

A new mineral occurrence in Yukon-Tanana Terrane near Little Salmon Lake (105L/2), central Yukon

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ABSTRACT

A new occurrence of sulphide-bearing iron formation is reported from a roadcut of Yukon-Tanana Terrane rocks along the Robert Campbell Highway, near Little Salmon Lake. This new discovery confirms the high potential for volcanogenic massive sulphide deposits similar to those of the Finlayson Lake district in Yukon-Tanana Terrane southwest of Tintina Trench.

RÉSUMÉ

Un nouvel indice de formation de fer sulfurée a été découvert dans un affleurement du terrane de Yukon-Tanana le long de la route Robert Campbell, près du lac Little Salmon. Cette nouvelle découverte confirme le haut potentiel pour des gisements de sulfures massifs volcanogènes, comparables à ceux de la région de Finlayson Lake, au sein du terrane de Yukon-Tanana au sud-ouest du sillon de Tintina.

INTRODUCTION

A new sulphide occurrence anomalous in copper was discovered in southern Glenlyon map area (UTM Zone 8, 520416E, 6895423N; NTS 105L/2; Fig. 1) during geological reconnaissance along the Robert Campbell Highway, near Little Salmon Lake. Detailed studies along Little Salmon Lake (Oliver and Mortensen, 1998) and regional mapping along strike to the north (Colpron, this volume) have confirmed the correlation of a 30-50 km-wide, northwest-striking belt of metasedimentary, metavolcanic and metaplutonic rocks in the centre of Glenlyon map area within Yukon-Tanana Terrane (Fig. 1). Restoration of 450 km of dextral displacement along Tintina Fault positions strata in the Little Salmon Lake area south of Yukon-Tanana Terrane rocks in the Finlayson Lake district which contains numerous volcanic-hosted massive sulphide (VMS) deposits and occurrences (Hunt, 1997).

DESCRIPTION

The roadcut described here is on the north side of the Robert Campbell Highway, about 12 km west of Drury Creek (Fig. 1). It consists of white muscovite-quartz-feldspar augen schist (felsic metavolcanic rocks).

Sulphide mineralization (pyrite-chalcopyrite) occurs in two horizons of magnetite iron formation. One horizon (10-15 cm thick) is located about 30 m from the west end of the roadcut and consists of disseminated pyrite (~15%), magnetite (1-2%) and chalcopyrite (trace) in a foliated matrix of chlorite-epidote-muscovite-calcite-quartz-plagioclase¹. Pyrite occurs as euhedral to subhedral grains up to 1 mm. Chalcopyrite is most commonly present as small inclusions ($\leq 10 \mu\text{m}$) within the pyrite but also occurs as interstitial grains in the matrix. Magnetite forms small (10-30 μm) elongated grains. Assay results representative of this horizon (98LS-1a) are presented in Table 1.

