



University of Zabol

Faculty of Water and Soil  
Department of Range and Watershed Management

**The Thesis Submitted to fulfill Degree of M.Sc  
in the field of Watershed Management**

**Effect of geological formations on  
groundwater quality Khash Plain**

**Supervisors:**

Dr. M. Nohtani

**Advisors:**

Dr. N. Asadi

Dr. M. ebrahimi

**By:**

M. Mirkazehi Rige

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## **Abstract**

**Khash aquifer is located 40 km to the south of Mount Taftan which is the main source of water supply for Khash city and surrounding villages. Dominant geological formations in the region are Qt2, Qt1 and E21, which affect on water quality. The present study examines the role geological formations in the quality of under groundwater resources in Khash plain. Therefore, 15 wells geological selected in Mehr, 1391 and Parameters Electrical Conductivity (EC), acidity (pH), hard Total (TH), remaining dry ingredients (TDS) and Cations and Anions main (calcium ( $\text{Ca}^{2+}$ ), magnesium ( $\text{Mg}^{2+}$ ), sodium ( $\text{Na}^+$ ), potassium ( $\text{K}^+$ ), sulfate ( $\text{SO}_4^{2-}$ ), bicarbonate ( $\text{HCO}_3^-$ ) and chloride ( $\text{Cl}^-$ )) Parameters were measured for each sample. And to determine the water resource quality, the standardized quality parameters were drawn as graphs and hydro geochemical maps. considering the Geological parameters and climatic factors, the effect of Geological parameters on water quality analyzed using PCA. Aqua Chem Software results proved that three hydro chemical facies types exist which are sodium sulphat, sodium bicarbonate and color sodium. The densty of sodium and color in the samples taken from wells proved the important of the influence of sedimentary rocks such as marn (flish) on the water sources of the region. The results of principal component analysis (PCA) elements such as Chloride, Sulfate, Sodium, Manesium, Potassium and Calcium as the first principal component, indicating predominance of andesitic rocks on regional under groundwater was revealed. The best model for zonation maps using kriging EC, TDS and pH were detected to be Gaussian model and the spherical model for TH.**

**Keywords: Aquifer, Factor Analysis, Principal Component Analysis, Hydrogeoshimi.**