New Contaminated Mud Marine Disposal Facility at Airport East/East Sha Chau Area

Project Profile

1. Basic Information

1.1. Project Title

New Contaminated Mud Marine Disposal Facility at the Airport East/East Sha Chau Area.

1.2. Purpose and Nature of Project

The capacity of the existing contaminated mud disposal facility, contaminated mud pit (CMP) IV, at East Sha Chau is expected to be exhausted by late 2007. At present, a study is being conducted to identify a suitable long-term option for the management of contaminated mud. It is unlikely that any long-term disposal facility would be ready by 2010. Therefore planning for measures to cover the intermediate period of 2007 to 2010 should start now to ensure continuous supply of contaminated dredged material disposal capacity. A consultancy, "Strategic Assessment and Site Selection Study for Contaminated Mud Disposal" (the Study), was commissioned in 1999 to provide a list of disposal options and an evaluation system for selecting the most suitable disposal options for contaminated mud as an intermediate measure for 2007 to 2010.

The Study recommended the strategy of developing a contained aquatic disposal (CAD) facility at Airport East which is considered to be the least constrained and, in terms of environmental ranking, is regarded as the most suitable option. Under the EIA Ordinance, the environmental acceptability of the proposed site would need to be confirmed via an environmental impact assessment (EIA) before the commencement of detailed design, construction and operation. The Study was presented to the Environmental Impact Assessment Sub-committee of the Advisory Council on the Environment (ACE) and the full ACE Council on 9.7.2001 and 23.7.2001 respectively. The Council had no objection to proceed with the EIA study and suggested that all sites and options should be kept open as far as practicable. The extent of the EIA study has now been broadened to cover the whole area of Airport East and East Sha Chau, and one of the objectives of the study is to recommend the best location for the facility.

In addition, one ACE member suggested that the EIA study should consider the feasibility of extending the facility to beyond 2010 in the event that a confined disposal facility (CDF) option would later prove to be not suitable as a long-term strategy.

1.3. Name of Project Proponent

Civil Engineering Department

1.4. Location and Scale of Project and History of the Site

The proposed new marine contaminated mud disposal facility will be located in the general area of Airport East/East Sha Chau as shown on Drawing No. MFX 018. The proposed facility is intended to be capable of handling up to a maximum of 8 Mm^3 of contaminated mud. The proposed site is within an area where the water depth is between 5m and 20m. It is estimated that an area of 2.4 km^2 on the seabed is required for the proposed contaminated mud disposal facility.

Since December 1992, the East Sha Chau area has been the site of a series of purpose-built pits and exhausted sand borrow pits to provide contained disposal facilities for contaminated mud arising from the Hong Kong Special Administrative Region's dredging and reclamation projects. The disposal operation follows the recommendations of environmental studies including specifications on limiting disposal rates, minimum capping thickness and maximum backfilling level. Impacts on water quality, fishery resources and marine ecology have been monitored under an intense monitoring programme. Monitoring results of more than eight years have demonstrated that there is no adverse trend on the marine environment due to the disposal activities at East Sha Chau.

The Airport East site is located to the southeast of the East Sha Chau site. It has similar geophysical setting as East Sha Chau, i.e. shallow water and slow current.

1.5. Number and Types of Designated Projects to be Covered

This project profile covers a new marine contaminated mud disposal facility at the Airport East/East Sha Chau area. In accordance with Items C.10 & C.12, Part 1 of Schedule 2 under the EIA Ordinance, this is a designated project.

1.6. Name and Telephone Number of Contact Person

2. Outline of Planning and Implementation Programme

2.1. The project proponent will carry out the planning and detailed design of this facility while the construction works will be carried out by contractors and supervised by the project proponent. It is intended to engage consultants to undertake the environmental impact assessment (EIA) study.

2.2. It is tentatively scheduled that the EIA study will commence in March 2002 for completion by August 2003 and that the construction will commence in January 2005 for completion by December 2006. It is intended to start operation of the proposed new contaminated mud disposal facility in 2007 until a long-term facility is available in around 2010.

