Hydrogeology of Hummar Aquifer System in Amman - Zerqa Basin in Jordan

Sayel Khader Washahi
B.Sc. of Science (Geology)
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Yarmouk University

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Thesis Committee

Dr. Mahmoud Awad	Chairman	
Dr. Najim El-Din Yousuf	Member	
Dr. Abed El-Fatah Lutfy	Member	

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Abstract

Hummar aquifer forms one of the most important aquifers in Amman - Zerqa basin. The aquifer is mainly composed of dolomitic limestone of upper Cretaceous age. The hydrogeological study suggests that Hummar formation is a confined aquifer, where it is sandwiched between two aquicludes namely, Fuhais (As), and Shueib (As/s) formations. In Sukhna area, the Hummar aquifer becomes of an unconfined nature, and it is directly overlain by wadi fill deposits, and a hydraulic connection takes place between the Hummar and Amman - Wadi Sir aquifers.

In the study area, the direct recharge of Hummar aquifer occurs along the narrow outcrop (20 Km^2) of the aquifer, which is estimated to be about 2 MCM/a, while, nearly 3 MCM/a enters this aquifer as an indirect recharge from other sources. The total recharge of Hummar aquifer in the study area was determined to be 5 MCM/a. On the other hand, the substantial decline of the water level, indicates that the Hummar aquifer is high exploited and overpumped by the production wells in the study area.

The pollution of the Hummar aquifer has a large extent reached a considerable degree, especially in Sukhna area. This pollution of the groundwater of this aquifer has been assumed to be due to the infiltration of poor quality water of Seil Zerqa into the aquifer, and also to the return flows from the irrigation water in the area.