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The Characteristic and Classification of Thermal Spring in Ramsar area, North of Iran

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Ramsar area is located across and between Alborze Mountain and Caspine Sea in North of Iran. About 30 spas are located south of the Ramsar and Sadatshar town. They are almost in between 20 to 70 m elevation. Paleozoic, Mesozoic and Tertiary rocks and alluvial deposit are exposed around the Ramsar area. In tertiary, acidic Plutonism was active and intrusion into the Paleozoic and Mesozoic formations. Quaternary and Alluvium deposits are exposed and extending on the Jurassic formations in Ramsar plain and have thickness lower than 10 m in show springs. The annual precipitation in the Ramsar region is 976 mm.

There has not any proper Thermal spring management in Ramsar area yet. This could post some serious problem on improper management of Thermal spring sites, where its environment has been put into jeopardy. This study aims to provide a way to classify the Thermal springs in Ramsar area. The result of this study help in the classification of Thermal spring sites for official planning improvement of administration and sustainable development of natural resources of the area.

The study makes use of the Department Applied Geosciences in Islamic Azad University and GIS data of a total of 9 Thermal springs in the attempt to set up a classification system of Thermal springs in Ramsar area. These data include surface temperature, conductivity, alkalinity, acidity, TDS, pH values, Ca, Cl, Fe, K, Mg, Mn, Na, SiO2, SO4 contents, their locations, usages and other relevant information.

The surface temperature of Thermal springs are between 19oC – 65oC and SiO2 geothermometer shows estimated reservoir temperature range from 86 o C – 96 o C. Most of the water from these Thermal springs is relatively turbidness and their composition is sodium choloride. The Thermal springs in this area generally exhibit high SiO2 and Na content; strong smell of sulfur.

In addition, there are 30 Thermal springs located in Ramsar area and that show high concentration of Cl, Ca, Na, K and Mg.

There are two major criteria used in the classification system in this study, temperature and their usage. On the basis of temperature, there are three classes of Thermal springs in Ramsar area: hyperthermal spring (10 %, 50-99o C); thermal spring (80%, 30-50o C). There are 4 types of usage classification: swimming pools, Tourism, space heating and drying of organic materials. There is one class achieved on the basis of pH values, all of Thermal springs exhibit weak acids.