

The Federal Perspective on Regulations for Aquifer Storage and Recovery Wells

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ABSTRACT

Aquifer Storage and Recovery (ASR) is the process of storing water in an aquifer through an injection well and recovering that injected water when needed. In the United States alone there are likely over 175 ASR projects in the lower 48 continental states. Because this process requires the injection of a fluid into the subsurface through a well it falls under the regulatory purview of the United States Environmental Protection Agency's (US EPA) Underground Injection Control (UIC) Program. The UIC program is authorized by the Safe Drinking Water Act of 1974. The primary responsibility of the program is to protect the environment and public health by preventing contamination of underground sources of drinking water from the injection of fluids underground. The UIC Program has been delegated to many states, but if this program has not been delegated the UIC Program is run by the US EPA.

The US EPA's Region 5 office has developed a conservative approach to the issuance of ASR permits. This approach was developed in part because of issues identified at ASR projects in areas such as Wisconsin and Florida. At several of these sites there has been a notable increase in trace metals concentrations (e.g. arsenic and manganese) within the aquifer as a result of the recharge process. The release of such trace metals can be directly linked to the changes in the water chemistry (e.g. pH and redox potential) of the aquifer surrounding the injection well after treated drinking water was injected. Some of these sites have also found increases in tri-halomethanes concentrations within the aquifer. The increase in concentration of chemicals like tri-halomethanes is likely due to residual halogens from the disinfection process and increased concentrations of dissolved organic carbon in the recharge water.

At the federal level, in Region 5, the permitting process will be a two permit process. The first permit will be a "pilot permit", which will include at least three cycling tests. These tests will be designed to determine what effect, if any, the project will have on the aquifer of use. This permit will only be in effect until the end of the cycling phase. Once the cycles have been completed and if everything appears satisfactory an "operational permit" will be issued. To date, ASR technology has not been widely utilized in the upper Midwest, due to uncertainties regarding cost and regulation. Information gathered through the first few permits issued will help to clarify the viability of the proposed regulatory approach. Once an approach has been fully adopted, it will minimize much of the uncertainty, which in turn may allow the development of more projects, thus helping drinking water systems better meet water resource needs without excessive new

infrastructure. It is anticipated that preliminary results will be available to share at the 2007 symposium.