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Innovative Exploration Drilling and Data Acquisition – Test Center



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Innovative Exploration Drilling and Data Acquisition – Test Center



Easily accessed test bed;
permits for drilling and testing exists



Well-characterized site, including detailed geology, geophysics, and existing boreholes.



Dedicated for tool testing
and drilling equipment
development

I-EDDA-TC aims to establish a leading test center for drilling and drilling-related equipment that supports and creates innovation in mineral exploration. The center will offer users to test new and innovative approaches to equipment and methodology in an operational environment expected in mining districts. The center aims to lower the threshold for implementing R&D projects, thus facilitating an increase in innovative output by industry and academia.

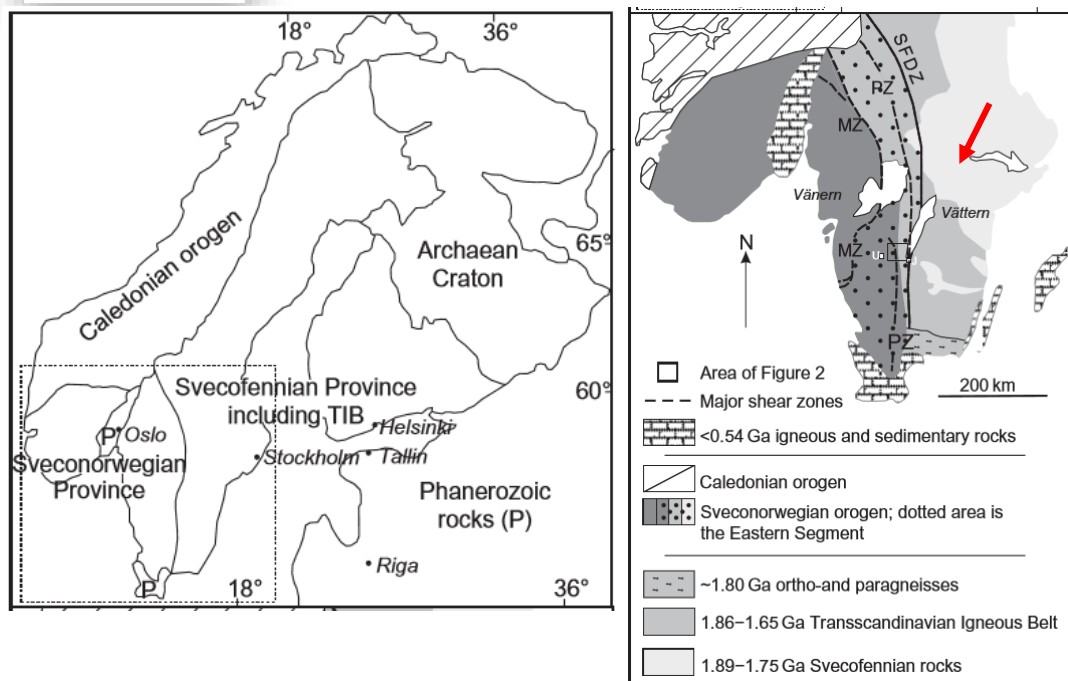


Funded by the
European Union

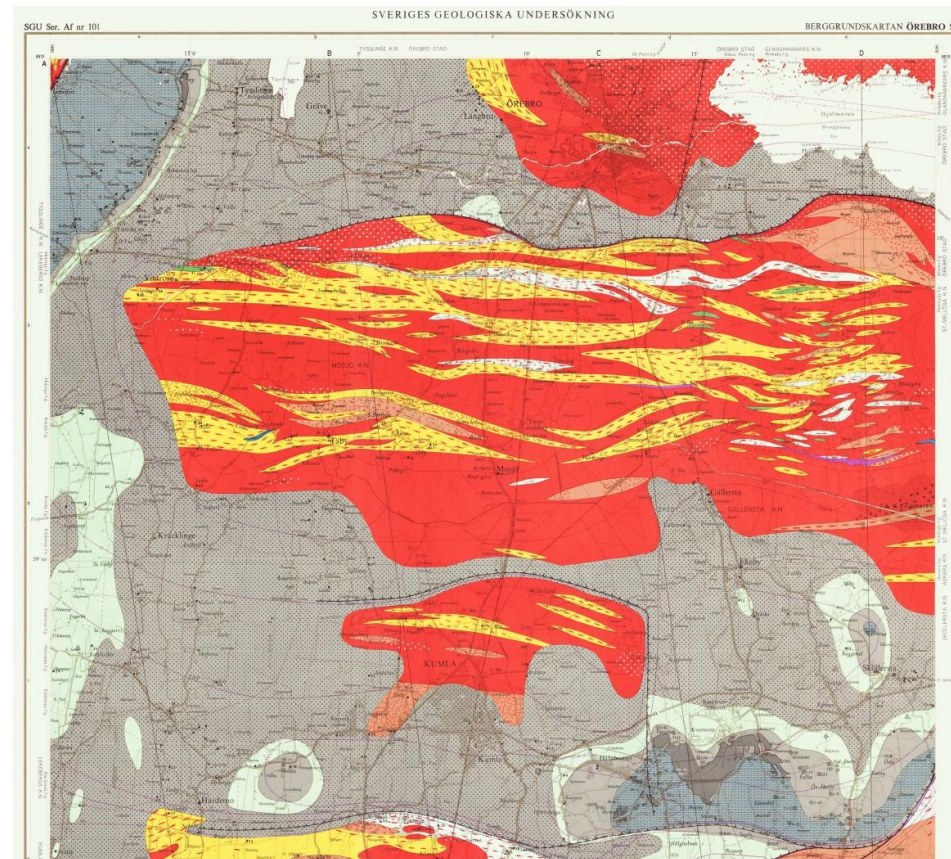


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Site location and geology



Fennoscandian Shield and its main constituents (left), and a magnified map of the southwestern part of Fennoscandia (right), with major tectonic units. Source: Brander et al. 2011. The position of Örebro and I-EDDA-TC is marked with a red arrow.

