








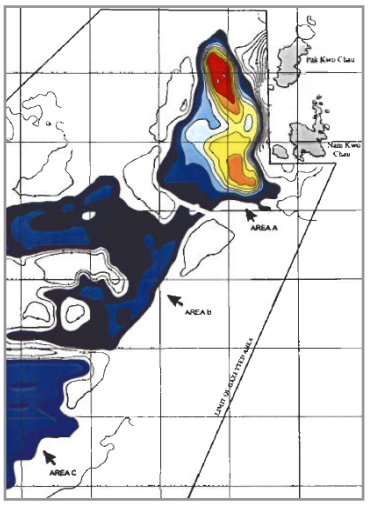

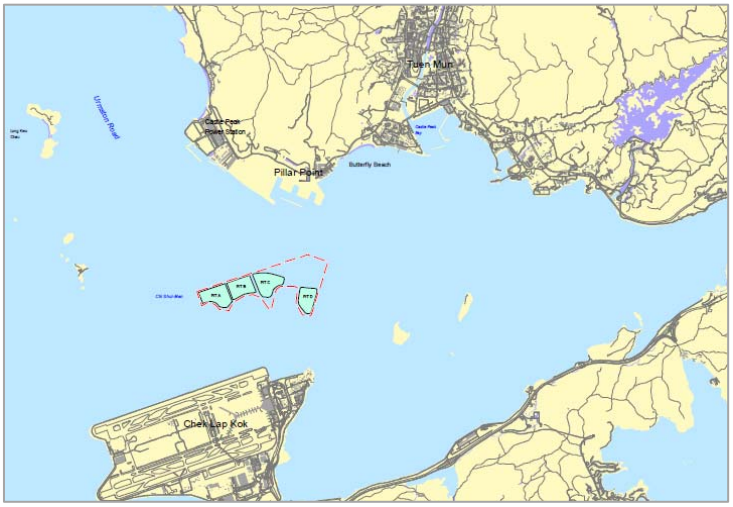

土木工程拓展署
Civil Engineering and Development Department

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

Agreement No. CE 4/2009(EP)

12th Monthly Progress Report for Contaminated Mud Pits at Sha Chau – June 2010

Revision 0

23 July 2010

Environmental Resources Management
21/F Lincoln House
Taikoo Place, 979 King's Road
Island East, Hong Kong
Telephone 2271 3000
Facsimile 2723 5660

www.erm.com

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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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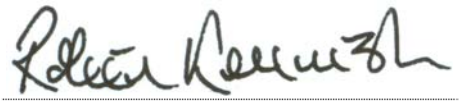
Environmental Resources Management

21/F Lincoln House
979 King's Road
Taikoo Place
Island East
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
http://www.erm.com

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 June 2010 under Agreement No. CE 4/2009 (EP).	Date: 23 July 2010 Approved by:  *Dr Robin Kennish* *Director*

Revision	Description	By	Checked	Approved	Date
0	12th Monthly Progress Report for CMP – Revision 0	JT	CAR	RK	23/07/10

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

12th MONTHLY PROGRESS REPORT FOR CONTAMINATED MUD PITS AT SHA CHAU - June 2010

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 2010. 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 are now taking place to construct CMP Va-b. The environmental monitoring and audit (EM&A) programme for the CMPs at the East of Sha Chau area presently covers disposal operations at CMP IVc and dredging operations at CMP V.

1.2 REPORTING PERIOD

This *Monthly Progress Report* covers the monitoring period of June 2010.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

Water Column Profiling was conducted for CMP IVc on 22 June 2010. For CMP V, sampling for *Impact Water Quality Monitoring during Dredging Operations* was conducted on 9, 12, 17, 21, 23, 25, 28 and 30 June 2010. A summary of field activities are presented in *Annex A*.

A summary of laboratory analysis results submitted by the Contractor in this reporting month is presented in *Table 1.1*.

Table 1.1 ***Summary of laboratory analysis results submitted by the Contractor during the reporting month***

Key Task	Monitoring Component	Results Received from the Contractor
CMP IVc		
Sediment Quality Monitoring	Pit Specific Sediment Chemistry Monitoring	April's sampling: 1 June 2010
CMP V		
Water Sampling and Chemical Analysis	Impact Monitoring during Dredging Operations	May's sampling: 28 June 2010

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

No outstanding sampling and laboratory analysis remained from June 2010.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS

Results of *Water Column Profiling* for June 2010 are presented for CMP IV. Results of *Impact Water Quality Monitoring during Dredging Operations* for June 2010 are presented for CMP V. Detailed results will be discussed in the relevant *Quarterly Reports*.

1.5.1 CMP IV

Water Column Profiling - June 2010

Results of *Water Column Profiling* for June 2010 show that levels of Salinity, pH, Dissolved Oxygen (DO) and Total Suspended Solids (TSS) compiled with the wet season WQOs at both the Upstream and Downstream stations (*Figures 1* to *4* of *Annex B*).

1.5.2 CMP V

Impact Water Quality Monitoring during Dredging Operations of CMP V – June 2010

Impact Water Quality Monitoring during Dredging Operations of CMP V was conducted for three times per week since 9 June 2010 in this reporting month. On each 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 *Figures 5* to *40* of *Annex B*. Levels of DO, depth-average Turbidity and TSS complied with the Action and Limit Levels set in the *Baseline Monitoring Report* [1] (*Tables B1* to *B18* of *Annex B*).

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

The following monitoring activities will be conducted in the next monthly period of July 2010:

- *Water Column Profiling* and *Demersal Trawling* for CMP IVc; and,
- *Impact Water Quality Monitoring during Dredging Operations* for CMP V.

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 IVc (July 2009 - December 2010)

			2009						2010											
Pit Specific Sediment Chemistry	**Code**	**Frequency**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Active-Pit																				
	NCA 1 - 8	3 times per year		*				*				*				*				*
	NCB 1 - 8	3 times per year		*				*				*				*				*
Pit-Edge																				
	CPA 1-8	3 times per year		*				*				*				*				*
	CPB 1-8	3 times per year		*				*				*				*				*
Near-Pit																				
	CNA 1-8	3 times per year		*				*				*				*				*
	CNB 1-8	3 times per year		*				*				*				*				*

Cumulative Impact Sediment Chemistry			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-field Stations																				
	RNA 1-9	2 times per year		*				*								*				*
	RNB 1-9	2 times per year		*				*								*				*
Mid-field Stations																				
	RMA 1-9	2 times per year		*				*								*				*
	RMB 1-9	2 times per year		*				*								*				*
Capped Pit Stations																				
	RCA 1-9	2 times per year		*				*								*				*
	RCB 1-9	2 times per year		*				*								*				*
Far-Field Stations																				
	RFA 1-9	2 times per year		*				*								*				*
	RFB 1-9	2 times per year		*				*								*				*

Sediment Toxicity Tests			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-Field Stations																				
	TCA	2 times per year		3				3								3				3
	TCB	2 times per year		3				3								3				3
Reference Stations																				
	TRA	2 times per year		3				3								3				3
	TRB	2 times per year		3				3								3				3

Tissue/ Whole Body Sampling			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near-Pit Stations																				
	INA	2 times per year		*						*						*				
	INB	2 times per year		*						*						*				
Reference North																				
	TNA	2 times per year		*						*						*				
	TNB	2 times per year		*						*						*				
Reference South																				
	TSA	2 times per year		*						*						*				
	TSB	2 times per year		*						*						*				

Demersal Trawling			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Near Pit Stations																				
	INA 1-5	4 times per year	5	5					5	5					5	5				
	INB 1-5	4 times per year	5	5					5	5					5	5				
Reference North																				
	TNA 1-5	4 times per year	5	5					5	5					5	5				
	TNB 1-5	4 times per year	5	5					5	5					5	5				
Reference South																				
	TSA 1-5	4 times per year	5	5					5	5					5	5				
	TSB 1-5	4 times per year	5	5					5	5					5	5				

Capping			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Ebb Tide																				
Impact Station Downcurrent																				
	IPE1	4 times per year	3	3				3		3				3		3				3
	IPE2	4 times per year	3	3				3		3				3		3				3
	IPE3	4 times per year	3	3				3		3				3		3				3
	IPE4	4 times per year	3	3				3		3				3		3				3
	PFC1	4 times per year	3	3				3		3				3		3				3
Intermediate Station Downcurrent																				
	INE1	4 times per year	3	3				3		3				3		3				3
	INE2	4 times per year	3	3				3		3				3		3				3
	INE3	4 times per year	3	3				3		3				3		3				3
	INE4	4 times per year	3	3				3		3				3		3				3
	INE5	4 times per year	3	3				3		3				3		3				3
Reference Station Upcurrent																				
	RFE1	4 times per year	3	3				3		3				3		3				3
	RFE2	4 times per year	3	3				3		3				3		3				3
	RFE3	4 times per year	3	3				3		3				3		3				3
	RFE4	4 times per year	3	3				3		3				3		3				3
	RFE5	4 times per year	3	3				3		3				3		3				3
Flood Tide																				
Impact Station Downcurrent																				
	INF1	4 times per year	3	3				3		3				3		3				3
	PFC2	4 times per year	3	3				3		3				3		3				3
	INF3	4 times per year	3	3				3		3				3		3				3
Intermediate Station Downcurrent																				
	IPF1	4 times per year	3	3				3		3				3		3				3
	IPF2	4 times per year	3	3				3		3				3		3				3
	IPF3	4 times per year	3	3				3		3				3		3				3
Reference Station Upcurrent																				
	RFF1	4 times per year	3	3				3		3				3		3				3
	RFF2	4 times per year	3	3				3		3				3		3				3
	RFF3	4 times per year	3	3				3		3				3		3				3

Routine Water Quality Monitoring			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Ebb Tide																				
Impact Station Downcurrent																				
	IPE1	2 times per year		*						*						*				
	IPE2	2 times per year		*						*						*				
	IPE3	2 times per year		*						*						*				
	IPE4	2 times per year		*						*						*				
	IPE5	2 times per year		*						*						*				
Intermediate Station Downcurrent																				
	INE1	2 times per year		*						*						*				
	INE2	2 times per year		*						*						*				
	INE3	2 times per year		*						*						*				
	INE4	2 times per year		*						*						*				
	INE5	2 times per year		*						*						*				
Reference Station Upcurrent																				
	RFE1	2 times per year		*						*						*				
	RFE2	2 times per year		*						*						*				
	RFE3	2 times per year		*						*						*				
	RFE4	2 times per year		*						*						*				
	RFE5	2 times per year		*						*						*				
Flood Tide																				
Impact Station Downcurrent																				
	INF1	2 times per year		*						*						*				
	INF2	2 times per year		*						*						*				
	INF3	2 times per year		*						*						*				
Intermediate Station Downcurrent																				
	IPF1	2 times per year		*						*						*				
	IPF2	2 times per year		*						*						*				
	IPF3	2 times per year		*						*						*				
Reference Station Upcurrent																				
	RFF1	2 times per year		*						*						*				
	RFF2	2 times per year		*						*						*				
	RFF3	2 times per year		*						*						*				

Water Column Profiling			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Plume Stations	WCP1	6 times per year	2	2				2	2	2				2	2	2				2
	WCP2	6 times per year	2	2				2	2	2				2	2	2				2

Benthic Recolonisation Studies			**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Capped Contaminated Mud Pits																				
	CPA 1-3	2 times per year		3				3								3				3
	CPB 1-3	2 times per year		3				3								3				3
	CPC 1-3	2 times per year		3				3								3				3
Reference Stations																				
	RBA 1-3	2 times per year		3				3								3				3
	RBB 1-3	2 times per year		3				3								3				3
	RBC 1-3	2 times per year		3				3								3				3

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

Sampling completed

Annex A2 - East of Sha Chau Environmental Monitoring and Audit Sampling Schedule for CMP V (July 2009 - December 2010)

			2009						2010											
Baseline Water Quality Monitoring			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Near Field	ESC-WNAA	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works	*	*																
	ESC-WNAB		*	*																
	ESC-WNAC		*	*																
	ESC-WNAD		*	*																
	ESC-WNBA		*	*																
	ESC-WNBB		*	*																
	ESC-WNBC		*	*																
	ESC-WNBD		*	*																
Mid Field	ESC-WMB	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works	*	*																
	ESC-WMA		*	*																
Far Field	ESC-WFA	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works	*	*																
	ESC-WFB		*	*																
	MW1		*	*																
Reference Stations	NM1	To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works	*	*																
	NM2		*	*																
	NM3		*	*																
	NM5		*	*																
	NM6		*	*																

Water Column Profiling		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Plume Stations	Upstream			2	2	2	2	2	2										
	Downstream			2	2	2	2	2	2										

Water Quality Impact Monitoring for Dredging		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Downcurrent Impact Stations	1			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	2			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	3			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	5			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Upcurrent Stations	1			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	2			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW1			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Sampling completed
Sampling to be completed

Annex B

Monitoring Results

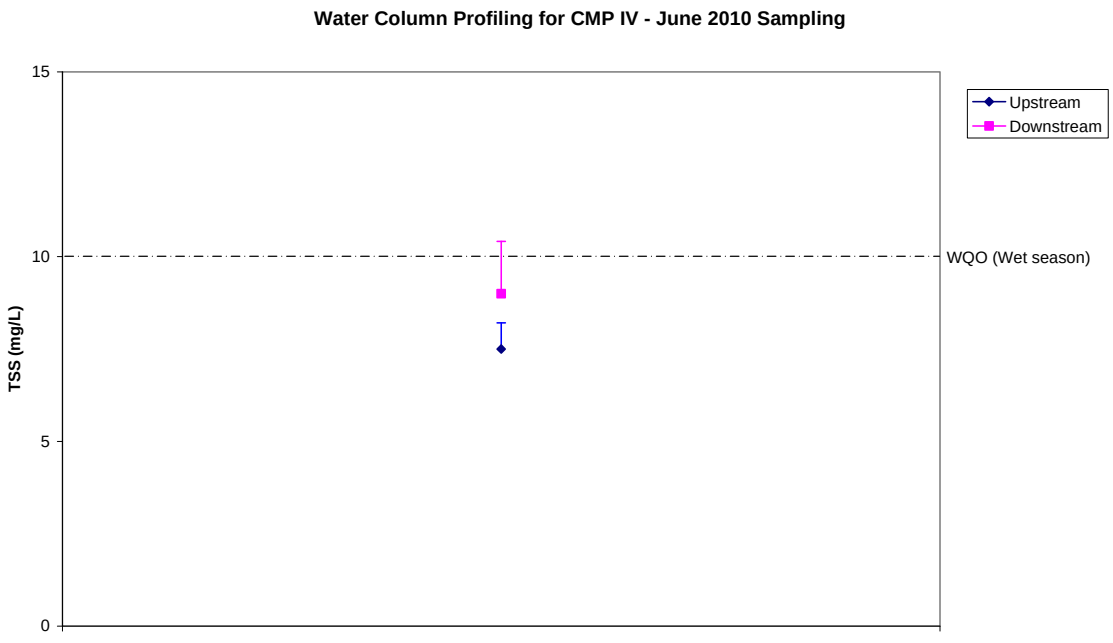

Figure 1: Levels of Total Suspended Solids (mean ± SD) during Water Column Profiling for CMP IV in June 2010.

