

**A STUDY ON THE HEAVY METAL CONTENTS AND SEDIMENTOLOGICAL
CHARACTERISTICS IN SEDIMENTS OF KERTEH LAGOON, TERENGGANU**

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**FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU**

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CHARACTERISTICS IN SEDIMENTS OF KERTEH LAGOON, TERENGGANU**

By

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**Research Report submitted in partial fulfillment of
the requirements for the degree of
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DEPARTMENT OF MARINE SCIENCE
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DECLARATION AND VERIFICATION FORM

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

A Study on the Heavy Metal Contents and Sedimentological Characteristics in Sediments of Kerteh Lagoon, Terengganu by Nurul Ain Bt Sumarji, Matric No. UK20707 has been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of **Bachelor of Science (Marine Science)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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ABBREVIATIONS

%	-	percentage
µm	-	micrometer
AAS	-	Atomic Absorption Spectrophotometer
As	-	Arsenic
B	-	Boron
Ba	-	Barium
Cd	-	Cadmium
CF	-	Correction formula
CHR	-	Corrected hydrometer formula
Cr	-	Chromium
Cu	-	Copper
EF	-	Enrichment Factor
Fe	-	Ferum
FeS	-	ferrous sulphate
g	-	gram
GPS	-	Global Positioning System
H ₂ O ₂	-	Hydrogen peroxide
HCl	-	Hydrochloric acid
HF	-	Hydrofluoric acid

Hg	-	Mercury
HNO ₃	-	Nitric acid
ICP-MS	-	Inductively Coupled Plasma-Mass Spectrophotometer
mg/kg	-	milligram/kg
ml	-	milliliter
Mn	-	Manganese
Na ₆ (PO ₃) ₆	-	Sodium hexametaphosphate
°C	-	degree centigrade
Pb	-	Lead
ppm	-	part per million
Se	-	Selenium
TOC	-	Total organic carbon
Zn	-	Zinc

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ABSTRACT

Surface sediment from 12 stations in Kerteh lagoon area were analyzed for metals Lead (Pb), Zinc (Zn), Manganese (Mn), Ferum (Fe), Chromium (Cr), Copper (Cu), Cadmium (Cd), total organic carbon and particle size. Metals were analyzed by using Inductively Coupled Plasma Mass Spectrometer (ICP-MS). Results showed that average concentration during pre-monsoon was 0.027 mg/kg for Cd, 6.60 mg/kg for Cu, 52.90 mg/kg for Cr, 91.1 mg/kg for Mn, 13.1 mg/kg for Pb, 26.4 mg/kg for Zn and 0.77% for Fe. On the other hand, during monsoon seasons, Cd has an average concentration of 0.022 mg/kg, 3.81 mg/kg for Cu, 21.0 mg/kg for Cr, 46.65 mg/kg for Mn, 6.11 mg/kg for Pb, 22.48 mg/kg for Zn and 0.65% for Fe respectively. From the results it showed that the sediments had high concentration of Pb and relatively low concentration of Fe. Normalization of metals (Pb, Zn, Mn, Cu, Cd, Cr) to Fe as a reference element indicated relatively moderate enrichment factors for Pb. Most of the elements studied in sediments were derived from natural sources and in minimum pollution level.

ABSTRAK

Enapan permukaan dari 12 stesen kajian telah dikaji bagi menentukan logam berat Pb, Zn, Mn, Fe, Cr, Cu, Cd, jumlah karbon organik dan juga saiz partikel. Kajian logam telah dijalankan menggunakan peralatan ICP-MS. Secara keseluruhannya, kepekatan logam Cd, Cu, Cr, Mn, Pb, dan Zn di dalam enapan yang diambil dari kawasan lagun Kerteh sebelum musim monsoon adalah 0.027, 6.60, 52.90, 91.1, 13.1, 26.4 mg/kg dan kepekatan Fe adalah 0.77%. Manakala, kepekatan logam Cd, Cu, Cr, Mn, Pb, Zn secara keseluruhannya semasa musim monsoon adalah 0.022, 3.81, 21.0, 46.65, 6.11, 22.48 mg/kg dan kepekatan Fe adalah 0.65%. Keputusan kajian menunjukkan enapan mengandungi kandungan kepekatan logam Pb yang tinggi dan kepekatan logam Fe yang rendah. Ujian penormalan bagi semua logam dengan Fe sebagai latar elemen menunjukkan faktor pengkayaan untuk Pb adalah sederhana. Hampir semua elemen yang dikaji adalah berasal dari sumber semulajadi dan kepekatan yang disebabkan oleh faktor antropogenik adalah rendah.