GEOLOGY AND DRILLING, 1981

MARN 1-108 CLAIMS

DAWSON MINING DISTRICT

NTS 116B/7 AND 10

LATITUDE: 62°29'N

LONGITUDE: 128°48'W

AUTHOR: J. BICZOK

OWNER: MATTAGAMI LAKE EXPLORATION LIMITED

DATE: NOVEMBER 1981

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ ~~24,250~~ 32,800 —

Revised March 3/82

Pulatson

for Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

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CHAPTER ONE: INTRODUCTION

1-1: Location and Access

The MARN claims are located 55km NNE of Dawson City, Yukon, in the Tombstone Mountains, part of the Ogilvie Range (Figure 1). They are located at the head of Fireweed Creek, a tributary of the Chandindu River (Figure 2).

During the past, access has been by helicopter from Dawson City or from a debarkation point on the Dempster Highway, 29km to the east (Figure 3). In the future, if the property warrants it, equipment could be hauled to the property by one of two routes:

1) Along the Tombstone River valley, from the Dempster Highway to the Chandindu River Valley (35km), and then up the Chandindu and Firewee valleys (10km) to the property.
2) Along the Chandindu River road, a dirt track that crosses relatively flat terrain from Dawson City to the Chandindu River, roughly 15km south of the property (Figure 3). Equipment could then be hauled up the Chandindu and Fireweed valleys approximately 16km to the property.

Both routes should be relatively problem free. However, there may be some official objections to constructing a road along the Tombstone River valley. In the past this area has been considered as a potential site for a national park and disturbances such as road construction may be frowned upon.

The merits of all potential routes to the property are being investigated for the company by Mr. Bob Olsen and his recommendations will be forthcoming under separate cover.

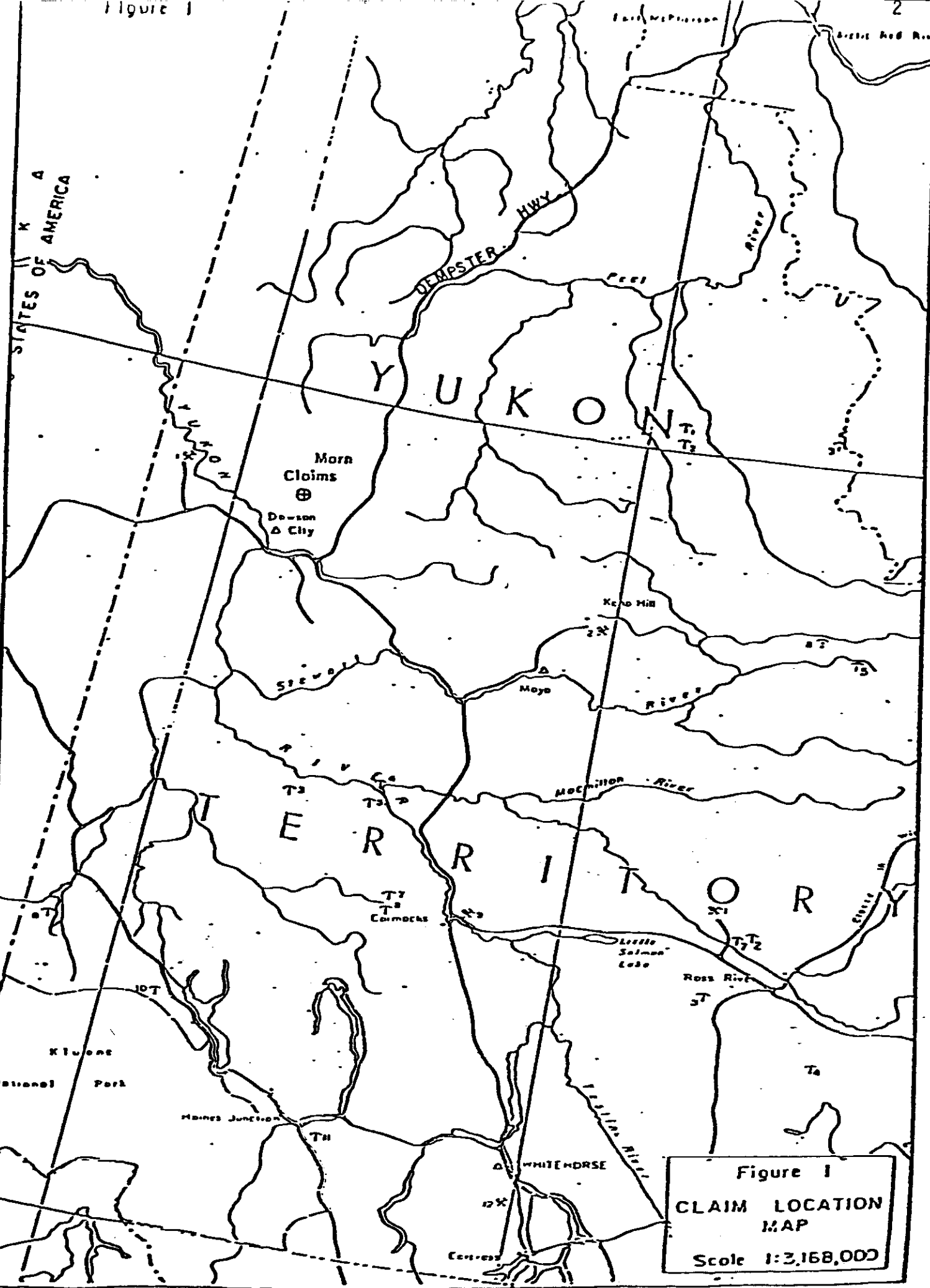

Figure 1
CLAIM LOCATION MAP
Scale 1:3,168,000

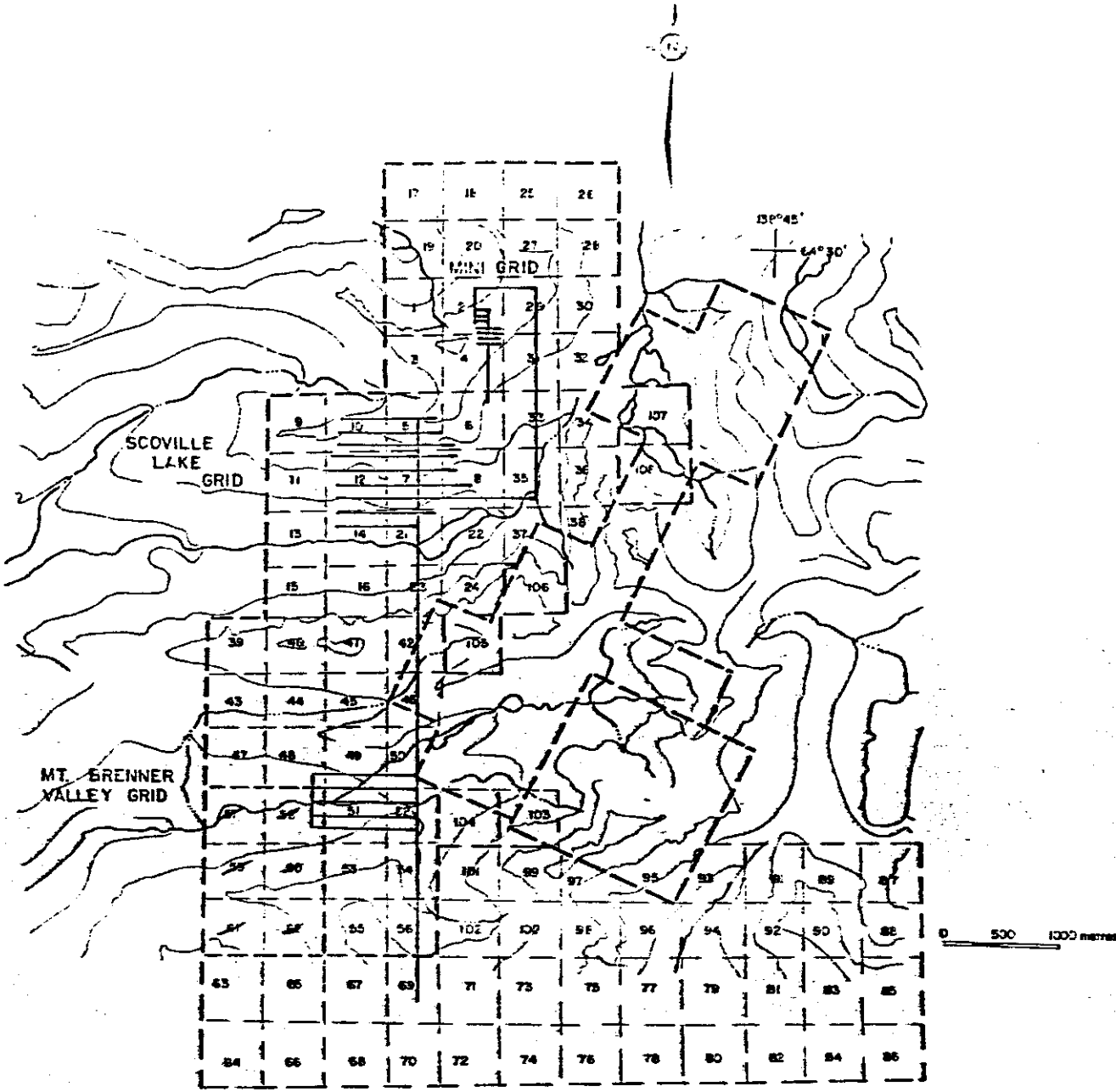

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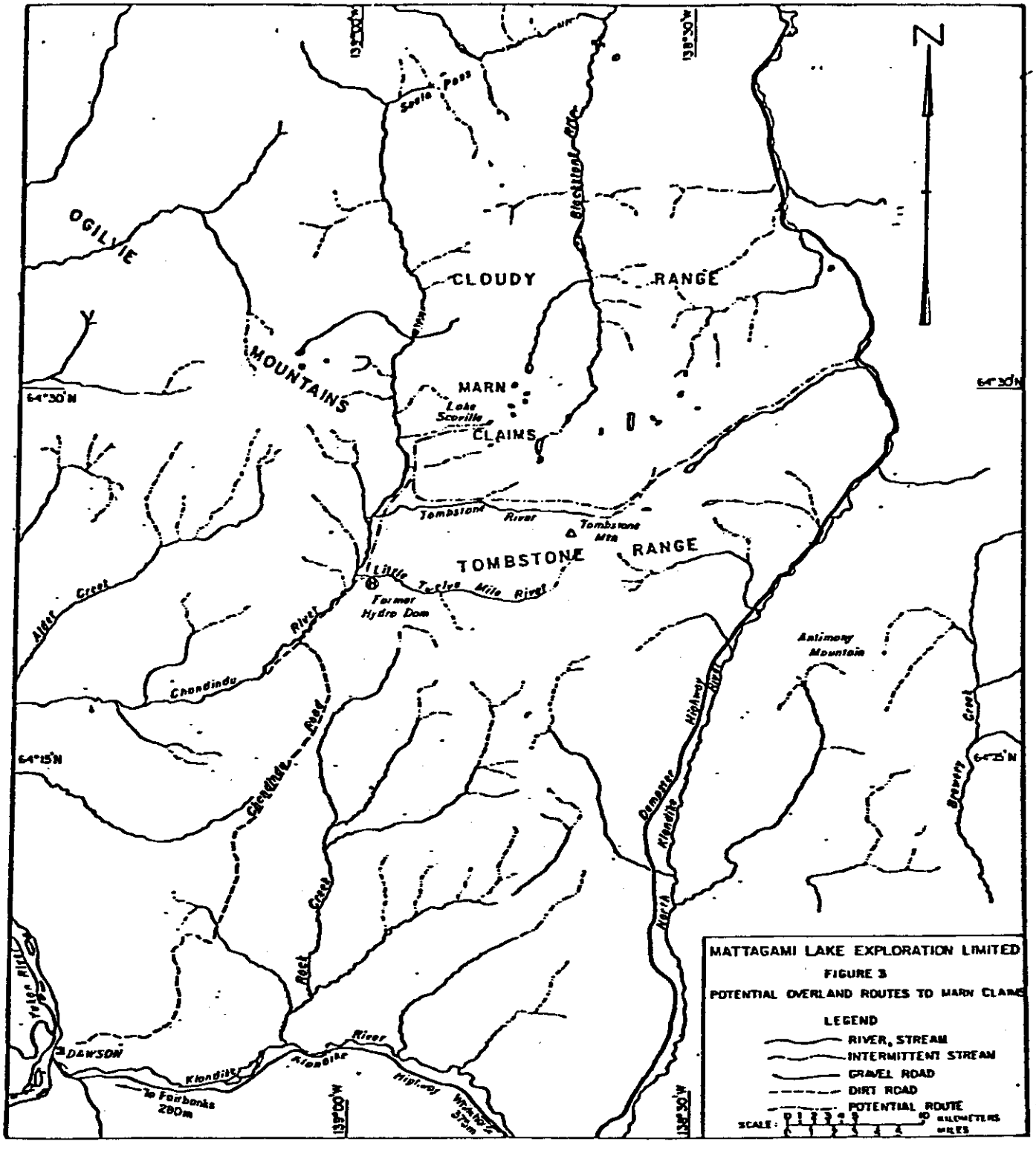
Figure 2

Claim Location Map


N
OGILVIE MOUNTAINS
CLOUDY RANGE
MARN
Lake Scoville
CLAIMS
TOMBSTONE RANGE
Tombstone River
Tombstone Mtn
Little Twelve Mile River
Former Hydro Dam
Eagle River
Chandindu River
Klondike Highway
Antimony Mountain
Rock Creek
Bonanza Creek
Hunker Creek
Klondike River
DAWSON
Klondike River
To Fairbanks 280m
Alaska Highway
Stewart River
Yukon River
Scale Pass
Blackstone River
64°30'N
64°15'N
138°00'W
138°30'W
MATTAGAMI LAKE EXPLORATION LIMITED
FIGURE 3
POTENTIAL OVERLAND ROUTES TO MARN CLAIMS
LEGEND
RIVER, STREAM
INTERMITTENT STREAM
GRAVEL ROAD
DIRT ROAD
POTENTIAL ROUTE
SCALE: 0 1 2 3 4 5 10 KILOMETERS
0 1 2 3 4 5 MILES

1-2: History of the Claims

The original MARN 1-8 claims were staked by Mattagami Lake Mines Limited July 29, 1978. Only a brief period of exploration was carried out in 1978.

Following the inital work on the claims in 1979 (June) an additional 54 claims were staked in July-September.

On June 2, 1980 an additional 46 claims, MARN 63-108, were staked. As well, MARN 29 and 30 were re-staked. The relevant data is summarized in Table One.

1-3: Physiography

"This rock is strongly jointed vertically and weathers into ruinous wedge-shaped ridges, surmounted by lines of sharp pinnacles and lofty tower-sahped peaks." (McConnell, 1903, p.63)

The Tombstone Mountains are truly one of the most remarkable areas of the Cordillera. Areas underlain by intrusive rocks feature extremely steep relief averaging 3,000 ft. (900 metres) with a maximum of 5,500 ft. (1,700 metres). Shear cliffs, 2,000 ft. (600 metres) high, are not uncommon in this area. The vertical jointing in the rock has led to the development of branching, razorback ridges, large pinnacles resembling hoodoos and large peaks towering above the ridges. Cirques and hanging valleys are common in this terrain. Fortunately, the MARN claims lie along the contact of the syenite with the Paleozoic sediments and here the terrain is not as rough, featuring broader valleys with gentler slopes and in some areas, a plateau type topography.

