








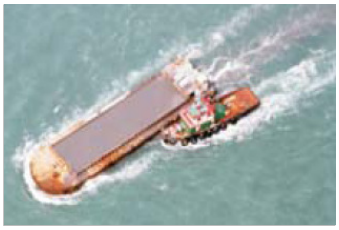
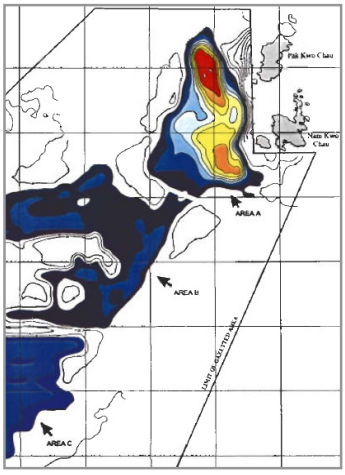

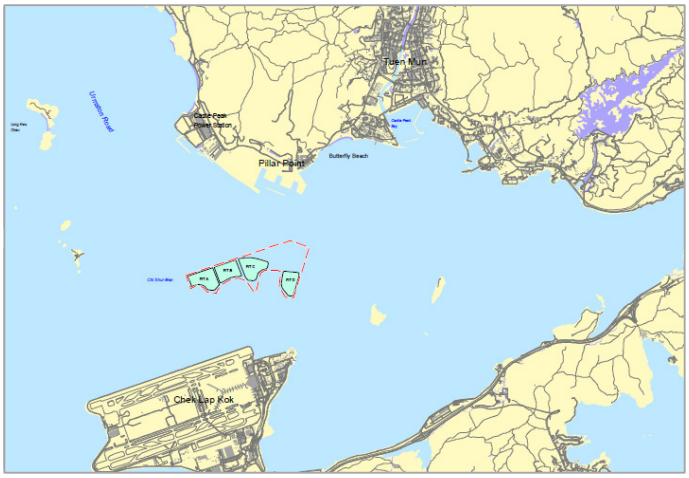

CEDD 土木工程拓展署
Civil Engineering and Development Department

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

Agreement No. CE 4/2009(EP)

42nd Monthly Progress Report for Contaminated Mud Pits at Sha Chau – December 2012

Revision 0

14 January 2013

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

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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 December 2012 under Agreement No. CE 4/2009 (EP).	Date: 14 January 2013 Approved by:  *Dr Robin Kennish* *Director*

Revision	Description	By	Checked	Approved	Date
0	42nd Monthly Progress Report for CMP	CL	JT	RK	14/01/13

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

New Contaminated Mud Marine Disposal Facility at Airport East/East Sha Chau Area

Environmental Certification Sheet
EP-312/2008/A

Reference Document/Plan

Document/~~Plan~~ to be ~~Certified~~/ Verified:	42nd Monthly Progress Report for Contaminated Mud Pits at Sha Chau – December 2012
Date of Report: 14/01/2013	
Date received by ET: 14/01/2013	
Date received by IA: 14/01/2013	

Reference EP Condition

Environmental Permit Condition: Condition No.: 3.4

Content:

Four hard copies and one electronic copy of monthly EM&A Report shall be submitted to the Director within 10 working days after the end of the reporting month. The EM&A Reports shall include a summary of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels). The submissions shall be 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

Dr Robin Kennish,
Environmental Team Leader: Robin Kennish Date: 14/01/2013

IA Verification

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

Dr Wang Wen Xiong,
Independent Auditor: Wen Xiong Wang Date: 14/01/2013

Notes:

CONTENTS

ANNEXES

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

42nd MONTHLY PROGRESS REPORT FOR CONTAMINATED MUD PITS AT SHA CHAU December 2012

1.1 BACKGROUND

1.1.1 Since 1992, the East of Sha Chau (ESC) 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 December 2012, the following works were being undertaken at the CMPs:

- Capping was being undertaken at CMP IVc;
- Disposal of contaminated mud was taking place at CMP Va; and
- Dredging of CMP Vd was in progress.

1.1.2 The Environmental Monitoring and Audit (EM&A) programme for the CMPs at the ESC area presently covers the above operations.

1.2 REPORTING PERIOD

1.2.1 This Monthly Progress Report covers the monitoring period of December 2012.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

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

- *Cumulative Impact Sediment Chemistry* was conducted for CMP Va on 3 December 2012;
- *Pit Specific Sediment Chemistry* was conducted for CMP Va on 7 December 2012;
- *Impact Water Quality Monitoring during Dredging Operations* was conducted for CMP Vd on 14 December 2012; and
- *Water Column Profiling* was conducted for CMP Va on 19 December 2012.

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

1.4 DETAILS OF OUTSTANDING SAMPLING AND / OR ANALYSIS

1.4.1 No outstanding sampling remained and laboratory analysis of *Pit Specific Sediment Chemistry* and *Cumulative Impact Sediment Chemistry* were yet to be completed during preparation of this monthly report.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR CMP V

1.5.1 *Table 1.1* summarises the monitoring results that are presented in the current monthly report. Brief discussion of the monitoring results is presented in this section. Detailed discussion will be presented in the corresponding *Quarterly Report*.

Table 1.1 Monitoring activities in December 2012

Monitoring activities	Date of Monitoring	Monitoring results presented in this report?
Cumulative Impact Sediment Chemistry Monitoring for CMP Va	3 Dec 2012	No. Laboratory analysis yet to be completed during preparation of this monthly report.
Pit Specific Sediment Chemistry Monitoring for CMP Va	8 November 2012	Yes
	7 Dec 2012	No. Laboratory analysis yet to be completed during preparation of this monthly report.
Impact Water Quality Monitoring during Dredging Operations of CMP Vd	14 Dec 2012	Yes
Water Column Profiling for CMP Va	19 Dec 2012	Yes

1.5.2 Pit Specific Sediment Chemistry of CMP Va – November 2012

1.5.3 Monitoring locations for Pit Specific Sediment Chemistry for CMP Va are shown in *Figure 1.1*. A total of six monitoring stations were sampled in November 2012. Concentrations of Arsenic exceeded the Lower Chemical Exceedance Level (LCEL) at Pit-Edge (NEDA and NEDB) and Near-Pit (NNDA) stations while concentrations of Chromium, Mercury and Zinc exceeded the LCEL at Active Pit station (NPDB) (*Figures 1-2* of *Annex C*). Concentrations of Copper, Nickel and Silver exceeded the UCEL at Active Pit Station (NPDB). Whilst the average concentration of Arsenic in the Earth's crust is generally ~2mg/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 slight exceedances of the LCEL for Arsenic are unlikely to be caused by the disposal operations at CMP Va but rather as a result of naturally occurring deposits. In addition, the Active Pit stations are located within CMP Va which was receiving contaminated mud during the reporting period. As such, the exceedances of LCEL/UCEL for Chromium, Copper, Mercury, Nickel, Silver and Zinc which were recorded at the Active Pit station only is not considered as indicating any dispersal of contaminated mud from CMP Va.

