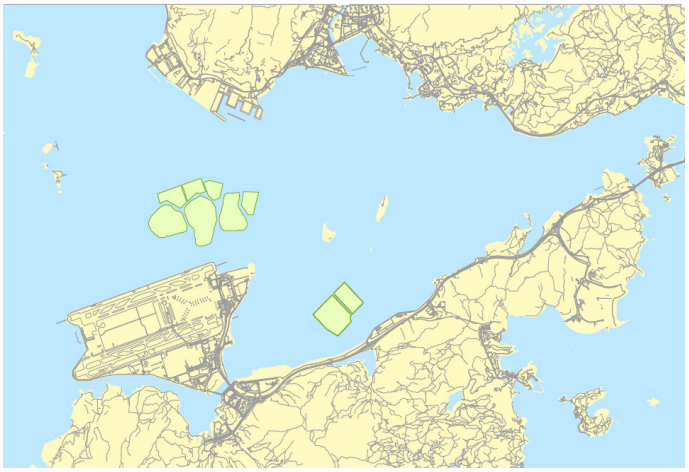
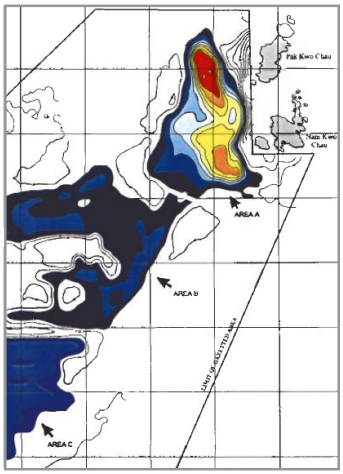
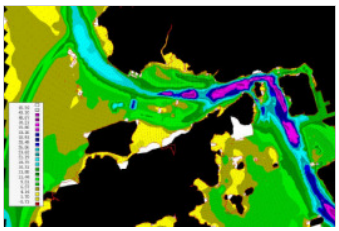






Environmental Monitoring and Audit for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau (2012-2017) – Investigation

Agreement No. CE 23/2012(EP)

7th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – March 2013

Revision 0

16 April 2013

Environmental Resources Management
16/F, DCH Commercial Centre
25 Westlands Road
Quarry Bay, Hong Kong
Telephone (852) 2271 3000
Facsimile (852) 2723 5660
www.erm.com

Environmental Monitoring and Audit for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau (2012-2017) – Investigation

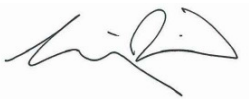
7th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – March 2013

Revision 0

Document Code: 0175086 Monthly Mar 13_v0.doc

Environmental Resources Management

16/F
DCH Commercial Centre
25 Westlands Road
Quarry Bay
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)	0175086
Summary: This document presents the seventh monthly progress report for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau.	Date: 16 April 2013 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
v0	7th Monthly Progress Report for CMP V and SB CMPs	RC	JT	CAR	16/4/13

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CEDD Civil Engineering and Development Department

ERM

Dredging, Management and Capping of Contaminated Sediment Disposal Facility to the South of The Brothers

Environmental Certification Sheet
EP-427/2011/A

Reference Document/Plan

Document/~~Plan~~ to be ~~Certified~~/ Verified:	7th Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – March 2013
Date of Report:	16 April 2013
Date prepared by ET:	16 April 2013
Date received by IA:	16 April 2013

Reference EP Condition

Environmental Permit Condition: Condition No.: 4.4

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

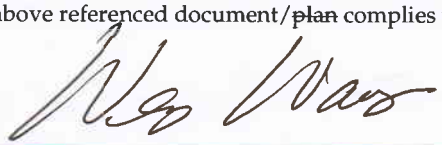
ET Certification

I hereby certify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-427/2011/A

Craig A. Reid,
Environmental Team Leader:  Date: 16/4/2013

IA Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-427/2011/A

Dr Wang Wen Xiong,
Independent Auditor:  Date: 16/4/2013

CONTENTS

ANNEXES

Agreement No. CE 23/2012 (EP)
Environmental Monitoring and Audit
for Contaminated Mud Pits at the South of The Brothers and at East Sha Chau (2012-2017) - Investigation

7TH MONTHLY PROGRESS REPORT FOR MARCH 2013

1.1 BACKGROUND

1.1.1 Since early 1990s, contaminated sediment (1) arising from various construction works in Hong Kong has been disposed of at a series of seabed pits at East of Sha Chau (ESC). In late 2008, a review indicated that the existing and planned facilities at ESC would not be able to meet the disposal demand after 2012. In order to meet this demand, the Hong Kong Special Administrative Region Government (HKSARG) decided to implement a new contained aquatic disposal (CAD) (2) facility at the South of The Brothers (SB CMPs) (hereafter referred to as "the Project") which had been under consideration for a number of years.

1.1.2 The environmental acceptability of the construction and operation of the Project had been confirmed by findings of the associated Environmental Impact Assessment (EIA) study completed in 2005 under *Agreement No. CE 12/2002(EP)* (3). The Director of Environmental Protection (DEP) approved this EIA report under the *Environmental Impact Assessment Ordinance* (*Cap. 499*) (*EIAO*) in September 2005 (*EIA Register No.: AEIAR-089/2005*).

1.1.3 In accordance with the EIA recommendation, prior to commencement of construction works for the SB CMPs, the Civil Engineering and Development Department (CEDD) undertook a detailed review and update of the EIA findings for the SB site (4). Findings of the EIA review undertaken in 2009/ 2010 confirmed that the construction and operation of the SB site had been predicted to be environmentally acceptable.

(1) According to the Management Framework of Dredged/ Excavated Sediment of ETWB TC(W) No. 34/2002, contaminated sediment in general shall mean those sediment requiring Type 2 – Confined Marine Disposal as determined according to this TC(W).

(2) CAD options may involve use of excavated borrow pits, or may involve purpose-built excavated pits. CAD sites are those which involve filling a seabed pit with contaminated mud and capping it with uncontaminated material such that the original seabed level is restored and the contaminated material is isolated from the surrounding marine environment.