This area was not affected by continental glaciation but was subjected to local alpine glaciation. Glaciers emanating from the Tombstone Mountains

TABLE ONE: MARN CLAIMS HISTORY

Claim No.	Grant Number	Date of Staking	Recording Date	Transfer State	Work Expiry Date
1- 4	YA 31491-94	July 29, 1978	August 4, 1978	Complete to Noranda	January 4, 1992
5- 8	YA 31495-98	July 29, 1978	August 4, 1978	Complete to Noranda	January 4, 1991
9- 13	YA 47156-60	August 1, 1979	August 14, 1979	Complete to Mattagami	January 4, 1987
14	YA 47161	August 1, 1979	August 14, 1979	Complete to Mattagami	August 14, 1987
15	YA 47162	August 1, 1979	August 14, 1979	Complete to Mattagami	January 4, 1987
16	YA 47163	August 1, 1979	August 14, 1979	Complete to Mattagami	August 14, 1987
17- 20	YA 47164-67	August 1, 1979	August 14, 1979	Complete to Mattagami	January 4, 1987
21- 24	YA 17600-03	September 7, 1979	September 10, 1979	Complete to Noranda	September 10, 1987
25- 28	YA 47168-71	August 1, 1971	August 14, 1979	Complete to Mattagami	January 4, 1987
29- 30	YA 50039-40	June 2, 1980	June 11, 1980	Complete to Mattagami	January 4, 1986
31- 36	YA 47172-77	July 31, 1979	August 14, 1979	Complete to Noranda	January 4, 1987
37- 38	YA 47574-76	September 7, 1979	September 10, 1979	Complete to Noranda	September 10, 1987
39- 46	YA 47265-72	August 17, 1979	N/A	Complete to Noranda	September 4, 1987
47- 48	YA 47577-78	September 7, 1979	September 10, 1979	Complete to Noranda	September 10, 1987
49- 56	YA 47273-80	August 24, 1979	N/A	Complete to Noranda	September 4, 1987
57- 62	YA 47643-48	September 16, 1979	September 18, 1979	Lapsed	Lapsed
63-106	YA 50041-84	June 2, 1980	June 11, 1980	Complete to Mattagami	January 4, 1983
107-108	YA 50085-86	June 2, 1980	June 11, 1980	Complete to Mattagami	January 4, 1985

travelled down the Chandindu River valley but apparently did not reach the Tintina Trench. Glacial drift mantles the lower slopes in the area up to 3,500 ft. (1,070 metres), however all of the MARN claims are above this elevation, ranging from 4,100 ft. to 6,600 ft. (1,250 to 2,000 metres).

1-4: Procedure

Work on the MARN claims in 1981 was conducted from May 29 to Sept. 22 and consisted primarily of a BQ diamond drilling program conducted for the company by Drilcor Industries Ltd. of Vancouver, B.C. A Bell 206B helicopter, under contract from Buffalo Airways Ltd. of Ft. Smith, N.W.T., was stationed on the property during the drilling program. Several geologists, including the author, were also stationed on the property at various times to supervise the drilling. Mr. Bill Howard was on duty from May 31 to June 14 at which time he was replaced by Mr. Paul Wagner, who remained on site until drilling was temporarily suspended on July 21st. Unfortunately both these gentlemen made several mistakes regarding the termination depth of drill holes. The author supervised the program directly from its resumption on August 13 to its closure on September 22.

Drill site preparation was undertaken in late May and early August by crews from McCrory Holding Ltd. of Whitehorse, Yukon. A large amount of blasting was required on most sites due to the steepness and instability of the boulder covered slope. In the Mini-Grid area (Figure 2) the slope ranges from 30° to 45° and boulders up to 30m³ are quite common.

Much of the Mini-Grid was re-surveyed and re-picketed by the author and his assistant (K. Tomlinson) after which an elevation survey was conducted using a GDD electronic level. From this data, a detailed contour map of the

Mini-Grid was produced (Figure 4).

The author also conducted several days of geological mapping and sampling in the areas between Mineral Gully and the Mini-Grid. The results are presented on the revised geological map (Map 1).

CHAPTER TWO: GENERAL GEOLOGY

The MARN claims cover the contact between a Cretaceous, monzonite intrusion - the Mt. Brenner Stock - and four, east to southeast dipping sedimentary units: a Devono-Mississippian black clastic unit; the Ordovician-Silurian Road River Formation; the Permian Tahkandit Limestone and a "Jurassic Schist" unit (Table 2). These units have been previously described (Biczok, 1980; Biczok and Kemp, 1980) and therefore this chapter offers only a few new observations. Petrographic descriptions of drill core samples are presented in Appendix Two.

During the month of September the author spent several days mapping the geology of the ridge between Mineral Gully and the Mini-Grid as well as the ridge to the west of Mineral Gully. The data is illustrated on Map 1. From what is evident along the west side of the ridge, it appears that the diorite sill, extending to the northwest from the Mt. Brenner stock, has an irregular "double rib" outline in cross-section (Figure 5). There appears to be two thick dyke-like "ribs" trending northwest-southeast along the northern and southern margins of the sill. These are visible in cross-section along the ridge where it is evident that they are considerably thicker than the rest of the sill and one extends considerably further to the northwest along a subsidiary ridge. These "ribs" quickly thin outwards until the sill disappears 200-300m away. The sill also thins somewhat in the centre of the sill, between the "ribs". In this area the sill is studded with numerous large xenoliths and rafts of Jurassic Schist and Tahkandit Limestone. These rafts are up to 100m long and several are skarnified. The 225m long block of limestone which was the target of drill hole M-80-5B may also be one of these rafts. Analytical results of samples collected from the skarnified rafts are presented in Chapter 4.

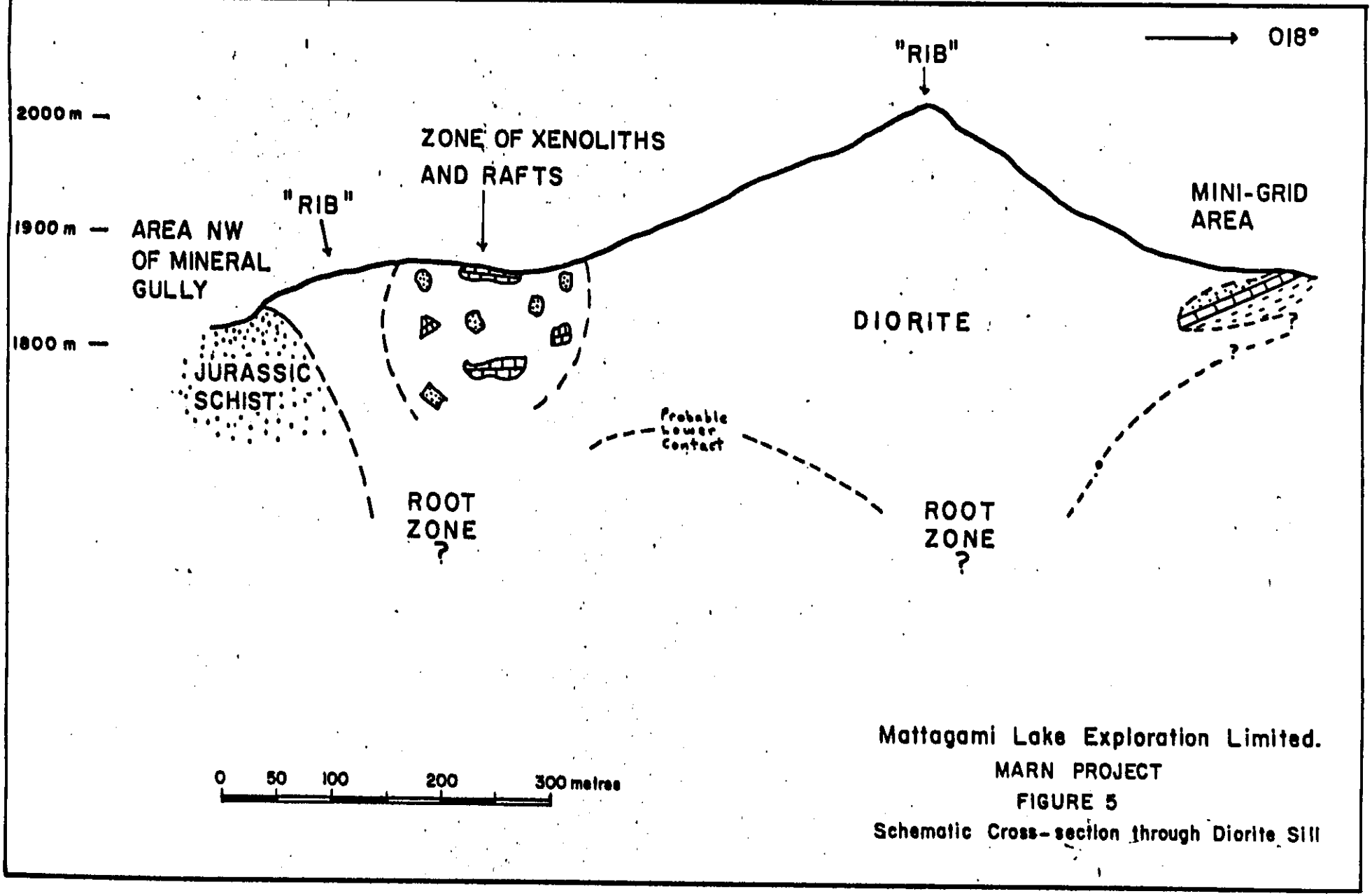


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FIGURE 5

Schematic Cross-section through Diorite Sill

TABLE TWO: TABLE OF FORMATIONS

Era	Period	Formation	Lithology
MESOZOIC	Mid-Cretaceous	Tombstone and Brenner Batholiths	Diorite, Syenite and Monzonite
	Lower Cretaceous	Keno Hill Quartzite	Orthoquartzite
	Jurassic	"Lower Jurassic Schist"	Quartzite with minor black graphitic slates
PALEOZOIC	Permian	Tahkandit Formation	Limestone with minor interbedded quartzite congomerate
	Devono-Mississippian	DMsc	Quartzite, slate, shale, chert, minor conglomerate
	Ordovician and Silurian	Road River Formation	Chert and argillite

During the summer of 1980, Dr. D. Tempelman-Kluit, resident geologist at Whitehorse, visited the property for one day and examined the local stratigraphy. Dr. Tempelman-Kluit has spent many years studying the geology of the Yukon, including the Tombstone area. In his opinion, the formation directly underlying the Tahkandit Limestone is not the Ordovician-Silurian Road River Formation, but rather a Devono-Mississippian formation (DMsc). There is no local name for such a formation but it may be roughly equivalent to the Canol or Imperial formations. This formation has been previously mapped by Dr. Tempelman-Kluit (1969) and by L. Green (1972) as the Road River Formation. However, as pointed out in previous assessment reports, the strata do not correspond to the general description of the Road River Formation (a basinal sequence of black chert, cherty shales, etc.) Instead, it is a coarser clastic unit consisting of argillaceous quartzite, shale and a polymictic conglomerate/breccia. The conglomerate unit is about 10m thick and consists of 70% angular to sub-rounded fragments of quartzite, sandstone, shale and minor chert. The matrix is fine-grained, argillaceous and generally much more mafic than the fragments. There are no such members known within the Road River Formation. During the 1982 season an attempt will be made to collect fossils from these strata with which to date the formations. Until then, we have tentatively re-assigned them to the black clastic sequence of the Devono-Mississippian.

CHAPTER THREE: DIAMOND DRILLING

3-1: Introduction

During the 1981 program a total of 999.1m of BQ diamond drilling was completed in 17 holes. Drilling was concentrated along the southern and northern margins of the diorite sill (Mineral Gully and Mini-Grid areas respectively) in an effort to trace skarn mineralization extending beneath the sill. High to low grade skarn mineralization in the Tahkandit Limestone is exposed in outcrop and trenches along both margins of the sill and occurs in several zones within, and adjacent to, the limestone as it dips beneath the sill. Data regarding each hole is summarized in Table Three, detailed logs are presented in Appendix One and individual sections are included in pockets at the end of the report. Following is a brief description of the purpose and results of each hole.

3-2: Drill Hole Purposes and Results

M-81-8D Location: 15,880N; 10,383E (Mini-Grid), Bearing: 213°, Dip: -70°

Due to the freezing conditions in 1980 this hole (M-80-8) was prematurely suspended at a depth of 47.85m. In 1981 it was deepened to 61.6m. The hole penetrated the biotite diorite sill to a depth of 13.41m, Jurassic Schist from 13.41 to 35.66m, Tahkandit Limestone from 35.66 to 59.70m and a biotite diorite dyke from 59.70 to 61.60m. The limestone is cut by a major dyke/sill from 51.20 to 56.40m which has produced extensive alteration (mainly carbonatization) along its margins.

TABLE THREE: 1981 DIAMOND DRILL SUMMARY

Hole Number	Co-ordinates	Bearing	Dip	Casing Depth(m)	Rock Drilled(m)	Total Drilled(m)	Remarks
M-81- 8D	15,880N 10,383E	213°	-70°	-	13.75	13.75	Completion of Hole M-80-8.
M-81- 9	14,630N 10,425E	160°	-80°	20.42	121.62	142.04	
M-81-10	15,880N 10,383E	012°	-70°	1.52	65.54	67.06	
M-81-11	15,880N 10,383E	012°	-45°	2.44	46.02	48.46	Terminated due to caving.
M-81-12	15,974N 10,407E	-	-90°	2.13	47.25	49.38	
M-81-13	15,974N 10,407E	012°	-45°	2.44	44.80	47.24	
M-81-14	15,995N 10,359E	-	-90°	2.13	44.50	46.62	
M-81-15	15,175N 10,250E	038°	-80°	2.13	63.71	65.84	
M-81-16	15,175N 10,250E	038°	-55°	1.52	71.78	73.30	
M-81-17	15,175N 10,250E	006°	-80°	1.22	48.38	49.60	
M-81-18	15,175N 10,250E	088°	-65°	4.27	38.40	42.67	Terminated due to falling rocks and pad degeneration.

TABLE THREE: 1981 DIAMOND DRILL SUMMARY (Con't.)

Hole Number	Co-ordinates	Bearing	Dip	Casing Depth(m)	Rock Drilled(m)	Total Drilled(m)	Remarks
M-81-19	15,880N 10,383E	012°	-45°	1.52	28.05	29.57	Attempted re-drilling of hol 11. Stopped due to rock slides.
M-81-20	15,924N 10,368E	-	-90°	1.22	69.54	70.76	Terminated due to broken rod in hole.
M-81-21	15,924N 10,368E	010°	-50°	1.22	42.21	43.43	Terminated due to broken rod in hole.
M-81-22	15,924N 10,368E	002°	-48°	2.13	64.93	67.06	Terminated due to broken rod in hole.
M-81-23	15,924N 10,368E	002°	-70°	6.10	85.34	91.44	Terminated due to drill breakdown.
M-81-24	15,852N 10,413E	-	-90°	1.98	48.92	50.90	
TOTALS FOR DRILL PERIOD				54.39	944.79	999.13	

M-81-9, Location: 14,630N; 10,425E, Bearing: 160°, Dip: -80°

This hole was drilled from the northern corner of Lake Scoville in an attempt to penetrate the Tahkandit Limestone beneath the diorite sill and adjacent to the margin of the Mt. Brenner Stock. Previous drill holes (M-80-1 and M-80-4) had indicated that the limestone should lie at a depth of about 600 ft. in this area (Figure 6). Unfortunately the hole was stopped by Mr. Howard at a depth of 466 ft. while it was still in the diorite sill. There were no signes that the bottom of the sill was close by (eg. numerous xenoliths, skarn veins, etc.) however these features are not always present. This hole may be re-drilled in the future.

M-81-10, Location: 15,880N; 10,383E, Bearing: 012°, Dip: -70°

This hole was spotted in order to delineate the extent of moderate skarn mineralization discovered from the same site last year in holes M-80-6, M-80-7 and M-80-8 (Figure 4). It intersected biotite diorite to a depth of 9.53m, Jurassic Schist to 32.00m and relatively barren Tahkandit Limestone from 32.00 to 41.70m. The Tahkandit consists of approximately 30% clean, fine-grained quartzite and 70% weakly skarnified limestone.

Mineralization in the limestone is virtually non-existent with only minor pyrite present. All elements of interest returned values close to, or below, the detection limits.

