MOTT MACDONALD

Expansion of Hong Kong International Airport into a Three-Runway System

Construction Phase Quarterly EM&A Report No.8 (1 October to 31 December 2017)

April 2018

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This Construction Phase Quarterly EM&A Report No. 8 has been reviewed and certified by

the Environmental Team Leader (ETL) in accordance with

Section 15.4 of the Updated EM&A Manual

Certified by: 

Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date 27 April 2018

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By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
Hong Kong International Airport
Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Principal Manager

27 April 2018

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Quarterly EM&A Report No.8 (For 1 October 2017 to 31 December 2017)

Reference is made to the Environmental Team's submission of Quarterly EM&A Report No.8 (For 1 October 2017 to 31 December 2017) under Condition 15.4 of the Updated EM&A Manual certified by the ET Leader on 27 April 2018.

We would like to inform you that we have no adverse comment and verify the captioned submission.

Should you have any query, please feel free to contact the undersigned at 3922 9376.

Yours faithfully,
AECOM Asia Co. Ltd.

Jackel Law
Independent Environmental Checker

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Abbreviations

3RS	Three-Runway System
AAHK	Airport Authority Hong Kong
AECOM	AECOM Asia Company Limited
AFCD	Agriculture, Fisheries and Conservation Department
AIS	Automatic Information System
ANI	Encounter Rate of Number of Dolphins
APM	Automated People Mover
AW	Airport West
BHS	Baggage Handling System
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CTP	Coral Translocation Plan
CWD	Chinese White Dolphin
DCM	Deep Cement Mixing
DEZ	Dolphin Exclusion Zone
DO	Dissolved Oxygen
EAR	Ecological Acoustic Recorder
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring & Audit
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
FCZ	Fish Culture Zone
HDD	Horizontal Directional Drilling
HKBCF	Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities
HKIA	Hong Kong International Airport
HSF	High Speed Ferry
IEC	Independent Environmental Checker
LKC	Lung Kwu Chau
MMHK	Mott MacDonald Hong Kong Limited
MMWP	Marine Mammal Watching Plan
MSS	Marine Surveillance System
MTRMP-CAV	Marine Travel Routes and Management Plan for Construction and Associated Vessel
NEL	Northeast Lantau
NWL	Northwest Lantau
PAM	Passive Acoustic Monitoring
PM	Partial Mortality
PVD	Prefabricated Vertical Drain
SC	Sha Chau
SCLKCMP	Sha Chau and Lung Kwu Chau Marine Park
SS	Suspended Solids
STG	Encounter Rate of Number of Dolphin Sightings
SWL	Southwest Lantau

The Project	The Expansion of Hong Kong International Airport into a Three-Runway System
The SkyPier Plan	Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier
TMT	Tai Mo To
TSP	Total Suspended Particulates
WL	West Lantau
WMP	Waste Management Plan

Executive Summary

The "Expansion of Hong Kong International Airport into a Three-Runway System" (the Project) serves to meet the future air traffic demands at Hong Kong International Airport (HKIA). On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the Project was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual.

This is the 8th Construction Phase Quarterly EM&A Report for the Project which summarizes the monitoring results and audit findings of the EM&A programme during the reporting period from 1 October 2017 to 31 December 2017.

Key Activities in the Reporting Period

The key activities of the Project carried out in the reporting period included reclamation works and land-side works. Reclamation works included deep cement mixing (DCM) works, laying of sand blanket, seawall construction, and prefabricated vertical drain (PVD) installation. Land-side works included horizontal directional drilling (HDD) works, site office establishment, cable ducting works, concrete removal works, piling, and excavation works.

EM&A Activities Conducted in the Reporting Period

The EM&A programme was undertaken in accordance with the Updated EM&A Manual of the Project. Summary of the monitoring activities during this reporting period is presented as below:

Monitoring Activities	Number of Sessions
1-hour Total Suspended Particulates (TSP) air quality monitoring	96
Noise monitoring	65
Water quality monitoring	39
Vessel line-transect surveys for Chinese White Dolphin (CWD) monitoring	6
Land-based theodolite tracking survey effort for CWD monitoring	15
Terrestrial ecology monitoring	3
Coral post-translocation monitoring	1

Apart from the regular site inspections, audit of SkyPier High Speed Ferries (HSF), audit of the construction and associated vessels, and audit of the implementation of Marine Mammal Watching Plan (MMWP) and Dolphin Exclusion Zone (DEZ) Plan were also conducted in the reporting period. Based on the information including ET's observations, records of Marine Surveillance System (MSS) and contractors' site records, the environmental mitigation measures were properly implemented and the construction operation of the Project in the reporting period did not introduce adverse impacts to the sensitive receivers.

Snapshots of EM&A Activities in the Reporting Period

Photo 1: Land-Based Theodolite Tracking Survey for CWD at Sha Chau Conducted by ET

Photo 2: Sample Collection for Water Quality Monitoring Conducted by ET

Photo 3: Chemical Spill Drill Conducted by Contractor

Summary Findings of the EM&A Programme

Monitoring results of construction dust, construction noise, construction waste, CWD, and coral post-translocation did not trigger the corresponding Action and Limit Levels in the reporting period.

The water quality monitoring results for dissolved oxygen (DO), turbidity, and total alkalinity obtained during the reporting period complied with their corresponding Action and Limit Levels stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme if being triggered. For suspended solids (SS), chromium, and nickel, some of the testing results triggered the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that the cases were not related to the Project; To conclude, the construction operation in the reporting period did not introduce adverse impact to all water quality sensitive receivers.

The monthly terrestrial ecology monitoring on Sheung Sha Chau observed that HDD works were conducted at the daylighting location and there was no encroachment upon the egretry area nor any significant disturbance to egrets foraging at Sheung Sha Chau by the works.

The key findings of the EM&A programme during the reporting period is summarized as below:

	Yes	No	Details	Analysis / Recommendation / Remedial Actions
Breach of Limit Level^		√	No breach of Limit Level was recorded.	Nil
Breach of Action Level^		√	No breach of Action Level was recorded.	Nil
Complaints Received	√		A complaint on material dumping from construction vessel was received on 24 Nov 2017.	Contractor had provided adequate disposal facilities and arranged regular disposal. No observation relating to illegal dumping was found during regular and *ad-hoc* site inspections.
Notification of any summons and status of prosecutions		√	No notification of summons or prosecution were received.	Nil
Changes that affect the EM&A		√	There was no change to the construction works that may affect the EM&A	Nil

Note:
^ Only triggering of Action or Limit Level related to Project works is counted as Breach of Action or Limit Level.

1 Introduction

1.1 Background

On 7 November 2014, the Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) for the "Expansion of Hong Kong International Airport into a Three-Runway System" (the Project) was approved and an Environmental Permit (EP) (Permit No.: EP-489/2014) was issued for the construction and operation of the Project.

Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) to undertake the role of Environmental Team (ET) for carrying out the Environmental Monitoring & Audit (EM&A) works during the construction phase of the Project in accordance with the Updated EM&A Manual (the Manual) submitted under EP Condition 3.1[1]. AECOM Asia Company Limited (AECOM) was employed by AAHK as the Independent Environmental Checker (IEC) for the Project.

The Project covers the expansion of the existing airport into a three-runway system (3RS) with key project components comprising land formation of about 650 ha and all associated facilities and infrastructure including taxiways, aprons, aircraft stands, a passenger concourse, an expanded Terminal 2, all related airside and landside works and associated ancillary and supporting facilities. The existing submarine aviation fuel pipelines and submarine power cables also require diversion as part of the works.

Construction of the Project is to proceed in the general order of diversion of the submarine aviation fuel pipelines, diversion of the submarine power cables, land formation, and construction of infrastructure, followed by construction of superstructures.

The updated overall phasing programme of all construction works was presented in Appendix A of the Construction Phase Monthly EM&A Report No. 7 and the contract information was presented in Appendix A of the Construction Phase Monthly EM&A Report No. 22.

1.2 Scope of this Report

This is the 8th Construction Phase Quarterly EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 October 2017 to 31 December 2017.

1.3 Project Organisation

The Project's organisation structure is provided in **Appendix A.** Contact details of the key personnel have been updated and provided in and **Table 1.1**.

Table 1.1: Contact Information of Key Personnel

Party	Position	Name	Telephone
Project Manager's Representative (Airport Authority Hong Kong)	Principal Manager, Environment	Lawrence Tsui	2183 2734
Environmental Team (ET)	Environmental Team Leader	Terence Kong	2828 5919

[1] The Manual is available on the Project's dedicated website (accessible at: http://env.threerunwaysystem.com/en/index.html)

Party	Position	Name	Telephone
(Mott MacDonald Hong Kong Limited)	Deputy Environmental Team Leader	Heidi Yu	2828 5704
	Deputy Environmental Team Leader	Keith Chau	2972 1721
Independent Environmental Checker (IEC) (AECOM Asia Company Limited)	Independent Environmental Checker	Jackel Law	3922 9376
	Deputy Independent Environmental Checker	Roy Man	3922 9376

Advanced Works:

Contract P560(R) Aviation Fuel Pipeline Diversion Works (Langfang Huayuan Mechanical and Electrical Engineering Co., Ltd.)	Project Manager	Wei Shih	2117 0566
	Environmental Officer	Lyn Liu	5172 6543

Deep Cement Mixing (DCM) Works:

Contract 3201 DCM (Package 1) (Penta-Ocean-China State-Dong-Ah Joint Venture)	Project Director	Tsugunari Suzuki	9178 9689
	Environmental Officer	Alan Tam	6119 3107
Contract 3202 DCM (Package 2) (Samsung-BuildKing Joint Venture)	Project Manager	Ilkwon Nam	9643 3117
	Environmental Officer	Dickson Mak	9525 8408
Contract 3203 DCM (Package 3) (Sambo E&C Co., Ltd.)	Project Manager	Eric Kan	9014 6758
	Environmental Officer	David Hung	9765 6151
Contract 3204 DCM (Package 4) (CRBC-SAMBO Joint Venture)	Project Manager	Kyung-Sik Yoo	9683 8697
	Environmental Officer	Kanny Cho	6799 8226
Contract 3205 DCM (Package 5) (Bachy Soletanche - Sambo Joint Venture)	Deputy Project Director	Min Park	9683 0765
	Environmental Officer	Margaret Chung	9130 3696

Reclamation Works:

Contract 3206 (ZHEC-CCCC-CDC Joint Venture)	Project Manager	Kim Chuan Lim	3693 2288
	Environmental Officer	Kwai Fung Wong	3693 2252

Airfield Works:

Contract 3301 North Runway Crossover Taxiway (FJT-CHEC-ZHEC Joint Venture)	Project Manager	Kin Hang Chung	9412 1386

Terminal 2 Expansion Works:

Contract 3501 Antenna Farm and Sewage Pumping Station (Build King Construction Ltd.)	Project Manager	Osbert Sit	9079 7030
	Environmental Officer	Kelvin Cheung	9305 6081
Contract 3502 Terminal 2 APM Depot Modification Works (Build King Construction Ltd.)	Project Manager	Kivin Cheng	9380 3635
	Environmental Officer	Chun Pong Chan	9187 7118

Automated People Mover (APM) Works:

Contract 3602 Existing APM System Modification Works (Niigata Transys Co., Ltd.)	Project Manager	Kunihiro Tatecho	9755 0351
	Environmental Officer	Arthur Wong	9170 3394

Airport Support Infrastructure and Logistic Works:

Contract 3801 APM and BHS Tunnels on Existing Airport Island (China State Construction Engineering (Hong Kong) Ltd.)	Project Manager	Tony Wong	9642 8672
	Environmental Officer	Fredrick Wong	9842 2703

1.4 Contact information for the Project

The contact information for the Project is provided in **Table 1.2**. The public can contact us through the following channels if they have any queries and comments on the environmental monitoring data and project related information.

Table 1.2: Contact Information of the Project

Channels	Contact Information
Hotline	3908 0354
Email	env@3rsproject.com
Fax	3747 6050
Postal Address	Airport Authority Hong Kong HKIA Tower 1 Sky Plaza Road Hong Kong International Airport Lantau Hong Kong Attn: Environmental Team Leader Mr Terence Kong c/o Mr Lawrence Tsui (TRD)

1.5 Summary of Construction Works

The key activities of the Project carried out in the reporting period included reclamation works and land-side works. Reclamation works included deep cement mixing (DCM) works, laying of sand blanket, seawall construction, and prefabricated vertical drain (PVD) installation. Land-side works included horizontal directional drilling (HDD) works, site office establishment, cable ducting works, concrete removal works, piling, and excavation works.

The locations of the works areas are presented in **Figure 1.1** to **Figure 1.2**.

1.6 Summary of EM&A Programme Requirements

The status for all environmental aspects is presented in **Table 1.3**. The EM&A requirements remained unchanged during the reporting period.

Table 1.3: Summary of Status for All Environmental Aspects under the Updated EM&A Manual

Parameters	EM&A Requirements	Status
Air Quality		
Baseline Monitoring	At least 14 consecutive days before commencement of construction work	The baseline air quality monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	At least 3 times every 6 days	On-going
Noise		
Baseline Monitoring	Daily for a period of at least two weeks prior to the commencement of construction works	The baseline noise monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
Water Quality		
General Baseline Water Quality Monitoring for reclamation, water jetting and field joint works	Three days per week, at mid-flood and mid-ebb tides, for at least four weeks prior to the commencement of marine works.	The baseline water quality monitoring result has been reported in Baseline Water Quality Monitoring Report and submitted to EPD under EP Condition 3.4.
General Impact Water Quality Monitoring for reclamation, water	Three days per week, at mid-flood and mid-ebb tides.	On-going

Parameters	EM&A Requirements	Status
jetting and field joint works		
Initial Intensive Deep Cement Mixing (DCM) Water Quality Monitoring	At least four weeks	The Initial Intensive DCM Monitoring Report was submitted and approved by EPD in accordance with the Detailed Plan on DCM.
Regular DCM Water Quality Monitoring	Three times per week until completion of DCM works.	On-going
Waste Management		
Waste Monitoring	At least weekly	On-going
Land Contamination		
Supplementary Contamination Assessment Plan (CAP)	At least 3 months before commencement of any soil remediation works.	The Supplementary CAP was submitted and approved by EPD pursuant to EP condition 2.20.
Contamination Assessment Report (CAR) for Golf Course	CAR to be submitted for golf course first; programme for submission of supplementary CAR at the other areas to be agreed.	The CAR for Golf Course was submitted to EPD.
Terrestrial Ecology		
Pre-construction Egretry Survey Plan	Once per month in the breeding season between April and July, prior to the commencement of HDD drilling works.	The Egretry Survey Plan was submitted and approved by EPD under EP Condition 2.14.
Ecological Monitoring	Monthly monitoring during the HDD construction works period from August to March.	On-going
Marine Ecology		
Pre-Construction Phase Coral Dive Survey	Prior to marine construction works	The Coral Translocation Plan was submitted and approved by EPD under EP Condition 2.12.
Coral Translocation	-	The coral translocation was completed on 5 January 2017.
Post-translocation Monitoring	As per an enhanced monitoring programme based on the Coral Translocation Plan	On-going
Chinese White Dolphins (CWD)		
Baseline Monitoring	6 months of baseline surveys before the commencement of land formation related construction works. Vessel line transect surveys: Two full surveys per month; Land-based theodolite tracking surveys: Two days per month at the Sha Chau station and two days per month at the Lung Kwu Chau station; and Passive Acoustic Monitoring (PAM): For the whole duration of baseline period.	Baseline CWD results were reported in the CWD Baseline Monitoring Report and submitted to EPD in accordance with EP Condition 3.4.
Impact Monitoring	Vessel line transect surveys: Two full surveys per month; Land-based theodolite tracking surveys: One day per month at the Sha Chau station and one day per	On-going

Parameters	EM&A Requirements	Status
	month at the Lung Kwu Chau station; and PAM: For the whole duration for land formation related construction works.	
Landscape and Visual		
Baseline Monitoring	One-off survey within the Project site boundary prior to commencement of any construction works	The baseline landscape & visual monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
Environmental Auditing		
Regular site inspection	Weekly	On-going
Marine Mammal Watching Plan (MMWP) implementation measures	Monitor and check	On-going
DEZ Plan implementation measures	Monitor and check	On-going
SkyPier High Speed Ferries (HSF) implementation measures	Monitor and check	On-going
Construction and Associated Vessels implementation measures	Monitor and check	On-going
Complaint Hotline and Email Channel	Construction phase	On-going
Environmental Log Book	Construction phase	On-going

Taking into account the construction works in the reporting period, impact monitoring of air quality, noise, water quality, waste management, terrestrial ecology, landscape and visual, and CWD were carried out in the reporting period. Upon completion of coral translocation in January 2017, a summary of the ensuing post-translocation monitoring is reported quarterly.

The EM&A programme also involved weekly site inspections and related auditing conducted by ET for the checking of implementation of required environmental mitigation measures recommended in the approved EIA Report. To promote the environmental awareness and enhance the environmental performance of the contractors, environmental briefings, environmental trainings, and regular environmental management meetings were conducted during the reporting period which are summarized as below:

- Five dolphin observer trainings provided by ET;
- Nine skipper trainings provided by ET;
- Three environmental briefings on EP and EM&A requirements of the 3RS provided by ET;
- One environmental briefing on Control of Marine Dumping provided by EPD; and
- 27 occasions of environmental management meetings on EM&A matters.

The EM&A programme has been following the recommendations presented in the approved EIA Report and the Manual. A summary of implementation status of the environmental mitigation

measures for the construction phase of the Project during the reporting period is provided in **Appendix B**.

2 Environmental Monitoring and Auditing

2.1 Air Quality Monitoring

Impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted three times every six days at two representative monitoring stations during the reporting period. The locations of monitoring stations are described in **Table 2.1** and presented in **Figure 2.1**.

2.1.1 Action and Limit Levels

The Action and Limit Levels of the air quality monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are provided in **Table 2.1** for reference.

2.1.2 Summary of Monitoring Results

The air quality monitoring results in the reporting period are summarized in **Table 2.1** and the graphical plot is presented in **Appendix C**.

Table 2.1: Impact Air Quality Monitoring Results

Monitoring Station	Location	1-hr TSP Concentration Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
AR1A	Man Tung Road Park	12 – 119	306	500
AR2	Village House at Tin Sum	14 – 276	298	

The monitoring results complied with the corresponding Action and Limit Levels at all monitoring stations in the reporting period.

The weather varied from sunny to rainy during the reporting period. Wind direction was mainly northeast or northwest in the reporting period.

2.1.3 Conclusion

The major dust sources during the reporting period were observed to be local air pollution and nearby traffic emissions. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the works of the Project.

2.2 Noise Monitoring

Impact noise monitoring was conducted at five representative monitoring stations once per week during 0700 and 1900 in the reporting period. The locations of monitoring stations are described in **Table 2.2** and presented in **Figure 2.1**.

2.2.1 Action and Limit Levels

The Action and Limit Levels of the noise monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are provided in **Table 2.2** for reference.

2.2.2 Summary of Monitoring Results

The noise monitoring results in the reporting period are summarized in **Table 2.2** and the graphical plot is presented in **Appendix C**.

Table 2.2: Impact Noise Monitoring Results

Monitoring Station	Location	Noise Level Range, $L_{eq\ (30\ mins)}$ (dB(A))	Action Level	Limit Level
NM1A	Man Tung Road Park	71 – 73	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)
NM3A	Site Office	57 – 63		75 dB(A)
NM4	Ching Chung Hau Po Woon Primary School	60 – 66		65dB(A) / 70 dB(A) [(i)]
NM5	Village House in Tin Sum	53 – 66		75 dB(A)
NM6	House No. 1, Sha Lo Wan	66 – 73		75 dB(A)

Note: [(i)] Reduced to 70dB(A) for school and 65dB(A) during school examination periods at NM4.

The monitoring results complied with the corresponding Action and Limit Levels at all monitoring stations in the reporting period.

2.2.3 Conclusion

The major noise sources during the reporting period were observed to be road traffic and helicopters at NM1A, aircrafts and helicopters at NM3A, helicopters and construction activities from a nearby school at NM4, aircrafts and helicopters at NM5, and aircrafts, helicopters, and marine vessels at NM6. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the works of the Project.

2.3 Water Quality Monitoring

During the reporting period, water quality monitoring was conducted three days per week, at mid-flood and mid-ebb tides, at a total of 22 water quality monitoring stations, comprising 12 impact (IM) stations, 7 sensitive receiver (SR) stations, and 3 control (C) stations in the vicinity of the water quality sensitive receivers around the airport island in accordance with the Manual. The purpose of water quality monitoring at the IM stations is to promptly capture any potential water quality impacts from the Project before the impacts could become apparent at sensitive receivers (represented by the SR stations). **Table 2.3** describes the details of the monitoring stations. **Figure 2.2** shows the locations of the monitoring stations.

Table 2.3: Monitoring Locations and Parameters for Impact Water Quality Monitoring

Monitoring Stations	Description	Coordinates		Parameters
		Easting	Northing	
C1	Control Station	804247	815620	
C2	Control Station	806945	825682	
C3[3]	Control Station	817803	822109	
IM1	Impact Station	806458	818351	DO, pH, Temperature, Salinity, Turbidity, SS, Total Alkalinity, Heavy Metals[2]
IM2	Impact Station	806193	818852	
IM3	Impact Station	806019	819411	
IM4	Impact Station	805039	819570	
IM5	Impact Station	804924	820564	
IM6	Impact Station	805828	821060	
IM7	Impact Station	806835	821349	
IM8	Impact Station	807838	821695	
IM9	Impact Station	808811	822094	
IM10	Impact Station	809838	822240	
IM11	Impact Station	810545	821501	
IM12	Impact Station	811519	821162	
SR1[1]	Future Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) Seawater Intake for cooling	812586	820069	DO, pH, Temperature, Salinity, Turbidity, SS
SR2[3]	Planned marine park / hard corals at The Brothers / Tai Mo To	814166	821463	DO, pH, Temperature, Salinity, Turbidity, SS, Total Alkalinity, Heavy Metals[2][4]
SR3	Sha Chau and Lung Kwu Chau Marine Park / fishing and spawning grounds in North Lantau	807571	822147	DO, pH, Temperature, Salinity, Turbidity, SS
SR4A	Sha Lo Wan	807810	817189	
SR5A	San Tau Beach SSSI	810696	816593	
SR6	Tai Ho Bay, Near Tai Ho Stream SSSI	814663	817899	
SR7	Ma Wan Fish Culture Zone (FCZ)	823742	823636	
SR8[5]	Seawater Intake for cooling at Hong Kong International Airport (East)	811418 (from July 2017 onwards)	820246	

Notes:

(1) The seawater intakes of SR1 for the future HKBCF is not yet in operation, hence no water quality impact monitoring was conducted at this station. The future permanent location for SR1 during impact monitoring is subject to finalisation after the HKBCF seawater is commissioned.

(2) Details of selection criteria for the two heavy metals for regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website (http://env.threerunwaysystem.com/en/ep-submissions.html). DCM specific water quality monitoring parameters (total alkalinity and heavy metals) were only conducted at C1 to C3, SR2, and IM1 to IM12.

(3) According to the Baseline Water Quality Monitoring Report, C3 station is not adequately representative as a control station of impact/ SR stations during the flood tide. The control reference has been changed from C3 to SR2 from 1 September 2016 onwards.

(4) Total alkalinity and heavy metals results are collected at SR2 as a control station for regular DCM monitoring.

(5) The monitoring location for SR8 is subject to further changes due to silt curtain arrangements and the progressive relocation of this seawater intake.

2.3.1 Action and Limit Levels

The Action and Limit Levels for general water quality monitoring and regular DCM monitoring stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme are presented in **Table 2.4**. The control and IM stations during flood tide and ebb tide for general water quality monitoring and regular DCM monitoring are presented in **Table 2.5**.

Table 2.4: Action and Limit Levels for General Water Quality Monitoring and Regular DCM Monitoring

Parameters	Action Level		Limit Level	
Action and Limit Levels for general water quality monitoring and regular DCM monitoring (excluding SR1& SR8)				
DO in mg/L (Surface, Middle & Bottom)	Surface and Middle 4.5 mg/L		Surface and Middle 4.1 mg/L 5 mg/L for Fish Culture Zone (SR7) only	
	Bottom 3.4 mg/L		Bottom 2.7 mg/L	
SS in mg/L	23	or 120% of upstream control station at the same tide of the same day, whichever is higher	37	or 130% of upstream control station at the same tide of the same day, whichever is higher
Turbidity in NTU	22.6		36.1	
Total Alkalinity in ppm	95		99	
Representative Heavy Metals for regular DCM monitoring (Chromium)	0.2		0.2	
Representative Heavy Metals for regular DCM monitoring (Nickel)	3.2		3.6	
Action and Limit Levels SR1				
SS (mg/l)	To be determined prior to its commissioning		To be determined prior to its commissioning	
Action and Limit Levels SR8				
SS (mg/l)	52		60	

Notes:

1. For DO measurement, Action or Limit Level is triggered when monitoring result is lower than the limits.
2. For parameters other than DO, Action or Limit Level of water quality results is triggered when monitoring results is higher than the limits.
3. Depth-averaged results are used unless specified otherwise.
4. Details of selection criteria for the two heavy metals for regular DCM monitoring refer to the Detailed Plan on Deep Cement Mixing available on the dedicated 3RS website http://env.threerunwaysystem.com/en/ep-submissions.html)
5. The Action and Limit Levels for the two representative heavy metals chosen will be the same as that for the intensive DCM monitoring.

Table 2.5: The Control and Impact Stations during Flood Tide and Ebb Tide for General Water Quality Monitoring and Regular DCM Monitoring

Control Station	Impact Stations
Flood Tide	
C1	IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, SR3
SR2^[1]	IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR3, SR4A, SR5A, SR6, SR8
Ebb Tide	
C1	SR4A, SR5A, SR6
C2	IM1, IM2, IM3, IM4, IM5, IM6, IM7, IM8, IM9, IM10, IM11, IM12, SR1A, SR2, SR3, SR7, SR8

[^1] As per findings of Baseline Water Quality Monitoring Report, the control reference has been changed from C3 to SR2 from 1 Sep 2016 onwards.

2.3.2 Summary of Monitoring Results

The summary or results complying with their corresponding Action and Limit Levels in the reporting period are presented in **Table 2.6**. It should be noted that Severe Typhoon Khanun hit Hong Kong from 14 to 16 Oct 2017 and the water quality monitoring results in that period might be affected by the inclement weather

Table 2.6: Percentage of Monitoring Results Complying with Action and Limit Levels

	DO (Surface and Middle)	DO (Bottom)	SS	Turbidity	Alkalinity	Chromium	Nickel
Oct 2017	100%	100%	98.75%	100%	100%	100%	100%
Nov 2017	100%	100%	98.96%	100%	100%	99.36%	99.68%
Dec 2017	100%	100%	97.09%	100%	100%	100%	100%
Overall	100%	100%	98.27%	100%	100%	99.79%	99.89%

Note: The percentages are calculated by dividing the number of depth-averaged results complying with their corresponding Action and Limit Level by the total number of depth-averaged results.

The monitoring results for DO, turbidity, and total alkalinity obtained in the reporting period complied with their corresponding Action and Limit Levels stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme if being triggered. For SS, chromium and nickel, some of the testing results triggered the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly.

Summaries of results triggering Action or Limit Level for SS, chromium, and nickel are presented in **Table 2.7** to **Table 2.10**. Details of the investigation findings are presented in Construction Phase Monthly EM&A Report No. 22, 23, and 24, which concluded that all results triggering the Action or Limit Level were not related to the Project.

Table 2.7: Summary of SS Results Triggering Action or Limit Level (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR2	SR3	SR4A	SR5A	SR6	SR7	SR8
17/10/2017																			
19/10/2017											D								
24/10/2017											D								
09/12/2017	D	D	D	D															
16/12/2017																			
21/12/2017				D															
No. of result triggering Action or Limit Level	1	1	1	2	3	2	0	0	1	0	2	0	0	0	0	0	0	0	0

Table 2.8: Summary of SS Results Triggering Action or Limit Level (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR3	SR4A	SR5A	SR6	SR7	SR8
24/10/2017																		
04/11/2017										D								
07/11/2017																		
23/11/2017									D									
07/12/2017					D	D												
16/12/2017					D													
21/12/2017																		
23/12/2017								D										
No. of result triggering Action or Limit Level	1	0	1	1	2	1	0	1	1	1	2	0	0	0	0	0	1	0

Table 2.9: Summary of Chromium Results Triggering Action or Limit Level (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12
25/11/2017									D	D		
No. of result triggering Action or Limit Level	0	0	0	0	0	0	0	0	1	1	0	0

Table 2.10: Summary of Nickel Results Triggering Action or Limit Level (Mid-Ebb Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12
18/11/2017								D				
No. of result triggering Action or Limit Level	0	0	0	0	0	0	0	1	0	0	0	0

Note: The monitoring results on monitoring dates not presented in the above tables did not trigger their corresponding Action or Limit Levels. Detailed results are presented in **Appendix C**.

Legend:	
	Result complied with corresponding Action and Limit Levels
	Result triggered the Action Level at monitoring station located upstream of the Project based on dominant tidal flow
D	Result triggered the Action Level at monitoring station located downstream of the Project based on dominant tidal flow
D	Result triggered the Limit Level at monitoring station located downstream of the Project based on dominant tidal flow
	Upstream station with respect to the Project during the respective tide based on dominant tidal flow

2.3.3 Conclusion

In the reporting period, it is noted that most monitoring results complied with their corresponding Action and Limit Levels, while minor number of results triggered their corresponding Action or Limit Level, and investigations were conducted accordingly. Based on the findings presented in Construction Phase Monthly EM&A Report No. 22, 23, and 24, all results that triggered the corresponding Action or Limit Level were not related to the Project; hence, the Project did not

introduce adverse impact to all water quality sensitive receivers. All required actions under the Event and Action Plan had been followed.

Nevertheless, the non-project related triggers have been attended to and have initiated corresponding action and measures. As part of the EM&A programme, the construction methods and mitigation measures for water quality will continue to be monitored and opportunities for further enhancement will continue to be explored and implemented where possible, to strive for better protection of water quality and the marine environment.

In the meantime, the contractors were reminded to implement and maintain all mitigation measures during weekly site inspection. These include maintaining the silt curtain for sand blanket laying properly and maintaining the levels of materials on barges to avoid overflow as recommended in the Manual.

2.4 Waste Monitoring

In accordance with the Manual, the waste generated from construction activities was audited once per week to determine if wastes were being managed in accordance with the Waste Management Plan (WMP) prepared for the Project, contract-specific WMP, and any statutory and contractual requirements. All aspects of waste management including waste generation, storage, transportation, and disposal were assessed during the audits.

2.4.1 Action and Limit Levels

The Action and Limit Levels of the construction waste are provided in **Table 2.11**.

Table 2.11: Action and Limit Levels for Construction Waste

Monitoring Stations	Action Level	Limit Level
Construction Area	When one valid documented complaint is received	Non-compliance of the WMP, contract-specific WMPs, any statutory and contractual requirements

2.4.2 Summary of Monitoring Results

Based on updated contractors' information, summary of construction waste generated in the reporting period is presented in **Table 2.12**.

The monitoring results complied with the corresponding Action and Limit Levels in the reporting period.

Table 2.12: Summary of Construction Waste Generated in the Reporting Period

	Excavated Material (m^3)[1]	C&D[2] Material Reused in the Project (m^3)	C&D Material Disposed of as Public Fill (m^3)	Chemical Waste (kg)	Chemical Waste (L)	General Refuse (tonne)[3]
Oct 2017	371	84	53	30	11,400	149
Nov 2017	380	530	101	105	3,100	193
Dec 2017	1,381	1,320	269	240	7,600	246
Total	2,132	1,934	423	375	22,100	589

Notes:

1. The excavated materials were temporarily stored at stockpiling area and will be reused in the Project.
2. C&D refers to Construction and Demolition.
3. Figures are rounded off to the nearest tonne.
4. Paper, plastics, and metals were recycled in the reporting period.

Weekly waste monitoring of the Project construction works was carried out by the ET in the reporting period to check and monitor the implementation of proper waste management practices during the reporting period.

Recommendations were provided during monitoring, including provision and maintenance of spill kits and drip trays, provision of proper storage area for general refuse and chemical waste, as well as regular segregation and removal of waste. The contractors had taken actions to implement the recommended measures.

2.5 Chinese White Dolphin Monitoring

CWD monitoring was conducted by vessel line transect survey at a frequency of two full surveys per month, supplemented by land-based theodolite tracking survey and PAM. The frequency of the land-based theodolite tracking survey during the construction phase was one day per month at both Sha Chau (SC) and Lung Kwu Chau (LKC) stations as stipulated in the Manual. Additional land-based theodolite tracking survey at the SC station and the LKC station (in total 2 tracking days and 3 tracking days per month at respective stations) were also conducted on a voluntary basis to collect supplementary information for the project. Monitoring was fully completed in the reporting period. The vessel survey transect lines matched those proposed in the Manual and transect lines are consistent with those used in the Agriculture, Fisheries and Conservation Department (AFCD) long-term CWD monitoring programme. The transect locations of CWD monitoring by vessel line transect survey conducted from October to December 2017 are shown in **Figure 2.3**, whilst the land-based theodolite tracking survey stations are described in **Table 2.13** and depicted in **Figure 2.4**. The location of the PAM device is shown in **Figure 2.10**.

Table 2.13: Land-based Theodolite Tracking Survey Station Details

Stations	Location	Geographical Coordinates	Station Height (m)	Approximate Tracking Distance (km)
D	Sha Chau (SC)	22° 20' 43.5" N 113° 53' 24.66" E	45.66	2
E	Lung Kwu Chau (LKC)	22° 22' 44.83" N 113° 53' 0.2" E	70.40	3

2.5.1 Action and Limit Levels

The Action Level and Limit Levels for CWD monitoring were formulated by an action response approach using the running quarterly dolphin encounter rates (STG and ANI) derived from baseline monitoring data, as presented in the CWD Baseline Monitoring Report. The derived values of Action and Limit Levels for CWD monitoring are shown in **Table 2.14**.

Table 2.14: Derived Values of Action Level and Limit Level for Chinese White Dolphin Monitoring

	NEL, NWL, AW, WL and SWL as a Whole
Action Level	Running quarterly STG < 1.86 & ANI < 9.35
Limit Level	Two consecutive running quarterly (3-month) STG < 1.86 & ANI < 9.35

2.5.2 Summary of Monitoring Results

2.5.2.1 Vessel Line Transect Survey

Survey Effort

During the reporting period, six complete sets of vessel line transect surveys were conducted from October to December 2017 to cover all transects in Northeast Lantau (NEL), Northwest Lantau (NWL), Airport West (AW), West Lantau (WL) and Southwest Lantau (SWL) survey areas twice per month.

A total of around 1,369 km of survey effort was collected from these surveys, with around 81.2% of the total survey effort being conducted under favourable weather condition (i.e. Beaufort Sea State 3 or below with favourable visibility). Details of the survey effort data are presented in **Appendix C**.

CWD Sighting

From October to December 2017, there were in total 47 groups with 168 dolphins sighted (**Table 2.19**). Amongst the sightings of CWDs, 45 groups with 164 dolphins were made during on-effort searches during favourable weather conditions.

When breaking down the sightings by survey areas, 13 sightings with 62 dolphins, two sightings with 10 dolphins, 24 sightings with 78 dolphins and 8 sightings with 18 dolphins were recorded in NWL, AW, WL and SWL survey areas respectively during the current reporting period. No CWD was sighted in NEL survey area.

Compared to last quarter (i.e. July to September 2017), there are observable declines in CWD sightings in WL and SWL (43% and 76% decline in WL and SWL respectively). Taking account of the number of dolphins as recorded, there are 33% and 83% decline in WL and SWL respectively.

However, the number of CWD sightings in NWL (including AW) remains relative steady and even with an increase of 76% in terms of number of dolphins compared with last quarter.

Comparison between the current reporting quarter and the same quarter of last year (i.e. October to December 2016) revealed that the overall number of CWD sightings has a decline of around 20%. However, there is an increase of about 8% in terms of number of dolphins.

Table 2.15 below shows the comparison of the numbers of sightings and dolphins amongst the current reporting period, last quarter, and the same quarter of year 2016.

Table 2.15: Summary of Number of CWD Sightings and Number of Dolphins for the Same Quarter Last Year, Previous Quarter, and Current Reporting Period

	October to December 2016	July to September 2017	October to December 2017
NEL	0 (0)	0 (0)	0 (0)
NWL	18 (59)	16 (40)	13 (62)
AW	0 (0)	1 (1)	2 (10)
WL	25 (63)	42 (116)	24 (78)
SWL	16 (34)	34 (109)	8 (18)
Total	59 (156)	93 (266)	47 (168)

Note: Values in ( ) represent number of dolphins

Distribution of CWD sightings recorded from October to December 2017 are illustrated in **Figure 2.5**. In NWL, CWD sightings were mostly within and around Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP) as well as the southwestern part of the survey area with two sightings recorded in close vicinity to the 3RS works area. In WL, the majority of the CWD sightings were located along the coastal waters from Tai O to Fan Lau, especially the waters around Tai O, Yi O and off Peaked Hill. While in SWL, CWD sightings mainly distributed in the coastal waters at Fan Lau Tung Wan and Lo Kei Wan. Details of the sighting data are presented in **Appendix C**.

