EXPLORATION GÉOLOGIQUE

MINISTĒRE
DES RICHESSES
NATURELLES

DIRECTION GĒNĒRALE
DES MINES

FORBES LAKE AREA

T.CLARK

PRELIMINARY REPORT

1977

DPV-452

MINISTERE DES RICHESSES NATURELLES

GEOLOGY OF THE

FORBES LAKE AREA

NEW QUEBEC TERRITORY

Preliminary Report

by

Thomas Clark

Placed on open file in February 1977.

DPV-452

INTRODUCTION

Location and Access

The area lies about 325 km NW of Schefferville, and 110 km SW of Fort Chimo. It is bounded by latitudes 57°15' and 57°30', and longitudes 70°15' and 69°15' and comprises, from west to east, a small portion of N.T.S. map 24E/8 (Lost Cache Lake), the whole of N.T.S. 24F/5 (Forbes Lake) and the west half of N.T.S. 24F/6 (Limestone Falls). The map-area covers an area of about 1500 sq. km.

The area may be reached by float-plane from Schefferville or Fort Chimo. The largest lakes and the Caniapiscau River are suitable for float-planes. However, some parts of the area are lacking in large lakes, and access by helicopter (available at Fort Chimo) is more practical. Caniapiscau River is the only river that is easily navigated by canoe.

Description of the Area

The highest point in the map-area (408 meters) lies northwest of Forbes Lake, where there are some prominent ridges with steep western flanks. The central part of the area is flat (about 200-250 meters in elevation), and is characterized by widespread moraine deposits. The topography in the eastern part of the area is noted for its pattern of parallel ridges and valleys. Thick sand and gravel deposits form terraces along the major rivers in the area (Aigneau, Forbes, and Caniapiscau). Active sand dunes are present on Forbes River.

Sheltered areas like river valleys have a subarctic forest cover of spruce and tamarack, but hills and uplands are devoid of trees or are sparsely treed. Nevertheless, there are sufficient trees in all parts of the area with which to build a camp.

Previous Work

The area lies within a region mapped by Fahrig (1965)* at the scale of 1 inch to 4 miles, and north of areas mapped by Ciesielski (1976) and Dressler (1973) at the scale of 1 inch to 1/2 mile. In addition, parts of the area were mapped by Bergeron (1954, 1952) and by the geologists of various mining companies.

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* References are listed at the end of the report.

Field Work

This report describes the results of part of the work carried out during the summer of 1976. Traverses were carried out at 1/2 mile intervals or less, in areas of good outcrop. In areas lacking in outcrop, traverses were spaced more widely; most such areas were examined from the air.

GENERAL GEOLOGY

Summary

Table 1 presents a list of the formations exposed in the map-area. The area is underlain mainly by Proterozoic sedimentary rocks belonging to the Kaniapiskau Supergroup of the Labrador Trough. In the western part of the map-area, these rocks are generally in fault contact with Archean granitic rocks. The Proterozoic sequence begins with quartz sandstones (Wishart Formation), which are conformably overlain by red cherts, shales, siltstones, and ferruginous sandstones (Ruth Formation). These are conformably overlain by iron oxide and iron carbonate iron formations (Sokoman Formation), which are followed disconformably by conglomeratic sandstones and interbedded siltstones and shales (Menihek Formation). Stratigraphic relations higher in the sequence are less certain. A unit of arkose, sandstone, conglomerate, siltstone, and dolomite occurs near the western margin of the Proterozoic rocks, and may be correlative with the Chioak Formation. At one locality, a dolomite unit (Abner Formation) is overlain conformably by a sequence of sandstones and iron formations. Bands of interbedded shale, siltstone, dolomite, and sandstone lie within the area underlain by the Abner Formation. A band of volcanic rocks lies within the Abner Dolomite near the east boundary of the map-area; the west side of the volcanic band is in fault contact with the Abner.

Archean (Unit 1)

Archean rocks form the western boundary of the Proterozoic sequence of the Labrador Trough. Although the contact is nowhere exposed in the map-area, it is thought to be a fault on the basis of the structure and the Proterozoic stratigraphy.

