



MARN 1-108 CLAIMS

EXPLORATION REPORT No. 5

GEOLOGY 1982

DAWSON MINING DISTRICT

NTS 116 B/7 & 10

LATITUDE $64^{\circ} 29' N$

LONGITUDE $138^{\circ} 48' W$

AUTHOR: J.L. BICZOK, H.B.Sc.

OWNER: NORANDA EXPLORATION COMPANY Ltd. (N.P.L.)

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P. Watson

for Personal Services for the Yukon and
Territorial Services for Commissioner
of Yukon Territory.

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ABSTRACT

During the summer of 1982, Mattagami Lake Exploration Ltd. (N.P.L.) conducted 18 mandays of geological mapping and prospecting on their wholly owned MARN claims (Dawson Mining District, N.T.S. 116 B7&10) and two adjacent areas. This was undertaken to increase our knowledge of the local geology and facilitate our understanding of several complex areas on the poroperty.

In the Blue Lagoon area at the north end of the property, mapping has tentatively delineated the stratigraphic boundaries and further work should reveal the complex geological nature of this important area. In the Syenite Lake area, southeast of the claims, mapping has confirmed the G.S.C.' interpretation of this area and revealed minor silcate skarnification in the Jurassic Schist. On the southern MARN claims initial mapping has been completed. A number of large, potentially significant monzonite dykes were discovered and should be investigated further in 1983. These dykes provide attractive limestone/intrusion contacts that may host skarn mineralization at considerably shallower levels than was previously suspected in this area.

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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 (Fig. 1). They are located at the head of Fireweed Creek, a tributary of the Chandindu River (Fig. 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 (Fig. 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 Fireweed 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 (Fig. 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.

