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MINERALOGICAL STUDY OF KELANTAN DELTA SEDIMENTS

By

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Research Report submitted in partial fulfillment of
The requirements for the degree of
Bachelor of Science (Marine Sciences)

Department of Marine Sciences
Faculty of Maritime Study and Marine Sciences
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SPECIALLY DEDICATED TO:

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THANK YOU FOR ALL THE LOVE, SUPPORTS AND MOTIVATION



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**APPROVAL AND CERTIFICATION FORM
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I certify that the research report entitled: Mineralogical study of Kelantan Delta Sediments by Siti Mawarni Murat, Matric No. UK 10225 has been read and all corrections recommended by the examiners have been done. This research project is submitted to the Department of Marine Science in partial fulfillment of the requirements for the degree of Bachelor of Science in Marine Science, Faculty of Maritime Study and Marine Science Universiti Malaysia Terengganu.

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ABSTRACT

The study was conducted to determine the mineral contents and type of mineral at Kelantan delta. The sediments were collected from 8 stations which covered an area of Kelantan delta consists of 3 islands which are Pulau Bedal, Pulau Terendak and Pulau Tengkorak . The sediments were analyzed for its mineralogy using two methods: The *X-Ray Diffractometer (XRD)*, *Quantitative Mineral Estimation (QME)* for silt and clay fractions and heavy minerals respectively. Textural analysis was determined using hydrometer method. Results of the *XRD* analysis showed that quartz is dominant in station 1 and 8 moderate in stations 2, 3, 4, 5, and 6 and trace in station 7. Goethite, vermiculite and kaolinite are present moderately in every station except at station 6 for goethite and station 1 for kaolinite. Illite is trace in station 4 and 8, microcline is trace in station 1, 2, 3, 6 and 8 and montmorillonite is trace in stations 1, 4, 7 and 8. Gibbsite, calcite and andalusite are also found trace in stations 4, 5, and 8 respectively. From the *QME* analysis, 13 heavy mineral were found. Quartz presents dominantly in stations 2, 3, 4, 5, 6, 7 and 8 at the study area. Mica has low percentage (5-10%) in stations 1 and 3 while present in trace amount in other stations. Besides, amphibole is present in station 8 (0.5%) while trace in other stations. Other minerals such as feldspar, rutile, epidote, leucoxene, pyroxene, hydroilmenite, sphene, iron oxide, magnetite, and zircon are present in trace amount. From textural analysis it showed that sandy clay loam was the texture of the study area.

ABSTRAK

Projek mineral ini dijalankan untuk mengenalpasti kandungan dan jenis mineral serta taburan sediment di kawasan delta Tumpat Kelantan. Kajian ini dijalankan di 8 stesen yang terletak disekitar delta kelantan meliputi Pulau Bedal, Pulau Terendak dan Pulau Tengkorak. Sedimen mineralogi dianalisa menggunakan dua kaedah utama: *X-Ray Diffractometer (XRD)*, *Hydrometer method* dan *Quantitative Mineral Estimation (QME)* untuk fraksi kelodak dan liat, pasir dan mineral berat. Tekstur Sedimen dianalisa berdasarkan hidrometer. Keputusan dari analisis *XRD* menunjukkan quartz dominan di stesen 1 dan 8 kerap ditemui di stesen 2, 3, 4, 5 dan 6 dan dikesan surih di stesen 7. Mineral yang kerap ditemui adalah goethite, vermiculate dan kaolinite kecuali di stesen 6 untuk goethite dan stesen 1 untuk kaolinite. Illite dikesan surih di stesen 4 dan 8, microline di kesan surih di stesen 1, 2, 3, 6 dan 8, montmorillonite di kesan surih di stesen 1, 4, 7 dan 8. Gibbsite, calcite dan andalusite di kesan surih di stesen 4, 5 dan 8. Analisa *QME* menunjukkan 13 mineral dijumpai. Quartz dominan di stesen 2, 3, 4, 5, 6, 7 dan 8. Mica mempunyai peratusan yang rendah (5-10%) di stesen 1 dan 3 manakala di kesan surih di stesen lain. Amphibole hadir di stesen 8 (0.5%) manakala di kesan surih di stesen lain. Feldspar, rutile, epidote, leucoxene, pyroxene, hydroilmenite, sphene, iron oxide, magnetite, zircon adalah mineral yang hadir surih. Kajian pengelasan tekstur menunjukkan sedimen tanah liat adalah tekstur kawasan kajian.