

GM 57927

GLACIAL & STRUCTURAL INTERPRETATION FROM AIR PHOTOS, OTISH MOUNTAINS EAST, PROJECT 7181, REPORT NO 17

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GLACIAL & STRUCTURAL INTERPRETATION FROM AIR PHOTOS

OTISH MOUNTAINS EAST, PROJECT 7181

Report No. 17

MRN-GÉOINFORMATION 2000

GM 57927

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SUMMARY

In two main target areas in the Eastern Otish Mountains, glacial geological and structural interpretation of aerial photos, covering an area of approximately 1600 km², have been carried out.

Various types of glacial deposits have been distinguished and mapped. Numerous faults and fractures have been identified and compiled on photomosaics.

ZUSAMMENFASSUNG

Zwei Teilgebiete in den oestlichen Otish Mountains, mit einer Gesamtflaeche von ca. 1600 km², wurden photogeologisch interpretiert.

Mehrere glazialgeologische Einheiten wurden unterschieden und kartiert. Zahlreiche Stoerungen wurden erfasst und auf Photomosaiks uebertragen.

1. GENERAL INFORMATION

1.1 Area

The studied areas are located in the eastern region of the Otish Mountains (see map No.1).

1.2 Targets

Target areas are the Kerveso Lake area and the Conflans Lake area. In both areas numerous geochemical anomalies have been found. In the Kerveso Lake area a mineralized boulder has been discovered (refer to final report 1975).

2. GEOLOGY

General geology: refer to final report 1975

3. PHOTOGEOLOGY

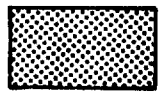
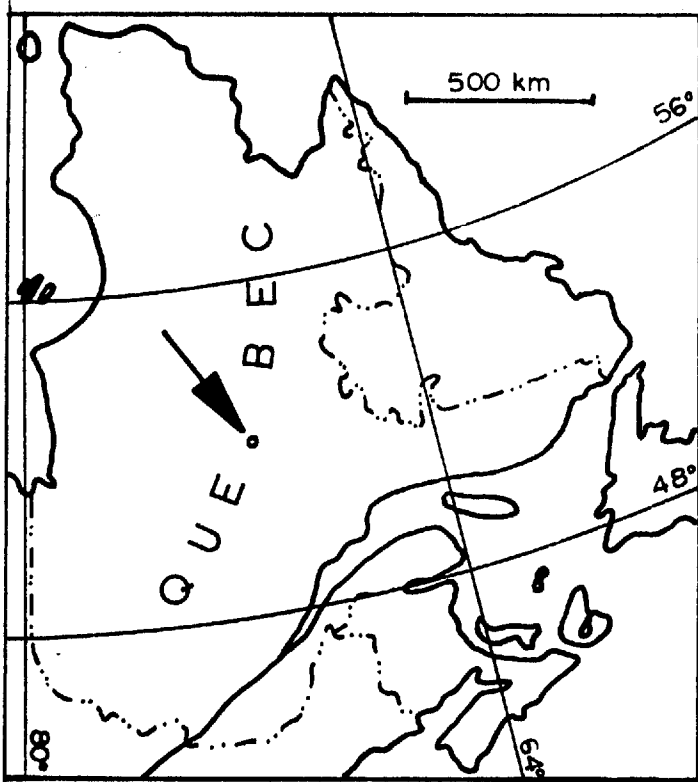
Both glacial and structural interpretations have been carried out by M. Bouchard (McGill University, Montreal), and by Dr. T. Allum (INCO) respectively.

In order to cover also surrounding areas, the glacial mapping was extended by Montreal office staff.

The following photos were used:

Kerveso Lake Area

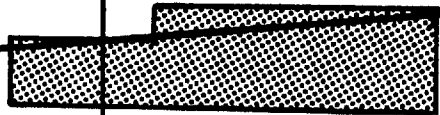
<u>Flight Line</u>	<u>Photo No.</u>	<u>Scale</u>
A 12494	422-424	1:36,000
A 12542	151-158	1:36,000
A 21578	99-108	1:45,000
A 21579	8-22 & 57-65	1:45,000



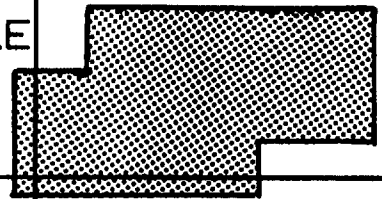
mapped areas



CONFLANS LAKE AREA



KERVESO LAKE AREA



52°

O T I S H M O U N T A I N S
A R E A

72°

71°

70°

50 km

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LOCATION MAP
PHOTO GEOLOGY
OTISH MOUNTAINS EAST

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DRAWN:	G.R.	DATE:	MAY 76	PLAN No.		REPORT No.	17
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T.C. TO BOMM:		REF:		FILE NO.:	MQ1-105		

Conflans Lake Area

<u>Flight Line</u>	<u>Photo No.</u>	<u>Scale</u>
A 12649	130-148	1:36,000
	135,138	1: 9,000
A 12798	398-416	1:36,000
	403,405,407	1: 9,000

Results have been transferred to photo mosaics with a scale of 1:50,000 of the Kerveso Lake area and 1:25,000 of the Conflans Lake area.

The covered area totals 1,600 km².

