

Appendiks A: MIP-metode (Membrane Interphase Probe)

The Membrane Interface Probe (MIP) is a screening tool that maps the vertical profile of soil and groundwater contamination. It provides continuous and instantaneous data on the relative concentrations of volatile organic compounds (VOCs), including chlorinated solvents (cVOCs), aromatic hydrocarbons and BTEX compounds.

The MIP system works on the principle of a drilling a probe that heats the soil to 120 °C in-situ, bringing VOCs to gaseous phase and transporting the gases to the surface for analysis in the MIP system gas chromatograph (GC). The GC contains 3 detectors, shown in the table below, which do not identify specific compounds or absolute concentrations, but indicate the contaminant family and relative concentration.

Detector	Parameter	Detection limit
PID (photo ionisation detector)	Aromatic hydrocarbons and chlorinated solvents	0.2 – 2.0 ppm
FID (flame ionisation detector)	Alkanes, short-chain hydrocarbons	1.0 – 20.0 ppm
XSD (halogen specific detector)	Chlorinated solvents	0.1 – 2.0 ppm

A MIP survey hole is drilled in 30 cm intervals, and at each interval the probe paused heat the soil for 45 seconds. This enables the soil to be heated to 120 °C and the maximum potential of VOCs to be captured. The probe is then drilled 30 cm deeper to the next interval and the process is repeated. The MIP survey hole is completed until either the pre-determined log depth is reached, or when the operator can see that the contaminant plume has been vertically delineated. The result is a MIP drill log showing the vertical variation in the relative contaminant concentration.

In addition to the detection of VOCs, the MIP probe also continuously collects data on the electrical conductivity (EC) of the soil, and the probe temperature. Both these parameters enable the MIP operator to interpret the soil type and lithology changes, which provide valuable data on which soil layers the contamination can be found.

A schematic of the MIP system is illustrated in figure 1.

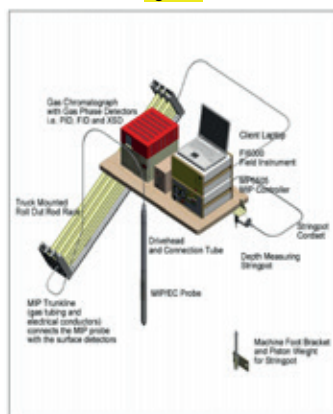


Figure 1: MIP System Setup

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