M-81-11, Location: 15,880N; 10,383E, Bearing: 012°, Dip: -45°

This hole was spotted from the same location as hole 10 and with the same purpose - to delineate mineralization identified in holes M-80-6 to M-80-8. It intersected biotite diorite to a depth of 12.80m, Jurassic Schist from 12.80 to 30.92m, Tahkandit Limestone from 31.39 to 44.20m and DMsc(?) from 44.20 to the end of the hole at 48.46m (Figure 7). A thin diorite dyke, sheared and quite friable, separates the Jurassic Schist from the Tahkandit. We had hope to drill to a greater depth in this hole but

M-81-12, Location: 15,974N; 10,407E, Dip: -90°

Hole 12 was spotted in an effort to delineate the skarn zone to the north of holes 6 to 11. We had hoped to set-up near the centre of the very strong magnetic anomaly in this area, however, due to the terrain conditions, this was not possible. The hole was spotted about 20m north of the anomaly. It intersected the basal chert pebble conglomerate member of the Tahkandit Limestone from 0.61m to 4.88m and the DMsc(?) from there to the end of the hole at 49.38m. The conglomerate unit consisted of 60-80% sub to well-rounded chert pebbles in a silicified matrix. Minor carbonate occurs within the matrix and minor pyrite is disseminated throughout. The DMsc(?) Formation consists of an upper biotite porphyroblastic calcareous quartzite member from 4.88 to 10.67m followed by a sequence of migmatitic metasediments (quartzite) with multidirectional bands of biotite-garnet. Below this the strata are more consistent with well-defined bedding.

No mineralization was encountered anywhere in the hole.

M-81-13, Location: 15,974N; 10,407E, Bearing: 012°, Dip: -45°

This angle hole was drilled from the same location as hole 12. Its completion was conditional upon the results of hole 12, and since that hole was barren, hole 13 should not have been drilled.

Hole 13 intersected Tahkandit Limestone (chert pebble conglomerate) from 1.52 to 3.81m and DMsc(?) from 3.81 to 47.24m. The same members developed within the DMsc(?) in hole 12 were present in hole 13.

The upper members (biotite porphyroblastic calcareous quartzite and migmatitic metasediment) are largely metamorphic/metasomatic in nature. Their contacts however, remain subparallel to the Tahkandit-DMsc(?) contact (Figure 8).

M-81-14, Location: 15,995N; 10,359E, Dip: -90°

Like holes 12 and 13, hole 14 was spotted in order to define the extent of mineralization to the north of holes 6 to 11. It intersected the entire Tahkandit formation from 5.79 to 26.82m. This is overlain by Jurassic Schist from 1.52 to 5.79m which is cut by several thin diorite dykes, and underlain by DMsc(?) from 26.82 to the end of the hole at 46.63m.

The Jurassic Schist interval was about 50% fault rubble. Although the Tahkandit is appreciably skarnified there are few sulphides present and metal values were virtually nil. The DMsc(?) strata is a fairly homogeneous sequence of quartzite and shale which is also barren.

M-81-15, Location: 15,175N; 10,250E (Mineral Gully), Bearing: 038°, Dip: -80°

Holes M-81-15 to M-81-18 were all spotted from the same location, a pad constructed by the author and assistants on the steep rock face above the skarn showings in Mineral Gully. The holes were angled to intersect the Tahkandit beneath the overlying sill.

Hole 15 reached bedrock at a depth of 3.65m and penetrated the Jurassic Schist from there to 24.46m. The Tahkandit Limestone was intersected from 24.46m to the end of the hole at 65.84m. The limestone is considerably thicker in this area than in the Mini-Grid area - at least 41m versus 14m - and this created some problems. The drill geologist at the time (P. Wagner) had difficulty in recognizing the Limestone-DMsc(?) contact - compounded by

the unexpected thickness of limestone - and holes 15 to 17 were stopped without passing through the limestone into the DMsc(?) strata.

Generally the upper portion of the limestone in holes 15 to 17 is skarnified to a dark green actinolite-diopside skarn. It consists of 96-97% fine-grained diopside, 1.5-2.0% actinolite, 0.5-1.0% scapolite and trace amounts of hornblende, quartz, calcite, sphene and pyrite (Appendix 2). The skarn is remarkably homogeneous, massive, hard and quite competent. In hole 15 it occurs from a depth of 24.46m (the top of the limestone) to 47.03m and is cut by a distinctive white syenite dyke from 26.52 to 36.96m. This dyke occurs in hole 17 and possibly 16 as well, and may have had some influence on the formation of the skarn (Figures 8 and 9).

The syenite is generally light grey-white in color, fine to medium-grained and contains 5-7% biotite±hornblende, trace quartz and rare K-feldspar phenocrysts up to 1cm in length with the remainder being largely anhedral to subhedral feldspar grains. No sulphides or other mineralization were encountered in the dyke.

The actinolite-diopside skarn occurs above and below the syenite dyke to a depth of 47.03m. Below this the limestone consists of a fine-grained, marble, generally white in color but varying from beige to light grey to grey-green. Skarn zones are rare and, like the rest of this marble section, they are barren.

The only mineralization encountered occurs within the actinolite-diopside skarn near the lower margin of the syenite dyke. It consists of massive pyrrhotite and pyrite in bands up to 20cm wide with trace amounts of chalcopyrite and scheelite.

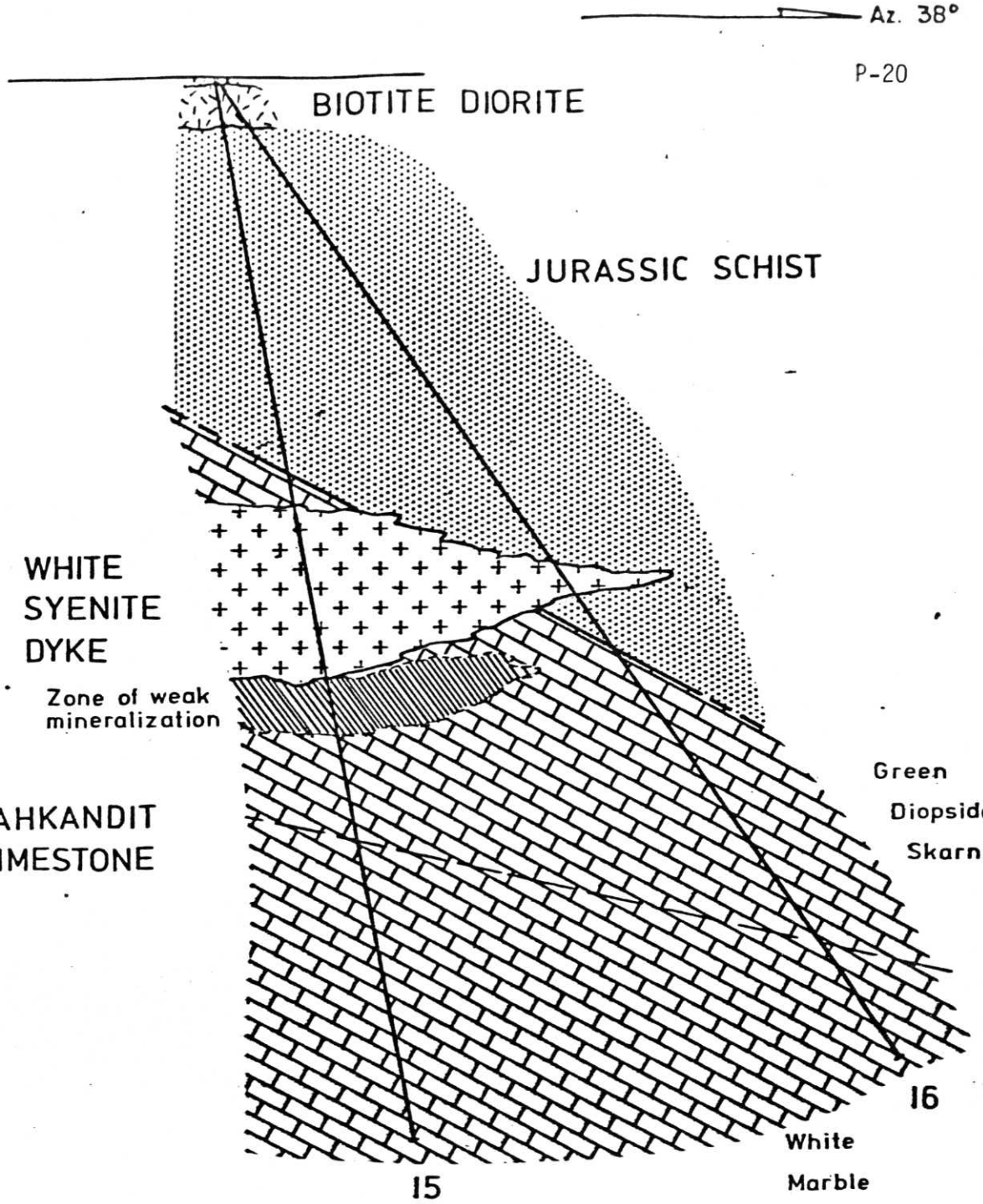

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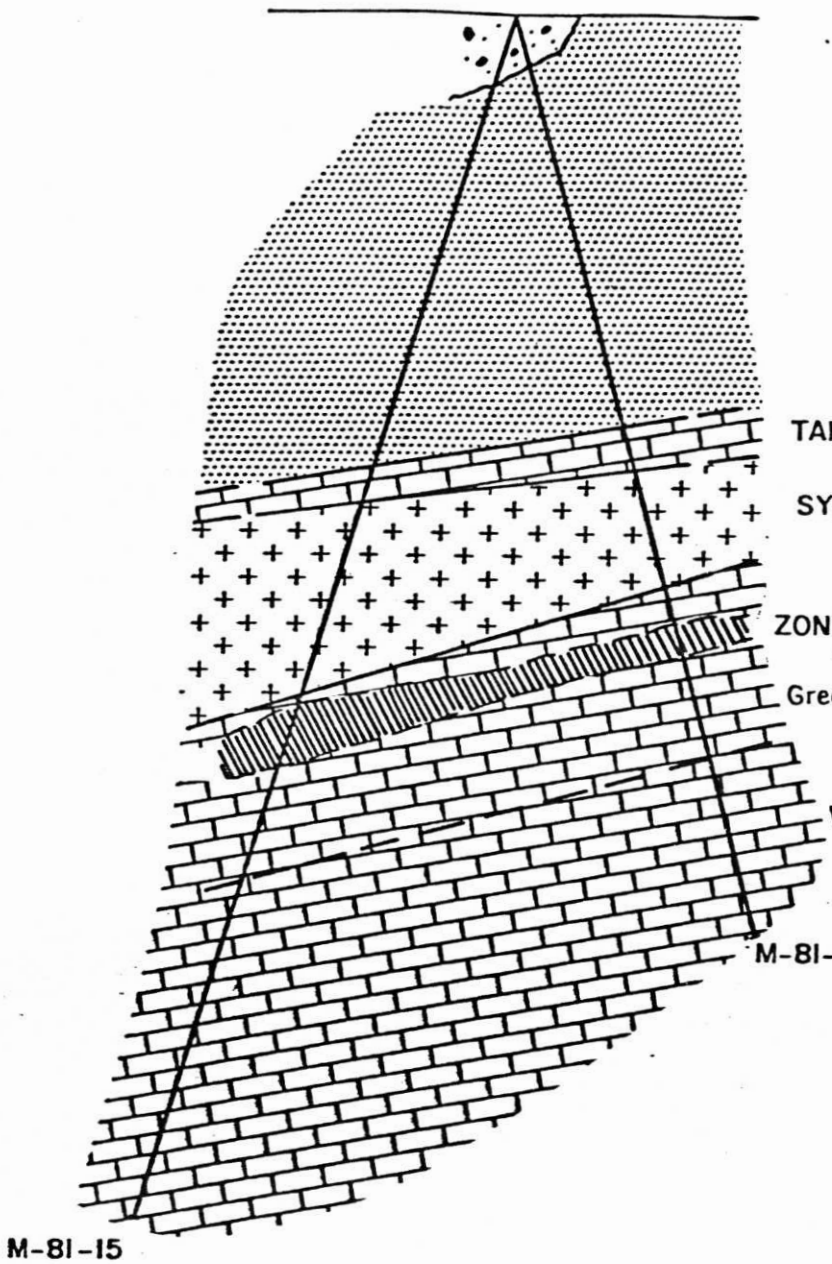
FIGURE 8

CROSS SECTION OF D.D. HOLES
M-81-15 & M-81-16

Az. 292°



0 5 10 15 20 metres

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FIGURE 9
CROSS SECTION OF D.D. HOLES
M-81-15 & M-81-17

M-81-16, Location: 15,175N; 10,250E, Bearing: 038°, Dip: -55°

This hole intersected the Jurassic Schist from a depth of 3.90m to 42.67m and the Tahkandit Limestone from 42.67m to the end of the hole at 73.30m. Biotite diorite was intersected from 0.30m to 3.90m and may be a narrow dyke cutting the schist.

As in hole 15, the upper portion of the limestone (42.67-64.15m) consists of green actinolite-diopside skarn and is followed by white marble. The only dyke present occurs from 36.10 to 38.48m within the Jurassic Schist. Although it is described as biotite-hornblende diorite, it has been highly altered (hydrothermally) and may be the contaminated extension of the syenite dyke encountered in holes 15 and 17 (Figures 9 and 10).

No mineralization was discovered in this hole.

M-81-17, Location: 15,175N; 10,250E, Bearing: 006°, Dip: -80°

Hole 17 penetrated biotite diorite to a depth of 2.3m, the Jurassic Schist from 2.3 to 22.1m and the Tahkandit Limestone from 22.1 to the end of the hole at 49.6m. The white syenite dyke cuts the limestone from 24.3 to 30.9m and is again flanked by actinolite-diopside skarn zones (22.1 to 24.3m and 30.9 to 40.2m). The white marble zone extends from 40.2 to 49.6m, the end of the hole.

Mineralization in this hole is virtually non-existent. Gold is only slightly enriched and only one significant tungsten value (900 ppm) was

encountered. Copper and silver levels are all very low. Only trace amounts of pyrrhotite, pyrite and scheelite were visible in the core.

M-81-18, Location: 15,175N; 10,250E, Bearing: 088°, Dip: -65°

This hole penetrated Jurassic Schist from 4.27 to 39.32m and the syenite dyke from 39.32 to the end of the hole at 42.67m. Unfortunately we were forced to terminate drilling at this point due to rockslides and degeneration of the drill pad. No mineralization was encountered in the hole.

M-81-19, Location: 15,880N; 10,383E (Mini-Grid), Bearing: -12°, Dip: -45°

After reviewing the results of holes 10 and 11 we decided to attempt to re-drill hole 11 to a greater depth. Hole 11 was terminated somewhat prematurely due to caving.

Hole 19 penetrated diorite to a depth of 12.80m and Jurassic Schist from there to the end of the hole at 29.57m. We were forced to suspend drilling at that point due to rockslides.

M-81-20, Location: 15,924N; 10,368E (Mini-Grid), Dip: -90°

Holes 20 to 23 were all drilled from the same set-up on the Mini-Grid (Figure 4). This set-up is about mid-way between the locations of holes 6 to 11 and 14, and was spotted in an effort to define the northern boundary of the mineralization.

Hole M-81-20 penetrated biotite diorite to a depth of 17.28m, Jurassic Schist from 17.28 to 38.70m, Tahkandit Limestone from 38.70 to 50.70m and DMsc(?) strata from 57.55 to 70.76m, the end of the hole. A thick biotite diorite dyke occurs between 50.70 and 57.50m, separating the Tahkandit and

DMsc(?) formations. A small biotite diorite dyke cuts the Jurassic Schist from 28.04 to 29.47m and has generated a narrow skarn zone in the adjacent schist. From 27.89 to 28.04m a light green skarn containing approximately 50% actinolite/diopside, 40-45% quartz+feldspar, 3-4% pyrrhotite and minor chalcopyrite is developed. The only noticeable metal enrichment occurs in the copper content which reaches 0.17% over 0.15m.