2.3. The existing contaminated mud disposal facility at East Sha Chau will still be in use when construction works commence for the proposed new contaminated mud disposal facility. Depending on the timing, reclamation works for the North Lantau development in Tung Chung and Tai Ho could be under construction. The cumulative impacts of these two projects on the marine environment will be considered and investigated in the EIA study. There are no other known projects that will have major interaction with this project.

3. Possible Impacts on the Environment

3.1. The major activity during the construction stage of the project will be dredging to form pits in the seabed for disposal of contaminated mud. The pits will be formed one by one depending on the demand for contaminated mud disposal capacity. In this connection, water quality, marine ecology, commercial fishery resources, marine traffic, noise and air quality may be of concern.

3.1.1. Water Quality

The primary impacts of dredging on water quality are increases in suspended sediment concentrations and decrease in dissolved oxygen. Such impacts may affect not only the water body within the site, but also the sensitive receivers in the vicinity of the area such as the Lung Kwu Chau and Sha Chau Marine Park, nearby artificial reef complexes, seawater intakes at the Chek Lap Kok airport, etc. The impact of dredging on water quality will be assessed in detail during the EIA study. Mitigation measures will be proposed if found necessary.

3.1.2. Marine Ecology

The primary impact on marine ecology during pit formation is direct habitat loss due to dredging and sediment deposition from dispersed plumes of dredged material covering up the habitats causing their death. Direct habitat loss could not be avoided due to the nature of the works. Measures would be investigated to limit the deposition of dredged material to the pit area and limit the loss of habitat as far as possible.

Chinese white dolphins are seen inside the proposed study area. Therefore, the possible impact and risk to this marine mammal during pit-formation works will be assessed in detail during the EIA study. Mitigation measures will be proposed if found necessary.

3.1.3. Commercial Fishery Resources

Potential impacts to commercial fishery recourses arising from the pit-forming process are direct disturbances to benthic habitats causing a loss of food supply, changes in water quality and disturbance due to the operation of construction plant. The impact of pit construction on commercial fishery resources will be assessed in

detail during the EIA study. Mitigation measures will be proposed if found necessary.

3.1.4. Marine Traffic

Access to the site will be solely by sea as no vehicular access to the site is available. It is envisaged that marine traffic will be generated during the construction stage by marine vessels and equipment for works and transportation of site personnel. The impact will depend on the type of vessels and equipment involved. The EIA study will assess the effects of different construction plant on marine traffic and recommend mitigation measures if needed.

3.1.5. Noise

During the construction stage, the operation of marine vessels and equipment will generate intermittent and transient noise to the nearby noise sensitive receivers. The EIA study will assess this effect and recommend mitigation measures if needed.

3.1.6. Air Quality

During the construction stage, the gaseous emission from construction plant will have an impact on the air quality. The impact can be minimised if the construction machines are properly operated and maintained.

3.1.7. Cultural Heritage

During the EIA study, Antiquities and Monuments Office will be consulted to confirm if they have any concern on cultural heritage which could be associated with the project.

3.2. During the operation stage, the main activities will be deposition of contaminated mud into the pits and capping with clean mud to the filled pits. In this connection, water quality, marine ecology, commercial fishery resources, risk to human and marine mammals, marine traffic, noise and air quality may be of concern.

3.2.1. Water Quality

The primary impacts of the mud disposal operations on water quality are increases in concentrations of suspended sediment, heavy metals, PAHs, PCBs and TBT and decrease in dissolved oxygen. Such impacts may affect not only the water body within the site, but also the sensitive receivers in the vicinity of the area. The impact of mud disposal activities on water quality and the potential cumulative impact including that from the nearby sewage outfalls will be assessed in detail during the EIA study. Mitigation measures will be proposed if found necessary.

