



Managed Aquifer Recharge of Surplus Desalinated Seawater: a MARSOL Case Study from Israel

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MARSOL is an EU-funded project on demonstrating managed aquifer recharge (MAR) as a solution to water scarcity and drought. Among other activities in MARSOL, 7 demo-sites in Mediterranean countries were chosen for research and demonstration of different types of MAR (e.g. soil aquifer treatment, river infiltration basins etc.). One of these demo sites is the Menashe infiltration basin (Israel) in which MAR of surplus desalinated sea water is demonstrated, monitored and investigated in the last year. Different operational circumstances create periods in which water from the Hadera seawater desalination plant cannot be distributed through the national water carrier to consumers. A solution was set in MAR of this water through sandy infiltration ponds to the Israeli coastal aquifer which is consisted mainly from calcareous sandstone. Hydrological and geochemical aspects are of interest in this MAR operation due to the high discharge rates of low-salinity chlorinated water to the infiltration pond. Monitoring of operational events, laboratory experiments, controlled field-experiments and modelling are carried out aiming at clarifying the following issues: infiltration rates - spatial and temporal variability; recharge and withdrawal operation; disinfection by-products due to infiltration of chlorinated water; changes in hydraulic properties due to dissolution\precipitation processes; and using MAR of desalinated water as a remineralization treatment. We will present some results concerning these aspects concentrating on the last one. Observations show that desalinated water dissolve carbonates relatively fast in the unsaturated zone and shallow groundwater of the infiltration site. This process which increases significantly the water's alkalinity also enriches the water with magnesium which its deficiency in desalinated seawater is an unsolved concern. Further increase in calcium and magnesium concentration requires flow in the aquifer through the calcareous-sandstone beds towards the production wells. Using the Menashe MAR system for remineralization, looks attractive economically, environmentally and for public health reasons.