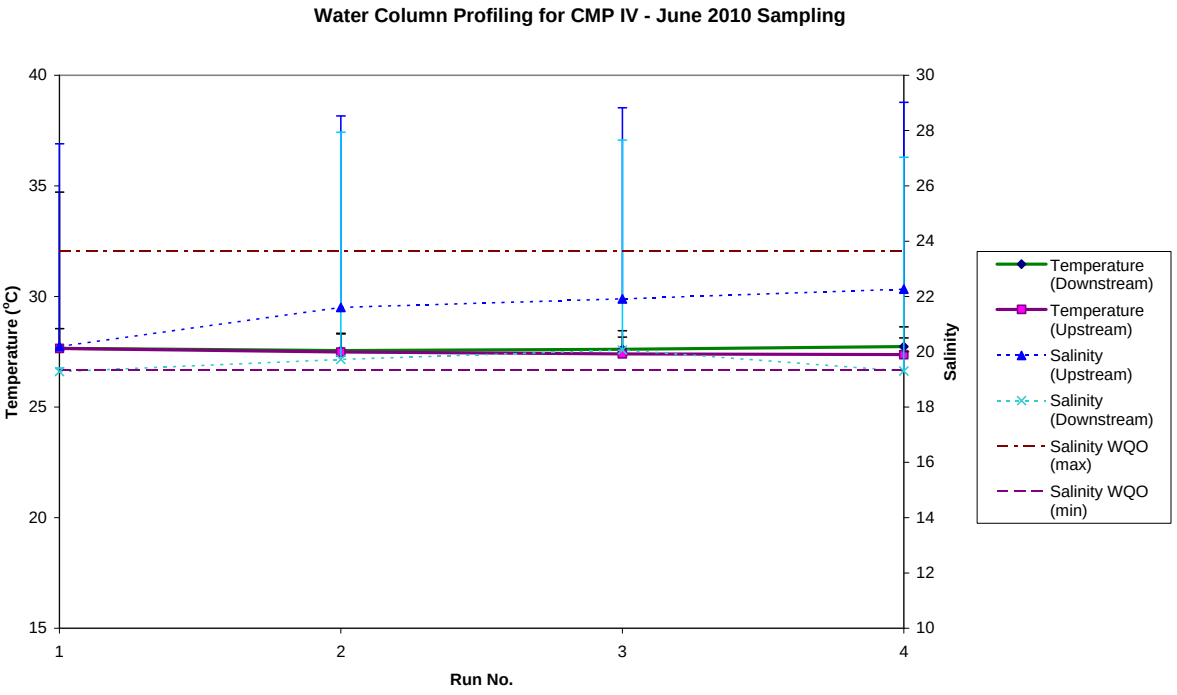

Figure 2: Salinity and Temperature (mean ± SD) during Water Column Profiling for CMP IV in June 2010.

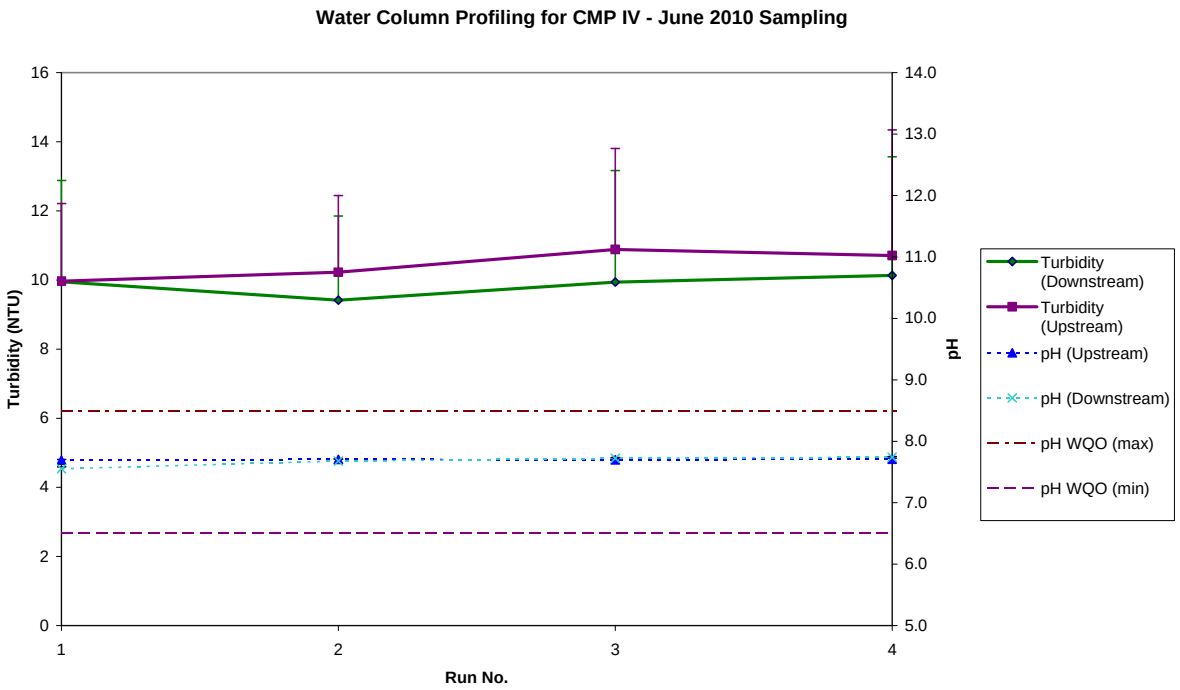

Figure 3: Turbidity and pH (mean ± SD) during Water Column Profiling for CMP IV in June 2010.

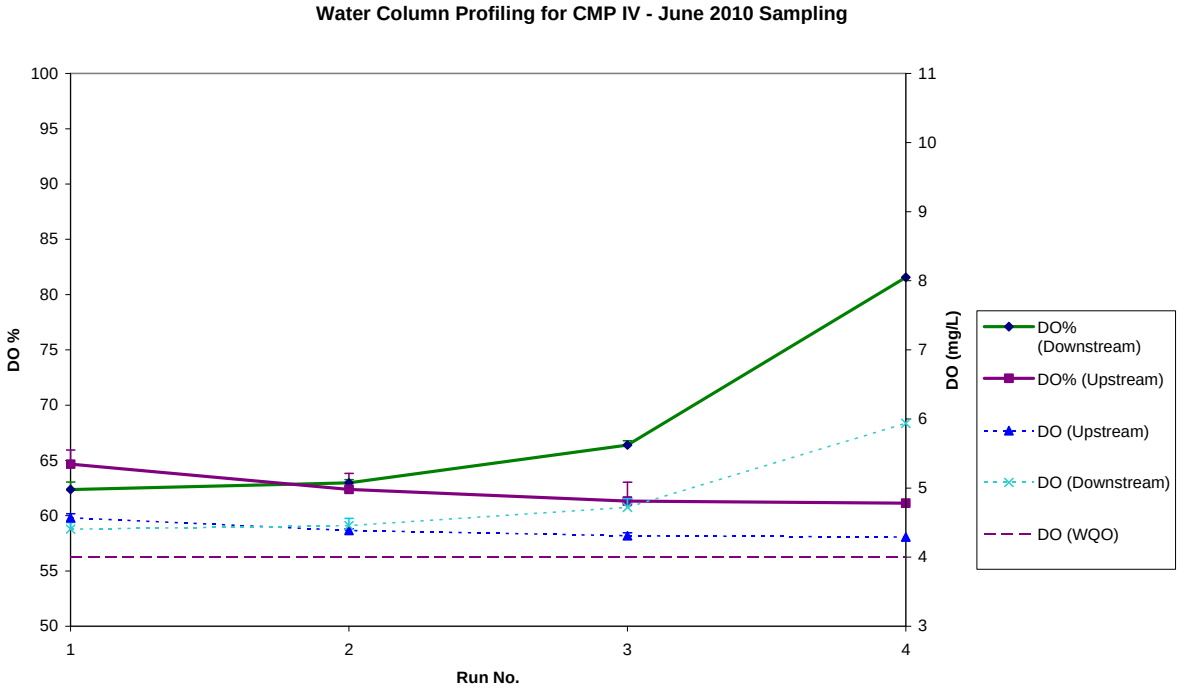

Figure 4: Dissolved Oxygen (mean ± SD) during Water Column Profiling for CMP IV in June 2010.

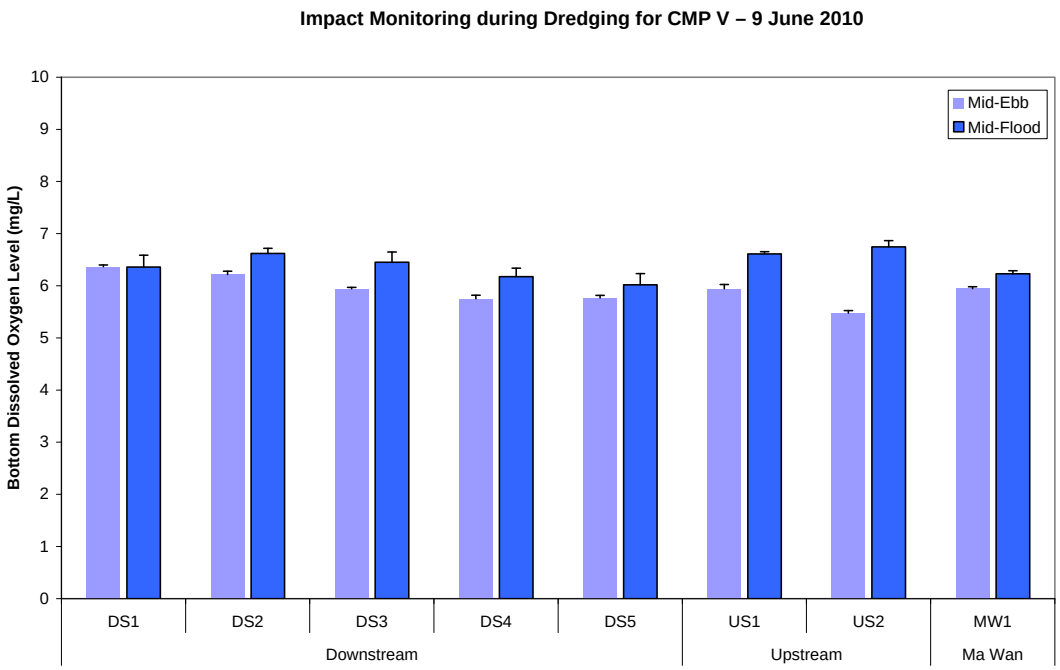

Figure 5: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 9 June 2010.

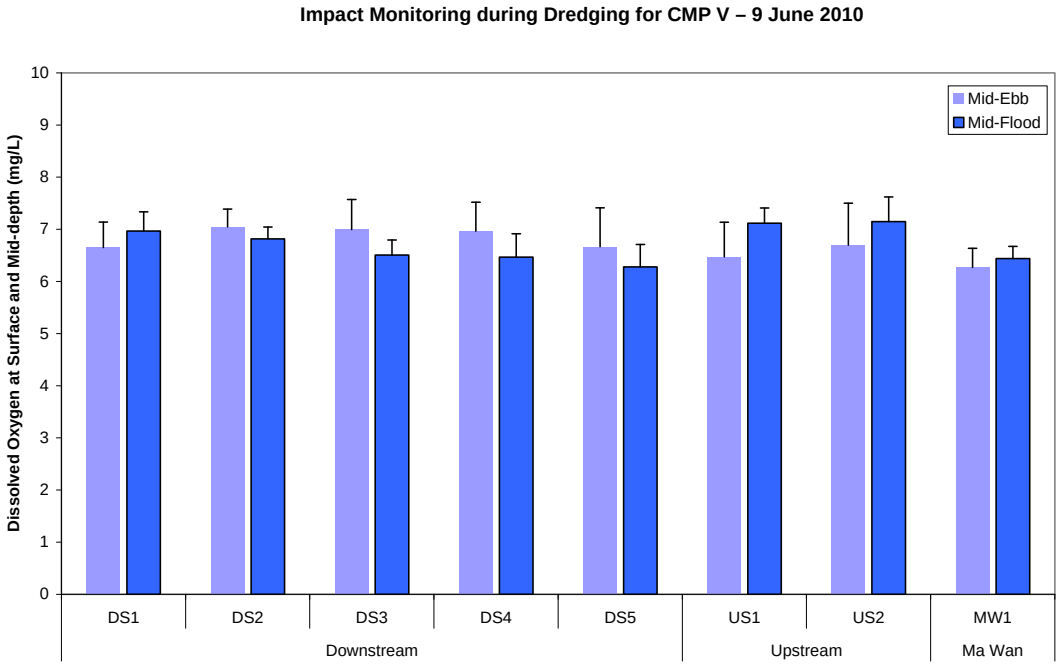

Figure 6: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 9 June 2010.

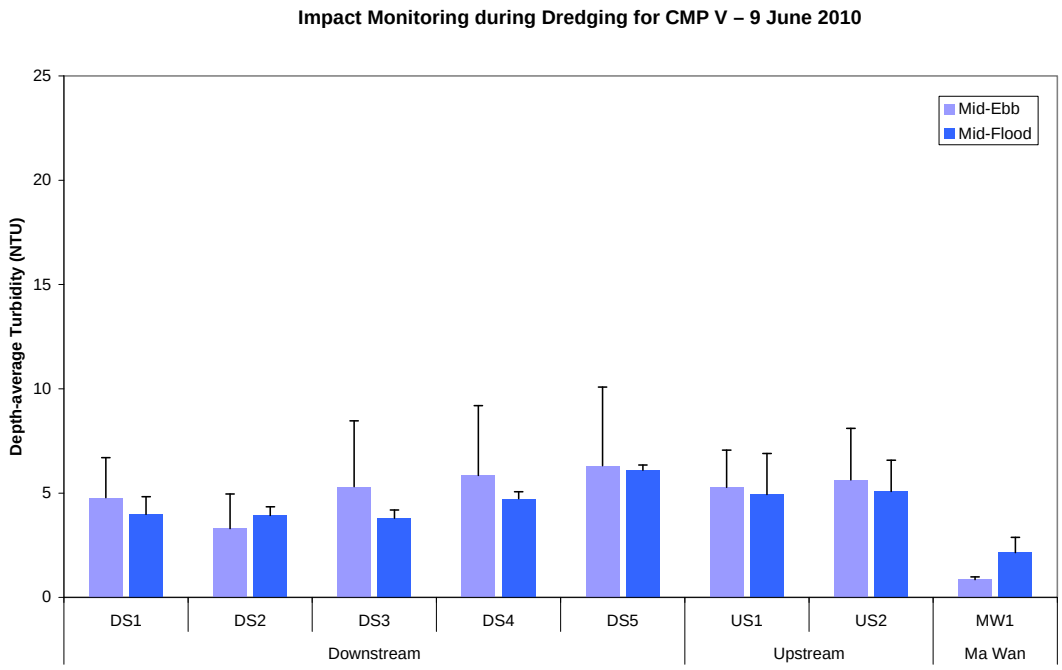

Figure 7: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 9 June 2010.

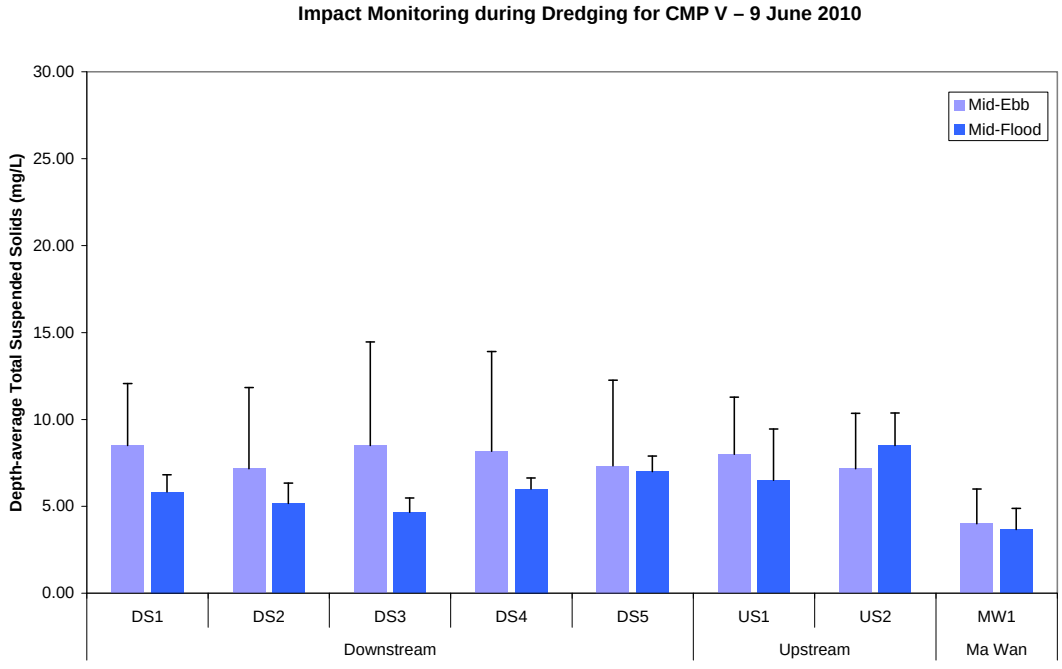

Figure 8: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 9 June 2010.

