

## Appendix B

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Works Branch Technical Circular No. 22/92

WORKS BRANCH  
GOVERNMENT SECRETARIAT  
MURRAY BUILDING  
GARDEN ROAD  
HONG KONG

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Marine Disposal of Dredged Mud

Introduction

This Circular outlines the procedures to be followed in all works, both public and private, which involve the marine disposal of dredged mud. It explains the responsibilities of the Environmental Protection Department and the Fill Management Committee. This Circular is complementary to WBTC 6/92 "Fill Management".

2. This Circular covers the disposal of dredged mud, whether uncontaminated or contaminated, in Gazetted marine disposal grounds or exhausted marine borrow pits. It does not cover the use of dredged mud to form reclamations. The Director of Environmental Protection will provide the criteria for the classification of contamination levels of mud.

3. The contents of this Circular have been agreed by the Secretary for Planning Environment & Lands. It should be brought to the attention of all consultants engaged on Government and quasi-Government projects, and on major private projects which involve the dredging and subsequent marine disposal of mud.

Responsibilities of DEP and FMC

4. Under the terms of the Dumping at Sea Act 1974 (Overseas Territory) Order 1975, both the Director of Environmental Protection (DEP) and the Director of Civil Engineering (DCE) are cited as delegated officers, DEP in respect of dumping at sea per se, and DCE in respect of dumping of material with the intention of forming reclamations. DEP is the Authority for the licensing and statutory control of marine disposal of dredged mud, but the Fill Management Committee (FMC), of which DCE is the Chairman, is responsible for management and allocation of the mud disposal capacity at different disposal sites.

5. DEP controls dumping at sea by means of licences which are issued to the contractors who undertake the dumping. Licences are valid for specific periods of time, for specific quantities and types of waste carried by specific vessels, and they are subject to certain conditions. Failure to comply with a licence renders the contractor liable to legal action, and for repeated offences, to refusal of future licences.

### Notification and Review of Disposal Requirements

6. For projects with mud disposal requirements of 500,000m<sup>3</sup> or more, it is the responsibility of the project department, consultant or developer to provide both DEP and FMC with a notification of marine disposal requirements at least eight months prior to contract tendering or dredging, whichever is earlier. Urgent, non-routine maintenance dredging does not require such prior notice. The notification, which should include proposals for sampling and testing the mud for contaminants, should be directed to the Principal Environmental Protection Officer of the Solid Waste Control Group of EPD (PEPO/SWC) and simultaneously to the FMC Secretary in the Civil Engineering Department.

7. Under the terms of WBTC 6/92, disposal of 500,000m<sup>3</sup> or more of uncontaminated mud or any volume of contaminated mud will not be considered until the need for removal of the mud has first been demonstrated. The rationale for mud removal must therefore be provided at this time and directed to the Principal Government Geotechnical Engineer (PGGE) who acts as adviser to the FMC on this matter.

8. For projects with uncontaminated mud disposal requirements of less than 500,000m<sup>3</sup>, PEPO/SWC will handle applications for marine disposal.

### Determination of Sediment Quality

9. Within one month of receipt of a notification of mud disposal requirements, PEPO/SWC will confirm the sampling and testing programme to be adopted to evaluate the sediment quality. This will include :

- (a) the number and locations of sampling stations,
- (b) the types of samples to be taken (eg, surface grab, vibrocore, etc),
- (c) the depths of sampling required, and
- (d) the types and numbers of tests to be undertaken.

Appendix 1 provides more detailed guidelines on likely requirements for sampling and testing of mud.

10. The sampling and testing procedures are critical to the accurate evaluation of the sediment quality, and close supervision by the project department is therefore necessary.

11. Upon completion of the sampling and testing, and at least three months prior to contract tendering of dredging, whichever is earlier, the project department, consultant or developer shall submit a formal Sediment Quality Report to PEPO/SWC. This Sediment Quality Report shall include records of the sampling and the results of the testing.

Allocation of Marine Disposal Site

12. When PGGE has agreed the volume of mud to be removed, the allocation of mud disposal capacity will proceed as follows :

*In All Cases*

12.1 Within three weeks of receipt of the Sediment Quality Report, PEPO/SWC will advise the Secretary of FMC and the project department, consultant or developer whether open dumping is environmentally acceptable or whether the mud is contaminated and requires to be disposed of at a designated exhausted marine borrow pit. The criteria to be adopted for the classification of contaminated sediments are to be obtained from DEP who will be guided by these criteria in the issue of licences for dumping at sea. Any environmental conditions to be imposed at a later date when the dumping licence is issued to the contractor will be specified at this time. For contaminated mud, the need for special disposal arrangements, such as concealed disposal in borrow pits, will also be specified at this time.

