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ANNUAL REPORT, DECEMBER 1978, PROJECT NO 71-86, GAYOT LAKE AREA

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GAYOT LAKE AREA
PROJECT No. 71-86
ANNUAL REPORT - DECEMBER 1978
Report No. 7186-17

CONFIDENTIAL

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1. INTRODUCTION

Gayot Lake, Project 71-86, is involved in uranium exploration within six permit areas and one claim group (see Table 1 and Figure 1), encompassing an area of 1017 km² within north-central Québec. The Société de Développement de la Baie James (S.D.B.J.) has entered into a joint venture agreement in this project, and now maintains a 50% share, with U.E.M. remaining as operator.

TABLE 1 - Land Status

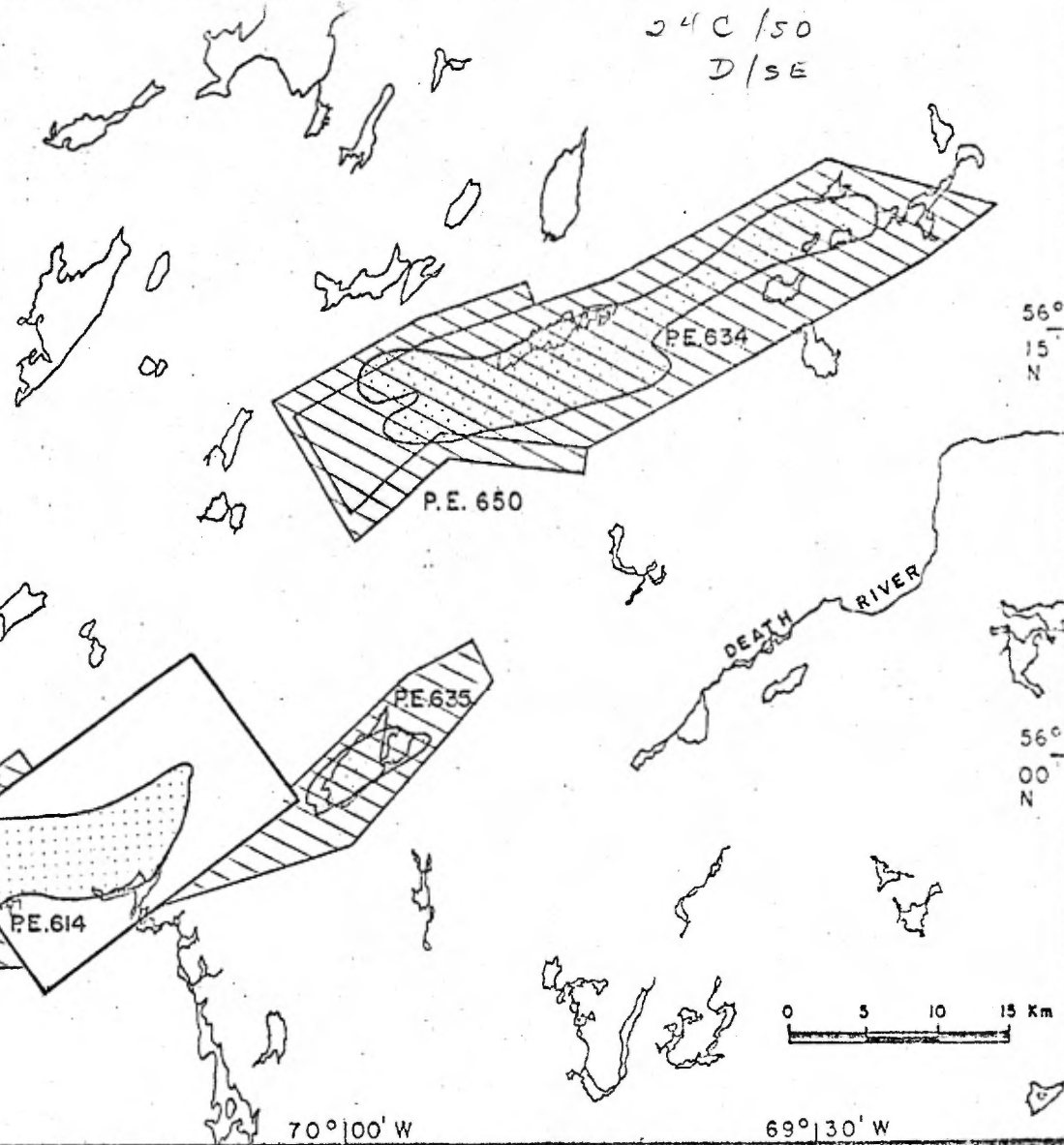
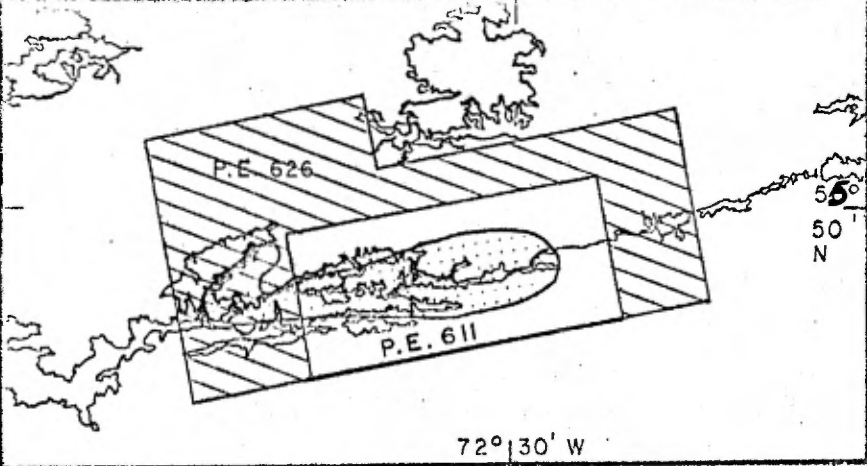
Area	Date Granted	Term	Area
Dieter Lake Claim Group	Aug./Sept. 77		30.75 km ²
P.E. 626 Mildred Lake	June 22, 1977	3 years	303.0
P.E. 627 Dieter Lake North	June 22, 1977	3 years	67.3
P.E. 628 Dieter Lake South	June 22, 1977	3 years	67.3
P.E. 634 Lac Gerzine	Nov. 23, 1977	3 years	388.5
P.E. 635 Lac Pons	Nov. 23, 1977	3 years	93.0
P.E. 650 Lac Gerzine West	Sept.18, 1977	3 years	67.3



Base of field operations is Dieter Lake, situated 274 km north-west of Schefferville, Québec; the coordinates being latitude 55°58'15"N, longitude 70°36'30"W.