(3) Detailed Site Selection Study for a Proposed Contaminated Mud Disposal Facility within the Airport East/ East of Sha Chau Area (Agreement No. CE 12/2002(EP))

(4) Under the CEDD study *Contaminated Sediment Disposal Facility to the South of The Brothers (Agreement No. FM 2/2009)*

1.1.4 An *Environmental Permit* (*EP-427/2011*) was issued by the Environmental Protection Department (EPD) to the CEDD, the Permit Holder, on 3 November 2011 and varied on 23 December 2011 (*EP-427/2011/A*). Under the requirements of *Condition 4* of the *EP* (*EP-427/2011/A*), an Environmental Monitoring and Audit (EM&A) programme as set out in the EM&A Manual (1) is required to be implemented for the SB CMPs. The present EM&A programme undertaken under *Agreement No. CE 23/2012 (EP)* covers the dredging, disposal and capping operations of the SB CMPs.

1.2 REPORTING PERIOD

1.2.1 This Monthly Progress Report covers the EM&A activities for the reporting month of March 2013.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

1.3.1 *Impact Water Quality Monitoring during Dredging Operations of CMP 1* was conducted three times per week (ie 2, 4, 6, 8, 11, 13, 15, 18, 20, 22, 25, 27 and 29 March 2013) in this reporting month in accordance with the EM&A Manual.

1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS

1.4.1 No outstanding sampling remained from March 2013. Laboratory analysis of Suspended Solids (SS) collected after 25 March 2013 was still in progress during the preparation of this monthly report. A summary of field activities conducted are presented in *Annex A*.

1.5 BRIEF DISCUSSION OF THE MONITORING RESULTS FOR SB CMPS

1.5.1 Monitoring data collected for SB CMPs from 26 February to 25 March 2013 are presented in this monthly report. Detailed discussion will be presented in the corresponding *Quarterly Report*.

(1) ERM (2012) Environmental Monitoring and Audit (EM&A) Manual. Final First Review. Environmental Monitoring and Audit for Contaminated Mud Pits to the South of the Brothers and at East Sha Chau (2012-2017) – Investigation. Agreement No. CE 23/2012(EP). Submitted to EPD in November 2012.

1.5.2 Impact Water Quality Monitoring during Dredging Operations of CMP 1 – February and March 2013

1.5.3 *Impact Water Quality Monitoring during Dredging Operations of CMP 1* was conducted three times per week with a total of thirteen (13) sampling days from 26 February to 25 March 2013. 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 1. Monitoring was also conducted at five Sensitive Receiver Stations (Ma Wan, Shum Shui Kok, Tai Mo To and Tai Ho Bay). A total of twelve stations were monitored and locations of the sampling stations are shown in *Figure 1.1*.

1.5.4 Monitoring results from 26 February to 25 March 2013 are presented in *Table B1* of *Annex B*. Levels of Dissolved Oxygen (DO), Turbidity and SS generally complied with the Action and Limit Levels (see *Table B2* for details) set in the Baseline Monitoring Report [(1)], except during mid-flood tide on 26, 28 February 2013.

1.5.5 Action Level exceedances of Turbidity and SS were recorded during mid-flood tide at Impact station DS1, on 26 and 28 February 2013, respectively.

1.5.6 Station DS1 is located in close proximity to the works area of CMP 1 (ie within 500m from the works area). Since the exceedances were recorded at station DS1 and during one tidal period only, it is considered that the sediment plume was transient in nature and limited to the close vicinity of the works area as predicted in the EIA review of the Project [(2)]. Hence, the dredging works did not appear to cause any unacceptable deterioration in water quality. It should also be noted that high levels of SS and Turbidity were occasionally recorded during baseline monitoring which are considered to be sporadic events and characteristic of water quality in this area of Hong Kong. As such, the exceedances recorded may also be caused by natural background variation in water quality of the area.

1.5.7 Overall, the results indicated that the dredging operations at CMP 1 of SB did not appear to cause any unacceptable deterioration in water quality during this reporting period. Therefore, no further mitigation measures, except for those recommended in the Environmental Permit (*EP-427/2011/A*), are considered necessary for the dredging operations.

(1) ERM (2012) Baseline Monitoring Report. Environmental Monitoring and Audit for Contaminated Mud Pits to the South of the Brothers and at East Sha Chau (2012-2017) – Investigation. Agreement No. CE 23/2012(EP). Submitted to EPD in October 2012.

(2) Under the CEDD study *Contaminated Sediment Disposal Facility to the South of The Brothers (Agreement No. FM 2/2009)*