1.5.4 For organic contaminants, Total Organic Carbon (TOC) concentration was similar amongst all stations (*Figure 3* of *Annex C*). Tributyltin (TBT) concentration was the highest at Active Pit station NPDB when compared to other stations (*Figure 4 of Annex B*). Low Molecular Weigh Polycyclic Aromatics Hydrocarbons (Low MW PAHs) and Total Polychlorinated Biphenyls (PCBs) concentrations were below the limit of reporting except at Active Pit station NPDB (*Figure 5 and 6 of Annex B*). High MW PAHs concentrations were below the limit of reporting at all stations except at both Active Pit stations NPDA and NPDB (*Figure 5 of Annex B*). Total DDT and 4,4'-DDE were below the limit of reporting at all stations.

1.5.5 As described in *Section 1.5.3*, the higher concentrations of contaminants (including metals and organic contaminants) recorded at the Active Pit stations only are not considered as indicating any dispersal of contaminated mud from CMP Va. Nevertheless, detailed analysis will be presented in the *Quarterly Report* to reveal any trend of increasing sediment contaminant concentrations towards CMP Va.

1.5.6 Overall, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at CMP Va during this monthly period.

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

(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

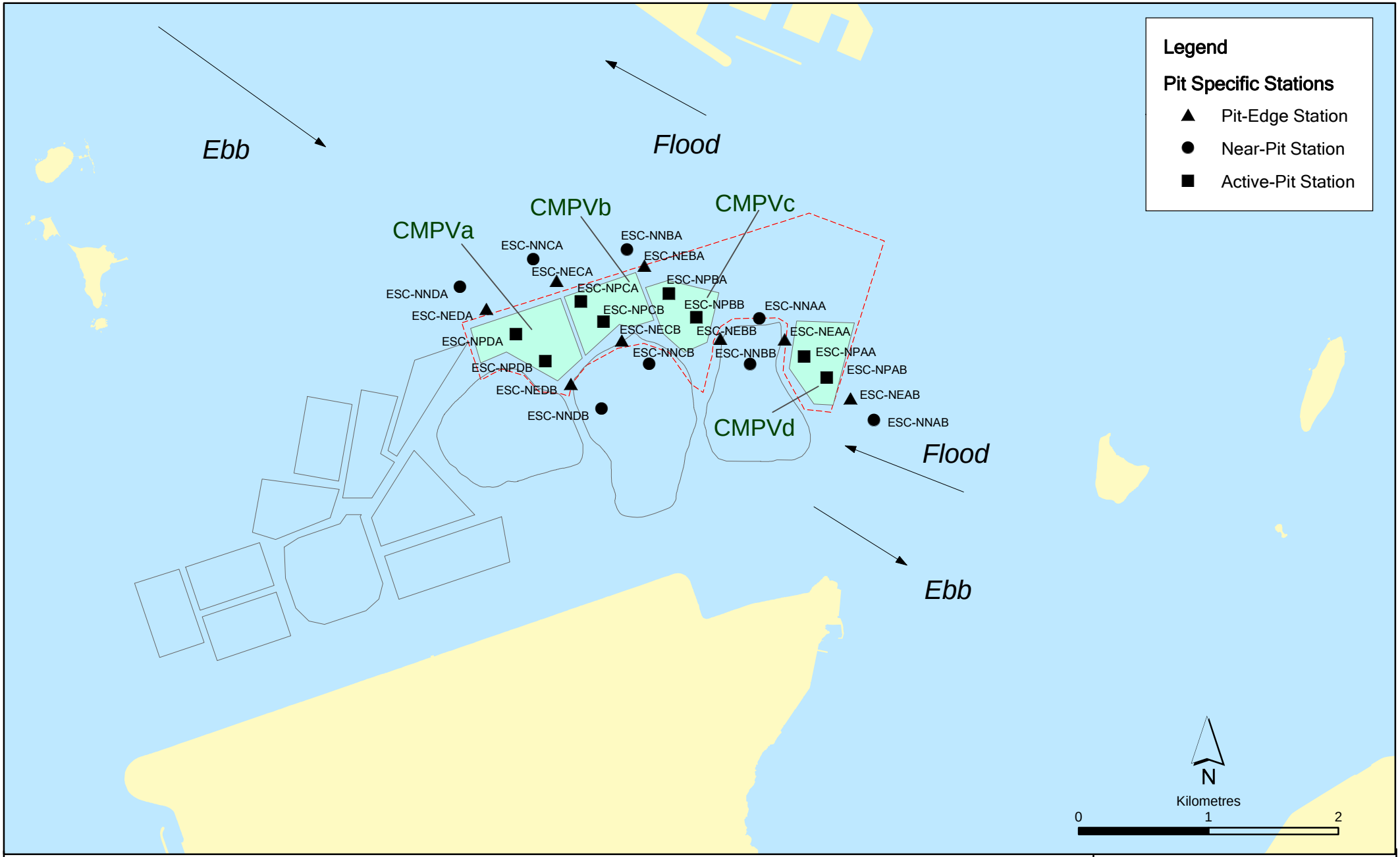

Figure 1.1

Pit Specific Sediment Quality Monitoring Stations for CMPV

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Date: 29/10/2009

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1.5.7 Impact Water Quality Monitoring during Dredging Operations of CMP Vd – December 2012

1.5.8 *Impact Water Quality Monitoring during Dredging Operations of CMP Vd* was conducted on 14 December 2012. 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 Vd (*Figure 1.2*). 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). Where water depth is less than 6m the mid-depth station was omitted. If water depth is less than 3m, only the mid-depth station was monitored.

1.5.9 Monitoring results are presented in *Table B1* of *Annex B*. Levels of Dissolved Oxygen (DO), Turbidity and Suspended Solids (SS) generally complied with the Action and Limit Levels set in the Baseline Monitoring Report [(1)].

1.5.10 Levels of Turbidity exceeded the Action Level in the downstream station DS5 during mid-flood tide. Station DS5 is located even further away from the works area of CMP Vd than other downstream stations (ie DS1-4) (please refer to *Figure 1.2* for the indicative locations of the monitoring stations). The compliance of Action and Limit Levels at other downstream stations would indicate that the recorded exceedance is unlikely to be caused by the dispersal of suspended sediments from the dredging operations at CMP Vd. In addition, high turbidity level was occasionally recorded during the baseline monitoring of the EM&A programme. The high turbidity level is thus considered to be sporadic events and characteristic of water quality in this area of Hong Kong.

