



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004HI55B

Title: Development of a New Technique for the use of Dissolved Helium as an Environmental Groundwater Tracer

Project Type: Research

Focus Categories: Hydrology, Solute Transport, Models

Keywords: helium, tracer tests, instrumentation

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds: \$17,006

Non-Federal Matching Funds: \$35,031

Congressional District: First

Principal Investigator:

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Abstract

Helium has several advantages over other tracers including the following: (1) Helium is non-toxic; (2) Helium is inert and therefore does not degrade or react with the aquifer matrix; (3) There are no esthetics issues involved in the use of helium as a tracer; and (4) Naturally occurring concentrations of dissolved helium are generally very low and well below its saturation concentration. Helium has thus great potential in certain specialized groundwater tracer applications. These include use near drinking water sources or in environmentally sensitive areas such as wet lands; use where esthetics are a concern such as recreational beaches; and use in conjunction when investigating the diffusion characteristics of the aquifer.

The proposed study will develop and demonstrate a new analytical system that will substantially improve the precision and utility of the helium tracer analysis techniques for routine use in surface and groundwater. The new design will allow on-site, continuous, real-time monitoring in a completely automated structure. The work proposed will include system development, calibration in a laboratory environment, and testing in the laboratory against other commonly used tracers.