The Archean rocks are predominantly intrusive. Most abundant are medium grained to coarse grained, grey, biotite and biotite-hornblende granodiorites and

Table 1. Table of Formations

<table>
<tr><td colspan="4">Quaternary (Pleistocene and Recent)</td><td>Unit 13</td><td>Moraine deposits, sand, gravel, boulders.</td></tr>
<tr><td colspan="6">UNCONFORMITY</td></tr>
<tr><td rowspan="16">Proterozoic</td><td rowspan="16">Kaniapiskau Supergroup</td><td>Montagnais Group</td><td></td><td>Unit 12</td><td>Volcanic and intrusive rocks (perhaps in part correlative with Abner Fm).</td></tr>
<tr><td colspan="4">Relations unknown</td></tr>
<tr><td rowspan="8"></td><td rowspan="8"></td><td>Unit 11</td><td>Uncorrelated shale, siltstone, dolomite, and sandstone.</td></tr>
<tr><td colspan="2">Relations unknown</td></tr>
<tr><td>Unit 10</td><td>Uncorrelated sandstone with magnetite-rich beds.</td></tr>
<tr><td>Unit 9</td><td>Uncorrelated iron formation.</td></tr>
<tr><td>Unit 8</td><td>Uncorrelated sandstone.</td></tr>
<tr><td>Unit 7</td><td>Abner Formation: dolomite, sandy dolomite.</td></tr>
<tr><td colspan="2">Relations unknown</td></tr>
<tr><td>Unit 6</td><td>?Chioak Formation: arkose, conglomerate, sandstone, siltstone, dolomite.</td></tr>
<tr><td colspan="4">?Disconformity</td></tr>
<tr><td rowspan="5">Knob Lake Group</td><td rowspan="2"></td><td>Unit 5</td><td>Menihek Formation: siltstone, shale, sandstone, conglomerate.</td></tr>
<tr><td colspan="2">Disconformity</td></tr>
<tr><td rowspan="3">Ferriman Supgroup</td><td>Unit 4</td><td>Sokoman Formation: iron formation, chert.</td></tr>
<tr><td>Unit 3</td><td>Ruth Formation: sandstone, siltstone, shale, chert.</td></tr>
<tr><td>Unit 2</td><td>Wishart Formation: orthoquartzite.</td></tr>
<tr><td colspan="6">Fault contact</td></tr>
<tr><td colspan="4">Archean</td><td>Unit 1</td><td>Granitic rocks, gneisses.</td></tr>
</table>

pink or grey leucocratic granitic rocks. In places, the leucocratic rocks intrude the biotite granodiorites. A mineral foliation, moderately to well developed in most of the intrusive rocks, strikes east to northeast, and is truncated by the Proterozoic contact. Thin pegmatite and quartz veins are locally present, but they are not common. In many places, the intrusive rocks (particularly the biotite and biotite-hornblende granodiorites) contain abundant melanocratic xenoliths of foliated diorite and hornblendite, massive ultrabasic rock, and paragneiss.

Wishart Formation (Unit 2)

The Wishart Formation outcrops sporadically along the western margin of the Trough from Aigneau River to the southeast corner of the Forbes Lake sheet.

The Wishart typically consists of white, pink, grey, or dark grey, medium to fine grained orthoquartzite. Some sandstones are somewhat ferruginous; some are slightly feldspathic. Rarely, the sandstones have a carbonate cement. Dolomite beds form a minor component of the formation in a very few places. Beds range from 1 cm to 2 m in thickness. The total thickness of the Wishart in the map-area is not known, but over 14 m have been measured.

Ruth Formation (Unit 3)

The Ruth Formation outcrops only sporadically beneath the Sokoman Formation, and in fact, may be absent in places. The Ruth has been identified in the NE corner of the Lost Cache Lake sheet, and in the Forbes Lake sheet, northwest and south of Forbes Lake. Its total thickness is unknown, but up to 12 m have been measured.

The Ruth Formation in the map-area appears to be predominantly a rather ferruginous sandy to silty unit. Fissile shaly horizons have been observed in a few places (for example, south of Forbes Lake), but they seem to be of subordinate importance. Lean red chert (in places with abundant quartz veins) is locally important (for example northwest and south of Forbes Lake), and appears to be located near or at the base of the Ruth. Bedding thickness in the Ruth ranges from 0.01 to 1 m.

The Ruth Formation at the east edge of the Lost Cache Lake sheet consists of red ferruginous sandstone, dark grey and grey-green siltstone and sandy siltstone and shale. The ferruginous sandstone appears to be most common close to the Sokoman contact, the darker sandstones and shales occuring at lower levels.