Figure 2.5: Sightings Distribution of Chinese White Dolphins

Remarks: Please note that there are 47 pink circles on the map indicating the sighting locations of CWD. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

Encounter Rate

The dolphin encounter rates for the number of dolphin sightings per 100 km survey effort (STG) and for the total number of dolphins per 100 km survey effort (ANI) in the whole survey area (i.e. NEL, NWL, AW, WL and SWL) for October, November and December 2017 are summarized in **Table 2.16**.

In this reporting period, the monthly encounter rates for STG and ANI both decrease from October to November 2017 followed by an increase in December 2017. Comparing with the previous reporting period, the running quarterly STG and ANI decrease from 6.68 to 4.05 and from 19.97 to 14.75 respectively.

Table 2.16: Summary of Monthly and Running Quarterly STG and ANI of Chinese White Dolphin for Previous and Current Reporting Periods

	Previous Reporting Period			Current Reporting Period		
	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
Monthly STG	6.76	8.11	5.32	4.54	2.07	5.33
Monthly ANI	18.45	24.06	17.73	16.02	6.82	20.77
Running Quarterly STG	5.73	7.03	6.68	5.90	4.09	4.05
Running Quarterly ANI	20.95	20.30	19.97	19.05	13.91	14.75

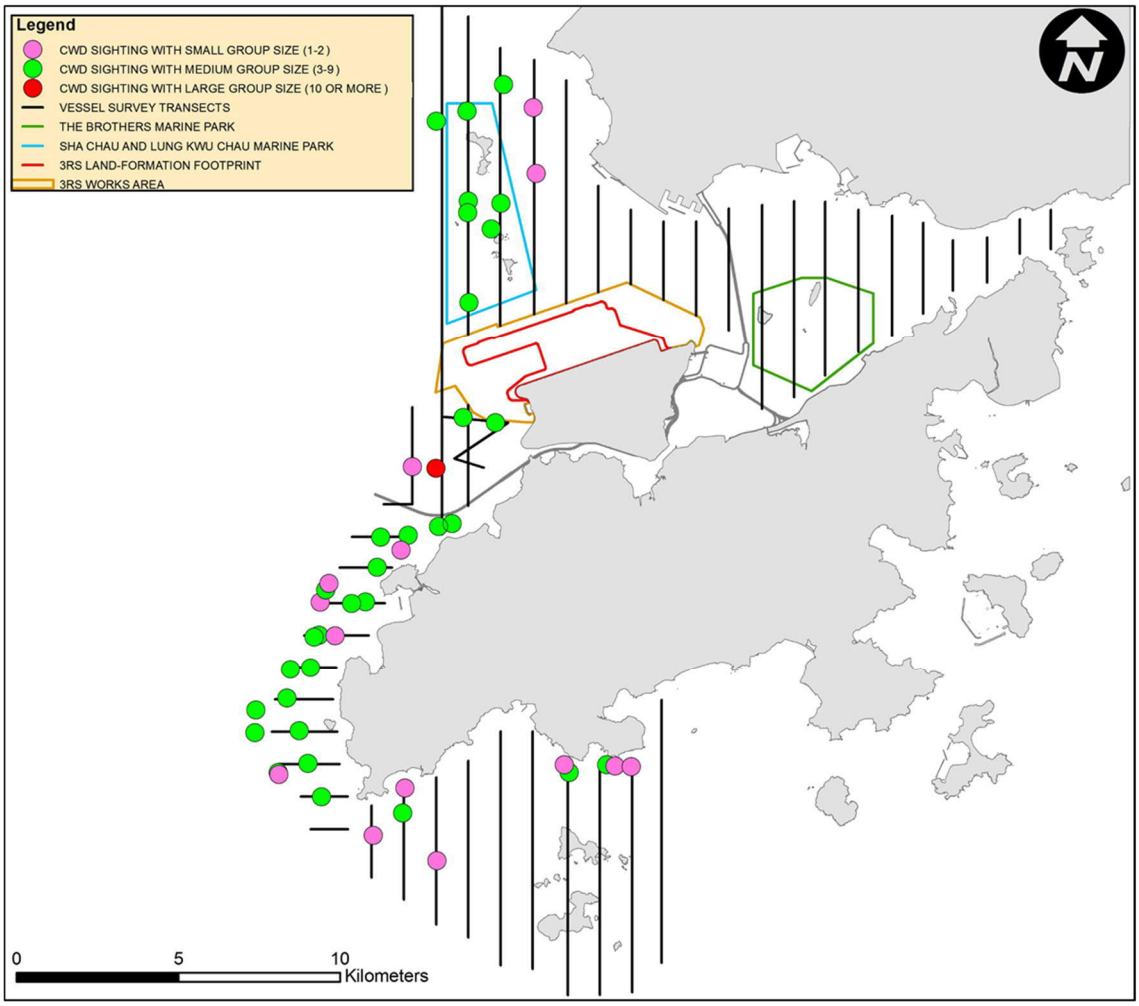
Notes: For detailed calculations of encounter rates STG and ANI, please refer to the Construction Phase Monthly EM&A Report No. 22, 23 and 24.

Group Size

Between October and December 2017, the group size of CWDs ranged from 1 to 12 dolphins per group. The average group size of CWDs was 3.6 dolphins per group while that of the last quarter was 2.9. Medium-sized CWD groups (i.e. 3-9 dolphins) were dominant (i.e. 32 out of 47 sightings). There was only one CWD sighting with a large group size (i.e. 10 or more dolphins) in this reporting period, which was recorded in NWL.

In NWL and WL, medium group size of CWD sightings dominated in this reporting period. While in SWL, the number of small group size sightings (i.e. 1-2 dolphins) dominated. This finding is a contrast to the findings of previous reporting period in which NWL and WL were dominated by small-sized CWD sightings and SWL was dominated by medium-sized sighting. Sighting locations of CWD groups with different group sizes are depicted in **Figure 2.6**.

Figure 2.6: Sighting Locations of Chinese White Dolphins with Different Group Sizes

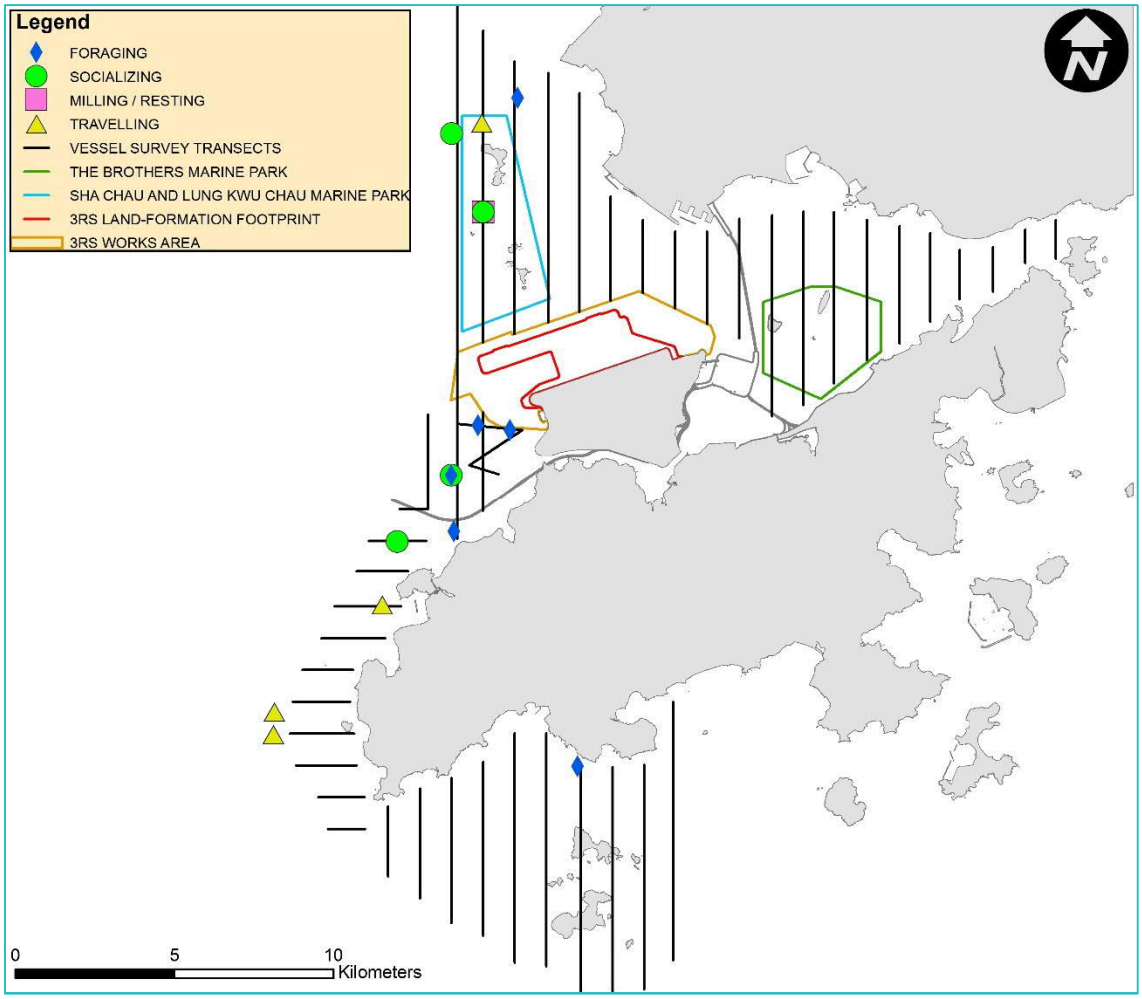


Remarks: Please note that there are 47 circles on the map indicating the sighting locations of CWD. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

Activities and Association with Fishing Boats

During October to December 2017, 14 sightings of CWDs were sighted with feeding activities. Amongst these 14 sightings of feeding CWDs, two were observed in association with operating gill netter in WL and SWL respectively, while one sighting was observed in association with operating shrimp trawler in WL. The numbers of sightings with feeding and association with operating fishing boats are similar to the last reporting period (i.e. 12 sightings involved feeding activities with two sightings observed in association with operating fish boat). Compared with the data in the same period of last year, there is a 30% decline of feeding activities (i.e. 20 sightings observed with feeding activities) while there were three sightings recorded in association with operating fishing boats. The sighting locations of CWDs engaged in different behaviours during the reporting period are illustrated in **Figure 2.7**.

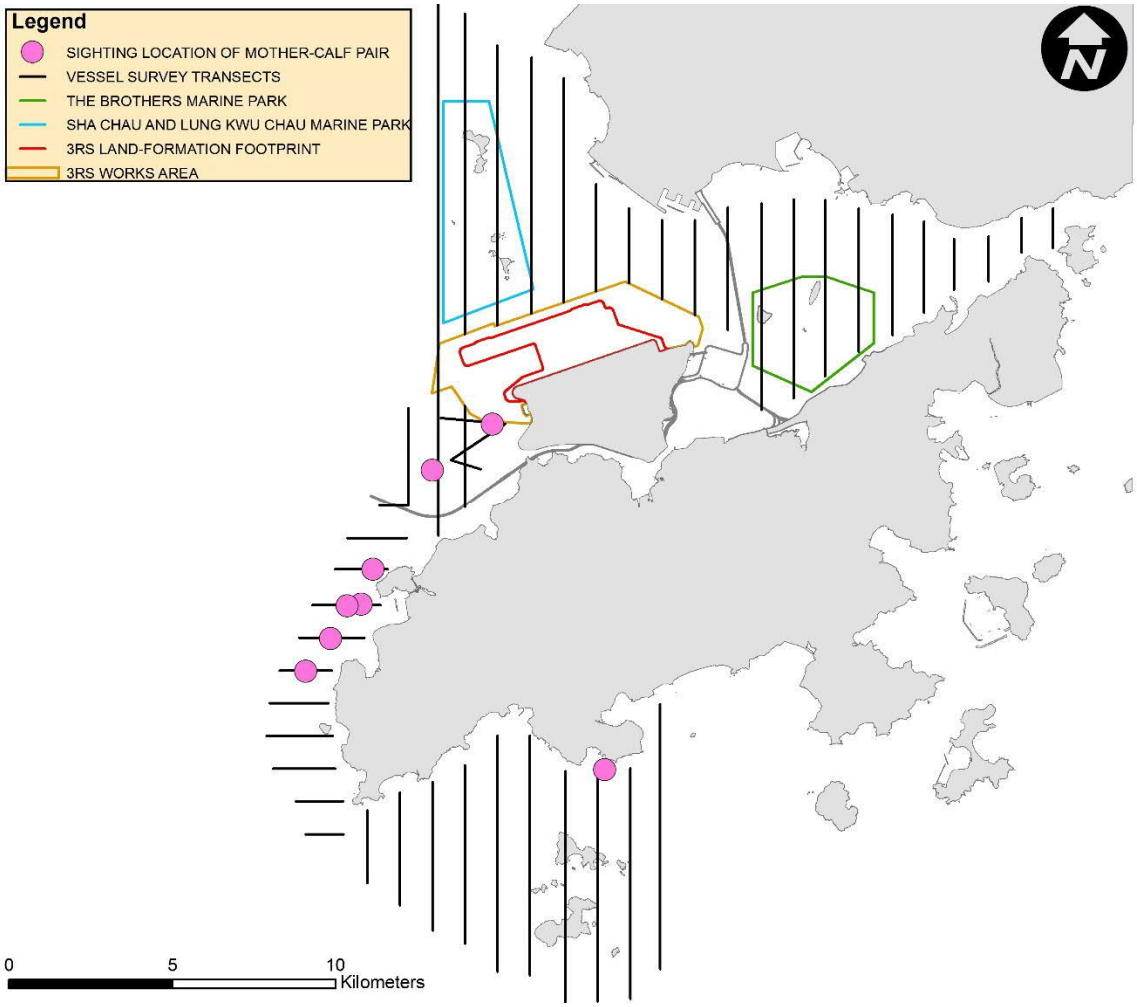
Figure 2.7: Sighting Locations of Chinese White Dolphins Engaged in Different Behaviours



Mother-calf Pairs

From October to December 2017, 8 sightings of CWDs were recorded with the presence of mother-and-calf, mother-and-unspotted juvenile and/or mother-and-spotted juvenile pairs. The majority of these mother-calf pairs were sighted in WL. The sighting locations of mother-calf pairs are shown in **Figure 2.8**.

Figure 2.8: Sighting Locations of Mother-calf Pairs



Remarks: Please note that there are 8 pink circles on the map indicating the locations of the sightings with the presences of mother-and-calf, mother-and-unspotted juvenile and/or mother-and-spotted juvenile pairs. Some of them were very close to each other and therefore appear overlapped on this sighting distribution map.

Photo Identification

During October to December 2017, a total number of 61 different CWD individuals were identified altogether for 84 times. Re-sighting information of CWD individuals provides an initial idea of their range use and apparent connection between different areas around Lantau. Amongst these 61 different CWD individuals, 16 animals (i.e. NLMM002, NLMM004, NLMM027, NLMM028, NLMM037, SLMM014, SLMM018, SLMM028, SLMM030, WLMM001, WLMM019, WLMM026, WLMM027, WLMM065, WLMM066, WLMM107) were sighted for more than once.

Six individuals including SLMM014, SLMM018, SLMM030, WLMM001, WLMM026 and WLMM027 were re-sighted in different survey areas within this reporting period. Amongst these six animals, WLMM026 and WLMM027 have cross-area movement between NWL (including AW) and WL or SWL survey area. Whilst SLMM014, SLMM018 and WLMM001 have cross-area movement in WL and SWL. The most frequently re-sighted individuals were SLMM030, WLMM065 and WLMM066, all recorded for 4 times during this reporting period. SLMM030 has shown cross-area movement amongst NWL, WL and SWL, while WLMM065 and WLMM066 were only encountered in WL. The number of CWD individuals re-sighted for more than once and the

number of CWD individuals showing cross-area movement are both fewer than last quarter (i.e. July to September 2017).

A summary of photo identification works is presented in **Table 2.17**. Representative photos of the 61 identified individuals and figures depicting the sighting locations of the aforementioned 16 re-sighted individuals recorded in this reporting period are presented **Appendix C**.

Table 2.17: Summary of Photo Identification

Individual ID	Date of sighting	Sighting Group No.	Area
NLMM002	25-Oct-17	1	NWL
	14-Dec-17	1	NWL
NLMM004	06-Dec-17	5	NWL
	14-Dec-17	1	NWL
NLMM005	14-Dec-17	1	NWL
NLMM010	25-Oct-17	1	NWL
NLMM011	15-Nov-17	1	NWL
NLMM012	15-Nov-17	1	NWL
NLMM015	27-Oct-17	3	WL
NLMM016	07-Dec-17	3	WL
NLMM019	21-Nov-17	1	AW
NLMM027	25-Oct-17	1	NWL
	14-Dec-17	2	NWL
NLMM028	25-Oct-17	1	NWL
	14-Dec-17	2	NWL
NLMM033	25-Oct-17	2	NWL
NLMM037	15-Nov-17	1	NWL
	14-Dec-17	1	NWL
NLMM039	15-Nov-17	1	NWL
NLMM049	07-Nov-17	1	NWL
NLMM051	25-Oct-17	2	NWL
NLMM054	07-Nov-17	1	NWL
NLMM055	06-Dec-17	1	NWL
NLMM056	06-Dec-17	4	NWL
NLMM057	06-Dec-17	4	NWL
NLMM058	06-Dec-17	4	NWL
NLMM059	06-Dec-17	4	NWL
SLMM014	07-Dec-17	5	WL
	08-Dec-17	2	SWL
SLMM015	19-Oct-17	2	SWL
SLMM018	23-Oct-17	2	SWL
	07-Dec-17	5	WL
SLMM021	19-Oct-17	2	SWL
SLMM023	26-Oct-17	8	WL
SLMM028	06-Dec-17	3	NWL
	07-Dec-17	1	AW
SLMM030	19-Oct-17	1	SWL
	26-Oct-17	1	WL
	06-Dec-17	3	NWL
	07-Dec-17	1	AW
SLMM031	26-Oct-17	10	SWL
SLMM037	26-Oct-17	2	WL

Individual ID	Date of sighting	Sighting Group No.	Area
SLMM048	28-Dec-17	3	WL
SLMM049	07-Dec-17	4	WL
SLMM052	28-Dec-17	8	SWL
SLMM053	06-Dec-17	2	NWL
WLMM001	21-Nov-17	2	SWL
	07-Dec-17	2	WL
WLMM007	07-Dec-17	4	WL
WLMM019	24-Oct-17	1	NWL
	25-Oct-17	1	NWL
WLMM021	27-Oct-17	1	WL
WLMM024	21-Nov-17	1	AW
WLMM026	26-Oct-17	1	WL
	06-Dec-17	3	NWL
WLMM027	26-Oct-17	1	WL
	06-Dec-17	3	NWL
WLMM030	25-Oct-17	2	NWL
WLMM049	06-Dec-17	5	NWL
WLMM054	26-Oct-17	1	WL
WLMM056	27-Oct-17	1	WL
WLMM062	26-Oct-17	5	WL
WLMM063	28-Dec-17	3	WL
WLMM064	06-Dec-17	1	NWL
WLMM065	26-Oct-17	4	WL
		6	WL
	27-Oct-17	2	WL
	17-Nov-17	1	WL
WLMM066	26-Oct-17	4	WL
		6	WL
	27-Oct-17	2	WL
	17-Nov-17	1	WL
WLMM071	06-Dec-17	1	NWL
WLMM075	27-Oct-17	2	WL
WLMM091	26-Oct-17	7	WL
WLMM093	26-Oct-17	7	WL
WLMM094	26-Oct-17	7	WL
WLMM100	24-Oct-17	1	NWL
WLMM104	26-Oct-17	2	WL
WLMM105	26-Oct-17	8	WL
WLMM106	26-Oct-17	8	WL
WLMM107	26-Oct-17	8	WL
	28-Dec-17	2	WL
		3	WL

2.5.2.2 Land-based Theodolite Tracking Survey

Survey Effort

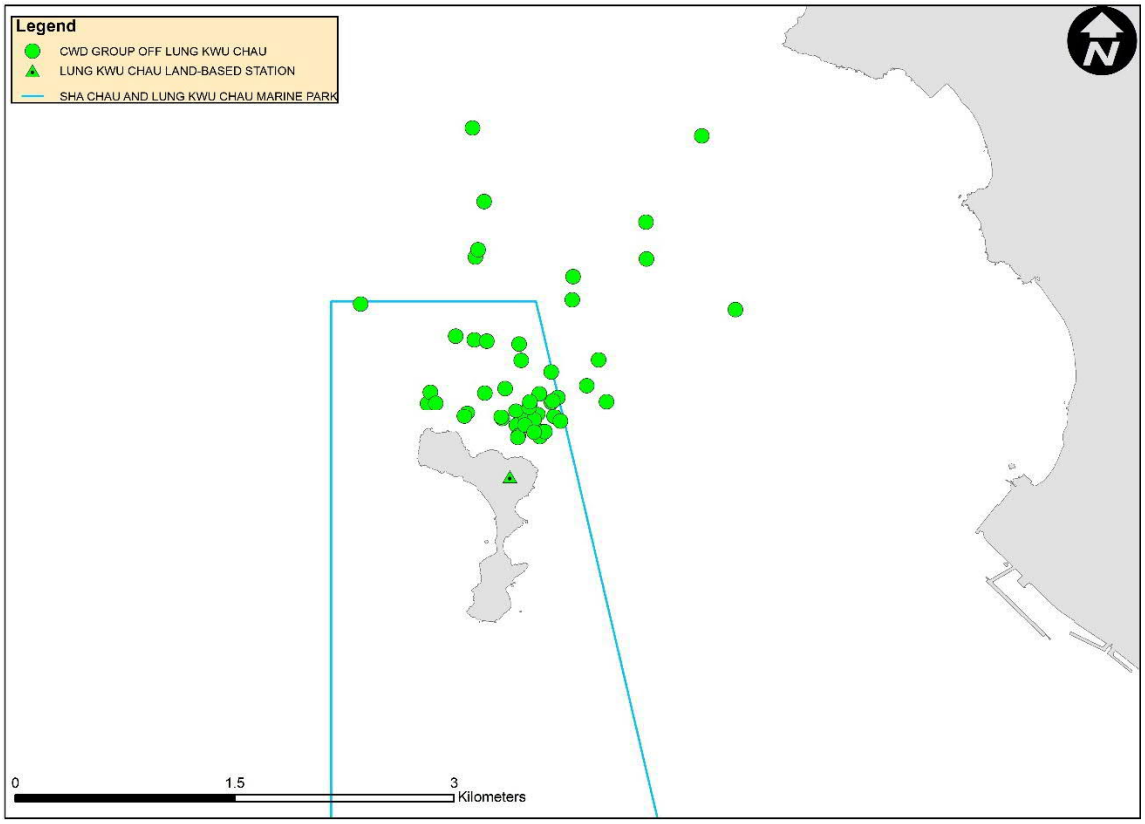
During October to December 2017, a total of 15 days of land-based theodolite tracking survey effort were completed, including nine days on Lung Kwu Chau and six days on Sha Chau. In total, 50 CWD groups were tracked from the Lung Kwu Chau station while no CWD groups were tracked from the Sha Chau station, with an overall 0.56 CWD groups sighted per survey effort hour.

Information on survey effort and CWD groups sighted during land-based theodolite tracking surveys are presented in **Table 2.18**. Details on the survey effort and CWD groups tracked are presented in **Appendix C**. The first sighting locations of CWD groups tracked between October and December 2017 are shown in **Figure 2.9**.

Table 2.18: Summary of Survey Effort and CWD Group of Land-based Theodolite Tracking Survey

Land-based Station	# of Survey Sessions	Survey Effort (hh:mm)	# CWD Groups Sighted	CWD Group Sighting per Survey Hour
October 2017				
Lung Kwu Chau	3	18:00	16	0.89
Sha Chau	2	12:00	0	0
TOTAL	**5**	**30:00**	**16**	**0.53**
November 2017				
Lung Kwu Chau	3	18:00	18	1.0
Sha Chau	2	12:00	0	0
TOTAL	**5**	**30:00**	**18**	**0.60**
December 2017				
Lung Kwu Chau	3	18:00	16	0.89
Sha Chau	2	12:00	0	0
TOTAL	**5**	**30:00**	**16**	**0.53**
OVERALL	**15**	**90:00**	**50**	**0.56**

Figure 2.9: Plots of First Sightings of All CWD Groups from Land-based Stations



Remarks: Please note that there are 50 green circles on the map indicating the first sighting locations of CWD groups tracked off Lung Kwu Chau. Some of them were very close to each other and therefore appear overlapped on this map.

2.5.2.3 Progress Update on PAM

An Ecological Acoustic Recorder (EAR) has been deployed and positioned to the south of Sha Chau Island inside the SCLKCMP (**Figure 2.10**) with 20% duty cycle with data from the EAR intended primarily to supplement the data collected from the land-based theodolite tracking survey station on Sha Chau. The EAR deployment generally lasts around 4-6 weeks followed by a period of data retrieval for subsequent analysis. As the data analysis takes more than two months after retrieval, PAM results are not suitable for reporting on a quarterly basis. Rather, detailed analysis of PAM data will be presented in annual CWD reports.

2.5.2.4 Site Audit for CWD-related Mitigation Measures

During the reporting period, silt curtains were in place by the contractors for sand blanket laying works, in which dolphin observers were deployed by each contractor in accordance with the Marine Mammal Watching Plan (MMWP). Teams of at least two dolphin observers were deployed at 12 to 22 dolphin observation stations by the contractors for continuous monitoring of the DEZ by all contractors for ground improvement works (DCM works and PVD installation) in accordance with the DEZ Plan. Trainings for the proposed dolphin observers on the implementation of MMWP and DEZ monitoring were provided by the ET prior to the aforementioned works, with a cumulative total of 546 individuals being trained and the training records kept by the ET. Observations were recorded on DEZ monitoring in this reporting period during site inspection by the ET and IEC. The contractors had taken actions to implement the recommended measures. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals

were observed within or around the silt curtains, whilst there was one record of dolphin sighting within the DEZ of DCM works in this reporting period. According to the contractor's site records, relevant DCM works were suspended in the dolphin sighting event until the DEZ was clear of dolphin for a continuous period of 30 minutes. The contractors' records were also audited by the ET during site inspection.

Audits of acoustic decoupling for construction vessels were carried out during weekly site inspection and summarized in **Section 2.6**. Summary of audits of SkyPier HSFs route diversion and speed control and construction vessel management are presented in **Section 2.8** and **Section 2.9** respectively.

2.6 Weekly Environmental Site Inspection

Site inspections of the construction works were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. Bi-weekly site inspections were also conducted by the IEC. Observations have been recorded in the site inspection checklist and passed to the contractor together with the appropriate recommended mitigation measures where necessary.

Based on the observations from site inspections, the key recommendations were related to:

- display of relevant permit, licenses, and labels;
- provision and maintenance of drip trays and chemical storage area;
- implementation of noise mitigation, dust suppression, wastewater treatment, tree protection and surface runoff prevention measures; and
- segregation of waste for recycling and disposal.

In addition, the following key recommendations were provided during site inspection on construction vessels:

- display of relevant permit, licenses, and labels;
- provision and maintenance of drip tray and chemical storage area;
- proper implementation of acoustic decoupling, wastewater treatment, dust suppression and spill and runoff preventive measures;
- proper disposal of general refuse and segregation of recyclables from general refuse; and
- ensuring the effectiveness of silt curtains.

The daily visual inspection checklists for silt curtains and bi-weekly diver inspection records which were implemented by the contractors in accordance with the Silt Curtain Deployment Plan had been checked during site inspection and reviewed at the end of the reporting period, summarizing that the silt curtains were maintained in the correct positions and intact without obvious defects or damage.

A summary of implementation status of the environmental mitigation measures for the construction phase of the Project during the reporting period is provided in **Appendix C**.

2.7 Ecological Monitoring

In accordance with the Manual, ecological monitoring shall be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island during the HDD construction works period from August to March to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.

Monthly ecological monitoring was carried out in October, November and December 2017 on Sheung Sha Chau Island. No encroachment of any works upon the egretry area nor any significant disturbance to the egrets foraging on the island by the works was recorded during ecological monitoring. No sign of nursery activity was observed in the reporting period at the previously identified egretry area at the southern side of Sheung Sha Chau Island. At the HDD daylighting location, neither nest nor breeding activity of birds were found during the monthly ecological monitoring and weekly site inspections in the reporting period. The site photos and location map regarding the ecological monitoring for HDD works and egretry area are provided in **Appendix C** for reference.

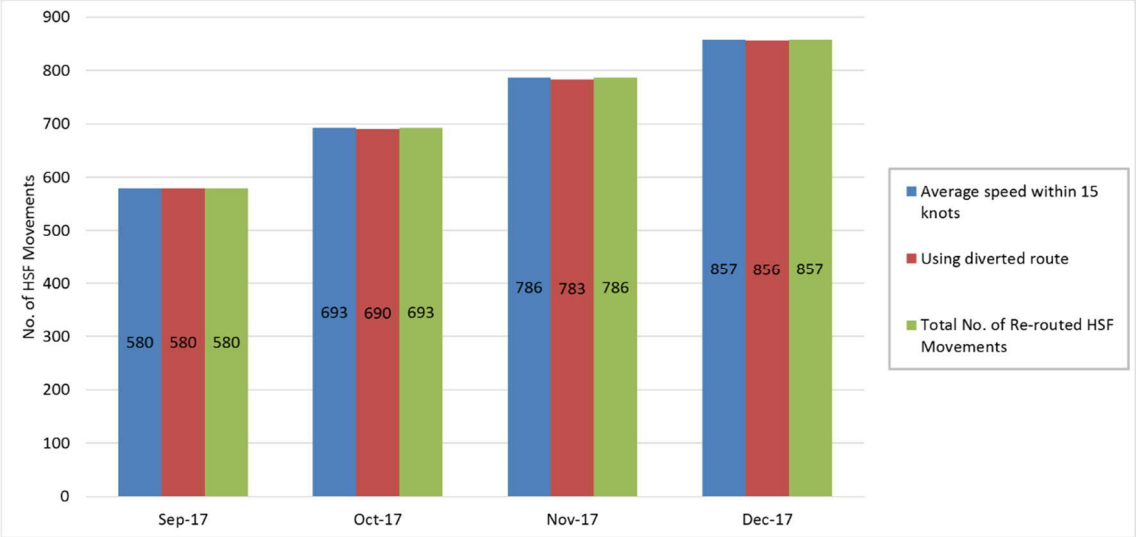
2.8 Audit of SkyPier High Speed Ferries

In total, 2,336 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. The daily movements of all SkyPier HSFs in the reporting period ranged between 1 and 93, which falls within the maximum daily cap number of 125. There was only one ferry movement on 15 October 2017 due to typhoon.

All HSFs travelled through the SCZ with average speed within 15 knots (9.2 knots to 14.1 knots), which complied with the Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier (the SkyPier Plan). Seven ferry movements were recorded with minor deviations from the diverted route during the reporting period. Notices of deviation were sent to the ferry operators and the cases have been investigated. One case on 30 October 2017 was due to error of a few Automatic Information System (AIS) points and the vessel had actually followed the normal route. Another four deviation cases from the diverted route during the reporting period were due to public safety considerations or emergency situations, i.e., giving way to other vessels or avoiding collision with floating objects to ensure safety, and the HSFs had returned to the normal route following the SkyPier Plan as soon as practicable. The remaining two deviation cases recorded on 7 October 2017 and 29 December 2017 were considered as non-safety related. In these two cases, the captains found difficulty to follow the normal route due to AIS failure. The ferry operator was advised to investigate the reason for the AIS failure and check the AIS system to ensure that accurate data points can be received for checking. The summary of the SkyPier Plan monitoring result is presented in **Graph 3**.

Insufficient AIS data were received from some HSFs during the reporting period. After investigation, it was found AIS data for the concerned ferries was missing due to effects of interference of the signal as reported by the ferry operator after checking the condition of the AIS transponders. Vessel captains were requested to provide the radar track photos which indicated the vessel entered the SCZ through the gate access points and there was no speeding in the SCZ. Ferry operator's explanation has been accepted.

Graph 3: Summary of SkyPier High Speed Ferries Monitoring Results



2.9 Audit of Construction and Associated Vessels

On the implementation of MTRMP-CAV, the MSS automatically recorded deviation cases such as speeding, entering no entry zone, and not traveling through the designated gate. ET conducted bi-weekly audit of relevant information including AIS data, vessel tracks and other relevant records to ensure sufficient information were provided by the system and the contractors complied with the requirements of the MTRMP-CAV. The contactors submitted endorsed 3-month rolling vessel plan for construction vessel activities to AAHK in order to help maintain the number of construction vessels to a practicable minimum. The IEC also performed audit on the compliance of the requirements as part of the EM&A programme.

Between October and December 2017, deviations including speeding in the works area, entry from non-designated gates and entering no-entry zones were identified. All the concerned captains were reminded by the contractor's MTCC representative to comply with the requirements of the MTRMP-CAV.

A total of 9 skipper training workshops were held by ET between October and December 2017 with 58 concerned captains of construction vessels associated with the 3RS Contracts to familiarise them with the predefined routes, general education on local cetaceans, guidelines for avoiding adverse water quality impact, the required environmental practices / measures while operating construction and associated vessels under the Project, and guidelines for operating vessels safely in the presence of CWDs. Another 9 skipper training workshops were held with 19 concerned captains by contractor's Environmental Officers and competency tests were conducted subsequently with the trained captains by ET.

2.10 Coral Post-Translocation Monitoring

In accordance with the approved Coral Translocation Plan (CTP), gorgonian corals suitable for translocation were translocated to the recipient site at Yam Tsai Wan (YTW), with translocation completed in January 2017. Since then the post-translocation monitoring programme has been undertaken according to the CTP. This quarterly report presents the results of the 5th post-translocation monitoring survey completed in October 2017 (summarized in **Table 2.19** below) and wraps up the *ad-hoc* surveys and further investigations initiated after the significant change in partial mortality (PM) and deterioration in coral health conditions that were identified during the April 2017 monitoring event.

Table 2.19: Summary of the 5th Post-Translocation Monitoring Surveys Completed in October 2017

	Colony Height (cm) [a]	General Health Conditions[b]	% Change in Partial Mortality (PM) [c] [d]	Triggering of Action Level[e]	Triggering of Limit Level[f]
Fifth Round of Survey in October 2017					
Control gorgonian corals (tagged)	7-59	0-5 (Average: 2.4)	<25% change for 10% of the tagged corals and ⩾25% change for 90% of the tagged corals (Average PM: 67.3%)	No	No
Translocated gorgonian corals (tagged)	5-44	0-4 (Average: 2.5)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 74.6%)		

Notes:
(a) Colony height refers to the baseline coral height.
(b) General health conditions of coral were measured on an ordinal scale of 0 to 5 (0=dead, 5=very healthy).
(c) The percentage change in partial mortality of the tagged translocated and control corals are both determined by comparing the partial mortality recorded during each post-translocation monitoring with reference to the partial mortality observed during the baseline conditions, as represented by the tagged coral survey results.
(d) Coral showing no change in partial mortality is not presented in this account.
(e) As defined in the approved CTP, the Action Level is triggered if during monitoring a 15% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.
(f) As defined in the approved CTP, the Limit Level is triggered if during monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the translocated coral colonies that is not recorded on the original (control) corals at the recipient site.

The monitoring results show that the PM and the health condition of both the translocated and control corals have largely stabilized after the significant change in April 2017 (see Quarterly EM&A Report No. 7). The tagged translocated corals showing ⩾25% change in PM remained at around 94% during the period from April to October, whilst the control corals showing ⩾25% change in PM remained in the range 90%-95% during the same period. Although minor fluctuations were observed in the period June to September, the average General Health Condition remained at between 2.0 and 3.0. Monitoring results in **Table 2.19** show that neither Action nor Limit Levels were triggered over the Quarter.

Review of Sediment Deposition

Ad-hoc surveys and investigations were conducted and reported in the Quarterly EM&A Report No. 7 (July to September 2017) with the exception of sediment deposition data results as the information was not available during Report No.7 preparation.

Sediment traps for measuring sediment deposition were set up at RT2 (recipient site) and RT4 (in Yam Tsai Wan) concurrently to obtain information on suspended sediment in the water column at these locations. Sediment traps were also set up at Tai Mo To (TMT) at later stage to collect

supplementary information about the general sediment condition in the *ad-hoc* dive survey area. The results are indicative only.

The sediment trap is a vertical pipe of 4 cm diameter with netting fitted over the top to prevent small animals from disturbing the contents of the traps. The traps were attached to specially prepared concrete bases which were placed in suitable locations in RT2, RT4 and TMT for a period of about 9 to 10 weeks. Locations of these three sites are shown in **Figure 2.11**.

Figure 2.11: Locations of Sediment Trap Deployment

The sediment trap results of the three sites are summarized in **Table 2.20** below:

Table 2.20: Summary of Sediment Trap Results

Site	Deposition of Dry Weight into Trap (g day^{-1})	Deposition Rate per area (mg cm^{-2} day^{-1})	Sediment Texture
RT2	0.644	51.3	Fine, very fine
RT4	0.201	15.4	Coarse
TMT	0.398	31.8	Very fine

Sediment Trap results identified differences in the deposition rate at recipient site RT2 and nearby comparison sites at TMT and RT4. The relationship between sedimentation rate and coral

mortality is not clearly known because the corals at TMT have the lowest PM among the three sites but the sedimentation rate at TMT is not the lowest (see **Table 2.21**). Similarly, even though the deposition rate at RT2 was higher than TMT and RT4 during the period of sediment trap deployment, there is no clear relationship between deposition rate and partial mortality.

