








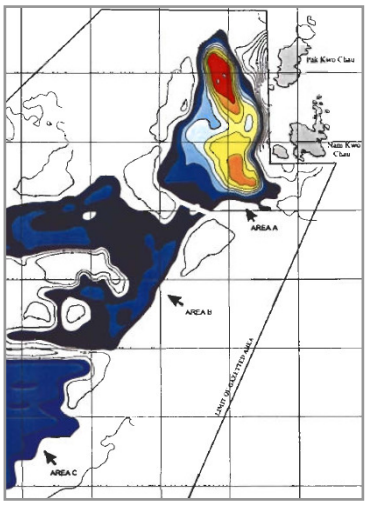

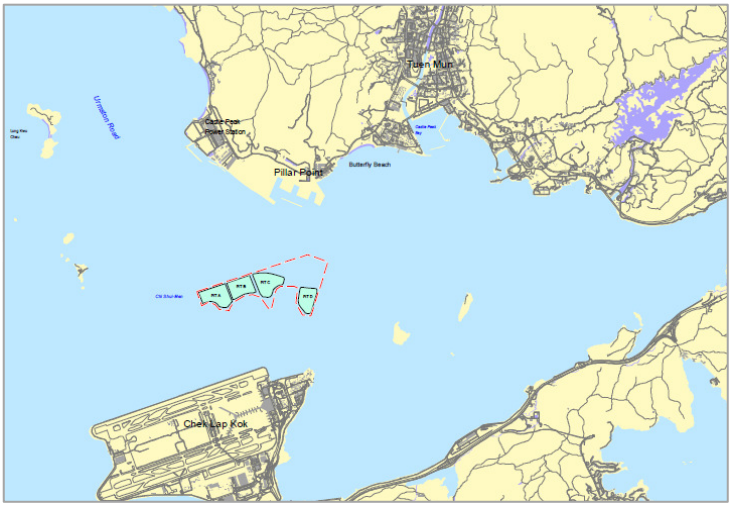

CEDD 土木工程拓展署
Civil Engineering and Development Department

Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation

Agreement No. CE 4/2009(EP)

32nd Monthly Progress Report for Contaminated Mud Pits at Sha Chau – February 2012

Revision 0

2 April 2012

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Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation

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Revision 0

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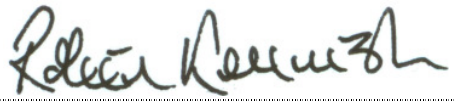
Client:	Project No:
Civil Engineering and Development Department (CEDD)	0103262
Summary: This document presents progress of monitoring works on contaminated mud pits at Sha Chau in February 2012 under Agreement No. CE 4/2009 (EP).	Date: 2 April 2012 Approved by:  *Dr Robin Kennish* *Director*

Revision	Description	By	Checked	Approved	Date
0	32nd Monthly Progress Report for CMP	CL	JT	RK	02/04/12

Distribution

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

32nd MONTHLY PROGRESS REPORT FOR CONTAMINATED MUD PITS AT SHA CHAU February 2012

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. In February 2012, the following works were being undertaken at the CMPs:

- On 10 February 2012, CMP IVc reached its capacity for the backfilling of contaminated mud. Capping was being undertaken at CMP IVc after it reached its capacity;
- Disposal of contaminated mud was taking place at CMP Va starting 10 February 2012; and
- The dredging of CMP Vc was in progress.

The environmental monitoring and audit (EM&A) programme for the CMPs at the East of Sha Chau area (ESC) presently covers capping operations at CMP IVc, disposal operations at CMP Va and dredging operations at CMP Vc.

1.2 REPORTING PERIOD

This *Monthly Progress Report* covers the monitoring period of February 2012.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

The following monitoring activities have been undertaken for CMP IVc in February 2012:

- *Demersal Trawling* was conducted on 16, 17 February; and
- *Water Quality Monitoring during Capping* was conducted on 21 February.

The following monitoring activities have been undertaken for CMP V in February 2012:

- *Water Column Profiling* was conducted for CMP Va on 17 February;

- *Routine Water Quality Monitoring* was conducted for CMP Va on 21 February;
- *Impact Water Quality Monitoring during Dredging Operations* was conducted for CMP Vc on 22 February;
- *Sediment Toxicity Test* and *Cumulative Impact Sediment Chemistry* were conducted for CMP Va on 24 February; and
- *Pit Specific Sediment Chemistry* was conducted for CMP Va on 27 February.

