

## **Status of Quaternary aquifer sustainability at Umm Ghafa area, eastern part of Al-Ain area, UAE**

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**Abstract** The Quaternary aquifer of the Umm Ghafa area, located in the eastern part of the Al-Ain area of southeast UAE, is facing a serious threat that might harm the sustainability of the aquifer. Groundwater sustainability in the region has been reduced and deteriorated. There are many natural and human factors affecting the quality and quantity of the groundwater. These factors include agriculture practices, weathering of the Oman Mountains, dissolution of carbonate rocks that exist in the study area, and atmospheric precipitation stored on the surface. Groundwater salinity is observed and high salinity in groundwater may be attributed to the evaporation of return flow and heavy groundwater abstraction for agricultural activities. In addition, high groundwater salinity may result from upward discharge of underlying brine as groundwater moves downgradient. The feasibility of agricultural activities is observed from high concentrations of nitrates in groundwater. Contamination chromium in the study area was noticed and exceeded the limit of WHO. The main reason for high chromium concentration in groundwater is weathering of pyroxenes and olivines of the Oman Mountains.

**Key words** aquifer; sustainability; groundwater; UAE; evaporation; weathering