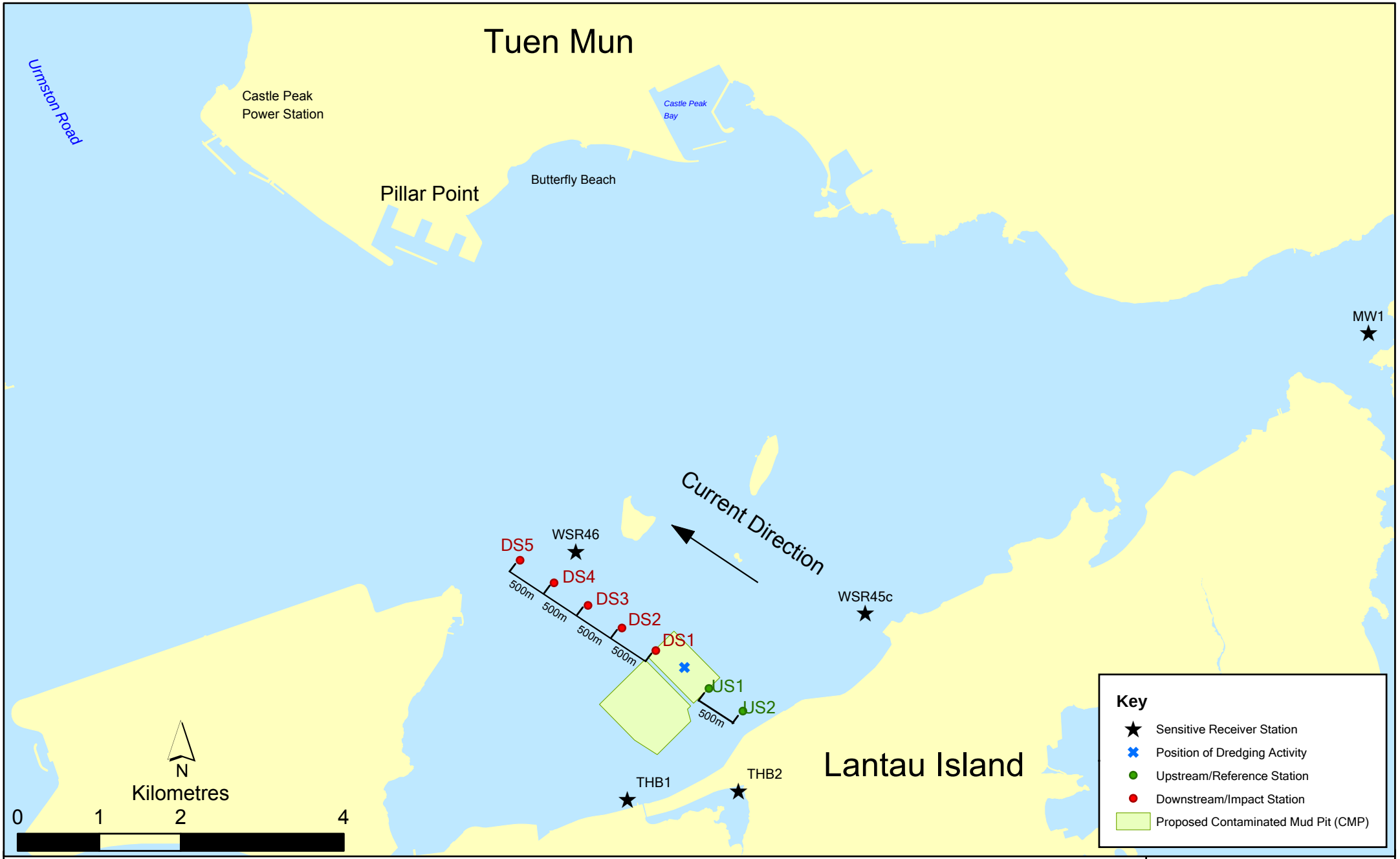


Figure 1.1

Indicative Dredging Impact Sampling Stations for South Brothers Facility

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

File: T:\GIS\CONTRACT\0175086\Mxd\0175086_3.2a_Indicative Dredging Impact_Flood.mxd
Date: 11-Dec-2012

Environmental Resources Management

ERM

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

1.6.1 *Impact Water Quality Monitoring during Dredging Operations for CMP 1* will be conducted three times per week in the next monthly period of April 2013. 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 C*.

Annex A

Sampling Schedule

Annex A - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 2017)

			2012						2013												2014												2015												2016												2017											
Baseline Monitoring Prior to Dredging	**Code**	**Frequency**	**J**	**A**	**S**	**O**	**N**	**D**	**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**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Far Field Stations																																																																			
	SB-WFA	3 days per week for 4 weeks	*	*																																																															
	SB-WFB	3 days per week for 4 weeks	*	*																																																															
Mid Field Stations																																																																			
	SB-WMA	3 days per week for 4 weeks	*	*																																																															
	SB-WMB	3 days per week for 4 weeks	*	*																																																															
Near Field Stations																																																																			
	SB-WNAA	3 days per week for 4 weeks	*	*																																																															
	SB-WNAB	3 days per week for 4 weeks	*	*																																																															
	SB-WNBA	3 days per week for 4 weeks	*	*																																																															
	SB-WNBB	3 days per week for 4 weeks	*	*																																																															
Reference Stations																																																																			
	NM1	3 days per week for 4 weeks	*	*																																																															
	NM2	3 days per week for 4 weeks	*	*																																																															
	NM3	3 days per week for 4 weeks	*	*																																																															
	NM5	3 days per week for 4 weeks	*	*																																																															
	NM6	3 days per week for 4 weeks	*	*																																																															
Sensitive Receiver Stations																																																																			
	MW1	3 days per week for 4 weeks	*	*																																																															
	THB1	3 days per week for 4 weeks	*	*																																																															
	THB2	3 days per week for 4 weeks	*	*																																																															
	WSR45C	3 days per week for 4 weeks	*	*																																																														
	WSR46	3 days per week for 4 weeks	*	*																																																															
Impact Monitoring for Dredging			**J**	**A**	**S**	**O**	**N**	**D**	**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**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Upstream Stations																																																																			
	US1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	US2	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
Downstream Stations																																																																			
	DS1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	DS2	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	DS3	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	DS4	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	DS5	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
Sensitive Receiver Stations																																																																			
	MW1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	THB1	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	THB2	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	WSR45C	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
	WSR46	3 days per week					*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																							
Pit Specific Sediment Chemistry			**J**	**A**	**S**	**O**	**N**	**D**	**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**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
SB CMP 1 Active																																																																			
Near-Pit																																																																			
	SB-NNAA	Monthly															12	12	12	12	12	12	12	12	12	12	12	12	12																																							
	SB-NNAB	Monthly															12	12	12	12	12	12	12	12	12	12	12	12	12																																							
Pit-Edge																																																																			
	SB-NEAA	Monthly															12	12	12	12	12	12	12	12	12	12	12	12	12																																							
	SB-NEAB	Monthly															12	12	12	12	12	12	12	12	12	12	12	12	12																																							
Active-Pit																																																																			
	SB-NPAA	Monthly															12	12	12	12	12	12	12	12	12	12	12	12	12																																							
	SB-NPAB	Monthly															12	12	12	12	12	12	12	12	12	12	12	12	12																																							
SB CMP 2 Active																																																																			
Near-Pit																																																																			
	SB-NNBA	Monthly																														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
	SB-NNBB	Monthly																														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
Pit-Edge																																																																			
	SB-NEBA	Monthly																														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
	SB-NEBB	Monthly																														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
Active-Pit																																																																		
	SB-NPBA	Monthly																														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								
	SB-NPBB	Monthly																														12	12	12	12	12	12	12	12	12	12	12	12	12	12	12																								

Annex A - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 2017)