1.5.11 Overall, there appears to be no unacceptable water quality impacts causing by the dredging operations at CMP Vd and no additional measures are thus considered required except for those stated in the Environmental Permit (*EP-312/2008*).

(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.

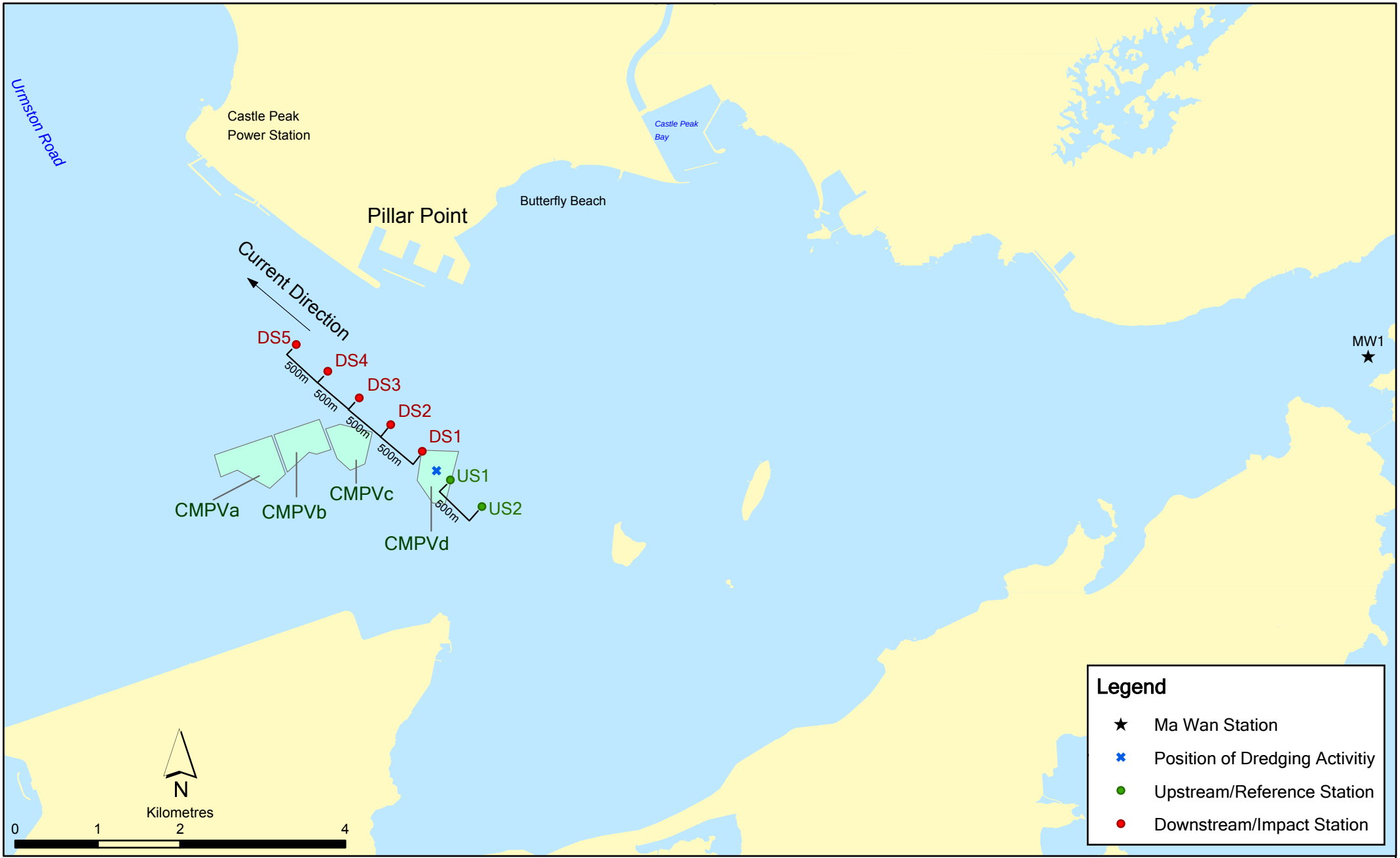

Figure 1.2

Indicative Dredging Impact Sampling Stations for CMPVd

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

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Date: 28/11/2012

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1.5.12 Water Column Profiling for CMP Va – December 2012

In-situ Measurements

1.5.13 Water Column Profiling was undertaken at a total of two sampling stations in December 2012. The water quality monitoring results for December 2012 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 1999-2010 from stations in the Northwestern Water Control Zone, where the CMPs are located. For Salinity, the average value obtained from the Upstream station was used for the basis as the WQO. Graphical presentation of the monitoring results is provided in *Annex C*.

1.5.14 Analyses of results for December 2012 indicated that levels of Salinity, pH and DO complied with the WQOs at both Upstream and Downstream stations (*Figures 7 - 9 of Annex C*). DO and Turbidity complied with the Action and Limit Levels set in the *EM&A Manual* (1).

Laboratory Measurements for Suspended Solids (SS)

1.5.15 Analyses of data obtained in December 2012 indicated that the SS levels at both Upstream and Downstream stations complied with the WQO (*Figure 10 of Annex C*). In addition, SS levels at all stations complied with the Action and Limit Levels set in the *EM&A Manual*.

1.5.16 Overall, the results indicated that the mud disposal operation at CMP Va did not appear to cause any deterioration in water quality during this reporting period.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

1.6.1 The following monitoring activities will be conducted in the next monthly period of January 2013 for CMP V:

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

(1) ERM (2009). Draft Second Review of the EM&A Manual. Prepared for CEDD for EM&A for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation Agreement No. CE 4/2009 (EP).

