Weyburn core assessment from pre CO₂ and post CO₂ injection wells. Determining the impact of injected CO₂ on the reservoir.

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Abstract

Saskatchewan is home to the Weyburn and Midale oilfields, which together contain the largest amount of injected anthropogenic CO₂ on the planet. Approximately 25 million tonnes of CO₂ are already stored in these two reservoirs, with an additional 2.8 million tonnes added annually. A recently initiated project, Saskatchewan CO₂ Oilfield Use for Storage and EOR Research (SaskCO₂ USER) will advance the rich datasets from the Weyburn and Midale fields to better inform prospective CO₂-EOR operators, government regulators and service providers on how to improve the efficiency of CO₂-EOR operations, maintain the safety and integrity of CO₂ storage, and limit liabilities and risks during operations. There are seven research areas in the SaskCO₂ USER Project, a core assessment being one.

The core assessment project is investigating the affect of injected CO₂ on the rock framework and the pore space. Two pressure observations wells have recently been drilled in the Weyburn field. Extensive cores were taken from the two wells. This provides a unique situation to observe the influence of injected CO₂ on the rock framework and pore space at reservoir conditions. Comparing the recently drilled wells to wells that were drilled prior to CO₂ injection will reveal, if any, the affects of injected CO₂ on the reservoir.

This field scale “laboratory” provides a rare opportunity to investigate the results of injected CO₂ on the reservoir at an active injection site leading to a better understanding of the response of the reservoir over the last 15 years of CO₂ injection. The analytical techniques that are being utilized to determine if the injected CO₂ has impacted the reservoir are: QEMSCAN to determine the mineralogy and porosity, thin sections, SEM images, and stable isotope analysis. Preliminary results will be presented recently commenced project.