MOUNTAINEER MINES LTD. - PAN OCEAN OIL LTD.

JOINT VENTURE

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

FOX CREEK AREA

INCLUDING DEER, FROG, MOSQUITO, CLAM CLAIM GROUPS

N.T.S. 106-E-2

65°13'N 134°45'W

YUKON TERRITORY

by

D. A. YEAGER - GEOLOGIST

C. K. IKONA - P. ENG.

July, 1978

090365

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

$ ~~24,400~~ 25,200.00

J A Morin

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

Office of the Supervising Mining Recorder
DEC 19 1978
WHITEHORSE
Yukon Territory

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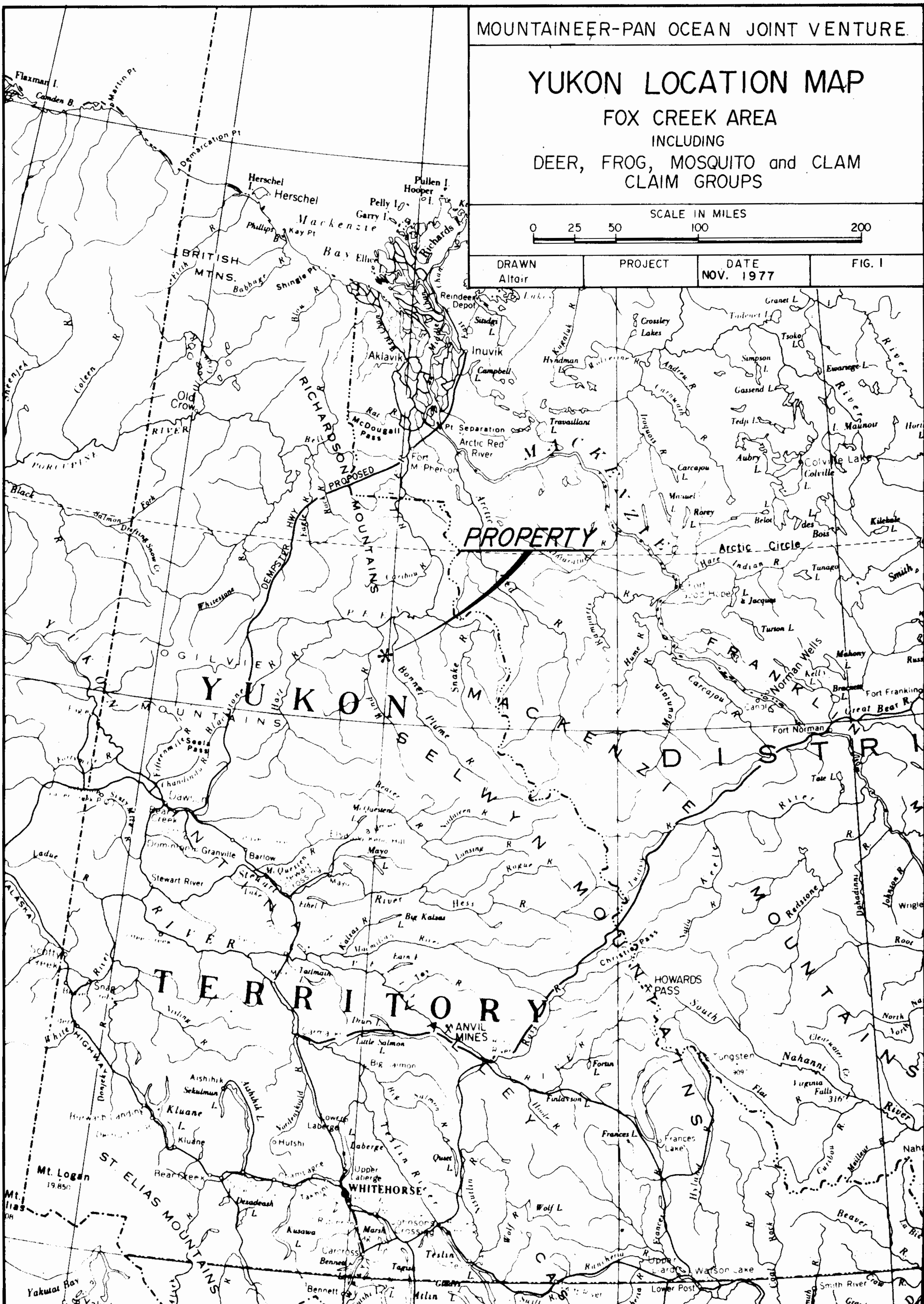


MOUNTAINEER-PAN OCEAN JOINT VENTURE
YUKON LOCATION MAP
FOX CREEK AREA
INCLUDING
DEER, FROG, MOSQUITO and CLAM
CLAIM GROUPS
SCALE IN MILES
0 25 50 100 200
DRAWN
Altair
PROJECT
DATE
NOV. 1977
FIG. I
PROPERTY
YUKON
TERRITORY
MACKENZIE DISTRICT
ARCTIC CIRCLE
DEMPSTER HWY
PROPOSED
RICHARDSON MOUNTAINS
OGILVIE MOUNTAINS
SELWYN MOUNTAINS
MACKENZIE MOUNTAINS
ST ELIAS MOUNTAINS
Inuvik
Aklavik
Fort McPherson
Old Crow
Dawson
Mayo
Norman Wells
Fort Norman
HOWARDS PASS
ANVIL MINES
WHITEHORSE
Mt. Logan
19,850

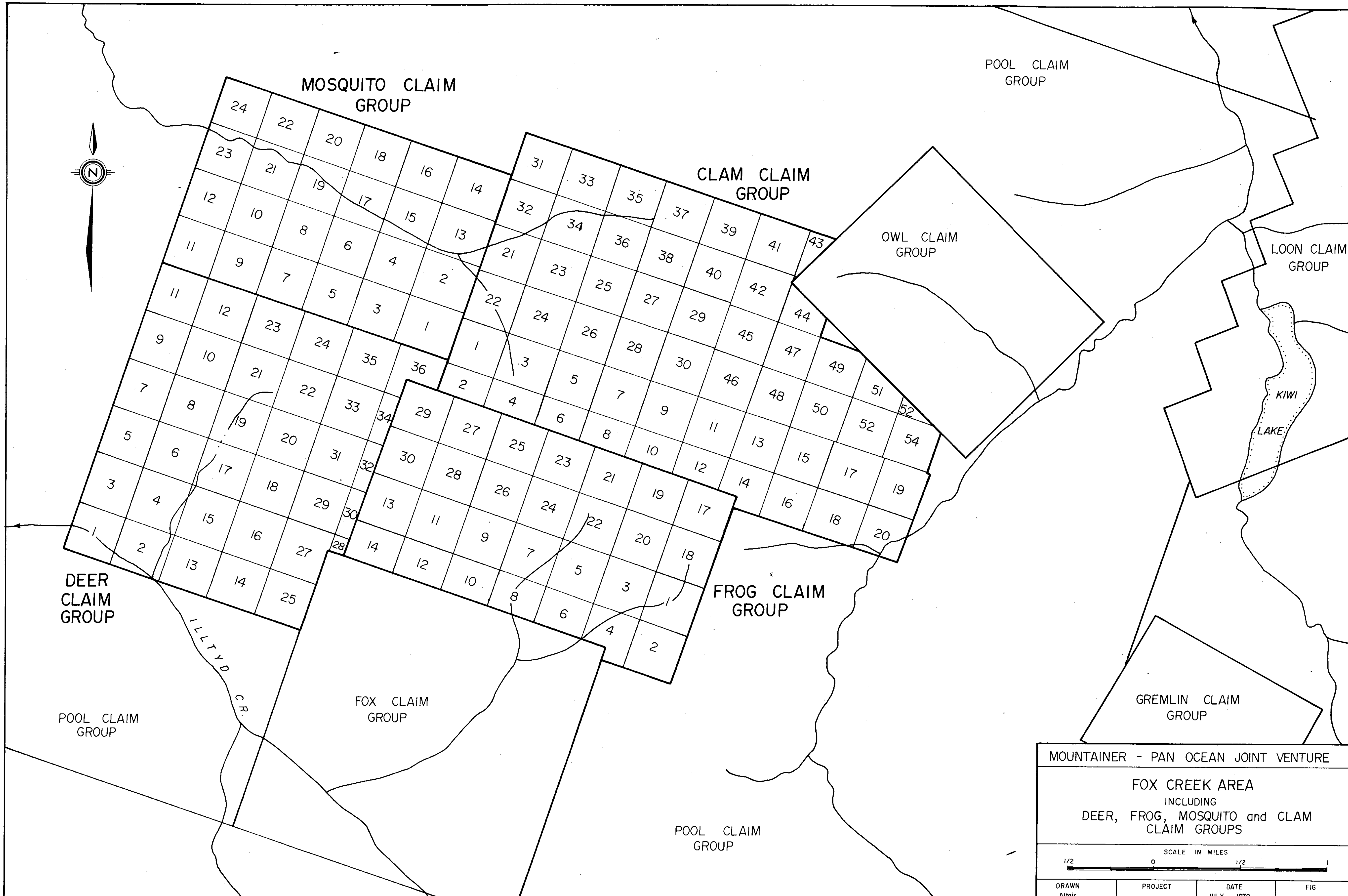
INTRODUCTION

The FOX 1-36 claims were staked on November 19, 1976 by the Joint Venture to cover favourable geologic targets in the Illtyd Creek area.

