



QUEBEC DEPARTMENT OF NATURAL RESOURCES
MINERAL DEPOSITS SERVICE

PRELIMINARY REPORT
ON THE
GEOLOGY
OF
PRIVAT TOWNSHIP
ABITIBI-WEST COUNTY
QUEBEC

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Ministère des Richesses Naturelles, Québec	
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INTRODUCTION

Privat Township forms part of the LaSarre region of Abitibi-West County in the northwestern section of the province (latitude 48°N, longitude 79°W). The paved highway between the regional centres of LaSarre and Amos passes through the northern part of the township; the major mining centre of Rouyn-Noranda lies about thirty-five miles to the south. The town of Taschereau, a division point on the northern transcontinental line of the Canadian National Railways, is the chief centre of population in the township. A large wood processing plant forms the principal industry.

The one hundred-square miles which comprise the township has been divided by cadastral survey into ranges and lots. Excellent access to all parts of the township is provided by a somewhat irregular grid of range and lot roads, with additional avenues of approach provided by Loys^{*} Lake and the shallow Lois River. In times of low water the Lois River is barely navigable by outboard-equipped motor boat because of many shallow sections (less than one foot) of muddy bottom heavily overgrown by water plants.

Lumbering is the principal activity of the population; in the past, farming was of considerable local importance, but it is much reduced at the present time. The north shores of Lois Lake attract a number of tourists, both local and international, during the summer

* Loys - here named after an English-speaking girl, and therefore the terminal "s" should be pronounced in French.

months. The waters of the lake are not muddied by clay as are most of the other lakes in the region, an attractive advantage.

The topography is low and for the most part gently rolling except for steep-sided outcrops of bedrock locally protruding through a covering of gravels and clay. Where the low-lying sections are largely swamp or muskeg a drainage system has not been established by the Ministry of Colonization. The original forest has long since been cleared, and away from the extensive tracts of farmland the forest is now largely small second growth poplar.

The township is bounded on the south by the long, east-west trending Lois Lake, which is drained by the north-flowing, shallow Lois River; this river roughly bounds the township on the west. Numerous other small, and generally shallow, lakes, the principal one of which is Lake Robertson, dot the surface of the township. Small streams and drainage ditches are numerous throughout the township - these generally are bounded by steep, heavily overgrown banks formed of glacial lake clays.

The bedrock is extensively covered by till, glacial lake clays, and fluvie-glacial and Recent sands and gravels, in many places to a thickness of over one hundred feet or more. This cover is a great hindrance to all forms of prospecting.

Mapping was carried out during parts of the field seasons of 1972 and 1973 by four-man parties using aerial photographs on a scale

of 1 inch equivalent to 1,000 feet. The mapping is now about two-thirds complete, and reveals the principal features, if not the intimate local details, of the geology.

The only published map, on a scale of 1 inch equivalent to 1 miles, is the long out-of-print Geological Survey of Canada "Taschereau Sheet". The area is covered by a recent Quebec airborne electromagnetic survey.

GENERAL GEOLOGY

The bedrock underlying Privat township is of Precambrian age; except for some late, northeasterly-trending diabase dikes, probably all of the bedrock units are of Early Precambrian, or Archean, age. These units form part of the Superior geological province of the Canadian Shield, and within that province one of the largest and most prominent "greenstone" belts.

The volcanic and plutonic lithotypes present, are overall typical of those found in the well-known and studied Noranda mining district to the south. The principal differences between the rock assemblage of the Privat area and that to the south, and possibly also to the north in the Normetal mining district, are:

- 1) the presence, locally, of basaltic lavas containing an unusually high content of magnesia (MgO) as a principal chemical component;

- 2) the presence of intrusive peridotite bodies, possibly genetically related to the high-magnesia basalts; and
- 3) the development of a strong zone of metamorphism and intense deformation within the volcanic assemblage spatially associated with numerous bodies of granite, granodiorite and various related types of migmatites.