			2012						2013												2014												2015												2016												2017											
Cumulative Impact Sediment Chemistry			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	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-field Stations																																																																				
	SB-RNA	4 times per year																		12		12				12		12				12		12				12		12				12																								
	SB-RNB	4 times per year																		12		12				12		12				12		12				12		12				12																								
Mid-field Stations																																																																				
	SB-RMA	4 times per year																		12		12				12		12				12		12				12		12				12																								
	SB-RMB	4 times per year																		12		12				12		12				12		12				12		12				12																								
Far-Field Stations																																																																				
	SB-RFA	4 times per year																		12		12				12		12				12		12				12		12				12																								
	SB-RFB	4 times per year																		12		12				12		12				12		12				12		12				12																								
Capped Pit Stations																																																																				
	SB-RCA	4 times per year																		12		12				12		12				12		12				12		12				12																								
	SB-RCB	4 times per year																		12		12				12		12				12		12				12		12				12																								
Sensitive Receiver Stations																																																																				
	MW1	4 times per year																		12		12				12		12				12		12				12		12				12																								
	THB1	4 times per year																		12		12				12		12				12		12				12		12				12																								
	THB2	4 times per year																		12		12				12		12				12		12				12		12				12																								

Sediment Toxicity Tests			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
SB CMP 1 Active																																																																				
Reference																																																																				
	SB-TRA	2 times per year																				5																																												
	SB-TRB	2 times per year																				5																																												
Near-Field																																																																				
	SB-TAA	2 times per year																				5																																												
	SB-TAB	2 times per year																				5																																												
Sensitive Receiver Stations																																																																				
	MW1	2 times per year																				5																																												
	THB1	2 times per year																				5																																												
	THB2	2 times per year																				5																																												
SB CMP 2 Active																																																																				
Reference																																																																				
	SB-TRA	2 times per year																										5						5						5																												
	SB-TRB	2 times per year																										5						5						5																												
Near-Field																																																																				
	SB-TBA	2 times per year																										5						5						5																												
	SB-TBB	2 times per year																										5						5						5																												
Sensitive Receiver Stations																																																																				
	MW1	2 times per year																										5						5						5																												
	THB1	2 times per year																										5						5						5																												
	THB2	2 times per year																										5						5						5																												

Tissue/ Whole Body Sampling			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	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																																																																				
	SB-INA	2 times per year																				*						*						*						*																												
	SB-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	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	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Impact																																																																				
	SB-INA 1-5	4 times per year																			5	5					5	5					5	5					5	5																												
	SB-INB 1-5	4 times per year																			5	5					5	5					5	5					5	5																												
Reference North																																																																				
	TNA 1-5	4 times per year																			5	5					5	5					5	5					5	5																												
	TNB 1-5	4 times per year																			5	5					5	5					5	5					5	5																												
Reference South																																																																				
	TSA 1-5	4 times per year																			5	5					5	5					5	5					5	5																												
	TSB 1-5	4 times per year																			5	5					5	5					5	5					5	5																												

Annex A - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 2017)

			2012						2013												2014												2015												2016												2017											
Routine Water Quality Monitoring			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	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 Stations Downcurrent																																																																			
	SB-IPE1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-IPE2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-IPE3	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-IPE4	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-IPE5	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Intermediate Stations Downcurrent																																																																			
	SB-INE1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-INE2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-INE3	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-INE4	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-INE5	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Reference Stations Upcurrent																																																																			
	SB-RFE1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-RFE2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-RFE3	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-RFE4	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-RFE5	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Sensitive Receiver Stations																																																																			
	MW1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	THB1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	THB2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	WSR45C	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	WSR46	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Flood Tide																																																																			
Impact Stations Downcurrent																																																																			
	SB-IPF1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-IPF2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-IPF3	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Intermediate Stations Downcurrent																																																																			
	SB-INF1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-INF2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-INF3	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Reference Stations Upcurrent																																																																			
	SB-RFF1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-RFF2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	SB-RFF3	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
Sensitive Receiver Stations																																																																			
	MW1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	THB1	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	THB2	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	WSR45C	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									
	WSR46	8 times per year																8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8		8	8																									

Water Column Profiling			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	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	Monthly															4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4																								
	WCP2	Monthly															4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4																								

Annex A - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - December 2017)

			2012						2013												2014												2015												2016												2017											
Capping Water Quality Monitoring			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	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 Stations Downcurrent																																																																				
	SB-IPE1	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-IPE2	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-IPE3	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-IPE4	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-IPE5	8 times per year																																									3	3		3	3		3	3		3	3													
Intermediate Stations Downcurrent																																																																				
	SB-INE1	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-INE2	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-INE3	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-INE4	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-INE5	8 times per year																																									3	3		3	3		3	3		3	3													
Reference Stations Upcurrent																																																																				
	SB-RFE1	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-RFE2	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-RFE3	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-RFE4	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-RFE5	8 times per year																																									3	3		3	3		3	3		3	3													
Sensitive Receiver Stations																																																																				
	MW1	8 times per year																																									3	3		3	3		3	3		3	3													
	THB1	8 times per year																																																																		
	THB2	8 times per year																																																																		
	WSR45C	8 times per year																																									3	3		3	3		3	3		3	3													
	WSR46	8 times per year																																									3	3		3	3		3	3		3	3													
Flood Tide																																																																				
Impact Stations Downcurrent																																																																				
	SB-IPF1	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-IPF2	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-IPF3	8 times per year																																									3	3		3	3		3	3		3	3													
Intermediate Stations Downcurrent																																																																				
	SB-INF1	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-INF2	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-INF3	8 times per year																																									3	3		3	3		3	3		3	3													
Reference Stations Upcurrent																																																																				
	SB-RFF1	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-RFF2	8 times per year																																									3	3		3	3		3	3		3	3													
	SB-RFF3	8 times per year																																									3	3		3	3		3	3		3	3													
Sensitive Receiver Stations																																																																				
	MW1	8 times per year																																									3	3		3	3		3	3		3	3													
	THB1	8 times per year																																																																		
	THB2	8 times per year																																																																		
	WSR45C	8 times per year																																									3	3		3	3		3	3		3	3													
	WSR46	8 times per year																																									3	3		3	3		3	3		3	3													

Benthic Recolonisation Studies			J	A	S	O	N	D	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	M	A	M	J	J	A	S	O	N	D	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																																																																				
	SB-CPA	2 times per year																																																12				12								12				12
	SB-CPB	2 times per year																																																12				12								12				12
																																																		12				12								12				12
Reference Stations																																																																				
	RBA	2 times per year																																																12				12								12				12
	RBB	2 times per year																																																12				12								12				12
	RBC	2 times per year																																																12				12								12				12

Notes:
"*" = Number of replicates depends on parameters
Naming of stations are tentative only and will be subjected to changes

