

Illinois Industrial Carbon Capture and Storage Project: Eliminating CO₂ Emissions from the Production of Bio Fuels – A 'Green' Carbon Process

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Abstract

The Illinois Basin is hosting several major carbon capture and sequestration projects. This basin, which underlies most of the state of Illinois, parts of Kentucky, and Indiana, ranks among one of North America's the best sites for potential storage of anthropogenic CO₂ emissions. Within this basin, the Mount Simon Sandstone, a major regional saline reservoir, is the target for sequestration because it has good permeability and porosity with overlying strata of impermeable shale. Because the regional thickness of this reservoir increases towards the center of the basin, the optimum location for maximum storage of CO₂ is in north central Illinois. Because of the excellent regional geology and access to industrial scale quantities of CO₂, two projects are being conducted at the Archer Daniels Midland Company's (ADM) agricultural processing and biofuel production facility located in Decatur, Illinois. Both projects will demonstrate the ability to inject and store industrial scale quantities CO₂ emissions into the Mount Simon; safely, permanently, and economically for hundreds of years.

Illinois Basin - Decatur Project (IBDP), (Status- Post injection site monitoring). This project is led by Illinois State Geological Survey (ISGS), under the Midwest Geological Sequestration Consortium (MGSC) Regional Carbon Sequestration Program, and is a large-volume, saline reservoir sequestration test that injected 333,000 tonnes/yr of CO₂ for three years reaching its storage target of 1.0 million tonnes in November 2014. The project is currently conducting post injection site monitoring and data analysis.

Illinois Industrial Carbon Capture and Storage Project (IL-ICCS), (Status- Operation). This project is led by ADM and expands the sites CO₂ injection and storage capability to that of a commercial-scale operation with the ability to capture, inject, and store over 1.0 million tonnes per year. In December 2014, ADM received the nation's first Class VI Underground Injection Control permit. This permit classification was specifically developed for the subsurface storage of CO₂ within the United States. In September 2015, the project completed all construction activities and is working with the USEPA on their review of the completion reports and evaluation of the pre-injection test data needed to finalize the permit's five year operating and monitoring conditions. Start-up is expected during the first half of 2017.

Intelligent Monitoring System (IMS) for Real-time Geologic Storage, Optimization, and Reservoir Management, (Status-Operation). This project is led by ADM and has the primary objective to develop an integrated IMS architecture that utilizes a permanent seismic monitoring network, combines the real-time geophysical and process data with reservoir flow and geomechanical models to create a comprehensive monitoring, visualization, and control system that delivers critical information for process surveillance and optimization that is specific to geologic storage projects.

The focus of this presentation will be to update the status and report the results from these first generation, commercial scale, carbon dioxide capture and storage projects.