



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)*

31st Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – March 2015

Final (Revision 1)

8 May 2015

Environmental Resources Management

16/F Berkshire House 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

31st Monthly Progress Report for Contaminated Mud Pits to the South of The Brothers and at East Sha Chau – March 2015

Final (Revision 1)

Document Code: 0175086 Monthly Mar 2015_v1.doc

Environmental Resources Management

16/F Berkshire House 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:		Proje	ct No	D:		
Civil Eng	gineering and Development Department (CEDD)	017	5086	6		
Summary	:	Date:				
		8 Ma	ay 2	015		
		Appro				
	ument presents the 31 st monthly progress report for nated Mud Pits at the South of The Brothers and at East	1	_	-		
		Crai Parti	_	Reid		
v1	31 st Monthly Progress Report for ESC CMPs and SB CMPs	EL	-	JT	CAR	8/5/15
v0	31 st Monthly Progress Report for ESC CMPs and SB CMPs	EL	-	JT	CAR	17/4/15
Revision	Description	Ву	/	Checked	Approved	Date
'ERM Hong- Contract with taking accou	has been prepared by Environmental Resources Management the trading name of Kong, Limited', with all reasonable skill, care and diligence within the terms of the high the client, incorporating our General Terms and Conditions of Business and int of the resources devoted to it by agreement with the client.	Distri		ernal		18001:2007 No. OHS 515956
scope of the	any responsibility to the client and others in respect of any matters outside the above.	\boxtimes	Pub	olic	6	BSI
third parties	s confidential to the client and we accept no responsibility of whatsoever nature to to whom this report, or any part thereof, is made known. Any such party relies on their own risk.		Cor	nfidential	100 3	001 : 2008 2 No. FS 32515







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:

31st Monthly Progress Report for Contaminated Mud Pits to

the South of The Brothers and at East Sha Chau - March

2015

Date of Report:

17 April 2015

Date prepared by ET:

17 April 2015

Date received by IA:

17 April 2015

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/ $\frac{1}{plan}$ complies with the above referenced condition of EP-427/2011/A

Craig A. Reid,

Environmental Team Leader:

Date:

17/4/2015

IA Verification

I hereby verify that the above referenced document/plan complies with the above referenced condition of

Men Mens

EP-427/2011/A

Dr Wang Wen Xiong, Independent Auditor:

Date:

17/4/2015

CONTENTS

1.1	BACKGROU	ND	1
1.2	REPORTING	PERIOD	2
1.3	DETAILS OF	SAMPLING AND LABORATORY TESTING ACTIVITIES	2
1.4	DETAILS OF	OUTSTANDING SAMPLING AND/OR ANALYSIS	3
1.5	BRIEF DISCU	ISSION OF THE MONITORING RESULTS FOR SB CMPS	3
1.6	ACTIVITIES S	SCHEDULED FOR THE NEXT MONTH	6
1.7	STUDY PRO	GRAMME	6
	ANNEXES		
	ANNEX A	SAMPLING SCHEDULE	
	ANNEX B	GRAPHICAL PRESENTATIONS	

ANNEX C WATER QUALITY MONITORING RESULTS
ANNEX D STUDY PROGRAMME

Agreement No. CE 23/2012 (EP) Environmental Monitoring and Audit inated Mud Pits to the South of The Brothers and a

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

31ST MONTHLY PROGRESS REPORT FOR MARCH 2015

1.1 BACKGROUND

- 1.1.1 Since early 1990s, contaminated sediment (1) arising from various construction works (e.g. dredging and reclamation projects) 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) 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.

- (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.7
- (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)

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).

- 1.1.4 Environmental Permits (EPs) (EP-312/2008/A and EP-427/2011A) were issued by the Environmental Protection Department (EPD) to the CEDD, the Permit Holder, on 28 November 2008 for ESC CMP V and on 23 December 2011 for SB CMPs, respectively. Under the requirements of the EPs, an Environmental Monitoring and Audit (EM&A) programme as set out in the EM&A Manuals (1) (2) is required to be implemented for the CMPs.
- 1.1.5 The present EM&A programme under *Agreement No. CE 23/2012 (EP)* covers the dredging, disposal and capping operations of the SB CMPs as well as ESC CMPs. Detailed works schedule for both CMPs is shown in *Figure 1.1*. In March 2015, the following works were being undertaken at the CMPs:
 - Capping operations at ESC CMPs;
 - Capping operations at SB CMP 1; and
 - Disposal of contaminated mud at SB CMP 2.

Figure 1.1 Works Schedule for ESC CMPs and SB CMPs

Pit	Onorotion		20	12								20	13	3												20	14						T						2	01	5												2	01	6						2	01	7
FIL	Operation	s	0	N	D	J	F	- 1	1	Α	М	J	J	Α	١,	S	o	Ν	D	J	F	= n	VI .	Α	М	J	J	Α	S	C	1	1	D	J	F	М	Α	N	١,	ıŢ,	J	Α	s	О	N	1 [)	J	F	М	Α	M	J	,	ı	١,	s	o	Ν	D	J	Т	=
	Dredging						Γ															T											I						Г		Ī						Ī									T						T	7
ESC CMP	Backfilling						Γ							Г								T											I						Г		Ī						ı					Г		Γ								Τ	
	Capping																					Τ							Γ		Γ		T					Г	Г	Τ					Г	Τ										T						T	7
	Dredging																																																														٦
SB CMP 1	Backfilling																																																														
	Capping																																																														
	Dredging																																																														
SB CMP 2	Backfilling																																																														
	Capping						Ī		I						Ī							Τ							Γ		Τ	T	1							T						I						Г		Γ	Т	Т						Τ	

1.2 REPORTING PERIOD

1.2.1 This 31st Monthly Progress Report covers the EM&A activities for the reporting month of March 2015.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

- 1.3.1 No monitoring activities have been undertaken for ESC CMPs in March 2015.
- 1.3.2 The following monitoring activities have been undertaken for SB CMPs in March 2015:
 - Pit Specific Sediment Chemistry of CMP 2 was undertaken on 4 March 2015;
 and

⁽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.

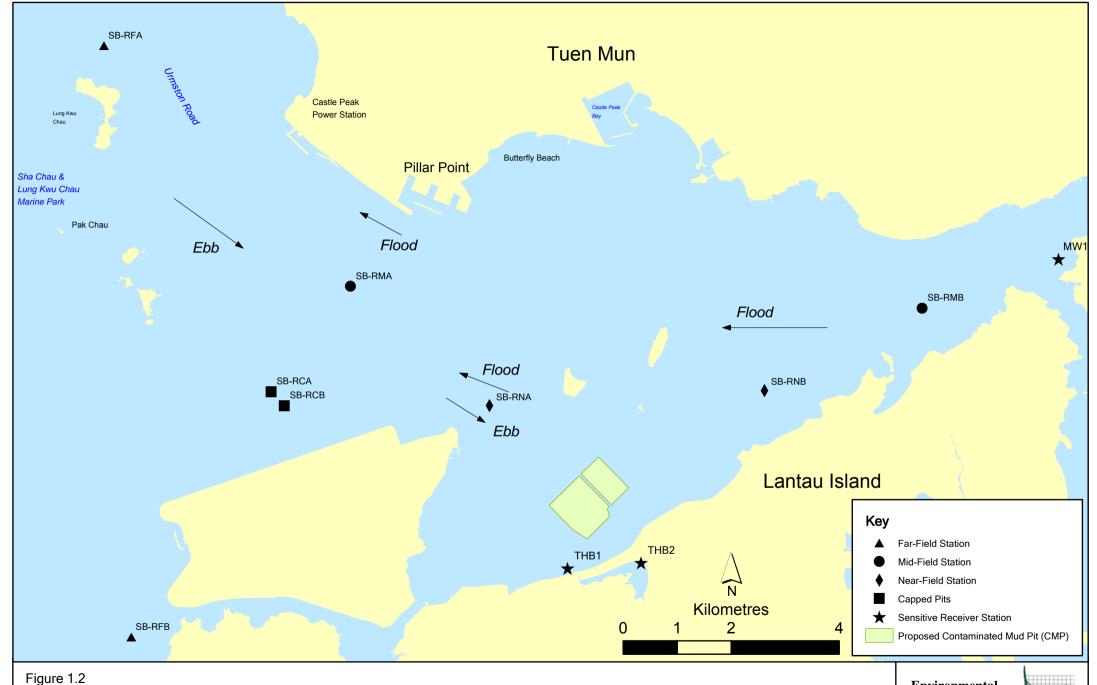
⁽²⁾ ERM (2010) Environmental Monitoring and Audit (EM&A) Manual. Final Second Review. Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation. Agreement No. CE 4/2009(EP). Submitted to EPD in November 2010.

- Water Column Profiling of CMP 2 was undertaken on 5 March 2015.
- 1.4 DETAILS OF OUTSTANDING SAMPLING AND/OR ANALYSIS
- 1.4.1 No outstanding sampling and laboratory analysis remained for March 2015.
- 1.4.2 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 Brief discussion of the monitoring results of the following activities for SB CMPs is presented in this 31st Monthly Progress Report:
 - Laboratory analyses of sediment samples collected for *Cumulative Impact Sediment Chemistry of SB CMPs* in February 2015;
 - Pit Specific Sediment Chemistry of CMP 2 undertaken on 4 March 2015; and
 - Water Column Profiling of CMP 2 undertaken on 5 March 2015.

