

Summary - Drinking Water:

Characterization of Injected Fluids Associated with Oil and Gas Production

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What GAO Found

The Environmental Protection Agency (EPA) oversees the Underground Injection Control (UIC) program, including oversight and regulation of injection wells associated with oil and gas production called class II wells. Under the Safe Drinking Water Act, these wells are subject to regulation to protect underground drinking water sources. EPA has approved 39 states to manage their own class II well programs and EPA regions are responsible for managing the programs in remaining states.

Information collected by EPA and select states on the characteristics of fluids injected into class II wells varies. Class II programs in seven of the eight states GAO reviewed require permit applicants to provide some information on the characteristics of fluids injected into class II wells prior to permitting, but the specificity and frequency of the information applicants are required to provide varies from state to state. Specifically, all of the states GAO selected except for Ohio require applicants to provide some information on the characteristics of fluids injected into class II wells, but the specific constituents to be reported differ by state. While Ohio's regulations do not require operators to provide information on the characteristics of fluids injected, the regulations narrowly define what fluids can be injected into class II wells. According to state officials, Ohio also conducted research on the characteristics of produced water in the state's oil and gas producing formations, and samples fluids injected into class II wells during well inspections. In addition, while all of the states GAO reviewed but Ohio require applicants to provide information on fluid characteristics when the well is permitted, five of the programs in eight states GAO reviewed require that well operators conduct additional analyses of fluids injected into class II wells after the well has been permitted.

According to EPA officials, fluid characterization requirements for class II wells are designed to ensure that no chemicals are injected that could potentially damage the wells. In addition, EPA officials told GAO that the agency does not prescribe a set list of constituents that state and EPA-managed class II programs should monitor. As a result, state programs and programs managed by EPA regions have discretion to monitor the injection fluid constituents that they deem critical to protect underground sources of drinking water in their respective states or regions.

Why GAO Did This Study

Every day in the United States, at least 2 billion gallons of fluids are injected into underground formations to enhance oil and gas production, or to dispose of fluids brought to the surface during the extraction of oil and gas resources. Water that is injected underground for disposal or to enhance recovery is regulated under EPA's UIC program and approved state programs. EPA developed safeguards to prevent fluids that are injected into underground formations from endangering underground drinking water sources, including monitoring of the characteristics of fluids injected into class II wells. Domestic production of oil and gas has increased dramatically in the last several years, with corresponding increases in the wastewater resulting from production processes. Because a significant percentage of

the population gets its drinking water from underground aquifers, these wells have raised concerns about the safety of the nation's drinking water.

GAO was asked to describe the information that EPA and states require injection well operators to provide on the characteristics of fluids injected into class II wells. GAO reviewed and summarized state class II fluid characterization requirements from a nongeneralizable sample of eight states--California, Colorado, Kentucky, North Dakota, Ohio, Oklahoma, Pennsylvania and Texas--selected on the basis of shale oil and gas regions and the highest number of class II wells. GAO also interviewed EPA and state officials.