

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

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## **SUPERVISOR'S DECLARATION**

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree in Bachelor of Civil Engineering.

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## **STUDENT'S DECLARATION**

I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at University Malaysia Pahang or any other institutions.

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Thesis submitted in fulfillment of the requirements  
for the award of the  
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Fieldwork experience made me more understand about the salt intrusion in the Kuantan Estuary. During fieldwork, moving boat technique was used to collect the salinity level of the estuary. The data for salinity level was collected during high water slack (HWS) condition. High water slack is where the tidal velocity is near to zero just before the tidal current changes to seaward direction during a tidal cycle. It is difficult to notice the slack moment for a newbie like me. With the help of the local people and staffs, I able to collect the salinity level easily and correctly.

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## LIST OF SYMBOLS

$a$	Cross-sectional convergence length [L]
$A$	Cross-sectional area [L <sup>2</sup> ]
$A_0$	Cross-sectional area at estuary mouth [L <sup>2</sup> ]
$b$	Width convergence length [L]
$B$	Estuary width [L]
$B_0$	Width at estuary mouth [L]
$D$	Longitudinal dispersion [L <sup>2</sup> /T]
$D_0$	Longitudinal dispersion at estuary mouth [L <sup>2</sup> /T]
$D_i$	Dispersion coefficient at HWS, TA and LWS [L <sup>2</sup> /T]
$E$	Tidal excursion [L]
$h$	Estuary depth [L]
$h_0$	Estuary depth at the mouth [L]
$L$	Salt intrusion length [L]
$Q_f$	The freshet or fresh water flushing [L <sup>3</sup> /T]
$s$	Salinity [M/L <sup>3</sup> ]
$S$	Steady state salinity [M/L <sup>3</sup> ]
$S_0$	Steady state salinity at estuary mouth [M/L <sup>3</sup> ]
$S_i$	Steady state salinity at HWS, TA and LWS [M/L <sup>3</sup> ]
$S_f$	Fresh water salinity [M/L <sup>3</sup> ]
$t$	Time [T]
$x$	Distance [L]
$\alpha_0$	Mixing number at estuary mouth [L <sup>-1</sup> ]
$\beta_0$	Dispersion reduction rate at estuary mouth [-]

## LIST OF ABBREVIATIONS

HWS	High Water Slack
LWS	Low Water Slack
NSE	Nash- Sutcliffe Efficiency
RMSE	Root Mean Square Error