Table 2.21: Average Partial Mortality of Natural Corals at TMT, RT2 and RT4

	TMT	RT2 (Recipient Site)	RT4
Distance from 3RS project site boundary	3.5km	8.5km	9.0km
Average Partial Mortality			
June 2017	10.0%	73.5%	29.8%
July 2017	6.8%	68.8%	57.3%
September 2017	12.3%	67.8%	61.3%

Potential Causes for Significant Change in Partial Mortality in April 2017

Various potential causes for the high PM and deterioration in coral health have been evaluated and were presented in Quarterly EM&A Report No. 7. The findings of the *ad-hoc* Dive Surveys of Natural Corals at YTW, Sham Shui Kok (SSK) and TMT have clearly identified that while the dive survey locations at TMT and SSK are much closer to the 3RS project site than the YTW survey locations, the average PM levels of natural corals (tagged) at these locations are generally lower than those at the four YTW locations. It is therefore evident that the relatively high PM levels at YTW are not likely to be related to 3RS marine works activities.

The results from the sediment trap work reported in this quarterly report do not alter *ad-hoc* investigation findings as reported in Quarterly EM&A Report No. 7. All of the *ad-hoc* findings can now be summarized as follows:

- ***Review of weather conditions:*** There were no obvious weather events (e.g. strong monsoon signal, typhoon, cold weather warning) that could potentially have affected coral health conditions during the period January to April 2017, before the significant change of PM was identified.
- ***Review of red tides/ algal blooms that may have affected Yam Tsai Wan:*** AFCD records show no red tides were reported during the period from January to April 2017, in the period before the significant change of PM. However, a University of Hong Kong coral specialist consulted by the ET reported that algal bloom incidents were observed at Kap Shui Mun, Sham Wat and Tai O during dive surveys in January 2017, with the bloom resembling *Microcystis sp.* (known to produce hepatoxins that have potentially chronic harmful effects on fish and shellfish). These observations suggest that harmful algal blooms may have occurred in some parts of north Lantau waters quite close to YTW with some potential for residual effects; meaning that these blooms may have been associated with the significant change of PM at the recipient site.
- ***Review of water quality:*** Relevant water quality parameters including pH, DO, temperature, salinity and total alkalinity were measured at all six *ad-hoc* survey sites in conjunction with coral monitoring at the same six sites in June, July and September 2017, after the April PM

was identified. Most of the monitored parameters at these sites generally fell within natural fluctuations at Station C3 (3RS water quality monitoring programme control station near YTW) between January and September 2017. Results indicated that the rate of salinity drop was higher in 2017 as compared to 2016 in the area surrounding the recipient site, and higher water temperature was recorded in 2017 than 2016. There was also a decrease in DO during the wet season. Hence the corals might have been exposed to an interplay of environmental stresses, including salinity, DO and thermal stress, leading to unfavourable water quality conditions during the period prior to April 2017.

- ***Review of sediment deposition*:** The sediment deposition investigations undertaken as part of the *ad-hoc* monitoring effort have identified relatively high sedimentation at recipient site RT2 compared to the other monitored site at YTW. Although no apparent relationship was evident between high sedimentation and the high coral PM, a possible detrimental effect from sedimentation on the translocated corals at the recipient site cannot be ruled out.

In conclusion, the *ad-hoc* dive surveys of natural corals nearer to the 3RS project site indicate that the relatively high PM levels identified in control and translocated corals at YTW in April 2017 are unlikely to be related to 3RS marine works activities. Various other potential causes of the high PM have been evaluated, however, it is not possible to single out one specific cause of the identified increased coral PM levels. From all of the investigation work undertaken, it seems that the relatively high PM levels identified in April 2017 are most likely to have been caused by an interplay of environmental factors, rather than one single factor.

2.11 Review of the Key Assumptions Adopted in the EIA Report

With reference to Appendix E of the Manual, it is noted that the key assumptions adopted in approved EIA report for the construction phase are still valid and no major changes are involved. The environmental mitigation measures recommended in the approved EIA Report remain applicable and shall be implemented in undertaking construction works for the Project.

3 Report on Non-compliance, Complaints, Notifications of Summons and Prosecutions

3.1 Compliance with Other Statutory Environmental Requirements

During the reporting period, environmental related licenses and permits required for the construction activities were checked. No non-compliance with environmental statutory requirements was recorded.

3.2 Analysis and Interpretation of Complaints, Notification of Summons and Status of Prosecutions

3.2.1 Complaints

One environmental-related complaint on material dumping from construction vessel of Contract 3205 was received on 24 November 2017. Investigation was conducted by the ET in accordance with the Manual and the Complaint Management Plan of the Project. The anonymous complainant did not provide any specific information (e.g. date/time) on the case or any details of the vessel(s) and materials (e.g. name of vessel, description or characteristic of vessel, type of materials etc.). During the ET's weekly and *ad-hoc* site inspections, it was observed that the concerned Contractor had provided sufficient waste disposal facilities including chemical waste storage area on each barge with regular collection for disposal. No observation relating to illegal dumping was found. ET reminded the concerned Contractor and other DCM Contractors to continue implementing proper waste handling procedures and conducting relevant on-site training for all frontline staff.

3.2.2 Notifications of Summons or Status of Prosecution

Neither notification of summons nor prosecution was received during the reporting period.

3.3 Cumulative Statistics

Cumulative statistics on non-compliance, complaints, notifications of summons and status of prosecutions are summarized in **Table 3.1**. Cumulative statistics on breach of Action or Limit Level for environmental monitoring are summarized in **Table 3.2**.

Table 3.1: Statistics for Non-compliance, Complaints, Notifications of Summons and Prosecution

Reporting Period	Cumulative Statistics			
	Non-compliance	Complaints	Notifications of Summons	Prosecutions
This reporting period	0	1	0	0
From 28 December 2015 to end of the reporting period	0	8	1	0

Table 3.2: Statistics for Breach of Action or Limit Level for the Environmental Monitoring

		Total No. in the Reporting Period	Total No. since the Project Commenced
1-hr TSP	Action Level	0	0
	Limit Level	0	0
Noise	Action Level	0	0
	Limit Level	0	0
Waste	Action Level	0	0
	Limit Level	0	0
Water	Action Level	0	0
	Limit Level	0	0
CWD	Action Level	0	0
	Limit Level	0	0

Remark: Exceedances, which are not project related, are not shown in this table.

4 Conclusion and Recommendation

In this quarterly period from 1 October 2017 to 31 December 2017, the EM&A programme has been implemented as planned, including 96 sets of air quality measurements, 65 sets of construction noise measurements, 39 sets of water quality measurements, 6 complete sets of vessel line transect surveys and 15 days of land-based theodolite tracking survey effort for CWD monitoring, 3 rounds of terrestrial ecology monitoring, as well as environmental site inspections and waste monitoring for the Project's construction works.

The key activities of the Project carried out in the reporting period included reclamation works and land-side works. Reclamation works included DCM works, laying of sand blanket, seawall construction, and PVD installation. Land-side works included HDD works, site office establishment, cable ducting works, concrete removal works, piling, and excavation works.

Monitoring results of construction dust, construction noise, construction waste, CWD, and coral post-translocation did not trigger any corresponding Action and Limit Levels in the reporting period. All site observations made by the ET were recorded in the site inspection checklists and passed to the contractor together with the recommended follow-up actions.

For water quality, the water quality monitoring results for DO, turbidity, and total alkalinity obtained during the reporting period complied with their corresponding Action and Limit Levels stipulated in the EM&A programme for triggering the relevant investigation and follow-up procedures under the programme if being triggered. For SS, chromium, and nickel, some of the testing results triggered the relevant Action or Limit Levels in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that the cases were not due to the Project; hence, no adverse impact was introduced to all water quality sensitive receivers.

In total, 2,336 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. All HSFs travelled through the SCZ with average speed within 15 knots, which complied with the SkyPier Plan. Seven ferry movements had minor deviations from the diverted route during the reporting period. ET investigated the deviation cases and confirmed that all of them were related to public safety or emergency situations, except two cases that the captains found difficulty to follow the normal route due to AIS failure. The ferry operator was advised to investigate the reason for the AIS failure and check the AIS system to ensure that accurate data points should be received.

Between October and December 2017, ET conducted bi-weekly audit of the MSS to ensure the system recorded all deviation cases accurately and the contractors fully complied with the requirements of the MTRMP-CAV. A total of nine skipper training workshops were held by ET between October and December 2017 for captains of construction vessels associated with 3RS contracts. Another nine skipper training workshops were held by contractors' Environmental Officers and competency tests were conducted subsequently with the trained captains by ET.

On the implementation of MMWP, dolphin observers were deployed by the contractors for laying of open sea silt curtain and laying of silt curtains for sand blanket in accordance with the plan. On the implementation of DEZ Plan, dolphin observers were deployed for continuous monitoring of the DEZ by the contractors for ground improvement works (DCM works and PVD installation) in accordance with the DEZ Plan. Trainings for the proposed dolphin observers were provided by the ET prior to the aforementioned works, with the training records kept by the ET. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine

mammals were observed within or around the silt curtains, whilst there was one record of dolphin sighting within the DEZ of DCM works in this reporting period. Audits of acoustic decoupling for construction vessels were also carried out by ET.

The recommended environmental mitigation measures, as included in the EM&A programme, have been effectively implemented during the reporting period. Also, the EM&A programme implemented by the ET has effectively monitored the construction activities and ensure the proper implementation of mitigation measures.

Figures

824000 N
822000 N
820000 N
818000 N
804000 E
806000 E
808000 E
810000 E
812000 E
814000 E

Contract P560 (R)- Daylighting Location

LEGEND:
- LAND FORMATION
- TEMPORARY WORKS AREA BOUNDARY
- KEY CONSTRUCTION ACTIVITIES

RECLAMATION WORKS AREA (please refer to Figure 1.2)

Contract 3801 - Works Area

Contract 3501 - Works Area

Contract 3502 - Works Area

Contract 3201- 3206 and AAHK Site Offices

Contract 3301 - Works Area

Contract P560 (R)- Launching Site

Contract 3301 - Works Area

Contract 3301 - Pre-cast Area

Contract 3301 - Works Area

Contract 3602 - Site Office

Contract P560 (R) - Site Office

Contract 3501 - Stockpiling Area

Contract P560 (R) - Stockpiling Area

0 250 500 750 1000 m
1 : 30 000 SCALE BAR

Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC

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Mott MacDonald

Title: LOCATIONS OF KEY CONSTRUCTION ACTIVITIES

Consultant's Signatures for Approval		Date
Design	DC	31AUG15
Checkers	DC	31AUG15
Design Supervisor	EC	31AUG15
Authorised Representative	JFP	31AUG15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No. FIGURE 1.1

Scale at A3 1 : 30000

Rev. A

Filename: J:\355482\REPORT\ENV\CWSLP\FIG 1.dgn

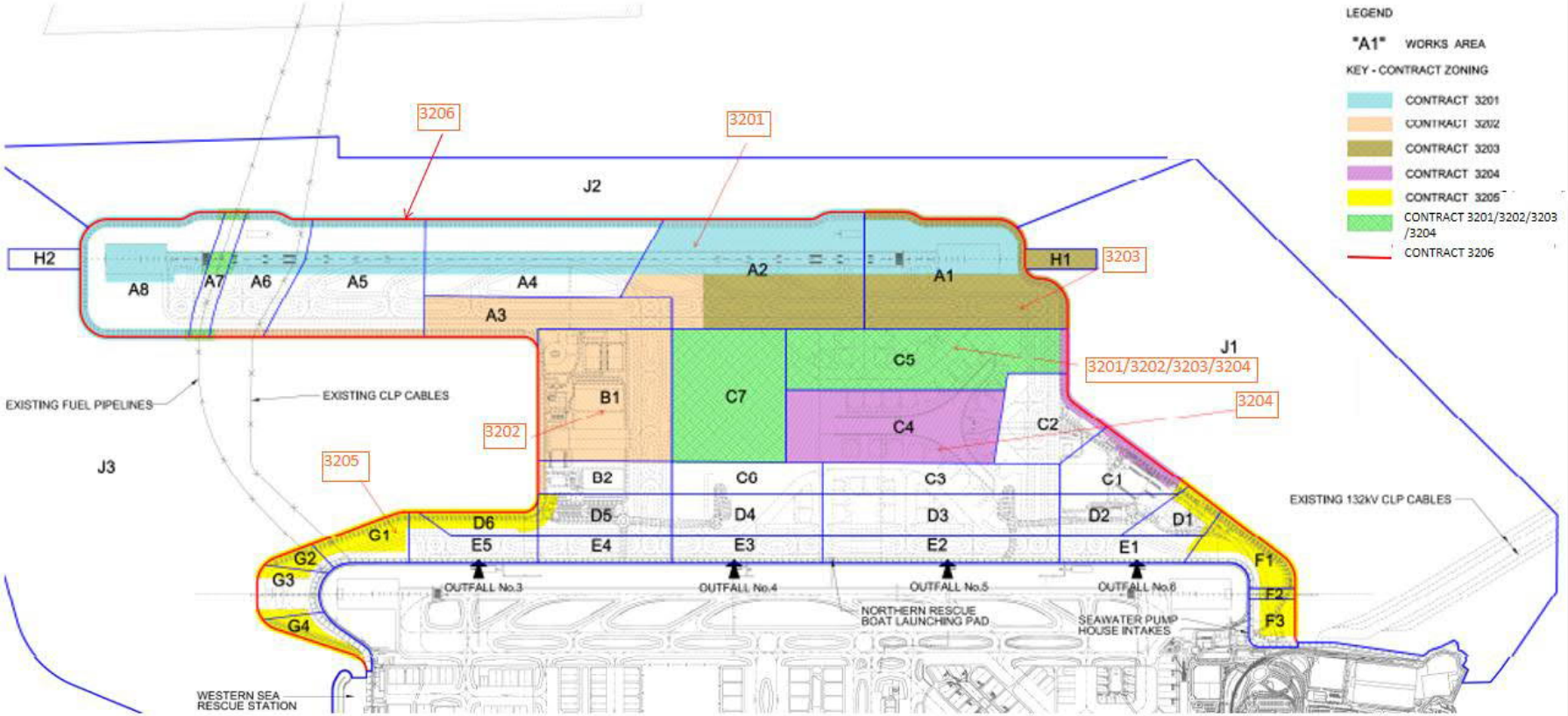

FIGURE 1.2- LOCATIONS OF RECLAMATION WORKS AREA

LEGEND:

- LAND FORMATION
- NOISE MONITORING STATION (UPDATED EM&A MANUAL)
- AIR QUALITY MONITORING STATION (UPDATED EM&A MANUAL)
- CHEK LAP KOK WIND STATION

806000 E
808000 E
810000 E
812000 E
814000 E
820000 N
818000 N

NM1A AR1A
NM2
NM3A
NM4
NM5 AR2
NM6

0 200 400 600 800 1000 m
1 : 22 500 SCALE BAR

Rev.	Date	Description	Checked
A	06JAN16	FIRST ISSUE	RO
B	29JAN16	GENERAL REVISION	RO
C	11FEB16	GENERAL REVISION	RO

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Mott MacDonald

Title

LOCATIONS OF AIR AND NOISE MONITORING STATIONS AND CHEK LAP KOK WIND STATION

Consultant's Signatures for Approval		Date
Design	AM	11FEB16
Checkers	AM / TK	11FEB16
Approver	EC	11FEB16

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No.

FIGURE 2.1

Scale at A3 1 : 22500

Rev. C

Filename: J:\355482\REPORT\ENV\EMA\160211\FIG 2.1.dgn

805000 E
810000 E
815000 E
820000 E
825000 N
820000 N
815000 N
HKSAR BOUNDARY
C1
C2
C3
IM1
IM2
IM3
IM4
IM5
IM6
IM7
IM8
IM9
IM10
IM11
IM12
SR2
SR3
SR4A
SR5A
SR6
SR7
SR8

LEGEND:
- LAND FORMATION
- 500m ENVELOPE
- IMPACT STATION
- SENSITIVE RECEIVER
- CONTROL STATION

0 500 1000 1500 2000 m
1 : 60 000 SCALE BAR

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	DC
B	04MAY16	GENERAL REVISION	RO
C	06JUN16	GENERAL REVISION	LC
D	02AUG17	GENERAL REVISION	RO

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Title

LOCATIONS OF WATER QUALITY MONITORING STATIONS

Consultant's Signatures for Approval		Date
Design	DC	02AUG17
Checkers	DC / TK	02AUG17
Approver	EC	02AUG17

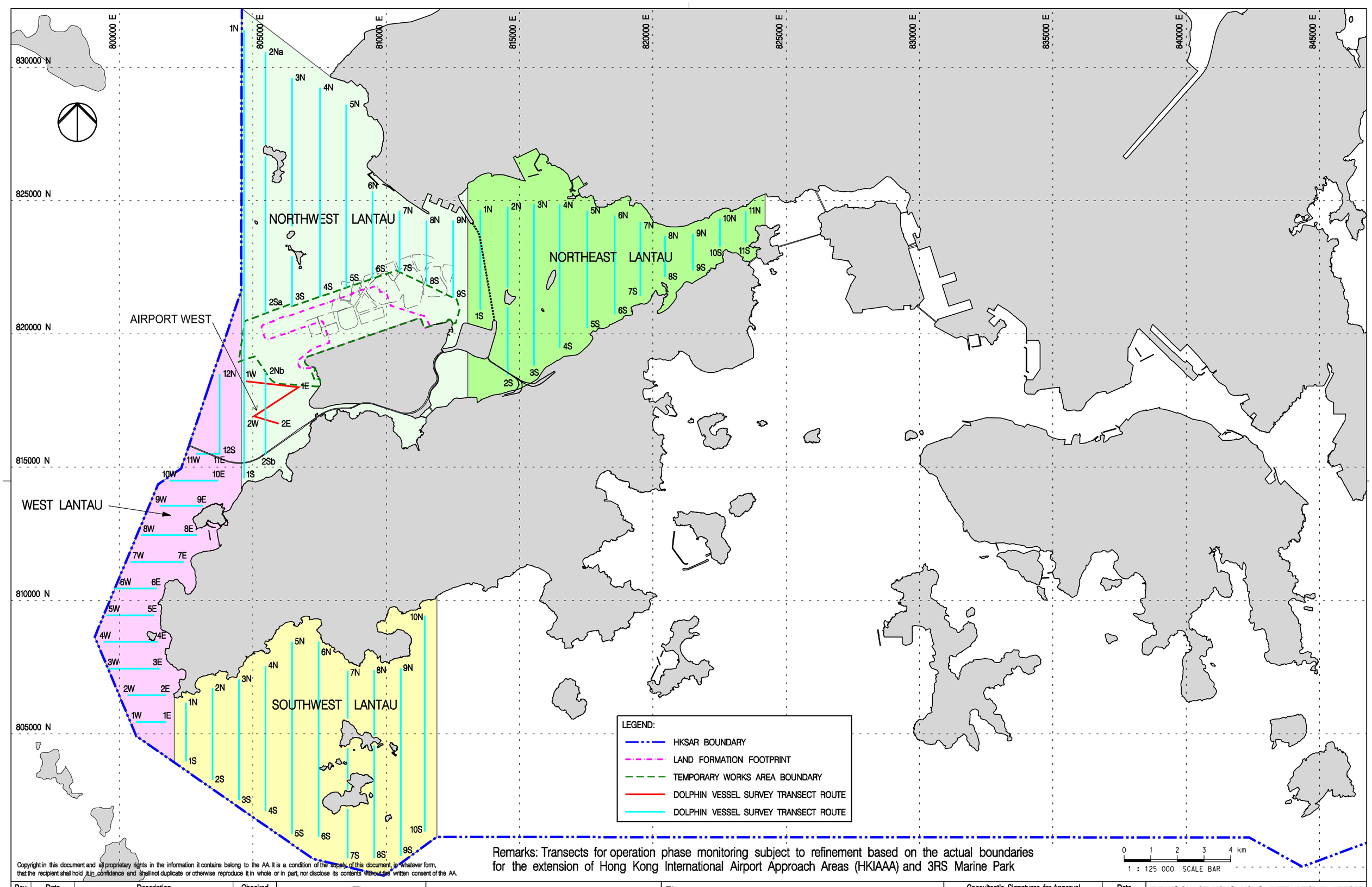
EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No. FIGURE 2.2

Scale at A3 1 : 60000

Rev. D

Filename: J:\355482\REPORT\ENV\EMA\170802\FIG 3.1.dgn



Remarks: Transects for operation phase monitoring subject to refinement based on the actual boundaries for the extension of Hong Kong International Airport Approach Areas (HKIAAA) and 3RS Marine Park

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC
B	27JUL16	GENERAL REVISION	JT
C	06FEB17	GENERAL REVISION	JT
D	01MAR17	GENERAL REVISION	JT

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Title

VESSEL BASED DOLPHIN MONITORING TRANSECTS IN CONSTRUCTION, POST-CONSTRUCTION AND OPERATION PHASES

Consultant's Signatures for Approval		Date
Design	JC	01MAR17
Checkers	JC / TK	01MAR17
Approver	EC	01MAR17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No. FIGURE 2.3

Scale at A3 1 : 125000

Rev. D

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804000 E
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808000 E
810000 E
812000 E
814000 E
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818000 E
820000 N
822000 N
824000 N
826000 N

E
D

沙洲及龍鼓洲海岸公園
SHA CHAU AND LUNG KWU CHAU MARINE PARK

RAMSTON ROAD

HKSAR BOUNDARY

LEGEND:
- LAND FORMATION FOOTPRINT
- HONG KONG INTERNATIONAL AIRPORT
- LAND BASED SURVEY LOCATION

0 500 1000 1500 2000 m
1 : 45,000 SCALE BAR

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC
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Title

LAND BASED DOLPHIN MONITORING IN BASELINE AND CONSTRUCTION PHASES

Consultant's Signatures for Approval		Date
Design	JC	06FEB17
Checkers	JC / TK	06FEB17
Approver	EC	06FEB17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No.

FIGURE 2.4

Scale at A3 1 : 45000

Rev. B

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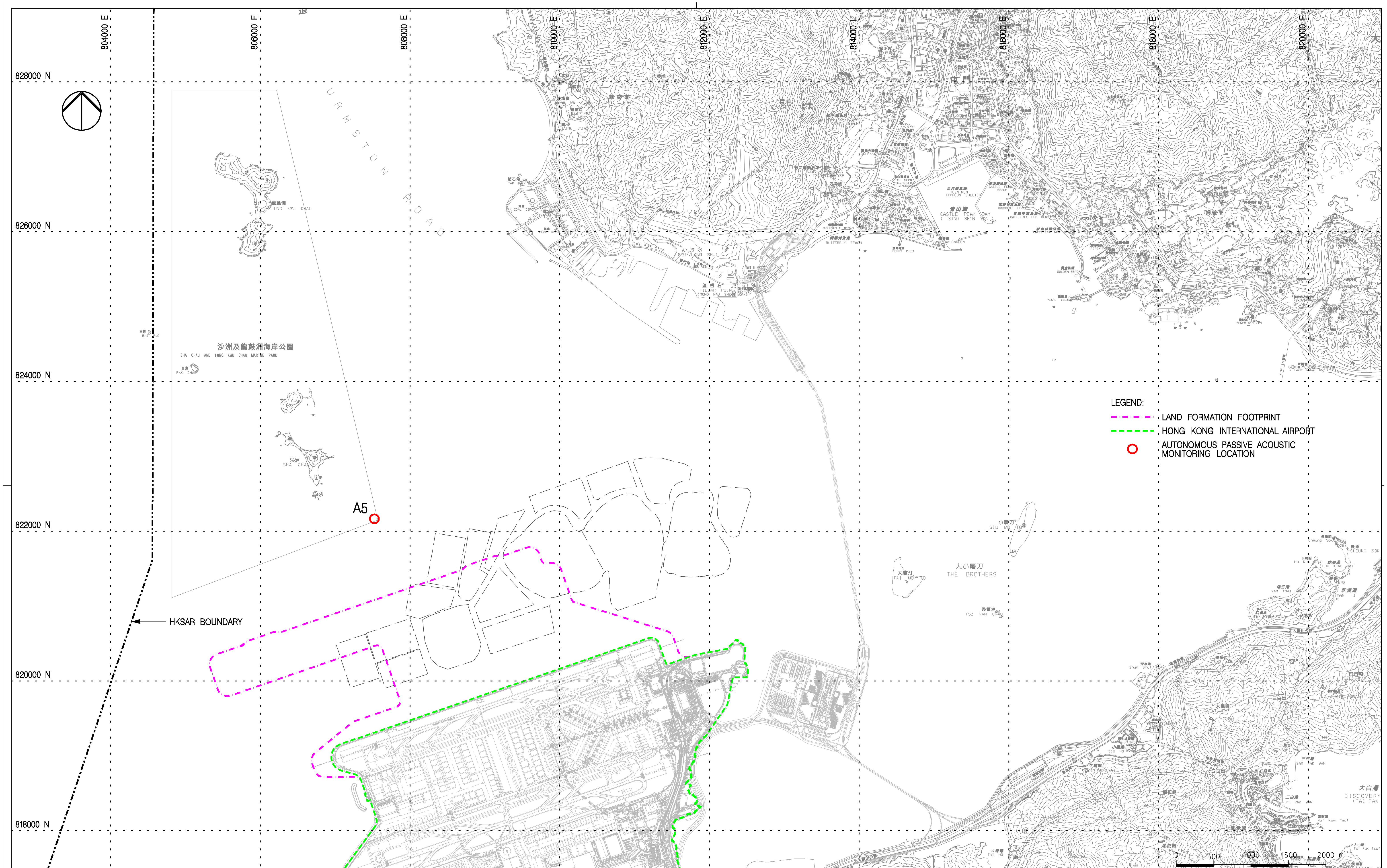
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818000 E
820000 E
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826000 N
824000 N
822000 N
820000 N
818000 N
URMSTON ROAD
沙洲及龍鼓洲海岸公園
SHA CHAU AND LUNG KWU CHAU MARINE PARK
A5
HKSAR BOUNDARY
大小磨刀
THE BROTHERS
東涌
TUNG CHUNG
LEGEND:
LAND FORMATION FOOTPRINT
HONG KONG INTERNATIONAL AIRPORT
AUTONOMOUS PASSIVE ACOUSTIC MONITORING LOCATION
0
500
1000
1500
2000 m
1 : 45 000 SCALE BAR

Rev.	Date	Description	Checked
A	29AUG17	FIRST ISSUE	JT
B	10OCT17	GENERAL REVISION	PL

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MOTT MACDONALD

Title

LOCATION FOR AUTONOMOUS PASSIVE ACOUSTIC MONITORING

Consultant's Signatures for Approval		Date
Design	JC	10OCT17
Checkers	JC / TK	10OCT17
Approver	EC	10OCT17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM

Drawing No.

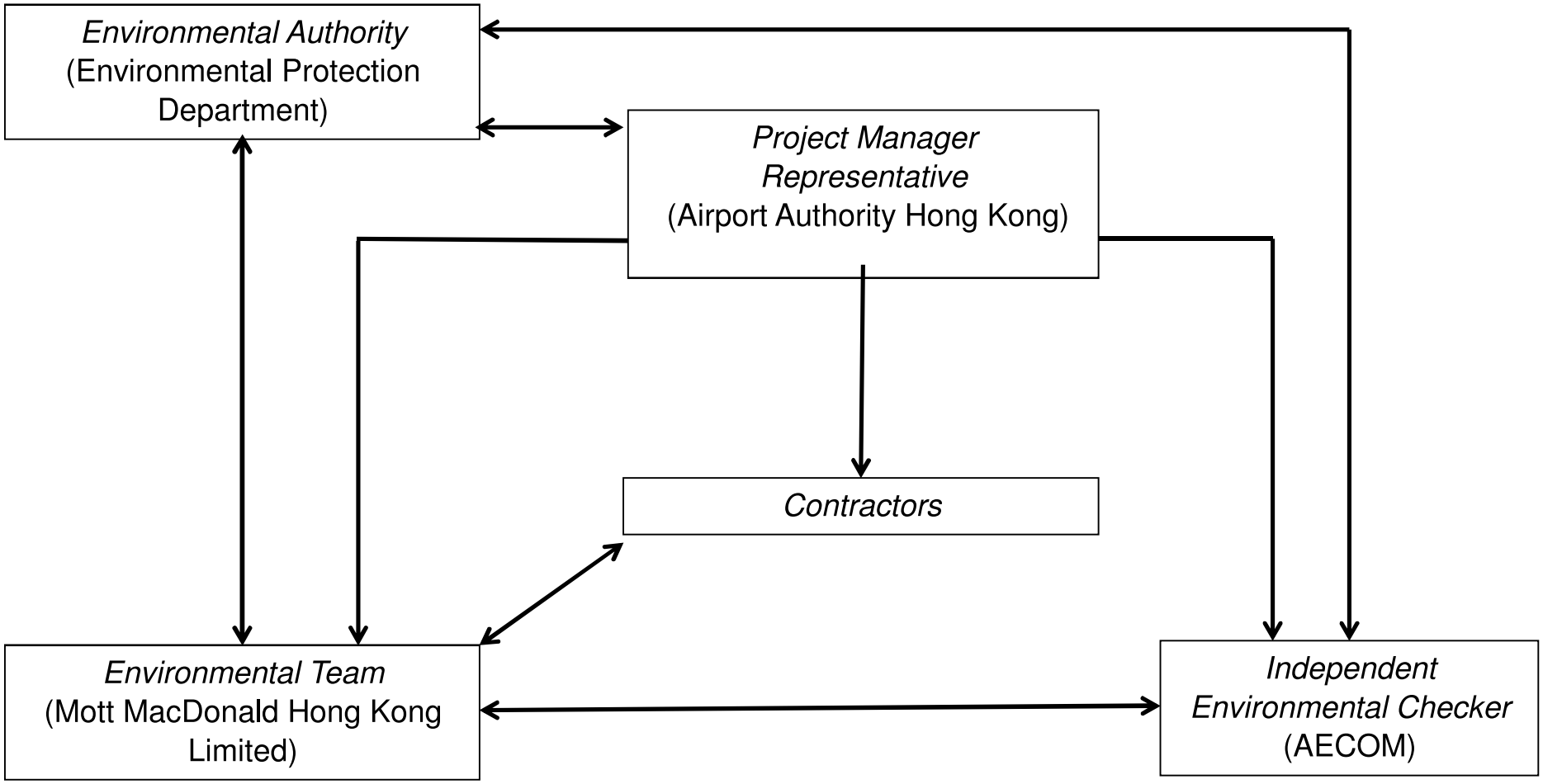
FIGURE 2.10

Scale at A3 1 : 45000

Rev. B

Filename: J:\355482\REPORT\ENV\EMA\171010\FIG 6.5.dgn

Appendix A. Project Organization Chart


Environmental Authority
(Environmental Protection Department)
Project Manager Representative
(Airport Authority Hong Kong)
Contractors
Environmental Team
(Mott MacDonald Hong Kong Limited)
Independent Environmental Checker
(AECOM)

Appendix B. Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

Appendix B Environmental Mitigation Implementation Schedule (EMIS) for Construction Phase