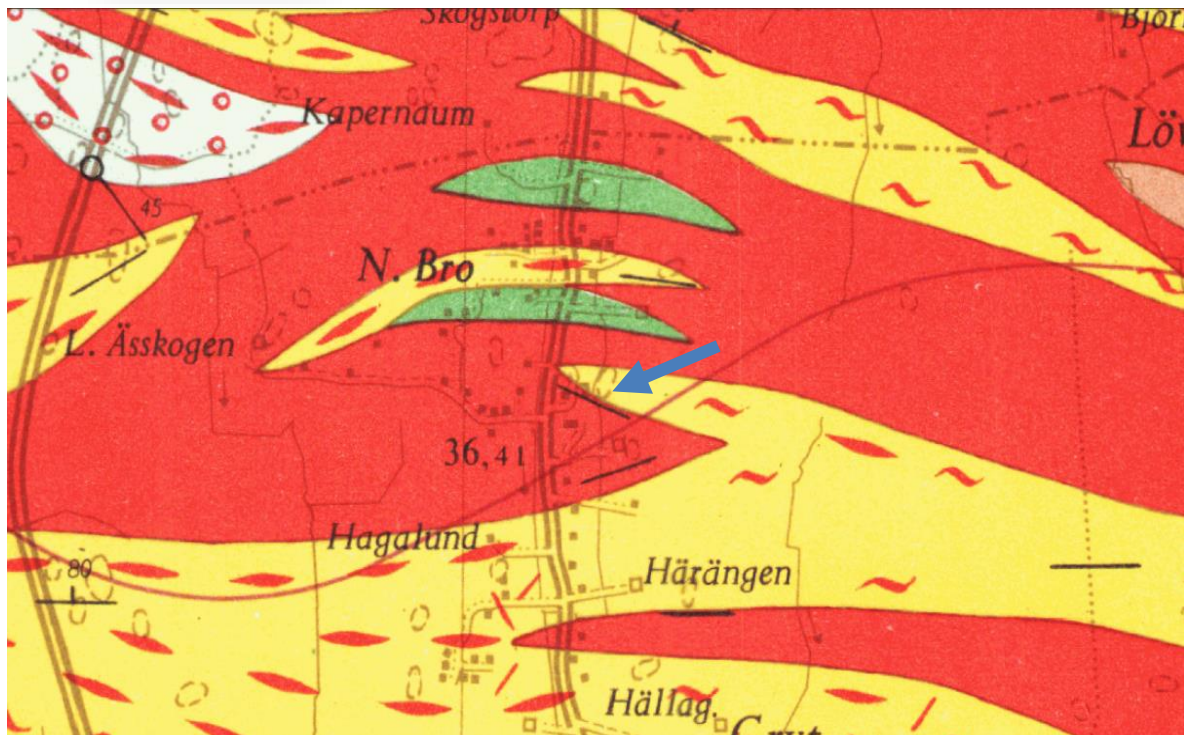


Bedrock map Örebro SW. Source: SGU Ser. Af number 101. Grey areas are Palaeozoic sedimentary rocks, whereas red, yellow and light blue are Svecofennian crystalline rocks; granites, metavolcanics and metagreywackes (two-mica gneisses), respectively.



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Geological setting and I-EDDA-TC site



Magnified part of the bedrock map Örebro SW. Source: SGU Ser. Af number 101. The