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LINKING LITHOFACIES TO GROUNDWATER PROVENANCE – EXAMPLES FROM THE NORTHERN CALCAREOUS ALPS, AUSTRIA, USING THE STABLE SULPHUR ISOTOPE AND TRACE ELEMENT ANTIMONY

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Presented are applied examples of linking lithofacies (geochemistry) to groundwater provenance (hydrochemistry) and its use in engineering geology and regional water supply investigations.

Using the values of the stable sulphur isotopes ($\delta^{34}S$) for the dating and distinguishing of sulphur bearing rocks has been applied for some time (e.g. NIELSEN et al. 1969, CLAYPOOL et al. 1980, PAK et al. 1981, SPÖTL 1988). Within the Northern Calcareous Alps, Austria, the sulphur bearing evaporitic rocks of the Raibl (Carnian) and Reichenhaller (Scythian/Anisian) Formations occur. By combining whole rock sulphur isotope dating results with those of the hydrochemistry, it is possible to determine the source rocks of sulphur bearing groundwater occurring within the Northern Calcareous Alps.

In 1999, trace element analyses of spring water used for the public supply, occurring within the Palaeozoic Rocks (Schwaz Dolomite and Wildschönau Phyllites) at Schwaz, Tirol, revealed an extremely high content of antimony (up to 3 mg/l). The World Health Organisation's recommended value for antimony in drinking water is <0,005 mg/l. The source of this geogenic contaminant was determined to be the silver bearing "Fahlerz" (Schwazit, Tetraedrit) which has been mined in the region. Presented are hydro- and geochemical data from Schwaz and a prognosis of the possible extent of this geogenic contaminant based on regional mapping results.

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