MOTT MACDONALD

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

Construction Phase Quarterly EM&A Report No.13 (1 January to 31 March 2019)

May 2019

Airport Authority Hong Kong

Mott MacDonald
3/F International Trade Tower
348 Kwun Tong Road
Kowloon
Hong Kong

T +852 2828 5757
F +852 2827 1823
mottmac.hk

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

Construction Phase Quarterly EM&A Report No.13 (1 January to 31 March 2019)

May 2019

Airport Authority Hong Kong

This Construction Phase Quarterly EM&A Report No. 13 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 29 May 2019

AECOM
8/F, Grand Central Plaza, Tower 2,
138 Shatin Rural Committee Road,
Shatin, Hong Kong
香港新界沙田鄉事會路 138 號新城
市中央廣場第 2 座 8 樓
www.aecom.com

+852 3922 9000 tel
+852 2317 7609 fax

Our Ref : 60440482/C/JCHL190529

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

29 May 2019

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Quarterly EM&A Report No.13 (For 1 January 2019 to 31 March 2019)

Reference is made to the Environmental Team's submission of Quarterly EM&A Report No.13 (For 1 January 2019 to 31 March 2019) under section 15.4 of the Updated EM&A Manual certified by the ET Leader on 29 May 2019.

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

Contents

Tables

Figures

Appendices

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
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
FCZ	Fish Culture Zone
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	Updated Marine Travel Routes and Management Plan for Construction and Associated Vessel
NEL	Northeast Lantau
NWL	Northwest Lantau
PAM	Passive Acoustic Monitoring
PVD	Prefabricated Vertical Drain
SC	Sha Chau
SCZ	Speed Control Zone
SCLKCMP	Sha Chau and Lung Kwu Chau Marine Park
SS	Suspended Solids
STG	Encounter Rate of Number of Dolphin Sightings
SWL	Southwest Lantau

The Manual	The Updated EM&A Manual
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
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 (the Manual).

This is the 13th 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 January 2019 to 31 March 2019.

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, marine filling, and seawall construction. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for Automated People Mover (APM) and Baggage Handling System (BHS), and preparation work for utilities, with activities include site establishment, site office construction, road and drainage works, cable ducting, demolition of existing facilities, piling, and excavation works.

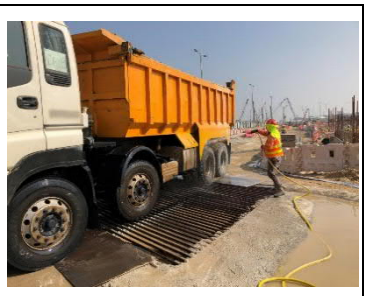
EM&A Activities Conducted in the Reporting Period

The EM&A programme was undertaken in accordance with the 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	52
Water quality monitoring	39
Vessel line-transect surveys for Chinese White Dolphin (CWD) monitoring	6
Land-based theodolite tracking survey effort for CWD monitoring	9
Terrestrial ecology monitoring	1

Environmental auditing works, including weekly site inspections of construction works conducted by the ET and bi-weekly site inspections conducted by the Independent Environmental Checker (IEC), audit of SkyPier High Speed Ferries (HSF), audit of construction and associated vessels, and audit of implementation of Marine Mammal Watching Plan (MMWP) and Dolphin Exclusion Zone (DEZ) Plan, were conducted in the reporting period. Based on information including ET's observations, records of Marine Surveillance System (MSS), and contractors' site records, it is noted that environmental pollution control and mitigation measures were properly implemented and construction activities of the Project in the reporting period did not introduce adverse impacts to the sensitive receivers.

Snapshots of Good Environmental Practices in the Reporting Period

		
Rockfill was reused by contractor for shoreline reinstatement at Sheung Sha Chau	Pre-treatment tanks with coagulant provided to improve silt removal efficiency	Enhanced wheel washing facility adopted by contractor

Key examples of good site practices implemented in the Project are highlighted here:

1. Inert construction waste was reused across work contracts under the Project to reduce the amount of materials being delivered to public fill reception facilities.
2. To cater for certain construction activities that might generate a considerable amount of wastewater, coagulant was added into pre-treatment tanks to improve silt removal efficiency.
3. Enhanced wheel washing facility design was adopted by contractor to prevent silty wash water being carried by dump trucks leaving construction sites.

Summary Findings of the EM&A Programme

The monitoring works for construction dust, construction noise, water quality, construction waste, landscape & visual, terrestrial ecology, and CWD were conducted during the reporting period in accordance with the Manual.

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

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

The monthly terrestrial ecology monitoring on Sheung Sha Chau in January 2019 observed that there was no encroachment upon the egretry area nor any significant disturbance to ardeids at Sheung Sha Chau by the works. All the works on Sheung Sha Chau had been completed and retreated on 29 January 2019.

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		√	No construction activities-related complaint was received	Nil
Notification of any summons and status of prosecutions		√	No notification of summons or prosecution were received.	Nil
Changes that affect the EM&A	√		Starting from 5 Jan 2019, two of the water quality sensitive receiver stations were updated.	Nil

Remarks:
^Only triggering of Action or Limit Level found 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 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. 38.

1.2 Scope of this Report

This is the 13th 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 January 2019 to 31 March 2019.

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**.

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

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) (Mott MacDonald Hong Kong Limited)	Environmental Team Leader	Terence Kong	2828 5919
	Deputy Environmental Team Leader	Heidi Yu	2828 5704
	Deputy Environmental Team Leader	Daniel Sum	2585 8495
Independent Environmental Checker (IEC) (AECOM Asia Company Limited)	Independent Environmental Checker	Jackel Law	3922 9376
	Deputy Independent Environmental Checker	Roy Man	3922 9141

Advanced Works:

Party	Position	Name	Telephone
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:

Party	Position	Name	Telephone
Contract 3201 DCM (Package 1) (Penta-Ocean-China State-Dong-Ah Joint Venture)	Project Director	Tsugunari Suzuki	9178 9689
	Environmental Officer	Hiu Yeung Tang	6329 3513
Contract 3202 DCM (Package 2) (Samsung-BuildKing Joint Venture)	Project Manager	Ilkwon Nam	9643 3117
Contract 3203 DCM (Package 3) (Sambo E&C Co., Ltd.)	Project Manager	Eric Kan	9014 6758
Contract 3204 DCM (Package 4) (CRBC-SAMBO Joint Venture)	Project Manager	Kyung-Sik Yoo	9683 8697
Contract 3205 DCM (Package 5) (Bachy Soletanche - Sambo Joint Venture)	Deputy Project Director	Min Park	9683 0765
	Environmental	Lawrence Chan	5107 5961

Reclamation Works:

Party	Position	Name	Telephone
Contract 3206 Main Reclamation Works (ZHEC-CCCC-CDC Joint Venture)	Project Manager	Kim Chuan Lim	3763 1509
	Environmental Officer	Kwai Fung Wong	3763 1452

Airfield Works:

Party	Position	Name	Telephone
Contract 3301 North Runway Crossover Taxiway (FJT-CHEC-ZHEC Joint Venture)	Deputy Project Director	Kin Hang Chung	9800 0048
	Environmental Officer	Nelson Tam	9721 3942
Contract 3302 Eastern Vehicular Tunnel Advance Works (China Road and Bridge Corporation)	Project Manager	Wan Cheung Lee	6100 6075
	Environmental Officer	Kanny Cho	6381 8171

Third Runway Concourse and Integrated Airport Centres Works:

Party	Position	Name	Telephone
Contract 3402 New Integrated Airport Centres Enabling Works (Wing Hing Construction Co., Ltd.)	Contract Manager	Michael Kan	9206 0550
	Environmental Officer	Lisa He	5374 3418

Terminal 2 Expansion Works:

Party	Position	Name	Telephone
Contract 3501 Antenna Farm and Sewage Pumping Station (Build King Construction Ltd.)	Project Manager	Vincent Kwan	9833 1313
	Environmental Officer	Edward Tam	9287 8270
Contract 3502 Terminal 2 APM Depot Modification Works (Build King Construction Ltd.)	Project Manager	David Ng	9010 7871
	Environmental Officer	Chun Pong Chan	9187 7118
Contract 3503 Terminal 2 Foundation and Substructure Works (Leighton – Chun Wo Joint Venture)	Construction Manager	Eric Wu	3973 1718
	Environmental Officer	Stephen Tsang	5508 6361

Automated People Mover (APM) Works:

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

Baggage Handling System (BHS) Works:

Party	Position	Name	Telephone
Contract 3603 3RS Baggage Handling System (VISH Consortium)	Project Manager	Andy Ng	9102 2739
	Environmental Officer	Eric Ha	9215 3432

Airport Support Infrastructure and Logistic Works:

Party	Position	Name	Telephone
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, marine filling, and seawall construction. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for Automated People Mover (APM) and Baggage Handling System (BHS), and preparation work for utilities, with activities include site

establishment, site office construction, road and drainage works, cable ducting, demolition of existing facilities, piling, and excavation works.

The locations of the key construction activities are presented in **Figure 1.1**. Locations of reclamation works area are presented in **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 jetting and field joint works	Three days per week, at mid-flood and mid-ebb tides.	On-going
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.

Parameters	EM&A Requirements	Status
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.	The terrestrial ecological monitoring at Sheung Sha Chau was completed in January 2019.
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	The post-translocation monitoring programme according to the Coral Translocation Plan was completed in April 2018.
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 month at the Lung Kwu Chau station; and PAM: For the whole duration for land formation related construction works.	On-going
Landscape and Visual		
Landscape and Visual Plan	At least 3 months before the commencement of construction works on the formed land of the Project.	The Landscape & Visual Plan was submitted to EPD under EP Condition 2.18
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)	Monitor and check	On-going

Parameters	EM&A Requirements	Status
implementation measures		
Dolphin Exclusion Zone (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 & 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 trainings and regular environmental management meetings were conducted during the reporting period which are summarized as below:

- Six skipper trainings provided by ET;
- Three meetings with High Speed Ferry operators for experience sharing and recommendations to strengthen the implementation of the Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier;
- Eighteen environmental management meetings for EM&A review with works contracts;

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.

Table 2.1: Impact Air Quality Monitoring Stations

Monitoring Station	Location	Action Level (μg/m³)	Limit Level (μg/m³)
AR1A	Man Tung Road Park	306	500
AR2	Village House at Tin Sum	298	

2.1.2 Summary of Monitoring Results

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

Table 2.2: Percentage of Air Quality Monitoring Results within Action and Limit Levels

	AR1A	AR2
Jan 2019	100.0%	100.0%
Feb 2019	100.0%	100.0%
Mar 2019	100.0%	100.0%
Overall	100.0%	100.0%

Note: The percentages are calculated by dividing the number of monitoring results within their corresponding Action and Limit Levels by the total number of monitoring results.

All monitoring results were within their corresponding Action and Limit Levels at all monitoring stations in the reporting period.

General meteorological conditions in the last month of the previous quarter and this reporting period were recorded and summarized in **Table 2.3**.

Table 2.3: General Meteorological Condition During Impact Air Quality Monitoring

	Weather	Dominant Wind Direction
Dec 2018	Sunny to Cloudy	North or Northwest
Jan 2019	Sunny to Cloudy	East
Feb 2019	Sunny to Cloudy	North or East
Mar 2019	Sunny to Cloudy	Southwest

2.1.3 Conclusion

No dust emission source from Project activities was observed during impact air quality monitoring. Major sources of dust observed at the monitoring stations during the monitoring sessions were 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 Project activities.

2.2 Noise Monitoring

Impact noise monitoring was conducted at four representative monitoring stations once per week during 0700 and 1900 in the reporting period. The locations of monitoring stations are described in **Table 2.4** 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 2.4** for reference.

Table 2.4: Impact Noise Monitoring Stations

Monitoring Station	Location	Action Level	Limit Level
NM1A	Man Tung Road Park	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)
NM4	Ching Chung Hau Po Woon Primary School		65dB(A) / 70 dB(A) [(i)]
NM5	Village House in Tin Sum		75 dB(A)
NM6	House No. 1, Sha Lo Wan		75 dB(A)

Note:

[(i)] Reduced to 70dB(A) for school and 65dB(A) during school examination periods at NM4. School examination took place from 4 to 10 January and from 22 to 29 March in this reporting period.

2.2.2 Summary of Monitoring Results

The noise monitoring results in the reporting period are summarized in **Table 2.5** and the graphical plot is presented in **Appendix C**.

Table 2.5: Percentage of Noise Monitoring Results within Action and Limit Levels

	NM1A	NM4	NM5	NM6
Jan 2019	100.0%	100.0%	100.0%	100.0%
Feb 2019	100.0%	100.0%	100.0%	100.0%
Mar 2019	100.0%	100.0%	100.0%	100.0%
Overall	100.0%	100.0%	100.0%	100.0%

Note: The percentages are calculated by dividing the number of monitoring results within their corresponding Action and Limit Levels by the total number of monitoring results.

No complaints were received from any sensitive receiver that triggered the Action Level. All monitoring results were also within the corresponding Limit Levels at all monitoring stations in the reporting period.

General meteorological conditions in the last month of the previous quarter and this reporting period were recorded and summarized in **Table 2.6**.

Table 2.6: General Meteorological Condition During Impact Noise Monitoring

	Weather
Dec 2018	Sunny to Cloudy
Jan 2019	Sunny to Cloudy
Feb 2019	Sunny to Cloudy
Mar 2019	Sunny to Cloudy

2.2.3 Conclusion

As the construction activities were far away from the monitoring stations, major sources of noise dominating the monitoring stations observed during the monitoring sessions were road traffic and aircraft noise near NM1A, school activities at NM4, and aircraft and helicopter noise near NM5 and NM6. It is considered that the monitoring work in the reporting period was effective and there was no adverse impact attributable to the Project activities.

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 23 water quality monitoring stations, comprising 12 impact (IM) stations, 8 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 2.7** describes the details of the monitoring stations. **Figure 2.2a** shows the locations of the monitoring stations. The monitoring location for SR1A and SR8 were updated on 5 January 2019. The updated monitoring locations are presented in **Figure 2.2b** from that day onwards.

Table 2.7: Monitoring Locations and Parameters for Impact Water Quality Monitoring

Monitoring Station	Description	Coordinates		Parameters
		Easting	Northing	
C1	Control Station	804247	815620	<u>General Parameters</u> DO, pH, Temperature, Salinity, Turbidity, SS <u>DCM Parameters</u> Total Alkalinity, Heavy Metals[2]
C2	Control Station	806945	825682	
C3[3]	Control Station	817803	822109	
IM1	Impact Station	807132	817949	
IM2	Impact Station	806166	818163	
IM3	Impact Station	805594	818784	
IM4	Impact Station	804607	819725	
IM5	Impact Station	804867	820735	
IM6	Impact Station	805828	821060	
IM7	Impact Station	806835	821349	
IM8	Impact Station	808140	821830	
IM9	Impact Station	808811	822094	
IM10	Impact Station	809794	822385	
IM11	Impact Station	811460	822057	
IM12	Impact Station	812046	821459	

Monitoring Station	Description	Coordinates		Parameters
SR1A[1]	Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities (HKBCF) Seawater Intake for cooling	812586	820069	General Parameters DO, pH, Temperature, Salinity, Turbidity, SS
		812660 (From 5 Jan 2019 onwards)	819977	
SR2[3]	Planned marine park / hard corals at The Brothers / Tai Mo To	814166	821463	General Parameters DO, pH, Temperature, Salinity, Turbidity, SS DCM Parameters Total Alkalinity, Heavy Metals[2][4]
SR3	Sha Chau and Lung Kwu Chau Marine Park / fishing and spawning grounds in North Lantau	807571	822147	General Parameters 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	820246	
		811623 (From 5 Jan 2019 onwards)	820390	

Notes:

(1) With the operation of HKBCF, water quality monitoring at SR1A station was commenced on 25 October 2018.

(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 2.8**. The control and IM stations during flood tide and ebb tide for general water quality monitoring and regular DCM monitoring are presented in **Table 2.9**.

Table 2.8: 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 SR1A & 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 SR1A				
SS (mg/l)	33		42	
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 2.9: 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

Note:

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 within their corresponding Action and Limit Levels in the reporting period are presented in **Table 2.10**. The weather and sea conditions in the last month of the previous quarter and this reporting period were recorded and summarized in **Table 2.11**.

Table 2.10: Percentage of Water Quality Monitoring Results within Action and Limit Levels

	General Water Quality Monitoring				Regular DCM Monitoring		
	DO (Surface and Middle)	DO (Bottom)	SS	Turbidity	Alkalinity	Chromium	Nickel
Jan 2019	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.7%
Feb 2019	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.6%
Mar 2019	100.0%	100.0%	99.0%	100.0%	100.0%	100.0%	99.7%
Overall	100.0%	100.0%	99.7%	100.0%	100.0%	100.0%	99.4%

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

Table 2.11: General Weather Condition and Sea Condition During Impact Water Quality Monitoring

	Weather	Sea Condition
Dec 2018	Sunny to Cloudy	Calm to Rough
Jan 2019	Sunny to Rainy	Calm to Rough
Feb 2019	Sunny to Rainy	Calm to Rough
Mar 2019	Sunny to Cloudy	Calm to Rough

The monitoring results for DO, turbidity, total alkalinity, and chromium obtained in the reporting period were within their corresponding Action and Limit Levels stipulated in the EM&A programme. Relevant investigation and follow-up actions will be conducted according to the EM&A programme if the corresponding Action and Limit Levels are triggered. For SS and nickel, some of the testing results triggered the relevant Action or Limit Level in the reporting period, and investigations were conducted accordingly.

Summaries of results triggering Action or Limit Level for SS and nickel are presented in **Table 2.12** to **Table 2.13**.

Details of the investigation findings were presented in Construction Phase Monthly EM&A Report No. 37, 38 and 39, which concluded that all results triggering the Action or Limit Level were not related to the Project.

Table 2.12: Summary of SS Results Triggering Action or Limit Level (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12	SR1A	SR3	SR4A	SR5A	SR6	SR7	SR8
23/3/2019					D					D									
No. of result triggering Action or Limit Level	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0

Table 2.13: Summary of Nickel Results Triggering Action or Limit Level (Mid-Flood Tide)

	IM1	IM2	IM3	IM4	IM5	IM6	IM7	IM8	IM9	IM10	IM11	IM12
15/1/2019									D			
9/2/2019								D	D	D		
12/3/2019								D				
No. of result triggering Action or Limit Level	0	0	0	0	0	0	0	2	2	1	1	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 within 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
	Downstream 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 were within 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. 37, 38 and 39, all cases 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 were followed.

Nevertheless, the non-project related triggers were attended to and 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 inspections and regular environmental management meetings. These include maintaining mitigation measures properly for reclamation works including DCM works, marine filling, and seawall construction as recommended in the Manual.

2.4 Waste Monitoring

In accordance with the Manual, 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 2.14**.

Table 2.14: 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

Weekly 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.

Recommendations made by the ET included provision and maintenance of proper chemical waste storage area, as well as handling, segregation, and regular disposal of general refuse. The contractors had taken actions to implement the recommended measures.

Based on updated contractors' information, summary of construction waste generated in the reporting period is presented in **Table 2.15**.

There were no complaints, non-compliance of the WMP, contract-specific WMPs, statutory and contractual requirements that triggered Action and Limit Levels in the reporting period.

Table 2.15: Construction Waste Statistics

	C&D[1] Material Stockpiled for Reuse or Recycle (m^3)	C&D Material Reused in the Project (m^3)	C&D Material Reused in other Projects (m^3)	C&D Material Transferred to Public Fill (m^3)	Chemical Waste (kg)	Chemical Waste (L)	General Refuse (tonne)
Jan 2019[2]	5,675	9,430	618	11,417	1,385	35,420	319
Feb 2019[2]	3,329	13,262	446	5,833	255	21,800	317
Mar 2019[2]	4,516	10,056	6,903	6,780	240	18,400	362
Total	13,520	32,748	7,967	24,030	1,880	75,620	998

Notes:

1. C&D refers to Construction and Demolition.
2. Paper, metals and/or plastics were recycled in the reporting period.

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. Since January 2019, additional theodolite tracking surveys for one day at LKC station was conducted on a voluntary basis to collect supplementary information for the Project, such that a total of one tracking day at SC station and two tracking days at LKC station were conducted per month. The vessel survey transects followed the transect lines proposed in the Manual and 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 January to March 2019 are shown in **Figure 2.3**, whilst the land-based theodolite tracking survey stations are described in **Table 2.16** and depicted in **Figure 2.4**. The location of the PAM device is shown in **Figure 2.10**.

Table 2.16: 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 Level 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 2.17.**

Table 2.17: 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 January to March 2019 reporting period, a total of six sets of vessel line transect survey covering all transects in Northeast Lantau (NEL), Northwest Lantau (NWL), Airport West (AW), West Lantau (WL) and Southwest Lantau (SWL) survey areas were conducted at a frequency of twice per month, in each survey area.

A total of around 1,365 km of survey effort was collected from these surveys, with around 90.5% 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 January to March 2019, there were a total of 25 sightings of CWDs, with 78 dolphins sighted (**Table 2.18**). Amongst the sightings of CWDs, 24 sightings with 70 dolphins were made during on-effort searches under favourable weather conditions.

When breaking down the sightings by survey areas, 6 sightings with 19 dolphins, 16 sightings with 45 dolphins and 3 sightings with 14 dolphins were recorded in NWL (including AW transects), WL and SWL survey areas respectively during the current reporting period. No CWD was sighted in NEL.

Compared with the last quarter (i.e. October to December 2018), there is an overall observable decline in terms of both number of CWD sightings and number of dolphins (decreased by around 40% and 44% respectively). Both WL and NWL waters showed observable decline in terms of both number of CWD sightings and number of dolphins (WL waters: decreased by around 33% and 49% respectively; NWL waters (including AW transects): decreased by around 50% and 46%

respectively). Regarding SWL, the number of CWD sighting decreased by 40% compared with the last quarter while the number of dolphins remained similar.

Compared with the same quarter of last year in 2018 (i.e. January to March 2018), the declines in number of CWD sightings and number of dolphins are both by 62%. The decrease is most pronounced in NWL waters (including AW transects) with the number of CWD sightings and number of dolphins dropped by around 79% and 78% respectively. Nevertheless, it is worth noting that the numbers of sightings and dolphins in NWL waters in the same quarter of 2018 increased by over three times compared with 2017 (7 sightings and 21 dolphins including AW transects) as presented in Section 2.5.2 of the Construction Phase Quarterly EM&A Report No. 9. The CWD sightings recorded for NWL waters in this reporting period is similar to that in the same quarter of 2017 despite the increase in marine works in this quarter compared with the same quarter of 2017. It is important to note that dolphins move around within their habitat across the Pearl River Estuary Region due to both natural and anthropogenic factors and thus there is possible fluctuations of CWD numbers from year to year.

Table 2.18 below shows the comparison of the numbers of sightings and dolphins amongst the current reporting period, last quarter, and the same quarter of year 2018.

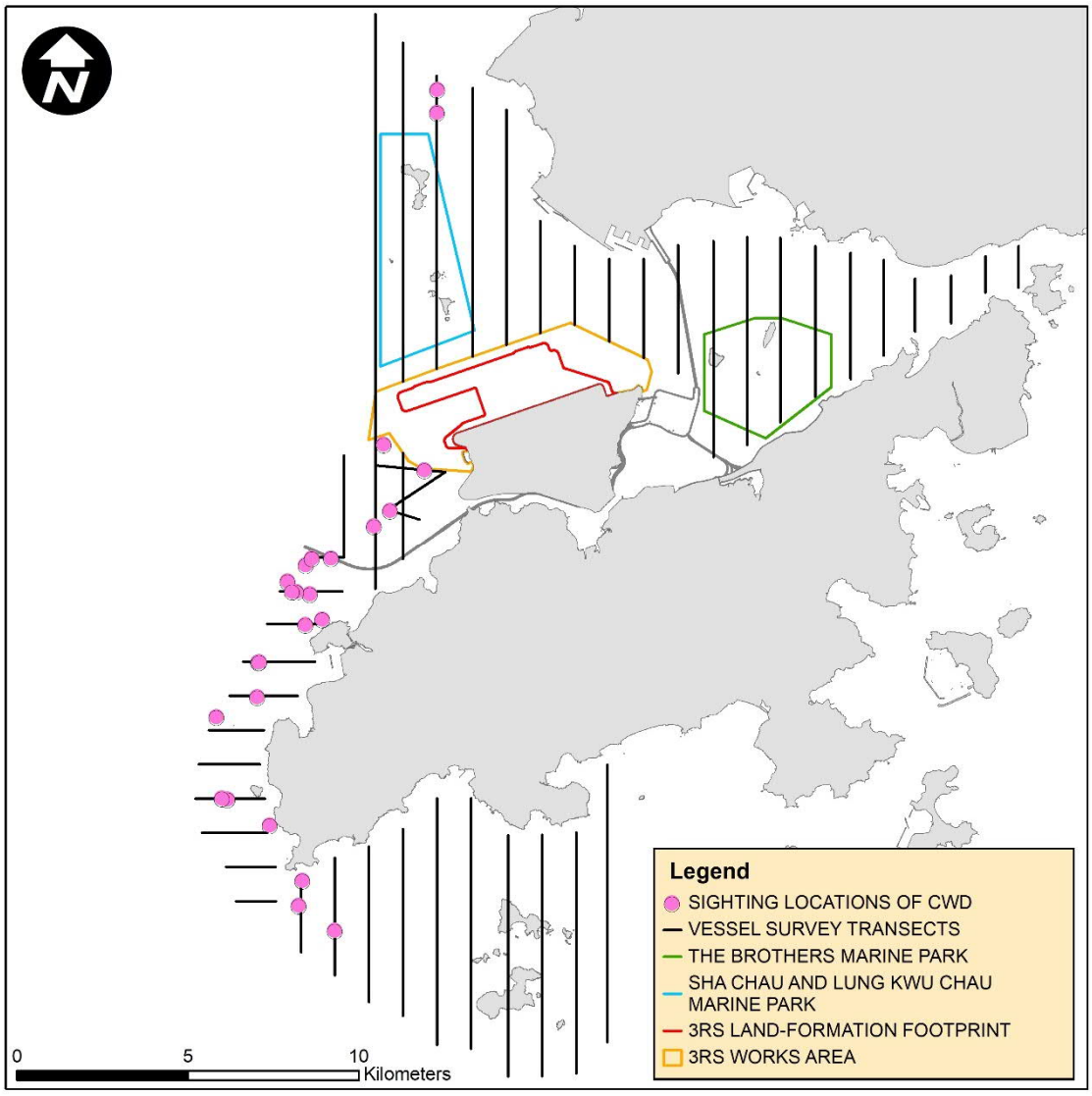
Table 2.18: Summary of Number of CWD Sightings and Number of Dolphins for the Same Quarter Last Year, Previous Quarter, and Current Reporting Period

	Same Quarter of Last Year	Previous Reporting Period	Current Reporting Period
	January to March 2018	October to December 2018	January to March 2019
NEL	0 (0)	1 (1)	0 (0)
NWL	23 (63)	12 (35)	4 (9)
AW	6 (22)	0 (0)	2 (10)
WL	28 (99)	24 (89)	16 (45)
SWL	8 (19)	5 (15)	3 (14)
Total	65 (203)	42 (140)	25 (78)

Note: Values in ( ) represent number of dolphins

The distribution of CWD sightings recorded from January to March 2019 is illustrated in **Figure 2.5**. In NWL, CWD sightings were located outside the northeastern corner of SCLKCMP and also at the waters western to the Hong Kong International Airport with two sightings being recorded just outside the temporary works area of the 3RS Project. In WL, CWD sightings were more frequented in the northern part of the survey area while some sightings scattered from Tai O to the waters between Peaked Hill and Fan Lau. In SWL, the limited CWD sightings were all located toward the western side of the survey area. Details of the sighting data are presented in **Appendix C**.

Figure 2.5: Sightings Distribution of Chinese White Dolphins from January to March 2019



Remarks: Please note that there are 25 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 on-effort dolphin sightings per 100 km survey effort (STG) and for the total on-effort number of dolphins per 100 km survey effort (ANI) in the whole survey area (i.e. NEL, NWL, AW, WL and SWL) for January, February and March 2019 are summarized in **Table 2.19.**

In this reporting period, both the monthly STG and ANI decreased from January to February but rebounded in March. The running quarterly STG and ANI encounter rates declined from January to February and reminded relatively steady in March. Although the running quarterly ANIs of three consecutive months from January to March 2019 fell below the action level (i.e. ANI < 9.35), however the action level for CWD monitoring was not triggered as the running quarterly STGs in this reporting quarter remained above the action level (i.e. STG ≥ 1.86). Therefore, the action level (running quarterly STG < 1.86 & ANI < 9.35) was not triggered.

Compared with the previous reporting period, there are significant declines in terms of both running quarterly STG and running quarterly ANI (STG decreased from 3.16 to 1.94 and the ANI from 10.36 to 5.67). While comparing with the same quarter of last year (i.e. January to March 2018), both running quarterly STG and ANI in each month were all significantly lower than the same period in 2018. However, it should be noted that the STG and ANI in this period in 2018 was an exception compared with the past years as discussed in Section 2.5.2 of the Construction Phase Annual EM&A Report No. 3. As aforementioned the numbers of CWD encountered in NWL waters in this reporting period being similar to that in the same quarter of 2017 despite the increase in marine works, there is no obvious relationship between 3RS marine works activities and the decrease of running quarterly encounter rates in this reporting period.

Table 2.19: Summary of Monthly and Running Quarterly STG and ANI of Chinese White Dolphin for the Same Quarter Last Year, Previous Quarter, and Current Reporting Period

	Same Quarter of Last Year			Previous Reporting Period			Current Reporting Period		
	Jan 18	Feb 18	Mar 18	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19
Monthly STG	5.10	5.38	3.84	3.07	4.85	1.67	2.47	1.47	1.89
Monthly ANI	19.94	16.15	10.33	8.97	14.28	8.10	5.69	3.43	7.81
Running Quarterly STG	4.27	5.27	4.78	4.19	4.29	3.16	2.96	1.87	1.94
Running Quarterly ANI	16.27	18.89	15.52	13.71	13.19	10.36	9.29	5.76	5.67

Note: For detailed calculations of encounter rates STG and ANI, please refer to the Construction Phase Monthly EM&A Report No. 37, 38 and 39.

