RECONNAISSANCE GEOLOGY OF THE WHITE BEAR RIVER (11P/14) AND DOLLAND BROOK (11P/15) MAP AREAS

by

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INTRODUCTION

The recently released 1:50,000 scale compilation maps of 11P/14 and 11P/15 (Smyth, 1979a) were spot checked during a ten-day period in August, 1979. Previous mapping at 1:63,360 scale was carried out by the Buchans Mining Company (Ledoux, 1957, and others) in the 1950's; these maps were available to Williams (1971) who produced a 1:250,000 scale map of the eastern half of the area. Riley (1959) produced a 1:253,440 map of the western half of the area.

The essential elements of the geology are a 10 km wide, roughly southeast-northwest trending belt of sedimentary, metasedimentary and minor silicic volcanic(?) rocks bounded to the north by a posttectonic megacrystic granite and to the south by a syntectonic megacrystic granite. The sedimentary belt terminates just east of Salmon River against highly deformed granite and gneiss. The belt continues westwards (Smyth, 1979a) and then southwestwards to the coast near La Poile where it has been subdivided into the La Poile Group and Bay du Nord Group (Cooper, 1954; Chorlton, 1979). To the east the belt is separated from the Ordovician Bay d'Espoir Group by 20 km of intervening granitoid rocks.

In the east of the map area, the metasedimentary belt can be subdivided into a southern belt of dominantly slates, argillites and probable silicic volcanic rocks in which metamorphic grade is lower greenschist facies and primary structures are preserved; and a northern belt of more highly deformed and metamorphosed slates and phyllites. In the west, this subdivision is not apparent and the sedimentary rocks show a southerly increase in deformation and metamorphism along the White Bear River (Smyth, 1979b). The ages of the sedimentary and volcanic(?) rocks are not known but are probably similar to the Bay du Nord Group to the west from which a U-Pb zircon age of 455 $\pm$ 15 Ma was recently determined (Dallmeyer, personal communication). The black graphitic slates in the metasedimentary terrain may represent the Caradocian sedimentary interval (D. Prince, personal communication) that is so well developd in central and northeastern Newfoundland (Dean, 1977).

