



Agreement No. CE 63/2016 (EP) Environmental Monitoring and Audit for Disposal Facility to the East of Sha Chau (2017-2020) – Investigation

Monthly EM&A Report for Contaminated Mud Pits to the East of Sha Chau – March 2019

Revision 0

April 2019

Environmental Resources Management 2507, 25/F, One Harbourfront 18 Tak Fung Street Hunghom, Kowloon Hong Kong Telephone (852) 2271 3000 Facsimile (852) 2723 5660



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Revision 0

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Environmental Resources Management

2507, 25/F, One Harbourfront 18 Tak Fung Street Hunghom, Kowloon Hong Kong Telephone: (852) 2271 3000 Facsimile: (852) 2723 5660 E-mail: post.hk@erm.com http://www.erm.com

Client:		Project N	0:		
Civil En	gineering and Development Department (CEDD)	040072	0		
Summary		Date:			
		12 April	2019		
		Approved	l by:		
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		Craig A	. Reid		
		Partner	1		1
v0	Monthly EM&A Report for ESC CMPs	RC	RC	CAR	12/04/19
Revision	Description	Ву	Checked	Approved	Date
name of 'EF terms of the	has been prepared by Environmental Resources Management the trading RM Hong-Kong, Limited', with all reasonable skill, care and diligence within the Contract with the client, incorporating our General Terms and Conditions of ad taking account of the resources devoted to it by agreement with the client.	Distributio	on ernal	OHSA Certificate	5 18001:2007 No. OHS 515956
We disclaim scope of the	any responsibility to the client and others in respect of any matters outside the above.	🛛 Pul	olic		BSI
nature to th	is confidential to the client and we accept no responsibility of whatsoever ird parties to whom this report, or any part thereof, is made known. Any such on the report at their own risk.	Col	nfidential	ISO 9 Certificat	2001 : 2008 e No. FS 32515







Dredging, Management and Capping of Contaminated Sediment Disposal Facility at Sha Chau

Environmental Certification Sheet EP-312/2008/A

Reference Document/Plan

Document/Plan to be Certified/ Verified:	Monthly EM&A Report for Contaminated Mud Pits to the East of Sha Chau – March 2019
Date of Report:	12 April 2019
Date prepared by ET:	12 April 2019
Date received by IA:	12 April 2019

Reference EP Condition

Environmental Permit Condition:

Condition 3.4 of EP-312/2008/A:

4 hard copies and 1 electronic copy of monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of the reporting month. The EM&A Reports shall include a summary of all noncompliance (exceedances) of the environmental quality performance limits (Action and Limit Levels). The submissions shall be certified by the ET Leader and verified by the Independent Auditor. Additional copies of the submission shall be provided to the Director upon request by the Director.

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-312/2008/A

Craig Reid, Environmental Team Leader:



12/04/2019 Date:

IA Verification

I hereby verify that the	above referenced document/ plan complies wit	th the above	e referenced condition of	
EP-312/2008/A	2			
Dr Wang Wen Xiong, Independent Auditor:	Mang Wang	Date:	12/04/2019	

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Agreement No. CE 63/2016 (EP) Environmental Monitoring and Audit for Disposal Facility to the East of Sha Chau (2017-2020) - Investigation

MONTHLY EM&A REPORT FOR MARCH 2019

1.1 BACKGROUND

- 1.1.1 The Civil Engineering and Development Department (CEDD) is managing a number of marine disposal facilities in Hong Kong waters, including the Contaminated Mud Pits (CMPs) to the South of The Brothers (SB) and to the East of Sha Chau (ESC) for the disposal of contaminated sediment, and opensea disposal grounds located to the South of Cheung Chau (SCC), East of Tung Lung Chau (ETLC) and East of Ninepins (ENP) for the disposal of uncontaminated sediment. Two Environmental Permits (EPs), EP-312/2008/A and EP-427/2011/A, were issued by the Environmental Protection Department (EPD) to the CEDD, the Permit Holder, on 28 November 2008 and 23 December 2011 for the Dredging, Management and Capping of Contaminated Sediment Disposal Facilities at ESC CMP V and SB CMPs, respectively.
- 1.1.2 Under the requirements of the two EPs for ESC CMP V and SB CMPs, EM&A programmes which encompass water and sediment chemistry, fisheries assessment, tissue and whole body analysis, sediment toxicity and benthic recolonisation studies as set out in the EM&A Manuals are required to be implemented. EM&A programmes have been continuously carried out during the operation of the CMPs at ESC and SB. A review of the collection and analysis of such environmental data from the monitoring programme demonstrated that there had not been any adverse environmental impacts resulting from disposal activities ^{(1) (2)}. The current programme will assess the impacts resulting from dredging, disposal and capping operations of CMP V as well as capping operations of SB CMPs.
- 1.1.3 The present EM&A programme under *Agreement No. CE 63/2016 (EP)* covers the dredging, disposal and capping operations of the ESC CMP V as well as the capping operations of the SB CMPs (see *Annex A* for the EM&A programme). The scheduled EM&A programme for SB CMPs was completed in December 2018. Detailed works schedule for ESC CMP V is shown in *Figure 1.1*. In March 2019, disposal of contaminated mud at ESC CMP Vd was undertaken.

