

UNDERSTANDING THE IMPACTS OF GROUNDWATER ABSTRACTION AT OLAK LEMPIT, SELANGOR

Mohd Khairul Nizar Shamsuddin^{1*}, Anuar Sefie² and Ismail Tawnie³

^{1,2,3}Hydrogeology Researcher Centre, National Water Research Institute of Malaysia
(NAHRIM), Lot 5377 Jalan Putra Permai, 43300 Seri Kembangan, Selangor, Malaysia

*Corresponding author email address: nizar@nahrim.gov.my

Abstract

It is important to understand trends when assessing the sustainability of groundwater abstraction. Abstraction to availability analysis is still used widely in groundwater management considering the water quantities and water quality utilization rates based on in and out flows in the Olak Lempit area. The objectives of the study to investigate the impact of groundwater abstraction to the surface water flow of the Langat river, to investigate the impact of groundwater abstraction on groundwater level in surrounding area Olak Lempit and to obtain the total availability of groundwater resources and water balance. In this study, the water balance approach and carried out a detailed investigation of trends in time series of groundwater level, in order to analyze the sustainability of groundwater abstraction were taken as consideration. In addition to that, three-dimensional (3D) numerical groundwater flow model using modflow-2005, MODPATH (modular finite differential pathlines), and ZONEBUDGET for sub regional water budgets were used and simulated as a three layered. Modelling was carried out on the platform of visual MODFLOW flex software and was calibrated in steady-state and run as a transient-state model. three hydrostratigraphic unit-were considered for the study area; (i) layer 1 (top soil), (ii) layer 2 (aquitard) and (iii) layer 3 (aquifer). Layer 1 is the topmost layer comprises of peat or completely weathered soil (sandy clay /sandy silt) with an estimated average thickness of 3 m. Layer 2 is less permeable of aquitard layer that comprises of clay or silty clay material with an average thickness of 14.2 m. Layer 3 is confined aquifer and comprises of gravelly sand with average thickness of 20 m. According to the findings of the water balance analysis in the study area, which indicates that the recent abstraction does not interfere in the aquifer. Method and results showed that water level trends can support the management of aquifer abstraction and evaluate sustainability on the well systems.

Keywords: Groundwater, water level, groundwater modeling, Selangor, malaysia