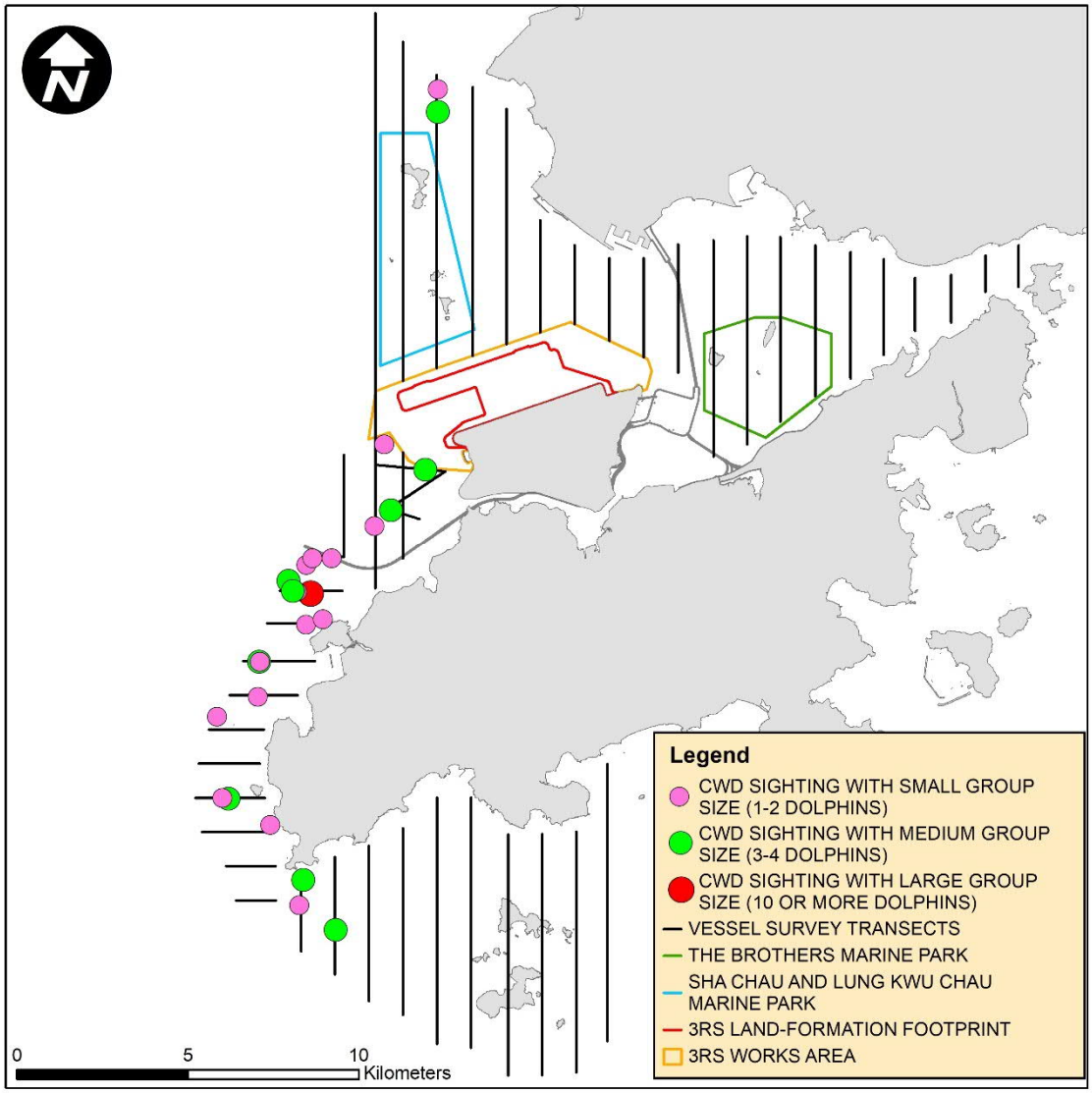
Group Size

Between January and March 2019, the group size of CWD sightings ranged from 1 to 11 dolphins. The average group size of CWDs was 3.1 dolphins per group while that of the last quarter was 3.3, which is quite similar. The average group size of CWDs in this reporting quarter is also similar to that of the same quarter of last year (3.2 dolphins per group).

In this reporting quarter, the numbers of CWD sightings with small group size (i.e. 1-2 dolphins) was dominant. Amongst all 25 sightings, there was one sighting with large group size (i.e. 10 or more dolphins). This large CWD group was sighted in WL. Sighting locations of CWD groups with different group sizes are depicted in **Figure 2.6**.

In NWL, medium-sized CWD groups (i.e. 3-9 dolphins) tended to appear in the waters west to the existing HKIA according to the limited sightings. In WL, CWD sightings with medium group size were recorded in the waters around Tai O the while small-sized groups were scattered throughout the survey area. The larger CWD group encountered in WL was recorded in waters between Tai O and the Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road. In SWL, all sightings restricted to western side of the survey area.

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



Remarks: Please note that there are 25 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.

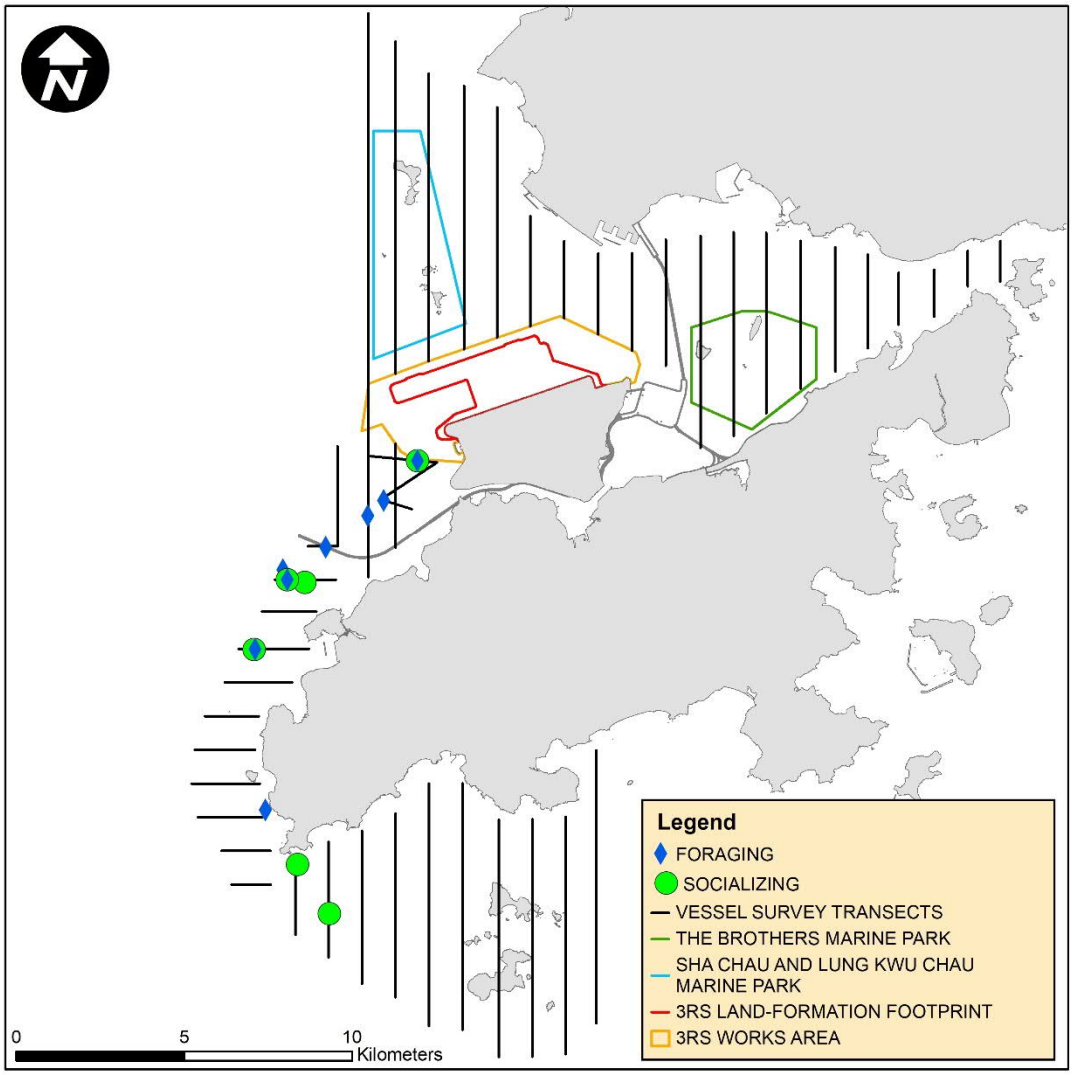
Activities and Association with Fishing Boats

During January to March 2019, 8 sightings of CWDs were recorded with feeding activities. One of these sightings was observed in association with operating gillnetter.

The number of sightings with feeding recorded in the current reporting period is slightly lower when compared to the last reporting period (10 sightings involved feeding activities with no association with operating fishing boats from October to December 2018). Compared with the data in the same quarter of last year, CWD sightings with feeding activities decreased drastically by 11 sightings.

The sighting locations of CWDs engaged in different behaviours during the current 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 January to March 2019, 3 sightings of CWDs were recorded with the presence of mother-and-unspotted calf and mother-and-unspotted juvenile, which is fewer than the last reporting quarter (i.e. 6 sightings between October and December 2018). The number is also lower than the same quarter of last year (i.e. 9 sightings between January and March 2018). These pairs were sighted in NWL and WL survey areas as shown in **Figure 2.8**.

Figure 2.8: Sighting Locations of Mother-calf Pairs

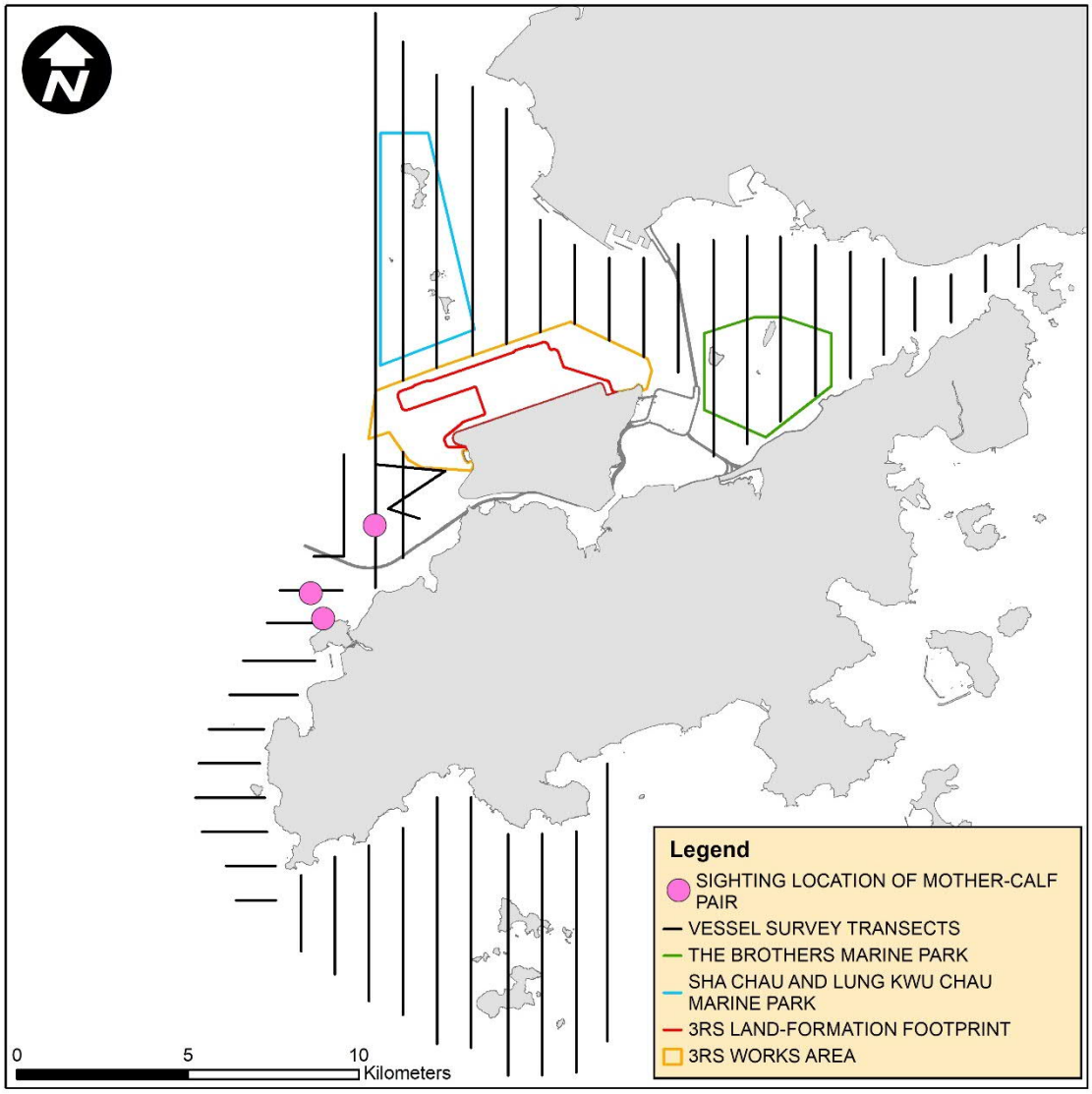


Photo Identification

During January to March 2019, a total number of 47 different CWD individuals were identified altogether for 59 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 47 different CWD individuals, 11 animals (i.e. NLMM019, NLMM020, SLMM002, SLMM003, SLMM007, SLMM010, SLMM012, SLMM052, WLMM001, WLMM056 and WLMM067) were sighted for more than once.

Five individuals including SLMM003, SLMM012, SLMM052, WLMM056 and WLMM067 were re-sighted in different survey areas during this reporting period. They had cross-area movement between SWL and WL survey areas. The most frequently re-sighted individual in this reporting quarter was WLMM067 which has been encountered altogether 3 times. The number of re-sighted CWD individuals and the number of CWD individuals showing cross-area movement from January to March 2019 were both lower than the last reporting quarter.

A summary of photo identification works is presented in **Table 2.20**. Representative photos of the 47 identified individuals and figures depicting the sighting locations of the aforementioned 11 re-sighted individuals recorded in this reporting period are presented **Appendix C**.

Table 2.20: Summary of Photo Identification

Individual ID	Date of sighting	Sighting Group No.	Area
NLMM002	11-Feb-19	1	NWL
NLMM009	11-Feb-19	1	NWL
NLMM016	28-Jan-19	1	WL
NLMM019	24-Jan-19	1	AW
	13-Feb-19	1	AW
NLMM020	24-Jan-19	1	AW
	13-Feb-19	1	AW
NLMM043	13-Feb-19	1	AW
NLMM056	12-Mar-19	3	WL
NLMM060	12-Mar-19	2	WL
NLMM062	17-Jan-19	1	NWL
NLMM063	24-Jan-19	4	WL
SLMM002	21-Jan-19	2	SWL
	22-Jan-19	4	SWL
SLMM003	22-Jan-19	4	SWL
	12-Mar-19	5	WL
SLMM007	21-Jan-19	2	SWL
	22-Jan-19	4	SWL
SLMM010	24-Jan-19	6	WL
	13-Feb-19	3	WL
SLMM011	13-Feb-19	1	AW
SLMM012	22-Jan-19	4	SWL
	13-Feb-19	2	WL
SLMM052	22-Jan-19	4	SWL
	25-Mar-19	1	WL
SLMM053	21-Jan-19	2	SWL
SLMM058	25-Mar-19	1	WL
SLMM064	12-Mar-19	3	WL
WLMM001	24-Jan-19	4	WL
	28-Jan-19	1	WL

Individual ID	Date of sighting	Sighting Group No.	Area
WLMM007	22-Jan-19	4	SWL
WLMM019	12-Mar-19	3	WL
WLMM027	25-Mar-19	1	WL
WLMM028	24-Jan-19	4	WL
WLMM029	24-Jan-19	4	WL
WLMM042	12-Mar-19	3	WL
WLMM052	12-Mar-19	3	WL
WLMM056	22-Jan-19	4	SWL
	13-Feb-19	2	WL
WLMM060	13-Mar-19	1	NWL
WLMM062	12-Mar-19	2	WL
WLMM064	17-Jan-19	1	NWL
WLMM067	21-Jan-19	2	SWL
	12-Mar-19	3	WL
	25-Mar-19	1	WL
WLMM069	24-Jan-19	5	WL
WLMM071	13-Mar-19	1	NWL
WLMM078	24-Jan-19	3	WL
WLMM079	22-Jan-19	4	SWL
WLMM085	12-Mar-19	3	WL
WLMM113	25-Mar-19	1	WL
WLMM114	12-Mar-19	4	WL
WLMM116	12-Mar-19	1	WL
WLMM131	12-Mar-19	5	WL
WLMM132	24-Jan-19	5	WL
WLMM133	12-Mar-19	2	WL
WLMM134	12-Mar-19	3	WL
WLMM135	12-Mar-19	3	WL
WLMM136	12-Mar-19	3	WL

2.5.2.2 Land-based Theodolite Tracking Survey

Survey Effort

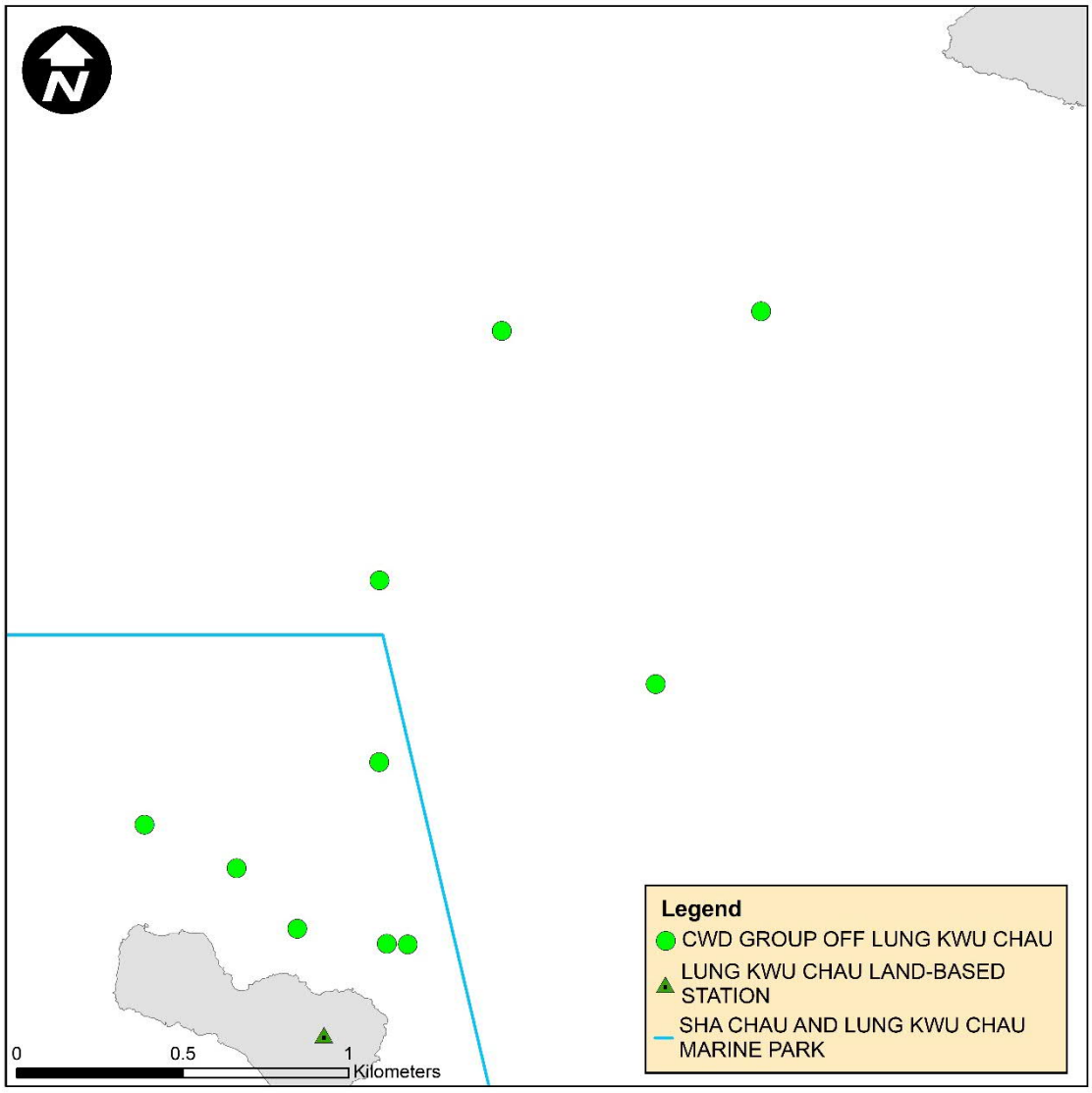
During January to March 2019, a total of nine days of land-based theodolite tracking survey effort were completed, including six days on Lung Kwu Chau and three days on Sha Chau. In total, 10 CWD groups were tracked from the Lung Kwu Chau station while no CWD groups were tracked from the Sha Chau station, with an overall 0.19 CWD groups sighted per survey hour.

Information on survey effort and CWD groups sighted during land-based theodolite tracking surveys are presented in **Table 2.21**. Details on the survey effort and CWD groups tracked are presented in **Appendix C**. The first sighting locations of CWD groups tracked between January and March 2019 are shown in **Figure 2.9**.

Table 2.21: 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
January 2019				
Lung Kwu Chau	2	12:00	3	0.25
Sha Chau	1	06:00	0	0
TOTAL	**3**	**18:00**	**3**	**0.17**
February 2019				
Lung Kwu Chau	2	12:00	4	0.33
Sha Chau	1	06:00	0	0
TOTAL	**3**	**18:00**	**4**	**0.22**
March 2019				
Lung Kwu Chau	2	12:00	3	0.25
Sha Chau	1	06:00	0	0
TOTAL	**3**	**18:00**	**3**	**0.17**
OVERALL	**9**	**54:00**	**10**	**0.19**

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



Remarks: Please note that there are 10 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, while data from the EAR intended primarily to supplement the data collected from the land-based theodolite tracking survey station on Sha Chau. In this reporting period, the EAR has been retrieved on 9 January and 21 February 2019 for data collection and subsequently redeployed. The EAR deployment is generally for 6 weeks prior to data retrieval for analysis. As the period of data collection and analysis takes more than four months, PAM results could not be reported in quarterly intervals but report for supplementing the annual CWD monitoring analysis.

2.5.2.4 Site Audit for CWD-related Mitigation Measures

During the reporting period, silt curtains were in place by the contractors for marine filling 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 5 to 17 dolphin observation stations by the contractors for continuous monitoring of the DEZ by all contractors for DCM works and seawall construction 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 677 individuals being trained and 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 or the DEZ in this reporting period. 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 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. Besides, *ad-hoc* site inspections were conducted by ET and IEC if environmental problems were identified, or subsequent to receipt of an environmental complaint, or as part of the investigation work. These site inspections provided a direct means to reinforce the specified environmental protection requirements and pollution control measures in construction sites.

During site inspections, environmental situation, status of implementation of pollution control and mitigation measures were observed. Environmental documents and site records, including waste disposal record, maintenance record of environmental equipment, and relevant environmental permit and licences, were also checked on-site. Observations were recorded in the site inspection checklist and passed to the contractor together with the appropriate recommended mitigation measures where necessary in order to advise contractors on environmental improvement, awareness and on-site enhancement measures. The observations were made with reference to the following information during the site inspections:

- The EIA and EM&A requirements;
- Relevant environmental protection laws, guidelines, and practice notes;
- The EP conditions and other submissions under the EP;
- Monitoring results of EM&A programme;
- Works progress and programme;
- Proposal of individual works;
- Contract specifications on environmental protection; and
- Previous site inspection results.

Good site practices were implemented in the project to enhance environmental performance. Key examples are highlighted here:

1. In order to reduce the amount of inert C&D materials being delivered to public fill reception facilities at source, the contractors were encouraged to reuse excavated materials as far as practicable. Not only were these materials reused within each work contract, some contractors also collected inert C&D materials generated from other works contracts,

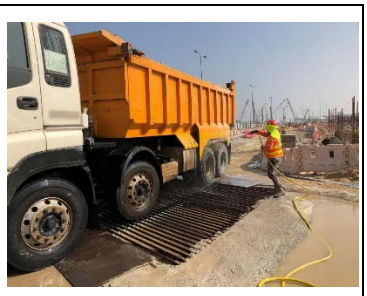
within or outside the Project, for reuse after seeking agreement with AAHK. For instance, rockfill generated within and outside the Project was collected for reuse in shoreline reinstatement after the completion of the new aviation fuel pipeline installation at Sheung Sha Chau. By better planning and overview of waste management across different works contracts at a Project level, public fill disposal could be minimized during the construction phase.

2. Some construction activities such as piling works could generate a considerable amount of wastewater. Handling these amounts of wastewater could impose a challenge to some construction sites. In order to meet the water quality conditions of the Water Pollution Control Ordinance license prior to discharging, various treatment facilities were deployed on site to treat the construction wastewater. For some work contracts, pre-treatment tanks were provided to increase retention time and coagulant was added to enhance the removal efficiency of suspended solid. This would reduce the load to downstream wastewater treatment system and hence the overall efficiency of the sedimentation systems on site could be improved.

3. According to Air Pollution Control (Construction Dust) Regulation, every vehicle of the Project was washed to remove any dusty materials from its body and wheels before leaving the construction site. To further improve the environmental performance of the wheel washing facility, one contractor adopted enhanced design for their wheel washing facilities, which featured a basin setup that could immediately drain off the silty water generated from wheel washing. With this setup, the wash water could be collected for treatment and reused without being carried by the dump truck to public area.

Rockfill was reused by contractor for shoreline reinstatement at Sheung Sha Chau

Pre-treatment tanks with coagulant provided to improve silt removal efficiency



Enhanced wheel washing facility adopted by contractor

Besides, advices were given when necessary to ensure the construction workforce were familiar with relevant procedures, and to maintain good environmental performance on site. Regular toolbox talks on environmental issues were organized for the construction workforce by the contractors to ensure understanding and proper implementation of environmental protection and pollution control mitigation measures.

During the reporting period, implementation of recommended landscape and visual mitigation measures (CM1 – CM10) where applicable was monitored weekly in accordance with the Manual and no non-conformity was recorded. In case of non-conformity, specific recommendations will be made, and actions will be proposed according to the Event and Action Plan. The monitoring status is summarized in **Appendix B**.

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**.

2.7 Terrestrial Ecological Monitoring

Monthly ecological monitoring was carried out in January 2019 on Sheung Sha Chau Island in accordance with the Manual. No encroachment of any works upon the egretry area nor any significant disturbance to the ardeids foraging at Sheung Sha Chau by the works were recorded during ecological monitoring. No signs of breeding or nursery activities were observed. At the HDD daylighting location, neither nest nor breeding activity of ardeids were found during the monthly ecological monitoring and weekly site inspections in January 2019. The site photos and location map regarding the ecological monitoring for HDD daylighting location and egretry area are provided in **Appendix C** for reference. All the HDD construction including shoreline landscape reinstatement works on Sheung Sha Chau was completed and retreated on 29 January 2019. Therefore, terrestrial ecological monitoring had been ceased since February 2019.

2.8 Audit of SkyPier High Speed Ferries

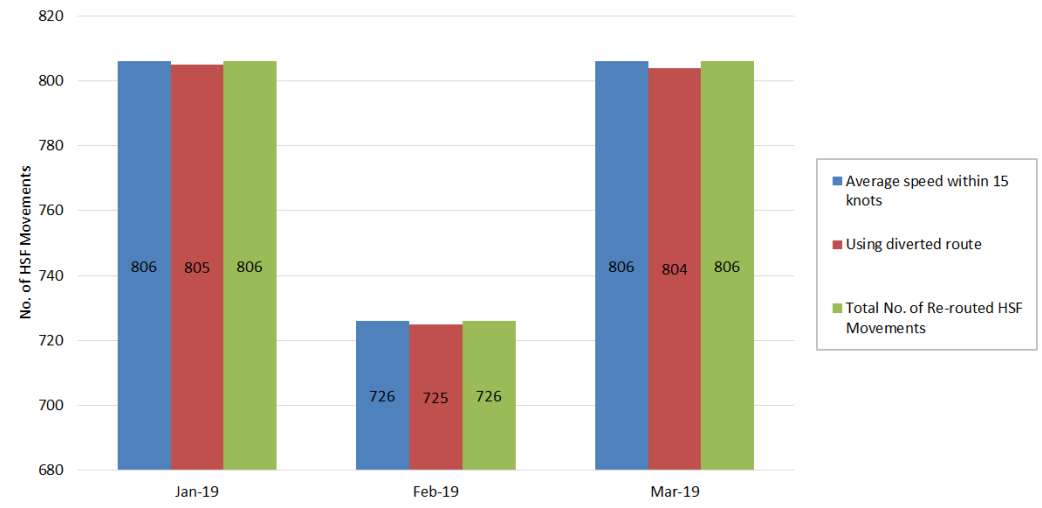
In total, 2,338 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. The daily movements of all SkyPier HSFs in the reporting period ranged between 82 and 94, which fell within the maximum daily cap number of 125.

The average speeds of all HSFs travelling through the Speed Control Zone (SCZ) ranged from 9.0 to 14.4 knots. All HSFs travelled through the SCZ with average speed within 15 knots in compliance with the Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier (the SkyPier Plan).

Four ferry movements were recorded with minor deviations from the diverted route. Notices of deviation were sent to the ferry operators and the cases were investigated. All the cases involved giving way to other vessels to ensure public safety, and the HSFs returned to the normal route following the SkyPier Plan as soon as practicable after the incidents. The summary of the SkyPier Plan monitoring result is presented in **Graph 3**.

