



GPR in large-scale groundwater and aggregate surveys

Juho Kupila

Geological Survey of Finland, Rovaniemi, Finland (juho.kupila@gtk.fi)

In Finland, which is fully self-sufficient in clean groundwater, it is essential to consolidate the groundwater protection and the usage of soil resources. Studies related to this issue have been carried out in several projects since 1990's and the last unstudied areas will be covered in EU –funded project “The coordination between groundwater protection and aggregates industry in Finnish Lapland, phase II”. The project started in July 2016 and it is carried out by Geological Survey of Finland (GTK), University of Oulu and Finnish Environment Institute. It covers the most northern parts of Finland and the total area of involving municipalities is over 80 000 km², about one quarter of a total area of Finland.

Due the size of the project area and number of specific target areas, GPR plays an important role as a fast and cost effective data collecting method. When studying groundwater and aggregate resources, interpreted GPR –data is used to determine the groundwater table, volumes and quality of the aggregate formations and the level of the bedrock. At the midway of the project, totally 180 kilometers of GPR –profiles has been measured in approximately 40 groundwater areas. Within two year field work periods both GSSI Sir20 and Malå Ramac ProEx were used with 100 MHz antennas. Field work was carried out by GTK and studies will continue during 2018, as the project will be finished at the end of March, 2019. As a result, new GPR information combined with other research data (e.g. data from drilling, water sampling and mapping), can be effective method when making guidelines for groundwater protection and usage of the aggregate resource.

GTK has the main role in this project with support from national and local authorities and stakeholders. Project is funded by European Regional Development Fund with support from the local communes, branch enterprises and executive actors of the project. Implementation period is 2016-2019.