

Testing the Efficacy of CO₂ for Enhanced Oil Recovery in the Illinois Basin: Preliminary Results, Rex Knepp, James R. Damico, Scott M. Frailey, John P. Grube, and Beverly Seyler, Illinois State Geological Survey, 615 E. Peabody Dr., Champaign, IL 61820, knepp@isgs.uiuc.edu

Previous analyses of historical production in the Illinois Basin by the Midwest Geological Sequestration Consortium suggest that using CO₂ for EOR would yield incremental oil of 0.86 to 1.3 billion barrels, while sequestering a portion of injected gases from the atmosphere. To further evaluate CO₂'s EOR potential in the basin's numerous mature producing fields, the consortium will conduct four tests under a variety of conditions. The first of these, a huff and puff, has recently been completed, while a second is scheduled for summer 2007.

The huff and puff test well, in Loudon Field (Fayette County, Illinois), produces from the Mississippian Cypress Sandstone at 1,516 feet. After geological modeling, reservoir characterization, and simulation of production under immiscible conditions, an injection program was designed and implemented in spring 2007. Results of this well stimulation technique and comparison of pre- and post-injection reservoir models will be presented, as will details of environmental monitoring carried out during and after the test injection and subsequent production.

A second scheduled EOR test entails conversion of an existing water injector to CO₂ injection, with hydrocarbon production from adjacent wells in a classic five-spot pattern. This test will also be carried out on a reservoir under immiscible pressure and temperature conditions. Geological and geostatistical modeling and reservoir simulation will be used to make final site selection and then design the CO₂ injection program. Two future tests will evaluate EOR from other prolific producing formations under miscible conditions.