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^{PS}Geologic Storage Field Demonstrations of the Midwest Regional Carbon Sequestration Partnership*

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Abstract

The eight states that comprise the Midwestern Regional Carbon Sequestration Partnership (MRCSP) - Indiana, Kentucky, Maryland, Michigan, New York, Ohio, Pennsylvania, and New York - represent a large fraction of the U.S. economy with a dependence on fossil-fuel-based generation resulting in significant CO₂ emissions. These states also represent a diverse geologic framework for carbon capture and storage (CCS) which includes two mature deep basins - Michigan and Appalachian - separated by the arches region, Appalachian Valley and Ridge, crystalline Blue Ridge, Piedmont provinces and the Coastal Plains sediments in the eastern part of the MRCSP. Validation of geologic storage potential and testing the applicability of monitoring technologies in this diverse area requires regional geologic characterization along with site-specific injection demonstrations.

To begin to test these varied geologic settings three deep saline reservoir tests are being conducted in collaboration with energy companies that are the potential future users of this technology. Each field test incorporates extensive reservoir and seal characterization, permitting, reservoir modeling, outreach, injection, and monitoring efforts. A gas processing plant operated by DTE in northern Michigan produces a pure CO₂ stream that is currently being used for EOR operations by Core Energy. Injection of more

than 10,000 tonnes of CO₂ was conducted during February-March 2008 into a dolomitic saline formation at a depth of 1,100 meters. Monitoring techniques at this site include cross well seismic, borehole micro-seismic, PFT tracers tests, wireline logging, fluid saturation profiles, fluid sampling, and continuous pressure-temperature monitoring. A ~2,500 meters deep test well drilled in 2007 at FirstEnergy's R.E. Burger Plant in the Appalachian Basin has provided an opportunity to test multiple deep saline reservoir zones, which are typical of many parts of this basin. Finally, in 2009 the MRCSP will drill injection and monitoring wells to test the Mt. Simon Sandstone in the arches geologic province at Duke Energy's East Bend Plant in Kentucky. For the large-scale demonstration project (Phase III), the MRCSP has proposed using CO₂ from an ethanol plant in western Ohio for injection of more than 250,000 tonnes per year for four years and also established an optional site in Indiana at an IGCC plant. Geologic assessments at these sites are now underway.

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