Waterra In-Situ®

Equilibrator™ diffusion sampler

Sample VOC's without bailing or purging

Diffusion sampling is a proven and accepted technique for determining concentrations of Volatile Organic Compounds (VOCs) in groundwater monitoring wells.

A semi-permeable sample chamber is filled with deionized or distilled water, then lowered into the well screen and left in place. VOCs in the groundwater diffuse into the sampler until the concentration gradient equilibrates between the water in the formation and the sampler. The sampler is retrieved and the contents emptied into VOA vials for laboratory analysis.

Applications

- Sampling for volatile organic compounds (VOC's)
- Low-yield boreholes
- Concentration profiling in long-screened boreholes

Benefits

- Reliable and inexpensive
- Practical and easy to use
- Eliminate bailing and pumping
- Profile contaminants vertically
- Reduce sampling error and improve repeatability
- No purge water disposal

Sampled compounds

Benzene
Bromodichloromethane
Bromoform
Chlorobenzene
Carbon tetrachloride
Chloroethane
Chloroform
Chloromethane
2Chlorovinyl ether
Dibromochloromethane
Dibromomethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethene
cis-1,2-dichloroethene (1,2-DCE)
1,2-dichloropropane (1,2-DCP)
1,2-dichloroethane (1,2-DCA)
1,1-dichloroethene (1,1-DCE)
cis-Dichloropropene
Dibromochloromethane
Trans-1,3-Dichloropropene
Ethyl benzene
Naphthalene
Toluene
1,1,1-Trichloroethane (1,1,1-TCA)
1,1,2-Trichloroethane
Trichloroethene (TCE)
Trichlorofluoromethane
1,2,3-Trichloropropane
1,1,2,2-Tetrachloroethane
Tetrachloroethene (PCE)
Vinyl chloride
Xylenes

Waterra supply a comprehensive range of accessories including weights and filling funnel, to make sampling with the Equilibrator simple and straightforward.

EQUILIBRATOR™

PR28

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Waterra In-Situ®

Equilibrator ™

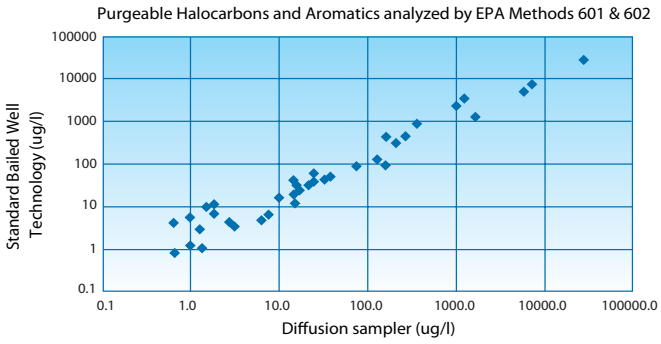
Equilibrator samplers are widely in use at sites where volatile organic compounds require on-going periodic monitoring. The elimination of well purging, and ease of use, result in substantially lower sampling costs. This simple technology combined with excellent correlation of analytical results to other methods has propelled diffusion sampling into acceptance and use by industry, consultants, and regulators alike.

How it works

Diffusion sampling is based on the underlying principle that water in the screened interval is in constant dynamic equilibrium with the aquifer so that there is constant flow from the aquifer through the screen. In addition to natural groundwater flow, molecular diffusion causes soluble compounds to remain evenly dispersed and in equilibrium from the aquifer through the screened portion of the well. The same dynamics hold true within the water-producing fracture zones of rock wells.

Comparative Data

Numerous installations exist from which correlative data compare the results of diffusion sampling with other techniques such as bailing and low-flow sampling. One such comparison, conducted by Bunnell-Lammons Engineering, Inc. (BLE) and shown graphically below, is based on a 28-well comparative study. For analytical data and case histories see the USGS Guidance Document "User's Guide for Polyethylene-Based Passive Diffusion Bag Samplers...", Report 01-4061.



Equilibrator field method

1. Fill with deionised water
2. Insert the plug
3. Attach the weight
4. Ready for use

Leave for 2 weeks or until next sampling event

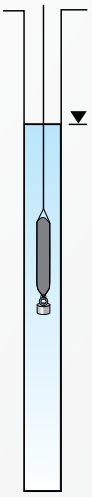
5. Sampling into VOC vial

Ordering information

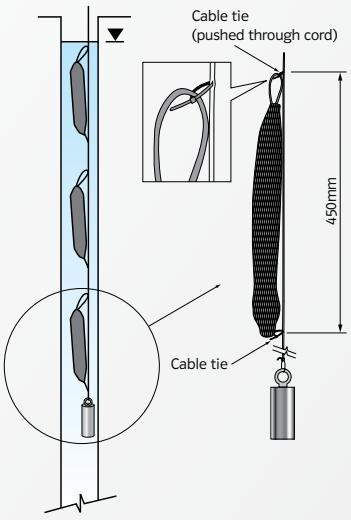
Code	*Description*
Equilibrator and Filling Kit	
EEQ-350	Equilibrator diffusion sampler (350 ml)
EFK-306	Filling kit (Funnel) for Standard Equilibrator
Stainless Steel Hanger (Reuseable)	
EEH-310	Stainless steel hangers for Equilibrator (Reusable)
Stainless Steel weights (Reuseable)	
EWT-150R	SS weight 175g with eye and split ring (35mm dia)
EWT-250R	SS weight 275g with eye and split ring (35mm dia)
EWT-500R	SS weight 525g with eye and split ring (35mm dia)
EWT-RING	SS Split Ring (25mm)
Reels and Cord	
ERL-110	Hand reel with removable spool (100m capacity)
BC/K35-50	Lifting cord - 3.5mm dia polyester cord (50m)
BC/K35-300	Lifting cord - 3.3mm dia polyester cord (300m)
KC2 - 100	Kevlar rope (100m x 2mm - spooled)
Ties for tethering	
EWT-CT100	Cable ties (100mm) Pack 100

Deployment methods

Equilibrator suspended in well



Vertical profiling with 3 or more samplers tethered



Method of tethering Equilibrator

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