During follow up work in the 1977 season, several groups were tied on to the FOX claims and following the location of several important showings near the end of the season, all the claim groups were incorporated into the large POOL block. The POOL block adjoins the LOON block in the Kiwi Lake Valley.

LIST OF CLAIMS

CLAIM NAME	STAKING DATE	RECORDING DATE	GRANT NO.
FOX 1-36	November 19/76	November 26/76	YA14443-14478
OWL 1-20	November 29/76	December 17/76	YA14823-14842
FROG 1-14	June 15/77	July 8, 1977	YA15363-15376
FROG 17-30	June 15/77	July 8, 1977	YA15377-15390
DEER 1-36	June 15/77	July 8, 1977	YA15391-15426
MOSQUITO 1-24	July 5/77	July 28/77	YA15806-15829
CLAM 1-40	August 28/77	September 2/77	YA16013-16052
CLAM 41-54	September 11/77	September 26/77	YA16535-16548
FROG 31-38	September 15/77	September 26/77	YA16527-16548
POOL 1-80	September 23/77	September 28/77	YA16769-16848
POOL 81-224	September 24/77	September 28/77	YA16849-16994
POOL 225-335	September 25/77	September 28/77	YA16995-17103



MOUNTAINER - PAN OCEAN JOINT VENTURE

FOX CREEK AREA
INCLUDING
DEER, FROG, MOSQUITO and CLAM
CLAIM GROUPS

TOPOGRAPHY AND VEGETATION

Elevations on the property range from 2,000 feet to 5,000 feet A.S.L. and topography varies from gentle in the creek valleys to extreme in the mountains. Bedrock exposure is probably less than 15%.

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.

GEOLOGY

Introduction

Preliminary geologic mapping was carried out at a scale of 1 inch to 1,000 feet along some of the higher ridges on the property. The results are presented in Figure 2 of this report.

The area is underlain by sedimentary and metasedimentary rocks belonging to the Fairchild Lake Group (Unit A). Metamorphic grade varies but appears highest in the Owl Creek area and northwest of Deer Creek. It was noted during mapping that many of the lithologic units were unaffected by metamorphism even though they were directly in contact with fairly highly metamorphosed rocks. This selective metamorphism of certain units is not yet fully understood although it is commonly seen in the Fairchild Lake Group. It is thought, however, that abrupt lateral facies changes may exist in certain siltstone units in the upper part of the group, and that preferential metamorphism would occur in chemically susceptible facies lying within these siltstone units.

Lithology

The portion of the Fairchild Lake Group present in the Fox Creek area has been divided into eight map units. These are local map divisions only and do not correspond to the subdivisions of the group used in the regional section of the report.

Unit A1 is a light grey weathering, banded quartzite and is only exposed in the area where Owl Creek runs into Pool Creek. The unit locally contains impure silty quartzites. Banding is outlined by chlorite segregate layers and partings.

Unit A2 contains light green weathering quartz chlorite schists, chlorite phyllites, and transitional phyllite/schists. This unit is the most common rock type on the central ridge between the Deer/Fox/Owl Creek drainages and the Mosquito Creek drainages. The unit is fine to medium grained and commonly exhibits relict bedding.

Unit A3 consists of a light green to grey green weathering, fine to medium grained, thin bedded, light green siltstone. Three sub-units are contained within the unit: a banded siltstone, a siliceous siltstone, and a phyllitic siltstone. It was not possible to map these sub-units at the scale used during the mapping. The banded siltstone sub-unit is the host rock in the DEER #1 and #2 showings as well as in the occurrences at the northern headwaters of Fox Creek.

Unit A4 is a medium to dark grey, fine grained, thinly bedded sandy siltstone. This unit was only encountered in float and suboutcrop on top of the ridge north of Owl Creek.

Unit A5 is made up of a light grey-green weathering, fine to medium grained, thinly interbedded calcareous siltstone and limestone. The unit outcrops 2,000 to 3,000 feet south of Mosquito Creek, north and northwest of the DEER #2 showing.

Unit A6 includes a thin bedded, grey-green, spotted slate and a thin bedded, black, rusty slate. The unit outcrops 1,000 feet and 6,000 feet west of the DEER #2 showing.

Unit A7 is composed of an interbedded, ribbed weathering, chocolate brown weathering, dolomite/silty dolomite; light grey shaley siltstones; and thinly bedded, dark grey slates. The dolomite contains lenses and bands of light grey chert. The shaley siltstone member in several localities was silicified, chloritized, and partially feldspathized. The unit outcrops 1,000 feet southeast of and 6,000 feet west of the DEER #2 showing.

Unit A8 consists of a light grey weathering, very thinly banded, very fine grained calcareous siltstone. The unit was seen approximately 6,500 feet west of the DEER #1 showing and at a second location 2,000 feet north-northeast of the DEER #1 showing.

Several breccia bodies have been mapped on the property. The largest is a narrow dyke shaped body outcropping over a distance of 3,000 feet in the area of the DEER #1 and DEER #2 showings. The surface trace of the body winds sinuously through the unit A2 siltstone underlying that portion of the property. Insufficient mapping has been done in the area to determine whether this unusual surface trace has resulted from post breccia folding or if it is a primary intrusive feature. The folding theory is more likely. Clasts in the breccia are usually less than 2 inches in size and are composed of altered local rock types. The matrix is composed of chlorite, dolomite, and feldspathized material. Brannerite and specular hematite were noted within the breccia at several localities.

Structure and Stratigraphy

Most of the rocks in the Fox Creek area belong to the Proterozoic Fairchild Group (Unit A). The Proterozoic sequence is overlain unconformably in the Illtyd Creek area by flat lying carbonates and clastics of Cambrian age. Although this contact is not well exposed in the Fox Creek area, its angular nature has been observed in many localities.

The Fairchild Group rocks exposed on the property are thought to lie fairly near the top of the sequence. However, this is only a tentative postulation pending further detailed mapping in the claims area.

Although intensive folding and faulting have occurred in the property area, there appears to be an overall northwesterly dip to the underlying strata.

Faulting is intense. This is evidenced both in outcrop during mapping, and by the large number of air photo linears. In addition, a large number of topographic linear features have been noticed during flying over the claims area. Two predominant fault directions were noted during mapping: 060° and 120°. Numerous very large (up to 10 feet thick) bull quartz veins have been noted at many localities on the property. Detailed mapping is required to determine if these features are fault related.

The wide variety of bedding attitudes measured during the mapping indicates the existence of complex folding in the region. Further mapping is required before conclusions can be drawn as to the style and extent of these fold structures.

Mineralization

A number of uranium mineralized surface showings have been located in the Fox Creek area. Several of them have received a fairly thorough initial evaluation while others have only had a cursory inspection. Assay locations are presented in Figure 4 of this report.

DEER NO. 1 SHOWING

The best surface showing found to date by the Mountaineer-Pan Ocean joint venture is situated on the DEER block of claims at the 4,050 foot elevation level, approximately 1,500 feet south of the northern headwaters of Deer Creek (See Figure 2, this report). Here, uranium mineralization was originally discovered in float on both sides of a westerly trending overburden and talus covered shoulder running off the central mountainous core of the Fox Creek area. The mineralized float trains, which can be traced for several hundreds of feet downhill, originate in an area measuring roughly 250 feet by 100 feet in size. (See Figure 3, this report).

Several types of mineralized float material were recognized. The most common was brannerite mineralized quartz/feldspar vein material in dark green, chloritic, phyllitic siltstones. The brannerite occurred as small laths up to 1/4 inch in size in the chloritic siltstones near the contacts with the vein material. The second most common float type consisted of quartz pods and lenses enclosed within chlorite envelopes. Once again, brannerite laths up to 1/4 inch in size could be seen in the chlorite near the contact with the quartz. The first assay sample of this material contained 1.71% U_3O_8. Only one large piece of the third float type was ever found on surface. It was a dark green, banded phyllitic siltstone with thin, pink, quartz/feldspar laminae occurring between the siltstone bands. The sample contained no visible uranium minerals yet assayed 0.73% U_3O_8.

