



Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation *Agreement No. CE 4/2009(EP)*

19th Monthly Progress Report for Contaminated Mud Pits at Sha Chau – January 2011

Revision 0

31 March 2011

Environmental Resources Management

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Civil Eng	gineering and Development Department (CEDD)	010	3262	2									
Summary:		Date 31 N	-	h 2011									
		Appr	oved	by:		800							
contamin	ument presents progress of monitoring works on ated mud pits at Sha Chau in January 2011 under	Robert Louish											
Agreeme	nt No. CE 4/2009 (EP).	Dr Robin Kennish Director											
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Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) - Investigation

19th MONTHLY PROGRESS REPORT FOR CONTAMINATED MUD PITS AT SHA CHAU - January 2011

1.1 BACKGROUND

Since 1992, the East of Sha Chau area has been the site of a series of dredged contaminated mud pits (CMPs) designed to provide confined marine disposal capacity for contaminated mud arising from the HKSAR's dredging and reclamation projects. CMP IVc is presently in operation for backfilling by contaminated mud and is anticipated to reach its capacity in 2011. A series of four newly constructed seabed pits at the East of Sha Chau area, CMP Va-d, will be provided for the disposal of contaminated mud after CMP IVc is full. Dredging operations were completed for the construction of CMP Va and are now taking place to construct CMP Vb. The environmental monitoring and audit (EM&A) programme for the CMPs at the East of Sha Chau area presently covers disposal and capping operations at CMP IV and dredging operations at CMP Vb.

1.2 REPORTING PERIOD

This *Monthly Progress Report* covers the monitoring period of January 2011.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

The following monitoring activities have been undertaken for CMP IVc and CMP Vb in January 2011:

- Impact Water Quality Monitoring during Dredging Operations for CMP V was conducted on 4 January;
- Water Column Profiling for CMP IVc was conducted on 6 January; and
- *Demersal Trawling* for CMP IVc was conducted on 13-14 January.

A summary of field activities are presented in *Annex A*.

1.4 DETAILS OF OUTSTANDING SAMPLING AND / OR ANALYSIS

No outstanding sampling and laboratory analysis remained from January 2011.

1.5 Brief Discussion of the Monitoring Results

Results of *Impact Water Quality Monitoring during Dredging Operations* for January 2011 are presented for CMP V. Detailed results will be discussed in the relevant *Quarterly Reports*.

1.5.1 CMP V

Impact Water Quality Monitoring during Dredging Operations of CMP V – January 2011

Impact Water Quality Monitoring during Dredging Operations of CMP V was conducted on 4 January 2011. On the survey day, sampling was conducted during both mid-ebb and mid-flood tides at two Reference (Upstream) stations upstream and five Impact (Downstream) stations downstream of the dredging operations at CMP V. Monitoring was also conducted at the Ma Wan station. At each station, *in-situ* measurements of water quality parameters as well as water samples were taken from three depths in the water column (ie surface: 1 m below sea surface, mid-depth and bottom: 1 m above the seabed).

Monitoring results are presented in *Table B1* of *Annex B*. Levels of Dissolved Oxygen (DO), Turbidity and Total Suspended Solids (TSS) generally complied with the Action and Limit Levels set in the *Baseline Monitoring Report* ⁽¹⁾. Levels of TSS and Turbidity exceeded the Action Level in the downstream station DS1 during the mid-ebb tide. Station DS1 is located on the edge of the works area of CMP Vb and the compliance of Action and Limit Levels at other downstream stations (ie DS2-4) outside the works area would indicate that there is no evidence of any unacceptable adverse water quality impacts arising from the dredging operations of CMP V at ESC.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

Water Column Profiling, Water Quality Monitoring during Capping and Demersal Trawling will be undertaken for CMP IV while Impact Water Quality Monitoring during Dredging will be undertaken for CMP V in the next monitoring month.

The sampling schedule is presented in *Annex A*.

1.7 STUDY PROGRAMME

A summary of the Study programme is presented in *Annex C*.

⁽¹⁾ ERM (2009) Baseline Monitoring Report. Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation. Agreement No. CE 4/2009(EP). Submitted to EPD in September 2009.

