



Hydraulic testing activities at the Ketzin test site (Germany)

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Several hydraulic production and injection tests were conducted in the three wells at the CO₂ storage site in Ketzin. Focus of these tests was to derive hydraulic formation parameters (permeability, static head, storativity) and to examine the well and near-well conditions (injectivity, skin factor), and to remove residuals of the drill mud to prepare the wells for CO₂ injection. The boreholes are approximately 750 m deep (Prevedel et al. – this volume).

Subsequent pumping tests with submersible pumps were carried out with durations between one to three days and a total production volume of 70 to 90 m³ per well. During these tests, all three wells were equipped with pressure transducers and monitored. Following the production, short injection tests were conducted to evaluate the injection capacity of the wells. Hydraulic tests revealed formation productivities of around 0.04 m³ day⁻¹ kPa⁻¹ and 0.06 m³ day⁻¹ kPa⁻¹, respectively. Based on the thickness of the permeable zones of the formation this results in permeabilities between 40•mDarcy and 80•mDarcy, which is significantly lower than predicted by rock core analysis. The analysis of core samples and hydraulic tests indicate significant hydraulic heterogeneity of the host formation. A model conceptualisation based on different no flow boundary configurations was used to consistently analyse the available data.

The comparison of the derived production / injection indices of tests indicated significantly lower injectivity in the injection well while the injectivity of the observation wells was in the expected range from production tests. The injectivity of wells was successfully enhanced by two N₂ lifts while removing solids, e.g. iron sulphide from filter screens, annulus and near well bore area. A total volume of about 300 m³ formation fluid was produced and chemically and biologically analysed (Zettlitzer et al. and Wandrey et al. – this volume).