The top of the Ruth is very well exposed at a locality on the bank of Aigneau River. There, the Ruth is in conformable contact with jasper-hematite iron formation of the Sokoman Formation. The stratigraphy established at this locality is as follows:

Table 2. Upper Ruth Formation

Sokoman Fm.	iron-formation: interbedded intraclastic red chert and metallic layers	> 12 m
Ruth Fm.	sandstone: red, ferruginous	1 m
	sandstone: interbedded red ferruginous and green sandstones (thin bedded)	0.5 m
	sandstone: green	2.5 m
	covered interval	5 m
	sandstone and siltstone: interlaminated green sandstone-siltstone and red ferruginous sandstone	3.5 m
	covered interval	

The sandy and ferruginous characteristics of the Ruth suggest that it is a transitional facies between the Wishart orthoquartzites and the Sokoman iron formations.

Sokoman Formation (Unit 4)

The Sokoman Iron Formation outcrops almost continuously along the western edge of the Proterozoic rocks in the map-area. Two broad types of iron formation have been recognised: an oxide iron formation consisting of chert and iron oxides (magnetite and hematite), and a carbonate iron formation consisting of chert, iron carbonate, and iron silicates. The two types are normally separable in the field, but intermediate types appear to exist.

Northwest of Aigneau River no complete sections through the Sokoman have been observed, but the stratigraphy can be pieced together from local sections. In this area, the Sokoman consists of the oxide member (at the base), overlain by the carbonate member. The base of the Sokoman is made up of red oolitic chert layers with a variable proportion of interbedded iron oxide-rich metallic layers. Iron oxides are also commonly disseminated in the cherty rocks. Bedding thickness ranges from less than 1 cm to 10 cm. At one locality, there are a few carbonate pods in the oxide iron formation close to the Ruth contact. At least 11 m of oxide iron formation with red chert is exposed at one place northwest of Aigneau River. Apparently above the red chert-iron oxide iron formation, there are over 43 m of fissile iron formation consisting of thin interbeds of grey, dark grey, and green-grey chert (commonly with very fine grained disseminations of iron oxides), and iron oxide-rich layers. Red chert is uncommon in this interval. In places, the grey cherts are poor or lean in iron oxides. The total thickness of the oxide member in this area is estimated at over 53 m. The beginning of the carbonate member is marked by the appearance of iron carbonate-rich layers, which are interbedded with grey cherts (commonly brecciated). Red chert layers are conspicuous near the base of the carbonate member in a zone whose thickness reaches 23 m. Higher up, red chert disappears, and the sequence consists of over 45 m of interbedded brown iron carbonate-rich layers and grey chert, bedding thickness being 0.5 to 5 cm. Commonly towards the top of this member, the iron carbonate is concentrated in spots whose diameter reaches 1 cm. The total thickness of the carbonate member northwest of Aigneau River is estimated to be in excess of 60 m.

South of Forbes Lake, the Sokoman stratigraphy is difficult to interpret because of faulting and folding. It is apparent, however, that an oxide member underlies a carbonate member. The oxide member rests on the ferruginous sandstone of the Ruth Formation, and consists, at its base, of interbedded oolitic red chert and metallic layers. Bedding thickness ranges from a few mm to a few cm. Brecciati of chert layers and slump structures are very commonly-observed indicators of soft-sediment deformation. Upward in the sequence, red chert layers become more abundar at the expense of metallic layers. The carbonate member consists of interbeds of r chert, grey chert, and brown iron carbonate-rich rock. Locally, the carbonate iro formation is spotted. In the area south of Forbes Lake, there is evidence of silicification and of considerable recrystallization of the cherty rocks. Red chert seems to be more abundant south of Forbes Lake than northwest of Aigneau River.

Southwest of Forbes Lake, the carbonate iron formation is seen in contact with the Menihek Formation. There, the normal carbonate iron formation is overlain by a 1 meter-thick bed of pale chert, which marks the top of the Sokoman. This is overlain by a unit of jasper-pebble conglomerate, followed by dark grey to black, medium grained sandstones (locally with a few small grey chert pebbles) belonging to the Menihek Formation.

Menihek Formation (Unit 5)

The Menihek Formation underlies a large area in the centre of the Forbes Lake sheet. To the west and southwest, it is bounded by the Sokoman Formation, which it overlies disconformably. Its eastern limit is uncertain, because the boundary between the Menihek and Larch River Formations (which formations consist of very similar rocks) has not yet been established.

The total thickness of the Menihek Formation is not known, although it must be considerable.

