



Reflection seismic imaging to construct a 3D/4D geological model of the Skellefte Ore District, northern Sweden

Mahdieh Dehghannejad (1), Tobias Bauer (2), Alireza Malehmir (1), Christopher Juhlin (1), Rodney Allen (2,3), and Pär Weihed (2)

(1) Uppsala University, Department of Earth Sciences, Uppsala, Sweden (mahdieh.dehghannejad@geo.uu.se / 0046-18-501110), (2) Luleå University of Technology, Division of Geosciences, SE-97187 Luleå, Sweden, (3) Boliden Mineral AB, SE-93681 Boliden, Sweden

The Paleoproterozoic Skellefte District is one of the most important mining districts in Europe because of its volcanic-hosted massive sulphide and orogenic gold deposits. In order to construct a 3D/4D-geological model of the district, five new reflection seismic profiles were acquired, with a total length of more than 110 km, in the western and central parts of the district during 2008-2010. Two of these profiles are located in western part of the district (Kristineberg mining area) and were acquired with the aim to improve the existing 3D model of the area, especially at shallower levels (< 3 km). The other three profiles, located in the Central Skellefte District, were acquired aiming for a better understanding of the geological structures at depth. Preliminary results from the two western seismic profiles show a series of reflections that confirm previous reflection seismic results and correlate well with geological observations. Preliminary results from the three profiles in the Central Skellefte District show a relatively different seismic character compared to those of the Kristineberg area, but also correlate with geological observations. A 3D-geological model of the study area is currently being constructed using the results from the reflection seismic data with other geophysical and geological data. A 4D-geological model (including the time-component) of the study area will be constructed using geological restoration techniques to interpret the geological history of the district.