The principal lava types present are pillow basalts and rhyolitic breccias. The latter rocks appear to form a broad anticlinal structure on the western side of the township, a structure which is enveloped on the south and east by younger basalts facing to the south. Flanking the anticlinal core on the north, and extending southeastwards across the township to its southeastern corner, is a poorly-exposed zone of highly-deformed pillowed basalts and breccias, tuffs, and possibly some definite sedimentary rock units (e.g., greywackes and slates).

A band of conglomerates, greywackes, and slates extends along the east-west axis of Lois Lake on the southern boundary of the township. These sedimentary units are apparently interlayered within the basaltic lavas, at least in part; some evidence, however, does suggest at least some local unconformable relationships.

Much of the northern and eastern part of the township is underlain by a soda-rich, biotite or biotite-hornblende, granite with broad marginal zones of granodioritic and more basic migmatites.

Except in the northwestern corner of the map-area, gabbroic rocks are not particularly well-developed in the township. Small late diabase dikes are widespread.

TABLE OF FORMATIONS

PLEISTOCENE AND RECENT

Sand and gravel
 Post-glacial glacial lake carved clays
 Glacio-fluvial sand and gravel
 Till

PRECAMBRIAN

Northeast-trending diabase dikes

ARCHEAN

North-trending diabase dikes
 Felsic and mafic dikes
 Granite and migmatites
 Gabbro
 Felsic and mafic dikes (in part related to the
 volcanism)

Lois Lake sedimentary rocks
 Basalt lavas and pyroclastic rocks
 Rhyodacite lavas and pyroclastic rocks

The Rhyolitic Lavas

The rhyolitic lavas seen are, overall, strongly schistose, and often, locally at least, strongly altered (carbonatized), so that their original character is obscured. They are typically white-weathering, fine-grained sericitic schists developed from both fragmental and massive lava types. The latered varieties weather very readily, and as a consequence form very poor outcrops, much overgrown with vegetation. In composition these rhyolitic rocks are probably rhyodacites, and possibly even dacites. They correspond stratigraphically to the rhyodacites of Roquemaure township, twenty miles to the west.

Southern Basaltic Lavas

The basaltic lavas of ranges I and II have been folded into vertically-dipping positions. On the basis of excellent pillow-top determinations they face to the south, but are otherwise little deformed. Pillowed units are the most prevalent type, but pillow breccias and flow breccias are locally prominent, particularly along the eastern shores of Lois Lake. These lavas are fawn-weathering, dark to medium green, fine-grained rocks, locally amygdaloidal and/or porphyritic in texture. Typically the pillows are thin skinned. In composition these lavas range from basaltic to andesitic.

Southeastern-trending Volcanic Rocks

Because of intense deformation and increased metamorphism the original nature of these volcanic units has in many exposures been blurred or even erased; indeed in some exposures highly stretched pillows can only be distinguished from layered tuffs in good exposures upon very close and careful examination.

Pillowed lavas appear to be the predominate rock type accompanied by lesser amounts of breccias and tuffs.

Lois Lake Sedimentary Rocks

For the most part exposed on islands and reefs in Lois Lake, these units are clearly sedimentary in origin in their finer phases. The coarser rocks are conglomerates, which could, and have been, mistaken for agglomerates. The clasts are clearly of volcanic origin, and the coarser rocks are probably debris flows moving downslope from a volcanic centre into deeper waters. The finer grained phases - greywackes and siltstones show excellent gradebedding they represent distant facies of the conglomerates.

The Lois Lake sedimentary band forms the locale for a regional AEM anomaly on the Ministry survey map. This anomaly extends for miles to the east into Manneville township, where the band appears to correspond with a group of outcrops shown on an earlier GSC map as greywacke.

Therefore these sedimentary rocks may have some regional stratigraphic significance.

Taschereau Granite and Related Rocks

The more central portions of the Taschereau granite body are made up of white-weathering, white, medium-grained biotite granite. Within several thousand feet of the main contacts with enclosing greenstones, this distinctive, cleancut rock type passes over into a reddish-brown weathering, light greenish-grey, granodioritic rock of variable composition, and finally into migmatite, i.e., a mixture of fragments, layers, or blocks of metamorphosed greenstones (amphibolites), either lying in or cut by numerous stringers and dikes of granitic to granodioritic material; locally may also be seen all the transitions of greenstone to granodiorite through feldspathization.

