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0.1 Study on impact of artificial recharge on groundwater quality

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With more attention to ecology safe and public health, the risk of artificial recharge (AR) on groundwater quality is becoming one of the key factors that will decide the feasibility of AR project. The main method to minimize AR risk on groundwater quality is control the recharge water quality strictly. But because the hydrogeology conditions and the characteristics of groundwater quality in specific site may be very different, the uniform or national standard for recharge water quality is very difficult to be proposed, therefore, the recharge water quality needed to be evaluated in every specific study area. The geochemistry modeling method is a convenient tool to evaluate the feasibility of chemical aspect of recharge water.

As a case study, the evolvement laws of groundwater quality in western Daqing City was firstly studied through geochemistry inverse-modeling method, the results showed that the groundwater quality was affected by dissolve-precipitation of aquifer minerals, alternate adsorption of cation and redox function. The dominative minerals in aquifer are calcite, dolomite, halite, fluorite, gypsum, hematite, siderite, pyrolusite, carbon dioxide and cation exchanger. Based on the above work, the water-rock interaction among Nenjiang River water, native groundwater of Xi-waterworks and aquifer minerals in western Daqing City was modeled through geochemistry forward-modelling method. The results showed that the TDS and hardness will decrease in mixing water, the more proportion of recharge water quantity, the low TDS and hardness of mixing water. The artificial recharge water will not lead to catastrophe or decrease of water quality in aquifer, and it will improve water quality in aquifer at a

certain extent.

However, without chemical reactive dynamics concern, this evaluation results is only the sketch evolutive tendency of water quality, because the chemical equivalent within induced water, native water and aquifer mineral will be a long time scale.