MOTT MACDONALD

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

Construction Phase Annual EM&A Report No.2

June 2018

Airport Authority Hong Kong

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This Construction Phase Annual EM&A Report No. 2 has been reviewed and certified by

the Environmental Team Leader (ETL) in accordance with

Section 15.5 of the Updated EM&A Manual

Certified by:

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

Date: 19 July 2018

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By Email

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

Attn: Mr. Lawrence Tsui, Principal Manager

19 July 2018

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Submission of Construction Phase Annual EM&A Report No.2

Reference is made to the Environmental Team's submission of the Construction Phase Annual EM&A Report No.2 under Condition 15.5 of the Updated EM&A Manual certified by the ET Leader on 19 July 2018.

We would like to inform you that we have no adverse comment on the captioned submission. Therefore we write to verify the captioned submission in accordance with the requirement stipulated in Condition 2.3 of EP-489/2014.

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

Yours faithfully,
AECOM Asia Co. Ltd.

Jackel Law
Independent Environmental Checker

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Abbreviations

3RS	Three-Runway System
AAHK	Airport Authority Hong Kong
AECOM	AECOM Asia Company Limited
AFCD	Agriculture, Fisheries and Conservation Department
AIS	Automatic Information System
ANI	Encounter Rate of Number of Dolphins
APM	Automated People Mover
AW	Airport West
BHS	Baggage Handling System
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CTP	Coral Translocation Plan
CWD	Chinese White Dolphin
DCM	Deep Cement Mixing
DEZ	Dolphin Exclusion Zone
DO	Dissolved Oxygen
DPSE	Number of Dolphins per 100 Units of Survey Effort
EAR	Ecological Acoustic Recorder
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring & Audit
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
FCZ	Fish Culture Zone
FEF	Fisheries Enhancement Fund
HDD	Horizontal Directional Drilling
HKBCF	Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities
HKIA	Hong Kong International Airport
HSF	High Speed Ferry
IEC	Independent Environmental Checker
LKC	Lung Kwu Chau
MEEF	Marine Ecology Enhancement Fund
MMHK	Mott MacDonald Hong Kong Limited
MMWP	Marine Mammal Watching Plan
MSS	Marine Surveillance System
MTRMP-CAV	Marine Travel Routes and Management Plan for Construction and Associated Vessel
NEL	Northeast Lantau
NWL	Northwest Lantau
PAM	Passive Acoustic Monitoring
PM	Partial Mortality
PVD	Prefabricated Vertical Drain

SC	Sha Chau
SCLKCMP	Sha Chau and Lung Kwu Chau Marine Park
SPSE	Number of On-effort Sightings per 100 Units of Survey Effort
SS	Suspended Solids
SSK	Sham Shui Kok
STG	Encounter Rate of Number of Dolphin Sightings
SWL	Southwest Lantau
The Project	The Expansion of Hong Kong International Airport into a Three-Runway System
The SkyPier Plan	Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier
TMT	Tai Mo To
TSP	Total Suspended Particulates
WL	West Lantau
WMP	Waste Management Plan
YTW	Yam Tsai Wan

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 2nd Construction Phase Annual 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 2017 to 31 December 2017.

Key Activities in the Reporting Period

Key activities of the Project carried out in the reporting period were related to the following contracts:

Advanced Works:

Contract P560 (R) Aviation Fuel Pipeline Diversion Works

- Horizontal directional drilling (HDD) works;
- Stockpiling of materials from HDD operation; and
- Pipeline supporting works.

Contract 3212 11kV Submarine Cable Diversion

- Forming of marine approach trench;
- Articulated pipe installation;
- Cable laying; and
- Post laid burial work and concrete protection slabs installation.

Deep Cement Mixing (DCM) Works:

Contracts 3201 to 3205 DCM Works

- Site office establishment;
- Laying of geotextile and sand blanket; and
- DCM trial and works.

Reclamation Works:

Contract 3206 Main Reclamation Works

- Site office establishment;
- Laying of geotextile and sand blanket;

- Prefabricated vertical drain (PVD) installation; and
- Seawall construction.

Airfield Works:

Contract 3301 North Runway Crossover Taxiway

- CLP cable ducting works;
- Subgrade works; and
- Precast of duct bank and fabrication of steel works;

Terminal 2 Expansion Works:

Contract 3501 Antenna Farm and Sewage Pumping Station

- Excavation and piling works; and
- Erection of antenna farm.

Contract 3502 Terminal 2 (T2) Automated People Mover (APM) Depot Modification Works

- Removal of existing concrete; and
- Formwork erection and concreting works.

APM Works:

Contract 3602 Existing APM System Modification Works

- Site office establishment.

Airport Support Infrastructure & Logistic Works:

Contract 3801 APM and Baggage Handling System (BHS) Tunnels on Existing Airport Island

- Site establishment works.

Other Works:

Contract 3213 CLP Cable Diversion Enabling Works

- Delivery of temporary power supply system.

EM&A Activities Conducted in the Reporting Period

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

Monitoring/ Audit Activities	Number of Sessions
Air Quality Monitoring	402
Noise Monitoring	260
Water Quality Monitoring	154
Terrestrial Ecological Monitoring [(1)]	8
Vessel line-transect surveys for Chinese White Dolphin (CWD) monitoring	24
Land-based theodolite tracking survey effort for CWD monitoring	60
Coral post-translocation monitoring	5

Note [(1)]: Terrestrial ecological monitoring on Sheung Sha Chau Island was conducted monthly when construction works was carried out on Sheung Sha Chau Island outside of ardeid's breeding season from April to July 2017.

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

Summary Findings of the EM&A Programme

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

For air quality, three monitoring results triggered the Limit Level of 1-hour total suspended particulates (TSP) in the reporting period. Corresponding investigations were conducted accordingly which concluded that the cases were not related to the Project.

For water quality, the monitoring results for total alkalinity obtained in the reporting period did not trigger the 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 dissolved oxygen (DO), turbidity, suspended solids (SS), chromium, and nickel, some of the monitoring results triggered the relevant Action or Limit Level in the reporting period, and the corresponding investigations were conducted accordingly. The investigation findings concluded that all cases were not related to the Project. To conclude, as all cases were considered non-Project related, the construction activities in the monitoring period did not introduce adverse impact to all water quality sensitive receivers.

The monthly terrestrial ecology monitoring on Sheung Sha Chau observed that HDD works were conducted at the daylighting location and there was no encroachment or disturbance to the egretry area.

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

	Yes	No	Details	Analysis / Recommendation / Remedial Actions
Breach of Limit Level^		√	No exceedance of project-related Limit Level was recorded.	Nil
Breach of Action Level^		√	No exceedance of project-related Action Level was recorded.	Nil
Complaints Received	√		Seven complaints were received on 19 January, 24 April, 9 May, 22 May, 8 August, 5 September, and 24 November respectively.	The complaint investigations were carried out in accordance with the Complaint Management Plan. Details are presented in S3.2.1.
Notification of any summons and status of prosecutions	√		Summons were received in June 2017 regarding the aviation fuel pipeline diversion works in December 2016.	Judicial process underway.
Changes that affect the EM&A		√	There was no change to the construction works that may affect the EM&A	Nil

Remarks: ^ Only triggering of Action or Limit Level related to Project works is counted as Breaches 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 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 hectares and all associated facilities and infrastructure including taxiways, aprons, aircraft stands, a passenger concourse, an expanded Terminal 2, all related airside and landside works and associated ancillary and supporting facilities. The existing submarine aviation fuel pipelines and submarine power cables also require diversion as part of the works.

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

The updated overall phasing programme of all construction works and contract description is presented in **Appendix A**.

1.2 Scope of this Report

This is the 2nd Construction Phase Annual EM&A Report for the Project which summarizes the key findings of the EM&A programme during the reporting period from 1 January 2017 to 31 December 2017.

1.3 Project Organization

The Project's organization structure and the contact details of the key personnel are provided in **Appendix B** and **Table 1.1** respectively.

[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	Keith Chau	2972 1721
Independent Environmental Checker (IEC) (AECOM Asia Company Limited)	Independent Environmental Checker	Jackel Law	3922 9376
	Deputy Independent Environmental Checker	Roy Man	3922 9348

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
Contract 3212 11kV Submarine Cable Diversion	Project Director	Colman Chan	6193 4729
	Environmental Officer	Samantha Kong	3995 8141

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	Sandra Lo	6329 3513
Contract 3202 DCM (Package 2) (Samsung-BuildKing Joint Venture)	Project Manager	Ilkwon Nam	9643 3117
	Environmental Officer	Dickson Mak	9525 8408
Contract 3203 DCM (Package 3) (Sambo E&C Co., Ltd.)	Project Manager	Eric Kan	9014 6758
	Environmental Officer	David Hung	9765 6151
Contract 3204 DCM (Package 4) (CRBC-SAMBO Joint Venture)	Project Manager	Kyung-Sik Yoo	9683 8697
	Environmental Officer	Kanny Cho	6799 8226
Contract 3205 DCM (Package 5) (Bachy Soletanche - Sambo Joint Venture)	Deputy Project Director	Min Park	9683 0765
	Environmental Officer	Margaret Chung	9130 3696

Reclamation Works:

Party	Position	Name	Telephone
Contract 3206 (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)	Project Manager	Kin Hang Chung	9412 1386

Terminal 2 Expansion Works:

Party	Position	Name	Telephone
Contract 3501 Antenna Farm and Sewage Pumping Station (Build King Construction Ltd.)	Project Manager	Raymond Au	6985 8860
	Environmental Officer	Edward Tam	9287 8270
Contract 3502 Terminal 2 APM Depot Modification Works (Build King Construction Ltd.)	Project Manager	Kivin Cheng	9380 3635
	Environmental Officer	Chun Pong Chan	9187 7118

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

Airport Support Infrastructure & 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

Other Works:

Party	Position	Name	Telephone
Contract 3213 CLP Cable Diversion Enabling Works (Wing Hing Construction Company)	Project Manager	Michael Kan	9206 0550
	Environmental Officer	Ivy Tam	2151 2090

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 marine and land-side works. Marine works included laying of geotextile and sand blanket, DCM trial and works, seawall construction, PVD installation, and submarine cable diversion works. Land-side works included site establishment, HDD works, cable ducting works, erection of antenna farm, and piling and excavation works.

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

1.6 Summary of EM&A Programme Requirements

The status for all environmental aspects is presented in **Table 1.3**.

Table 1.3: Summary of status for all environmental aspects under the 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 results were 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 results were 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 results were reported in Baseline Water Quality Monitoring Report and submitted to EPD under EP Condition 3.4.

Parameters	EM&A Requirements	Status
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.
Early/ Regular DCM Water Quality Monitoring	Three times per week until completion of DCM works.	On-going
Waste Management		
Waste Monitoring	At least weekly	On-going
Land Contamination		
Supplementary Contamination Assessment Plan (CAP)	At least 3 months before commencement of any soil remediation works.	The Supplementary CAP was submitted and approved by EPD pursuant to EP condition 2.20.
Contamination Assessment Report (CAR) for Golf Course	CAR to be submitted for golf course first; programme for submission of supplementary CAR at the other areas to be agreed.	The CAR for Golf Course was submitted to EPD.
Terrestrial Ecology		
Pre-construction Egretry Survey Plan	Once per month in the breeding season between April and July, prior to the commencement of HDD drilling works.	The revised Egretry Survey Plan was submitted and approved by EPD under EP Condition 2.14.
Ecological Monitoring	Monthly monitoring during the HDD construction works period from August to March.	On-going
Marine Ecology		
Pre-Construction Phase Coral Dive Survey	Prior to marine construction works	The Coral Translocation Plan was submitted and approved by EPD under EP Condition 2.12.
Coral Translocation	-	The coral translocation was completed on 5 January 2017.
Coral Post-translocation Monitoring	As per an enhanced monitoring programme based on the Coral Translocation Plan	On-going
Chinese White Dolphins (CWD)		
Baseline Monitoring	6 months of baseline surveys before the commencement of land formation related construction works. Vessel surveys: Two full surveys per month; Land-based theodolite tracking: 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 surveys: Two full surveys per month; Land-based theodolite tracking: 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 since its commencement in August 2016. Land-based theodolite tracking: In addition to the frequency as stipulated in the Manual, supplemental theodolite tracking is ongoing during the initial implementation period for the SkyPier Plan, i.e. in total twice per month at the Sha Chau station and three times per month at the Lung Kwu Chau station

Parameters	EM&A Requirements	Status
Landscape and Visual		
Baseline Monitoring	One-off survey within the Project site boundary prior to commencement of any construction works	The baseline landscape & visual monitoring result has been reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4.
Impact Monitoring	Weekly	On-going
Environmental Auditing		
Regular site inspection	Weekly	On-going
Marine Mammal Watching Plan (MMWP) implementation measures	Monitor and check	On-going
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 and visual, and CWD were carried out in the reporting period. Upon completion of coral translocation in January 2017, post-translocation monitoring was also carried out in the reporting period.