1.1 PROJECT HISTORY

Project 71-86 was conceived in 1976 by B. Starke, and field work was begun during the year's field season. A short (two week) reconnaissance program was undertaken to begin a preliminary assessment of the area's uranium potential. Initial surveys consisted of centre-lake sediment and water sampling, ground traversing across the unconformity and airborne mapping of the outlier. An airborne spectrometer survey was undertaken of the Gayot Lake outlier after radioactivity was encountered in outcrop north of Dieter Lake. Uranium anomalies were also obtained from both lake bottom sediments and waters in the same area, as well as in the vicinity of Mildred Lake (P.E. 626). As a result, a group of one hundred and ninety contiguous claims were staked along the unconformity at Dieter Lake.

24 C / 50
D / SE



-  PROPERTY HELD BY U.E.M
-  OUTLINE OF SAKAMI OUTLIER

U.E.M. PROPERTY		AREA Km ²
DIETER LAKE CLAIM GROUP		30.75
P.E. 626	MILDRED LAKE	303.0
P.E. 627	DIETER LAKE NORTH	67.3
P.E. 628	DIETER LAKE SOUTH	67.3
P.E. 634	LAC GERZINE	388.5
P.E. 635	LAC PONS	93.0
P.E. 650	LAC GERZINE WEST	67.3

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**GAYOT LAKE 71-86
LAND STATUS MAP
ANNUAL REPORT 1978**

COMPILED BY: R.O.	DATE: DEC / 78	TECHNICAL: []	MAP No. FIG. 1
DRAWN BY: M.E.L.	DATE: DEC / 78	PLAN No. []	SHEET No. 17
LAST REVISION: []	SCALE: 1=500,000	PROJECT No. 71-86	
T.C. TO BOARD: []	REF: 23 M.N.; 24 C; 33 P	[]	

In 1977 a full exploration program was mounted, emphasis being placed on detailed work at Dieter Lake, but also with a wideranging reconnaissance survey throughout the area of interest. Results of this work were the finding of three additional showings (Matoush, Lake Vivian and Bert's Lake) on the Dieter Lake property, and the discovery of two previously unmapped Sakami outliers to the northeast of Dieter Lake (Lac Pons and Lac Gerzine). Exploration permits were obtained for these two new areas (P.E. 634, 635), as were three others (P.E. 626, 627, 628) for portions of the known outliers at Gayot and Mildred Lakes.

Analyses obtained for samples taken from the showings were encouraging, especially in the case of Lake Vivian, where the mean of four siltstone samples was 0.78 wt% U_3O_8 , and Bert's Lake where seven shale samples averaged 0.74 wt% U_3O_8 .

1.2

EXPLORATION TARGET

This project was developed with the intention of exploring several outliers of Aphebian (?) aged sediments for uranium mineralization. The model on which the exploration was initiated called for a study of the Proterozoic/Archean unconformity, following the successes in western Canada and Australia within a geological environment of similar age and disposition. After two years of exploration activity, this original model has not been proven, but mineralization of a disseminated nature has been found within sediments of the lower Sakami Formation. Characteristic of this type of syngenic occurrence is its stratabound nature, the uranium being generally limited to a particular stratigraphic horizon (or a facies equivalent thereof). This lower Sakami unit has been found to outcrop in three locations and has been consistently intersected through diamond drilling; it can safely be interpreted to extend the full strike-length of the outlier, of which 12-15 km is held by U.E.M.

2.

GENERAL GEOLOGY

The sedimentary rocks which comprise the Sakami Formation occur as a series of local outliers, forming two belts within the northeast arm of the Superior Structural Province. As such, all of the rocks within the area of interest are Precambrian in age; the oldest being the Archean volcanics and sediments, which were folded, faulted, intruded and metamorphosed during the Kenoran Orogeny of 2480 Ma ago. Finding no evidence to the contrary, the G.S.C. (Eade, 1966) has tentatively classified the Sakami sediments (which are unmetamorphosed and nearly flat-lying) as early Proterozoic.

The Sakami may be in fault or nonconformable contact with the Archean. It has become apparent that faulting produced the graben structures which formed the centres of deposition, and mapping of the

present day contacts indicates these faults to have also been active in post-depositional times. It had been thought (Eade, 1966) that downfaulting had been responsible for the preservation of the outliers, and that the Sakami had possibly once been much more areally extensive. As a group, the sedimentary units bear certain affinities to those of the Otish Basin, the Labrador Trough, and Richmond Gulf, and it has been suggested that all were once part of a widespread cover (Chown et al. 1977). The age of the Sakami relative to these other assemblages is unknown.

Lithologic and stratigraphic correlation between the various outliers is quite close, considering the distances which separate them. The sequence has been subdivided into an upper and lower member by the G.S.C., and such has been found to be applicable within those areas studied (Table 2). The lower units are red beds, conglomerates, arkosic sandstones, and wacke-siltstone-shale all of which are conformably overlain by clean, homogenous quartz arenites. The lower sequence is not complete in every area, while the upper arenites are ubiquitous. In areas where the beds are undeformed, strikes are generally east-west and dips are 5°-20° to the south.