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Air Quality Impact – Construction Phase		
5.2.6.2	2.1	-	**Dust Control Measures** ▪ Water spraying for 12 times a day or once every two hours for 24-hour working at all active works area.	Within construction site / Duration of the construction phase	I
5.2.6.3	2.1	-	▪ Covering of at least 80% of the stockpiling area by impervious sheets. Water spraying of all dusty materials immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling.	Within construction site / Duration of the construction phase	I
5.2.6.4	2.1	-	Dust control practices as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted. These practices include: Good Site Management ▪ Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning.	Within construction site / Duration of the construction phase	I
			Disturbed Parts of the Roads ▪ Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or ▪ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.	Within construction site / Duration of the construction phase	I
			Exposed Earth ▪ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.	Within construction site / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Loading, Unloading or Transfer of Dusty Materials ▪ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.	Within construction site / Duration of the construction phase	I
			Debris Handling ▪ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides; and ▪ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.	Within construction site / Duration of the construction phase	I
			Transport of Dusty Materials ▪ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.	Within construction site / Duration of the construction phase	I
			Wheel washing ▪ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.	Within construction site / Duration of the construction phase	I
			Use of vehicles ▪ The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site; ▪ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels; and ▪ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.	Within construction site / Duration of the construction phase	I
			Site hoarding ▪ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.	Within construction site / Duration of the construction phase	I
5.2.6.5	2.1	-	**Best Practices for Concrete Batching Plant** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2 as well as in the future Specified Process licence should be adopted. The best practices are recommended to be applied to both the land based and floating concrete batching plants. Best practices include: Cement and other dusty materials	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ The loading, unloading, handling, transfer or storage of cement, pulverised fuel ash (PFA) and/or other equally dusty materials shall be carried in a totally enclosed system acceptable to EPD. All dust-laden air or waste gas generated by the process operations shall be properly extracted and vented to fabric filtering system to meet the required emission limit; ▪ Cement, PFA and/or other equally dusty materials shall be stored in storage silo fitted with audible high level alarms to warn of over-filling. The high-level alarm indicators shall be interlocked with the material filling line such that in the event of the silo approaching an overfilling condition, an audible alarm will operate, and after 1 minute or less the material filling line will be closed; ▪ Vents of all silos shall be fitted with fabric filtering system to meet the required emission limit; ▪ Vents of cement/PFA weighing scale shall be fitted with fabric filtering system to meet the required emission limit; and ▪ Seating of pressure relief valves of all silos shall be checked, and the valves re-seated if necessary, before each delivery.		
			Other raw materials ▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rock, sand, stone aggregate, shall be carried out in such a manner to prevent or minimize dust emissions; ▪ The materials shall be adequately wetted prior to and during the loading, unloading and handling operations. Manual or automatic water spraying system shall be provided at all unloading areas, stock piles and material discharge points; ▪ All receiving hoppers for unloading relevant materials shall be enclosed on three sides up to 3 m above the unloading point. In no case shall these hoppers be used as the material storage devices; ▪ The belt conveyor for handling materials shall be enclosed on top and two sides with a metal board at the bottom to eliminate any dust emission due to wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can achieve same performance; ▪ All conveyor transfer points shall be totally enclosed. Openings for the passage of conveyors shall be fitted with adequate flexible seals; ▪ Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface; ▪ Conveyors discharged to stockpiles of relevant materials shall be arranged to minimize free fall as far as practicable. All free falling transfer points from conveyors to stockpiles shall be enclosed with chute(s) and water sprayed; ▪ Aggregates with a nominal size less than or equal to 5 mm should be stored in totally enclosed structure such as storage bin and should not be handled in open area. Where there is sufficient buffer area surrounding the concrete batching plant, ground stockpiling may be used;	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side; ▪ Aggregates with a nominal size greater than 5 mm should preferably be stored in a totally enclosed structure. If open stockpiling is used, the stockpile shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; and ▪ The opening between the storage bin and weighing scale of the materials shall be fully enclosed.		
			Loading of materials for batching ▪ Concrete truck shall be loaded in such a way as to minimise airborne dust emissions. The following control measures shall be implemented: (a) Pre-mixing the materials in a totally enclosed concrete mixer before loading the materials into the concrete truck is recommended. All dust-laden air generated by the pre-mixing process as well as the loading process shall be totally vented to fabric filtering system to meet the required emission limit; and (b) If truck mixing batching or other types of batching method is used, effective dust control measures acceptable to EPD shall be adopted. The dust control measures must have been demonstrated to EPD that they are capable to collect and vent all dust-laden air generated by the material loading/mixing to dust arrestment plant to meet the required emission limit. ▪ The loading bay shall be totally enclosed during the loading process.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Vehicles ▪ All practicable measures shall be taken to prevent or minimize the dust emission caused by vehicle movement; and ▪ All access and route roads within the premises shall be paved and adequately wetted.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Housekeeping ▪ A high standard of housekeeping shall be maintained. All spillages or deposits of materials on ground, support structures or roofs shall be cleaned up promptly by a cleaning method acceptable to EPD. Any dumping of materials at open area shall be prohibited.	Within Concrete Batching Plant / Duration of the construction phase	N/A
5.2.6.6	2.1	-	**Best Practices for Asphaltic Concrete Plant** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Tar and Bitumen Works (Asphaltic Concrete Plant) BPM 15 (94) as well as in the future Specified Process licence should be adopted. These include: Design of Chimney ▪ The chimney shall not be less than 3 metres plus the building height or 8 metres above ground level, whichever is the greater; ▪ The efflux velocity of gases from the main chimney shall not be less than 12 m/s at full load condition;	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ The flue gas exit temperature shall not be less than the acid dew point; and ▪ Release of the chimney shall be directed vertically upwards and not be restricted or deflected.		
			Cold feed side ▪ The aggregates with a nominal size less than or equal to 5 mm shall be stored in totally enclosed structure such as storage bin and shall not be handled in open area; ▪ Where there is sufficient buffer area surrounding the plant, ground stockpiling may be used. The stockpile shall be enclosed at least on top and three sides and with flexible curtain to cover the entrance side. If these aggregates are stored above the feeding hopper, they shall be enclosed at least on top and three sides and be wetted on the surface to prevent wind-whipping; ▪ The aggregates with a nominal size greater than 5 mm should preferably be stored in totally enclosed structure. Aggregates stockpile that is above the feeding hopper shall be enclosed at least on top and three sides. If open stockpiling is used, the stockpiles shall be enclosed on three sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping; ▪ Belt conveyors shall be enclosed on top and two sides and provided with a metal board at the bottom to eliminate any dust emission due to the wind-whipping effect. Other type of enclosure will also be accepted by EPD if it can be demonstrated that the proposed enclosure can be achieve the same performance; ▪ Scrapers shall be provided at the turning points of all belt conveyors inside the chute of the transfer points to remove dust adhered to the belt surface; ▪ All conveyor transfer points shall be totally enclosed. Openings for the passages of conveyors shall be fitted with adequate flexible seals; and ▪ All materials returned from dust collection system shall be transferred in enclosed system and shall be stored inside bins or enclosures.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Hot feed side ▪ The inlet and outlet of the rotary dryer shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter. The particulate and gaseous concentration at the exhaust outlet of the dust collector shall not exceed the required limiting values; ▪ The bucket elevator shall be totally enclosed and the air be extracted and ducted to a dust collection system to meet the required particulates limiting value; ▪ All vibratory screens shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings; ▪ Chutes for carrying hot material shall be rigid and preferably fitted with abrasion resistant plate inside. They shall be inspected daily for leakages;	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ All hot bins shall be totally enclosed and dust tight with close-fitted access inspection opening. Gaskets shall be installed to seal off any cracks and edges of any inspection openings. The air shall be extracted and ducted to a dust collection system to meet the required particulates limiting value; and ▪ Appropriate control measures shall be adopted in order to meet the required bitumen emission limit as well as the ambient odour level (2 odour units).		
			Material transportation ▪ The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rocks, sands, stone aggregates, reject fines, shall be carried out in such a manner as to minimize dust emissions; ▪ Roadways from the entrance of the plant to the product loading points and/or any other working areas where there are regular movements of vehicles shall be paved or hard surfaced; and ▪ Haul roads inside the Works shall be adequately wetted with water and/or chemical suppressants by water trucks or water sprayers.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Control of emissions from bitumen decanting ▪ The heating temperature of the particular bitumen type and grade shall not exceed the corresponding temperature limit of the same type listed in Appendix 1 of the Guidance Note; ▪ Tamper-free high temperature cut-off device shall be provided to shut off the fuel supply or electricity in case the upper limit for bitumen temperature is reached; ▪ Proper chimney for the discharge of bitumen fumes shall be provided at high level; ▪ The emission of bitumen fumes shall not exceed the required emission limit; and The air-to-fuel ratio shall be properly controlled to allow complete combustion of the fuel. The fuel burners, if any, shall be maintained properly and free from carbon deposits in the burner nozzles.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Liquid fuel ▪ The receipt, handling and storage of liquid fuel shall be carried out so as to prevent the release of emissions of organic vapours and/or other noxious and offensive emissions to the air.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Housekeeping ▪ A high standard of housekeeping shall be maintained. Waste material, spillage and scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared frequently. The minimum clearing frequency is on a weekly basis.	Within Concrete Batching Plant / Duration of the construction phase	N/A
5.2.6.7	2.1	-	**Best Practices for Rock Crushing Plants** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Mineral Works (Stone Crushing Plant) BPM 11/1 (95) as well as in the future Specified Process licence should be adopted. These include:	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Crushers ▪ The outlet of all primary crushers, and both inlet and outlet of all secondary and tertiary crushers, if not installed inside a reasonably dust tight housing, shall be enclosed and ducted to a dust extraction and collection system such as a fabric filter; ▪ The inlet hopper of the primary crushers shall be enclosed on top and 3 sides to contain the emissions during dumping of rocks from trucks. The rock while still on the trucks shall be wetted before dumping; ▪ Water sprayers shall be installed and operated in strategic locations at the feeding inlet of crushers; and ▪ Crusher enclosures shall be rigid and be fitted with self-closing doors and close-fitting entrances and exits. Where conveyors pass through the crusher enclosures, flexible covers shall be installed at entries and exits of the conveyors to the enclosure.		
			Vibratory screens and grizzlies ▪ All vibratory screens shall be totally enclosed in a housing. Screenhouses shall be rigid and reasonably dust tight with self-closing doors or close-fitted entrances and exits for access. Where conveyors pass through the screenhouse, flexible covers shall be installed at entries and exits of the conveyors to the housing. Where containment of dust within the screenhouse structure is not successful then a dust extraction and collection system shall be provided; and ▪ All grizzlies shall be enclosed on top and 3 sides and sufficient water sprayers shall be installed at their feeding and outlet areas.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Belt conveyors ▪ Except for those conveyors which are placed within a totally enclosed structure such as a screenhouse or those erected at the ground level, all conveyors shall be totally enclosed with windshield on top and 2 sides; ▪ Effective belt scraper such as the pre-cleaner blades made by hard wearing materials and provided with pneumatic tensioner, or equivalent device, shall be installed at the head pulley of designated conveyor as required to dislodge fine dust particles that may adhere to the belt surface and to reduce carry-back of fine materials on the return belt. Bottom plates shall also be provided for the conveyor unless it has been demonstrated that the corresponding belt scraper is effective and well maintained to prevent falling material from the return belt; and ▪ Except for those transfer points which are placed within a totally enclosed structure such as a screenhouse, all transfer points to and from conveyors shall be enclosed. Where containment of dust within the enclosure is not successful, then water sprayers shall be provided. Openings for any enclosed structure for the passage of conveyors shall be fitted with flexible seals.	Within Concrete Batching Plant / Duration of the construction phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Storage piles and bins ▪ Where practicable, free falling transfer points from conveyors to stockpiles shall be fitted with flexible curtains or be enclosed with chutes designed to minimize the drop height. Water sprays shall also be used where required. ▪ The surface of all surge piles and stockpiles of blasted rocks or aggregates shall be kept sufficiently wet by water spraying wherever practicable; ▪ All open stockpiles for aggregates of size in excess of 5 mm shall be kept sufficiently wet by water spraying where practicable; or ▪ The stockpiles of aggregates 5 mm in size or less shall be enclosed on 3 sides or suitably located to minimize wind-whipping. Save for fluctuations in stock or production, the average stockpile shall stay within the enclosure walls and in no case the height of the stockpile shall exceed twice the height of the enclosure walls. ▪ Scattered piles gathered beneath belt conveyors, inside and around enclosures shall be cleared regularly.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Rock drilling equipment ▪ Appropriate dust control equipment such as a dust extraction and collection system shall be used during rock drilling activities.	Within Concrete Batching Plant / Duration of the construction phase	N/A
			Hazard to Human Life – Construction Phase		
Table 6.40	3.2	-	▪ Precautionary measures should be established to request barges to move away during typhoons.	Construction Site / Construction Period	I
Table 6.40	3.2	-	▪ An appropriate marine traffic management system should be established to minimize risk of ship collision.	Construction Site / Construction Period	I
Table 6.40	3.2	-	▪ Location of all existing hydrant networks should be clearly identified prior to any construction works.	Construction Site / Construction Period	I
			Noise Impact – Construction Phase		
7.5.6	4.3	-	**Good Site Practice** Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum;	Within the Project site / During construction phase / Prior to commencement of operation	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and ▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.		
7.5.6	4.3	-	**Adoption of QPME** ▪ QPME should be adopted as far as applicable.	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	**Use of Movable Noise Barriers** ▪ Movable noise barriers should be placed along the active works area and mobile plants to block the direct line of sight between PME and the NSRs.	Within the Project site / During construction phase / Prior to commencement of operation	I
7.5.6	4.3	-	**Use of Noise Enclosure/ Acoustic Shed** ▪ Noise enclosure or acoustic shed should be used to cover stationary PME such as air compressor and generator.	Within the Project site / During construction phase / Prior to commencement of operation	I
			Water Quality Impact – Construction Phase		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
8.8.1.2 and 8.8.1.3	5.1	2.26	**Marine Construction Activities** <u>General Measures to be Applied to All Works Areas</u> ▪ Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; ▪ Use of Lean Material Overboard (LMOB) systems shall be prohibited; ▪ Excess materials shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessels are moved; ▪ Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; ▪ Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; ▪ All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ▪ The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site; and ▪ For ground improvement activities including DCM, the wash water from cleaning of the drilling shaft should be appropriately treated before discharge. The Contractor should ensure the waste water meets the WPCO/TM requirements before discharge. No direct discharge of contaminated water is permitted.	Within construction site / Duration of the construction phase	I
			<u>Specific Measures to be Applied to All Works Areas</u> ▪ The daily maximum production rates shall not exceed those assumed in the water quality assessment in the EIA report; ▪ A maximum of 10 % fines content to be adopted for sand blanket and 20 % fines content for marine filling below +2.5 mPD prior to substantial completion of seawall (until end of Year 2017) shall be specified in the works contract document;	Within construction site / Duration of the construction phase	I
			▪ An advance seawall of at least 200m to be constructed (comprising either rows of contiguous permanent steel cells completed above high tide mark or partially completed seawalls with rock core to high tide mark and filter layer on the inner side) prior to commencement of marine filling activities;		N/A
			▪ Closed grab dredger shall be used to excavate marine sediment; ▪ Silt curtains surrounding the closed grab dredger shall be deployed in accordance with the Silt Curtain Deployment Plan; and		N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ The Silt Curtain Deployment Plan shall be implemented.		I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Specific Measures to be Applied to Land Formation Activities prior to Commencement of Marine Filling Works ▪ Double layer 'Type III' silt curtains to be applied around the active eastern works areas prior to commencement of sand blanket laying activities. The silt curtains shall be configured to minimise SS release during ebb tides. A silt curtain efficiency test shall be conducted to validate the performance of the silt curtains;	Within construction site / Duration of the construction phase	NA *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ Double layer silt curtains to enclose WSRs C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of construction; and		For C7a, I For C8, N/A *(The requirement of silt curtain / screen has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ The silt curtains and silt screens should be regularly checked and maintained.		I
			Specific Measures to be Applied to Land Formation Activities during Marine Filling Works ▪ Double layer 'Type II' or 'Type III' silt curtains to be applied around the eastern openings between partially completed seawalls prior to commencement of marine filling activities. The silt curtains shall be configured to minimise SS release during ebb tides;	Within construction site / Duration of the construction phase	N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ Double layer silt curtains to be applied at the south-western opening prior to commencement of marine filling activities;		N/A *(The arrangement of silt curtain has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ Double layer silt curtain to enclose WSR C7a and silt screens installed at the intake points for both WSR C7a and C8 prior to commencement of marine filling activities; and		N/A *(The requirement of silt curtain / screen has been modified. The details can be referred to Silt Curtain Deployment Plan)
			▪ The silt curtains and silt screens should be regularly checked and maintained.		N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Specific Measures to be Applied to the Field Joint Excavation Works for the Submarine Cable Diversion ▪ Only closed grabs designed and maintained to avoid spillage shall be used and should seal tightly when operated. Excavated materials shall be disposed at designated marine disposal area in accordance with the Dumping and Sea Ordinance (DASO) permit conditions; and ▪ Silt curtains surrounding the closed grab dredger to be deployed as a precautionary measure.	Within construction site / Duration of the construction phase	N/A
8.8.1.4	5.1	-	**Modification of the Existing Seawall** ▪ Silt curtains shall be deployed around the seawall modification activities to completely enclose the active works areas, and care should be taken to avoid splashing of rockfill / rock armour into the surrounding marine environment. For the connecting sections with the existing outfalls, works for these connection areas should be undertaken during the dry season in order that individual drainage culvert cells may be isolated for interconnection works.	At the existing northern seawall / Duration of the construction phase	N/A
8.8.1.5	5.1	-	**Construction of New Stormwater Outfalls and Modifications to Existing Outfalls** ▪ During operation of the temporary drainage channel, runoff control measures such as bunding or silt fence shall be provided on both sides of the channel to prevent accumulation and release of SS via the temporary channel. Measures should also be taken to minimise the ingress of site drainage into the culvert excavations.	Within construction site / Duration of the construction phase	N/A
8.8.1.6 8.8.1.7	5.1	2.27	**Piling Activities for Construction of New Runway Approach Lights and HKIAAA Marker Beacons** Silt curtains shall be deployed around the piling activities to completely enclose the piling works and care should be taken to avoid spillage of excavated materials into the surrounding marine environment. For construction of the eastern approach lights at the CMPs ▪ Ground improvement via DCM using a close-spaced layout shall be completed prior to commencement of piling works; ▪ Steel casings shall be installed to enclose the excavation area prior to commencement of excavation; ▪ The excavated materials shall be removed using a closed grab within the steel casings; ▪ No discharge of the cement mixed materials into the marine environment will be allowed; and ▪ Excavated materials shall be treated and reused on-site.	Within construction site / Duration of the construction phase	N/A
8.8.1.8	5.1	-	**Construction of Site Runoff and Drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended: ▪ Install perimeter cut-off drains to direct off-site water around the site and implement internal drainage, erosion and sedimentation control facilities. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site	Within construction site / Duration of the construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			drainage system should be undertaken by the Contractors prior to the commencement of construction (for works areas located on the existing Airport island) or as soon as the new land is completed (for works areas located on the new landform);		
			▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM-DSS standards under the WPCO. The design of efficient silt removal facilities should make reference to the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractors prior to the commencement of construction;		I
			▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly;		I
			▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities;		N/A
			▪ In the event that contaminated groundwater is identified at excavation areas, this should be treated on-site using a suitable wastewater treatment process. The effluent should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge to foul sewers or collected for proper disposal off-site. No direct discharge of contaminated groundwater is permitted; and		N/A
			▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exits. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. All washwater should be treated according to the requirements of the TM-DSS standards under the WPCO prior to discharge.		I
8.8.1.9	5.1	-	**Sewage Effluent from Construction Workforce** ▪ Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	Within construction site / During construction phase	I
8.8.1.10 8.8.1.11	5.1		**General Construction Activities** ▪ Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used; and	Within construction site / During construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.		
8.8.1.12 8.8.1.13	5.1	2.28	**Drilling Activities for the Submarine Aviation Fuel Pipelines** To prevent potential water quality impacts at Sha Chau, the following measures shall be applied: ▪ A 'zero-discharge' policy shall be applied for all activities to be conducted at Sha Chau; ▪ No bulk storage of chemicals shall be permitted; and ▪ A containment pit shall be constructed around the drill holes. This containment pit shall be lined with impermeable lining and bunded on the outside to prevent inflow from off-site areas.	Within construction site / During construction phase	I
			At the airport island side of the drilling works, the following measures shall be applied for treatment of wastewater: ▪ During pipe cleaning, appropriate desilting or sedimentation device should be provided on site for treatment before discharge. The Contractor should ensure discharge water from the sedimentation tank meet the WPCO/TM requirements before discharge; and ▪ Drilling fluid used in drilling activities should be reconditioned and reused as far as possible. Temporary enclosed storage locations should be provided on-site for any unused chemicals that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.	Within construction site / During construction phase	I
			Waste Management Implication – Construction Phase		
10.5.1.1	7.1	-	Opportunities to minimise waste generation and maximise the reuse of waste materials generated by the project have been incorporated where possible into the planning, design and construction stages, and the following measures have been recommended: ▪ The relevant construction methods (particularly for the tunnel works) and construction programme have been carefully planned and developed to minimise the extent of excavation and to maximise the on-site reuse of inert C&D materials generated by the project as far as practicable. Temporary stockpiling areas will also be provided to facilitate on-site reuse of inert C&D materials;	Project Site Area / During design and construction phase	I
			▪ Priority should be given to collect and reuse suitable inert C&D materials generated from other concurrent projects and the Government's PFRF as fill materials for the proposed land formation works;		I
			▪ Only non-dredged ground improvement methods should be adopted in order to completely avoid the need for dredging and disposal of marine sediment for the proposed land formation work;		I
			▪ Excavation work for constructing the APM tunnels, BHS tunnels and airside tunnels will not be down to the CMPs beneath the fill materials in order to avoid excavating any sediments; and		N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ For the marine sediments expected to be excavated from the piling works of TRC, APM & BHS tunnels, airside tunnels and other facilities on the proposed land formation area, piling work of marine sections of the approach lights and HKIAAA beacons, basement works for some of T2 expansion area and excavation works for the proposed APM depot should be treated and reused on-site as backfilling materials, although required treatment level / detail and the specific re-use mode are under development.		N/A
10.5.1.1	7.1	-	The following good site practices should be performed during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; ▪ Training of site personnel in proper waste management and chemical waste handling procedures; ▪ Provision of sufficient waste disposal points and regular collection for disposal; ▪ Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks by tarpaulin/ similar material or by transporting wastes in enclosed containers. The cover should be extended over the edges of the sides and tailboards; ▪ Stockpiles of C&D materials should be kept wet or covered by impervious sheets to avoid wind-blown dust; ▪ All dusty materials including C&D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the barging points/ stockpile areas; ▪ C&D materials to be delivered to and from the project site by barges or by trucks should be kept wet or covered to avoid wind-blown dust; ▪ The speed of the trucks including dump trucks carrying C&D or waste materials within the site should be controlled to about 10 km/hour in order to reduce the adverse dust impact and secure the safe movement around the site; and ▪ To avoid or minimise dust emission during transport of C&D or waste materials within the site, each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials. Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.	Project Site Area / Construction Phase	I
10.5.1.3	7.1	-	The following practices should be performed to achieve waste reduction include: ▪ Use of steel or aluminium formworks and falseworks for temporary works as far as practicable; ▪ Adoption of repetitive design to allow reuse of formworks as far as practicable; ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;	Project Site Area / Construction Phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force; ▪ Any unused chemicals or those with remaining functional capacity should be collected for reused as far as practicable; ▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and ▪ Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.		
10.5.1.5	7.1		▪ Inert and non-inert C&D materials should be handled and stored separately to avoid mixing the two types of materials.	Project Site Area / Construction Phase	I
10.5.1.5	7.1	-	▪ Any recyclable materials should be segregated from the non-inert C&D materials for collection by reputable licensed recyclers whereas the non-recyclable waste materials should be disposed of at the designated landfill site by a reputable licensed waste collector.	Project Site Area / Construction Phase	I
10.5.1.6	7.1	-	▪ A trip-ticket system promulgated shall be developed in order to monitor the off-site delivery of surplus inert C&D materials that could not be reused on-site for the proposed land formation work at the PFRF and to control fly tipping.	Project Site Area / Construction Phase	I
10.5.1.6	7.1	2.32	▪ The Contractor should prepare and implement a Waste Management Plan detailing various waste arising and waste management practices.	Construction Phase	I
10.5.1.16	7.1	-	The following mitigation measures are recommended during excavation and treatment of the sediments: ▪ On-site remediation should be carried out in an enclosed area in order to minimise odour/dust emissions; ▪ The loading, unloading, handling, transfer or storage of treated and untreated sediment should be carried out in such a manner to prevent or minimise dust emissions; ▪ All practical measures, including but not limited to speed control for vehicles, should be taken to minimise dust emission; ▪ Good housekeeping should be maintained at all times at the sediment treatment facility and storage area; ▪ Treated and untreated sediment should be clearly separated and stored separately; and ▪ Surface runoff from the enclosed area should be properly collected and stored separately, and then properly treated to levels in compliance with the relevant effluent standards as required by the Water Pollution Control Ordinance before final discharge.	Project Site Area / Construction Phase	N/A
10.5.1.18	7.1	-	The marine sediments to be removed from the cable field joint area would be disposed of at the designated disposal sites to be allocated by the MFC. The following mitigation measures should be strictly	Project Site Area / Construction Phase	N/A

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			followed to minimise potential impacts on water quality during transportation of the sediments requiring Type 1 disposal: ▪ Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material; ▪ Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by EPD; and ▪ Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation.		
10.5.1.19	7.1	-	Contractor should register with the EPD as a chemical waste producer and to follow the relevant guidelines. The following measures should be implemented: ▪ Good quality containers compatible with the chemical wastes should be used; ▪ Incompatible chemicals should be stored separately; ▪ Appropriate labels must be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc.; and ▪ The contractor will use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Project Site Area / Construction Phase	I
10.5.1.20	7.1	-	▪ General refuse should be stored in enclosed bins or compaction units separated from inert C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site for disposal at designated landfill sites. An enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	Project Site Area / Construction Phase	I
10.5.1.21	7.1	-	▪ The construction contractors will be required to regularly check and clean any refuse trapped or accumulated along the newly constructed seawall. Such refuse will then be stored and disposed of together with the general refuse.	Project Site Area / Construction Phase	N/A
			Land Contamination – Construction Phase		
11.10.1.2 to 11.10.1.3	8.1	2.32	For areas inaccessible during site reconnaissance survey ▪ Further site reconnaissance would be conducted once the areas are accessible in order to identify any land contamination concern for the areas.	Project Site Area inaccessible during site reconnaissance / Prior to Construction Phase	I
			▪ Subject to further site reconnaissance findings, a supplementary Contamination Assessment Plan (CAP) for additional site investigation (SI) (if necessary) may be prepared and submitted to EPD for endorsement prior to the commencement of SI at these areas.		I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ After completion of SI, the Contamination Assessment Report (CAR) will be prepared and submitted to EPD for approval prior to start of the proposed construction works at the golf course, the underground and above-ground fuel storage tank areas, emergency power generation units, airside petrol filling station and fuel tank room.		I *(CAR for golf course)
			▪ Should remediation be required, Remediation Action Plan (RAP) and Remediation Report (RR) will be prepared for EPD's approval prior to commencement of the proposed remediation and any construction works respectively.		N/A
11.8.1.2	8.1	-	If contaminated soil is identified, the following mitigation measures are for the excavation and transportation of contaminated materials (if any): ▪ To minimize the incidents of construction workers coming in contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; ▪ Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when working directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; ▪ Stockpiling of contaminated excavated materials on site should be avoided as far as possible; ▪ The use of any contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; ▪ Vehicles containing any excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; ▪ Truck bodies and tailgates should be sealed to prevent any discharge; ▪ Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; ▪ Speed control for trucks carrying contaminated materials should be exercised. 8km/h is the recommended speed limit; ▪ Strictly observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and ▪ Maintain records of waste generation and disposal quantities and disposal arrangements.	Project Site Area / Construction Phase	N/A
			Terrestrial Ecological – Construction Phase		
12.10.1.1	9.2	2.14	**Pre-construction Egretry Survey** ▪ Conduct ecological survey for Sha Chau egretry to update the latest boundary of the egretry.	Breeding season (April - July) prior to commencement of HDD drilling works at HKIA	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
12.7.2.3 and 12.7.2.6	9.1	2.30	**Avoidance and Minimisation of Direct Impact to Egretry** ▪ The daylighting location will avoid direct encroachment to the Sheung Sha Chau egretry. The daylighting location and mooring of flat top barge, if required, will be kept away from the egretry; ▪ In any event, controls such as demarcation of construction site boundary and confining the lighting within the site will be practised to minimise disturbance to off-site habitat at Sheung Sha Chau Island; and ▪ The containment pit at the daylighting location shall be covered or camouflaged.	During construction phase at Sheung Sha Chau Island	I
12.7.2.5	9.1	2.30	**Preservation of Nesting Vegetation** ▪ The proposed daylighting location and the arrangement of connecting pipeline will avoid the need of tree cutting, therefore the trees that are used by ardeids for nesting will be preserved.	During construction phase at Sheung Sha Chau Island	I
12.7.2.4 and 12.7.2.6	9.1	2.30	**Timing the Pipe Connection Works outside Ardeid's Breeding Season** ▪ All HDD and related construction works on Sheung Sha Chau Island will be scheduled outside the ardeids' breeding season (between April and July). No night-time construction work will be allowed on Sheung Sha Chau Island during all seasons.	During construction phase at Sheung Sha Chau Island	I
12.10.1.1	9.3	-	**Ecological Monitoring** ▪ During the HDD construction works period from August to March, ecological monitoring will be undertaken monthly at the HDD daylighting location on Sheung Sha Chau Island to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.	at Sheung Sha Chau Island	I
			Marine Ecological Impact – Pre-construction Phase		
13.11.4.1	10.2.2	-	▪ Pre-construction phase Coral Dive Survey.	HKIAAA artificial seawall	I
			Marine Ecological Impact – Construction Phase		
13.11.1.3 to 13.11.1.6	-	-	**Minimisation of Land Formation Area** ▪ Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population.	Land formation footprint / during detailed design phase to completion of construction	I
13.11.1.7 to 13.11.1.10	-	2.31	**Use of Construction Methods with Minimal Risk/Disturbance** ▪ Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF;	During construction phase at marine works area	I
			▪ Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on CWDs, fisheries and the marine environment;		I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway;		N/A
			▪ Avoid bored piling during CWD peak calving season (Mar to Jun);		I
			▪ Prohibition of underwater percussive piling; and		I
			▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of submarine cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources.		I
13.11.2.1 to 13.11.2.7	-	-	**Mitigation for Indirect Disturbance due to Deterioration of Water Quality** ▪ Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices;	All works area during the construction phase	I
			▪ Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains);		I
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and		N/A
			Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to the CWDs and other marine ecological resources.		I
13.11.1.12	-	-	**Strict Enforcement of No-Dumping Policy** ▪ A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area; ▪ Mandatory educational programme of the no-dumpling policy be made available to all construction site personnel for all project-related works; ▪ Fines for infractions should be implemented; and ▪ Unscheduled, on-site audits shall be implemented.	All works area during the construction phase	I
13.11.1.13	-	-	**Good Construction Site Practices** ▪ Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines; ▪ Keep the number of working or stationary vessels present on-site to the minimum anytime; and ▪ Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators.	All works area during the construction phase	I
13.11.1.3 to 13.11.1.6	-	-	**Minimisation of Land Formation Area** ▪ Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for marine resources, especially the CWD population.	Land formation footprint / during detailed design phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
				to completion of construction	
13.11.5.4 to 13.11.5.13	10.3.1	-	**SkyPier High Speed Ferries' Speed Restrictions and Route Diversions** ▪ SkyPier HSFs operating to / from Zhuhai and Macau would divert north of SCLKC Marine Park with a 15 knot speed limit to apply for the part-journeys that cross high CWD abundance grid squares as indicatively shown in **Drawing No. MCL/P132/EIA/13-023** of the EIA Report. Both the alignment of the northerly route and the portion of routings to be subject to the speed limit of 15 knots shall be finalised prior to commencement of construction based on the future review of up-to-date CWD abundance and EM&A data and taking reference to changes in total SkyPier HSF numbers; and ▪ A maximum of 10 knots will be enforced through the designated SCLKC Marine Park area at all times.	Area between the footprint and SCLKC Marine Park during construction phase	I
			Other mitigation measures ▪ The ET will audit various parameters including actual daily numbers of HSFs, compliance with the 15-knot speed limit in the speed control zone and diversion compliance for SkyPier HSFs operating to / from Zhuhai and Macau; and ▪ The effectiveness of the CWD mitigation measures after implementation of initial six month SkyPier HSF diversion and speed restriction will be reviewed.	Area between the footprint and SCLKC Marine Park during construction phase	I
13.11.5.14 to 13.11.5.18	10.3.1	2.31	**Dolphin Exclusion Zone** ▪ Establishment of a 24 hr Dolphin Exclusion Zone (DEZ) with a 250 m radius around the land formation works areas;	Marine waters around land formation works area during construction phase	I
			▪ A DEZ would also be implemented during ground improvement works (e.g. DCM), water jetting works for submarine cables diversion, open trench dredging at the field joint locations and seawall construction; and		I
			▪ A DEZ would also be implemented during bored piling work but as a precautionary measure only.		N/A
13.11.5.19	10.4	2.31	**Acoustic Decoupling of Construction Equipment** ▪ Air compressors and other noisy equipment that must be mounted on steel barges should be acoustically-decoupled to the greatest extent feasible, for instance by using rubber or air-filled tyres; and ▪ Specific acoustic decoupling measures shall be specified during the detailed design of the project for use during the land formation works.	Around coastal works area during construction phase	I
13.11.5.20	10.6.1	2.29	**Spill Response Plan** ▪ An oil and hazardous chemical spill response plan is proposed to be established during the construction phase as a precautionary measure so that appropriate actions to prevent or reduce risks to CWDs can be undertaken in the event of an accidental spillage.	Construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
13.11.5.21 to 13.11.5.23	10.6.1	-	**Construction Vessel Speed Limits and Skipper Training** ▪ A speed limit of 10 knots should be strictly observed for construction vessels at areas with the highest CWD densities; and ▪ Vessels traversing through the work areas should be required to use predefined and regular routes (which would presumably become known to resident dolphins) to reduce disturbance to cetaceans due to vessel movements. Specific marine routes shall be specified by the Contractor prior to construction commencing.	All areas north and west of Lantau Island during construction phase	I
			Fisheries Impact – Construction Phase		
14.9.1.2 to 14.9.1.5	-		**Minimisation of Land Formation Area** ▪ Minimise the overall size of the land formation needed for the additional facilities to minimise the overall loss of habitat for fisheries resources.	Land formation footprint / during detailed design phase to completion of construction	I
14.9.1.6	-	-	**Use of Construction Methods with Minimal Risk/Disturbance** ▪ Use of non-dredge method for the main land formation and ancillary works including the diversion of the aviation fuel pipeline to the AFRF;	During construction phase at marine works area	I
			▪ Use of Deep Cement Mixing (DCM) method instead of conventional seabed dredging for the land formation works to reduce the risk of negative impacts through the elevation of suspended solids and contaminants on fisheries and the marine environment;		I
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and		N/A
			▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources.		I
14.9.1.11	-		**Strict Enforcement of No-Dumping Policy** ▪ A policy prohibiting dumping of wastes, chemicals, oil, trash, plastic, or any other substance that would potentially be harmful to dolphins and/or their habitat in the work area; ▪ Mandatory educational programme of the no-dumpling policy be made available to all construction site personnel for all project-related works; ▪ Fines for infractions should be implemented; and ▪ Unscheduled, on-site audits shall be implemented.	All works area during the construction phase	I
14.9.1.12	-		**Good Construction Site Practices** ▪ Regular inspection of the integrity and effectiveness of all silt curtains and monitoring of effluents to ensure that any discharge meets effluent discharge guidelines; ▪ Keep the number of working or stationary vessels present on-site to the minimum anytime; and	All works area during the construction phase	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			▪ Unscheduled, on-site audits for all good site practice restrictions should be conducted, and fines or penalties sufficient to be an effective deterrent need to be levied against violators.		
14.9.1.13 to 14.9.1.18	-		**Mitigation for Indirect Disturbance due to Deterioration of Water Quality** ▪ Water quality mitigation measures during construction phases include consideration of alternative construction methods, deployment of silt curtain and good site practices;	All works area during the construction phase	I
			▪ Alternative construction methods including use of non-dredge methods for ground improvement (e.g. Deep Cement Mixing (DCM), prefabricated vertical drains (PVD), sand compaction piles, steel cells, stone columns and vertical sand drains);		I
			▪ Use of bored piling in short duration to form the new approach lights and marker beacons for the new runway; and		N/A
			▪ Use of horizontal directional drilling (HDD) method and water jetting methods for placement of undersea cables and pipelines to minimise the disturbance to fisheries resources.		I
			Landscape and Visual Impact – Construction Phase		
Table 15.6	12.3	-	**CM1 -** The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM2 -** Reduction of construction period to practical minimum.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM3 -** Phasing of the construction stage to reduce visual impacts during the construction phase.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM4 -** Construction traffic (land and sea) including construction plants, construction vessels and barges should be kept to a practical minimum.	All works areas for duration of works; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM5 -** Erection of decorative mesh screens or construction hoardings around works areas in visually unobtrusive colours.	All works areas for duration of works; Upon handover and completion of works. –	I

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
				may be disassembled in phases	
Table 15.6	12.3	-	**CM6 -** Avoidance of excessive height and bulk of site buildings and structures.	New passenger concourse, terminal 2 expansion and other proposed airport related buildings and structures under the project; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	**CM7** - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	All works areas for duration of works; Upon handover and completion of works. – may be disassembled in phases	I
Table 15.6	12.3	-	**CM8 -** All existing trees shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas.	All existing trees to be retained; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM9 -** Trees unavoidably affected by the works shall be transplanted where practical. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.	All existing trees to be affected by the works; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	**CM10 -** Land formation works shall be followed with advanced hydroseeding around taxiways and runways as soon as practical.	All affected existing grass areas around runways and verges/Duration of works; Upon handover and completion of works.	N/A
			Cultural Heritage Impact – Construction Phase		
			Not applicable.		

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
			Health Impact – Aircraft Emissions		
			Not applicable.		
			Health Impact – Aircraft Noise		
			Not applicable.		

Notes:

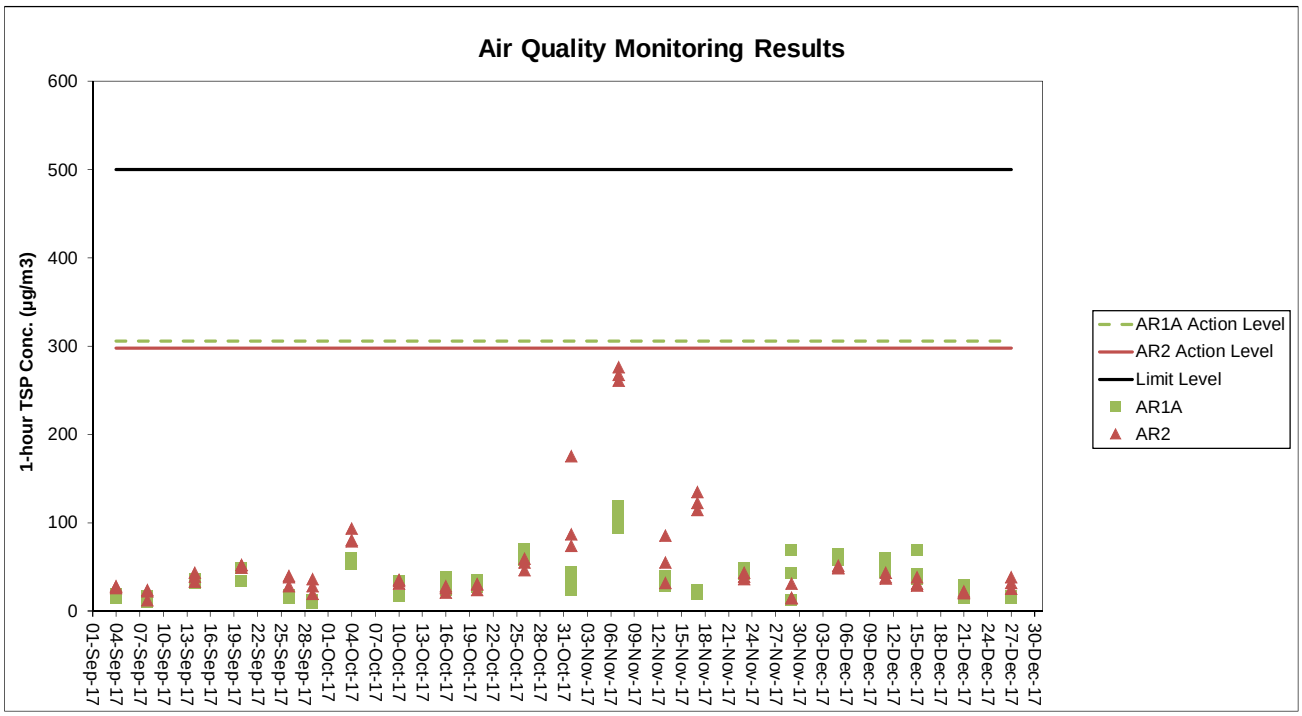
I= implemented where applicable;

N/A= not applicable to the construction works implemented during the reporting month.

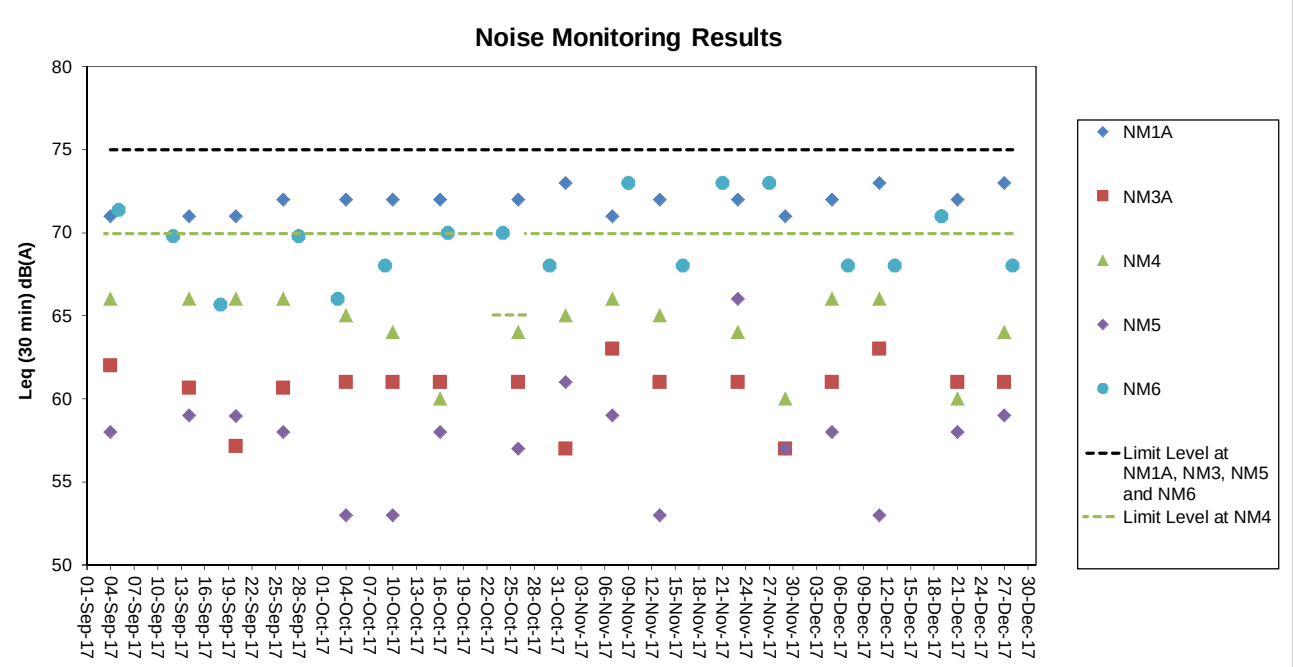
^ Checked by ET through site inspection and record provided by the Contractor.