ERM (2013) Final Report. Submitted under Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pit at East Sha Chau. For CEDD.

⁽²⁾ ERM (2017) Final Report. Submitted under Agreement No. CE 23/2012 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau (2012 - 2017). For CEDD.

Figure 1.1 Works Schedule for ESC CMP V and SB CMPs

Pit	Operation				1	20	17										2	201	8											20	019)					I						20	20						2	202	21
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	Dredging																														Γ			Ι		Τ																Γ
ESC CMP V	Disposal														Т		T														Γ					Τ	Т															
	Capping																																																			

1.2 REPORTING PERIOD

- 1.2.1 This *Monthly EM&A Report for March* 2019 covers the EM&A activities for the reporting month of March 2019.
- 1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES
- 1.3.1 The following monitoring activities were undertaken for ESC CMP V in March 2019:
 - Water Column Profiling of ESC CMP Vd; and
 - Pit Specific Sediment Chemistry of ESC CMP Vd.
- 1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS
- 1.4.1 No outstanding sampling remained for March 2019.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR ESC CMP V

- 1.5.1 Brief discussion of the monitoring results of the following activities for ESC CMP V is presented in this *Monthly EM&A Report for March* 2019:
 - Water Column Profiling of ESC CMP Vd in March 2019; and
 - *Pit Specific Sediment Chemistry of ESC CMP Vd* in March 2019.

1.5.2 Water Column Profiling of ESC CMP Vd – March 2019

1.5.3 *Water Column Profiling* was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 5 March 2019. The monitoring results have been assessed for compliance with the Water Quality Objectives (WQOs) set by Environmental Protection Department (EPD). This consists of a review of the EPD routine water quality monitoring data for the dry season period (November to March) of 2008 - 2017 from stations in the Northwestern Water Control Zone (WCZ), where the ESC CMPs are located ⁽¹⁾. For Salinity, the averaged value obtained from the Reference (Upstream) station was used for the basis as the WQO. Levels of Dissolved Oxygen (DO) and Turbidity were also assessed for compliance with the Action and Limit Levels (see *Table B1* of *Annex B* for details).

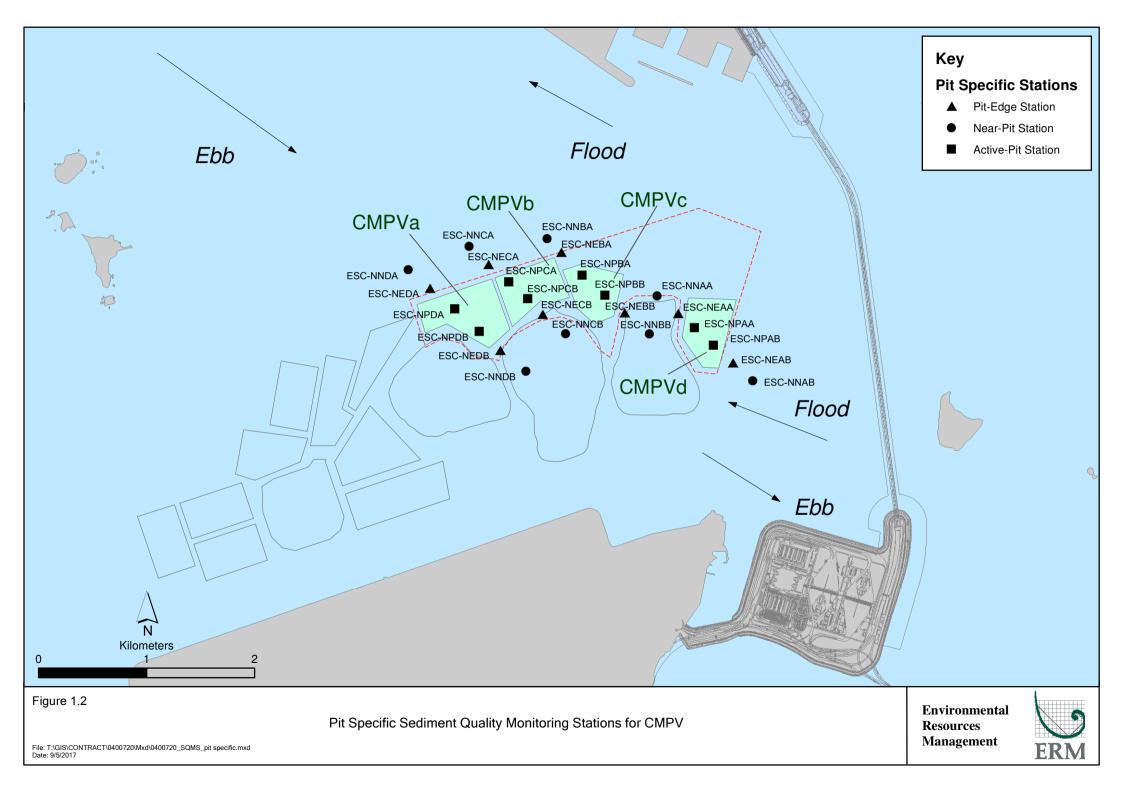
In-situ Measurements

1.5.4 Analyses of results for March 2019 indicated that levels of Salinity, pH and DO complied with the WQOs at both Downstream and Upstream stations (*Table B2* of *Annex B*). Levels of DO and Turbidity at all stations complied with the Action and Limit Levels (*Tables B1* and *B2* of *Annex B*).