TABLE 2 - Stratigraphy of the Sakami Formation, Gayot Lake

Upper Sakami	Quartz arenite; white to pink in colour, massively bedded, 1-2 m thick, crossbedded; some redbed interbeds 0.5-1.0 m thick
	Shale; mainly red some green; occurring across the Dieter Lake area; is a single bed 1-2 m thick.
	Subarkose-quartz arenite; possibly transitional to upper Sakami; colour variable; grey, brown, white, pink; K-feldspar content approaches 5%; massively bedded; occasional planar crossbeds.
	Shale; irregularly distributed; red and green coloured; finely laminated; silty interbeds; evidence of ripple marks and desiccation cracks.
	Wackes; red and green in colour; may be facies equivalent of subarkose-quartz arenite in certain locales; massively bedded.
	Shale; alternating red and green horizons; minor sandstone interbeds.
Lower Sakami	Basal conglomerate; some sandstone; granite boulder-bearing, in a variable red matrix varying in size from silt to coarse sand; thickness of 1.5 m.

3. EXPLORATION PROGRAM 1978

The goal of the program carried out this year was twofold:

- 1) to assess the uranium potential of a shale-wacke horizon of the lower Sakami Formation in the vicinity of Dieter Lake;
- 2) to examine each of the four known Sakami outliers within the project area for possible uranium mineralization;

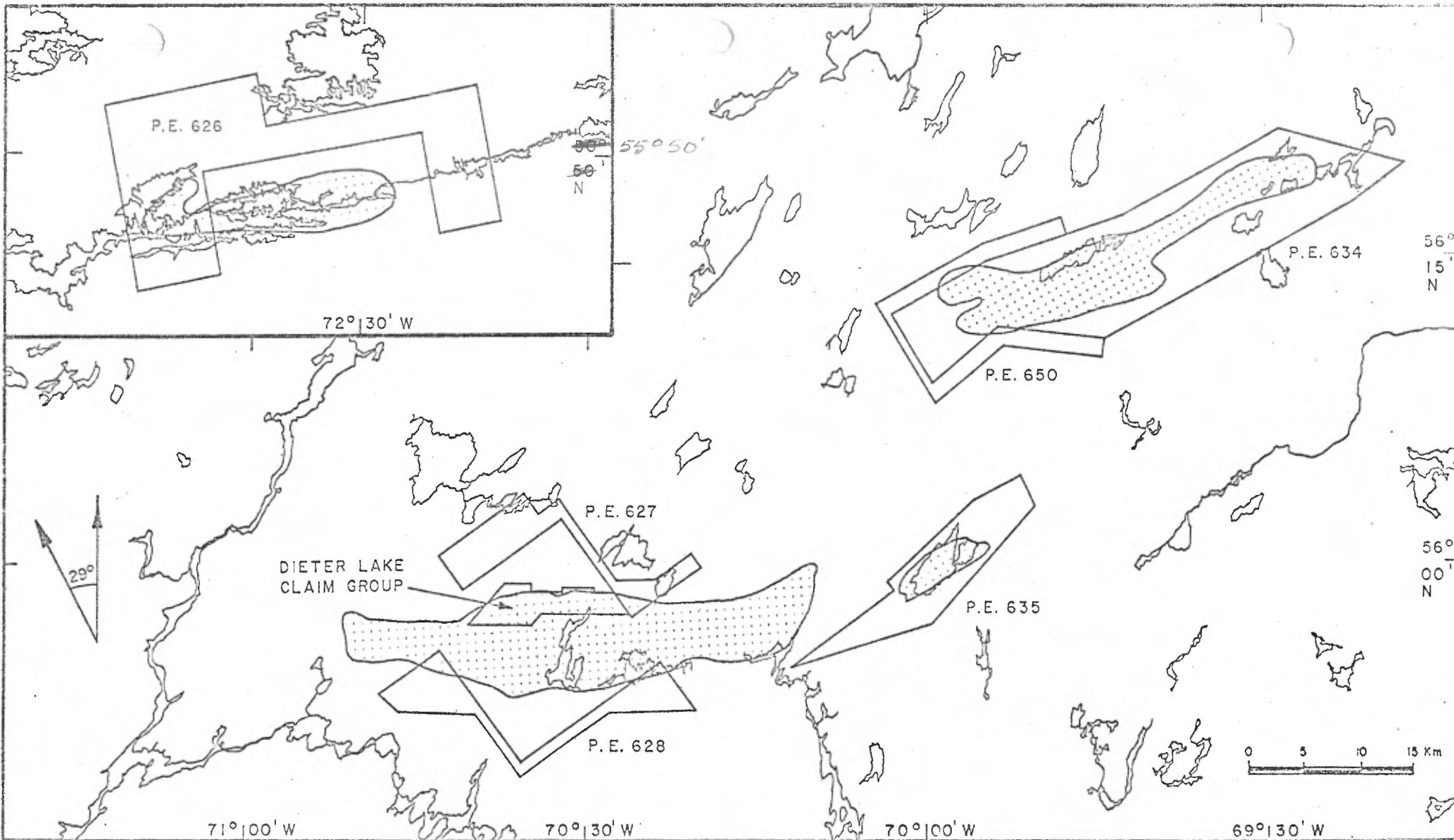
Work undertaken during 1978 was as follows:

3.1 WINTER PROGRAM

- 1 - A diamond drilling program was begun on the Dieter Lake Claim Group with 1248.7 m (fifteen holes) and 289.5 m (four holes) having been drilled at the Fearless I and Matoush showings respectively. The period involved was from April 2 until May 11.
- 2 - EM 16 and magnetometer surveys were done over the lakes on the Dieter Lake property, completing the surveys commenced the previous summer.
- 3 - Two hundred and forty-eight water samples were collected through the ice on Dieter Lake; one hundred and fifteen analyses were each done for uranium and helium, and eighteen for radon content.

3.2 SUMMER PROGRAM

- 1 - The diamond drilling program was continued; 313.3 m (four holes) having been drilled at Lake Vivian, and another 1835 m (twenty holes) at the Bert's Lake showing. With those, the planned program of 3658 m was fulfilled. This portion of the program ran from June 30 until August 25.
- 2 - Mapping Program
 - the Dieter Lake Claim Group was mapped at 1:10,000
 - the permit areas (626 west half, 627, 628, 634, 635) were mapped at 1:50,000.
- 3 - Prospecting
 - The balance of the claim group and portions of permits 627, 628 and 635 were prospected.



