A Systematic Assessment of CO$_2$ Enhanced Oil Recovery and Co-Sequestration Potential in Ohio’s Depleted Oilfields

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**ABSTRACT**

The goal of this study is to develop process understanding and evaluate technical and economic feasibility of CO$_2$ utilization for enhanced oil recovery (EOR) and geologic storage in Ohio. Our focus is on depleted oilfields in the Clinton Sandstone (Eastern Ohio) and the Knox Dolomite Group (North-Central Ohio). These fields are promising candidates for CO$_2$-assisted EOR because of poor primary recovery efficiency that leaves behind approximately 80-90% of the original oil in place. A systematic assessment of EOR and co-sequestration potential for CO$_2$ in these depleted oilfields has not been undertaken to date – which is the objective of this research project.

**[1] Reservoir Characterization**
- Collected data on location and production history for major Ohio oilfields
- Evaluated geologic characteristics from well logs in selected fields

**[2] Fluid Property Characterization**
- Evaluated empirical correlations for CO$_2$ oil-brine-gas properties
- Created fluid property prediction toolbox

**[3] Geologic Modeling and Storage Capacity Estimation**
- Assessed available geologic data and rock properties
- Estimated CO$_2$ storage capacity in depleted oilfields
- Built geologic models for reservoir simulation

**[4] Reservoir Modeling and Simulation**
- Assessed simulation tools for CO$_2$ storage and CCUS
- Executed simulations for CO$_2$ Brine-DI interaction within modeled oilfields

**[5] Source-Sink Matching and Pipeline Routing**
- Assessed sources and volumes of stationary CO$_2$ emissions
- Mapped location of emission sources via a via depleted oilfields sinks
- Developed a pipeline routing methodology

**[6] Economic and Cost-Benefit Analysis**
- Created framework for cost-benefit analysis
- Collected inputs which impact CCUS costs
- Analyzed breakeven-cost of CO$_2$ feasibility for range of oil prices

**CCUS in Ohio’s Depleted Oilfields**