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

- 33 dolphin observer trainings provided by ET;
- 44 skipper trainings provided by ET;
- 9 environmental briefings on EP and EM&A requirements of the 3RS provided by ET;
- 3 environmental briefings provided by EPD; and
- 87 occasions of environmental management meetings on EM&A matters.

The EM&A programme has been undertaken in accordance with 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 C**.

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**.

Table 2.1: Impact Air Quality Monitoring Stations

Monitoring Station	Location	Action Level (μg/m^3)	Limit Level (μg/m^3)
AR1A	Man Tung Road Park	306	500
AR2	Village House at Tin Sum	298	

2.1.2 Monitoring Results

The graphical plots of impact air quality monitoring results during the reporting period are presented in **Appendix D**. Percentage of monitoring results within their corresponding Action and Limit Levels in the reporting period are presented in **Table 2.2**.

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

	AR1A	AR2
Jan 2017	100.0%	100.0%
Feb 2017	100.0%	100.0%
Mar 2017	100.0%	100.0%
Apr 2017	100.0%	100.0%
May 2017	100.0%	83.3%
Jun 2017	100.0%	100.0%
Jul 2017	100.0%	100.0%
Aug 2017	100.0%	100.0%
Sep 2017	100.0%	100.0%
Oct 2017	100.0%	100.0%
Nov 2017	100.0%	100.0%
Dec 2017	100.0%	100.0%
Overall	100.0%	98.5%

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

All monitoring results at AR1A were within their corresponding Action and Limit Levels.

Three monitoring results of 1-hour TSP at AR2 triggered the Limit Level on 10 May 2017, and corresponding investigations were conducted accordingly. Details of the investigation findings are presented in the Contruction Phase Monthly EM&A Report No. 17, which concluded that the results were not related to the Project.

General meteorological conditions throughout the impact monitoring period were recorded and summarized in **Table 2.3**.

Table 2.3: General Meteorological Condition During Impact Air Quality Monitoring

	Weather	Wind Direction
Jan – Mar 2017	Sunny to Rainy	North or East
Apr – Jun 2017	Sunny to Rainy	South or Southwest
Jul – Sep 2017	Sunny to Rainy	South or Southwest
Oct – Dec 2017	Sunny to Rainy	Northeast or Northwest

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 was considered that the mitigation measures taken during the reporting period were effective and there was no adverse impact attributable to the works of the Project.

2.2 Noise Monitoring

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

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)
NM3A	Site Office		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)] reduce to 70dB(A) for school and 65dB(A) during school examination periods at NM4.

2.2.2 Monitoring Results

The graphical plots of impact noise quality monitoring results during the reporting period are presented in **Appendix D**. Percentage of monitoring results within their corresponding Action and Limit Levels in the reporting period are presented in **Table 2.5**.

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

	NM1A	NM3A	NM4	NM5	NM6
Jan 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Feb 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Mar 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Apr 2017	100.0%	100.0%	100.0%	100.0%	100.0%
May 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Jun 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Jul 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Aug 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Sep 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Oct 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Nov 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Dec 2017	100.0%	100.0%	100.0%	100.0%	100.0%
Overall	100.0%	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 Level by the total number of monitoring results.

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

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 construction noise impact monitoring were road traffic and helicopters at NM1A, aircrafts and helicopters at NM3A and NM5, school activities at NM4, and noise from aircrafts, helicopters and marine vessels at NM6 during the reporting period. It was considered that the mitigation measures taken during the reporting period were effective and there was no adverse impact attributable to the works of the Project.

2.3 Water Quality Monitoring

Impact water quality monitoring of the Project commenced on 4 Aug 2016. During the reporting period, water quality monitoring was conducted three days per week, at mid-ebb and mid-flood tides, at 23 water quality monitoring stations, comprising 12 impact (IM) stations, 1 mobile impact station, 7 sensitive receiver (SR) stations, and 3 control (C) stations in the vicinity of the water quality sensitive receivers around the airport island in accordance with the Manual. The purpose of water quality monitoring at the IM stations is to promptly capture any potential water quality impacts from the Project before the impacts could become apparent at sensitive receivers (represented by the SR stations). **Table 2.6** describes the details of the monitoring stations. **Figure 2.2** shows the locations of the monitoring stations.

Table 2.6: Monitoring Locations and Parameters for Impact Water Quality Monitoring

Monitoring Stations	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	806458	818351	
IM2	Impact Station	806193	818852	
IM3	Impact Station	806019	819411	

Monitoring Stations	Description	Coordinates		Parameters
		Easting	Northing	
IM4	Impact Station	805039	819570	
IM5	Impact Station	804924	820564	
IM6	Impact Station	805828	821060	
IM7	Impact Station	806835	821349	
IM8	Impact Station	807838	821695	
IM9	Impact Station	808811	822094	
IM10	Impact Station	809838	822240	
IM11	Impact Station	810545	821501	
IM12	Impact Station	811519	821162	
IM13	Impact Station (for submarine 11kV cable diversion)	Mobile station (500m envelope of water jetting works)		General Parameters DO, pH, Temperature, Salinity, Turbidity, SS
SR1[1]	Future 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
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)	811593	820417	
		811418 (from July 2017 onwards)	820246	

Notes:

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

(2) Details of selection criteria for the two heavy metals for early regular and 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 IM / 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 station for SR8 is subject to future 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 2.7**. The control and impact stations

during flood tide and ebb tide for general water quality monitoring and regular DCM monitoring are presented in **Table 2.8**.

Table 2.7: Action and Limit Levels for General Water Quality Monitoring and Regular DCM Monitoring

Parameters		Action Level (AL)		Limit Level (LL)	
Action and Limit Levels for general water quality monitoring and regular DCM monitoring (excluding SR1& SR8)					
General Water Quality Monitoring	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	
	Suspended Solids (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	
Regular DCM Monitoring	Total Alkalinity in ppm	95		99	
	Representative Heavy Metals for regular DCM monitoring (Chromium)	0.2		0.2	
	Representative Heavy Metals for regular DCM monitoring (Nickel)	3.2		3.6	
Action and Limit Levels SR1					
SS (mg/l)		To be determined prior to its commissioning		To be determined prior to its commissioning	
Action and Limit Levels SR8					
SS (mg/l)		52		60	

Note:

1. For DO measurement, Action or Limit Level is triggered when the monitoring result is lower than the limits.
2. For parameters other than DO, Action or Limit Level is triggered when monitoring result 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 early regular and 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 2.8: 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, IM13, 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, IM13, SR1A, SR2, SR3, SR7, SR8

Note (1): As per findings of Baseline Water Quality Report, the control reference has been changed from C3 to SR2 from 1 Sep 2016 onwards.

2.3.2 Monitoring Results

Percentage of monitoring results within their corresponding Action and Limit Levels in the reporting period are presented in **Table 2.9**. It should be noted that Hong Kong was under the effect of tropical cyclones from 11 to 13 June, 22 to 23 July, 22 to 23 August, 26 to 27 August, 2 to 4 September, and 14 to 15 October respectively, and the water quality monitoring results during the said periods might be affected by the inclement weather.

Table 2.9: 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 2017	100.0%	100.0%	96.5%	98.9%	100.0%	100.0%	99.4%
Feb 2017	100.0%	100.0%	97.1%	96.9%	100.0%	100.0%	100.0%
Mar 2017	100.0%	100.0%	96.7%	99.3%	100.0%	100.0%	99.7%
Apr 2017	100.0%	100.0%	98.8%	100.0%	100.0%	99.7%	99.4%
May 2017	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.2%
Jun 2017	89.8%	97.1%	100.0%	99.8%	100.0%	99.7%	97.9%
Jul 2017	97.9%	98.9%	99.8%	100.0%	100.0%	100.0%	96.0%
Aug 2017	97.9%	98.7%	98.0%	98.5%	100.0%	100.0%	97.5%
Sep 2017	100.0%	100.0%	99.6%	100.0%	100.0%	100.0%	96.7%
Oct 2017	100.0%	100.0%	98.8%	100.0%	100.0%	100.0%	100.0%
Nov 2017	100.0%	100.0%	99.0%	100.0%	100.0%	99.4%	99.7%
Dec 2017	100.0%	100.0%	97.1%	100.0%	100.0%	100.0%	100.0%
Overall	98.8%	99.6%	98.4%	99.5%	100.0%	99.9%	98.6%

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

The monitoring results for total alkalinity obtained in the reporting period were within their corresponding Action and Limit Levels.

For DO, turbidity, SS, chromium and nickel, some of the testing results triggered the corresponding Action or Limit Levels in the reporting period. Investigations were conducted accordingly and the details were presented in the corresponding Construction Phase Monthly EM&A Reports. The status of each water quality parameter collected in the reporting period are presented graphically in **Appendix D**. Some of these cases were recorded at monitoring stations located upstream of the Project based on dominant tidal flow and were considered not affected by the Project. Based on respective investigation findings, triggering of Action or Limit Level were found not related to the Project.

2.3.3 Conclusions

During the reporting period, it was noted that the vast majority of monitoring results (from 98.4% for SS to 100% for alkalinity as presented in **Table 2.9**) were within their corresponding Action and Limit Levels, while only a minor number of results triggered their corresponding Action or Limit Level, and investigations were conducted accordingly when Action or Limit Level was triggered. Based on the findings of the investigations presented in the Construction Phase Monthly EM&A Reports, all results that triggered the corresponding Action or Limit Level were not related to the Project. Therefore, the Project did not cause adverse impact at the water quality sensitive receivers. All required actions under the Event and Action Plan were followed. These cases were considered to be due to natural fluctuation or other sources not related to the Project.

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

In the meantime, the contractors were reminded to implement and maintain all mitigation measures during weekly site inspection. These include proper deployment of silt curtain for sand blanket laying and control the level of sand material stockpile on barges to avoid overflow as recommended in the Manual.

2.4 Waste Monitoring

In accordance with the Manual, the waste generated from construction activities was audited once per week to determine if waste was 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 reviewed during the audits.

2.4.1 Action and Limit Levels

The Action and Limit Levels of the construction waste are provided in **Table 2.10**.

Table 2.10: 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

The construction waste generated in the reporting period is summarized in **Table 2.11**.

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 2.11: Statistics of Construction Waste Generated in the Reporting Period

	Excavated Material (m^3)[1]	C&D[2] Material Reused in the Project (m^3)	C&D Material Reused in other projects (m^3)	C&D Material Disposed of as Public Fill (m^3)	Chemical Waste (kg)	Chemical Waste (L)	General Refuse (tonne)[3]
Jan 2017	195	0	0	24	0	0	16
Feb 2017	594	0	0	185	0	0	45
Mar 2017	789	0	0	718	0	0	27
Apr 2017	556	0	0	534	0	0	82
May 2017	1,071	0	0	615	80	0	83
Jun 2017	576	0	0	132	0	1,600	127
Jul 2017	435	0	0	26	120	0	157
Aug 2017	802	0	555	62	75	7,800	120
Sep 2017	619	17	20	0	200	1,200	138
Oct 2017	371	84	0	53	30	11,400	149

	Excavated Material (m^3)[1]	C&D[2] Material Reused in the Project (m^3)	C&D Material Reused in other projects (m^3)	C&D Material Disposed of as Public Fill (m^3)	Chemical Waste (kg)	Chemical Waste (L)	General Refuse (tonne)[3]
Nov 2017	380	530	0	101	105	3,100	193
Dec 2017	1,381	1,320	0	269	240	7,600	246
Total	7,769	1,951	575	2,719	850	32,700	1385

Notes:

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

Weekly waste monitoring of the Project construction works was conducted in the reporting period to check and monitor the implementation of proper waste management practices. Measures which included the provision and maintenance of spill kits and drip trays, provision of proper storage area for general refuse and chemical waste, proper storage of construction material, as well as proper waste segregation and regular waste disposal were recommended to the contractors.

2.5 Chinese White Dolphin Monitoring

According to Sections 10.2.1.2 and 10.2.1.3 of the EM&A Manual, CWD monitoring is required during the baseline, construction, post-construction and operation phases of the project. The aims of CWDs monitoring during construction period are:

- to monitor the effects on the potential shift in the CWD travelling areas and habitat use;
- to monitor the effectiveness of the HSF speed and routing restrictions to the CWDs;
- to provide a dataset that can be compatible with the AFCD long-term monitoring, be stratified in such a way as to allow the calculation of density and abundance for the various different phases; and

  to calculate the trends from these estimates; and
- to provide assessment of how the project and cumulative effects may be impacting the CWDs.

