Hydrogeological and hydrogeochemical aspects of the Nubian Sandstone aquifer in East Oweinat area, SW Egypt

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With 15 figures and 3 tables

Abstract: An overview is given of the hydrogeological and hydrogeochemical conditions of the Nubian Sandstone aquifer in East Oweinat area, southwest Egypt. This aquifer is composed of sandstone with intercalations of siltstone and kaolinitic sandstone with groundwater in this aquifer occurring under free water condition with the thickness of the zone of saturation ranging from less than one meter to 650 m, and the depth to water from 20 to 60 meter. The aquifer coefficient shows low values reflecting a dominance of clay in the aquifer material and a low productivity of the aquifer if compared with other localities such as El-Dakhla and El-Kharga. Structural setting of the area affects the groundwater flow system. A considerable drawdown in water levels is recorded over the whole area, which indicates excessive pumping rates and very low natural annual recharge to the aquifer. That groundwater in East Oweinat area belongs to the fresh water class substantiates a meteoric water origin. A predominance of sulphate and chloride salts in the groundwater indicates deep percolation, active dissolution of marine gypsiferous shale and clay with long term contact time between aquifer and groundwater. Low bicarbonate contents indicate a recent very low annual recharge or non-renewability of groundwater.