

## **Groundwater Simulation at AL-Warrar Canal Reach, Ramadi City-Iraq**

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The study area located area adjacent the right bank of Al-Warrar canal, where the area suffers from a significant rise in groundwater levels. after collecting the available data on the previously drilled wells in the region, in addition three monitoring wells were conducted in the form of a right-angled triangle, the depth of one well reaches about ten meters, through which the fluctuation of the groundwater was monitored with the change in the water level in the Al-Warrar canal, the GMSv10.3 (mudflow) software using to simulation the groundwater flow in study area. Two scenarios for the movement of groundwater were adopted, as it was adopted that the area adjacent to the study area is what feeds the area with groundwater, so that the direction of the movement of groundwater is towards the Warrar canal and the second scenario It was run on the basis of the rise of water levels in the Warrar canal to its highest levels during the flood season, as it was found that there was a slight rise in groundwater levels in the area parallel to the Al Warrar canal. The results of the model were calibrated to the state of steady flow, and the results of the steady flow condition were adopted as inputs to the unsteady flow condition. For the purpose of addressing the problem of high groundwater levels, it was proposed to drill seven wells distributed in the area. The model was run for a period of one year so that the amount of decrease in the area is monitored every six months the decrease in groundwater levels during the first six months ranged from 0.25-0.75 meters, and the decrease in groundwater levels after one year of operation was about 1.2 meters. To control the impact of rising water levels in the Al-Warrar canal on the groundwater level, it was suggested adding additional two wells parallel to the Warrar canal, the model was run for a year, and the decline was monitored by the presence of the proposed wells, a total of nine wells. It flooded in the range of (0.25-1) meters after six months, and the decrease reached within (0.25-1.5) meters after one year.