

**Groundwater modelling of managed aquifer recharge in infiltration ponds with reclaimed water (NE Spain)
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We present the modelling results in El Port de la Selva Demoware project site where a pilot study for Soil Aquifer Treatment (SAT) of reclaimed water is being implemented. Numerical simulations of groundwater flow through the aquifer have been used to design a proper Soil Aquifer Treatment (SAT) of reclaimed water. Port de la Selva is a coastal town in Costa Brava (Northern Catalunya) where summer population increases up to 10 times. Water supply relies mainly in groundwater as surface water is very scarce. Reclaimed water from local wastewater treatment facilities may constitute an alternative water source for local population (Sala and Serra, 2004). The system consists on 3 infiltration basins that operates alternatively. Key variables in the design of SAT systems are the travel time from infiltration ponds to downstream wells and dilution factors of reclaimed water in active nearby pumping wells. In Port de la Selva these variables are evaluated in water supply wells located 1 km downstream. Using a flow and transport Finite Element numerical model, we simulate the migration of the plume of reclaimed water through the aquifer to analyse the sensitivity of travel times and dilution factors to parameters such as rainfall, infiltration rates, pumping schemes in water supply wells, aquifer porosity and hydraulic conductivity. The model will be used to optimize quality and quantity of infiltrated water ensuring that negative potential impacts on health and environment are kept to a minimum. During the framework of this project, we monitor water quality for both native groundwater and outflows from the water treatment plant to optimize treatment needs. The numerical model is used for quantitative analyses of sensitivity to precipitation recharge and variable water demand pumping rates at water supply wells. This numerical model is capable of simulating aquifer response to rainfall events and pumping in water supply wells with reasonable accuracy.