In the vicinity of Forbes Lake, the Menihek consists of two members. The lower member is a well-bedded, grey orthoquartzite (locally feldspathic) containing numerous 0.01 to 1 m-thick conglomerate beds. Grey chert pebbles are most common; however, white quartzite pebbles (fairly common) and jasper pebbles (generally rare) are also present. Within this member, two beds of conglomerate containing abundant jasper pebbles have been observed. Pebbles are sub-spherical to elongated and well rounded to sub-angular, and are contained in a quartz sandstone matrix. Channel structures and cross-bedding are locally observed. The thickness of this member is over 100 metres. At one locality south of Forbes Lake, it is apparent that the conglomeratic sandstone member conformably overlies about 5 m of interbedded grey sandstone-siltstone, thin grey and red chert beds, and ferruginous siltstones and shales. The conglomeratic member has been found south and west of Forbes Lake, but appears to be absent northwest of Forbes Lake.

The upper member, of unknown thickness, consists mainly of grey and greenish-grey (very rarely reddish) siltstones and interbedded dark grey to black shales. Locally, shales or grey to dark grey sandstones are the predominating rocks. In two places near Forbes Lake, thin grey chert beds were observed in the siltstones. Dolomite beds are very rare, but dolomitic concretions from several cm to 0.6 m across are locally quite common in the siltstones. Near Forbes Lake (particularly to the south of the lake), the member is fissile, and commonly consists of grey siltstones with black shaly laminations. North and northeast of Forbes Lake, the Menihek is generally less fissile, due to an increase in the thickness of siltstone beds (commonly 0.3 to 1 m, locally greater); such siltstones tend to have a conchoidal fracture. In places in the upper member, small channel structures, slump structures, graded bedding, and cross-bedding can be observed.

Unit 6

Unit 6, a heterogeneous sandy unit, occurs along the western margin of the Trough in the Forbes Lake and Lost Cache Lake sheets. It also occurs beneath the iron formation in the southeast corner of the Forbes Lake sheet and south and southwest of Forbes Lake. Its stratigraphic position has not yet been established, but it may be correlative with the Chioak Formation (Bérard, 1965). Its aggregate thickness is estimated to be in excess of 200 meters.

The base of this unit is exposed in the northeast corner of the Lost Cache Lake sheet. The unit lies probably disconformably on interbedded grey-green and red-brown, argillaceous, laminated siltstones whose total thickness is over 135 m. Near the top of the latter sequence, there are a few thin arkose beds intercalated with the siltstones. The siltstones are followed abruptly by over 12 m of interbedded arkoses, quartz sandstones, and conglomerates, all with dolomitic cement. Pebbles in the conglomerates are well-rounded, and are mainly pink granite, but some white quartzite and a few red chert pebbles are also present. Cross-bedding, channelling, and graded bedding are commonly-observed structures. Higher up, Unit 6 consists of grey-green and red-brown siltstones and shales which are interbedded with considerable dolomitic sandstone, sandy dolomite, and dolomite. The dolomitic beds are from a few cm to over 8 m thick. The thickest dolomitic sandstone bed is markedly pisolitic; thin dolomite beds commonly exhibit slump structures. Locally present are reddish siltstone and arkosic sandstone beds. Thin horizons of grey- and red-chert pebble conglomerate with a dolomitic matrix are present in the siltstones at one locality. Total thickness of the siltstones and dolomitic rocks is probably at least 30 m.

Northwest of Forbes Lake, just east of Aigneau River, Unit 6 consists of a sequence of fine to coarse grained grey sandstones (locally with dolomite fragments grey siltstones, arkoses, conglomerates with granite, grey- and red-chert pebbles and dolomitic cements, and red-brown dolomites. Assuming no structural repetitions, the sequence must have a thickness of at least 180 m. North of Aigneau River in the Forbes Lake sheet, Unit 6 consists of dolomitic arkoses and conglomerates to the south and dark grey to black feldspathic orthoquartzites with local dolomite and dolomitic sandstone beds to the north.

In the southeast corner of the Forbes Lake sheet, Unit 6 consists of grey siltstones (thick bedded to laminated) and generally dark grey, fine grained to coarse grained quartz sandstones, which are locally interbedded with dolomite, dolomitic shale, and shale. In one place, conglomerate with pebbles of grey chert was observed.

South and southwest of Forbes Lake, Unit 6 consists mainly of medium grained (also fine and coarse grained) pink, red, and grey arkoses. Arkose beds are from a few mm to a few tens of cm thick, and some show excellent cross-bedding. Dolomitic sandstone and siltstone beds and pods (commonly cross-bedded) are locally conspicuous. Of quite rare occurrence are conglomeratic beds containing pebbles of grey and black chert.

If Unit 6 correlates with the Chioak Formation, then the underlying green and red siltstones probably belong to the upper Menihek Formation.