This section summarises the results of the CWD construction phase monitoring effort over a 12-month period between 1 January 2017 and 31 December 2017, to gather information on the spatial and temporal distribution patterns as well as calculate density and abundance of the CWD in the western Hong Kong waters. Supplementary information collected focusing on northwestern Lantau waters including the habitat use and behaviours of CWD before and during the construction phase of the Project has also been reviewed.

This reporting period is effectively the first full year of construction phase monitoring of CWDs. The overall monitoring programme commenced in August 2016, although there were no marine construction works in August and September 2016, and only localised sand blanket laying and DCM trial works from October to December 2016. This annual report reviewed the construction phase monitoring data for 2017 and compare with the 6 months baseline survey with supplement of initial 6 months construction phase monitoring data in 2016 (there were limited marine works in this initial stage) to increase the analytical precision.

CWD monitoring was conducted by undertaking vessel line-transect surveys, supplemented by land-based theodolite tracking survey and Passive Acoustic Monitoring (PAM). The vessel line transects covered Northeast Lantau (NEL), Northwest Lantau (NWL), Airport West (AW), West Lantau (WL) and Southwest Lantau (SWL) areas at a frequency of two full surveys per month as

proposed in Section 10.2.3.2 of the Updated EM&A Manual and are consistent with the AFCD long-term monitoring programme (except AW). Additional survey effort was collected on a voluntary basis at the same frequency of two surveys per month from Deep Bay (DB) (refer to **Appendix E** for the location of this additional survey), which is an area that historically had CWD in the outer bay, to establish a full understanding of CWD abundance. All DB data were considered supplemental and only be used for density and abundance estimation.

Regarding focal follows, CWDs were followed during sightings from vessel surveys and focal follow was attempted as far as practicable, however, information collected during sightings was insufficient for focal follow analysis of any identified dolphin. The travelling pattern in different areas were therefore reviewed by using photo-identification of individuals dolphin where practicable. These data were supplemented with information from land-based theodolite tracking survey findings.

For the land-based theodolite tracking survey, the monitoring frequency during the construction phase for marine works was one day per month at both the Lung Kwu Chau (LKC) station and Sha Chau (SC) station as stipulated in Section 10.2.3.4 of the EM&A Manual. Additional theodolite tracking surveys for one day at SC station and two days at LKC station were conducted on a voluntary basis to collect supplementary information for the Project during the implementation for the SkyPier HSF diversion and speed control in this reporting period, such that a total of two tracking days at SC station and three tracking days at LKC station were conducted per month. PAM was also deployed with a duty cycle of 20% for the construction phase with data supplementing the results of both vessel and land-based surveys. For detail on CWD monitoring and data analysis methodologies refer to Section 10.2.4 of the EM&A Manual. The locations of the CWD vessel survey transects are shown in **Figure 2.3**, whilst the land-based survey stations are described in **Table 2.12** and depicted in **Figure 2.4**. The location of the Passive Acoustic Monitoring device is shown in **Figure 2.5**.

Table 2.12: Land-based 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 (Encounter Rate by Number of Dolphin Sightings 'STG' and Encounter Rate by Number of Dolphins 'ANI') derived from baseline monitoring data covering six months from mid-December 2015 to June 2016, as presented in the CWD Baseline Monitoring Report. The derived values of Action and Limit Levels for CWD monitoring are shown in **Table 2.13**. Running quarterly encounter rates STG and ANI have been determined for each month since August 2016 to compare with the derived Action/Limit levels for construction phase monitoring of CWD. The results were used as a management tool, so that if the decline in overall CWD encounter rate is determined to be from the 3RS construction process, appropriate measures may then be triggered / considered to minimise possible impacts with short term response to events after reviewing the monitoring data for each month.

Table 2.13: 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 Summary of Vessel Line-transect Survey Monitoring Results

Survey Effort

During the reporting period from January to December 2017, survey effort was completed in NEL, NWL, AW, WL, and SWL survey areas. Although the frequencies of visiting each survey area per survey month were identical, the survey effort of different survey areas varied and was generally in proportion to the size of each survey area (larger survey area having longer distance of survey effort). A total of 5,427.7 km survey effort was collected in this reporting period (NEL: 1,120.9 km, NWL: 1,799.2 km, AW: 114.4 km, WL: 753.6 km, and SWL: 1,639.6 km). The percentage of the total survey effort collected in NEL, NWL, AW, WL and SWL was around 20.7%, 33.1%, 2.1%, 13.9% and 30.2% respectively.

Around 84.5% (4,583.7 km) of the survey effort was collected under favorable weather condition (Beaufort 0-3 and visibility of approximately 1200 m or beyond), that can be utilized in analyses of encounter rates, density and abundance. A detailed record of the survey effort data is provided in **Appendix E**.

Sighting Distribution

During the reporting period, a total of 252 groups consisting of 845 CWDs were sighted. Amongst these 252 groups of CWDs, 220 groups with 771 CWDs were sighted during on-effort surveys under favorable weather condition (Beaufort 0-3 and visibility of approximately 1200 m or beyond).

The number of sightings by survey area recorded that NWL comprised 39 groups of 128 CWDs, AW comprised 5 groups of 16 CWDs, WL comprised 129 groups of 473 CWDs, while there were 79 groups of 228 CWDs seen in SWL. No CWDs were sighted in NEL during the entire reporting period.

In NWL, most CWDs were sighted within or in close vicinity of the Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP), particularly in the northwestern part off Lung Kwu Chau. Around one-fourth of the sightings (including AW sightings) were recorded at the southwestern part of the survey area, with a few of them recorded close to the 3RS works area. No dolphins were sighted from central to eastern part of the NWL survey area.

In WL, CWDs were sighted along the coast and off-shore waters from Sham Wat to Fan Lau, with relatively more sightings between Tai O and Peaked Hill.

In SWL, sightings of CWDs were scattered amongst the survey area particularly around Fan Lau, western side of the Soko Islands and the coastal waters around Lo Kei Wan and Shui Hau.

The sighting locations of CWDs during this reporting period are depicted in Figure 1 of **Appendix E**.

Encounter Rates

Two types of dolphin encounter rates were calculated based on the data collected during the reporting period. They included the number of dolphin sightings per 100 kilometres survey effort

(STG) and total number of dolphins per 100 kilometres survey effort (ANI). The dolphin encounter rates were calculated by using survey data collected under favorable weather condition only (Beaufort Sea State 3 or below with favorable visibility). Encounter rate provides a short to medium term frequency method for monitoring and responding appropriately to changes in CWD abundance as project works progress (referring to Section 10.5.2.3 of the EM&A Manual). The two types of encounter rates provide indications to determine areas of importance to CWD and the change in population of the CWDs in the western Hong Kong waters.

During the reporting period, the combined STG and ANI of CWDs (from NEL, NWL, AW, WL and SWL) were 4.80 and 16.8 respectively. Dolphin encounter rates by survey area and a summary of monthly encounter rates are presented in Table 1 and Table 2 of **Appendix E**. Compared by area, WL had the highest STG and ANI amongst the survey areas, followed by SWL, AW and NWL. The encounter rates of NEL were zero as no dolphins were sighted in the reporting period. The monthly encounter rates reviewed that summer months had generally higher STG and ANI although the ANI peaked in May 2017. The lowest STG occurred in March 2017 whilst the lowest ANI occurred in November 2017.

The trends of both monthly STG and ANI are presented in Figure 2 and Figure 3 of **Appendix E**. The temporal trends in 2017 were generally similar to 2016. From January to July, gradual increase of monthly STG from March to June was recorded in both 2016 and 2017, with an exceptionally higher STG recorded in January and February 2017; the value of monthly STG during 3RS construction phase monitoring period in April to July 2017 were also higher than the same months during baseline monitoring in 2016, which indicates no adverse effect on CWD abundance as 3RS works progress.

Running quarterly encounter rates STG and ANI data were determined for each month for comparison with the Action/Limit levels for construction phase monitoring of CWD. No Action Level was triggered in this reporting period. The running quarterly STG and ANI from January to December 2017 are summarized in Table 2 of **Appendix E** while the trends of both running quarterly STG and ANI of the current reporting year and the last reporting year are presented in Figure 2 and Figure 3 of **Appendix E**.

It was recommended in Section 4.2 of the CWD Baseline Monitoring Report that a review of the annual encounter rates is to be made upon the collection of 12 months of CWD monitoring data, including the review of any potential peak season. The trends of running quarterly STG and ANI from January to December 2017 (shown in Figure 2 and Figure 3, **Appendix E**) are further reviewed with the seasonal variations of CWD quarterly encounter rates based on the AFCD long-term marine mammal monitoring in the past six years (2010 to early 2016) covering the NEL, NWL, WL and SWL waters (Figure 4, **Appendix E**). Compared to the running quarterly encounter rates under the AFCD monitoring programme during the period without 3RS marine works, and the 3RS monitoring results in 2016 in the period with some localised marine works, the running quarterly encounter rates of the 3RS monitoring results in 2017 did not show any substantial difference with the range throughout the past years. In view of no obvious variation observed in the seasonal pattern and the small difference in encounter rates between peak and low seasons in this reporting year 2017, it is suggested to remain using the encounter rates previously established during the baseline monitoring period and thus the Action and Limit Levels for CWD monitoring remain unchanged.

Density and Abundance Estimation

Line transect analyses to estimate the density and abundance of CWDs in Hong Kong waters during the reporting period were conducted using the same basic methods as in previous analyses (Table 3, **Appendix E**). The detection function of 3RS CWD monitoring data of this

reporting period is shown in Figure 5 of **Appendix E**. The overall abundance estimate for this reporting period (incorporating an entire year of data from all four seasons) was 71 CWDs, which shows a stable trend from last year, with a CV of 19.9% (which indicates a reasonable level of precision). As in analyses of the last reporting year in 2016, the area with the highest abundance and highest density was WL (N=36, this has been consistent over the AFCD long-term records), although SWL also had reasonably high numbers of dolphins (N=22), and registered higher numbers than NWL (N=14). NEL still registered zero sightings and an abundance estimate of zero. Due to the recently completion of marine works for the Hong-Kong-Zhuhai-Macao Bridge project and the planned development at the Northern Lantau area has yet to be commenced, the cumulative impacts due to 3RS project with other concurrent projects will be reviewed upon collection of more data from the on-going impact monitoring with other concurrent projects in place.

In addition to estimating year-round abundance for each of the survey areas, a seasonal analysis was also conducted (the pooled dataset from all survey areas was used, as stratifying by both survey area and season would reduce the sample sizes that result in estimates with unacceptably-low levels of precision) (refer to Table 3 of **Appendix E**). The spring estimate was the lowest (N=40 dolphins), in which spring was generally the low season for dolphin numbers in Hong Kong. The summer estimate was the highest (N=112 dolphins).

Quantitative Grid Analysis on Habitat Use

Habitat use amongst the survey areas were examined by using quantitative grid analysis, both SPSE (no. of on-effort sightings per 100 units of survey effort) and DPSE (no. of dolphins per 100 units of survey effort) values were calculated in all grids amongst all survey areas for the time period from January 2017 to December 2017. SPSE and DPSE of the last reporting year and the current reporting year are depicted in Figure 6 of **Appendix E**.

Compared with last reporting period, the important habitat of CWDs in NWL waters with high dolphin densities recorded in 2017 slightly shifted from north to northwest off Lung Kwu Chau. Increased usage by CWDs in the southwestern part of the survey area (waters between Sham Wat and the 3RS works area) in 2017 was indicated. Both SPSE and DPSE showed a general increasing trend of dolphin usage in the WL waters as a whole in 2017 compared with last reporting period. Grids with high SPSE and/or DPSE value(s) in WL were near Tai O, Yi O, Peaked Hill and Fan Lau, which are similar to last reporting period. While in SWL, the coastal waters around Fan Lau Tung Wan remain as an important habitat of CWDs. There was a decreasing trend of dolphin usage in the coastal waters of Shek Pik in 2017 but more CWDs used the waters around the western part of the Soko Islands and also the coastal waters around Lo Kei Wan and Shui Hau.

Cumulative SPSE and DPSE values were also calculated by using data since mid-Dec 2015 and depicted in Figure 7 of **Appendix E**. Grids in western waters of Hong Kong with high dolphin density are waters of northwest off Lung Kwu Chau, Tai O, Yi O, Peaked Hill and Fan Lau.

Group Size

During the reporting period from January 2017 to December 2017, group size of CWDs ranged from one to 15 dolphins, with an average of 3.77. The average group sizes of NWL, AW, WL and SWL were 3.28, 3.20, 3.67 and 2.89 respectively. By four solar seasons, the average group size of CWDs was the highest in spring (4.69) but the lowest in summer (2.83). The summaries of the average group size of CWDs by survey areas and by seasons are presented in Table 4 and Table 5 of **Appendix E**.

