From conceptual to numerical modelling of a complex contaminated site in Italy using hydrogeological and hydrochemical characterization

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Abstract Chemical, geological and hydrogeological investigations were conducted in a polluted site in southern Italy, with the aim of improving and validating a conceptual model of groundwater flow and contaminant transport. The collected data allowed building of a numerical model, which takes into account groundwater flow interaction with salt water intrusion by a density-dependent model. Simulation results agree with field data, showing that the salt wedge intrusion has reached the pumping wells, the dissolved contaminants are completely intercepted by a P&T system and that around 25% of exploited flow comes from losses from a surface seawater canal. Finally the three dimensional flow model was validated by new data collected in 2009, and it is now used to forecast and to manage the pumping rates of more than 70 wells.

Key words conceptual model; numerical model; remediation; mega-sites; Italy