1.6.2 The sampling schedule is presented in *Annex A*.

1.7 STUDY PROGRAMME

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

Annex A

Sampling Schedule

Annex A1 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP IV (January 2012 - December 2013)

		2012												2013											
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
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	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	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	J	F	M	A	M	J	J	A	S	O	N	D
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
Capped Contaminated Mud Pits III																									
CPA	1 grab per station								*				*								*				*
CPB	1 grab per station								*				*								*				*
CPC	1 grab per station								*				*								*				*
Reference Stations																									
RBA	1 grab per station								*				*								*				*
RBB	1 grab per station								*				*								*				*
RBC	1 grab per station								*				*								*				*

"*" = 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)

Pit Specific Sediment Chemistry	Code	2012 J	F	M	A	M	J	J	A	S	O	N	D	2013 J	F	M	A	M	J	J	A	S	O	N	D	2014 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																				*				*		*

		2012												2013												2014	
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

Results of Impact Monitoring during CMP Vd Dredging Operations for December 2012

Table B1 Summary Table of DO, Turbidity and SS Levels Recorded in December 2012

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2012/12/14	ME	DS1	6.80	6.81	21.30	28.17
		DS2	6.83	6.86	19.95	29.00
		DS3	6.93	6.93	8.70	8.00
		DS4	6.96	6.98	7.12	7.33
		DS5	7.10	7.06	5.98	6.33
		MW1	6.59	6.60	6.94	7.33
		US1	6.83	6.84	9.92	10.67
		US2	6.83	6.84	10.48	14.50
	MF	DS1	6.94	6.91	26.55	34.50
		DS2	6.97	6.95	25.93	33.67
		DS3	6.89	6.88	25.85	35.17
		DS4	6.87	6.85	24.32	30.83
		DS5	6.89	6.87	35.60	30.83
		MW1	6.75	6.80	22.44	33.67
		US1	6.86	6.86	18.07	20.33
		US2	6.87	6.90	16.99	19.17

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

Monitoring Results

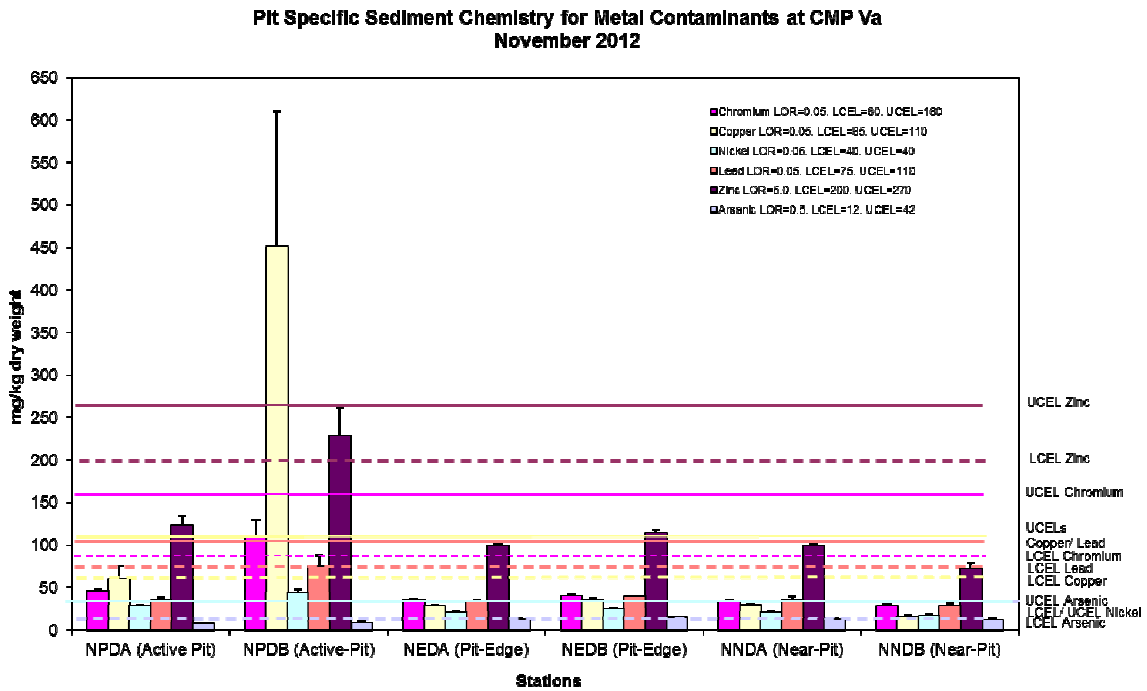

Figure 1: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in November 2012.

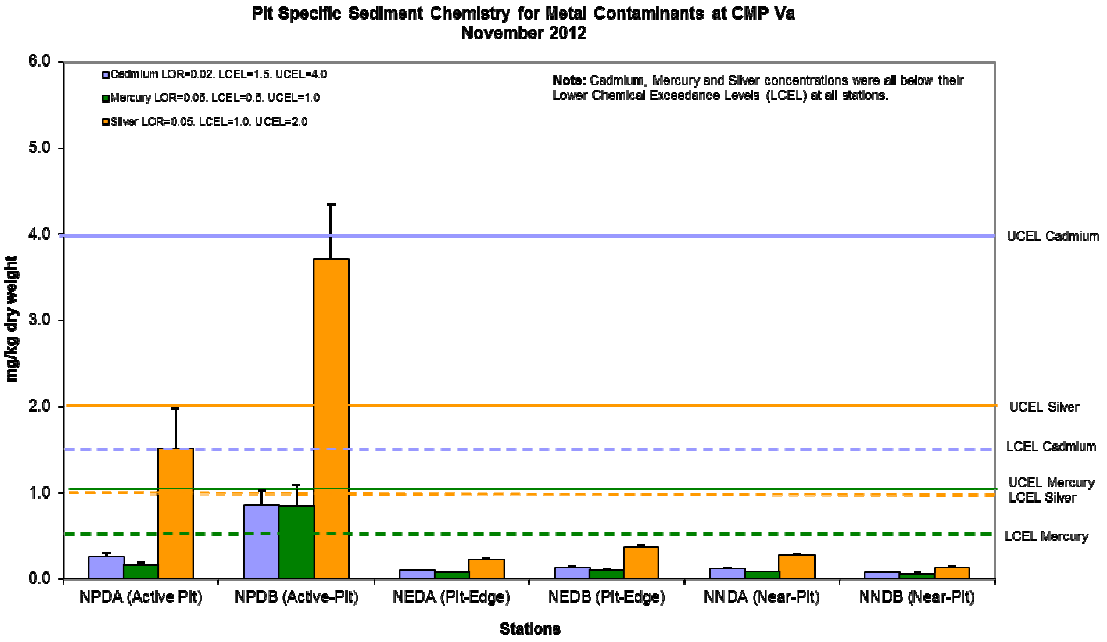

Figure 2: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in November 2012.