A hand trenching program was initiated on the showing and uranium mineralization was encountered in bedrock at two locations. The first location is in Trench No. 1 where brannerite laths up to 1/4 inch in size occur in phyllitic siltstones in the footwall of a 4-1/2 inch to 6 inch thick quartz vein. The brannerite occurs up to 6 inches away from the quartz vein. The vein dips from 0 to 5 degrees to the southwest in siltstones dipping approximately 16 degrees to the southwest. The mineralization was exposed for 12 feet along strike.

The second location is in Trench No. 2 and in an open cut that was excavated between Trench No. 2 and Trench No. 5. It was here that the source of the mineralized banded siltstone float was located. Mineralized bedrock and broken bedrock was exposed along strike for a total length of 22 feet.

Several possible controlling factors for uranium mineralization were recognized:

1) Most of the uranium is contained in the pink banded dark green siltstone unit.

2) The siltstone unit is cut off to the west against a shear zone trending approximately 010° and dipping 85° to the west. Extreme folding and shattering have occurred in the mineralized siltstones adjacent to the shear.

3) A post shear quartz vein cuts across the shear zone and is mineralized in all places where it was seen; both in the pink banded dark green siltstone and in the otherwise barren, light green siltstones on the west side of the shear.

4) Secondary uranium mineralization has formed in pods within the pink banded siltstones, in the crosscutting quartz vein, and especially in large lenses (4 inches by 24 inches) lying on top of the mineralized bedrock surface.

These four controlling factors imply four possible modes of uranium emplacement:

1) Original deposition in the pink banded dark green siltstone. The pink quartz/feldspar bands in the siltstones are continuous to semi-continuous and occasionally open up to form vugs up to 2 m.m. thick and up to 30 m.m. to 40 m.m. in size in the bedding plane. These bands and vugs definitely appear to be original depositional features and may represent either primary algal mats or inorganic concretionary nodules. Either one of these features could at times be in a reducing environment that could lead to the precipitation of uranium from sea water contemporaneous with the deposition of the siltstone.

2) Introduction of uranium along openings provided by the

shear zone has more than adequately opened up channelways in the country rock.

3) Introduction of uranium by hydrothermal quartz veins. This mode of emplacement is lent support by a number of factors: firstly, ample evidence of mineralized quartz veins exists in the showing area and secondly, assays of the quartz vein material revealed considerable silver content (R.Mazur, pers. comm.) which indicates a similarity to several Canadian deposits felt to be hydrothermal in origin.

4) Introduction and enrichment of uranium during an erosional cycle. The large amounts of secondary uranium minerals indicate this to be a possible mode of uranium emplacement.

At this point in time it is felt that all four of these possible modes of uranium emplacement must be kept in mind during future exploration work on the property.

Mineralogical studies of DEER #1 samples carried out by Geological Survey of Canada mineralogists have indicated the following:

The yellow secondary uranium minerals are uranophane Ca $(UO2)2(SiO3)2(OH)2 \cdot 5H2O$ and kasolite Pb $(UO2)(SiO3)(OH)2$. The green secondary uranium mineral is metatorbernite $Cu(UO2)(PO4)2 \cdot nH2O$ and the fluorescent secondary uranium mineral is probably uraniferous opal. The yellow uranium mineral in the quartz vein is beta-uranophane. Microscopically disseminated brannerite and uraninite (poss. pitchblende) occur in the banded siltstone.

DEER NO. 2 SHOWING

This showing occurs on the north side of the central mountainous core of the Fox Creek area at the 4,000 foot elevation level, approximately 2,000 feet north of the headwaters of Deer Creek. To date, mineralization has only been seen in float. Brannerite occurs, in fractures up to 1 inch wide, as very large laths up to 3/4 inch by 4 inches in size. The mineralized fractures occur in the Unit A3 light green siltstone adjacent to the breccia body in that area. A short trench was excavated to bedrock but failed to locate the source of the mineralized material. It was decided at that point to return to trenching on the DEER #1 showing.

OTHER SHOWINGS

Two other showings, one located 4,000 feet north of the headwaters of Deer Creek and the other located near the northern headwaters of Fox Creek, were briefly examined. In both showings brannerite was observed as coarse laths in quartz/feldspar vein systems in or near breccia bodies intruding Unit A2 phyllites and Unit A3 siltstone. On both showings, good grade float was traced over distances of approximately 100 feet.

Table 1 Assay Results (Locations Fig. 4)

Sample No.	% U_3O_8	Description
62581	0.007	Sample across 9" of frost shattered quartz/feldspar material on bedrock surface. Trench #2 DEER #1.

Table 1 Assay Results - Continued..

Sample No.	% U_3O_8	Description
62582	1.08	Sample across 15" of frost shattered chloritic, phyllitic siltstone from Trench #2 DEER #1. From beneath 62581.
62583	0.147	Sample across 6" of chloritic siltstone underlying 62582 from Trench #2 DEER #1.
62584	0.079	Grab sample from low grade siltstone material below 62583. Trench #2 DEER #1.
62585	0.092	Grab sample of mineralized banded phyllitic siltstone in footwall of quartz vein. Trench #1 DEER #1.
62628	0.665	Channel sample from bedrock across 24" of folded, pink banded, vuggy, dark green siltstone. Trench #2 DEER #1.
64629	4.56	Channel sample from bedrock across 24" of folded, pink banded, dark green siltstone and secondary lens. Trench #2 DEER #1.
64630	0.721	Channel sample from bedrock across 12" of shattered, pink banded, dark green siltstone. Trench #2 DEER #1.
64631	0.468	Channel sample from bedrock across 12" of pink banded, dark green siltstone immediately adjacent to shear. Trench #2 DEER #1.
64632	0.027	Grab sample of unconsolidated quartz/ feldspar vein material in overburden in Trench #5 DEER #1.
64633	0.125	Grab sample of unconsolidated quartz/ feldspar vein material in overburden in open cut DEER #1.
64634	0.70	Channel sample across 20" of bedrock from pink banded, dark green siltstones in open cut DEER #1.
64635	0.69	Representative grab sample from bedrock over 1' by 1' area of pink banded dark green siltstone in floor of open cut DEER #1.

Table 1 Assay Results - Continued..

Sample No.	% U_3O_8	Description
62561	0.28	Grab sample over 5 feet from headwaters Fox Creek showing.
62562	0.053	Grab sample over 75 feet from headwaters Fox Creek showing.

GEOCHEMISTRY

Introduction

The uranium geochemical prospecting program in the Fox Creek area was conducted in several stages. The first stage was carried out during the period June 17, 1977 to July 5, 1977 and was initiated in an attempt to outline target areas on the FOX, OWL, and at that time the newly acquired DEER and FROG claims. All flowing streams in the area were silt sampled at 500 foot or 1,000 foot intervals depending on the availability of sediments; and water samples were taken at reconnaissance spacing from most streams as well as all seepages and springs encountered. Silt samples were also taken from drainage areas outside the staked blocks to determine if more ground should be acquired.

The second stage of the program was carried out from July 29, 1977 to August 3, 1977 in conjunction with hand held scintillometer prospecting of the then newly staked MOSQUITO claims and adjoining areas. Silt samples were collected from previously outlined anomalous areas in order to confirm those anomalies.

The third stage of the program was carried out from August 19, 1977 to August 31, 1977 and was initiated as a means of testing the effectiveness of soil sampling in the Fox Creek area as well as to outline additional areas of interest. Soil samples were collected at approximately 200 foot intervals along reconnaissance style single line traverses covering large portions of the area.

Sample locations and results are presented in Figure 5 of this report, "Fox Creek Area: Geochemical Survey for Uranium" at a scale of 1 inch to 1,000 feet. All samples taken in the survey were analysed by Chemex Labs. Ltd. in North Vancouver, B.C. whose description of analysis procedures appears in Appendix II to this report.

Stream Sediment Sampling

A total of 217 silt samples were analysed from the Fox Creek area with values ranging from less than 0.5 parts per million uranium to greater than 400 parts per million uranium. These upper and lower values represent the upper and lower detection limits for the analysis procedures used.