1-2: History of the Claims

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

Figure 1

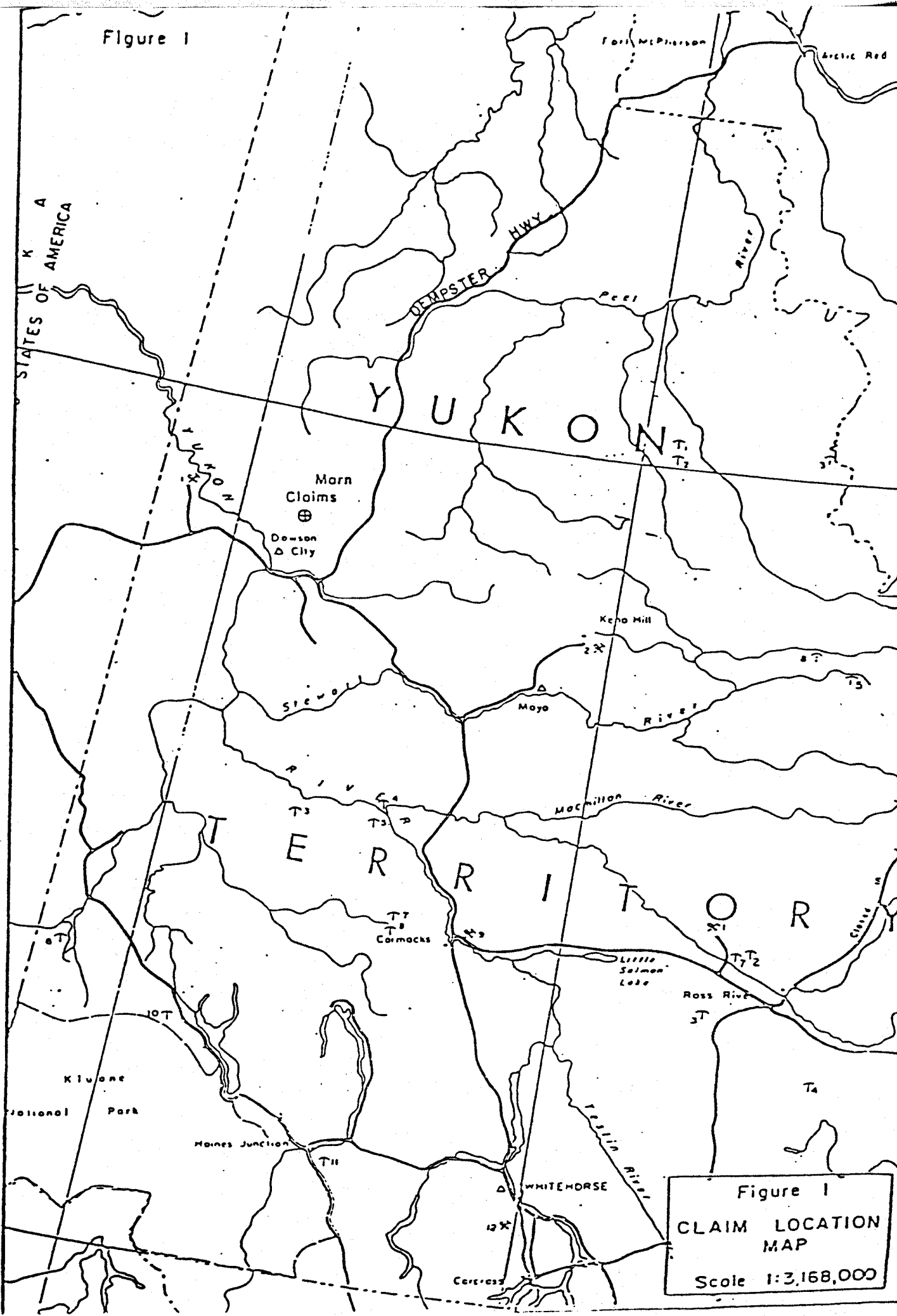
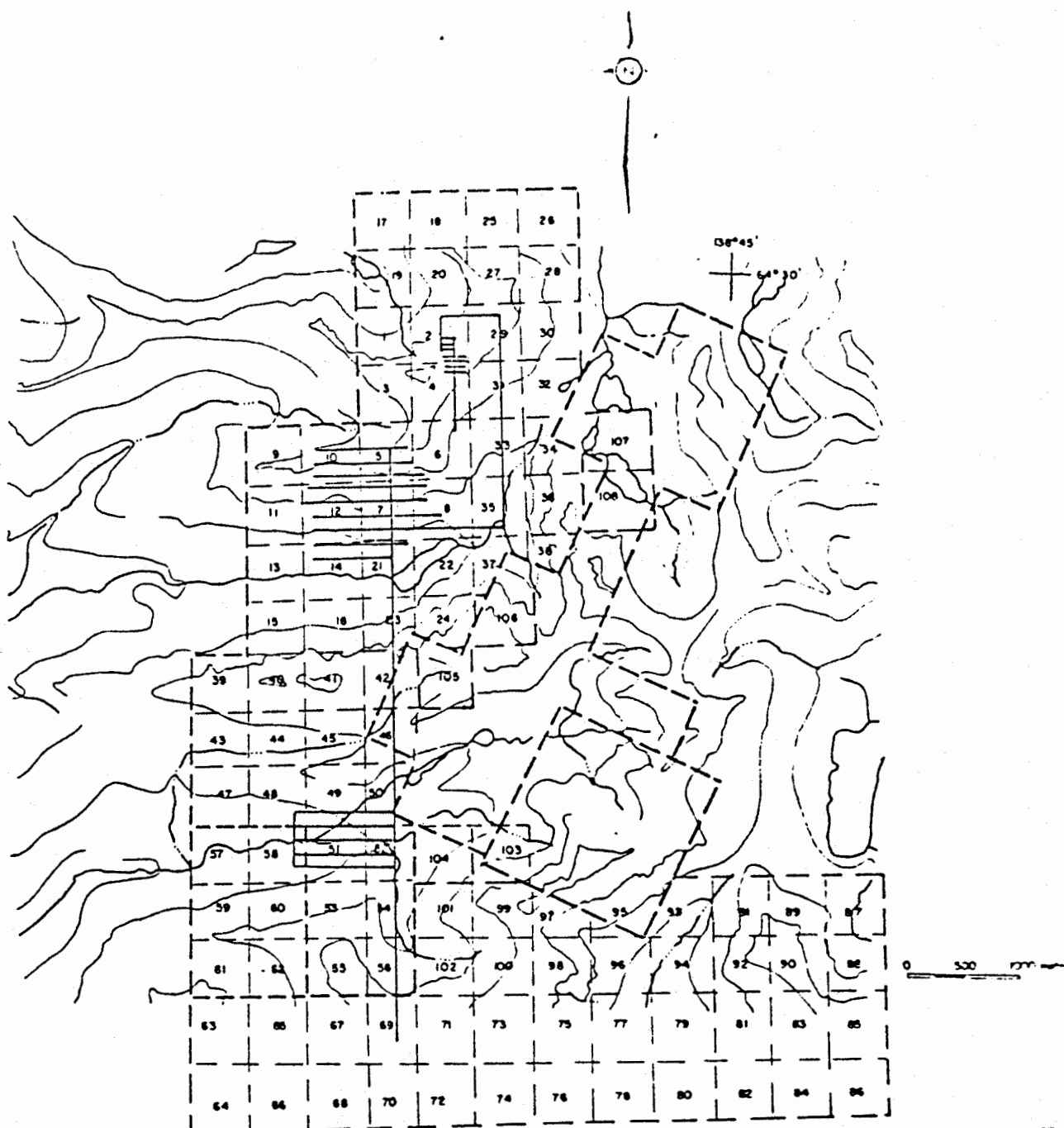
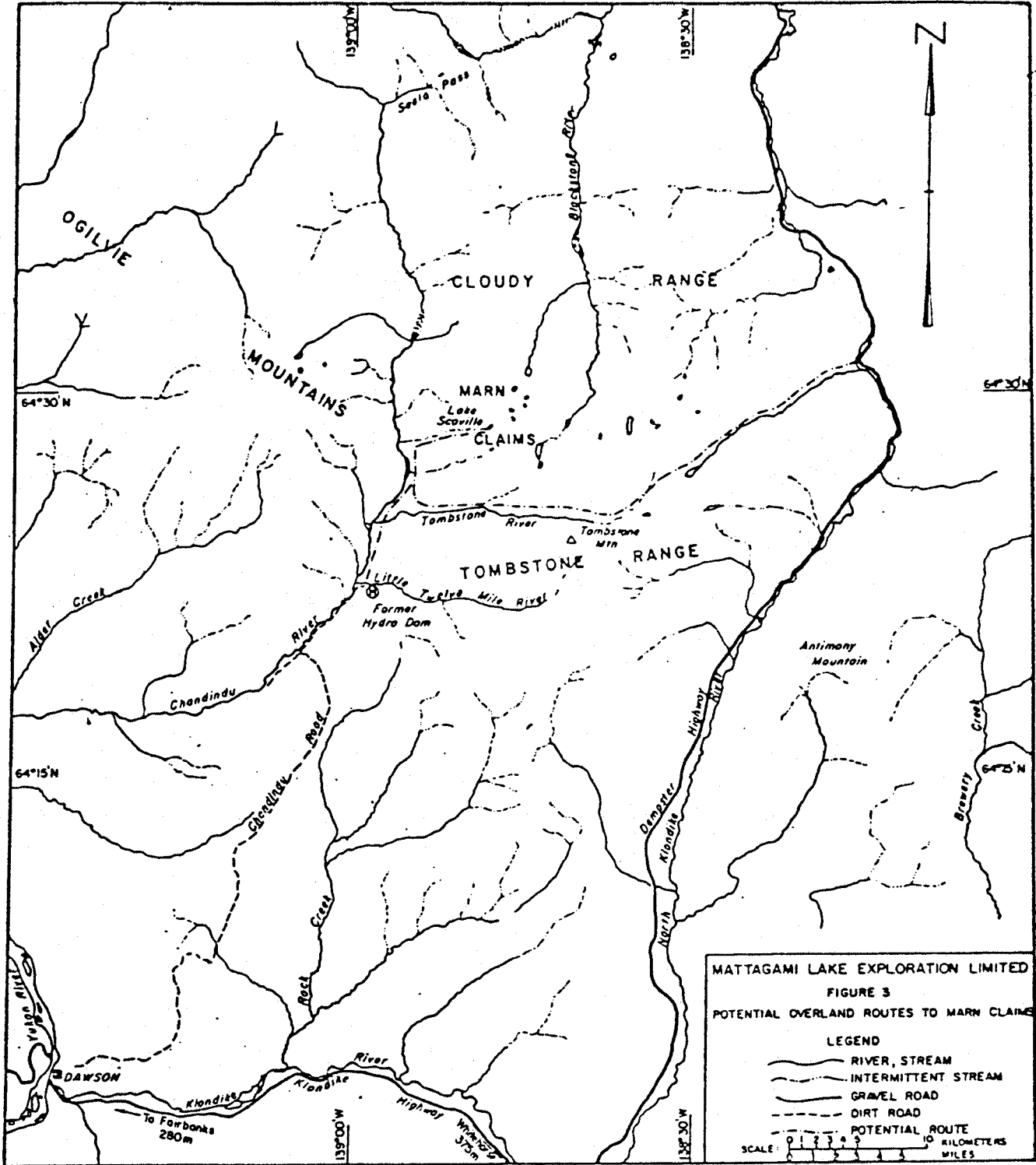