Appendix C. Monitoring Results

Air Quality Monitoring Results

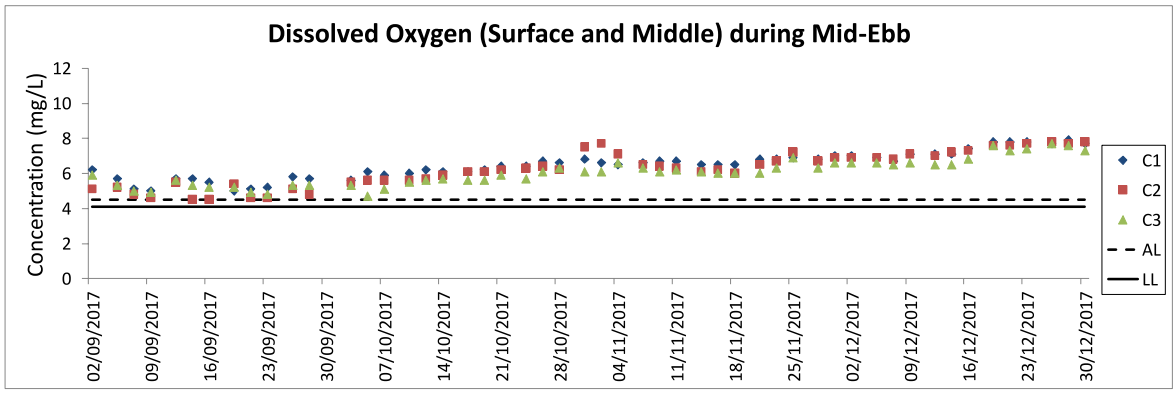

Air Quality Monitoring Results
1-hour TSP Conc. (µg/m3)
600
500
400
300
200
100
0
01-Sep-17
04-Sep-17
07-Sep-17
10-Sep-17
13-Sep-17
16-Sep-17
19-Sep-17
22-Sep-17
25-Sep-17
28-Sep-17
01-Oct-17
04-Oct-17
07-Oct-17
10-Oct-17
13-Oct-17
16-Oct-17
19-Oct-17
22-Oct-17
25-Oct-17
28-Oct-17
31-Oct-17
03-Nov-17
06-Nov-17
09-Nov-17
12-Nov-17
15-Nov-17
18-Nov-17
21-Nov-17
24-Nov-17
27-Nov-17
30-Nov-17
03-Dec-17
06-Dec-17
09-Dec-17
12-Dec-17
15-Dec-17
18-Dec-17
21-Dec-17
24-Dec-17
27-Dec-17
30-Dec-17
AR1A Action Level
AR2 Action Level
Limit Level
AR1A
AR2

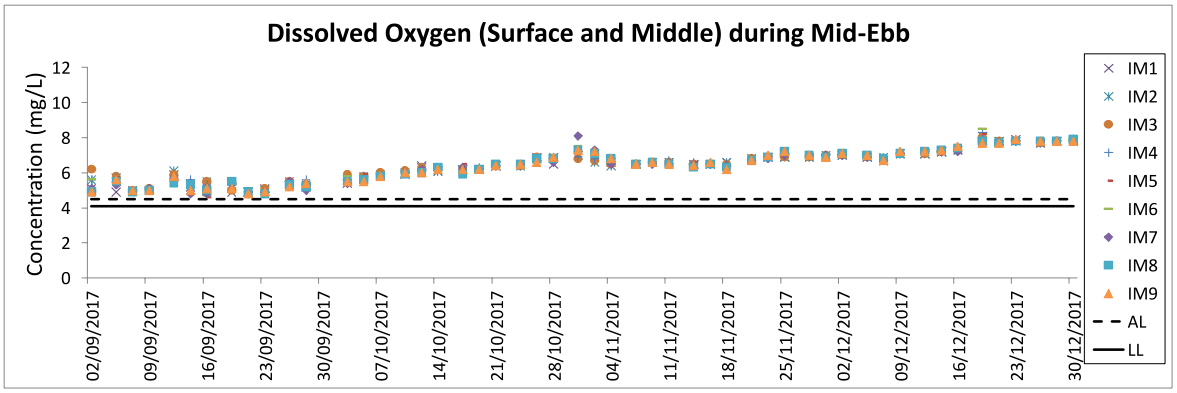
Noise Monitoring Results

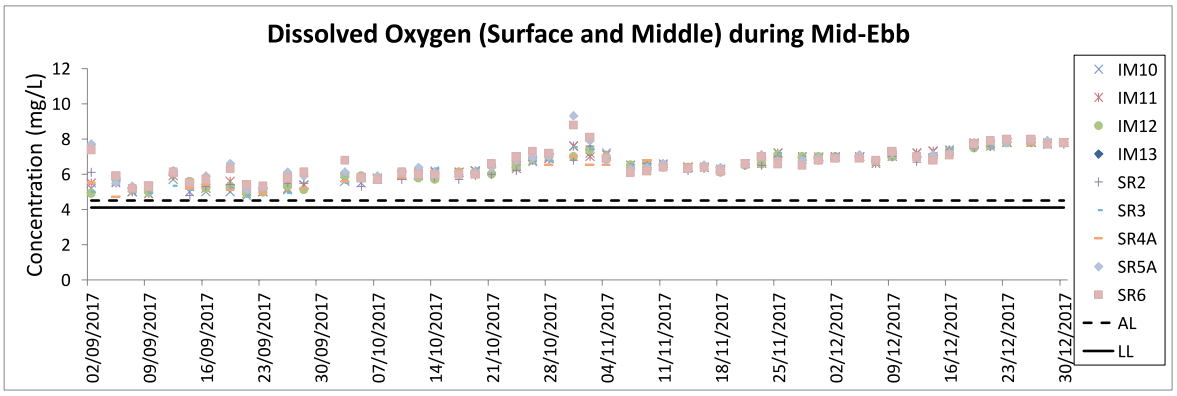


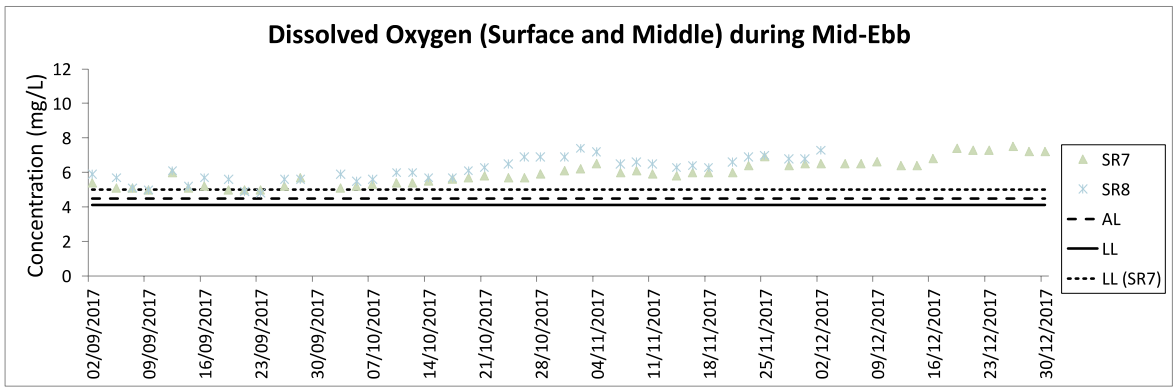
Note: School examination took place from 23 to 27 October 2017 in the reporting period.

Water Quality Monitoring Results


Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
0
2
4
6
8
10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
C1
C2
C3
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
0
2
4
6
8
10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
IM1
IM2
IM3
IM4
IM5
IM6
IM7
IM8
IM9
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
0
2
4
6
8
10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
IM10
IM11
IM12
IM13
SR2
SR3
SR4A
SR5A
SR6
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Ebb
Concentration (mg/L)
0
2
4
6
8
10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
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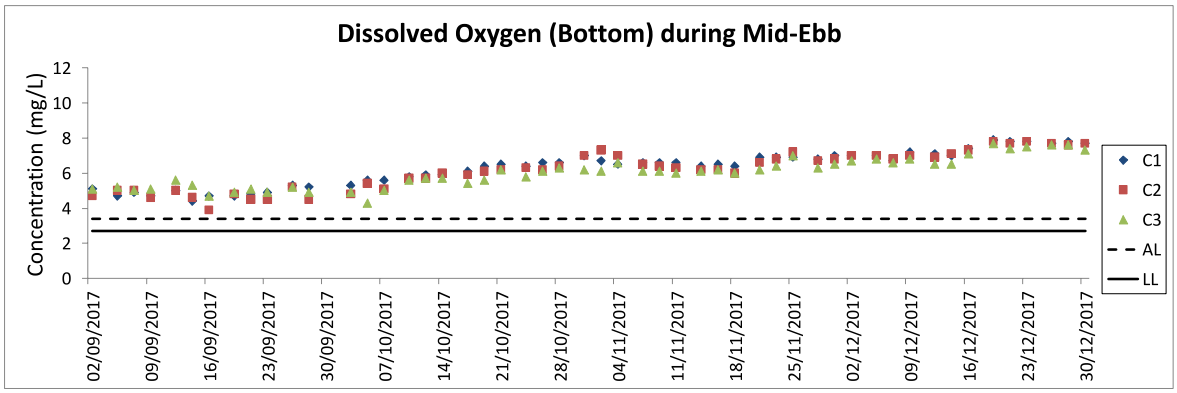
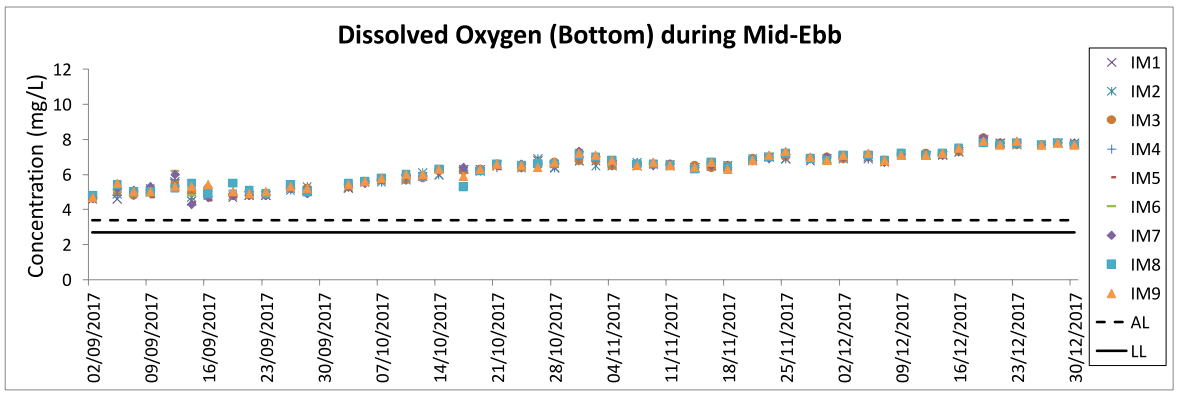
30/12/2017
SR7
SR8
AL
LL
LL (SR7)


Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
0
2
4
6
8
10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
C1
C2
C3
AL
LL


Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
0
2
4
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12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
IM1
IM2
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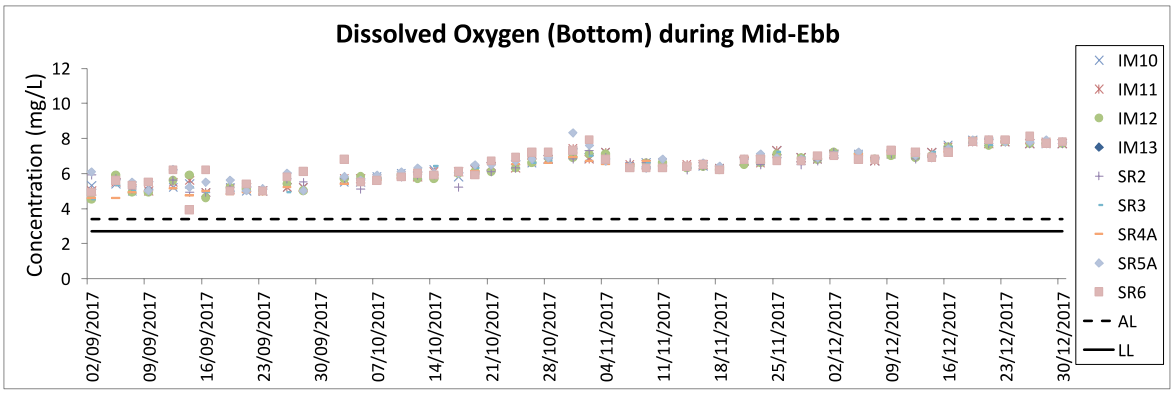
IM4
IM5
IM6
IM7
IM8
IM9
AL
LL


Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
0
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02/09/2017
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16/09/2017
23/09/2017
30/09/2017
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04/11/2017
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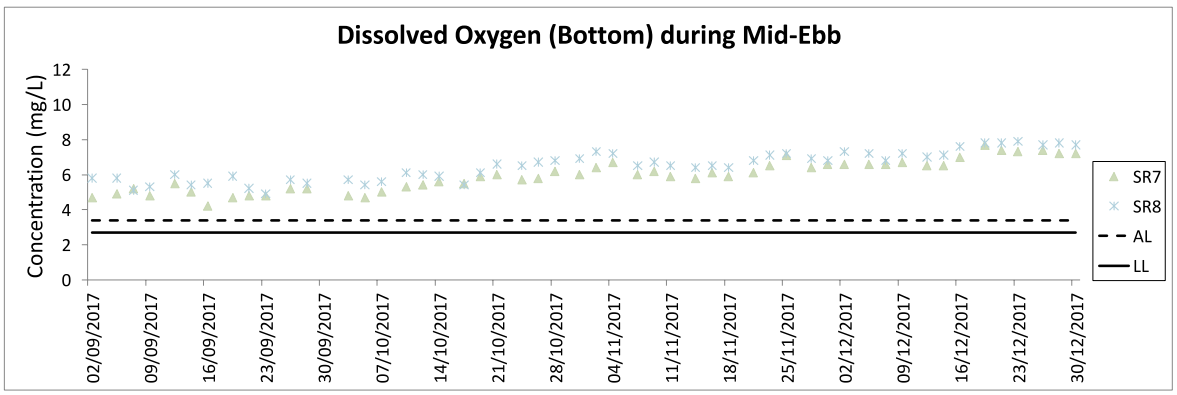
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
IM10
IM11
IM12
IM13
SR2
SR3
SR4A
SR5A
SR6
AL
LL


Dissolved Oxygen (Bottom) during Mid-Ebb
Concentration (mg/L)
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02/09/2017
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23/09/2017
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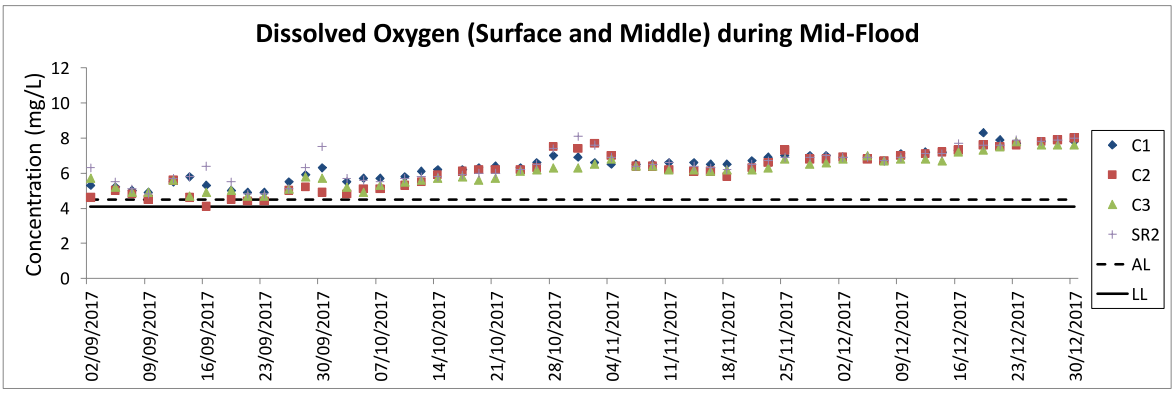
30/12/2017
SR7
SR8
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
0
2
4
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8
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12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
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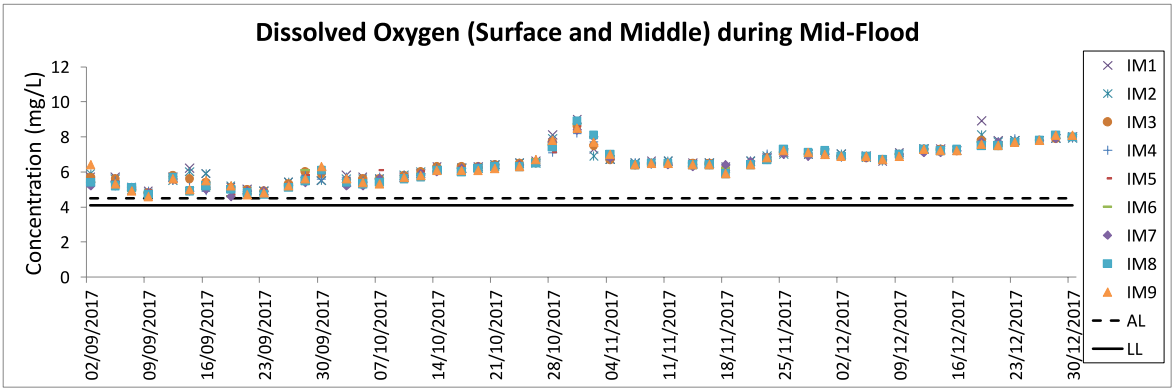
04/11/2017
11/11/2017
18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
C1
C2
C3
SR2
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
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28/10/2017
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02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
IM1
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IM7
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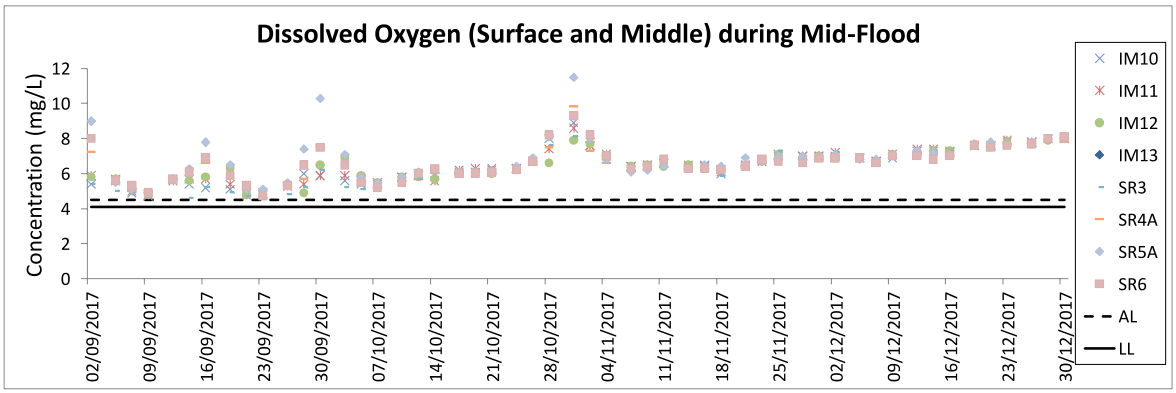
IM9
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
0
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02/09/2017
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23/09/2017
30/09/2017
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21/10/2017
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09/12/2017
16/12/2017
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30/12/2017
IM10
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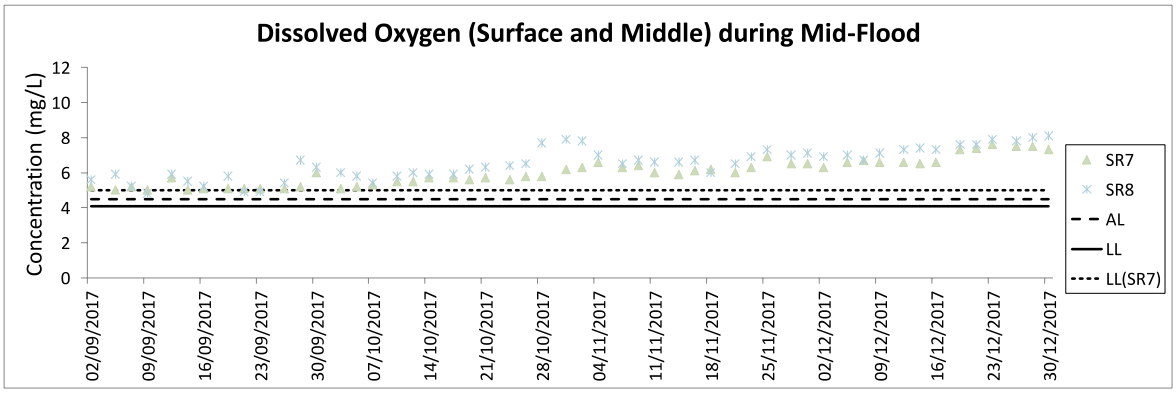
IM12
IM13
SR3
SR4A
SR5A
SR6
AL
LL


Dissolved Oxygen (Surface and Middle) during Mid-Flood
Concentration (mg/L)
0
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02/09/2017
09/09/2017
16/09/2017
23/09/2017
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07/10/2017
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04/11/2017
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18/11/2017
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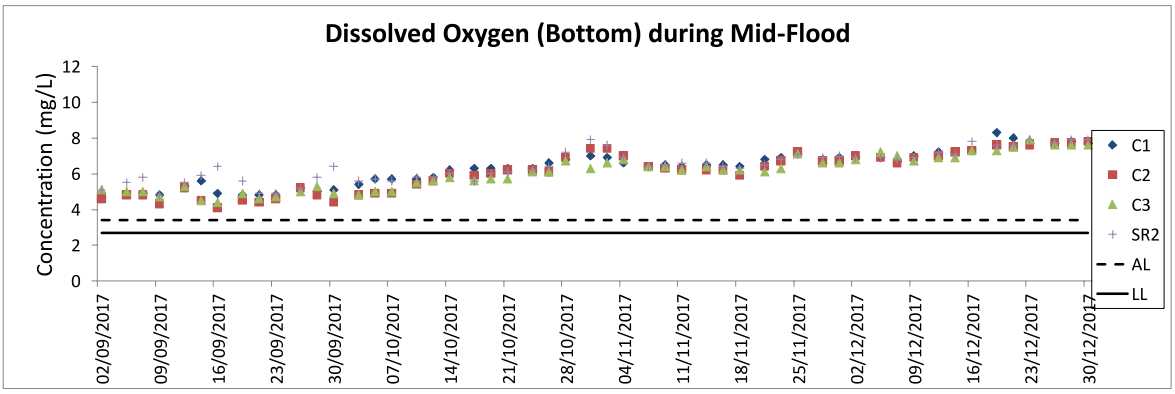
30/12/2017
SR7
SR8
AL
LL
LL(SR7)


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
4
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10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
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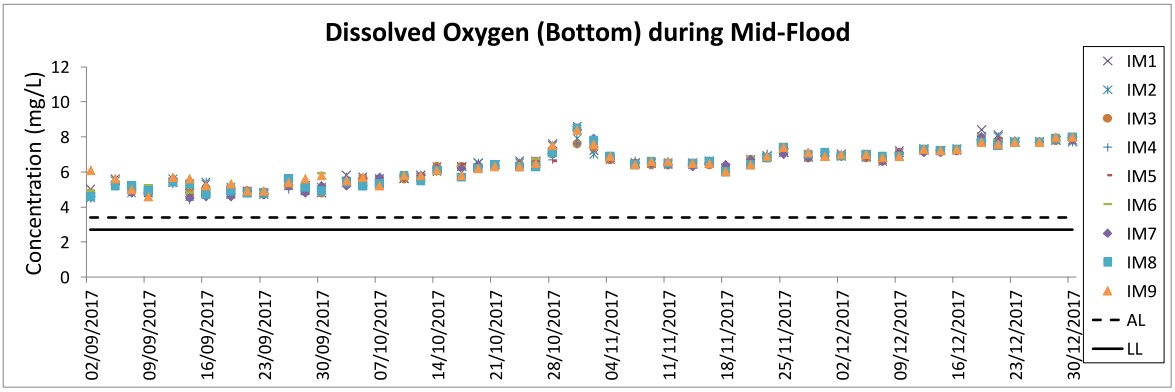
30/12/2017
C1
C2
C3
SR2
AL
LL


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
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02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
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18/11/2017
25/11/2017
02/12/2017
09/12/2017
16/12/2017
23/12/2017
30/12/2017
IM1
IM2
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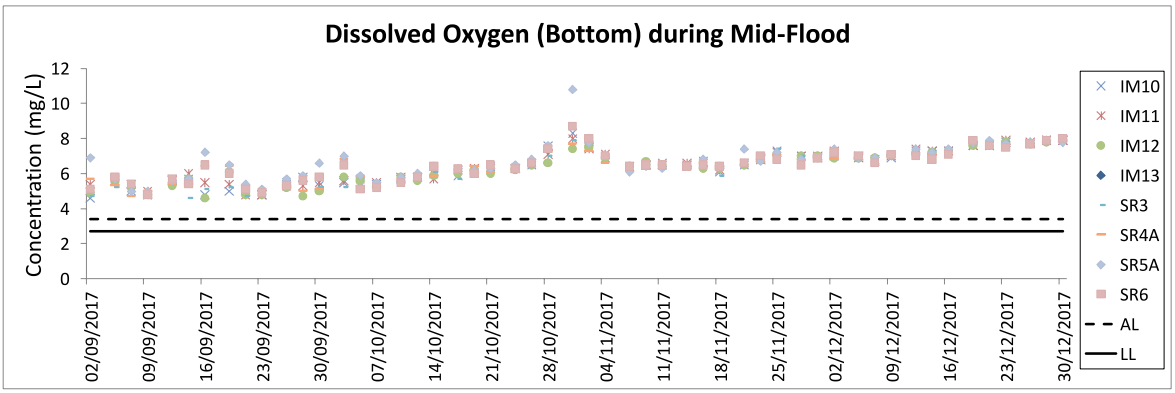
IM5
IM6
IM7
IM8
IM9
AL
LL


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
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10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
28/10/2017
04/11/2017
11/11/2017
18/11/2017
25/11/2017
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09/12/2017
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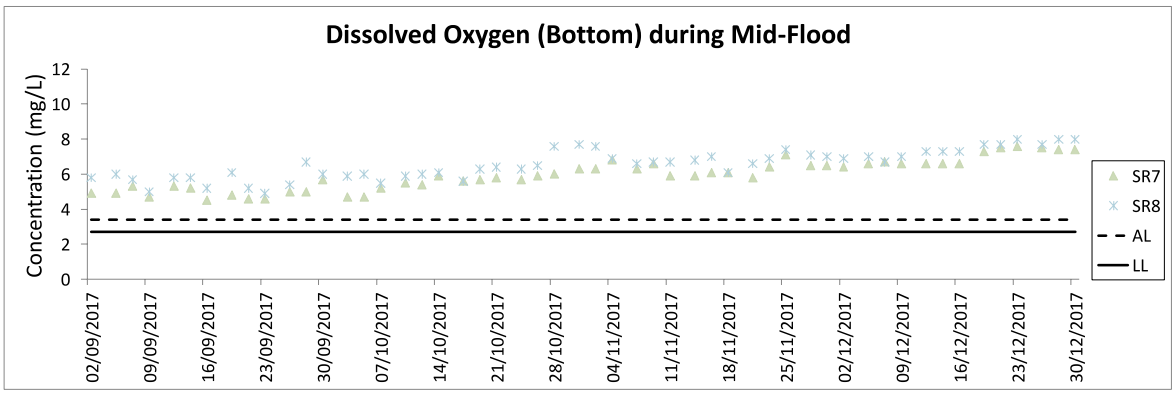
30/12/2017
IM10
IM11
IM12
IM13
SR3
SR4A
SR5A
SR6
AL
LL


Dissolved Oxygen (Bottom) during Mid-Flood
Concentration (mg/L)
0
2
4
6
8
10
12
02/09/2017
09/09/2017
16/09/2017
23/09/2017
30/09/2017
07/10/2017
14/10/2017
21/10/2017
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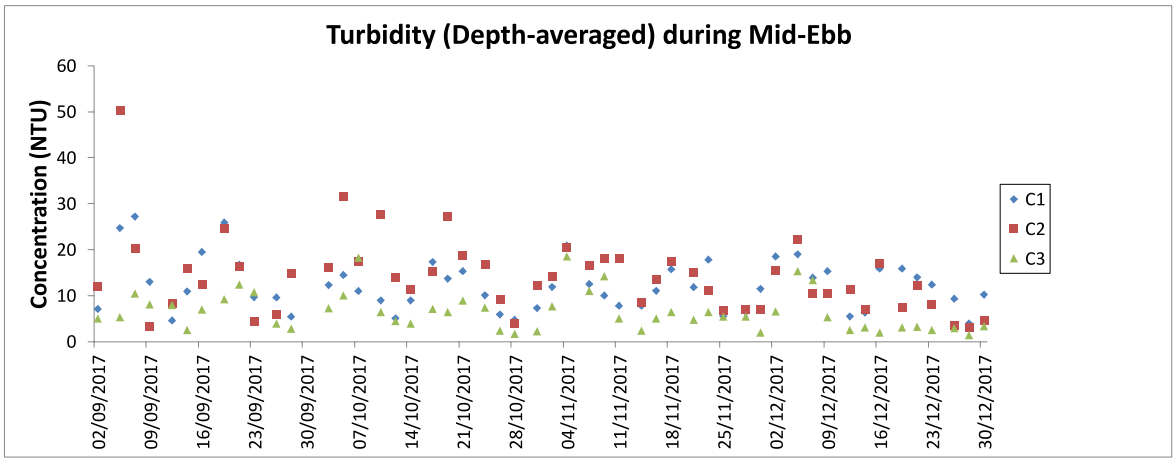
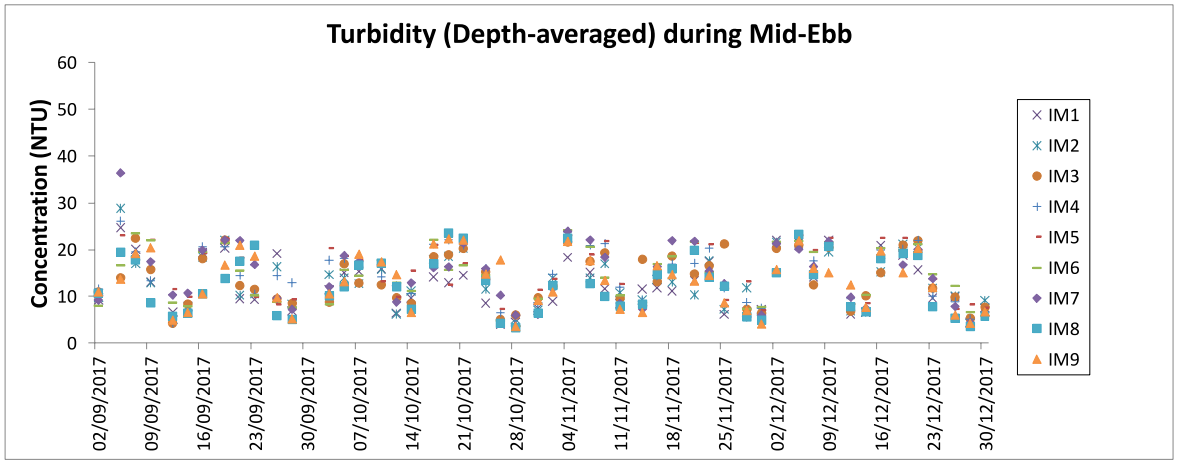
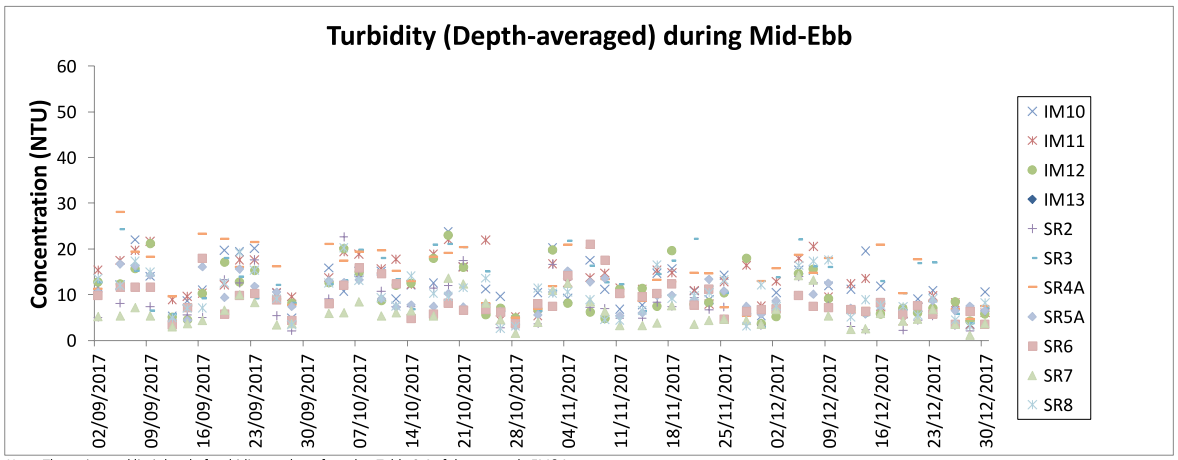
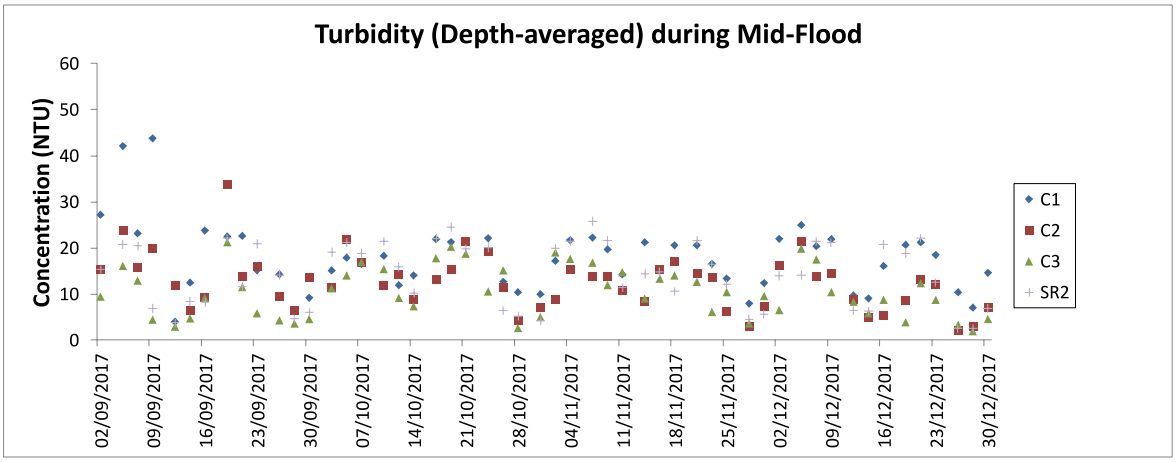
30/12/2017
SR7
SR8
AL
LL

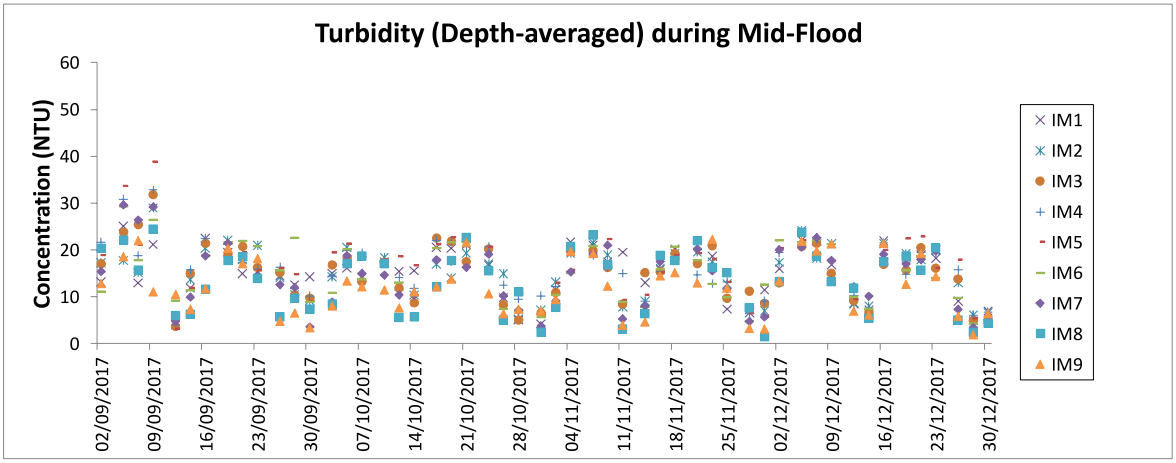


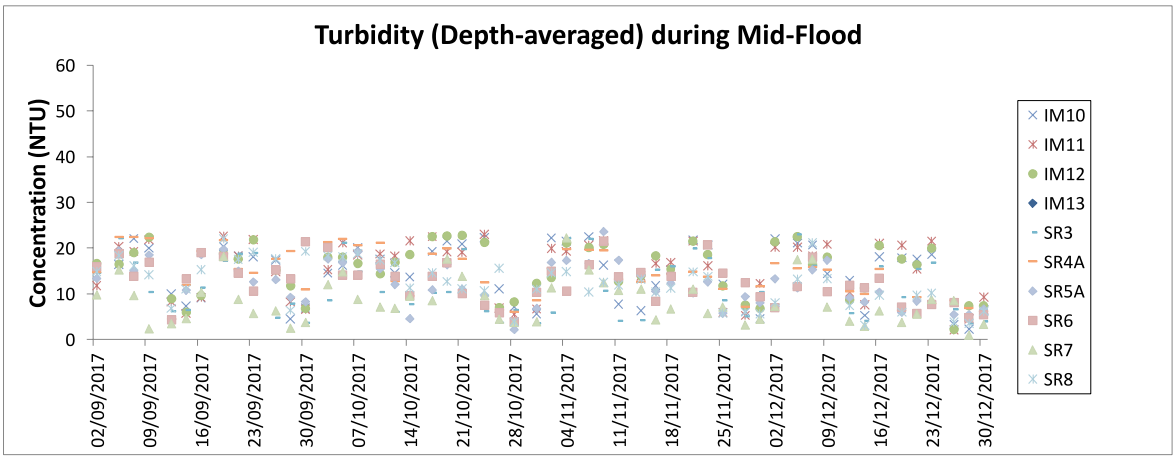




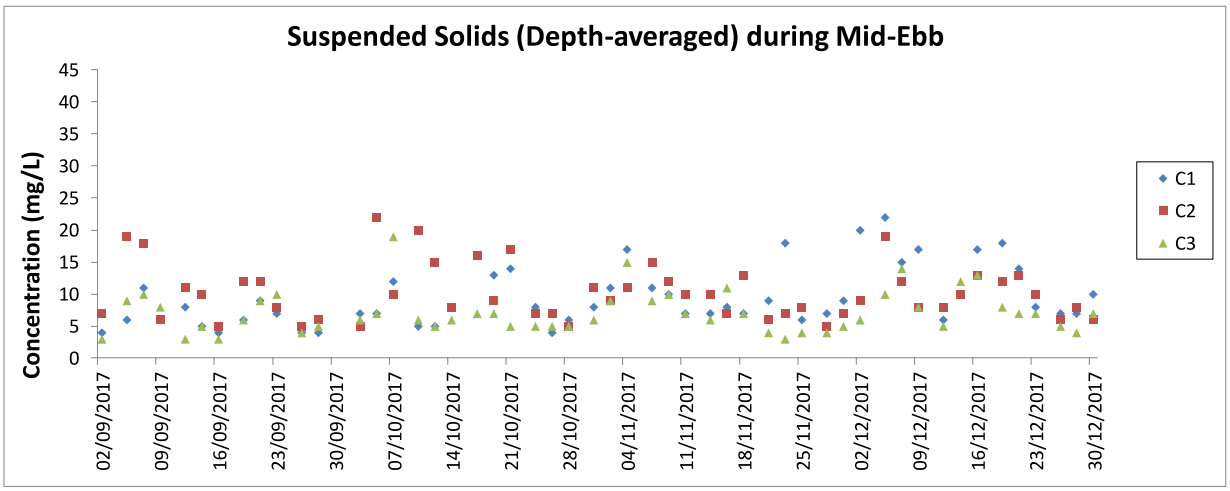
Note: The action and limit level of turbidity can be referred to Table 2.4 of the quarterly EM&A report.