The results were divided into 0.5 ppm value ranges and cumulative percentages were plotted on logarithmic probability paper. The resulting graph appears in Figure 6 of this report. The straight line configuration shown in this figure indicates that the sample results most likely belong to one lognormal population with a mean background value of 2.5 ppm; a first order anomaly threshold (65% cumulative frequency level) of 5 ppm; and a second order anomaly threshold (95% cumulative frequency level) of 35 ppm.

These values, visually compared with G.S.C. regional sampling results, appear high, and may indicate that the entire sample population collected in the Fox Creek program is a separate anomalous population as compared to the G.S.C. regional population.

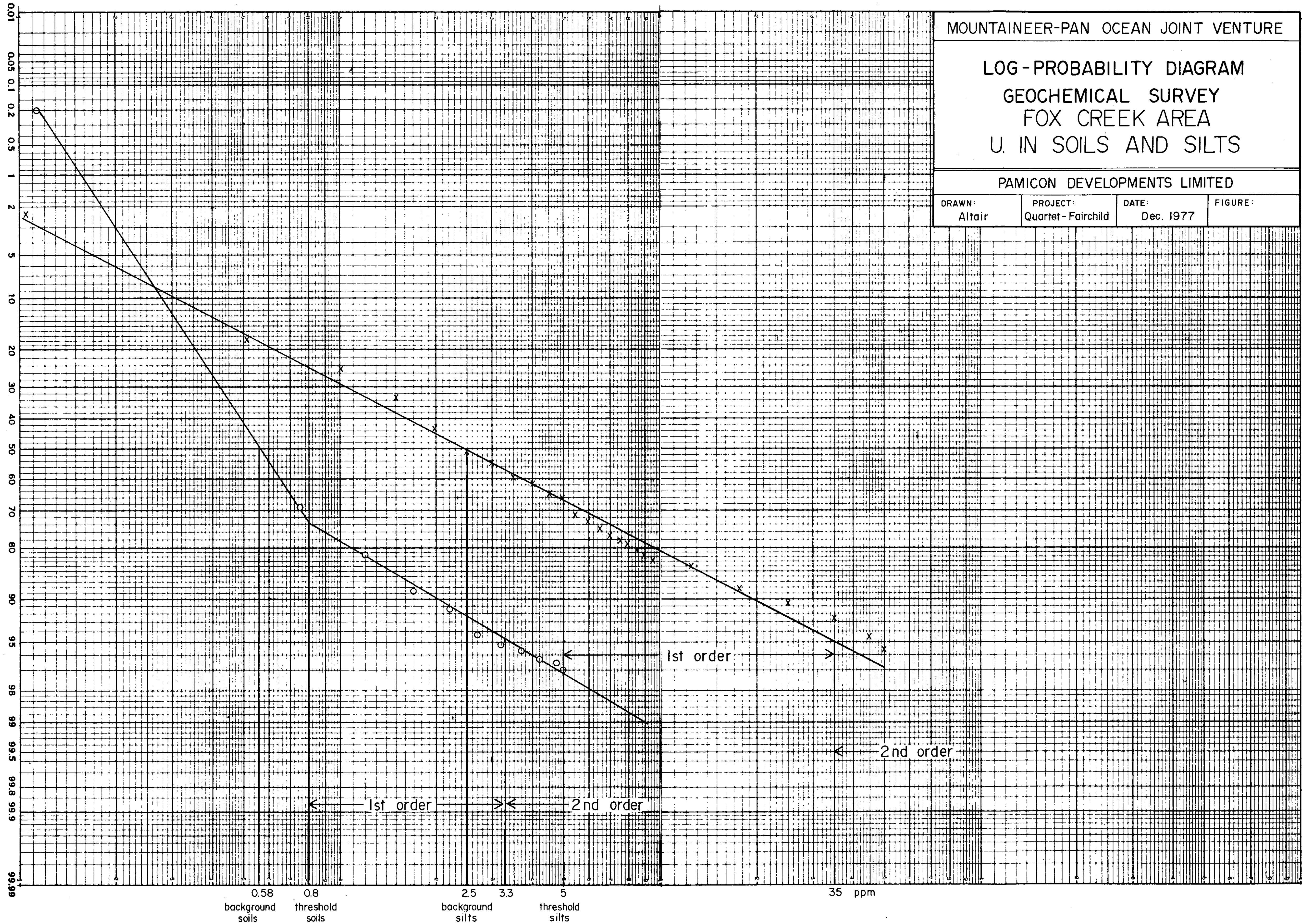
Water Sampling

Insufficient water samples were collected in the Fox Creek area to allow a statistical interpretation. As the area is primarily underlain by Fairchild Lake Group (Unit A) rocks, values employed for thresholds are those derived from the regional water sampling program for Fairchild Lake Group rocks. Refer to the regional water sampling section of this report for a discussion of statistical treatment of regional water samples.

Soil Sampling

A total of 512 soil samples were analysed from the Fox Creek area with values ranging from less than 0.5 parts per million uranium to 90 parts per million uranium.

Of the 512 samples analysed, 16 were disregarded for statistical purposes on account of poor analytical results due to quenching of uranium fluorescence by extraneous metallic ions. The remaining values were divided into 0.5 ppm value ranges and cumulative percentages were plotted on logarithmic probability paper. The resulting graph appears in Figure 6 of this report. The broken line curve shown in this figure is characteristic of a population containing an excess of high values (positive skew) as compared to a normal population. The breaking point (at 0.8 ppm) indicates the point at which the


MOUNTAINEER-PAN OCEAN JOINT VENTURE
LOG-PROBABILITY DIAGRAM
GEOCHEMICAL SURVEY
FOX CREEK AREA
U. IN SOILS AND SILTS
PAMICON DEVELOPMENTS LIMITED
DRAWN: Altair
PROJECT: Quartet-Fairchild
DATE: Dec. 1977
FIGURE:
1st order
2nd order
1st order
2nd order
0.58
background soils
0.8
threshold soils
2.5
background silts
3.3
5
threshold silts
35 ppm

population departs from a lognormal distribution and may be taken as a threshold value for a first order anomalous population. The threshold for a second order anomalous population has been chosen at the 95% cumulative frequency level (at 3.3 ppm.)

DISCUSSION OF GEOCHEMICAL RESULTS

Three immediate observations can be made after a brief examination of the sample results plotted on the uranium survey map for the Fox Creek area:

- A large number of stream sediment and soil anomalies were outlined which, it is felt, indicates the usefulness of these geochemical techniques as a prospecting tool in the Fox Creek area.
- The high grade DEER #1 showing has absolutely no anomalous soil expression and only a very subdued anomalous stream sediment expression.
- Silt samples collected during the July-August sampling period, in virtually all cases had lower values than samples collected during the June-July sampling period although the anomalous areas were still outlined. This indicates the existence of seasonal fluctuations in absolute geochemical values.

These observations point out that no single geochemical technique can be relied upon to adequately pinpoint target locations. Instead, careful interpretations of a combination of water, soil, and stream sediment data must be made in selecting out zones of interest. It is suspected that in some areas on the property there may be no geochemical expression of uranium occurrences at all and that geophysical tools such as large crystal spectrometer surveys and Alpha Nuclear or track etch surveys will be required.

A number of important areas requiring follow-up work have been outlined by the 1977 geochemical program.

The strongest values obtained in the stream sediment survey occur in the northernmost headwaters of both forks of Fox Creek itself. Here, an area roughly 4,000 feet by 4,000 feet in size is drained by streams exhibiting second order anomalous values. A number of brannerite mineralized float occurrences were discovered within this area at the end of the 1977 season and 16 anomalous soil samples were also taken from the same region.

The highest values obtained in the soil survey occur in a 3,000 foot long zone on the northwest side of the main Fox Creek valley starting approximately 4,000 feet upstream from the mouth of the creek. Fifteen highly anomalous soil samples were collected in this zone and anomalous silt sample values were obtained from the portion of Fox Creek draining this area.

Anomalous or highly anomalous silt samples were taken from all but two of the major tributaries flowing northerly into Mosquito Creek. The main body of Mosquito Creek yielded anomalous or highly anomalous silt samples over most of its length in that area. In addition, a very subtle but definite trend of anomalous and highly anomalous soil samples can be traced along the south side of the Mosquito Creek valley beginning north and east of the DEER #1 & #2 showings and extending some 6,000 feet to the east-northeast.

Other notable geochemical anomalies occur at the northwest end of the soil sample line on the north side of Mosquito Creek, at the head of the westerly flowing stream draining the western portion of the DEER claims, in Deer Creek centered approximately 4,000 feet from its mouth, in the pass between the Illtyd Creek drainage and the Pool Creek drainage, in the small creek flowing southeasterly into Pool Creek from the CLAM claims, and in Owl Creek. All the above mentioned anomalous areas require follow-up geochemical work.