Figure 1
CLAIM LOCATION
MAP
Scale 1:3,168,000



MATTAGAMI LAKE EXPLORATION LIMITED

Morn Project
FIGURE 2
CLAIM MAP



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
 KILOMETERS
 MILES

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

On June 2nd, 1980, an additional 46 claims, MARN 63-108, were staked and MARN 29 & 30 were restaked. The relevant claim data is summarized in Table 1. Exploration work in 1980 consisted of geological mapping, grid layout, geophysical surveys (RADEM, Magnetometer, Crone Shootback), trenching and 1005m of diamond drilling. As well, a topographic survey of the property was undertaken for the company by Hosford, Impey and Welter.

In 1981 an additional 1000m of diamond drilling was completed and minor amounts of mapping and topographic surveys undertaken.

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-shaped 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.

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	Jan. 4th,1996
5- 8	YA 31495-98	July 29, 1978	August 4, 1978	Complete to Noranda	Jan. 4th,1995
9- 16	YA 47156-63	August 1, 1979	August 14, 1979	Complete to Mattagami	#9-13,15: Jan.4th,1991 #14 & 16: Aug. 14,1987
17- 20	YA 47164-67	August 1, 1979	August 14, 1979	Complete to Mattagami	Jan. 4th,1992
21- 24	YA 47600-03	September 7, 1979	September 10, 1979	Complete to Noranda	September 10, 1987
25- 28	YA 47168-71	August 1, 1979	August 14, 1979	Complete to Mattagami	Jan. 4th,1992
29- 30	YA 50039-40	June 2, 1980	June 11, 1980	Complete to Mattagami	Jan, 4th,1990
31- 36	YA 47172-77	July 31, 1979	August 14, 1979	Complete to Noranda	#31 & 32: Jan.4,1992 #33 - 36: Jan.4,1991
37- 38	YA 47575-76	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, 1983
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, 1983
57- 62	YA 47643-48	September 16, 1979	September 18, 1979	Lapsed	Lapsed
63-108	YA 50041-86	June 2, 1980	June 11, 1980	Complete to Mattagami	#63-106: Jan.4,1984 #107-108:Jan.4,1985

7

This area was not affected by continental glaciation but was subjected to local alpine glaciation. Glaciers emanating from the Tombstone Mountains 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 metres to 2,000 metres).