The Tahkandit Limestone is generally a barren, fine-grained crystalline white marble with interbeds of very clean quartzite. Only minor skarnification is present, this in the lower section of the limestone adjacent to the biotite diorite dyke. This is a banded to mottled grey-green, actinolite-rich skarn with short intervals of up to 15% Po.

M-81-21, Location: 15,924N; 10,368E (Mini-Grid), Bearing: 010°, Dip: -50°

Hole 21 intersected the biotite diorite sill to a depth of 17.4m, Jurassic Schist from 17.4 to 28.66m, Tahkandit Limestone from 28.66 to 43.13m and strata which are probably DMsc(?) from 43.13 to the end of the hole at 43.43m. Again, a biotite diorite dyke cuts the Tahkandit (from 28.96-31.36m). A major shear zone from 22.25 to 29.56m cuts the dyke, the Tahkandit and the Jurassic Schist. The intense alteration along this zone, and the very friable nature of the core recovered, make it difficult to locate the schist-limestone contact. It has been drawn at a depth of 28.66m due to a change in the color and texture of the mud and rubble recovered. From 28.96 to 31.36m the limestone is cut by a diorite dyke, however there is no skarn developed immediately adjacent to this dyke. Another, much thinner, dyke cuts the limestone from 32.08 to 32.69m and is probably an offshoot of the larger dyke above it.

After passing through the basal chert pebble conglomerate member of the Tahkandit Limestone, the hole intersected an arkosic quartzite (DMsc?) from 43.13 to 43.43m. Unfortunately we were forced to terminate drilling when the rods broke off in the hole and could not be removed.

M-81-22, Location: 15,924N; 10,368E, Bearing: 002°, Dip: -48°

This hole was essentially a re-drilling of hole 21 at a slightly different bearing and dip. The geology of the two holes is essentially the same (Appendix 1 and Figure 11) however, in this hole we managed to drill 23m into the DMsc(?) strata before the drillers snapped off the rods, again forcing termination of the hole. The DMsc(?) formation is quite heterogeneous, ranging from the typical upper member of biotite porphyroblastic calcareous quartzite to polymictic conglomerate and a variety of clean to argillaceous, thinly bedded quartzites.

M-81-23, Location: 15,924N; 10,368E, Bearing: 002°, Dip: -70°

Hole 23 passed through the biotite diorite sill to a depth of 16.60m, Jurassic Schist from 16.60 to 34.14m, Tahkandit Limestone from 34.14 to 47.76m, DMsc(?) strata from 47.76 to 69.80m and biotite diorite from 69.80 to 91.44m. The major diorite dyke encountered previously in holes 20 to 22, cuts the limestone from 37.68 to 43.28m.

The entire limestone section is very friable and highly altered. Hematization and green clay alteration are common and locally intense. Although there are indications of local shearing, this is a relatively minor feature. The majority of the alteration appears to be hydrothermal in origin.

The underlying DMsc(?) strata is again quite variable ranging from an upper, recrystallized, argillaceous quartzite (probably an altered biotite porphyroblastic calcareous quartzite) to a migmatitic quartzite-shale sequence to the more typical homogeneous, grey, argillaceous quartzite.

The last 21m of the hole, from 69.80 to 91.44m, encountered a biotite diorite dyke/sill. It is a fairly distinctive unit characterized by white, 10cm patches of plagioclase which are devoid of any mafic minerals. It resembles somewhat the diorite encountered in the bottom of hole 10.

M-81-24, Location: 15,825N; 10,413E (Mini-Grid), Dip: -90°

This hole was spotted in an effort to define the southern extent of the mineralized zone encountered a short distance to the north in the trenches and to the northwest in holes 6 to 11 and 20 to 23. It intersected Jurassic Schist to a depth of 12.19m, Tahkandit Limestone from 12.19 to 29.11m and diorite from 29.11 to the end of the hole at 50.90m. The diorite sill overlying most of the other drill hole locations on the Mini-Grid was not present at this site. The limestone is again cut by a fairly thick dyke/sill, from 23.65 to 27.58m but overall it is quite hard and competent with only very minor shearing and minor skarnification.

STATEMENT OF COSTS

Drilling Contractor Charges:		$ 245,000.00
Helicopter Charges:		
Buffalo 206B:	336.95 hours x $ 345/hour	116,247.75
Buffalo Hiller 12E:	2.10 hours x $ 200/hour	420.00
Canwest 500D:	47.30 hours x $ 400/hour	18,920.00
TNTA 500D & 206B:	20.60 hours x $ 465/hour	9,579.00
TNTA 204B:	2.90 hours	2,730.00
Wages:		
J. Biczok:	115 days x $ 68.20/day	7,845.00
P. Wagner:	30 days x $ 75.00/day	2,250.00
W. Howard:	15 days x $ 75.00/day	1,125.00
Propane:		1,989.49
Fuel (White Pass):		16,407.44
Radio Rental:		1,697.20
Equipment Rental (electronic level):		1,544.00
Trenching Contractor:		25,720.09
TOTAL COSTS		$ 451,474.97

CERTIFICATE

I, John Biczok, of Edmonton, Province of Alberta, do hereby certify that:

1. I am a geologist residing at #5, 10556 - 80 Avenue, Edmonton, Province of Alberta.
2. I am a graduate of Lakehead University, Ontario with a H. B.Sc. (1976) in geology and am presently completing an M.Sc. at the University of Manitoba, Winnipeg.
3. I have been practising my profession since 1973 and am at present Exploration Geologist with Mattagami Lake Exploration Limited in Edmonton.
4. I was party chief for the crew that conducted the work in this report and the report is correct to the best of my knowledge and ability.

Dated: Dec. 16th 1981

John Biczok

John Biczok, H. B.Sc.

APPENDIX ONE

LOGS OF 1981 DIAMOND DRILL HOLES

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,880N	STARTED	June 25, 1981
HOLE NO.	M-81-8D (extension of 80-8)	DEPARTURE	10,383E	FINISHED	June 25, 1981
BEARING	213°	ELEVATION	1,860m	LENGTH	13.75m (total dep. 61.6)
DIP-COLLAR	-70°	SECTION		LOGGED BY	J. Biczok and P. Wagner

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization
47.85m	59.7m	TAHKANDIT LIMESTONE	
		Formation began at 43.0m in M-80-8	
		47.85-51.20: Extensively altered and sheared limestone/skarn. Heavy green alteration - minor malachite and possibly chrysocolla, but most is probably a green clay, tosudite(?). Several 0.3-0.6m wide diprite dykes heavily altered to carbonate, actinolite and tosudite(?).	Possible secondary copper mineralization (malachite & chrysocolla?) in minor amounts.
		51.20-56.4m: Biotite Diorite Dyke. Extensive alteration (especially carbonatization) along the upper contact and minor carbonatized shears throughout. 54.25-54.75: Xenolith of brown, friable, skarnified limestone.	
		56.40-57.90m: Calcareous Quartzite. Mainly grey calcareous quartzite, locally biotite porphyroblastic.	
		57.90-59.70: White to brown skarnified limestone. Generally soft and friable with frequent hematitic parthes throughout. 59.4-59.7: very clean white quartzite.	
59.70m	61.6m	BIOTITE DIORITE DYKE	
	61.6m	END OF HOLE	

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	14,630N	STARTED	June 5, 1981	DIP TEST					
HOLE NO.	M-81-9	DEPARTURE	10,425E	FINISHED	June 7, 1981	Footage	Corrected	Footage	Corrected	Footage	Corrected
BEARING	160°	ELEVATION	1,280m	LENGTH	142.04m						
DIP-COLLAR	-80°	SECTION		LOGGED BY	Paul Wagner						

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization	SAMPLE NO.	FOOTAGE From	FOOTAGE To	FOOTAGE Length	ASSAYS
0m	20.00m	OVERBURDEN						
20.00m	142.04m	BIOTITE HORNBLENDE DIORITE						
		20.00- 22.90m: Medium-grained, massive inhomogeneous. Some disseminated pyrite in isolated locations. Biotite stringers. 20% hornblende, 5% biotite (major clusters), 75% plagioclase, no visible K-feldspar or quartz. Biotite up to 1mm across, hornblende up to 2mm.						
		22.90- 23.47m: Gouge from fault zone(?). Contains quartzite fragments plus biotite diorite chips. Plagioclase veinlets run at steep angles to the core axis - no preferred directions of dip.						
		29.01- 43.28m: Small (6mm) shear zone with granulated hornblende, biotite and plagioclase at 50° to core axis. Plagioclase is subhedral to anhedral; hornblende is subhedral to euhedral.						
		43.28- 53.45m: Minor quartz associated with biotite.						
		53.45- 53.55m: 5mm wide vertical shear (relative to core axis), small rafts of biotite.						
		56.70- 56.75m: 5cm wide plagioclase vein at 45° to core axis.						
		58.10- 58.35m: Several plagioclase veins at medium angles to core axis, all less than 10mm across.						
		79.95- 81.10m: Large vein nearly parallel to core axis. Composed of plagioclase (medium grain size) and minor hornblende and biotite, some graphitic shear at approximately 45° to core axis.						
		83.23- 83.26m: Skarn vein of quartz/calcite with minor scheelite intersected by 0.5mm thick graphitic shear veinlets. Skarn vein 5-18mm wide at 30° to core axis.						
		85.91- 86.96m: Zone of strong plagioclase veining up to 2cm wide at 45° to core axis.						
		93.15- 94.30m: 1.5cm wide band(shear?). Very fine-grained, split into two bands with mafics on lower side. Composed mainly of hornblende (±biotite?) plus plagioclase in a 50:50 ratio. Upper felsics consist mostly of plagioclase. Band at approximately 20° to core axis.						
		95.16-102.42m: Distinct change in grain size. Becomes coarse-grained changing to a porphyritic monzonite with plagioclase laths, approximately 80% up to 1.2cm long and 4-5mm wide. Random orientation. Contains 15% hornblende up to 1.2cm long. 0.5cm side. Upper contact is at 70° to core axis.						

M.L.M. EXPLORATION DIVISION, D.D.H. RECORD

PROPERTY MARN HOLE NO. M-81-9 Page 2/2

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization	SAMPLE NO.	FOOTAGE From	FOOTAGE To	FOOTAGE Length	ASSAYS
		BIOTITE HORNBLENDE DIORITE (Con't.)						
		102.42-106.99m: Rock becomes hornblende diorite again. Medium-grained, inhomogeneous, massive with plagioclase veins sporadically cutting core, most at mdeium to high angles to the core axis.						
		106.99-117.00m: Grain size becomes slightly coarser. Modal composition remains the same. 80:20 plagioclase, hornblende.						
	142.34	END OF HOLE						

MATTAGAMI LAKE MINES LIMITED – EXPLORATION DIVISION – DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,880N	STARTED	June 7, 1981
HOLE NO.	M-81-10	DEPARTURE	10,383E	FINISHED	June 21, 1981
BEARING	012°	ELEVATION	1,060m	LENGTH	67.06m
DIP-COLLAR	-70°	SECTION		LOGGED BY	P. Wagner & J. Biczok

FOOTAGE From	To	DESCRIPTION	% Mineralization
0	1.08m	OVERBURDEN	
1.08m	9.53m	BIOTITE DIORITE	
		Medium-grained, equigranular, heterogeneous. 20% biobite, 75% feldspar, <5% quartz grains up to 1.5mm. Locally up to 10% hornblende.	Minor disseminated pyrite.
		9.53- 9.75m: Hybrid Zone. Chilled margin. Contact with the Jurassic Schist at 36° to the core axis.	
9.75m	32.00m	JURASSIC SCHIST	
		Argillaceous to clean quartzite with occasional shale interbeds. Fine-grained, medium to dark grey, weathers to rusty red-brown color. Poorly bedded, moderately hornfelsed. Minor fine-grained pyrite disseminated throughout and recrystallized along some minor fractures as veins.	
		10.67-11.58m: Massive quartzite with rounded to sub-rounded quartz grains 1mm across, rimmed with pyrite.	Pyrite rims around quartz grains.
		12.12-12.52m: Calcareous Quartzite with disseminated pyrite.	Disseminated py.
		19.05-19.45m: Hematized, rotted Argillaceous Quartzite. Very friable, heavily pyritized and rusted zone. Shearing and veining at 25° to 45° to core axis.	Abundant pyrite
		22.94-23.88m: Biotite Porphyroblastic Quartzite. Fine-grained, clean quartzite with biotite porphyroblasts to 1mm.	
		22.94-23.27m: Pyrite disseminated throughout.	Disseminated py.
		25.76-25.78m: 2cm wide shale bed trending at 80° to core axis.	
32.00m	47.5m	TAHKANDIT LIMESTONE	
		Generally a white, bioclastic limestone with frequent clean or calcareous quartzite interbeds and a basal chert pebble conglomerate member. Extensive skarnification.	
		32.00-32.20m: Very clean, fine-grained Quartzite. Slight greenish tinge, minor pyrite veins parallel to core axis.	
		32.20-33.10m: Hematized, friable, rotted Limestone. Brown color, minor very fine-grained pyrite, now hematized.	
		33.10-33.80m: Green Actinolite/Diopside Skarn. Fine-grained, hard, internally fairly homogeneous but is oxidized extensively along fractures.	
		33.80-35.90m: 60% grey Quartzite and 40% white, friable rotted limestone. No skarn mineralization.	
		35.90-41.70m: Sheared Rubble. The top 2.6m is strongly sheared grey quartzite rubble and minor limestone rubble. The rest is 30% 0.3-6m long grey quartzite beds separated by 0.3-1.2m long intervals of green calcareous mush (disintegrated actinolite/diopside skarn.) Some secondary chrysocolla.	

V.L.N. EXPLORATION DIVISION, D.D.H. RECORD

FOOTAGE From	FOOTAGE To	DESCRIPTION
		41.70-47.50m: Hornblende-Biotite Diorite Dyke. Contains 15-20% each of medium-grained biotite and chloritized hornblende. Generally equigranular, locally abundant xenoliths to 3cm. Minor calcite
47.50m	61.00m	ROAD RIVER FORMATION (?) DMsc(?)
		47.50-48.30m: Grey Quartzite with minor actinolite skarnification over the last 7cm.
		48.30-48.80m: Shear Zone. Well developed fault breccia in upper 6cm followed by sheared limestone and quartzite. Breccia contains 70% hematized limestone fragments in a clay and carbonate matrix.
		48.80-49.40m: Grey-Green-White Mottled Skarn/Marble. 40% fine-grained actinolite bands.
		49.40-49.90m: White-grey mottled marble.
		49.90-50.60m: Moderately Sheared Quartzite with coarse-grained calcite veins and some hematization.
		50.60-51.92m: Grey Quartzite member. Minor shearing in upper 0.6m, rest is massive, homogeneous.
		51.92-54.25m: Diopside Skarn. Fine-grained, homogeneous and massive. Locally high grade mineralization with scheelite crystals up to 1.5 cm long and appreciable sulphides; Py>Po>Cp; Cp is 5-7%.
		54.25-54.51m: Minor shear zone in skarn, locally graphitic, minor pyrite.
		54.51-55.02m: Biotite-Hornblende Diorite Dyke.
		55.02-55.93m: Actinolite Skarn. Green, fine-grained, moderately sheared. Minor chalcopyrite and pyrrhotite.
		55.93-56.60m: Actinolite-Diopside Skarn. Heterogeneous, mineralized with Cp-Po-Sch.
		56.60-57.20m: Sheared Biotite Porphyroblastic Calcareous Quartzite.
		57.20-58.60m: Massive Biotite Porphyroblastic Calcareous Quartzite.
		58.60-59.40m: Sheared Biotite Porphyroblastic Calcareous Quartzite and beige friable limestone with frequent hematite reduction spots.
		59.40-59.84m: Shear zone consisting of rubble (quartzite, minor
		59.84-61.00m: Dark grey, fine-grained, Argillaceous Quartzite or Shale. Moderately to heavily sheared.
67.06m		BIOTITE DIORITE
		Generally equigranular, massive, medium-grained diorite. Minor shearing and some calcite-hematite veining in upper 2m.
67.06m		END OF HOLE

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY: MARJI	LATITUDE: 15,880N	STARTED: June 21, 1981
HOLE NO.: M-81-11	DEPARTURE: 10,383E	FINISHED: June 21, 1981
BEARING: 012°	ELEVATION: 1,860m	LENGTH: 48.46m
DIP-COLLAR: -45°	SECTION:	LOGGED BY: Paul Wagner

FOOTAGE From	To	DESCRIPTION	% Mineralization
0m	0.76m	OVERBURDEN	
0.76m	12.80m	BIOTITE DIORITE	
		Typical medium-grained equigranular, homogeneous, biotite diorite. Plagioclase>Biotite>Hornblende>K-feldspar>Quartz. Minor pyrite disseminated throughout. Minor plagioclase veining at 35-60° angles to the core axis.	
		12.50-12.80m: Hybrid Zone. Chilled margin, contact between intrusive complex and the underlying metasediment. Hematization, banding and coarse-grained quartz veining evident. Bands of metasediment and diorite are diffuse.	
12.80m	30.92m	JURASSIC SCHIST	
		Generally a fine-grained, grey Argillaceous Quartzite.	
		12.80-13.72m: Fine-grained argillaceous metasediment with abundant pyrite (up to 5%) disseminated throughout. Rock is light to medium greenish grey when fresh. Very few veins and fractures in this section. Pyrite as eyes up to 1.2cm across, also in small veins and stringers at approximately 40-50° to the core axis. Bedding is poorly developed in this unit and trends approximately same as pyrite stringers.	
		13.72-13.79m: Py-po-qtz vein cross-cutting the schist. Unit is hornfelsed with minor biotite porphyroblasts becoming apparent lower in unit.	
		20.57-22.56m: Series of longitudinal, 9mm wide, shears or veins in sediments. Rusty, with no visible mineralization.	
		30.93-31.39m: Sheared and rotted diorite. Largely rubble and sand left.	
31.39m	44.20m	TAHKANDIT LIMESTONE	
		31.79-32.16m: Beige to grey, very friable, soft limestone. Largely rubble, gravel and sand.	
		32.16-32.61m: Shear Zone filled with coarse grained calcite veins open space fillings. Up to 3cm side, separated by beige limestone or grey quartzite.	
		32.61-32.92m: Fine-grained, friable, soft light green actinolite skarn. Locally high hematite staining.	

