# Fault Distribution Characters and its Influence on Hydrothermal Water Flow of Risha Field in North East Jordan

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## ABSTRACT

Risha gas field is in a strike-slip fault , which covers the concession area and identified regionally has been revealed by the 3D seismic. Fault offset are in the main very small and the fault are stress laterally extensive WNW-ESE faults from fault compartments within the field, More impo rtant, small faulting appears pervasive on the many areas (particularly the NNW-SSE orientation) supporting the possibility of wide spread natural fracture fabric which could impact production. Thirty five vertical wells have been drilled in Risha field without water phenomena above 3200 m except shallow aquifer, and produced over 140 billion CF of gas with little amount of water 7 bbl/MMSCF. Turning to horizontal drilling wells have good performance but on the other hand is not good with substantial losses and water flow into the well along natural fracture systems from deeper fluid source had migrated into Risha formation through fault and associated open fractures allowing easy flow of gas and water flow. Water Isotope analysis indicated that the Risha water had strontium Isotope ratios higher than the Phanerozoic sea water (Ca. 0.707 to 0.709). Additio nally , addition of radiogenic 87Sr from Rubidium decay is indicative for water - rock interaction. It's plausible hydrothermal waters given the high heat flow in the area and presence of volcanics Magneties may show up any fault zone that have been mineralized byhydrothermal fluid or any igneous body. 813Cc0 2 suggested either magmatic or carbonate breakdown fromhot Burj carbonates as source of CO2 migrated into Risha formation. Fin ally, we can conclude that we have four types of water, condensate water with TDS around 1000 ppm, formation water within Risha formation with TDS around 60,000 ppm, at depth between 2600-2700 m, Dubeidib formation water with TDS around 16 0,000 ppm below 3200 m, and finally hydrothermal water from deeper faults.