Laboratory Measurements for Suspended Solids (SS)

- 1.5.5 Analyses of results for March 2019 indicated that the SS levels at both Downstream and Upstream stations complied with the WQO and the Action and Limit Levels at both Downstream and Upstream stations (*Tables B1* and *B2* of *Annex B*).
- 1.5.6 Overall, the monitoring results indicated that the mud disposal operation at ESC CMP Vd did not appear to cause any deterioration in water quality during this reporting period.
- 1.5.7 Pit Specific Sediment Chemistry of ESC CMP Vd March 2019
- 1.5.8 Monitoring locations for *Pit Specific Sediment Chemistry for ESC CMP Vd* are shown in *Figure 1.2.* A total of six (6) monitoring stations were sampled on 4 March 2019.
- 1.5.9The concentrations of all inorganic contaminants were lower than the Lower
Chemical Exceedance Level (LCEL) at most stations, except the concentrations
of Arsenic and Copper were higher than the LCEL at Active Pit stations ESC-
NPAA and ESC-NPAB, respectively (*Figures 1 and 2* of Annex C).

(1) http://epic.epd.gov.hk/EPICRIVER/marine/?lang=en



- 1.5.10 For organic contaminants, the concentrations of Total Organic Carbon (TOC) varied between stations and were higher at Active-Pit station ESC-NPAB in March 2019 (*Figure 3* of *Annex C*). The concentrations of Tributyltin (TBT) and Low and High Molecular Weight Polycyclic Aromatic Hydrocarbons (PAHs) were higher at Active-Pit station ESC-NPAB in March 2019 (*Figures 4 and 5 of Annex C*). Total Polychlorinated Biphenyls (PCBs), Total dichloro-diphenyl-trichloroethane (DDT) and 4,4'-dichlorodiphenyldichloroethylene (DDE) concentrations were below the limit of reporting at all stations.
- 1.5.11 Whilst the average concentration of Arsenic in the Earth's crust is generally ~2 mg/kg, significantly higher Arsenic concentrations (median = 14 mg/kg) have been recorded in Hong Kong's onshore sediments ⁽¹⁾. It is presumed that the natural concentrations of Arsenic are similar in onshore and offshore sediments ⁽²⁾, and relatively high Arsenic levels may thus occur throughout Hong Kong. Therefore, the LECL exceedances of Arsenic are unlikely to be caused by the disposal operations at ESC CMP Vd but rather as a result of naturally occurring deposits.
- 1.5.12 Considering that the higher levels of Copper occurred within one Active-Pit station ESC-NPAB only but not at the Pit-Edge and Near-Pit stations, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at ESC CMP Vd in March 2019. Statistical analysis will be undertaken and presented in the corresponding quarterly report to investigate whether there are any unacceptable impacts in the area caused by the contaminated mud disposal.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

- 1.6.1 The following monitoring activities will be conducted in the next monthly period of April 2019 for ESC CMP V (see *Annex A* for the sampling schedule ⁽³⁾):
 - Water Column Profiling of ESC CMP Vd;
 - Routine Water Quality Monitoring of ESC CMPs; and
 - Pit Specific Sediment Chemistry of ESC CMP Vd.

1.7 STUDY PROGRAMME

1.7.1 A summary of the Study Programme is presented in *Annex D*.

- (2) Whiteside PGD (2000) Natural geochemistry and contamination of marine sediments in Hong Kong. In: The Urban Geology of Hong Kong (ed Page A & Reels SJ). Geological Society of Hong Kong Bulletin No. 6, p109-121
- (1) The scheduled EM&A Programme for SB CMPs was completed in December 2018.

Sewell RJ (1999) Geochemical Atlas of Hong Kong. Geotechnical Engineering Office, Government of the Hong Kong Special Administrative Region