FOOTAGE From	FOOTAGE To	DESCRIPTION
		TAHKANDIT LIMESTONE (Con't)
		32.92-33.53m: Grey Quartzite. Coarse-grained calcite veins over 10cm.
		33.53-35.74m: Mainly sheared rotted brown Limestone, minor Quartzite. Graphitic shear zone from 34.59 to 34.90 cuts green Diopside/Actinolite Skarn.
		35.74-36.20m: Biotite Diorite Dyke. Minor shearing, friable.
		36.20-37.03m: Pale green to beige, very friable Limestone.
		37.03-37.57m: Hard, Diopside/Actinolite Skarn. Fine-grained, massive, locally greater than 5% chalcopyrite over a few cm.
		37.57-38.25m: Sheared, rotted Limestone. Several calcite veins to ½cm. 1/3 is mottled green-red-brown, hematized. Actinolite Skarn.
		38.25-38.56m: Fine-grained, grey Quartzite.
		38.56-41.15m: Chert Pebble Conglomerate. Well-rounded pebbles, 2-8mm (rarely >1cm). Highly altered matrix of hematized carbonates. Abundant calcite veins to 1cm at approximately 60-85° to core axis.
		41.15-41.61m: Grey Quartzite. Fine-grained, homogeneous, light grey minor pyrite.
		41.61-42.21m: Biotite Porphyroblastic Calcareous Quartzite. Approximately 5-7% biotite porphyroblasts (6mm) in a very fine-grained aphanitic groundmass. Also trace pyrite.
		42.21-42.67m: Friable, semi-rotted, very calcareous Chert Pebble Conglomerate.
		42.67-44.20m: Mix of Chert Pebble Conglomerate bed, to 0.3m plus grey (calcareous) Quartzite.
44.20m	48.46m	ROAD RIVER FORMATION(?) DMsc(?)
		44.20-44.50m: Greenish-grey, very Argillaceous Quartzite.
		44.50-48.46m: Mix of Biotite Porphyroblastic Quartzite and pyrite rich - locally 10% over several cm - Migmatitic Argillaceous Quartzite. Both are fine grained.
	48.46m	END OF HOLE

MATTAGAMI LAKE MINES LIMITED – EXPLORATION DIVISION – DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,974N	STARTED	June 26, 1981
HOLE NO.	M-81-12	DEPARTURE	10,407E	FINISHED	June 29, 1981
BEARING	Vertical	ELEVATION	1,852m	LENGTH	49.38m
DIP-COLLAR	-90°	SECTION		LOGGED BY	J. Biczok & P. Wagner

FOOTAGE From	To	DESCRIPTION	% Mineralization
0	0.61m	OVERBURDEN	
0.61m	4.88m	TAHKANDIT LIMESTONE	
		Medium-grained chert pebble conglomerate with pebbles less than 1mm to greater than 1cm. Largely silicified, minor pyrite disseminated throughout. No evidence of bedding or size gradation in clasts. Pebbles 60-80% of unit, sub- to well-rounded, minor carbonate in matrix. No visible mineralization.	
4.88m	49.38m	ROAD RIVER FORMATION(?) DMsc(?)	
		Biotite Porphyroblastic Calcareous Quartzite, fine-grained with biotite porphyroblasts to 3mm, no orientation of the biotite.	
		5.94- 6.71m: 2mm longitudinal vein, hematitic.	
		6.71-10.67m: Minor bedding at 70° to core axis.	
		10.67-17.22m: Migmatitic(?) metasediment. Fine to medium-grained, clean quartzite with biotite and garnet in multidirectional bands.	
		17.22-49.38m: Beds are well-defined, 23-45° to core axis, up to 5cm thick. Isolated pyrite eyes occur sporadically. At 56.5m, fine-grained dark to medium grey metasediment. Poorly developed bedding, minor pyrite disseminated locally.	
	49.38m	END OF HOLE	

NATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,974M	STARTED	June 29, 1981
HOLE NO.	M-81-13	DEPARTURE	10,407E	FINISHED	July 1, 1981
BEARING	012°	ELEVATION	1,852m	LENGTH	47.24m
DIP-COLLAR	-45°	SECTION		LOGGED BY	John Biczok & Paul Wagner

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization
0m	0.76m	OVERBURDEN	
0.76m	1.52m	BIOTITE DIORITE	
		Massive, medium-grained, equigranular biotite diorite. Trace fine-grained pyrite.	
1.52m	3.81m	TAHKANDIT LIMESTONE	
		Basal chert pebble conglomerate with 60-80% sub to well rounded pebbles, predominantly chert in composition but also minor shale and quartzite pebbles. Pebbles are well sorted (but bedding is difficult to determine), vary from <1mm to 1cm in diameter and are silicified but there is some remnant carbonate (dolomite). Rare, very fine grained, pyrite.	
3.81m	47.24m	ROAD RIVER FORMATION(?) DMsc(?)	
		3.81- 9.3m: Biotite Porphyroblastic Calcareous Quartzite. Medium-grained biotite distributed throughout a fine-grained matrix of quartz and feldspar. Biotite grains are up to 2mm across and decrease in size towards the base of the unit. Trace garnets and minor pyrite.	
		9.30-12.2m: Migmatitic Argillaceous Quartzite. Irregular, contorted bands of felsic mobilizate (quartz & feldspar, minor hematization) and mafic, garnetiferous resistate bands up to 2cm wide at moderate angles to the core. Isolated pyrite eyes.	
		12.20-18.0m: Argillaceous Quartzite. Fine-grained, poorly developed bedding at high angles to the core axis. Locally sheared, disseminated pyrite throughout.	
		18.0-21.94m: Sheared Black Shale. Poorly bedded, frequent quartz veins 1-2mm wide at 60-80° to the core axis.	
	47.24m	END OF HOLE	

PATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,995N	STARTED	July 1, 1981
HOLE NO.	M-81-14	DEPARTURE	10,359E	FINISHED	July 2, 1981
BEARING	Vertical	ELEVATION	1,900m	LENGTH	46.63m
DIP-COLLAR	-90°	SECTION		LOGGED BY	J. Biczok & P. Wagner

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization
0m	1.52m	OVERBURDEN	
1.52m	5.79m	JURASSIC SCHIST	
		Fine-grained, very homogeneous, grey quartzite; trace pyrite disseminated throughout. Approximately half of section is rubble. Several thin Biotite Diorite dykes less than 0.3m wide.	
5.79m	26.82m	TAHKANDIT LIMESTONE	
		5.79- 6.91m: Fine-grained, light green, friable, skarnified limestone, probably mainly actinolite. Minor calcite veining; effervesces strongly.	
		6.91- 7.21m: Shear Zone. Brown, hematized rubble, probably was a quartzite	
		7.21- 8.38m: Fine-grained homogeneous, grey massive Quartzite. Hematite coatings on fractures at approximately 45° and approximately parallel to core axis.	
		8.38-11.80m: Biotite Porphyroblastic Calcareous Quartzite. Approximately 7% Biotite porphyroblasts to 5mm in an aphanitic, grey, siliceous groundmass; massive. White limestone from 10.36 to 10.62m. Friable, irregular mottled texture, effervesces strongly.	
		11.80-15.85m: White skarnified Limestone. Some is calcareous quartzite; most effervesces strongly and is very friable, white, soft limestone. Frequently rubble zones from shears.	
		15.85-19.51m: Brown Skarn/Limestone Rubble. Both brown, hematized carbonate rubble and sand and, very friable, brown-beige limestone.	
		19.51-19.96m: Light green friable Limestone. Very similar to first limestone. Fine-grained, friable, almost chalky in appearance.	
		19.96-24.38m: Green-brown, sheared Skarn. Friable, very frequently sheared, extensive hematization, abundant graphite/serpentine(?) on shears. Probably high percentage of fine grained actinolite but difficult to see due to hematization and shearing.	
		24.38-26.82m: Chert Pebble Conglomerate. Typical conglomerate, approximately 80% sub-rounded chert pebbles, 2-10mm, average diameter of 3-5 mm, but is quite friable due to shearing and extensive hematization of the matrix.	

N.L.M. EXPLORATION DIVISION, D.D.H. RECORD

FOOTAGE From	FOOTAGE To	DESCRIPTION
26.82m	46.63m	ROAD RIVER FORMATION(?) ORsc(?)
		26.82-41.76m: Generally light grey, fine-grained Quartzite, several shear zones at approximately 29m (40° to core axis) and 41m (80-90° to core axis).
		27.13-28.35m: Shear Zone with white clay(?) alteration, possibly dolomite as well. Friable, soft, hematized rubble. (Possibly was a dyke?)
		41.76-46.63m: Dark grey-green, very argillaceous, well banded Shale, Argillaceous Quartzite. Bedding at 40° to core axis.
	46.63m	END OF HOLE

MATTAGAMI LAKE MINES LIMITED – EXPLORATION DIVISION – DIAMOND DRILL HOLE RECORD

PROPERTY	HARU	LATITUDE	15,175N	STARTED	July 10, 1981
HOLE NO.	H-81-15	DEPARTURE	10,250E	FINISHED	July 12, 1981
BEARING	038°	ELEVATION	1,680m	LENGTH	65.84m
DIP-COLLAR	-80°	SECTION		LOGGED BY	J. Biczok & P. Wagner

FOOTAGE From	To	DESCRIPTION	% Mineralization
0m	3.65m	OVERBURDEN	
3.65m	24.46m	JURASSIC SCHIST	
		Fine to medium-grained, grey Argillaceous Quartzite. Fractured, minor shearing, some veining at approximately 40° to core axis. Minor biotite and very finely disseminated pyrite veins. Fractures covered with hematite staining. No discernable bedding. Gradational contact with Tahkandit Limestone.	
24.46m	65.84m	TAHKANDIT LIMESTONE	
		24.46-26.52m: Dark green, very fine-grained, Actinolite/Diopside Limestone Skarn. Pyrite>pyrrhotite>>chalcopyrite. Sections are either very fine-grained and barren or heavily mineralized with disseminated mineralization (but pervasive). No scheelite. Some graphitic shears at low angles to core axis.	
		26.52-36.96m: Light grey-white, fine to medium grained syenite dyke. 5-7% biotite>hornblende, <2% quartz, rare K-feldspar phenocrysts to 1cm, rest is subhedral-anhedral feldspar with no visible sulphides.	
		28.65-28.70: Fault Rubble	
		34.98-35.13: Fault Rubble	
		36.96-47.03m: Dark green Skarn/Limestone. A variety of textures: 1) very fine-grained, hard diopside skarn; 2) fine to medium-grained actinolite/diopside skarn in calcite, with trace scheelite. Pyrrhotite>pyrite>chalcopyrite occur in massive bands up to 20cm wide. Contacts prior unit at 75° to core axis.	
		38.16-38.71m: Actinolite Limestone Skarn with massive graphite shear. Shear is approximately 40-60° to core axis. At 38.71-38.86m are 7-10cm bands of pyrrhotite veins with trace chalcopyrite.	
		38.86m: 1cm wide calcite vein at 30° to core axis.	
		43.97-44.04m: Shear Zone at 35° to core axis.	
		44.04-44.50m: Zone of 2-5mm actinolite crystals (lath shaped) in calcite matrix. Contact with very fine-grained actinolite limestone unit at 40° to core axis. Possibly a shear. Trace magnetite.	
		44.50-47.03m: Fine-grained, hard green Skarn. Weak shearing at 45° to core.	
		47.03-65.84m: White Marble. Gradational contact with green skarn. No visible sulphides. Very fine-grained, variable color: buff, beige, light grey, grey-green. Minor bedding, poorly developed at medium angles to core axis. Several interbedded grey quartzite bands 0.61-0.9m wide. Brown-beige intervals are often spotted with up to 25% 1-2mm hematite spots. Hematite pervasive in other brown sections. Numerous <0.6m wide zones of rotted calcite and a few green diopside rich sections, general-	

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,175N	STARTED	July 15, 1981
HOLE NO.	M-81-17	DEPARTURE	10,250E	FINISHED	July 16, 1981
BEARING	006°	ELEVATION	1,680m	LENGTH	49.6m
DIP-COLLAR	-80°	SECTION		LOGGED BY	J. Biczok, P. Wagner

FOOTAGE From	To	DESCRIPTION	% Mineralization
0m	0.9m	OVERBURDEN	
0.9m	2.3m	BIOTITE DIORITE	
		Medium-grained, massive, heterogeneous. Up to 2% disseminated pyrite.	2% pyrite
2.3m	22.1m	JURASSIC SCHIST	
		Fine-grained argillaceous quartzite. Disseminated pyrite throughout, minor calcite veining (at 30°-60° to the core axis) and hematization along fractures.	
		2.3- 6.6m: Weakly calcareous, gritty Quartzite.	
		6.6-21.6m: Fine to very fine-grained argillaceous, weakly pyritic, Quartzite. Locally biotite porphyroblastic.	
		21.6-22.1m: Heavily pyritized metasediment with pyrite veins and fracture fillings to 4mm at 80° to core axis.	Pyrite veining and disseminations.
22.1m	49.6m	TAHKANDIT LIMESTONE	
		Very fine-grained actinolite/diopside skarnified limestone with pyritic and white marble zones. Generally pale to dark green in color with spotty pyrite-pyrrhotite and trace scheelite mineralization.	Spotty py-po-sch mineralization
		22.1-22.9m: Mottled dark green actinolitic limestone with white limestone patches to 2cm.	
		22.9-24.3m: Diopside-Actinolite Limestone. Massive, homogeneous, light to medium green in color, minor pyrite eyes.	Minor py eyes.
		24.3-30.9m: White Syenitic Dyke. Generally equigranular, fine to medium-grained, rare feldspar phenocrysts. 5% fine-grained biotite.	Rare py on fractures.
		25.3-25.6m: Dykelet of mafic hornblende-biotite diorite.	
		29.5-30.9m: Contaminated contact zone. Diorite with minor assimilated limestone.	
		30.9-39.5m: Diopside/Actinolite Skarn. Hard, homogeneous, fine-grained and massive. Some graphitic shear zones.	
		31.5m: Shear zone at 15° to core axis with calcite/siderite veinlets to 1cm	
		38.1-38.4m: Shear Zone.	
		39.5-40.2m: Transition Zone. Green skarn gradually changes to a white siliceous marble or calcareous quartzite.	
		40.2-49.6m: Interbedded white-grey limestone/marble and grey quartzite.	
	49.6m	END OF HOLE	

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	HARN	LATITUDE	15,175N	STARTED	July 15, 1981
HOLE NO.	H-81-18	DEPARTURE	10,250E	FINISHED	July 16, 1981
BEARING	088°	ELEVATION	1,680m	LENGTH	42.67m
DIP-COLLAR	-65°	SECTION		LOGGED BY	J. Biczok

DIP TEST					
Footage	Corrected	Footage	Corrected	Footage	Corrected
43m	70.0°				

FOOTAGE From	To	DESCRIPTION	% Mineralization	SAMPLE NO.	FOOTAGE From	To	Length	ASSAYS
0m	4.27m	OVERBURDEN						
4.27m	42.67m	JURASSIC SCHIST						
		4.27-11.58m: Relatively coarse for the Jurassic Schist, Medium-grained, high percentage of medium grained biotite (i.e. 30%) in a quartzite matrix. Only weak foliation and no bedding evident. Some minor shearing and hematized fractures.						
		11.58-21.95m: Shear Zone. Moderate shearing/fractures throughout most of section. Abundant hematization, red to brown color throughout. Shearing is irregular from 45° to 0° to core axis. No sulphides visible.						
		21.95-39.32m: Homogeneous, massive, fine-grained, grey Argillaceous Quartzite. No shears, veins or sulphides.						
		39.32-42.67m: Fine-grained, white equigranular Biotite Syenite Dyke. Trace hornblende, 5% biotite, 0.5% xenoliths up to 1cm of quartzite.						
	42.67m	END OF HOLE						
		Terminated due to falling rocks and pad degeneration.						