DISCUSSION AND CONCLUSIONS

The encouraging results of the 1977 program have made it obvious that a large property exploration program will be required in the 1978 season to fully evaluate both the Fox Creek and Loon Creek areas. A number of problems immediately present themselves.

The first problem is one of topographic control. There is no detailed scale government map available for the area. Such a map will have to be compiled privately using aerial photographs available from the National Air Photo Library for a base. An ideal working map for the 1978 season would consist of an aerial photograph mosaic at a scale of 1:10,000 with topographic contours superimposed on the photos. This would undoubtedly be expensive to compile but it is felt that the expense would soon be defrayed by the speed at which this control would allow work to proceed.

The second problem is that most parts of the area are overburden covered. This means that reliance will have to be placed on geochemical and geophysical prospecting techniques. More important however, it means that trenching as a means of evaluating showings and anomalies will have to be undertaken on a much larger scale than it was in the 1977 season. If bulldozer trenching is to be considered, then steps will have to be taken to mobilize the equipment and fuels necessary early in the 1978 season, as summer bulldozer travel is impossible over many portions of the access route to the area.

RECOMMENDATIONS

1. A topographic base map should be compiled at a scale of 1:10,000 for the entire Fox Creek and Loon Creek areas. An air photo mosaic at the same scale should also be prepared.

2. A detailed geochemical survey using water sampling, stream sediment sampling, and soil sampling techniques should be carried out in the already outlined areas of interest. In addition, detailed reconnaissance surveys should be carried out over the unexplored parts of the property and the surrounding areas.

3. Detailed geophysical surveys using Alpha Nuclear and ground borne radiometric techniques should be carried out to follow up presently outlined anomalous areas. In addition, detailed reconnaissance surveys should be carried out over the unexplored parts of the property.

4. Detailed prospecting using hand held scintillometers should be continued in the claims area.

5. Detailed geologic mapping should be completed for the entire property area and an interpretation of structural events should be attempted in the important showing areas.

6. Trenching should be carried on in the areas where it has already proven useful and should be used to evaluate new areas of interest if it is required.

7. Preparations should be made for a preliminary diamond drilling program pending the successful completion of the first parts of the property program.

Respectfully submitted,

D. A. Yeager - Geologist

C. K. Ikona, P.Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
CHARLES K. IKONA

APPENDIX I

PETROGRAPHIC REPORT

Sample No.	Description
D1	Pink banded, dark green siltstone from Trench No. 5, DEER #1 showing.
D2	Pink banded, dark green siltstone from Trench No. 5,DEER #1 showing.
D3	Vuggy, pink banded, dark green siltstone from Trench No. 5, DEER #1 showing.
U1	Fairchild Lake Group metasiltstone from URSUS claims.
B1	Typical Wernecke Group inter banded siltstone/mudstone.
O	Banded metasiltstone from OWL claims.
D4	Phyllitic metaquartzite from DEER claims.
D5	Diatreme Breccia from northern headwaters Fox Creek.
BG 30	Mineralized breccia SSE of Gillespie Lake
R1	Mineralized breccia from RAM claims.
L1	Mineralized, altered, ultra-mafic pod from Trench #1, LOON claims.

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph. D. Geologist

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY, B.C.
VOX 1JO

PHONE (604) 533-1155

Report for: Pamicon Dev. Ltd.,
610 850 West Hastings,
Vancouver, B.C.

Job 77-29

Samples: D-1, D-2, D-3, U-1, B-1, O, D-4, D-5, BG-30, R-1, L-1

The samples are divided as follows:

Metasiltstones, Mudstones: D-1, D-2, D-3, U-1, B-1, O, R-1
Metaquartzite (impure): D-4
Intrusive Breccia: D-5, BG-30
Silicified Serpentinite: L-1

The following samples contain radioactive minerals:

a) strongly radioactive: R-1, D-5, L-1 (locally), D-3

b) moderately radioactive: BG-30, D-2

Metasedimentary rocks consist mainly of quartz, sericite, and variable amounts of chlorite, with plagioclase in D-1, and minor amounts of zircon, tourmaline, apatite, and Ti-oxide throughout. Some are carbonaceous. Samples D-2 and D-3 contain lenses and patches of plagioclase-chlorite, many of which are vuggy. Their origin is unknown.

Sample D-4 is unusual in that it is higher grade and contains chloritoid, garnet, and epidote-allanite. Sample R-1 contains the most abundant radioactivity and very abundant calcite.

Sample D-5 is a brecciated plagioclase-quartz rock intruded by fine grained magmatic groundmass. Sample BG-30 is a strongly brecciated microcline-quartz rock.

Sample L-1 is an unusual silicified serpentinite after an olivine pyroxenite.

Radioactive minerals include at least three phases with different optical properties, which are U-minerals, and zircon.

U-minerals are as follows:

1) Opaque, very fine grained, with calcite (sample R-1)
2) Red-brown, isotropic mineral, probably metamict (samples D-2, D-3, BG-30, L-1)
3) Orange-brown, anisotropic (samples D-5, BG-30, L-1)

Sample D1 Metasiltstone-Mudstone

sericite	70-75%	
quartz	10-15%	
plagioclase	10-15%	(porphyroblasts ?)
zircon	1- 2%	
tourmaline	0.2%	
Ti-oxide	0.2%	
plagioclase veinlet	.5%	

The rock is a finely banded metasiltstone or metamudstone, composed of sericite and quartz of grain size 0.02-0.04 mm, with layers up to 3 mm thick (most less than 1 mm). Layers are shown by color alternation in hand sample, and are not obvious in thin section. Zircon forms abundant scattered grains up to 0.01 mm; most are short to elongate prismatic crystals or crystal fragments. A few coarser zircon grains and aggregates are up to 0.25 mm across. Tourmaline forms scattered grains up to 0.02 mm across. Ti-oxide forms granular aggregates of grain size 0.01 mm.

Forming crude layers are porphyroblasts(?) of plagioclase from 0.05 to 0.15 mm across. Most are rounded and contain inclusions of quartz; twinning is absent. R.I. is slightly less than quartz, and the optic sign is positive; this suggests a composition of albite. They may be of similar origin to lenses and patches of plagioclase-chlorite in samples D-2 and D-3.

The rock is cut by plagioclase veinlets of grain size 0.04-0.10 mm. Veinlets occur along fractures along which color bands are offset up to 3 mm.

A few patches are distinguished in which quartz is much more abundant than in the main rock. Quartz is generally coarser grained (0.1 to 0.3 mm. These patches may represent original quartz-rich lenses (sand?) in the original sediment. They are up to 1 mm long, and have diffuse borders with the main rock.

Sample D-2 Banded Metasiltstone-Mudstone

quartz	45-50%
sericite	40-45%
chlorite	2%
zircon	1%
apatite	0.5%
U-mineral (?)	0.5%
Ti-oxide	0.2%

The rock is very finely banded on a scale of 0.1-0.5 mm. Color bands are obvious in hand specimen but not obvious in thin section. They may be related to distribution of chlorite, with darker bands containing more chlorite.

Quartz and sericite are 0.04-0.08 mm in size. Quartz has a mosaic texture, and sericite forms unoriented to slightly oriented flakes and laths. Chlorite is slightly pleochroic from colorless to pale green, and commonly is slightly coarser than sericite; it is intergrown with quartz and sericite. Zircon forms sub- to euhedral elongated prismatic crystals up to 0.02 mm long. Apatite forms scattered euhedral grains up to 0.15 mm across; almost all are oriented with their c-axis perpendicular to the plane of the thin section. The U-mineral (?) forms patches of grains up to 0.06 mm across. It is orange-brown, has high relief, and appears isotropic. Ti-oxide forms patches up to 0.05 mm across.

(continued)

Sample D-2 (continued)

Lenses of plagioclase with lesser chlorite occur along some bedding planes. They are up to 1 mm thick and several mm long, and some are vuggy along their centerlines. Plagioclase grains are from 0.1 to 0.5 mm in size, with chlorite forming laths up to 0.3 mm long. Plagioclase contains abundant dusty zircon crystals up to 0.006 mm long.

Sample D-3 Metasiltstone

sericite	35-40%
chlorite	25-30%
quartz	20%
U-mineral (?)	3- 5%
apatite	1- 2%
plagioclase-chlorite lenses	15%

The sample is less obviously banded in hand sample than samples D-1 and D-2. Sericite forms laths and flakes from 0.015 to 0.03 mm long. Chlorite is intergrown with sericite as flakes and laths from 0.02 to 0.1 mm long. Quartz forms interlocking grains 0.03 to 0.05 mm across. Sericite is crudely aligned parallel to bedding and plagioclase-chlorite lenses. In thin section, a slight banding is seen; it is caused by slight variation in the quartz content of the layers.