Annex A

Sampling Schedule

Pit Specific Sediment Chemistry	Code	Frequency	A M	1 J	20) J A		0 1	I D	JI	F M A		2018 J J	A S	O N E	J	F M	A A		2019 J J	A S	0	I D	J	F M	A M	20 1 J		S O	N D	J F	
Active-Pit	ESC-NPAA ESC-NPAB	Monthly Monthly	12 12 12 12			2 12 2 12	12 12 12 12			12 12 12 12 12 12				12 12 12 12 12 12			2 12 1 2 12 1			12 12 12 12			12 1 12 1		12 12 12 12				12 12 12 12	12 12 12 12	
Pit-Edge	ESC-NEAA ESC-NEAB	Monthly Monthly	12 12		12 12	2 12	12 12	2 12	12 1	12 12 12	12 1	12 12	12 12	12 12 12 12 12 12 12 12 12	2 12	12 12	2 12 1	12 1	12 12	12 12	12 1	2 12	12 1	12 12	12 12	2 12	12 12	12 12	12 12	12 12	12
Near-Pit	ESC-NEAB ESC-NNAA ESC-NNAB	Monthly	12 12 12 12 12 12	2 12	12 12		12 12 12 12 12 12	2 12	12 1	12 12 12	12 1	12 12	12 12	12 12 12 12 12 12 12 12 12	2 12	12 12	2 12 1	12 1	12 12	12 12	12 1	2 12	12 1 12 1 12 1	12 12	12 12	2 12	12 12 12 12 12 12	12 12	12 12		12
Cumulative Impact Sediment Che		,	A M				0 N			F M A				O N E			A A										J A			J F	М
Near-field Stations	ESC-RNA ESC-RNB1	4 times per year 4 times per year		12				12 12		12		12	12 12	11		12 12				12 12		12 12		12		12 12	12		12	12	
Mid-field Stations	ESC-RMA	4 times per year		12	12	2		12		12	1	12	12	11	2	12				12		12		12		12	12		12	12	
Capped Pit Stations	ESC-RMB ESC-RCA1	4 times per year 4 times per year		12				12		12		12	12	11		12				12		12		12		12	12		12	12	
Far-Field Stations	ESC-RCB1	4 times per year		12	11	2		12	1	12	1	12	12	12	2	12		1	12	12		12		12		12	12		12	12	
Ma Wan Station	ESC-RFA ESC-RFB	4 times per year 4 times per year		12	11	2		12		12		12	12	12	2	12 12		1	12	12		12 12		12		12 12	12		12	12	
Sediment Toxicity Tests	MW1	4 times per year		12 1			0 1	12 I D		F M A		12 I I	12 A S	0 N E		12 F M	1 A 1			12 A S	0	12 J D		12 F M	AN	12	12 I A	S O	12 N D	12 I F	
Near-Pit Stations	ESC-TDA	2 times per year			5				5	5		, ,	5			5		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		5				5			5			5	
Reference Stations	ESC-TDB1 ESC-TRA	2 times per year 2 times per year			5					5			5			5		_		5				5			5			5	
Ma Wan Station	ESC-TRB MW1	2 times per year 2 times per year			5				5	5			5			5				5				5			5			5	
Tissue/ Whole Body Sampling	MIW1	2 times per year	A M	1 J			0 1	D		-	М	JJ		O N E	J		A A	M]	JJ		0 1	I D		÷	A M	1 J	-	S O	N D		М
Near-Pit Stations	ESC-INA ESC-INB	2 times per year 2 times per year			*					*			*			*				*				*			*			*	
Reference North	TNA	2 times per year	F	+	*	-		╞		*	\square		*		\square	*	\square	+		*	H		+	*			*			*	日
Reference South	TNB TSA	2 times per year 2 times per year	Ħ	1	*				,	*			*			*		_		*				*			*			*	
Demersal Trawling	TSB	2 times per year	A	1 1	J A		0		, I, I,	* F M A	M	I I	*	O N E		* F M	4 4	M		*		I D	T	*	A	1 T	*	S O	ND	I E	М
Near Pit Stations	ESC-INA	4 times per year		. 1	5 5		N		5 5	5		5	5		5	5			5	5			5	5	IV.		5 5			5 5	
Reference North	ESC-INB TNA	4 times per year 4 times per year	Ħ	+	5 5			\ddagger	5 5		+	5		+ +		5	+	╡		5	\vdash	+	5	5	+		5 5 5 5			5 5 5 5	╡
Reference South	TNB	4 times per year	Ħ	+	5 5				5 5	5		5	5		5	5	+	+	5	5			5	5	+		5 5			5 5	
	TSA TSB	4 times per year 4 times per year	\vdash		5 5 5 5				5 5 5 5	-		5 5				5 5				5 5	$\left \right $			5 5			5 5 5 5			5 5 5 5	
Capping Ebb Tide			A M	1 J	J A	S	0 1	I D	JI	F M A	M	J J	A S	O N E	J	F M	A	M]	JJ	A S	0 1	1 D	J	F M	A N	1 J	J A	S O	N D	J F	M
Impact Station Downcurrent	ESC-IPE1A ESC-IPE2A ESC-IPE3 ESC-IPE4	4 times per year 4 times per year 4 times per year																		3 3 3 3		3 3 3 3		3 3 3 3		3 3 3	3 3 3 3		3 3 3 3	3 3 3 3	
Intermediate Station Downcurrent	ESC-INE2A ESC-INE3A	4 times per year 4 times per year 4 times per year 4 times per year																		3 3 3 3		3 3 3 3		3 3 3 3		3 3 3 3	3 3 3 3		3 3 3 3	3 3 3 3	
Reference Station Upcurrent	ESC-INE5A ESC-RFE1 ESC-RFE2	4 times per year 4 times per year 4 times per year 4 times per year																		3 3 3 3		3 3 3 3		3 3 3 3 3		3 3 3 3	3 3 3 3 3		3 3 3 3 3	3 3 3 3 3	