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE 15,880N	STARTED July 16, 1981
HOLE NO.	M-81-19	DEPARTURE 10,383E	FINISHED July 17, 1981
BEARING	012°	ELEVATION 1,875m	LENGTH 29.57m
DIP-COLLAR	-45°	SECTION	LOGGED BY J. Biczok

DIP TEST					
Footage	Corrected	Footage	Corrected	Footage	Corrected

FOOTAGE From	To	DESCRIPTION	% Mineralization	SAMPLE NO.	FOOTAGE From	To	Length	ASSAYS
0m	12.80m	BIOTITE HORNBLENDE DIORITE						
		Typical massive, medium-grained, homogeneous biotite diorite.						
12.80m	29.57m	JURASSIC SCHIST						
		12.80-28.04m: Very grey Argillaceous Quartzite, almost shaley. Bedding at approximately 80° to core axis. Frequent porphyroblastic intervals with equant crystals 2mm across, possibly cordierite. Trace pyrite - 1 pod 2cm x 4cm, trace garnets.						
		28.04-28.80m: Minor shearing in the quartzite, few thin calcite veins.						
		28.80-29.57m: Major shear with white clayey alteration and hematization.						
	29.57m	END OF HOLE						
		Hole suspended due to falling rocks.						

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY MARK	LATITUDE 15,924N	STARTED	August 24, 1981
HOLE NO. M-81-20	DEPARTURE 10,368E	FINISHED	August 29, 1981
BEARING -Vertical	ELEVATION 1,877m	LENGTH	70.76m
DIP-COLLAR -90°	SECTION	LOGGED BY	J. Biczok

FOOTAGE From	To	DESCRIPTION	% Mineralization
0m	0.61m	OVERBURDEN	
0.61m	17.28m	BIOTITE DIORITE	
		Medium-grained, equigranular, massive biotite diorite. Contains 25% anhedral subhedral biotite partially altered to chlorite, trace quartz, minor K-feldspar, rest is largely plagioclase. No visible mineralization. No major shear zones, rock is quite fresh and competent. Minor rubble at 15.8m. Fairly sharp contact with the Jurassic Schist and only minor chilling. Contact at 61° to core.	
17.28m	38.70m	JURASSIC SCHIST	
		Generally a very fine-grained, medium grey, very Argillaceous Quartzite. Relatively massive with no visible bedding. Occasional fracture fillings (epidote, carbonate, etc.) at 45-70° to the core angle.	
		17.28-17.98m: Sedimentary Breccia member. Angular fragments of shale and quartzite in a variable matrix of biotite and quartz.	
		21.03-21.64m: Sheared Rubble Zone. Extensive hematization and minor Fe carbonate veining along shears.	
		27.89-28.04m: Actinolite Skarn. 50-60% medium-grained actinolite, 3-4% pyrrhotite, minor chalcopyrite. Skarn developed along upper contact of a dyke.	3-4% po, minor cp
		28.04-29.47m: Fine to medium-grained Biotite Diorite Dyke. 25% medium-grained biotite in a fine-grained chilled groundmass. Trace to minor pyrite throughout.	minor py.
38.70m	50.70m	TAHKANDIT LIMESTONE	
		Generally a barren, fine-grained, crystalline massive marble or a very clean quartzite. Marble varies from white to dark grey in color. Only minor skarnification present.	
		43.30-43.60m: Light green fine-grained Actinolite Skarn over 0.15m. Minor po.	minor po.
		48.40-48.80m: Mottled green-grey Actinolite Skarn. Up to 15% po as blebs to 5mm over 2 intervals 3cm long.	15% po over 6cm
		49.50m: Graphite Band, 0.5cm thick.	
		49.60-50.70m: Banded green and grey-green skarn at contact with dyke. Trace pyrrhotite.	trace po.

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,924N	STARTED	August 30, 1981
HOLE NO.	M-81-21	DEPARTURE	10,368E	FINISHED	August 31, 1981
AZIMUTH	010°	ELEVATION	1,877m	LENGTH	43.43m
DIP-COLLAR	-50°	SECTION		LOGGED BY	J. Biczok

FOOTAGE From	To	DESCRIPTION	% Mineralization
0m	1.2m	OVERBURDEN	
1.2m	17.4m	BIOTITE-DIORITE	
		Fine to medium-grained, very homogeneous, equigranular, massive, rare schistose xenoliths to 2cm. 20-25% biotite, rest mainly plagioclase. No visible quartz or sulphides, several quartz veins over the last 1.5m. Last 0.15m is quite friable and hematized.	
		17.22-17.37m: Friable, hematized diorite adjacent to the contact with the Jurassic Schist.	
17.4m	28.0m	JURASSIC SCHIST	
		Generally a fine-grained, grey to black quartzite. Upper portion is very argillaceous, approaching argillite or shale in composition, possibly due to metasomatism from the diorite. Most of the section is highly altered and sheared rubble.	
		17.37-19.51: Baked contact. Schist is highly altered to clay, hematite, etc., very friable and locally sheared intensely.	
		19.51-21.03m: Dark grey-black shale/argillite. Locally well developed bedding at 50-60° to the core. Frequently contains numerous 1-2mm, white, equant porphyroblasts. I.D. unknown.	
		21.03-22.25m: Light grey Quartzite. Generally hematized to a moderate degree but locally intense over 5-10cm. 50% is grey, 50% is brown due to hematization.	
22.25m	29.56	FAULT ZONE	
		Mainly highly sheared grey quartzite rubble and locally mud. Minor secondary carbonate veining and open quartz veins to 1cm. Core recovery 60% to 100 over 1.4m.	
		28.82-28.04m; Biotite Diorite Dyke. Highly sheared, friable.	
		28.04-28.96m: Fault gouge and breccia. Top 0.45m is intensely altered - mainly to hematized clay, black chlorite/serpentine and minor Fe carbonate. Very friable. Followed by 0.15m of fault breccia(?) consisting of >50% shale and carbonate fragments to 3cm in a siliceous matrix. Last 0.3m is very friable hematitic rubble. This section is probably the start of the Tahkandit Limestone.	

M.L.N. EXPLORATION DIVISION, D.D.H. RECORD

FOOTAGE From	FOOTAGE To	DESCRIPTION
28.65m	43.13m	TAHKANDIT LIMESTONE
		Upper margin uncertain due to intense shearing and diorite intrusion - see fault zone 28.04-28.96m. Generally the unit is heavily skarnified to a fine-grained, medium green actinolite-diopside skarn with abundant chalcopyrite distributed throughout along veinlets and micro-fractures.
		28.96-31.36m: Biotite Diorite. Sheared throughout, extensive clay alteration minor carbonate and quartz veining.
		28.96-30.02m: Sheared and friable diorite
		30.02-30.17m: Hematized Cp-Py vein 7cm wide flanked by 6cm of quartz vein.
		30.17-30.69m: Moderately sheared and highly altered (clay, hematite) diorite. Minor quartz veins.
		30.69-31.09m: Lower margin. Heavily veined; quartz crystals to 1cm, numerous fine-grained veins; high clay.
		31.36-32.08m: White-grey, very clean Quartzite cut by a 3cm wide vein with 10% Cp.
		32.08-32.69m: Biotite Diorite. Barren, massive, homogeneous.
		32.69-33.59m: *Fine-grained Quartzite. Abundant hematite spots (after Py) and along fractures.*
		33.59-33.83m: Intense Skarn Zone. Abundant actinolite and hematite, no visible mineralization.
		33.83-35.05m: Fine-grained Quartzite. Minor skarnification as grey-green actinolite bands. No visible mineralization.
		35.05-35.66m: Extremely hematized zone, quite friable and sheared. Last 4cm is 50% Cp. Only trace Cp visible elsewhere.
		35.66-36.27m: Banded grey quartzite and green skarn. Several narrow Cp veinlets.
		36.27-37.64m: Same as previous section.
		37.64-39.92m: Fairly consistent section of medium-green skarn with abundant Cp-Hem coated fractures and thin veinlets. Fractures at 65° to the core. Minor scheelite, crystals to 1cm.
		39.92-40.23m: Grey Quartzite.
		40.23-40.84m: Fine-grained, hard green skarn (Diopside>Actinolite). Trace Cp.
		40.84-41.15m: Grey Quartzite, weakly skarnified.
		41.15-42.67m: Green skarn with chalcopyrite veinlets and fracture coatings. Same as 37.6-39.9m section.
		42.67-42.82m: Grey Quartzite.
		42.82-43.13m: Chert Pebble Conglomerate.
43.13m	43.43m	ROAD RIVER FORMATION(?) DMsc(?)
		Coarse grained, arkosic quartzite.
	43.43m	END OF HOLE.
		Terminated due to broken rods.

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,924N	STARTED	September 2, 1981
HOLE NO.	M-81-22	DEPARTURE	10,368E	FINISHED	September 9, 1981
BEARING	002°	ELEVATION	1,877m	LENGTH	67.06m
DIP-COLLAR	-48°	SECTION		LOGGED BY	John Biczok

FOOTAGE From	To	DESCRIPTION	% Mineralization
0m	1.2m	OVERBURDEN	
1.2m	19.2m	BIOTITE DIORITE	
		Medium-grained, equigranular, massive biotite diorite. Scattered carbonate+ quartz veins, generally fine-grained (chalcedonic); up to 3cm thick in the last 4m. No visible mineralization.	
19.2m	28.6m	JURASSIC SCHIST	
		Typical fine-grained, grey, argillaceous quartzite, moderately pyritiferous. Upper 2m is generally darker in color and more mafic, possibly due partially to metasomatism from the diorite but appears to be largely an original feature. Contains abundant 1-2mm equant, white porphyroblasts (cordierite?) and locally trace garnets up to 3mm. After 21.5m beds are the typical grey quartzite. Bedding at 53° to core axis.	
23.0m	30.8m	FAULT ZONE	
		Core is largely sheared rubble and mud. Most is probably the Jurassic Schist but there are two diorite dykes from 26.1-26.5m and 26.8-27.4m. No visible mineralization. Core recovery is 80%. Mud changes color from dark grey to white at 28.6m and this is assumed to be they start of the Tahkandit Limestone.	
28.6m	44.2m	TAHKANDIT LIMESTONE	
		Upper portion is highly sheared rubble, breccia and mud followed by a 3m thick dyke. Below this the unit is heavily skarnified to an actinolite-diopside skarn containing abundant chalcopyrite and scheelite. Chalcopyrite occurs along thin veinlets and microfractures whereas the scheelite is found as medium to coarse grained crystals disseminated throughout the skarn or concentrated in veins up to 30cm wide.	
		28.65-29.87m: White to beige mud. Does not effervesce.	Nil
		29.87-30.78m: Fault Breccia. Carbonate and clean quartzite fragments up to 3cm in a clay-silica matrix.	Nil
		30.78-33.53m: Biotite Diorite. Typical, medium-grained equigranular diorite. Upper and lower margins (0.45m) are highly hematized and altered to clay.	Nil
		33.53-34.59m: Extremely hematized limestone with minor chalcopyrite and malachite. Hematite seems to be both pervasive and after fine-grained pyrite. Section is quite friable but core recovery is 100%.	Minor cp and malachite

FOOTAGE		DESCRIPTION
rom	To	
		TAHKANDIT LIMESTONE (Con't.)
	34.59-35.35m:	Hematized Limestone. Friable, soft, minor shearing and green clay alteration.
	35.35-36.50m:	Banded Green Skarn and Grey Quartzite at a 60:40 ratio. Thin (1-4mm) chalcopyrite-scheelite veinlets at regular intervals of 10-12cm throughout. *One cp-py-sch-po vein 3cm thick at 35.97m* Scheelite crystals to 1cm. Minor carbonate, hematite and actinolite(?) in the vein.
	36.50-38.16m:	Zone of irregular banding of green skarn and grey marble or quartzite. Minor cp-sch mineralization.
	38.16-38.47m:	Chalcopyrite-Scheelite Vein. 5-7% cp, 5% sch as euhedral crystals up to 1cm. Locally contains a high percentage of actinolite and/or hematite. Rest of vein is remnant marble or quartzite.
	38.47-43.28m:	Consistent zone of intense skarnification. Rock is a medium green actinolite-diopside skarn with moderately well-developed fractures and a weak foliation at about 65° to the core axis. Chalcopyrite ranges from 1-10%, average 3-5% throughout.
	43.28-44.20m:	Chert Pebble Conglomerate. Weakly sheared, rubbly, weak to moderate hematization. Locally the matrix is calcareous probably due to carbonatization. Thin carbonate and quartz veinlets are common.
	67.06m	ROSS RIVER FORMATION(?) DMsc(?)
		Relatively heterogeneous formation containing a variety of clean to argillaceous, massive to porphyroblastic quartzites. Trace pyrite throughout.
	44.20-45.72m:	Biotite Porphyroblastic Calcareous Quartzite. Very fine-grained grey quartzite with 5-7% medium-grained biotite porphyroblasts.
	45.72-53.10m:	Grey, pyritiferous Argillaceous Quartzite. Relatively massive, poorly bedded.
	53.10-54.71m:	Conglomerate. 60-70% sub to well-rounded pebbles, up to 1cm across, in a matrix of calcite, clay and quartz. Pebbles are quite siliceous, possibly were quartzite or chert, now they are quite granular due to alteration and weak shearing. Locally hematization is intense over 12-15cm. Cut by several Fe-carbonate veins and one very thin (1mm) malachite fracture filling. *Minor pyrite and trace chalcopyrite.*
	54.71-67.06m:	Light colored, clean quartzite with thinly interbedded argillaceous (shaley) beds. Quartzite is white to cream colored with only trace pyrite and very minor biotite. Argillaceous beds occur every 10-20cm and contain about 20% biotite over 0.5-4cm. More poorly defined argillaceous quartzite units occur over 1-2m intervals. Occasionally thin chert beds. Bedding at 71° to the core axis.