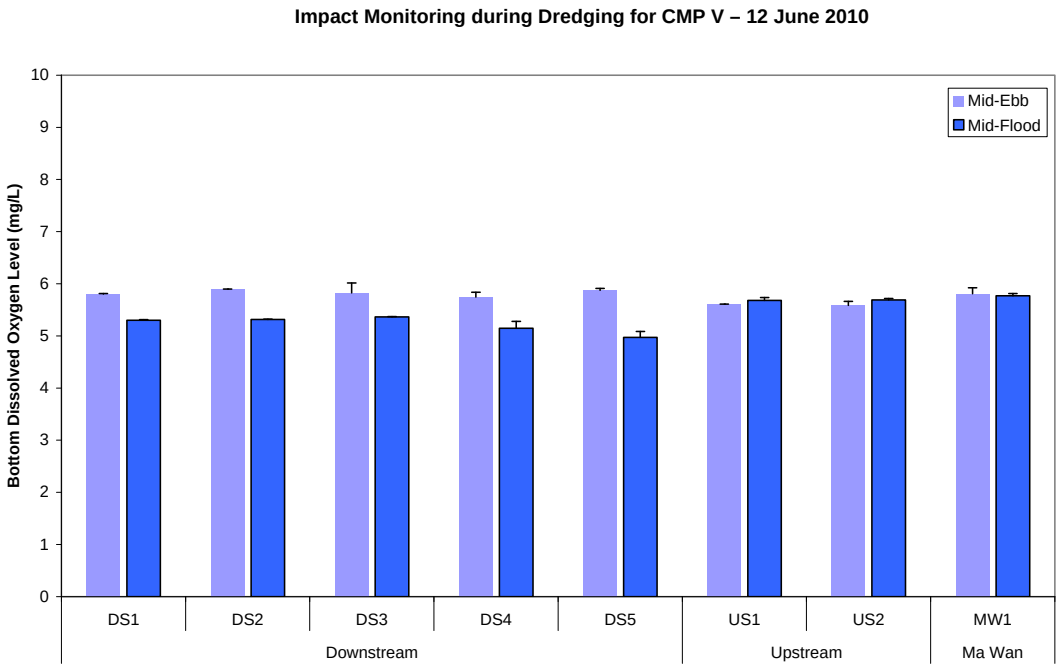

Figure 9: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 12 June 2010.

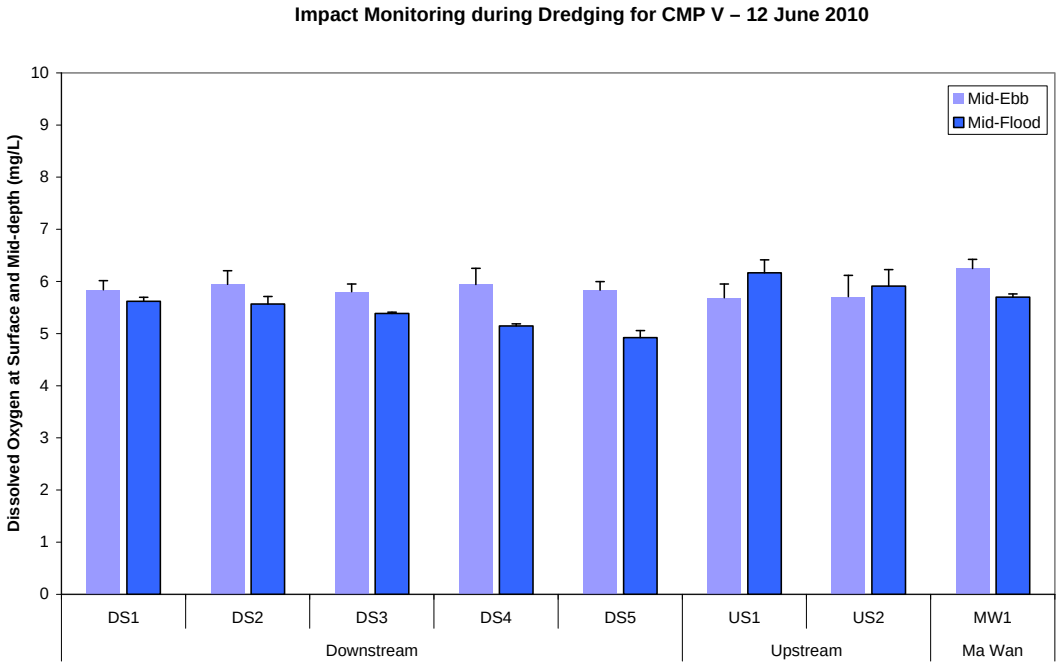

Figure 10: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 12 June 2010.

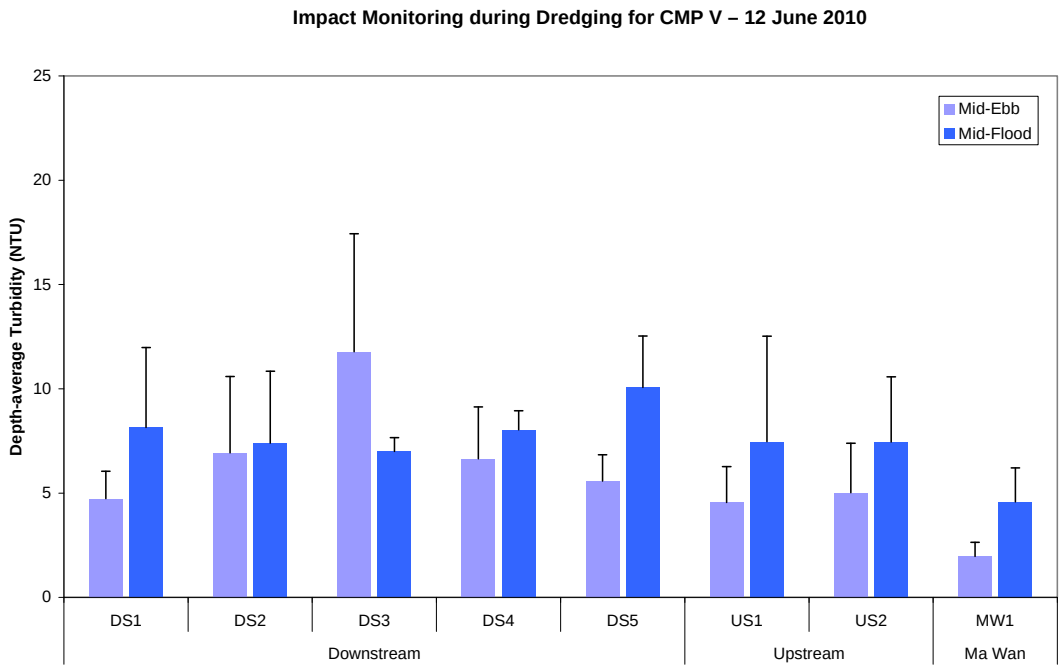

Figure 11: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 12 June 2010.

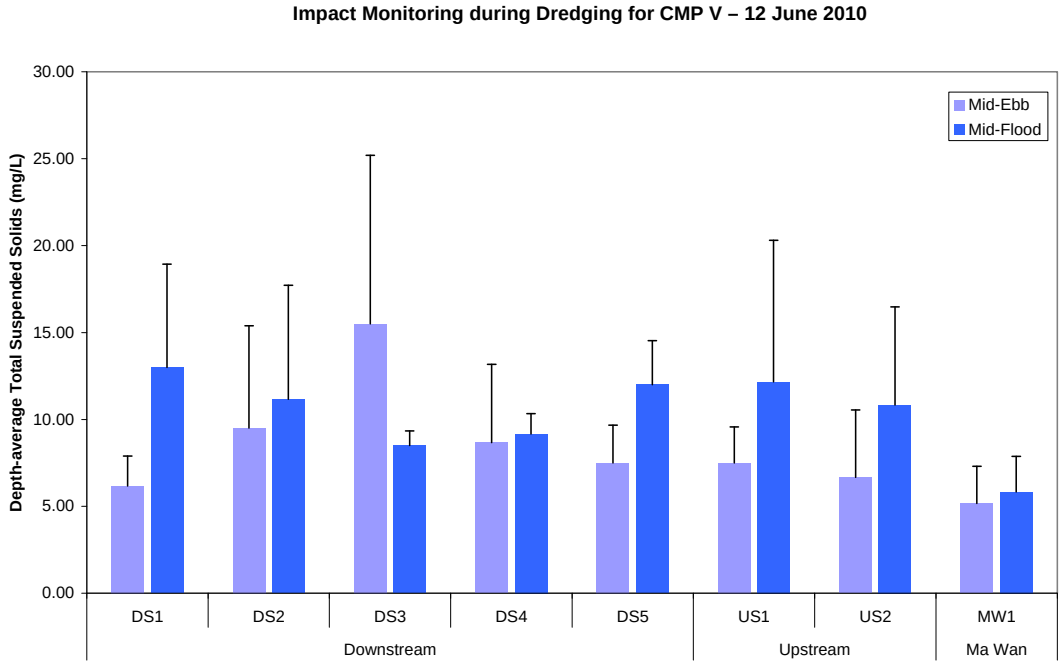

Figure 12: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 12 June 2010.

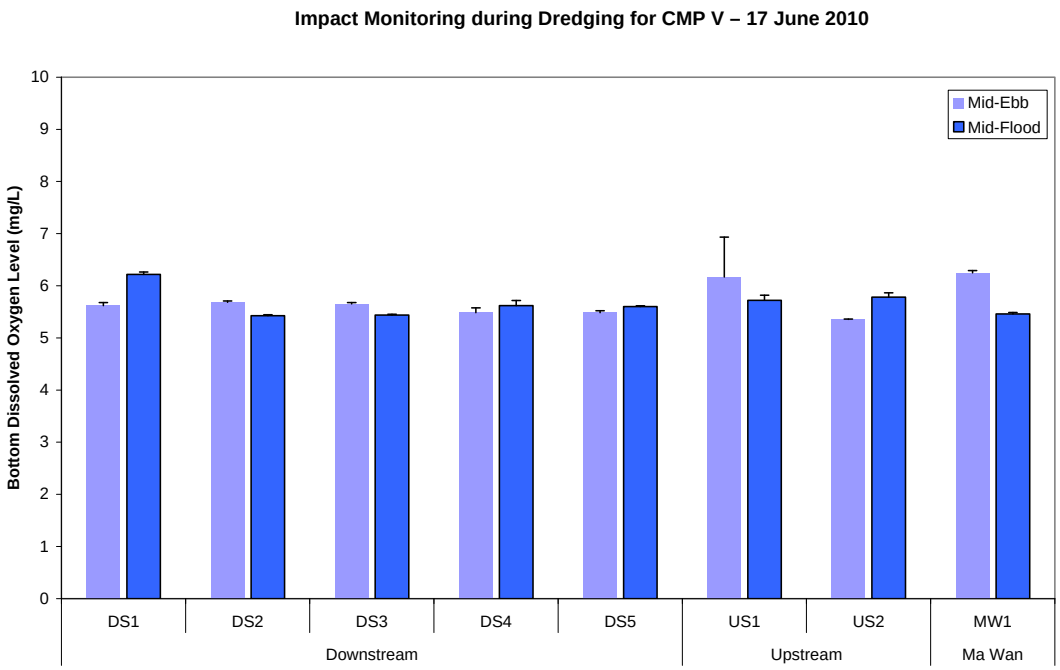

Figure 13: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 17 June 2010.

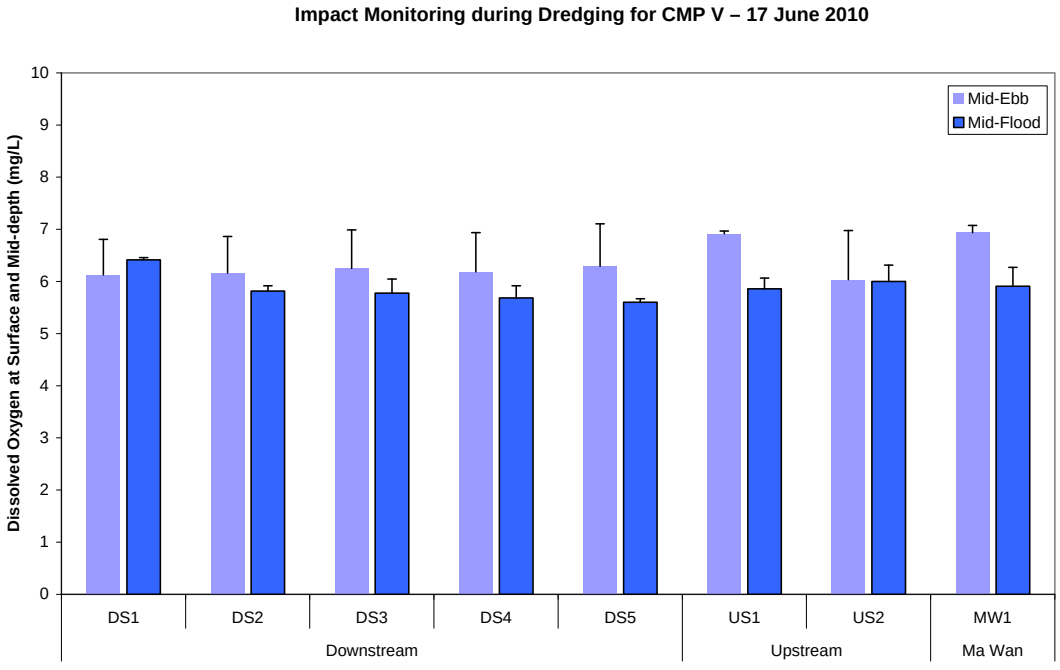

Figure 14: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 17 June 2010.

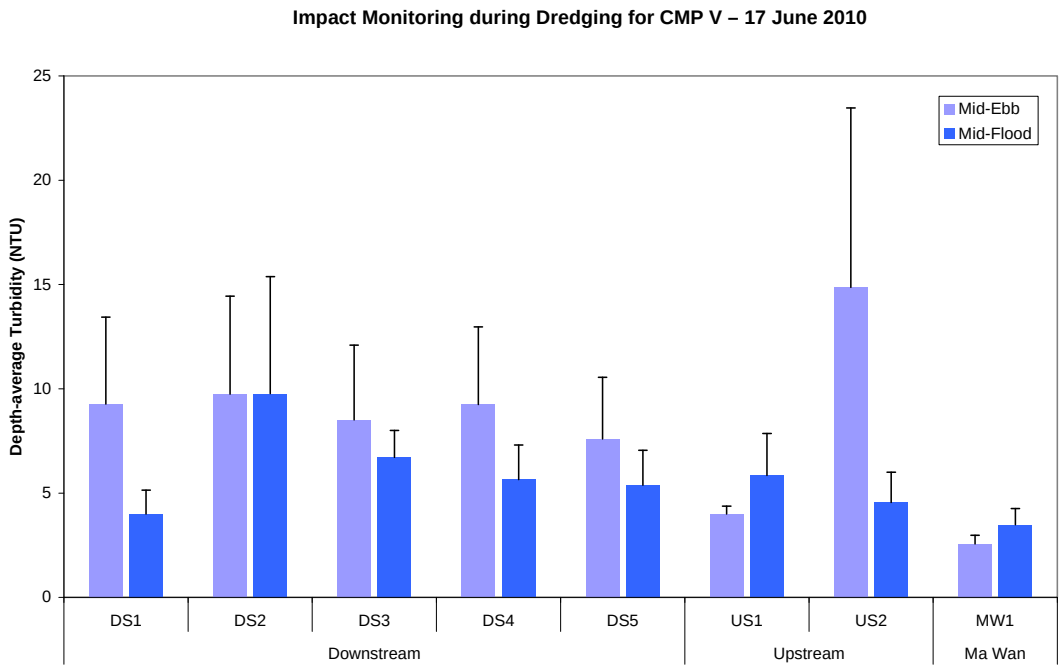

Figure 15: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 17 June 2010.