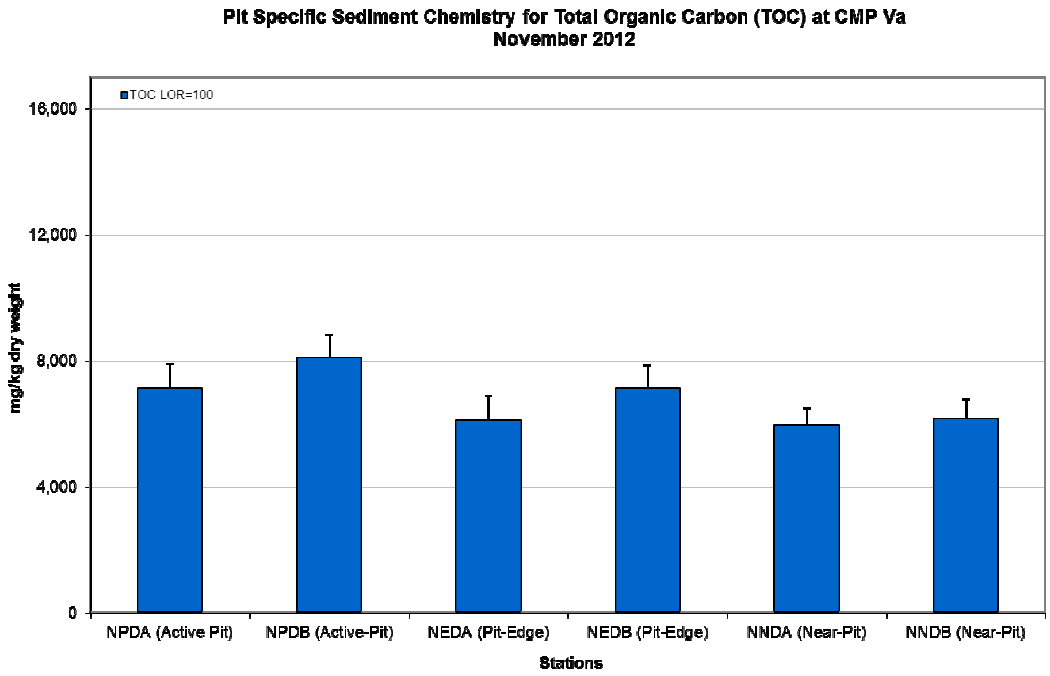

Figure 3: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in November 2012.

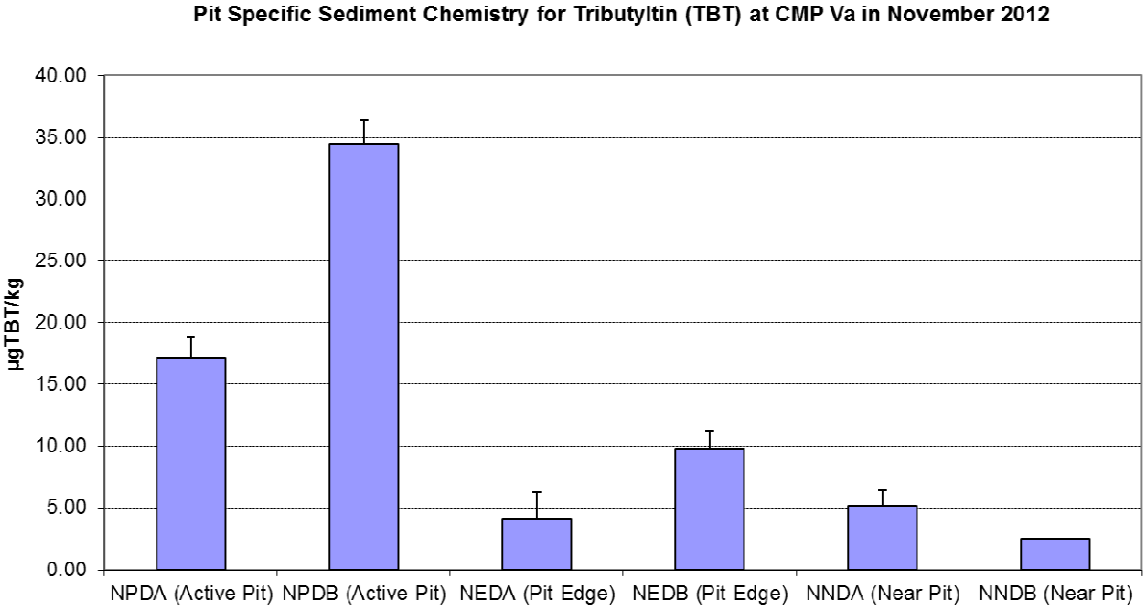

Figure 4: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring of CMP Va in November 2012.

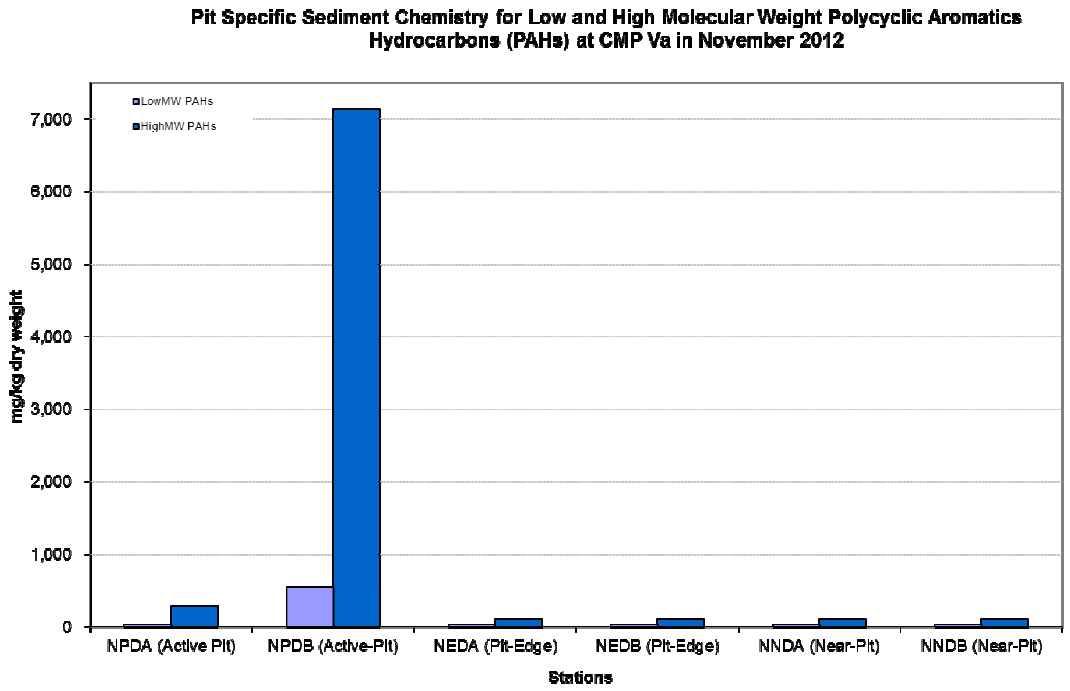

Figure 5: Concentration of Low and High Molecular Weight Polycyclic Aromatics Hydrocarbons (PAHs) (µg/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring for CMP Va in November 2012.