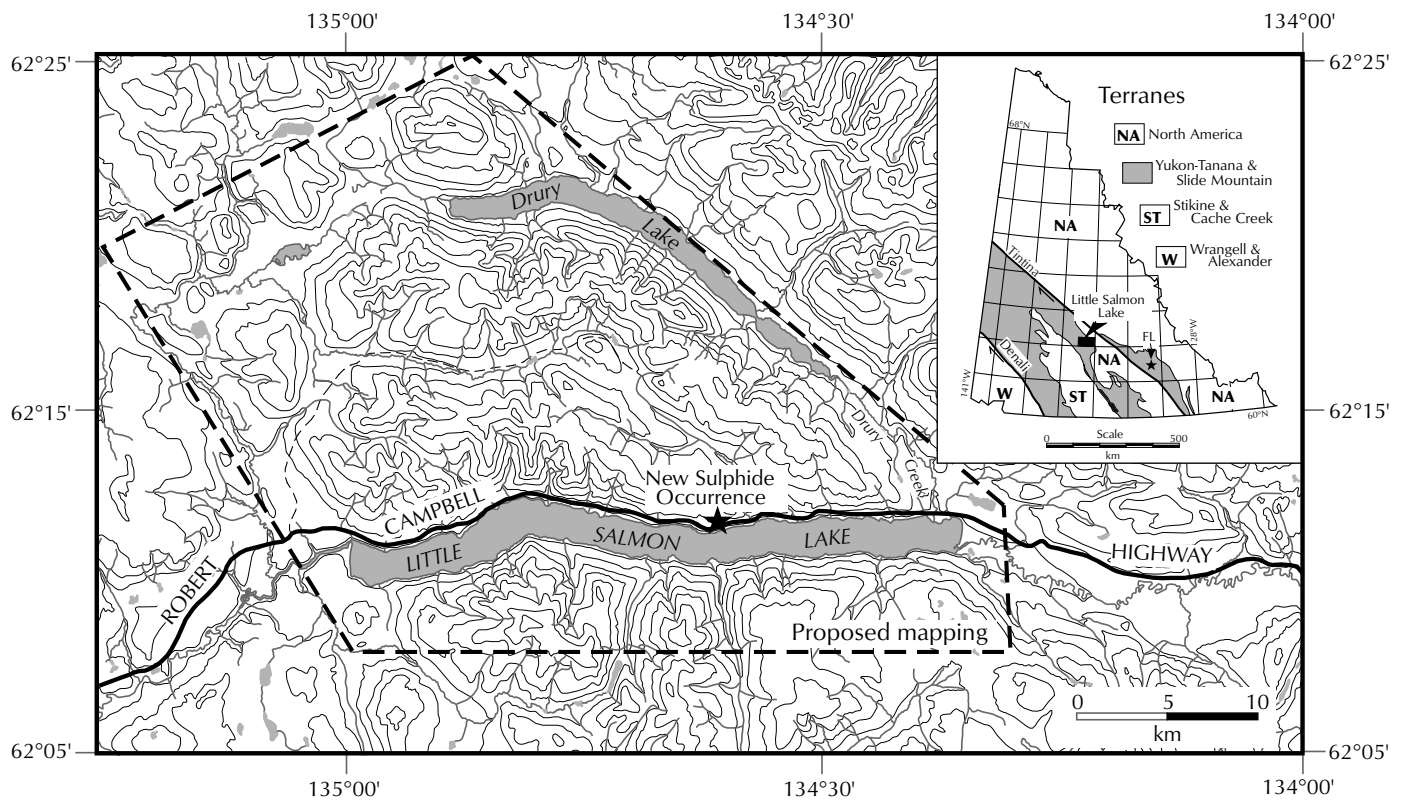


Figure 1. Location of the new sulphide occurrence (star). Inset shows the Little Salmon Lake area with respect to distribution of Yukon-Tanana terrane in Yukon and the Finlayson Lake district (FL). Heavy dash line indicates area of proposed bedrock mapping as part of the Glenlyon project.

¹Matrix minerals are listed in decreasing order of relative abundance.

A second sulphide-bearing horizon (~50 cm thick) is present at the western end of the roadcut. It consists of semi-massive pyrite (~40%), magnetite (5-10%) and chalcopyrite (trace) in a medium-grained, weakly foliated matrix of chlorite-quartz-calcite-plagioclase (Fig. 2). Pyrite occurs as coarse subhedral grains up to 5 mm long. Anhedral grains of magnetite (10-50 μm) occur locally as inclusions in pyrite, but are more commonly present as interstitial grains within the chlorite matrix. As in the first horizon, chalcopyrite ($\leq 20 \mu\text{m}$) most commonly occurs as inclusions within the pyrite. Assay results from two samples from this horizon (98LS-1b, c) are presented in Table 1.

DISCUSSION

The discovery of a sulphide-bearing iron formation within a sequence of altered felsic metavolcanic rocks along the Robert Campbell Highway attests to the high potential for discovery of additional VMS deposits in Yukon-Tanana Terrane southwest of Tintina Trench. The Little Salmon Lake iron formation strongly resembles the iron formation which occupies a similar stratigraphic position as the Kudz Ze Kayah deposit in the Finlayson Lake district (Murphy and Piercey, this volume) and, therefore, constitutes a pathfinder for this type of deposit. No regional-scale geochemical anomaly is associated with this new occurrence, although weak northwest-trending (parallel to regional strike) anomalies in Co, Cu, Au, Pb and Ni occur on both sides of Little Salmon Lake (Friske and Hornbrook, 1989).

The stratigraphic and structural contexts of this new occurrence are largely unknown. Although a stratigraphic succession has been proposed for the eastern part of Little Salmon Lake (Oliver and Mortensen, 1998), the felsic metavolcanic rocks which host this new sulphide occurrence had not been identified. Also, based on the current understanding of the regional and local structures (Campbell, 1967; Oliver, 1996), it is unclear whether the two sulphide-bearing horizons identified in this roadcut constitute two distinct horizons or a single structurally repeated horizon. In order to resolve the stratigraphic and structural settings of this new sulphide occurrence, bedrock mapping of the area between Little Salmon and Drury lakes by the Yukon Geology Program has been proposed (Fig. 1). An additional objective of this study will be to determine whether the

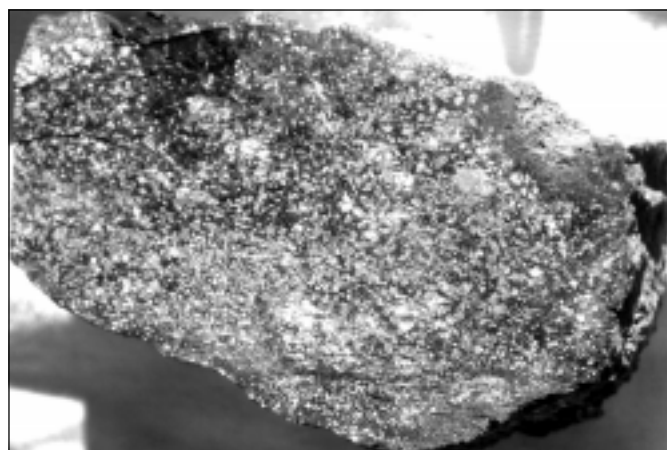


Figure 2. Semi-massive sulphide mineralization (white grains) from iron formation at west end of roadcut (sample 98LS-1b). Sample is 8 x 14 cm.

stratigraphic sequence established in the northwestern part of Glenlyon map area (Colpron, 1999, this volume) could be extended to Little Salmon Lake area.

ACKNOWLEDGEMENTS

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Sample	Au ppb	Ag ppm	As ppm	Ba ppm	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Mn ppm	Ni ppm	Pb ppm	Zn ppm	Comments
98LS-1a	10	0.8	10	40	0.5	31	61	606	10.30	960	51	30	76	disseminated Py-Cpy in 10-15 cm Mt Fe-fm
98LS-1b	< 5	1.4	18	< 10	< 0.5	43	55	573	> 15.00	1050	15	20	62	semi-massive Py-Cpy in 50 cm Mt Fe-fm
98LS-1c	< 5	1.4	10	< 10	< 0.5	67	57	531	> 15.00	1095	11	16	30	duplicate of 98LS-1b

Table 1. Selected assay results from sulphide-bearing iron formations, Little Salmon Lake area. Analyses completed by Chemex Labs Ltd., North Vancouver, B.C. Au by fire assay; all other elements by ICP. Py: pyrite; Cpy: chalcopyrite; Mt Fe-fm: magnetite-bearing iron formation.

PROPERTY DESCRIPTIONS

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