HYDRODYNAMICS OF KLANG ESTUARY

by

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TABLE OF CONTENTS

ABSTRACT

In recent years engineering problems in estuary have received increased attention from the practitioner, the experimentalist, and the analyst in view of the important functions assigned to estuaries in the human environment. The South Port of Port Klang being situated right at the mouth of Klang River has problems of siltation ever since it operated. This siltation is caused by sediment discharge from the river entering the sea. The mixing process with denser saltwater and tidal rise and fall causes sedimentation problems in the estuary to be more serious than that encountered in the coastal regions. Thus, an analysis is required to study the hydrodynamics of the Klang Estuary.

The hydrodynamics of an estuary is a complex process due to interaction of the freshwater flow and the tidal movements of the sea. It is determined by the coexistence of fresh water flow, strong tidal and wind currents generating turbulent fluctuations and mixing, and small but still significant salinity gradients and gravity effects. Being a complex environment where freshwater from the river mixes with denser saltwater from the sea, it is therefore important that the hydrodynamics of the Klang Estuary be carefully understood. This hydrodynamic characteristic which is unique to each estuary is then used to predict the behaviour and patterns of sedimentation.

1.0 INTRODUCTION

1.1 SILTATION IN SOUTH PORT, PORT KLANG

It is the intention of Port Klang Authority to carry out a study on hydrodynamics of Klang Estuary. This study is to be considered as Phase 1 of the whole analysis of the estuary behaviour. The results obtained would then be used to predict the siltation rate that occurs in the area which is a problem faced by the Port Klang Authority every year. This is because ships using the Port requires deep channels to navigate and the cost of dredging work nowadays is about RM12.00 per cubic meter. The overall results obtained from this study would then be compared with a previous report, that had been completed in May 1995 last year, done by an intergroup maritime consultant. In their report they claimed that the rate of siltation is about 400,000 cubic meters each year and the rate will be increasing from year to year.

Some part of the activities planned by the Port Klang Authority in the future include rendering services to vessels of up to 50,000 DWT (DeadWeight Tonnage) at the harbour via the construction of a dry dock facility. Thus, the Authority has to consider the need for dredging the existing navigation channel to cater for ships as large as 50,000 DWT based on the prevailing tide and current conditions. The proposed dredging work, if required, will have an impact on the riverine and coastal environment in terms of changes in the current patterns, increase in suspended sediment concentration, and possible sedimentation elsewhere in the channel.