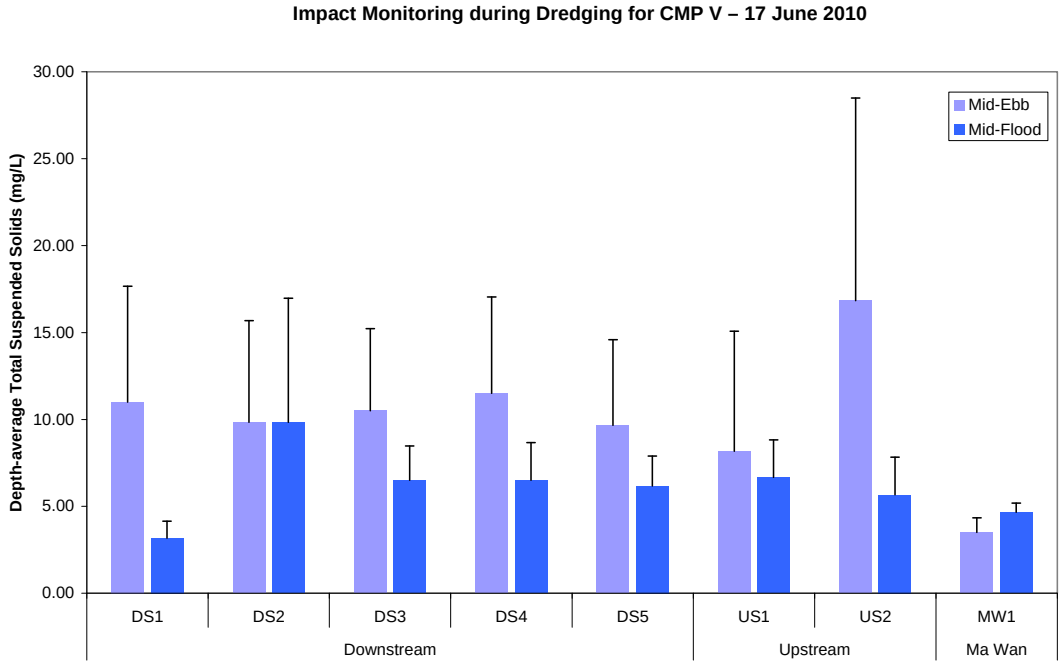

Figure 16: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 17 June 2010.

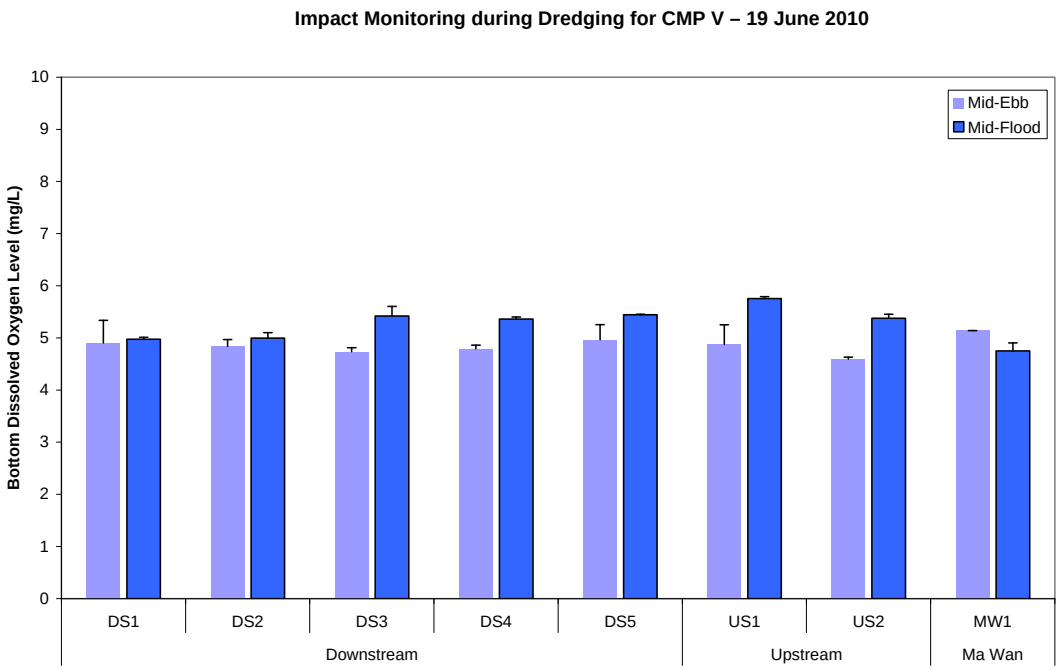

Figure 17: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 19 June 2010.

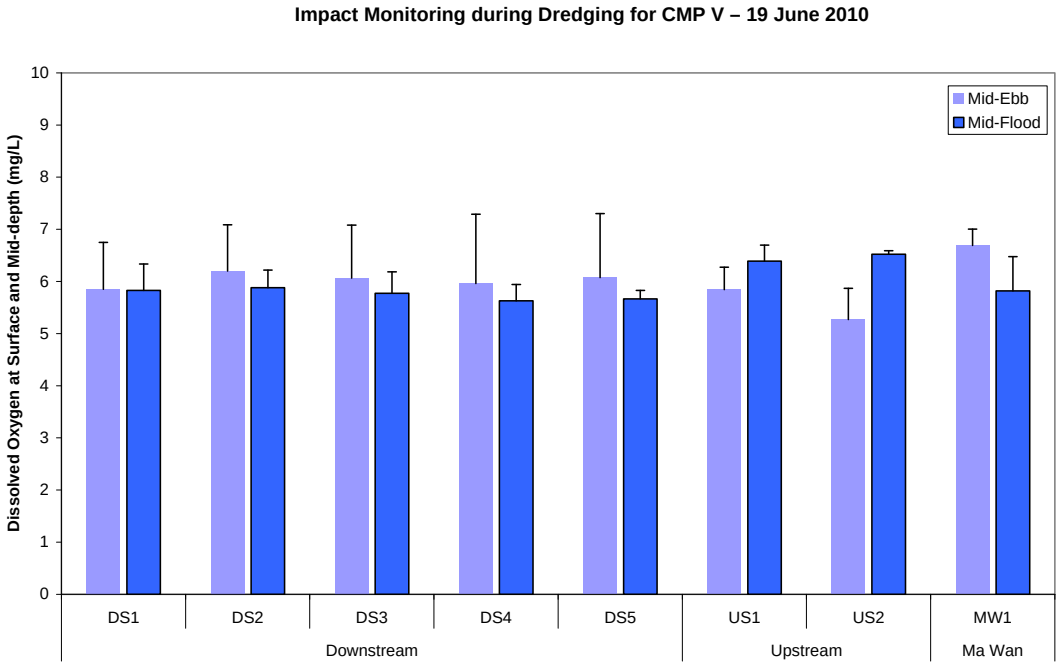

Figure 18: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 19 June 2010.

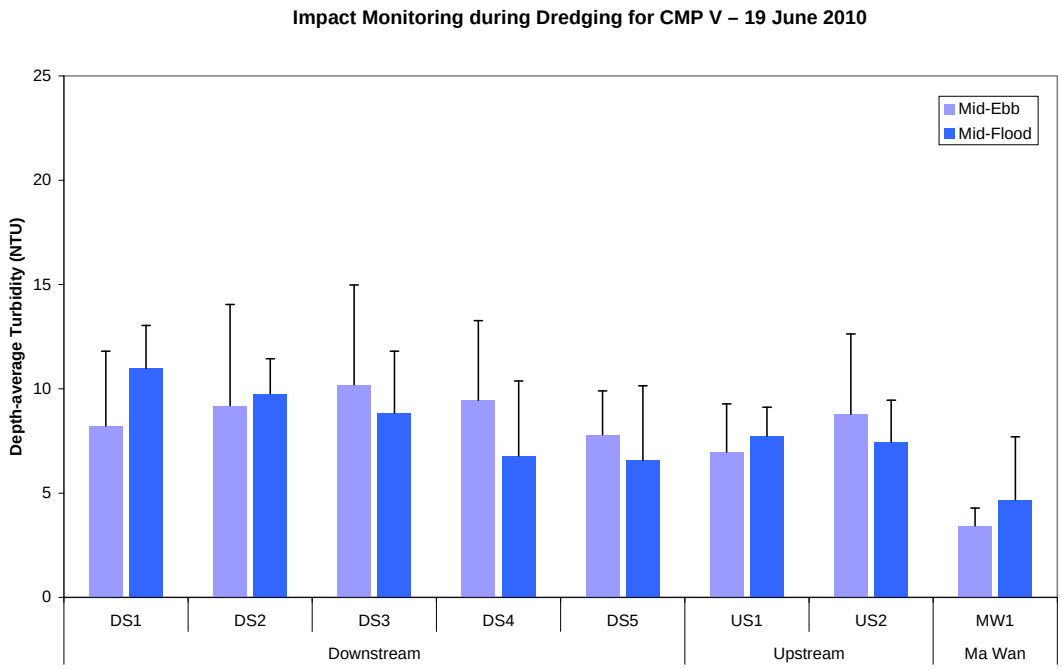

Figure 19: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 19 June 2010.

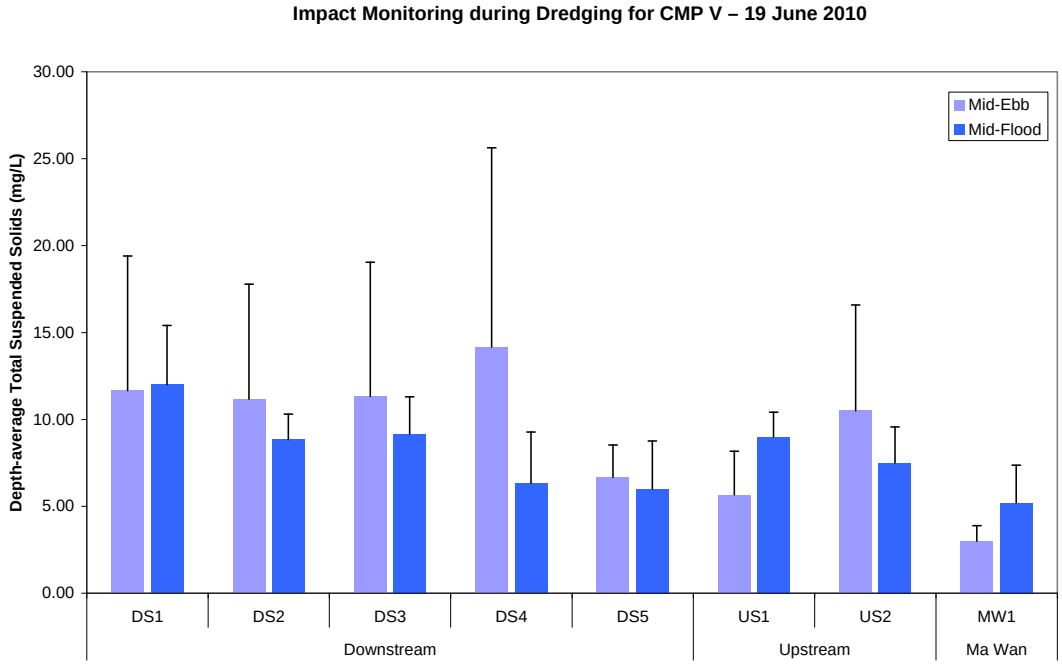

Figure 20: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 19 June 2010.

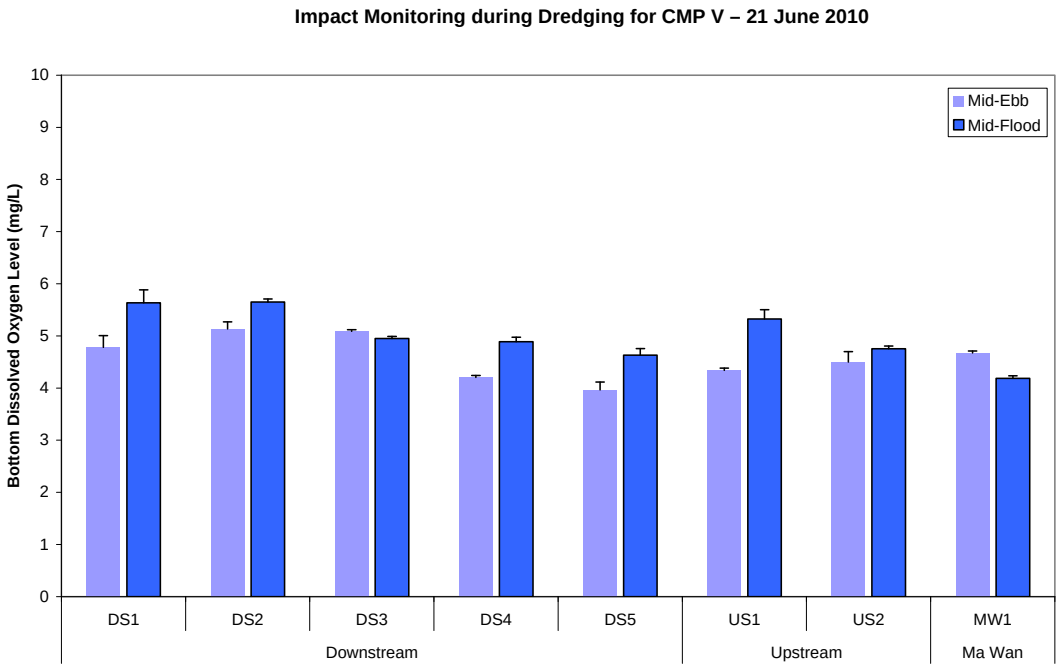

Figure 21: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 21 June 2010.

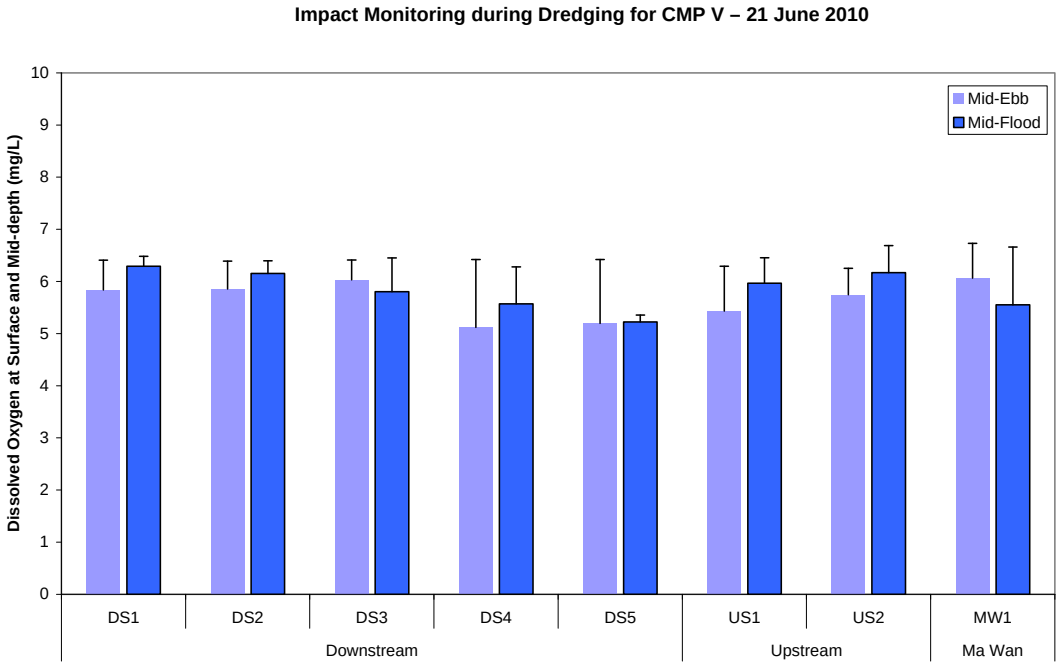

Figure 22: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 21 June 2010.