- 1.5.2 Cumulative Impact Sediment Chemistry of SB CMPs February 2015
- 1.5.3 Monitoring locations for *Cumulative Impact Sediment Chemistry for SB CMPs* are shown in *Figure 1.2*. A total of eleven (11) monitoring stations were sampled in February 2015.
- 1.5.4 Analyses of results for the *Cumulative Impact Sediment Chemistry Monitoring* indicated that the concentrations of most inorganic contaminants, except Arsenic, were below the Lower Chemical Exceedance Level (LCEL) in February 2015 (*Figures 1* and 2 of *Annex B*). Concentration of Arsenic exceeded the LCEL at Capped Pit station SB-RCA and SB-RCB and Mid Field station SB-RMA.
- 1.5.5 Whilst the average concentration of Arsenic in the Earth's crust is generally ~2mg/kg, significantly higher Arsenic concentrations (median = 14 mg/kg) have been recorded in Hong Kong's onshore sediments (1). It is presumed that the natural concentrations of Arsenic are similar in onshore and offshore sediments (2), and relatively high Arsenic levels may thus occur throughout Hong Kong. Therefore, the LCEL exceedances of Arsenic are unlikely to be caused by the disposal operations at CMP 2 but rather as a result of naturally occurring deposits.
- 1.5.6 For organic contaminants, concentration of Total Organic Carbon (TOC) at Tai Ho Bay Station 2 (THB2) was recorded to be higher than other stations (*Figure 3* of *Annex B*). Concentrations of Tributyltin (TBTs) were recorded to be higher at Near-field station SB-RNB and Ma Wan station (*Figure 4* of *Annex B*). Total Dichloro-Diphenyl-Trichloroethane (DDT), 4,4′-Dichloro-Diphenyl-Dichloroethylene (4,4′-DDE), Total Polychlorinated Biphenyls (PCBs) as well as Low and High Molecular Weight Polycyclic Aromatic Hydrocarbons (MW PAHs) were recorded below the limit of reporting at all stations.
- 1.5.7 Overall, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at CMP 2 in February 2015.
- 1.5.8 Pit Specific Sediment Chemistry of CMP 2 March 2015
- 1.5.9 Monitoring locations for *Pit Specific Sediment Chemistry for CMP 2* are shown in *Figure 1.3*. A total of six (6) monitoring stations were sampled in March 2015.
- 1.5.10 The concentrations of all inorganic contaminants were lower than the LCEL in March 2015 (*Figures 5-6* of *Annex B*).

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

⁽²⁾ Whiteside PGD (2000) Natural geochemistry and contamination of marine sediments in Hong Kong. In: The Urban Geology of Hong Kong (ed Page A & Reels SJ). Geological Society of Hong Kong Bulletin No. 6, p109-121

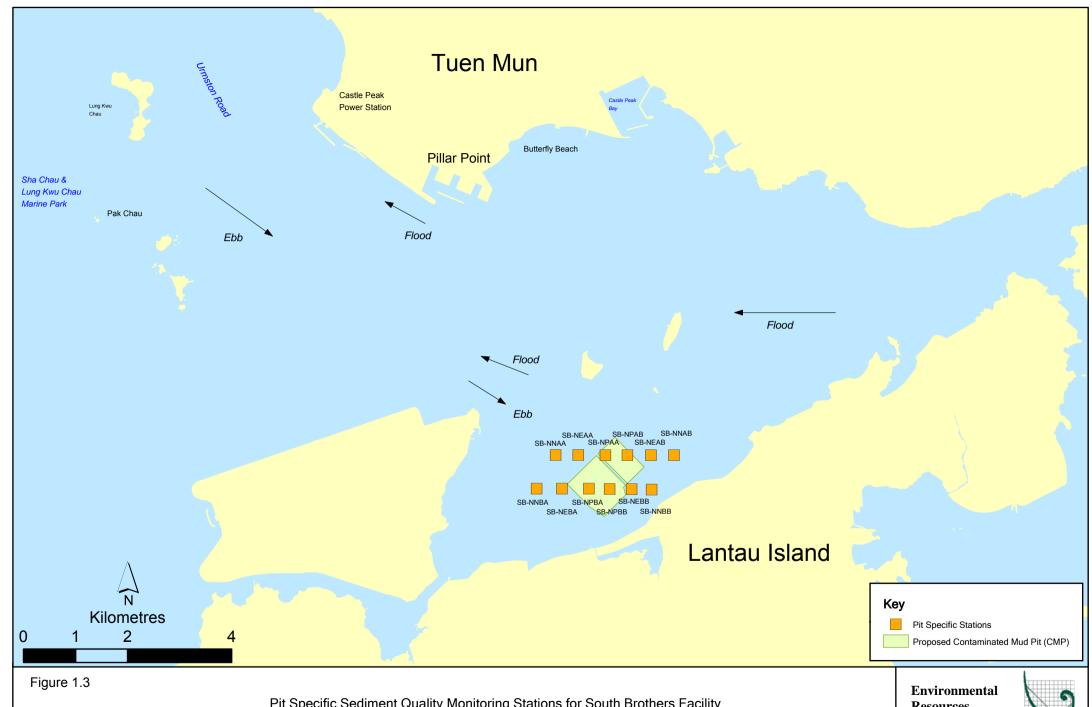


Cumulative Impacts Sediment Quality Monitoring Stations for South Brothers Facility

File: T:\GIS\CONTRACT\0175086\Mxd\0175086_4.2_SQMS_cum impact.mxd

Date: 11/12/2012





Pit Specific Sediment Quality Monitoring Stations for South Brothers Facility

Resources Management



- 1.5.11 For organic contaminants, the concentrations of TOC were similar amongst stations in March 2015 (*Figure 7* of *Annex B*). TBTs concentrations were observed to be slightly higher at Pit Edge station SB-NEBB in March 2015 (*Figures 8* of *Annex B*). Total DDT, 4,4′-DDE, Total PCBs, Low and High MW PAHs were below the limit of reporting at all stations in March 2015.
- 1.5.12 Overall, there is no evidence indicating any unacceptable environmental impacts to sediment quality as a result of the contaminated mud disposal operations at CMP 2 in March 2015. Statistical analysis will be undertaken in the quarterly report to investigate whether there are any unacceptable impacts in the area caused by the contaminated mud disposal.

1.5.13 Water Column Profiling of CMP 2 - March 2015

1.5.14 Water Column Profiling was undertaken at a total of two sampling stations (Upstream and Downstream stations) on 5 March 2015. The water quality monitoring results have been assessed for compliance with the Water Quality Objectives (WQOs) through a review of the Environmental Protection Department (EPD) routine water quality monitoring data for the dry season period (November to March) of 2004 – 2013 from stations in the North Western Water Control Zone (WCZ), where SB CMP 2 is located. For Salinity, the average value obtained from the Reference stations was used for the basis as the WQO. The monitoring results were also compared with the Action and Limit Levels set in Baseline Monitoring Report (see Table C1 of Annex C for details).

In-situ Measurements

1.5.15 Analyses of results for March 2015 indicated that levels of Salinity, Dissolved Oxygen (DO) and pH complied with the WQOs at both Downstream and Upstream stations (*Table C2* of *Annex C*). DO and Turbidity at all stations complied with the Action and Limit Levels (*Table C1* and *C2* of *Annex C*).

Laboratory Measurements for SS

- 1.5.16 Analyses of results for February 2015 indicated that the Suspended Solid (SS) levels at both Upstream and Downstream stations complied with the WQO and the Action and Limit Levels (*Tables C1 and C2* of *Annex C*).
- 1.5.17 Overall, the monitoring results indicated that the mud disposal operation at CMP 2 did not appear to cause any deterioration in water quality during this reporting period.

1.6 ACTIVITIES SCHEDULED FOR THE NEXT MONTH

- 1.6.1 The following monitoring activities will be conducted in the next monthly period of April 2015 for SB CMPs:
 - Pit Specific Sediment Chemistry of CMP 2;
 - Water Column Profiling of CMP 2; and
 - Routine Water Quality Monitoring of CMP 2.
- 1.6.2 No monitoring activity is scheduled to be conducted in the next monthly period of April 2015 for ESC CMPs.
- 1.6.3 The sampling schedule is presented in *Annex A*.
- 1.7 STUDY PROGRAMME
- 1.7.1 A summary of the Study programme is presented in *Annex D*.