Small and medium sized CWD groups accounted for most of the sightings during the reporting period (48.0% and 48.4% respectively). Only nine sightings, which accounted for 3.8% of the sightings, contained 10 or more animals per group.

Both small and medium-sized CWD groups were sighted throughout the distribution range of dolphins in NWL, WL and SWL waters. There were relatively more large-sized CWD groups sighted in WL than in SWL or NWL. In NWL, two large CWD groups were sighted on the westernmost transect. In WL, the large CWD groups were sighted in waters between Yi O and Fan Lau. While in SWL, the only large CWD group was sighted in at the eastern side of Fan Lau Tung Wan. The sighting distribution of CWDs with different group sizes is illustrated in Figure 8 of **Appendix E**.

Activities and Association with Fishing Boats

Although vessel surveys do not provide the most unbiased information on the behaviour and activities of dolphins (due to the potentially disturbing presence of the vessel itself, and also the low vantage point of small vessels), nonetheless behaviour and activity data are still useful and are being collected from the vessel surveys.

During the reporting period, a total of 62, 28, 24 and 4 groups of CWDs were observed engaging in feeding, socialising, travelling and resting/milling activities, comprising of 24.6%, 11.1%, 9.5% and 1.6% of all CWD sightings respectively. The sightings locations of CWD groups engaged in different types of activities are depicted in Figure 9 of **Appendix E**.

Feeding activities mainly occurred from west of existing airport island down to Sham Wat and along the coastal water of SWL to Shui Hau. Occasional feeding activities were also observed in the western part of the Soko Islands. Considering the sample size of sighting data of different survey areas, AW has the highest percentage of feeding again in 2017 (although it should be kept in mind that the sample size in AW was very small), followed by SWL. A significant decline in feeding activities was observed in NWL (from 41% in 2016 to 15% in 2017) and the feeding activities in NWL shifted to the southwestern part of the survey area, whereas feeding activities mainly occurred in waters off northern Lung Kwu Chau in 2016 (refer to in Table 6 of **Appendix E**).

Socialising activities were mainly sighted around SCLKCMP, Tai O, Fan Lau and western side of the Soko Islands. Travelling activities in NWL were mainly sighted near Lung Kwu Chau, particularly the area north off. While in WL, travelling activities frequently occurred in the northernmost part of the survey area, and from Tai O to Peaked Hill. There were also several sightings with travelling activities scattered in SWL. In addition, resting/milling activities mainly occurred in WL and SWL. Only three sightings of resting/milling activities in total were sighted in NWL and SWL. The percentages of different activities for each of the survey areas are shown in Table 6 of **Appendix E**.

A total of 16 sightings of CWDs were observed associating with operating fishing boats, including gill netters (seven groups), purse seiners (six groups), shrimp trawler (one group) and pair trawlers (two groups), accounted for 6.3% of all sightings. Although a trawling ban was implemented in December 2012, illegal trawling activities were still often observed near the western and southwestern borders of Hong Kong. Three groups of CWDs, one in SWL and two in WL, were observed feeding in association with trawling activities. CWDs were observed most often associated with gill netters and purse seiners. CWD association with operating fishing boats were mainly observed in WL and SWL and absent from most part of NWL. This may be due to the shift of fishing operation (a general observation was made from the CWD monitoring that fewer fishing operation took place in NWL, but an increase of fishing operation in WL). The

sighting locations of CWD groups associated with operating fishing boats are depicted in Figure 10 of **Appendix E**.

Mother-calf Pairs

During the reporting period, 37 sightings were observed having mother-and-unspotted calf, or mother-and-unspotted juvenile pairs. The percentages of sightings with mother-calf pairs in NWL (including AW), WL and SWL were 11.4%, 20.2% and 7.6% respectively. These percentages were calculated by dividing the number of sightings with mother-calf pairs of a survey area by the total number of sightings of that survey area. These mother-calf pairs were mainly recorded from the western waters of the existing airport to Peaked Hill and around Fan Lau. The sighting distribution of mother-calf pairs are depicted in Figure 11 of **Appendix E**.

Photo Identification – Summary

During the reporting period, a total of 62 newly identified CWD individuals were added to the photo-identification catalogues, including 10 added to NL catalogue, another 10 added to SL catalogue and 42 added to WL catalogue. Three animals identified in this reporting period (WLMM084, WLMM088 and SLMM054) were confirmed to be replicates of three earlier identified individuals named WLMM001, NLMM019 and WLMM054 respectively. Therefore, all records under these three replicates were transferred to the records under WLMM001, NLMM019 and WLMM054, respectively.

A total of 155 CWD individuals were identified altogether 386 times from all sightings in 2017. Amongst these 155 CWD individuals, 36, 80 and 39 belonged to NL, WL and SWL catalogues respectively. Amongst these 155 identified individuals, 88 individuals (56.8%) were sighted more than once. The number of re-sightings of an identified animal ranged from two to 11 times. The re-sighting rates (number of identified individuals that were re-sighted more than once divided by the total number of the identified individuals in the catalogue) of NL, WL and SWL catalogues were 27.0%, 39.7% and 42.2% respectively. Twenty-five of these 88 re-sighted individuals were sighted five times or above.

The most frequently re-sighted animal in 2017 was SLMM014 which has been re-sighted 11 times and it is also the most frequently re-sighted animals since the establishment of the photo-identification catalogue, with a total number of 19 re-sightings. In the previous reporting period, SLMM014 only occurred throughout the entire SWL survey area while it still occurred extensively in SWL in 2017, but with an extension of home range to the waters near Yi O in WL. The sighting locations of SLMM014 are depicted in a location map under Figure 12 of **Appendix E**. Summary of the photo-identification of CWDs is presented in Table 7 of **Appendix E**.

Photo Identification – Range Use of Identified CWD individuals

Amongst these 88 re-sighted individuals, 50 individuals showed cross-area movement between different survey areas. This accounted for about 32.3% of all 155 identified animals. Seventeen (34.0%) out of these 50 animals were re-sighted in both NWL (including AW) and WL, while 35 (70.0%) animals were recorded in both WL and SWL. Five (10%) out of these 50 animals were re-sighted in three main survey areas (WL, SWL and NWL including AW). These five animals were NLMM020, NLMM023, SLMM030, WLMM027 and WLMM064. Despite the fact that a number of identified CWD individuals were re-sighted in different survey areas, a significant proportion of animals were observed not crossing between different survey areas and were sighted in only one survey area repeatedly in 2017. For instance, six individuals occurred repeatedly in NWL only, 25 animals were re-sighted within WL only, while seven animals occurred repeatedly in SWL only.

Some of the frequently seen individuals in last reporting period (NLMM002, NLMM010, SLMM002, SLMM010, SLMM013 and SLMM022) have apparently diminished their use of Hong Kong waters in 2017, and the mother-and-spotted juvenile pair NLMM006 and NLMM013 have significantly reduced their time spent in NWL. Although some individuals showed declining use of Hong Kong waters in 2017 compared with the previous year, some were still seen frequented around Lantau waters. For example, NLMM004, NLMM019, SLMM011, SLMM014, SLMM015, SLMM028, SLMM030, SLMM031, WLMM007 and WLMM027 were quite frequently seen in both 2016 and 2017. A few animals, such as NLMM016, NLMM020, NLMM037, SLMM023, SLMM036, SLMM052, WLMM001, WLMM008, WLMM011 and WLMM060, even apparently greatly increased their use of Hong Kong waters in 2017 compared with 2016.

The re-sighting locations of those re-sighted individuals that involved NWL are depicted in the location maps in Figure 12 of **Appendix E** to provide a preliminary picture of their range use.

2.5.2.2 Summary of Land-based Theodolite Tracking Monitoring Results

Survey Effort

In this reporting period, the land-based surveys commenced on 9 January 2017, and concluded on 29 December 2017. A total of 60 days and 360:25 (hh:mm) of land-based theodolite survey effort have been accomplished (Table 8 of **Appendix E** for summary). A total of 196 CWD groups were tracked from land, all from the LKC station with the exception of 2 CWD groups tracked from the SC station (Table 8, Figure 13 and Figure 14 of **Appendix E**). After the raw data were filtered, 91 CWD group focal follows fit criteria for analyses. From these focal follow tracks, 157 10-minute segments were extracted for analyses. CWD group sighting per survey hour was 0.90 from LKC and 0.01 from SC.

In the last reporting period (2016), a total of 126 CWDs were sighted off LKC during essentially the same survey effort as in 2017, for a total of 0.58 CWD group sighting per survey hour in 2016, substantially less than in 2017. Sightings off SC were the same in both years, at 2 CWD groups.

Time of Day

The diurnal pattern of CWDs was calculated by dividing the total tracking time of CWD groups (prior to filtering data) by the total effort per hour block. Off LKC, the highest percentages of CWD groups (per hour of effort) were during the 1000 (20.47%), 1100 (20.23%), and 1300 (17.51%) hour blocks (Figure 15 of **Appendix E**). The two groups recorded off SC were tracked during the 0900 hour block only.

Compared with the last reporting period (2016), sightings off LKC by hour in 2017 were more uni-modal than in 2016, with the major peak in the 1000 to 1300 hour blocks. In 2016, the 1000 hour and 1300 to 1400 hour blocks were highest, with fewer sightings during the mid-day 1100 to 1200 hour blocks.

Time of Year

The highest percentage of CWD groups observed from LKC was during February (18.04%) and the lowest percentage observed was during May (2.58%) while CWDs were only observed from SC during August (Table 9 and Figure 16 of **Appendix E**). Off LKC, there were fewer sightings between the months of March and August in 2017. This increased in the late months of the year, September to December, unlike the fewer sightings in that time period in 2016.

Group Size

The mean group size of CWD filtered tracks off LKC was 3.03±1.58, ranging from singletons to a maximum group size of 7 (Table 10 of **Appendix E**), and this was very similar to the last reporting

year (3.08±1.81 in 2016). The sighting distribution of CWDs relative to group sizes within SCLKCMP, crossing SCLKCMP boundary and outside SCLKCMP are represented in Figure 17, Figure 18 and Figure 19 of **Appendix E** respectively. Group sizes of CWDs were largest outside of the SCLKCMP boundary (4.05±1.54), where ferry traffic is routed, compared to inside the boundary (2.73±1.51) and groups crossing the boundary (2.93±1.45). Singletons were most often observed inside the boundary near shore. However, this trend may reflect a sighting bias wherein single dolphin may be more difficult to locate farther from the survey platform. The group size of the CWD filtered track off SC was 2 dolphins (Table 10 of **Appendix E**).

Behavioural State

Excluding the unknown behavioural category from the filtered segments, foraging and travelling were observed most frequently (52.73% and 38.39%, respectively) off LKC, and milling, resting, and socialising were observed least frequently (1.37%, 1.91%, and 5.60%, respectively) off LKC (Figure 20 of **Appendix E**). Travelling was the only behaviour recorded off SC from the filtered segments. However, raw data include foraging by one group observed for approximately 1 minute.

Vessel Activity and Dolphin Movement Analysis

Plots of vessels, including high speed ferries under speed restriction (lower than or equal to 15 knots) and high speed ferries (higher than 15 knots), and CWDs show overlap in habitat off LKC throughout the year (Figure 21 of **Appendix E**). Plots of vessels and CWD groups also show overlap in habitat off SC (Figure 22 of **Appendix E**).

Off LKC in 2017, vessels were recorded within 500 meters of focal CWD groups on 27 occasions (based on filtered 10-minute segments), including high speed ferries under speed restriction on 8 occasions, high speed ferries on 3 occasions, and other vessels (e.g., fishing and government vessels) on 16 occasions. Mean speed, reorientation rate and linearity for CWDs in the absence of vessels and in the presence of each vessel category are detailed in Table 11 of **Appendix E**. A basic one-way ANOVA showed no significant difference at the 0.05 alpha level in CWD speed relative to vessel type present ($p=0.321$). A significant difference was detected in CWD reorientation rate ($p=0.001$) and linearity ($p<0.001$) relative to vessel type present. A sequential Bonferonni post hoc test showed significantly higher reorientation rate at alpha level 0.05 when other non-ferry boats were present compared to when no boats were present ($p=0.02$), and high speed ferries were present ($p<0.001$). Reorientation rate was also significantly higher when high speed ferries under speed restrictions were present compared to when high speed ferries were present ($p=0.01$). A sequential Bonferonni post hoc test also showed significantly higher linearity when no boats were present compared to when other non-ferry boats were present ($p=0.01$). Linearity was also higher when high speed ferries were present when compared to when high speed ferries under speed restrictions ($p=0.003$) and other non-ferry boats ($p<0.001$) were present.

