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Hydrogeological characterization of the Heletz Sands Reservoir, Heletz (Israel) as a preliminary step towards CO_2 injection experiments

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One the major components of the EU-FP7 funded MUSTANG project is to conduct a highly controlled series of CO_2 injection experiments, aimed at determining field values of key CO_2 trapping mechanisms such as dissolution and residual trapping and to establish a comprehensive and consistent dataset for model validation. Prior to injecting CO_2 there is a need to achieve a sufficient degree of hydrogeological characterization of the reservoir. In what follows we present a sequence of hydrologic tests to be conducted at Heletz and their expected contribution to the understanding relevant hydrogeology. These include: 1) Chemical characterization of the formation fluid; 2) Flowing Fluid Electrical Conductivity log, aimed at determining the vertical variability of the reservoir permeability in the near well vicinity; 3) Water pulse and pumping tests, aimed at determining the reservoir scale hydraulic properties; 4) Thermal test, aimed at determining the value of the heat transfer coefficient from the reservoir to the borehole fluid, which is responsible for the heating of injected fluid in the borehole; 5) two-well injection and pumping of water and tracers test, in order to determine the impact of heterogeneity on the hydraulic parameters and to identify preferential flow paths in the reservoir. This paper presents the design and planning of the experiments, the results obtained in field and a preliminary interpretation.