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

Graph 3: Summary of SkyPier High Speed Ferries Monitoring Results



2.9 Audit of Construction and Associated Vessels

On the implementation of the updated Marine Travel Routes and Management Plan for Construction and Associated Vessels (MTRMP-CAV), the Marine Surveillance System (MSS) automatically recorded deviation cases such as speeding, entering no entry zone, and not traveling through the designated gates. 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 plans 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.

During the reporting period, 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 six skipper training workshops were held by ET during the reporting period with 15 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 14 skipper training workshops were held with 28 captains by contractors' 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 and was completed in April 2018. Two additional monitoring surveys (beyond the CTP requirement) scheduled in October 2018 and April 2019 were proposed in the Detailed Coral Translocation Report. Results of the former additional monitoring survey were presented in

Section 2.10 of the Construction Phase Quarterly EM&A Report No. 12 and results for the latter will be presented in the next Quarterly EM&A Report.

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

No construction activities-related complaint was received during the reporting period.

3.2.2 Notifications of Summons or Status of Prosecution

No notification of summons nor prosecution was received during the reporting period.

3.3 Cumulative Statistics

Cumulative statistics on valid exceedance, non-compliance, complaints, notifications of summons and status of prosecutions are summarized in **Table 3.1** and **Table 3.2**.

Table 3.1: Statistics for Valid Exceedances for the Environmental Monitoring

		Total No. Recorded in the Reporting Period	Total No. Recorded 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: Non-project related triggers of Action or Limit Level are not shown in this table.

Table 3.2: 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	0	0	0
From 28 December 2015 to end of the reporting period	0	16	1	1

4 Conclusion and Recommendation

In this quarterly period from 1 January 2019 to 31 March 2019, the EM&A programme has been implemented as planned, including 96 sets of air quality measurements, 52 sets of construction noise measurements, 39 sets of water quality measurements, 6 complete sets of vessel line transect surveys and 9 days of land-based theodolite tracking survey effort for CWD monitoring, 1 round of terrestrial ecological 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, marine filling, and seawall construction. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for APM and BHS, and preparation work for utilities, with activities include site establishment, site office construction, road and drainage works, cable ducting, demolition of existing facilities, piling, and excavation works.

Monitoring results of construction dust, construction noise, construction waste, and CWD did not trigger the 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, total alkalinity, and chromium obtained during the reporting period did not trigger their corresponding Action and Limit Levels stipulated in the EM&A programme. Relevant investigation and follow-up actions will be conducted according to the EM&A programme if the corresponding Action and Limit Levels are triggered. For SS, 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. To conclude, the construction activities in the reporting period did not introduce adverse impact to all water quality sensitive receivers.

In total, 2,338 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 in compliance with the SkyPier Plan. Four 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.

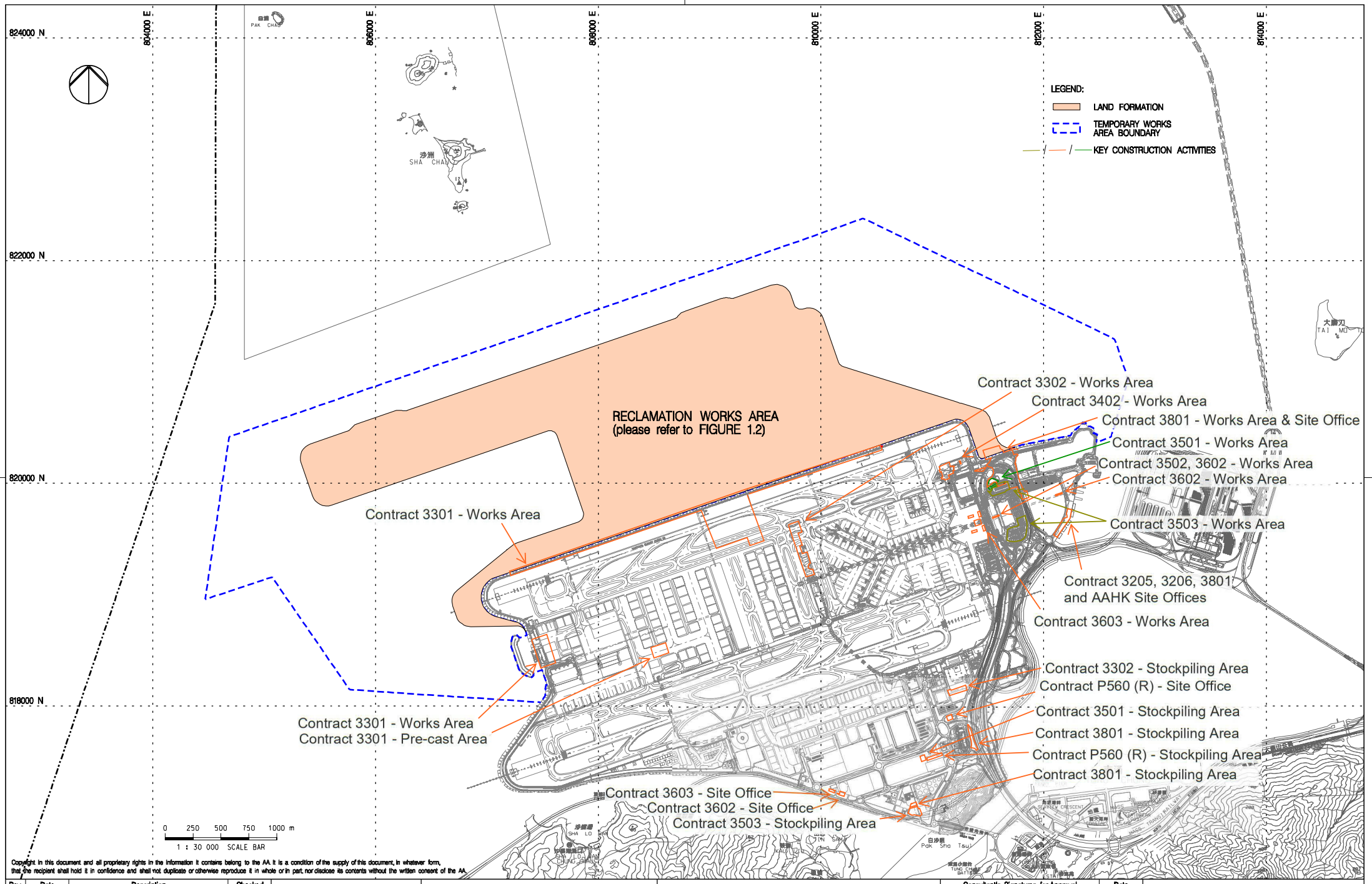
During the reporting period, ET conducted bi-weekly audit of the MSS to ensure the system recorded all deviation cases accurately and the contractors fully complied with the requirements of the MTRMP-CAV. A total of six skipper training workshops were held by ET during the reporting period for captains of construction vessels associated with 3RS contracts. Another 14 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 silt curtains for marine filling works 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 DCM works and seawall construction 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 or the DEZ 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, were effectively implemented during the reporting period. Also, the EM&A programme implemented by the ET has effectively monitored the construction activities and ensured the proper implementation of mitigation measures.

Figures



Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC
B	04APR19	GENERAL REVISION	JL

HONG KONG INTERNATIONAL AIRPORT 香港國際機場

MOTT MACDONALD

Title

LOCATIONS OF KEY CONSTRUCTION ACTIVITIES

Consultant's Signatures for Approval		Date
Design	JC	04APR19
Checkers	JC / TK	04APR19
Approver	EC	04APR19

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

Drawing No. FIGURE 1.1

Scale at A3 1 : 30000

Rev. B

Filename: J:\355482\REPORT\ENV\EMA\190404\FIG 1.1.dgn

Note: The locations are for indicative purpose. The actual construction work locations are in accordnace with the construction work programme.

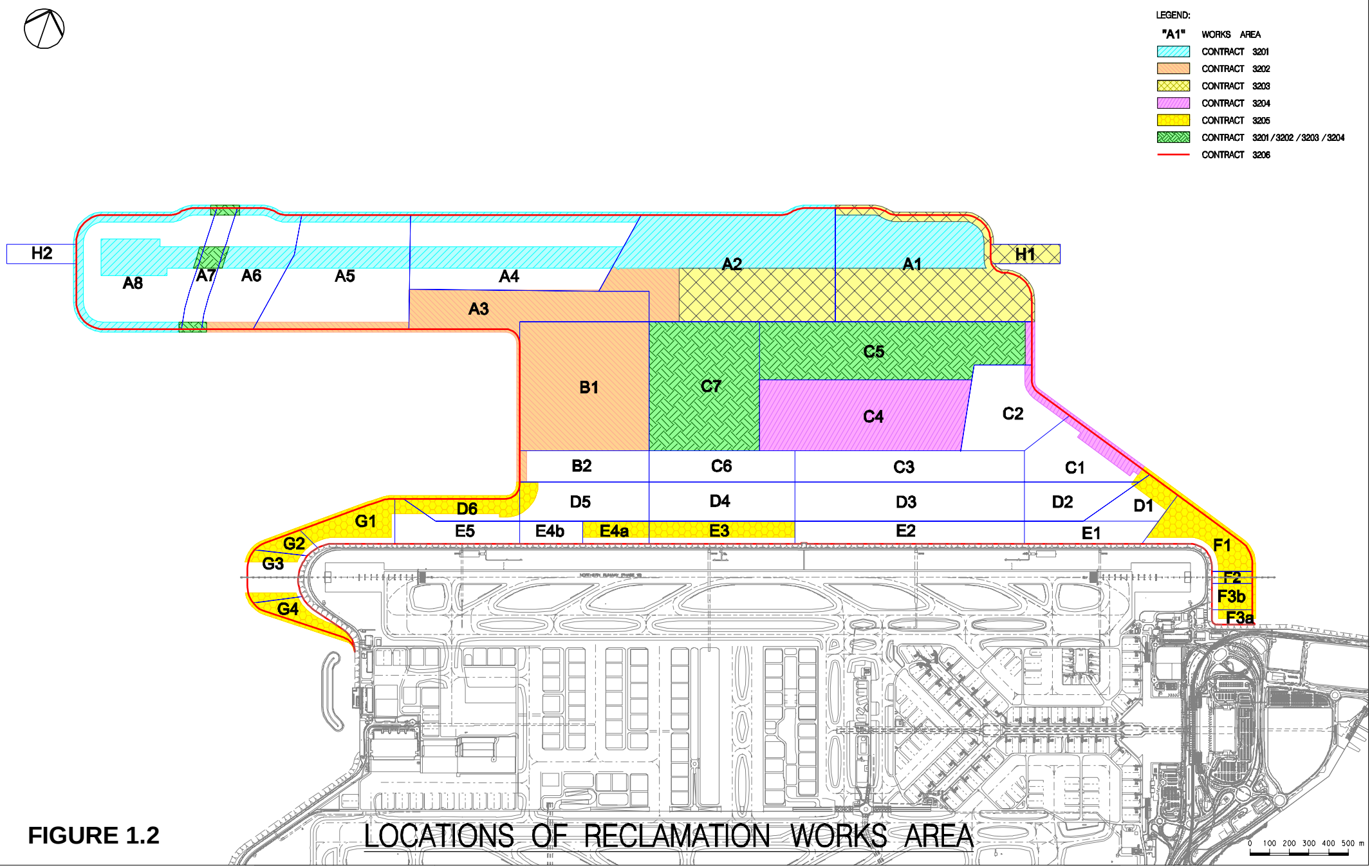
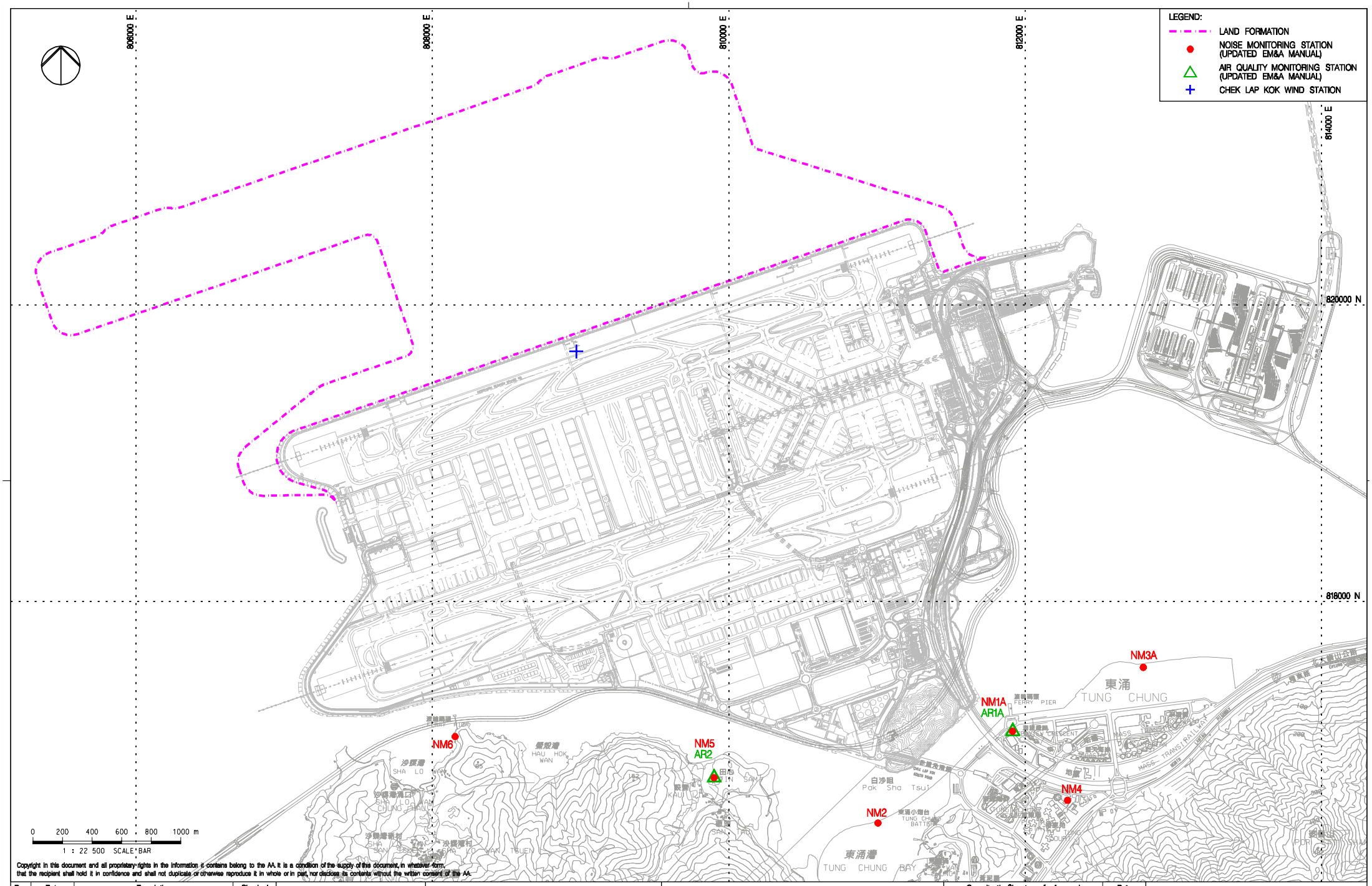


FIGURE 1.2

LOCATIONS OF RECLAMATION WORKS AREA



Rev.	Date	Description	Checked
A	06JAN16	FIRST ISSUE	RO
B	29JAN16	GENERAL REVISION	RO
C	11FEB16	GENERAL REVISION	RO
D	29OCT18	GENERAL REVISION	SH

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

Airport Authority Hong Kong International Airport, Lantau, Hong Kong

MOTT MACDONALD

Title

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

Consultant's Signatures for Approval		Date
Design	TK	29OCT18
Checkers	TK	29OCT18
Approver	EC	29OCT18

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

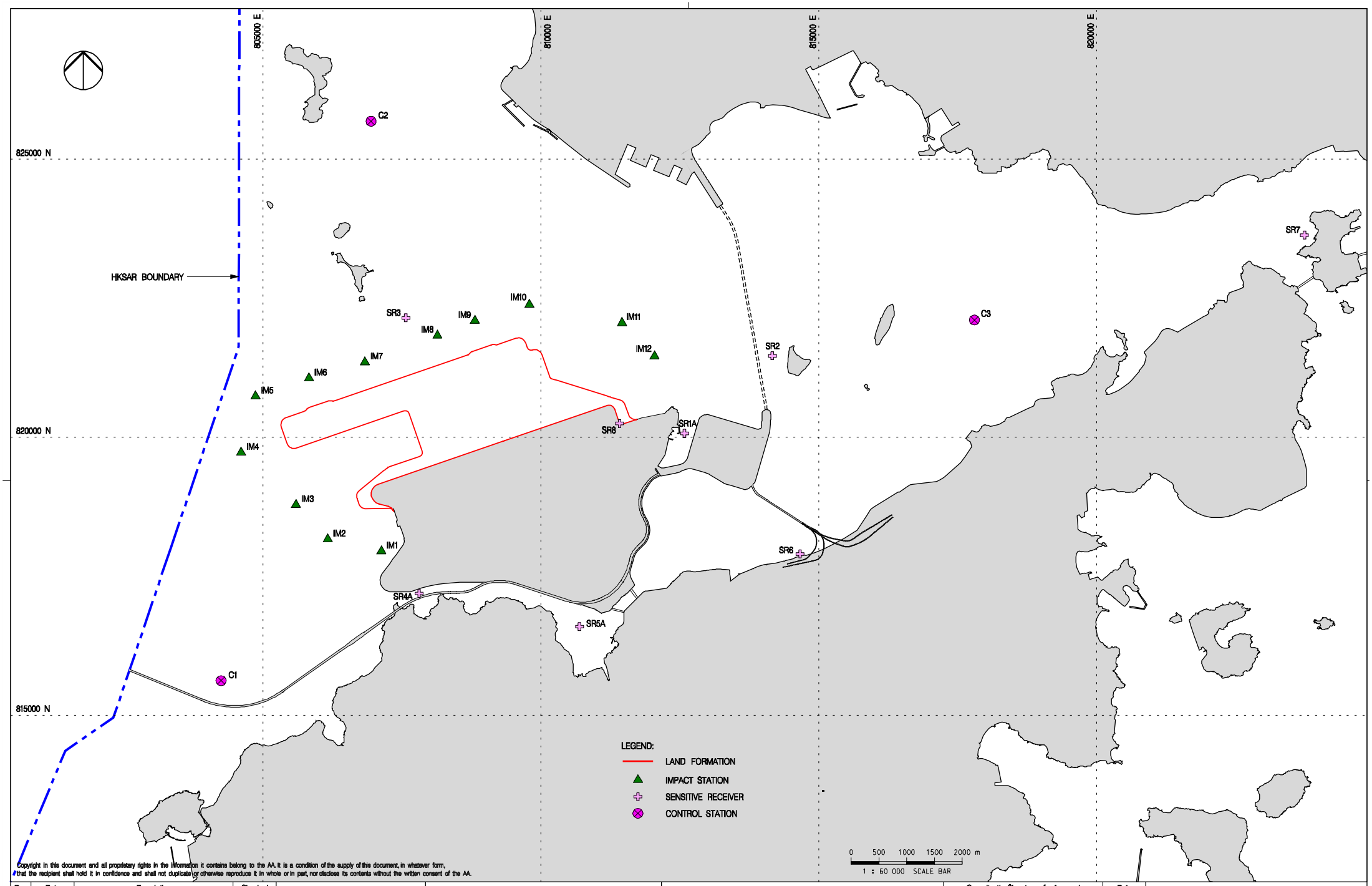
Drawing No.

FIGURE 2.1

Scale at A3: 1 : 22500

Rev. D

Filename: J:\355482\REPORT\ENV\EMA\181029\FIG 2.1.dgn



Rev.	Date	Description	Checked
A	25MAY17	FIRST ISSUE	HY
B	07AUG17	GENERAL REVISION	JL
C	25MAY18	GENERAL REVISION	SH
D	29OCT18	GENERAL REVISION	SH

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

LOCATIONS OF WATER QUALITY MONITORING STATIONS

Consultant's Signatures for Approval		Date
Design	DC	29OCT18
Checkers	DC / TK	29OCT18
Approver	EC	29OCT18

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

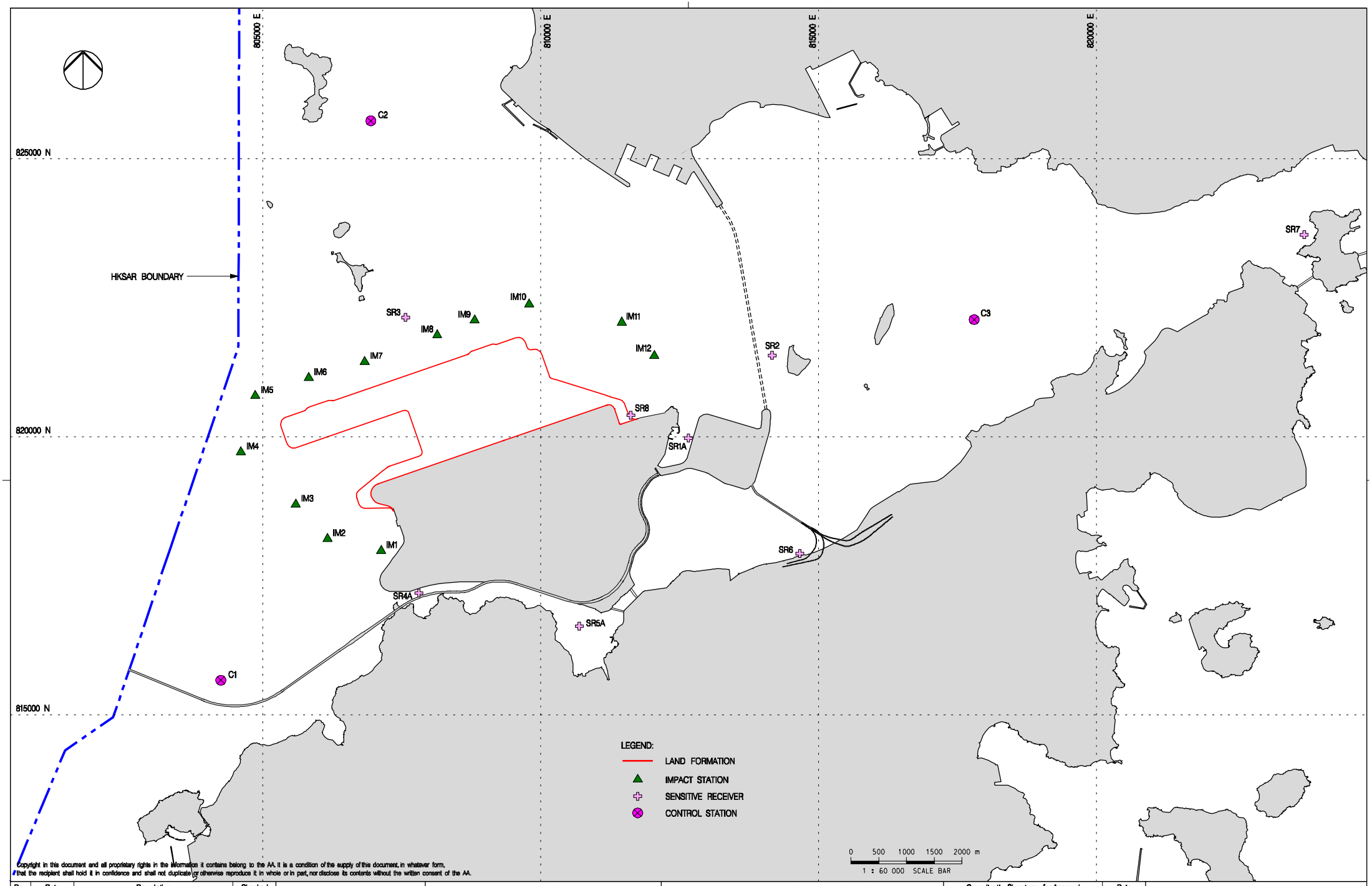
Drawing No.

FIGURE 2.2a

Scale at A3: 1 : 60000

Rev. D

Filename: J:\355482\REPORT\ENV\EMA\181029\FIG 2.2.dgn



Rev.	Date	Description	Checked
A	25MAY17	FIRST ISSUE	HY
B	07AUG17	GENERAL REVISION	JL
C	25MAY18	GENERAL REVISION	SH
D	29OCT18	GENERAL REVISION	SH
E	23JAN19	GENERAL REVISION	SH

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

UPDATED LOCATIONS OF WATER QUALITY MONITORING STATIONS (SINCE 5 JANUARY 2019)

Consultant's Signatures for Approval		Date
Design	DC	23JAN19
Checkers	DC / TK	23JAN19
Approver	EC	23JAN19

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

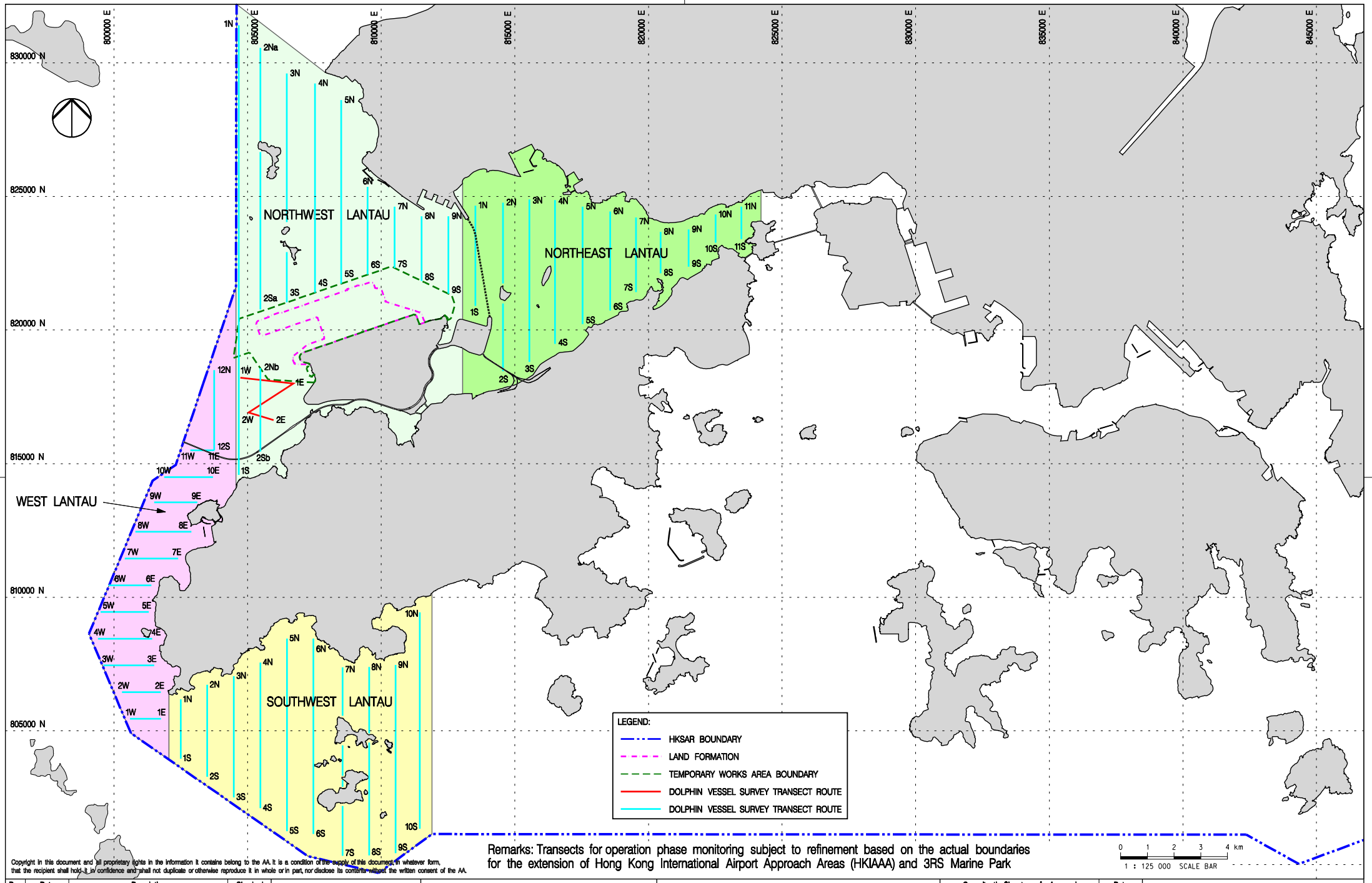
Drawing No.