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

A summary of monitoring data submitted by the Contractor for this reporting month is presented in *Table 1.1*.

Table 1.1 Summary of monitoring data submitted by the Contractor for the reporting month

Key Task	Monitoring Component	Date of Results Received from the Contractor
CMP Vc		
Impact Monitoring during Dredging Operations	Water Quality	29 February 2012

1.4 DETAILS OF OUTSTANDING SAMPLING AND / OR ANALYSIS

No outstanding sampling and laboratory analysis remained from February 2012

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS

1.5.1 CMP V

Impact Water Quality Monitoring during Dredging Operations of CMP V – February 2012

Impact Water Quality Monitoring during Dredging Operations of CMP V was conducted on 22 February 2012 for CMP Vc. 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 Vc (*Figure 1.1*). 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) complied with the

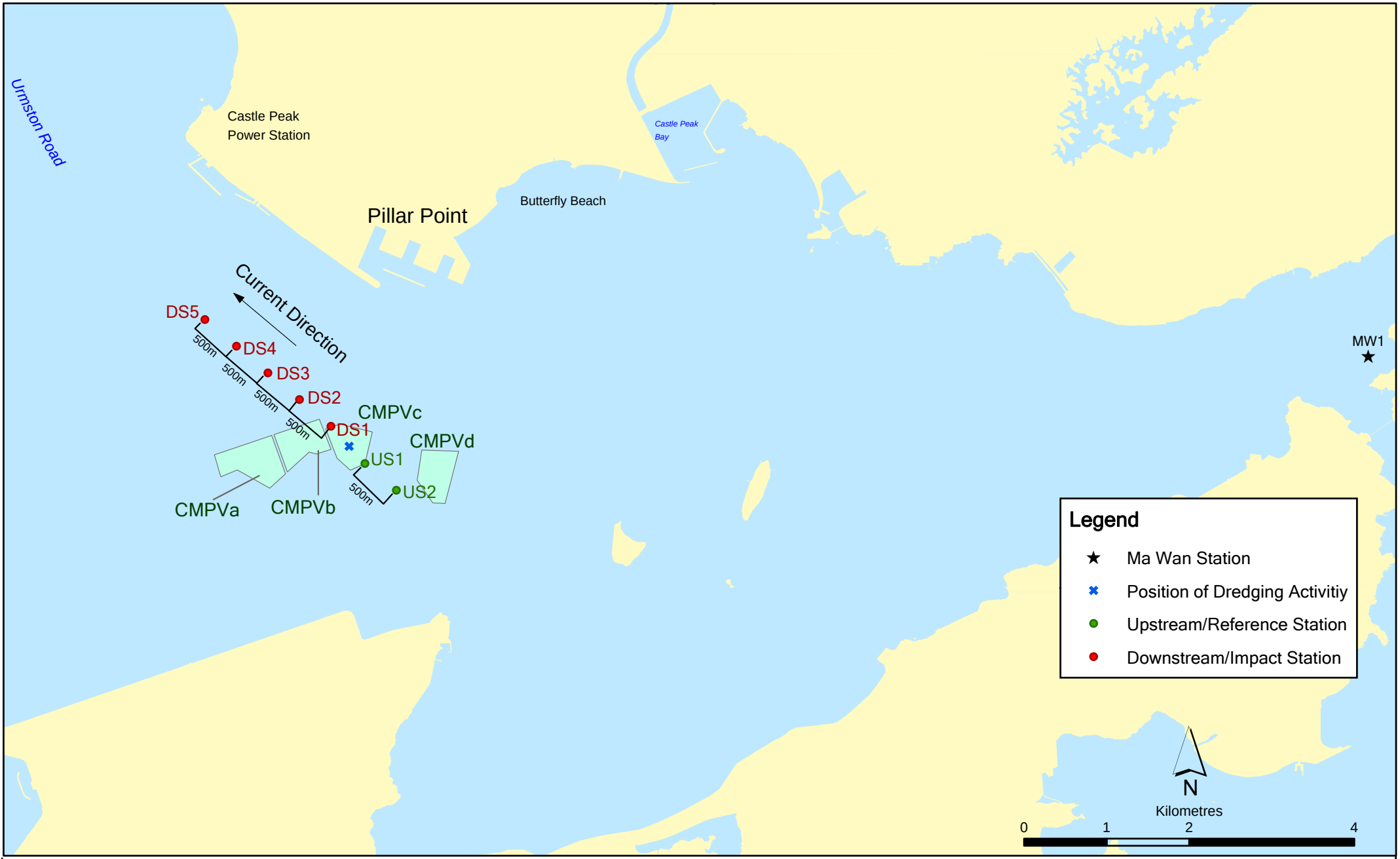

Figure 1.1

Indicative Dredging Impact Sampling Stations for CMPVc

Note: The locations of sampling stations will be determined on site based on current direction and position of dredging activities.

File: CMPV\0103262_modelling stations2.mxd
Date: 27/03/2012

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Action and Limit Levels set in the *Baseline Monitoring Report* (1). Overall, the results indicated that the dredging operations at CMP Vc did not appear to cause any unacceptable deterioration in water quality during this reporting period.

Therefore, no further mitigation measures, except for those recommended in the Environmental Permit (*EP-312/2008*), are considered required for the dredging operations of CMP Vc.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

The following monitoring programmes will be conducted in the next monthly period of March 2012:

CMP V

- *Pit Specific Sediment Chemistry* for CMP Va;
- *Water Column Profiling* for CMP Va; and
- *Impact Water Quality Monitoring during Dredging Operations* for CMP Vc**.**

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

Annex A1 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP IV (January 2012 - December 2012)

		2012											
Tissue/ Whole Body Sampling		**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-Pit Stations													
	INA		*										
	INB		*										
Reference North													
	TNA		*										
	TNB		*										
Reference South													
	TSA		*										
	TSB		*										
Demersal Trawling		**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near Pit Stations													
	INA 1-5	*	*										
	INB 1-5	*	*										
Reference North													
