodation | 43.24 |
| Prepaid Expenses | 1.45 |
| Sundry | - |
| Camp and Miscellaneous Fuels | 561.27 |
| Camp Fixed Wing Support | 443.37 |
| Overhead | - |
| Wages | 827.34 |
| Helicopter Support | 2,528.00 |
| Assaying and Geochemistry | - |
| Trenching | - |
| Contracting Fees | 382.00 |
| Report Preparation | 300.00 |
| Not Assigned | - |
| TOTAL | <u><u>\$5,466.04</u></u> |

And I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act.

Declared before me at Vancouver in)
 the Province of British Columbia this)
 _____ day of _____, 1980)



A Commissioner for Oaths for,
 or Notary Public for the _____