Annex A

Sampling Schedule

Pit Specific Sediment Chemistry	Code	S	0	N I	D]	J F	M	AA	M J	J	A S	0	N D	J	F	M A	M	J	J	A S	0	N D	J	F	M A	M	J	J A	S	O N	D	J	F	M	A I	M J	J	Α	S	O N	D	J	F
Active-Pit																																											
	ESC-NPDA	*	*	* *	* 1	* *	*	* *	* *	*	*																					*	*	*	*	* *	*	*	*	* *	*	*	*
	ESC-NPDB	*	*	* *	* 1	* *	*	* *	* *	*	*																					*	*	*	*	* *	*	*	*	* *	*	*	*
Pit-Edge																																											, —
	ESC-NEDA	*	*	* *	* '	* *	*	* *	* *	*	*																					*	*	*	*	* *	*	*	*	* *	*	*	*
	ESC-NEDB	*	*	* *	* 1	* *	*	* *	* *	*	*																					*	*	*	*	* *	*	*	*	* *	*	*	*
Near-Pit																																										t	
	ESC-NNDA	*	*	* *	* 1	* *	*	* *	* *	*	*																					*	*	*	*	* *	*	*	*	* *	*	*	*
	ESC-NNDB	*	*	* *	* 1	* *	*	* *	* *	*	*	1 1				+											+					*	*	*	*	* *	*	*	*	* *	*	*	*
	ESC IVIVED							<u> </u>				<u> </u>									<u> </u>										1												—
Cumulative Impact Sediment Chem	aicter	e	Ω	NI T	n L	T E	M	AN	и т	т	A C		N D	т	Е	M A	M	т	т	A C	0	J D	T	Е	M A	М	T	J A	S	O N	n	J	Е	М	Λ 7	M J	Т	Α	S	O N	n	I	F
Near-field Stations	шѕиу	3	U	IN I		j r	17/1	AN	VI J	J	A 3	U	N D	J	F .	IVI A	171	J	J 4	A 3		V D	J	Г	IVI A	171	J	J A	3	UN	D	J	ľ	IVI	A l	IVI J	J	A	3	O N	D	J	ľ
Near-neid Stations	EGG DNIA		-	,		*	-	-	*	-	*	1											+										*			*		*	-				
	ESC-RNA					*			*		*	1				-	-			_			_								<u> </u>		*			*		*				1	'
	ESC-RNB			,	*	*			*		*																						*			*		*			*		
Mid-field Stations					_																																						——'
	ESC-RMA			,	*	*			*		*																						*			*		*			*		*
	ESC-RMB			4	*	*			*		*																				ļ		*			*		*			*		*
Capped Pit Stations												$\sqcup \bot$																															—— [']
	ESC-RCA			4	*	*			*		*																						*			*		*			*		*
	ESC-RCB			,	*	*			*		*																						*			*		*			*		*
Far-Field Stations																	<u> </u>				$\coprod I^{-}$																						
	ESC-RFA			si si	*	*			*		*																						*			*		*			*		*
	ESC-RFB			,	*	*			*		*																						*			*		*			*		*
Ma Wan Station																																											
	MW1			4	*	*			*		*																						*			*		*			*		*
						- 1	_						ı	<u> </u>							1		-						<u> </u>	1										·			
Sediment Toxicity Tests		S	0	NI	n I	I F	M	A N	и і	T	A S	0	N D	Ī	F	M A	M	Ţ	I .	A S	0	J D	I	F	M A	М	T	J A	S	O N	D	ī	F	М	A 1	M J	Ţ	Α	S	O N	D	I	F
Near-Field Stations			_			, -			,					,				,	,			_	1				,	,				,				<u> </u>	,		_	-		'	_
rear riera stations	ESC-TDA				+	*				+	*																						*					*					*
	ESC-TDB				\dashv	*		1			*	1 1				+											+						*					*			1		*
Reference Stations	Loc 1DD				\dashv			1			_	1 1				+											+														1		
Reference Stations	ESC-TRA				+	*	+		_	+ +	*					-																-	*					*					*
	ESC-TRB				-	*				+	*	+ +																					*					*					*
Ma Wan Station	ESC-TRD				+	-	-		_			+ +					-						+				-												-				
Wa Wan Station	MW1		-		+	*		-	_	-	*	-	-			-							+										*					*					*
	IVIVVI																														<u> </u>												
Tissue/ Whole Body Sampling		S	0	N I	n I	I F	M	A N	и і	T	A S	0	N D	Ī	F :	M A	M	ī	I .	A S	O	J D	Ţ	F	M A	М	Ī	J A	S	O N	D	ī	F	М	A 1	M I	Ţ	Α	S	O N	D	I	F
Impact Stations				., .		, -	212	11 11	· <u>·</u>	,	11 0		., 2			.,,	112	,	, ,			, 2	'	-	112 12	112	'	,	Ü	0 11		,	_			,,,,	,			0 1		'	ئے
impact stations	ESC-INA				-	*				+	*	+ +																					*					*					*
	ESC-INB				-	*				+	*	+ +																					*					*					*
Defenses	ESC-IND		-		+	-		-	_	-	-	-	-			-							+																				
Reference	ESC-TNA	┢		_	+	*	-	\vdash		+	*	++		\vdash		_	1			-	+		+	\vdash		-	\vdash		-		┼	\vdash	*		+		-	*	\vdash		-	+	*
	ESC-TNA ESC-TNB	\vdash			+	*			_		*	+ +					+			-	-	-	-	\vdash	- -		 		-			-	*				-	,	-		-	lacksquare	-
	LOC-11ND	\vdash			+	^	+	\vdash		+		++		\vdash			+				\vdash		+	\vdash		-	\vdash		+		1	-					+-	H	\vdash		-	\mathbf{H}	
	ECC TC A		+		+	,4.		\vdash	-	+		+	-	\vdash		-	+ +		-				+	$\vdash \vdash$		-	\vdash		-		1		*	-	-		-	*	\vdash			1	4
	ESC-TSA				+	- *		\vdash	+	+	*	++	+	\vdash	-+		+ +		-			-	+	$\vdash \vdash$		-	\vdash		-		1	-	*	-	+		-	*	\vdash			lacksquare	-
	ESC-TSB					*					•						1														1	Ш	^					*				1	
																_																											_
Demersal Trawling		S	0	N I)	J F	M	A N	M J	J	A S	0	N D	J	F :	M A	M	J	J	A S	0	N D	J	F	M A	M	J	J A	S	O N	D	J	F	M	A I	M J	J	A	S	O N	D	J	F
Impact Stations				_								$\sqcup \bot$		lacksquare				_																	_								ь—
	ESC-INA					* *				*																							*					*				*	*
	ESC-INB				,	* *				*	*																					*	*				*	*				*	*
Reference Stations																	<u> </u>																										
	ESC-TNA				3	* *				*	*																					*	*				*	*				*	*
	ESC-TNB				1	* *				*	*																					*	*				*	*				*	*
	ESC-TSA				,	* *			T	*	*																					*	*				*	*				*	*
1	ESC-TSB				,	* *				*	*																					*	*				*	*				*	*
-				- 1			-			1 1			ı			<u> </u>	1	ı	- I							-1			1	· · · · · · · · · · · · · · · · · · ·	1			1		ı	-1		<u> </u>	ı			
		S																																									

	ESC-TSB					*	*					*	*																																*	*					t e	k	*					*	*	
				_		_				_																																	_		_													_	_	
Water Column Profiling		S	О	N	D	J	F	M	A	M	J	J	A	S	О	N	D	J	F	N	M.	A	M	J	J	A	S	О	ľ	J)	J	F	M	A	M	J	J	A	S	(O	1 I)	J	F	M	A	M	J	J		A	S	0	N	D	J	F	1
Plume Stations	WCP1	*	*	*	*	*	*	*	*	*	*	*	*																																*	*	*	*	*	*	9	k	*	*	*	*	*	*	*	ĺ
	WCP2	*	*	*	*	*	*	*	*	*	*	*	*																																*	*	*	*	*	*	,	k	*	*	*	*	*	*	*	ĺ

