

**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**PRESENTATION TO
THE NUCLEAR WASTE TECHNICAL REVIEW BOARD**

**SUBJECT: TESTING OF THE SATURATED
ZONE WITH REACTIVE TRACERS**

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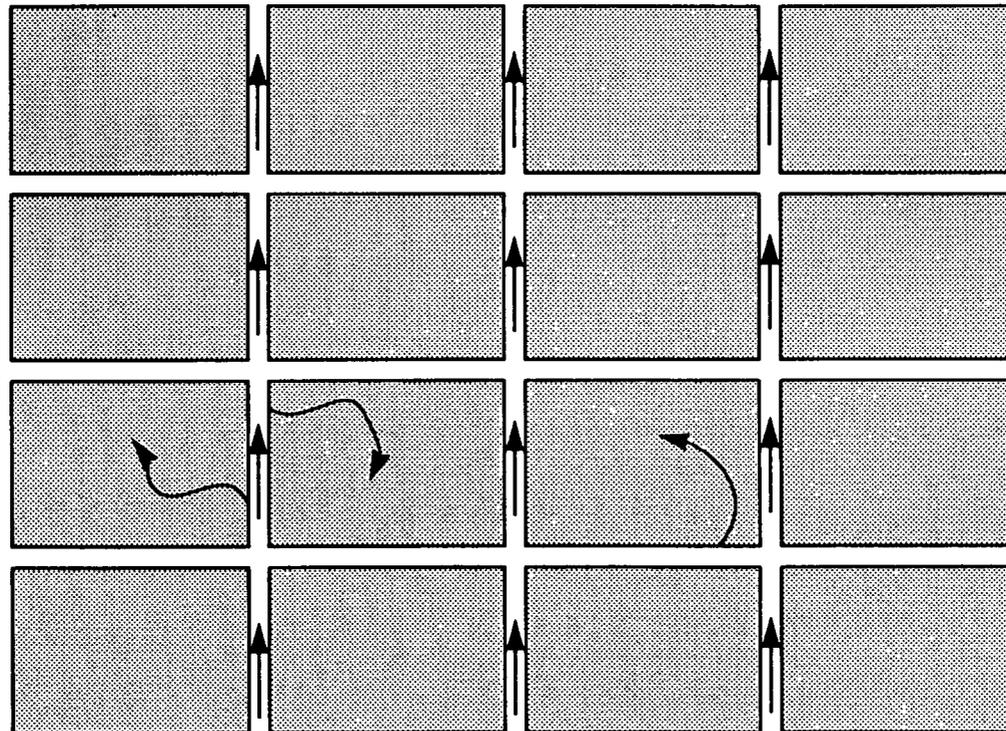
**PRESENTER'S
TELEPHONE NUMBER: (505) 667-1910**

