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Evaluation of groundwater quality and the hydrogeochemical processes of shallow Dibdibba aquifer in Basra Governorate, southern Iraq

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Abstract

Thirty seven groundwater samples were taken from groundwater wells to evaluate the groundwater quality of shallow Dibdibba aquifer at Safwan-Zubair area in Basrah governorate.

The physiochemical parameters were analyzed including pH, total dissolved solids (TDS), electrical conductivity (EC), the cations and anion elements. The results show that 81% and 19% of the studied samples are within (CaCl and NaCl) water type respectively. The results show that the middle and southern parts of the study area have the largest concentration of the most chemical and physical characteristics indicating increasing in it is agricultural and domestic activities.

The geochemical evaluated of the groundwater samples results show that 83.7% represented by probable mixing water affected by dissolution depended on Durov diagraph. All the studied samples were considered unsuitable for drinking purposes because of high total dissolved solids ranged between (2704 to 10322 mg/l). The groundwater samples were considered as unsuitable for irrigation because of higher concentration of Sodium adsorption ratio (SAR), Sodium percentage (Na%), Permeability index (PI), Magnesium ratio MR and Residual sodium bicarbonate (RSBC).

Keywords: Groundwater quality, GIS, Spatial analyses, Hydrogeochemical processes, Dibdibba formation, Iraq.