*Volumes of Uncontaminated Mud of 500,000m<sup>3</sup> or More and Any Volume of Contaminated Mud*

12.2 Within six weeks of PEPO/SWC receiving the Sediment Quality Report, the FMC will finalise the disposal allocation, and the project department, consultant or developer will be informed. Any further conditions relating to management of the disposal area, such as the need for bathymetric surveys, will be specified at this time.

*Volumes of Uncontaminated Mud Less than 500,000m<sup>3</sup>*

12.3 Within six weeks of receipt of the Sediment Quality Report, PEPO/SWC will finalise the disposal allocation, and the project department, consultant or developer will be informed. Any further conditions relating to the management of the disposal area, such as the need for bathymetric surveys, will be specified at this time.

Application for Marine Dumping Licence

13. The contractor who will be undertaking the works must make a formal application to DEP for a dumping licence, and if the licence is granted, it will be the contractor's responsibility to ensure that the licence conditions are met to DEP's satisfaction. These licence conditions will include any FMC conditions relating to bathymetric surveys, etc.



( H B Phillipson )  
Deputy Secretary (Works Policy)

## GUIDELINES FOR SAMPLING AND TESTING OF MUD TO BE DREDGED

When notifying DEP and FMC of an intention to dredge and dispose of mud, the project department, consultant or developer must provide a detailed programme for sampling and testing the mud. This programme, which is to determine whether the mud is contaminated, will include:

- (a) *A plan showing the area to be dredged, the locations to be sampled and their Hong Kong metric grid coordinates*

In areas unlikely to be contaminated, surface samples on a 200 x 200m grid will be adequate. In areas expected to be contaminated, a vertical profile of samples should be taken on a 100 x 100m grid. In areas near outfalls or nullahs, which are expected to be highly contaminated, the vertical profile of samples should be on a 50 x 50m grid. PEPO/SWC in EPD can advise in cases where there is doubt as to the appropriate sampling grid.

- (b) *A schedule of types of sample to be taken (eg grab samples, gravity coring, piston samples, vibrocores, etc) with their locations and depths*

Where vertical profiles of samples are to be taken, samples should be continuous, and 100mm long sub-samples should be taken for testing. The top level of the sub-samples should be the seabed, 0.9m down, 1.9m down, 2.9m down, and then every 3m until the dredge depth is reached.

Each sample should be sealed in a polythene bag and labelled with the date, station number, sample length, diameter and depth, together with a full description of the sample using the methods described in Geoguide 3 - "Guide to Rock and Soil Descriptions" (Geotechnical Control Office, 1988). Samples should be stored in chilled conditions. When, for logistical reasons, analysis cannot be initiated immediately, the sample must either be frozen or pre-treated in a manner appropriate for the analytical parameter in question in order to prevent degradation of the sample.

- (c) *A schedule of tests to be carried out on the samples*

The concentration in mg/kg (dry weight) of cadmium, chromium, copper, mercury, nickel, lead and zinc shall be determined. Analysis for organic micropollutants, such as polychlorinated biphenyls (PCB's), tributyl tin (TBT) and polyaromatic hydrocarbons (PAH's), may also be required in areas where contamination by such compounds is suspected.

The analytical methods used for detecting trace metals in sediments should be in accordance with the methodology described in Table A1. The procedures, which should incorporate proper quality control methods including use of replicates, standards in calibrating instruments etc. should be similar to those for the analysis of trace metals in sludge as outlined in "Standard Method for the Examination of Water and Wastewater" 17th Edition, published by the American Public Health Association.

Table A1 - Analytical Methodology

PARAMETER	METHODOLOGY
Total Copper	Direct acid digestion followed by Atomic Absorption Analysis
Total Chromium	As above
Total Cadmium	As above
Total Lead	As above
Total Nickel	As above
Total Zinc	As above
Total Mercury	Cold Vapour Generation
Dry Weight	Constant Weight at 103-105°C

(d) *Timetable for sampling, testing and reporting*

The anticipated timetable for taking the samples, carrying out the tests and producing the Sediment Quality Report shall be provided.