FIGURE 2.2b

Scale at A3: 1 : 60000

Rev. E

Filename: J:\355482\REPORT\ENV\EMA\180123\FIG 2.2.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
B	27JUL16	GENERAL REVISION	JT
C	06FEB17	GENERAL REVISION	JT
D	01MAR17	GENERAL REVISION	JT
E	29OCT18	GENERAL REVISION	SH
F	04APR19	GENERAL REVISION	SH

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

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

Consultant's Signatures for Approval		Date
Design	JC	04APR19
Checkers	JC / TK	04APR19
Approver	EC	04APR19

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

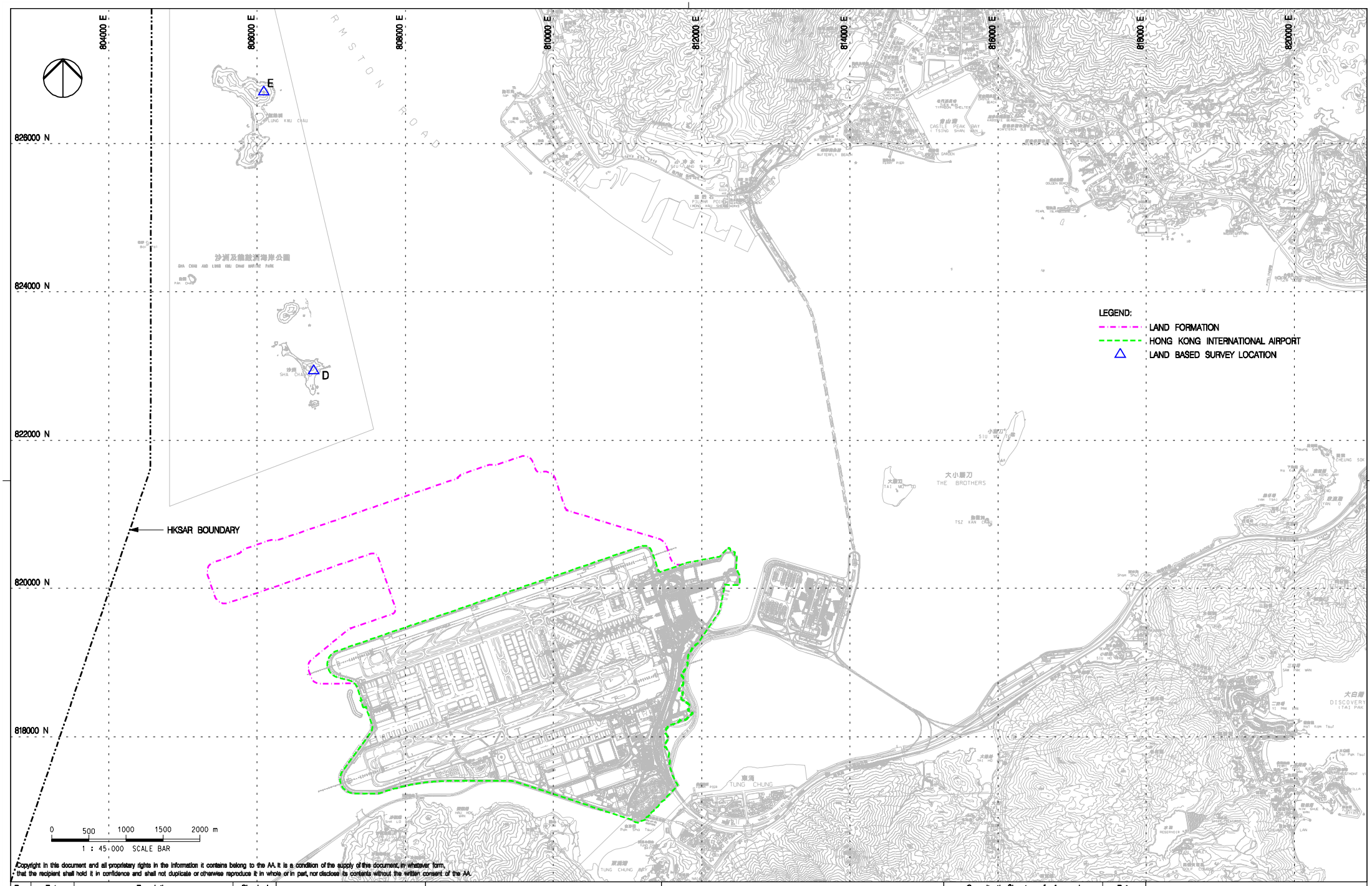
Drawing No.

FIGURE 2.3

Scale at A3 1 : 125000

Rev. F

Filename: J:\355482\REPORT\ENV\EMA\190404\FIG 6.1.dgn



Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC
B	06FEB17	GENERAL REVISION	JC
C	29OCT18	GENERAL REVISION	SH

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

LAND BASED DOLPHIN MONITORING IN BASELINE AND CONSTRUCTION PHASES

Consultant's Signatures for Approval		Date
Design	JC	29OCT18
Checkers	JC / TK	29OCT18
Approver	EC	29OCT18

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

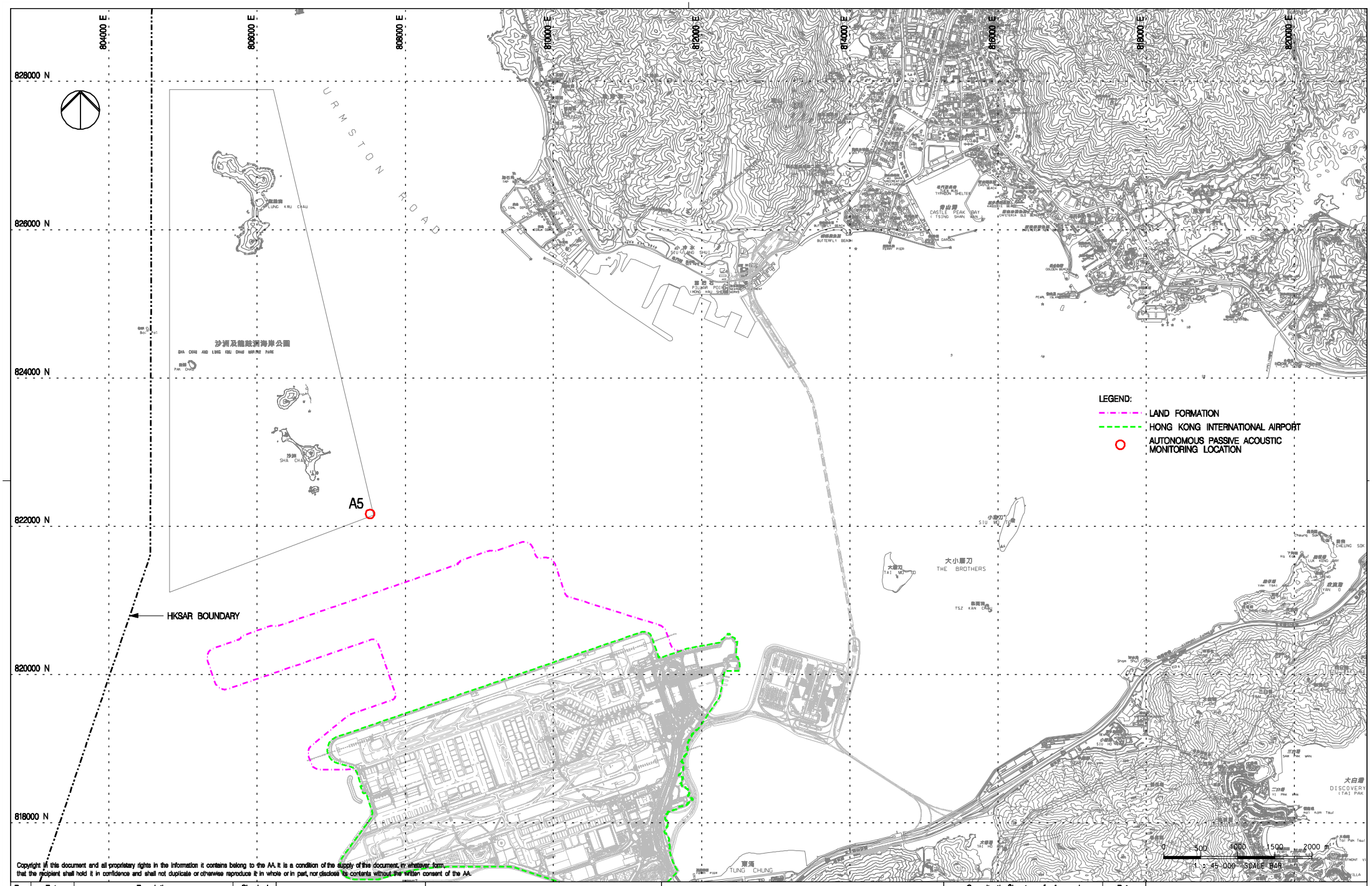
Drawing No.

FIGURE 2.4

Scale at A3: 1 : 45000

Rev. C

Filename: J:\355482\REPORT\ENV\EMA\181029\FIG 2.5.dgn



Rev.	Date	Description	Checked
A	29AUG17	FIRST ISSUE	JT
B	10OCT17	GENERAL REVISION	PL
C	29OCT18	GENERAL REVISION	SH

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

LOCATION FOR AUTONOMOUS PASSIVE ACOUSTIC MONITORING

Consultant's Signatures for Approval		Date
Design	JC	29OCT18
Checkers	JC / TK	29OCT18
Approver	EC	29OCT18

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

Drawing No.

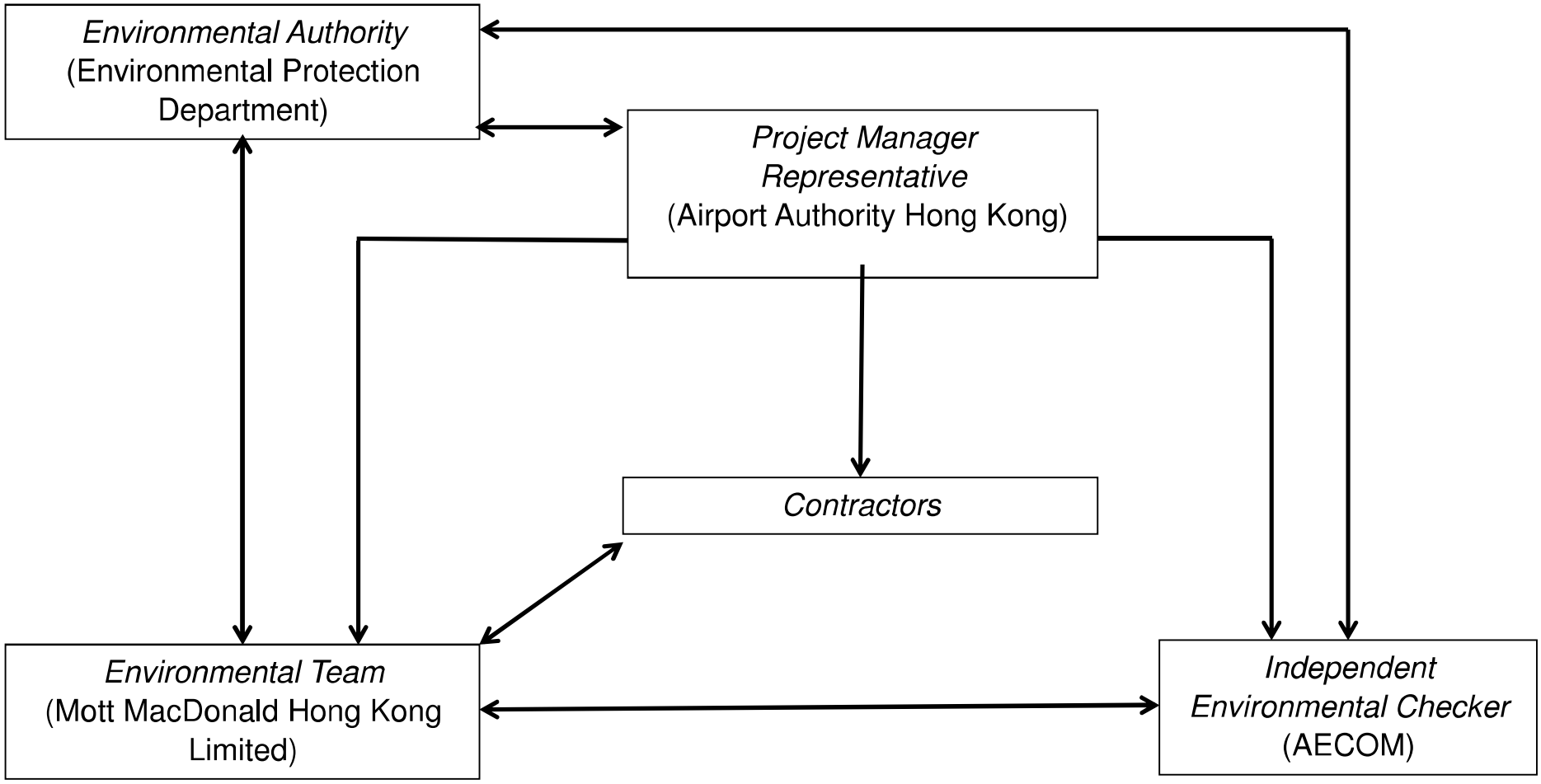
FIGURE 2.10

Scale at A3: 1 : 45000

Rev. C

Filename: J:\355482\REPORT\ENV\EMA\181029\FIG 2.11.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

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	I

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;		I
			▪ 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?^
			<u>Specific Measures to be Applied to Land Formation Activities prior to Commencement of Marine Filling Works</u> ▪ 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, I *(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
			<u>Specific Measures to be Applied to Land Formation Activities during Marine Filling Works</u> ▪ 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	I *(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.		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 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 at 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;		I
			▪ 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		I

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.		I
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;	Project Site Area / Construction Phase	I
			▪ 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;		I
			▪ All practical measures, including but not limited to speed control for vehicles, should be taken to minimise dust emission;		I
			▪ Good housekeeping should be maintained at all times at the sediment treatment facility and storage area;		I
			▪ Treated and untreated sediment should be clearly separated and stored separately; and		I
			▪ 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.		I
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.	I
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:

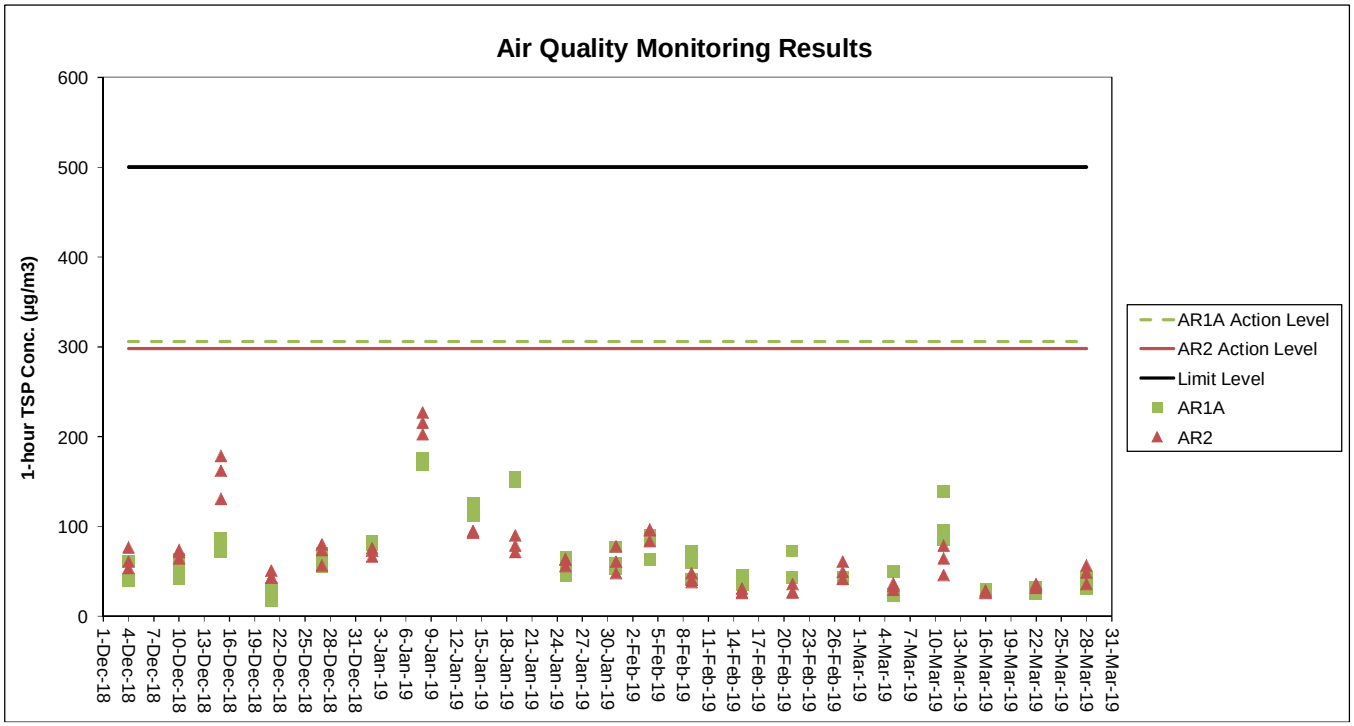
I= implemented where applicable;

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

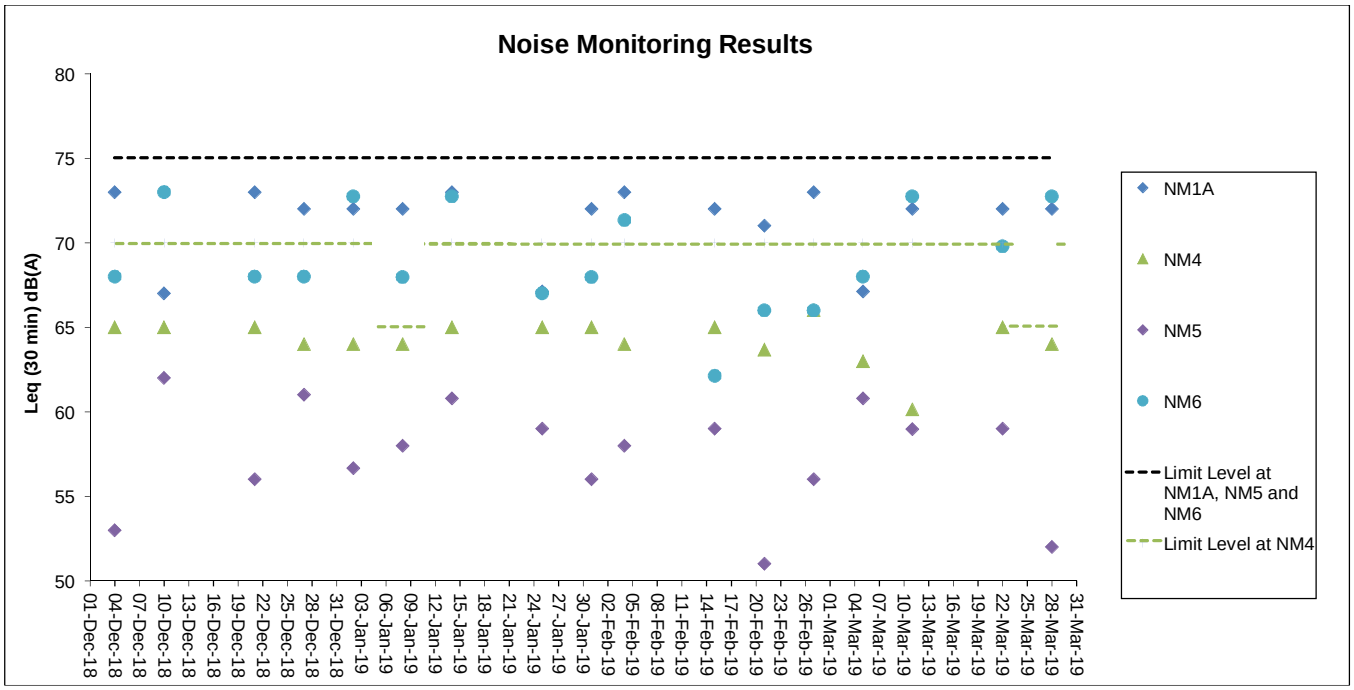
Air Quality Monitoring Results



Notes:

1. The key activities of the Project during monitoring included reclamation works and land-side works. Reclamation works included deep cement mixing (DCM) works, marine filling, and seawall construction. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for Automated People Mover (APM) and Baggage Handling System (BHS), and preparation work for utilities.
2. General weather condition during monitoring ranged from sunny to cloudy. Detailed meteorological conditions can be referred to Table 2.3 of this Report and corresponding Monthly EM&A Reports.
3. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

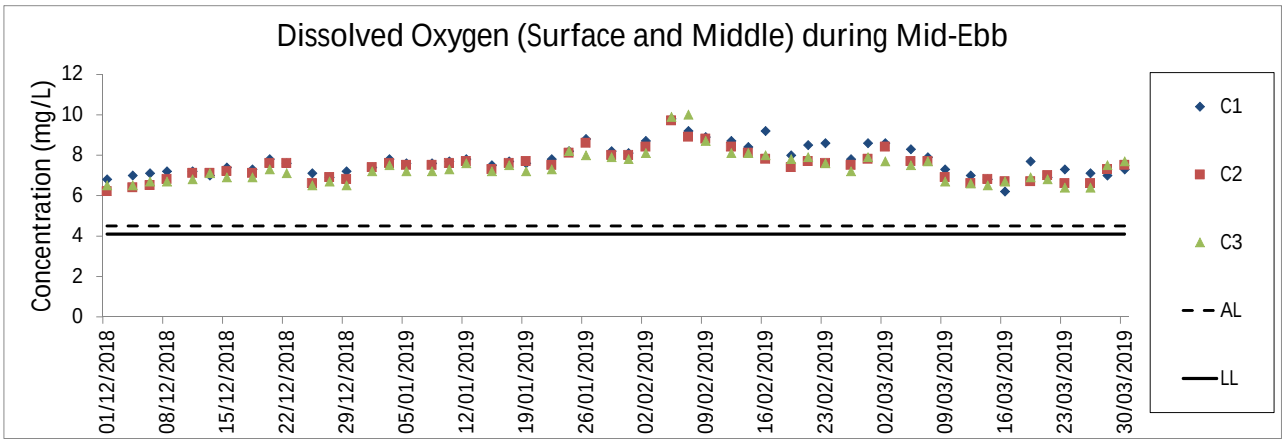
Noise Monitoring Results

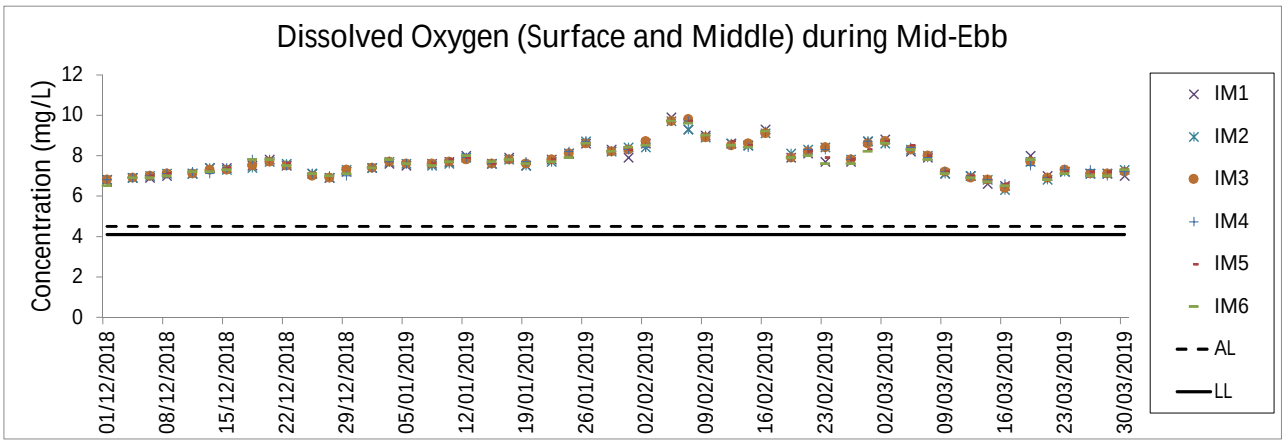


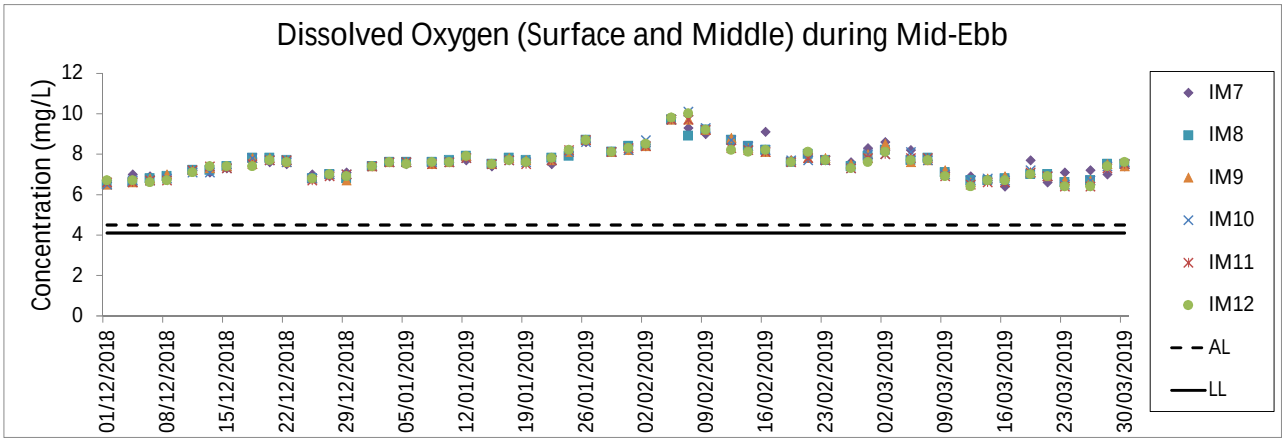
Notes:

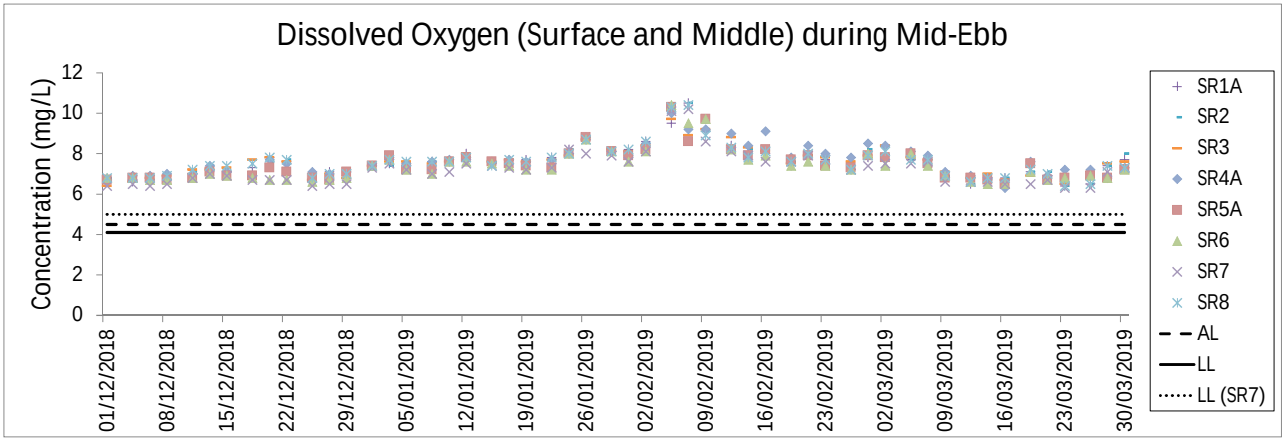
1. The Limit Level is reduced to 70dB(A) for school and 65dB(A) during school examination period at NM4. School examination periods in the reporting period were 4/1 to 10/1 and 22/3 to 29/3.
2. The key activities of the Project during monitoring included reclamation works and land-side works. Reclamation works included deep cement mixing (DCM) works, marine filling, and seawall construction. Land-side works involved mainly foundation and substructure work for Terminal 2 expansion, modification and tunnel work for Automated People Mover (APM) and Baggage Handling System (BHS), and preparation work for utilities.
3. General weather condition during monitoring ranged from sunny to cloudy. Detailed meteorological conditions can be referred to Table 2.6 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

Water Quality Monitoring Results



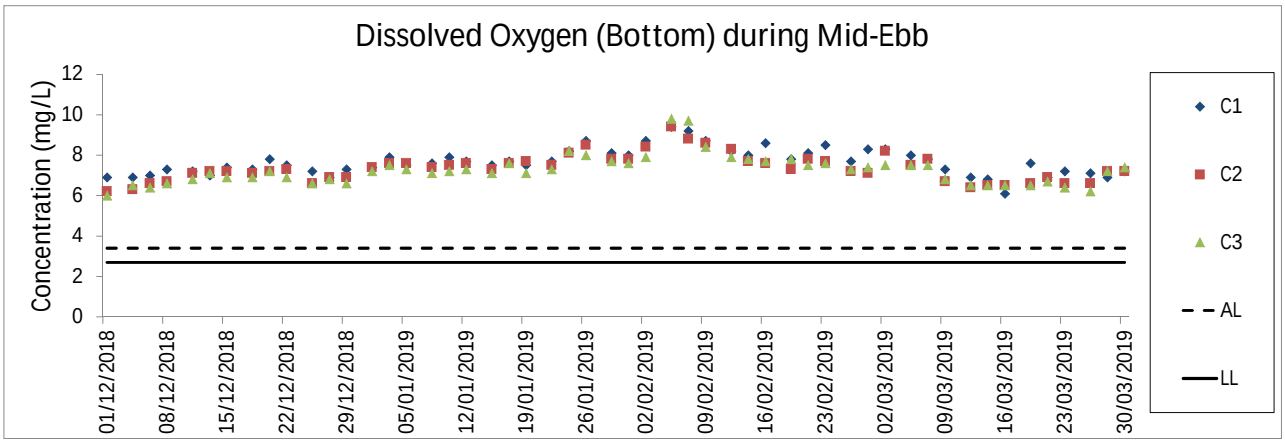


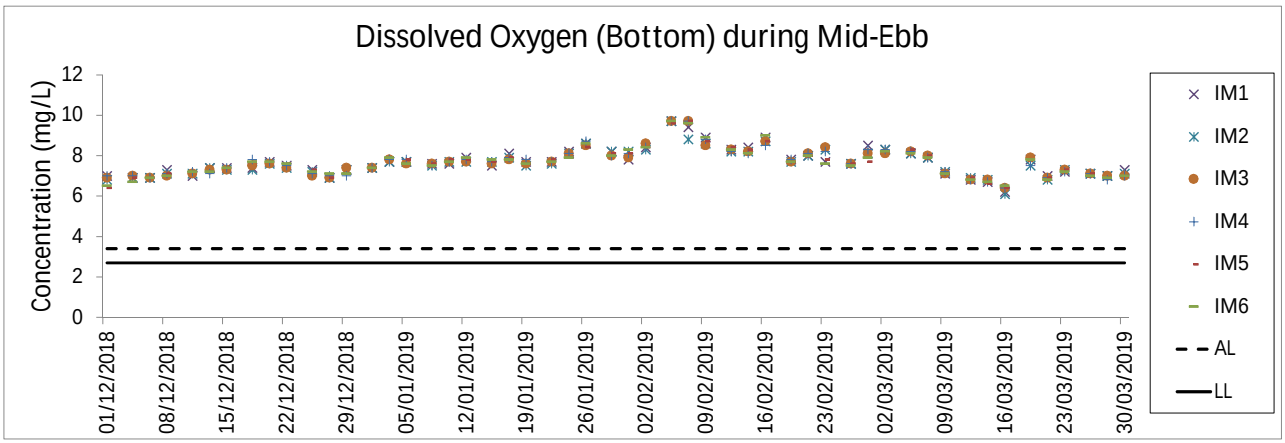


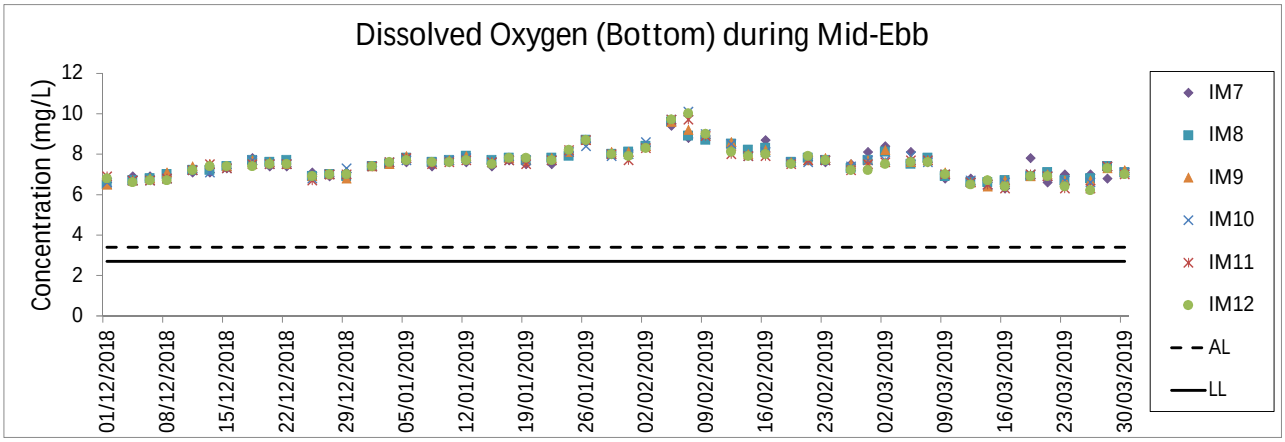


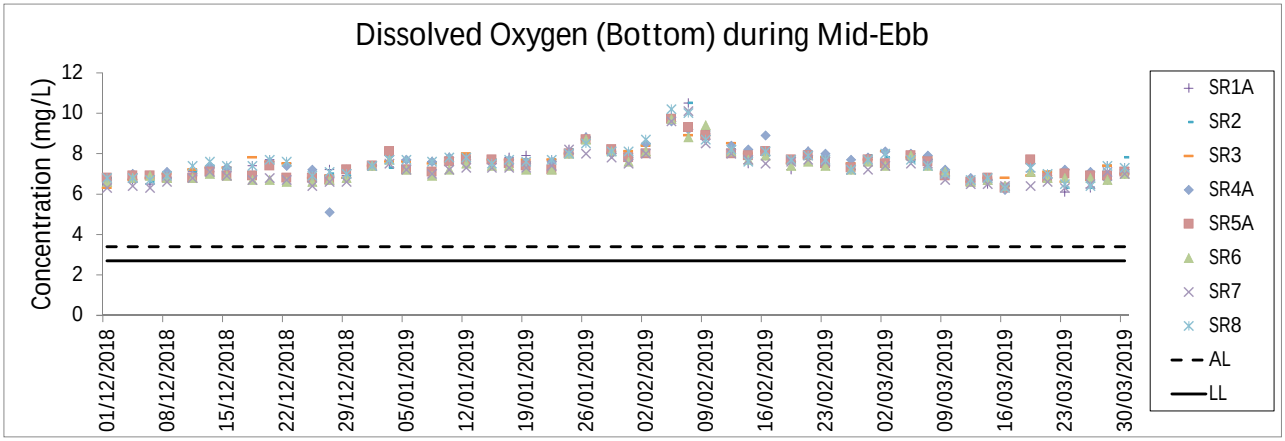
Notes:

1. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
2. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
3. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.