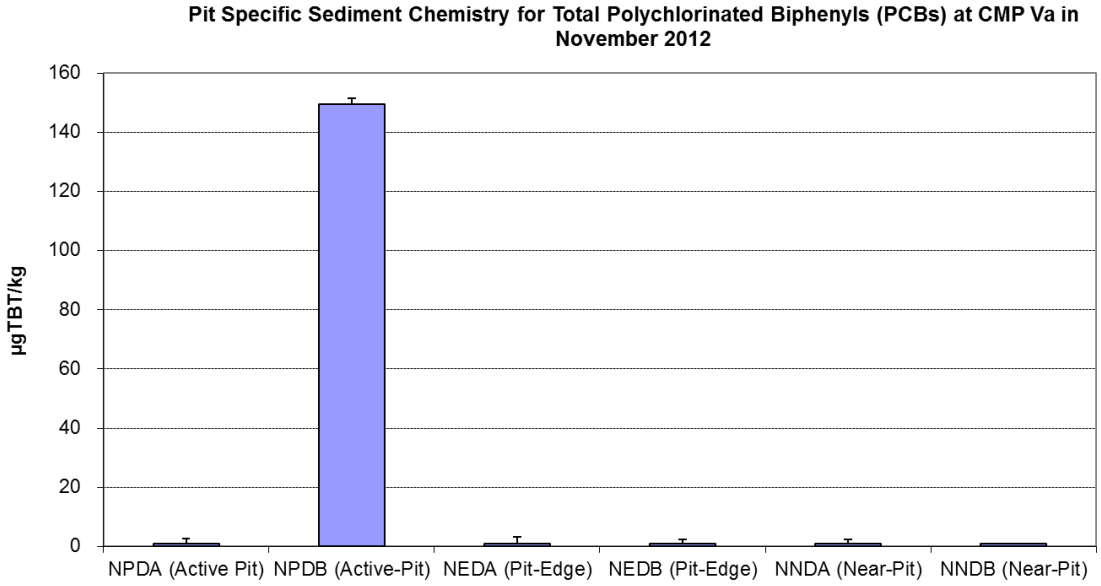

Figure 6: Concentration of Total Polychlorinated Biphenyls (µg/kg; mean +SD) in sediment samples collected from Pit Specific Sediment Chemistry Monitoring of CMP Va in November 2012.

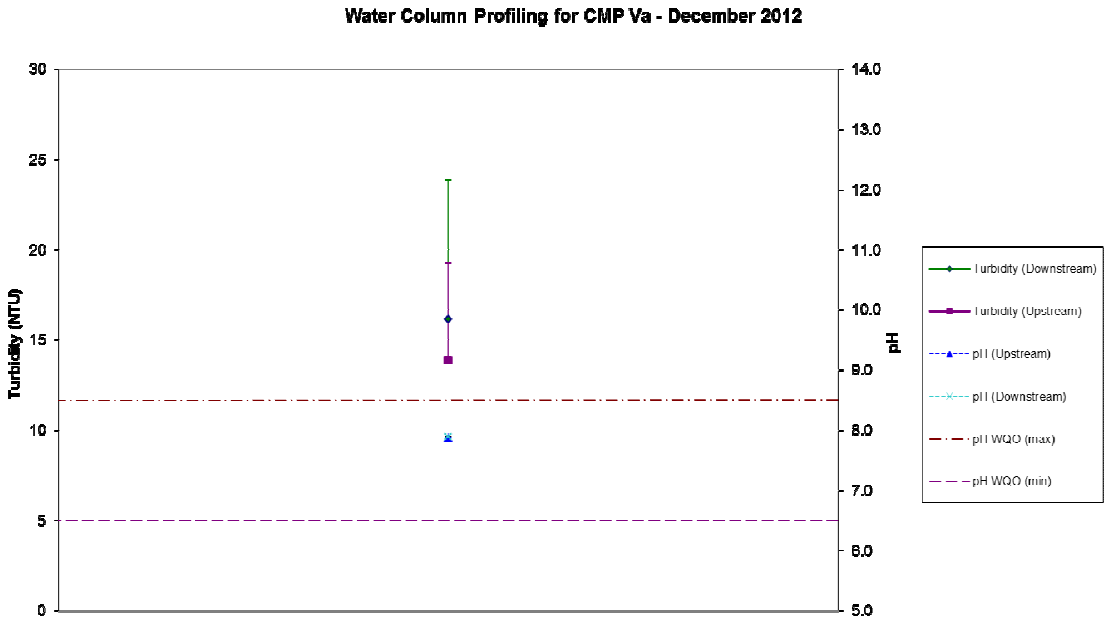

Figure 7: Turbidity and pH (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in December 2012.

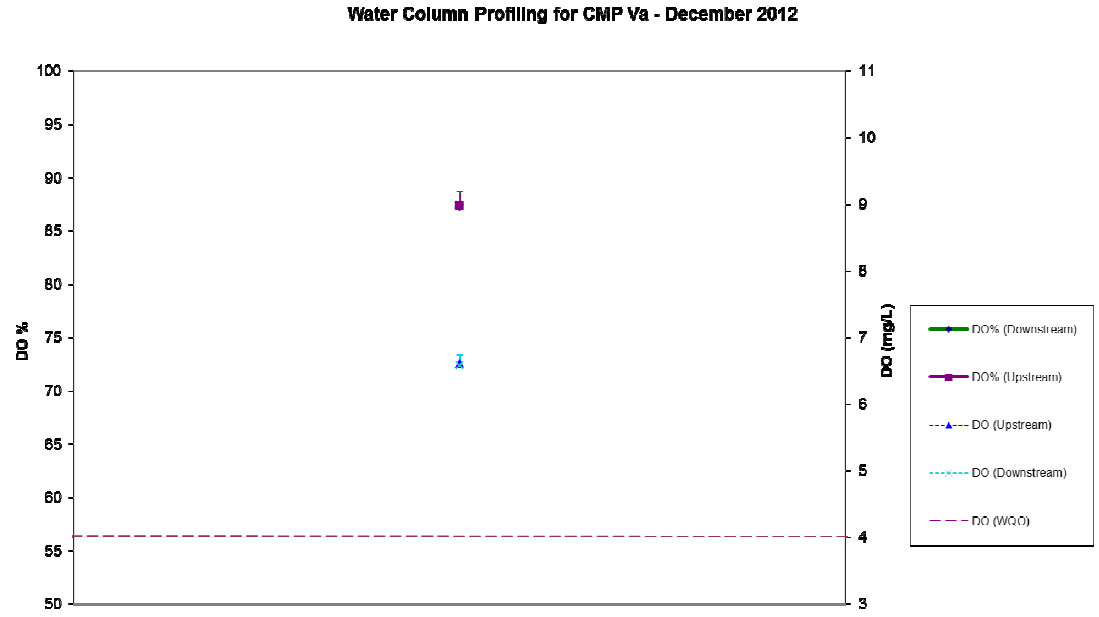

Figure 8: Dissolved Oxygen (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in December 2012.

