WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: KS1701

Title: A field assessment of direct-push technology for site characterization investigations - Year Two

Focus Categories: Groundwater, Water Quality

Keywords: Direct Push, Site Characterization, Hydraulic Tests, Water Sampling, Hydrostratigraphy

Start Date: 03/01/2001

End Date: 02/28/2002

Federal Funds: $32,972

Non-Federal Matching Funds: $36,907

Congressional District: 3

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Abstract

Groundwater resources currently provide more than 85% of the water used in Kansas. A significant portion of the groundwater that is used for drinking water supplies comes from aquifers consisting of unconsolidated sediments lying in past or present river valleys. Effective management of these important groundwater resources depends on our ability to reliably assess the threat posed by potential sources of contamination (such as leakage from landfills and animal waste lagoons, intrusion of saline river water, etc.). This assessment, however, is only as good as the data on which it is based. Using conventional field methods, large amounts of time and money can be expended without necessarily improving our knowledge of conditions in the unconsolidated alluvial deposits that compose these aquifers. There is a critical need for efficient and scientifically sound methods that will provide the information necessary to reliably evaluate the severity of contamination threats in a practically feasible manner. In this proposal, we outline a plan of research directed at the development and evaluation of a set of practical site-characterization techniques designed to significantly reduce the uncertainty associated with hydrogeologic investigations. This set of techniques will be based on direct-push methods, an innovative alternative to conventional drilling approaches developed since the mid-1980s for obtaining soil-gas, water, and core samples at sites of groundwater contamination. The major focus of this research will be the development and evaluation of direct-push techniques for the detailed hydraulic, geochemical, and stratigraphic characterization of unconsolidated alluvial deposits. The information obtained from such a detailed characterization is essential for siting waste disposal and storage facilities, designing effective remediation schemes, evaluating the risk posed by existing contamination, and managing stream-aquifer interactions. The end product of this research will be a suite of techniques of demonstrated effectiveness for the hydraulic, geochemical, and stratigraphic characterization of unconsolidated alluvial aquifers. These techniques will form a low-cost, scientifically sound "tool set" that can be utilized by practicing water-resources professionals to address a wide variety of issues relevant to the protection and management of water resources in Kansas.