Statistically significant key findings for fine-scale movement patterns of CWDs are:

- Swimming speed: Group size had a significant effect on swimming speed, with speed generally increasing as group size increased from 1 to 5 dolphins, and then declining with larger group sizes. Socialising behaviour was associated with significantly slower swimming speed than travelling, and swimming speed was significantly faster among CWDs crossing the marine park boundary.
- Reorientation rate: significantly reduced among CWDs crossing the marine park boundary, and increased in the presence of non-ferry boats.
- Linearity: decreased significantly in the presence of non-ferry boats.

Summary of findings from the data of 2016 and 2017 are:

- Lung Kwu Chau remains an important foraging habitat, where foraging is observed more than expected by chance.
- Foraging was associated with increased reorientation rate and reduced linearity when compared to travelling behaviour.
- Socialising was associated with decreased swimming speed compared to speed while travelling.
- Group size was significantly larger outside the SCLKCMP compared to inside the marine park, and in the presence of each individual boat type compared to no vessels present. An increase in group size was also associated with increased swimming speed and increased reorientation rate.
- CWDs crossing the SCLKCMP boundary showed increased swimming speed, decreased reorientation rate, and increased linearity compared to CWDs inside the marine park.
- Although ANOVA tests did not detect a response in CWD movement patterns in the presence of vessels, the sophisticated multivariate GAM analysis detected significantly reduced swimming speed and increased reorientation rate in the presence of "other" non-ferry vessels.

2.5.2.3 Summary of Passive Acoustic Monitoring (PAM) Results

Dolphin Detection Rates Per Day

In 2017, there were six deployment periods of Ecological Acoustic Recorder (EAR) for PAM (summarized in Table 12 of **Appendix E**). Dolphins were detected at the EAR location (A5) at the south of Sha Chau (**Figure 2.5** refers) on 109 of 280 days with recording effort (39% of days), and dolphin signals were detected in a total of 236 of 79,931 files (0.3% of files) (Table 12 and Figure 23 of **Appendix E**). The overall metrics for dolphin occurrence during this period are comparable to previously reported values from monitoring in 2016 (dolphins were present in 40% of recording days and in 0.3% of files). On days with dolphins detected, the mean percentage of files with detections per day was 0.8%, and the maximum percentage of files with dolphin detections was 4.2%, on 27 Feb 2017 (Figure 23 of **Appendix E**). On 52% of the days with dolphin detections (57 of 109 days), only one file containing dolphin signals was detected. Clicks were the predominant type of dolphin signal detected (n = 222 of 238 detections, or 93%). Whistles (n = 16) were occasionally detected throughout the monitoring period.

Dolphin detection rates in 2017 were lowest in Deployment 4, which recorded data in late spring/early summer (late May to early July); in this deployment dolphins were detected on 19% of recording days and in 0.10% of files (Table 12 of **Appendix E**). The percentage of days with dolphins was greatest in Deployment 2 (late winter, February to March) at 71%, but only a small percentage of files contained dolphin detections (0.9%). Overall, both measures of dolphin detection rates were relatively high during Deployments 3, 5, and 6. During the spring (Deployment 3), dolphins were detected on 46% of recording days and in 0.3% of files, and during late summer/autumn (Deployments 5-6), dolphins were recorded on 37-39% of recording days and in 0.21-0.25% of files (Table 12 and Figure 23 of **Appendix E**).

Dolphin Diel Pattern

Dolphin detection rates at A5 in 2017 were greater at night than during daytime, with peak detection hours from 1900-2300 (Figure 24 of **Appendix E**). During the previous year of data collection, hourly detection rates were also highest at night, with a similar peak hour of 2100 and another early-morning peak at 0300 (Figure 25 of **Appendix E**). This pattern of detection was similar compared to the diel pattern in dolphin detections observed throughout Hong Kong waters, with higher numbers of detections during night-time and fewest detections at midday (Munger et al. 2016). The diel pattern in 2017 was evident in winter, spring and autumn but not in the summer,

in which detections were low overall (Figure 26 of **Appendix E**). The seasonal pattern in hourly detection rates was similar in 2016 and 2017, with low detection rates in summer in both years (Figure 27 of **Appendix E**).

Sound Pressure Levels Per Day

Ambient received noise levels (referred to as sound pressure levels or SPL) at the EAR were calculated for each recording within the full effective frequency bandwidth (~0 to 32 kHz) as well as octave bands of 0-2 kHz, 2-4 kHz, 4-8 kHz, 8-16 kHz, and 16-32 kHz. Mean daily sound pressure levels over the full bandwidth ranged from approximately 109 to 119 dB, with a mean of 115 dB rms re 1 µPa (Figure 28 of **Appendix E**). Mean daily sound pressure levels in all frequency bands gradually increased to a maximum in August 2017 and gradually decreased over the remainder of the recording period.

Daily mean sound pressure levels in the 16-32 kHz band, in which energy from CWD clicks occurs, ranged from approximately 96 to 102 dB, with the maximum in summer and minimum in late autumn/early winter (Figure 28 of **Appendix E**). CWD click and whistle frequencies are above 16 kHz and below 10 kHz, respectively (Sims et al. 2012); however, these sounds were very rare in the data compared to other sound sources and would not be distinguishable in ambient noise plots.

Diel Sound Pressure Level

Mean sound pressure levels plotted by hour indicated a daily peak during the hour 1900, which was mainly due to the contribution from the 0-2 kHz frequency band that is not the high-sensitivity region of CWD hearing (Figures 29 and 30 of **Appendix E**). This daily peak was most pronounced in spring, summer, and autumn months (Figure 30 of **Appendix E**). This seasonally shifting peak is similar to the diel pattern of sound pressure levels reported during previous Hong Kong PAM efforts (Munger et al. 2016), and is hypothesized to be related to a local fish chorus, probably dominated by croakers (family Sciaenidae). Sound pressure levels in the 16-32 kHz band remained relatively flat and constant (within 2 dB) throughout all hours of the day (Figures 29 and 30 of **Appendix E**).

In the absence of the evening fish chorus (see Winter subplot in Figure 30 of **Appendix E**), daily noise levels were approximately 2 dB lower during the nighttime hours of 0000 to 0600, and increased throughout the day beginning at approximately 0700, due to the contribution of anthropogenic traffic/activity.

2.5.3 Discussions on CWD Monitoring Results

Each main survey type used in this project (i.e., vessel-based line transect and photo-identification surveys, land-based surveys with theodolite-tracking, and passive acoustic monitoring) provides important data that are complementary to each other, and when analysed together and in parallel, they provide a robust dataset to examine the kinds of issues that need to be considered for proper management and conservation of CWD in Hong Kong.

2.5.3.1 Vessel Line-transect Survey and Photo-identification

From the CWD monitoring data, the estimate of overall abundance for 2017 was 71 dolphins, which is somewhat higher than the year before, with a CV of 19.9% (which indicates a reasonable level of precision). It is encouraging to see that the estimate of total dolphin numbers in Hong Kong was somewhat higher than the previous year's estimate when Hong Kong waters have shown in general a declining trend in dolphin numbers over the last decade. This is despite the extensive construction work being conducted in 2017 in North Lantau waters for the Project. Within NWL waters, dolphins are mostly found around the Castle Peak and LKC areas. The

seasonal analysis showed that within summer, dolphin numbers are still quite high in Hong Kong waters. The 2017 seasonal range is 40-112 dolphins. The spring estimate was the lowest (40 dolphins), while the summer estimate was the highest (112 dolphins), and this indicates that, despite the overall reduction in the average number of dolphins using Hong Kong waters in recent years, there are quite a number of dolphins still present in the summer months.

Earlier, concerns had been expressed by some interested stakeholders that dolphin numbers in NWL may have decreased, specifically due to potential negative impacts from the re-routing of high speed ferries (HSFs) to the Speed Control Zone (SCZ) north of Lung Kwu Chau. The analysis covering the entire first year post-SCZ (2016) provided an estimated abundance of 15 dolphins for NWL (refer to the 2016 annual report). The estimate for 2017 for the same area was 14 dolphins; this is considered a non-significant difference. Therefore, these early analyses have not supported the hypothesis of a decline, and in fact suggested that dolphin numbers in NWL may have actually remained quite stable since the SCZ has been implemented.

Regarding the effectiveness of the implementation of SkyPier HSF route diversion in alleviating the impacts on travelling areas of CWD using the waters between the project and SCLKCMP, and the areas between the CWD hotspots to the Northwest, Northeast and West Lantau, in view of no sighting of CWD at NEL area from vessel surveys and only two groups of CWD recorded off Sha Chau from theodolite tracking in both 2016 and 2017, the usability for CWDs to travel between western and eastern waters through the north of the airport island is yet to be determined. However, as the dolphin numbers estimated in NWL and WL were stable in 2017 compared to 2016, no obvious change in the functionality of the travelling areas was observed.

Regarding the results of photo-identification work, a total number of 155 CWD individuals were identified altogether 386 times from all sightings in 2017, with 88 (56.8%) sighted more than once. Fifty (32.3%) of the 155 identified animals showed cross area movement between different survey areas. Five animals (NLMM020, NLMM023, SLMM030, WLMM027 and WLMM064) were re-sighted in three main survey areas (WL, SWL and NWL including AW). Several frequently seen individuals in 2016 have greatly diminished their use of Hong Kong waters in 2017. Amongst them, the mother-and-spotted juvenile pair NLMM006 and NLMM013, which were the most frequently identified individuals of the last reporting period, have significantly reduced their time spent in NWL, being sighted only one and two times respectively in 2017. Another animal, SLMM013, which has been sighted six times in the last reporting period, has not been seen in Hong Kong waters in 2017. On the other hand, there were quite a number of individuals that continued to frequent Lantau waters or even greatly increased their use of Hong Kong waters in 2017 compared with 2016. The most frequently re-sighted animal in 2017 was SLMM014, which has been re-sighted 11 times and it is also the most frequently re-sighted animal since the establishment of the photo-identification catalogue. In 2016, SLMM014 only occurred in the SWL survey area, while it still occurred extensively in SWL in 2017, but with an extension of home range up to the waters near Yi O in WL. With more re-sighting data to be collected in the future, more analyses on the change of individuals' home ranges and nature of residency will be conducted.

2.5.3.2 Land-based Theodolite Tracking

Based on theodolite data, the waters off Lung Kwu Chau remain an important foraging area for CWDs throughout the year. Relative occurrence peaked in February 2017, and again during autumn months (September through November). Group sizes of CWDs were generally smaller closer to shore, with the largest groups occurring outside of the SCLKCMP boundary.

CWD fine-scale movement patterns off LKC varied based on natural (group size and behavioural state) and anthropogenic (boat presence and marine park) factors. CWD swimming speed varied

based on group size and decreased during socialising behaviour. CWDs also swam significantly faster, with reduced reorientation rate, when moving across the marine park boundary. Increased speed and reduced reorientation rate are consistent with directed travel through an area, perhaps due to heavier vessel traffic around the SCLKCMP boundary. Although the SCLKCMP is an artificial construct lacking physical barriers, there are tangible differences based on vessel restrictions and operating routes within and beyond the designated area. In the presence of "other" non-ferry boats, reorientation rate increased and linearity decreased, indicating potential avoidance of vessels. Sample size in this category was unequal and low (n=20), which is a further indication of general vessel avoidance.

Group size was also largest near high speed ferries traveling greater than 15 knots speed, slightly less so near high speed ferries traveling equal to or less than 15 knots speed, less near other boats, and least with no boats present within 500 m. This indicates a behavioural "clumping" or aggregation effect near low to high speed vessels, perhaps as social aggregation in times of perceived danger. It is also possible that lone dolphins or those in small groups react more easily to (especially) faster boat travel and move out of the way more often, while those in larger groups – although the above speeds and orientations indicate that they do react – may be slightly more inclined to stay in the area, again as a perception of safety in numbers. Since more animals have more capabilities of sensory awareness, such increased tolerance in larger groups makes behavioural sense (and has been witnessed by the authors elsewhere).

Dolphins crossing the SCLKCMP boundary exhibited increased swimming speed, decreased reorientation rates, and increased linearity compared to dolphins inside the park. While there was no statistically significant overall difference in movement patterns in the presence of vessels (very possibly due to generally small sample sizes, especially for high speed ferries going at high speed), this difference related to the park boundary may be in response to increased boat traffic and more higher speeds in general outside of the park than in it. The dolphins may be more aware of this general boat shift (and perhaps associated noise) from inside the park to outside and react accordingly.