Annex A1 - Environmental Monito	oring ana Auait S	sampli			or Eas	st oj Sn	ia Cnau			2 - Febri	ary 2017)						2014								2015									2016				2017
Benthic Recolonisation Studies		S		012 N D	I	F	M A		2013	A S	O N	D	I F	M	Α		2014	AS	0	NI	D I	F	M A	M	2015 J J A	SO	N	D	I	F	М	A	M	2016	A	SO	NΓ	2017) J F
Capped Contaminated Mud Pits I	Va-c				+			,	,	-			, -			,	,	1 0			'				, ,			_	,	_				, ,	+		-	
	ESC-CPA			*						*		*						*		,	*				*			*					\neg	\neg	+		+	1
	ESC-CPB			*	1					*		*						*			*				*			*							1 1			
	ESC-CPC			*						*		*						*			*				*			*										
Reference Stations																																						
	ESC-RBA			*						*		*						*			*				*			*										
	ESC-RBB			*						*		*						*			*				*			*										
	ESC-RBC			*						*		*						*			*				*			*										
Impact Monitoring for Dredging		S	0	N D	J	F	M A	M J	J	A S	O N	D	J F	M	A	M J	J	A S	0	N I	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
Upstream/Reference Stations	1.101	-	*	* *	*	*	* *	*			1						-				_													_	+	-	+-+	
	US1 US2	*				*							_																				+	-	+	-	+-+	
Downstream/Impact Stations	032	-	-	H	+	+ -				-		-	-				-				+												+	-	+		+-+	
Downstream/ impact stations	DS1	*	*	* *	*	*	* *	*			1										-												\dashv	+	+		+-+	- - -
	DS2	*	*		_		* *	*									+-				-												+	+	+	-	+-+	+++-
	DS3	*	*	* *	*	*	* *	*									-				-												+	+	+	-+	+-+	
	DS4	*			_		* *	*		-	+ +	╁┼					+	+++	+		+	+								\vdash	-+	-+	+	+	+++	+	++	+
	DS5	*				*		*		-	+ +	+	-				+		+		+	-								 	-+	-+	+	+	+	+	+++	+
Ma Wan Station	D33	\vdash	1	+ +	+	++	-			+	+	╁	-+				-	+	+		+	+	+		 	++-				\vdash	-+	+	+	+	+	+	++	+
	MW1	*	*	* *	*	*	* *	*											1		+										$-\dagger$		+	+	+	+	++	+
			-1	<u> </u>		1	<u> </u>							1		<u> </u>			<u> </u>	<u> </u>			1 1			<u> </u>	<u> </u>		<u> </u>	<u> </u>	1							
Capping		S	0	N D	J	F	M A	M J	J	A S	O N	D	J F	M	Α	M J	J	A S	0	N I	D J	F	M A	M	J J A	S O	N	D	J	F	M	A	M	J J	A	S O	ΝΓ) J F
Ebb Tide																																						
Impact Station																																						
	ESC-IPE1											*	*			*		*			*	*			* *			*										
	ESC-IPE2											*	*			*		*			*	*			* *			*										
	ESC-IPE3											*	*			*		*			*	*			* *			*										
	ESC-IPE4											*	*			*		*			*	*			* *			*										
	ESC-IPE5											*	*			*		*			*	*			* *			*										
Intermediate Station																																						
	ESC-INE1											*	*			*		*			*	*			* *			*										
	ESC-INE2											*	*			*		*			*	*			* *			*										
	ESC-INE3											*	*			*		*		:	*	*			* *			*										
	ESC-INE4											*	*			*		*			*	*			* *			*						\bot	$\perp \perp \perp$			
	ESC-INE5											*	*			*		*		,	*	*			* *			*						\bot	$\perp \perp \perp$			
Reference Station																																			\perp		\bot	
	ESC-RFE1											*	*			*		*				*			* *			*							\perp		\bot	
	ESC-RFE2											*	*			*		*			*	*			* *			*							\perp		\bot	
	ESC-RFE3											*	*			*		*			*	*			* *			*					_		\bot		\perp	
	ESC-RFE4	<u> </u>		$\bot \bot$							$\bot \bot$	*	*			*		*			*	*			* *	$oxed{oxed}$		*					\perp		+	\bot	+	
	ESC-RFE5	<u> </u>	-		1	+						*	*	1		*	_	*	4		*	*			* *		-	*				_	\dashv	\bot	+		+	
Ma Wan Station) This	\vdash		+	1	1						<i>J.</i>		1		*	_	*	1		*	at.			* *			4-				_	\dashv	-	+	-	+	
Flood Tide	MW1	+			+	<u> </u>						_ ^	*	1		*		î			_	*			^ *			_ ^						—				+
Impact Station		1																																				
Impact outlon	ESC-IPF1	\vdash	1		+						П	*	*			*		*			*	*		1	* *			*			1		$\overline{}$	\neg	\top	$\overline{}$	$\overline{}$	+
	ESC-IPF2	\vdash	-	++-	+	++		+	+	+	++	*	*			*	+	*	+	,		*	+++	-	* *		+	*		\vdash	-+	-+	+	+	++	+	++	++-
	ESC-IPF3	\vdash	1	++-	+	++	_	++		-	+ +	*	*			*	+	*	+		*	*	+		* *			*		 		-+	+	+	+	+	++	+
Intermediate Station	Local Fo	\vdash		1 1	+	+				+	+ + -	+	+	+			+	+ +	+		+					 				 	-	+	+	+	++	+	++	+
	ESC-INF1	\vdash	+	+ +	+	+ +			+	+	+ + -	*	*			*	+	*	+		*	*	+		* *			*			-	+	+	+	++	+	+++	+
	ESC-INF2	\vdash	+	1 1	1	+ +				-	+ + -	*	*			*	+	*	+		*	*			* *			*				-	+	+	++	+	++	+ + - '
	ESC-INF3	\vdash		1	1						+ + -	*	*			*	+	*	+		*	*			* *			*					+	+	+	+	++	
Reference Station	100 HVI	\vdash	+	+ +	+	+ +			+	+	+ + -	╁	+				+	+ +	+		+	+	+		 			\vdash			-	+	+	+	++	+	+++	+
The control of the co	ESC-RFF1	\vdash			+						+ + -	*	*			*	+	*			*	*			* *			*			-	-	+	+	+	+	++	
	ESC-RFF2	\vdash	+	+ +	+	+ +			+	+	+ + -	*	*			*	+	*	+		*	*	+		* *			*			-	+	+	+	++	+	+++	+
	ESC-RFF3	\vdash	+	1 1	1	+ +				-	+ + -	*	*			*	+	*	+			*			* *			*				-	+	+	++	+	++	+ + - '
Ma Wan Station	200 1010	\vdash	+	+ +	+	+ +			+	+	+ + -	1	+	+			+	+ +	+		+	+								\vdash	-	-+	+	+	++	+	+++	+
	MW1	\vdash	+	1	1					-	+ + -	*	*			*	+	*	+		*	*			* *			*					+	+	+	+	+ +	+ + - '
	******	_1						<u> </u>	1			1							1																			

Annex A1 - Environmental Monitoring and Audit Sampling Schedule for East of Sha Chau (September 2012 - February 2017)

Trayer Station SCL-195 SCL-195	Timex III Environmental Monte			2012						2013			J							201	4									20	015									2016					2017
The part of Section Section Sec	Routine Water Quality Monitoring	ç	S	O N	D	J :	F M	A	M	J	J.	A S	О	N I	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	ı j	J	A	s O	N	D	J F
SC-1P2 SC-1P3 S	Ebb Tide																																												$\neg \neg$
SCL-175 SCL 175 SCL	Impact Station																																						\top				1		
BSCHIPS BSCHIP		ESC-IPE1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
55.174 57.		ESC-IPE2		* *		*	*	*	*		*	*																								*	*	* *	\top	*	*	*	*		* *
SCHES SCHES		ESC-IPE3		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
Mathematical Mathe		ESC-IPE4		* *		*	*	*	*		*	*																								*	*	* *	\top	*	*	*	*		* *
FROM THE MATERIAN STATE		ESC-IPE5		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
School Sc	Intermediate Station																																												
Schelle Schell		ESC-INE1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
SS-INF SS-I		ESC-INE2		* *		*	*	*	*		*	*																								*	*	* *	\top	*	*	*	*		* *
SCAPS SCAPS		ESC-INE3		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
Reference Station Column		ESC-INE4		* *		*	*	*	*		*	*			ı																					*	*	* *		*	*	*	*		* *
SCARFE S		ESC-INE5		* *		*	*	*	*		*	*																								*	*	* *	\top	*	*	*	*		* *
ESCRETA SCRETA SCRET	Reference Station																																												
SCARFIA SCAR		ESC-RFE1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
SCAREA S		ESC-RFE2		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
ESCRIPS SCRIPS SC		ESC-RFE3		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
May		ESC-RFE4		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
FLOOM TIME IMPACT STATION SECRETIC SECRETION		ESC-RFE5		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
Field Tide Impact Station SC-IPF1 ESC-IPF2 ESC-IPF3 ESC-	Ma Wan Station																																												
May and Station		MW1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
ESC-IPF1 SC-IPF1 SC-IPF2 SC-IPF3 SC-IP	Flood Tide																																												
ESC-IPF3 SC FS SC SC	Impact Station																																												
ESC-IPF3 ESC-IPF3 ESC-INF1 ESC-INF2 ESC-INF3 ESC-INF5 ESC-IN		ESC-IPF1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
Intermediate Station		ESC-IPF2		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
ESC-INF1 ESC-INF2 ESC-INF3		ESC-IPF3		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
ESC-INF2 ESC-INF3 ESC-RF1 ESC-RF2 ESC-RF3 A W W W W W W W W W W W W W W W W W W	Intermediate Station																																												
ESC-INF3 Reference Station Fig. 1. F		ESC-INF1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
Reference Station ESC-RFF1 ESC-RFF2 ESC-RFF3 Ma Wan Station ESC-RFF3 Ma Wan Station		ESC-INF2		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
ESC-RF1 ESC-RF2 ESC-RF3 Ma Wan Station		ESC-INF3		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
ESC-RFF2	Reference Station																																												
ESC-RFF3		ESC-RFF1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
Ma Wan Station		ESC-RFF2		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*	\Box	* *
		ESC-RFF3		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *
MW1 * * * * * * * * * *	Ma Wan Station																																												
		MW1		* *		*	*	*	*		*	*																								*	*	* *		*	*	*	*		* *