Annex B

Results of Impact Monitoring during Dredging Operations of CMP 1 in February and March 2013

Table B1 *Summary Table of DO, Turbidity and SS Levels Recorded in February and March 2013*

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
2013/2/26	Mid-Ebb	DS1	9.16	9.41	9.82	10.33
		DS2	9.17	9.34	3.26	4.11
		DS3	8.92	9.16	1.96	2.67
		DS4	9.51	9.64	1.82	3.44
		DS5	9.50	9.60	2.05	3.00
		US1	9.52	9.73	8.13	7.83
		US2	9.39	9.44	10.73	12.50
		MW1	8.13	8.53	1.40	3.11
		THB1	9.59	10.08	1.99	4.83
		THB2	-	9.74	2.81	3.33
		WSR45C	8.39	8.92	1.65	3.22
		WSR46	9.04	9.58	1.83	4.44
	Mid-Flood	DS1	9.23	9.27	29.27	15.67
		DS2	9.13	9.26	4.35	4.17
		DS3	9.26	9.29	3.12	4.50
		DS4	9.32	9.34	3.55	4.33
		DS5	9.38	9.46	2.47	4.50
		US1	8.93	9.00	2.76	4.33
		US2	8.97	9.04	2.80	3.89
		MW1	8.35	8.38	3.07	6.56
		THB1	8.91	8.96	1.97	4.00
		THB2	-	8.75	3.47	2.67
		WSR45C	8.74	8.83	2.36	5.56
		WSR46	8.89	8.96	4.62	8.00
2013/2/28	Mid-Ebb	DS1	8.97	9.09	4.04	9.22
		DS2	8.75	9.07	7.82	14.11
		DS3	8.72	9.09	3.83	6.89
		DS4	8.83	9.09	1.83	6.78
		DS5	8.99	9.11	1.75	6.33
		US1	9.05	9.09	7.20	11.17
		US2	9.05	9.05	8.42	12.50
		MW1	8.16	8.23	2.08	9.44
		THB1	8.59	8.68	1.47	6.50
		THB2	-	9.16	2.04	6.33
		WSR45C	8.12	8.59	2.17	5.22
		WSR46	8.49	8.75	2.94	7.22
	Mid-Flood	DS1	9.34	9.36	20.60	30.83
		DS2	9.28	9.35	9.15	13.33
		DS3	9.20	9.25	4.12	9.67
		DS4	9.00	9.06	3.72	5.50
		DS5	8.99	9.02	2.74	8.56
		US1	9.12	9.22	5.87	8.00
		US2	8.79	8.92	2.74	6.33
		MW1	8.41	8.58	2.32	15.67
		THB1	8.65	8.73	1.66	8.50
		THB2	-	7.52	10.61	6.33
		WSR45C	8.78	8.91	3.06	7.56

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		WSR46	8.98	9.04	8.20	7.33
2013/3/2	Mid-Ebb	DS1	7.76	7.84	6.45	6.50
		DS2	7.74	7.90	7.07	8.50
		DS3	7.71	7.83	2.58	4.33
		DS4	7.75	7.79	2.30	2.67
		DS5	7.74	7.74	1.90	2.00
		US1	7.77	7.82	5.30	7.00
		US2	7.76	7.76	5.37	5.00
		MW1	7.77	7.80	2.07	4.17
		THB1	8.00	8.04	1.77	3.00
		THB2	-	7.68	3.51	7.67
		WSR45C	7.73	7.89	1.95	2.67
		WSR46	8.00	8.03	2.35	5.50
	Mid-Flood	DS1	8.18	8.18	5.87	8.00
		DS2	8.05	8.17	5.80	5.00
		DS3	8.11	8.15	4.23	4.33
		DS4	7.89	8.10	3.17	5.00
		DS5	7.88	7.92	3.40	3.83
		US1	8.00	8.03	5.02	4.33
		US2	7.93	8.01	4.15	4.67
		MW1	7.69	7.77	1.79	3.50
		THB1	7.90	7.95	2.70	2.33
		THB2	-	7.08	12.24	22.00
		WSR45C	7.89	7.94	3.17	4.83
		WSR46	8.05	8.07	11.45	21.17
2013/3/4	Mid-Ebb	DS1	7.26	7.41	6.70	7.00
		DS2	7.35	7.45	3.65	3.67
		DS3	7.51	7.54	3.22	4.83
		DS4	7.39	7.58	2.53	2.67
		DS5	7.65	7.62	2.68	4.33
		US1	7.63	7.56	3.78	7.00
		US2	7.60	7.62	5.53	8.83
		MW1	7.03	7.05	1.90	4.00
		THB1	7.27	7.27	2.90	4.00
		THB2	-	8.12	4.77	5.67
		WSR45C	7.29	7.40	2.90	5.67
		WSR46	7.13	7.33	3.00	6.17
	Mid-Flood	DS1	7.36	7.40	5.57	9.00
		DS2	7.40	7.40	4.40	6.00
		DS3	7.46	7.42	3.72	4.17
		DS4	7.58	7.48	3.72	4.00
		DS5	7.59	7.51	3.17	4.00
		US1	7.32	7.38	3.07	5.33
		US2	7.29	7.32	2.28	5.33
		MW1	6.60	6.57	2.45	7.83
		THB1	6.99	6.95	2.17	4.00
		THB2	-	7.54	5.50	6.33
		WSR45C	6.72	6.83	1.97	6.17
		WSR46	6.95	6.94	3.12	5.67
2013/3/6	Mid-Ebb	DS1	7.38	7.39	1.42	3.78
		DS2	7.37	7.35	1.39	1.44