3.2.2. Marine Ecology

The primary impact on marine ecology during the mud disposal operations is sediment deposition from dispersed plumes of contaminated mud covering up the habitats outside the pit area and causing their death. Other potential impacts include habitat disturbance due to increased marine traffic, noise and uptake of contaminants through bioturbation and bioaccumulation. The mud disposal operations could also cause potential impact to the nearby artificial reef complexes and the Lung Kwu Chau and Sha Chau Marine Park. Measures would be investigated to limit the sediment deposition to the pit area and limit the loss of habitat as far as possible. Upon completion of the disposal activities the pits will be capped with clean mud to the origin seabed level. Experience indicates that re-colonisation of benthic organisms will happen quickly and the seabed will return to the pre-disturbed state within two to three years' time. Therefore, there should be no permanent loss of habitat area.

Chinese white dolphins are seen inside the proposed study area. Therefore, possible impact and risk to this marine mammal during the mud disposal operations will be assessed in detail during the EIA study.

3.2.3. Commercial Fishery Resources

Potential impacts to commercial fishery recourses arising from the disposal operations are direct disturbances to benthic habitats due to sediment deposition in the vicinity of the pit causing a loss of food supply, indirect disturbance due to changes in water quality and uptake of contaminants into the food chain. The impact of disposal activities on commercial fishery resources including risk to the health of human and marine mammal due to changes in the food chain will be assessed in detail during the EIA study. Mitigation measures will be proposed if found necessary.

3.2.4. Marine Traffic

Access to the site will be solely by sea as no vehicular access to the site is available. It is envisaged that some additional marine traffic will be generated during the operation stage due to the mud disposal activities and transportation of site personnel. The impact will mainly arise from barges and other vessels used to transport contaminated mud requiring disposal. The EIA study will assess the effect of different types of mud disposal vessels to marine traffic and recommend mitigation measures if needed.

3.2.5. Noise

During the operation stage, intermittent and transient noise will be generated by the mud disposal vessels and may affect nearby noise sensitive receivers. The EIA

study will assess this effect and recommend mitigation measures if needed.

3.2.6. Air Quality

During the operation stage, the gaseous emission from the mud disposal vessels will have an impact on the air quality. The impact can be minimised if the vessels are properly maintained.

4. Major Elements of the Surrounding Environment

4.1. The study area is situated within the Northwestern Water Control Zone. The EIA would need to demonstrate that the impact on water quality from pit formation and the disposal activities comply with the statutory Water Quality Objectives of this water control zone. In addition, the following sensitive receivers may be affected by the proposed work and operation:

(a) There are a number of gazetted and non-gazetted bathing beaches along the Tuen Mun coastline. These may be affected by the changed water quality resulting from the mud pit construction works and mud disposal operations.

(b) There are a number of water intakes around the study area. They have specified suspended sediment criteria to protect the water abstraction system.

(c) There are several fisheries and mariculture areas around the study area. They have individual water quality criteria.

(d) There are existing and planned housing and other developments along the north Lantau coastal areas.

(e) The Lung Kwo Chau and Sha Chau Marine Park is located to the northwest of the study area.

(f) Chinese white dolphins are frequently seen inside the proposed study area.

4.2. The following existing or proposed facilities would need to be investigated and assessed in detail during the EIA study:

(a) Siu Ho Wan outfall.

(b) Submarine cables.

(c) Storm water discharge from the north Lantau coastal development.

5. Environmental Protection Measures to be Incorporated in the Design and Operation of the Facility and any Future Environmental Implications

5.1. Water Quality

Measures to mitigate possible environmental impacts on water quality will be

incorporated in the design and operation of the contaminated mud disposal facility. Appropriate contract provision will be included to minimise possible impacts during the construction and operation stage.

It is expected that the impact on water quality during dredging for forming the pit will be of a transient nature. Nevertheless, mitigation measures such as silt curtain for grab dredging, use of closed grabs and no overflow for trailer dredging will be investigated during the EIA study.