Scattered thru the rock are patches of the U-mineral up to 0.10 mm across. These are composed of fine granular aggregates of grains about 0.02 mm across. Locally they are concentrated in layers parallel to bedding. The U-mineral is similar to that in sample D-2.

Apatite forms euhedral grains up to 0.15 mm across. Most are perpendicular to the plane of the section, and appear as hexagonal to rounded grains.

Plagioclase-chlorite lenses are very abundant, and most have large central cavities. Plagioclase is coarse grained (0.5 to 2 mm) and has a composition of An_7 (Michel-Levy method). Chlorite forms minor flakes up to 0.5 mm long. The lenses have diffuse borders with the wall rock, and most contain 10-15% fine grained sericite as in the wall rock. Lenses are mainly elongate and parallel to bedding. Some are rounded patches up to 2 mm across.

Sample U-1 Metasiltstone

quartz-plagioclase	60-65%		
sericite	20-25%		
chlorite porphyroblasts	3-10%		
opaque	0-10%		
tourmaline	0.5%	zircon	trace
quartz-chlorite veinlets	0.5%		
limonite stain	minor		

The rock is composed of equant anhedral grains of quartz and plagioclase about 0.04 mm across set in a matrix of very fine grained (0.01-0.02 mm) sericite flakes intergrown in random orientation. Some layers (dark in hand sample) contain up to 10% opaque as irregular grains and patches up to 0.04 mm across, and laths up to 0.08 mm long; laths are roughly oriented parallel to bedding. Contacts between beds

Sample U-1 (continued)

are diffuse, and recognizable only by the abrupt change in percentage of opaque. Light colored layers (hand sample) contain very little opaque. The opaque is probably carbonaceous materail.

Chlorite forms porphyroblasts in most layers. These are mainly up to 0.2 mm across, but in the thick light-colored layer at one end of the section, they are up to 0.4 mm across, and more abundant than in other layers. Many are poikilitic with rounded inclusions of quartz and plagioclase. Chlorite also forms scattered grains and clusters up to 0.1 mm across.

Tourmaline forms elongated trigonal prisms up to 0.08 mm long. Pleochroism is strong from pale to medium green. Distribution is random to slightly concentrated in light-colored layers. Zircon forms a few grains up to 0.015 mm across, and one grain 0.04 mm across.

The rock is cut by a medium grained quartz veinlet with minor chlorite along parts of the borders. Limonite occurs in scattered fractures, some related to the quartz vein.

Sample B-1 Banded Carbonaceous Metasiltstone-Mudstone

minerals very variable from layer to layer

sericite	20-80%
quartz	10-50%
chlorite	5-70%
as porphyroblasts	5-10%
carbonaceous opaque	2-25%
tourmaline	0.2%
mineral X (semiopaque)	3-5%
mineral Y	0-10%
quartz veinlet	1-2%

The rock is thinly banded from less than 0.1 mm to 5 mm thick. Some layers show excellent graded beds from 0.015 mm at the base to 0.005 mm at the top; tops are towards the "B1" label on the thin section. One graded bed also shows good cut-and-fill structure. A few beds pinch out in the section.

The main beds are of two compositional types. Some contain 80% sericite, 5-10% quartz, 5-10% chlorite porphyroblasts, and 5% carbonaceous opaque. Grain size is 0.01-0.02 mm, with graded beds being finer at the tops. The other main type contains up to 50% quartz with lesser sericite and chlorite. Grain size is about as in the sericite-rich beds. A few coarse beds (up to 0.03 mm in grain size and up to 0.25 mm thick) contain 60% quartz, 20% sericite, and 20% chlorite. Many coarser grained lenses and parts of beds contain more abundant opaque. As well, the tops of layers and thin interlayers are commonly marked by up to 25% opaque and abundant mineral Y. A few layers consist of 50-70% chlorite up to 0.04 mm in grain size (layers up to 0.6 mm thick), with lesser sericite and minor quartz.

Mineral X forms elongate narrow plates up to 0.3 mm long scattered through the rock, and probably of metamorphic origin. Some cut across bedding planes and foliation is warped around some. Many have recrystallized quartz along one or both sides. The mineral is almost opaque, with very high relief and high (?) birefringence. It appears to be made up of aggregates of very fine grains.

Mineral Y is strongly pleochroic from light green to dark green-grey, and forms irregular elongate grains up to 0.015 mm long. It has moderate relief, medium birefringence, parallel extinction, and is length slow. Absorption is stronger parallel to the length of crystals.

Sample B-1 (continued)

Tourmaline forms scattered grains up to 0.03 mm long. Pleochroism is strong from pale to medium green.

Contacts between layers are sharp, and represent original sedimentary features; recrystallization has preserved many sedimentary features, while metamorphic features consist of formation of chlorite porphyroblasts and probably crystallization of mineral X.

Sample O   Metasiltstone

two main types of layers with gradations

quartz-rich layers		sericite-rich layers	
quartz	70-80%	sericite	85-90%
sericite	15-20%	semi-opaque	5-7%
semi-opaque	2- 3%	chlorite	1-2%
tourmaline	0.2-0.5%	quartz	2-5%
qtz-chl-ser patches	7-10%	qtz-chl-ser patches	2%
		chlorite patches	0-5%

The sample is banded finely from 0.1 to 4 mm thick. Color bands in hand sample are much more prominent than compositional bands in thin section; however, darker bands are more-sericitic and lighter bands richer in quartz. Gradations between end members occur (these are represented by medium green bands in hand sample. Detailed structural features are better observed in hand sample than in thin section. The rock is more highly metamorphosed than previously described samples.

Quartz-rich layers contain granular to mosaic aggregates of quartz 0.04 to 0.08 mm in grain size, with scattered sericite flakes with the same grain size having a preferred orientation at about 30° to the compositional layering (primary bedding). The preferred orientation is best seen in layers with more abundant sericite. The semi-opaue mineral froms scattered equant patches and aggregates up to 0.1 mm. Except for its habit and slightly lower relief the mineral is similar to mineral X of sample B-1. Quartz-chlorite-sericite patches are rounded to slightly elongate and up to 0.6 mm in size. They consist of coarser grained mosaic quartz (0.08-0.10 mm) with chlorite laths up to 0.25 mm long and lesser sericite flakes up to 0.8 mm long. Minerals have random orientations in the patches.

Sericite-rich beds appear much more strongly deformed than quartz-rich beds. A prominent foliation is at 30° to the bedding; it has warped the sericite and partly recrystallized it to form chevron folds of period and amplitude about 0.1 mm. The beds have sharp contacts at one side (away from "O" label), and diffuse contacts at the other side with quartz-rich layers; this suggests original graded beds(?) with sericite-rich material representing original finer grained clay-rich material at tops of beds. The semi-opaque mineral forms patches up to 0.3 mm across. One is an elongate lath similar to those of Mineral Y in sample B-1, but most are equant. Some have coarse grained chlorite along their borders. Quartz-chlorite-sericite patches are minor and occur near the diffuse contacts with quartz-rich layers. The layer at one end of the section contains several patches of chlorite of grain size up to 0.25 mm.

Tourmaline forms scattered grains up to 0.02 mm long in quartz-rich layers.

Intermediate compositional layers show a prominent foliation of sericite parallel to that in sericite-rich layers. Most of these have compositions about 60-70% quartz and 30-40% sericite.

Sample D-4   Impure Metaquartzite

quartz	70-75%	
sericite	10-15%	(possibly paragonite)
chloritoid	5- 7%	(porphyroblasts with quartz)
chlorite	5- 7%	
garnet	1- 2%	
epidote-allanite	1-2%	
Ti-oxide	1- 2%	
apatite	0.2%	
tourmaline	0.2%	

The rock has been deformed and recrystallized by two periods of deformation. In the first, a major foliation was developed parallel to compositional banding by formation of sheet silicates. In the second this foliation was deformed and partial recrystallization of sheet silicates occurred along the limbs of kink folds developed in the deformation. This has resulted in an irregular texture to the entire rock, with parts showing the prominent primary foliation, and parts showing a more or less unoriented texture. Quartz in particular shows an unoriented mosaic texture throughout the rock. The hand sample shows the effects of the second deformation on thin layers rich in epidote-allanite.