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS3	7.33	7.36	1.22	1.44
		DS4	7.31	7.33	1.20	2.11
		DS5	7.22	7.21	1.33	1.67
		US1	7.46	7.47	5.40	7.50
		US2	7.57	7.53	3.00	3.67
		MW1	6.65	6.63	1.40	2.11
		THB1	7.12	7.10	2.07	1.67
		THB2	-	9.19	4.00	6.67
		WSR45C	6.90	6.89	1.28	2.11
		WSR46	7.20	7.19	1.65	1.67
	Mid-Flood	DS1	7.40	7.49	4.13	14.00
		DS2	7.48	7.48	3.52	4.00
		DS3	7.63	7.62	3.20	2.50
		DS4	7.67	7.64	2.28	3.33
		DS5	7.63	7.61	1.90	2.67
		US1	7.37	7.40	1.44	2.56
		US2	7.24	7.23	0.82	1.56
		MW1	6.62	6.62	1.07	2.56
		THB1	7.23	7.20	1.94	2.67
		THB2	-	9.41	4.63	5.33
		WSR45C	6.79	6.77	0.85	2.00
		WSR46	7.05	7.10	1.50	3.00
2013/3/8	Mid-Ebb	DS1	7.57	7.75	5.96	7.11
		DS2	7.63	7.91	1.44	4.22
		DS3	7.59	7.79	1.54	6.56
		DS4	7.69	7.81	1.42	3.44
		DS5	7.99	8.01	1.68	2.83
		US1	7.93	8.18	2.87	7.44
		US2	7.90	8.08	3.08	3.83
		MW1	6.73	6.75	1.25	4.78
		THB1	8.14	8.27	1.52	4.67
		THB2	-	9.04	2.24	7.33
		WSR45C	7.09	7.44	1.36	1.89
		WSR46	7.60	8.08	1.83	2.78
	Mid-Flood	DS1	8.65	8.74	3.13	4.33
		DS2	8.82	8.88	2.42	2.67
		DS3	9.12	8.86	2.90	4.00
		DS4	9.11	8.88	3.50	5.17
		DS5	9.29	9.20	3.09	4.00
		US1	8.34	8.76	4.31	4.56
		US2	7.77	8.67	2.42	3.67
		MW1	7.30	7.48	1.59	3.89
		THB1	9.24	9.26	2.30	3.17
		THB2	-	9.31	6.33	7.00
		WSR45C	7.66	8.64	2.76	4.22
		WSR46	7.88	8.93	3.64	4.22
2013/3/11	Mid-Ebb	DS1	7.94	8.06	2.46	3.89
		DS2	8.00	8.13	2.38	4.44
		DS3	7.99	8.14	2.34	4.00
		DS4	7.87	8.06	2.22	3.67
		DS5	7.98	7.99	2.05	3.67

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		US1	8.13	8.33	6.13	8.67
		US2	8.17	8.20	7.45	9.33
		MW1	7.64	7.76	1.63	3.67
		THB1	8.42	8.46	3.08	3.83
		THB2	-	11.44	4.63	5.00
		WSR45C	7.70	7.90	2.01	3.00
		WSR46	7.97	8.10	2.58	3.67
	Mid-Flood	DS1	8.28	8.31	3.78	4.83
		DS2	8.25	8.27	3.35	5.00
		DS3	8.32	8.32	5.28	6.67
		DS4	8.32	8.32	4.81	7.44
		DS5	8.19	8.21	3.58	4.78
		US1	8.09	8.09	3.62	5.00
		US2	7.94	7.97	2.83	4.33
		MW1	7.76	7.95	2.23	4.33
		THB1	8.23	8.29	3.82	4.83
		THB2	-	10.29	4.13	5.67
		WSR45C	7.97	8.09	3.97	4.33
		WSR46	8.28	8.37	4.92	5.89
2013/3/13	Mid-Ebb	DS1	7.56	7.61	3.12	8.11
		DS2	7.64	7.69	2.92	5.11
		DS3	7.71	7.70	2.33	3.78
		DS4	7.64	7.64	3.51	4.22
		DS5	7.68	7.67	2.92	4.83
		US1	7.61	7.64	8.32	12.33
		US2	7.63	7.62	5.45	7.67
		MW1	7.44	7.57	1.53	3.67
		THB1	7.65	7.66	4.10	3.67
		THB2	-	7.28	3.39	7.00
		WSR45C	7.54	7.73	2.09	4.33
		WSR46	7.56	7.61	2.95	5.22
	Mid-Flood	DS1	7.52	7.50	2.72	4.50
		DS2	7.51	7.51	3.53	6.17
		DS3	7.48	7.50	3.17	5.67
		DS4	7.46	7.47	2.25	3.67
		DS5	7.42	7.44	1.90	5.33
		US1	7.57	7.57	2.62	3.67
		US2	7.57	7.59	2.63	5.78
		MW1	7.42	7.49	2.19	4.11
		THB1	7.51	7.52	2.27	4.00
		THB2	-	7.03	3.59	6.33
		WSR45C	7.51	7.61	2.67	6.78
		WSR46	7.66	7.69	4.14	7.56
2013/3/15	Mid-Ebb	DS1	7.04	7.12	4.06	8.00
		DS2	6.99	7.13	4.57	14.56
		DS3	7.01	7.11	3.98	12.56
		DS4	6.99	7.06	3.74	8.44
		DS5	7.05	7.02	4.12	14.67
		US1	7.15	7.19	8.73	11.00
		US2	7.13	7.14	8.20	7.33
		MW1	7.14	7.16	1.83	6.89

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		THB1	7.16	7.09	5.67	6.50
		THB2	-	6.56	4.23	6.00
		WSR45C	7.03	7.09	2.90	6.78
		WSR46	7.20	7.23	3.80	6.56
	Mid-Flood	DS1	7.12	7.09	9.85	7.67
		DS2	7.13	7.12	13.17	8.17
		DS3	7.13	7.11	8.12	8.33
		DS4	7.06	7.04	9.12	7.33
		DS5	6.95	6.93	5.89	7.56
		US1	7.00	7.01	9.54	8.00
		US2	6.96	7.04	4.02	13.33
		MW1	7.15	7.18	1.81	6.44
		THB1	7.10	7.00	4.74	8.00
		THB2	-	6.32	4.56	13.33
		WSR45C	7.25	7.11	3.86	6.11
		WSR46	7.26	7.17	4.79	6.11
2013/3/18	Mid-Ebb	DS1	7.39	7.43	17.28	18.67
		DS2	7.38	7.47	7.96	9.89
		DS3	7.17	7.66	5.36	6.78
		DS4	7.09	7.53	5.20	6.44
		DS5	7.37	7.71	3.58	3.33
		US1	7.38	7.46	5.87	8.17
		US2	7.22	7.38	8.10	9.33
		MW1	7.02	7.27	2.14	3.00
		THB1	7.08	7.48	5.34	4.83
		THB2	-	7.23	6.74	7.11
		WSR45C	6.96	7.13	6.24	5.89
		WSR46	6.81	7.07	7.02	10.50
	Mid-Flood	DS1	7.00	7.07	3.52	3.50
		DS2	7.04	7.09	3.80	4.50
		DS3	6.80	7.16	3.58	5.33
		DS4	6.97	7.12	5.04	6.33
		DS5	7.03	7.12	4.94	4.33
		US1	7.05	7.18	3.90	7.22
		US2	6.84	6.93	1.80	2.67
		MW1	6.90	7.18	4.05	3.67
		THB1	7.11	6.80	7.89	6.33
		THB2	-	7.06	4.88	5.00
		WSR45C	6.81	7.06	5.96	8.00
		WSR46	6.83	7.43	17.28	18.67
2013/3/20	Mid-Ebb	DS1	7.63	7.46	5.73	11.50
		DS2	7.53	7.54	3.46	5.44
		DS3	7.62	7.74	3.38	4.11
		DS4	7.80	7.73	2.90	3.17
		DS5	7.66	7.67	3.23	3.50
		US1	7.31	7.29	4.58	8.00
		US2	7.27	7.26	4.57	6.33
		MW1	6.85	7.53	2.21	3.89
		THB1	7.77	7.89	3.25	5.67
		THB2	-	6.57	11.28	7.00
		WSR45C	6.67	7.38	5.55	9.11