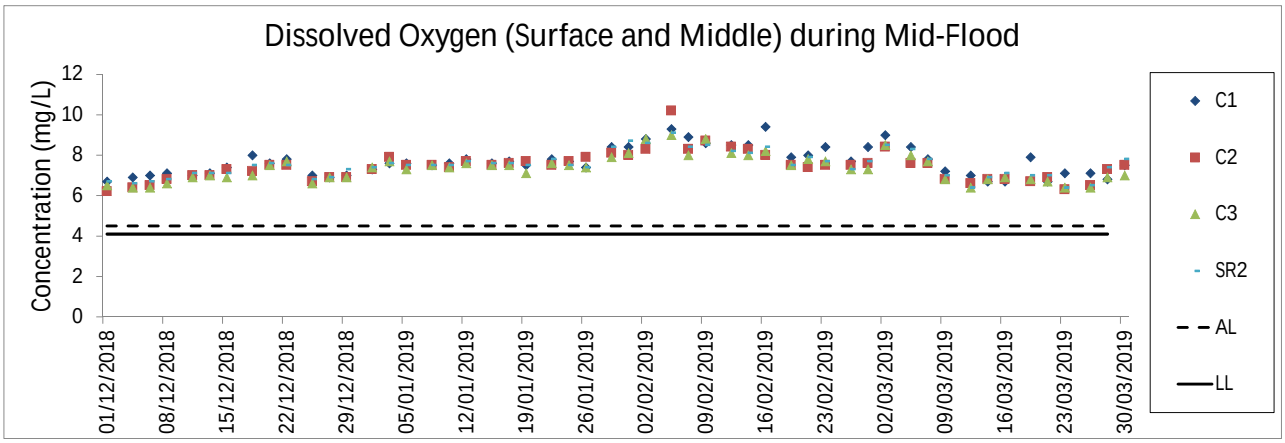


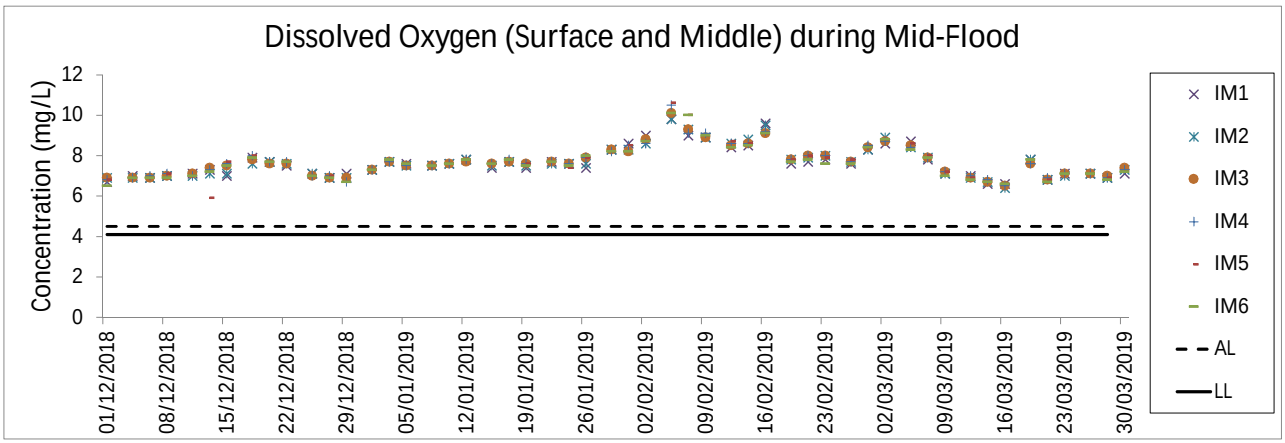


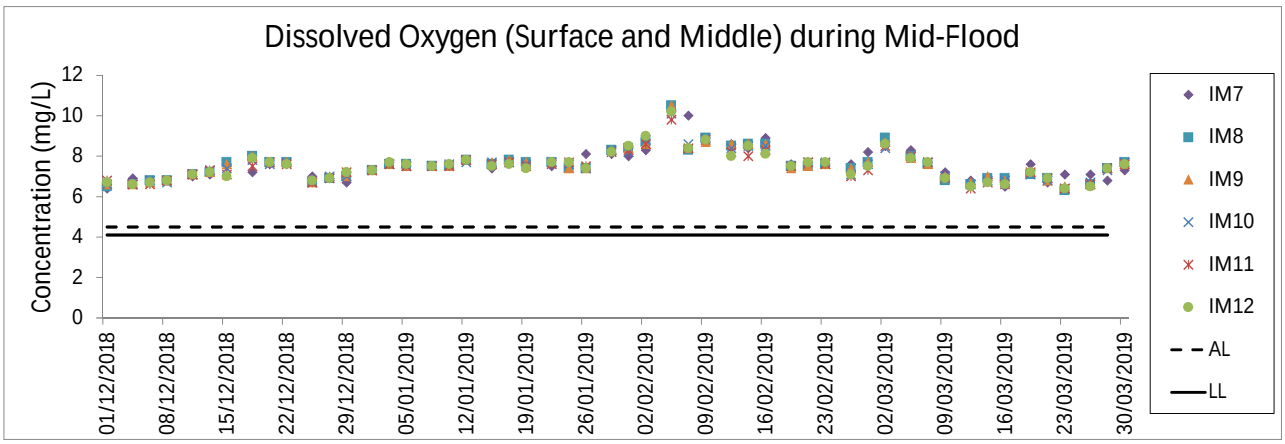


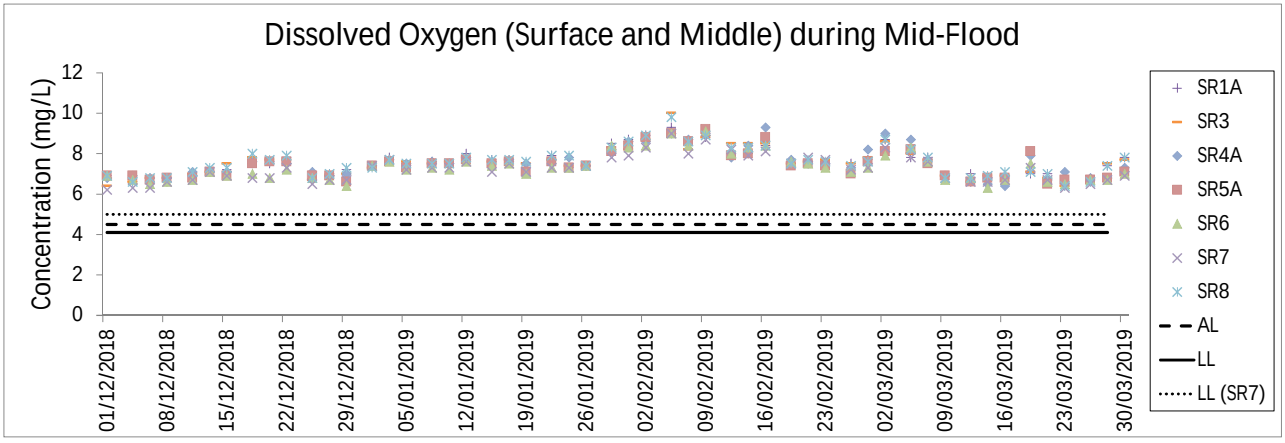
Notes:

1. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
2. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
3. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.



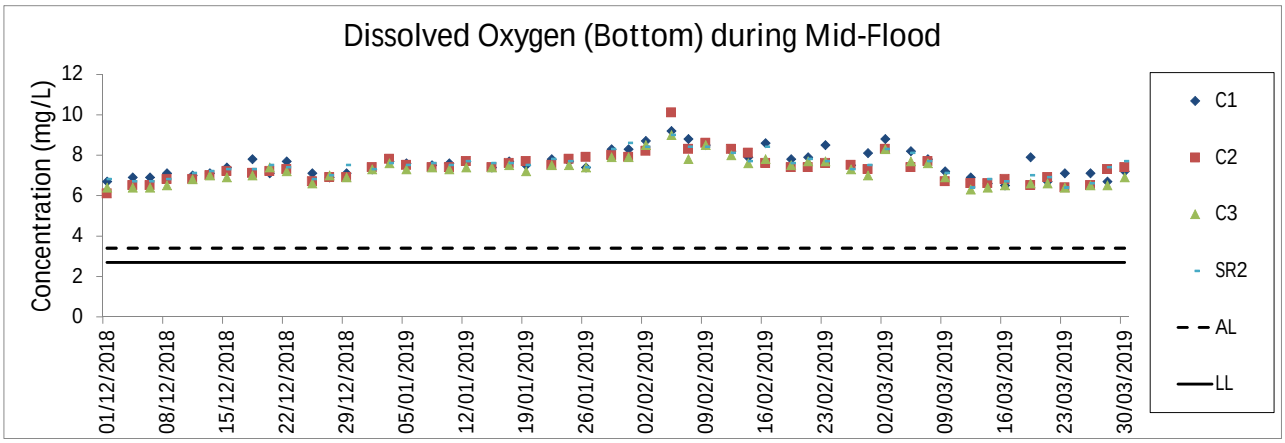


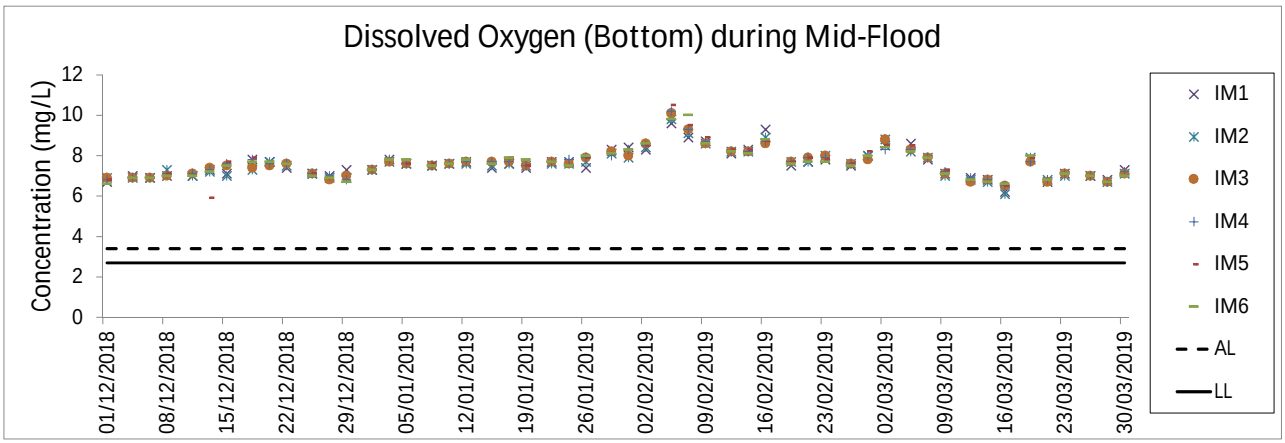


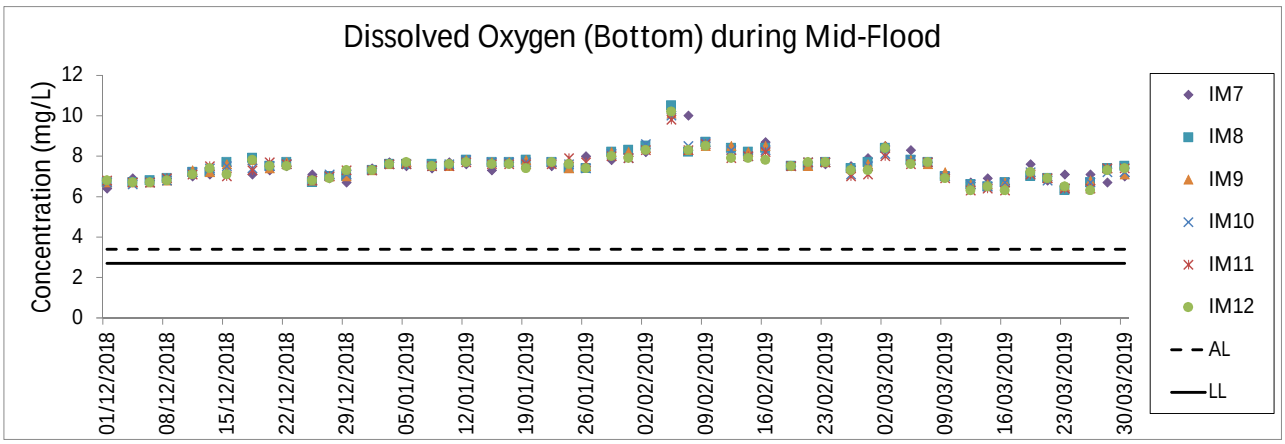


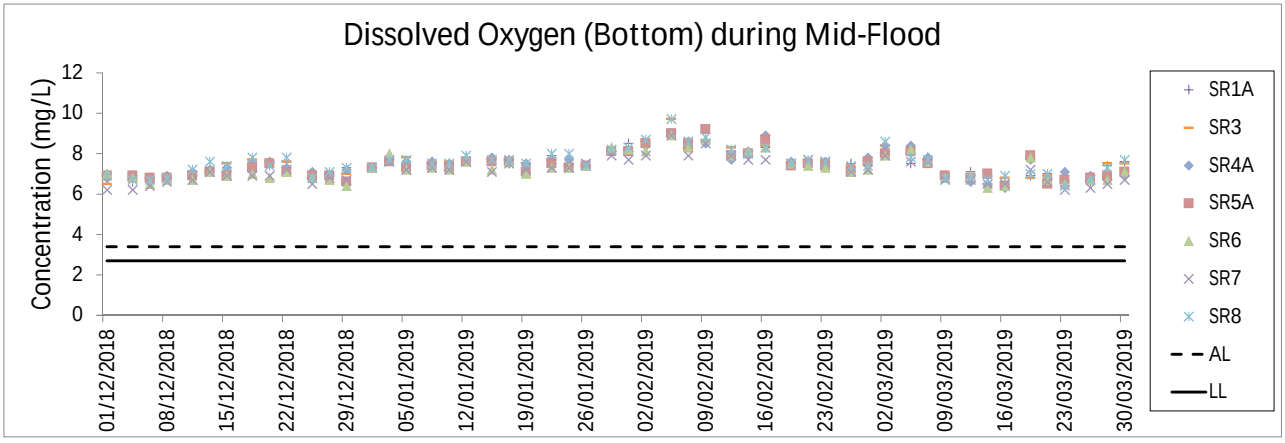
Notes:

1. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
2. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
3. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.



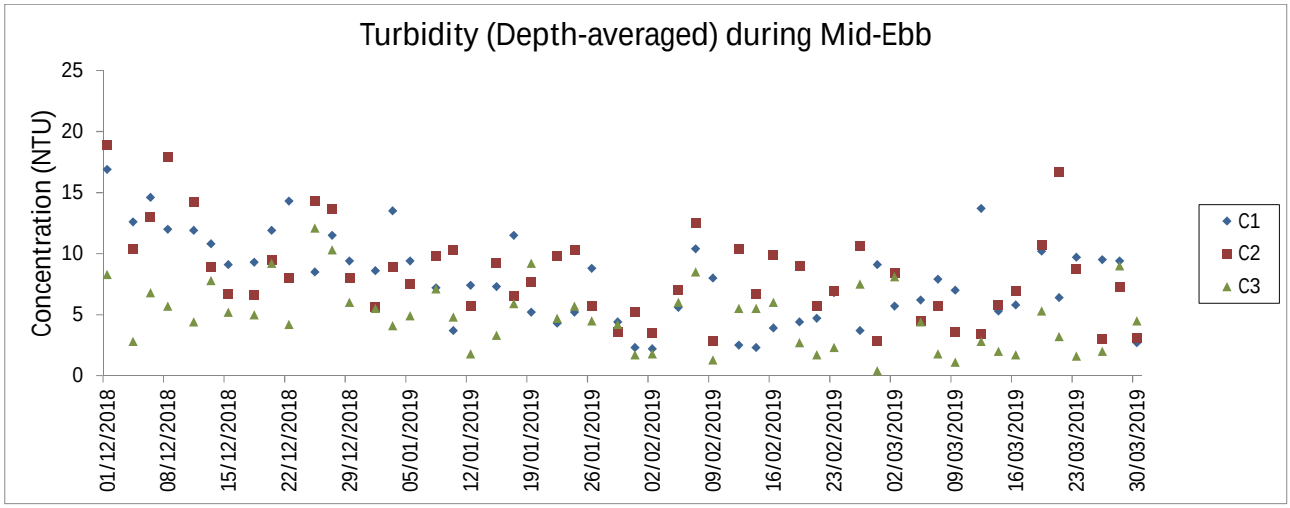


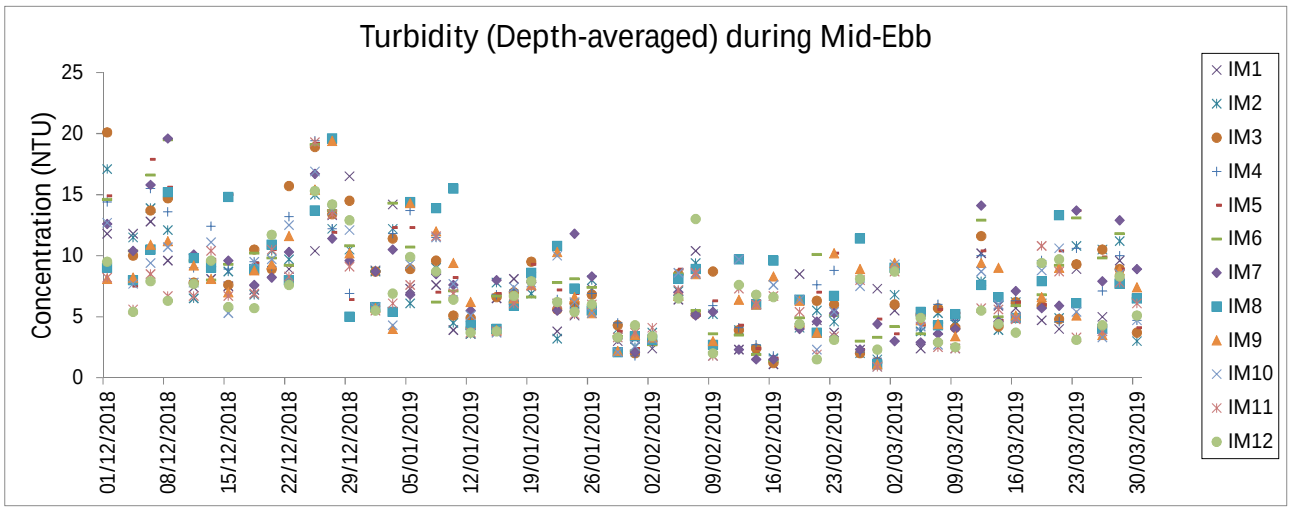


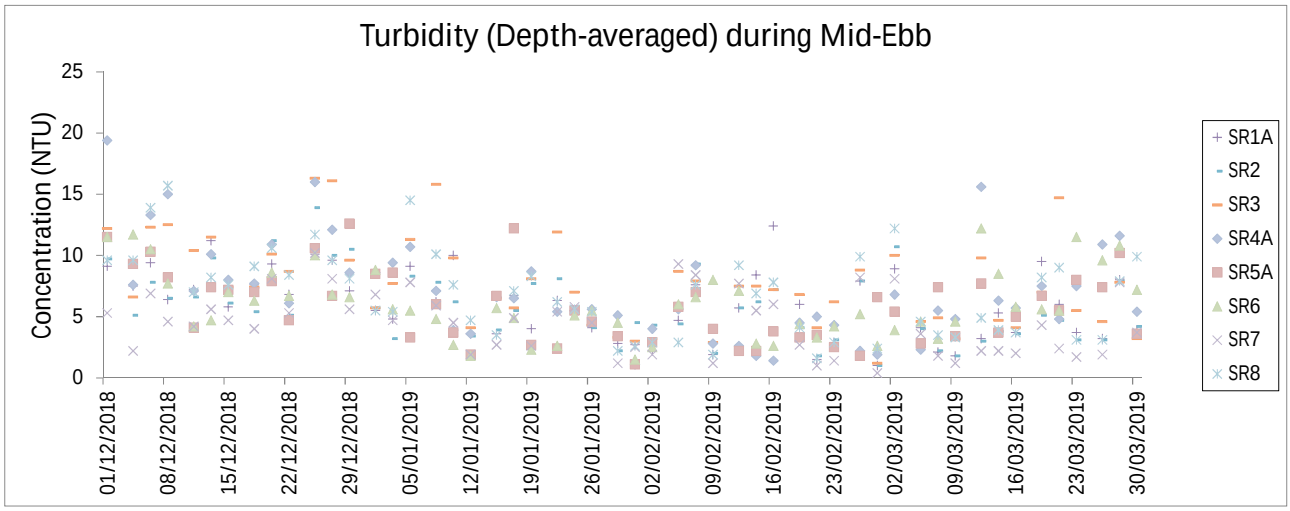


Notes:

1. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
2. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
3. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