1- 4 : 1982 Work Program

During the summer of 1982 several traverses were conducted near the perimeter of the MARN claims, from a base camp several kilometers south of North Fork Pass, on the Dempster Highway. These were conducted to aid in our understanding of geological factors affecting the MARN, including structural geology, contact metamorphism and skarn mineralization. In addition to this, several days were spent cleaning up the old drill camp and slinging out barrels.

From September 12th to 15th, the author and an assistant conducted geological mapping of the southern claims from a fly camp in the Mt. Brenner valley. Previous mapping of this area was of a cursory nature and required some upgrading.

CHAPTER TWO : GEOLOGY

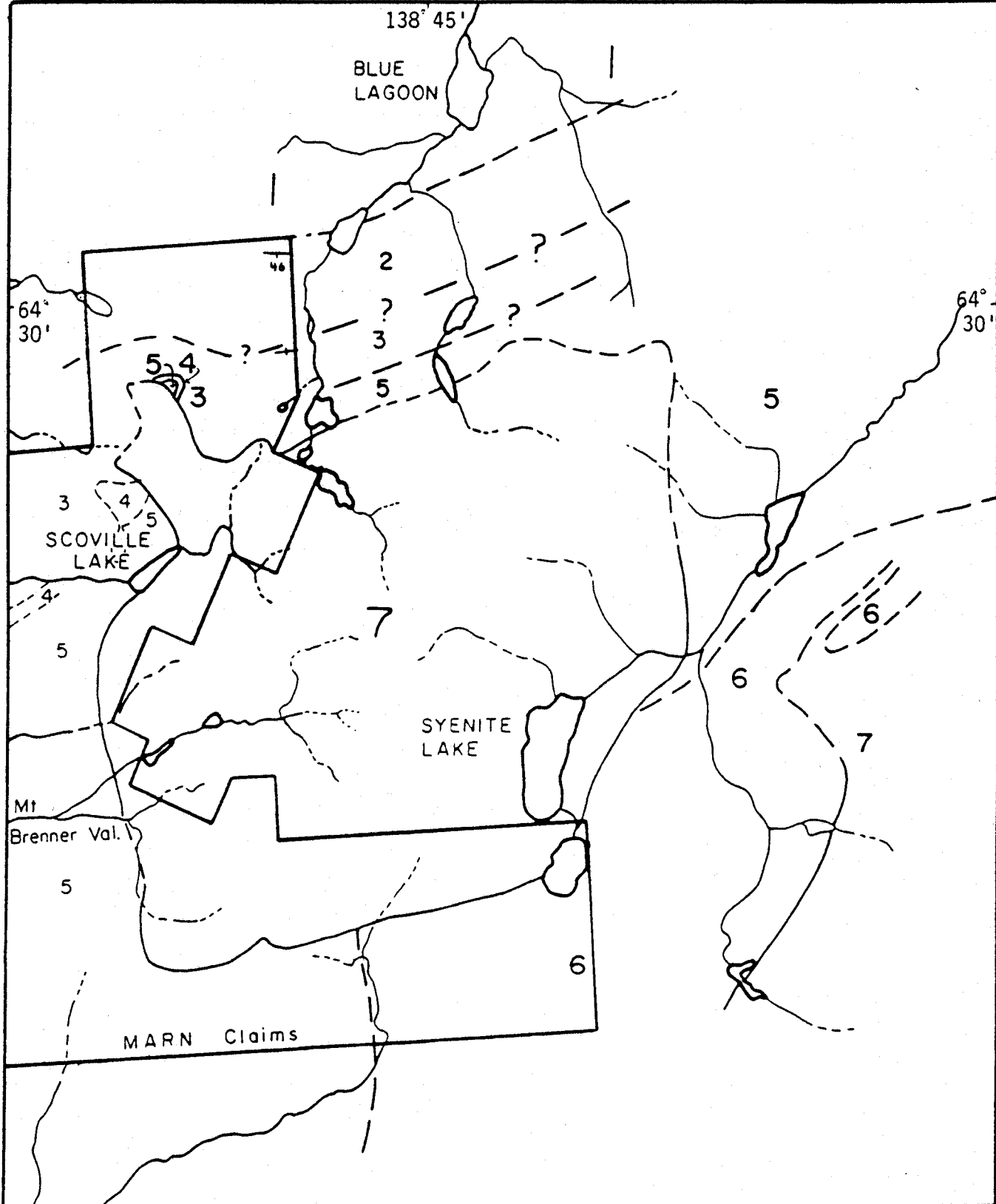
2-1 : General Geology

The geology of the claims has been discussed previously in numerous assessment reports (Biczok 1979; Biczok, 1980; Biczok and Kemp, 1981; Biczok, 1981), therefore only new observations are presented in this report. The general geology is depicted in Fig. 4.