**REGISTRY HOTEL, DENVER, COLORADO
JUNE 25-27, 1991**

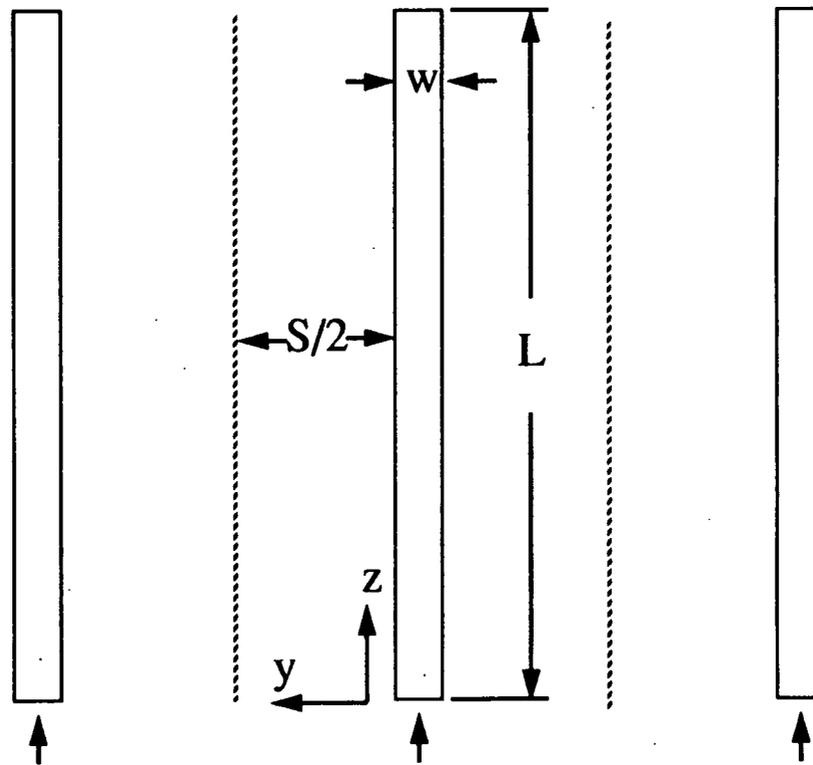
Goals of the Reactive Tracer Study

- **Demonstrate the applicability of laboratory sorption data for predicting field behavior**
- **Improve our understanding of transport processes in the saturated zone**
- **Evaluate the mobility of colloids in the saturated zone**