dominating lithologies are equigranular granites and pegmatites (red), felsic metavolcanic rocks (yellow, "leptite gneiss") with granitic and pegmatitic veins (superimposed red vein symbol), metabasites (green) and migmatitic metagreywacke (light blue, "two-mica gneiss"). The position of the I-EDDA-TC is marked with a blue arrow.



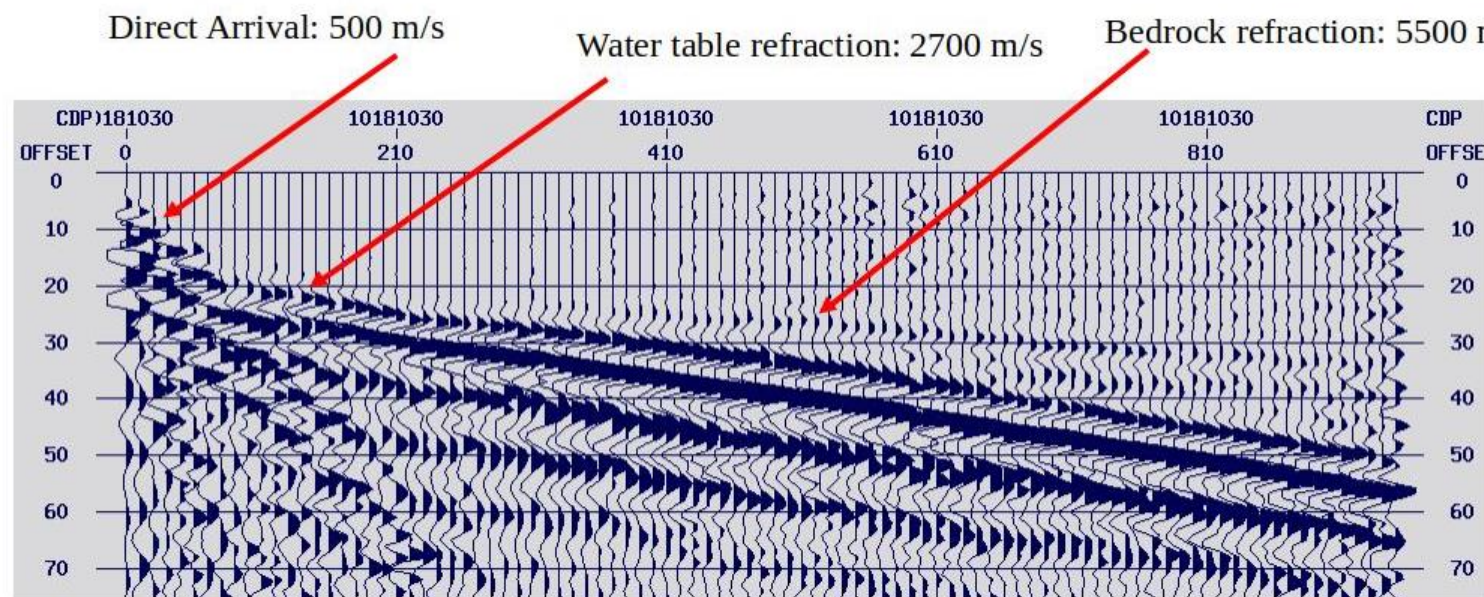
Site location of the test center, covering a 100x60 m area, just southeast of the Epiroc AB factory.



