Quality Assessment of SIRJAN Plain Groundwater Resources to Evaluate Their Contamination to Heavy Metals at 2014

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Abstract

Background and Aims: Heavy metals pollution is a worldwide problem due to the chemical stability and accumulation properties in living things. High levels of these metals increased mortality, morphological abnormalities, growth retardation and genetic effects in humans. This study investigated the concentration of heavy metals in SIRJAN plain groundwater resources and compared the results with current standards.

Materials and Methods: This cross-sectional study was performed in Environmental Health Engineering Research Center of Kerman University of Medical Science from April to June 2014.Samples were collected from 40 deep wells, in the middle of each month. EC, TDS, pH and temperature were measured at the sampling site. Heavy metals were measured using ICP. Sampling, sample storage and laboratory tests were done according to Standard Methods for Water and Wastewater Examinations.

Results: According to results, the mean concentration of Zinc, Chromium and Cadmium in samples were not exceeded 0.8, 1 and 0.5µg/l, respectively. The average concentrations of Pb and Cu were 2.842 and 26.743 µg/l, respectively. Average amount of electrical conductivity (EC) was 6820.575µs/cm. Mean concentration of total dissolved solids (TDS) was 3891.57mg/l. pH mean was 7.5 and mean of temperature was 21.95^{O}C.

Conclusion: The results show that studied resources are reliable for drinking and agricultural purposes in terms of Cadmium, Chromium, Copper, Zinc, Lead and pH. In addition, these resources are not exposed to pollution due to the various reasons such as geological compositions, limited industries in the region, reduction or absence of municipal and industrial sewage infiltration into water supplies and the geographical conditions. But the recent drought, reduced rainfall and indiscriminate withdrawal of ground water resources, has led to TDS and EC exceed national, USEPA and FAO standards and WHO guidelines for drinking and agricultural purposes.

Keywords: heavy metals, SIRJAN plain, groundwater resources.

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