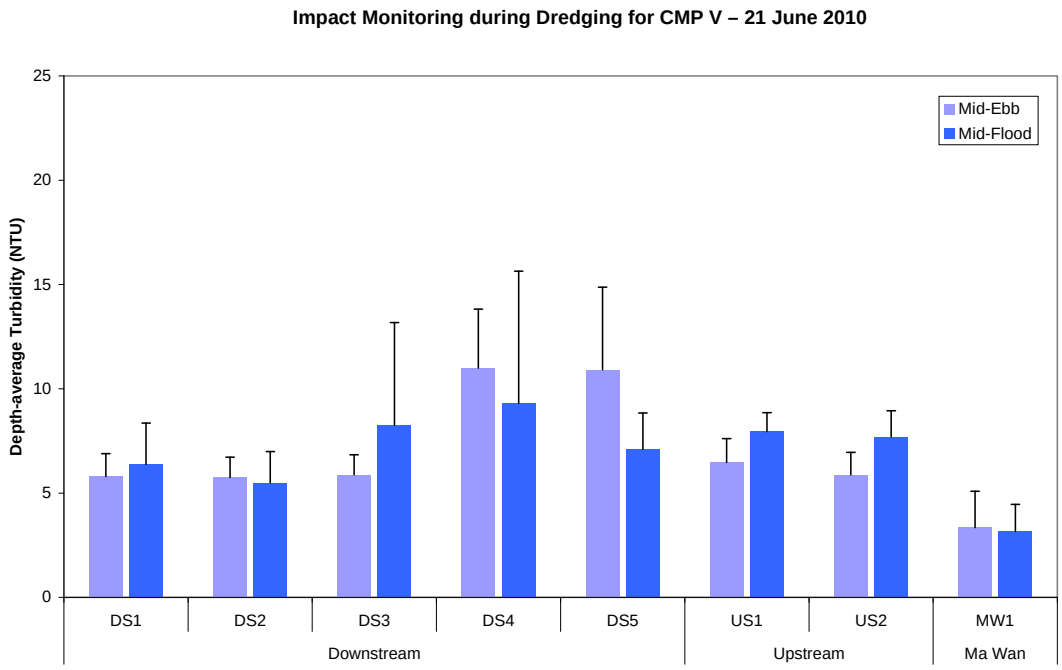

Figure 23: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 21 June 2010.

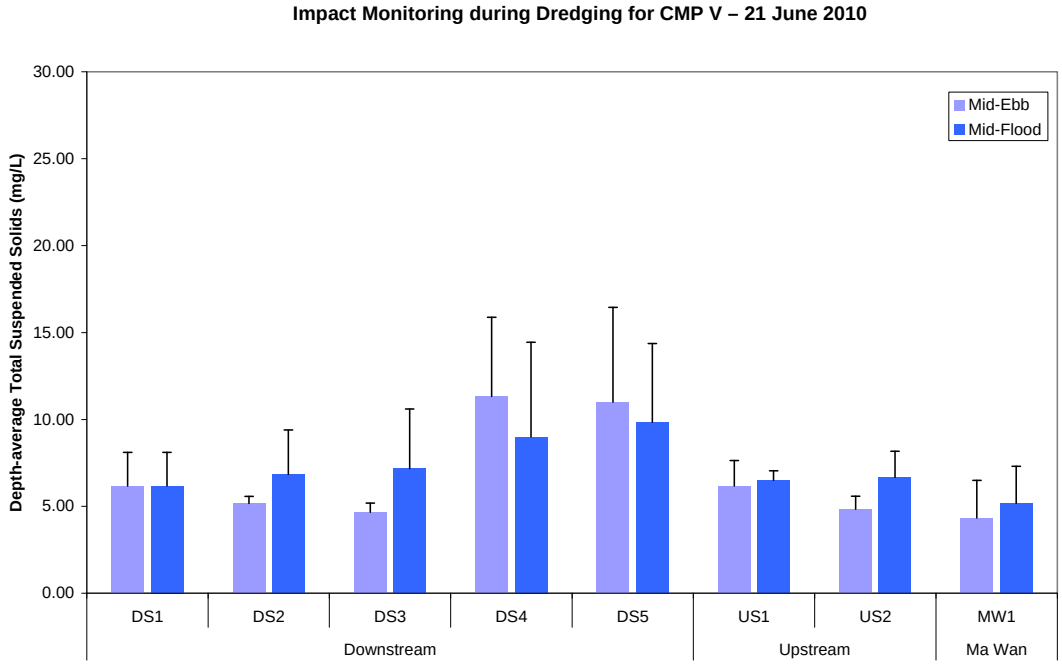

Figure 24: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 21 June 2010.

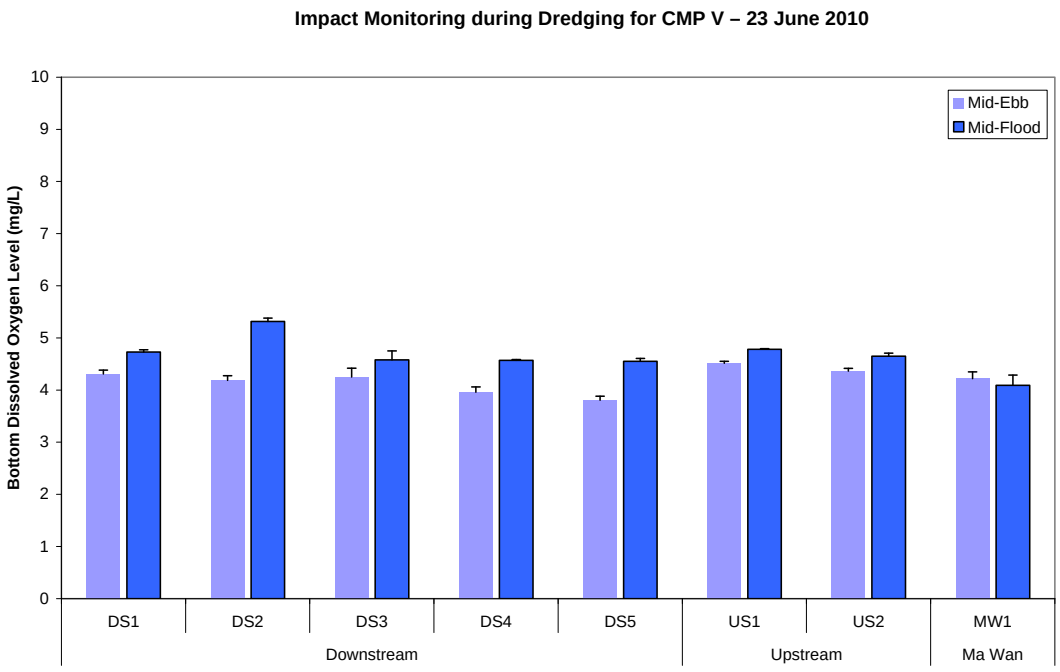

Figure 25: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 23 June 2010.

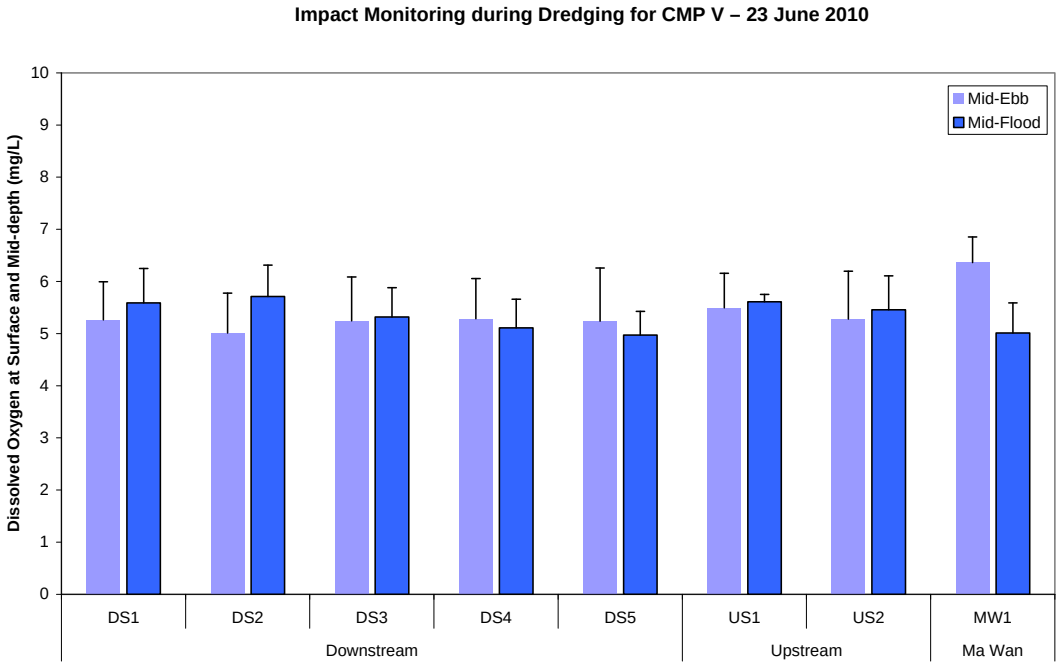

Figure 26: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 23 June 2010.

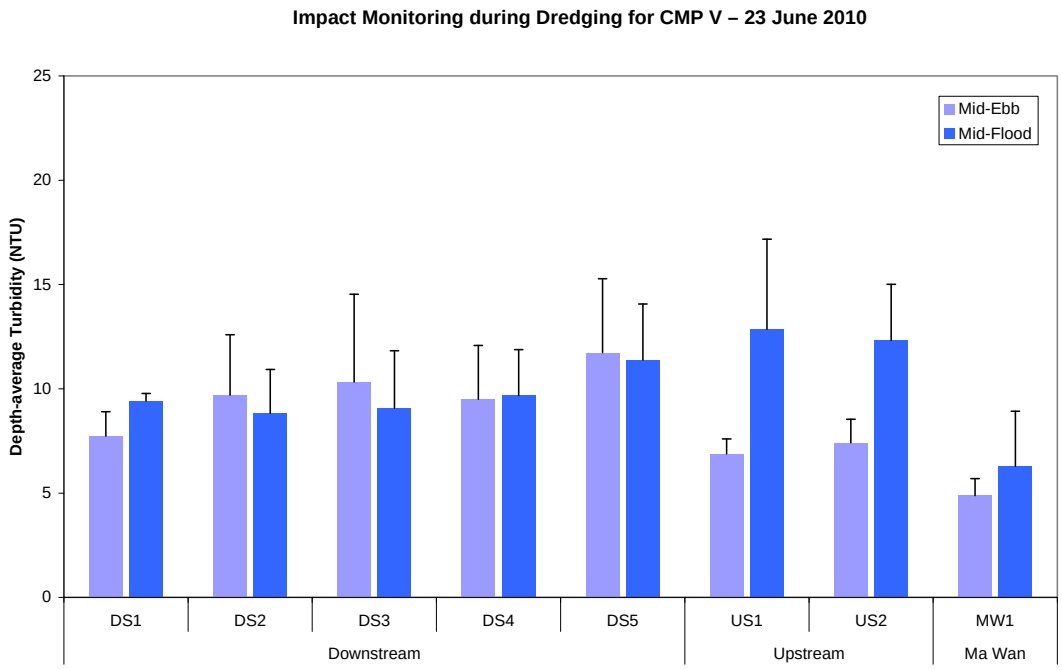

Figure 27: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 23 June 2010.

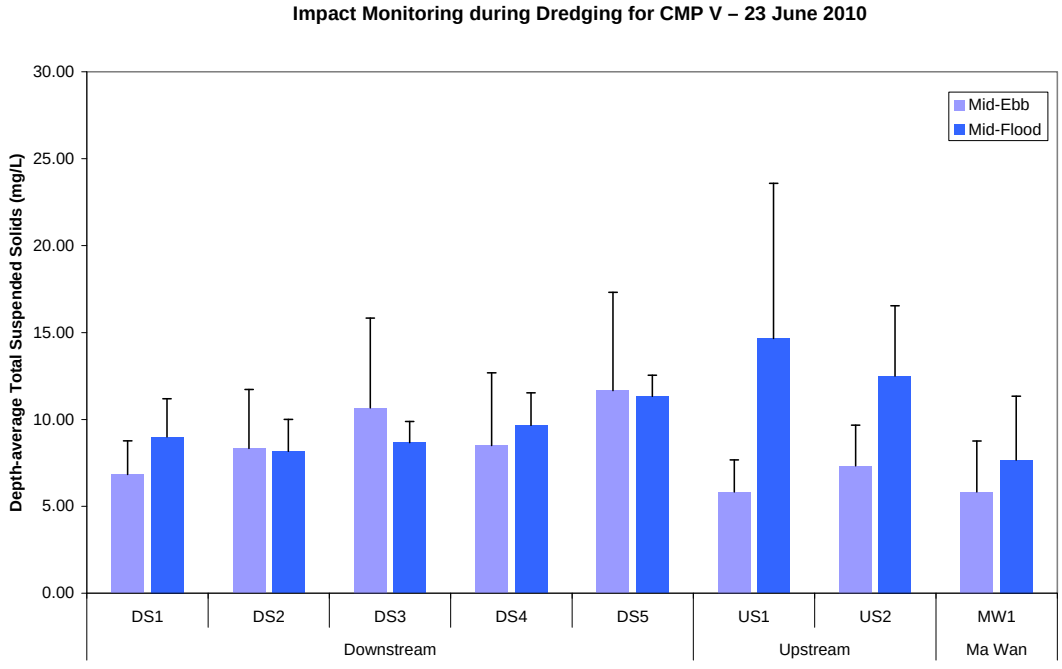

Figure 28: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 23 June 2010.

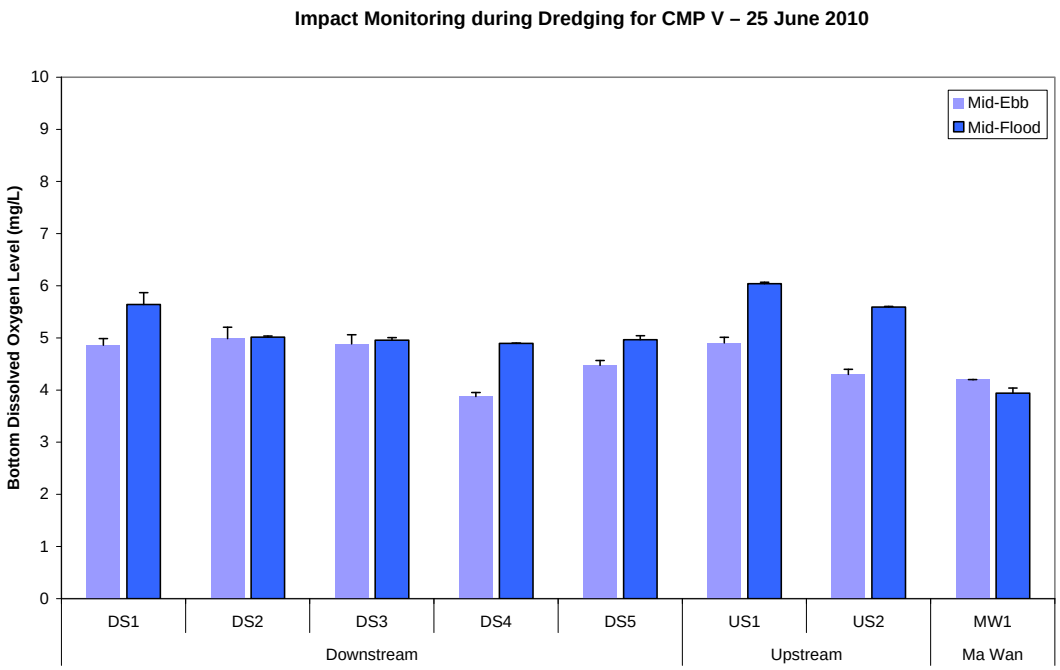

Figure 29: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 25 June 2010.