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

				2012	2						2013									2014	!								20	15									2016	5					201
Baseline Monitoring Prior to Dredging	Code	Frequency	JA	A S		D	J	F M	I A	M		A	S) N	D	J	F M	Л А	M			S	O N	N D	J	F	M	A M			A	s (O N	D	J	F	M A	A M			S	0	N		
Far Field Stations				$\overline{}$																																\Box	-	\Box		\top	\top			\top	
	SB-WFA	3 days per week for 4 weeks	* *	k																																									
	SB-WFB	3 days per week for 4 weeks	* *	ř																																									
Mid Field Stations																																													
	SB-WMA	3 days per week for 4 weeks	* *	*																																Ш			Ш		'				
	SB-WMB	3 days per week for 4 weeks	* *	e																																Ш			$\perp \perp$		'				
Near Field Stations																																				Ш			$\perp \perp$		'				
	SB-WNAA	* *	* *	e																																Ш			$\perp \perp$		'				
	SB-WNAB	3 days per week for 4 weeks	* *	e																																Ш			$\perp \perp$		'				
	SB-WNBA	3 days per week for 4 weeks	* *	e																																Ш			$\perp \perp$		'				
	SB-WNBB	3 days per week for 4 weeks	* *	e																																Ш			$\perp \perp$		'				
Reference Stations																																				Ш			$\perp \perp$		'				
	NM1	3 days per week for 4 weeks	* *	*																																Ш			$\perp \perp$		'				
	NM2	3 days per week for 4 weeks	* *																																	$\perp \perp \downarrow$			ш.		'			$oldsymbol{\perp}$	
	NM3	3 days per week for 4 weeks	* *																																	$\perp \perp \downarrow$			ш.		'			$oldsymbol{\perp}$	
	NM5	3 days per week for 4 weeks	* *	*																																$\perp \perp \downarrow$			ш.		'			$oldsymbol{\perp}$	
	NM6	3 days per week for 4 weeks	* *	*				_		igspace							_								\perp			_					┸		1	$\perp \perp$		$\perp \!\!\! \perp \!\!\! \perp$	\sqcup	Щ.	Щ'				
Sensitive Receiver Stations				\bot		\perp									-							\perp				igsquare									1	$\downarrow \downarrow \downarrow$	\perp	$\perp \!\!\! \perp \!\!\! \perp$	\sqcup		Щ'	\bigsqcup		\perp	
	MW1	3 days per week for 4 weeks	* *			\perp			-						1		_					$\perp \perp$			1				\bot				\perp		1	$\downarrow \downarrow \downarrow$	\perp	$\perp \perp \downarrow$	\vdash		Щ		\Box		
	THB1	3 days per week for 4 weeks	* *						-						1		_					$\perp \perp$			1				\bot				\perp		1	$\downarrow \downarrow \downarrow$	\perp	$\perp \perp \downarrow$	\vdash		Щ		\Box		
	THB2	3 days per week for 4 weeks		*					-						1		_					$\perp \perp$			1				\bot				\perp		1	$\downarrow \downarrow \downarrow$	\perp	$\perp \perp \downarrow$	\vdash		Щ		\Box		
	WSR45C	3 days per week for 4 weeks	* *	*																																$\perp \perp \downarrow$		\bot	\sqcup		'				
	WSR46	3 days per week for 4 weeks	* *																																	Ш			ـــــــــــــــــــــــــــــــــــــــ					丄	
																																													_
Impact Monitoring for Dredging			J A	ı S	O N	D	J	F M	I A	M	J J	Α	S) N	D	J	F N	A A	M	J	J A	S	O N	N D) J	F	M	A N	J	J	A :	S) N	D	J	F	M A	M	7	JA	S	O	N	D	J
Upstream Stations	LICA	2.1	<u> </u>	++	*	*	*	* *	*	*	* *	*	*	k *	*		* *	k *	*	*	* *				-									-	1	++	+	\dashv	\vdash	+	┿			-	_
	US1	3 days per week		+	*	*	*	* *	*		* *			· ·				· · ·		*	* *	*	* '	*	-										+	++	+	+	++	+				\dashv	\dashv
Downstream Stations	US2	3 days per week	-	+	- "		-		-	- "		-			-			-	-	-		,		-	-								-	-	1	++	+	+	\vdash	+	+-'			+	\dashv
Downstream Stations	DS1	3 days per week		+++	*	*	*	* *	*	*	* *	*	*	k *	*	*	* *	k *	*	*	* *	*	* *	*	-					-			-	+	1	++	+	+	\vdash	+	+'			+	\dashv
	DS2	3 days per week		+	*	*	*	* *	*		* *			k *		*		k *			* *	*	* *	*	+										1 -	++	+	+	\vdash	+	+'			+	\dashv
	DS3	3 days per week		++	*		*	* *	*		* *		*	* *	*	*		* *			* *	*	* *	*								-			1	++	+	+	\vdash	+	+-			+	\dashv
	DS4	3 days per week		++	*	*	*	* *	*	*	* *	*	*	* *	*	*	* *	* *	*	*	* *	*	* *	*								-			1	++	+	+	\vdash	+	+-			+	\dashv
	DS5	3 days per week		+	*	*	*	* *	*	*	* *	*	*	* *	*	*	* *	* *	*	*	* *	*	* *	*	+										1	++	+	+	\vdash	+	+-			+	_
Sensitive Receiver Stations	200	s days per week		+																					1							-			1	+	+	1	\Box	+	+			\dashv	\dashv
	MW1	3 days per week			*	*	*	* *	*	*	* *	*	*	k *	*	*	* *	* *	*	*	* *	*	* *	*											1						\top				\neg
	THB1	3 days per week			*	*	*	* *	*	*	* *	*	*	* *	*	*	* *	* *	*	*	* *	*	* *	*											l			111			\top				\exists
	THB2	3 days per week			*	*	*	* *	*	*	* *	*	*	* *	*	*	* *	* *	*	*	* *	*	* *	*																					\exists
	WSR45C	3 days per week			*	*	*	* *	*	*	* *	*	*	* *	*	*	* *	* *	*	*	* *	*	* *	*																					\Box
	WSR46	3 days per week			*	*	*	* *	*	*	* *	*	*	*	*	*	* *	* *	*	*	* *	*	* *	*												Ш			Ш						
																																													_
Pit Specific Sediment Chemistry			J A	A S	O N	D	J	F M	I A	M	J J	Α	S) N	D	J	F N	A A	M	J	J A	S	O N	N D) J	F	M	A N	J	J	A :	S) N	D	J	F	M A	A M	J	JA	S	O	N	D j	J
SB CMP 1 Active Near-Pit			$\vdash \vdash$	++		+		_	-	\vdash	+	+	_	-	-	\vdash		+	-			++	+	-	+	\vdash			+		+	_		-	1	++	+	\dashv	\vdash	+	┿	\vdash	\vdash	+	\dashv
i vear-i it	SB-NNAA	Monthly	$\vdash \vdash$	++		+	+		-	++	-	12	12 1	2 12	10	12	12 1	2 12	12	12	12 12	12	12 1	2	+	\vdash			+	\dashv	-+	+	+	+	1	++	+	+	\vdash	+	+'	\vdash	\vdash	+	\dashv
	SB-NNAB		\vdash	++	-	+			-	+	-	12	12 1	2 12	12	12	12 1	2 12	12	12	12 12	12	12 1	2	+	+					-	\dashv	+		1	++	+	+	\vdash	+	+-	\vdash	\vdash	+	\dashv
Pit-Edge	OD INIMITE	14101111111	$\vdash \vdash$	++				-	+	++	+	14	14 1	_ 12	12	14 .	1.	_ 12	. 12	14 .	14 14	14	14 1	-	+	+			+-1		+	-	+	+	+	++	+	+	\vdash	+	+-	\vdash	+	+	\dashv
	SB-NEAA	Monthly		++		+		-	1	† †	_	12	12 1	2 12	12	12	12 1	2 12	12	12	12 12	12	12 1	2	+	+		-	+ +		-+	\dashv	+	+	1	+	+	+	\vdash	+	+-	\vdash	-+	+	\dashv
	SB-NEAB			++					1			12	12 1	2 12	12	12	12 1	2 12	12	12	12 12	12	12 1	2	+		H				-	-			1	++	+	+	\vdash	+	+-	\vdash	\vdash	+	\dashv
Active-Pit		• 1		+					1		_	+	+	+	† 		+	+==	+		+-	† †		_	1				+ +		-	_	-	+	1	+	+	+	\sqcap	+	+	\Box	\vdash	十	\dashv
	SB-NPAA	Monthly		+								12	12 1	2 12	12	12	12 1	2 12	12	12	12 12	12	12 1	2								$\neg \vdash$			1	+	\dashv	+	一十	\top	\top			十	\dashv
	SB-NPAB			+					1			12	12 1	2 12	12	12	12 1	2 12	12	12	12 12	12	12 1	2							\neg	1			1	+	\dashv	11	一十	\top	\top			\top	\dashv
SB CMP 2 Active		*		+					i			1 1			Ì		1	1	1		1				1					i		\top	1		1	\sqcap	\dashv	\dashv	\sqcap	\top	\top			一	\dashv
Near-Pit				+					1			1 1			1		\neg																		1	T	\neg	\top	一十	十	T			一	\dashv
	SB-NNBA	Monthly		+					1			1 1			1		\neg							12	2 12	12	12	12 12	12	12	12 1	2 1	2 12	2 12	1	T	\neg	\top	一十	十	T			一	\dashv
	SB-NNBB			11																								12 12									\neg	11	\Box		1				\exists
				\top															L						Ĭ										L			17			I				
Pit-Edge						_			$\overline{}$	-														10	2 12	10	10		_					_		$T \rightarrow T$	-	-							\neg
Pit-Edge	SB-NEBA	Monthly													Ш.																12 1					ш		\perp		\perp	Щ,				
	SB-NEBA SB-NEBB																											12 12 12 12								\Box	\pm		$oxed{oxed}$	\perp	\pm			士	$ \exists $
Pit-Edge Active-Pit	SB-NEBB	Monthly																						12	2 12	12	12	12 12	12	12	12 1	12 1	.2 12	2 12										\pm	
-		Monthly Monthly																						12	2 12	12	12		12	12	12 1	12 1	.2 12	2 12			\pm							#	

 $Annex\ A2-Environmental\ Monitoring\ and\ Audit\ Sampling\ Schedule\ for\ South\ of\ The\ Brothers\ (July\ 2012-February\ 2017)$

