



Soil Saw™



Developer: Halliburton NUS Environmental Corporation
Contract Number: DE-AC21-92MC29114
Crosscutting Area: N/A



Problem:

The prevention of off-site migration of contaminated groundwater along with the prevention of water entering waste disposal cells is a concern at many Department of Energy (DOE) sites. An effective measure to segregate contaminated soils from uncontaminated soils is also a major need.

Solution:

The Soil Saw™ is an innovative method of forming underground cut-off walls for environmental remediation or civil construction. This method is an in situ, one-step method which eliminates the

excavation and replacement process and greatly improves the quality of the final product.

Benefits:

- ▶ Calculations indicate formation of walls at depths of over 180 feet (54 meters) may be possible
- ▶ The Soil Saw™ forms an in situ wall which is potentially cleaner than conventional methods and operates at sub-zero conditions
- ▶ The Soil Saw™ is being designed to excavate and back-fill with the same slurry, eliminating many of the problems concerning incomplete slurry replacement

Technology:

The Soil Saw™ differs from conventional technology in its ability to form continuous walls at great depths. The Soil Saw™, based on the hydraulic erosion principle, is an in situ technology which uses reciprocating jets of cement grout or bentonite slurry to cut a continuous path through the soil. The result is a homogenous grout wall of very uniform quality and thickness. The physical properties of the wall can be tailored to create a plastic-like material or a high-compressive-strength concrete.

In the Soil Saw™ concept, jet grouting nozzles are mounted along a rigid beam that is reciprocated through the soil media producing a sawing action like "a hot knife through butter." The combined sawing, jet-slurry grouting action, and the effects of gravity on the (locally) rigid beam results in the construction of a continuous soil/cement slurry wall. This wall can be constructed to depths only limited by the mechanical or hydraulic means to reciprocate the beam. The Soil Saw™ method is a one step in situ process which does away with the extensive and messy surface mixing and backfill operation. Since it is also a



continuous process, this makes it a unique technology. The equipment is mobile and able to work under low overhead clearance; thus it is well suited for working in and around complex DOE facilities.

Project Conclusion:

A demonstration of the Soil Saw™ was performed at the Savannah River Site (SRS) in February 1994. Approximately 350 linear feet of underground barrier wall was constructed with a one foot thickness and a maximum depth of 42 feet. The estimated production rate was 2 linear feet per minute.

This project was successfully completed in January 1995. At completion of this project, the technology developer was working to identify further needs and to gain experience with various soil types. Additional applications at industrial partner sites were being pursued. The technology developer has indicated that they are looking to gain more experience with different soil types before considering the SoilSaw™ ready for commercial usage.

Contacts:

The Halliburton NUS team develops and implements new technologies for environmental restoration. For information on this project, the contractor contact is:

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