Annex A

Sampling Schedule

Pit Specific Sediment Chemistry Active-Pit			20	009										20	10							20	
	Code NCA 1 - 8	3 times per year	J	A	S	0	N	D *	J	F	M	A *	M	J	J	A *	S	0	N	D *	J	F	M
Pit-Edge	NCB 1 - 8	3 times per year		*				*				*				*				*			
Vear-Pit	CPA 1-8 CPB 1-8	3 times per year 3 times per year		*				*				*				*				*			
veal 110	CNA 1-8 CNB 1-8	3 times per year 3 times per year		*				*				*				*				*			
Cumulative Impact Sediment Chemistry Near-field Stations			J	A	S	0	N	D	J	F	M	A	M	J	J	A	S	0	N	D	J	F	M
Near-neid Stations	RNA 1-9 RNB 1-9	2 times per year 2 times per year		*				*								*				*			
Mid-field Stations	RMA 1-9 RMB 1-9	2 times per year		*				*								*				*			
Capped Pit Stations	RCA 1-9	2 times per year 2 times per year		*				*								*				*		H	
Far-Field Stations	RCB 1-9 RFA 1-9	2 times per year 2 times per year		*				*								*				*			
	RFB 1-9	2 times per year 2 times per year		*				*								*				*			
Sediment Toxicity Tests Near-Field Stations	TC A	2.0	J	A	S	0	N	D	J	F	M	A	M	J	J	A	S	0	N	D	J	F	M
Reference Stations	TCA TCB	2 times per year 2 times per year		3				3								3				3			
	TRA TRB	2 times per year 2 times per year		3				3								3				3			
Tissue/ Whole Body Sampling			J	A	S	0	N	D	J	F	M	A	M	J	J	A	S	0	N	D	J	F	M
Near-Pit Stations	INA INB	2 times per year 2 times per year		*						*						*						*	
Reference North	TNA	2 times per year		*						*						*						*	
Reference South	TNB TSA	2 times per year 2 times per year		*						*						*						*	
	TSB	2 times per year 2 times per year		*						*						*						*	
Demersal Trawling Near Pit Stations			J	A	S	0	N	D	J	F	M	A	M	J	J	A	S	0	N	D	J	F	M
Reference North	INA 1-5 INB 1-5	4 times per year 4 times per year	5	5					5	5					5	5					5	5	
	TNA 1-5 TNB 1-5	4 times per year 4 times per year	5 5	5 5					5 5	5					5 5	5 5					5 5	5 5	
Reference South	TSA 1-5 TSB 1-5	4 times per year 4 times per year	5	5					5	5					5	5					5	5	
Capping		- mare per year	J	A	S	0	N	D	J	F	M	A	M	J	J	A	S	0	N	D	J	F	M
Ebb Tide Impact Station Downcurrent	IDE1	46	2	2				2		2				2		0				0		2	
	IPE1 IPE2 IPE3	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	
	IPE4 PFC1	4 times per year 4 times per year	3	3				3		3				3		3				3		3	
Intermediate Station Downcurrent	INE1 INE2	4 times per year 4 times per year	3	3				3		3				3		3				3		3	
	INE3 INE4	4 times per year 4 times per year	3	3				3		3				3		3				3		3	
Reference Station Upcurrent	INE5	4 times per year	3	3				3		3				3		3				3		3	
	RFE1 RFE2 RFE3	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	
	RFE4 RFE5	4 times per year 4 times per year	3	3				3		3				3		3				3		3	
Flood Tide Impact Station Downcurrent	INF1	A times per year	3	3				3		3	Ī			3		3				2		3	
	PFC2 INF3	4 times per year 4 times per year 4 times per year	3	3				3		3				3		3				3		3	
Intermediate Station Downcurrent	IPF1	4 times per year	3	3				3		3				3		3				3		3	
Reference Station Upcurrent	IPF2 IPF3	4 times per year 4 times per year	3	3				3		3				3		3				3		3	
1	RFF1 RFF2	4 times per year 4 times per year	3	3				3		3				3		3				3		3	
Routine Water Quality Monitoring	RFF3	4 times per year	3	3 A	S	0	N	3 D	ī	3 F	M	A	M	3	ī	3 A	S	0	N	D D	ĭ	3 F	M
Ebb Tide Impact Station Downcurrent			Ĺ	71	5	O	14		,	•	141	71	141	,	,	2%	5	U	-14		,		172
	IPE1 IPE2 IPE3	2 times per year 2 times per year 2 times per year		*						*						*						*	
	IPE4 IPE5	2 times per year 2 times per year		*						*						*						*	
F 4 10 4 10 10 10 10 10 10 10 10 10 10 10 10 10	INE1															*						*	
Intermediate Station Downcurrent		2 times per year		*						*						-							
intermediate Station Downcurrent	INE2 INE3	2 times per year 2 times per year		* * *						*						*						* *	