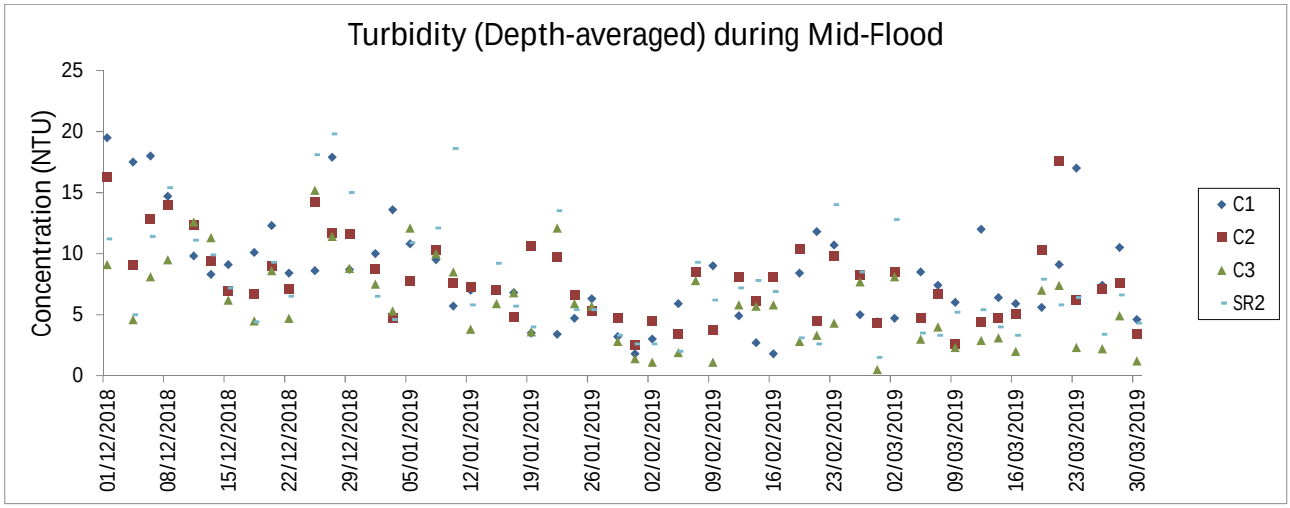


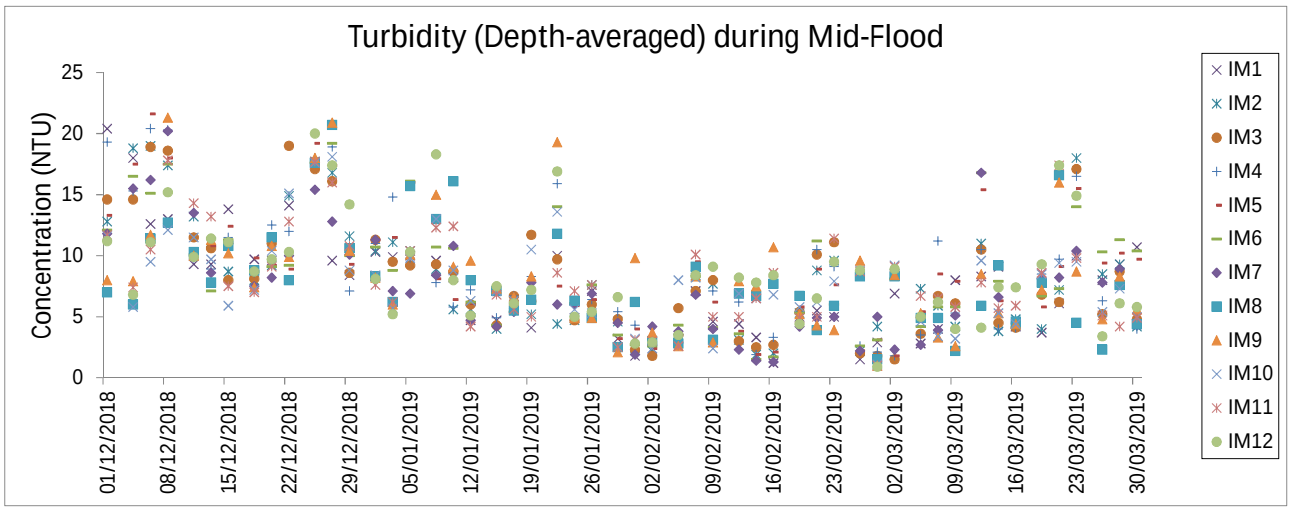


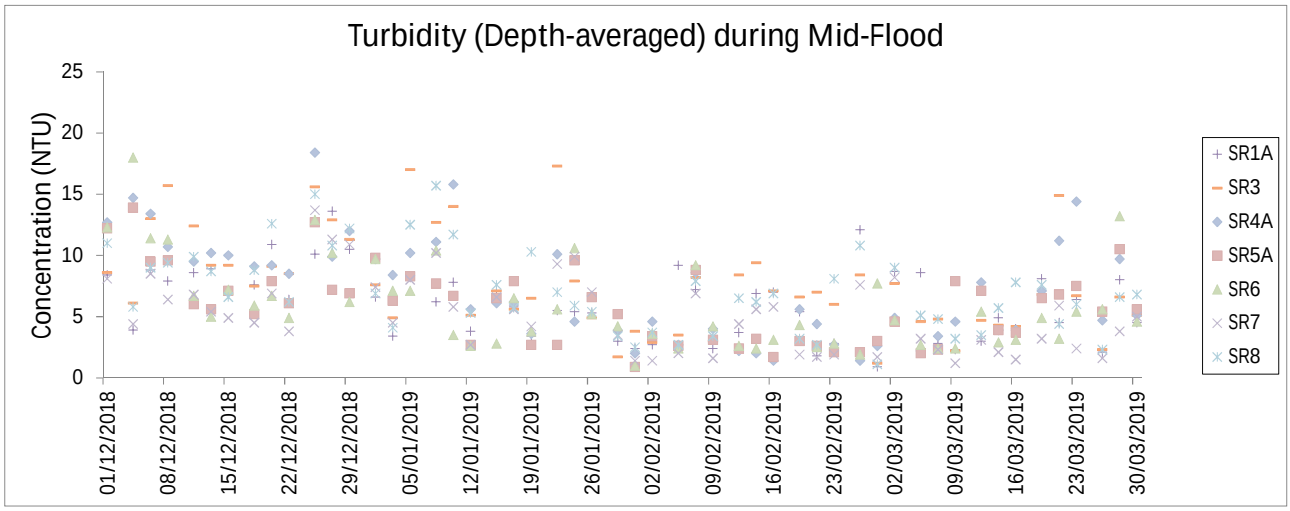


Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

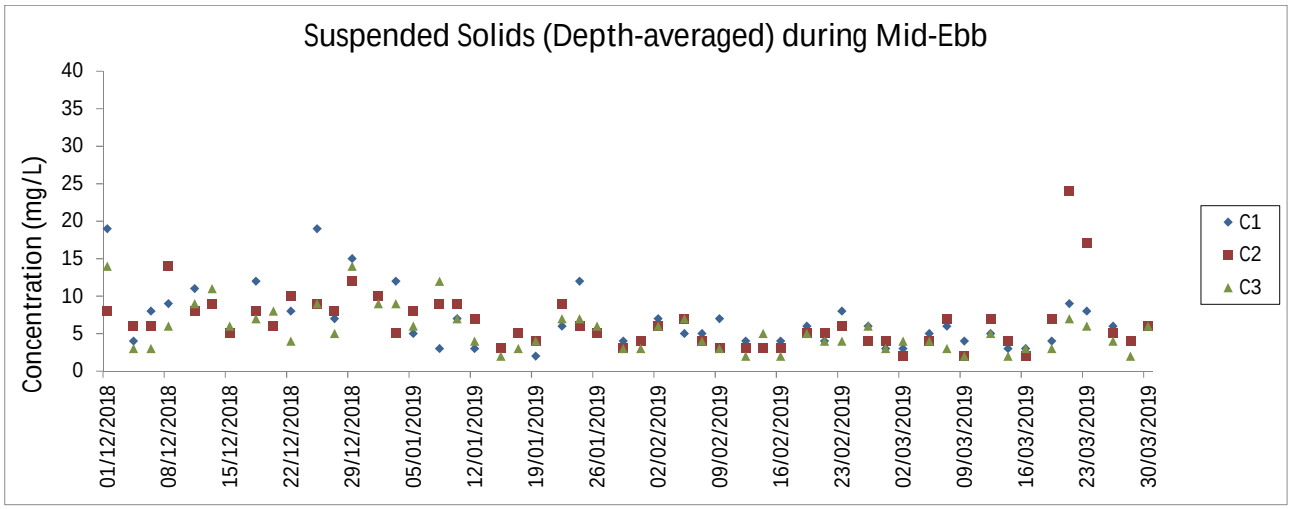


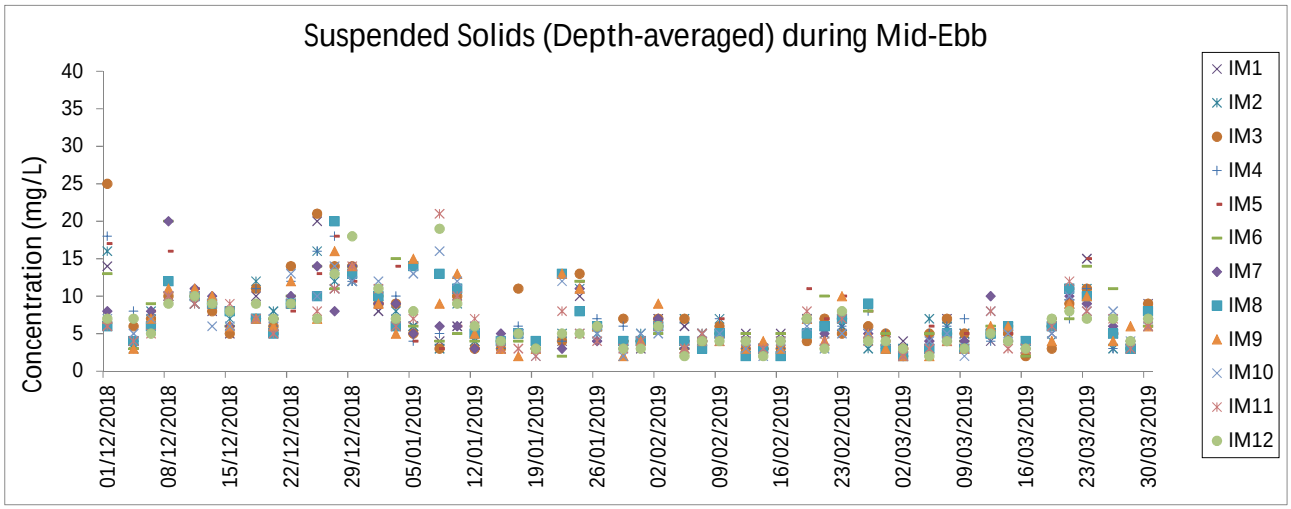


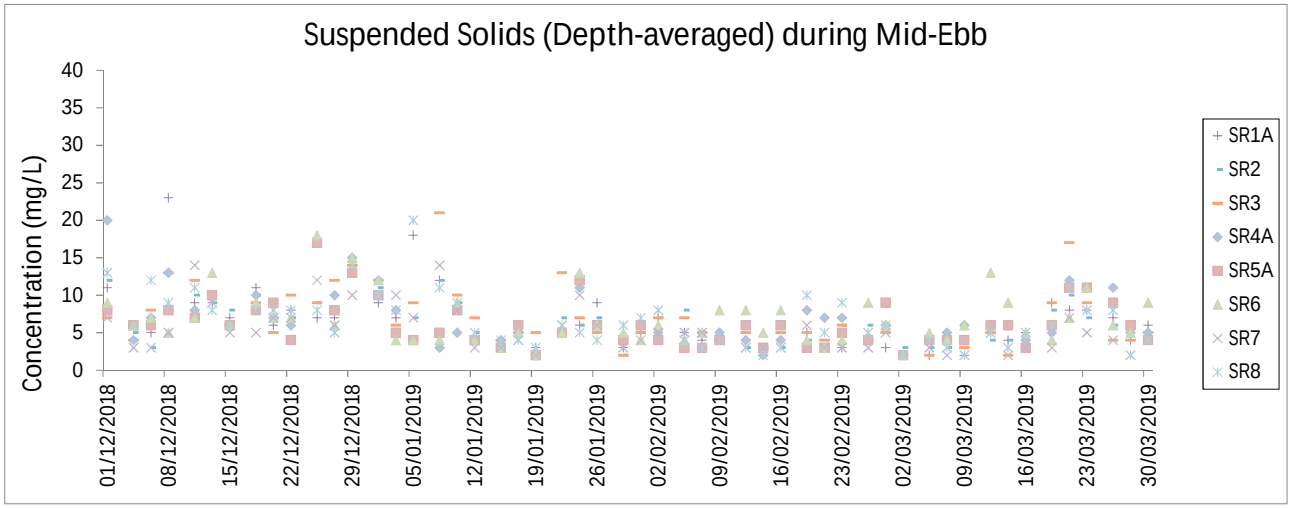


Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

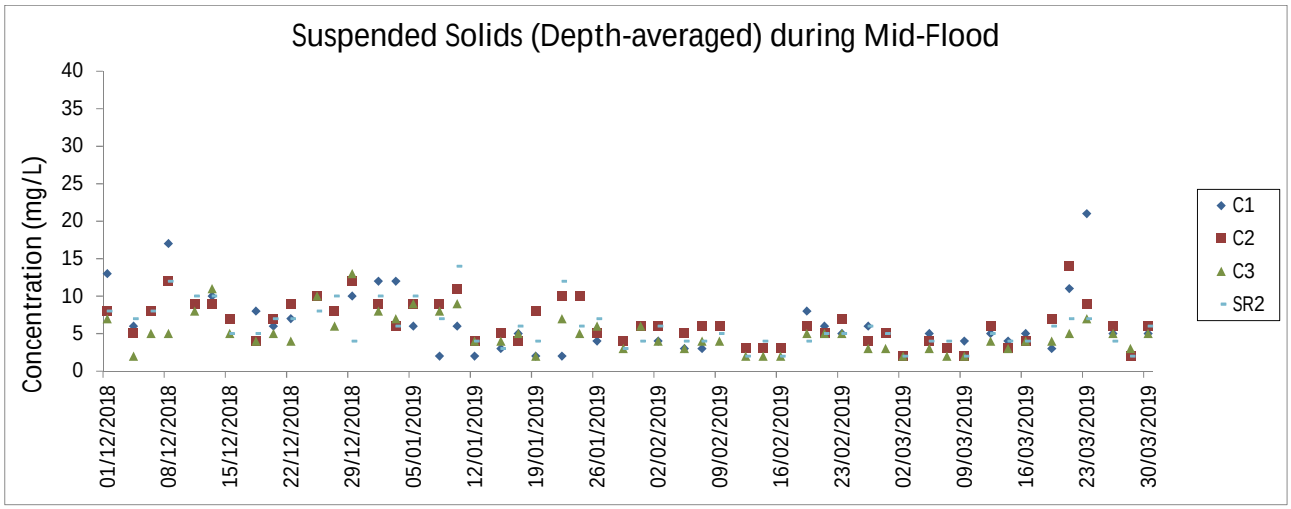


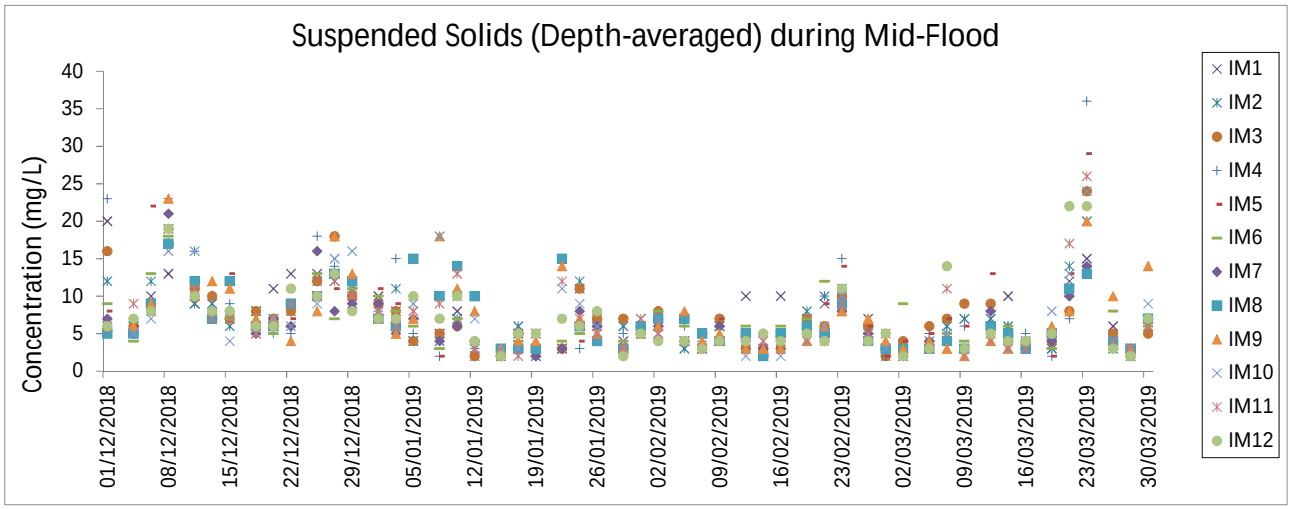


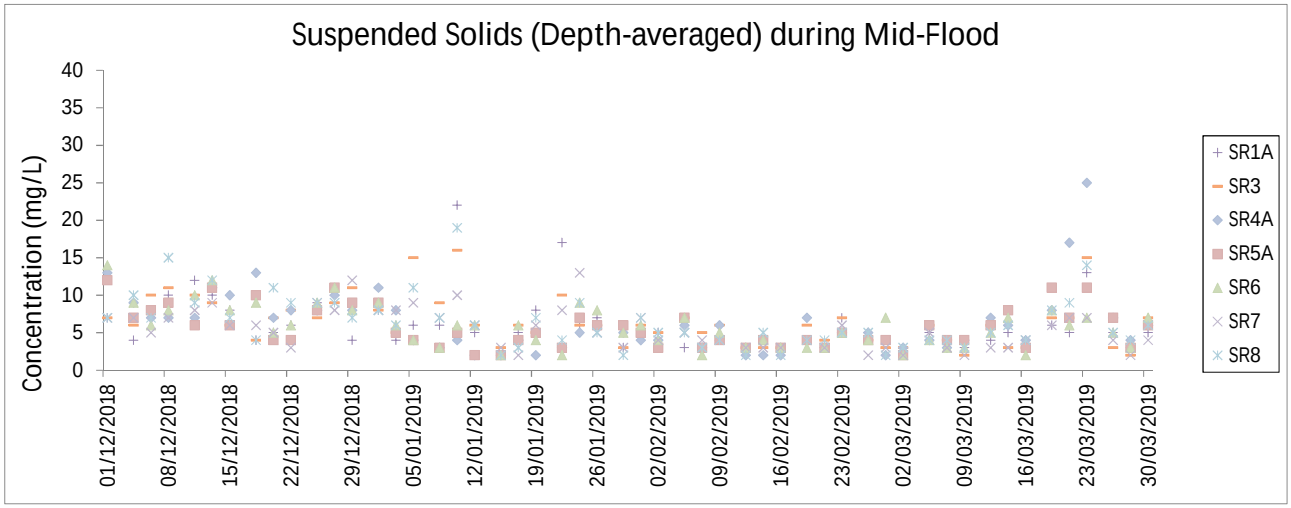


Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

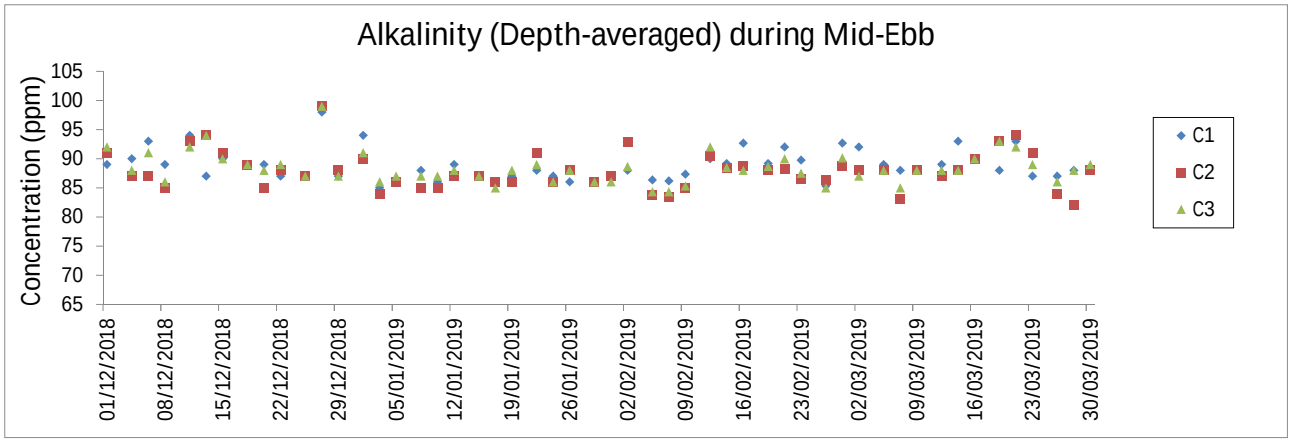


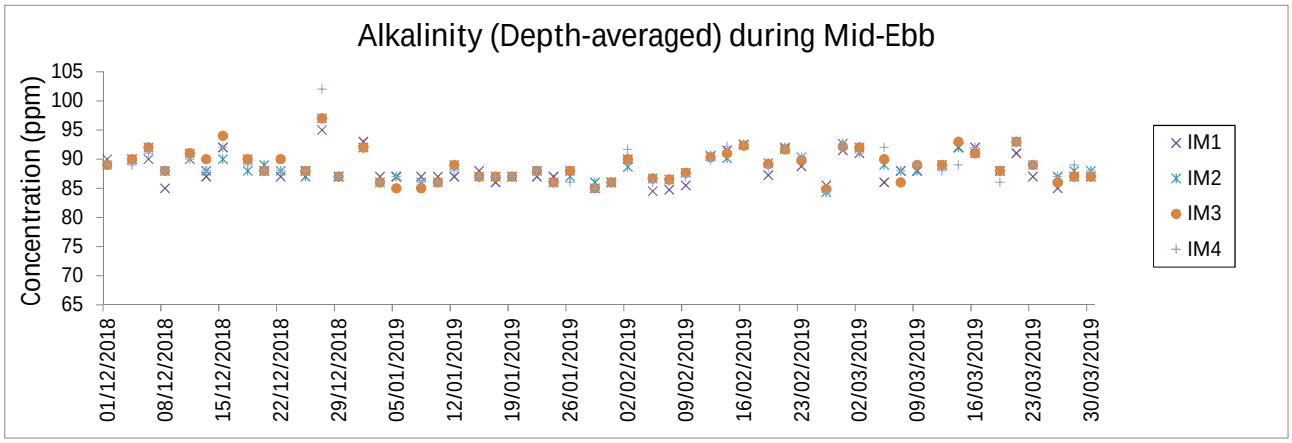


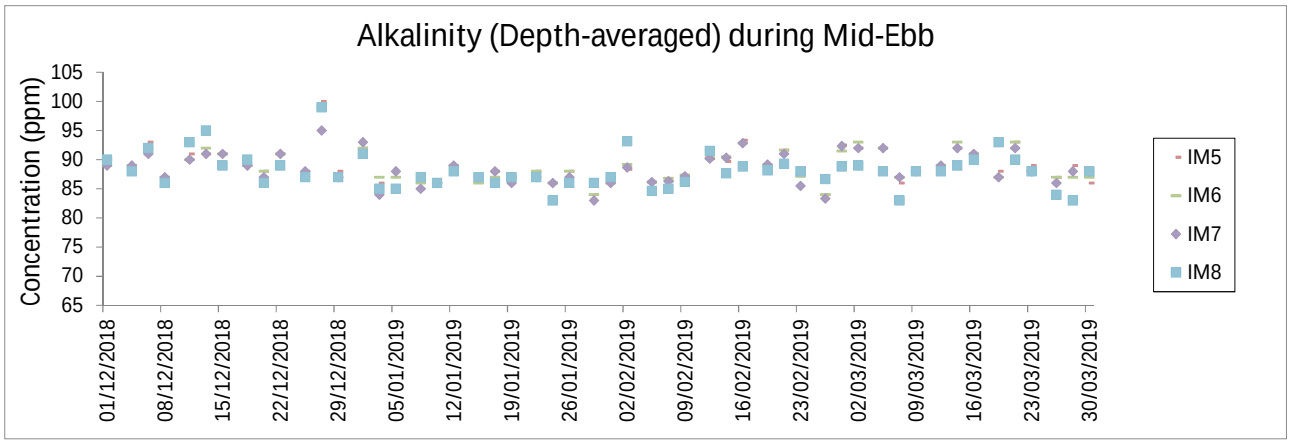


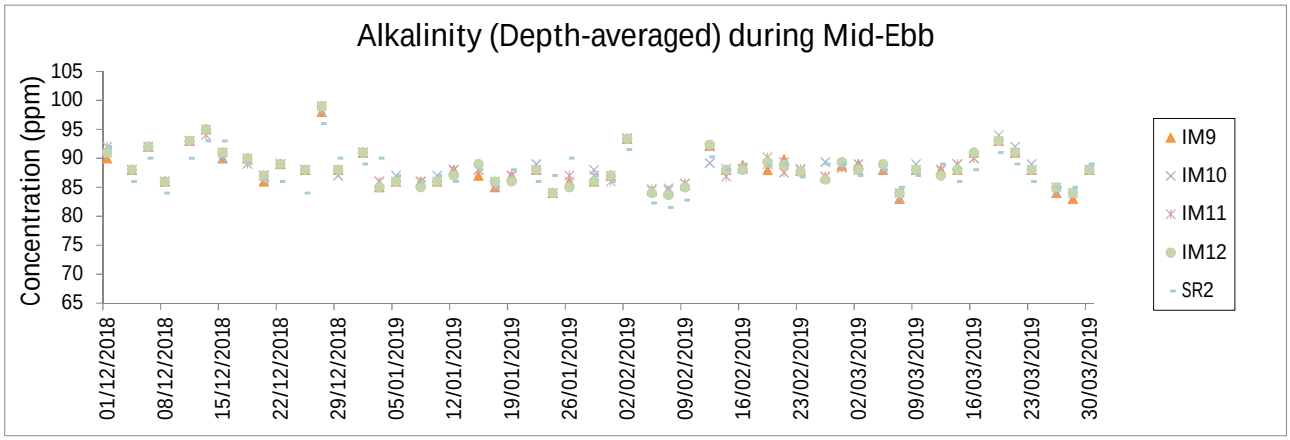
Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.



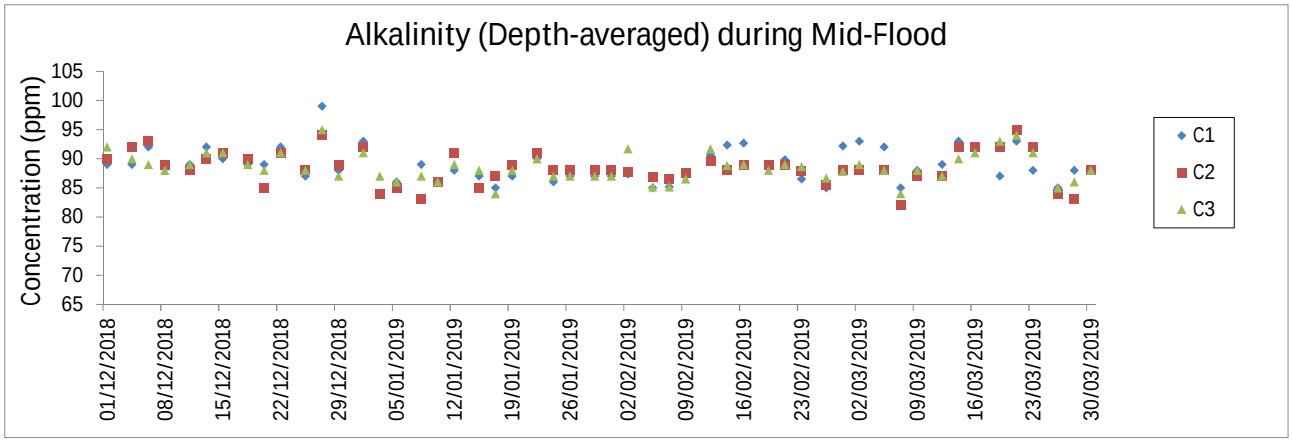


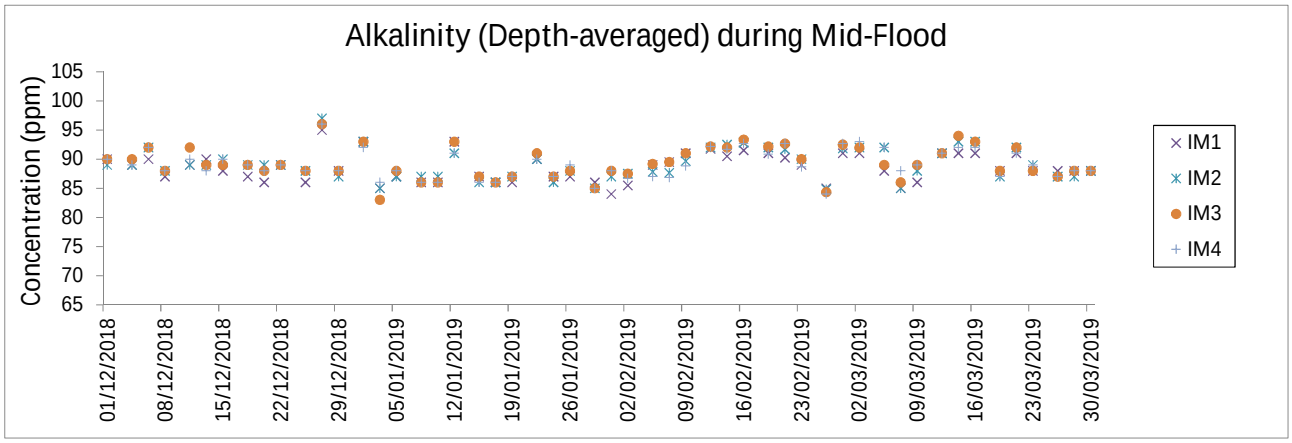


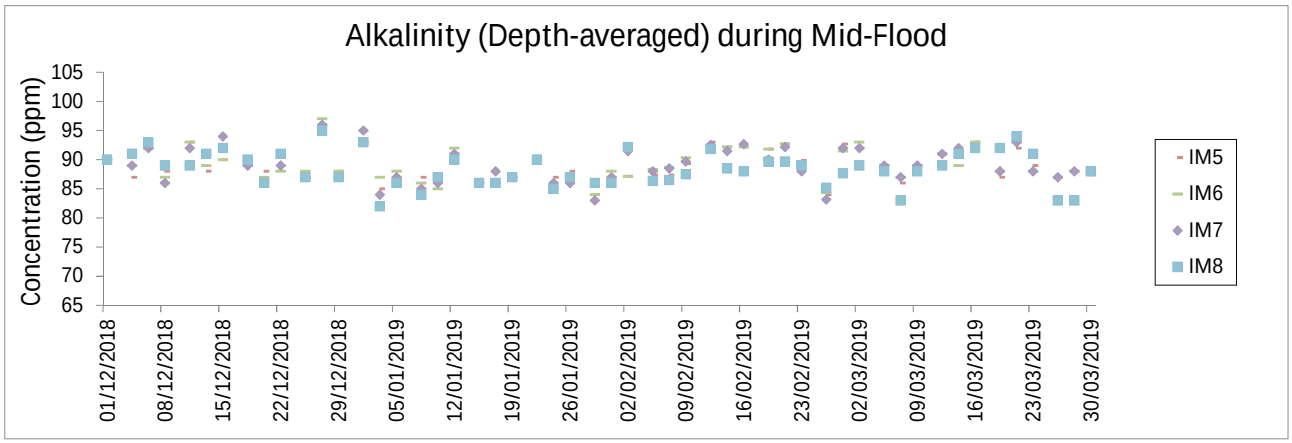


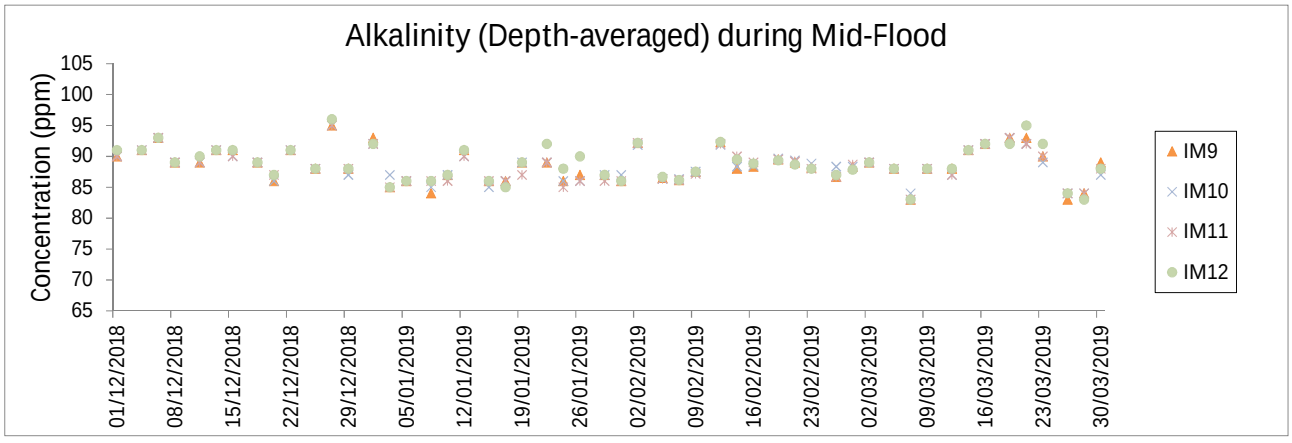
Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.