Quartz grains are mainly 0.04 mm in size. Sericite and chlorite form scattered flakes and patches of unoriented to strongly oriented grains up to 0.08 mm long. Commonly the rock is composed of irregular patches of more-quartz-rich rock enclosed in wispy zones of slightly more sericitic rock.

Chloritoid forms porphyroblasts with quartz. Patches are up to 1.2 mm across and consist of mosaic quartz surrounding and enclosed in poikilitic chloritoid grains up to 0.6 mm long. Garnet forms subhedral to euhedral grains from 0.04 to 0.08 mm; these are free of inclusions. Epidote-allanite occurs in the light green layers in the rock (color of hand sample) as elongated unoriented laths up to 0.08 mm long. Tourmaline forms scattered grains up to 0.06 mm across, and apatite forms scattered grains up to 0.04 mm across. Ti-oxide forms irregular patches of aggregates of very fine grains.

Sample D-5   Quartz Diorite to Soda Granite Breccia

plagioclase (coarse crystals)	10-15%	
fine groundmass (plag + qtz)	50-60%	(plag/qtz = 3/1 to 4/1)
chlorite	10%	
U-mineral	2%	
zircon	2%	
fragments of very fine grained igneous rock (plag-qtz)	5%	

The rock contains coarse grained plagioclase laths to 3 mm long; these are fresh and have a composition of An_7 (Michel-Levy method). Many are fractured, and they are set in a groundmass of granular plagioclase and quartz of grain size 0.1-0.2 mm. The groundmass also contains scattered flakes of chlorite and rare biotite. Biotite forms ragged laths with pleochroism light to medium brown. The groundmass is replaced(?) by patches of very fine grained chlorite (0.02-0.04 mm grain size). Associated with chlorite and scattered in the rock away from chlorite are irregular grains of the U-mineral and very abundant tiny zircon grains.

(continued)

Sample D-5 (continued)

The U-mineral forms anhedral rounded grains mainly up to 0.2 mm in size, with one irregular patch 2.5 mm long. The mineral is yellow brown in color and has altered halos of darker green-brown chlorite. Most grains are isotropic; one grain does not go extinct indicating that it is a very fine grained aggregate. Some grains are surrounded by thin rims of secondary U-minerals. The altered chlorite surrounding the grains has a characteristic blue interference color, while much of the chlorite away from U-mineral grains has a brown interference color.

Zircon forms clusters of up to a few hundred grains of size from 0.001 to 0.015 mm. Some are subhedral and slightly elongated, but many are anhedral and equant.

The rock contains a fragment 5 mm across of very fine grained plagioclase-quartz rock (grain size 0.015 mm); the rock has similar composition to the main groundmass of the sample. Zircon is very abundant as scattered grains and clusters of grains.

Sample BG-30 Strongly Brecciated Granite

microcline (coarse fragments)	20-30%
quartz (coarse fragments)	7-10%
groundmass	
A- microcline-quartz (coarser)	7- 10%
B-sericite-microcline-quartz	10-15%
rock fragments	10-15%
calcite	15%
chlorite	7%
U-minerals (two)	3%
zircon	0.1%
tourmaline	trace
fluorite	trace
opaque	1-2%
apatite	0.5%

The sample is strongly brecciated, with fragments of microcline, quartz, and fine grained microcline-rich rocks from 0.05 to several mm across in a complex groundmass of intrusive and replacement (hydrothermal) origins. Coarse microcline grains commonly are fractured and fragmented; many fine fragments may be parts of grains from an original coarse grained granite.

Two types of intrusive breccia matrices are present, but no age relations could be determined. One is slightly coarser (0.02-0.04 mm) and consists mainly of microcline and minor quartz (groundmass A). The other is finer (0.015-0.025 mm) and consists of microcline grains surrounded by sericite and minor calcite and quartz (groundmass B).

Coarse patches and grains of calcite and chlorite occur throughout the sample. Associated with these are the U-minerals, apatite, and fluorite. The U-minerals are the same as in sample D-5 except that the orange-brown mineral is more abundant than the red-brown mineral. The former appears in part to be an alteration of the latter. Some of the orange-brown mineral forms coarse grains, while other parts are very fine grained aggregates. Chlorite surrounding some tiny U-minerals is strongly pleochroic.

Zircon and tourmaline form scattered grains throughout the rock.

The opaque is concentrated in certain parts of the section; some of it is altered along the borders to hematite.

Calcite-chlorite patches and zones are very irregular in distribution, and probably are of replacement origin.

Sample R-1 Brecciated Metasiltstone

quartz	40-50%	
sericite	10-20%	
calcite	5-15%	(porphyroblasts)
	10-35%	(veins and replacement patches)
U-mineral	5%	(opaque)
apatite	trace	

The sample is a banded metasiltstone, with bands representing original beds of slightly variable composition and grain size. Grain size ranges from 0.02 to 0.08 mm for quartz and sericite; generally quartz has a mosaic to granular texture, while sericite forms unoriented flakes and aggregates.

Calcite forms porphyroblasts up to 0.3 mm across, commonly with very fine inclusions of sericite and/or opaque. It also forms irregular patches and veins. Calcite is probably of secondary origin; the porphyroblasts might be replacement of chlorite porphyroblasts as in some other rocks of the suite.

Associated with calcite patches and veins is a dusty to fine grained opaque mineral which is probably a U-mineral. It forms grains up to 0.05 mm across and occurs in veins, generally parallel to bedding planes and in fractures with calcite at high angles to bedding planes. Dusty opaque from 0.005 to 0.015 mm across forms scattered irregular patches and clusters of grains throughout the sample.

The texture of the rock shows well in the hand sample. Pink layers are coarser grained and slightly richer in quartz than light green layers. Irregularities and dark veins are calcite-U mineral veins and patches.

Sample L-1 Silicified Serpentinite

antigorite	50-60%		
quartz	25-30%		
mineral X	10-15%		
zircon	1%	tourmaline	0.2-0.5%

quartz-chlorite-U mineral veins 5%

The rock is strongly altered. It appears to have been originally a coarse grained (3 to 5 mm) olivine pyroxenite. The rock was then altered completely to an intergrowth of antigorite (serpentine) and Mineral X. The alteration was such that original grain boundaries were preserved. These suggest that the original rock was composed mainly of slightly to strongly elongated pyroxene grains and fewer olivine (?) grains. Pyroxene grains are altered along cleavages and fractures to antigorite with cores of mineral X intergrown with antigorite.

Antigorite is light green in color and mainly very fine grained (0.003-0.008 mm). Some late(?) coarser antigorite is recrystallized along fractures or cleavage directions of the original pyroxene. Mineral X is colorless, with low relief (R.I. slightly greater than quartz), very low birefringence (0.005-0.010), and is biaxial negative with moderate to high 2V.

What may have been original olivine grains are represented by an unoriented very fine grained aggregate of antigorite and minor

The rock has been silicified, with Mineral X-antigorite intergrowths replaced in large part by fine grained quartz patches. Within any one pyroxene grain, quartz is approximately in optical continuity.

Sample L-1 (continued)

Within the antigorite are scattered grains of zircon(?) up to 0.4 mm across (mainly 0.04-0.08 mm). They have similar optical properties to zircon including high relief, moderate birefringence, uniaxial positive optic sign; but differ in that the extinction is inclined by up to 30^{o} from the crystal outlines. Grains are slightly radioactive, and are enclosed by brown-green halos in the antigorite.

The rock is cut by several narrow quartz veins, probably of the same age or slightly later than the quartz replacement. One large vein at one end of the section contains quartz and chlorite and a large patch of U-mineral. The U-mineral is mainly deep red brown and isotropic (probably metamict). One grain 0.10 mm across included in this mineral is orange brown in color, with two cleavages at 70^{o}, and is anisotropic.

Tourmaline forms scattered grains up to 0.08 mm across throughout the rock.

