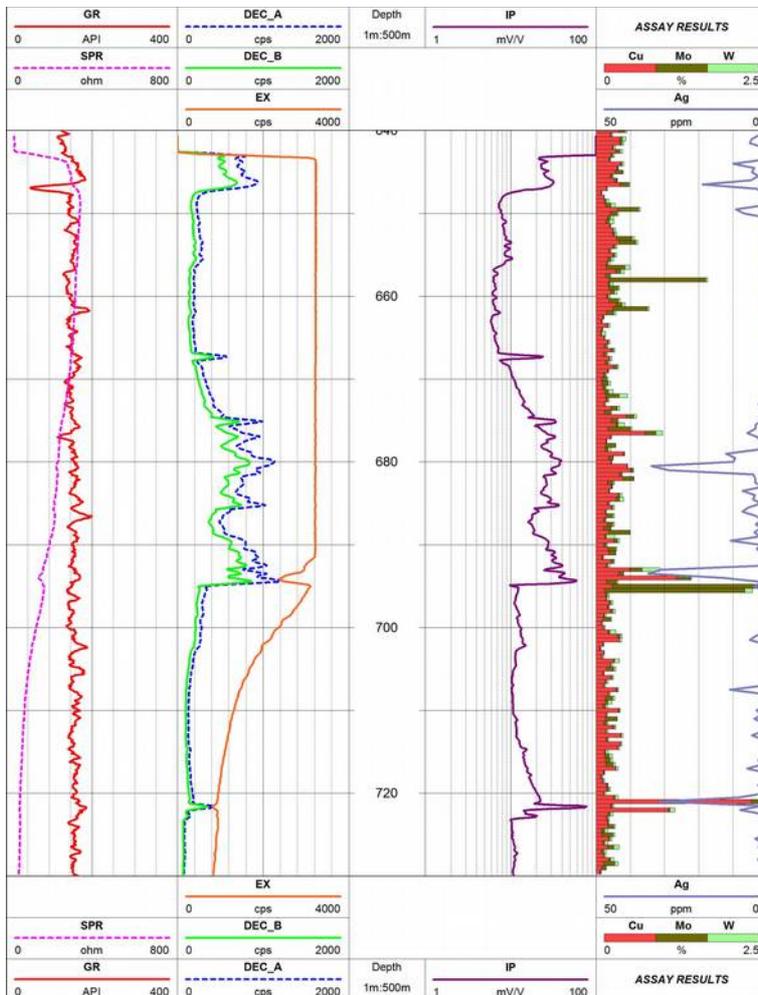


BOREHOLE LOGGING PROBE CASE STUDY INDUCED POLARISATION PROBE IP38 / IP38G



The example log shown on the left was recorded in an HQ-cored borehole drilled on an exploration prospect located in eastern Europe.

The deposit is of a “stockwork” type, consisting of a network of mineralised veins hosted within a granitic body. Different phases of hydrothermal mineralisation have resulted in localised, elevated concentrations of Cu (chalcopyrite), Mo (molybdenite) and W (scheelite) in particular.

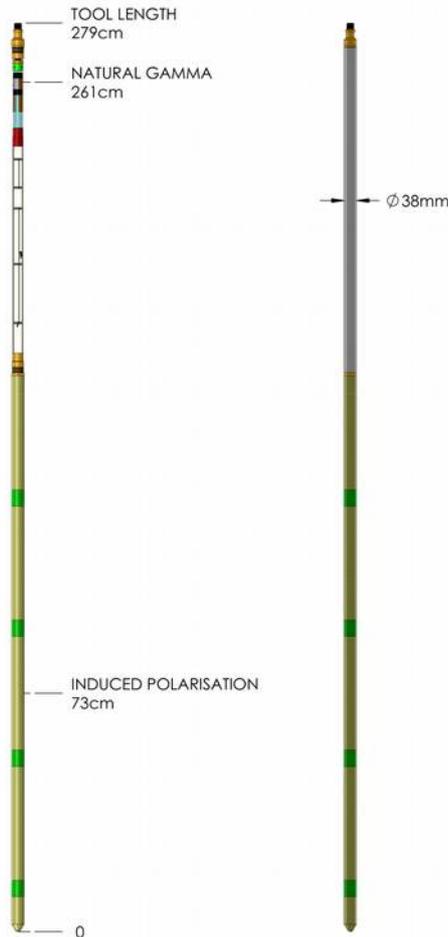
A weathered and mineralised section between ± 668 and 695 m gives rise to a significant IP anomaly but is “invisible” on the natural gamma log (GR).

Below 690 m the probe’s excitation voltage reduces as a result of encountering highly saline borehole fluid: this does not, however, prevent the detection of a thin mineralised zone at around 722 m.



Core photos showing typical chalcopyrite (left) and molybdenite (right) mineralisation as encountered in this borehole.

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The formations surrounding the borehole are subjected to an alternating square-wave voltage applied via the upper and lower injection electrodes. Following each injection cycle, the resulting potential difference over a section of the formations is analysed as it decays with time. The form of this decay curve is related to the chargeability of the formations.

A high chargeability indicates that induced electrochemical potentials are able to develop within the formations as a result of ion transfer between pore fluids and semi-conductive metallic mineral grains present within the rocks.

The **IP38** probe is particularly suitable for mining exploration in the context of a disseminated sulphide mineralisation. In the hydrogeological domain, it can also provide qualitative information about the permeability of potential aquifer horizons.

A formation resistance value (SPR) is also calculated.

As an option, the probe can be supplied with a natural gamma detector to provide additional lithological information or for horizon correlation purposes.

Specifications

- Diameter:
- Length:
- Weight:
- Max. operating temperature:
- Max. operating pressure:

38 mm
2 790 mm
7 kg
70°C
200 bar

Data / sensor parameters

- Chargeability:
- SPR measurement range:

injection during 100 ms
sensing from 120 to 200 ms
0 to 10 000 Ω

Accessories / options

- Natural gamma detector:

\varnothing 25 x 50 mm NaI(Tl) crystal

Borehole conditions

- Fluid-filled, open borehole