Some of the gabbroic rocks, if not all of them, cropping out in the northwestern corner of the township, have probably been derived from originally fine-grained mafic lavas (and possibly local peridotites) through recrystallization and feldspathization. This process of mafic migmatization can be seen to extend as far west as to the Ontario boundary, some thirty (30) miles west of the western boundary of the township.

Pegmatite stringers and dikes are conspicuous by their absence in the terrain around the Taschereau granite, as well as within the

body itself. Some of the fine-grained, porphyritic salic dikes observed cutting the greenstones may however be related to it.

STRUCTURAL GEOLOGY

The overall evidence provided by facing determinations (pillow tops, graded bedding), indicates that a regional anticline extends into the township from the west. The core of this anticline is made up of rhyolitic lavas capped by basaltic flows. The northern and southern flanks of this fold show a very marked contrast in both the degree of deformation and of metamorphic facies - the northern flank is composed of highly deformed lavas, breccias and tuffs in the amphibolite facies; the southern flank shows little deformation of primary structures beyond tilting into vertical attitudes, and is in the greenschist facies.

The major folding phase which formed this anticline has left no imprint on the rocks involved in the form of cleavages, lineations, or drag folds, at least so far as has been discerned. The overall trend of the folding is east-west to probably northeast-southwest, with a shallow plunge. The north flank of this early anticline structure is caught up in an intense deformation trending northwest-southeast, which has strongly disrupted primary structures (stretched pillows, fragments) and formed isoclinal folds with steep plunges. This second phase of deformation has resulted in the development of broad schistose zones. In the zones of second deformation, many

units are also strongly recrystallized to the amphibolite grade of metamorphism by the intrusion and migmatitic advance of granitic plutons.

A last but important phase of deformation is represented in massive units by numerous faults, and in well-layered rocks by kink layers trending approximately north-south and east-northeast-west-southwest. Locally these faults or kink layers are closely spaced (1 cm to 3 cm) and in the case of the kink layers create a strong late folding pattern with a vertical plunge. This last deformation appears in part to be related to the invasion of the folded volcanic units by the granitic rocks.

From a practical point of view, it should be noted that structure is locally very complicated and unpredictable. Caution should be exercised in extrapolating geological and/or geophysical data under covered areas.

ECONOMIC GEOLOGY

At least from time to time in Privat township over the past fifty years there has been considerable prospecting activity, including geophysical surveys and diamond drilling. The most extensive efforts appear to have been given over to the discovery of gold deposits, but in more recent years attention has been largely devoted to probing for extensions eastward of the Lyndhurst copper

mineralization. To date little mineralization of any significance appears to have been uncovered. The degree to which prospecting is inhibited by the considerable thicknesses of sand, gravel and clay cover, at least locally, can not at present be determined with any precision, and therefore an accurate evaluation of mineral potential is impossible.

The most important geological feature present in the township of interest to prospectors and mineral exploration companies is the main contact between rhyolitic lavas and overlying pillowed basalts. This feature is enhanced in interest by the presence of the Lyndhurst copper mineralization on the general trend of this contact to the west. Unfortunately the actual contact is not exposed anywhere in the township, nor for that matter can it be located with any precision because of a lack of critical outcrop.

Scattered showings and drill hole intersections of low grade gold mineralization have been encountered in many parts of the township and have locally stimulated extensive drilling companies with but marginal results.

Base metal showings are scarce and low-grade, but barren sulphides in small amounts are not at all uncommon. One remarkable occurrence of sulphides is as nodules or pebbles from 0.5 cm to 10 cm in diameter in the Lois Lake conglomerates and siltstones. In

these occurrences barren sulphides may compose up to about ten percent (10%) of the rock.

Sand and gravel adequate for local road building is present in the township. Granite for building stone could probably be obtained readily if required locally.