During the operation stage, operation details such as the mud disposal rate and disposal method taking into account of the current flow direction will be investigated under the EIA study so as to minimise the impact to an acceptable level. Also, mitigation measures will be proposed if found necessary.

The effectiveness of the operation details and mitigation measures adopted will be closely monitored through a comprehensive environmental monitoring and audit scheme.

5.2. Marine Ecology

Measures to mitigate possible environmental impacts on marine ecology will be incorporated in the design and operation of the facility. Appropriate contract provisions will be included to minimise possible impacts during the construction and operation stages.

Direct habitat loss due to pit formation works could not be avoided due to the nature of the works. However, mitigation measures would be investigated and implemented to minimise the amount of sediment deposition from dispersed plumes. The effectiveness of the mitigation measures adopted will be closely monitored through a comprehensive environmental monitoring and audit scheme.

A well-developed operation plan will be implemented during the mud disposal activities. Full-time staff will be deployed to provide 24-hour site management of the mud disposal facility. The mud disposal activities will be carried out under strict site control and supervision similar to that currently adopted at East Sha Chau. The effectiveness of the operation will be closely monitored through a comprehensive environmental monitoring and audit scheme.

Chinese white dolphins are seen inside the proposed study area. Appropriate contract provisions to minimise the effect of the project during the construction and operation stages on the marine environment will also minimise the effect on the Chinese white dolphins. However, detailed analysis will be carried out using the actual monitoring results to assess the possible impact and risk to this marine mammal during the various stages of the project. Mitigation measures will be implemented if found necessary.

Upon completion of the disposal activities, the pits will be capped with clean mud to the origin seabed level. Experience indicates that re-colonisation of benthic organisms will happen quickly and the seabed will return to the pre-disturbed state within two to three years' time. Therefore, there should be no permanent loss of habitat area.

5.3. Commercial Fishery Resources

Potential impacts to commercial fishery recourses can be regarded as a knock-on effect due to changes in water quality and disturbances to benthic habitats. Mitigation measures to reduce impacts to water quality and benthic habitats to acceptable levels would also expect to mitigate impacts to fishery resources.

5.4. Marine Traffic

As the proposed new mud disposal facility is in the vicinity of the existing one, it is envisaged that impact due to disposal activities on marine traffic will be similar to the present condition. Some additional marine traffic will be generated during the construction stage due to the dredging works by marine vessels and equipment for works and transportation of site personnel. The situation will be monitored during construction and mitigation measures, such as working outside peak hours and specified working method/sequence, will be implemented if found necessary.

