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PERPUSTAKAAN

KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA
21030 KUALA TERENGGANU

1100042343

Lihat sebelah



**HYDROLOGICAL SURVEY AND HIDROCARBON DISTRIBUTION IN THE
WATER OF PASIR PANJANG, REDANG ISLAND**

By

Raymond Maurice Anak Stephan Bujang

**Research report submitted in partial fulfillment of
the requirement of the degree of
Bachelor of Science (Marine Science)**

**Department of Marine Science
Faculty of Science and Technology**

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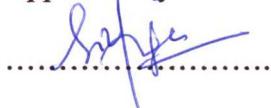
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APPROVAL OF RESEARCH PROJECT REPORT I AND II

Whereby this was approved that the research report entitled:

Hydrological Survey And Hydrocarbon Distribution In The Water Of Pasir Panjang, Redang Island by Raymond Maurice Anak Stephan Bujang, Metric No.: UK 7701 have been checked and all the proposed correction have been made. This research report submitted in partial fulfillment of the requirement of the degree of Bachelor of Science (Marine Science), Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia.

Approved by:

.....


Main Supervisor: DR. HING LEE SIANG

Pensyarah
Jabatan Sains Samudera

Name: Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Official Stamp:

Date: 2/5/06

.....


Head of Department of Marine Science

PROF. MADYA DR. HJ. ROSNAN H.J. YAACOB

Name: Ketua

Jabatan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu

Official Stamp: 

Date: 8/5/06

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LIST OF SYMBOL AND ABBREVIATIONS

°C	degree celcius
%	percentage
o/oo	part per thousand
o/ooo	part per million
DCM	dichloromethane
Na ₂ SO ₄	natrium sulphate
DO	dissolved oxygen
DO%	dissolved oxygen percentage saturation
GPS	global positioning system
mg/l	milligram per liter
NTU	natural turbidity unit
pH	- log [H ⁺]
ppb	part per billion
ppm	part per million
ppt	part per thousand

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ABSTRACT

The pass-by commercial boat and recreational resort activities effect on the hydrological parameters and hydrocarbon distribution in the water of Pasir Panjang, Redang Island was studied. Three sampling periods were conducted during July, September and October. For all three sampling periods during July, September and October, out of five hydrological parameters which are temperature, pH, turbidity, dissolved oxygen and salinity, three were relatively affected by the recreational tourism activities which were pH, dissolved oxygen and salinity. The temperature range from 28.54 °C to 31.65 °C, pH range from 8.05 to 8.30, turbidity range from 0.1 NTU to 13.0 NTU, dissolved oxygen range from 3.51 mg/l to 11.54 mg/l and salinity range from 31.08 ppt to 33.25 ppt. However, the level for pH and dissolved oxygen in the water of Pasir Panjang, Redang Island were still between the safety level of pH and dissolved oxygen which are 5.00 and 9.00 for pH and 3 – 5 mg/l for dissolved oxygen respectively. As for the salinity distribution, the salinity distribution for most of the stations and different water column were less than the normal 35 ppt. While as for the hydrocarbon distribution, the results shows that the water of Pasir Panjang was polluted as the hydrocarbon concentration for most of different sampling stations and sampling periods for surface, middle and bottom water were exceeding the hydrocarbon pollution in water level which is 0.1 mg/l or 100 ppb. The hydrocarbon distribution range from 0.18917 mg/l or 189.17 ppb to 1.97582 mg/l or 1975.82 ppb. Anova analysis showed that there were significant differences in between parameters values for pH, dissolved oxygen, salinity and hydrocarbon distribution in the three sampling periods ($p<0.05$).

ABSTRAK

Kajian mengenai pengaruh laluan bot-bot komersial dan aktiviti rekreasi resort ke atas parameter hidrologi air serta taburan hidrokarbon di kawasan perairan Pasir Panjang, Pulau Redang telah dilakukan. Tiga penyempelan telah dijalankan pada bulan Julai, September dan Oktober. Untuk kesemua tempoh penyempelan pada Julai, September dan Oktober, daripada lima hidrologi iaitu suhu, pH, kekeruhan, oksigen terlarut dan kemasinan, tiga daripadanya adalah dipengaruhi oleh aktiviti rekreasi resort iaitu pH, oksigen terlarut dan kemasinan. Suhu berjulat dari 28.54°C kepada 31.65°C , pH berjulat dari 8.05 kepada 8.30, kekeruhan berjulat dari 0.1 NTU kepada 13.0 NTU, oksigen terlarut berjulat dari 3.51 mg/l kepada 11.54 mg/l dan kemasinan berjulat dari 31.08 ppt kepada 33.25 ppt. Walaubagaimanapun, nilai pH dan oksigen terlarut bagi kawasan perairan Pasir Panjang, Pulau Redang adalah masih berada dalam julat paras normal iaitu 5.00 hingga 9.00 untuk pH dan 3 – 5 mg/l untuk oksigen terlarut. Bagi taburan kemasinan, taburan kemasinan untuk kebanyakkan stesen dalam kesemua lapisan air adalah di bawah aras normal 35 ppt. Untuk taburan hydrocarbon pula, keputusan menunjukkan bahawa perairan Pasir Panjang untuk kebanyakkan stesen dan tempoh penyempelan, bagi air permukaan, tengah dan dasar, adalah melebihi tahap pencemaran hidrokarbon dalam air iaitu 100 ppb atau 0.01 mg/l. Taburan hidrokarbon berjulat dari 0.18917 mg/l atau 189.17 ppb kepada 1.97582 mg/l atau 1975.82 ppb. Analisis Anova telah menunjukkan bahawa terdapat perbezaan yang nyata di antara parameter-parameter hidrologi iaitu pH, oksigen terlarut dan kemasinan serta taburan hidrokarbon bagi ketiga - tiga tempoh penyempelan ($p<0.05$).