	INE2 INE3 INE4 INE5	2 times per year 2 times per year 2 times per year 2 times per year														* * *						* * *	
	INE2 INE3 INE4 INE5 RFE1 RFE2	2 times per year 2 times per year														* * * * *						*	
Intermediate Station Downcurrent Reference Station Upcurrent	INE2 INE3 INE4 INE5	2 times per year 2 times per year 2 times per year 2 times per year 2 times per year								*						* * * * * *						* * * * * * * * * * * * * * * * * * * *	
Reference Station Upcurrent Flood Tide	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5	2 times per year 2 times per year								* *						* * * * * * *						* * * * * * * * * *	
Reference Station Upcurrent Flood Tide	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5	2 times per year								* *						* * * * * * *						* * * * * * * * * *	
	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1	2 times per year		* * * * * * * *						* * * * * * * * * * * * * * * * * * * *						* * * * * * * * * * * * * * * * * * * *						* * * * * * * * * * * * * * * * * * * *	
Reference Station Upcurrent Flood Tide mpact Station Downcurrent ntermediate Station Downcurrent	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5	2 times per year		* * * * * * *						* *						* * * * * * * * * * * * * * * * * * * *						* * * * * * * * * * * * * * * * * * * *	
Reference Station Upcurrent Flood Tide impact Station Downcurrent intermediate Station Downcurrent	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1 IPF2 IPF3 RFF1 RFF2	2 times per year		* * * * * * * * * * * * * * * * * * * *						* * * * * * * * * *						* * * * * * * * * * * * * * * * * * * *						* * * * * * * * * * * * * * * * * * * *	
Reference Station Upcurrent Flood Tide Impact Station Downcurrent Intermediate Station Downcurrent Reference Station Upcurrent	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1 IPF2 IPF3 RFF1	2 times per year		* * * * * * * * * * * * * * * * * * * *						* * * * * * * * * * * * * * * * * * * *						* * *							
lood Tide Intermediate Station Downcurrent Intermediate Station Downcurrent Intermediate Station Upcurrent Intermediate Station Upcurrent	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1 IPF2 IPF3 RFF1 RFF2	2 times per year	J 2 2 2 2	* * * * * * * * * * * * * * * * * * *	S	O	N	D 2 2 2		* * * * * * * * * *	M	A	M	J 2 2 2	J 2 2 2	* * * * * * * * * * * * * * * * * * *	S	O	N	D 2 2 2	J 2 2 2	* * * * * * * * * * * * * * * * * * * *	M
Reference Station Upcurrent Flood Tide mpact Station Downcurrent Intermediate Station Downcurrent Reference Station Upcurrent Water Column Profiling Plume Stations Genthic Recolonisation Studies	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1 IPF2 IPF3 RFF1 RFF2 RFF3	2 times per year	2	* * * * * * * * * * * * * * * * * * *	S	0	N	2		* * * * * * * * * * * * * * * * * * *	M	A A	M			* * * A 2	S	0	N	2		* * * * * * * * * * * * * * * * * * *	M
Reference Station Upcurrent Flood Tide mpact Station Downcurrent Intermediate Station Downcurrent Reference Station Upcurrent Water Column Profiling Plume Stations Genthic Recolonisation Studies	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1 IPF2 IPF3 RFF1 RFF2 RFF3 WCP1 WCP2	2 times per year 6 times per year 6 times per year	2	* * * * * * * * * * * * * * * * * * *				2 2 D		* * * * * * * * * * * * * * * * * * *						* * * A 2 2 A				2 2 D		* * * * * * * * * * * * * * * * * * *	
Reference Station Upcurrent Flood Tide mpact Station Downcurrent	INE2 INE3 INE4 INE5 RFE1 RFE2 RFE3 RFE4 RFE5 INF1 INF2 INF3 IPF1 IPF2 IPF3 RFF1 RFF2 RFF3 WCP1 WCP2	2 times per year 4 times per year 5 times per year 6 times per year 6 times per year	2	* * * * * * * * * * * * * * * * * * *				2 2 D		* * * * * * * * * * * * * * * * * * *						* * * A 2 2 A				2 2 D		* * * * * * * * * * * * * * * * * * *	

