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## **Monitoring Methods for Enhanced Aquifer Recharge Projects**

by Stephanie J. Moore, John T. Kay, and James A. Kelsey

Daniel B. Stephens & Associates, Inc.

This paper presents an overview of enhanced aquifer recharge, its current status in New Mexico, and methods that can be used to monitor the movement and quality of recharged water. Despite their growing use in communities throughout the United States and particularly in the arid Western United States, no enhanced aquifer recharge projects have yet been implemented in New Mexico, although several entities are exploring the feasibility of such projects. Concerns about potential impacts to water quality and the potential for disputes over water accounting have been raised by regulatory agencies. Permitting systems for aquifer recharge projects are being established by the New Mexico Office of the State Engineer and the New Mexico Environment Department Ground Water Quality Bureau, but have yet to be implemented. Comprehensive and effective monitoring programs will likely be required for large aquifer recharge projects in New Mexico. Monitoring programs are typically designed to track recharged water along its entire flow path to ensure that it reaches its intended storage location, that it does not adversely affect the quality of existing groundwater or soils, and to determine the amount of recoverable water. For a surface infiltration project, the monitoring program is often more complex than for a direct injection system because instrumentation must be installed within the vadose zone as well as the saturated zone. A variety of methods are available to monitor the movement of water and water quality changes within the vadose zone; the most appropriate method depends on the hydrogeologic characteristics of a given site. Common techniques include neutron logging, using heat as a tracer, tensiometers, porous cup lysimeters, and ground surface imagery techniques.

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