Southwest Regional Partnership on Carbon Sequestration

Quarterly Progress Report

Reporting Period: January 1–March 31, 2016

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DE- FC26-05NT42591

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Executive Summary

Task 1–Regional Characterization: Researchers continued to map the Arbuckle disposal site in the area where the projected depth to Arbuckle is 3,000–13,000 feet.

Task 2–Public Outreach and Education: The more modern SWP website was installed and ready to go public. Researchers also worked on developing a web-based interface for submitting manuscripts/abstracts needing review by NMT, Chaparral and DOE. Researchers continued improvements to the MVA data website to allow for more secure and user-friendly SWP-wide access. Many GIS/mapping aspects of the MVA effort were improved. Researchers continued work on requested changes to SWP-Velo to make it more user-friendly.

Task 6–Operational Monitoring and Modeling: The project team continued to refine the MVA database. In *6.1 Surface and Near-Surface:* Researchers conducted fieldwork at the Farnsworth site, performing maintenance of the continuous self-potential monitoring system at WH1310 and data downloading from the weather station. CO_2 surface flux in soil and air was sampled and measured, and tracer tests were ongoing, with no breakthrough observed. Tracer sampling was reduced to twice weekly. *In 6.2 Subsurface:* Water samples were taken and analyzed. In *6.3 Seismic:* work began on the VSP Inversion project. To optimize timing of repeat VSPs, the sensitivity of the 3D VSP surveys to CO_2 injection was analyzed to determine when a seismic response to the injected CO_2 could be observed. *In 6.4 Reservoir Modeling:* notable improvements in reactive transport simulation were made. It is now possible to use nine minerals, and refinements in mineral selection made it possible to simulate about one year per day of computer time. Researchers began defining hydraulic flow units to aid in development of facies-based models. Conversion of archived micro seismic data to mini-seed format began. Researchers completed 2D basin models using wells in Farnsworth, Booker fields and 2D seismic lines samples from the re-started tracer program were sent for analysis. FWU water chemistry and minerals were applied to the reactive transport models in STOMP. Reactive transport models were found to be sensitive to CO_2 injection temperature. A local fine scale model for the area around the 13-10a injector was released to simulators. Work continued on TOUGHREACT and on converting the FWU model from STOMP to Eclipse as simulations using STOMP were abandoned due to technical issues with the code. *In 6.5 Risk Assessment:* Monte Carlo simulations and PCE expansion continued to be applied to risk assessment. STOMP-EOR work was focused on implementing block refinement into the OpenMPI version of the simulator. CO2-PENS-PSUADE risk analysis of FEPS continued.

Task 8–Project Management and Oversight: The SWP Advisory Board was chartered and membership confirmed. The final, official version of the Risk Report was completed and the Best Practices Manual was finalized and delivered. Planned fieldwork took place, including sample collection and routine maintenance on seismic equipment. No breakthrough was observed in the tracer project. CELLC had layoffs that required a new EOR team to work with SWP researchers. Chaparral's financial issues continued throughout the quarter. Researchers submitted a notable quantity of papers for presentation at a variety of professional meetings.

TASK 1 Regional Characterization

1.4 Continued Assessment

Arbuckle Group

During this period, researchers continued to map the Arbuckle disposal site in the area where the projected depth to Arbuckle is 3,000 - 13,000 feet. Future work will be to complete volumetric estimates of fluid storage in the Arbuckle Group using depth intervals of 3,000 ft to 13,000 ft.

TASK 2 Public Outreach and Education

Subtask 2.2 Project Website

Website Maintenance

During the quarter, researchers continued to facilitate the Domain Name System (DNS) and registration of the SWP Internet presence. The more modern SWP website was installed and ready to go public during the quarter, while researchers awaited the decision to shift the DNS from the current commercial host to the UU in a move to reduce costs and allow SWP personnel more direct control. An updated "clone" of the current, publicly available SWP website, was created for the purposes of discontinuing use of the commercial web hosting service when the contract is terminated. Researchers also worked to develop a web-based interface for submitting manuscripts/abstracts needing review by NMT, Chaparral and the Department of Energy. The project team also continued improvements to the MVA data website to allow for more secure and user-friendly SWP-wide access. many GIS/mapping aspects of the MVA task and greater SWP project have been updated, including:

- Updated satellite photos for FWU and surrounding region.
- Digitization of CELLC FWU feed and production pipelines.
- Updated tracer injection and sampling wells.