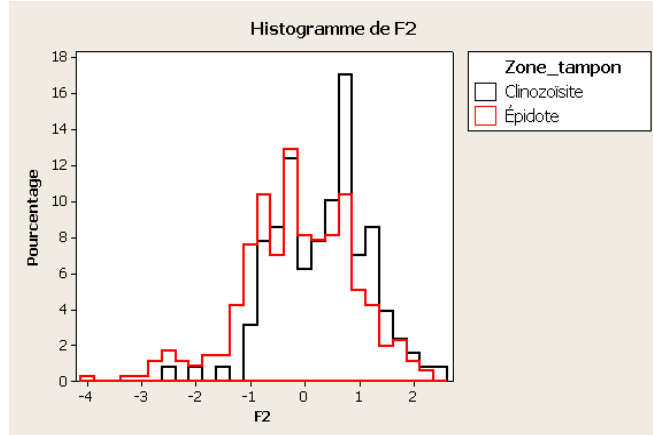


2009-03: Lithochemical signature of semiconcordant epidote-quartz alterations associated with VMS

Project 2009-03 aimed to recognise the lithochemical signature of semiconcordant alteration zones associated with volcanogenic massive sulphide mineralisation. The project focused in particular on characterising epidote-quartz alteration zones described in the Noranda mining camp, Abitibi, and in the ophiolitic sequences (epidosite zone). The zones are regional and reflect a high-temperature hydrothermal system capable of generating economic deposits. The interest in identifying similar zones elsewhere in the Abitibi is therefore understandable. Thus, the objective was to identify areas with mineral potential using the copious available lithochemical data contained in the many private and public databases.

The known semiconcordant zone in the Noranda mining camp was used to test the method. The zone was defined using mapping and published microprobe analyses from the literature (clinozoisite, a member of the epidote group). It represents what is considered to be typical for this type of alteration. The CONSOREM lithochemical database for the Abitibi was used for analysing the data. It includes proprietary data from its members and the SIGÉOM database. The lithochemical signature of the rocks located near sites known to contain clinozoisite were compared to the signature of rocks close to epidote locations using the following methods: mass balance calculation by precursor modelling, developed by CONSOREM; normative mineral calculation by Normat; and principal component analysis. Although there was a weak statistical signal using principal component analysis of major elements (see attached figure), the project demonstrated that the identification of zones from analyses taken wholesale from databanks is unrealistic. This is probably due to the strongly heterogeneous nature of the epidote-quartz alteration on the outcrop and sample scale.



Histogram of the F2 component (richer in Al, Na and poorer in Fe, Mn, Ti) for major elements of rocks close to clinozoisite and epidote. The histogram shows a weak signal compatible with a composition richer in Al for clinozoisite, but with a large overlap of the two groups. Therefore, the two zones cannot be spatially defined on the scale of the mining camp.

Project 2009-03: Summary	
Objectives	<ul style="list-style-type: none"> To recognise the lithochemical signature of semiconcordant alteration zones in the Abitibi Subprovince.
Innovation	<ul style="list-style-type: none"> Establishment of a spatial relationship between microprobe analyses of epidotes with lithochemical data analysed using three discriminating methods.
Results	<ul style="list-style-type: none"> Conclusive demonstration that the use of existing lithochemical data is not a suitable method for the identification of semiconcordant alteration zones associated with VMS.