Abner Formation (Unit 7)

The Abner Formation underlies a band up to about 12 km wide in the Limestone Falls (W½) sheet. A large isolated outcrop of dolomite probably belonging to the Abner lies within an area underlain by Menihek siltstones in the Forbes Lake sheet. South of Forbes River in the northwest corner of the Limestone Falls (W½) sheet, the Abner is overlain by sandstones and iron formations. Similar rocks occur elsewhere along and near the western margin of the Abner Formation, but the stratigraphic relations with the Abner are less clear.

Dolomite is the most abundant rock in the Abner Formation, but there is also considerable sandy dolomite and dolomitic sandstone interbedded with the normal dolomite. Dolomitic sandstone layers are commonly cross-bedded. Thin grey and black chert layers and pods are found locally in the dolomite. In places, thin (less than 1 m) argillaceous siltstone and shale beds occur interbedded with the dolomite. Dolomite is most commonly grey, but also occurs in the colours of white, yellow, orange, pink, and mauve. Dolomite may be massive,thin-bedded, or laminated.

Of very common occurrence are thin beds (less than 0.5 m thick) of intraformational conglomerate, in which grey dolomite or cherty dolomite fragments are contained within a somewhat sandy dolomitic matrix.

Stromatolitic horizons are very common, and range from a few centimeters to a few meters in thickness. Stromatolites are commonly bulbous in shape, and measure 2 cm to 1 m in diameter.

The tops of ridges are commonly underlain by massive grey dolomite, while the flanks contain the more thinly bedded and conglomeratic dolomite. This feature suggests that the stratigraphy repeats itself from ridge to ridge; however, there are no marker horizons to confirm the hypothesis.

Units 8, 9, and 10

A sequence of sandstones and iron formations is well exposed in the NW corner of the Limestone Falls (W½) sheet (lat. 57°26'). The sequence appears to lie conformably on dolomite of the Abner Formation. Several other bands of iron formation outcrop along and near the western margin of the Abner. These are tentatively correlated with Unit 9, but their stratigraphic position is uncertain, and some may belong to the Sokoman Formation. The uncertainty is due in large measure to the variability in the stratigraphy from band to band.

The sequence established at the northernmost outcrops (lat. 57°26') is as follows:

Table 3. Units 8, 9, and 10

Unit 10	sandstone: laminated, grey-green, with thin magnetite-rich red-brown weathering silty or argillaceous layers	15 m
Unit 9	iron formation: banded silicate-carbonate iron formation, consisting of layers of grey chert and Fe-carbonate-rich rock	15 m
Unit 8	quartz sandstone: grey, locally dolomitic; laminated near base	at least 10 m
Abner Fm.	dolomite	

Abrupt conformable contacts separate each of these units. At another locality nearby, there appears to be a second unit of iron formation lying above Unit 10. The contact between them is not exposed, and it is not possible to confirm that the two units are conformable. The stratigraphy of this band of iron formation is as follows:

Table 3a

covered interval	
chert: bedded, grey-green	8 m
chert and SCIF: interbedded grey-green chert and silicate-carbonate iron formation (SCIF); the SCIF is spotted; jasper fragments in the iron formation locally;	8 m
HIF: hematite iron formation (HIF): hematite disseminated in a red pelletoidal chert	2.5 m
SCIF and HIF: interbedded spotted SCIF and HIF	1 m
HIF	1 m
SCIF: spotted	1 m
covered interval	

The thin band of iron formation centred at lat. 57°19' consists of dark grey magnetite-bearing quartz sandstone and siltstone, which are overlain by a sequence of banded oxide iron formation, grey chert, and conglomerate with red chert fragments. The band appears to be separated from the Abner Dolomite to the east by a fault.

Unit 11

Rocks of Unit 11 outcrop in the Limestone Falls (W½) sheet in the form of bands or irregular zones within or at the margin of the Abner Dolomite. Although contacts with the Abner Formation are difficult to interpret, in most cases they may be faulted. The thickness of the unit is not well established, but about 30 m are locally exposed.

East of the Caniapiscau River in the southeast corner of the Limestone Falls (W½) sheet, Unit 11 consists of interbedded dark grey shale, greenish siltstone, dolomite, and quartz sandstone. The long band west of the Caniapiscau River consists of interbedded red, green, and grey siltstones and shales, grey quartz sandstones, and dolomite. Bedding thickness is typically on the scale of several centimeters.

Unit 12

Volcanic and intrusive rocks of Unit 12 underlie a 1 mile-wide band oriented NW-SE in the Limestone Falls ($W\frac{1}{2}$) sheet. The band consists mainly of grey-green and grey schists rich in chlorite and containing small amounts of disseminated pyrite. In some places, feldspar phenocrysts are visible, and in one place, the schist contains small, lenticular, black, cherty fragments. The rocks probably comprise deformed gabbros, volcanic flows, and pyroclastic rocks. In places, particularly in the eastern half of the band, there are dolomite beds within the volcanic rocks.

