World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:10, No:01, 2016

# Thermal and Radon-222 Appraisal in Geothermal Aquifer System, Southeastern Tunisia

**Authors :** Agoubi Belgacem, Adel Kharroubi

**Abstract :** Geothermal groundwater is the main water source to supply various sectors in El Hamma city, southeastern Tunisia. This region was long the destination of thousands of people from Tunisia and neighboring countries for care and bathing. The main objective of this study is to understand the groundwater mineralization origins and factors that control. The second goal is the appraisal of radon in geothermal groundwater in the study area. For this aim, geothermal groundwater was sampled and collected from different locations (thermal baths and deep wells). Physical parameters were measured and major ions were analyzed. Results reveal three water types. The water first type has Na-Mg-Ca-SO4-Cl facies and T>55°C. The second water type dominated by Na-Ca-Cl-SO4 facies with a temperature < 45 °C. However the third water type is dominated by Ca-SO4-Na-Cl-Mg. The three water types may be controlled by depth and geology. The first represent groundwater from deep aquifer (lower cretaceous), the second type was the shallow aquifer and the first is mixed water from deep and shallow water with a temperature ranging from 45 to 55°C. Measured Radon shows that shallow aquifer has a higher 222Rn concentration (677 to 2903 Bq.m-3) than deep water (203 to 1100 Bq.m-3). R-222 in El Hamma thermal aquifer was controlled by structures, porosity and permeability of aquifers. Geostatistical analyses of hydrogeological data and radon activities confirm the vertical flow and communication between deep and shallow aquifers through vertical faults system.

**Keywords :** Radon-222, geothermal, water, environment, Tunisia
**Conference Title :** ICEWRE 2016 : International Conference on Environmental and Water Resources Engineering
**Conference Location :** Jeddah, Saudi Arabia
**Conference Dates :** January 26-27, 2016