

## **SEDEX deposits in the Graz Paleozoic – investigations to the exploration potential with the Arzberg deposit as calibration region**

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The sedimentary exhalative (SEDEX) deposits of the Graz Paleozoic (Austroalpine Unit, Eastern Alps) carry raw materials that have been important for basic supply for a long time (Ag, Pb and Zn). Some of the raw materials that are potentially available in these ores (barite, Co, In, Sb and Ge) have been put on the list of critical raw materials by the European Commission. Of the Paleozoic units of the Eastern Alps, these deposits constitute the most important ore district for non-ferrous metals. On a global scale, SEDEX deposits are among the largest non-ferrous metal concentrations, containing > 50 % of the world's resources for zinc and lead and carrying a number of other important minor elements (for example Co, In, Sb and Ge) in addition to silver. The deposits of the former mining districts in the Graz Paleozoic are well studied, however, the focus was mainly on the ore occurrences themselves providing details on ore mineralogy and chemical composition. A detailed investigation of the spatial extent and composition of wall rock alteration formed during the mineralization process is missing. However, these alterations are an essential tool for exploration of SEDEX mineralizations and are recorded and characterized in this project. The definition and application of proximity indicators from geochemical and mineralogical data can provide evidence of hidden ore occurrences. As a further prospecting method, the investigation of stream and mine waters and their respective sediments in and around a deposit is used. Not only in the case of the Graz Paleozoic such a detailed survey, which considers all indicative measurable geochemical factors, is missing. This investigation is carried out in the Arzberg test area in this project. Arzberg and its surroundings were sites of mining for silver, lead and zinc for about 680 documented years. After several closures and restarts, mining was terminated in 1927. Since then, there has been repeated research work as well as an exploration phase with drilling activity in the 1970s to 1980s. The results of these investigations are to be built upon in this survey. The project MRI\_SEDEXPOT, supported by the "Initiative GBA-Forschungspartnerschaften Mineralrohstoffe – MRI", aims to calibrate and define prospectivity indicators for base and critical metal deposits in the Graz Paleozoic. These could also be transferable to SEDEX deposits in other areas.