There were very few CWDs observed off Sha Chau, with only two groups observed throughout the entire year, which is the same number as recorded in 2016. The primary behaviour observed from this location was travelling, suggesting that CWDs are simply moving through this area to more suitable habitat. However, one minute of foraging behaviour was observed. This is a sharply-reduced use of the area north of the airport and south of the Sha Chau and Lung Kwu Chau Marine Park from studies prior to 2016, as expected relative to increasing marine works in this area.

2.5.3.3 Passive Acoustic Monitoring

The PAM data continue to provide useful information, especially on patterns of dolphin vocalization at night, which has previously been unavailable to us. The diurnal detection of clicks showed a consistent pattern of higher levels in late evening and at night compared with the day, which may be indicative of increased use of echolocation by dolphins during hours of darkness.

The PAM data provide evidence that dolphins are using the area around south of Sha Chau throughout the year. In 2017, dolphins were present with especially high incidence in winter, and less so in other seasons. The per-file detection rates were also highest in winter; taken together, these metrics suggest that dolphins use the area more frequently and intensively in winter than in other seasons. Dolphins were detected more frequently during nighttime hours than during the day, and this may be related to increased nocturnal foraging behaviour.

2.5.4 Conclusions of CWD Monitoring Results

With reference to the aims of construction phase CWD monitoring described in the EM&A Manual, the key findings of CWD monitoring in 2017 are summarised as follows:

Effects on the Potential Shift in CWD Travelling Areas and Habitat Use

Both SWL and WL waters were being used more heavily in 2017 than in the past, likely due to shifting of dolphins away from highly-disturbed habitats in NWL and NEL waters; whilst dolphin sightings by vessel surveys have remained nonexistent around the Brothers Islands of NEL.

While shore-based observations and theodolite tracking do not present overall estimates of numbers of dolphins, the 2017 data from LKC showed about 1.5 times as many groups sighted and tracked than in 2016 (an increase of about 0.3 sightings per survey hour), with overall very similar observation effort between the two years. This indicates a higher use of this area in 2017 than 2016, perhaps indicative of more dolphins using the habitat due to construction works of the Project to the south.

Shore-based work found very few dolphin groups off Sha Chau (much reduced from past levels); Nevertheless, acoustic monitoring showed consistently higher levels of clicking activity at night which may indicate increased use of echolocation by dolphins during hours of darkness, and also dolphins using the area around south of Sha Chau throughout the year with increased activity during winter and spring months.

Effectiveness of the HSF Speed and Routing Restrictions to the CWDs

Waters around Lung Kwu Chau remain an important year-round habitat, especially for foraging; and there continues to be no evidence of a decline in dolphin use of the HSF SCZ around Lung Kwu Chau since ferries were re-routed to that area with slower speeds at the end of 2015.

Trends in Long Term Monitoring Data

From vessel surveys conducted in 2017, CWD use of Hong Kong waters was similar to in 2016, though with an apparent increase in use of the western waters, especially WL and SWL. It is estimated that 71 dolphins (on average) were found within Hong Kong waters in 2017, which is up slightly from last year (2016). There continues to be no evidence that the implementation of the SCZ is having any negative impacts on dolphin use of the NWL area. Diverted SkyPier HSFs with speed control measures in place appear to be reducing risks to CWDs using the narrowing waters between south of SCLKCMP and the airport north and at the same time do not appear to be resulting in apparent negative impacts on CWDs along the diverted route.

From land-based surveys with theodolite-tracking in 2017, use of LKC by CWD was highest during mid-day, 10-13 hours; with the overall lowest season of use from March to May; the highest month was February and the lowest was May. Mean group size off LKC was about 3, with singles up to a maximum of 7 CWD per group. Group size was largest outside of the SCLKCMP, at about 4, compared to inside of the park at about 2.7. Singletons most often occurred inside of the SCLKCMP boundary, closer to shore. It is unknown how much a bias of vision (sighting bias) resulted in this latter low number closer to the observation session, as it is easier to find and track dolphins when they are closer. Group size was largest within 500 m of HSF's at speeds >15 knots, indicative that either dolphins are aggregating in response to rapidly-approaching vessels, remain more often near such vessels when in larger groups, or both. The group size off SC was 2.

Overall, the behavioural states of foraging and travelling were by far the most frequent off LKC (and the two observations off SC were primarily of travelling groups). Swim speed increased with group size up to 5 dolphins per group, and since group size increased outside the marine park, these two parameters may be related to some degree. As expected, swim speed decreased with increase in socialising. Swim speed increased while dolphins crossed the marine park boundary, but boat presence showed no significant effect. In concordance with swim speed increasing at the SCLKCMP boundary, reorientation rate decreased there. Reorientation rate increased in the presence of non-ferry vessels, and there was a potential, but non-significant, trend for reorientation rate in the presence of ferries travelling lower than or equal to 15 knots. Linearity decreased in the presence of non-ferries, and there was a potential, but non-significant, variation in linearity in the presence of ferries travelling lower than or equal to 15 knots.

The CWD construction phase monitoring data so far does not contradict findings of the ecological assessments completed during the EIA; recommended mitigations have been implemented accordingly and we will keep reviewing the effectiveness of the mitigation measures upon obtaining more monitoring data in future.

2.5.5 Site Audit for CWD-related Mitigation Measures

During the reporting period, silt curtains were in place by the contractors for sand blanket laying works and at least two dolphin observers were deployed by each contractor in accordance with the Marine Mammal Watching Plan. Teams of at least two dolphin observers were deployed by contractors for continuous monitoring of the Dolphin Exclusion Zone (DEZ) for DCM works, water jetting works for submarine cable diversion, PVD installation and seawall construction in accordance with the DEZ Plan. Trainings for the dolphin observers on the implementation of MMWP and DEZ monitoring 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. During the reporting period, ET was notified on six records of dolphin sighting within the DEZ of DCM works by the contractors. The ET checked the dolphin sighting records and the contractors' site records to audit the implementation of DEZ. Details of the sightings are summarized in Table 13 of **Appendix E**. DCM works within the DEZ were ceased by the contractors, and not resumed until the DEZ was clear of dolphin for a continuous period of at least 30 minutes in accordance with the DEZ Plan.

Audits of acoustic decoupling for construction vessels were carried out during weekly site inspection and summarised in Section 2.6. Summary of audits of SkyPier High Speed Ferries 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 both within the site area as well as outside the project sites which was likely to be affected, directly or indirectly, by the site activities. 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 observed in site inspections during the reporting period. The ET participated in environmental drills organized by the contractor as observer, including chemical spill drills and silt curtain deployment drills. Advices were given when necessary to ensure the construction workforce were familiar with relevant procedures, and to maintain good environmental performance on site. Environmental briefings were provided to the contractors by EPD on various topics including CNP and waste management. Environmental briefings on EP and EM&A requirements were also provided to the new contracts by ET. 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.

Based on the site inspections, the key construction activities and contractors' site management practice or actions, are presented in **Table 2.14** below.

Table 2.14 Summary of Key Findings during Environmental Site Inspection

Construction Activities	Mitigation Measures	Contractors' Site Management Practices or Actions
General construction activities	Chemical spill and leakage prevention measures	Contractor provided and regularly maintained drip trays and storage area for chemicals; Spill kits were provided on site according to Spill Response Plan.
	Runoff prevention measures	Contractor properly maintained bunding or toeboard around vessels or drainage system to avoid runoff impact.
	Dust suppression measures	Contractor applied water spraying regularly and covered idling stockpile of construction material.
	Dark smoke preventive measures	Cleaning, maintenance and repair of plants were carried out by contractor to avoid dark smoke emission.
	Waste recycling and disposal management	Recycling bins were provided on site. Different types of waste were also segregated to enhance reuse or recycling, or proper disposal. Contractor set up designated collection points for general waste and chemical waste.
Marine construction activities	Acoustic decoupling measures	Acoustic decoupling material was placed under noisy equipment.
Sand blanket laying	Deployment of silt curtain	Contractor checked regularly the silt curtains in place and maintain them when necessary.

Construction Activities	Mitigation Measures	Contractors' Site Management Practices or Actions
DCM works	Wastewater treatment	Contractors deployed water pumps to collect and treat wastewater in accordance with the effluent discharge license. No direct discharge of wastewater is permitted.
	DEZ monitoring	Contractors established the DEZ according to the DEZ Plan.
Land based construction activities	Tree protection measures	Contractors set up tree protection zones with appropriate barriers for trees that were identified as to be retained.
	Noise mitigation measures	Contractor provided noise barriers or noise insulation material around site area or the equipment. Acoustic panels on equipment were closed during operation if available.

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

2.7 Ecological Monitoring

In accordance with the Manual, during the HDD construction works period from August to March, ecological monitoring shall 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.

Monthly ecological monitoring was carried out in January, February, March, August, September, October, November and December 2017 on Sheung Sha Chau Island. During these reporting months, the monthly ecological monitoring at the HDD daylighting location on Sheung Sha Chau observed that HDD works were ongoing at the daylighting location, and there was no encroachment of any works upon the egretry area nor any disturbance to the ardeids on the island by the works. Signs of early breeding activity of ardeids were observed in February and March, and signs of late nursery activity were observed in August and September on trees located at the previously identified egretry area where it is at the southern side of Sheung Sha Chau Island. At the HDD daylighting location, neither nest nor breeding activity of ardeids were found during the ecological monitoring and site inspections in the reporting period.

2.8 Audit of the SkyPier High Speed Ferries

The Marine Travel Routes and Management Plan for High Speed Ferries of SkyPier (the SkyPier Plan) was submitted to the Advisory Council on the Environment (ACE) for comment and subsequently submitted to and approved by EPD in November 2015 under EP Condition 2.10. The approved SkyPier Plan is available on the dedicated website of the Project. In the SkyPier Plan, AAHK has committed to implementing the mitigation measure of requiring HSFs of SkyPier travelling between HKIA and Zhuhai / Macau to start diverting the route with associated speed control across the area, i.e. SCZ, with high CWD abundance. The route diversion and speed restriction at the SCZ have been implemented since 28 December 2015. The IEC has also performed audit on the compliance of the requirements as part of the EM&A programme. The latest summary of key audit findings in the reporting period is presented in **Table 2.15**.

A total of five skipper workshops were held in 2017 with ferry operators and relevant ferry captains to refresh their understanding about the requirements of the SkyPier Plan, such as the routing and speed control requirements, with discussion on deviation cases, experience sharing and recommendations to strengthen the implementation of the SkyPier Plan.

In total, 9,560 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. The daily movements of all SkyPier HSFs in the reporting period ranged between 1 and 97, which falls within the maximum daily cap number of 125. There were no /fewer ferry

movements on 23 July, 23, 24, 27 August, and 15 October due to typhoon. The annual daily average of all SkyPier HSF movements in 2017 was 88, which falls within the annual daily average cap of 99 SkyPier HSF movements.

Most of the HSFs travelled through the SCZ with average speeds at or below 15 knots, which complied with the SkyPier Plan. One case of average speed deviation in April was due to giving way to vessels to ensure public safety. All ferry movements that were not strictly following the diverted route have been investigated. All of the route deviation cases were related to strong tidal wave and current, or giving way to other vessels due to safety and emergency situations, except two cases which the captain found difficulty to follow the normal route due to Automatic Identification System (AIS) failure. The ferry operator was advised to check the AIS system to ensure sufficient data points can be received.

Insufficient AIS data were received from some HSFs due to interference effect of AIS signal as reported by the ferry operators after checking the condition of the AIS transponders. In such cases, vessel captains were requested to provide radar track photos to indicate that the vessel entered the SCZ though the gate access points and without speeding in the SCZ.

Table 2.15 Summary of Key Audit Findings against the SkyPier Plan

Requirements in the SkyPier Plan	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Total number of ferry movements recorded and audited	868	783	860	845	864	834	846	744	580	693	786	857
Use diverted route and enter / leave SCZ through Gate Access Points	866	782	859	841	860	833	845	743	580	691	785	856
No. of SkyPier HSFs in compliance with Average Speed within 15 knots in SCZ	868	783	860	844	864	834	846	744	580	693	786	857
Daily Cap (including all SkyPier HSFs)	83-91	89-93	85-94	90-97	91-97	56-95	20-93	11-91	70-87	1-87	84-93	87-90

Source: excerpt from Monthly and Quarterly EM&A Reports

Note: There were fewer ferry movements on 23 July, 24, 27 August and 15 October (20, 60, 11 and 1 movements respectively) due to typhoon.

There were no HSF movement on 23 August due to typhoon Signal No. 10 on that day.

