

**Subcommittee on
The Dumping at Sea (Exemption) (Amendment) Order 2009**

**Response to questions raised at the
Second meeting held on 1 December 2009**

Response to Question 1

a) The extent and time taken for the affected seabed to return to its pre-dredged state for marine organisms

Based on the benthic surveys conducted in early 2004 at the completed Contaminated Mud Pit III (CMP III) at East of Sha Chau (ESC), which ceased to operate and was capped with clean marine sediment in 2002, the monitoring results indicate that the benthic community at the capped CMP has increased in biomass, number of individuals and species richness over time. This shows that marine organisms have returned to the affected seabed shortly after completion of the reinstatement work and progressive recolonisation is achieved within a short period of around 1 year. Regarding the existing disposal facility at CMP IV, two completed disposal pits are being capped and reinstatement works are being carried out, while the remaining disposal pit is still in operation.

For the new ESC disposal facility at CMP V, the facility is designed as four separate pits, which minimizes the exposure time of dumped contaminated mud to the marine environment and allows early reinstatement works to be made in phases. The Civil Engineering and Development Department (CEDD) will reinstate the affected seabed using clean marine sediment generated from other works within Hong Kong waters, soon after completion of each of the four disposal pits of the ESC facility.

b) The environmental monitoring and audit results for the Contaminated Mud Pit IV at East of Sha Chau including the types and frequency of monitoring data collected and the method of collection

A summary of the environmental monitoring and audit results for the previous and existing Contaminated Mud Pits (i.e. CMP I to IV) at ESC from 1993 to 2008, together with the types and frequency of monitoring data collected and the method of collection for the current disposal facility at CMP IV, is enclosed at **Annex 1**.

Response to Question 2

All along, CEDD has been providing reports on environmental monitoring results of the existing disposal facility at ESC to the Environmental Hygiene and District Development Committee of the Tuen Mun District Council on a bimonthly basis for their consideration. CEDD undertakes to continue this practice until the completion of the new disposal facility (CMP V).

Environmental Protection Department
Civil Engineering and Development Department

December 2009

**Environmental Monitoring and Audit (EM&A)
for Contaminated Mud Pits at East of Sha Chau**

Summary of Monitoring Results from 1993 to 2008

1. Monitoring Programme

The environmental monitoring programme conducted for contaminated mud pits (CMPs) at East of Sha Chau (ESC) is drawn up in light of the findings and recommendations of the environmental impact assessment. Apart from monitoring of water quality, ecological community structure and biotic tissue contamination, sediment samples are collected outside the ESC mud pits to check their chemical contamination levels and toxicity. The monitoring results of the sediment samples will help to check whether the ESC facilities are properly designed and operated such that there is no leakage or dispersion of contaminated mud outside the mud pits.

An updated summary on the types and frequency of monitoring data collected, as well as the method of collection for the current disposal facility at CMP IV, is shown at *Appendix 1*.

2. Monitoring Findings

2.1 Quality monitoring of sediments outside ESC facilities

Concentrations of most contaminants in the sediment were below their respective Lower Chemical Exceedance Level (LCEL)¹, and exceedances of LCEL were observed for some contaminants very occasionally. There were no observable trends of increasing contaminant concentrations in sediment with increasing proximity to the CMP, and all contaminants showed either no or a weak relationship between their concentrations and time. The results show no

¹ In accordance with the Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002 – Management of Dredged/Excavated Sediment, a set of chemical contaminant levels is laid down for the purpose of sediment classification. Those sediments containing low levels of chemical contaminants which do not exceed the Lower Chemical Exceedance Level (LCEL) are classified as Category L sediment, and they are considered suitable for open sea disposal since they will unlikely pose toxic effects upon the marine organisms.

evidence of dispersion of contaminated mud outside the mud pits to the surrounding waters, nor any adverse environmental impacts to the sediment quality as a result of the disposal operation at ESC.

2.2 Sediment toxicity testing of sediments outside ESC facilities

Long term monitoring result indicated no history of toxic responses in organisms related to mud disposal operations as little or no toxicity was observed in the sediments.

2.3 Testing for contaminant concentration of target species

For samples collected from trawling, it was noted that the abundance of fisheries resources was similar between the Reference and Impact stations, and occasionally, was higher in the Impact than the Reference stations. This indicates that disposal operations at the CMP may not have any adverse effects on the abundance of fisheries resources. The CMP facility and its operation are therefore considered to be environmentally acceptable in the context of fisheries resources.

For the tissue/whole body contaminant testing, contaminant concentrations in the tissues and the whole body of the target species fluctuated over time, but no temporal trends of concern, i.e. no increasing concentration over time, were observed for any of the target species.

2.4 Water Quality

There was no evidence of any adverse environmental impacts to water quality as a result of contaminated mud disposal operations at the ESC CMP, and the CMP facility and its operation are considered to be environmentally acceptable in the context of water quality.

3. Conclusions

Based on the findings of the review of environmental monitoring data collected by various monitoring programmes from 1993 to February 2008, there is no evidence of any adverse impacts caused by the disposal activities in the ESC contaminated mud disposal facility, and the CMP facility and operation have proceeded in an environmentally acceptable manner.

**An updated summary table of the ESC CMP IV
environmental monitoring programme**

Parameters	Method of collection	Sampling frequency
Water Quality Temperature, DO, pH, Salinity, Current Velocity & Direction, SS, Ammonia, Nutrients (NO _x & TIN), BOD ₅ , COD, Turbidity, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc, Arsenic	<i>In-situ</i> measurement and water sample collection	6 times/year
Sediment Quality Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc, Arsenic, PAHs, PCBs, DDE & DDT, TBT, TOC, Particle Size Distribution	Sediment collection with sea bed grab samplers	5 times/year
Sediment Toxicity Test	Sediment collection with sea bed grab samplers	2 times/year
Tissue/Whole Body Contaminant Testing Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc, Arsenic, PAHs, PCBs, DDE & DDT, TBT	Trawl Sampling	2 times/year
Fisheries Resources	Trawl Sampling	4 times/year
Benthic Ecology Benthic Communities, Benthic Colonisation	Sediment collection with sea bed grab samplers	2 times/year