	TNA 1-5	*	*										
	TNB 1-5	*	*										
Reference South													
	TSA 1-5	*	*										
	TSB 1-5	*	*										
Capping		**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Ebb Tide													
Impact Station Downcurrent													
	IPE1		*				*		*				*
	IPE2		*				*		*				*
	IPE3		*				*		*				*
	IPE4		*				*		*				*
	PFC1		*				*		*				*
Intermediate Station Downcurrent													
	INE1		*				*		*				*
	INE2		*				*		*				*
	INE3		*				*		*				*
	INE4		*				*		*				*
	INE5		*				*		*				*
Reference Station Upcurrent													
	RFE1		*				*		*				*
	RFE2		*				*		*				*
	RFE3		*				*		*				*
	RFE4		*				*		*				*
	RFE5		*				*		*				*
Flood Tide													
Impact Station Downcurrent													
	INF1		*				*		*				*
	PFC2		*				*		*				*
	INF3		*				*		*				*
Intermediate Station Downcurrent													
	IPF1		*				*		*				*
	IPF2		*				*		*				*
	IPF3		*				*		*				*
Reference Station Upcurrent													
	RFF1		*				*		*				*
	RFF2		*				*		*				*
	RFF3		*				*		*				*
Water Column Profiling		**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Plume Stations	WCP1	*											
	WCP2	*											

"*" = Number of replicates depends on field catch or parameters

Sampling completed

Sampling to be completed

Annex A2 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP V (January 2012 - February 2014)

		2012												2013												2014	
Pit Specific Sediment Chemistry	**Code**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Active-Pit																											
	ESC-NPDA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	ESC-NPDB		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Pit-Edge																											
	ESC-NEDA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	ESC-NEDB		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Near-Pit																											
	ESC-NNDA		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	ESC-NNDB		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Cumulative Impact Sediment Chemistry	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Near-field Stations																										
ESC-RNA		*				*		*				*		*				*		*				*		*
ESC-RNB		*				*		*				*		*				*		*				*		*
Mid-field Stations																										
ESC-RMA		*				*		*				*		*				*		*				*		*
ESC-RMB		*				*		*				*		*				*		*				*		*
Capped Pit Stations																										
ESC-RCA		*				*		*				*		*				*		*				*		*
ESC-RCB		*				*		*				*		*				*		*				*		*
Far-Field Stations																										
ESC-RFA		*				*		*				*		*				*		*				*		*
ESC-RFB		*				*		*				*		*				*		*				*		*
Ma Wan Station																										
MW1		*				*		*				*		*				*		*				*		*