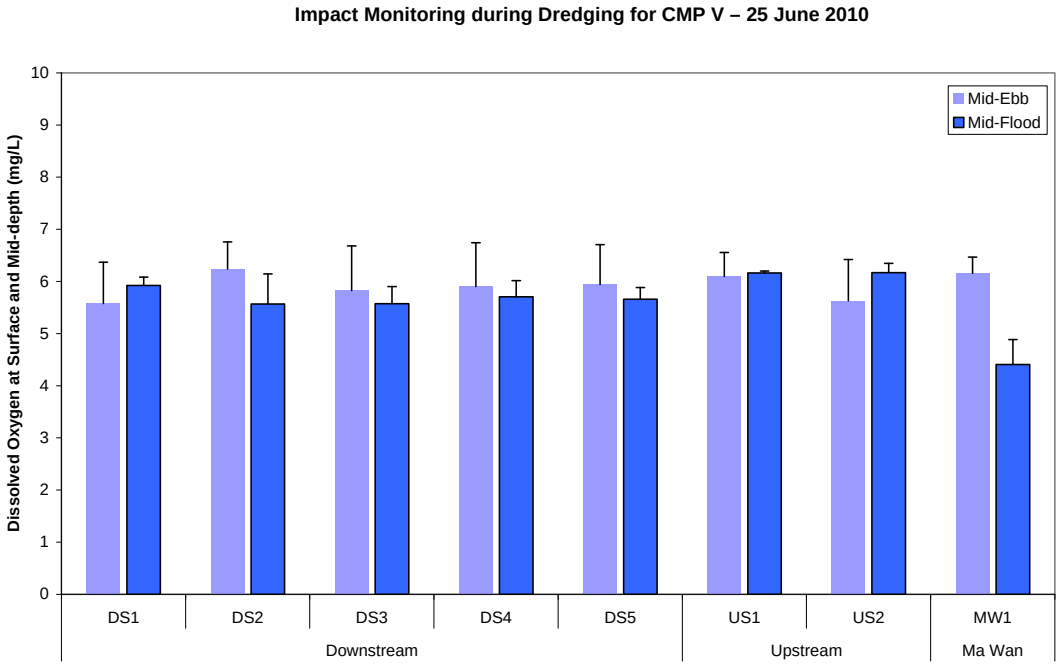

Figure 30: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 25 June 2010.

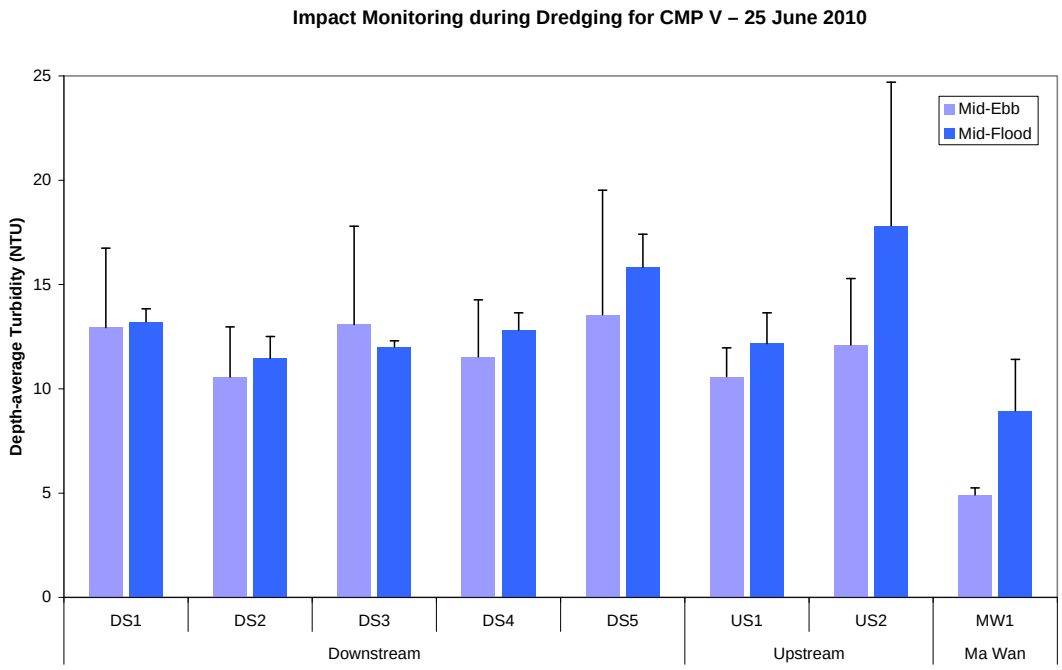

Figure 31: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 25 June 2010.

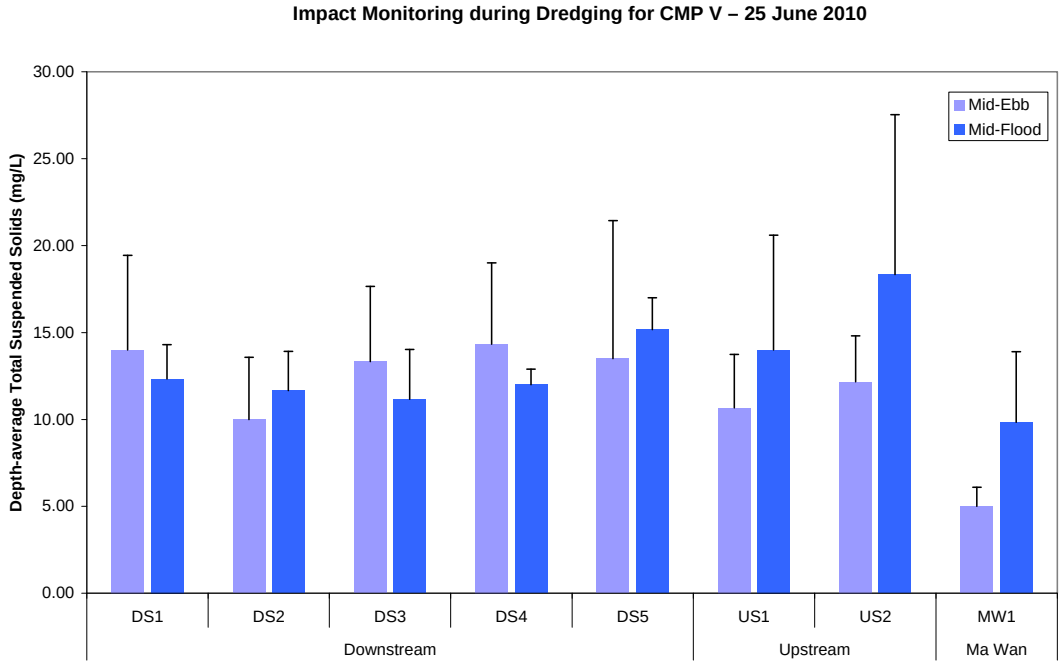

Figure 32: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 25 June 2010.

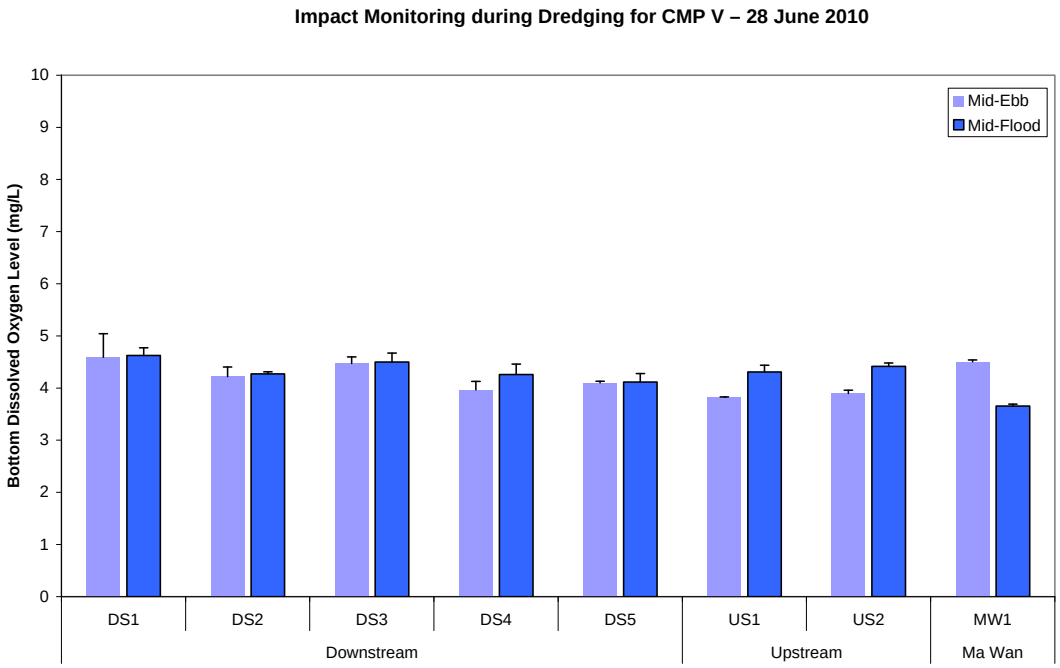

Figure 33: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 28 June 2010.

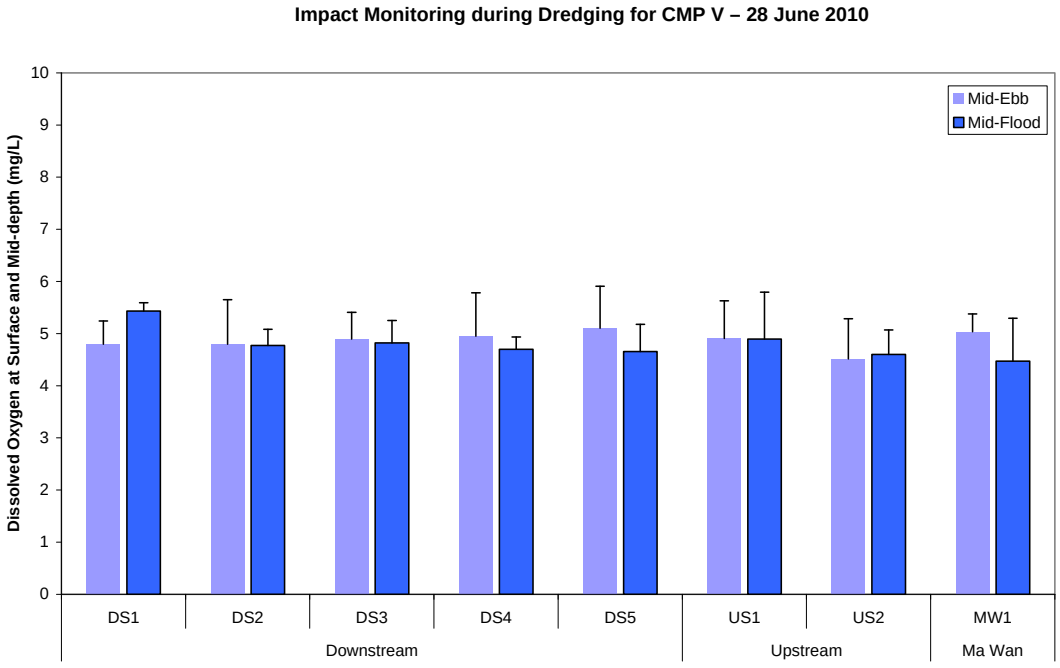

Figure 34: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 28 June 2010.

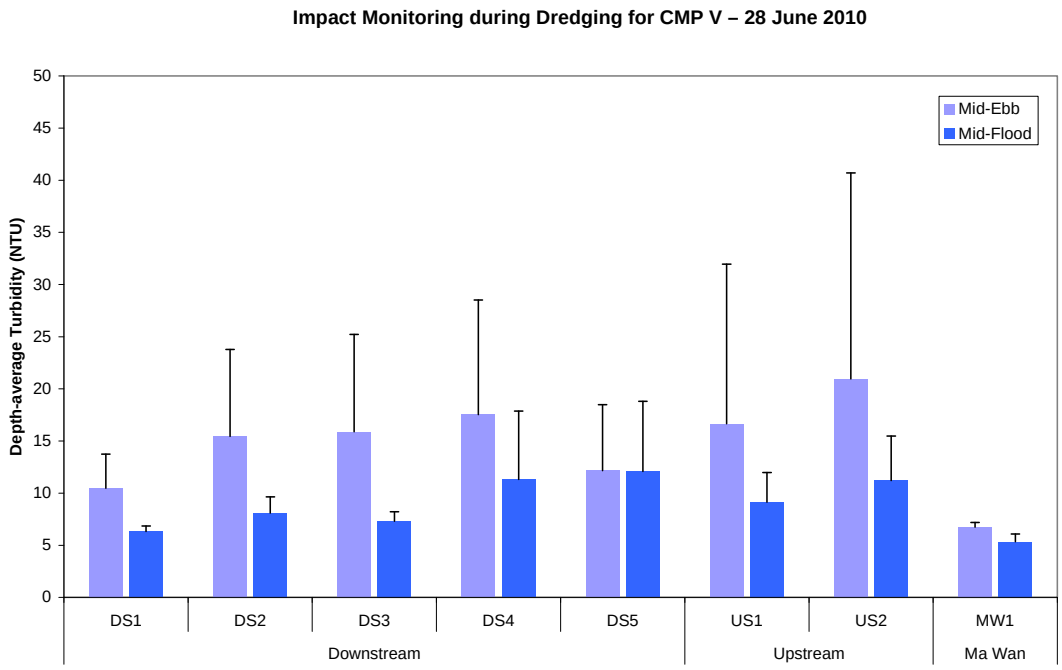

Figure 35: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 28 June 2010.

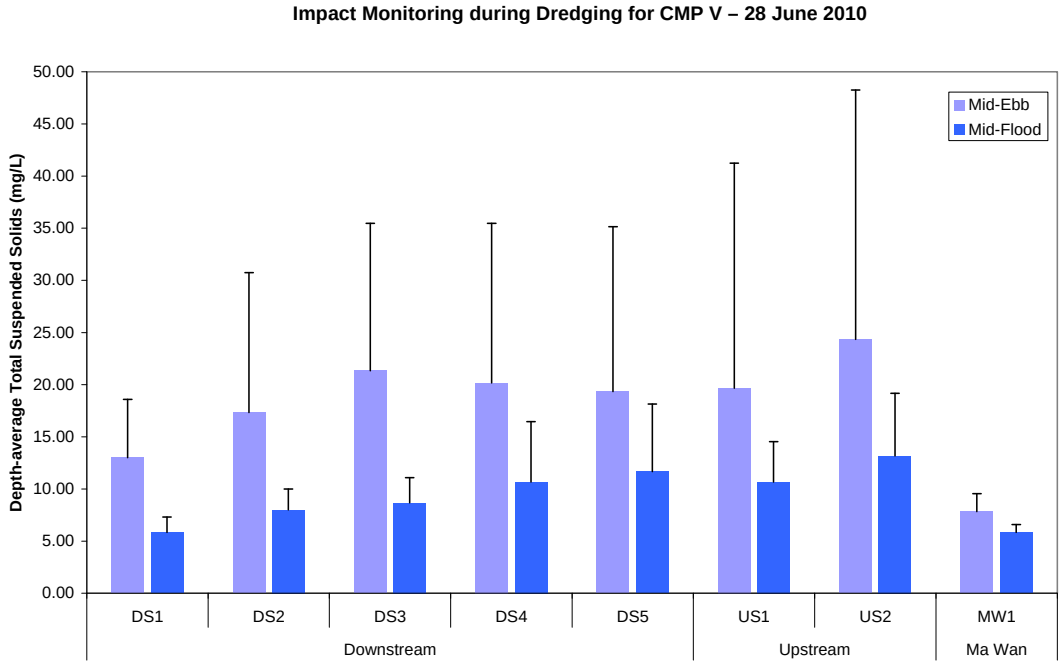

Figure 36: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 28 June 2010.