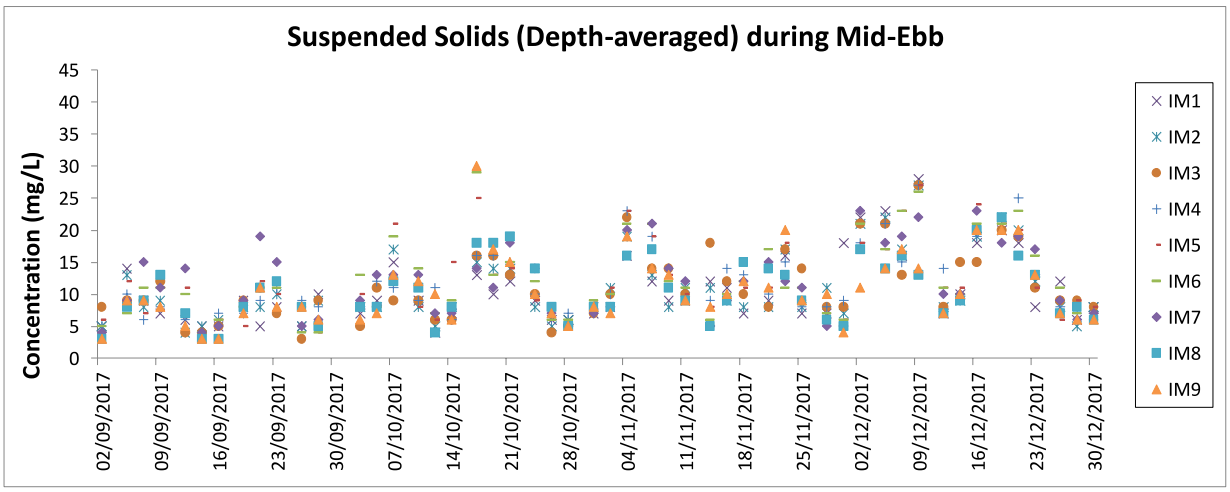


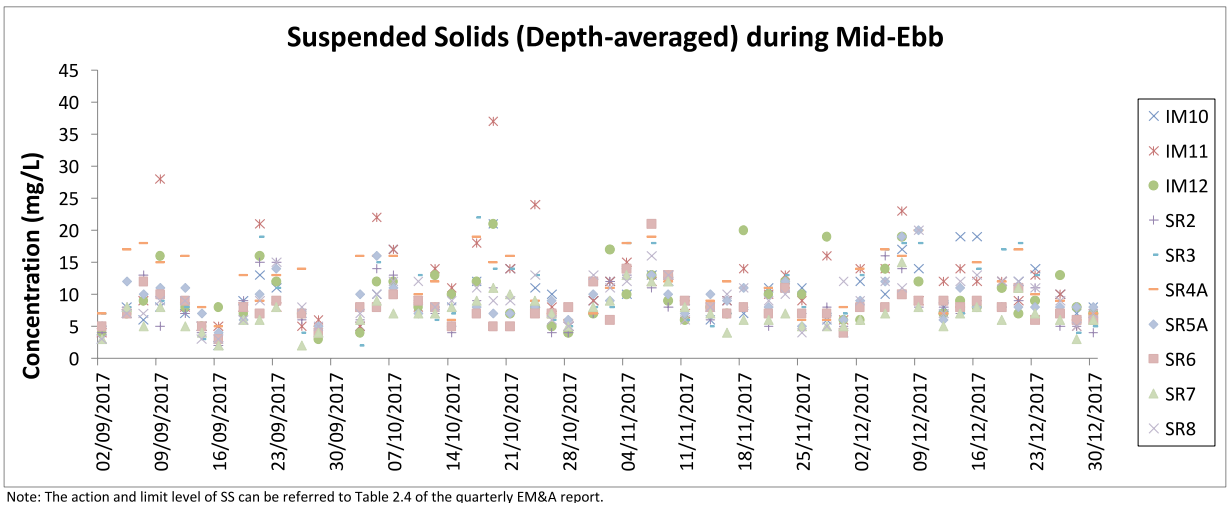




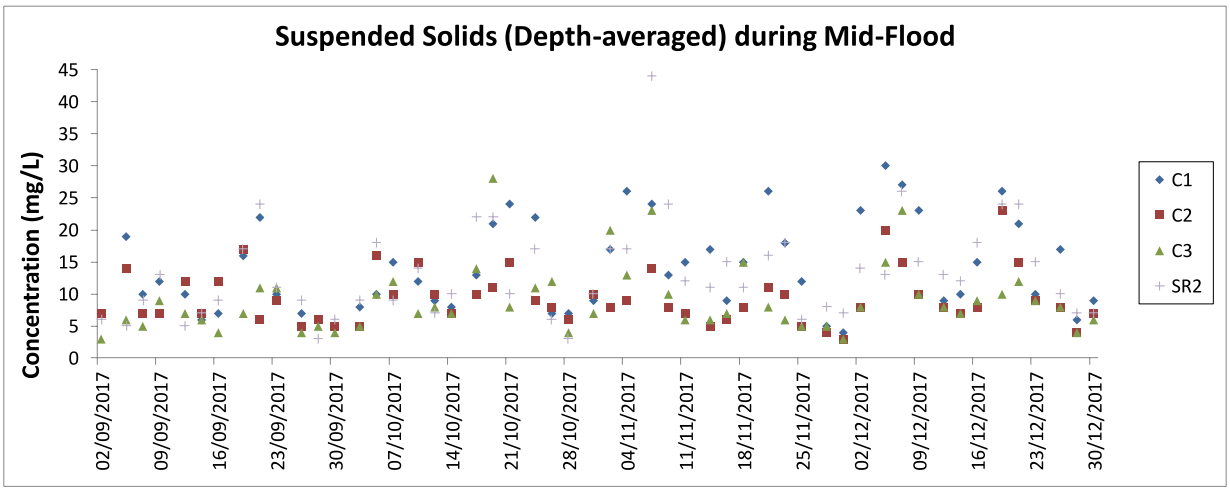
Note: The action and limit level of turbidity can be referred to Table 2.4 of the quarterly EM&A report.

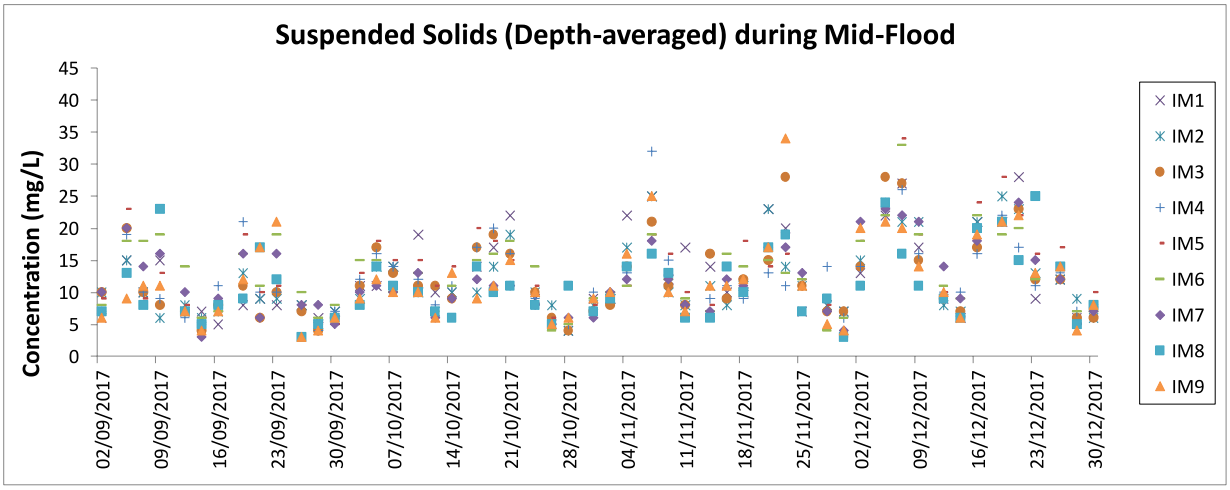


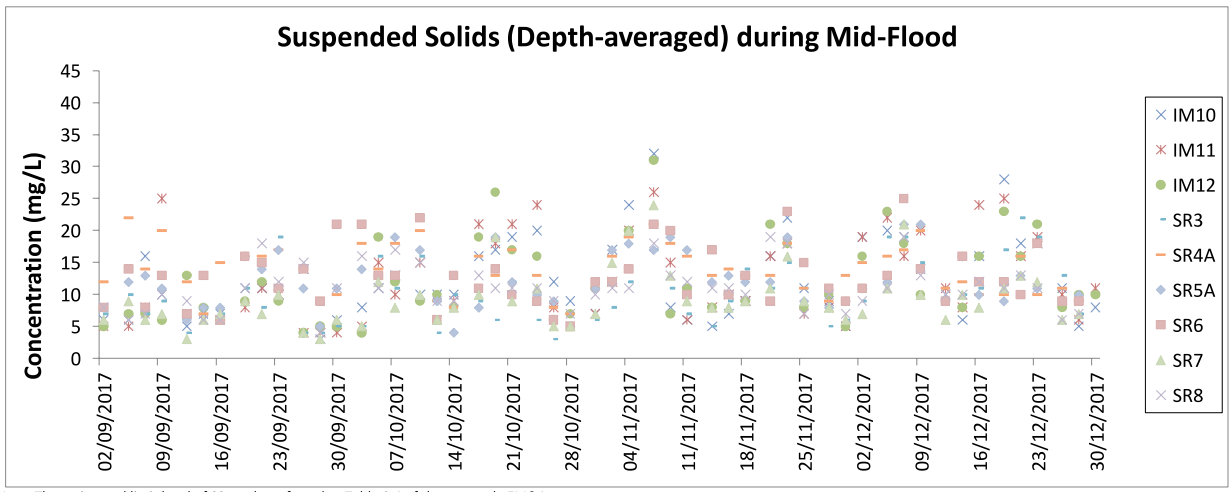




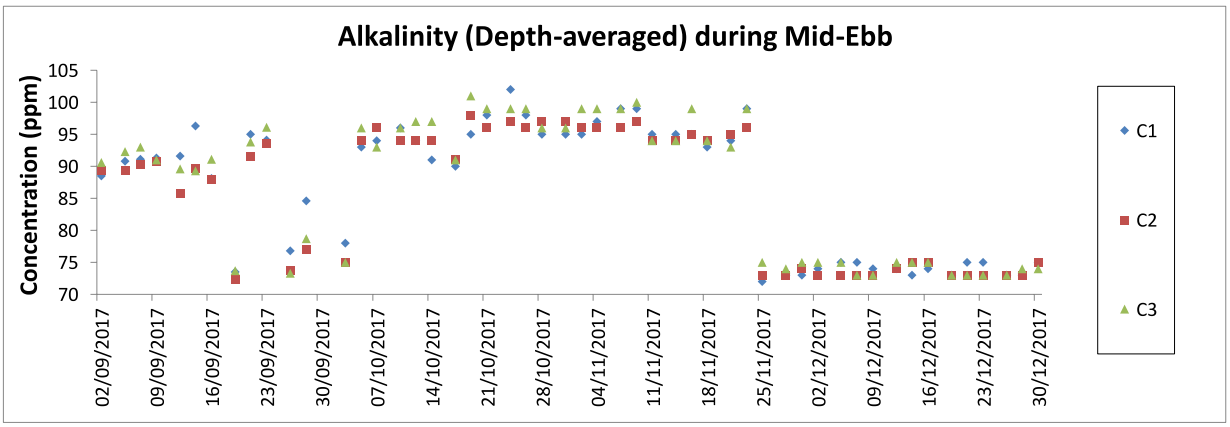
Note: The action and limit level of SS can be referred to Table 2.4 of the quarterly EM&A report.

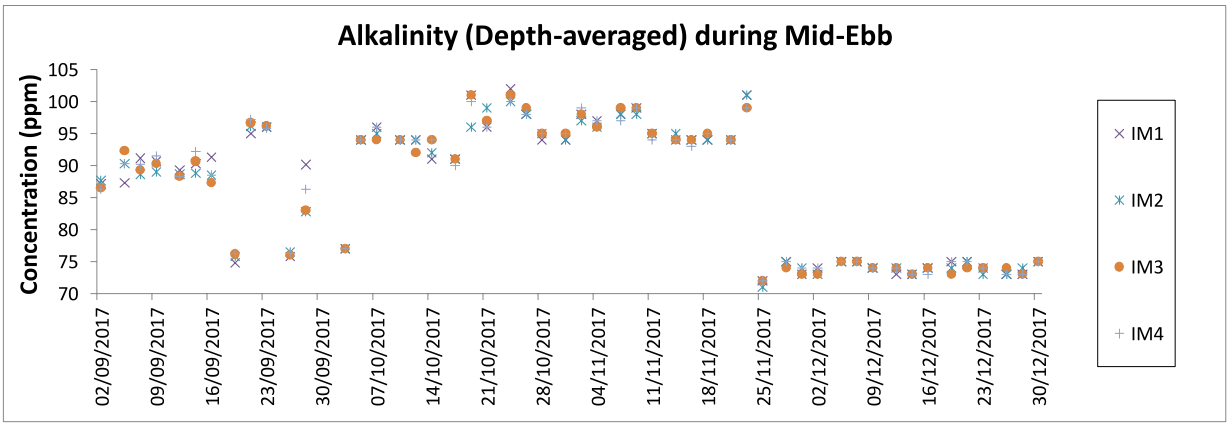


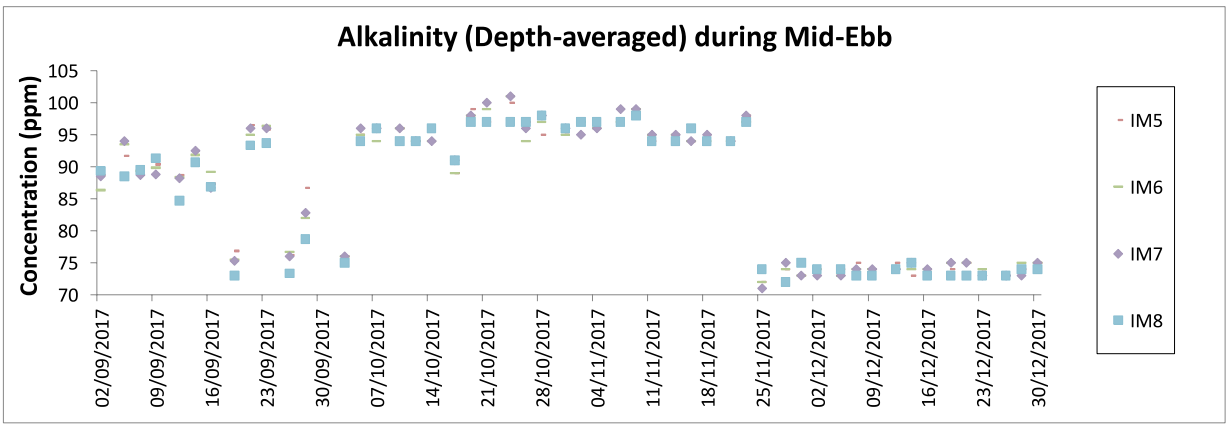


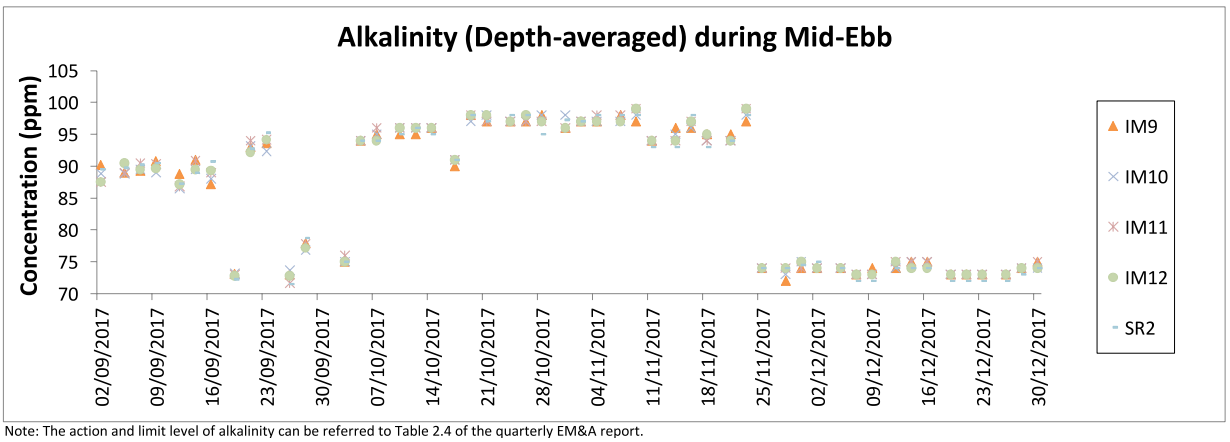


Note: The action and limit level of SS can be referred to Table 2.4 of the quarterly EM&A report.

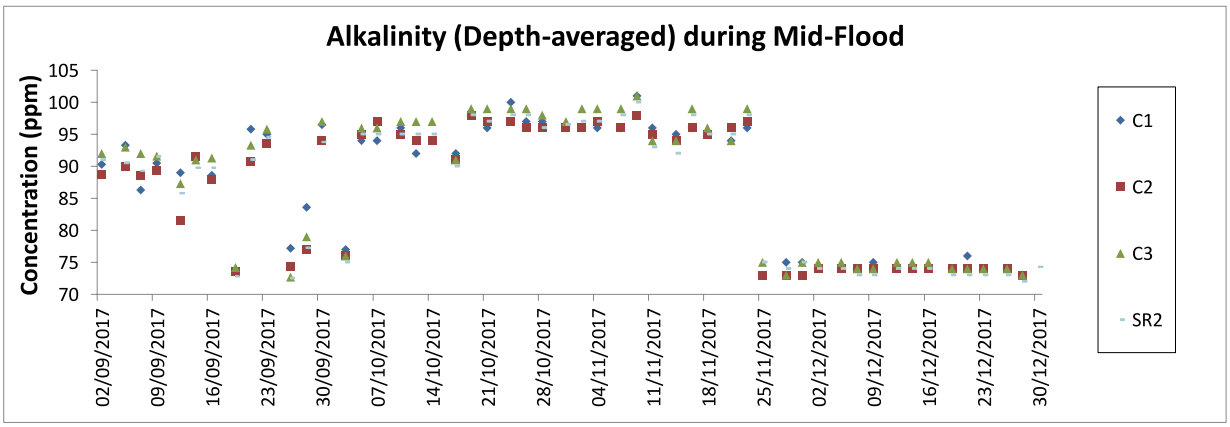


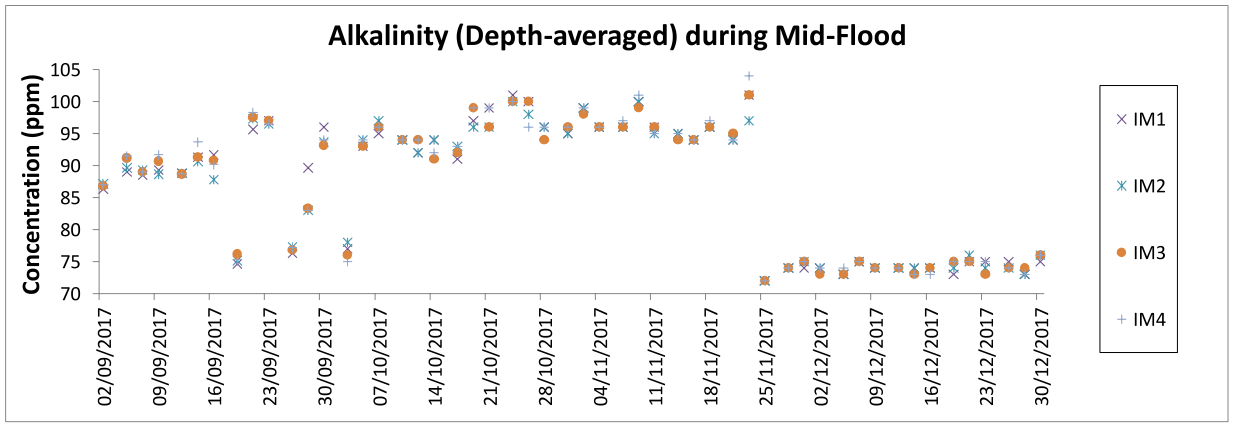


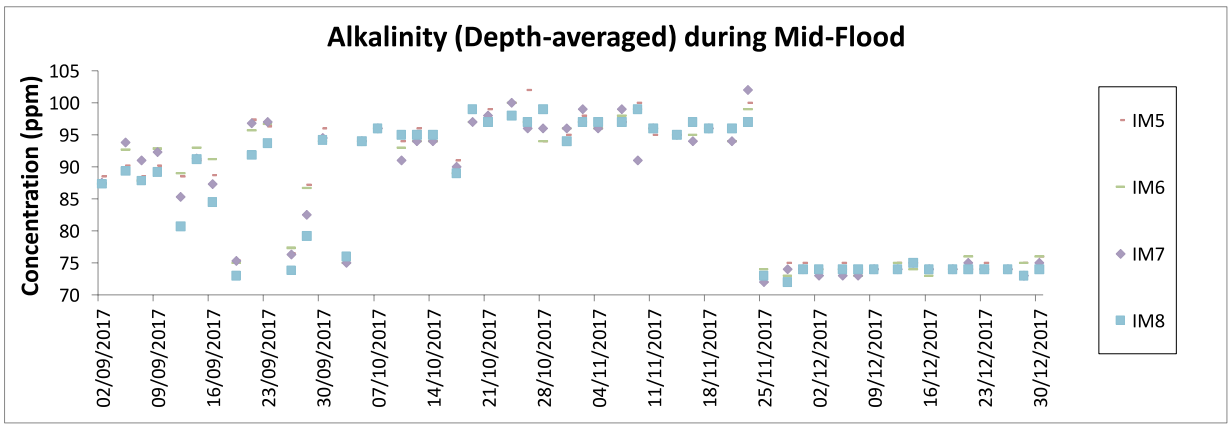


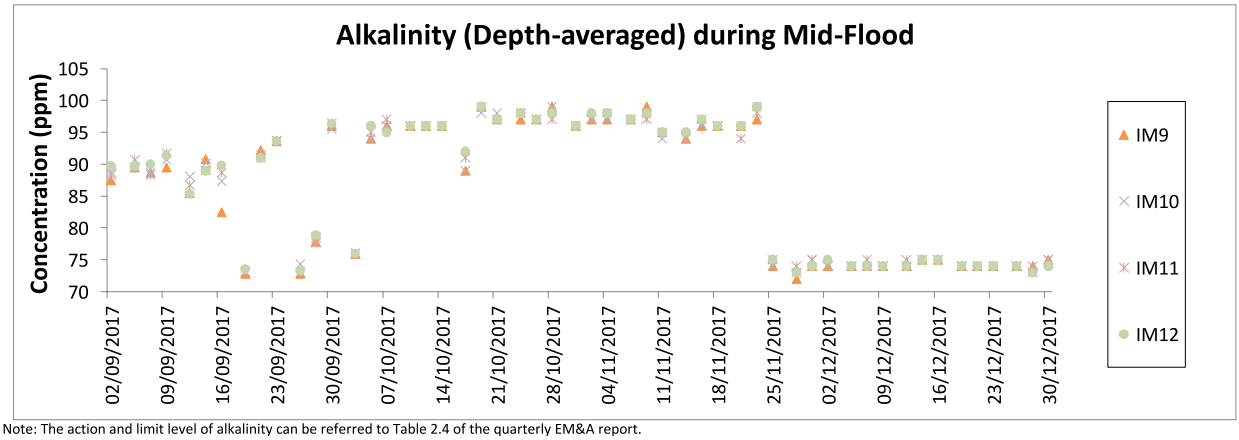


Note: The action and limit level of alkalinity can be referred to Table 2.4 of the quarterly EM&A report.

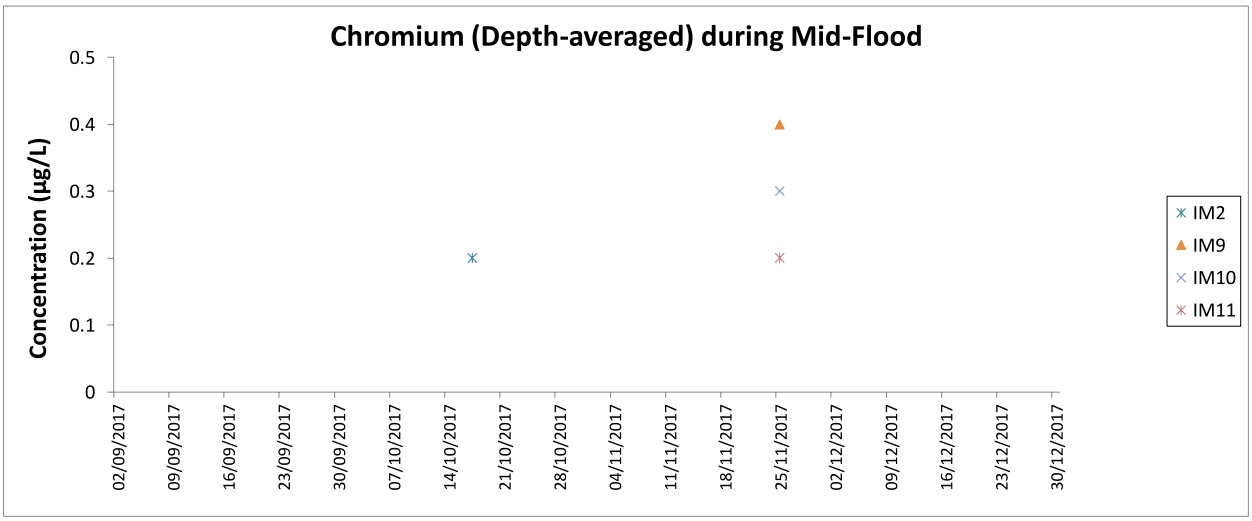




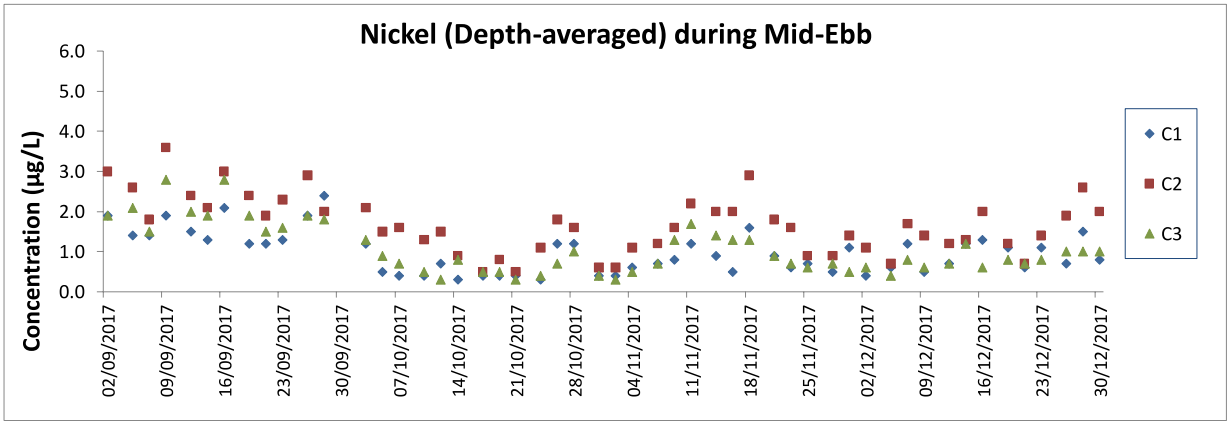


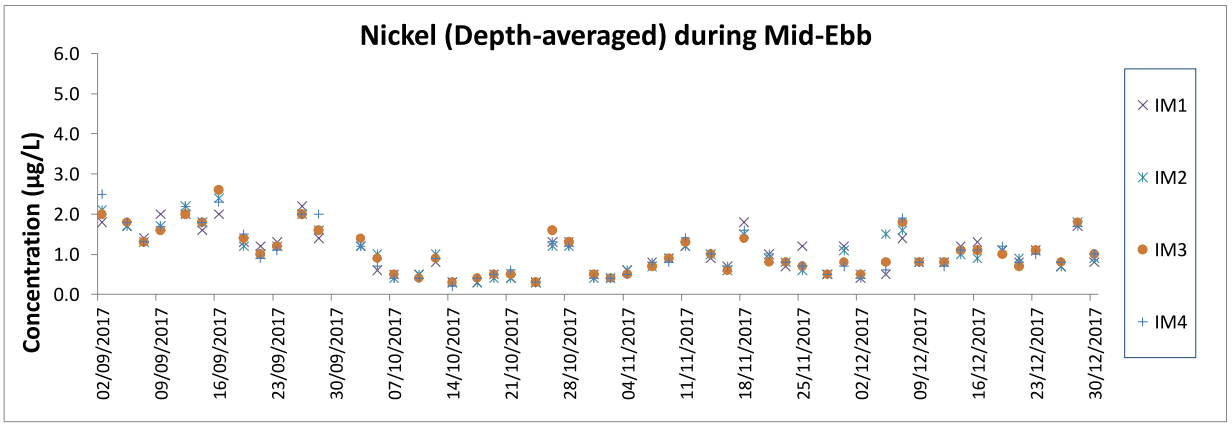


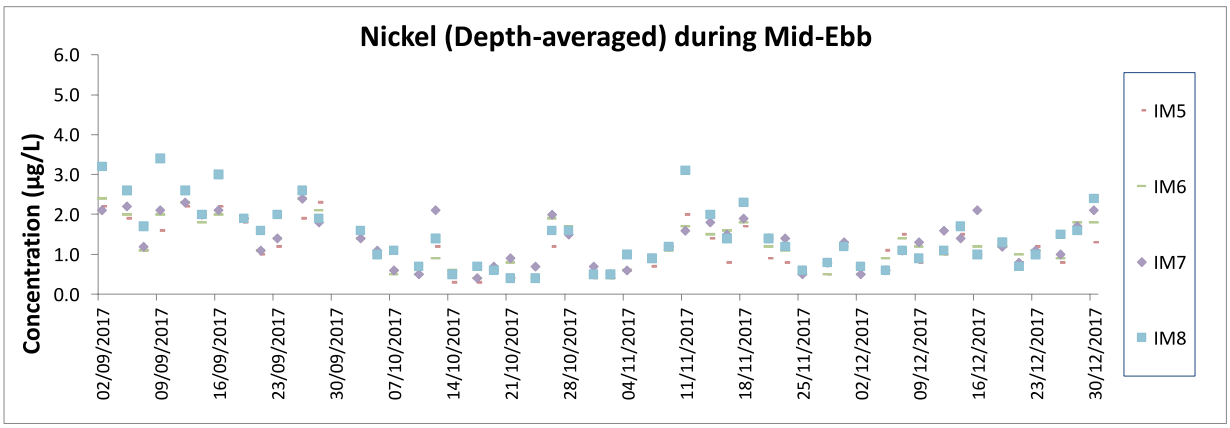
Note: The action and limit level of alkalinity can be referred to Table 2.4 of the quarterly EM&A report.