2.9 Audit of Construction and Associated Vessels

The audit of construction and associated vessels in accordance with the Marine Travel Route and Management Plan for Construction and Associated Vessel (MTRMP-CAV) has started since August 2016. ET has audited relevant information including AIS data, vessel tracks and other relevant records provided by the contractors to ensure that the contractors were fully complied with the requirements of the MTRMP-CAV. The Marine Surveillance System (MSS) was launched in March 2017. The MSS automatically recorded deviation cases such as speeding, entering no entry zone, and not traveling through designated gates. ET conducted checking to ensure the MSS records all deviation cases accurately. The 3-month rolling programme submitted by contractors for construction vessel activities were also checked every month to ensure the logistic of construction vessels were well planned to achieve a practicable minimum. The IEC has also performed audit on the compliance of the requirements as part of the EM&A programme.

Deviations including speeding in the works area, entry from non-designated gates, not following the designated route and entering no-entry zones were identified. All the concerned contractors were reminded to comply with the requirements of the MTRMP-CAV during the weekly MTCC audit and such deviations were also reviewed and highlighted during the monthly Environmental Management Meeting.

A total of 44 skipper training workshops were held by ET in 2017 with 369 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 43 skipper training workshops were held with 76 captains by contractor's Environmental Officers and competency tests were conducted subsequently with the trained captains by ET. In addition, ET participated Marine Management Liaison Group meetings to assist and resolve any marine issues which might be encountered under the Project.

2.10 Coral Post-Translocation Monitoring

Further to the requirements of the Coral Translocation Plan (CTP) which was submitted in May 2016, pre-translocation surveys were conducted along the airport island to identify gorgonian corals suitable for translocation in August 2016 and the translocation to recipient site RT2 in Yam Tsai Wan (YTW) was conducted. To gauge the success of the translocation, the post-translocation monitoring of 85 translocated corals and 20 control corals commenced following the completion of translocation in January 2017.

This section summarizes the results of post-translocation monitoring and *ad-hoc* monitoring conducted during the reporting period.

Summary of Post-translocation Monitoring Survey Results

The translocation of 384 gorgonian corals from the airport island to recipient site (RT2) at Yam Tsai Wan (YTW) was completed by January 2017. The post-translocation monitoring began in January 2017 and up to five rounds were completed by the end of 2017.

Table 2.16: Post-translocation Monitoring Programme and Monitoring Dates

Timing after Completion of Translocation	Programme	Monitoring Survey Date
15 days	1st round	20, 21 January 2017
30 days	2nd round	4, 5 February 2017
2 Months	3rd round	3, 4 March 2017
3 Months	4th round	5 April 2017
9 Months	5th round	25, 26 October 2017
15 Months	6th round	To be provided
21 Months	7th round	To be provided
27 Months	8th round	To be provided

Note: Six rounds of monitoring up to 15 months after completion of translocation were proposed in the CTP. Two extra rounds of monitoring, i.e. 21 and 27 months after completion of translocation, were proposed in the Detailed Coral Translocation Report.

Action and Limit Levels as stipulated in the CTP were not triggered. Low partial mortality (PM) levels and good general health conditions were recorded on both tagged control and translocated corals from January to March 2017. Notable change in PM and health were recorded in both tagged translocated and control corals in the April 2017 monitoring. A meeting was also held

between ET, AAHK and AFCD to discuss follow-up actions and an investigation on the possible cause(s) of the notable change in PM, including *ad-hoc* coral monitoring on top of the CTP's requirements was conducted. The investigation revealed that the relatively high PM levels identified in control and translocated corals at YTW in April 2017 were unlikely to be related to 3RS marine works activities and that the relatively high PM levels were mostly likely to have been caused by an interplay of environmental factors, rather than a single factor. For more information on the findings of the investigation and actions, please refer to Section 2.10 of Construction Phase Quarterly EM&A Reports No.7 and No.8.

The key results of the post-translocation monitoring surveys conducted from January to April and October 2017 as well as the *ad-hoc* surveys conducted in June, July and September 2017 are summarized in **Appendix F**.

The next post-translocation monitoring will be conducted in April 2018. In accordance with the CTP, a Post-translocation Coral Monitoring Report which reviews the post-translocation survey results between January 2017 and April 2018 with reference to the baseline conditions (as represented by the tagged coral survey results), will be submitted to EPD and AFCD upon completion of the April 2018 survey. The results of the two extra rounds of monitoring in October 2018 and April 2019 will be reported in the respective Quarterly EM&A Reports.

2.11 External Stakeholder Engagement

In accordance with the EP's requirements of setting up Community and Professional Liaison Groups, the AAHK has been continuing to proactively reach out to a wide spectrum of external stakeholders to update them on the environmental aspects of the Project and to seek their insights and views. These incessant exchanges with the local communities, relevant professionals, experts, and other stakeholders. Below are highlights of the engagement activities held in 2017.

2.11.1 Community Liaison Groups

In order to enhance communication with the community in a proactive way, five Community Liaison Groups (CLGs) were set up in 2012 in the neighbouring districts of HKIA, namely Islands, Kwai Tsing, Shatin, Tsuen Wan and Tuen Mun. The CLGs are comprehensive platforms for the AA to update the community leaders about the detailed design, progress of construction and operation, and environmental monitoring and audit results of the Project, and listen to their views on various topics related to HKIA and the Project, including environmental matters. The AA also leverages on the CLGs to exchange views with the community on the latest airport developments, hence enhancing airport services and helping to contribute to the betterment of these districts. The CLGs have a total of about 130 members involving district councillors and community leaders.

Three rounds of five meetings were held in January, July and December 2017. The members also undertook a visit to the marine work site in December 2017 to observe environmental and construction aspects of the Project at the marine work site.

2.11.2 Professional Liaison Group and green Non-Governmental Organizations (NGOs)

The Professional Liaison Group, comprising 19 members of relevant professionals and experts, was set up to enhance transparency and communication, as well as enquiries and complaints-handling on all environmental issues related to the Project; and to promote community cooperation and participation and implementation of suitable local environmental enhancement works that are included in the Environmental Permit. Information of the Project including detailed

design, progress of construction and operation, and environmental monitoring and audit results are shared with the members. In the reporting period, two PLG meetings were held in May and November 2017. Members also visited the Marine Traffic Control Centre and attended a visit to the marine work site in May 2017 to learn more about the real-time marine surveillance arrangements and to observe environmental and construction aspects of the Project at the marine work site.

Roundtable meetings with NGOs were proactively arranged to facilitate exchanges on environmental issues related to the Project. Updates of the Project, including environmental monitoring and audit results are shared with the participants. Two roundtable meetings were held in May and November 2017.

2.11.3 Fishermen liaison

In an effort to deepen outreach to the fishermen community, a dedicated Fishermen Liaison Group was set up in November 2016 to share updates on environmental matters and progress of construction and operation with the chairmen and leaders of fishermen groups and associations. A meeting was held in July 2017.

2.11.4 Other Stakeholders

The AAHK attended three Legislative Council 3RS Subcommittee meetings in April, September and October 2017 to share with members updates regarding environmental, construction and funding aspects. A visit to the marine work site was arranged for the subcommittee members in May 2017. The AAHK also attended two Advisory Council on the Environment meetings in May and October 2017 to share with the council members environmental monitoring and audit results of the Project and updates on the effectiveness of various implemented mitigation measures.

A visit to the marine work site was arranged for the media in May 2017 for the participants to observe the vastness and robustness of the Project, including environmental and construction aspects. In addition, two interviews were arranged regarding funded projects for the Marine Ecology Enhancement Fund (MEEF) and the Fisheries Enhancement Fund (FEF), with the two feature stories published and broadcasted in December 2017.

To keep the general public abreast on the environmental aspects of the Project, including environmental monitoring and audit results, MEEF and FEF plus an array of topics and materials, a dedicated project website was set up since November 2015. Number of visits to the website in 2017 totalled 103,042, 63% higher than the number of visits in 2016.

To encourage two-way communications with stakeholders and the community, a dedicated telephone hotline and email was set up since December 2015. 7 enquiries were received via the hotline, and 2 enquiries were received via the dedicated email in 2017.

2.12 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.

2.13 Key Environmental Issues for the Coming Reporting Period

The key environmental issues for the Project in the coming reporting period are expected to be associated with construction activities including marine works such as laying of sand blanket,

DCM works, seawall construction, and marine filling, as well as land-based works such as excavation, piling, T2 expansion works, and APM works. Relevant environmental impact mitigation measures will be implemented, including the deployment of enhanced silt curtains, reuse of excavated material and public fill for marine filling, and stockpiling of excavated materials for future reuse.

The implementation of required mitigation measures by the contractors will be monitored by the ET.

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

Seven environmental complaints were received in the reporting period. All environmental complaints were attended to and investigations were conducted by the ET in accordance with the Manual and the Complaint Management Plan. The summary of the complaints and analysis is presented in **Appendix G**.

3.2.2 Notifications of Summons or Status of Prosecution

Summons were received in June 2017 alleging use of powered mechanical equipment outside the permitted hours for the aviation fuel pipeline diversion works in December 2016.

3.3 Cumulative Statistics

Cumulative statistics on exceedance, non-compliance, complaints, notifications of summons and status of prosecutions are summarized in **Appendix G**.

4 Conclusion and Recommendation

In the reporting period from 1 January 2017 to 31 December 2017, the EM&A programme has been implemented in accordance with the Manual of the Project. The EM&A works carried out during the reporting period include construction dust and noise measurements, water quality monitoring, ecological monitoring on Sheung Sha Chau Island, vessel line-transect surveys, land-based theodolite tracking surveys supplemented with passive acoustic monitoring for CWD monitoring, waste monitoring, coral post-translocation monitoring, as well as environmental site inspections and landscape and visual monitoring for the Project's construction works.

For air quality, three monitoring results triggered the Limit Level of 1-hour TSP in the reporting period, and the corresponding investigations were conducted accordingly which concluded that the cases were not related to the Project.

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

The monitoring results in relation to the construction noise, waste, CWD, and coral post-translocation monitoring did not trigger their corresponding Action or Limit Levels during 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. No encroachment or disturbance to the egretry area on Sheung Sha Chau was recorded during monthly ecological monitoring conducted when construction works was carried out on Sheung Sha Chau Island outside of ardeid's breeding season from April to July 2017.

A total of 5,427.7 km survey effort was conducted for the vessel line transect monitoring for CWD during the 12-month monitoring period. A total of 252 groups of 845 CWDs were sighted, with 39 groups of 128 CWDs recorded in NWL, 5 groups of 16 CWDs in AW, 129 groups of 473 CWDs in WL and 79 groups of 228 CWDs in SWL. No CWDs were sighted in NEL during the 12-month reporting period. The combined encounter rate by number of dolphin sightings and by number of dolphins were 4.80 and 16.8 respectively. No triggering of Action and Limit Level on the encounter rates were recorded during the construction phase. Average annual abundance of CWD in Hong Kong western waters was estimated at 71 dolphins in 2017 from line-transect analysis. CWD relative occurrence from land-based surveys around Lung Kwu Chau peaked in February, with fewer sightings between March and August and then increased in the late months of the year, September to December. Waters around Lung Kwu Chau remain an important year-round habitat for CWDs, especially for foraging. Passive acoustic monitoring showed dolphins used the area around south of Sha Chau throughout the year, but with increased activity during spring and late summer/autumn. The acoustic data also showed consistently higher levels of dolphin clicking

activity at night than during daytime, which might indicate increased using of echolocation by dolphins during hours of darkness.

Ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. In total, 9,560 ferry movements between HKIA SkyPier and Zhuhai / Macau were audited in the reporting period. The daily movements of all SkyPier HSFs in the reporting period ranged between 1 and 97, which falls within the maximum daily cap number of 125. There are fewer ferry movements on 23 July, 23, 24, 27 August, and 15 October 2017 due to typhoon. The annual daily average of all the SkyPier HSFs in 2017 was 86 movements, within the annual daily average cap of 99 SkyPier HSF movements. Most of the diverted HSFs travelled through the SCZ with average speeds within 15 knots, which complied with the SkyPier Plan. One case of average speed deviation was due to public safety. All ferry movements that did not strictly follow the diverted route were investigated.