John Payne

John Payne
December, 1977

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

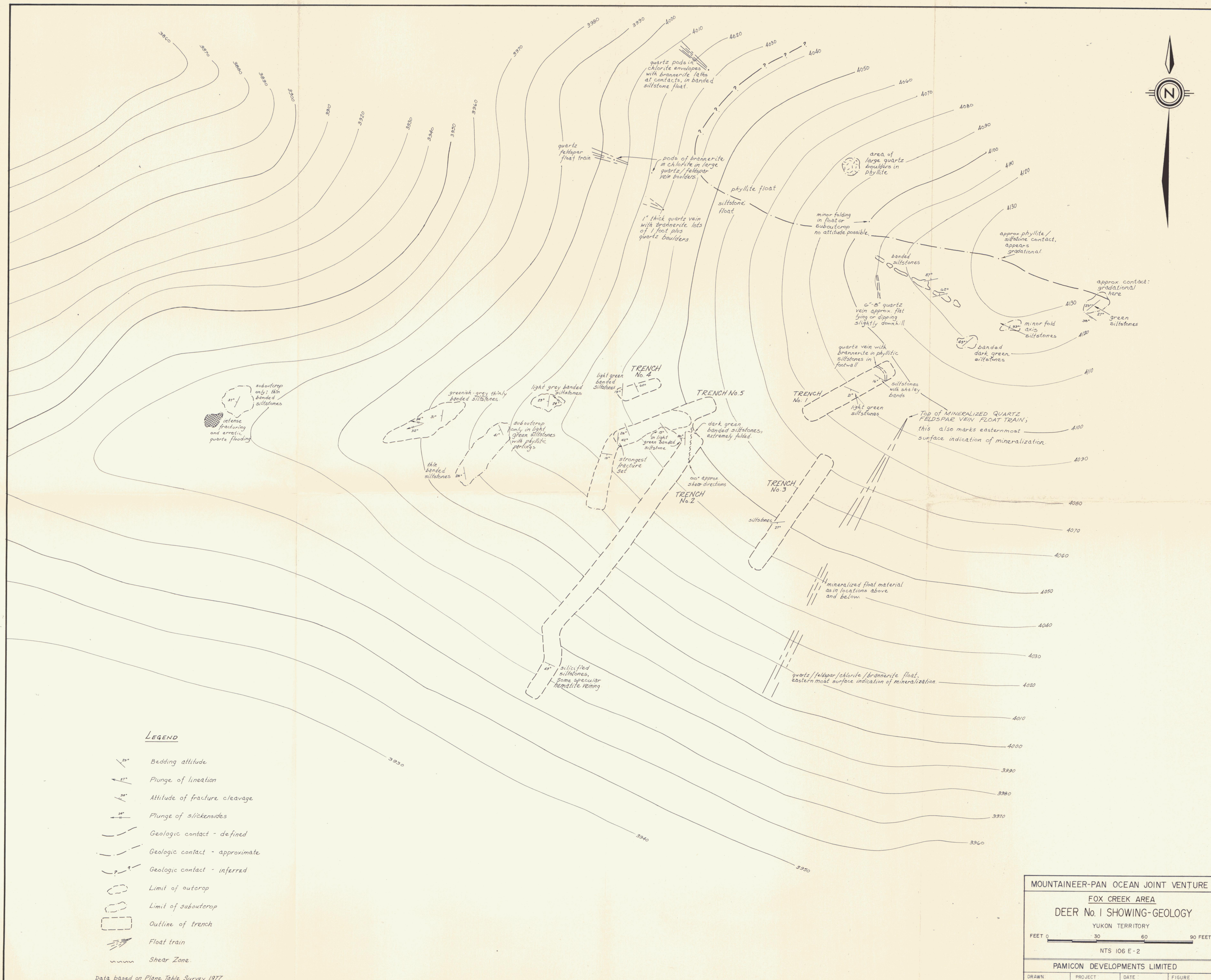
These materials normally arrive unprepared. Preparation requires drying @ 60° C and screening to obtain the -80 mesh fraction. Coarse material is retained if the screened fraction is small. A 0.25 gm sample of -80 mesh material is weighed into a 100 ml pyrex beaker. The sample is ashed at 550° C to remove 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.



quartz pods in chlorite envelopes with brannerite laths at contacts, in banded siltstone float.
quartz feldspar float train
pods of brannerite in chlorite in large quartz / feldspar vein boulders.
phyllite float
siltstone float
1" thick quartz vein with brannerite lots of 1 foot plus quartz boulders
area of large quartz boulders in phyllite
minor folding in float or suboutcrop no attitude possible.
approx phyllite / siltstone contact, appears gradational
banded siltstones
approx contact: gradational here
green siltstones
minor fold axis siltstones
banded dark green siltstones
6"-8" quartz vein approx. flat lying or dipping slightly downhill
quartz vein with brannerite in phyllitic siltstones in footwall
siltstones with shaley bands
light green siltstones
TRENCH No. 1
Top of MINERALIZED QUARTZ FELDSPAR VEIN FLOAT TRAIN; this also marks easternmost surface indication of mineralization.
TRENCH No. 4
light green banded siltstones
TRENCH No. 5
light grey banded siltstones
greenish-grey thinly banded siltstones
suboutcrop only; thin banded siltstones
intense fracturing and erratic quartz flooding
suboutcrop only in light green siltstones with phyllitic partings
thin banded siltstones
in light green banded siltstone
dark green banded siltstones, extremely folded.
strongest fracture set
approx shear directions
TRENCH No. 2
TRENCH No. 3
siltstones
mineralized float material as in locations above and below.
quartz / feldspar / chlorite / brannerite float, easternmost surface indication of mineralization.
silicified siltstones, Some specular hematite veining
LEGEND
Bedding attitude
Plunge of lineation
Attitude of fracture cleavage
Plunge of slickensides
Geologic contact - defined
Geologic contact - approximate
Geologic contact - inferred
Limit of outcrop
Limit of suboutcrop
Outline of trench
Float train
Shear Zone
Data based on Plane Table Survey 1977
MOUNTAINEER-PAN OCEAN JOINT VENTURE
FOX CREEK AREA
DEER No. 1 SHOWING-GEOLOGY
YUKON TERRITORY
FEET 0 30 60 90 FEET
NTS 106 E-2
PAMICON DEVELOPMENTS LIMITED
DRAWN Altair
PROJECT Quartet-Fairchild
DATE DEC. 1977
FIGURE

134° 45' W
65° 15' N
N
MOSQUITO CREEK
DEER CREEK
Deer Showing 2
Deer Showing 1
ILLTYD CREEK
FOX CREEK
POOL CREEK
OWL CREEK
KIWI LAKE
APPROX. OUTLINE JOINT VENTURE HOLDINGS
APPROX. OUTLINE JOINT VENTURE HOLDINGS
COLOUR CODE
SOILS
< 0.8 ppm
0.8 - 3.3 ppm
> 3.3 ppm
SILTS
< 5 ppm
5 – 35 ppm
> 35 ppm
WATERS – from Regional Program.
<1.3 ppb
1.3 ppb – 9 ppb
> 9 ppb
LEGEND
Soils sample PPM. U
Silt sample PPM. U JUNE-JULY sampling.
Silt sample PPM. U AUGUST-SEPTEMBER sampling.
Water sample PPB.U
* <4.0 PPM detection limit due to quenching of fluorescence by extraneous metallic ions
MOUNTAINEER- PAN OCEAN JOINT VENTURE.
FOX CREEK AREA.
GEOCHEMICAL SURVEY FOR URANIUM
YUKON TERRITORY
SCALE
FEET 1000 0 1000 2000 3000
METRES 300 200 100 0 100 200 300 400 500 600 700 800 900 METRES
PAMICON DEVELOPMENTS LTD
DRAWN: Altair
PROJECT: Quartet- Fairchild
DATE: Nov. 1977
FIGURE


134° 45′ W
65° 15′ N
MOSQUITO CREEK
Deer Showing 2
TRENCH
Deer Showing 1
DEER CREEK
OWL CREEK
KIWI LAKE
POOL CREEK
ILLTYD CREEK
FOX CREEK
APPROX OUTLINE JOINT VENTURE HOLDINGS
APPROX OUTLINE JOINT VENTURE HOLDINGS
LEGEND
Breccia
FAIRCHILD GROUP
A8 Calcareous Siltstone light green grey
A7 Dolomite, Siltstone and Slate interbedded
A6 Shale black, rusty or Slate green grey
A5 Calcareous Siltstone, and Limestone light green grey
A4 Siltstone,/ Sandstone dark grey
A3 Siltstone, light green, banded or phyllitic
A2 Phyllite / schist light green
A1 Quartzite, light grey, banded
Fault
Bedding (S,) Attitude
Schistosity (S,) Attitude (Foliation)
×U Uranium Mineralization
Geologic Contact
MOUNTAINEER- PAN OCEAN JOINT VENTURE.
FOX CREEK AREA.
PRELIMINARY GEOLOGIC MAP
YUKON TERRITORY
SCALE
FEET 1000 0 1000 2000 3000
METRES 300 200 100 0 100 200 300 400 500 600 700 800 900 METRES
PAMICON DEVELOPMENTS LTD
DRAWN: Altair
PROJECT: Quartet- Fairchild
DATE: Nov. 1977
FIGURE