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,924N	STARTED	September 11, 1981
HOLE NO.	M-81-23	DEPARTURE	10,368E	FINISHED	September 17, 1981
BEARING	002°	ELEVATION	1,877m	LENGTH	91.44m
DIP-COLLAR	-70°	SECTION		LOGGED BY	John Biczok

FOOTAGE From	To	DESCRIPTION	% Mineralization
0	1.2m	OVERBURDEN	
1.2m	16.60m	BIOTITE DIORITE	
		Typical medium-grained, massive, homogeneous biotite diorite. Contains 20-25% biotite, rest is largely plagioclase. No visible quartz or mineralization, except trace pyrite. Cut by several chalcedonic quartz veins up to 4mm wide.	
16.60m	34.14m	JURASSIC SCHIST	
		Fairly homogeneous, fine-grained, argillaceous, grey quartzite. Bedding poorly developed at 50-60° to core axis. Hematite common as fracture coatings and disseminated over 10m adjacent to the upper contact. Occasional argillaceous units with 15-20% medium-grained biotite. Generally the unit is much more homogeneous and massive than the Road River Formation.	
		16.70-16.75m: Dark grey to balck argillite/argillaceous quartzite with 10% white, equant porphyroblasts 1-3mm across. Porphyroblasts (cordierite?) invariably occur adjacent to the diorite-schist contact in this area.	
		18.85-19.15m: Pyrite-Garnet rich Breccia Zone. Probably a hydrothermal alteration zone. Contains 30% angular fragments of a garnet-pyrite rich rock up to 2cm, in a quartzite matrix.	
		24.99-25.29m: Zone of coarse-grained pyrite-quartz segregation and pervasive hematization caused by recrystallization adjacent to a diorite dyke.	
		25.29-25.59m: Biotite Diorite Dyke. Moderate hematization and alteration to clay.	
		25.59-26.00m: Zone of recrystallization and metamorphism adjacent to dyke. Fine-grained garnets form aggregates up to 1cm across, 5-7% over 6cm. Biotite recrystallized into streaks up to 1cm-long over the last 0.4m.	
		26.97-27.28m: Barren grey Argillaceous Quartzite above skarn zone.	
		27.28-27.65m: Very hard, green to grey skarn. Fine to medium-grained, diopside>>actinolite. 3-4% pyrite, trace chalcopyrite.	3-4% py, tr. cpy.
		32.61-34.14m: Rubble Zone. The quartzite is largely just rubble but still fairly hard. Minor slickensides in lower part.	

N.L.M. EXPLORATION DIVISION. D.D.H. RECORD

FOOTAGE From	FOOTAGE To	DESCRIPTION
34.14m	47.76m	TAHKANDIT LIMESTONE
		The entire section is very friable and highly altered. Locally it is moderately sheared but most alteration appears to be hydrothermal. Hematization is fairly intense throughout the section and actinolite skarnification is prevalent over several 1-2m intervals. Visible mineralization is quite minor only trace chalcopyrite and no scheelite.
		34.14-34.44m: Fault(?) Breccia. Angular fragments of grey quartzite in a sandy matrix of clay-calcite-quartz. 50% fragments, up to 5cm long.
		34.44-35.05m: Beige to brown, granular, quartzite rubble.
		35.05-35.66m: Grey to rust colored mud. Very fine-grained, slightly calcareous.
		35.66-36.24m: 50% grey, very friable, calcareous quartzite and 50% grey mud.
		36.24-36.76m: Very friable, intensely hematized limestone.
		36.76-37.40m: Beige, friable quartzite.
		37.40-37.68m: Very friable, intensely hematized and altered limestone adjacent to a diorite dyke.
		37.68-43.28m: Biotite Diorite Dyke. Fairly massive and equigranular, frequent schistose xenoliths to 1.5cm. Clay alteration and hematization common throughout, especially along contacts.
		37.68-39.01m: Friable, hematized diorite, heavily altered to clay.
		39.01-40.23m: Altered diorite cut by two veins, 1cm and 1.5cm wide, of a massive, black Cu-rich mineral flanked by 1cm zones of chrysocolla veins at 39.50m and 39.77m.
		43.28-43.89m: Beige, friable limestone. Minor malachite.
		43.89-44.35m: Moderately sheared and hematized limestone. High clay alteration in top 10cm, last half has 10% hematite spots 2-3mm. after pyrite.
		44.35-44.80m: Grey to beige Quartzite. Minor hematite and green clay alteration.
		44.80-45.41m: Highly altered and friable limestone. Heavily altered to green clay, malachite and chrysocolla.
		45.41-45.71m: Grey Quartzite. Moderate green clay alteration.
		45.71-46.93m: Intense Skarn Zone. Very friable, fine-grained actinolite rich skarn with locally abundant malachite and chrysocolla over 2-3cm
		46.93-47.76m: Friable, sheared, intensely hematized limestone rubble. Cut by numerous thin (<1mm) calcite veinlets at 80° to the core axis. Probably represents the chert pebble conglomerate.

N.L.M. EXPLORATION DIVISION. D.D.H. RECORD

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization
47.76m	69.80m	ROAD RIVER FORMATION (?) DMsc(?)	Nil
		Highly variable formation ranging from the "biotite porphyroblastic calcareous quartzite" to thinly bedded quartzite-shale sequence. Hematization and shearing is fairly common throughout the section. No visible mineralization.	
		47.76-48.77m: Moderately altered and recrystallized pinkish-beige, argillaceous quartzite. Probably an altered version of the biotite porphyroblastic calcareous quartzite. Moderate hematization throughout and frequent chalcedonic quartz veins to 1cm.	
		48.77-49.99m: Biotite Diorite Dyke. Medium-grained, fairly massive, several chalcedonic quartz veins.	
		49.99-53.03m: Highly altered (clay, hematite, chalcedonic veining) friable, sheared Quartzite rubble. Upper 0.5m is biotite porphyroblastic calcareous quartzite.	
		53.03-63.09m: Interbedded grey quartzite and black shale. 80-90% is a grey, granular, slightly argillaceous quartzite. 10-20% is thin (<1cm) argillaceous beds (shale) composed largely of biotite and minor chlorite. Bedding at 70° to the core angle. Much of this section appears to be migmatic. Quartzite is strongly recrystallized and the biotite layers are often very irregular. Upper 3m is friable, rest is fairly competent.	
		63.09-69.80m: Homogeneous, massive, grey, Argillaceous Quartzite. Poorly bedded.	
		69.27-69.80m: Brecciated Quartzite adjacent to dyke. Angular quartzite fragments rimmed by diorite.	
69.80m	91.44m	BIOTITE DIORITE	
		Upper 0.3m is heavily hematized and friable. Rest is quite competent and fairly fresh. several chalcedonic quartz veins up to 1.5cm thick at 70.7m. The diorite appears slightly coarser grained than the other sills/dykes and is characterized by frequent white patches, up to 10 cm across, which are devoid of biotite. Resembles somewhat the diorite in the bottom of Hole #10.	
	91.44m	END OF HOLE	

MATTAGAMI LAKE MINES LIMITED - EXPLORATION DIVISION - DIAMOND DRILL HOLE RECORD

PROPERTY	MARN	LATITUDE	15,852N	STARTED	September 19, 1981
HOLE NO.	M-81-24	DEPARTURE	10,413E	FINISHED	September 21, 1981
BEARING	--	ELEVATION	1,825m	LENGTH	50.90m
DIP-COLLAR	-90°	SECTION		LOGGED BY	John Biczok

FOOTAGE From	FOOTAGE To	DESCRIPTION	% Mineralization
0m	1.83m	OVERBURDEN	
1.83m	12.19m	JURASSIC SCHIST	
		Very homogeneous, massive, very fine grained, grey argillaceous quartzite. No visible bedding. Trace pyrite, some hematite as fracture coatings.	
12.19m	29.11m	TAHKANDIT LIMESTONE	
		Very hard, competent section with only shearing over a few cm. Generally white marble and clean quartzite, minor skarnification and chalcopyrite-scheelite mineralization.	
		12.19-13.64m: White Marble. Very hard marble and clean quartzite. 0.6m of the marble consists largely of a coarse-grained, fibrous, white mineral (tremolite?).	
		13.64-14.71m: Beige Limestone/Marble. Fairly massive and homogeneous, somewhat pitted, no visible mineralization.	
		14.71-15.27m: 90% Grey Marble, 10% Beige Marble. Cut by numerous 1-3mm wide calcite veinlets at 20-30° to the core axis.	
		15.27-15.85m: Grey Marble cut by frequent thin calcite veinlets.	
		15.85-17.37m: Generally fine-grained, Grey Marble with weak green skarnification (actinolite-diopside) over 15cm and beige marble over 38 cm.	
		17.37-17.98m: Grey Marble. One minor quartz vein, 4mm.	
		17.98-18.75m: Beginning of Actinolite Skarn zone. Well developed green, actinolite skarn over 50% of the section; rest is a homogenous grey marble. 2-3% Chalcopyrite in the skarn, minor malachite along fractures throughout the section.	
		18.75-19.45m: Actinolite Skarn. Heavily veined with thick chalcopyrite-scheelite veins, possibly along fracture since the veins are strongly aligned and pitted. Veins at 38° to core axis. 3-4% chalcopyrite, 1% scheelite.	
		19.45-19.69m: Diorite Dyke. Relatively fresh but quite fractured. Some hematite fracture coatings.	
		19.69-20.51m: Grey Marble. Very minor skarnification. Trace malachite along several thin quartz veins.	
		20.51-23.65m: Grey Marble with patchy green skarnification. Skarn zones 2-12cm wide every 4-6cm.	
		23.65-27.58m: BIOTITE DIORITE. Typical medium-grained, massive, equigranular diorite. Cut by frequent chalcopyrite-scheelite veins.	

N.L.M. EXPLORATION DIVISION, D.D.H. RECORD

FOOTAGE From	FOOTAGE To	DESCRIPTION	Mineralization
		23.65-27.58m: BIOTITE DIORITE (con't)	
		24.78-25.15m: Friable, sheared chalcopyrite bearing vein 13 cm thick cutting the diorite. Vein consists of 40-50% quartz, 40% a friable black amorphous mineral, 5-7% chalcopyrite, minor hematite chalcopyrite, minor hematite. Minor disseminated cp in the adjacent diorite. Barren above and below this zone.	
		25.15-25.39m: Relatively barren biotite diorite.	
		25.39-25.51m: 5cm thick chalcopyrite vein. 60% cp, 20% quartz, 15-20% pyrite, 1-2% coarse grained scheelite crystals to 0.5cm.	
		25.51-26.00m: Biotite Diorite. 2 minor cp veins, 3mm.	
		26.00-26.24m: Major, sheared cp-sch vein, 15cm thick. 40-50% cp, 2-3% sch, rest is quartz, hematite, black unknown mineral.	
		26.24-26.52m: Biotite Diorite with minor chalcopyrite-actinolite veining. Barren below this section.	
		27.58-29.11m: Skarnified Quartzite. Formation uncertain but probably still Tahkandit Limestone. Generally the unit is a fine-grained grey quartzite, fairly massive with patches and bands of weak green actinolite skarn.	
		27.58-28.50m: Grey Quartzite. Less than 10% green skarn. Trace cp	
		28.50-28.71m: Massive green actinolite skarn, 10% cp, 5-7% py.	
		28.71-29.11m: Barren, Grey Quartzite.	
29.11m	50.90m	BIOTITE DIORITE	
		Generally barren, massive, equigranular, medium-grained biotite diorite. Several chalcopyrite veins to 4cm.	
		29.11-29.57m: Barren Biotite Diorite.	
		30.94-31.09m: Biotite Diorite cut by 4cm chalcopyrite vein. Barren on both sides. Sent for thin section.	
	50.90m	END OF HOLE	

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
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Report for: John Biczok,
Mattagami Lake Exploration Ltd.,
Suite 502, 8215 - 112 Street,
EDMONTON, Alberta, T6G 2C8

Samples: M-81 series, 5 samples of skarn
16-60 m, 20-65 m, 20-66 m, 23-39.77 m, 24-12.8 m

Summary:

The skarn samples show a varied mineralogy and texture typical of this type of deposit.

16-60 m diopside skarn; fine grained, with minor scapolite, actinolite hornblende?, and quartz

20-65 m quartz-diopside-K-feldspar skarn with lesser biotite and apatite; coarser patches of quartz-K-feldspar-chalcopyrite-hornblende-pyrrhotite-allanite?
pyrrhotite in part altered to pyrite, in part altered? to chalcopyrite

20-66 m quartz-K-feldspar-hornblende skarn, with clusters of apatite; chalcopyrite and pyrrhotite patches; pyrrhotite partly altered to pyrite

23-39.77m (no thin section) sericite or serpentine? with apatite? in groundmass; vein composed of hematite-limonite in part at least after chalcopyrite (chalcopyrite rimmed by covellite-chalcocite); secondary green Cu-minerals; scattered irregular grains of native Gold.

24-12.8 m quartz-tremolite-diopside-Mineral X-(calcite) skarn showing a variety of textures; cut by veinlets of idocrase-calcite.

John Payne

John Payne,
October 1981

M-81-16 60 m. Diopside Skarn

The rock consists mainly of fine grained diopside with minor medium to coarse grains. Interstitial minerals include scapolite, quartz, actinolite, and hornblende, with a trace of calcite and sphene.

diopside	96-97%		
scapolite	½- 1		
actinolite	1½-2		
hornblende	0.5		
quartz	0.5		
calcite	trace		
sphene	trace	pyrite	trace

Diopside forms an irregular mosaic of grains averaging 0.1-0.2 mm in size, with a few from 0.3-0.7 mm in size, and a very few up to 1.2 mm long. The mineral is colorless.

Actinolite forms irregular interstitial grains and patches of grains averaging 0.1-0.3 mm in size. The mineral is identified by its slight extinction angle and birefringence.

Scapolite forms scattered anhedral grains up to 0.7 mm in size. The mineral has low relief, moderate birefringence, one good cleavage, and a length-fast character (parallel to cleavage).

Hornblende forms anhedral interstitial grains averaging 0.05-0.1 mm in size. The mineral is slightly pleochroic from medium green to medium bluish green.

Quartz forms interstitial grains averaging 0.05-0.15 mm in size.

Calcite forms a few interstitial grains up to 0.1 mm in size.

Sphene forms scattered grains and clusters of a few grains averaging 0.05 mm in size. Most grains have subhedral rhombic outlines.

Pyrite forms a very few scattered grains averaging 0.01 mm.

M-81-20 65 m. Quartz-Diopside-K-feldspar-Apatite-Biotite Skarn with coarser grained patches of Quartz-K-feldspar-Chalcopyrite-Hornblende-Pyrrhotite-(Allanite?)

The rock is a variable skarn, composed mainly of an irregular fine grained aggregate of quartz, diopside, and K-feldspar with local concentrations of biotite and of apatite, and finer grained patches up to a few mm across of quartz-apatite. The rock contains patches and veins of coarser grained intergrowths of quartz and K-feldspar, with many of these containing abundant chalcopyrite and pyrrhotite intergrown with hornblende. Allanite occurs along one vein.

quartz	50-55%
diopside	17-20
K-feldspar	8-10
chalcopyrite	4- 5
hornblende	4- 5
apatite	3- 4
biotite	1½-2
pyrrhotite	1½-2
allanite	0.3
Ti-oxide	0.3
sphene	trace
limonite	0.5

Much of the rock consists of an irregular aggregate of quartz (0.05-0.15 mm), diopside (0.02-0.1 mm) and K-feldspar (0.1-0.2 mm), with concentrations of biotite and of apatite. Biotite forms clusters of flakes averaging 0.15-0.3 mm in size; pleochroism is from light to medium brown. Apatite forms clusters of subhedral to anhedral grains averaging 0.05-0.1 mm in size. Ti-oxide and sphene form scattered grains averaging 0.02-0.07 mm in size.

One patch a few mm across consists mainly of irregular, very fine grained quartz (0.02-0.05 mm) with very abundant intergrown subhedral to euhedral apatite prisms averaging 0.01-0.03 mm in length.

