Environmental Technology Verification (ETV) Program ~ Technology Fact Sheet

SmartSoil™

Soconag Environmental Expertise Inc.

Performance claim

SmartSoil™ is a PC platform knowledge-based system with remote capabilities, designed by Soconag Environmental Expertise Inc., that has been demonstrated to precisely and accurately monitor and control, on a real-time basis, steady and unsteady-state fluid flow in porous media such as soil, residue and sediment within the context of environmental remediation processes.*

** at a 95% level of confidence, as required by Canada's ETV Program*

Description

The SmartSoil™ technology is a generic, PC platform, knowledge-based system designed to maximize the performance of various remediation technologies in the treatment of contaminated matrices, including soils, residues, sediments, and compost.

Application

Soconag designed SmartSoil™ to optimize the use of a number of remediation technologies.

Technology description

The SmartSoil™ technology is a generic system which provides, on a real time basis, an unprecedented level of precision and accuracy of the monitoring and control on the treatment fluid properties, in either steady or unsteady flow state, and on the governing parameters of the treatment process. The technology is applicable in various contaminated porous matrices. Comprising both software and hardware components, it includes a proprietary measuring and sampling tool, a communication tool providing a remote control capability with live video transmission from the site.

Technology application

SmartSoil™ can be used to enhance the use of the following remediation technologies:

Soil Vacuum / Vapour Extraction (SVE)
Bioventing (conventional and/ or pulse remediation)
Sequential Batch Reactor (SBR)
Petrification
Pneumatic Fracturing / Pneumatic Sparging
Soil Washing
Amendment Distribution
Phytoremediation

Performance conditions

Two performance tests were conducted using similar, but different-sized apparatus, each containing a distinct matrix: 1) a test that simulated air (fluid) flow through fine sand in a pedon-sized (1 m³) lysimeter, and 2) a test that simulated water (fluid) flow through mine tailings in a 500 L-sized lysimeter. The technology was tested using porous media that fell within the range of 5-40% effective porosity. The lowest level at which data could be measured was within 0.01 inches of water. The conditions under which the verification tests were performed were shown to be representative of conditions that would be encountered during operation of the technology for a environmental remediation.

The data collected to verify the SmartSoil™ technology was considered to be representative of the processes being monitored. The technology is novel and has been developed to replace typical randomized, matrix-like data gathering of porous media flow pattern measurements during monitoring and remediation.