

HPT (Hydraulic Profiling Tool)



The Hydraulic Profiling Tool (HPT) allows the user to create fast, continuous, real-time profiles of soil hydraulic properties in both fine- and coarse-grained material. The HPT uses a sensitive, downhole transducer to measure the pressure response of the soil to injection of water.



HPT Features:

- Fast, continuous, real-time profiling of soil hydraulic properties
- Use in both fine- and coarse-grained material
- Use in both saturated and unsaturated conditions
- Built to withstand percussion driving
- Collects static water level data
- Provides a simultaneous log of electrical conductivity with integrated Wenner array
- Sensitive downhole transducer measures pressure response of soil to injection of water
- Parameters are displayed and stored on the Field Instrument for future analysis

HPT SPECIFICATIONS

Data Acquisition Rate..... 5 Hz
 Recommended Probing Rate..... 2 cm/sec
 Conductivity Array..... Wenner
 Working Depth (max)..... 120 feet 36.6m
 below groundwater

Pressure Transducer

Operating Pressure..... 0-101 psia
 Maximum Overpressure 400 psia
 Full Scale Accuracy 2.5 percent

Flow Meter

Flow Rate (max)..... 0-1 Lpm
 Pressure (max)..... 500 psig
 Full Scale Accuracy +/- 1 percent
 Full Scale Repeatability +/- 0.2 percent

Flow Controller

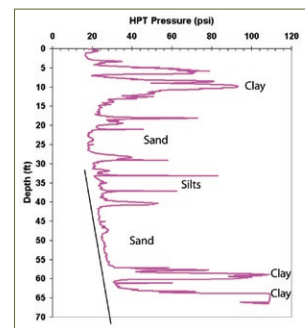
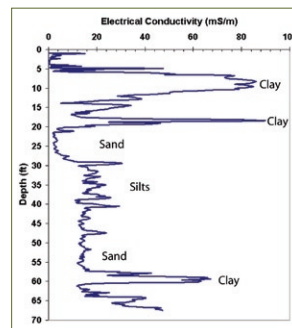
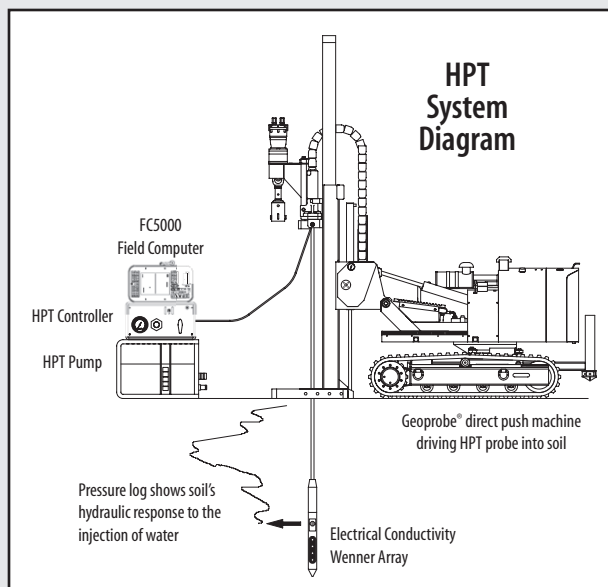
Maximum Flow Rate..... 0-1 Lpm
 Maximum Pressure 500 psig
 Stability of Setpoint 2 percent +/- 0.5 percent
 Repeatability..... 0.3 percent



The **Hydraulic Profiling Tool** has many field applications. One primary use of this new tool is to locate and define preferential migration pathways for contaminants in the subsurface. It can also be used to target zones for injection of remediation material. In addition, the HPT can be used to select well screen intervals, evaluate locations to conduct slug tests, and measure static water conditions across a site.



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Plots of EC (left) and HPT pressure (right) collected concurrently. Both the HPT pressure and the EC data confirm that clays predominate the upper 20 feet, which is underlain by ~35 ft. of silts and sands, followed by ~10 ft. of clays. Static water level was calculated to be at 31 ft. The HPT log was made to characterize potential contaminant migration pathways at the site. The line drawn on the HPT pressure plot shows the hydrostatic increase as the probe gets deeper below the static water level.



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