Cumulative Impact Sediment Chemistry Near-field Stations SB-RNA SB-RNB Mid-field Stations SB-RMA SB-RMB Far-Field Stations SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year	J A	2012 A S (D J	F	M A	2013 M J		0	12	12		A M J 12		O N	N D	J F 12	M A M J		S O	N D	J F M A M	2016 1 J J		S O	NI	2017 D J F
SB-RNA SB-RNB Mid-field Stations SB-RMA SB-RMB Far-Field Stations SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year 4 times per year 4 times per year												2	12	12	H	12	12	12	12		12			$oxed{oxed}$			\Box
SB-RNB Mid-field Stations SB-RMA SB-RMB Far-Field Stations SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year 4 times per year 4 times per year				\pm					+			2	12	12	1 1	12	12	12	12		12	1 I I T		$\perp \perp \perp$			
Mid-field Stations SB-RMA SB-RMB Far-Field Stations SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year 4 times per year			$\pm \pm$	+	+			12														 					
SB-RMA SB-RMB Far-Field Stations SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year			++						+ +	12	12	2	12	12	-	12	12	12	12		12		-				
SB-RMB Far-Field Stations SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year		+			+-+		+++	12		12	12	2	12	12		12	12	12	12	+++	12		+ +	+-+			++
SB-RFA SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations		 	1 1	+	+	+			12		12	12		12	12		12	12	12	12		12			+			++
SB-RFB Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year	I 1																							1 1			
Capped Pit Stations SB-RCA SB-RCB Sensitive Receiver Stations									12		12	12		12	12		12	12	12	12		12						
SB-RCA SB-RCB Sensitive Receiver Stations	4 times per year			\longrightarrow		 			12		12	12	2	12	12		12	12	12	12		12						+
SB-RCB Sensitive Receiver Stations	A times non year	+	+	+	-	+	_		12	+	12	12	,	12	12	+ +	12	12	12	12		12		+	+-+	-		++
Sensitive Receiver Stations	4 times per year 4 times per year	+	+ +	+	+	+			12		12	12		12	12	+ +	12	12	12	12		12		+++	++	+		++
				+	+									1 1 -			1 - t								+			1
MW1	4 times per year								12		12	12	2	12	12		12	12	12	12		12						
THB1	4 times per year								12		12	12		12	12		12	12	12	12		12						
THB2	4 times per year					ـــــــــــــــــــــــــــــــــــــــ			12		12	12	2	12	12		12	12	12	12		12						
Sediment Toxicity Tests		T A	\	O N	D I	E N	и Га	МІІ	IAC		N D	ŢŢ	M	A M I	IAG	0 N	I D	I E	M A M T	I A	s o	N D	J F M A M	4 T T T		S O	NIT) I I -
SB CMP 1 Active		JA	3 (, IN	<i>D</i>	I IV	vi A	IVI J) A 3	0	N D	JI	IVI	A WI J) A 3	UN		j F	A WI J	JA	3 0	TA D	J I WI A N	<u> </u>	A	3 0	IN L	, r
Reference		+	++	++	+	++		+++	++	++			+			++	++	-	+ + + -		+++	+		++	++		\vdash	++
SB-TRA	2 times per year			+	+	++		 	5	+			5		5	1 1	+	+			++			+ +	++	+		++
SB-TRB	2 times per year				二				5				5		5										11			
Near-Field																												
SB-TAA	2 times per year			\bot		\bot			5				5		5										44			
SB-TAB	2 times per year	\vdash	++	+	+	+	-	$\vdash \vdash \vdash$	5				5		5		++	_	-		+	\dashv		+	++			+
Sensitive Receiver Stations MW1	2 times per year	\vdash	++	++	+	++	_	++	5	++	_		5		5	++	++	+			+	+		+	++	-	\vdash	++
THB1	2 times per year 2 times per year	\vdash	+	+	+	++	+	+++	5	++			5		5	+ +	++	+		++	++	+		++	+++	+	\vdash	++
THB2	2 times per year	 	+ +	++	+	++		 	5	+			5		5		++	+	- 	++	++	+		+ +	++	1		++
SB CMP 2 Active	1 7	1	1 1	+++	一	++		 		+							+					\dashv		+ +	+			1
Reference					二																				11			
SB-TRA	2 times per year																	5		5								
SB-TRB	2 times per year	\vdash	+	$\rightarrow \rightarrow$	+	$\perp \perp$		+++		+	_		\bot				+	5		5	\rightarrow	\dashv			++			+
Near-Field SB-TBA	2 1:	\vdash	++	+	+	++	_	+++	++	++			+				++	-			+	-		+	++		\vdash	++
SB-TBB	2 times per year 2 times per year	\vdash	+	++	+	++	-	+ + +	+	++			+			+ +	++	5	- 	5	+	+ 1		+	++	+	\vdash	++
Sensitive Receiver Stations	2 times per year			+	+	++		+++		+ +						1		3			++				+			+
MW1	2 times per year			+														5		5					1 1			1
THB1	2 times per year																	5		5								
THB2	2 times per year																	5		5								
Tiana / Milala Da Ja Com P		T .			D ·	r ·		MIT	T 4 2		NI I D	y -	3.	A 36 7	TAC		I D	7 I v	MARKET	T ,	6 6	N D	T E M	4 T T		6 1 5	NY -	
Tissue/ Whole Body Sampling Near-Pit Stations		J A	5 (N	ן ע	F N	VI A	M J	J A S	U	ND	J	M	A M J	J A S	UN	שומ	J F	M A M J	JA	5 0	N D	J F M A N	1 J J	A	5 0	NI	J I
Near-Pit Stations SB-INA	2 times per year	 	+ +	++	+	++	-	+ + +	++	+		*	+		*		++	*		*	++	+		+ +	++		\vdash	++
SB-INB	2 times per year		+	++	+	++				+		*			*		+	*		*		+		+ +	++	+		++
Reference North	. ,			17																					11			
TNA	2 times per year											*			*			*		*								
TNB	2 times per year	\vdash		+		++		$\sqcup \bot \bot$	\perp	$\perp \perp$		*			*		+	*		*	\rightarrow			\perp	+		$\vdash \vdash$	+
Reference South	2 6	\vdash	+	+	+	++	_	+++	++	++	_	*	+	-	*	+	++	*		*	+	+		+	++	_	\vdash	++
TSA TSB	2 times per year 2 times per year	 	+ +	++	+	++		 	++	++		*			*		++	*	 	*	+++	+		+ +	++	-		++
130	2 mico per jeur				—	——				1 1		<u> </u>							1 1 1								<u> </u>	
Demersal Trawling		JA	S) N	D J	FN	М А	M J	J A S	0	N D	JF	M	A M J	J A S	O N	l D	J F	M A M J	J A	s o	N D	J F M A M	1 J J	A	s o	ΝΙ)]]
Impact					工																							
	-5 4 times per year		$\bot \bot \bot$	\bot \bot \bot	\bot	LΙ			5			5 5			5 5			5 5		5 5					$\bot I$			
	-5 4 times per year	\vdash		+		++		$\sqcup \bot \bot$	5	$\perp \perp$		5 5			5 5		+	5 5		5 5	\rightarrow			\perp	+		$\vdash \vdash$	+
Reference North	4 6	\vdash	+	+	+	++	_	+++	+-	++	_	5 5	+	-		+	++				+	+		+	++	_	\vdash	++
· · · · · · · · · · · · · · · · · · ·			\bot	+	+	++	-	+++	5	1 1		5 5 5 5		- 	5 5 5 5	+		5 5 5 5		5 5 5 5		-			+			++
TNA 1-5 TNR 1-5			1 1																									
TNB 1-5	4 times per year	-		++	+	++		+++	3	++		3 3	<u> </u>		5 5		+	3 3	- 	3 3	+++	+		++	++	+		++
	4 times per year			\ddagger	丰	井			5			5 5			5 5			5 5		5 5					++			##

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

				2012			2013						2014						201	.5					201	6				
Routine Water Quality Monitoring			J A	s o	N D	J F M A M		Α	s O N D	I	F			s	O N D	J F	M .	A M	Ţ	I A	s o	N	D	J F M A M	Ţ	I A	A S	О	N	
Ebb Tide			11				, ,			1			+										_					$\overline{}$		Ŧ
Impact Stations Downcurrent										1 1			+	-				_		-	-	+	-				+	+	-	+
impact stations bowncarrent	SB-IPE1	8 times per year						8	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	Ü	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	-	- 		_	-+	+	-+	-
	SB-IPE4	8 times per year						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	-	- 		_	-+	+	-+	-
Intermediate Stations Downcurrent	3D-11 L3	o times per year						0	0 0	0	0	8 8	8 8		0	0 0		0 0		0 0	0	0	-				+	+	-+	+
memediate stations bowncurrent	SB-INE1	Q times many year						8	8 8	8	0	8 8	8 8	_	8 8	8 8		8 8		8 8	0	8	+	 			+-	+	-+	-
	SB-INE2	8 times per year						8	8 8		8	8 8	8 8		8 8	0 0	_	8 8		8 8		8					+	+	\leftarrow	+
	SB-INE3	8 times per year						8	8 8		8	8 8	8 8		8 8	0 0		8 8		0 0		8					+	+	\leftarrow	+
	SB-INE3	8 times per year									8					0 0				8 8			-				+	$+\!-\!\!\!\!-$	\leftarrow	-
		8 times per year						8	8 8	-	-	8 8	8 8		8 8	8 8	_	8 8		8 8		8	-				+	$+\!-\!\!\!\!-$	\leftarrow	-
D. C. C. H.	SB-INE5	8 times per year						8	8 8	δ	8	8 8	8 8		8 8	8 8		8 8	+	0 8	8	8	-	+ + + + +			+	+	\leftarrow	+
Reference Stations Upcurrent	CD DEE4	0.4									0			-		0 0		0 0	+	0 0			-	+ + + + +			+	+	\leftarrow	+
	SB-RFE1	8 times per year		\dashv				8	8 8	Ü	8	8 8	8 8		8 8	8 8		8 8	+	8 8		8	-	 	_	+	+	+	\vdash	+
	SB-RFE2	8 times per year						8	8 8	-	8	8 8	8 8		8 8	8 8		8 8	+	8 8		8	_	 		_	\dashv	$+\!\!-\!\!\!\!-$	\vdash	+
	SB-RFE3	8 times per year						8	8 8		8	8 8	8 8		8 8	8 8		8 8	+	8 8		8	_	 		_	\dashv	$+\!\!-\!\!\!\!-$	\vdash	+
	SB-RFE4	8 times per year						8	8 8		8	8 8	8 8		8 8	8 8		8 8		8 8		8						\bot	\vdash	
	SB-RFE5	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8						\bot	\longrightarrow	
Sensitive Receiver Stations													\bot									\perp						\perp	\vdash	_
	MW1	8 times per year						8	8 8	Ü	8	8 8	8 8		8 8	8 8		8 8		8 8		8							\leftarrow	
	THB1	8 times per year						8	8 8	Ü	8	8 8	8 8		8 8	8 8		8 8		8 8		8							\leftarrow	
	THB2	8 times per year						8	8 8	Ü	8	8 8	8 8		8 8	8 8		8 8		8 8		8							\leftarrow	
	WSR45C	8 times per year						8	8 8		8	8 8	8 8		8 8	8 8		8 8		8 8	8	8						\bot	ightharpoonup	
	WSR46	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8							ш	
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	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	8						T	$_{i}$	
	SB-IPF3	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8							\Box	
Intermediate Stations Downcurrent																												T	īT	
	SB-INF1	8 times per year						8	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	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	8								
Reference Stations Upcurrent		• •																										\top		
•	SB-RFF1	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8						1		
	SB-RFF2	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8						1		
	SB-RFF3	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8						+		
Sensitive Receiver Stations		1 ,																									\neg	+	1	
	MW1	8 times per year						8	8 8	8	8	8 8	8 8		8 8	8 8		8 8		8 8	8	8		 			\top	\top	\vdash	\neg
	THB1	8 times per year						8	8 8		8	8 8	8 8		8 8	8 8		8 8		8 8		8		 			\top	+	-	\pm
	THB2	8 times per year		1				8	8 8		8	8 8	8 8		8 8	8 8		8 8		8 8		8	-	 	$\neg \dagger$	_	+	+	\neg	+
	WSR45C	8 times per year						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	\dagger	8 8		8	-	 		-	+	+	-+	+
	,,,,,,,,,	- mico per yeur		1 1			1 1	V	1 0 1 0 1	7	Ŭ	, , , , , , , , , , , , , , , , , , ,		1	- -			- 1 0	1 1	J 0		1 7								
Water Column Profiling			J A	S O	N D	J F M A M	Ј Ј	Α	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	0	N	D J
•								_																	-		_	_	_	Ŧ
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	4	4		J.			1	, ,	

