

## Hydrodynamic Modeling of the Hydraulic Threshold El Haouareb

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**Abstract :** Groundwater is the key element of the development of most of the semi-arid areas where water resources are increasingly scarce due to an irregularity of precipitation, on the one hand, and an increasing demand on the other hand. This is the case of the watershed of the Central Tunisia Merguellil, object of the present study, which focuses on an implementation of an underground flows hydrodynamic model to understand the recharge processes of the Kairouan's plain groundwater by aquifers boundary through the hydraulic threshold of El Haouareb. The construction of a conceptual geological 3D model by the Hydro GeoBuilder software has led to a definition of the aquifers geometry in the studied area thanks to the data acquired by the analysis of geologic sections of drilling and piezometers crossed shells partially or in full. Overall analyses of the piezometric Chronicles of different piezometers located at the level of the dam indicate that the influence of the dam is felt especially in the aquifer carbonate which confirms that the dynamics of this aquifer are highly correlated to the dam's dynamic. Groundwater maps, high and low-water dam, show a flow that moves towards the threshold of El Haouareb to the discharge of the waters of Ain El Beidha discharge towards the plain of Kairouan. Software FEFLOW 5.2 steady hydrodynamic modeling to simulate the hydraulic threshold at the level of the dam El Haouareb in a satisfactory manner. However, the sensitivity study to the different parameters shows equivalence problems and a fix to calibrate the limestones' permeability. This work could be improved by refining the timing steady and amending the representation of limestones in the model.

**Keywords :** Hydrodynamic modeling, lithological modeling, hydraulic, semi-arid, merguellil, central Tunisia

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