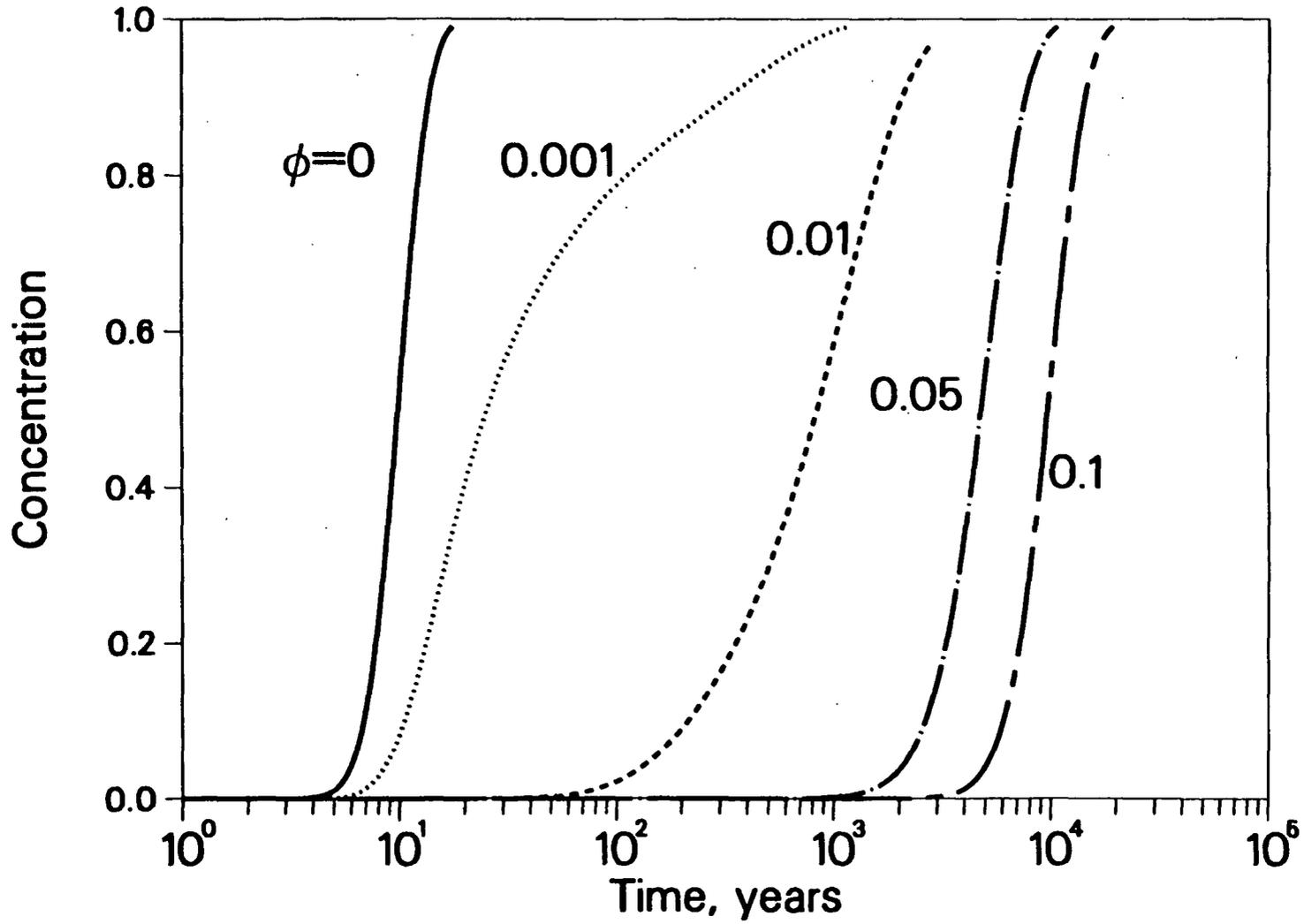
Fracture Flow With Matrix Diffusion



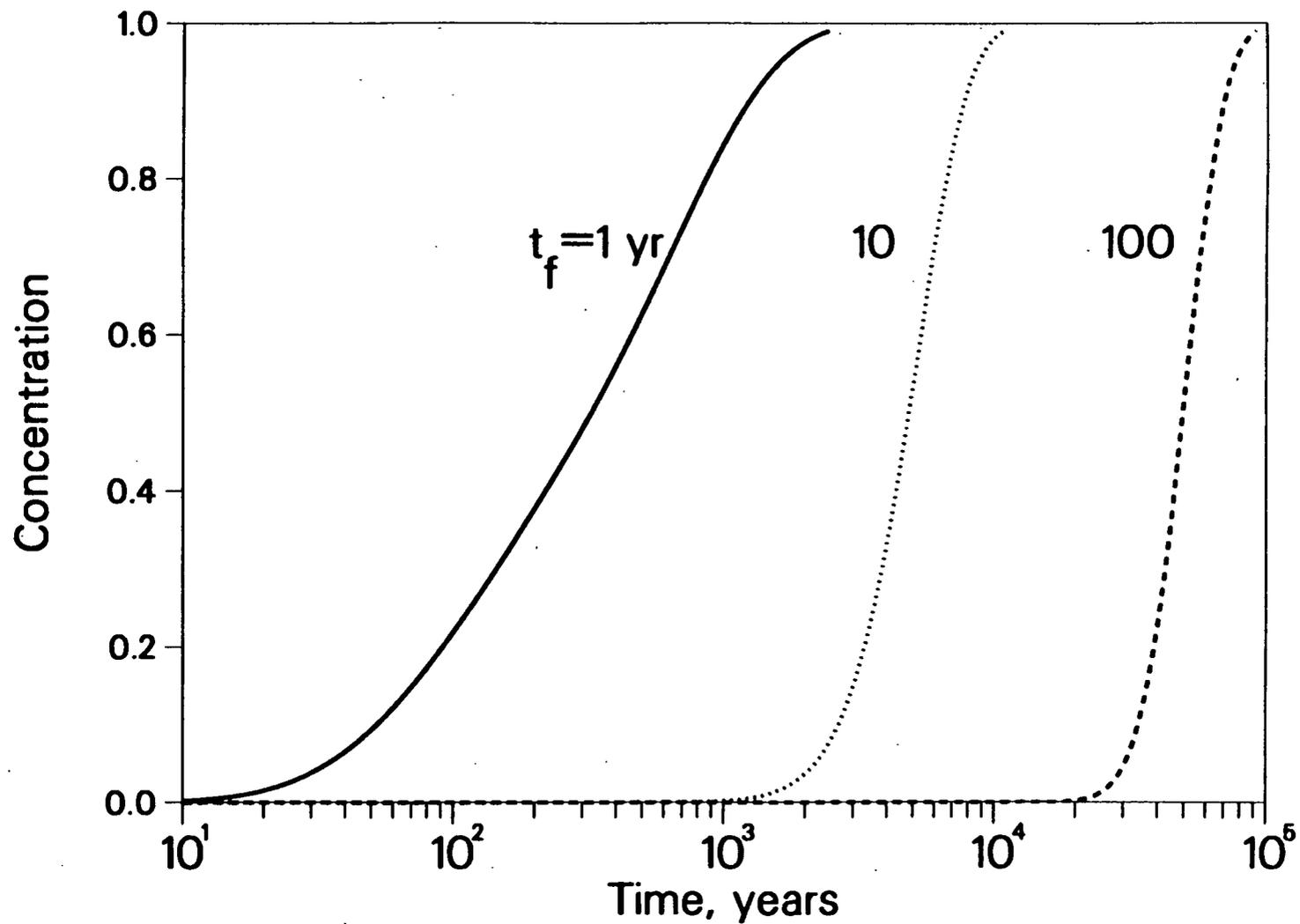
Geometry for Solute Transport



Effect of Matrix Porosity

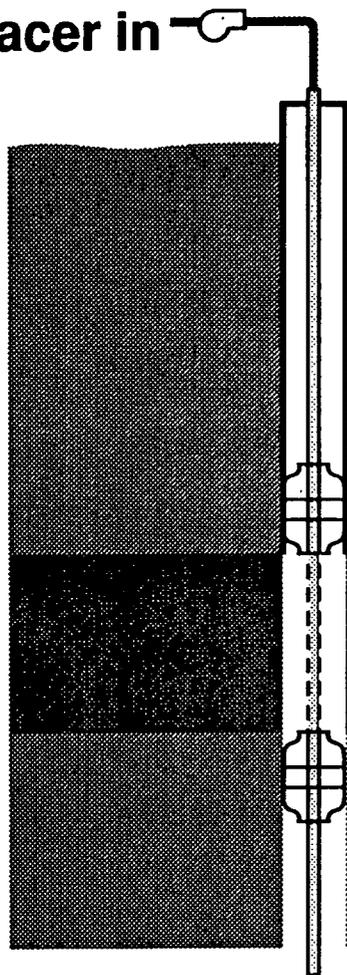


Effect of Groundwater Travel Time