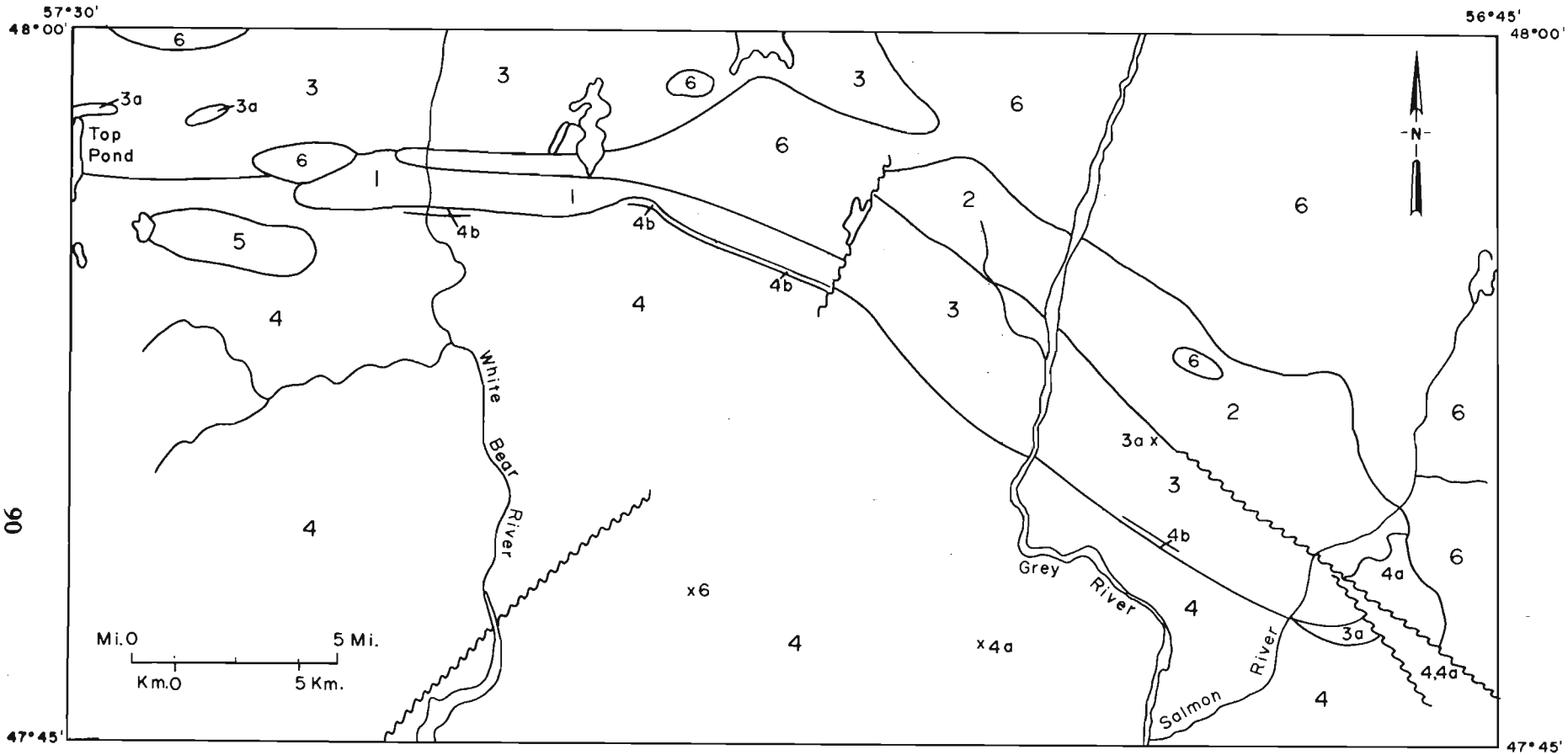
UNIT 1

Unit 1 consists of intermixed amphibolites, psammitic and semipelitic schists. It forms the most southerly exposures of the metasedimentary belt at White Bear River and extends up to 15 km to the east. The unit is extensively invaded by schistose granites and associated pegmatites, quartz veins and stringers. Locally, the metasediments have a migmatitic appearance.

The unit is bounded to the south by a mylonite which passes southwards into a megacrystic granite. Dikes of the megacrystic granite crosscut the main fabric of the schists, the schistose granites and early quartz veins.

UNIT 2

Unit 2 forms the northern part of the metasedimentary belt and consists mainly of psammitic and semipelitic schists metamorphosed to biotite grade or higher. Typical rock type is garnet-biotite schist. The belt passes southeastwards into a terrain dominated by deformed muscovite-garnet-leuco-granites and orthogneisses. Locally, exposures of the metasediments in the



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3 Slate, Phyllite, Conglomerate
3a Silicic volcanic(?) rocks

2 Meta-Greywackes, Garnet-Biotite Schist

1 Amphibolite, Psammitic and Semi-Pelitic Schist

6 Undeformed Megacrystic Granite

5 Deformed Quartz Gabbro

4 Deformed Megacrystic Granite.
4a Granite Gnesis and Migmatite
4b Mylonitic Granite

Salmon River contain up to 50% granite dikes and pegmatites. The granite dikes predate the main fabric (S_2) in the schists but in places can be seen to postdate the S_1 fabric. Xenoliths of paragneiss occur within the deformed granites.

The metamorphic grade of the metasediments decreases to the northwest into an area of poor exposure and the relationship with Unit 3 in this region was not determined.

UNIT 3

Unit 3 comprises the southern part of the metasedimentary belt in the Grey River - Salmon River area and consists of slates, phyllites, conglomerates and a possible extrusive silicic unit (Unit 3a). Similar low grade rocks (Unit 3b) also occur west of an intervening granite in the northwest of the area.

The most easterly rock type of the belt consists of a purple, aphanitic to finely crystalline, locally banded, siliceous igneous rock (Unit 3a). It was described as volcanic by Ledoux (1957) but similar rocks to the northwest of White Bear River are fine grained intrusives.

Pebble to cobble conglomerate (Unit 3b) outcrops in Salmon River and to the southeast. It contains up to 90% quartzite clasts with shale, sandstone and feldspar clasts making up the remainder. The conglomerates are clast supported and occur in beds up to 1 m thick interbedded with slates and phyllites. The source of the quartzite clasts is not known; however, extensive bands of quartzite occur 20 km to the south near the community of Grey River (Williams, 1971, Higgins and Smyth, this volume).

The predominant rock types of Unit 3 consist of black to dark gray slates, phyllites and argillites. Graphitic slates are present throughout the unit and are well exposed in a stream gully west of Grey River. They have a strong cleavage co-planar to bedding, that is folded about northerly inclined F_2 folds. The associated S_2 fabric is weakly developed. Locally, the F_2 folds are downward facing indicating that the early folds were flat lying.

UNIT 4

The metasedimentary belt is bounded on its southern margin by a deformed, coarse grained biotite granite with anhedral megacrysts of microcline and numerous associated pegmatites. Unit 4 appears to be an syn D_2 intrusion. Within Unit 4 small areas of granite gneiss and migmatite (Unit 4a) were noted. The gneiss appears to be gradational into deformed granite.

A mylonitic granite (Unit 4b) occurs at or close to the boundary between Unit 4 and the metasedimentary belt. In White Bear River, zones of mylonite can be seen to grade into the deformed megacrystic granite.

UNIT 5

Unit 5 consists of deformed coarse grained quartz gabbro with hornblende crystals up to 4 cm long. Its relationship to Unit 4 was not determined.

UNIT 6

Unit 6 consists of undeformed, porphyritic, biotite-hornblende granodiorite with associated aplite dikes and occurs predominantly to the north of the metasedimentary belt. It postdates the two deformations of the metasediments and intrusive contacts are common. Garnet-muscovite aplites are associated with Unit 6.

MINERALIZATION

A number of scheelite occurrences were discovered by the Buchans Mining Company at the contact of Unit 6 and Unit 2. These were not re-examined in this survey. Disseminated pyrite is common in the shales and pelitic schists.

ACKNOWLEDGEMENTS

Bill Hudson is thanked for able assistance in the field. Mike Lavoy of Viking Helicopters provided excellent helicopter support and Wayne, Sid and Jim are thanked for their logistical assistance. Lesley Chorlton reviewed the manuscript.

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