Briefly, the claims cover the contact of the Cretaceous, Mt. Brenner stock (diorite to quartz monzonite) with several sedimentary formations: 1) the Ordovician-Silurian Road River Formation which consists largely of black chert and cherty shales; 2) the Devonian "Black Clastic" Formation comprised mainly of black shale; 3) the Permian Tahkandit Limestone; 4) the Jurassic "Lower Schist" Formation, a sequence of quartzite and slate, and 5) the Cretaceous, Keno Hill Quartzite. Throughout most of the claims the strata strike roughly north-south and dip to the east at a shallow angle. Within the northern claims however the strata curve to the northeast, eventually trending east-west several kilometers northeast of the claims. Interpreting the geology is made more difficult by the similarities between several units, especially since they have been subjected to contact metamorphism.

2-2 : Detailed Geology

In the northernmost claims (north of Lake Scoville) the structural geology becomes fairly complex. South of the sill, the strata trend to the northeast and dip fairly steeply (approximately 45°) to the southeast. Since the Lower Schist unit overlies the Tahkandit Limestone, it is in contact with the Mt. Brenner stock. However,

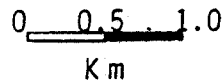


LEGEND

- | | | | |
|---|------------------------------|---|------------------------------------|
| 7 | MT. BRENNER STOCK | 1 | PRECAMBRIAN (or later) "GRIT UNIT" |
| 6 | KENO HILL QUARTZITE | | |
| 5 | Jurassic LOWER SCHIST | | |
| 4 | TAHKANDIT LIMESTONE | | |
| 3 | DEVONIAN "BLACK CLASTIC" Fm. | | |
| 2 | ROAD RIVER Fm. | | |

Fig. 4: GENERAL GEOLOGY, MARN CLAIMS

NTS 116 B/7



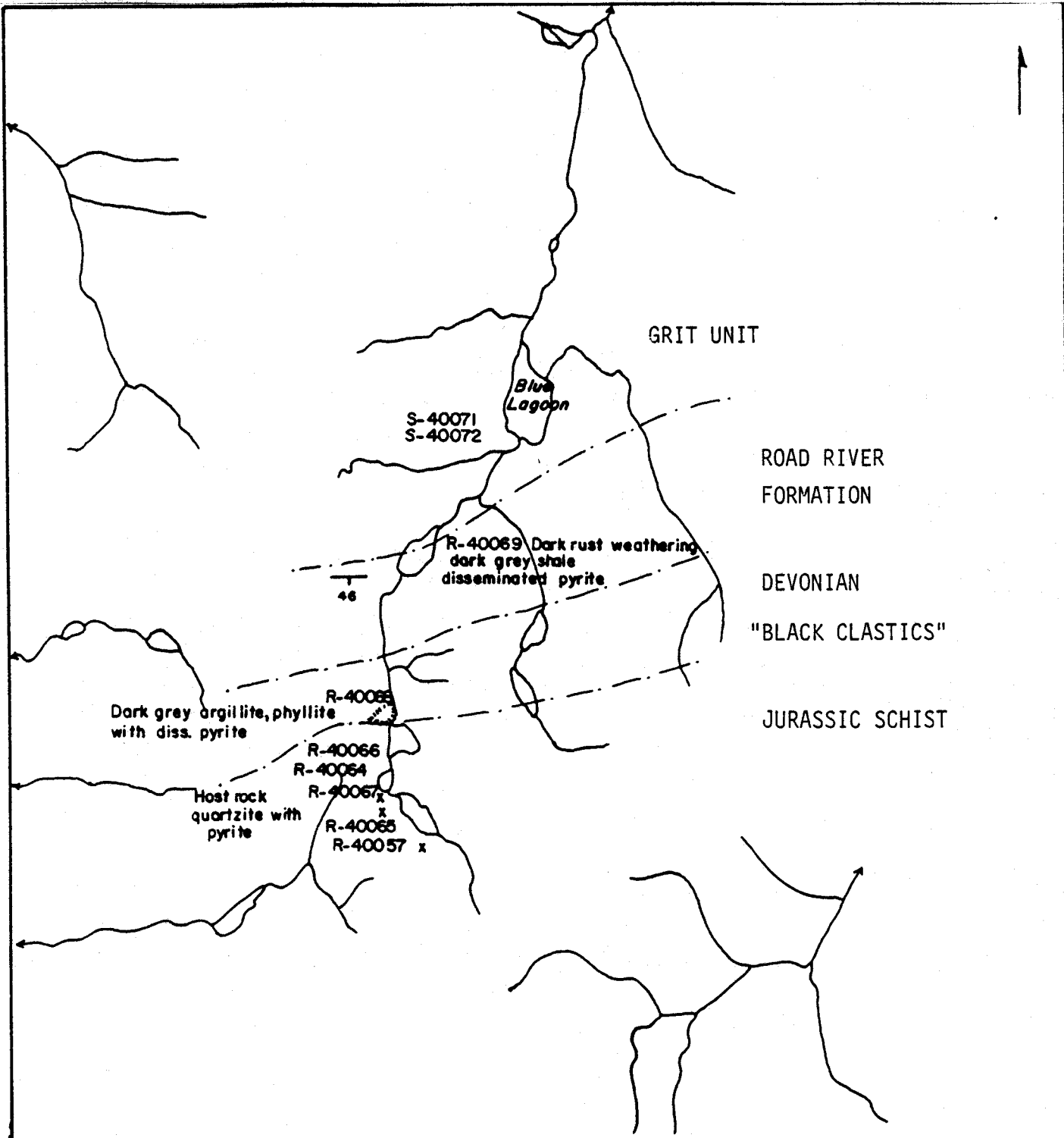
north of the sill, the Tahkandit Limestone trends to the northwest and dips to the southwest at a shallow angle (25° - 28°). Therefore, the underlying Devonian "black clastics" may be closest to the stock, not the Lower Schist, as depicted by previous workers (L. Green, 1961; D. Tempelman-Kluit, 1969).