Coarse grained patches average 0.3-1 mm in grain size. Some consist entirely of aggregates of quartz and K-feldspar. Others, including several major veins and patches contain abundant sulfides intergrown with quartz and hornblende. Chalcopyrite is the dominant sulfide forming patches up to 1.5 mm across. Pyrrhotite forms fewer grains up to 0.7 mm in size intergrown coarsely with chalcopyrite. Numerous patches in the sulfide appear to be secondary assemblages, probably after original pyrrhotite. Many of these consist of very fine to extremely fine grained intergrowths of chalcopyrite and non-reflective material, with lesser irregular patches of very fine grained pyrite scattered through the chalcopyrite. Others consist of extremely fine grained to dusty pyrite with dusty intergrown non-reflective material, with scattered patches of very fine to fine grained pyrite without dusty inclusions. Some of these patches are adjacent to fresh pyrrhotite and do not show evidence of replacement of that pyrrhotite. Nevertheless the textures are typical for altered pyrrhotite. The presence of chalcopyrite in altered pyrrhotite is very unusual, and no explanation can be given for this occurrence.

Hornblende forms irregular to elongate prismatic grains up to 1.2 mm long, mainly intergrown with sulfides. Pleochroism is from light to medium green. Allanite occurs along one vein, intergrown with quartz and locally with hornblende and sulfides. It forms grains averaging 0.3-0.7 mm in size. It has optical properties similar to epidote, but with pleochroism from light to medium reddish brown.

Limonite forms alteration patches and veinlets throughout the rock.

M-81-20 66 m. Quartz-K-feldspar-Hornblende Skarn? with Cpy, Po

The rock is a relatively uniform, medium to fine grained skarn probably formed from a sediment (based on high quartz content). The texture is metamorphic, with irregular intergrowths of anhedral grains dominating.

quartz	60-65%	
K-feldspar	15-17	
hornblende	10-12	
chalcopyrite	4- 5	
apatite	1½-2	
biotite	minor	
pyrrhotite	0.3	
pyrite	*minor*	*(after pyrrhotite)*
calcite	minor	
limonite	0.5	
hematite	minor	

Quartz forms anhedral equant grains averaging 0.2-0.7 mm in size. Grain borders are very irregular and partly interlocking.

K-feldspar forms equant grains from 0.2-0.5 mm in size, with a few up to 1 mm across. Grains commonly have angular outlines against quartz in textures which locally resemble mosaic textures. Some contain wispy to dusty limonite alteration.

Hornblende forms anhedral ragged, in part poikilitic grains averaging 0.1-0.5 mm in size, with a few up to 1.2 mm long. The mineral is pleochroic from light to medium green.

Chalcopyrite forms irregular patches of grains up to a few mm across, intergrown irregularly with silicates. Grain borders commonly a.e rounded against silicates. Pyrrhotite occurs in a few coarse intergrowths with chalcopyrite as grains from 0.3 to 0.8 mm in size. A few grains consist of irregular pyrite, whose texture appears to be extremely fine grained aggregates in part intergrown with non-reflective minerals. This pyrite probably is after pyrrhotite (see sample M-81-20 65 m).

Apatite forms clusters of subhedral to euhedral grains averaging 0.05-0.12 mm in grain size, with a few up to 0.2 mm long. These mainly occur in quartz.

Biotite forms scattered grains averaging 0.15-0.25 mm in size. They are light to dark brown in color and are slightly altered along cleavage to chlorite.

Calcite forms scattered anhedral patches averaging 0.2-0.5 mm across.

Hematite occurs with chalcopyrite as grains from 0.05-0.3 mm in size. It probably is an alteration of a sulfide, but whether it is of chalcopyrite or pyrrhotite is unknown. Another possibility is that it is after magnetite.

Limonite forms scattered patches up to 0.3 mm in size throughout the rock. Some are associated with hornblende and/or biotite clusters, and some occurs in K-feldspar as described above.

M-81-23 39.77 m. Strongly altered vein in Skarn, with Native Gold

Despite numerous attempts, it was impossible to make a thin section of this sample. Thus only a polished block was prepared.

The sample consists of a vein or patch which originally consisted mainly of chalcopyrite, possibly with pyrrhotite, in contact with a medium to coarse grained skarn.

The skarn contains a soft, waxy, light green mineral, possibly sericite or serpentine. This is intergrown with a harder (H=4) brown mineral, possibly apatite.

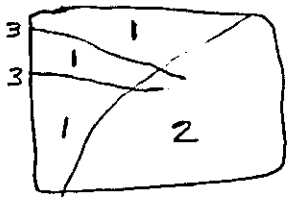
The vein consists mainly of hematite-limonite. Patches from 0.3-1 mm in size consist of concentric aggregates of hematite of slightly variable reflectivity. In the cores of a few of these are relic patches of chalcopyrite rimmed by chalcocite-covellite or alone. These patches are from 0.05-0.1 mm in size. Hematite also forms very abundant wispy veinlets between these patches, intergrown with a non-reflective very soft mineral, possibly limonite.

The rock contains scattered irregular grains of native gold up to 0.05 mm in size, averaging about 0.02 mm. These are concentrated mainly away from the hematite-chalcopyrite zone, and commonly occur in a bluish-green zone in the rock containing secondary Cu-minerals.

Some of the oxide in the rock may be cuprite.

M-81-24 12.8 m Quartz-Tremolite-Diopside-(Mineral X) Skarn

The rock has a variable texture; two sections were made. In the first the distribution of zones is as shown in the sketch.



Zone 1. (quartz-rich)

This zone contains quartz (80%) as anhedral irregular grains averaging 0.3-0.5 mm in size, with a few in coarser grained patches up to 0.7 mm across. Tremolite (15%) forms very irregular interstitial grains from 0.05-0.5 mm in size. Diopside (2-3%) forms anhedral equant, commonly subrounded grains averaging 0.07-0.12 mm across. Calcite (minor) forms scattered irregular grains averaging 0.02-0.1 mm in size.

Zone 2 (calc-silicate-rich)

This zone contains quartz (35-40%) as anhedral grains averaging 0.07-0.2 mm in size. Diopside (15-20%) forms irregular grains averaging 0.07-0.2 mm across. Tremolite (35-40%) forms irregular poikilitic grains and aggregates of grains, with coarser grains from 1.5 to 3 mm in size, and finer aggregates from 0.5-1 mm in grain size. Grains contain moderately abundant diopside and lesser quartz inclusions, and some contain calcite inclusions. Mineral X (5-7%) occurs in the same textural sites as tremolite, forming poikilitic grains up to 2 mm in size. The mineral is very similar to tremolite in some optical properties (relief, cleavage) but has much lower birefringence (0.005) and is length fast. The extinction angle ranges from 0 to about 30°. No mineral could be found in the reference tables to fit these properties. Calcite (3-4%) forms irregular grains from 0.05-0.3 mm in size.

Zone 3 (idocrase-calcite veins)

These are wispy to very patchy veins with irregular outlines. They are up to 0.7 mm wide, and average 0.1-0.2 mm. They consist of very fine grained patches of idocrase (high relief, very low birefringence) and scattered grains and patches of calcite averaging 0.05-0.1 mm in grain size.

The rock contains a trace of pyrite grains averaging 0.01 mm in size

The second section consists of porphyroblasts of tremolite up to several mm across (65%) with interstitial patches of fine grained quartz (25%) and disseminated irregular grains of diopside (10%) averaging 0.05-0.15 mm in size. This part of the section has a mottled texture outlined by patches of tremolite against those of quartz.

10,250 E
10,300 E
10,350 E
10,400 E
10,450 E
10,500 E
10,550 E

16,150 N
16,100 N
16,050 N
16,000 N
15,950 N
15,900 N
15,850 N
15,800 N
15,750 N

N

1983
1980
1918
1907
1899
1892
1885
DDH 81-14
1894
1882
1879
1876
DDH 81-20
81-21
81-22
81-23
1873
1871
DDH 81-6
81-11
1860
1859
1849
1868
1890
1880
1870
1860
1850
1840
DDH 81-12
81-13
1852
1841
1837
1834
1832
1830
1820
1810
1800
1790
1780
ADIT
REFERENCE
POINT.
1816
TRENCH #2
1829
1827
TRENCH #1
1823
1823
HELI - PAD
1817
1817
DDH 81-24
1811
1792
1774

LEGEND

1845 — Elevation Point, with elevation in metres.

1863 — Diamond Drill Hole Collar, elevation in metres.

1816 — Adit Reference Point, elevation in metres.

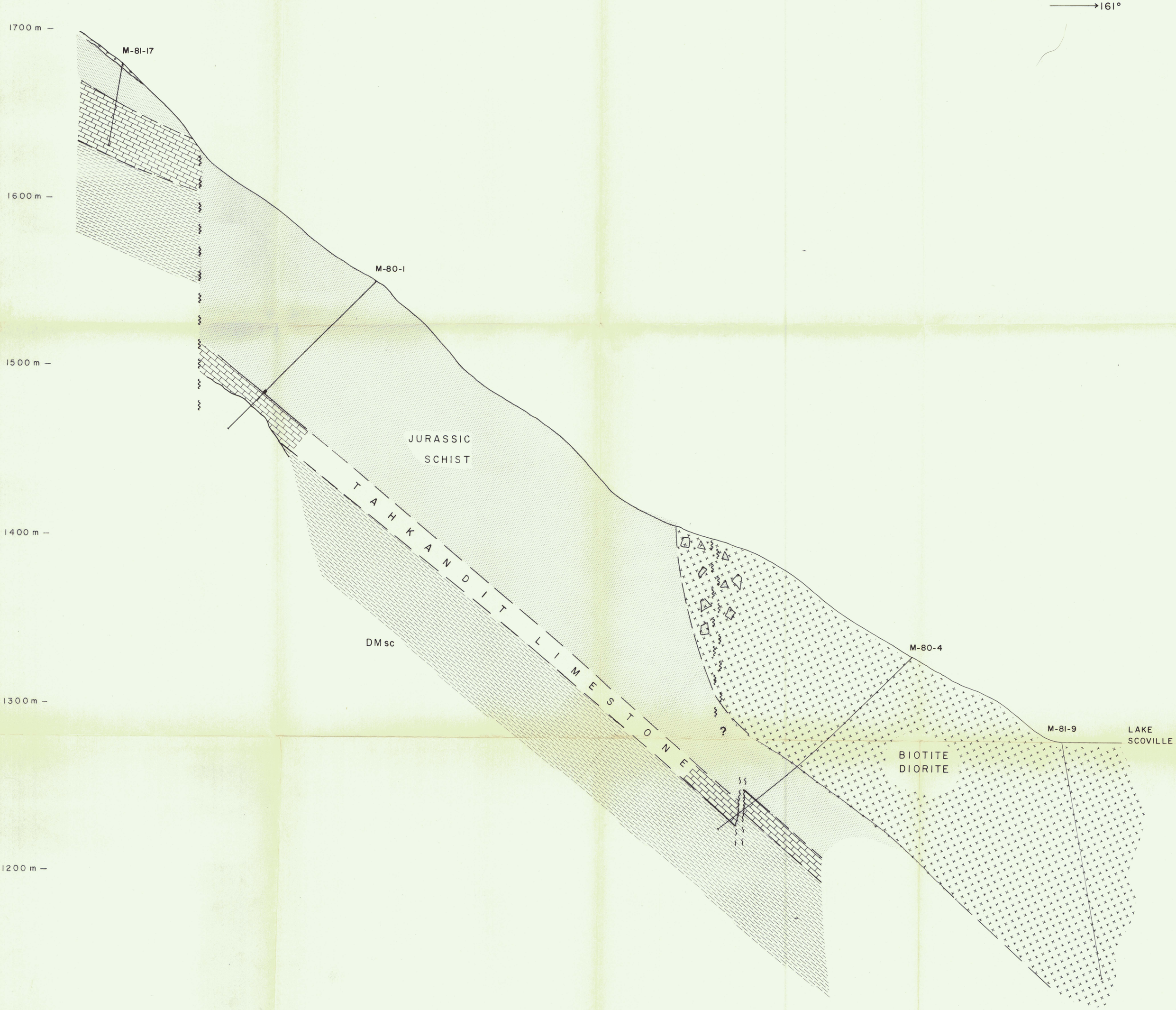
1820 — Elevation Contour, at 10 metre intervals.

MATTAGAMI LAKE EXPLORATION LIMITED.
WESTERN FIELD OFFICE
EDMONTON, ALBERTA.

MARN PROJECT
MINI GRID 09098 1

DRAWN BY: D.R.BULL.
DATE: SEPTEMBER '81

Scale of Metres
0 10 20 30 40 50 metres.



Mattagami Lake Exploration Limited.

MARN PROJECT
FIGURE 6
CROSS SECTION OF D.D. HOLES 1, 4, 9, 17.

090981

012°

El. 1852 metres.

Tahkandit Limestone
medium grain, basal chert pebble conglomerate member. Barren.

Biotite porphyroblastic calcareous quartzite.

Migmatic quartzite

Massive argillaceous quartzite, minor shale.

DM sc
variable formation, primarily argillaceous quartzite, locally migmatitic, upper 5m. consists of a biotite porphyroblastic member. Barren.

M-81-12
49·38 metres.

M-81-13
47·24 metres.

— ——— — Defined Contact.

— — — — — Gradational Contact.

FIGURE 8

CROSS SECTION OF D.D.HOLES M-81-12 & 13

MATTAGAMI LAKE EXPLORATION LIMITED.
WESTERN FIELD OFFICE
EDMONTON - ALBERTA 090981

PROJECT : MARN	LATITUDE: 15,993 N
ANOMALY: Mini Grid.	DEPARTURE: 10,412 E
SECTION :	BEARING: 13 at 012°
D.D. HOLE Nº: M-81-12 M-81-13	DIP AT COLLAR: 12 at -90°, 13 at -45°
LOGGED BY: J. BICZOK. P. WAGNER.	DRAWN BY: D. R. BULL. DATE: OCTOBER 1981

0 5 10 15 20 25 m

Fireweed Creek

LAKE SCOVILLE

El. 1279 m

MOUNT BRENNER STOCK

El. 1909.3m

MOUNT BRENNER STOCK

Lake El. 1490m

Lake El. 1541m

El. 2015.9m

MINERAL GULCH

MINI GRID

Limit of Detailed Mapping

Limit of Detailed Mapping

SURVEY LINE 10000 E

LINE 10,450 E

SURVEY LINE 10,825 E

LINE 14,600 N

9,400 E

9,500 E

10,375 E

10,500 E

10,600 E

15,000 N

15,500 N

16,000 N

16,150 N

M-80-3

M-80-2

M-80-1

M-80-4 DIORITE "Lt. Sch." Lat. Rh. Fm.

M-81-9 MONZ.

M-81-15 M-81-17

M-81-16

M-81-18

M-80-5

M-80-6 M-80-7 M-80-8 M-81-10 M-81-11 M-81-19

M-81-20,21,22,23

M-81-14

M-81-12

M-81-13

M-81-24

LEGEND

Elevations in Metres
Contour interval 50 metres.

(Prismacolor)

CRETACEOUS
929 [4] Mount Brenner Stock. Monzonite, Diorite.

JURASSIC
930 [3] Jurassic Schist. Quartzite, minor shale.

PERMIAN
913 [2] Tahkandit Limestone

AGE UNCERTAIN
903 [1] 1a: Polymictic Conglomerate, 1b: Shale, slate, quartzite. (Formerly mapped as Road River Formation, may possibly be of Devonian - Mississippian age.)

Scree slope / boulders.
Diamond Drill Hole
Rock outcrop
Geological contact: defined, assumed.
Jointing
Bedding
Foliation
Fault

MATTAGAMI LAKE EXPLORATION LIMITED.
WESTERN FIELD OFFICE
EDMONTON, ALBERTA.

09C99 1

MARN PROJECT
DAWSON MINING DISTRICT. YUKON TERRITORY
MAP I
(1981) GEOLOGY & DIAMOND DRILL HOLES

DRAWN BY: D.R. BULL.
DATE: OCTOBER 1981

SCALE OF METRES
0 25 50 100 200 metres