To the west, the volcanic rocks are in fault contact with the Abner Dolomite. The eastern contact is not exposed.

STRUCTURAL GEOLOGY

The Proterozoic rocks show a variation in structural style from west to east in the map-area. Along the western edge of the Trough, dips are generally easterly at angles of 10^{o} to 70^{o}. Tops of beds also face easterly. Lithologic repetition and superposition of older rocks on younger indicate the major importance of thrust faulting in that area. The fact that dips are commonly over 20^{o}, even very close to the Archean contact, supports this interpretation. Locally, vertical and near-vertical dips testify to a strong deformation near the western margin of the Trough. Although the rocks are not folded in many places, small folds whose axes trend in a large range of directions are locally conspicuous. Offsetting of the Archean-Proterozoic contact and of formational contacts within the Proterozoic indicates that cross-faulting has also occurred.

The central part of the area, underlain mainly by the Menihek Formation, is well folded, and dips range from shallow to steep. In places, large-scale gentle warping of the beds gives rise to shallow dome and basin structures. In other places, the beds are folded into open to close synclines and anticlines. Small scale folds are commonly concentric.

In the area underlain by the Abner Dolomite, beds dip moderately to steeply, mostly to the east, but also to the west. Tops of beds face both east and west. In this area, the structure is dominated by close inclined and overturned folds, and by thrust faults. Small scale folds are similar. Large-scale warping about NE-SW trending axes has resulted in NW and SE plunging lineations.

ECONOMIC GEOLOGY

In the early 1950's, the map-area saw extensive prospecting for iron (see the publication "Iron in Québec", Special Paper 12). Several zones of iron enrichment have been discovered, notably 3 km south and 2 km northwest of Forbes Lake, and 2 km northeast of North Ring Lake.

Currently, prospecting for uranium is increasing in importance in the Labrador Trough. The possible correlation of Unit 6 in the present map-area with the Chioak Formation of the northern Labrador Trough is important in view of the occurrence of a significant uranium showing in that formation near Merchère Lake (outside the northern boundary of the map-area).

Very low concentrations of galena were discovered at one locality in the Abner Dolomite near the Caniapiscau River (see map). In addition, a trace of chalcopyrite was noted in an arkose of Unit 6.

GEOCHEMISTRY

Stream sediment samples from numerous water courses in the map-area have been sent to the Department's laboratories for analysis. The sampling sites are shown on the map accompanying the present report and the results are given in table form at the end of the report.

REFERENCES

BEDARD, J.
1965 *Bédard Lake area, New Québec;* Ministère des Richesses naturelles, Québec; geological report 111.

BERGERON, R.
1952 *Geology of the Forbes Lake area, Ungava;* Unpub. M.A. thesis, Columbia University.

1954 *A study of the Quebec-Labrador iron belt between Derry Lake and Larch River.* Unpub. D.Sc. Thesis, Laval University.

CIESIELSKI, A.
1977 *Contact Archéen-Protérozoïque entre les lacs Forbes et Sénat;* Ministère des Richesses naturelles, Québec; preliminary report, DPV 449.

DRESSLER, B.
1973 *Geology of the Lalande Lake area, New Québec Territory;* Ministère des Richesses naturelles, Québec; preliminary report, DP 192.

FAHRIG, W.F.
1965 *Lac Hérodier, Québec;* Geological Survey of Canada; map 1146A.

RESULTATS D'ANALYSES GEOCHIMIQUES
(en ppm sauf Hg qui est en ppb)