During a short prospecting and mapping program along the headwaters of the Blackstone River in the Blue Lagoon* area (Figure 5), possible formation contacts were identified but these are somewhat speculative. A considerable amount of detailed mapping is still required to accurately delineate these units and this mapping may have important economic implications. If the Devonian "Black Clastic" unit/Jurassic Lower Schist Unit contact can be defined, we may also discover more exposures of the intervening Tahkandit limestone which hosts the local skarn mineralization.

Mapping to the east of the southern claims in the Syenite Lake area (Figures 4&6) did not result in any significant revision of the geology as reported by Tempelman-Kluit (1969). Basically, a northeast trending zone of Cretaceous Keno Hill Quartzite and Jurassic "Lower Schist" is bounded to the west by the Mt. Brenner stock and to the east by the Tombstone Intrusion. Minor skarnification of quartzites to wollastonite was observed but no economic mineralization was encountered.

Several days were spent mapping the geology of the southern claims (Map 1 in pocket), resulting in some revisions. The margin of the Mt. Brenner stock is much more irregular than originally thought. Several minor dykes and a 600m long sill, offshoots of the main stock, were delineated. In addition, a 90m wide hornblende

*unofficial name



Scale: 1:50,000

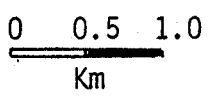


Fig. 5 : Sample locations and rock descriptions, Blue Lagoon area

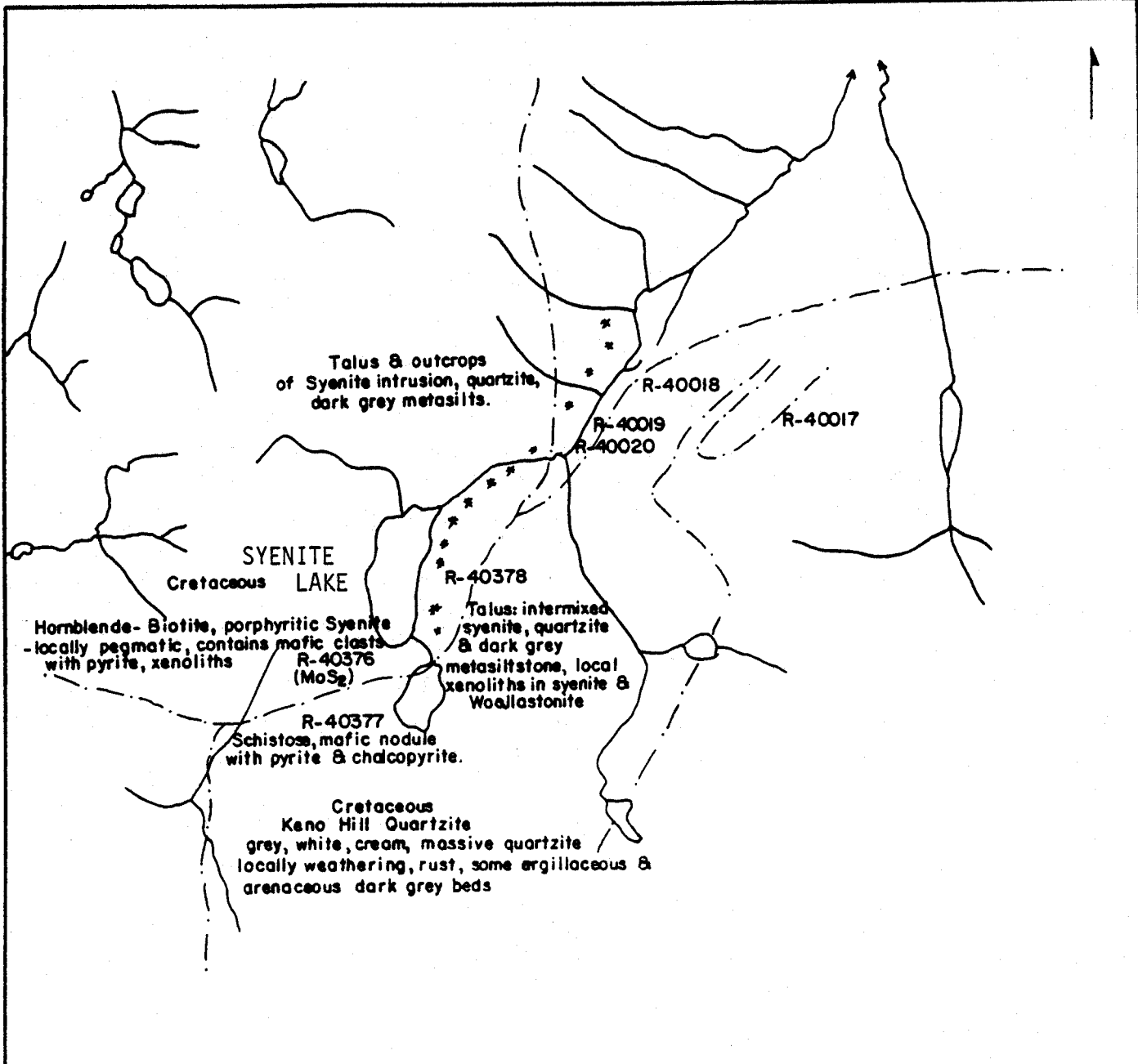


Fig. 6 : Sample locations and rock descriptions, Syenite Lake area.

monzodiorite dyke was discovered about 600m west of the stock on the north side of Mt. Brenner valley. It strikes roughly parallel to the margins of the stock (north-south), dips steeply to the east, and may be continuous with a dyke mapped in 1980 on the south side of the valley. Strata within 50m of the dyke are highly deformed and metamorphosed but not sheared.

An initial subdivision of the Jurassic Lower Schist was also undertaken during this mapping program. To date, three mappable units have been distinguished : Unit 4a is a thinly laminated shale and grey siltstone member, Unit 4b consists of weakly graphitic, metamorphosed shale and is by far the most abundant unit in this area, and Unit 4c which consists of argillaceous quartzite with minor shale and occasional 1-2m thick massive limestone beds. The latter unit predominates in the southeast corner of the map area (Map 1) where minor silicate skarnification has been produced by the intrusion of the Mt. Brenner stock.

Only one outcrop of the underlying Permian Tahkandit Limestone was examined, that in the western part of the map area. In this area, the formation is at least 30m thick (upper and lower contacts are not exposed) and as elsewhere on the property it appears to have three separate horizons. The upper horizon consists of massive, fine-grained limestone with occasional chert beds up to 30 cm thick. The midsection also contains fairly massive limestone but with 10-20% chert as pebbles rather than beds. The lower section is quite fossiliferous, containing numerous brachiopods up to 13 cm across.

Underlying the Tahkandit Limestone is a 20-25m thick section

of argillaceous quartzite and shale which is locally cherty. It is most likely a member of the Devonian "Black Clastic" Formation, however, further mapping is required to confirm this.

Unconformably underlying the Devonian (?) strata is a fine-grained, dark grey andesite/basalt of probable Cambrian age (Unit 4 of Green 1961, Unit 5 of Tempelman-Kluit 1969). However, volcanic strata apparently occur within the Road River Formation therefore this outcrop has been listed as having an uncertain age on Map 1. Further mapping of the strata to the west of this outcrop should enable us to quickly determine the correct age of this basalt.

CHAPTER THREE : CONCLUSIONS AND RECOMMENDATIONS

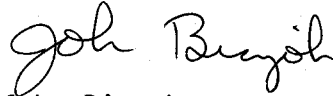
Work on the MARN claims in 1982 consisted mainly of mapping and prospecting on the southern claims and on open ground to the north and east of the claims. The purpose of this was to unravel some of the structural and stratigraphic complexities of the area with a view towards increasing our understanding of the property geology and defining exploration targets in the immediate area.

While a good start was made, further work is required especially in the "Blue Lagoon" area north of the claims, and the Mt. Brenner valley area. If the stratigraphy near the Blue Lagoon can be determined, we may be able to locate extensions of the Tahkandit Limestone, which hosts the local skarn mineralization. It is quite possible that extensions of the limestone exist in this rugged area and were missed by previous mappers. Future mapping therefore should concentrate on delineating the Devonian-Jurassic contact.

Additional, detailed mapping should also be undertaken along Mt. Brenner valley for a number of reasons. We still do not have a clear picture of the stratigraphy below the Tahkandit Limestone in this area and this may be of considerable importance in any future drill programs. Also, the area appears to be one with numerous dykes and sills, some of major proportions. Delineation of these intrusions could quite possibly provide important drill targets in the future. This area was not drilled in the past because it was assumed that the limestone-pluton contact was at a considerable depth (G 300m). However, it now appears that a major dyke cuts the limestone 600m from the pluton, providing a fairly shallow limestone-intrusion contact. Further mapping should be directed towards collection

of accurate structural measurements in an effort to determine the contact depth and the likelihood of it being mineralized.

