

INVESTIGATION OF SALT INTRUSION IN THE KUANTAN ESTUARY DURING
HIGH TIDE CONDITION ADOPTING 1-D ANALYTICAL SOLUTION

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ABSTRAK

Selepas pembinaan Kobat Barrage pada 1970-an, stesen pengambilan air di muara Kuantan telah bebas dari masalah pencerobohan garam. Tetapi sehingga baru-baru, stesen pengambilan air pada Kg.Kobat dilaporkan berada terjejas air masin kerana fenomena El-Nino. Oleh itu, adalah penting untuk menilai semula keadaan pencerobohan air masin di muara Kuantan. Objektif kajian ini adalah: 1) untuk menyasat pengedaran kemasinan di muara Kuantan pada musim kemarau di air pasang; 2) menguji analisis model satu dimensi pencerobohan garam di muara Kuantan dan 3) untuk mengubah suai dan mengesahkan analisis model pencerobohan garam satu dimensi di muara Kuantan. Dalam kajian ini, kemasinan di sepanjang muara diukur dan direkodkan dengan menggunakan teknik bot yang bergerak. Analisis model pencerobohan garam satu dimensi telah berjaya digunakan untuk muara Kuantan semasa musim bunga air pasang dengan keadaan kendur air yang tinggi. Keputusan dikira dan ditentukan K pekali Van der Bugh, penyebaran D_0 dan penyempitan E pasang surut yang diperolehi daripada kajian yang mempunyai nilai-nilai 0.50, 15.06 / m dan 5600m, masing-masing. Pekali Van der Burgh dan pasang surut lawatan telah disahkan dengan membandingkan hasil simulasi dari kedua-dua kaji selidik. RMSE dan nilai purata NSE daripada 3.7ppt dan 85% dianggap diterima. Secara keseluruhannya, hasil kajian ini telah memberikan gambaran tentang keadaan kemasinan semasa di Estuary Kuantan selepas pembinaan bendungan pada lewat 1970-an.

ABSTRACT

After the construction of the Kobat Barrage in the 1970's, the water intake station in the Kuantan Estuary had been free from salt intrusion problem. But until recently, the water intake station at Kg.Kobat was reported being affected saline water due to the El-Nino phenomenon. Hence, it is important to reassess the saline intrusion condition in the Kuantan estuary. The objectives of this research are: 1) to investigate the salinity distribution in the Kuantan Estuary during the dry season at high tide; 2) to test 1-D analytical salt intrusion model in the Kuantan Estuary and 3) to calibrate and validate the 1-D analytical salt intrusion model in the Kuantan Estuary. In this study, the salinities along the estuary were measured and recorded by using moving boat technique. A one-dimensional analytical salt intrusion model has been successfully applied to the Kuantan Estuary during spring tide with the high water slack condition. The computed and calibrated results of Van der Bugh's coefficient K , dispersion D_0 and the tidal extrusion E obtained from the study have values of 0.50, 15.06/m and 5600m, respectively. The Van der Burgh's coefficient and tidal excursion were validated by comparing the simulated outcome from the two surveys. The RMSE and NSE average values of about 3.7ppt and 85% are considered acceptable. In overall, the results of this study have provided an insight into the current salinity condition in the Kuantan Estuary after the construction of the barrage in the late 1970's.