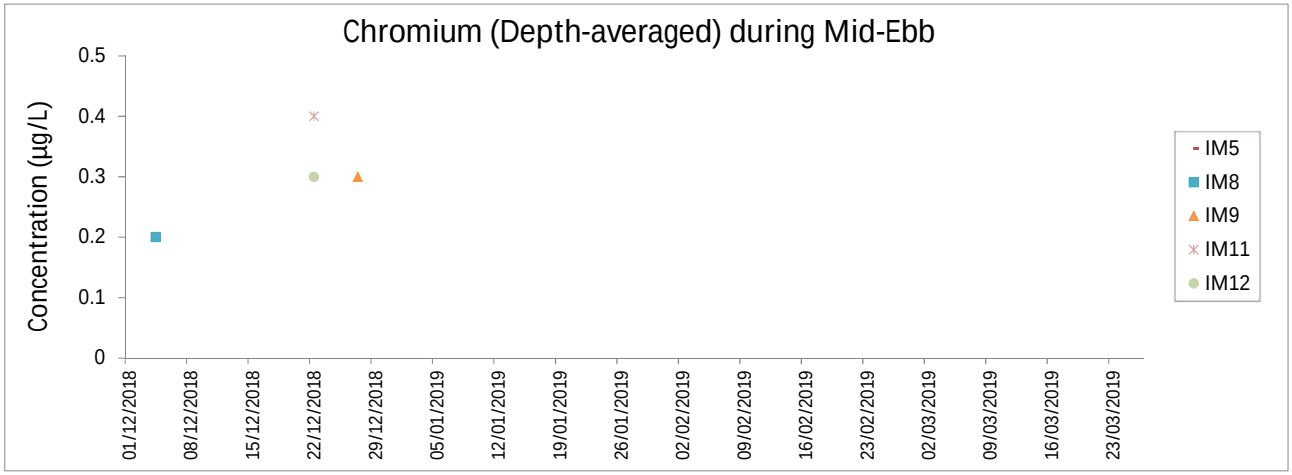






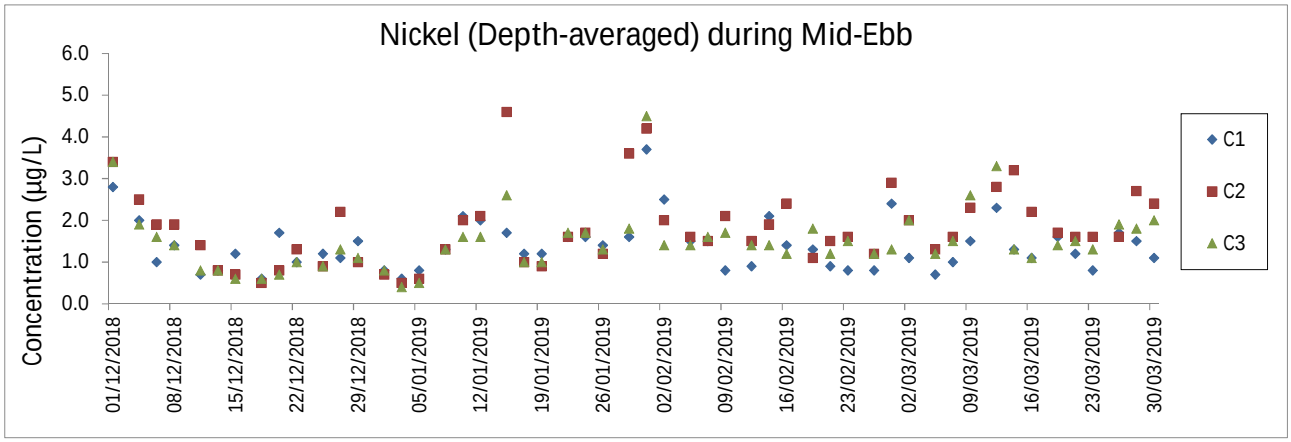
Notes:

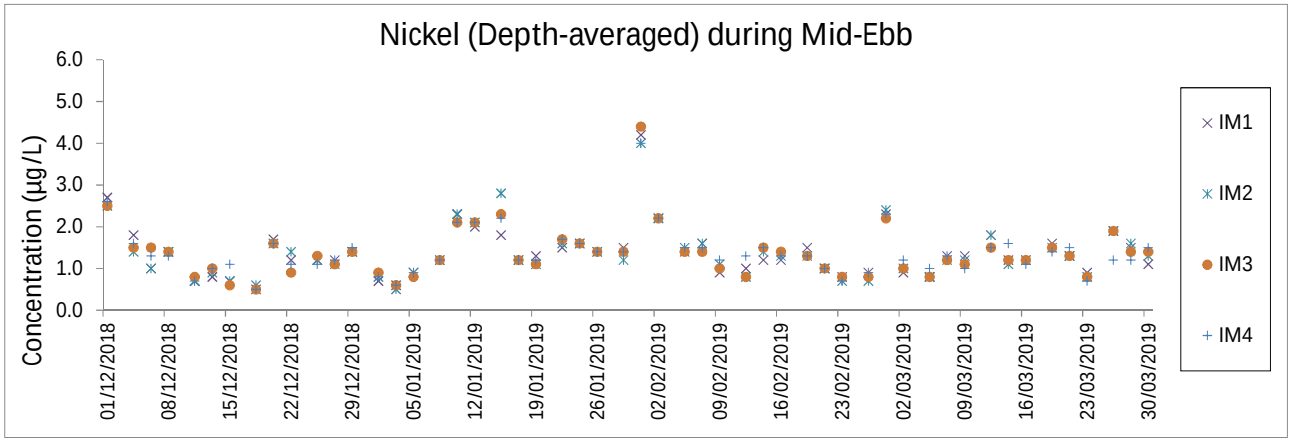
1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

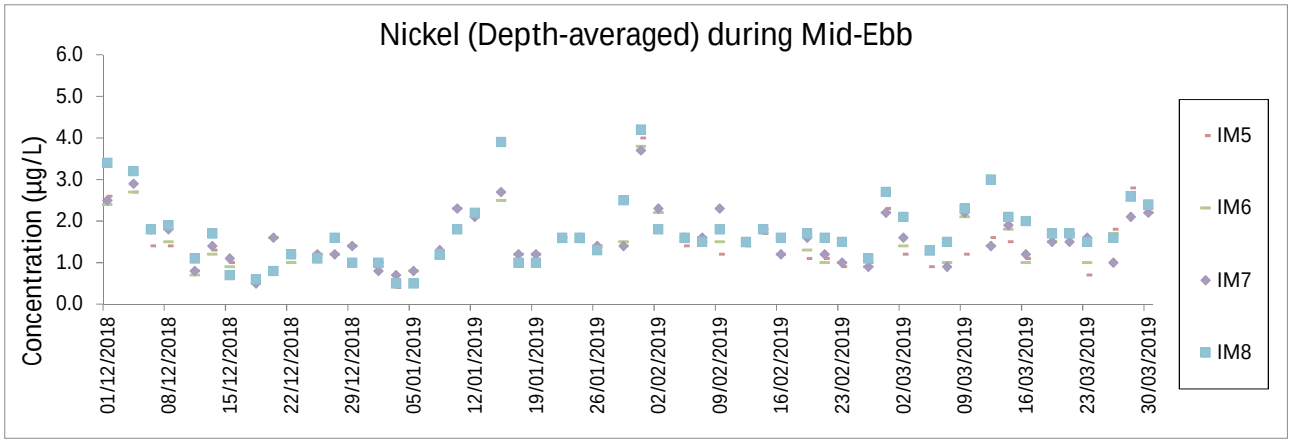


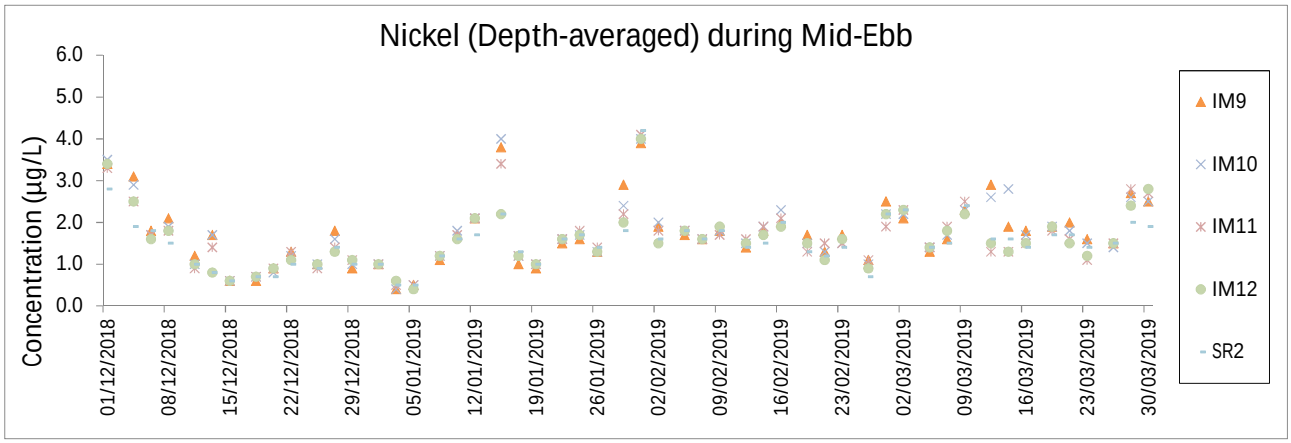
Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The monitoring results of chromium not presented above were below the reporting limit of 0.2 µg/L.
3. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
4. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
5. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.



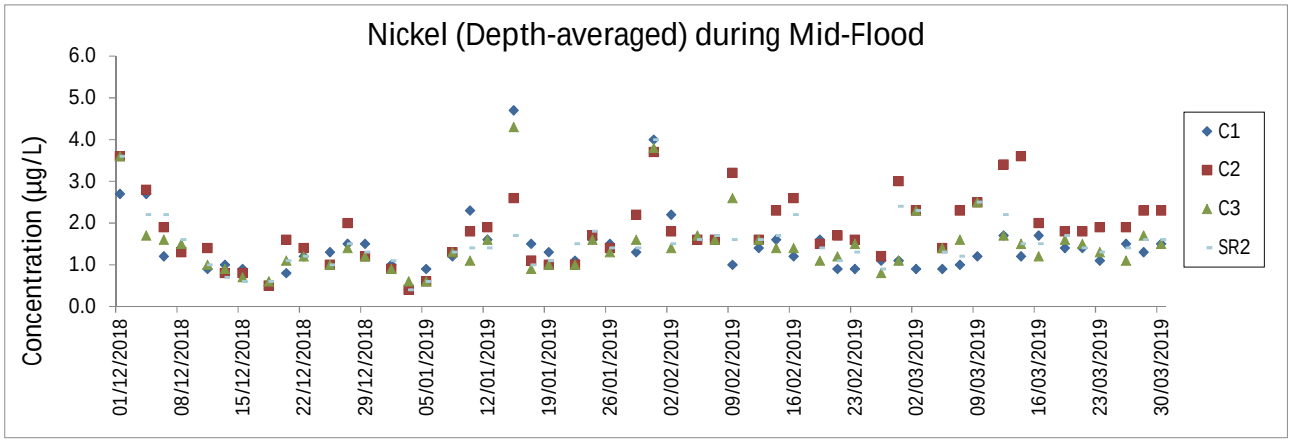


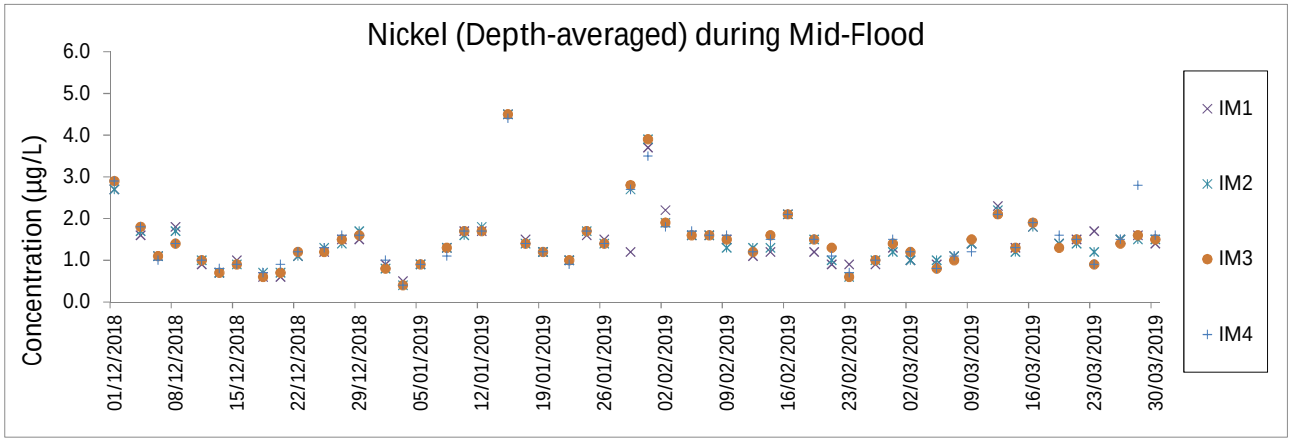


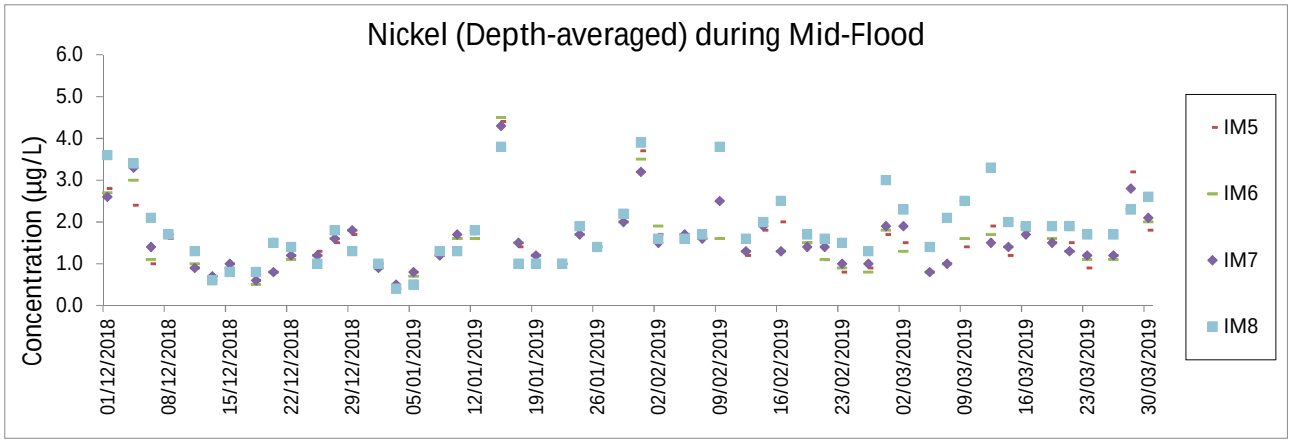


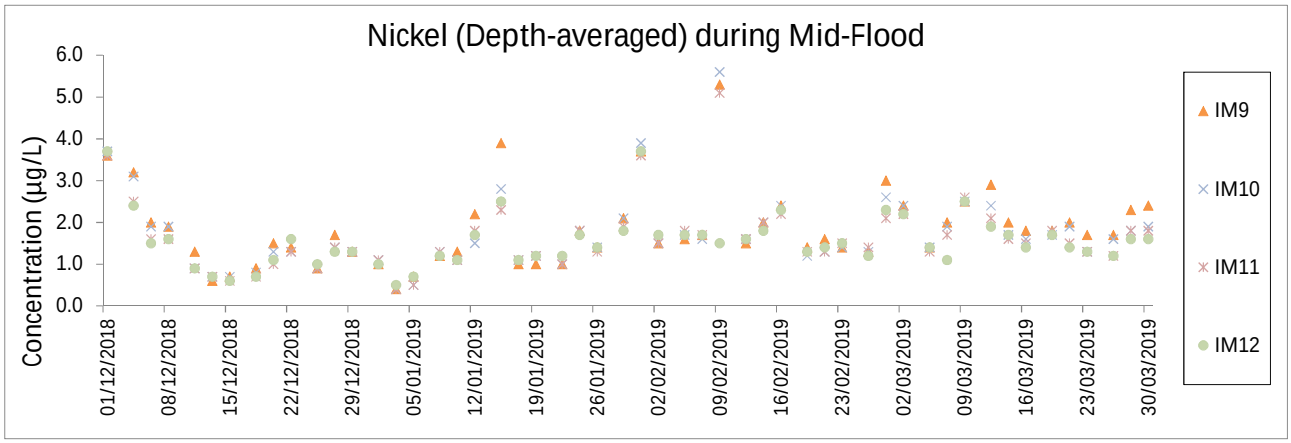
Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.









Notes:

1. The Action and Limit Levels can be referred to Table 2.8 of this Report.
2. The key marine works activities of the Project during monitoring included deep cement mixing (DCM) works, marine filling, and seawall construction.
3. General weather condition during monitoring ranged from sunny to rainy, with sea condition ranged from calm to rough. Detailed meteorological conditions can be referred to Table 2.11 of this Report and corresponding Monthly EM&A Reports.
4. QA/ QC requirements as stipulated in the EM&A Manual were carried out during measurement.

Chinese White Dolphin Monitoring Results

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

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE	P/S
7-Jan-19	NWL	2	20.930	WINTER	32166	3RS ET	P
7-Jan-19	NWL	3	43.070	WINTER	32166	3RS ET	P
7-Jan-19	NWL	2	4.300	WINTER	32166	3RS ET	S
7-Jan-19	NWL	3	7.100	WINTER	32166	3RS ET	S
8-Jan-19	NEL	2	34.190	WINTER	32166	3RS ET	P
8-Jan-19	NEL	3	3.500	WINTER	32166	3RS ET	P
8-Jan-19	NEL	2	10.310	WINTER	32166	3RS ET	S
15-Jan-19	AW	1	4.830	WINTER	32166	3RS ET	P
15-Jan-19	WL	1	1.210	WINTER	32166	3RS ET	P
15-Jan-19	WL	2	19.630	WINTER	32166	3RS ET	P
15-Jan-19	WL	2	11.260	WINTER	32166	3RS ET	S
16-Jan-19	NEL	2	20.580	WINTER	32166	3RS ET	P
16-Jan-19	NEL	3	16.890	WINTER	32166	3RS ET	P
16-Jan-19	NEL	2	7.160	WINTER	32166	3RS ET	S
16-Jan-19	NEL	3	3.170	WINTER	32166	3RS ET	S
17-Jan-19	NWL	3	63.630	WINTER	32166	3RS ET	P
17-Jan-19	NWL	2	0.900	WINTER	32166	3RS ET	S
17-Jan-19	NWL	3	10.670	WINTER	32166	3RS ET	S
21-Jan-19	SWL	2	1.230	WINTER	32166	3RS ET	P
21-Jan-19	SWL	3	32.659	WINTER	32166	3RS ET	P
21-Jan-19	SWL	4	21.736	WINTER	32166	3RS ET	P
21-Jan-19	SWL	3	8.780	WINTER	32166	3RS ET	S
21-Jan-19	SWL	4	5.765	WINTER	32166	3RS ET	S
22-Jan-19	SWL	2	15.148	WINTER	32166	3RS ET	P
22-Jan-19	SWL	3	25.163	WINTER	32166	3RS ET	P
22-Jan-19	SWL	4	19.730	WINTER	32166	3RS ET	P
22-Jan-19	SWL	2	2.289	WINTER	32166	3RS ET	S
22-Jan-19	SWL	3	3.160	WINTER	32166	3RS ET	S
22-Jan-19	SWL	4	4.930	WINTER	32166	3RS ET	S
24-Jan-19	WL	1	3.950	WINTER	32166	3RS ET	P
24-Jan-19	WL	2	1.670	WINTER	32166	3RS ET	P
24-Jan-19	WL	3	1.480	WINTER	32166	3RS ET	P
24-Jan-19	WL	1	2.240	WINTER	32166	3RS ET	S
24-Jan-19	WL	2	1.240	WINTER	32166	3RS ET	S
24-Jan-19	AW	1	4.480	WINTER	32166	3RS ET	P
28-Jan-19	WL	2	8.141	WINTER	32166	3RS ET	P
28-Jan-19	WL	3	2.710	WINTER	32166	3RS ET	P
28-Jan-19	WL	4	0.680	WINTER	32166	3RS ET	P
28-Jan-19	WL	2	4.949	WINTER	32166	3RS ET	S
28-Jan-19	WL	3	1.530	WINTER	32166	3RS ET	S
11-Feb-19	NWL	3	56.030	WINTER	32166	3RS ET	P
11-Feb-19	NWL	4	5.200	WINTER	32166	3RS ET	P
11-Feb-19	NWL	5	1.800	WINTER	32166	3RS ET	P
11-Feb-19	NWL	3	9.170	WINTER	32166	3RS ET	S
11-Feb-19	NWL	4	3.300	WINTER	32166	3RS ET	S

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE	P/S
12-Feb-19	NEL	1	24.190	WINTER	32166	3RS ET	P
12-Feb-19	NEL	2	12.260	WINTER	32166	3RS ET	P
12-Feb-19	NEL	3	1.200	WINTER	32166	3RS ET	P
12-Feb-19	NEL	1	6.760	WINTER	32166	3RS ET	S
12-Feb-19	NEL	2	2.690	WINTER	32166	3RS ET	S
13-Feb-19	AW	2	5.048	WINTER	32166	3RS ET	P
13-Feb-19	WL	1	1.980	WINTER	32166	3RS ET	P
13-Feb-19	WL	2	18.238	WINTER	32166	3RS ET	P
13-Feb-19	WL	1	1.410	WINTER	32166	3RS ET	S
13-Feb-19	WL	2	7.462	WINTER	32166	3RS ET	S
18-Feb-19	NEL	3	15.320	WINTER	32166	3RS ET	P
18-Feb-19	NEL	4	12.170	WINTER	32166	3RS ET	P
18-Feb-19	NEL	5	9.810	WINTER	32166	3RS ET	P
18-Feb-19	NEL	3	8.270	WINTER	32166	3RS ET	S
18-Feb-19	NEL	4	1.930	WINTER	32166	3RS ET	S
20-Feb-19	SWL	2	41.440	WINTER	32166	3RS ET	P
20-Feb-19	SWL	3	11.900	WINTER	32166	3RS ET	P
20-Feb-19	SWL	2	15.540	WINTER	32166	3RS ET	S
20-Feb-19	SWL	3	1.100	WINTER	32166	3RS ET	S
21-Feb-19	SWL	2	9.600	WINTER	32166	3RS ET	P
21-Feb-19	SWL	3	44.290	WINTER	32166	3RS ET	P
21-Feb-19	SWL	4	1.000	WINTER	32166	3RS ET	P
21-Feb-19	SWL	2	5.100	WINTER	32166	3RS ET	S
21-Feb-19	SWL	3	10.810	WINTER	32166	3RS ET	S
22-Feb-19	NWL	2	15.900	WINTER	32166	3RS ET	P
22-Feb-19	NWL	3	43.000	WINTER	32166	3RS ET	P
22-Feb-19	NWL	4	4.900	WINTER	32166	3RS ET	P
22-Feb-19	NWL	2	4.100	WINTER	32166	3RS ET	S
22-Feb-19	NWL	3	3.500	WINTER	32166	3RS ET	S
22-Feb-19	NWL	4	3.700	WINTER	32166	3RS ET	S
26-Feb-19	AW	3	2.920	WINTER	32166	3RS ET	P
26-Feb-19	AW	4	1.950	WINTER	32166	3RS ET	P
26-Feb-19	WL	2	5.060	WINTER	32166	3RS ET	P
26-Feb-19	WL	3	12.840	WINTER	32166	3RS ET	P
26-Feb-19	WL	4	2.280	WINTER	32166	3RS ET	P
26-Feb-19	WL	2	3.960	WINTER	32166	3RS ET	S
26-Feb-19	WL	3	6.840	WINTER	32166	3RS ET	S
6-Mar-19	NWL	2	7.760	SPRING	32166	3RS ET	P
6-Mar-19	NWL	3	45.090	SPRING	32166	3RS ET	P
6-Mar-19	NWL	4	9.860	SPRING	32166	3RS ET	P
6-Mar-19	NWL	2	2.390	SPRING	32166	3RS ET	S
6-Mar-19	NWL	3	9.400	SPRING	32166	3RS ET	S
8-Mar-19	NEL	2	7.210	SPRING	32166	3RS ET	P
8-Mar-19	NEL	3	15.470	SPRING	32166	3RS ET	P
8-Mar-19	NEL	4	14.300	SPRING	32166	3RS ET	P
8-Mar-19	NEL	2	1.100	SPRING	32166	3RS ET	S
8-Mar-19	NEL	3	9.020	SPRING	32166	3RS ET	S

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE	P/S
12-Mar-19	AW	2	4.790	SPRING	32166	3RS ET	P
12-Mar-19	WL	2	17.206	SPRING	32166	3RS ET	P
12-Mar-19	WL	3	1.200	SPRING	32166	3RS ET	P
12-Mar-19	WL	2	8.012	SPRING	32166	3RS ET	S
12-Mar-19	WL	3	0.890	SPRING	32166	3RS ET	S
13-Mar-19	NWL	2	25.190	SPRING	32166	3RS ET	P
13-Mar-19	NWL	3	37.650	SPRING	32166	3RS ET	P
13-Mar-19	NWL	2	9.060	SPRING	32166	3RS ET	S
13-Mar-19	NWL	3	2.600	SPRING	32166	3RS ET	S
15-Mar-19	NEL	2	22.660	SPRING	32166	3RS ET	P
15-Mar-19	NEL	3	15.030	SPRING	32166	3RS ET	P
15-Mar-19	NEL	2	8.010	SPRING	32166	3RS ET	S
15-Mar-19	NEL	3	1.700	SPRING	32166	3RS ET	S
21-Mar-19	SWL	1	6.680	SPRING	32166	3RS ET	P
21-Mar-19	SWL	2	49.790	SPRING	32166	3RS ET	P
21-Mar-19	SWL	3	4.000	SPRING	32166	3RS ET	P
21-Mar-19	SWL	2	9.960	SPRING	32166	3RS ET	S
22-Mar-19	SWL	1	3.850	SPRING	32166	3RS ET	P
22-Mar-19	SWL	2	56.301	SPRING	32166	3RS ET	P
22-Mar-19	SWL	2	9.689	SPRING	32166	3RS ET	S
25-Mar-19	AW	3	4.650	SPRING	32166	3RS ET	P
25-Mar-19	WL	2	3.400	SPRING	32166	3RS ET	P
25-Mar-19	WL	3	12.070	SPRING	32166	3RS ET	P
25-Mar-19	WL	4	4.800	SPRING	32166	3RS ET	P
25-Mar-19	WL	2	4.640	SPRING	32166	3RS ET	S
25-Mar-19	WL	3	6.190	SPRING	32166	3RS ET	S

CWD Small Vessel Line-transect Survey — Sighting Data

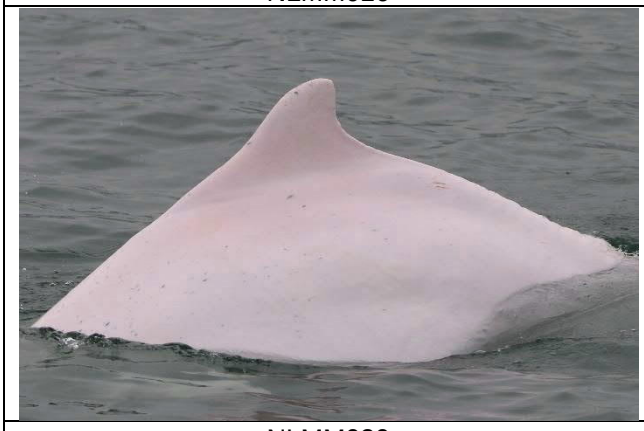
DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.	P/S
17-Jan-19	1	1055	CWD	2	NWL	3	8	ON	3RS ET	22.3081	113.8727	WINTER	NONE	S
21-Jan-19	1	1057	FP	3	SWL	3	20	ON	3RS ET	22.1425	113.9280	WINTER	NONE	S
21-Jan-19	2	1449	CWD	5	SWL	3	327	ON	3RS ET	22.1796	113.8591	WINTER	NONE	P
22-Jan-19	1	1036	FP	4	SWL	3	115	ON	3RS ET	22.1850	113.9360	WINTER	NONE	P
22-Jan-19	2	1100	FP	1	SWL	2	88	ON	3RS ET	22.1483	113.9341	WINTER	NONE	S
22-Jan-19	3	1230	FP	1	SWL	3	8	ON	3RS ET	22.1705	113.9084	WINTER	NONE	P
22-Jan-19	4	1519	CWD	8	SWL	4	105	ON	3RS ET	22.1928	113.8499	WINTER	NONE	P
24-Jan-19	1	0942	CWD	4	AW	1	87	ON	3RS ET	22.3014	113.8843	WINTER	NONE	P
24-Jan-19	2	1044	CWD	1	WL	1	110	ON	3RS ET	22.2778	113.8578	WINTER	NONE	P
24-Jan-19	3	1054	CWD	1	WL	1	161	ON	3RS ET	22.2778	113.8524	WINTER	NONE	P
24-Jan-19	4	1106	CWD	4	WL	1	325	ON	3RS ET	22.2691	113.8467	WINTER	NONE	P
24-Jan-19	5	1131	CWD	2	WL	1	91	ON	3RS ET	22.2617	113.8554	WINTER	NONE	S
24-Jan-19	6	1152	CWD	1	WL	2	97	ON	3RS ET	22.2505	113.8375	WINTER	NONE	P
28-Jan-19	1	1002	CWD	2	WL	2	24	ON	3RS ET	22.2359	113.8254	WINTER	NONE	S
28-Jan-19	2	1052	CWD	1	WL	2	336	ON	3RS ET	22.2145	113.8270	WINTER	NONE	P
11-Feb-19	1	1153	CWD	2	NWL	3	1	ON	3RS ET	22.4017	113.8877	WINTER	NONE	P
13-Feb-19	1	0941	CWD	6	AW	2	77	ON	3RS ET	22.2907	113.8745	WINTER	NONE	P
13-Feb-19	2	1042	CWD	2	WL	2	114	ON	3RS ET	22.2690	113.8480	WINTER	NONE	P
13-Feb-19	3	1203	CWD	1	WL	2	1	ON	3RS ET	22.2074	113.8406	WINTER	GILLNETTER	S
20-Feb-19	1	1033	FP	2	SWL	2	7	ON	3RS ET	22.2022	113.9362	WINTER	NONE	P
20-Feb-19	2	1511	CWD	1	SWL	2	127	ON	3RS ET	22.1862	113.8488	WINTER	NONE	P
21-Feb-19	1	1313	FP	2	SWL	2	3	ON	3RS ET	22.1482	113.8935	WINTER	NONE	S
26-Feb-19	1	1031	CWD	2	WL	3	64	ON	3RS ET	22.2603	113.8506	WINTER	NONE	P
6-Mar-19	1	1204	CWD	3	NWL	2	244	ON	3RS ET	22.3957	113.8876	SPRING	NONE	P
12-Mar-19	1	1014	CWD	1	WL	2	434	ON	3RS ET	22.2760	113.8506	SPRING	NONE	S
12-Mar-19	2	1026	CWD	5	WL	2	9	ON	3RS ET	22.2718	113.8455	SPRING	NONE	S
12-Mar-19	3	1051	CWD	11	WL	2	313	ON	3RS ET	22.2684	113.8518	SPRING	NONE	P
12-Mar-19	4	1137	CWD	1	WL	2	53	ON	3RS ET	22.2412	113.8370	SPRING	NONE	P
12-Mar-19	5	1216	CWD	4	WL	2	295	ON	3RS ET	22.2142	113.8286	SPRING	NONE	P
13-Mar-19	1	1032	CWD	2	NWL	2	76	ON	3RS ET	22.2866	113.8699	SPRING	NONE	P
21-Mar-19	1	1039	FP	6	SWL	1	230	ON	3RS ET	22.1842	113.9354	SPRING	NONE	P