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		WSR46	6.56	7.26	5.07	9.78
	Mid-Flood	DS1	6.74	6.94	7.02	11.33
		DS2	6.93	7.01	3.97	7.33
		DS3	6.95	6.94	3.12	6.33
		DS4	6.79	6.85	3.95	7.83
		DS5	6.80	6.85	3.93	7.67
		US1	6.92	6.99	2.61	6.00
		US2	6.86	6.96	2.59	5.11
		MW1	6.81	6.87	2.13	5.89
		THB1	6.56	6.56	5.27	4.83
		THB2	-	6.05	5.92	10.33
		WSR45C	6.58	6.84	3.16	4.44
		WSR46	6.51	6.99	4.89	6.56
2013/3/22	Mid-Ebb	DS1	6.71	6.94	5.63	5.56
		DS2	6.93	7.08	5.54	5.78
		DS3	6.82	7.10	4.26	4.11
		DS4	6.99	7.08	3.84	4.00
		DS5	6.74	6.82	3.73	3.67
		US1	7.33	7.41	5.75	4.17
		US2	7.16	7.29	6.80	7.83
		MW1	6.99	7.14	1.45	2.67
		THB1	7.05	7.45	6.99	5.00
		THB2	-	6.45	7.12	4.33
		WSR45C	6.82	7.01	4.17	4.44
		WSR46	6.63	7.04	4.16	5.78
	Mid-Flood	DS1	7.01	7.09	4.63	5.33
		DS2	7.08	7.12	4.88	4.83
		DS3	7.09	7.05	5.77	6.17
		DS4	7.10	7.17	5.45	6.17
		DS5	7.04	7.08	6.54	7.00
		US1	6.93	7.10	3.68	3.89
		US2	6.79	7.11	4.46	4.22
		MW1	6.77	6.83	1.13	1.00
		THB1	6.53	6.56	9.37	9.17
		THB2	-	6.17	6.32	6.33
		WSR45C	6.64	6.87	2.93	3.22
		WSR46	6.79	7.01	4.31	3.67
2013/3/25	Mid-Ebb	DS1	6.54	6.71	7.89	13.22
		DS2	6.60	6.84	5.09	7.00
		DS3	6.52	6.73	5.09	6.22
		DS4	6.58	6.67	5.06	6.44
		DS5	6.47	6.54	6.57	8.17
		US1	6.74	6.87	8.13	10.50
		US2	6.73	6.74	9.77	12.00
		MW1	6.65	6.69	3.23	4.56
		THB1	6.74	6.95	11.04	6.83
		THB2	-	6.41	5.72	4.67
		WSR45C	6.64	6.71	4.43	3.00
		WSR46	6.52	6.71	9.47	10.56
	Mid-Flood	DS1	6.70	6.79	8.65	7.00
		DS2	6.80	6.75	10.52	14.67

Sampling Date	Tidal Period	Station	Average DO Levels (mg/L)		Average Turbidity Level (NTU)	Average SS Level (mg/L)
			Bottom	Surface and Mid Depth		
		DS3	6.87	6.85	12.28	16.83
		DS4	6.81	6.80	13.48	17.22
		DS5	6.98	6.97	14.97	13.17
		US1	6.92	6.89	3.93	4.78
		US2	6.79	6.79	7.34	6.56
		MW1	6.61	6.63	3.43	5.33
		THB1	6.65	6.59	12.29	14.67
		THB2	-	7.37	10.15	14.33
		WSR45C	6.59	6.77	6.05	9.33
		WSR46	6.52	6.83	9.14	12.78

Notes:

1. Please refer to Table B2 below for the Action and Limit Levels for dredging activities.
2. Cell shaded yellow indicated value exceeding the Action Level criteria.
3. Cell shaded red indicated value exceeding the Limit Level criteria.
4. Only mid-depth water was sampled at Station THB2 because water depth was less than 3m.

Table B2 ***Action and Limit Levels of Water Quality for Dredging, Backfilling and Capping Activities***

Parameter	Action Level	Limit Level
Dissolved Oxygen (DO) (1)	Surface and Mid-depth (2) The average of the impact, WSR 45C and WSR 46 station readings are < 5%-ile of baseline data for surface and middle layer = **4.32 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)	Surface and Mid-depth (2) The average of the impact, WSR 45C and WSR 46 station readings are **< 4 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)
	Bottom The average of the impact, WSR 45C and WSR 46 station readings are < 5%-ile of baseline data for bottom layers = **3.12 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)	Bottom The average of the impact station, WSR 45C and WSR 46 readings are **< 2 mg L^{-1}** and Significantly less than the reference stations mean DO (at the same tide of the same day)
Depth-averaged Suspended Solids (SS) (3) (4)	The average of the impact, WSR 45C and WSR 46 station readings are > 95%-ile of baseline data for depth average = **21.60 mg L^{-1}** and 120% of control station's SS at the same tide of the same day	The average of the impact, WSR 45C and WSR 46 station readings are > 99%-ile of baseline data for depth average = **40.10 mg L^{-1}** and 130% of control station's SS at the same tide of the same day
Depth-averaged Turbidity (Tby) (3) (4)	The average of the impact, WSR 45C and WSR 46 station readings are > 95%-ile of baseline data = **25.04 NTU** and 120% of control station's Tby at the same tide of the same day	The average of the impact, WSR 45C and WSR 46 station readings are > 99%-ile of baseline data = **56.30 NTU** and 130% of control station's Tby at the same tide of the same day

