Southwest Regional Partnership on Carbon Sequestration

Quarterly Progress Report

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Executive Summary

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

Task 1–Regional Characterization: Researchers finished the map of the depth to the top of the Arbuckle Group, which will be allied to volumetrics in order to estimate CO_2 disposal.

Task 2–Public Outreach and Education: Researchers continued to assist with contact email for the SWP website and to implement the Velo data-sharing system. They also assisted with the recovery of files from the SWP Project data-sharing site Velo, due to the deletion of the SWP files that occurred while a user was connected to Velo by the WebDAV sharing protocol.

Task 4–Site Characterization and Planning: Researchers made progress in the geologic characterization of the FWU. Coordination of the core analysis continued. The STOMP-EOR simulator is now functioning as an executable; verification testing continued. A STOMP-EOR workshop was held September 30–October 1 at the University of Utah. CO2-PENS-PSUADE: researchers first conducted a geostatistical analysis of the well-log data collected from 70 boreholes of the FWU and then developed an integrated framework for understanding CO_2 storage potential within an EOR environment. The project team continued to work on simulations and verification of uncertainty quantification approaches.

Task 6–Operational Monitoring and Modeling: Researchers took measurements of gravity, self-potential, micro-seismicity and weather, and conducted basic studies for improving in-situ monitoring and data analysis methods. The project team continued to work on surface and near-surface monitoring tasks, addressing the visualization and analysis of eddy flux data at the site with an open-source package, "openair". Background CO_2 surface flux was taken from specific sampling locations. Work on the geochemical model focused on extending TOUGHREACT reactive transport simulations. SWP researchers worked on finding a solution for vapor-phase tracer sampling at Farnsworth. A 3D VSP and crosswell tomography processing review meeting took place in Houston on July 9. In the field, coring and logging operations on the FWU 32-08 well were finished. By the end of the quarter, erratic DTS readings from the FWU 13-10A and 13-10 wells were fixed, but noise was still occurring in the passive seismic array. By the end of the quarter, SWP researchers determined that installation of downhole gauges in E Farnsworth was not possible due to numerous casing leaks discovered while preparing the well. Work was performed on high-resolution 3D seismic cube data interpretations to improve geologic and structural understanding of the CO_2 reservoir system. Researchers continued to study key potential geomechanical processes in the Morrow formation and the associated effects on CO_2 capacity and injectivity. A geological model was constructed from the 3-D seismic interpreted surfaces.

Task 8–Project Management: Well 3208 had the intermediate drilling, open hole logs, and intermediate casing completed and 267 ft of core taken. The new well, 1315, displayed increasing production since April; by mid-August it was producing over 400 barrels/day; a case of drilling into a trapped secondary oil bank. Two new Ogallala water sampling site were added and an additional series of CO_2 soil flux samples and were taken with no out-of-normal flux readings. Aqueous tracer samples were also taken. Efforts to determine which well in the 3208 pattern will be used as a downhole sensor/observation well continued. A number of workshops, meetings, and conferences were held, attended, or planned. Working Group activities progressed on schedule for the quarter.

TASK 1 Regional Characterization

Arbuckle Formation

Researchers finished the map depicting the depth to the top of the Arbuckle Group, which will be allied to volumetrics in order to estimate CO_2 disposal. Bottomhole temperature data acquisition is nearly finished with the eastern Townships and about 65% finished with the western Townships.

TASK 2 Public Outreach and Education

Subtask 2.2 Project Website

SWP researchers assisted with the Domain Name System (DNS) and registration of the SWP Internet presence. They continued to assist with contact email for the SWP website and to implement the Velo data-sharing system. Researchers also assisted with the recovery of files from the SWP Project data-sharing site Velo due to the deletion of the SWP files that occurred while a user was connected to Velo by the WebDAV sharing protocol. Researchers prepared for the combined SWP Simulation workshop and core viewing event in Salt Lake City on September 30 – October 2, 2014. The preparations included lodge, catering service, transportation, computer laboratory reservation, website creation, and STOMP-necessary software installation on the lab computers.

During the quarter, work associated with the SWP-Velo element of the project continued to be maintenance of the core software and user support. The SWP-Velo framework is now operational and most of the SWP research team are registered users. The SWP-Velo team maintains the core software