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Geophysics

Example of seismic data acquired at the site used to generate bedrock topography map

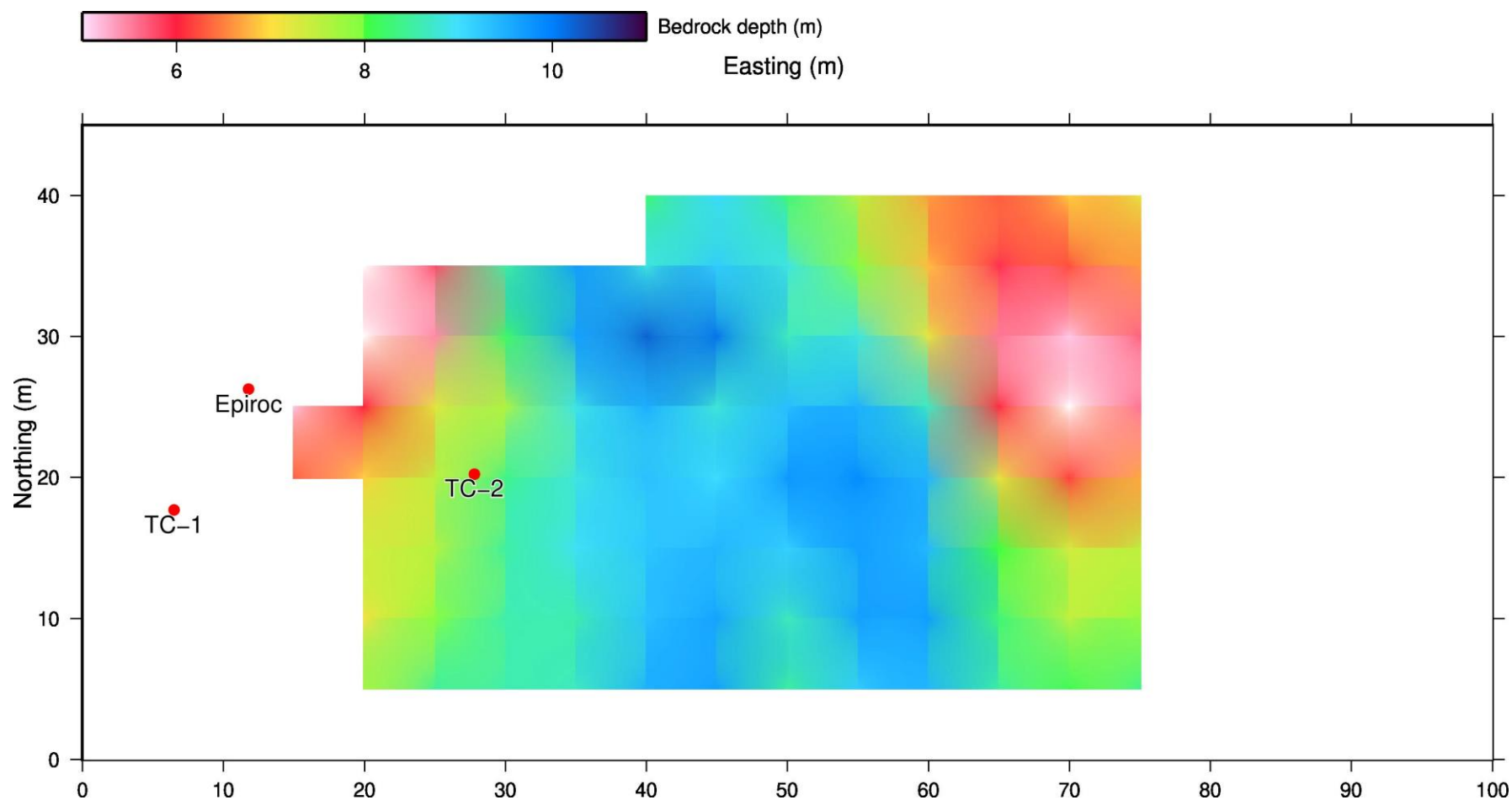




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Geophysics

Depth to bedrock calculated from observed velocities and crossover distances