AREA	SURVEYS CONDUCTED 1978					
	AIR SPECT.	DRILLING	MAPPING	GEOCHEM	RADON	PROSPECT
D. L.K.	127.5 Km	3686.5 m	1:10,000	290 sp.	74 sp.	187 MANDAYS
626			1:50,000			18
627	400		1:50,000	5		13
628	270		1:50,000	34		22
634	1200		1:50,000	199		
635	300		1:50,000	162	45	16

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**GAYOT LAKE 71-86
1978 EXPLORATION PROGRAM
ANNUAL REPORT 1978**

COMPILED: R.O.	DATE: OCT. 78	TITLE SHEET:	MAP No. FIG. 2
DRAWN: M.E.L.	DATE:	PLAN No.	REPORT No. 17
LAST REVISION:	SCALE: 1:500,000	PROJECT No. 71-86	
10/25/78		23 M.N. 240: 33 P	

- 4 - Geochemistry
 - lake bottom sediment sampling within permits 627, 628, 634, 635
 - lake margin waters from Dieter and Pons Lakes were tested for their radon content
 - soil sampling (82 samples) were collected over the mineralized granite area at P.E. 635 Lac Pons
 - stream sediment sampling within permits 627, 628, 634, 635.

- 5 - Helicopterborne Spectrometer Survey
 - areas were flown at 500 m intervals between flight lines
 - Dieter Lake: 127.5 km
 - P.E. 627: 400
 - P.E. 628: 270
 - P.E. 634: 1200
 - P.E. 635: 300

- 6 - Surficial Mapping
 - study of esker within P.E. 634 Lac Gerzine
 - study of erosional features along northern contact within Lac Pons outlier P.E. 635.

4. 1978 EXPLORATION RESULTS

4.1 DIAMOND DRILLING PROGRAM

Diamond drilling at four locations on the Dieter Lake property has confirmed the original assessment made from surface studies, that a mineralized horizon exists within the lower Sakami, extending the length of the property. Information obtained is twofold: it allows preliminary estimates to be made concerning the economic potential of the mineralization, as well as providing geological information regarding stratigraphy and structure, which cannot be had from the surface exposures alone. From this, inferences can be drawn with regards to depositional environments and influences which may have effected the uranium emplacement.

The reader is referred to Appendix A for a complete report of the drilling program.

4.2 EXPLORATION PROGRAM

4.2.1 Dieter Lake Claim Group (Map 1)

a) Mapping

Geological mapping in this area has resulted in the defining of the Proterozoic/Archean contact, the detailing of the Sakami Fm. stratigraphy, and the unraveling of the pre- and postdepositional structural influences.

The stratigraphy across the property has been shown to be generally correlative, and it has been possible to subdivide the Sakami into lower and upper members. The lower units are terrestrially derived clastic sediments whose source was the Archean basement rocks which they nonconformably overlie. A local provenance is apparent, the basal unit being a granite-bearing conglomerate (fanglomerate), with a noticeable feldspar content being present throughout. Rapid facies changes both laterally and upward in the sequence indicate a fluvial transport of these sediments, with deposition being controlled by local structure. Figure 3 is a simplified correlation of the Sakami sediments across the property compiled from both surface and drilling data along the basin margin. It is apparent that the paleosurface consisted of local depressions separated by uplifted blocks, which resulted in corresponding lithological changes due to the differing environments. Surface mapping shows that faulting responsible for these local structures may have had both pre- and postsedimentary influences.

b) Prospecting

Prospecting carried out across the claim group did not result in the discovery of new boulder fans. Mineralization in outcrop was found however within subarkosic arenites, east of Bert's Lake. Twenty isolated occurrences were found within a single horizon, along a distance of 200 m. Analyses received have returned values of 0.46 and 0.56 wt% U_3O_8 , but mineralogical and petrological studies undertaken by U.E.B. (Dr. Voultzidis) indicate the mineralization to be contained within xenolithic inclusions derived from the Archean basement, and without economic significance.

c) Geochemistry

Lake bottom water samples, obtained through the ice at Dieter Lake, were analyzed for their helium, uranium, and radon contents. Anomalies were obtained using the first two elements, but an insufficient number of radon analyses were made to allow for conclusive results. Radon analyses were made on waters collected during the summer for samples taken along the shoreline at Dieter Lake. Anomalous values were noted along the bay in the south of the lake, and are not apparently related to any known minerali-

zation. Strongly anomalous (81 x above background) values were recorded for waters taken from a spring also on the south side of the lake. It is possible that faults in this area served as a mechanism in the transporting of the gas.

d) Airborne Spectrometer Survey

A helicopterborne spectrometer survey was flown along lines at 0.5 km spacing, subparallel to the strike of the sediments. Four anomalies, none of which provided new information, were received.

4.2.2

P.E. 634 - Lac Gerzine (Maps 2 - 4)

a) Mapping-Prospecting

A combination of ground traversing and helicopter mapping has provided a basis for further exploration in this previously unmapped area. Geological findings in this area are summarized as follows:

- a stratigraphy comparable to that of the Gayot Lake Sakami Fm. outlier
- radioactivity (up to 5000 c/s) having been encountered at two locales within rocks at the base of the formation, in units analogous to those found at Dieter Lake
- radioactivity (up to 5000 c/s) occurring in arenites of the upper (?) Sakami
- generally high background for granites bounding the western end of the outlier
- significant faulting being present throughout the outlier
- metamorphosed (greenschist facies) sediments being present, the cause of which may be local faulting
- the existence of a regolith at the southern contact.

Areal extent of the above features has yet to be determined, as only reconnaissance mapping was carried out due to the short time allowed. The most complete sequence of sedimentary rocks observed was in the western part of the permit, where they are in nonconformable contact with a granite inlier or tongue. Based upon this area, the following preliminary stratigraphic column was prepared.

