

Geological Site Characterization of the Aneth Unit, Greater Aneth Field, Southeastern Utah, for Sequestration of Carbon Dioxide: A Project Summary

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The Greater Aneth oil field, Utah's largest oil producer, was discovered in 1956 and has produced over 453 million BO. Located in the Paradox Basin of southeastern Utah, Greater Aneth is a stratigraphic trap producing from the Pennsylvanian Paradox Formation. Because it represents an archetype oil field of the western U.S., Greater Aneth was selected to demonstrate combined EOR and CO₂ sequestration under the auspices of the Southwest Regional Partnership (SWP) on Carbon Sequestration, sponsored by the U.S. Department of Energy. The Aneth Unit in the northwestern part of the field has produced 149 million bbls of the estimated 450 million bbls of original oil in place - a 33% recovery rate. The large amount of remaining oil makes the Aneth Unit ideal to demonstrate both CO₂ storage capacity and enhanced oil recovery by CO₂ flooding.

The Utah Geological Survey evaluated how the surface and subsurface geology of the Aneth Unit demonstration site will affect sequestration operations and engineering strategies. The research for the project included (1) mapping the surface geology including stratigraphy, faulting, fractures, and deformation bands, (2) describing the local Jurassic and Cretaceous stratigraphy, (3) mapping the Desert Creek zone reservoir, Gothic seal, and overlying aquifers, (4) characterizing the depositional environments and diagenetic events that produced significant reservoir heterogeneity, (5) describing the geochemical, petrographic, and geomechanical properties of the seal to determine the CO₂ or hydrocarbon column it could support, and (6) evaluating the production history to compare primary production from vertical and horizontal wells, and the effects of waterflood and water alternating gas injection programs.