Sediment Toxicity Tests	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Near-Field Stations																										
ESC-TDA		*						*						*						*						*
ESC-TDB		*						*						*						*						*
Reference Stations																										
ESC-TRA		*						*						*						*						*
ESC-TRB		*						*						*						*						*
Ma Wan Station																										
MW1		*						*						*						*						*

Tissue/ Whole Body Sampling	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Impact Stations																										
ESC-INA								*						*						*						*
ESC-INB								*						*						*						*
Reference																										
ESC-TNA								*						*						*						*
ESC-TNB								*						*						*						*
ESC-TSA								*						*						*						*
ESC-TSB								*						*						*						*

Demersal Trawling	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Impact Stations																										
ESC-INA							*	*					*	*					*	*					*	*
ESC-INB							*	*					*	*					*	*					*	*
Reference Stations																										
ESC-TNA							*	*					*	*					*	*					*	*
ESC-TNB							*	*					*	*					*	*					*	*
ESC-TSA							*	*					*	*					*	*					*	*
ESC-TSB							*	*					*	*					*	*					*	*

Capping	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Ebb Tide																										
Impact Station																										
ESC-IPE1														*				*		*				*		*
ESC-IPE2														*				*		*				*		*
ESC-IPE3														*				*		*				*		*
ESC-IPE4														*				*		*				*		*
ESC-IPE5														*				*		*				*		*
Intermediate Station																										
ESC-INE1														*				*		*				*		*
ESC-INE2														*				*		*				*		*
ESC-INE3														*				*		*				*		*
ESC-INE4														*				*		*				*		*
ESC-INE5														*				*		*				*		*
Reference Station																										
ESC-RFE1														*				*		*				*		*
ESC-RFE2														*				*		*				*		*
ESC-RFE3														*				*		*				*		*
ESC-RFE4														*				*		*				*		*
ESC-RFE5														*				*		*				*		*
Ma Wan Station																										
MW1														*				*		*				*		*
Flood Tide																										
Impact Station																										
ESC-IPF1														*				*		*				*		*
ESC-IPF2														*				*		*				*		*
ESC-IPF3														*				*		*				*		*
Intermediate Station																										
ESC-INF1														*				*		*				*		*
ESC-INF2														*				*		*				*		*
ESC-INF3														*				*		*				*		*
Reference Station																										
ESC-RFF1														*				*		*				*		*
ESC-RFF2														*				*		*				*		*
ESC-RFF3														*				*		*				*		*
Ma Wan Station																										
MW1														*				*		*				*		*

Routine Water Quality Monitoring	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Ebb Tide																										
Impact Station																										
ESC-IPE1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-IPE2		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-IPE3		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-IPE4		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-IPE5		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Intermediate Station																										
ESC-INE1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-INE2		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-INE3		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-INE4		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-INE5		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Reference Station																										
ESC-RFE1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-RFE2		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-RFE3		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-RFE4		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-RFE5		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Ma Wan Station																										
MW1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Flood Tide																										
Impact Station																										
ESC-IPF1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-IPF2		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-IPF3		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Intermediate Station																										
ESC-INF1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-INF2		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-INF3		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Reference Station																										
ESC-RFF1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-RFF2		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
ESC-RFF3		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*
Ma Wan Station																										
MW1		*		*	*		*	*		*	*		*	*		*	*		*	*		*	*		*	*

Water Column Profiling		**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Plume Stations	WCP1		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	WCP2		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Benthic Recolonisation Studies	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Capped Contaminated Mud Pits IVa-c																										
ESC-CPA								*				*								*				*		
ESC-CPB								*				*								*				*		
ESC-CPC								*				*								*				*		
Reference Stations																										
ESC-RBA								*				*								*				*		
ESC-RBB								*				*								*				*		
ESC-RBC								*				*								*				*		

Impact Monitoring for Dredging	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**
Upstream/Reference Stations																										
US1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
US2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
Downstream/Impact Stations																										
DS1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
DS2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
DS3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
DS4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
DS5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										
Ma Wan Station																										
MW1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*										