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Boreholes



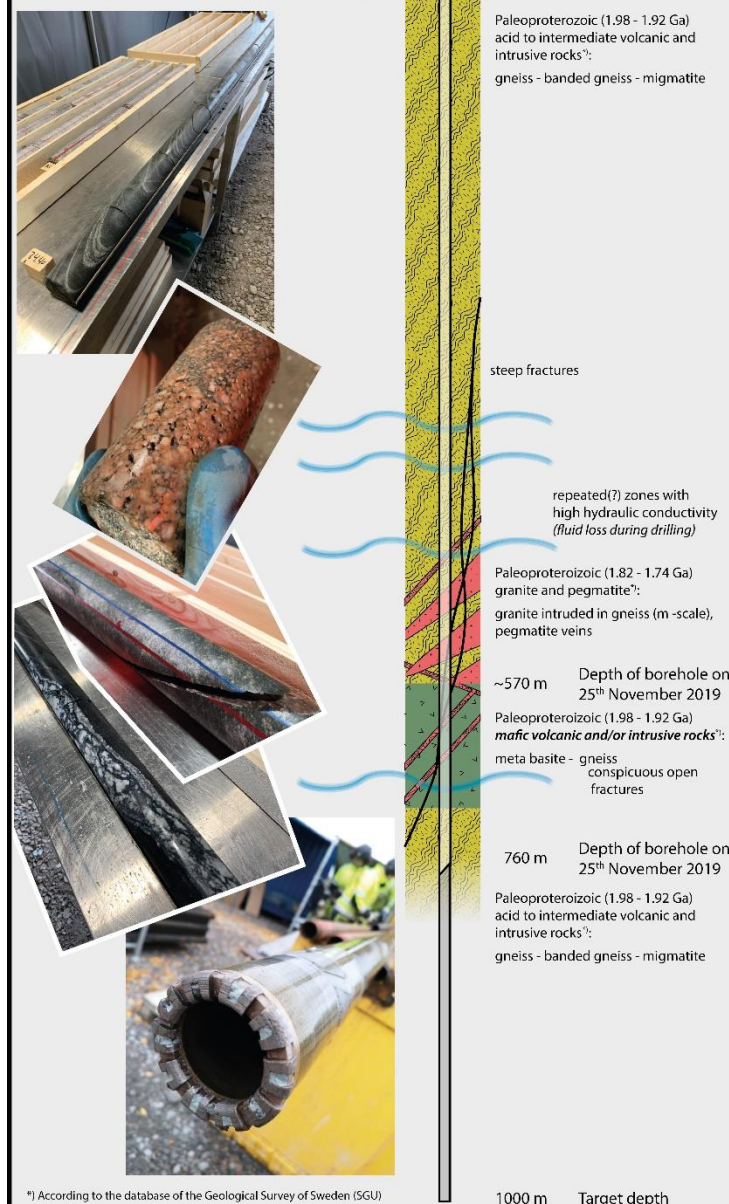
Two boreholes drilled as part of the EIT project:

I-EDDA-TC, Hole A (TC-1): 970 m – fully cored diamond drill bit borehole, HQ size (61 mm diameter drill core; tripple tubing).

I-EDDA-TC, Hole B (TC-2): 220 mm diameter, 200 m deep borehole.