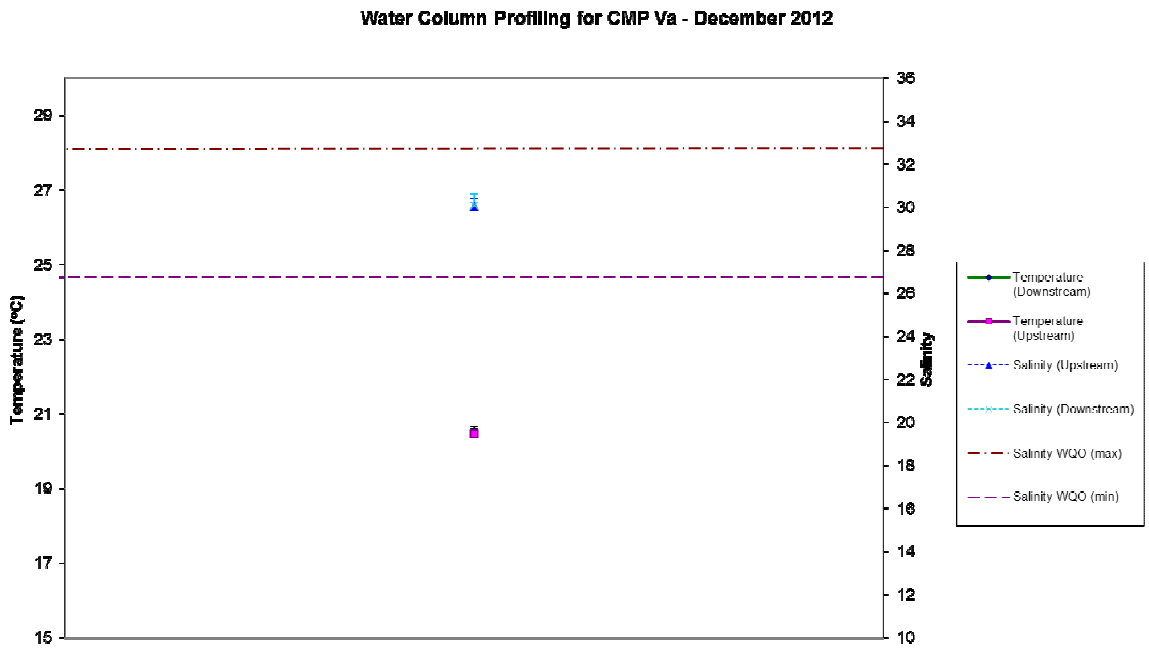

Figure 9: Salinity and Temperature (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in December 2012.

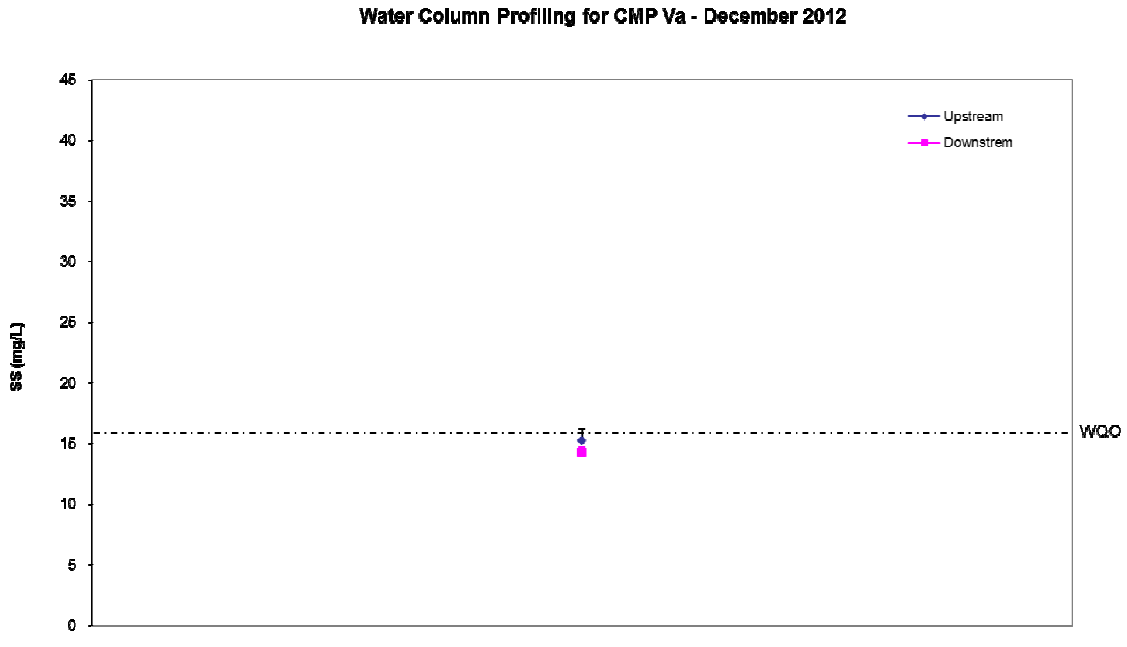

Figure 10: Suspended Solids (mean + SD) recorded during Water Column Profiling for disposal operations at CMP Va in December 2012.