Sampling completed

Sampling to be completed

Annex B

Monitoring Results

Table B1 Summary Table of DO, Turbidity and TSS Levels Recorded in February 2012

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average TSS Level (mg/L)
			Bottom	Surface and Mid Depth		
2012/02/22	ME	DS1	7.63	7.64	15.10	19.50
		DS2	7.60	7.64	21.50	31.00
		DS3	7.61	7.64	15.80	23.70
		DS4	7.63	7.65	12.20	19.50
		DS5	7.69	7.70	9.80	11.80
		MW1	7.28	7.32	6.40	7.70
		US1	7.62	7.63	11.20	12.50
		US2	7.61	7.64	7.00	9.20
	MF	DS1	7.56	7.58	19.80	27.20
		DS2	7.56	7.54	23.10	32.80
		DS3	7.50	7.50	15.60	20.00
		DS4	7.44	7.45	19.70	27.30
		DS5	7.41	7.46	11.20	16.50
		MW1	7.42	7.46	7.70	11.33
		US1	7.65	7.62	15.00	22.70
		US2	7.63	7.63	18.50	28.17

Notes:

1. Cell shaded yellow indicated value exceeding the Action Level criteria.
2. Cell shaded red indicated value exceeding the Limit Level criteria.
3. DO for Surface and Mid-depth: less than 3.76 mg L^{-1} (Action Level); less than 3.11 mg L^{-1} (Limit Level)
   DO for Bottom: less than 2.96 mg L^{-1} (Action Level); less than 2 mg L^{-1} (Limit Level)
   Depth-average Turbidity: greater than 28.14 NTU(Action Level); greater than 38.32 NTU(Limit Level)
   Depth-average SS: greater than 37.88 mg L^{-1} (Action Level); greater than 61.92 mg L^{-1} (Limit Level)

Annex C

Study Programme

ID	Task Name
1	**Project Commencement**
2	
3	**For CMP IV and New Facility at East Sha Chau**
4	
5	Submission of Draft Inception Report & Draft Programme
6	Submission of Final Inception Report & Final Programme
7	Submission of Draft Operations Manual
8	Submission of Final Operations Manual
9	**Submission of Operations Manual Updates**
17	Submission of Draft Monitoring And Audit Manual (Rev 1)
18	Submission of Final Monitoring And Audit Manual (Rev 1)
19	Submission of Draft Monitoring And Audit Manual (Rev 2)
20	Submission of Final Monitoring And Audit Manual (Rev 2)
21	**Submission of EM&A Manual Updates**
29	
30	**Monitoring Contract Works**
31	Prepare Draft Letters of Invitation, Gazette Documents & Tender Documents
32	Submission of Draft Tender Documents
33	Submission of Draft Gazette Documents
34	Submission of Final Tender Documents
35	Submission of Final Gazette Documents
36	Tendering and Tender Assessment
37	Prepare Contact Documents
38	Submission of Contract Documents
39	Administrate and Supervise Contracted Field and Laboratory Works
40	**Submission of Report on Dredging & Capping Operations**
49	**Monthly Progress Report**
101	**Quarterly EM&A Reports**
115	**Submission of Annual Review Report**
120	**Submission of Annual Risk Assessment Report**
125	**Submission of Draft Final Report**
126	**Submission of the Final Report**
127	**Submission of Draft Executive Summary Report**
128	**Submission of Final Executive Summary Reports**
129	
130	**For East Tung Lung Chau Disposal Facility**
131	
132	**Submission of Monitoring Results & Monthly EM&A Progress Report**
133	October 2009
134	November 2009
135	December 2009
136	January 2010

