

## Study of Surface Water Quality in the Wadi El Harrach for Its Use in the Artificial Groundwater Recharge of the Mitidja, North Algeria

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**Abstract :** The Mitidja coastal groundwater which extends over an area of 1450 km<sup>2</sup> is a strategic resource in the Algiers region. The high dependence of the regional economy on the use of this groundwater forces us to have recourse to its artificial recharge from the Wadi El Harrach in its upstream part. This system of artificial recharge has shown its effectiveness in the development of water resource mentioned in the succeeding works in several regions of the world. The objective of this study is to: Increase the reserves of water inputs by infiltration, raise the water level and its good quality in wells and boreholes, reduce losses to the sea, and address seawater intrusion by maintaining balance in the freshwater-saltwater interface in the downstream part of the groundwater basin. After analyzing the situation, it was noticed that a qualitative monitoring of the Wadi water for the groundwater recharge has to be done. For this purpose, we proceeded during three successive years (2010, 2011, and 2012) to the monthly sampling of water in the upstream part of the Wadi El Harrach for chemical analysis. The variation of the sediment transport concentration will be also measured. This monitoring aims to characterize the water quality and avoid clogging in the proposed recharge area. The results of these analyses showed the good chemical quality according to the analyses we performed in the laboratory during the three years, but they are too loaded with suspended matters. We noticed that these fine particles come from the grinding of limestone of sandpit located upstream of the area of the proposed recharge system. This problem can be solved by a water supply upstream of sandpit. For the recharge, we propose the method of using two wells for dual use, which means that it can be used for water supply and extraction. This solution is inexpensive in our case and could easily be used as wells are already drilled in the upstream part. This solution increases over time the piezometric level and also reduce groundwater contamination by saltwater in the downstream part.

**Keywords :** water quality, artificial groundwater recharge, Mitidja, North Algeria

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