

Short Course C - Using the GeoProbe system for high resolution investigations at contaminated sites

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The GeoProbe system consists of a drilling rig that can be equipped with tools for sampling of soil and groundwater, but also various probes for real-time measurements of contaminant type, contaminant level, geology, groundwater pressure, and more. The *MIP-system* is probably the most commonly known application associated with the GeoProbe. However, during recent years several other probes and tools have been developed and used in projects in both Denmark and Sweden. These include:

- **MiHPT** (Traditional MIP equipped with a Hydraulic Profiling Tool) that provides a continuous determination of the soil hydraulic conductivity, K, over the probing depth,
- **LL-MiHPT** (Low Level MiHPT) which enables detection of VOC's down to the µg/l-scale. Hence, contaminant plumes can be identified and characterized with a single push.
- **LIF** (Laser Induced Fluorescence) providing high resolution real-time information of PAH concentrations over the probing depth. To be used when characterizing creosote- or petroleum contaminants.
- **MIP-probe attached directly to a mass spectrometer** (MS) resulting in continuous and real time detection and speciation of VOC's over the entire probing depth.

Furthermore, the GeoProbe can perform continuous soil sampling (Dual Tube) and water sampling through standard screens, depth-specific screens or as grab samples. Separate soil-, groundwater- and gas samples can be analysed in the field with stand-alone on-site analytical methods using GC or MS based systems.

The GeoProbe platform can be used for cost efficient screening investigations and high resolution characterisation of source zones and plumes at DNAPL/LNAPL contaminated sites. Since probing data is generated in real-time, a dynamic investigation approach is often used in the field.

During the course, the various tools will be presented and demonstrated together with different investigation approaches and case studies. The course will include the following elements:

- Introduction to typical challenges at sites contaminated with LNAPL and DNAPL.
- Introduction to the GeoProbe system and description of the probes/tools. Demonstration of probes, samplers and other equipment. Selecting and combining tools and investigations strategies based on project goals and objectives.
- Presentation of case studies from Denmark and Sweden, where a combination of strategies and tools has been used to build up detailed conceptual site models at LNAPL and DNAPL contaminated sites.

The course will provide valuable information to regulators and consultants involved in general site investigations and more focused remedial investigations, and will highlight the importance of building conceptual site models and how to use the Geoprobe system as part of this process.