TABLE 3 - Sakami Formation Stratigraphy - P.E. 634 Lac Gerzine

Upper Sakami	<ul style="list-style-type: none">- pink to brick-red arenites and quartz arenites- white quartzitic arenites, feldspathic arenites; conglomeratic intervals- red shale and red ferruginous arenites- mature, white, feldspathic arenite; conglomeratic intervals
Lower Sakami	<ul style="list-style-type: none">- white arenites, minor shale, microconglomerate- red and green wackes; mudstones, siltstones- basal conglomerate
	non conformity?
	<ul style="list-style-type: none">- local? regolithic horizon developed along southern contact

It is within the green wacke unit south of the granitic inlier that radioactive outcrop of up to 5000 c/s was found. Both the stratigraphy and nature of the host rock and mineralization are reminiscent of that seen at Dieter Lake. Other radioactive lower Sakami outcrop is located immediately north of Fenster Lake. Here, shear zones within a strongly chloritized green wacke situated in fault contact with the basement had readings of 3000 c/s.

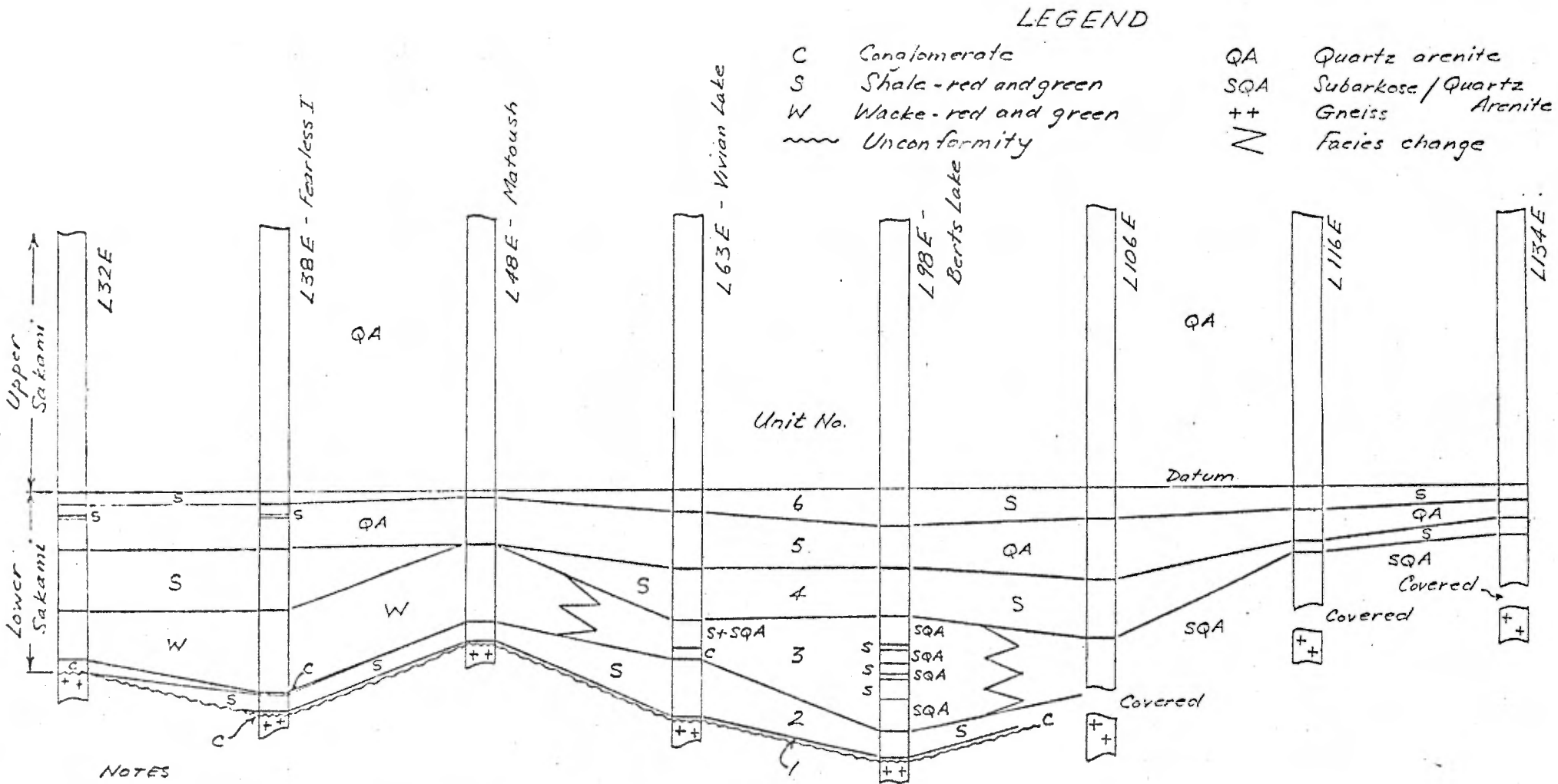
b) Geochemistry

Geochemical anomalies obtained from the analysis of lake bottom sediments for uranium showed the following characteristics:

- four values in excess of 100 ppm U
- a marked association with the outlier boundary, especially along the northern margin
- the lakes within the interior of the outlier showing below threshold levels
- numerous values within areas underlain by granites above the threshold level.

c) Airborne Spectrometer Survey - Ground Follow-Up

The helicopterborne spectrometer survey resulted in the locating of thirty-two anomalies, of which twenty-three were ground-checked. Eleven were within areas underlain by sediments or at



NOTES

1. Unit thicknesses are true widths
2. The correlation runs from west to east. Viewer is looking north.
3. Scales: Vertical 1:5000
Horizontal None

FIGURE 3

Simplified stratigraphic columns and stratigraphy
L32E - L134E Dieter Lake claim group.

the contact. A cluster of fifteen occurs within the high background granites (up to 2500 c/s) immediately west of the outlier; a geochemical anomaly is coincident. An anomaly located at the southern contact of the granite inlier is caused by a radioactive unit of the lower Sakami. A second anomaly was due to the granites of the inlier where readings measured in fractures went up to 2000 c/s.