Annex A2 - Environmental Monitoring and Audit Sampling Schedule for South of The Brothers (July 2012 - February 2017)

				20	12					2	013							2014						2015						2016					2017
Capping Water Quality Monitoring			Т			П	T I	E M	Δ			s o	N	пп	E	M	М		S	O N	D .	I E	МА			s o	N I) I	F M A M			s o	N		F
Ebb Tide			, ,	A 3	O N	Б) 1	I IVI	А	IVI J	J A	3 0	19	Б ,	ľ	IVI I	1 111	J J A	. 3	O N	D .) F	IVI A	WI J	j A	3 0	IN I	, ,	I WI A WI))	Α	3 0	10	<u> </u>	#
Impact Stations Downcurrent				+										-					+ +		 	-			+		+ +		++++		+ +		+	-	+
Impact Stations Downcurrent	SB-IPE1	4 times per year											 	-	-				+ +		3	3		3	3				3	3	3		+ +	3	+
	SB-IPE2	4 times per year											1 1	-				- + +			2	3		2	3			,		3	3		1	2	+
	SB-IPE3										-	_	 	-		-	-		+ +	_	2	3		2	3			,		3	3			3	+
		4 times per year									 	_	 	_							3			3		-	3	,					+ +	3	+
	SB-IPE4	4 times per year											 	_							3	3		3	3		3	3		3	3		1 1	3	+
	SB-IPE5	4 times per year											.								3	3		3	3		3	3	3	3	3		1	3	—
Intermediate Stations Downcurrent																													+						_
	SB-INE1	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-INE2	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-INE3	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-INE4	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-INE5	4 times per year																			3	3		3	3		3	3	3	3	3			3	T
Reference Stations Upcurrent		1 ,									1 1 1																								+
	SB-RFE1	4 times per year				1 1		1											1 1		3	3	\dashv	3	3		9	3	3	3	3		† †	3	+
	SB-RFE2	4 times per year		+		+ +		+				-	++				+ +		+ +	-	3	3	\dashv	3	3	-	1 3	3		3	3		+	3	+
	SB-RFE3	4 times per year		++		+ +		-	┢		++++		++	-	H		+		+++	-	3	2	+++	2	3	_	1 3	2		3	3	_	++	3	+
1	SB-RFE4		\vdash	-		+	\vdash		\vdash		+++		\vdash		H	\vdash	-		+		2	3	++	3	3		3	,	<u> </u>	3	3		+	3	+
	SB-RFE5	4 times per year		+		+			\vdash		+++		++		\vdash		+		+		3	Ŭ	+	3		-	1 3	,		-		_	+		+
L	SB-RFE5	4 times per year											 	_							3	3		3	3		3	3	3	3	3		1 1	3	4
Sensitive Receiver Stations													$\vdash \vdash$								├ _ └	\bot	\longrightarrow		+		1 1	_	+-+-+-		\perp		1 1		\bot
	MW1	4 times per year																	$\bot \bot$		3	3	$\perp \downarrow \perp$	3	3		3			3	3			3	
	THB1	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	THB2	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	WSR45C	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	WSR46	4 times per year																			3	3		3	3		3	3	3	3	3			3	
Flood Tide		• •																	1 1			1 1					1 1						1 1	一	_
Impact Stations Downcurrent																											+ +		+ + + + + +				1 1	-	+
impact Stations Bowncurrent	SB-IPF1	4 times per year				+		_			+ + +		 	_						_	3	3		3	3			2	3	3	3	_	1 1	3	+
	SB-IPF2										-	_	 	-		-	-		+ +	_	3	3		3	3		3				3			3	+
		4 times per year									 	_	 	_							3			3		-				3			+ +		+
	SB-IPF3	4 times per year											.								3	3		3	3		3	3	3	3	3		1	3	_
Intermediate Stations Downcurrent																													+						
	SB-INF1	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-INF2	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-INF3	4 times per year																			3	3		3	3		3	3	3	3	3			3	
Reference Stations Upcurrent																																			
	SB-RFF1	4 times per year																			3	3		3	3		3	3	3	3	3			3	
	SB-RFF2	4 times per year									1 1 1										3	3		3	3		3	3	3	3	3			3	+
	SB-RFF3	4 times per year				1													1 1		3	3		3	3		1 1	3	3	3	3		1 1	3	\top
Sensitive Receiver Stations		r / cm		+		+ +		+				-	++				+ +		+ +	-	 	+ +	\dashv	+ $$ $+$	+ +	-	+ + `		+ + + + + + + + + + + + + + + + + + + +		+ +		+	$\dot{-}$	+
School of Stations	MW1	4 times per year		++		+ +		-	┢		++++		++	-	H		+		+++	-	3	3	+++	2	3	_	3	2	3	3	3	_	++	3	+
				+		+ +	\vdash	-			+++	-	++		-		+ +		+ +	-	3	3	++	2	3		3			3	3		++	3	+
	THB1	4 times per year		+		+			\vdash		+++		++		\vdash		+		+		3		+	3		-	`					_	+		+
	THB2	4 times per year		-		$oldsymbol{\perp}$							\vdash	_			_		+		3	3	\rightarrow	3	3		3			3	3		$\downarrow \downarrow \downarrow$	3	+
	WSR45C	4 times per year							\sqcup				\vdash		\sqcup			-	1 1		3	3		3	3	_	3	5		3	3		1 1	3	+
	WSR46	4 times per year																			3	3		3	3		3	3	3	3	3			3	
Benthic Recolonisation Studies			J .	A S	O N	I D	J	F M	Α	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	NI) J	F M A M	J	A	s o	N	D J)
Capped Contaminated Mud Pits																																		$\neg \vdash$	T
11	SB-CPA	2 times per year				1 1		1											1 1			\dashv	\dashv		12		1	2	 		12	_	† †	12	+
	SB-CPB	2 times per year		+		1 1							++		\vdash	-	+		+			+	\dashv	+	12		1		++++	-	12			12	+
	3D-C1 D	2 times per year				+ - 1			\vdash		+++		 	-	-			++	+ +		 	\dashv			12		1	_	+ + + + +		12	_		12	+
Defence of Chatiers			+	+		+			\vdash		+++	-	\vdash		\vdash				++	-	\vdash	+	++	++	12	_	+ 1	_	+++++		12	_	++	14	+
Reference Stations	DP:	2.11		-		-	\vdash		$\vdash \downarrow$		+++		$\vdash \vdash$	_	\vdash		+	-	+		$oldsymbol{oldsymbol{+-}}$	\dashv	$\rightarrow \rightarrow$	++			+ + -	_	++++		4.5		++	-12	+
	RBA	2 times per year							\sqcup				\vdash		\sqcup			-	1 1		lacksquare	-			12	_	1	_		_	12			12	+
	RBB	2 times per year																	$\bot \bot$		$oxed{oxed}$	\perp	$\perp \downarrow \perp$	\bot	12		1			_	12			12	_
i .	RBC	2 times per year						1	1 I	1		1	1		1			1 1	1 1	ı	1 1			1 1	12	1	1	2	1 1 1 1 1		12	1	1 1	12	1

Naming of stations are tentative only and will be subjected to changes

Annex B

Graphical Presentations

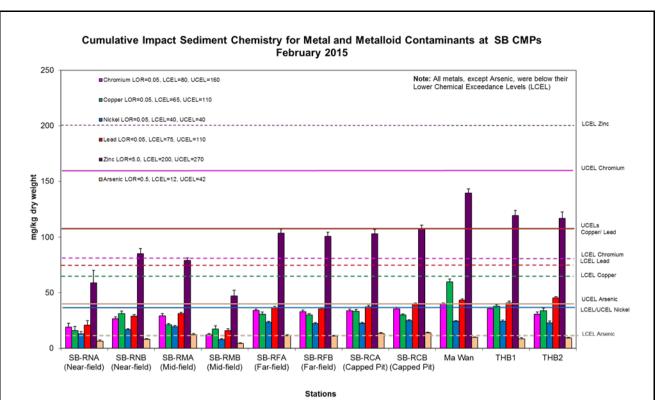


Figure 1: Concentration of Metals and Metalloid (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from Cumulative Impact Sediment Chemistry Monitoring for SB CMPs in February 2015.