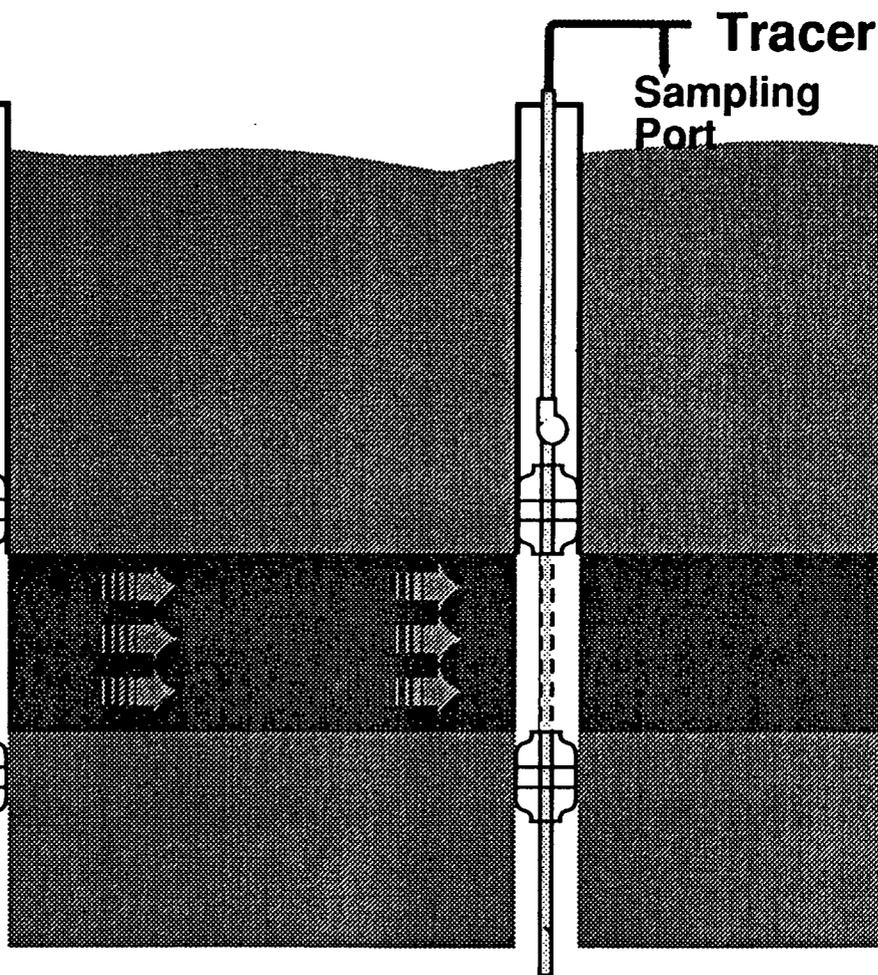
Two Well Recirculating Tracer Test

Fluid and
Tracer in

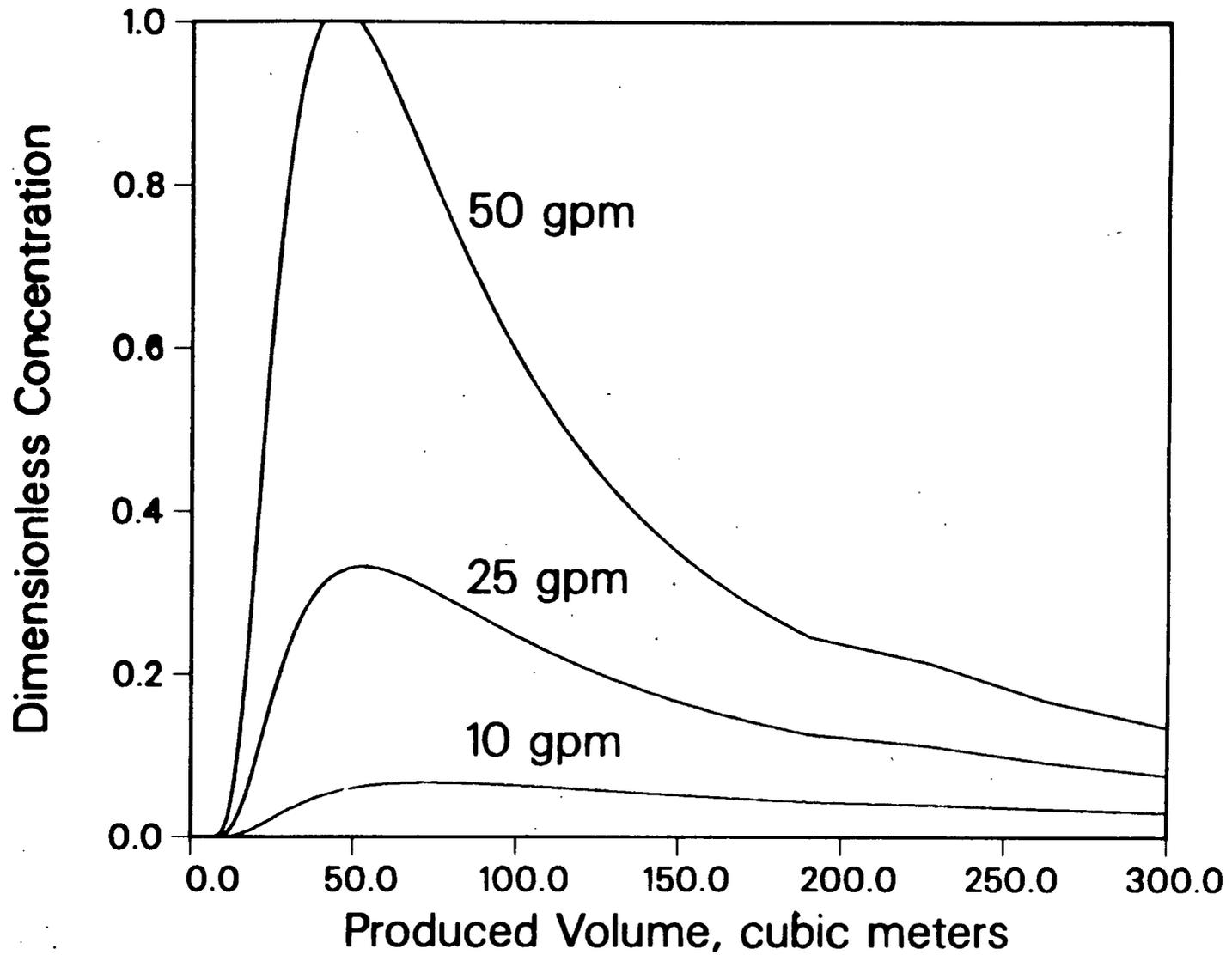


Fluid and
Tracer out

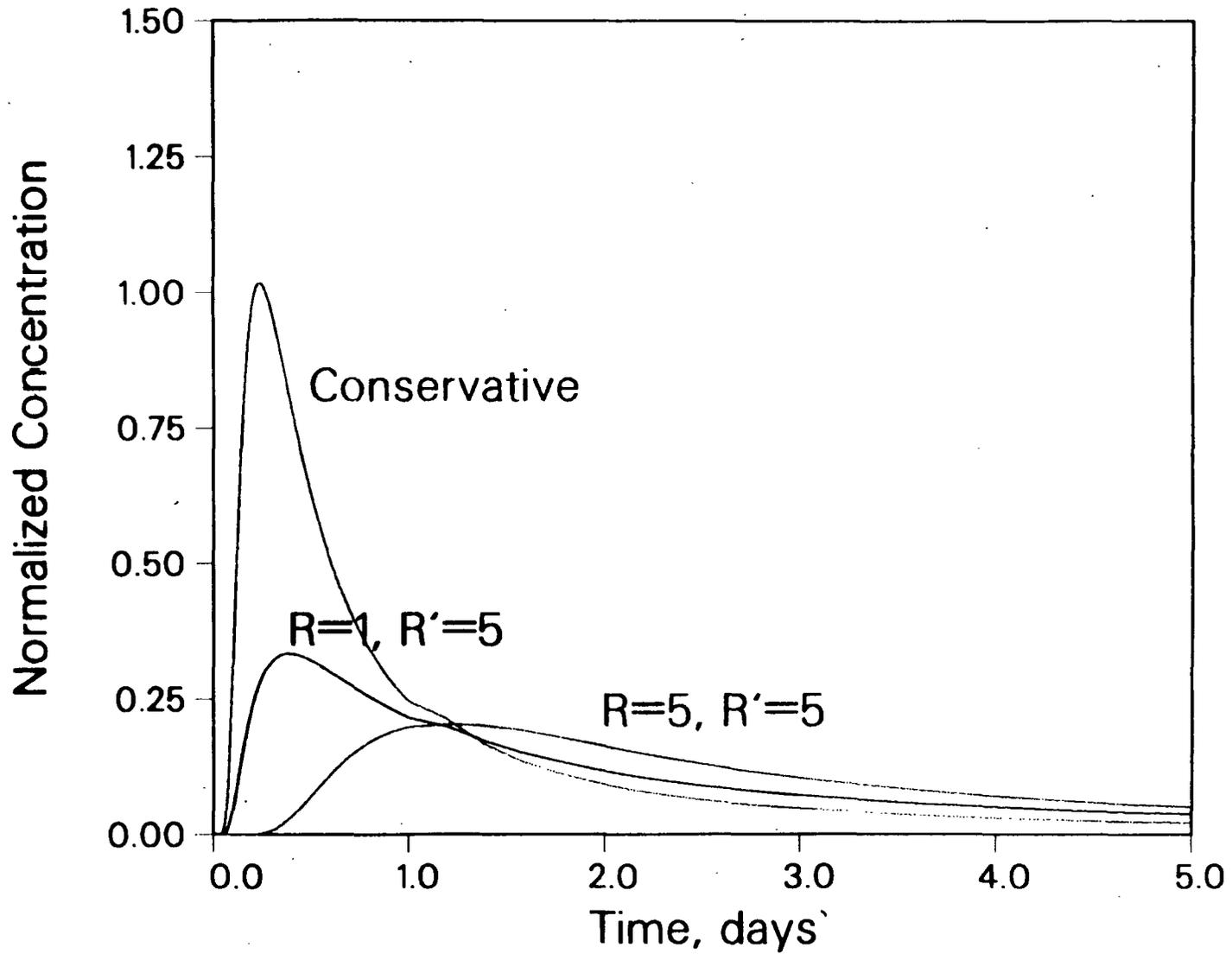
Sampling
Port