The fact that abundant geochemical and radiometric anomalies were measured in areas underlain by granitic rocks, indicates that abundant source material was available for deposition, coevally with the Sakami sedimentary rocks.

4.2.3

P.E. 635 Lac Pons (Map 3)

a) Mapping-Prospecting

Geological mapping of this outlier has established the following facts:

- the outlier is wholly contained within the permit
- most of the area underlain by the Sakami Fm. is covered by the waters of Lac Pons
- no outcrops of lower Sakami mudstones were found
- regolith was mapped at the southern contact of the outlier
- structural deformation appears to be minimal within the Sakami.

Because units of the lower Sakami, which to date are the host rocks to the uranium mineralization, have not been found to outcrop, it will be difficult to assess this area. This is further complicated by the fact that the Sakami in this area was apparently not susceptible to glacial erosion, virtually no sedimentary boulders or pebbles having been noticed down ice from the contact area.

Mapping has shown however the existence of uranium as fracture fillings within the Archean granite at the northern contact with the Sakami. Counts of up to 15000 c/s were obtained in small isolated fractures within a hematized granite. This mineralization is not in itself significant, but the fact that it is immediately adjacent to the contact, and that it is the first indication of epigenetic uranium found, warrants follow-up.

b) Geochemistry

Soil samples taken across a small grid over the mineralized granites have produced a well defined uranium anomaly, coincident with the assumed location of the contact. Values of 2000 ppm U or more were measured in two sample sites, while a first

order anomaly (> 60.8 ppm) exists for at least 225 m along the contact. Values in soils above the granites to the north and sediments to the south fall to background levels.

Strong radon anomalies in water were also present in this locale, and it was a radioactive spring (5000 c/s) which originally brought attention to the area. Water samples taken along the shoreline of Lac Pons (at 1 km intervals) also indicate anomalous radon in the northern part of the lake.

- c) Airborne Spectrometer Survey - Ground Follow-Up
Fourteen of the sixteen airborne radiometric anomalies obtained were found to have been caused by high background granites, and were not significant. The remaining two were both situated along the outlier margin, one each in the north and south. Again however, granites were determined to have been responsible, the radioactive granites mentioned above being one of them.

4.2.4 P.E. 627, 628 Dieter Lake North, South (Map 1)

- a) Mapping-Prospecting
Neither of these areas were found to contain outcrops of mineralized lower Sakami units, nor any other radioactive sources. Quartz arenites from the upper Sakami were the predominate sedimentary lithology encountered, most of these permits being underlain however, by granites. Mapping has shown that more Sakami falls within the permits than the amounts indicated by the G.S.C. (Eade, 1966).
- b) Airborne Spectrometer Survey - Ground Follow-Up
Airborne radiometric anomalies received for these permits were found in every case to have been caused by high background granites, and were not judged to require further work.

4.2.5 P.E. 626 Mildred Lake

Efforts during the past field season were concentrated within the western sector of the permit, where a mapping program at a scale of 1:50,000 attempted to establish both the extent and stratigraphy of the Sakami which falls within the map area. On the basis of reconnaissance work done in previous years, it is believed that the main body of the outlier falls outside of the permit, and that the remainder of the area covered is underlain by Archean basement rocks.

The determination of the relative stratigraphic relationships is complicated by poor outcrop and structural deformation. Lower Sakami units observed in the field include a granite-bearing basal conglomerate, red siltstone and conglomeratic arkosic arenite, while the upper member was the ubiquitous quartz arenite. The areas under which the Proterozoic/Archean contacts are expected are covered by lakes and rivers, but it is assumed that these contacts are fault-controlled. Faulting has also resulted in the emplacement of a granitic inlier at the eastern margin of the map area.

5. RECONNAISSANCE

An area of ca. 1000 km² was flown by helicopter at 1 km line spacings between the Lac Gerzine area and the Rivière Delay (lat. 56°05'N to lat. 56°15'N, long. 70°00'W to long. 71°00'W) as a method of rapidly determining if any unmapped areas of Sakami sediments could be discovered. A similar survey carried out in 1977 led to the locating of the Lacs Pons and Gerzine areas. No new areas were seen in this attempt however.

A second area was flown in the Seal Lakes vicinity, north of Clearwater Lake (225 km northwest of Dieter Lake). These areas were selected because of their distinct similarities, as observed from an aircraft by a U.E.M. geologist, to areas underlain by Sakami sediments. These features include the large scale bedding associated with the upper Sakami sandstones. When the outcrops were ground checked, they were determined to be Archean paragneisses, in which relict bedding structures have been well preserved.

6. ASSESSMENT OF POTENTIAL

Favourable indicators determined from exploration results are as follows:

Dieter Lake Area

1. Uranium values have been intersected in every drill hole in which Sakami Fm. sediments were encountered, indicating a large potential area.
2. Grades of up to 0.42 wt% U₃O₈ over 1 m have been obtained, which may be an indication of isolated zones of above average content. The genetic model proposed for the syngenetic uranium would allow for such an enriched zone.

3. A source for the uranium found within the lower Sakami sediments is apparent in the high background granites, from which the sediments were also derived.
4. Potential structural traps for remobilized-reconcentrated uranium have been mapped, but are as yet untested. The numerous faults found, are, in many cases those which were active in pre- and synsedimentary times, and could serve as both mechanisms of transport as well as favourable sites for deposition.
5. Three potential genetic models exist for the Sakami environment: 1) disseminated stratabound uranium; 2) structurally controlled epigenetic uranium; and 3) an unconformity type uranium deposit.

Other Areas

6. Favourable lithologies - similar to those found at Dieter Lake - have been mapped in the Lac Gerzine area. Four radioactive outcroppings have been found to date.
7. The geochemical signature for the Lac Gerzine area is very positive, indicating anomalous zones associated with the Proterozoic/Archean contact.
8. High background granites border the Lac Gerzine sedimentary basin, which would have been an ample source for uranium.
9. Uranium found in granites at the northern contact of the Lac Pons outlier indicates a potential for epigenetic mineralization, perhaps along the unconformity.