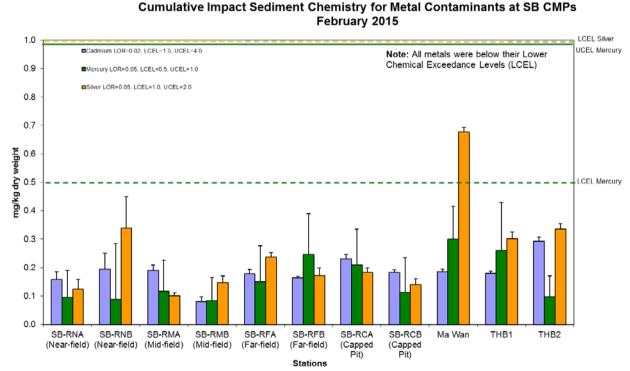


Figure 2: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from Cumulative Impact Sediment Chemistry Monitoring for SB CMPs in February 2015.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02

Deliverable \07 CMP Monthly Report \31st (March 2015)

Date: 17/4/2015



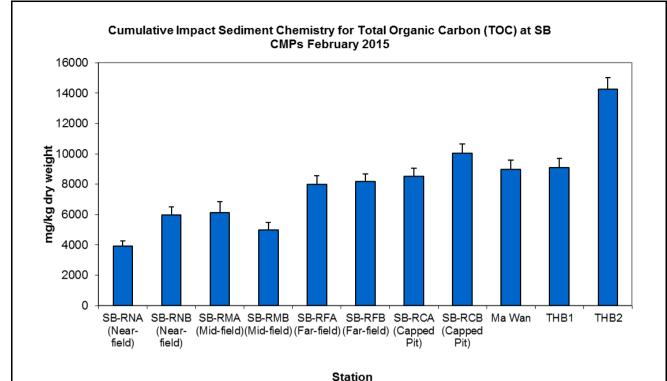


Figure 3: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from Cumulative Impact Sediment Chemistry Monitoring for SB CMPs in February 2015.

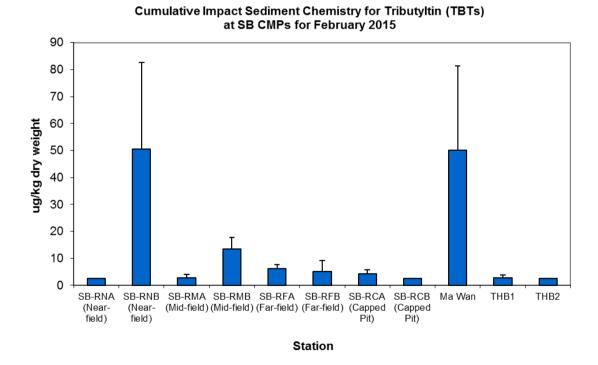


Figure 4: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from Cumulative Impact Sediment Chemistry Monitoring for SB CMPs in February 2015.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02 Deliverable\07 CMP Monthly Report\31st (March 2015)

Date: 17/4/2015



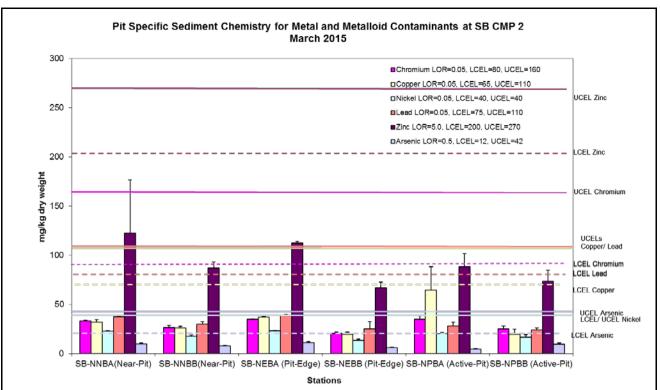


Figure 5: Concentration of Metals (Cr, Cu, Ni, Pb, Zn, As; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for SB CMP 2 in March 2015.

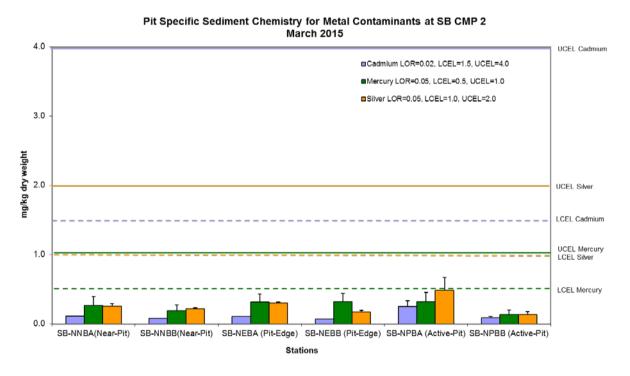


Figure 6: Concentration of Metals (Cd, Hg, Ag; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for SB CMP 2 in March 2015.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02

Deliverable\07 CMP Monthly Report\31st (March 2015)

Date: 17/4/2015



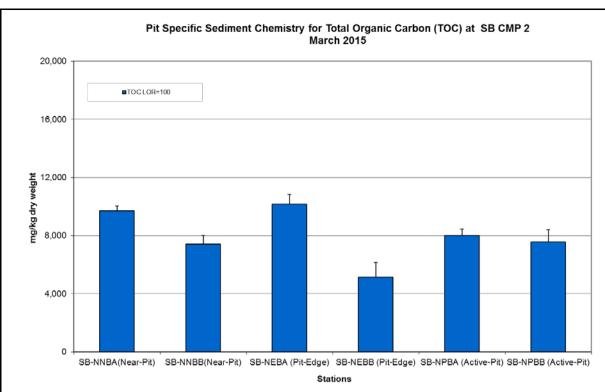


Figure 7: Concentration of Total Organic Carbon (mg/kg dry weight; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* for SB CMP 2 in March 2015.

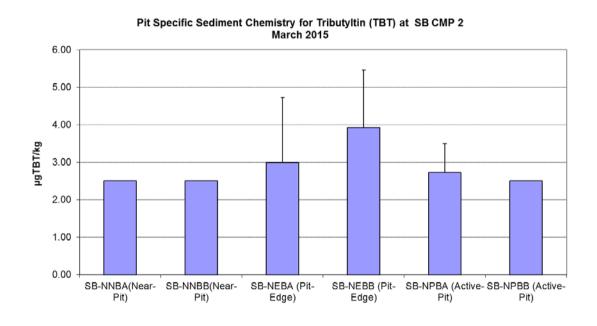


Figure 8: Concentration of Tributyltin (µg TBT/kg; mean +SD) in sediment samples collected from *Pit Specific Sediment Chemistry Monitoring* of SB CMP 2 in March 2015.

Source: H:\Team\EM\GMS Projects\0175086 CEDD EM&A for South Brothers\02

Deliverable\07 CMP Monthly Report\31st (March 2015)

Date: 17/4/2015



Annex C

Water Quality Monitoring Results

Table C1 Action and Limit Levels of Water Quality for Dredging, Backfilling and Capping Activities for SB CMPs

stations mean DO (at the same tide of the same day) Bottom	Parameter	Action Level	Limit Level
Significantly less than the reference stations mean DO (at the same tide of the same day) Bottom	Dissolved Oxygen (DO) (1)	The average of the impact, WSR 45C and WSR 46 station readings are < 5%-ile of baseline data for surface and	The average of the impact, WSR 45C and WSR 46 station readings are < 4
The average of the impact, WSR 45C and WSR 46 station, 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) Depth-averaged Suspended Solids (SS) (9) (4) Depth-averaged Suspended Solids (SS) (9) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4		Significantly less than the reference stations mean DO (at the same tide of	Significantly less than the reference stations mean DO (at the same tide of
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 Depth-averaged Turbidity (Tby) (3) (4) The average of the impact, WSR 45C and WSR 46 station readings are > 95%-ile of baseline data for depth average = 40.10 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 > 95%-ile of baseline data = 25.04 NTU and and 30% of control station's Tby at the 130% of control station's Tby at the		The average of the impact, WSR 45C and WSR 46 station readings are < 5%-ile of baseline data for bottom layers =	The average of the impact station, WSR 45C and WSR 46 readings are < 2 mg L-1
Solids (SS) (3) (4) 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 Depth-averaged Turbidity (Tby) (3) (4) 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 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 130% of control station's Tby at the		Significantly less than the reference stations mean DO (at the same tide of	Significantly less than the reference stations mean DO (at the same tide of
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 > 95%-ile of baseline data = 25.04 NTU and 120% of control station's Tby at the 130% of control station		and WSR 46 station readings are > 95%-ile of baseline data for depth	and WSR 46 station readings are > 99%-ile of baseline data for depth
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		and	and
(Tby) (3) (4) and WSR 46 station readings are > 95%-ile of baseline data = 25.04 NTU and and and 120% of control station's Tby at the 130% of control station's Tby at the			
120% of control station's Tby at the 130% of control station's Tby at the		and WSR 46 station readings are >	and WSR 46 station readings are >
		and	and

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.

Table C2 Water Column Profiling Results for SB CMP 2 on 5 March 2015

Stations	Temp	Salinity	Turbidity	Dissolved Oxygen		pН	Suspended Solids
	(°C)	(ppt)	(NTU)	(%)	(mg L-1)	(mg L-1)	(mg L-1)
WCP 1 (Downstream)	18.52	30.59	5.93	92.66	7.23	8.01	7.35
WCP 2 (Upstream)	18.58	30.40	10.23	93.45	7.29	7.99	10.23
WQO (dry season)	N/A	27.44- 33.43#	N/A	N/A	>4	6.5-8.5	13.7

Note: *Not exceeding 10% of natural ambient level which is the result obtained from the Reference Station.

Annex D

Study Programme

