Southwest Regional Partnership on Carbon Sequestration

Quarterly Progress Report

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Executive Summary

Task 2–Public Outreach and Education: Improvements to the MVA data website continued to allow for more secure and user-friendly access. The project fact sheet was updated and a list of SWP publications and presentations was added to the website. Maintenance of SWP-Velo continued, with no significant bugs reported.

Task 6–Operational Monitoring and Modeling: Researchers continued to incorporate new data into the MVA Database. In *6.1 Surface and Near-Surface:* CO_2 surface flux measurements and water sample analyses were performed and eddy flux research continued. Gravity measurements were not taken. In *6.2 Subsurface:* CO_2 storage summaries showed a total of 946,010 tons stored since the inception of FWU CO_2 accounting. Aqueous-phase tracer results indicated a likely tracer breakthrough in each of the four production wells surrounding #14-1. Analysis continued on PMCH and PECH tracers collected from May 2016 injections. In *6.3 Seismic:* the 3D VSP repeat survey was conducted in FWU well 13-10A. An effort to repair the WellWatcher Connect* wellsite data transmission system showed that the damage was worse than initially thought so the cause was investigated. Work continued on seismic data evaluation, identification of STA/LTA detection parameters and detecting and locating microseismic events at FWU. In *6.4 Reservoir Modeling:* Researchers continued to analyze the effects of three-phase relative permeability on CO_2-EOR forward models. Work continued with the calibrated West Half Fault Model with Hydraulic Flow Unit (HFU) reservoir delineation. Researchers worked with experimental capillary pressure data obtained for 13 samples of the Morrow sandstone covering all eight HFUs identified. Other characterization efforts involved describing reservoir architecture and performing reactive transport simulations with STOMP. Researchers finished constructing the improved history match based on the third-generation SWP geological model, using HFUs and including faults previously unknown within the FWU. Work continued on improving forecasting of CO_2 storage and oil recovery. In *6.5 Risk Assessment*: Researchers evaluated eight well patterns for pressure management at a generic post-EOR site, and the impact of several model simplifications, including high intrinsic permeability, homogeneity, linear relative permeability function and flatness of vertical layers. Studies continued on arsenic mobilization in shallow groundwater with CO_2 leakage. Other research focused on developing geomechanical capabilities for the STOMP-EOR simulator and risk analysis of FEPS with CO2-PENS-PSUADE, where researchers conducted a set of economic risk analyses to estimate the profitability under different oil prices based on previous 1000 MC simulations for CO_2-oil-water flow in the Morrow-B reservoir at the site.

Task 8–Project Management and Oversight: SWP's Annual and Advisory Board meetings were held at CELLC's Oklahoma City office October 18–19. Fieldwork at FWU proceeded as planned, and researchers collected soil flux, groundwater, and seismic data, as well as data from the NETL surface array. Memory gauges were installed in Well 13-10a to measure bottomhole pressure and temperature. The final risk report was submitted. A PI participated in the ISO TC265 (for carbon capture, transportation, utilization and geologic storage) meeting as a US ANSI team member. SWP researchers presented a number of papers and posters at GHGT-13 and the AGU Meeting.