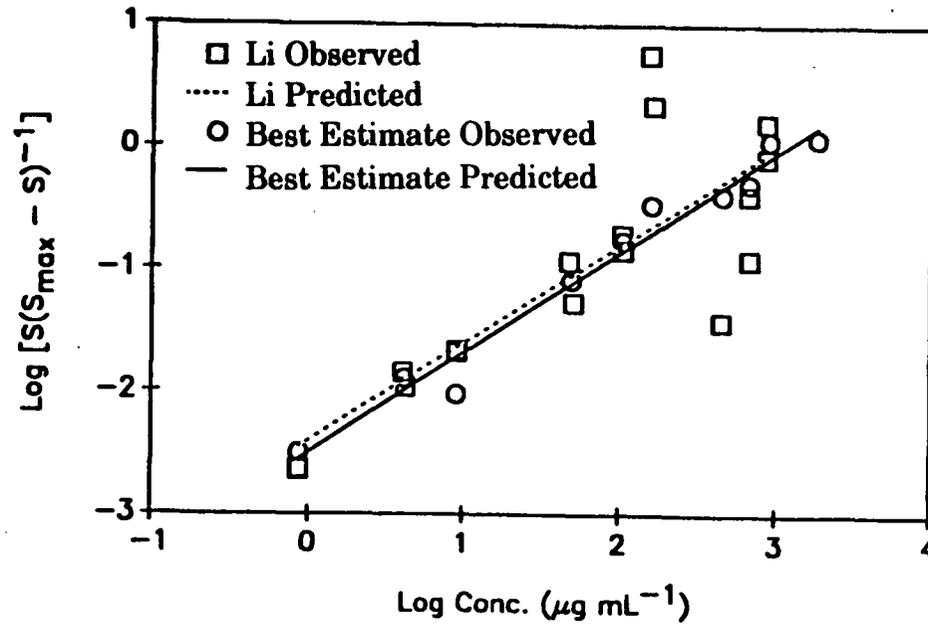
Breakthrough Curves - Different Flow Rates



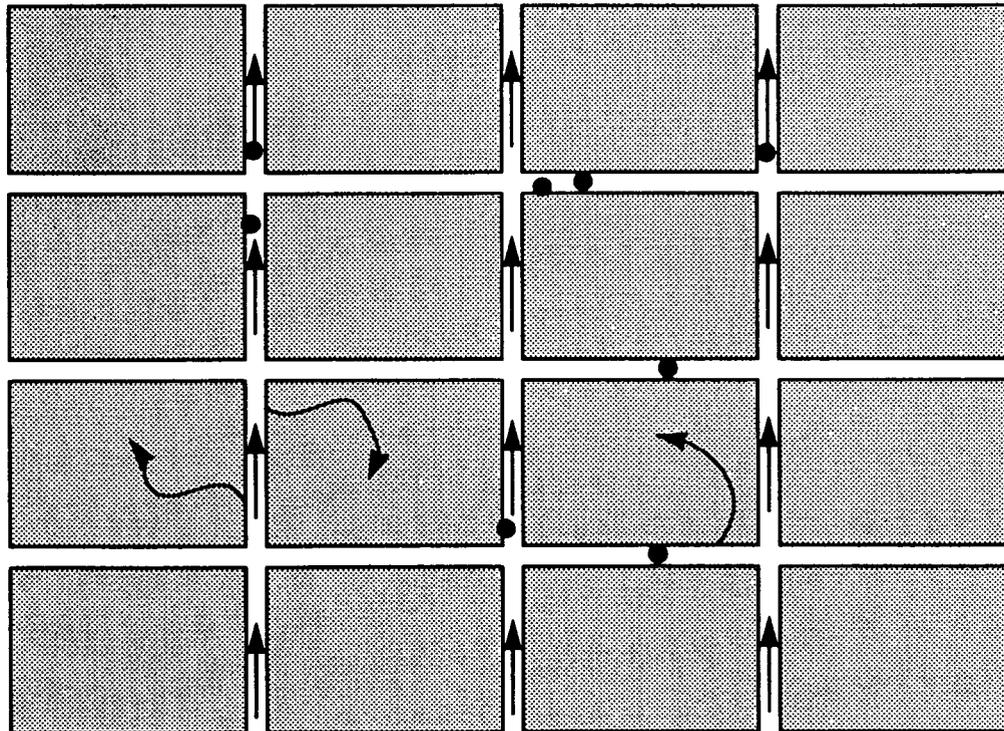
Sorbing Tracer Behavior



Sorption of Lithium on Prow Pass Tuff



Colloid Transport Through Fractures



Current Status of the Project

■ Laboratory Studies

- Preliminary studies of Li sorption are complete.
- Request for C-Well core samples has been approved, and isotherm experiments will be carried out when the samples are received.

■ Modeling

- Software development and qualification efforts are ongoing.
- Parameter sensitivity studies are being refined and documented.

■ Field Experiments

- The collaboration with the USGS is in place.
- Design calculations will be carried out once the software has been qualified for use.