

Contamination of the Groundwater by the Flow of the Discharge in Khouribga City (Morocco) and the Danger It Presents to the Health of the Surrounding Population.

Authors : Najih Amina

Abstract : Our study focuses on monitoring the spatial evolution of a number of physico-chemical parameters of wells waters located at different distances from the discharge of the city of Khouribga (S0 upstream station, S1, S2 et S3 are respectively located at 5.5, 7.5, 11 Km away from solid waste discharge of the city). The absence of a source of drinking water in this region involves the population to feeding on its groundwater wells. Through the results, we note that most of the analyzed parameters exceed the potable water standards from S1. At this source of water, we find that the conductivity (1290 μmScm^{-1} ; Standard 1000 μmScm^{-1}), Total Hardness TH (67.2°F/ Standard 50° F), Ca²⁺ + (146 mg l⁻¹ standard 60 mg l⁻¹), Cl⁻ (369 mg l⁻¹ standard 150 mg l⁻¹), NaCl (609 mg l⁻¹), Methyl orange alkalinity "M. alk" (280 mg l⁻¹) greatly exceed the drinking water standards. By following these parameters, it is obvious that some values have decreased in the downstream stations, while others become important. We find that the conductivity is always higher than 950 μmScm^{-1} ; the TH registers 72°F in S3; Ca²⁺ is in the range of 153 mg l⁻¹ in S3, Cl⁻ and NaCl- reached 426 mg l⁻¹ and 702 mg l⁻¹ respectively in S2, M alk becomes higher and reaches 430 to 350 in S3. At the wells S2, we found that the nitrites are well beyond the standard 1.05 mg l⁻¹. Whereas, at the control station S0, the values are lower or at the limit of drinking water standards: conductivity (452 μmScm^{-1}), TH (34 F°), Ca²⁺ (68 mg l⁻¹), Cl⁻ (157 mg l⁻¹), NaCl- (258 mg l⁻¹), M alk (220 mg l⁻¹). Thus, the diagnosis reveals the presence of a high pollution caused by the leachates of the household waste discharge and by the effluents of the sewage waste water plant (SWWP). The phenomenon of the water hardness could, also, be generated by the processes of erosion, leaching and soil infiltration in the region (phosphate layers, intercalated layers of marl and limestone), phenomenons also caused by the acidity due to this surrounding pollution. The source S1 is the nearest surrounding site of the discharge and the most affected by the phenomenon of pollution, especially, it is near to a superficial water source S'1 polluted by the effluents coming from the sewage waste water plant of the city. In the light of these data, we can deduce that the consumption of this water from S1 does not conform the standards of drinking waters, and could affect the human health.

Keywords : physico-chemical parameters, ground water wells, infiltration, leaching, pollution, leachate discharge effluent SWWP, human health.

Conference Title : ICEPPHI 2015 : International Conference on Environmental Pollution, Public Health and Impacts

Conference Location : Istanbul, Türkiye

Conference Dates : January 26-27, 2015