ECHANTILLONS (carte) (original)	CU	ZN	PB	NI	CO	MN	AG	BA	LI	U	SN	HG	AS	MO	PF*
1 - 172	7	14	2	8	3	50	0.1	30	2.5	1	2	20	0.8	1	6.
2 - 174	27	18	3	9	7	412	0.1	130	6	15	2	65	23	1.5	10.
3 - 118	12	46	3	18	4	270	0.1	40	10	1	2	30	2.4	1	2.
4 - 124	8	30	2	12	5	180	0.1	34	7	1	2	20	1.6	0.5	0.4
5 - 119	120	100	4	24	2	70	0.1	42	9.5	4	2	-	-	-	14.4
6 - 116	40	174	8	32	9	272	0.1	86	25	2	2	145	-	-	11.2
7 - 125	20	74	6	14	9	538	0.1	68	9.5	7	2	5	2.3	2	19.6
8 - 123	46	114	10	26	10	280	0.1	100	16.	4	2	120	3.4	-	12.4
9 - 120	21	68	7	12	10	1866	0.1	96	4.5	7	2	100	7.5	-	16
10 - 127	53	144	35	16	11	724	0.1	66	7	6	2	-	-	-	24.4
11 - 128	39	118	14	17	10	670	0.1	56	10	6	2	5	35	-	22
12 - 133	8	36	5	11	7	2620	0.1	330	6	3	2	45	6.5	1.5	4.4
13 - 135	14	48	4	15	6	394	0.1	74	9.5	4	2	75	3.6	1	12
14 - 256	14	40	2	19	9	264	0.1	70	7.5	5	2	35	2.8	2	10
15 - 257	40	38	13	36	17	1526	0.1	192	7	7	2	5	1.8	1.5	23.6
16 - 259	14	64	7	28	16	900	0.1	108	13	6	2	40	4.9	1	4
17 - 169	15	50	5	18	16	592	0.1	50	10.5	6	2	25	1.2	32.5	6
18 - 171	8	64	2	11	9	1300	0.1	156	5.5	1	2	40	5	-	7.6
19 - 170	9	18	2	9	4	136	0.1	40	2.5	5	2	15	0.9	4	8.4
20 - 113	8	12	2	10	3	60	0.1	16	2	1	2	15	1	0.5	0.8
21 - 176	35	152	9	23	13	376	0.1	108	18	9	2	300	-	-	11.2
22 - 177	10	32	3	16	5	118	0.1	36	7	1	2	30	1.6	0.5	2
23 - 173	26	20	2	10	5	136	0.1	124	5	12	2	40	7.6	1.5	12
24 - 130	11	48	2	18	10	310	0.1	42	7.5	1	2	25	2.2	0.5	2
25 - 129	54	144	19	25	10	130	0.1	70	14	10	2	250	-	-	22
26 - 132	22	22	2	13	2	840	0.1	98	2.5	6	2	5	0.8	1.5	31.6
27 - 136	9	56	2	21	9	516	0.1	166	14	3	2	45	5.8	2.5	6
28 - 137	10	32	4	13	9	572	0.1	66	7.5	1	2	20	3.5	0.5	0.4
29 - 258	27	60	4	25	12	646	0.1	124	8.5	6	2	65	0.4	1.5	7.2
30 - 168	17	34	2	12	12	606	0.1	88	4	4	2	5	1.4	3.5	18
31 - 112	10	20	2	11	7	400	0.1	50	3.5	7	2	10	1.1	4	8
32 - 175	37	22	5	14	8	382	0.1	192	7.5	16	2	100	21.5	2	16.8
33 - 122	43	194	16	30	10	450	0.1	80	11	3	2	130	7.5	1.5	6
34 - 121	39	148	21	21	11	762	0.1	124	17.5	6	2	180	-	-	20
35 - 182	13	30	2	15	8	304	0.1	32	7	1	2	25	2.1	0.5	0.4
36 - 138	8	34	2	14	6	606	0.1	78	8.5	3	2	25	5.1	1	2
37 - 261	26	28	2	15	6	224	0.1	72	7	8	2	100	0.8	-	16
38 - 262	6	14	2	8	2	60	0.1	20	2	1	2	15	1.1	0.5	2
39 - 107	15	74	5	18	10	488	0.1	56	8	7	2	10	2.1	3.5	11.2
40 - 106	13	76	2	15	18	846	0.1	74	3.5	12	2	80	1.2	25	12.4
41 - 109	24	52	4	21	6	256	0.1	194	12	7	2	50	2.4	1	7.6
42 - 108	23	44	2	18	5	290	0.1	560	12	13	2	5	3.6	2	18
43 - 115	16	40	9	22	8	588	0.1	68	7.5	1	2	15	2.4	1	0.8
44 - 181	16	72	2	13	7	486	0.1	42	6.5	1	2	55	6.6	0.5	5.2