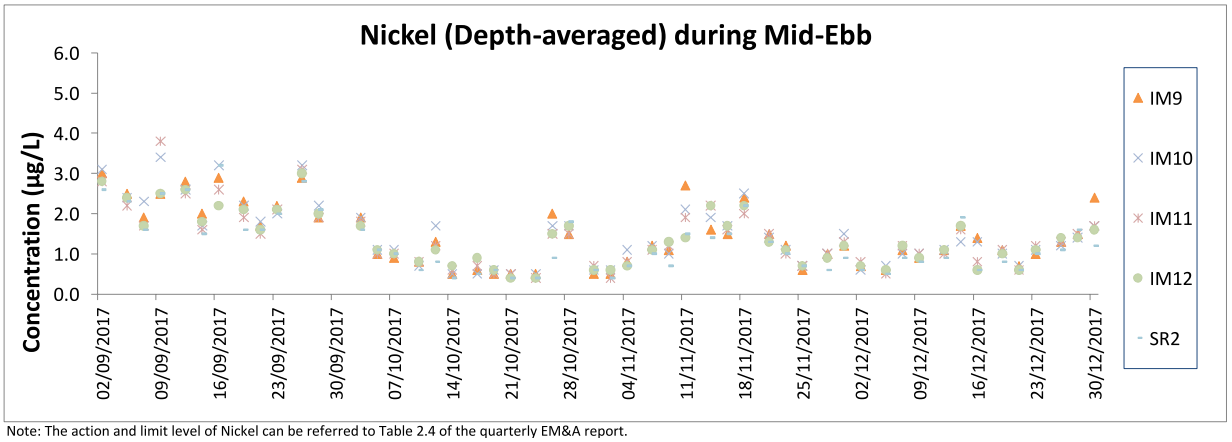


Note: The action and limit level of Chromium can be referred to Table 2.4 of the quarterly EM&A report.
The monitoring results of Chromium at all other monitoring stations during mid-flood and mid-ebb tides were below the reporting limit 0.2 µg/L

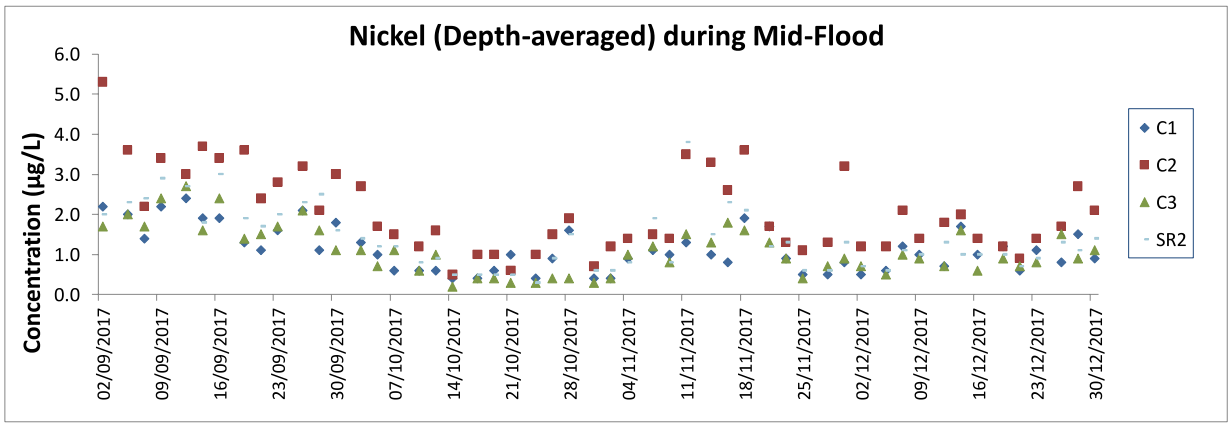


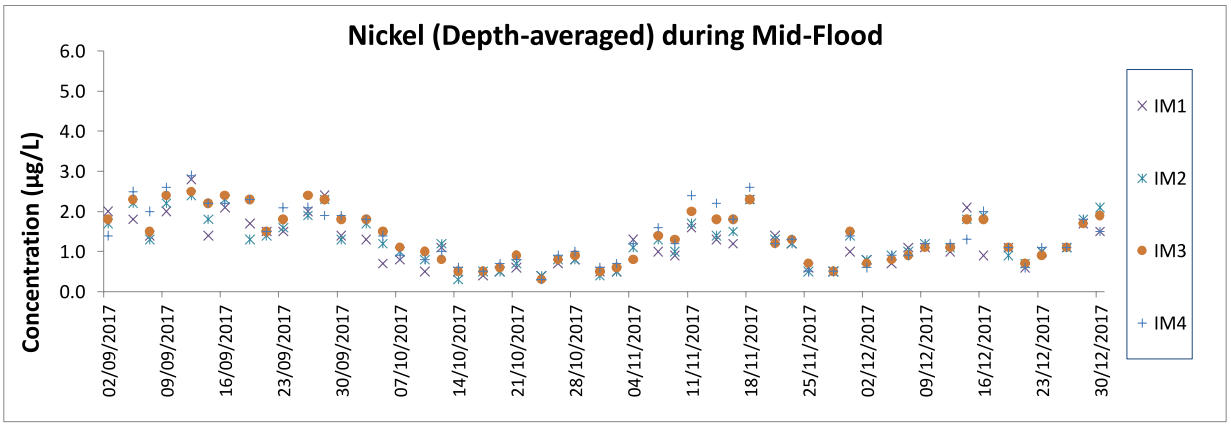


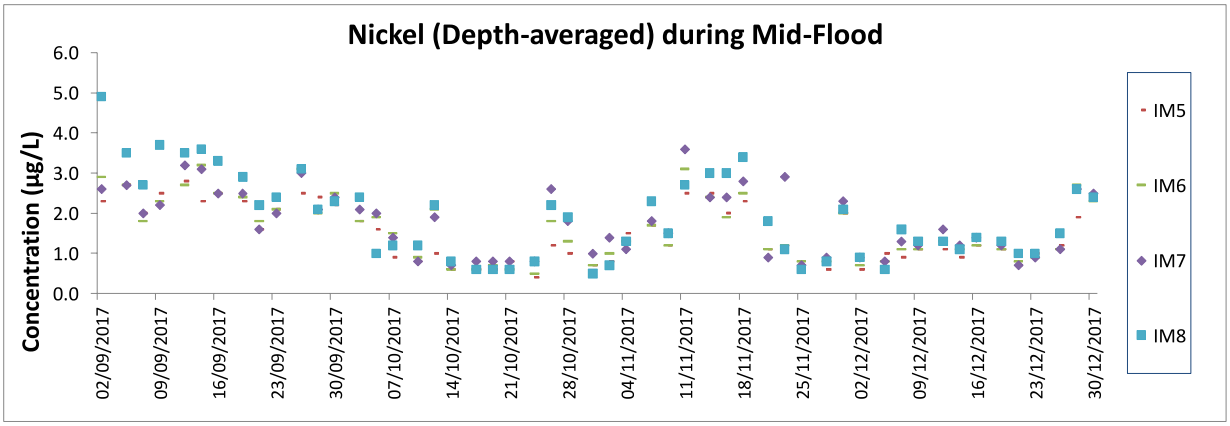


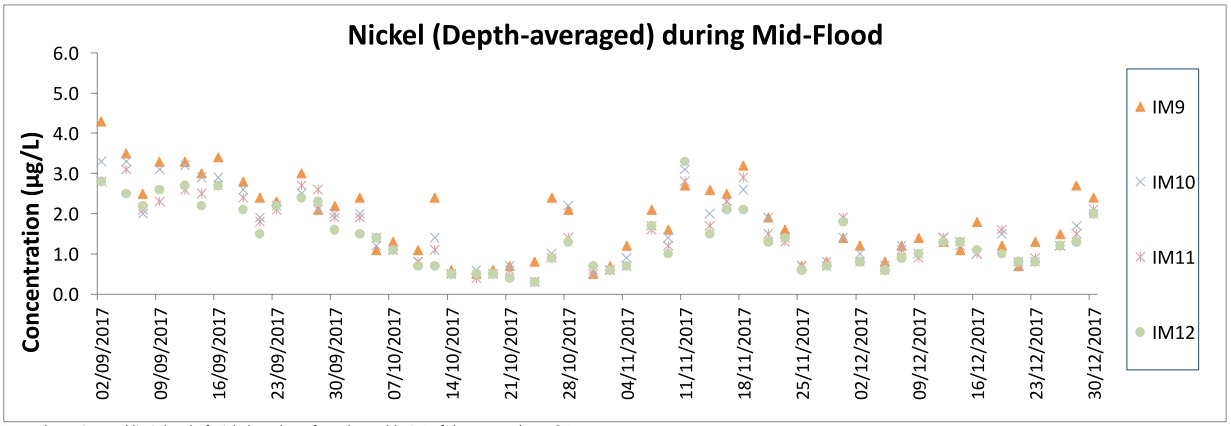


Note: The action and limit level of Nickel can be referred to Table 2.4 of the quarterly EM&A report.









Note: The action and limit level of Nickel can be referred to Table 2.4 of the quarterly EM&A report.

Chinese White Dolphin Monitoring Results

CWD Small Vessel Line-transect Survey **Survey Effort Data**

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
09-Oct-17	NEL	2	12.420	AUTUMN	32166	3RS ET
09-Oct-17	NEL	3	30.880	AUTUMN	32166	3RS ET
09-Oct-17	NEL	4	3.500	AUTUMN	32166	3RS ET
18-Oct-17	NEL	2	43.800	AUTUMN	32166	3RS ET
18-Oct-17	NEL	3	3.000	AUTUMN	32166	3RS ET
19-Oct-17	SWL	2	3.260	AUTUMN	32166	3RS ET
19-Oct-17	SWL	3	32.800	AUTUMN	32166	3RS ET
19-Oct-17	SWL	4	26.700	AUTUMN	32166	3RS ET
23-Oct-17	SWL	2	19.370	AUTUMN	32166	3RS ET
23-Oct-17	SWL	3	41.060	AUTUMN	32166	3RS ET
23-Oct-17	SWL	4	2.300	AUTUMN	32166	3RS ET
24-Oct-17	NWL	2	35.250	AUTUMN	32166	3RS ET
24-Oct-17	NWL	3	39.850	AUTUMN	32166	3RS ET
25-Oct-17	NWL	1	2.320	AUTUMN	32166	3RS ET
25-Oct-17	NWL	2	48.270	AUTUMN	32166	3RS ET
25-Oct-17	NWL	3	23.420	AUTUMN	32166	3RS ET
26-Oct-17	AW	2	4.880	AUTUMN	32166	3RS ET
26-Oct-17	WL	2	25.367	AUTUMN	32166	3RS ET
26-Oct-17	WL	3	7.387	AUTUMN	32166	3RS ET
26-Oct-17	SWL	2	6.890	AUTUMN	32166	3RS ET
27-Oct-17	SWL	2	3.450	AUTUMN	32166	3RS ET
27-Oct-17	SWL	3	3.360	AUTUMN	32166	3RS ET
27-Oct-17	WL	2	5.730	AUTUMN	32166	3RS ET
27-Oct-17	WL	3	20.457	AUTUMN	32166	3RS ET
27-Oct-17	WL	4	7.333	AUTUMN	32166	3RS ET
27-Oct-17	AW	2	4.890	AUTUMN	32166	3RS ET
06-Nov-17	NEL	2	37.700	AUTUMN	32166	3RS ET
06-Nov-17	NEL	3	9.600	AUTUMN	32166	3RS ET
07-Nov-17	NWL	2	5.860	AUTUMN	32166	3RS ET
07-Nov-17	NWL	3	53.860	AUTUMN	32166	3RS ET
07-Nov-17	NWL	4	14.980	AUTUMN	32166	3RS ET
15-Nov-17	NWL	2	13.220	AUTUMN	32166	3RS ET
15-Nov-17	NWL	3	55.550	AUTUMN	32166	3RS ET
15-Nov-17	NWL	4	5.100	AUTUMN	32166	3RS ET
16-Nov-17	NEL	2	12.810	AUTUMN	32166	3RS ET
16-Nov-17	NEL	3	31.090	AUTUMN	32166	3RS ET
16-Nov-17	NEL	4	2.100	AUTUMN	32166	3RS ET
17-Nov-17	AW	2	2.920	AUTUMN	32166	3RS ET
17-Nov-17	AW	3	1.800	AUTUMN	32166	3RS ET
17-Nov-17	WL	1	1.082	AUTUMN	32166	3RS ET
17-Nov-17	WL	2	18.218	AUTUMN	32166	3RS ET
17-Nov-17	WL	3	1.660	AUTUMN	32166	3RS ET
17-Nov-17	WL	4	12.240	AUTUMN	32166	3RS ET
17-Nov-17	SWL	3	16.340	AUTUMN	32166	3RS ET
17-Nov-17	SWL	4	2.360	AUTUMN	32166	3RS ET
20-Nov-17	SWL	2	3.100	AUTUMN	32166	3RS ET
20-Nov-17	SWL	3	24.410	AUTUMN	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
20-Nov-17	SWL	4	22.590	AUTUMN	32166	3RS ET
21-Nov-17	AW	3	4.660	AUTUMN	32166	3RS ET
21-Nov-17	WL	2	1.000	AUTUMN	32166	3RS ET
21-Nov-17	WL	3	22.000	AUTUMN	32166	3RS ET
21-Nov-17	WL	4	10.500	AUTUMN	32166	3RS ET
21-Nov-17	SWL	2	3.860	AUTUMN	32166	3RS ET
21-Nov-17	SWL	3	12.600	AUTUMN	32166	3RS ET
21-Nov-17	SWL	4	2.190	AUTUMN	32166	3RS ET
22-Nov-17	SWL	3	4.100	AUTUMN	32166	3RS ET
22-Nov-17	SWL	4	18.741	AUTUMN	32166	3RS ET
22-Nov-17	SWL	5	27.459	AUTUMN	32166	3RS ET
06-Dec-17	NWL	2	38.557	WINTER	32166	3RS ET
06-Dec-17	NWL	3	33.211	WINTER	32166	3RS ET
07-Dec-17	AW	2	4.662	WINTER	32166	3RS ET
07-Dec-17	WL	2	8.193	WINTER	32166	3RS ET
07-Dec-17	WL	3	25.630	WINTER	32166	3RS ET
07-Dec-17	SWL	2	1.930	WINTER	32166	3RS ET
07-Dec-17	SWL	3	4.795	WINTER	32166	3RS ET
08-Dec-17	SWL	3	27.200	WINTER	32166	3RS ET
08-Dec-17	SWL	4	23.990	WINTER	32166	3RS ET
08-Dec-17	SWL	5	11.760	WINTER	32166	3RS ET
13-Dec-17	NEL	2	46.600	WINTER	32166	3RS ET
14-Dec-17	NWL	2	63.690	WINTER	32166	3RS ET
14-Dec-17	NWL	3	11.210	WINTER	32166	3RS ET
18-Dec-17	SWL	3	10.240	WINTER	32166	3RS ET
18-Dec-17	SWL	4	35.830	WINTER	32166	3RS ET
18-Dec-17	SWL	5	17.000	WINTER	32166	3RS ET
21-Dec-17	NEL	2	10.490	WINTER	32166	3RS ET
21-Dec-17	NEL	3	25.110	WINTER	32166	3RS ET
21-Dec-17	NEL	4	10.900	WINTER	32166	3RS ET
28-Dec-17	AW	2	4.810	WINTER	32166	3RS ET
28-Dec-17	WL	2	32.373	WINTER	32166	3RS ET
28-Dec-17	WL	3	0.910	WINTER	32166	3RS ET
28-Dec-17	SWL	2	5.346	WINTER	32166	3RS ET
28-Dec-17	SWL	3	1.280	WINTER	32166	3RS ET

CWD Small Vessel Line-transect Survey — Sighting Data

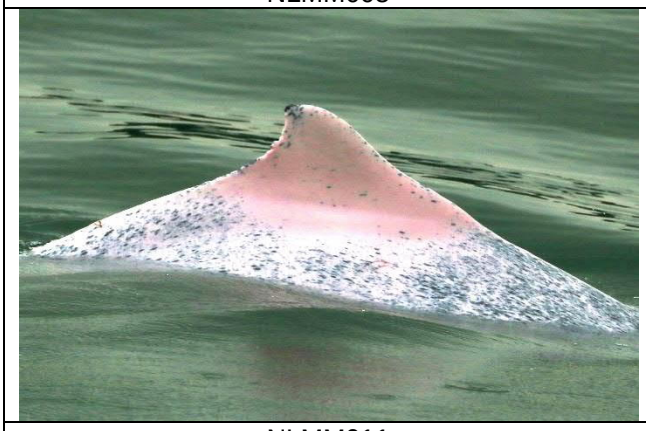
DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
19-Oct-17	1	1228	CWD	3	SWL	3	420	ON	3RS ET	22.2031	113.9085	AUTUMN	NONE
19-Oct-17	2	1351	CWD	4	SWL	3	176	ON	3RS ET	22.2053	113.9197	AUTUMN	GILLNET
19-Oct-17	3	1436	FP	1	SWL	3	11	ON	3RS ET	22.1671	113.9271	AUTUMN	NONE
23-Oct-17	1	1110	FP	2	SWL	3	105	ON	3RS ET	22.1654	113.9271	AUTUMN	NONE
23-Oct-17	2	1133	CWD	1	SWL	2	18	ON	3RS ET	22.2050	113.9222	AUTUMN	NONE
24-Oct-17	1	1114	CWD	3	NWL	2	1096	ON	3RS ET	22.3346	113.8782	AUTUMN	NONE
25-Oct-17	1	1126	CWD	5	NWL	2	178	ON	3RS ET	22.3628	113.8779	AUTUMN	NONE
25-Oct-17	2	1158	CWD	4	NWL	2	459	ON	3RS ET	22.3878	113.8775	AUTUMN	NONE
26-Oct-17	1	1024	CWD	6	WL	2	174	ON	3RS ET	22.2689	113.8519	AUTUMN	NONE
26-Oct-17	2	1052	CWD	5	WL	3	84	ON	3RS ET	22.2605	113.8508	AUTUMN	NONE
26-Oct-17	3	1116	CWD	2	WL	2	814	ON	3RS ET	22.2507	113.8338	AUTUMN	GILLNET
26-Oct-17	4	1142	CWD	2	WL	3	396	ON	3RS ET	22.2413	113.8383	AUTUMN	NONE
26-Oct-17	5	1206	CWD	3	WL	3	427	ON	3RS ET	22.2410	113.8320	AUTUMN	NONE
26-Oct-17	6	1233	CWD	3	WL	3	199	ON	3RS ET	22.2323	113.8309	AUTUMN	NONE
26-Oct-17	7	1301	CWD	6	WL	2	916	ON	3RS ET	22.2237	113.8239	AUTUMN	SHRIMP TRAWLER
26-Oct-17	8	1326	CWD	4	WL	2	67	ON	3RS ET	22.2140	113.8143	AUTUMN	NONE
26-Oct-17	9	1410	CWD	4	WL	2	57	ON	3RS ET	22.1962	113.8343	AUTUMN	NONE
26-Oct-17	10	1511	CWD	2	SWL	2	143	ON	3RS ET	22.1987	113.8593	AUTUMN	NONE
27-Oct-17	1	1236	CWD	5	WL	3	35	ON	3RS ET	22.2415	113.8334	AUTUMN	NONE
27-Oct-17	2	1304	CWD	4	WL	3	257	ON	3RS ET	22.2508	113.8474	AUTUMN	NONE
27-Oct-17	3	1402	CWD	1	WL	2	320	ON	3RS ET	22.2886	113.8613	AUTUMN	NONE
07-Nov-17	1	1211	CWD	3	NWL	3	5	ON	3RS ET	22.3622	113.8877	AUTUMN	NONE
15-Nov-17	1	0946	CWD	6	NWL	2	594	ON	3RS ET	22.3850	113.8683	AUTUMN	NONE
15-Nov-17	2	1314	CWD	1	NWL	3	4	ON	3RS ET	22.3705	113.8983	AUTUMN	NONE
17-Nov-17	1	1053	CWD	4	WL	2	668	ON	3RS ET	22.2504	113.8432	AUTUMN	NONE
20-Nov-17	1	1154	FP	2	SWL	3	122	ON	3RS ET	22.1564	113.9180	AUTUMN	NONE
21-Nov-17	1	0936	CWD	5	AW	3	46	ON	3RS ET	22.3009	113.8862	AUTUMN	NONE
21-Nov-17	2	1324	CWD	2	SWL	3	142	ON	3RS ET	22.1785	113.8689	AUTUMN	NONE
22-Nov-17	1	1121	CWD	2	SWL	3	21	ON	3RS ET	22.2048	113.9271	AUTUMN	NONE
06-Dec-17	1	1031	CWD	12	NWL	3	630	ON	3RS ET	22.2881	113.8684	WINTER	NONE
06-Dec-17	2	1113	CWD	4	NWL	3	100	ON	3RS ET	22.2719	113.8692	WINTER	NONE

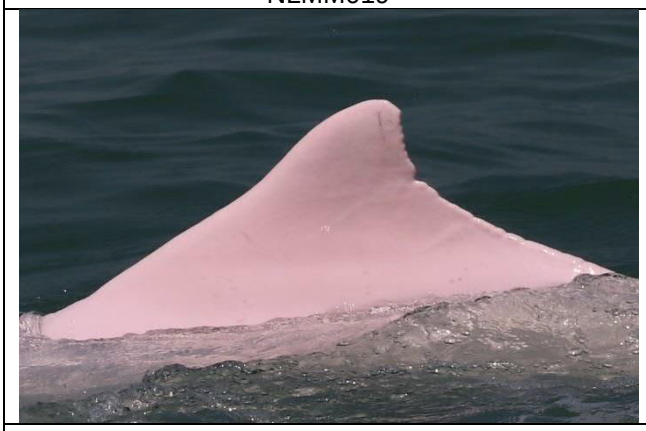
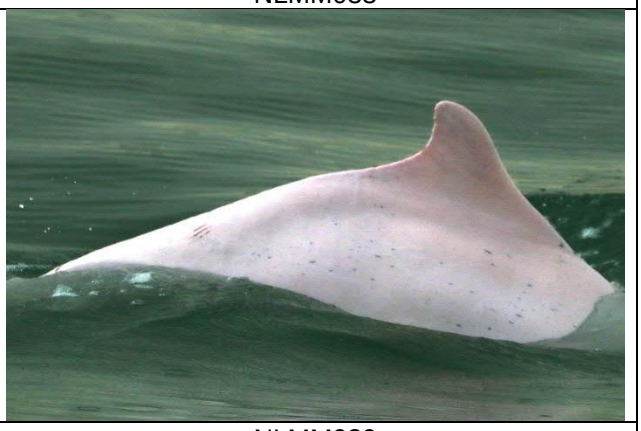
DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
06-Dec-17	3	1132	CWD	7	NWL	2	137	ON	3RS ET	22.2727	113.8733	WINTER	NONE
06-Dec-17	4	1236	CWD	5	NWL	3	494	ON	3RS ET	22.3596	113.8777	WINTER	NONE
06-Dec-17	5	1350	CWD	3	NWL	2	13	ON	3RS ET	22.3551	113.8848	WINTER	NONE
07-Dec-17	1	0929	CWD	5	AW	2	145	ON	3RS ET	22.3023	113.8765	WINTER	NONE
07-Dec-17	2	1058	CWD	3	WL	2	146	ON	3RS ET	22.2694	113.8601	WINTER	NONE
07-Dec-17	3	1126	CWD	1	WL	2	46	ON	3RS ET	22.2653	113.8580	WINTER	NONE
07-Dec-17	4	1238	CWD	3	WL	3	194	ON	3RS ET	22.2204	113.8146	WINTER	NONE
07-Dec-17	5	1407	CWD	2	WL	3	530	ON	3RS ET	22.1855	113.8498	WINTER	NONE
08-Dec-17	1	1213	FP	1	SWL	3	61	ON	3RS ET	22.1481	113.9173	WINTER	NONE
08-Dec-17	2	1258	CWD	1	SWL	5	343	ON	3RS ET	22.2053	113.9070	WINTER	NONE
14-Dec-17	1	1204	CWD	7	NWL	2	765	ON	3RS ET	22.3952	113.8884	WINTER	NONE
14-Dec-17	2	1327	CWD	2	NWL	3	127	ON	3RS ET	22.3888	113.8974	WINTER	NONE
18-Dec-17	1	1056	FP	2	SWL	4	135	ON	3RS ET	22.1511	113.9358	WINTER	NONE
28-Dec-17	1	1044	CWD	1	WL	3	216	ON	3RS ET	22.2559	113.8364	WINTER	NONE
28-Dec-17	2	1102	CWD	3	WL	2	34	ON	3RS ET	22.2541	113.8354	WINTER	NONE
28-Dec-17	3	1146	CWD	4	WL	2	82	ON	3RS ET	22.2318	113.8249	WINTER	NONE
28-Dec-17	4	1244	CWD	4	WL	2	106	ON	3RS ET	22.2146	113.8276	WINTER	NONE
28-Dec-17	5	1303	CWD	3	WL	2	100	ON	3RS ET	22.2055	113.8302	WINTER	NONE
28-Dec-17	6	1322	CWD	2	WL	2	306	ON	3RS ET	22.2024	113.8215	WINTER	NONE
28-Dec-17	7	1332	CWD	3	WL	2	N/A	OFF	3RS ET	22.2030	113.8213	WINTER	NONE
28-Dec-17	8	1428	CWD	3	SWL	2	1182	ON	3RS ET	22.1918	113.8586	WINTER	NONE

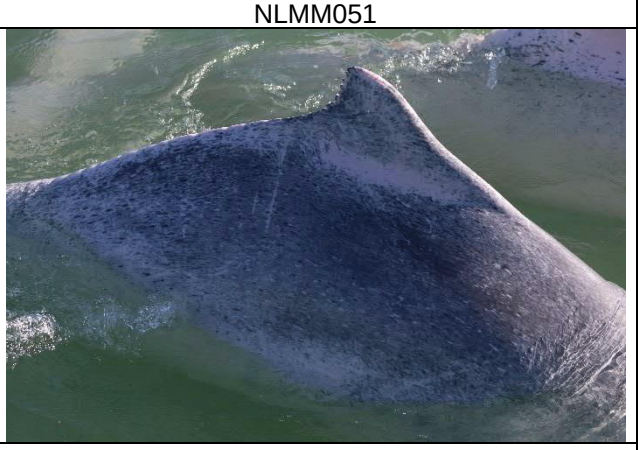
Abbreviations: STG# = Sighting Number; GP SZ = Dolphin Group Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance (in metres); N/A = Not Applicable; DEC LAT = Latitude (WGS84 in Decimal), DEC LON = Longitude (WGS84 in Decimal); BOAT ASSOC. = Fishing Boat Association

Sighting data of finless porpoise (FP) are presented for reference only. No relevant figure or text will be mentioned in the quarterly EM&A report. All FP sightings are excluded in calculation.

CWD Small Vessel Line-transect Survey **Photo Identification**

	
NLMM002	NLMM004
	
NLMM005	NLMM010
	
NLMM011	NLMM012

	
NLMM015	NLMM016
	
NLMM019	NLMM027
	
NLMM028	NLMM033
	
NLMM037	NLMM039

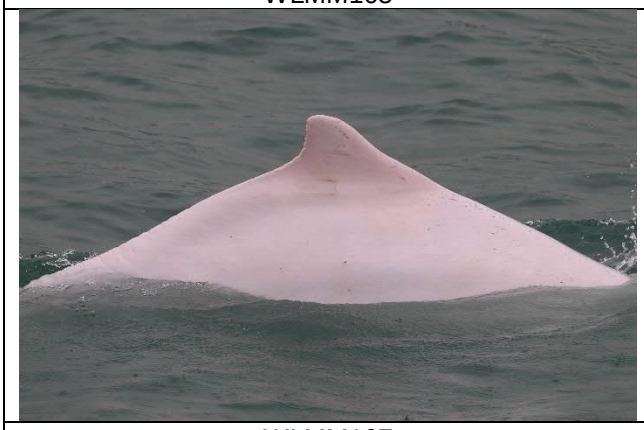
	
NLMM049	NLMM051
	
NLMM054	NLMM055
	
NLMM056	NLMM057
	
NLMM058	NLMM059

	
SLMM014	SLMM015
	
SLMM018	SLMM021
	
SLMM023	SLMM028
	
SLMM030	SLMM031

	
SLMM037	SLMM048
	
SLMM049	SLMM052
	
SLMM053	WLMM001
	
WLMM007	WLMM019

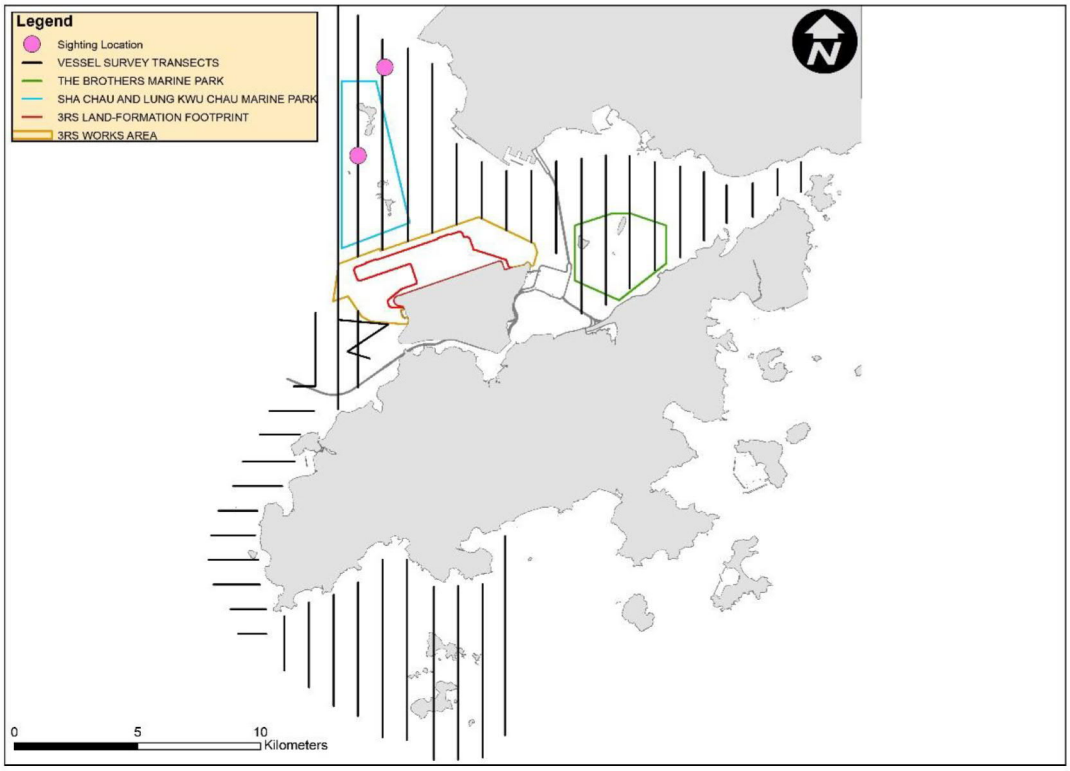
	
WLMM021	WLMM024
	
WLMM026	WLMM027
	
WLMM030	WLMM049
	
WLMM054	WLMM056

	
WLMM062	WLMM063
	
WLMM064	WLMM065
	
WLMM066	WLMM071
	
WLMM075	WLMM091

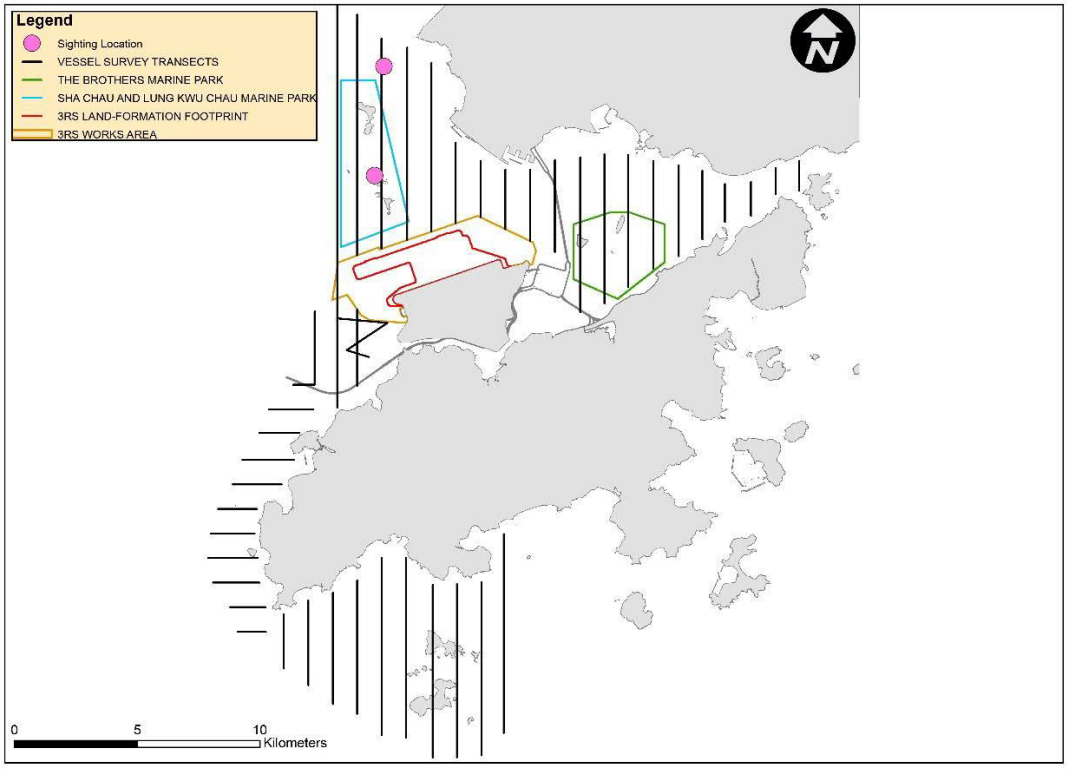
	
WLMM093	WLMM094
	
WLMM100	WLMM104
	
WLMM105	WLMM106
	
WLMM107	

CWD Small Vessel Line-transect Survey **Photo Identification – Re-sighting Locations**