	ESC-RFE3 ESC-RFE4 ESC-RFE5	4 times per year 4 times per year 4 times per year																		3 3		3 3 3		3 3 3		3	3		3	3	
Ma Wan Station	MW1	4 times per year																		3		3		3		3	3		3	3	
Flood Tide Impact Station Downcurrent	ESC-IPF1	4 times per year																		3		3		3		3	3		3	3	
Intermediate Station Downcurrent	ESC-IPF2 ESC-IPF3	4 times per year 4 times per year																		3 3		3		3		3	3		3	3	
intermediate station bowncurrent	ESC-INF1 ESC-INF2	4 times per year 4 times per year																		3 3		3		3 3		3	3		3	3	
Reference Station Upcurrent	ESC-INF3 ESC-RFF1A	4 times per year 4 times per year																		3		3		3		3	3		3	3	
Ma Man Chatlan	ESC-RFF2A ESC-RFF3	4 times per year 4 times per year																		3 3		3		3		3	3		3	3	
Ma Wan Station	MW1	4 times per year		+		+												_		3		3		3		3	3		3	3	
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Intermediate Station Downcurrent	ESC-INE1A	8 times per year 8 times per year	8 8	3	8 8		8 8	;	8 8	8 8	8	8	8	8 8	8	8	8	8	8	8	8 8	3	8	8	8 8	;	8 8	8	8	8 8	
	ESC-INE2A ESC-INE3A ESC-INE4A ESC-INE5A	8 times per year 8 times per year 8 times per year 8 times per year	8 8 8 8 8 8 8 8	3	8 8 8 8 8 8 8 8		8 8 8 8 8 8 8 8		8 8 8 8 8 8	8 8	8 8	8 8 8 8	8 8	8 8 8 8 8 8 8 8	8 8	8 8 8 8	8 8 8 8	8 8	8 8 8 8	8 8 8 8	8 8 8 8 8 8	3	8		8 8 8 8 8 8 8 8	;	8 8 8 8 8 8 8 8	8 8 8 8	8 8	8 8 8 8 8 8 8 8	
Reference Station Upcurrent	ESC-RFE1	8 times per year	8 8	3	8 8		8 8		8 8	8 8	8	8	8	8 8	8	8	8	8	8	8	8 8	3	8	8	8 8	;	8 8	8	8	8 8	╡
	ESC-RFE2 ESC-RFE3 ESC-RFE4	8 times per year 8 times per year 8 times per year	8 8 8 8 8 8	3	8 8 8 8 8 8		8 8 8 8 8 8		8 8 8 8 8 8	8 8	8	8 8 8	8	8 8 8 8 8 8	8	8 8 8	8 8 8	8	8 8 8	8 8 8	8 8 8 8 8 8		8 8 8		8 8 8 8 8 8	;	8 8 8 8 8 8	8 8 8		8 8 8 8 8 8	\exists
Ma Wan Station	ESC-RFE5	8 times per year	8 8	3	8 8		8 8		8 8	8 8	8	8	8	8 8	8	8	8	8	8	8	8 8	3	8	8	8 8	-	8 8	8	8	8 8	
Flood Tide Impact Station Downcurrent	MW1	8 times per year	8 8	5	8 8		8 8		8 8			8	8	8 8		8	8		8	8	8 8		8	8	8 8		8 8	8	8	8 8	
	ESC-IPF1 ESC-IPF2 ESC-IPF3	8 times per year 8 times per year 8 times per year	8 8 8 8 8 8	_	8 8 8 8 8 8		8 8 8 8 8 8			8	8	8 8 8	8 8 8	8 8 8 8 8 8	8	8 8 8	8 8 8		8 8 8	8 8 8	8 8 8 8 8 8	3	-	8 8 8	8 8 8 8 8 8	_	8 8 8 8 8 8		8 8 8	8 8 8 8 8 8	╡
Intermediate Station Downcurrent	ESC-INF1	8 times per year 8 times per year	8 8	3	8 8		8 8			8	8	8	8	8 8	8	8	8	8	8	8	8 8	3	8	8	8 8	;	8 8	8	8	8 8	
Reference Station Upcurrent	ESC-INF2 ESC-INF3	8 times per year 8 times per year	8 8		8 8	_	8 8 8 8		+	8		8	8	8 8 8 8		8	8		8	8	8 8		8	8	8 8 8 8		8 8 8 8	8		8 8 8 8	\exists
openient	ESC-RFF1A ESC-RFF2A	8 times per year 8 times per year	8 8 8 8	3	8 8		8 8 8 8		+	8	8	8	8	8 8 8 8	8	8	8	8	8	8	8 8	3	8	8	8 8 8 8	:	8 8 8 8	8	8	8 8 8 8	
Ma Wan Station	ESC-RFF3 MW1	8 times per year 8 times per year	8 8 8 8		8 8		8 8			8		8		8 8	8	8	8		8	8	8 8			8	8 8 8 8		8 8 8 8	8	8	8 8 8 8	
Water Column Profiling Plume Stations	WCP1	Monthly	A M 4 4	1 J 4 4	J A 4 4	S	0 N 4 4	4	4 4	F M A 4 4 4	M 4	J J 4 4	A S 4 4	O N E 4 4 4	J 4	F M 4 4	A A B	M]	4 4	4 4	0 N 4 4	D	J 4	F M 4 4	4 4	4	J A 4 4	S 0 4 4	N D 4 4	J F 4 4	4
Benthic Recolonisation Studies	WCP2	Monthly	4 4	4	4 4	4	4 4	4	4 4	4 4 4	4	4 4	4 4	4 4 4	4	4 4	4 4	4 4	4 4	4 4	4 4	4	4	4 4	4 4	4	4 4	4 4	4 4	4 4	4
Capped Stations at CMPV		2 times per year	AN	* J		. 3	- S N		, 1	• wi A	111	, ,	A 5			- M	A	.74	,]	A 5			1	. M	AN	- 7	, А			, r	ivi
	ESCV-CPC	2 times per year 2 times per year 2 times per year	Ħ	F	Ħ			Ħ	+		Ħ	\square			F	+	Ħ	+	Ħ	+		\square	+	\square	+				+	+	
Reference Stations	ESCV-CPD RBA RBB RBC1	2 times per year 2 times per year 2 times per year 2 times per year																													
Impact Monitoring for Dredging					· · · ·	_				FMA																					