Respectfully submitted,



John Biczok
District Geologist
Noranda Exploration Co. Ltd. (N.P.L.)

STATEMENT OF QUALIFICATIONS

I, John Biczok, of the City of Whitehorse, in the Yukon Territory, do hereby certify :

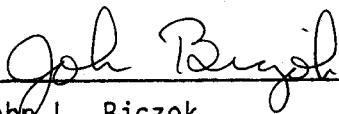
THAT I have been employed as a Geologist by Noranda Exploration Company, Limited (No Personal Liability) since October 1, 1982, and by Mattagami Lake Exploration Limited (No Personal Liability) (a Noranda subsidiary) for three years previous to that date;

THAT I am a graduate of Lakehead University in Thunder Bay, Ontario, with an Honours Bachelor of Science Degree in Geology;

THAT I am currently completing a Master of Science Degree in Geology with the University of Manitoba;

THAT I am a member of the Geological Association of Canada, and the Canadian Institute of Mining and Metallurgy;

THAT I supervised the work described in this report.



John L. Biczok
District Geologist
Noranda Exploration Co. Ltd. (N.P.L.)

STATEMENT OF COSTS

WAGES AND CAMP COSTS

18 mandays x \$150/day= \$ 2700.

VEHICLE RENTALS

7 days x \$20/day= 140.

HELICOPTER CHARTERS

Buffalo Hiller 12E: 3 hrs. x \$300/hr= 900.

T.N.T.A. Hughes 500D: 2 hrs. x \$550/hr.= 1100.

DRAFTING, TYPING and REPORT WRITING

6 days x \$150/day= 900.

TOTAL = \$5740

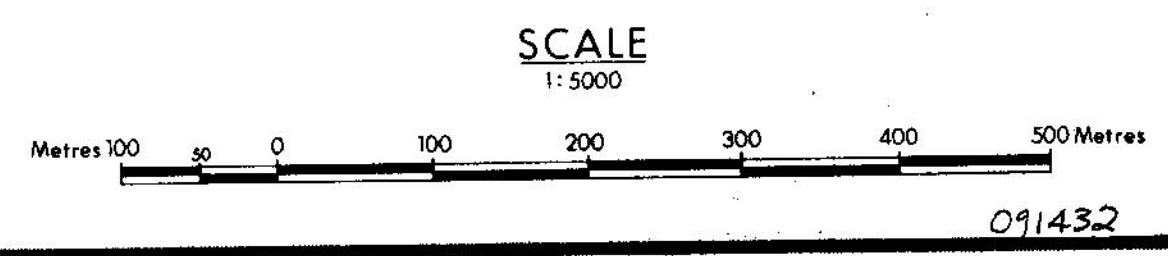
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Map 1284 A to accompany G.S.C. Memoir 364 by L.H. Green.
- Tempelman-Kluit, D.J., 1969. Geology, Tombstone-Upper Klondike River, Yukon
Territory. G.S.C. Map 1248A to accompany G.S.C Bulletin 180.



LEGEND

- CRETACEOUS**
- 5 MT. BRENNER STOCK
 - 5a Biotite Diorite
 - 5b Hornblende Diorite
 - 5c Medium to coarse-grained, flow banded Hornblende - Plagioclase Diorite
- JURASSIC**
- 4 LOWER SCHIST
 - 4a Thinly laminated shale and siltstone
 - 4b Weakly graphitic, metamorphosed shale
 - 4c Argillaceous quartzite with thin limestone interbeds and minor shale
- PERMIAN**
- 3 TAHKANDIT LIMESTONE
 - Fine grained limestone locally with interbedded calcareous quartzite and chert pebble conglomerate
- DEVONIAN**
- 2 "BLACK CLASTIC UNIT"
 - Black shale with minor conglomerate
- ORDOVICIAN-SILURIAN**
- 1 ROAD RIVER FORMATION
 - Mainly black chert and cherty shale
- AGE UNCERTAIN**
- A Dark grey andesite
- OUTCROP
 x SMALL OUTCROP
 --- GEOLOGICAL CONTACT; Defined, Approximate
 - - - FAULT
 ... LIMIT OF HORNFELS AUREOLE
 --- SYNCLINE AXIS
 x FOLIATION
 45° BEDDING; Inclined, Vertical



REVISED	MARN PROJECT		
	GEOLOGY MAP		
	OF THE		
	SOUTHERN MARN CLAIMS		
	091432		
	CONTOUR INTERVAL: 100m.		
PROJ. No 915	SURVEY BY J.L.B.	DATE	Jan/83
N.T.S. 116B/77	DRAWN BY H. H. H.	SCALE	1:5000
DWG. No	NORANDA EXPLORATION		
1	OFFICE Whitehorse		