45 - 207	24	22	2	13	4	484	0.1	54	4.5	4	2	85	0.2	1.5	22
46 - 110	16	18	6	10	4	258	0.1	78	1.5	4	2	5	1.7	1	27.6
47 - 111	23	26	10	16	5	280	0.1	74	5	8	2	5	2	5	20
48 - 114	21	60	2	15	7	2640	0.1	790	10	7	2	5	25	3	22.4
49 - 167	8	22	2	11	2	616	0.1	240	3.5	5	2	5	0.7	2	18
50 - 154	41	58	6	16	3	84	0.1	46	7.5	4	2	25	-	-	14
51 - 208	38	48	2	14	9	1494	0.1	60	5.5	1	2	70	1.7	1	9.2
52 - 221	8	36	2	18	7	310	0.1	30	7.5	2	2	15	2.3	1	1.2
53 - 166	19	28	2	16	4	180	0.1	122	4	3	2	5	2.4	1.5	0.8
54 - 152	5	14	2	8	2	246	0.1	54	3	5	2	35	0.7	1	4
55 - 153	44	58	2	18	2	94	0.1	52	8	3	2	35	1.1	-	14.4
56 - 155	23	96	5	24	6	728	0.1	64	9.5	3	2	55	4.8	1.5	4
57 - 150	27	92	18	17	24	6880	0.1	272	11	6	2	10	29	20	22
58 - 103	32	60	5	22	7	218	0.1	102	10	17	2	5	4.2	1.5	19.6
59 - 180	5	22	2	14	10	420	0.1	40	6	1	2	15	2.7	2	0.8
60 - 165	7	12	2	8	2	78	0.1	38	2.5	3	2	30	3.4	2	4.8
61 - 164	10	32	2	12	6	550	0.1	100	6.5	15	2	50	6.8	7.5	6
62 161	8	20	2	10	3	116	0.1	50	2.5	1	2	5	2.1	0.5	4.8
63 - 162	12	30	2	14	4	468	0.1	70	8	16	2	5	3.3	3.5	6.4
64 - 160	3	10	2	5	2	36	0.1	16	1.5	1	2	5	2.8	0.5	0.8
65 - 163	15	48	3	21	15	3800	0.1	344	8	16	2	30	23	8.5	16
66 - 158	15	92	7	18	5	572	0.1	66	13.5	2	2	40	6	-	4
67 - 159	25	60	2	18	6	190	0.1	98	9	2	2	55	2	-	12
68 - 251	5	26	2	10	3	92	0.1	52	4	1	2	23	2.6	0.5	2.4
69 - 252	11	22	2	9	4	72	0.1	90	3	4	2	55	1.6	1	4.8
70 - 151	41	66	4	14	4	254	0.1	58	6.5	7	2	5	3	-	20
71 - 102	33	16	6	21	8	254	0.1	68	15	10	2	155	-	-	10
72 - 253	19	84	2	16	7	606	0.1	74	9.5	7	2	68	6.3	5.5	6.8
73 - 255	12	30	2	15	6	140	0.1	56	6.5	6	2	70	1.1	1.5	1.6
74 - 254	26	72	2	21	11	3810	0.1	390	6	11	2	45	7	6	16.4
75 - 217	12	52	3	19	5	632	0.1	60	9	5	2	30	3.2	1	3.6
76 - 218	14	40	3	20	7	2990	0.1	284	10.5	3	2	30	6.4	1.5	2
77 - 101	5	34	2	6	4	1050	0.1	186	4	3	2	25	0.8	1	3.6
78 - 100	4	16	2	8	4	92	0.1	44	2	1	2	5	2.5	1	2
79 - 250	6	10	4	7	2	74	0.1	46	2	5	2	20	0.2	0.5	2
80 - 131	32	40	10	12	12	1284	0.1	146	4.5	16	2	5	4.1	-	20
81 - 104	36	122	10	23	9	1700	0.1	394	11	17	2	40	7	3.5	20.4
82 - 211	13	190	2	23	24	7220	0.1	380	8.5	12	2	40	4.5	5.5	6
83 - 210	9	24	2	11	5	118	0.1	30	3.5	3	2	5	0.2	1	0.8
84 - 214	13	28	3	15	10	306	0.1	52	8	1	2	20	1.7	0.5	0.8
85 - 216	9	46	2	17	3	1208	0.1	140	9	4	2	30	3.7	1.5	4
86 - 215	9	26	2	14	8	322	0.1	32	6	1	2	10	2.4	0.5	0.8
87 - 205	15	76	2	20	12	6200	0.1	520	13	1	2	35	4	5	3.2
88 - 105	40	120	3	35	15	4720	0.1	1120	26	17	2	170	-	-	14
89 - 209	19	52	10	10	6	1120	0.1	74	2	1	-	-	1.7	-	1.2
90 - 212	6	22	2	10	8	214	0.1	28	3.5	1	2	10	1.1	0.5	0.8

* *Loss on ignition* / Perte au feu

L'ÉDITEUR OFFICIEL DU QUÉBEC
SERVICE DE LA REPROGRAPHIE
Février 1977