5.5. Noise

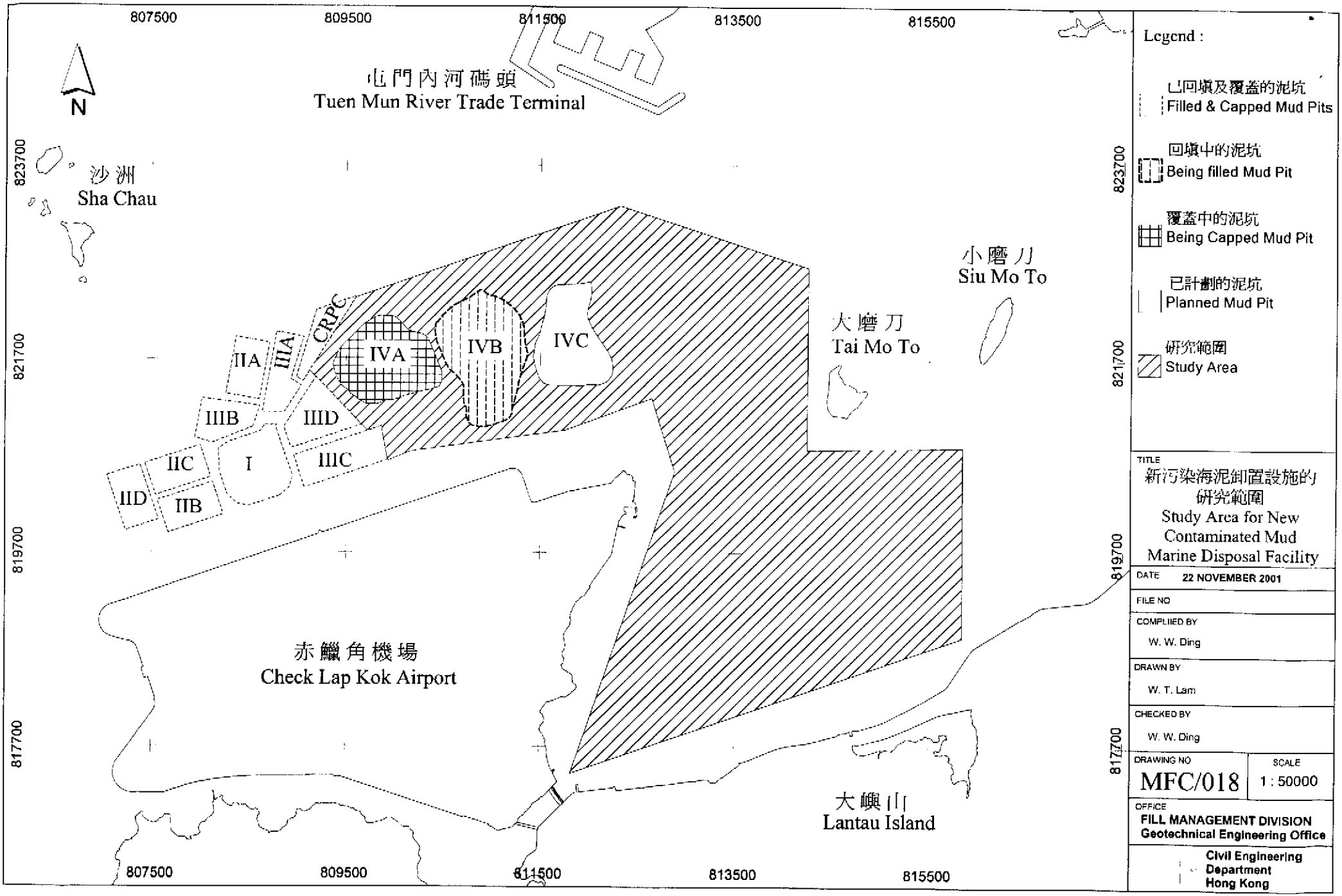
The noise level arising from the construction activities will be regulated by the licensing conditions of construction noise permits issued under the Noise Control Ordinance. The mitigation measures recommended in ProPECC PN 2/93 "Noise from Construction Activities – Non-statutory" will be implemented, as appropriate, to control any noise impacts. Similar mitigation measures will be adopted during the operation stage if found necessary.

5.6. Air Quality

During the construction and operation stages, the gaseous emission from dredging and disposal vessels will have an impact on the air quality. To minimise the impact, the vessels will need to be properly maintained.

6. Use of Previously Approved EIA Reports

Reports of previously approved relevant EIA studies, including the Environmental Impact Assessment (EIA) Study for Disposal of Contaminated Mud in the East Sha Chau Marine Borrow Pit dated 27 January 1997 and the 1998 Supplement EIA for the Proposed Sand Extraction from the Brother's Marine Borrow Area should be used as references for this study.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Being Capped Mud Pit
已計劃的泥坑
Planned Mud Pit
研究範圍
Study Area
TITLE
新污染海泥卸置設施的研究範圍
Study Area for New Contaminated Mud Marine Disposal Facility
DATE 22 NOVEMBER 2001
FILE NO
COMPLIED BY W. W. Ding
DRAWN BY W. T. Lam
CHECKED BY W. W. Ding
DRAWING NO MFC/018
SCALE 1 : 50000
OFFICE
FILL MANAGEMENT DIVISION
Geotechnical Engineering Office
Civil Engineering Department
Hong Kong