Impact Monitoring for Dred	ging		A M	J	J A	s	0	N D	J	F	Μ.	A N	1 J	J	Α	s c) N	D	J	F N	M A	Μ	J	J A	S	0	Ν	D	JI	F M	I A	Μ	JJ	Α	s	0	NI)]	F M
Upstream Stations																																							
-	US1	3 times per week			2 2	2																																	
	US2	3 times per week			2 2	2																																	
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	DS1	3 times per week			2 2																																		
	DS2	3 times per week			2 2	2																																	
	DS3	3 times per week			2 2	2																																	
	DS4	3 times per week			2 2	2																																	
	DS5	3 times per week			2 2	2																																	
Ma Wan Station						1			1								1	1			1				1	1					1			1				1	
	MW1	3 times per week			2 2	2																																	

Notes: The number shown in each cell represents the numbers of replicates per monitoring station Impact Monitoring for Dredging will be scheduled when dredging operations commence. Benthic Recolonisation Studies for CMP V will be scheduled when capping operation for CMP V is completed.

Annex B

Water Quality Monitoring Results

Parameter	Action Level	Limit Level
Dissolved Oxygen (DO) (1)	Surface and Mid-depth ⁽²⁾	Surface and Mid-depth ⁽²⁾
	5%-ile of baseline data for surface and	1%-ile of baseline data for surface and
	middle layer = 3.76 mg L ⁻¹	middle layer = 3.11 mg L-1 ⁽³⁾
	and	and
	Significantly less than the reference	Significantly less than the reference
	stations mean DO (at the same tide of	stations mean DO (at the same tide of
	the same day)	the same day)
	Bottom	Bottom
	5%-ile of baseline data for bottom	The average of the impact station
	layers = 2.96 mg L ⁻¹	readings are <2 mg/L ⁻¹
	, ,	0
	and	and
	Significantly less than the reference	Significantly less than the reference
	stations mean DO (at the same tide of	stations mean DO (at the same tide of
	the same day)	the same day)
Depth-averaged Suspended	95%-ile of baseline data for depth	99%-ile of baseline data for depth
Solids (SS) (4) (5)	average = 37.88 mg L-1	average = 61.92 mg L ⁻¹
	and	
		and
	120% of control station's SS at the same	130% of control station's SS at the same
	tide of the same day	tide of the same day
	2	2
Depth-averaged Turbidity (Tby) ^{(4) (5)}	95%-ile of baseline data = 28.14 NTU	99%-ile of baseline data = 38.32 NTU
	and	and
	120% of control station's Tby at the	130% of control station's Tby at the
	same tide of the same day	same tide of the same day

Table B1Action and Limit Levels of Water Quality for Dredging, Disposal and
Capping Activities at ESC CMP V

Notes:

(1) For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

(2) The Action and Limit Levels for DO for Surface & Middle layers were calculated from the combined pool of baseline surface layer data and baseline middle layer data.

(3) Given the Action Level for DO for Surface & Middle layers has already been lower than 4 mg L⁻¹, it is proposed to set the Limit Level at 3.11 mg L⁻¹ which is the first percentile of the baseline data.

(4) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.

(5) For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Stations	Temp	Salinity	Turbidity	Dissolved	Oxygen	рН	Suspended Solids
	(°C)	(ppt)	(NTU)	(%)	(mg L-1)		(mg L-1)
WCP 1 (Downstream)	20.86	28.96	1.63	110.08	8.30	8.25	2.98
WCP 2 (Upstream)	20.88	28.63	1.84	109.90	8.30	8.24	2.95
WQO (Dry Season)	N/A	25.77-31.49#	N/A	N/A	>4	6.5-8.5	13.6

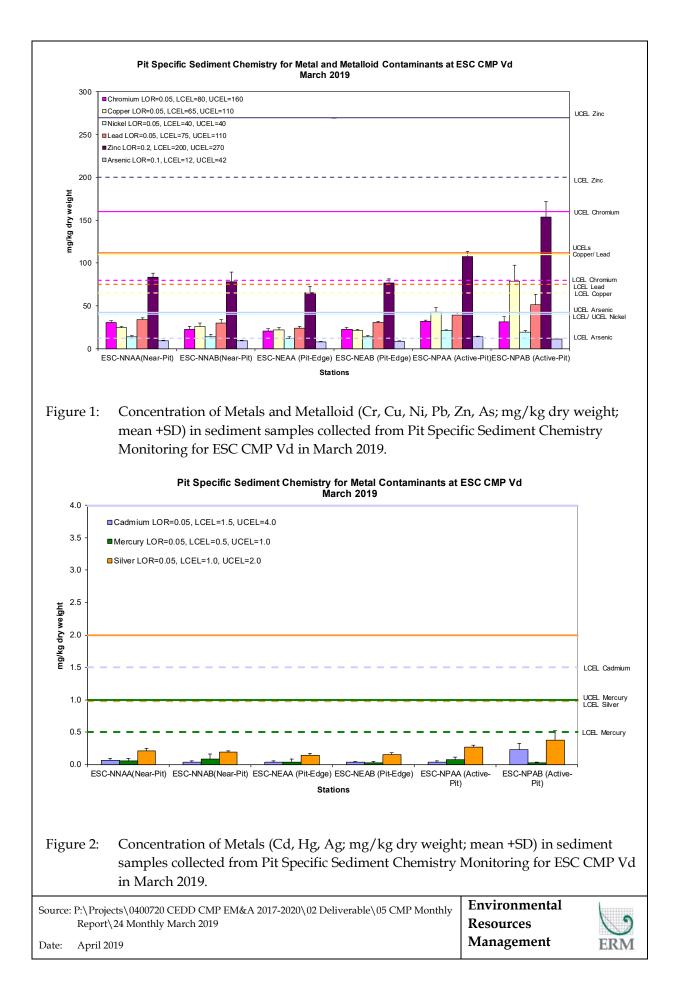
Note:

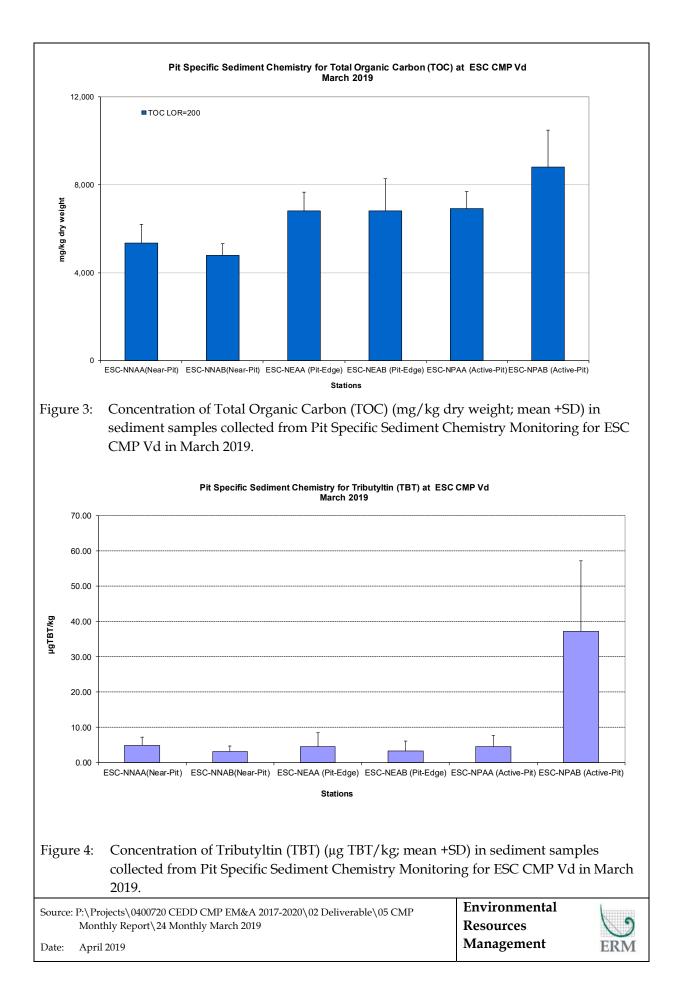
*Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station. Cell shaded yellow / red indicate value exceeding the Action/Limit levels.

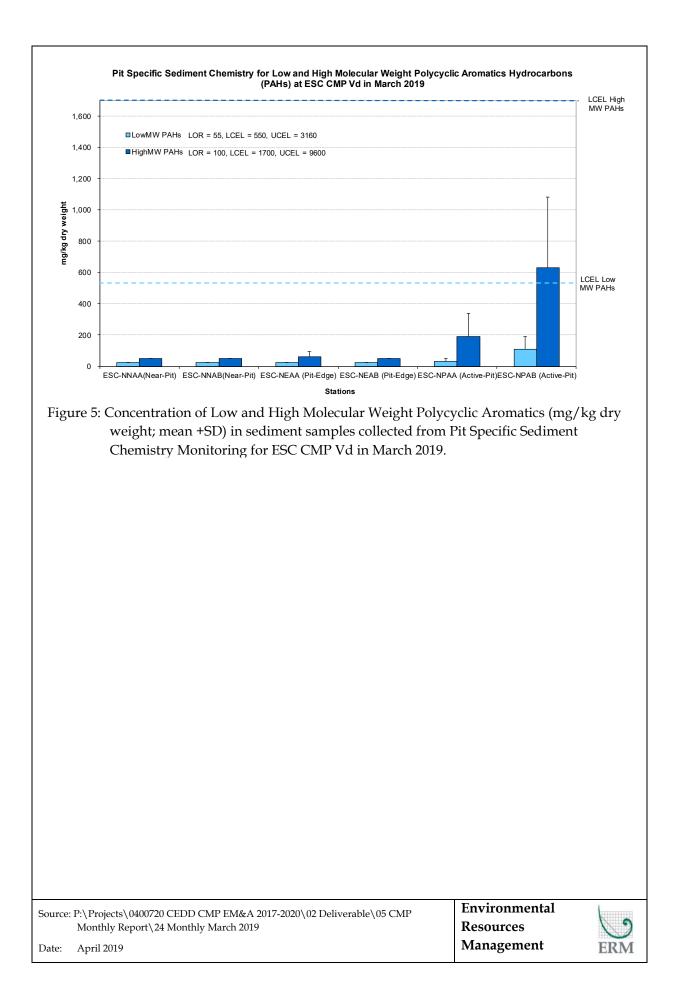
Cell shaded grey indicate value exceeding the WQO.

