

# Study of Salinity Causes of Karstic Springs and Groundwater of Shallow Aquifer in South - East of Rahmat Anticline

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## Abstract:

Rahmat anticline is located at 55 kilometers North – East of Shiraz city, in the South of Iran (29, 45 – 30, 00 N and 52, 45 – 53, 15 E). This anticline is in the zone “three“ (simply folded belt) of Zagros ranges. The expose formation of the anticline is mainly carbonate rocks of Sarvak formation (Cenomanian) and marls of Kajhdumi formation (Albian). Karstification is developed in the carbonate rocks due to the effect of climatic and tectonic condition of the area. Several small and large springs around the anticline discharge the karst water of this formation.

The quality of spring's water in southern flank of the anticline decreases from NW towards SE. Electrical conductivity ranges from 698 to 10000 micromohs/cm and also in this direction the quality of groundwater in the shallow aquifer located in the south of the Rahmat anticline decreases and the electrical conductivity reaches to the 13000 micromohs/cm.

Hydrogeological studies including preparation of Isopotential map of the shallow aquifer in the south part of the anticline and groundwater flow direction which is towards the karstic formation. In the other word, the karstic aquifer of the Rahmat Mountain is recharged from this upper aquifer.

An attempt has been made to illustrate the reason of increasing salinity of the springs and groundwater in the SE of the Rahmat anticline. Water samples are located for hydrochemical analysis from springs and several shallow and deep wells of the adjacent area in the south of the Rahmat anticline. In addition, different parameter such as: Electrical conductivity, Dissolved oxygen, pH and Temperature were measured in different depth of several piezometers in the karstic formation as well as in shallow wells of the upper alluvial aquifer in the south of the Rahmat anticline. Isopotential map, Composition and Durov diagrams were drawn which illustrate that the saline water springs is a mixture of karstic and alluvial water.

In the study area the climate is semi – arid, the soil texture is heavy (clay and silty clay), and the depth to water table is low, thus evaporation from groundwater is high which causes salt concentration in the shallow aquifer. It seems that the saline water of the upper alluvial aquifer, which flows from NW to SE direction, is mixed with karstic water in Rahmat anticline and discharge from saline springs at the lower anticline rim.