Annex D

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

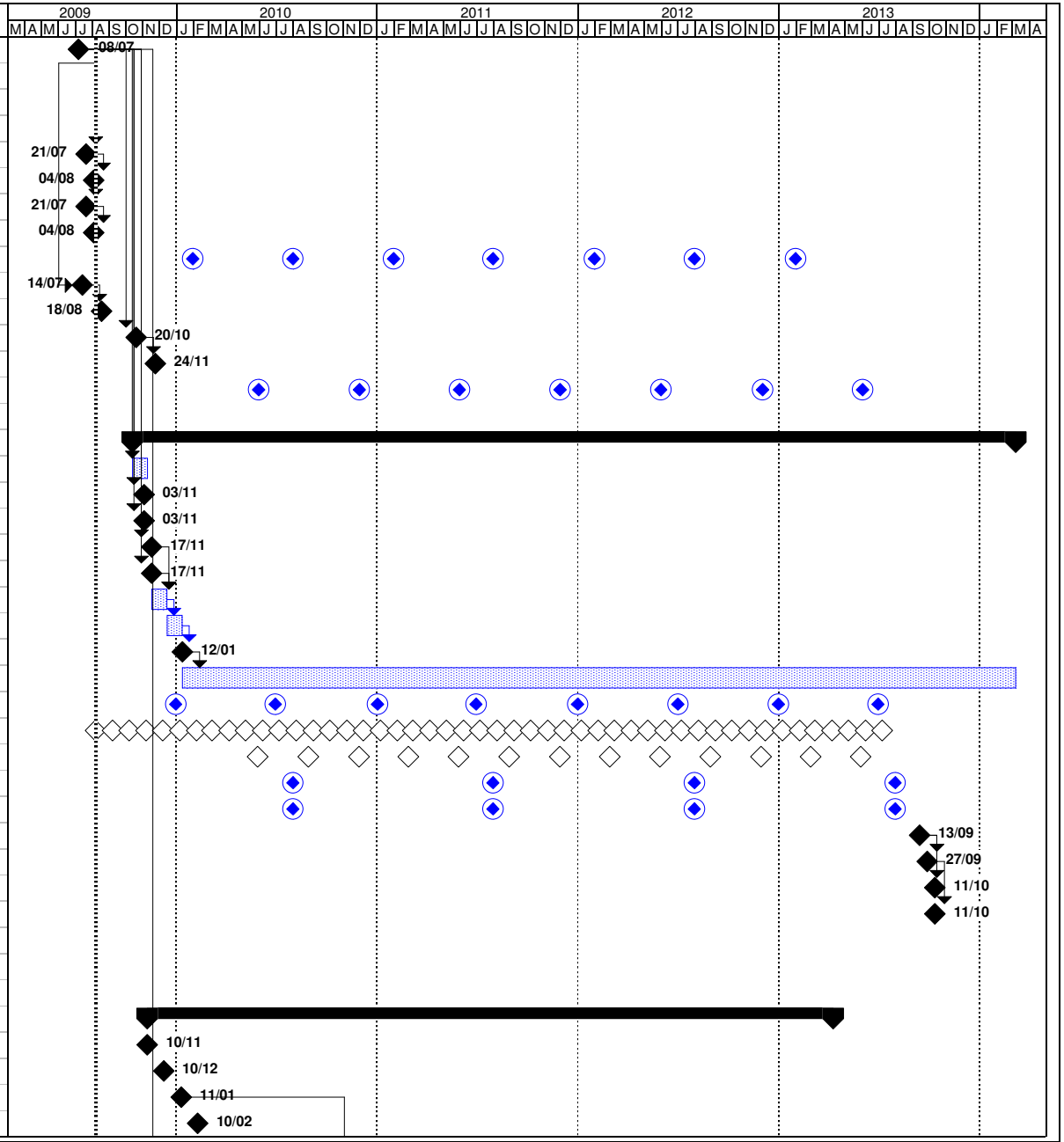

Figure 4.1 - Study Programme

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

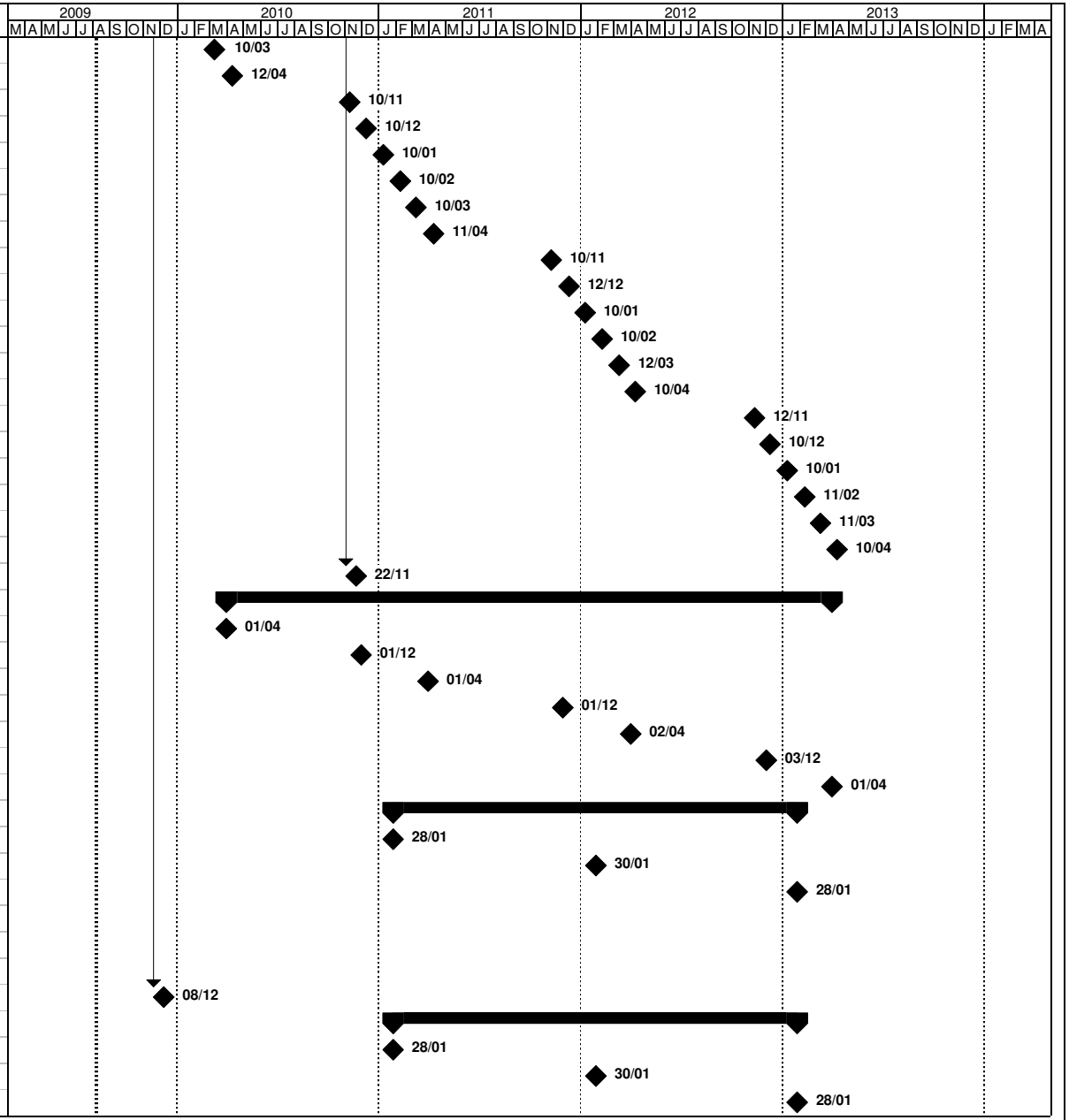

Figure 4.1 - Study Programme

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