



Determining the characteristics of an aquifer based on the groundwater response to the sea tidal fluctuation in artificial islands

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This research investigates the heterogeneous aquifer of artificial islands based on the relationship between the groundwater and the sea tidal. The study area is located in the Sixth Naphtha Cracker Plant, which is near the estuary mouth of the Jhuoshuei River in the west side of Taiwan. The island is approximately 22.55 km² and although, the geology is consisted mostly of sandy soil, the hydraulic conductivity is heterogeneous; based on the slug test results. Due to the fact that the study area is an island, the groundwater levels are, of course, affected by the sea tidal. For this experiment, 10 observation wells for monitoring the groundwater levels were set and the observation frequency was hourly for a period of seven months. In addition to that, this study used cross-correlation analyses and estimated the velocity based on the relatively lag time. Furthermore, there is an attempt for estimating the storage coefficient by analytical solutions (Gelhar, 1974).

Keywords: sea tidal, artificial islands, cross-correlation, lag time