Annex C

Graphical Presentations







Annex D

Study Programme

Task Name	Start	Finish		201	7				201	8	olula			201	9				20	20				20	21	SONI	<u> </u>
Commencement of Agreement No. CE 63/2016 (EP)	Sat 1/4/17	Sat 1/4/17			JAS		JJF	MA	MJJ	IAS	ONL	JF	MAR	MJ.	JAS	ON	DJ	- MA	MJ	JAS	<u> 50 N</u>	DJ		(MJ	JAS	<u>30NI</u>	DJI
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	Nov 0/4/47	Mar 5/4/04																		Ш			Ш			\square	
Project Management and General Deliverables	Mon 3/4/17	Mon 5/4/21																									
																			+++								
For the disposal facilities to the East of Sha Chau (ESC) (between 2017 and 2021)	Sat 1/4/17	Fri 1/10/21	i 🐳															÷	+	+	╪╤	₩	╞┿╤	╪╤╤		↓ †	
and the South of The Brothers (SB) (between 2017 and 2018)																											
Draft Report on Review of EM&A Manual	Tue 2/5/17	Tue 2/5/17		2/5																\square							
Final Report on Review of EM&A Manual	Tue 23/5/17	Tue 23/5/17	$\left \cdot \right $	23	3/5										++			++	++	\vdash	++		┝┼┼╴	+++	++	+++	
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Regular Review of EM&A Manual	Wed 2/5/18	Sat 2/5/20												`					Ŷ								
Regular Site Inspections of CMP Contractors	Sat 1/4/17	Wed 31/3/21																									
Participate in Linian Occur Masting / Occur Mating as a serviced by OFDD	Sat 1/4/17	Wed 31/3/21																		Ш				+++		+++	\rightarrow
Participate in Liaison Group Meetings/ Consultations as required by CEDD	3dt 1/4/17	Weu 31/3/21										Ī															
Submission of Monthly EM&A Report	Sun 14/5/17	Sun 14/3/21		>�	00		> <		$\diamond \diamond$	$\diamond \diamond$	00	> (>		>0	00	\diamond	\diamond		$\diamond \diamond$		> 0	×	$\Diamond \Diamond$				
Submission of Quarterly EM&A Report	Fri 14/7/17	Wed 14/4/21	$\left \right $		>	\diamond				>	\diamond		\diamond		>	\diamond			<u>_</u>	\diamond	\diamond			<u></u>		+++	
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Submission of Annual EM&A Report	Sun 14/1/18	Thu 14/1/21					\diamond					\diamond					\diamond										
Submission of Annual Risk Assessment Report	Thu 14/6/18	Mon 14/6/21							\diamond					\diamond				++-	\diamond		++-		H		++	+++	
	Eri 00/7/04	Eri 00/7/01																	<u> </u>	\square	++	<u> </u>	\square	+++	◆_23		
Submission of Draft Final Report (including database of all data collected)	Fri 23/7/21	Fri 23/7/21																								"	
Submission of Final Report (including database of all data collected)	Fri 27/8/21	Fri 27/8/21																							Ť	27/8	
Submission of Draft Executive Summary	Fri 27/8/21	Fri 27/8/21	$\left \cdot \right $			$\left \right $		$\left \right $					+ +	++	++			++-	++-	\vdash	++-	$\left - \right $	┝┼┼┾	+++		27/8	
Submission of Dran Excedure Summary																											
Submission of Final Executive Summary	Fri 1/10/21	Fri 1/10/21																								1/1	0
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For East Tung Lung Chau Disposal Facility (subject to the actual disposal	Sun 14/10/18	Fri 14/12/18	$\left \right $										$\left \right $	+	++			++	++-	\vdash	++	$\left - \right $	H	+++	++	+++	+
programme to be confirmed by CEDD)																											
Submission of Monthly EM&A Report	Sun 14/10/18	Fri 14/12/18									000	>							+++								
Ocharization of Oceandratic ENIXA Descent	Fri 14/12/18	Fri 14/12/18										h14/	12					++	<u> </u>	\square	\parallel	<u> </u>	\square	+++		\square	
Submission of Quarterly EM&A Report	FII 14/12/10	FII 14/12/10											12														
Submission of Annual EM&A Report	Fri 14/12/18	Fri 14/12/18						\square				14/	12								+						
																				Ш							
Study Programme Task Milestone	•	5	Summa	ary						•	Rolled	Up	/ilesto	one ·	\diamond												
Tue 13/6/17	•			.,						• •		- 4 -			~												
Agreement No. CE 63/2016 (EP) Environmenta	al Monitoring a	nd Audit for Di	spos	al Fa	acilit	y to t	he E	ast o	of Sha	a Cha	au (2	017-:	2020) - In	vest	igati	on	04	10072	.0_CN	/IP EN	i&A F	rogra	.mme_	_v1_E	M&A.r	mpp