

Coastal Aquifer Is A Natural SAT System In Removing Organic Parameters from Seawater, Kuwait

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Abstract

Aquifer treatment system (ATS) is considered a cheap and effective method of treating dissolved and suspended organic compounds from seawater as it pass through the aquifer materials. The use of Total Organic Carbon (TOC), Total Petroleum Hydrocarbon (TPH) parameters and Polynuclear Aromatic Hydrocarbon (PAH) compounds as a human health pollution indicator in groundwater has been applied in such systems by many researchers. The present study aims to investigate the efficiency of the coastal aquifer in removing organic parameters such as TOC, TPH and selected PAH compounds from the seawater by collecting the groundwater from the coastal aquifer using the beach wells, which is normally supplied to the Reverse Osmosis (RO) unit at Doha Desalination Plant, Kuwait as a feedwater. Influent (seawater) from sea and saline groundwater samples were collected from two production beach wells, and analyzed for TOC and TPH parameters, and for 16 selected PAH compounds. Results showed that the removal rates for TOC and TPH parameters ranged between 44 and 48%, and between 85 and 92% respectively, and out of 16 PAH compounds, only 4 compounds were detected in seawater and completely removed by the coastal aquifer since these are not detected in the saline groundwater from the beach wells. These compounds include Acenaphthene, Fluorene, Fluoranthene and Pyrene. Results are also compared with drinking water standards. The study proved that coastal aquifer is a natural SAT system (because seawater is entered into the aquifer naturally) which is very efficient in removing organic parameters from seawater.

Keywords: Beach well, TOC, TPH, PAHS, Groundwater,