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.	P/S
21-Mar-19	2	1220	FP	3	SWL	2	103	ON	3RS ET	22.1539	113.9068	SPRING	NONE	P
22-Mar-19	1	1032	FP	3	SWL	2	81	ON	3RS ET	22.1998	113.9356	SPRING	NONE	P
22-Mar-19	2	1041	FP	5	SWL	2	103	ON	3RS ET	22.1822	113.9365	SPRING	NONE	P
22-Mar-19	3	1114	FP	9	SWL	2	296	ON	3RS ET	22.1637	113.9278	SPRING	NONE	P
22-Mar-19	4	1207	FP	2	SWL	2	2	ON	3RS ET	22.1482	113.9175	SPRING	NONE	P
22-Mar-19	5	1413	FP	1	SWL	2	199	ON	3RS ET	22.1820	113.8780	SPRING	NONE	P
22-Mar-19	6	1425	FP	1	SWL	2	45	ON	3RS ET	22.1766	113.8781	SPRING	NONE	P
22-Mar-19	7	1433	FP	2	SWL	2	70	ON	3RS ET	22.1626	113.8784	SPRING	NONE	P
22-Mar-19	8	1447	FP	4	SWL	2	85	ON	3RS ET	22.1710	113.8688	SPRING	NONE	P
25-Mar-19	1	1052	CWD	6	WL	2	206	ON	3RS ET	22.2504	113.8372	SPRING	NONE	P

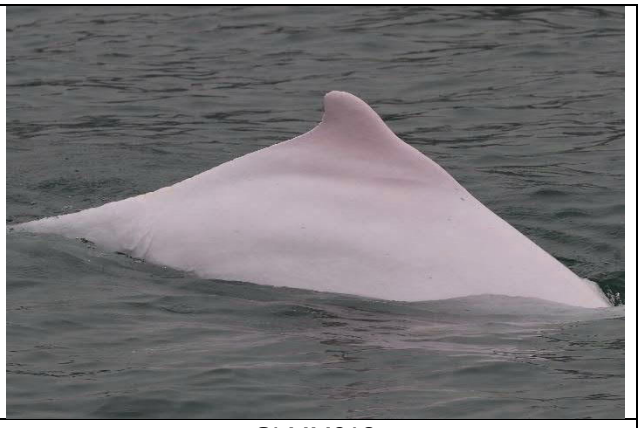
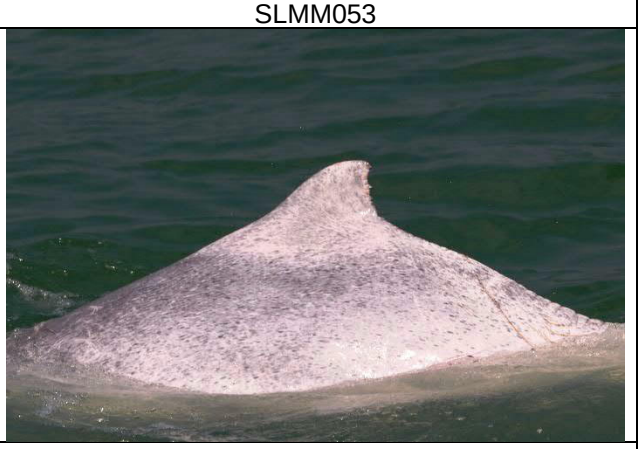
Abbreviations: STG# = Sighting Number; GP SZ = Group Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance (in metres); N/A = Not Applicable; DEC LAT = Latitude (WGS84 in Decimal), DEC LON = Longitude (WGS84 in Decimal); BOAT ASSOC. = Fishing Boat Association

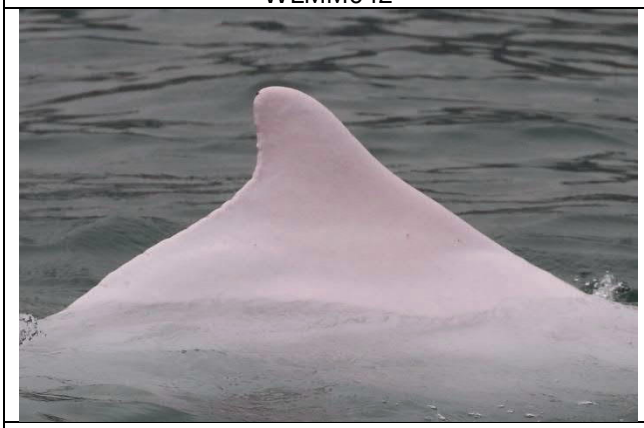
Sighting data of finless porpoise (FP) are presented for reference only. No relevant figure or text will be mentioned in the quarterly EM&A report. All FP sightings are excluded in calculation.

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

	
NLMM002	NLMM009
	
NLMM016	NLMM019
	
NLMM020	NLMM043

	
NLMM056	NLMM060
	
NLMM062	NLMM063
	
SLMM002	SLMM003
	
SLMM007	SLMM010

	
SLMM011	SLMM012
	
SLMM052	SLMM053
	
SLMM058	SLMM064
	
WLMM001	WLMM007

	
WLMM019	WLMM027
	
WLMM028	WLMM029
	
WLMM042	WLMM052
	
WLMM056	WLMM060

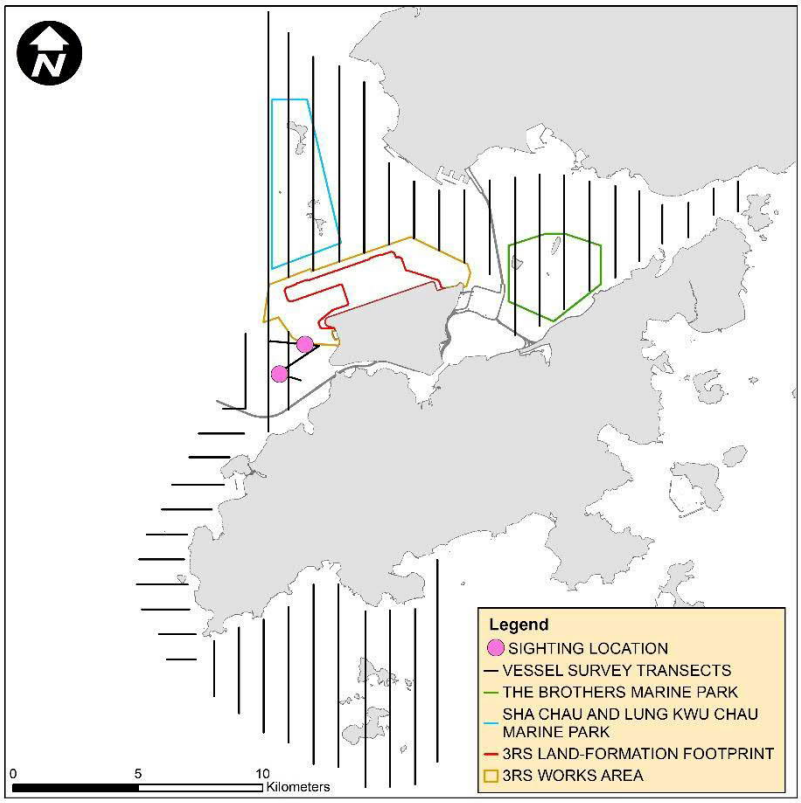
	
WLMM062	WLMM064
	
WLMM067	WLMM069
	
WLMM071	WLMM078
	
WLMM079	WLMM085

	
WLMM113	WLMM114
	
WLMM116	WLMM131
	
WLMM132	WLMM133
	
WLMM134	WLMM135

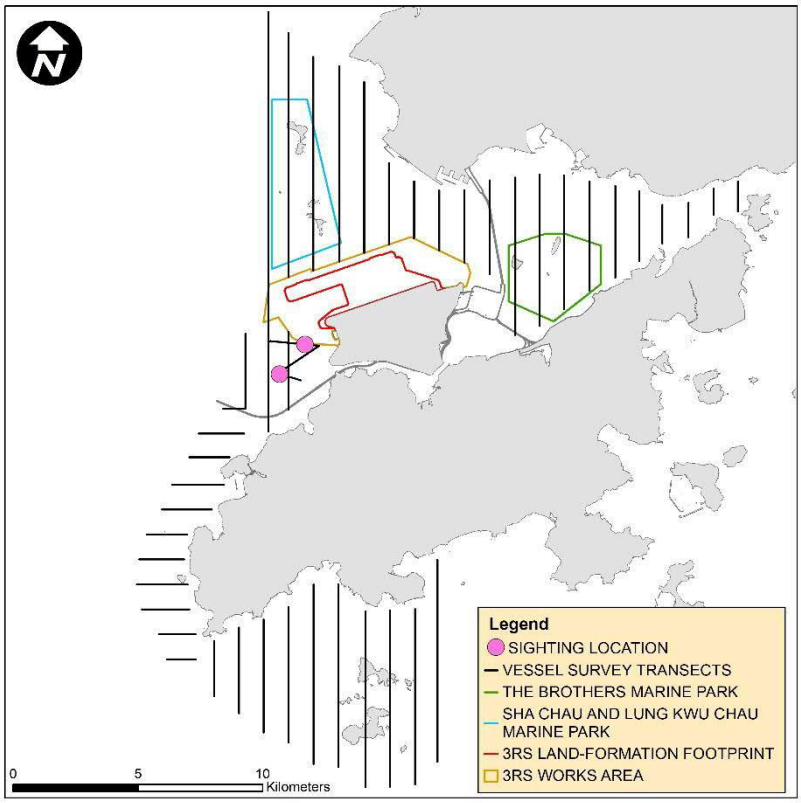
	
WLMM136	

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

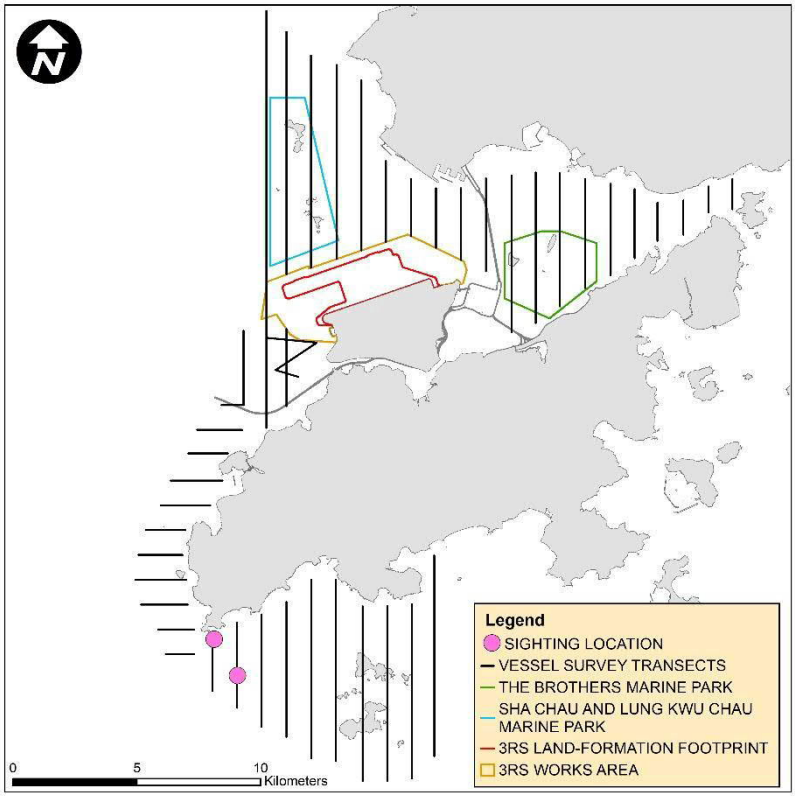
NLMM019



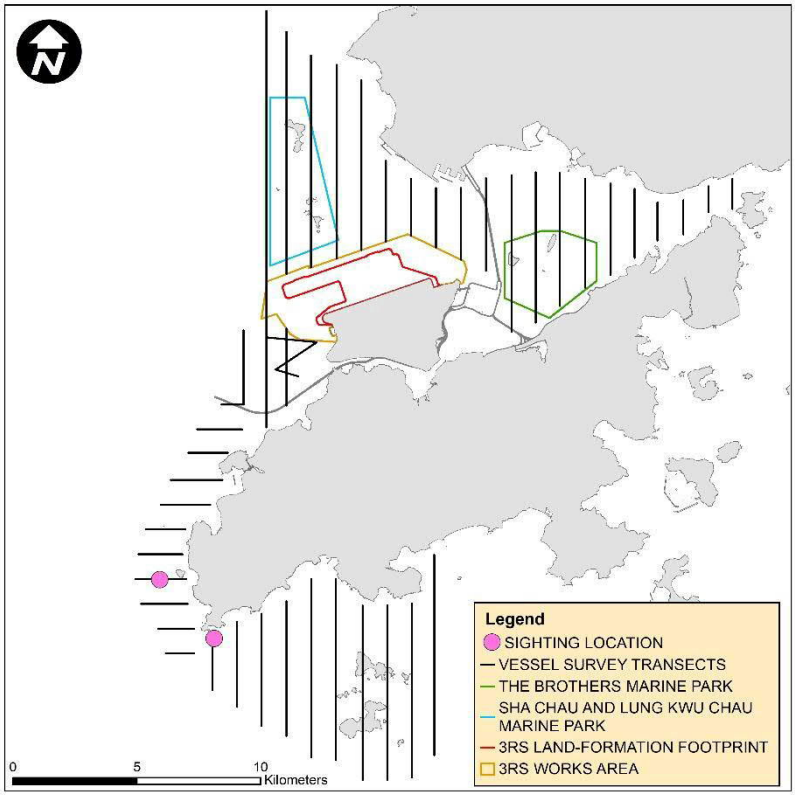
NLMM020



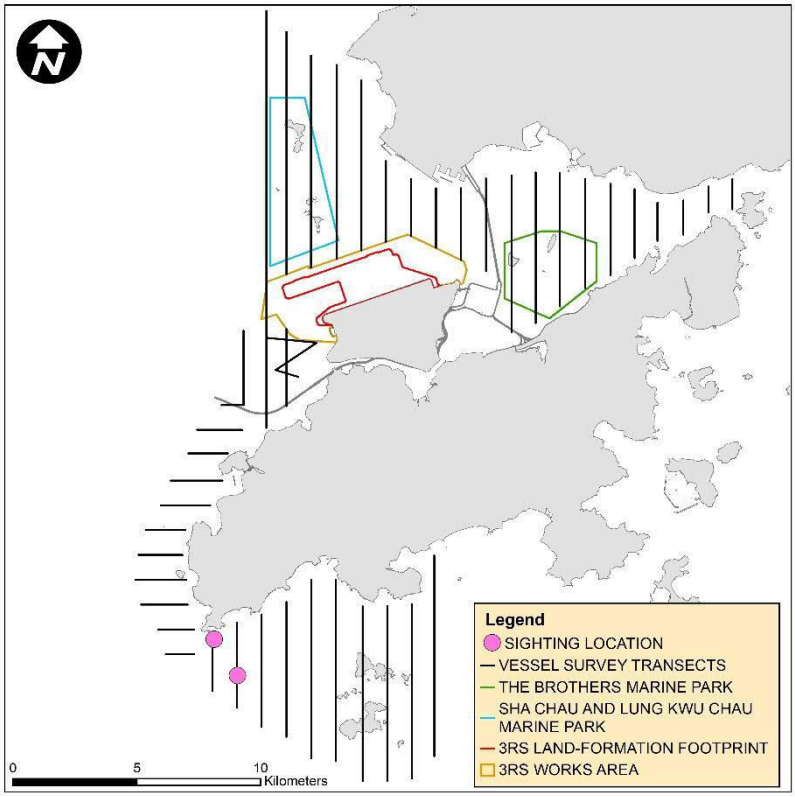
SLMM002



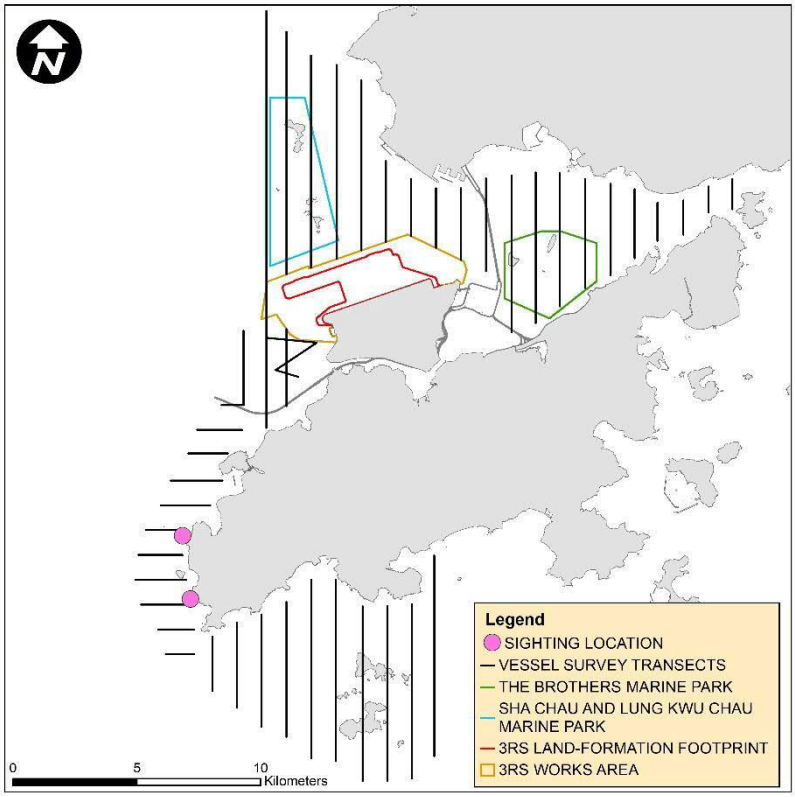
SLMM003



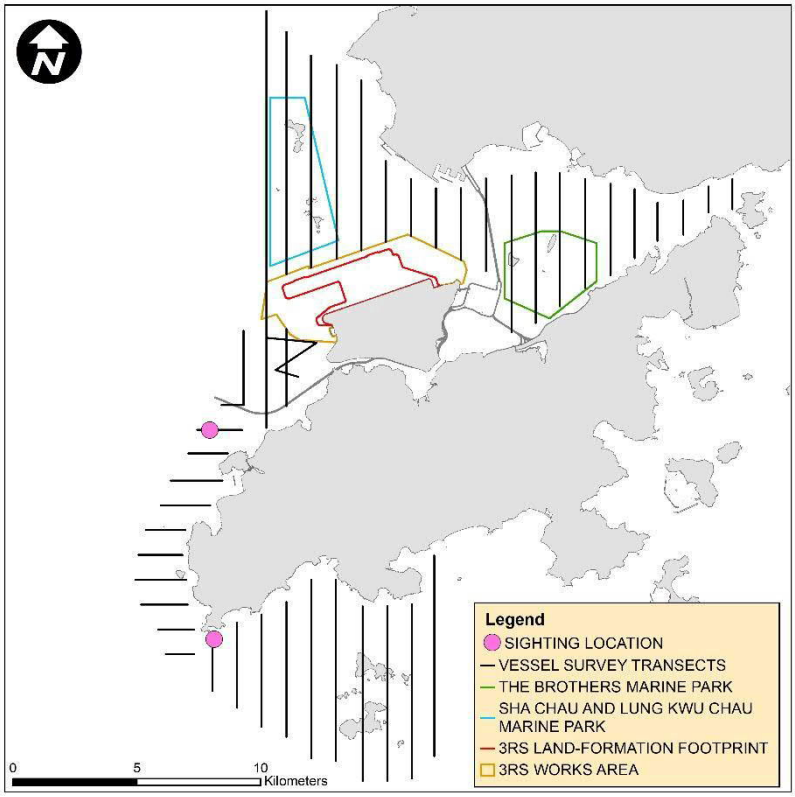
SLMM007



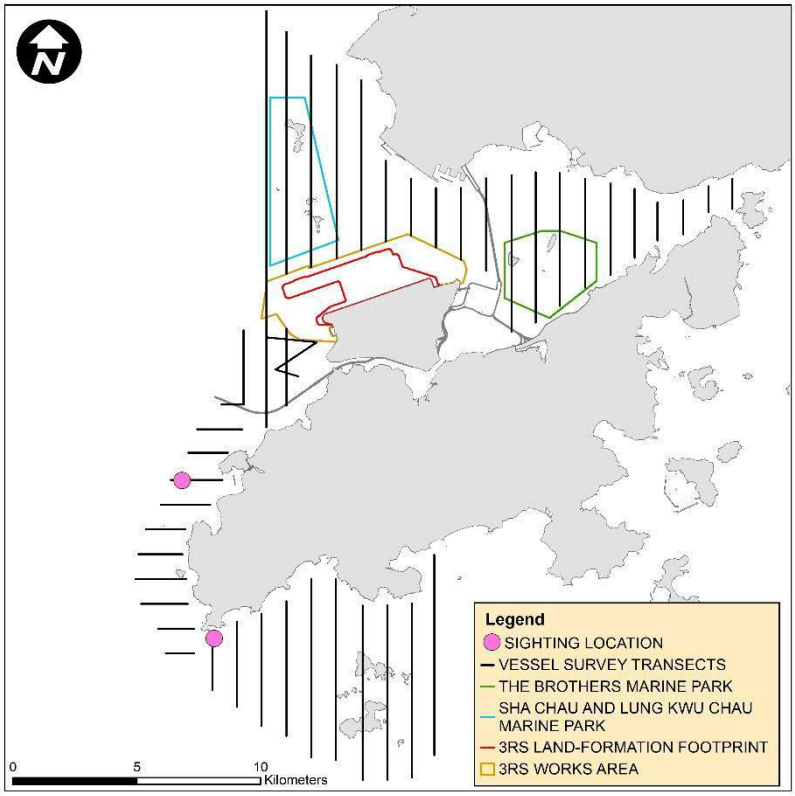
SLMM010



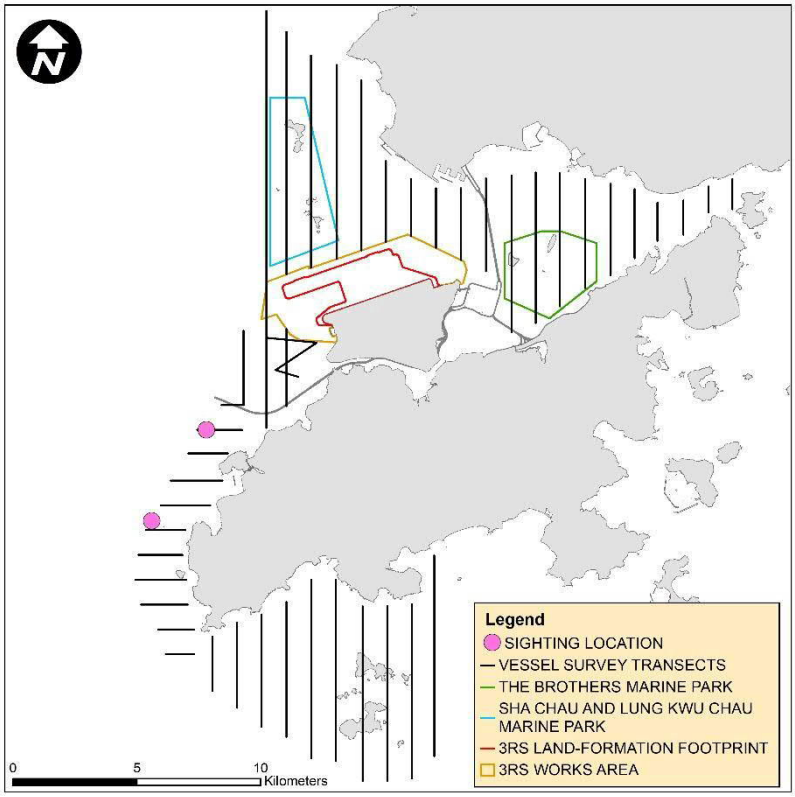
SLMM012



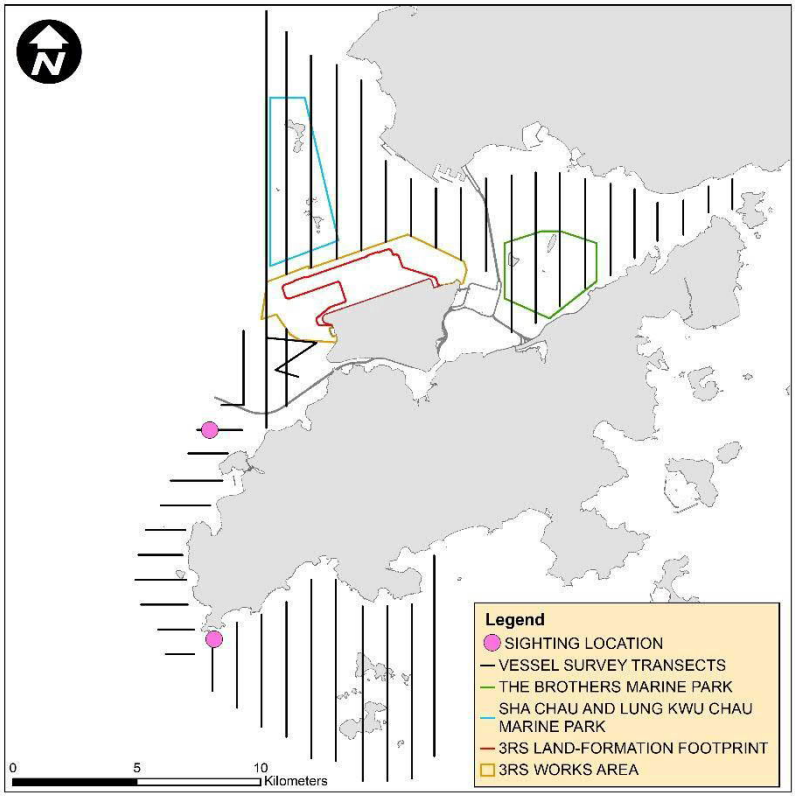
SLMM052



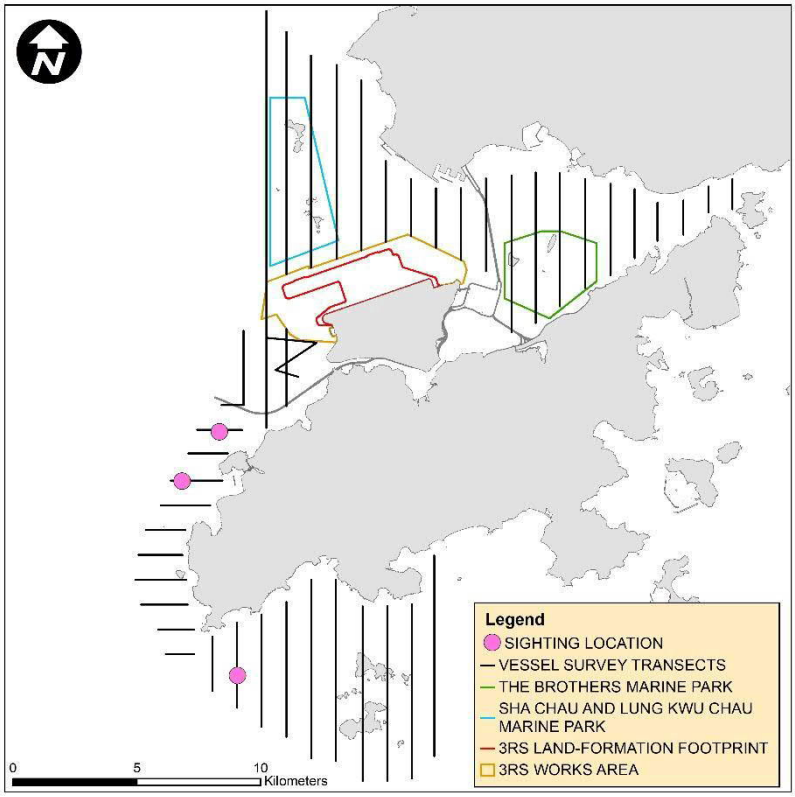
WLMM001



WLMM056



WLMM067


Legend
SIGHTING LOCATION
VESSEL SURVEY TRANSECTS
THE BROTHERS MARINE PARK
SHA CHAU AND LUNG KWU CHAU MARINE PARK
3RS LAND-FORMATION FOOTPRINT
3RS WORKS AREA
0
5
10
Kilometers

CWD Land-based Theodolite Tracking

CWD Groups by Survey Date

Date	Station	Start	End	Duration	Beaufort	Visibility	No. of Focal Follow	Dolphin Group Size
11/Jan/19	Lung Kwu Chau	8:53	14:53	6:00	2-3	5	2	1
23/Jan/19	Sha Chau	9:02	15:02	6:00	2-3	3	0	-
14/Feb/19	Lung Kwu Chau	8:38	14:38	6:00	2-3	3	3	2-4
22/Feb/19	Sha Chau	9:10	15:10	6:00	2-3	3	0	-
27/Feb/19	Lung Kwu Chau	8:52	14:52	6:00	3-4	2	1	1
11/Mar/19	Lung Kwu Chau	8:59	14:59	6:00	2-3	3	1	1
19/Mar/19	Sha Chau	8:45	14:45	6:00	2	3-4	0	0
20/Mar/19	Lung Kwu Chau	8:48	14:52	6:04	2-3	3	2	2

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

Terrestrial Ecological Monitoring

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

Photo record of View 1

Photo record of View 2