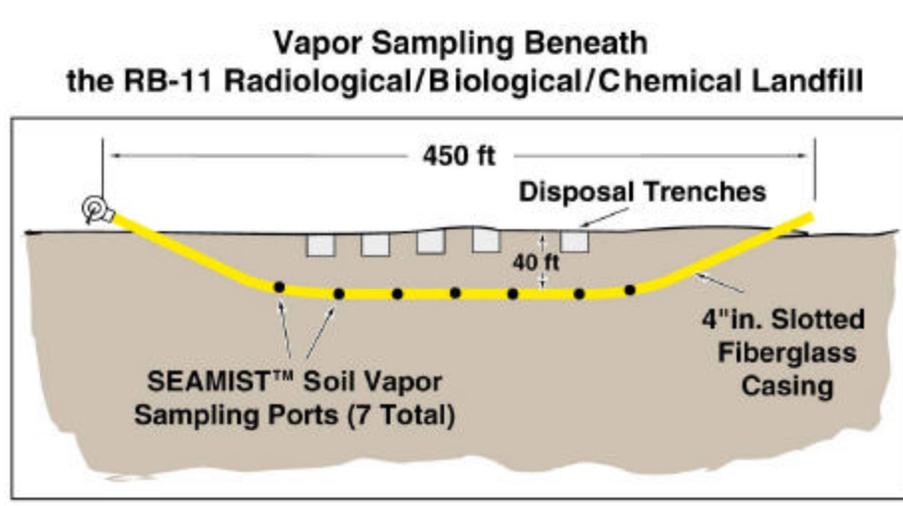




## SEAMIST™ Instrumentation/Sampling System

SEAMIST is a revolutionary approach to underground instrumentation and fluid sampler emplacement that was specially designed for hydrologic investigations. This low-cost system can substantially increase the quantity and quality of hydrologic data derived from drilled or punched wells.



### SEAMIST Performance

**Lining Boreholes:** Once in place, SEAMIST seals the entire hole wall to prevent the ventilation of the pore space or the flow of pore water into the hole volume, which can alter the well's hydrologic state.

**Supporting Boreholes:** As soon as the pressurized SEAMIST membrane contacts the hole wall, that surface is reinforced against sloughing.

**Transporting Instruments:** Quickly positions instruments and sampling stations over the entire length of the "everted" membrane, at any desired spacing. SEAMIST is also capable of transporting equipment on the membrane's inside surface, or on a tether which extends up the center of the hole.

**Protecting Equipment:** Logging tools, video cameras, and other instruments can be towed and protected inside the everting membrane during emplacement and retrieval. The SEAMIST design eliminates any dragging of instruments along the borehole wall and ensures that the only contact is with that section of wall defined by the operator.

**Separating Measurement Points:** When SEAMIST's thin membrane is molded around an instrument by the internal air pressure a "blister" is formed which houses the gauge or sampling port. The size of the volume measured by the instrument can be increased by attaching a thin spacer of coarse fabric to the membrane forming an annular volume between the membrane and the hole wall.

## **SEAMIST Operation**

SEAMIST is designed to replace the usual casing and backfill operation of a common monitoring well, allowing access to the entire geologic medium for measurement while providing a very fast method for borehole instrumentation. The system's principle feature is a hole liner that consists of a coated fabric called an impermeable membrane, which is fed from a reel into a borehole. The membrane, driven by air or water pressure everts (turns inside out) as it descends into the borehole, pressing up against the walls. This effectively lines the surface like a continuous packer and prevents flow into the hole. Any instruments, such as absorbent collectors or gas-sampling ports, are pressed against the wall and are well isolated from other measurement points in the same hole. SEAMIST's everting membrane can propagate in vertical and horizontal holes, traverse curves, slough piles and washouts to a depth of over 200 ft.

## **SEAMIST Installation**

This flexible tool is equally suited to quick and simple screening measurements as well as long-term, detailed hydrologic studies. Permanent installation is accomplished by filling the membrane with grout after emplacement. Because this membrane is impermeable, intrusion of grout into the soil is prevented along with any undesirable hydrologic interaction.

Semi-permanent installation -- where instrument retrieval for recalibration may be necessary -- is as simple as filling the membrane with sand after emplacement. The sand can be vacuumed out of the hole to retrieve the membrane.

An inexpensive membrane material makes it possible to use SEAMIST once, discard the membrane and eliminate any decontamination costs.

## **SEAMIST Applications**

- Plugging boreholes quickly and economically.
- Sampling gas at multiple points in uncased or screened holes.
- Performing absorbent collection of liquid samples.
- Mapping contaminant plumes, radioactive isotopes and salt-bed fracture flows; mapping pressure fields subsurface due to air injection or barometric pressure.
- Monitoring plume migration beneath surface obstacles; monitoring in situ bioremediation progress.
- Measuring permeability distributions in uncased or screened holes.
- Towing neutron moisture monitors to map saturation distributions.

## **SEAMIST Uses**

**Fracture or Soil Liquid Sampling:** A detailed array of absorbent pads pressed against the wall by the SEAMIST membrane makes possible the high spatial resolution of the pore's liquids' contaminant distribution. SEAMIST's ability to retrieve these pads within its inverted membrane facilitates quality control.

**Soil Gas Sampling:** Depending on its composition, volatility, and the amount needed for analysis, gas can be extracted from soil with SEAMIST by (1) pulling samples from discrete ports on the membrane via tubes to surface collectors; or (2) attaching activated charcoal absorbers to the membrane surface to gather contaminants.

Air Permeability Distribution Measurement: SEAMIST is useful in assessing the permeability distribution, which is critical prior to remedial activity. Emplacing a membrane with numerous gas sampling ports supports detailed gas sampling and multiple gas permeability measurements because the gas can be drawn or pressure measured from each port along the length of the membrane.

### **Contacts**

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