I-EDDA-TC, Hole A





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Borehole logging

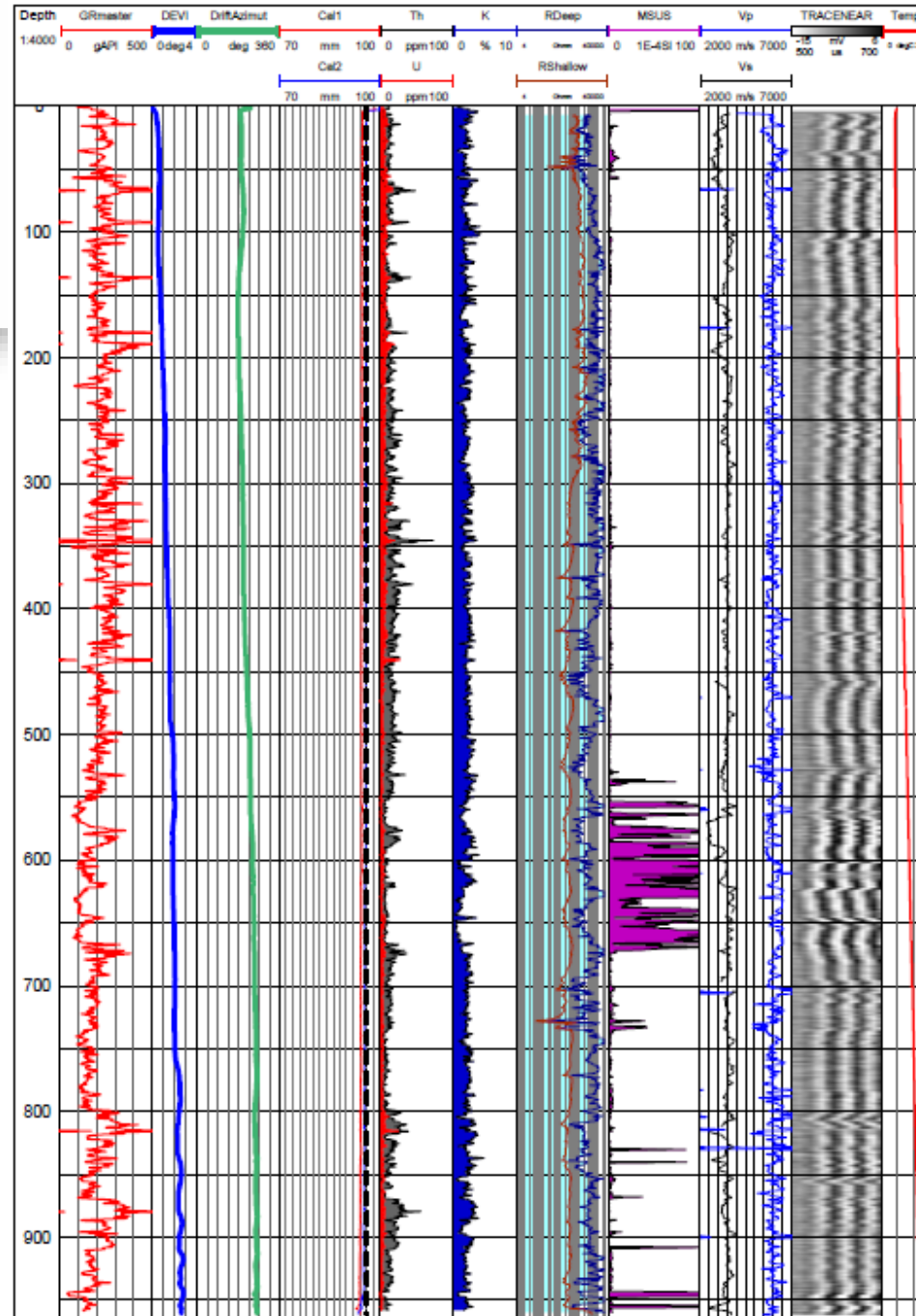
Comprehensive borehole logging campaign (Sept. 2020), including:

- Gyro orientation
- Acoustic imager
- Sonic log (V_p , V_s)
- Density
- Resistivity
- Magnetic susceptibility
- Temperature
- Natural gamma
- Borehole seismic

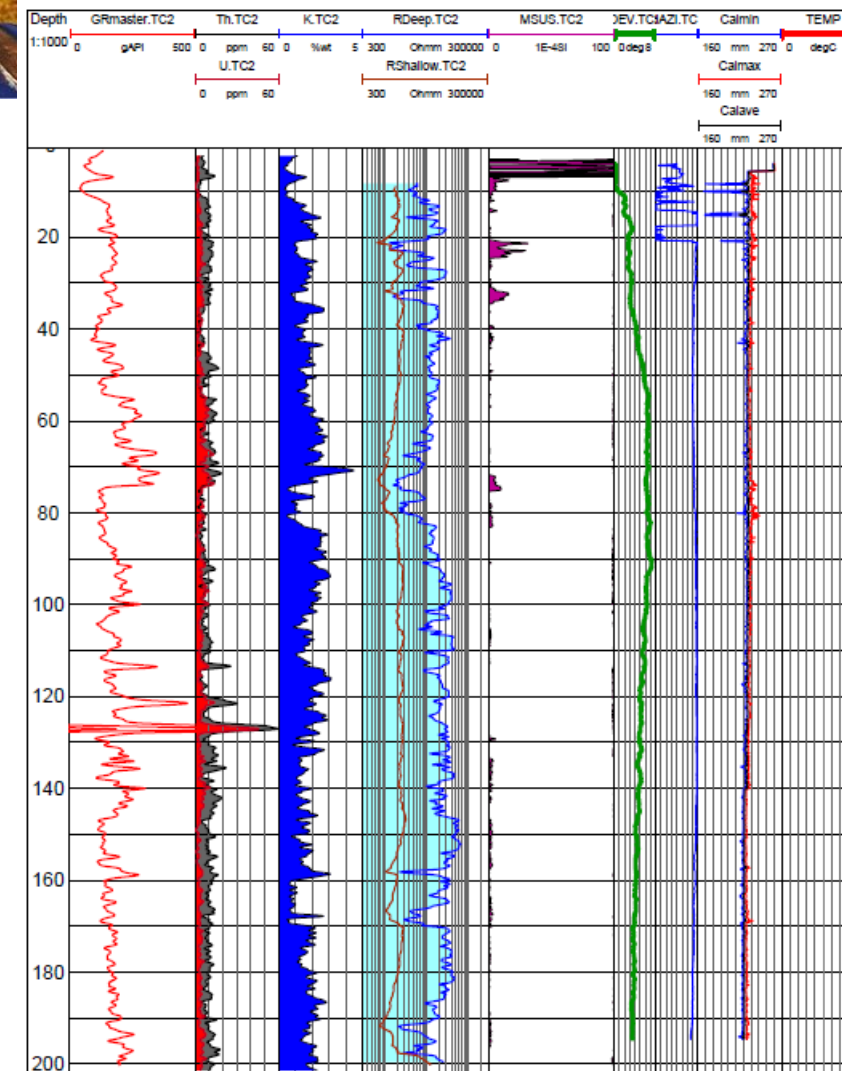




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Borehole logs TC1 – HQ, 963 m



Borehole logs TC2 – 220 mm wide, 200 m



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Core characterization and materials testing

- Mineralogy and petrography of drill core
- X-ray diffraction
- XRF
- Porosity and density
- Uniaxial compressive testing (UCP)
- Brazilian test (tensile strength)
- Abrasiveness
- Ultrasonic wavespeeds



Material for density, porosity, UCP



Test of abrasiveness (Cerchar Abrasiveness Index)



Conclusions and outlook

- Existing facility and collected data will be available for research purposes and development of drilling and drilling-related equipment.
- Detailed geological characterization of site, geophysics and borehole logging.
- Test bed is available for use and experiments, with joint future development between RISE (Research Institutes of Sweden) and Epiroc AB.