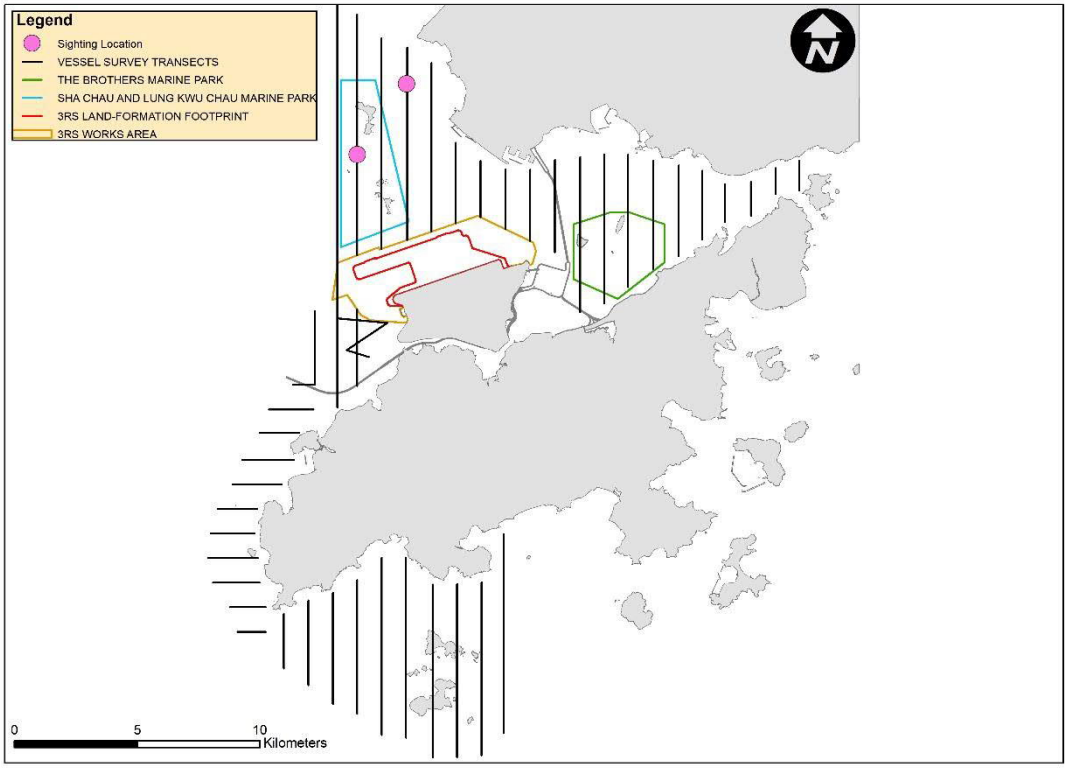
NLMM002



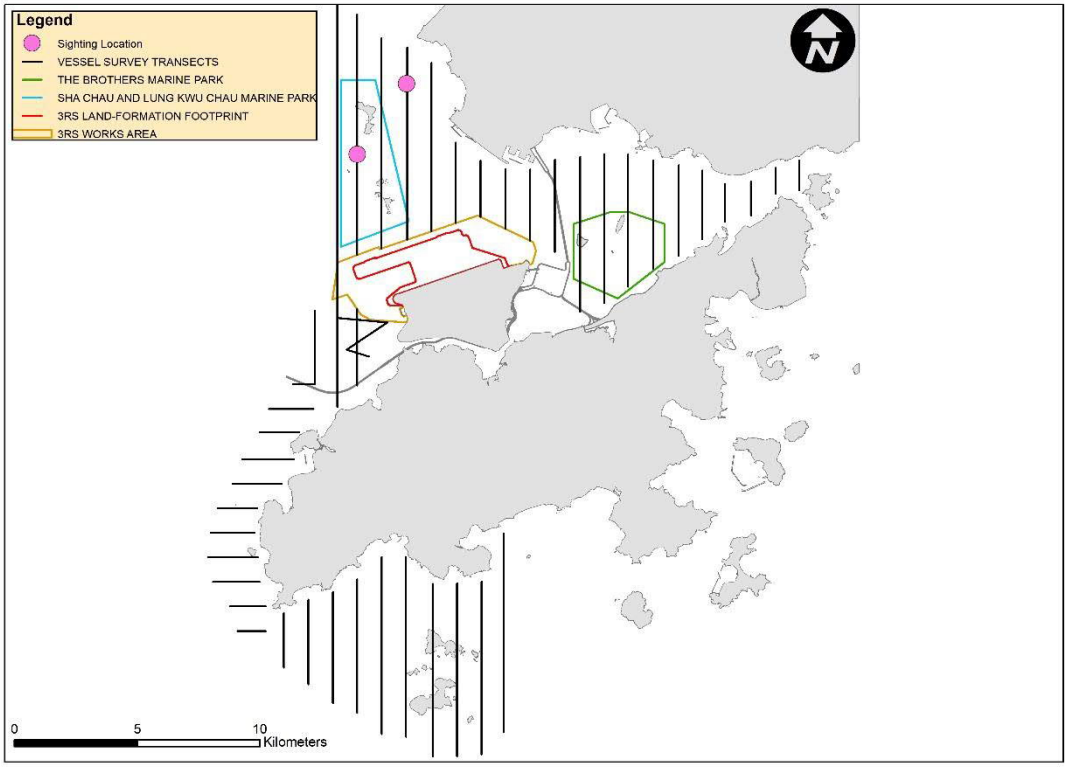
NLMM004



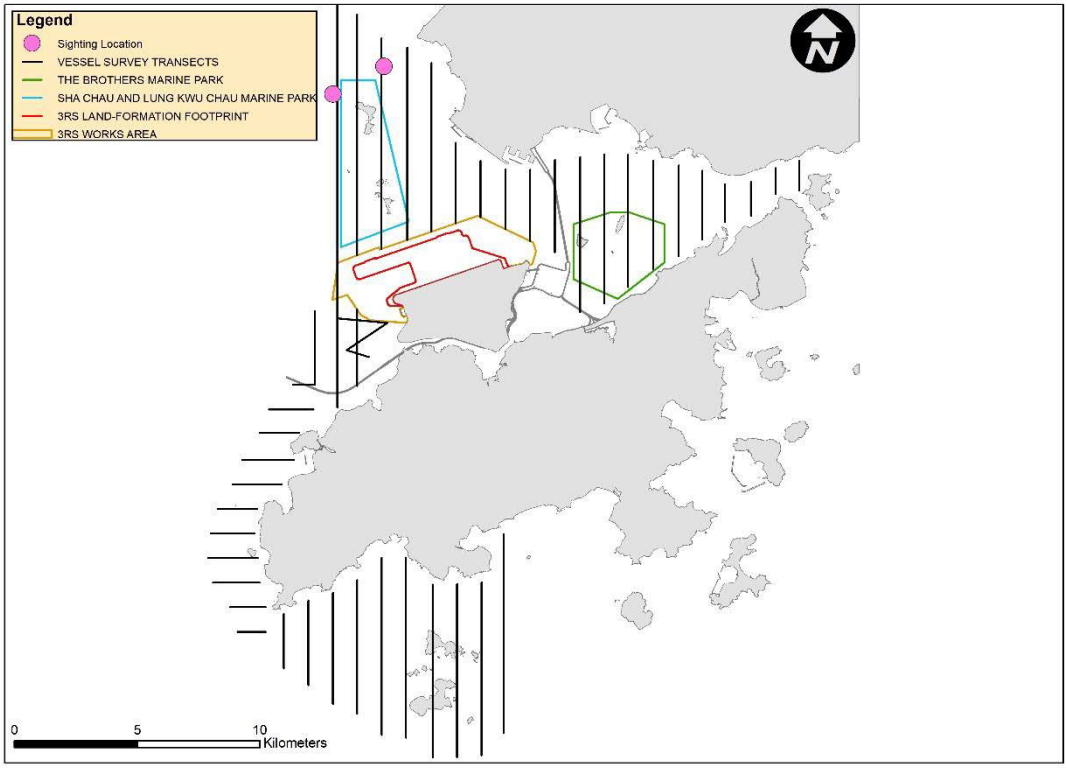
NLMM027



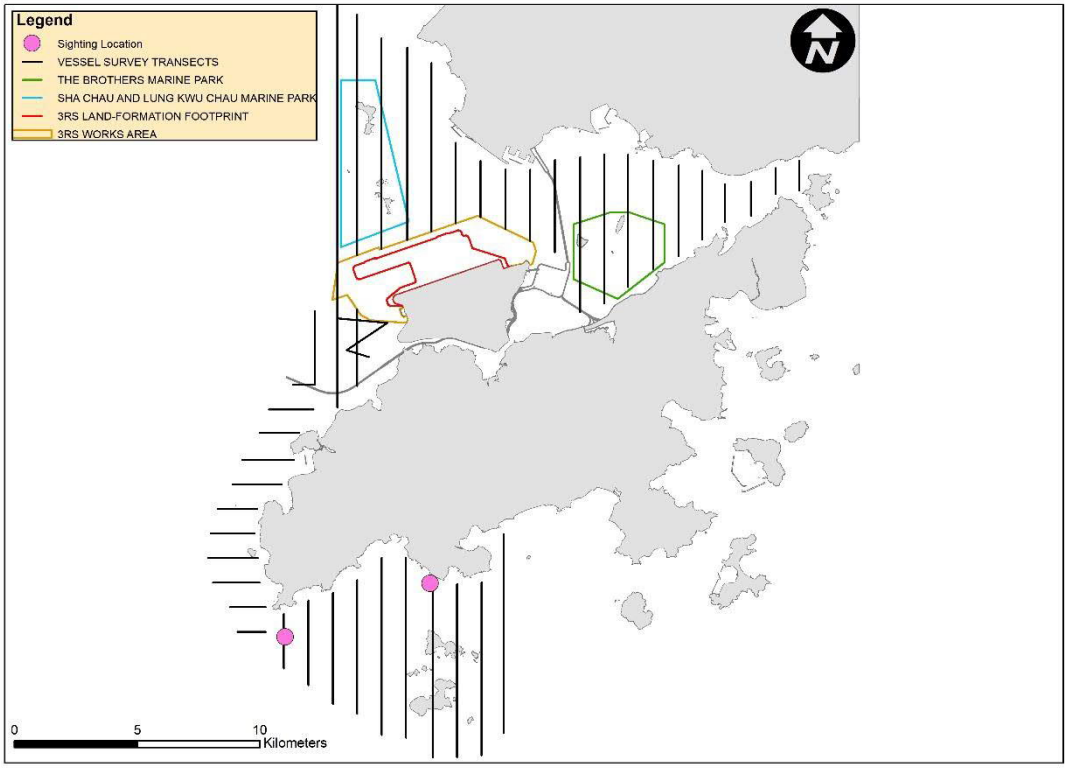
NLMM028



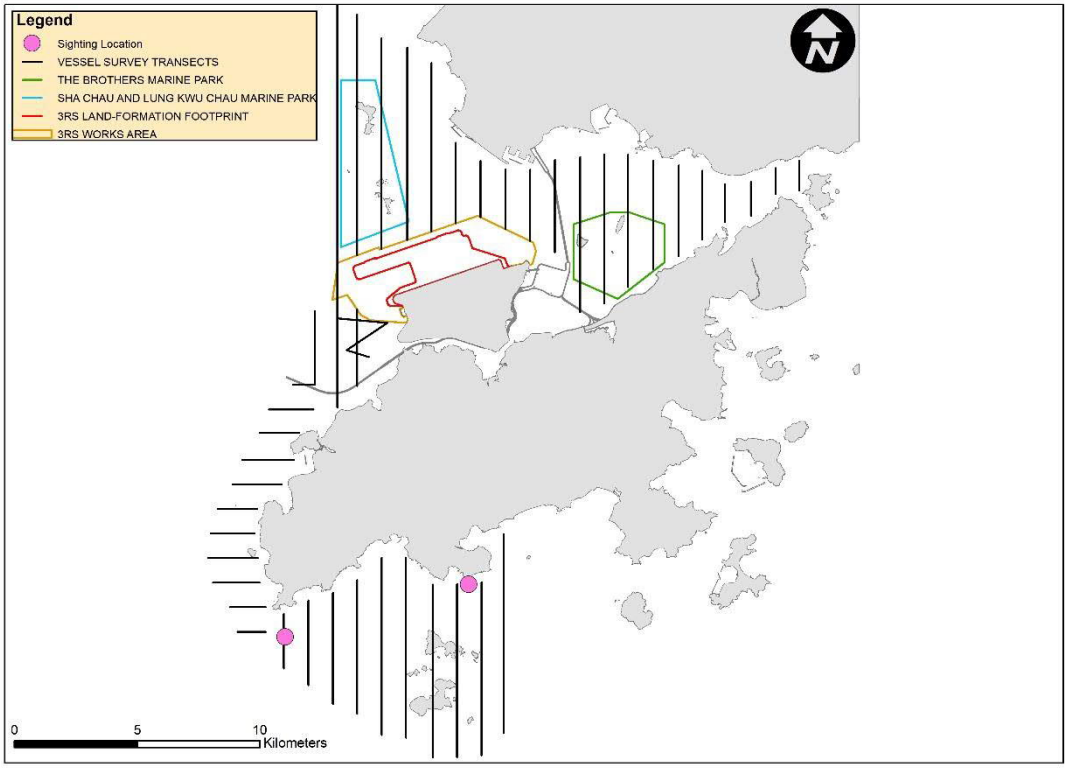
NLMM037



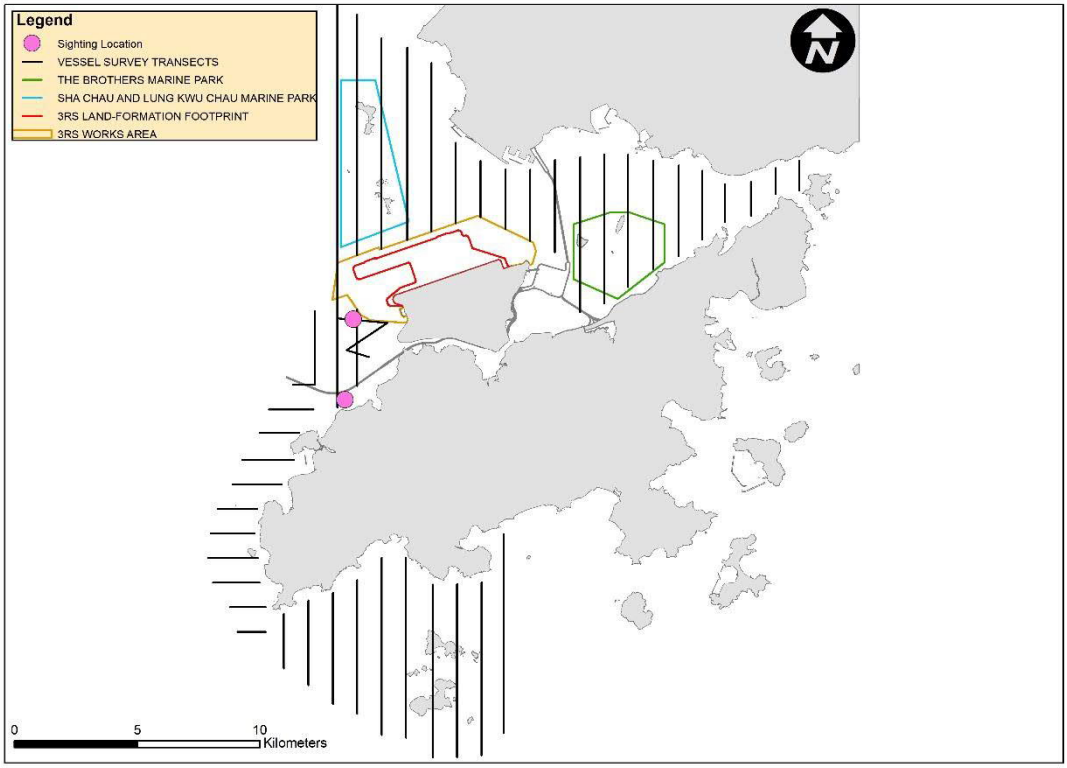
SLMM014



SLMM018



SLMM028



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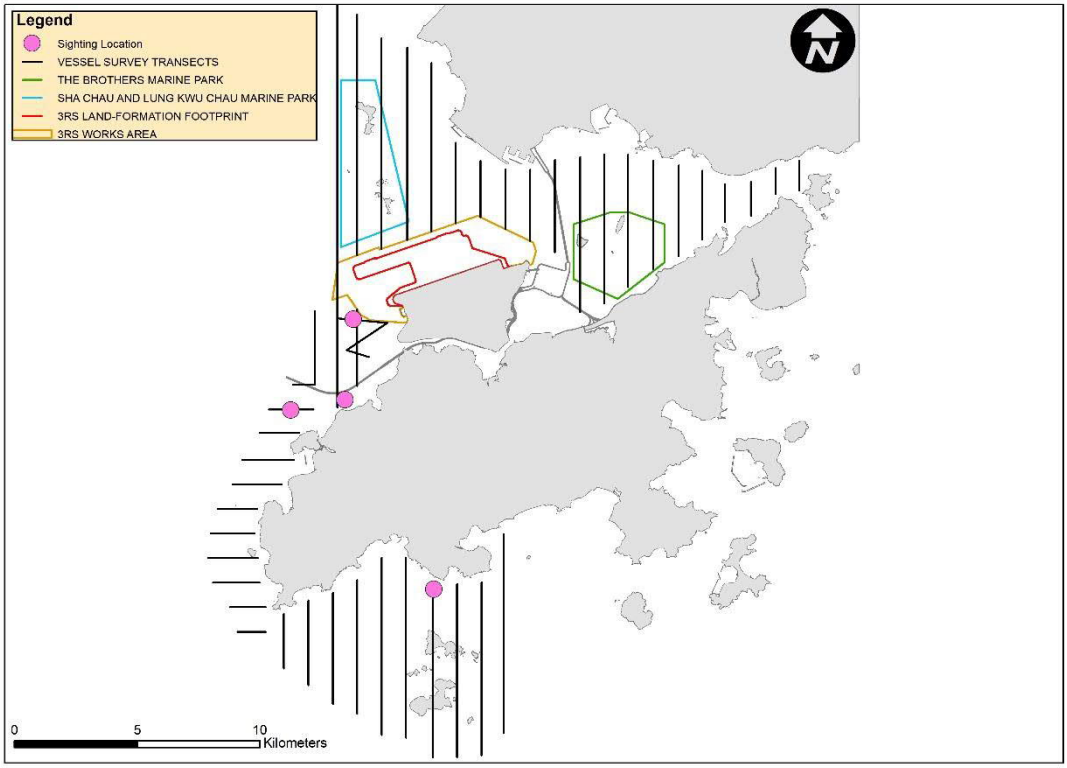

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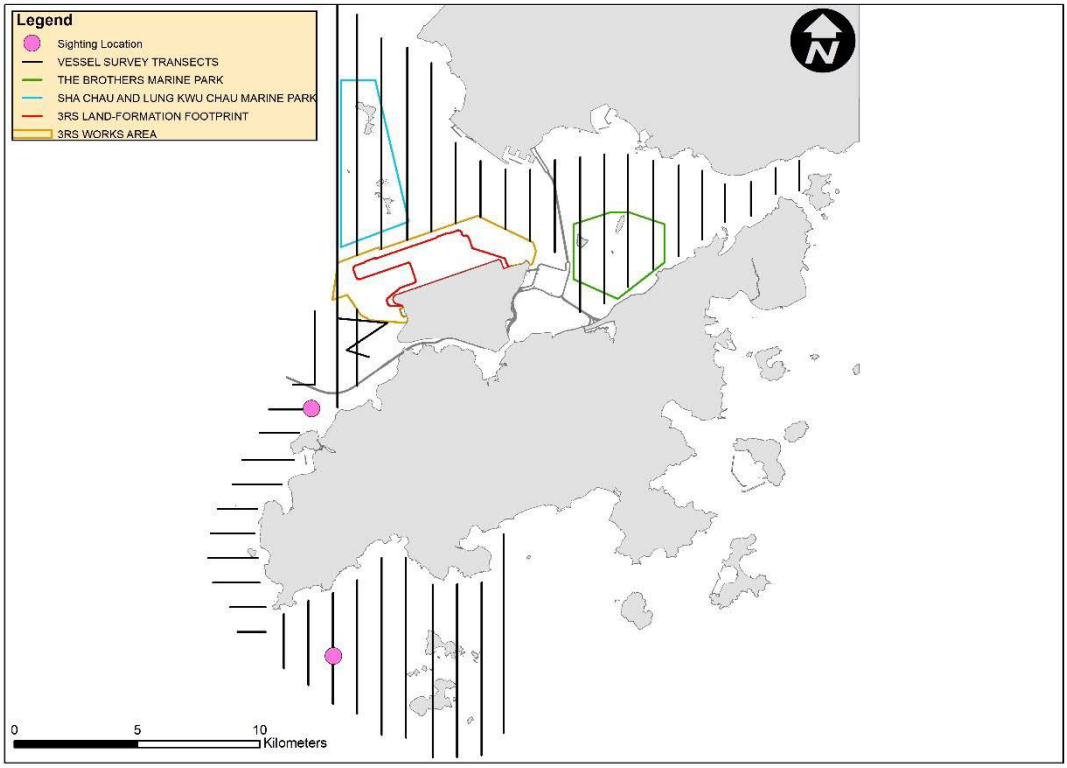

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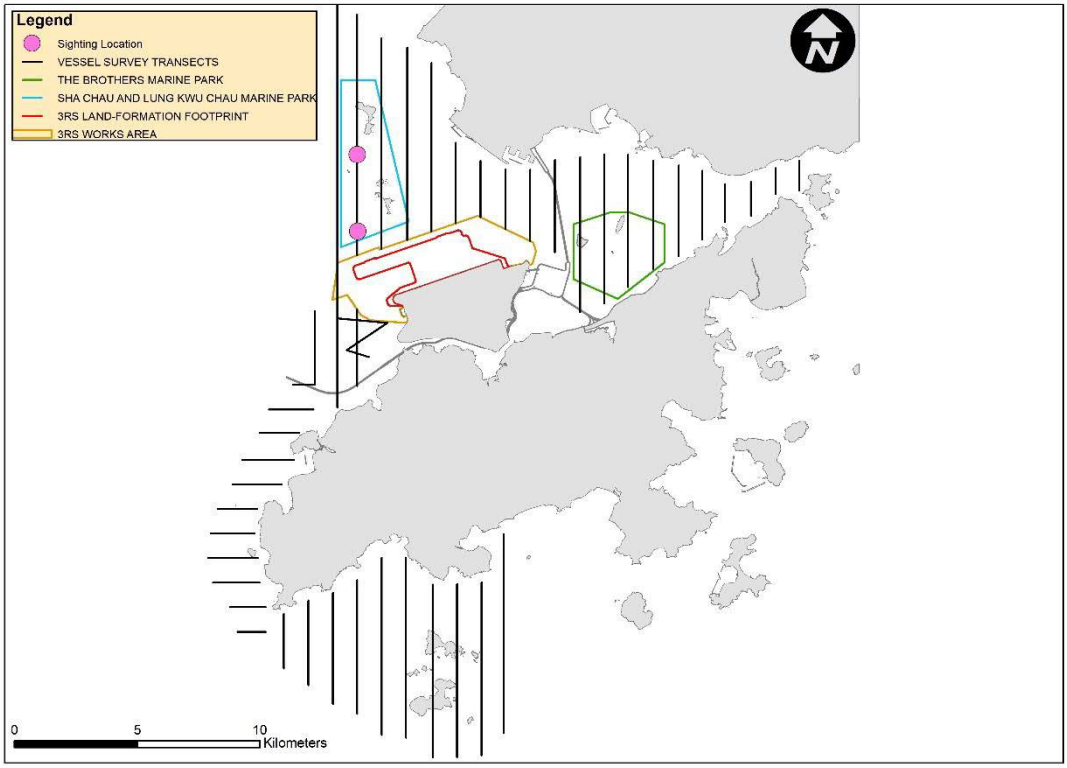

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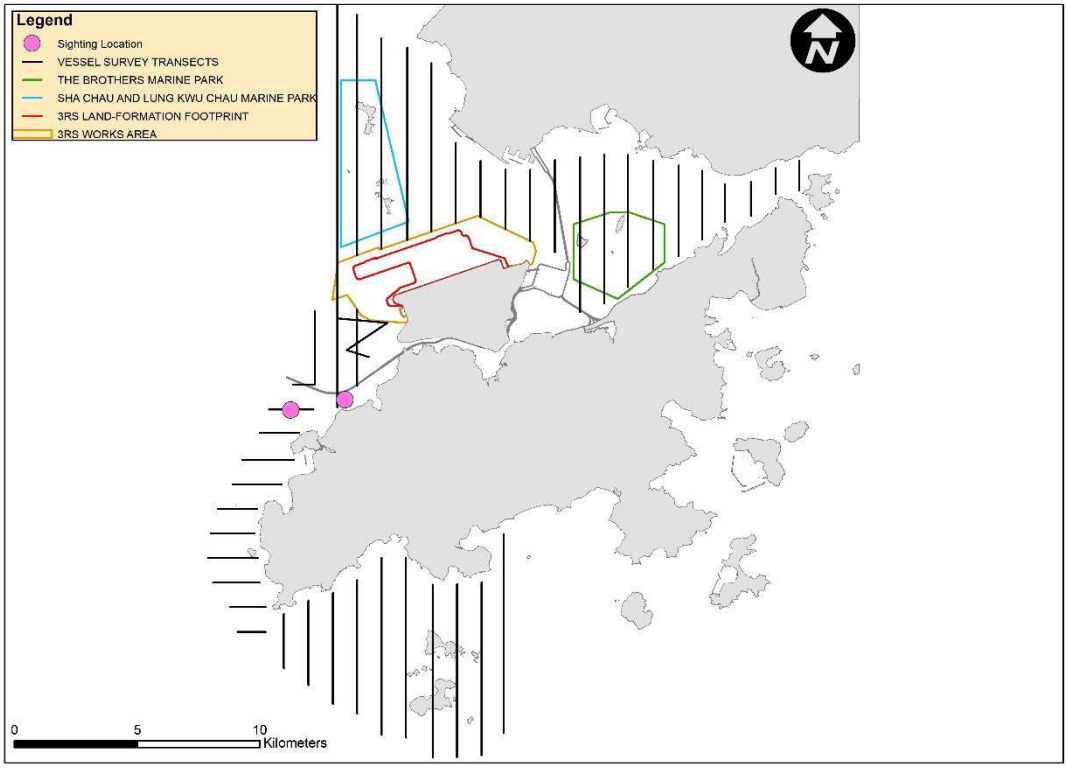
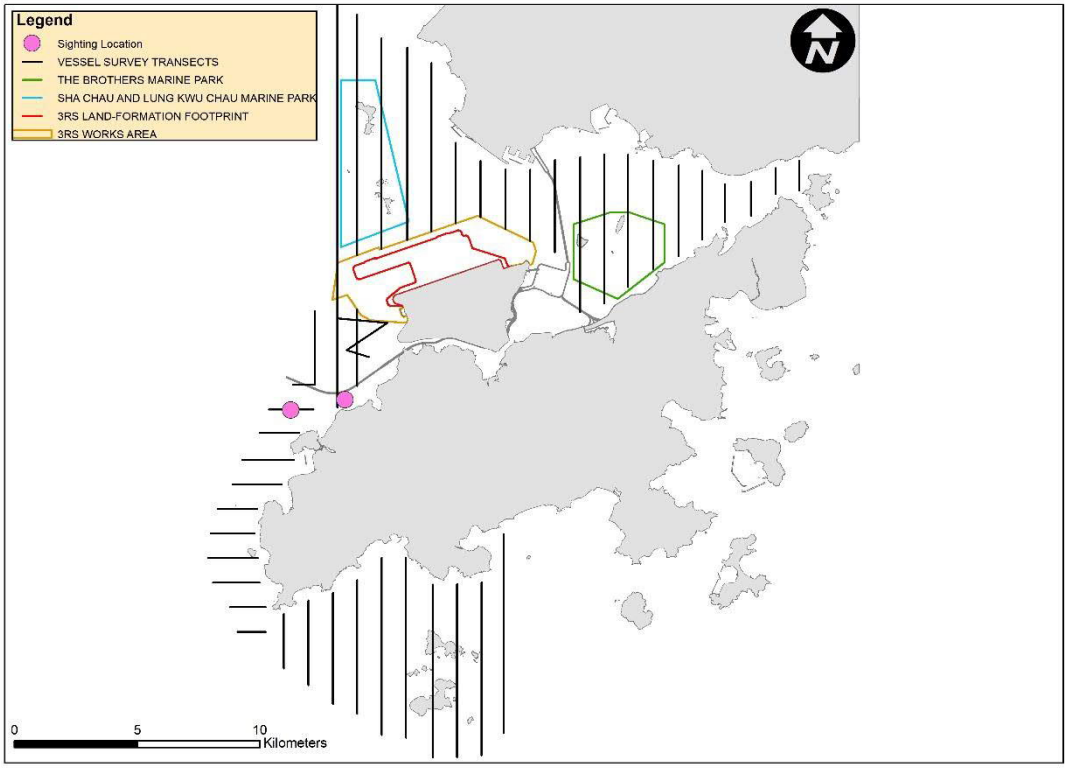


WLMM027



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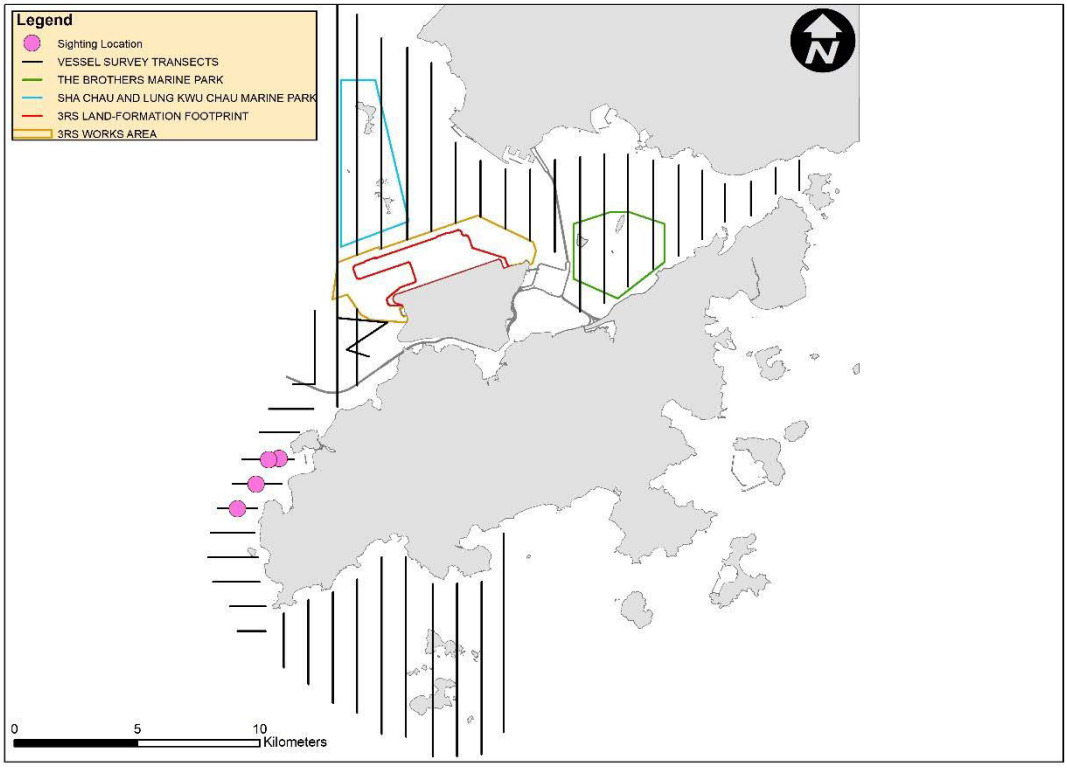

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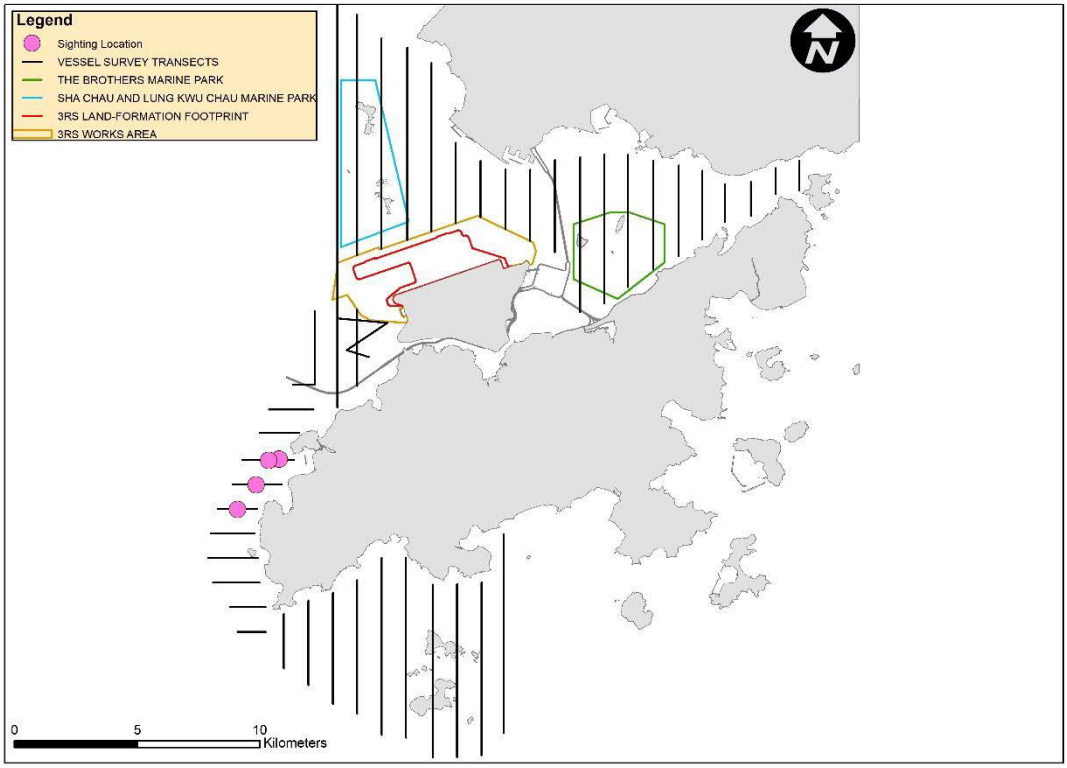

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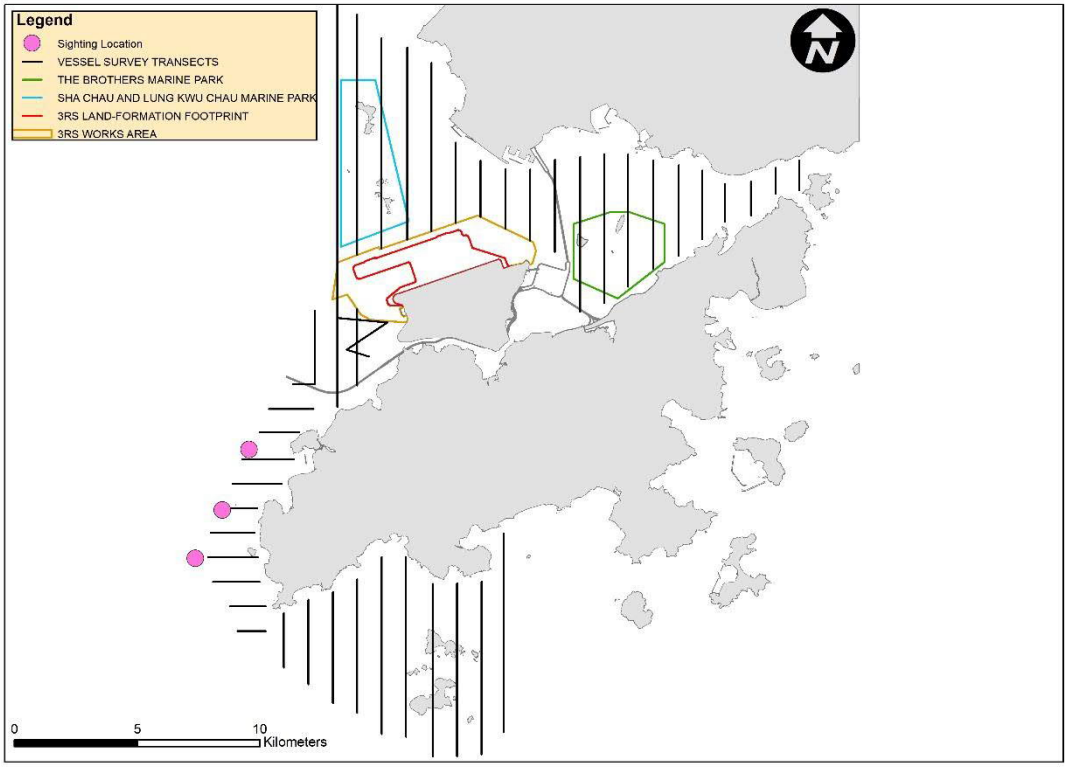


CWD Land-based Theodolite Tracking

CWD Groups by Survey Date

Date	Station	Start	End	Duration	Beaufort	Visibility	No. of Focal Follow	Dolphin Group Size
20/Oct/17	Lung Kwu Chau	8:52	14:52	6:00	2-3	2	4	1-4
23/Oct/17	Lung Kwu Chau	8:42	14:42	6:00	3-4	3	6	2-4
25/Oct/17	Sha Chau	8:46	14:46	6:00	2	3	0	N/A
26/Oct/17	Sha Chau	9:01	15:01	6:00	2	3	0	N/A
27/Oct/17	Lung Kwu Chau	8:48	14:48	6:00	2-3	2	6	1-6
2/Nov/17	Lung Kwu Chau	8:52	14:52	6:00	3	3	7	2-6
9/Nov/17	Sha Chau	8:40	14:40	6:00	2	2-3	0	N/A
16/Nov/17	Sha Chau	8:36	14:36	6:00	2-3	1-2	0	N/A
22/Nov/17	Lung Kwu Chau	8:48	14:48	6:00	4	2	4	3-11
23/Nov/17	Lung Kwu Chau	8:37	14:37	6:00	3-4	3	7	1-6
5/Dec/17	Sha Chau	8:38	14:38	6:00	2-3	3	0	N/A
11/Dec/17	Lung Kwu Chau	8:41	14:41	6:00	2-4	3	6	1-5
15/Dec/17	Lung Kwu Chau	8:40	14:40	6:00	2-3	2-3	6	2-4
28/Dec/17	Sha Chau	9:01	15:01	6:00	2	2-3	0	N/A
29/Dec/17	Lung Kwu Chau	9:09	15:09	6:00	2-3	3	4	1-3

Visibility: 1=Excellent, 2=Good, 3=Fair, 4=Poor

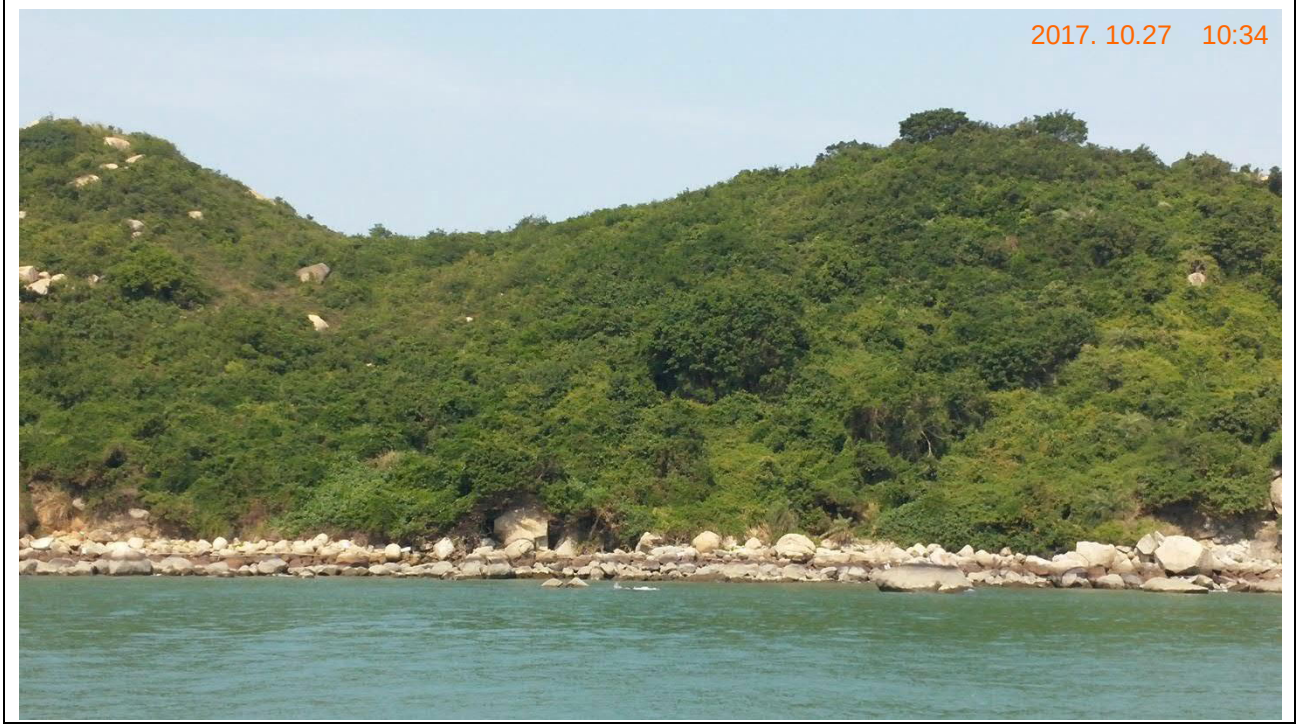
Ecological Monitoring Results

Ecological Monitoring – site photos and location map regarding the monthly ecological monitoring for the egretry area on Sheung Sha Chau and the HDD works

October 2017

Photo record of View 1

Photo record of View 2



November 2017

Photo record of View 1

Photo record of View 2

December 2017

Photo record of View 1

Photo record of View 2