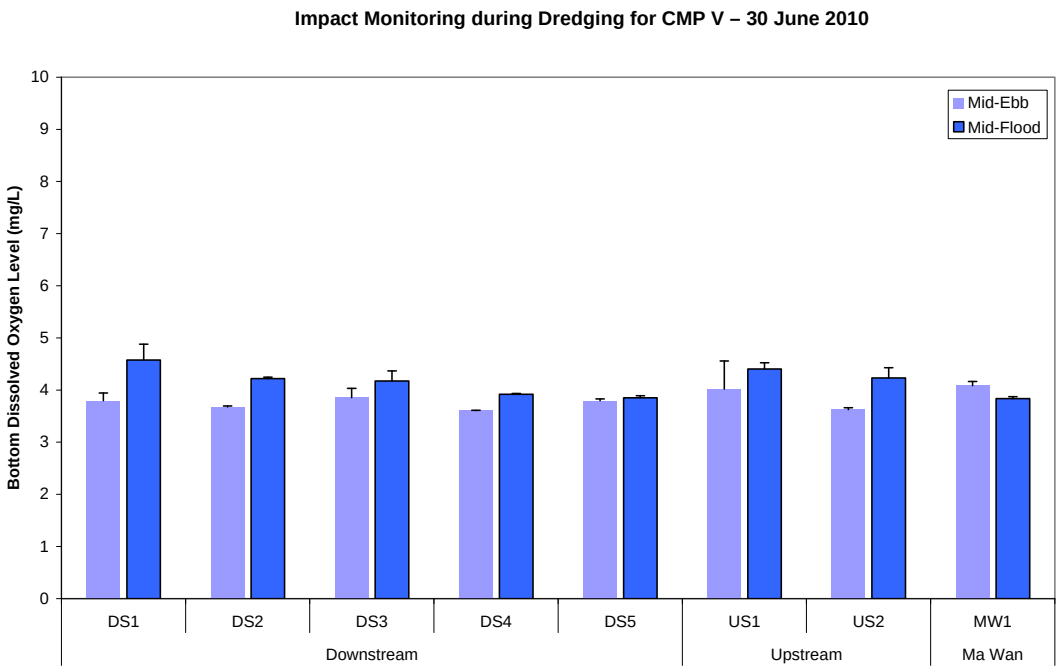

Figure 37: Bottom DO level (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 30 June 2010.

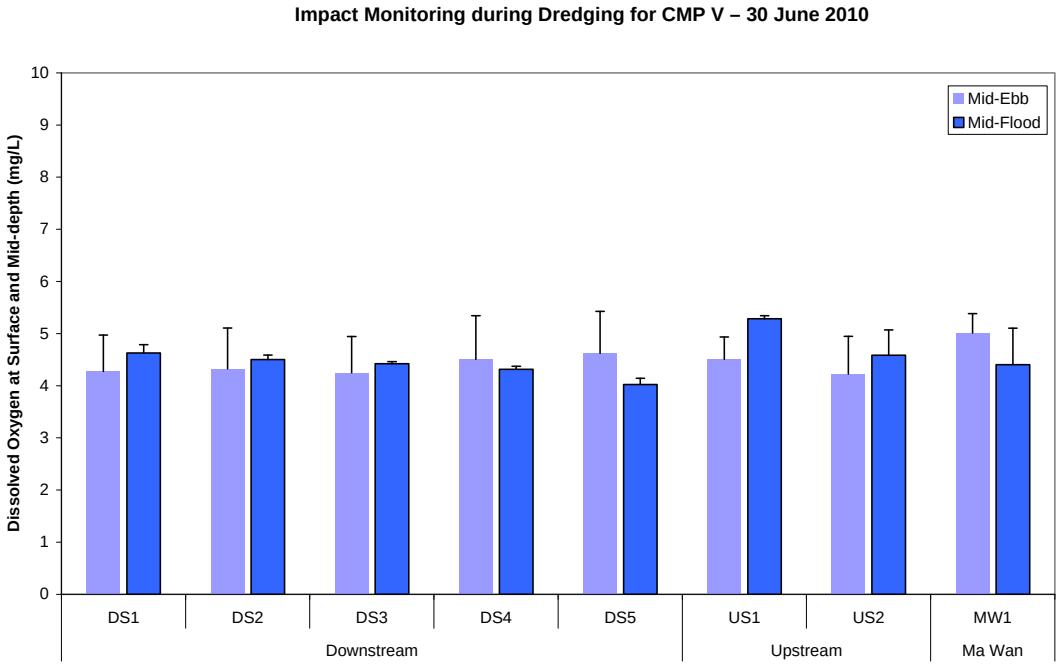

Figure 38: DO level at Surface and Mid-depth (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 30 June 2010.

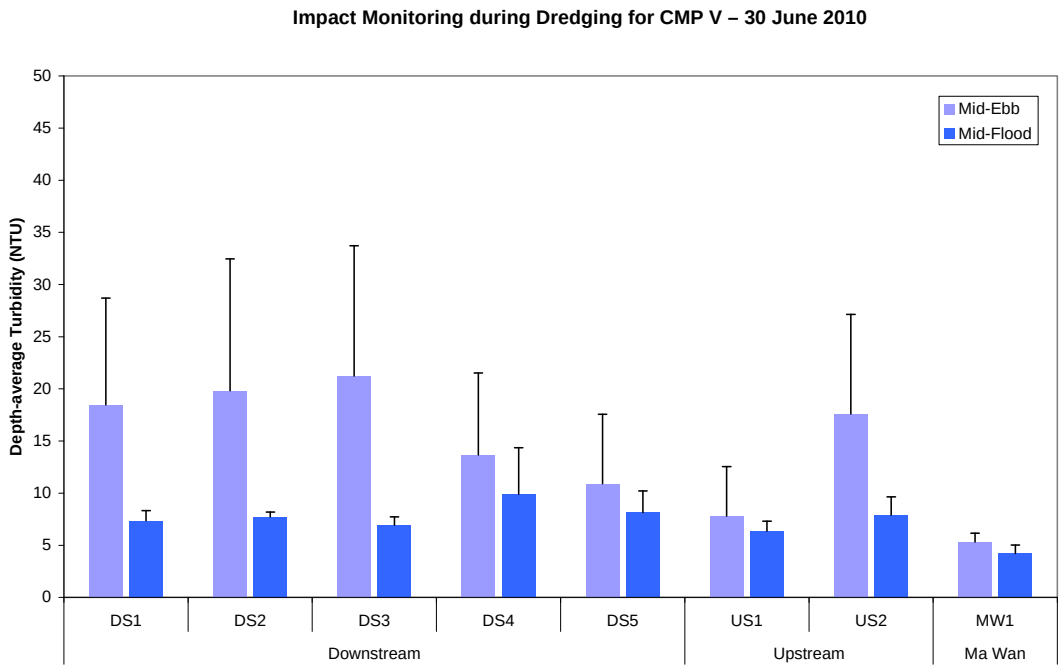

Figure 39: Depth-average Turbidity (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 30 June 2010.

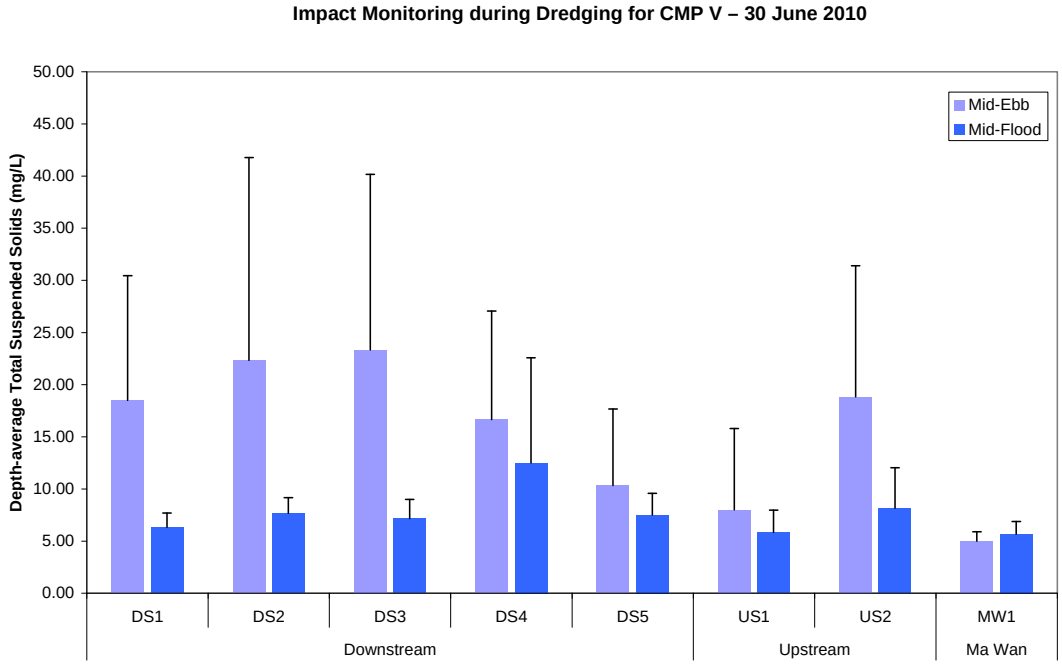

Figure 40: Depth-average TSS (mean + SD) at Downstream (DS1, DS2, DS3, DS4 and DS5), Upstream (US1 and US2) and Ma Wan (MW1) stations during Impact Monitoring for Dredging at CMP V on 30 June 2010.

Table B1: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 9 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	09:34-12:23		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.86	6.01
Turbidity (NTU)	5.11	N/A	N/A
SS (mg/L)	7.93	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	09:34-12:23		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.59	5.71
Turbidity (NTU)	5.46	N/A	N/A
SS (mg/L)	7.58	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	09:34-12:23		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.27	5.95
Turbidity (NTU)	0.85	N/A	N/A
SS (mg/L)	4.00	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	**Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Mean Value at Reference Stations**	**Compliance with Action level**	**Compliance with Limit Level**
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	6.01	5.71	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	6.86	6.59	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (6.55)	> 38.32	I ≥ 1.3 R (7.10)	5.11	5.46	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (9.10)	> 61.92	I ≥ 1.3 R (9.86)	7.93	7.58	Y	Y

Table B2: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 9 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	16:23-18:21		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.61	6.33
Turbidity (NTU)	4.51	N/A	N/A
SS (mg/L)	5.73	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	16:23-18:21		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	7.13	6.68
Turbidity (NTU)	5.01	N/A	N/A
SS (mg/L)	7.50	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	16:23-18:21		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.44	6.23
Turbidity (NTU)	2.15	N/A	N/A
SS (mg/L)	3.67	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Mean Value at Reference Stations**	**Compliance with Action level**	**Compliance with Limit Level**
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	6.33	6.68	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	6.61	7.13	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (6.01)	> 38.32	I ≥ 1.3 R (6.51)	4.51	5.01	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (9.00)	> 61.92	I ≥ 1.3 R (9.75)	5.73	7.50	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B3: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 12 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	11:46-15:00		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.87	5.83
Turbidity (NTU)	7.14	N/A	N/A
SS (mg/L)	9.47	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	11:46-15:00		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.70	5.60
Turbidity (NTU)	4.78	N/A	N/A
SS (mg/L)	7.08	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	11:46-15:00		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.25	5.81
Turbidity (NTU)	1.97	N/A	N/A
SS (mg/L)	5.17	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	**Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Mean Value at Reference Stations**	**Compliance with Action level**	**Compliance with Limit Level**
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	5.83	5.60	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	5.87	5.70	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (5.74)	> 38.32	I ≥ 1.3 R (6.22)	7.14	4.78	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (8.50)	> 61.92	I ≥ 1.3 R (9.21)	9.47	7.08	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B4: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 12 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	18:56-21:09		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.33	5.22
Turbidity (NTU)	8.13	N/A	N/A
SS (mg/L)	10.77	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	18:56-21:09		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.04	5.69
Turbidity (NTU)	7.46	N/A	N/A
SS (mg/L)	11.50	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	18:56-21:09		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.70	5.77
Turbidity (NTU)	4.58	N/A	N/A
SS (mg/L)	5.83	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	5.22	5.69	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	5.33	6.04	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (8.95)	> 38.32	I ≥ 1.3 R (9.70)	8.13	7.46	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (13.80)	> 61.92	I ≥ 1.3 R (14.95)	10.77	11.50	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B5: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 17 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	15:39-17:40		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.20	5.59
Turbidity (NTU)	8.88	N/A	N/A
SS (mg/L)	10.50	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	15:39-17:40		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.48	5.76
Turbidity (NTU)	9.43	N/A	N/A
SS (mg/L)	12.50	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	15:39-17:40		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.94	6.25
Turbidity (NTU)	2.57	N/A	N/A
SS (mg/L)	3.50	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	**Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Mean Value at Reference Stations**	**Compliance with Action level**	**Compliance with Limit Level**
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	5.59	5.76	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	6.20	6.48	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (11.32)	> 38.32	I ≥ 1.3 R (12.26)	8.88	9.43	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (15.00)	> 61.92	I ≥ 1.3 R (16.25)	10.50	12.50	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B6: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 17 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	08:20-11:18		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.86	5.66
Turbidity (NTU)	6.30	N/A	N/A
SS (mg/L)	6.43	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	08:20-11:18		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.93	5.75
Turbidity (NTU)	5.20	N/A	N/A
SS (mg/L)	6.17	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	08:20-11:18		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.91	5.46
Turbidity (NTU)	3.48	N/A	N/A
SS (mg/L)	4.67	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	5.66	5.75	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	5.86	5.93	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (6.24)	> 38.32	I ≥ 1.3 R (6.76)	6.30	5.20	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (7.40)	> 61.92	I ≥ 1.3 R (8.02)	6.43	6.17	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B7: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 19 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	17:26-19:34		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.03	4.85
Turbidity (NTU)	8.97	N/A	N/A
SS (mg/L)	11.00	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	17:26-19:34		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.56	4.74
Turbidity (NTU)	7.88	N/A	N/A
SS (mg/L)	8.08	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	17:26-19:34		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.69	5.14
Turbidity (NTU)	3.43	N/A	N/A
SS (mg/L)	3.00	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	4.85	4.74	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	6.03	5.56	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (9.45)	> 38.32	I ≥ 1.3 R (10.24)	8.97	7.88	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (9.70)	> 61.92	I ≥ 1.3 R (10.51)	11.00	8.08	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B8: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 19 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	10:52-13:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.76	5.24
Turbidity (NTU)	8.59	N/A	N/A
SS (mg/L)	8.47	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	10:52-13:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.46	5.57
Turbidity (NTU)	7.59	N/A	N/A
SS (mg/L)	8.25	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	10:52-13:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.82	4.75
Turbidity (NTU)	4.68	N/A	N/A
SS (mg/L)	5.20	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, p < 0.05)	< 2.00	R significantly greater than I (t-test, p < 0.05)	5.24	5.57	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, p < 0.05)	< 3.11	R significantly greater than I (t-test, p < 0.05)	5.76	6.46	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (9.11)	> 38.32	I ≥ 1.3 R (9.87)	8.59	7.59	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (9.90)	> 61.92	I ≥ 1.3 R (10.73)	8.47	8.25	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B9: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 21 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	07:49-10:44		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.61	4.64
Turbidity (NTU)	7.87	N/A	N/A
SS (mg/L)	7.67	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	07:49-10:44		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.59	4.42
Turbidity (NTU)	6.18	N/A	N/A
SS (mg/L)	5.50	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	07:49-10:44		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.07	4.68
Turbidity (NTU)	3.35	N/A	N/A
SS (mg/L)	4.33	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, p < 0.05)	< 2.00	R significantly greater than I (t-test, p < 0.05)	4.64	4.42	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, p < 0.05)	< 3.11	R significantly greater than I (t-test, p < 0.05)	5.61	5.59	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (7.41)	> 38.32	I ≥ 1.3 R (8.03)	7.87	6.18	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (6.60)	> 61.92	I ≥ 1.3 R (7.15)	7.67	5.50	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B10: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 21 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	14:07-16:34		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.81	5.15
Turbidity (NTU)	7.31	N/A	N/A
SS (mg/L)	7.80	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	14:07-16:34		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.07	5.04
Turbidity (NTU)	7.83	N/A	N/A
SS (mg/L)	6.58	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	14:07-16:34		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.55	4.19
Turbidity (NTU)	3.17	N/A	N/A
SS (mg/L)	5.17	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, p < 0.05)	< 2.00	R significantly greater than I (t-test, p < 0.05)	5.15	5.04	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, p < 0.05)	< 3.11	R significantly greater than I (t-test, p < 0.05)	5.81	6.07	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (9.39)	> 38.32	I ≥ 1.3 R (10.17)	7.31	7.83	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (7.90)	> 61.92	I ≥ 1.3 R (8.56)	7.80	6.58	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B11: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 23 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	09:31-12:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.21	4.10
Turbidity (NTU)	9.80	N/A	N/A
SS (mg/L)	9.20	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	09:31-12:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.39	4.44
Turbidity (NTU)	7.15	N/A	N/A
SS (mg/L)	6.58	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	09:31-12:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.36	4.22
Turbidity (NTU)	4.88	N/A	N/A
SS (mg/L)	5.83	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
DO (Bottom)	< 2.96	R significantly greater than I (t-test, p < 0.05)	< 2.00	R significantly greater than I (t-test, p < 0.05)	4.10	4.44	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, p < 0.05)	< 3.11	R significantly greater than I (t-test, p < 0.05)	5.21	5.39	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (8.58)	> 38.32	I ≥ 1.3 R (9.30)	9.80	7.15	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (7.90)	> 61.92	I ≥ 1.3 R (8.56)	9.20	6.58	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B12: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 23 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	17:04-19:10		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.34	4.75
Turbidity (NTU)	9.68	N/A	N/A
SS (mg/L)	9.37	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	17:04-19:10		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.53	4.72
Turbidity (NTU)	12.59	N/A	N/A
SS (mg/L)	13.58	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	17:04-19:10		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.01	4.09
Turbidity (NTU)	6.28	N/A	N/A
SS (mg/L)	7.67	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	4.75	4.72	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	5.34	5.53	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (15.11)	> 38.32	I ≥ 1.3 R (16.37)	9.68	12.59	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (16.30)	> 61.92	I ≥ 1.3 R (17.66)	9.37	13.58	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B13: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 25 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	10:59-14:01		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.90	4.62
Turbidity (NTU)	12.33	N/A	N/A
SS (mg/L)	13.03	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	10:59-14:01		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.86	4.60
Turbidity (NTU)	11.34	N/A	N/A
SS (mg/L)	11.42	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	10:59-14:01		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.16	4.20
Turbidity (NTU)	4.92	N/A	N/A
SS (mg/L)	5.00	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	**Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Mean Value at Reference Stations**	**Compliance with Action level**	**Compliance with Limit Level**
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	4.62	4.60	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	5.90	5.86	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (13.61)	> 38.32	I ≥ 1.3 R (14.74)	12.33	11.34	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (13.70)	> 61.92	I ≥ 1.3 R (14.84)	13.03	11.42	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B14: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 25 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	18:31-20:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.68	5.09
Turbidity (NTU)	13.07	N/A	N/A
SS (mg/L)	12.47	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	18:31-20:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	6.17	5.82
Turbidity (NTU)	14.99	N/A	N/A
SS (mg/L)	16.17	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	18:31-20:37		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.41	3.94
Turbidity (NTU)	8.95	N/A	N/A
SS (mg/L)	9.83	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	5.09	5.82	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	5.68	6.17	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (17.99)	> 38.32	I ≥ 1.3 R (19.49)	13.07	14.99	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (19.40)	> 61.92	I ≥ 1.3 R (21.02)	12.47	16.17	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B15: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 28 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	13:12-15:11		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.91	4.27
Turbidity (NTU)	14.30	N/A	N/A
SS (mg/L)	18.23	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	13:12-15:11		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.71	3.86
Turbidity (NTU)	18.80	N/A	N/A
SS (mg/L)	22.00	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	13:12-15:11		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.04	4.51
Turbidity (NTU)	6.75	N/A	N/A
SS (mg/L)	7.83	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

