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U-Pb age dating carried out in support of the SGNO's geological mapping and geoscience compilation work (2003-2004)

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ABSTRACT

U-Pb analyses were performed in 2002 and 2003 on accessory minerals (zircon and titanite) from 10 samples collected in the Abitibi and James Bay regions. The detrital zircon analysis (SGNO-2003-02) was carried out according to the LA-MC-ICPMS method at the GEOTOP laboratory in Montreal. The other samples were treated according to the ID-TIMS method at the Jack Satterly Geochronological Laboratory of the Royal Ontario Museum and at the University of Toronto.

Abitibi Subprovince, Lac Olga area:

Sample SGNO-2003-02, a polygenetic conglomerate from the Taibi Group (32F/10), was analysed to determine the sedimentation age in the Lac Olga area. Zircons yielded $^{207}\text{Pb}/^{206}\text{Pb}$ ages between 2653 and 2737 Ma, with almost 25 near-concordant results concentrated between 2680 and 2710 Ma. Three populations of zircons are distinguished: 2684.9 ± 2.6 Ma, 2695.6 ± 1 Ma and 2705.1 ± 1.5 Ma. The maximum sedimentation age is estimated at 2684.9 ± 2.6 Ma, which is similar to the age of the turbidites of the Cadillac, Kewagama and Pontiac groups deposited in basins in the southern part of the Abitibi.

Sample SGNO-2003-03 comes from a dacite belonging to the Dussieux Formation (32F/14). This formation, drawn on NTS sheets 32F/14 and 32F/15, contains andesitic to rhyolitic lavas and pyroclastic rocks. Analytical results from five monozircons are concordant within the error limits and the mean $^{207}\text{Pb}/^{206}\text{Pb}$ age is of 2719.9 ± 1.3 Ma.

Sample SGNO-2003-07 is from the Berthiaume Syenite (32F/10), which is one of the rare alkaline intrusions represented on the 32F NTS sheet. The two youngest $^{207}\text{Pb}/^{206}\text{Pb}$ ages (out of a group of 6) yield a mean age of 2687.9 ± 1.2 Ma which is the best estimation of the syenite's age.

Abitibi Subprovince, Lebel-sur-Quévillon area:

Sample SGNO-2003-04, a felsic lapilli tuff from the Gonzague-Langlois mine (32F/02), was analysed to define the age of the volcanism associated with the VMS mineralization. Five concordant results give a mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2718.2 ± 2.1 Ma. This age is close to that of the Novellet Member (2714.1 ± 1.1 Ma) of the Urban Formation, located farther east.

Abitibi Subprovince, Grenville Front area east of Chibougamau:

Sample SGNO-2003-05 comes from the Boisvert Pluton Tonalite (32G/09) located in the Grenville Front's tectonic zone. Monozircons analysed permitted the identification of a discordance line with an upper intersection, interpreted as the crystallization age, at 2697 ± 3 Ma. Three zircons display inherited effects and an age of 2714 Ma. The titanites define a $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2627 ± 2 Ma, considered as the minimum age for metamorphism.

Sample SGNO-2003-08 is a migmatitic orthogneiss from the Lac Larouche area (32B/14). This sample was collected to measure the migmatitization age in this part of the Grenville Front. The regression of the analytical results from the four zircon fragments and the two titanite groups yielded an age of 2647 ± 2 Ma, considered to be the mobilisate's age. Zircon cores are dated at 2686 Ma and reflect the age of the tonalitic protolith.

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Abitibi Subprovince, 32E/06 NTS sheet:

Sample SGNO-2003-10, a rhyolite from the Gémini-Turgeon property (32E/06), is part of a felsic complex host of the polymetallic massive sulphides (Cu, Zn, Au, Ag) in the area. Analytical results obtained from three monozircons are concordant within the error limits and yield a mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2735.5 ± 1.0 Ma.

La Grande Subprovince, Sakami area:

Sample SGNO-2002-01 originates from a porphyritic monzodiorite (33F/06) hosting gold showings north of Menarik Lake. This intrusion cuts the molasse-type sedimentary rocks of the Ekomiak Formation. Three zircon fragments yielded concordant results within error limits. They represent a mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2712.4 ± 1.4 Ma, which is interpreted as the crystallization age. This determination also represents the minimum age for the Ekomiak Formation sedimentation and the maximum age for the gold mineralization.

Sample SGNO-2002-02 is a rhyolitic tuff from the Yasinski Group (33F/10). This unit is mainly composed of mafic, intermediate and felsic volcanic rocks, and it hosts the La-Grande-Sud Tonalite (2734 ± 2 Ma). Analyses of three monozircons yielded concordant results within the error limits. The mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2740.4 ± 1.2 Ma is interpreted as the rhyolite emplacement age.

Sample SGNO-2003-09 comes from a dacitic epiclastic tuff of the Laguiche Group (33F/09), interstratified with feldspathic wackes and mudrocks. This unit's emplacement age has previously been estimated at $<2648 \pm 50$ Ma. Four concordant analytical results obtained on monozircons yielded a mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2738.3 ± 1.1 Ma. Two other monozircons gave concordant results whose mean age is younger than 2718.0 ± 2.3 Ma. This last age corresponds to the maximum age of deposition.