3.1 Glacial Interpretation

Basicly 6 types of surface structures have been distinguished and interpreted: Bedrock, ground moraine, transversal moraine, ablation moraine, fluvioglacial outwash, and colluvial. These were subdivided occasionally, e.g. drumlinized ground moraine.

In some cases a clear identification was not possible as various surface structures appear simultaneously, e.g. fluted and hummocky ground moraine. In these cases the designated identification letters have been indexed accordingly.

The classification of the units is based solely on their morphology since no field examination was made. However, the knowledge of glacial deposits in an area situated north of Lake Mistassini (about 150 km to the southwest of the sector here covered) enabled the consultant to estimate the thickness of the units.

MAP UNITS

Bedrock (R):

Crystalline rocks or sediments. A veneer of till may cover the bedrock surface. Dip and strike of sediments were marked where an estimate was possible. Rock drumlins and crag and tail hills were observed in various areas, but not marked especially.

Ground Moraine (M):

Deposits with a thickness of more than 1 meter consisting of lodgement till, a subglacial unsorted sediment. The thickness is averaging 2 to 3 meters.

The relationship to underlying bedrock may vary but is generally close. In some cases the transport was probably less than one kilometer.

Subunits

M_D Ground moraine moulded into drumlins, elongated hills of drift.

M_F Ground moraine with parallel more or less straight grooves (1 to 10 m wide and approx. 1 m deep),

M_H Hummocky ground moraine

Transversal Moraine (T):

Lodgement till? accumulated in ridges trending perpendicular to main glacial direction. The relief is in the order of 2 to 20 meters. The ridges may represent minor halts or readvances of the ice margin.

The relationship to the underlying bedrock is probably similar to that of ground moraines. However, reworking took place in the meltwater channels.

Subunit

T_D Drumlinized minor moraines and dissected by meltwater channels which developed on perpendicular shear planes

Ablation Moraine (H)

Infra - or supraglacially transported debris, generally concentrated near the ice margins. The material is reworked to varying degree by meltwater activity. The surface is characteristically hummocky and traversed by numerous meltwater channels, which are well incised and now occupied by largely underfit streams or no streams at all.

The thickness may reach up to 40 meters and the relief is in the order of 1 to 20 meters. The material has been deposited either on bedrock or lodgement till. As known from other areas the relationship to underlying bedrock may be very poor. Transport distances up to 120 kilometers are reported.

Fluvioglacial Outwash (F):

Sand and gravel deposits laid down by major glacial melt-water river systems. The surface is flat to slightly undulating or terraced. Furthermore it generally appears in a lighter tone on the airphoto due to being well drained.

In some areas, esker systems are associated which were formed either in subglacial tunnels or possibly in open air ice walled channels in the late phases of glaciation.

The thickness of these deposits may be considerable, up to probably 50 meters.

The relationship to underlying bedrock is poor since the material has been reworked and sorted in a high degree.

Colluvial (V):

Slope deposit which may consist of rock debris and/or of till, reworked by slope processes.

3.2 Structural Interpretation

Faults and fractures indicated by surface structures as gooves, ridges and streams and lakes have been traced. Although the glacial transport has largely overprinted the tectonic structure, especially in areas with drumlinized lodgement till, tectonic features may be revealed by the irregular shape of lakes. Lake basins in ablation till and in areas of fluvioglacial outwash seem to be controlled mainly by the glacial relief but may be controlled originally also by regional structures.

4. RESULTS

In the Kerveso Lake area and the Conflans Lake area drumlins, flutings, crag and tail hills point to a glacial movement and direction toward S 20 W. Regional deviations may occur.

Numerous faults and fractures with minor movements have been traced some of which extend for several kilometers under the drift cover.

Main strike direction is S to W which coincides with the glacial direction.

4.1 Kerveso Lake Area

Sediment samples which revealed 1. order anomalous U-values (refer to final report 1975) have been taken in an area of hummocky and fluted lodgement till. The mineralized boulder (505-1) is situated in the same glacial environment and was probably transported only over a short distance. The interpretation seems to indicate a nearby source for both anomalies and the mineralized boulder.

The glacial movement crossed several faults situated in an area of drumlinized ground moraine 4 to 9 kilometers NW of the boulder.

4.2 Conflans Lake Area

This region includes the northern part of the Otish Mountains which are topped by large areas of outcrop. The slopes are covered by colluvial deposits. Fluvioglacial outwash associated with esker systems and ablation moraines prevail north of the mountain slopes. Lodgement till is exposed mainly as a thin cover over bedrock.

Faults are striking primarily N to E.

Sediment and water samples which yielded anomalous U-values (refer to final report 1975) were taken mainly in areas of lodgement till, which is shown by the following table:

Glacial environment	No. of 1. order U-anomalies (re final report 1975)		
	in sediment	in water	total
Esker	1	-	1
F	2	-	2
H	6	5	11
M	18	4	22
R	-	1	1
V	1	-	1

Three highly anomalous areas, CON 1, CON 5, CON 15, (refer to final report 1975) are characterized by the presence to nearby fault systems and thus are favourable targets for detailed follow-up investigations.

5. RECOMMENDATIONS

1. Detailed prospecting in up ice direction of U-anomalies within areas of lodgement till and favourable structures e.g. Kerveso Lake area, Conflans Lake area.
2. EM and Mag ground survey in U-anomalous areas in order to verify the mapped faults and to locate other structures as possible U-traps.