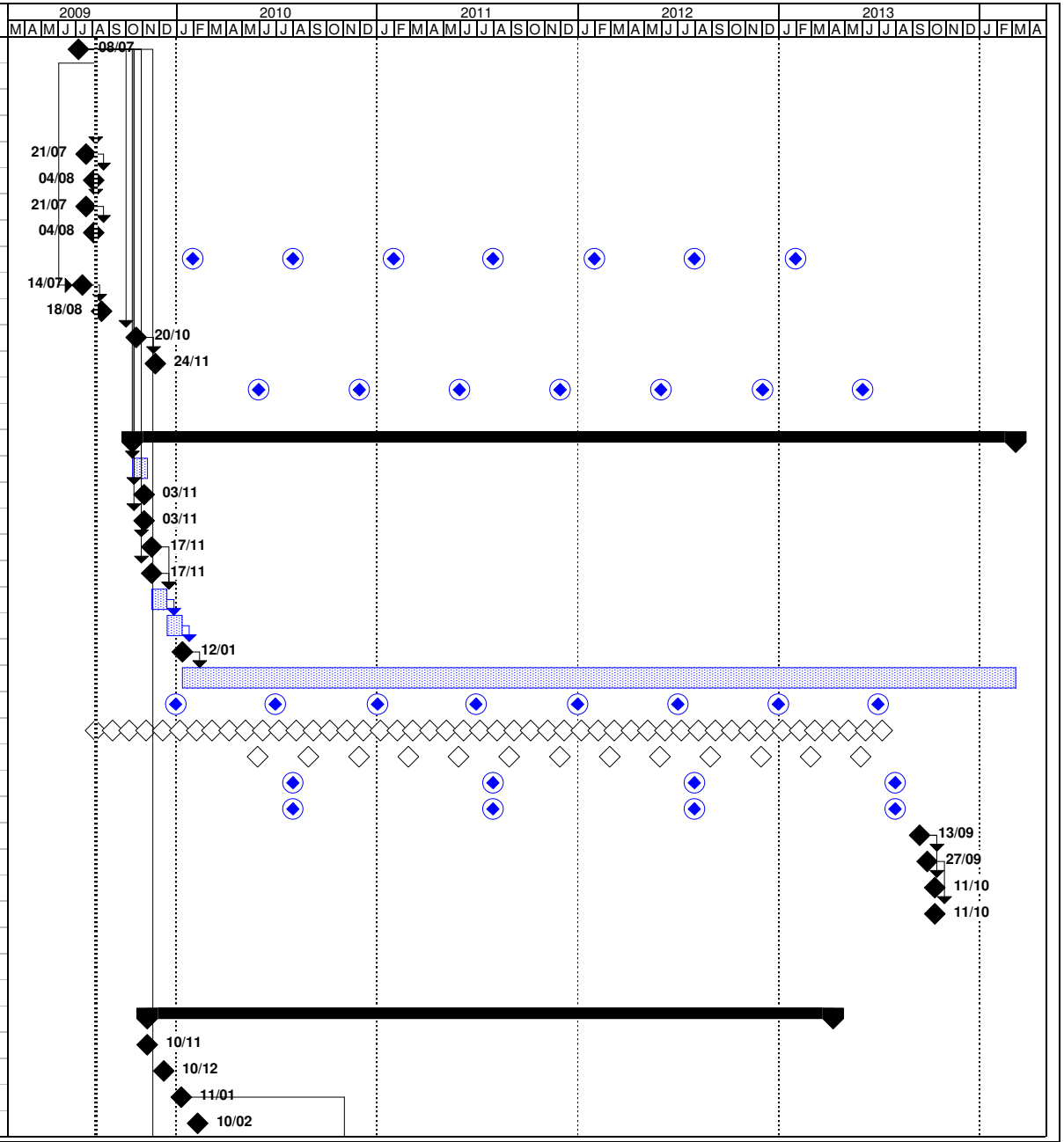

Figure 4.1 - Study Programme

Task | Milestone | Rolled Up Task
Progress | Summary | Rolled Up Milestone

Project: Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits at Sha Chau (2009-2013) - Investigation

ID	Task Name
137	February 2010
138	March 2010
139	October 2010
140	November 2010
141	December 2010
142	January 2011
143	February 2011
144	March 2011
145	October 2011
146	November 2011
147	December 2011
148	January 2012
149	February 2012
150	March 2012
151	October 2012
152	November 2012
153	December 2012
154	January 2013
155	February 2013
156	March 2013
157	**Submission of Initial Review Report**
158	**Submission of Quarterly EM&A Report**
159	Quarter 1 2010
160	Quarter 2 2010
161	Quarter 3 2011
162	Quarter 4 2011
163	Quarter 5 2012
164	Quarter 2 2012
165	Quarter 1 2013
166	**Submission of Annual Report**
167	Annual Report 1 2010
168	Annual Report 2 2011
169	Annual Report 3 2012
170	
171	**Alternative / Modified Capping Design**
172	
173	**Submission of Investigation Report**
174	**Submission of Annual Report**
175	Capping Design Annual Report 2010
176	Capping Design Annual Report 2011
177	Capping Design Annual Report 2012