In review, the Sakami outliers have been demonstrated to be a uranium province, with potential existing for both syngenetic and epigenetic mineralization. Target areas have been found, and the potential for locating the sources of the indicators is good.

7.

PROPOSED EXPLORATION PROGRAM

Work in 1979 will continue the evaluation begun of mineralization discovered at Dieter Lake, through an expanded program of diamond drilling. Areas which will receive particular attention are Lac Gerzine and Lac Pons, where detailed geological mapping, boulder prospecting, and geochemical sampling will be undertaken with the intention of developing drilling targets.

The Mildred Lake area (P.E. 626) will be mapped and prospected so as to determine if the potential exists upon which further exploration should be committed. Regional mapping will continue the program which in 1977 led to the discovery of the Sakami outliers at Lac Pons and Gerzine. This will entail helicopter mapping and some sampling of the region north of the Gayot-Mildred area.

8.

SUMMARY

It is proposed that exploration be continued in the evaluation of the Sakami Fm. outliers as results to date are favourable for the discovery of viable uranium occurrence.

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Investigation of a Uraniferous Sample. U.E.B., Bonn.

APPENDIX A

DIAMOND DRILLING REPORT

GAYOT LAKE 71-86

DIETER LAKE CLAIM GROUP

ANNUAL REPORT 1978

(Report No. 7186-17)

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1. INTRODUCTION

In 1978, 43 vertical holes totalling 3686.5 m were drilled in the Dieter Lake Claim Block.

TABLE 1 - DRILLING SUMMARY 1978

<u>Location Name</u>	<u>No. Holes</u>	<u>Metres Drilled</u>
Fearless One	15	1248.7 m
Matoush	4	289.5
Lake Vivian	4	313.3
Bert's Lake	<u>20</u>	<u>1835.0</u>
	43	3686.5 m

2. GEOLOGY

A summary of the rock types encountered in the 1978 drilling on the Dieter Lake grid appears in Table 2. For more detailed geology please refer to the quarterly report - September 1978 or the Diamond Drill Logs included at the end of this report.

The main Sakami rock types encountered were red and green wackes, red and green shales and siltstone, sandstone and conglomerate lying unconformably on Archean basement rocks. The correlation of the geology between the showings was very good between Fearless One and Matoush, however correlation was less than satisfactory for Lake Vivian and Bert's Lake due to rapid facies changes and post-depositional faulting. From surface mapping, abundant faulting was found in this area, however only 3 holes at Bert's Lake appeared to come close to a fault zone. In other areas displacement of the bedding was explained by faulting although no physical evidence of the fault zone could be found in the drill holes.

TABLE 2 - GEOLOGICAL SUMMARY

FEARLESS

MATTOUSH

VIVIAN

BERT'S

Buff Sandstone
with red & green
shales

Red & green shales
with minor red
siltstone

Red & Green
Wackes over-
lying siltstone
and conglomerate
unit (avg. thick-
ness 65 m)

Red & Green
wackes overlying
minor siltstone
sandstone and
conglomerate

Red shale with interbeds of
buff sandstone and conglom-
erate and minor green shale

Sandstone interbedded
with lenses of con-
glomerate.
(avg. thickness 72m)

Red & Green
shales over-
lying basal
siltstone,
sandstone &
conglomerate
unit.
(avg. thickness
38m)

Red & Green
shales overlying
minor siltstone,
sandstone and
conglomerate
(avg. thickness 42m)

Red & Green shales overlying
basal siltstone, sandstone
and conglomerate
(avg. thickness 59m)

Red & Green shales
overlying basal
siltstone, sandstone
and conglomerate.
(avg. thickness 33m)

U N C O N F O R M I T Y

ALTERED BASEMENT - STRONGLY CHLORITIZED AND HEMATIZED (LOCALIZED)

UNALTERED BASEMENT - GRANITIC GNEISS WITH MINOR GRANITIC PEGMATITE

3. MINERALIZATION

The uranium mineralization found on the Dieter Lake grid appears to be stratabound and relatively continuous from showing to showing. Preliminary analysis indicates the mineralization to be sooty pitchblende with no thorium. To date no secondary mineralization has been observed. Below is a summary of the mineralization found at the four showings.

3.1 FEARLESS ONE AND MATOUSH SHOWING

There are three main zones of stratabound mineralization at the Fearless One and Matoush Showings:

TABLE 3 - MINERALIZATION AT FEARLESS ONE AND MATOUSH SHOWING

Zone	Rock Type	<u>Fearless One</u>			<u>Matoush Showing</u>		
		Average Thickness (m)	U ₃ O ₈ ppm		Average Thickness (m)	U ₃ O ₈ ppm	
			Max.	Avg.		Max.	Avg.
A	Greenwacke	1.7	341	203	1.3	208	151
B	Greenwacke	2.8	382	305	1.7	327	220
C	<u>Fearless One</u> Siltstone Sandstone & Conglomerate	1.5	401	191	1.8	867	500
<u>Matoush Showing</u> Greenwacke with sandstone and conglomerate							

The best mineralization found in the Fearless One showing was in zone 'B' of holes 78-10, 78-14 and 78-15 with an average value of 271 ppm over 3.9 m.

At the Matoush Showing the best mineralization was in the 'C' zone of hole 78-19. Here a value of 867 ppm was found over an interval of 1.8 m.

The following generalizations may be made about the core in the vicinity of the mineralization.

- 1) The greenwacke became very dark in colour with abundant black mottling.
- 2) The greenwacke became more silty in composition and was interbedded with minor lenses of quartz pebble conglomerate.
- 3) Trace pyrite and chalcopyrite were sometimes present.

