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QUALITY OF SOME WELLS IN SINAI FOR DIFFERENT USES

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ABSTRACT

Forty ground water samples were collected, from different wells in a part of the southwestern Sinai Peninsula, on the eastern side of the Suez Gulf, (Latitudes 28° 20' and 28° 55' N and Longitudes 33° 20' and 34° 03' E) occupied by an area about 1829 km² (~ 440000 fed.) to represent the existing wells in the studied area, and test different characteristics of their quality for irrigation and the other purposes.

The tested characteristics of ground water of the studied wells can be summarized as the following:

The pH values, TDS, EC_w and SAR ranging from 6.75 to 7.85, 432 to 5815 mg/L, 0.861 to 8.090 dS/m and 1 to 44 respectively, which show some unsuitable appropriate limits for irrigation and drinking for this characteristic. The ground water had classes as C₃-S₁, C₄-S₁, C₄-S₂, C₄-S₃ and C₄-S₄ and the last three classes represented 12.5 % of the studied wells and bad water classes for irrigation.

The maximum major ions constituents were 17.61, 18.84, 74.35, 0.64, 0.40, 3.77, 20.0, 75.05 meq/L for Ca²⁺, Mg²⁺, Na⁺, K⁺, CO₃²⁻, HCO₃⁻, SO₄²⁻, Cl⁻, respectively, of ground water and their relationships had been studied and maximum ratios were 1.44, 1.51, 8.93, 134.61 for (Na⁺+K⁺)/Cl⁻, SO₄²⁻/Cl⁻, Ca²⁺/Mg²⁺, Na⁺/K⁺ respectively because they are equally important in determining the suitability of ground water for different uses. Ground water salinity of wells is situated between fresh to slightly saline.

Some trace and heavy elements tested are present in ground water with low concentration (less than 0.1 mg/L), but sometimes much higher, which maximum values are 4.73, 1.23, 1.96, 0.18, 0.29, 0.02 mg/L for Fe³⁺, Mn²⁺, Zn²⁺, Cu²⁺, Pb²⁺, Cd²⁺ respectively, particularly if the water has been in contact with mineralized rock or ore bodies.

Excellent ground water are for all classes of livestock and poultry (TDS <1000 mg/L), represented by 5% of the total studied wells number. Very satisfactory water for all classes of livestock and poultry (TDS 1000 to <3000 mg/L), represented by 80% of the total studied wells.

Key Words: Ground water , Sinai, Water quality, Wells.