

Southwest Regional Partnership on Carbon Sequestration

Quarterly Progress Report

Reporting Period: January 1, 2014–March 31, 2014

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DE- FC26-05NT42591

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Executive Summary

Tasks addressed in this quarter were Tasks 1, 2, 4, 5, 6, and 8.

Task 1–Regional Characterization: SWP finalized its contributions to the NATCARB Atlas V for the GIS section. Using the revised Arbuckle database, researchers prepared a map depicting the depth to the top of the Arbuckle (versus subsurface structure) and continued acquisition of bottomhole temperature data from deep wells in Oklahoma.

Task 2–Public Outreach and Education: Project Website: maintenance and upgrades for STOMP-EOR were performed.

Task 4–Site Characterization and Planning: Core analysis researchers visited TerraTek in Salt Lake City, to observe Farnsworth core, observing and documenting the rock type or lithofacies, and obtaining preliminary descriptions of fractures. Highlights for STOMP-EOR included: 1) implementation of a new solution algorithm for the EOS routines, 2) demonstration of the new EOS routines in STOMP-EOR on a 11-component model of the Farnsworth oil, and 3) development of fully coupled injection and production well models. In other modeling activities, researchers worked on numerical simulations of the relative permeability models and simulated the geochemical reactions of CO₂-rock interactions in the Upper Morrow formation (storage reservoir) and the Thirteen Finger formation (caprock) in the Farnsworth EOR field. Work with the risk assessment software *CO₂-PENS* with PSUADE progressed. Risk Workplan final completion outline was finished.

Task 5–Well Drilling and Completion: The first and second characterization wells at the FWU were drilled, cored, logged and completed.

Task 6–Operational Monitoring and Modeling: Work progressed on a number of fronts. Researchers worked on the design for the eddy covariance field deployment for the FWU and on the methane release monitoring project on the UU campus, including calibration of wind direction data. CO₂ surface flux data and water samples were collected each month at the FWU, and analyzed. Injection and production data for the FWU was analyzed, and CO₂ storage monthly totals were updated. Groundwater geomechanical modeling work continued, focusing on building an initial TOUGHREACT model of the Morrow Sandstone. In seismic activities, the baseline 3D VSP and crosswell seismic survey for characterization wells 1310A and 1314 (west side of FWU) were completed. Maintenance of the super conducting gravimeter at the FWU was conducted in January. Geophone data (VSP shot points) were analyzed with a velocity model generated using sonic log data from well 1310A. A flow model for the FWU continued in development, and 3D seismic interpretation was performed.

Task 8–Project Management: A number of meetings and workshops were planned early in the quarter, and carried out later in the quarter. A presentation with questions and answers was given at the Chaparral Office in OKC for Chaparral and SWP by Oklahoma State University researchers on March 12, 2014. They presented their project to test CCUS monitoring techniques at a field site; specifically, performing tests at the FWU. SWP was represented at a NRAP Stakeholders meeting and responses to the IEA Expert Review comments to the FWU Project were submitted.