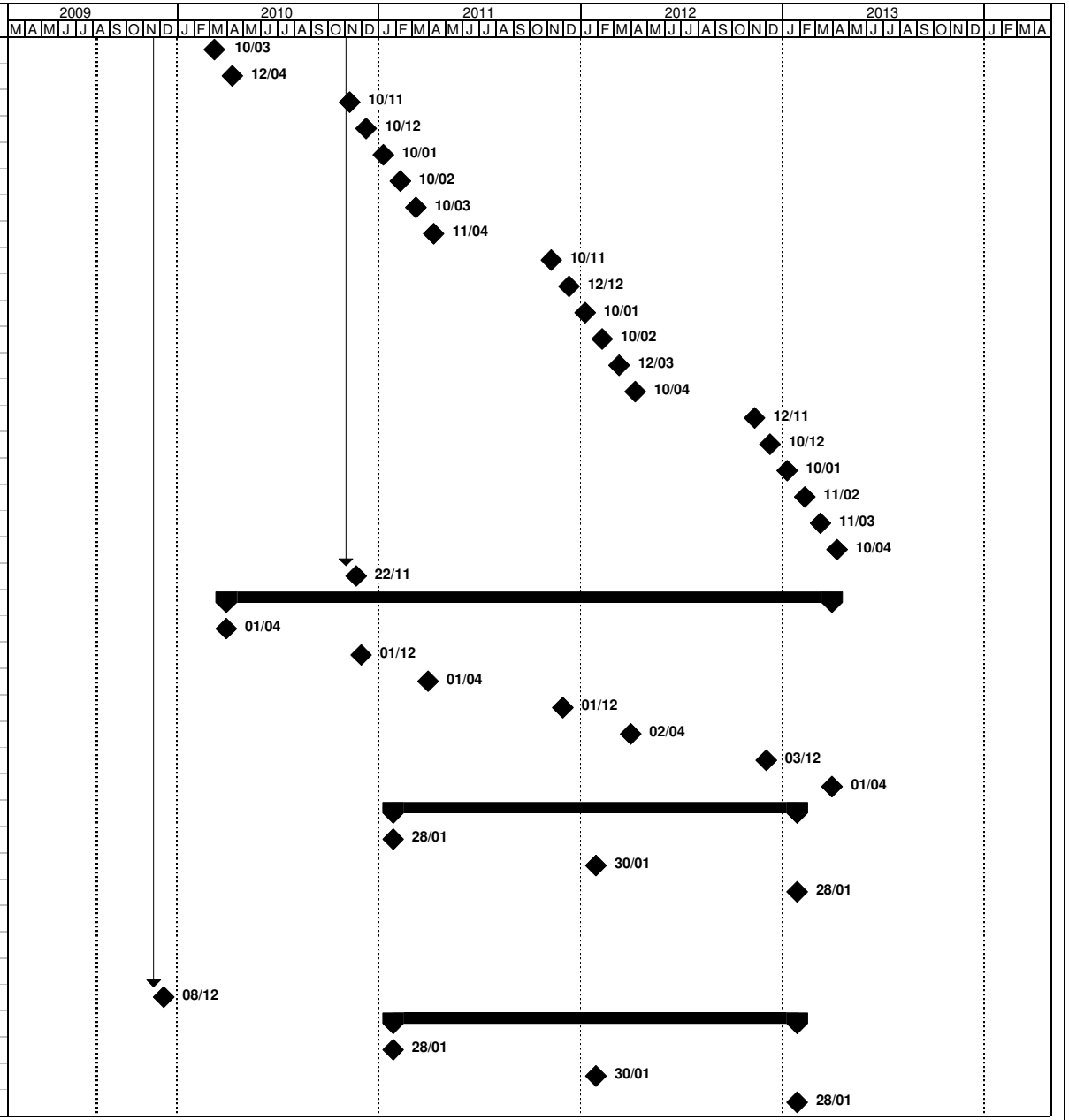

Figure 4.1 - Study Programme

Task | Milestone | Rolled Up Task
Progress | Summary | Rolled Up Milestone

Project: Agreement No. CE 4/2009 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits at Sha Chau (2009-2013) - Investigation

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