APPENDIX 4F CALCULATIONS ON RELEASE OF CONTAMINANTS FROM DREDGING

The potential heavy metal release arising from contaminated pore water released from sediment during dredging is estimated based on the equation adopted from the "Water Quality Prevention, Identification and Management of Diffuse Pollution" by Vladimir Novotny & Harvey Olem, Van Nostrand Reinhold, New York, 1994.

where
$$C_T = \theta C_d + C_p$$
 where
$$C_T = Total \ contaminant \ concentration \ (\mu g \ l^{-1})$$

$$\theta = Water \ content \ of \ the \ sediment \ as \ a \ fraction \ of \ the \ volume \ (for \ water \ \theta = 1)$$

$$C_d = Desorbed \ concentration \ of \ the \ contaminant \ (\mu g \ l^{-1})$$

$$C_p = Adsorbed \ concentration \ of \ the \ contaminant \ (\mu g \ l^{-1})$$

$$C_p = Mss \ x \ r$$
 where
$$Mss = Concentration \ of \ solids \ in \ g \ l^{-1}$$

$$r = Adsorbed \ contaminant \ concentration \ in \ \mu g \ g^{-1}$$

$$r = K_d \ x \ C_d$$
 where
$$K_d = Particulate \ coefficient \ of \ the \ contaminant \ (l \ g^{-1})$$
 Therefore

Apply Equation (1), where input data/assumptions are detailed as follows in Table F1:

 $C_d = C_T/(\theta + K_d \times Mss)$

1. Total contaminant concentration in sediment (C_T)

 Contaminant concentration in sediment. The heavy metal concentration used in the calculation is the highest concentration from vibrocore V4 so as to represent the worst-case scenario. (Source: Test Report on Chemical Analysis of Sediment - Reclamation of Yau Tong Bay Stage 1 Site Investigation (Marine), Reported by MateriaLab, February 1999)

(1)

2. Partitioning coefficient (l kg⁻¹) (K_d)

The partitioning coefficient of the heavy metal is obtained from values quoted in *Environmental Impact Assessment Study for Disposal of Contaminated Mud in the East Sha Chau Marine Borrow Pit, by ERM, January 1997.*

- 3. Concentration of suspended solid in Sediment disposed at the Mud Pit (g l⁻¹) (Mss) = 1750 g/l⁻¹ (Source: This is the value used in the sediment plume modelling undertaken in the EIA Report)
- 4. Water content of the sediment as a fraction of the volume ($\theta = 0.42$)

 (Source: Test Report on Chemical Analysis of Sediment Reclamation of Yau Tong Bay Stage 1 Site Investigation (Marine), Reported by MateriaLab, February 1999)

able F1 Calculat	ions on Heavy Meta	Calculations on Heavy Metal Release from Contaminated Pore Water released from Sediment during Dredging	minated Pore Wat	er released from Sedim	ent during Dredging				
ontaminant	Total Contaminant conc in sediment -	Total Contaminant conc in sediment - Partitioning coefficent CT (mg/kg) Kd (l/kg): low	Partitioning coefficent - Kd (J/kg): high	Desorbed contaminant Desorbed contaminant conc in pore water - Cd conc in pore water - Cc (ug/l): high	Desorbed contaminant conc in pore water - C (ug/l): high	nt Cd Water Quality Standard (ug/l)*	Exceedance of Water Quality Standard (Yes/No)		
fercury		1000000	100000	2.57E-03	2.57E-02	0.3	No		
oncentration of Solids in Sediment - Mss (g/l)	in Sediment - Mss ((g/l)	1750						•
Vater content in Sediment	ent		0.42						
lote: The Hg concer	itration used in the c	calculation is the highes	t concentration rec	The Hg concentration used in the calculation is the highest concentration recorded at vibrocore V4 to represent the worst case scenario	represent the worst cas	scenario.			