	Action Level		Limit Level					
Parameter	**Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Comparison between I and R [(a)]**	**Mean Value at Impact Stations**	**Mean Value at Reference Stations**	**Compliance with Action level**	**Compliance with Limit Level**
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	4.27	3.86	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	4.91	4.71	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (22.56)	> 38.32	I ≥ 1.3 R (24.44)	14.30	18.80	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (26.40)	> 61.92	I ≥ 1.3 R (28.60)	18.23	22.00	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B16: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 28 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	05:42-08:26		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.88	4.35
Turbidity (NTU)	9.03	N/A	N/A
SS (mg/L)	8.97	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	05:42-08:26		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.75	4.36
Turbidity (NTU)	10.17	N/A	N/A
SS (mg/L)	11.92	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	05:42-08:26		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.47	3.66
Turbidity (NTU)	5.35	N/A	N/A
SS (mg/L)	5.83	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	4.35	4.36	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	4.88	4.75	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (12.20)	> 38.32	I ≥ 1.3 R (13.22)	9.03	10.17	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (14.30)	> 61.92	I ≥ 1.3 R (15.49)	8.97	11.92	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B17: Impact Water Quality Monitoring for Dredging Activities during Mid-ebb Tide for 30 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	14:13-16:23		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.39	3.75
Turbidity (NTU)	16.82	N/A	N/A
SS (mg/L)	18.23	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	14:13-16:23		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.37	3.82
Turbidity (NTU)	12.70	N/A	N/A
SS (mg/L)	13.42	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	14:13-16:23		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	5.01	4.09
Turbidity (NTU)	5.32	N/A	N/A
SS (mg/L)	5.00	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, $p < 0.05$)	< 2.00	R significantly greater than I (t-test, $p < 0.05$)	3.75	3.82	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, $p < 0.05$)	< 3.11	R significantly greater than I (t-test, $p < 0.05$)	4.39	4.37	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (15.24)	> 38.32	I ≥ 1.3 R (16.51)	16.82	12.70	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (16.10)	> 61.92	I ≥ 1.3 R (17.44)	18.23	13.42	Y	Y

Note: (a) I = Impact; R = Reference Stations

Table B18: Impact Water Quality Monitoring for Dredging Activities during Mid-flood Tide for 30 June 2010

Station	Downstream (Impact)		
Time (hh:mm)	07:09-09:41		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.38	4.15
Turbidity (NTU)	8.01	N/A	N/A
SS (mg/L)	8.23	N/A	N/A
Remarks	Dredging works were observed.		

Station	Upstream (Reference)		
Time (hh:mm)	07:09-09:41		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.94	4.32
Turbidity (NTU)	7.13	N/A	N/A
SS (mg/L)	7.00	N/A	N/A
Remarks	Dredging works were observed.		

Station	Ma Wan		
Time (hh:mm)	07:09-09:41		
Monitoring Depth (m)	Depth Average	Surface and Middle	Bottom
D.O. (mg/L)	N/A	4.41	3.84
Turbidity (NTU)	4.22	N/A	N/A
SS (mg/L)	5.67	N/A	N/A
Remarks			

Compliance with Action and Limit Levels

Parameter	Action Level		Limit Level		Mean Value at Impact Stations	Mean Value at Reference Stations	Compliance with Action level	Compliance with Limit Level
	Mean Value at Impact Stations	Comparison between I and R [(a)]	Mean Value at Impact Stations	Comparison between I and R [(a)]				
DO (Bottom)	< 2.96	R significantly greater than I (t-test, p < 0.05)	< 2.00	R significantly greater than I (t-test, p < 0.05)	4.15	4.32	Y	Y
DO (Surface and Mid Depth)	< 3.76	R significantly greater than I (t-test, p < 0.05)	< 3.11	R significantly greater than I (t-test, p < 0.05)	4.38	4.94	Y	Y
Turbidity (Depth-averaged)	> 28.14	I ≥ 1.2 R (8.56)	> 38.32	I ≥ 1.3 R (9.27)	8.01	7.13	Y	Y
SS (Depth-averaged)	> 37.88	I ≥ 1.2 R (8.40)	> 61.92	I ≥ 1.3 R (9.10)	8.23	7.00	Y	Y

Note: (a) I = Impact; R = Reference Stations

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

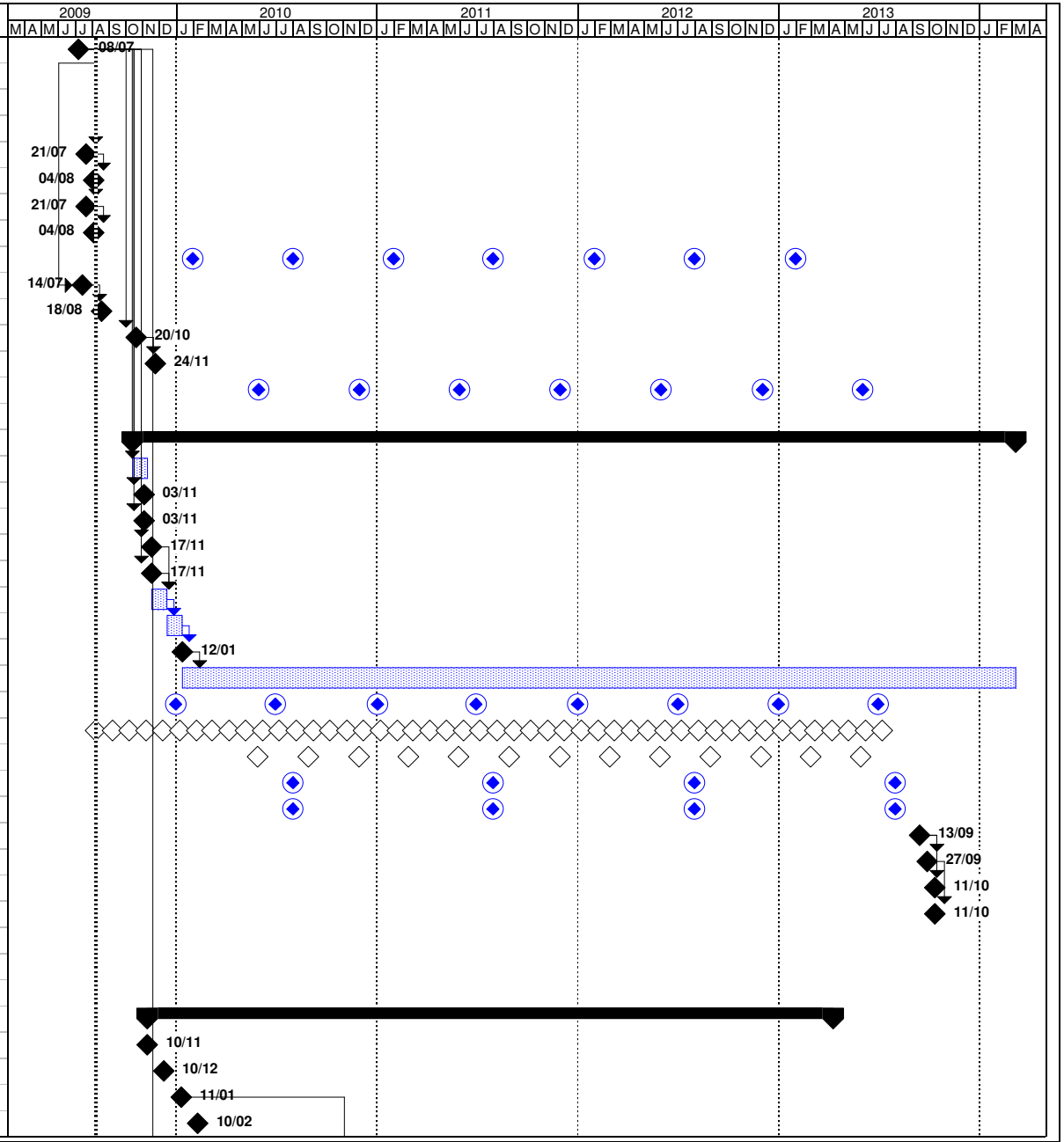

Figure 4.1 - Study Programme

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

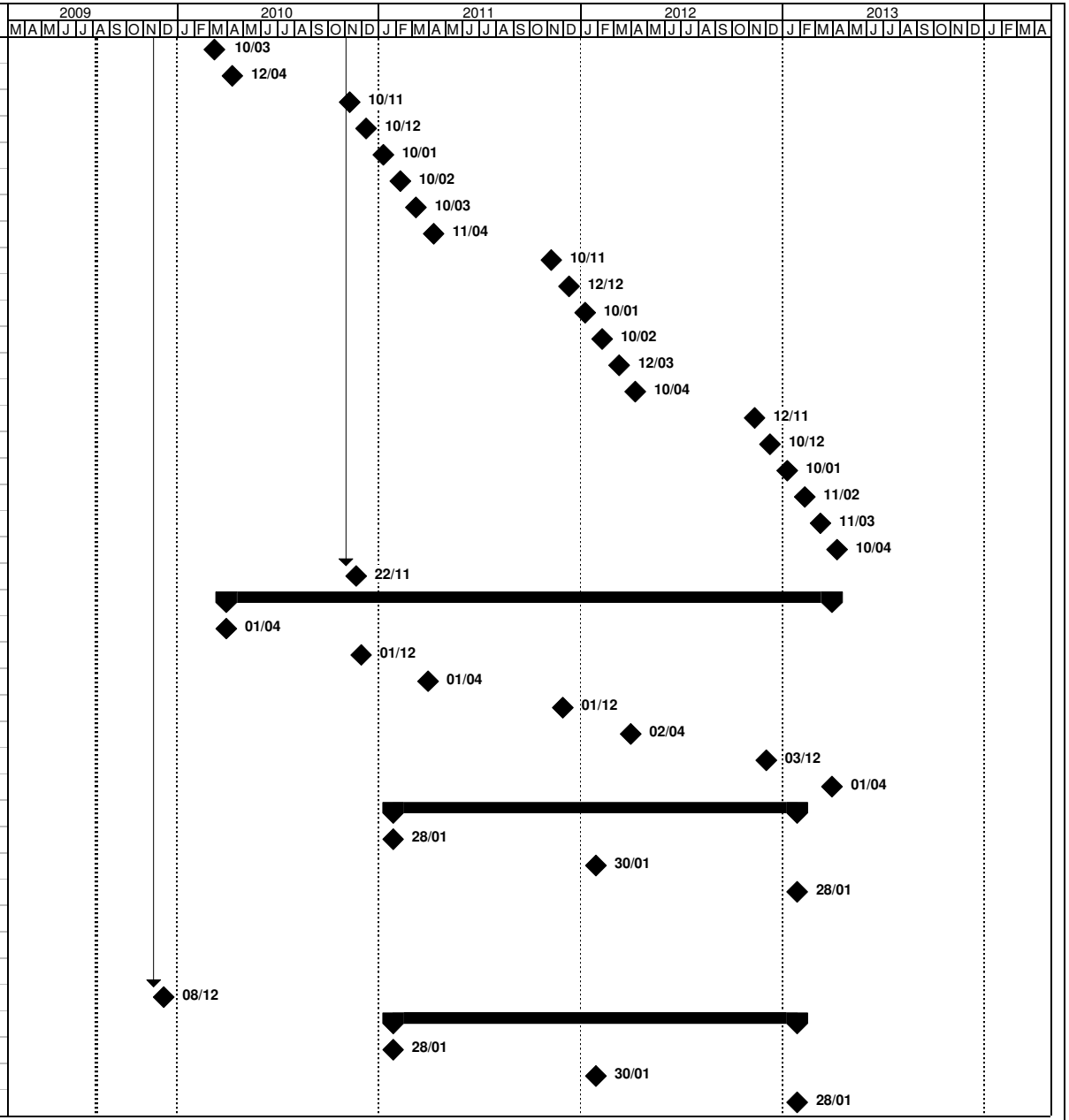

Figure 4.1 - Study Programme

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