3.2 LAKE VIVIAN

There was one main zone of mineralization in the Vivian Lake area:

TABLE 4 - MINERALIZATION OF LAKE VIVIAN

<u>Zone</u>	<u>Rock Type</u>	<u>Average Thickness (m)</u>	<u>U₃O₈ ppm</u>	
			<u>Maximum</u>	<u>Average</u>
'D'	Green Shale	1.0-1.5	4218	1839

The best mineralization found to date occurs in zone 'D' of hole 78-23 in the Vivian Lake area. Over a length of 1.0 m. an average of 4218 ppm was found. A detailed petrographic description of the mineralization has not yet been received, however, the following observations have been made from the core in the vicinity of the mineralization.

- 1) Calcite content of green shale appears to increase.
- 2) Green shale becomes darker in colour.
- 3) Trace pyrite and chalcopyrite are sometimes present.

3.3 BERT'S LAKE

There are three main zones of mineralization in the Bert's Lake area:

TABLE 5 - MINERALIZATION AT BERT'S LAKE

<u>Zone</u>	<u>Rock Type</u>	<u>Average Thickness (m)</u>	<u>U₃O₈ ppm</u>	
			<u>Maximum</u>	<u>Average</u>
'E'	Green & Red Shale	1.0	1120	372
'F'	Green Shale	1.0	549	218
'G'	Green Shale	1.0	328	184

The best hole for uranium mineralization in the Bert's Lake area is 78-40 with a 500-550 ppm average over 2.0 m for zone 'E' and zone 'F'. Hole 78-30 was also good with a 1120 ppm average over 1.0 m in zone 'E'.

As a preliminary observation, the mineralization appears to be very similar to that of Lake Vivian. However, direct correlation between the two areas is very difficult due to rapid facies changes and post depositional faulting.

4. DENSITY DETERMINATIONS

In August 1978, 66 density determinations were done on holes 78-4 and 78-18. The results are summarized below:

TABLE 6 - DENISTY DETERMINATION SUMMARY

<u>Hole No.</u>	<u>Rock Type</u>	<u>No. Samples</u>	<u>Average Density (g/cc)</u>
78-4	Greenwacke	21	2.68
	Siltstone, sandstone & conglomerate	4	2.65
78-18	Redwacke	4	2.66
	Greenwacke	19	2.69
	Green shale	14	2.73
	Red Shale	<u>54</u>	2.71
		66	

The overall average density for these two holes was found to be 2.69 g/cc.

5. TONNAGE AND GRADE ESTIMATES

The following Table No. 7 shows the estimated tonnage and grade in the areas covered by drilling at each showing. An average density of 2.7 tonnes/m³ was used in the calculation and mineralized sections under 1.0 meter thick were disregarded.

From Table No. 7 it may be seen that the grade and tonnage was relatively good at Vivian Lake and marginal at Fearless One, Matoush and Bert's Lake.

TABLE 7

TONNAGE AND GRADE ESTIMATES FOR DRILL AREAS

Drill Area	100 ppm CUTOFF			200 ppm CUTOFF			300 ppm CUTOFF			400 ppm CUTOFF		
	Tonnes U ₃ O ₈	Tonnes Ore	Grade %	Tonnes U ₃ O ₈	Tonnes Ore	Grade %	Tonnes U ₃ O ₈	Tonnes Ore	Grade %	Tonnes U ₃ O ₈	Tonnes Ore	Grade %
FEARLESS ONE	very low grade			566	1,765,800	0.03	399	1,036,800	0.04	168	356,400	0.05
MATOUSH	"	"	"	115	251,100	0.05	87	137,700	0.06	84	121,500	0.07
LAKE VIVIAN	312	364,500	0.09	273	135,000	0.20	261	81,000	0.32	261	81,000	0.32
BERT'S LAKE	very low grade			251	634,500	0.04	436	317,250	0.06	136	209,250	0.07
TOTALS				1,205	2,786,400		1,183	1,572,750		649	768,150	
Average grade for all four drill areas (%)				0.04			0.08			0.08		

6. PRELIMINARY MINERALOGICAL REPORT

In September 1978, 52 core samples were sent to Uranerz Bonn for detailed mineralogical and petrographic work. To date only preliminary results are available.

From the preliminary report, it appears that most of the rocks found in the Dieter Lake Area are finely layered shales, siltstones and matrix-rich arkoses. These rocks appear to have formed in a shallow water environment. The predominant minerals present in the mineralized rocks are: calcite, quartz, chlorite, plagioclase and sericite. A more detailed report will be following.

7. INTERPRETATION

A suitable model to explain the geology and mineralization in the Dieter Lake area is a prograding delta advancing into a shallow, marine, lagoonal-type environment.

Prior to the marine transgression and delta formation, a regolithic sand, gravel and silt would be deposited in the lows of the Archean paleosurface. This would correspond to the basal conglomeratic unit found in places at the base of the Sakami sediments.

A marine transgression would change the depositional environment to a low energy marine environment depositing silty clays on top of the Archean basement and regolithic material. These silty clays represent the lower shales that are found at the base of the Sakami sediments. The red and green colour of these shales may be explained by fluctuations in the sea level caused by subsidence of the land mass and periodic marine regressions. The changing water depth would vary the depth at which euxinic conditions predominate and thus the colour of the sediments being deposited. The reddish sediments would be deposited in a shallow oxidizing environment while the greenish sediments would be deposited in a deeper reducing or euxinic environment.

After the deposition of the shales the environment of deposition would change to a higher energy deltaic-type environment. Sediments closer to the centre of the delta would be coarser (e.g. sands and gravels at Bert's Lake) while sediments farther from the delta would be finer (e.g. wackes at Dieter Lake). The red and green colouration would still be present again due to water level fluctuations.

The uranium in this area appears to have been precipitated in the greenish sediments that are transitional between the low energy marine environment and the higher energy deltaic environment.

8. RECOMMENDATIONS

In 1979 it is planned to continue exploration drilling along the length of the unconformity with emphasis on the area between Dieter Lake and Bert's Lake where relatively good assay values were obtained in the 1978 season.

The exploration strategy will be based on three types of mineralization that could be possible in this area;

- 1) stratabound
- 2) secondary enrichment, vein-type
- 3) unconformity related