Notes:

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

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

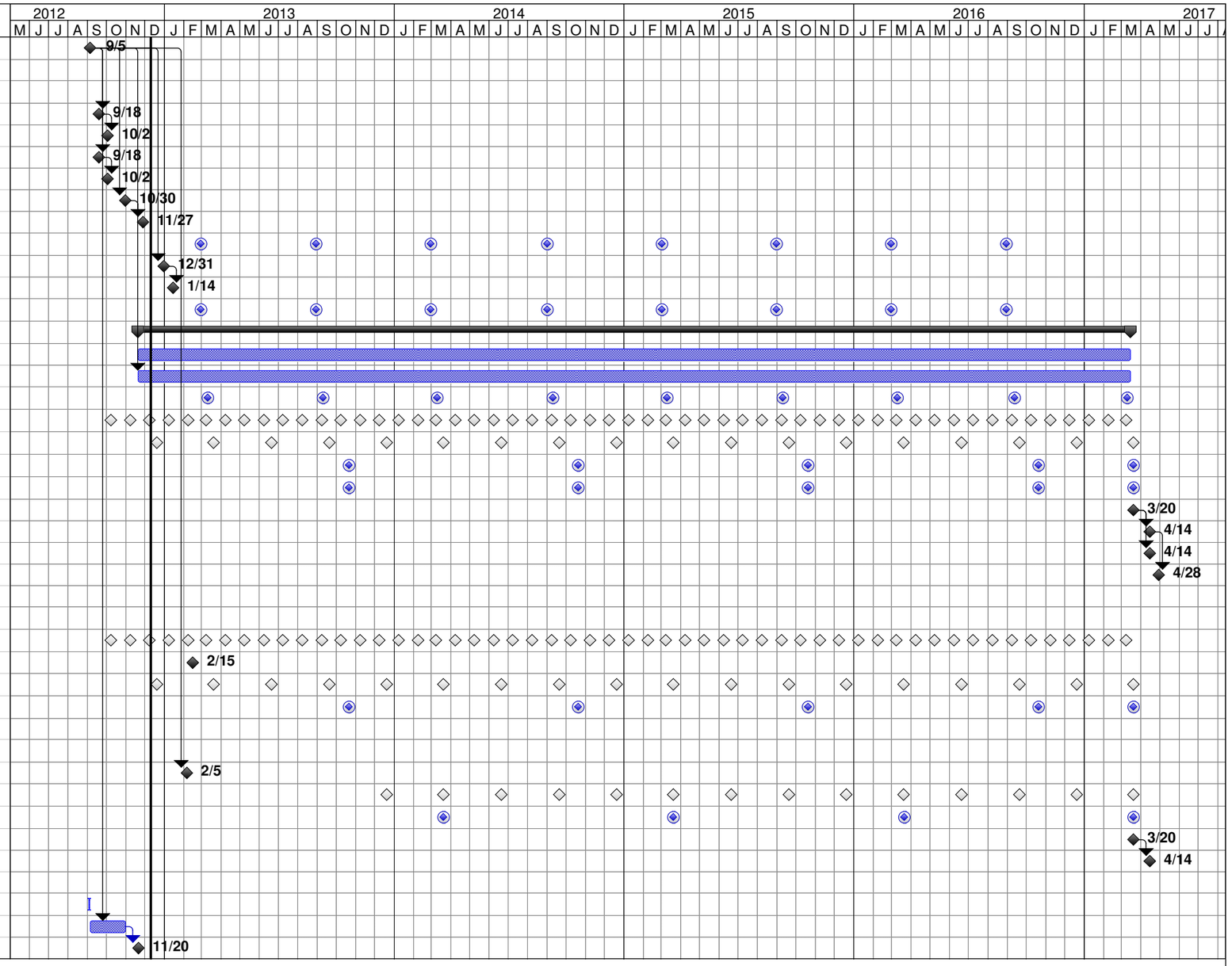
(3) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.

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

Annex C

Study Programme

Task Name
Project Commencement
For South Brothers CMPs and East of Sha Chau CMPs
Submission of Draft Inception Report & Draft Programme
Submission of Final Inception Report & Final Programme
Submission of Draft EM&A Manual (First Review)
Submission of Final EM&A Manual (First Review)
Submission of Draft EM&A Manual (Second Review)
Submission of Final EM&A Manual (Second Review)
Submission of Subsequent EM&A Manual Updates
Submission of Draft Operations Manual
Submission of Final Operations Manual
Submission of Operations Manual Updates
Monitoring Contracts
Regular Site Inspections of CMP Contractors
Participate in Liaison Group Meetings/ Consultations as required by CEDD
Submission of Report on Dredging & Capping Operations
Submission of Monthly Progress Report
Submission of Quarterly EM&A Report
Submission of Annual Review Report
Submission of Annual Risk Assessment Report
Submission of Draft Final Report
Submission of the Final Report
Submission of Draft Executive Summary Report
Submission of Final Executive Summary Report
For East Tung Lung Chau Disposal Facility
Submission of Monitoring Results & Monthly EM&A Progress Report
Submission of Initial Review Report (assume disposal commences in November 2012)
Submission of Quarterly EM&A Report
Submission of Annual Report
Alternative / Modified Capping Design
Submission of Investigation Report
Submission of Quarterly Report
Submission of Annual Report
Submission of Draft Final Report
Submission of the Final Report
Baseline Pelagic and Demersal Fisheries Survey
Baseline Shrimp Trawl & Hang Trawl Surveys, twice before SB CMPs dredging
Submission of Baseline Pelagic and Demersal Fisheries Survey Report



Study Programme	Task	Milestone	Summary	Rolled Up Task	Rolled Up Milestone

Agreement No. CE 23/2012 (EP) Environmental Monitoring and Audit for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau (2012-2017) - Investigation