Annex A2 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP V (July 2009 - April 2011)

					200	9							2010							2011	
Baseline Water Quality Monitoring			J	Α	S	0	N D	J	F	M	Α	M	J J	Α	S	О	N	D j	J F	M	Α
Near Field	ESC-WNAA		*	*																	
	ESC-WNAB		*	*																	
	ESC-WNAC		*	*																	
	ESC-WNAD	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of	*	*																	
	ESC-WNBA	each day) in the month prior to commencement of marine works	*	*																	
	ESC-WNBB		*	*																	
		*	*																		
	ESC-WNBD		*	*				_										_			
Mid Field	ESC-WMB	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of	*	*				+										+			
	ESC-WMA	each day) in the month prior to commencement of marine works	*	*																	
Far Field	ESC-WFA		*	*				+										+			\vdash
	ESC-WFB	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of	*	*																	
	MW1	each day) in the month prior to commencement of marine works																			
Reference Stations	NM1		*	*																	
	NM2																				
	NM3	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of		*																	
	NM5	each day) in the month prior to commencement of marine works	*	*																	
	NM6																				
																l					Щ
Water Column Profiling			J	A	S	0	N D	J	F	M	A	M	J J	Α	S	0	N	D j	J F	M	Α
Plume Stations	Upstream						2 2	2	2									_			Ш
	Downstream				2	2	2 2	2	2												Щ
Water Quality Impact Monitoring for Dredging			J	Α	S	0	N D	J	F	M	A	M	J J	Α	S	0	N	D j	J F	M	Α
Downcurrent Impact Stations	1				*	*	* *	*	*	*	*	*	* *	*	*	*	*	*	* *	*	*
	2				*	*	* *	*	*	*	*	*	* *	*	*	*	*	* :	* *	*	*
	3				*	*	* *	*	*	*	*	*	* *	*	*	*	*	* :	* *	*	*
	4				*	_	* *	*	*	*	*	*	* *	*	*	*	*	* :		*	*
	5		<u> </u>	_	*	*	* *	*	*	*	*	*	* *	*	*	*	*	* :	* *	*	*
	_		<u> </u>	+																	
Upcurrent Stations	1		<u> </u>	+	*	*	* *	*	*	*	*	*	* *	*	*	*	*	* :	* *	*	*
	2		<u> </u>	+	*	*	* *	*	*	*	*	*	* *	*	*	*	*	* :	* *	*	*
	NOTATA		\vdash	-	*	*	* 4	,L	*	*	*	*	* *	*	*	*	*	*	* 4	· *	*
	MW1		1		~	~	*	*	Ĩ	7	~	1	*	*	~	*	*	1	*	*	~

Sampling completed
Sampling to be completed

Annex B

Monitoring Results

Table B1 Summary Table of DO, Turbidity and TSS Levels recorded in January 2011

Sampling Date	Tidal Period	Station	_	e DO Levels mg/L)	Average Turbidity	Average TSS Level
			Bottom	Surface and Mid Depth	Level (NTU)	(mg/L)
2011/01/04	ME	DS1	7.40	7.29	29.68	39.50
		DS2	7.59	7.30	12.98	16.00
		DS3	7.29	7.23	7.92	10.00
		DS4	7.31	7.20	6.35	9.00
		DS5	7.37	7.19	6.08	8.83
		MW1	7.03	6.98	7.95	14.83
		US1	7.89	7.38	7.32	12.33
		US2	7.41	7.32	8.78	11.83
	MF	DS1	7.46	7.26	9.52	12.33
		DS2	7.49	7.26	19.78	25.67
		DS3	7.56	7.35	19.20	20.33
		DS4	7.49	7.35	15.80	21.17
		DS5	7.50	7.28	8.92	13.00
		MW1	6.88	6.82	7.18	11.00
		US1	7.44	7.24	7.77	10.00
		US2	7.28	7.16	10.05	12.83

^{1.} Cell shaded yellow indicates value exceeding the Action Level.

^{2.} Cell shaded red indicates value exceeding the Limit Level.

Annex C

Study Programme