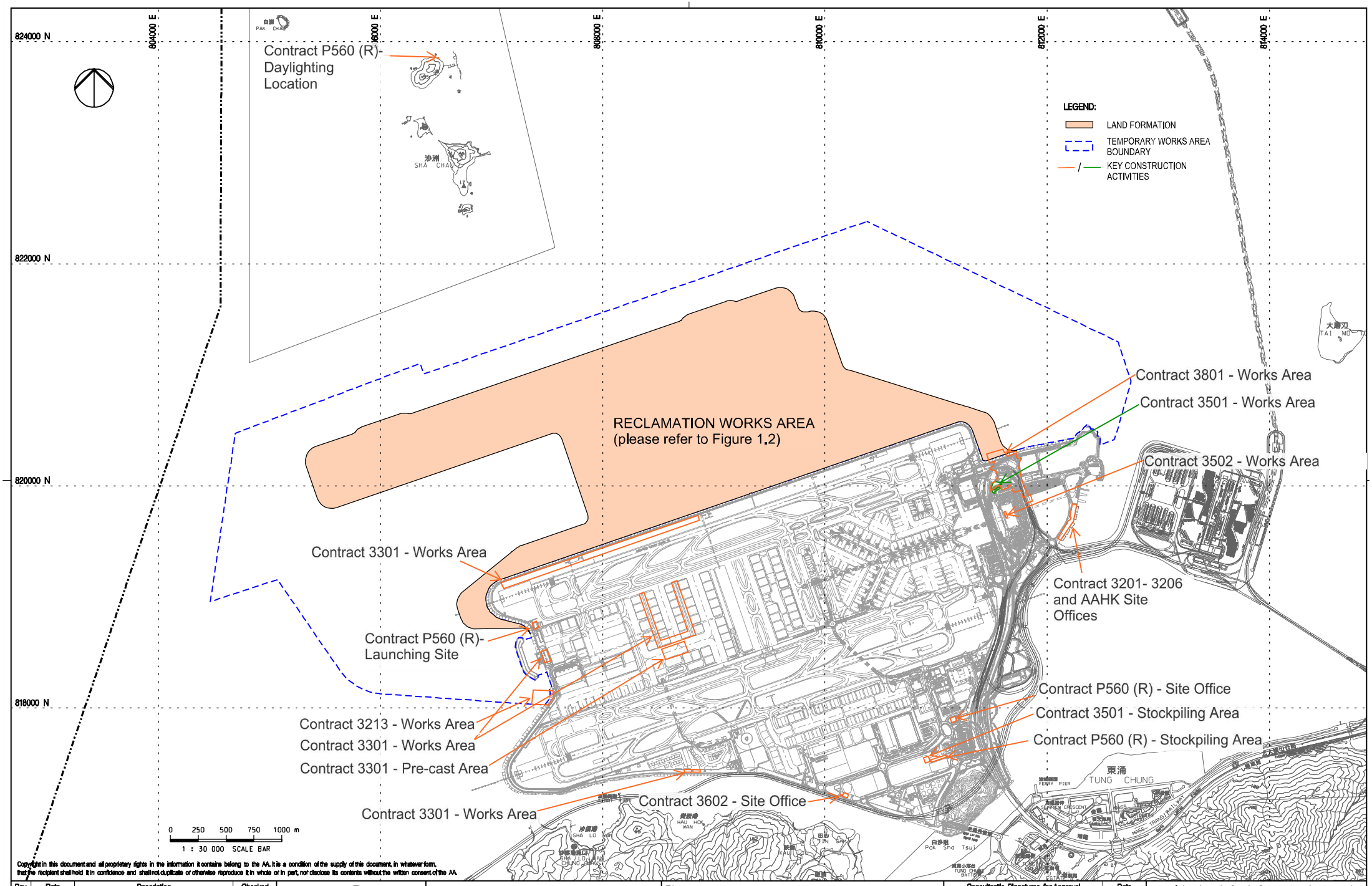
The audit of construction and associate vessels has started since August 2016. ET has conducted audit to ensure that the contractors were fully complied with the requirements of the MTRMP-CAV. The MSS was launched in March 2017. The MSS automatically recorded the deviation case such as speeding, entering no entry zone, not traveling through the designated gate. ET conducted checking to ensure the MSS records all deviation cases accurately. A total of 44 skipper training workshops were conducted by the ET from January to December 2017 with captains of construction vessels associated with 3RS contracts. Another 43 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, silt curtains were in place by the contractors for sand blanket laying works and dolphin observers were deployed in accordance with the MMWP. On the implementation of DEZ Plan, dolphin observers were deployed by the contractors for continuous monitoring of the DEZ for DCM trial works in accordance with the DEZ Plan. Trainings for the dolphin observers on the implementation of MMWP and DEZ monitoring were provided by the ET prior to the aforementioned works. Testing on night vision devices for DEZ monitoring was also conducted before the DCM trials. From the contractors' MMWP observation records and DEZ monitoring records, no dolphin or other marine mammals were observed within or around silt curtains during the reporting period, while there were six records of dolphin sighting within the DEZ of DCM works. Audits of acoustic decoupling for construction vessels were also carried out by the ET during weekly site inspections.

External stakeholder engagement activities ranging from liaison meetings with the local community, relevant professional and green groups, regular meetings with other stakeholders, setting up of a dedicated project website for the general public, to marine work site visit and feature stories publishing etc., were carried out to update them on the environmental aspects of the Project and ensure transparent and engaging communication.

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

Figures



Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC

HONG KONG INTERNATIONAL AIRPORT

Mott MacDonald

Title: LOCATIONS OF KEY CONSTRUCTION ACTIVITIES

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

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

Drawing No. FIGURE 1.1

Scale at A3 1 : 30000

Rev. A

Filename: J:\355482\REPORT\ENV\CWS\LP\FIG 1.dgn

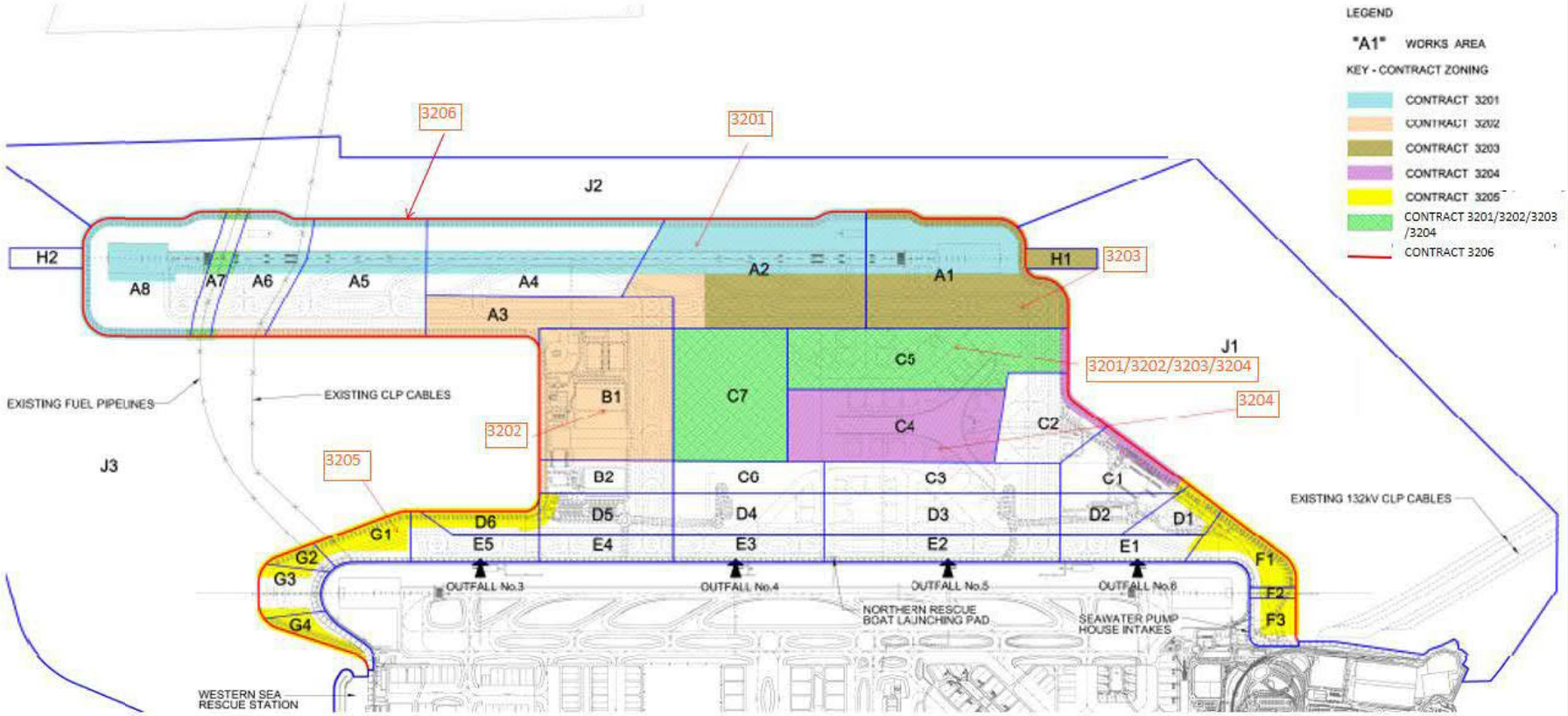
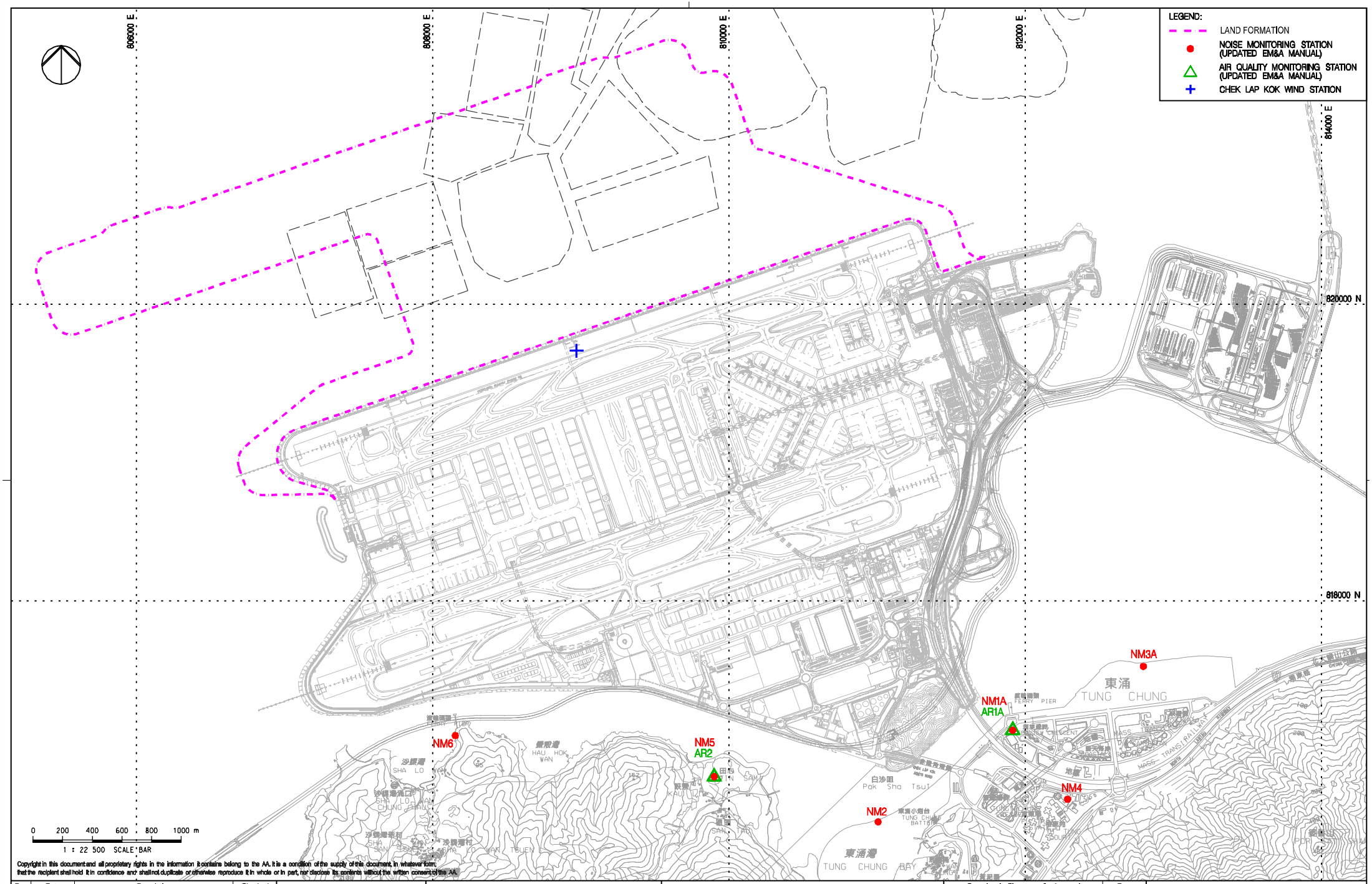


FIGURE 1.2- LOCATIONS OF RECLAMATION WORKS AREA



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

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

Mott MacDonald

Title

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

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

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

Drawing No.

FIGURE 2.1

Scale at A3 1 : 22500

Rev. C

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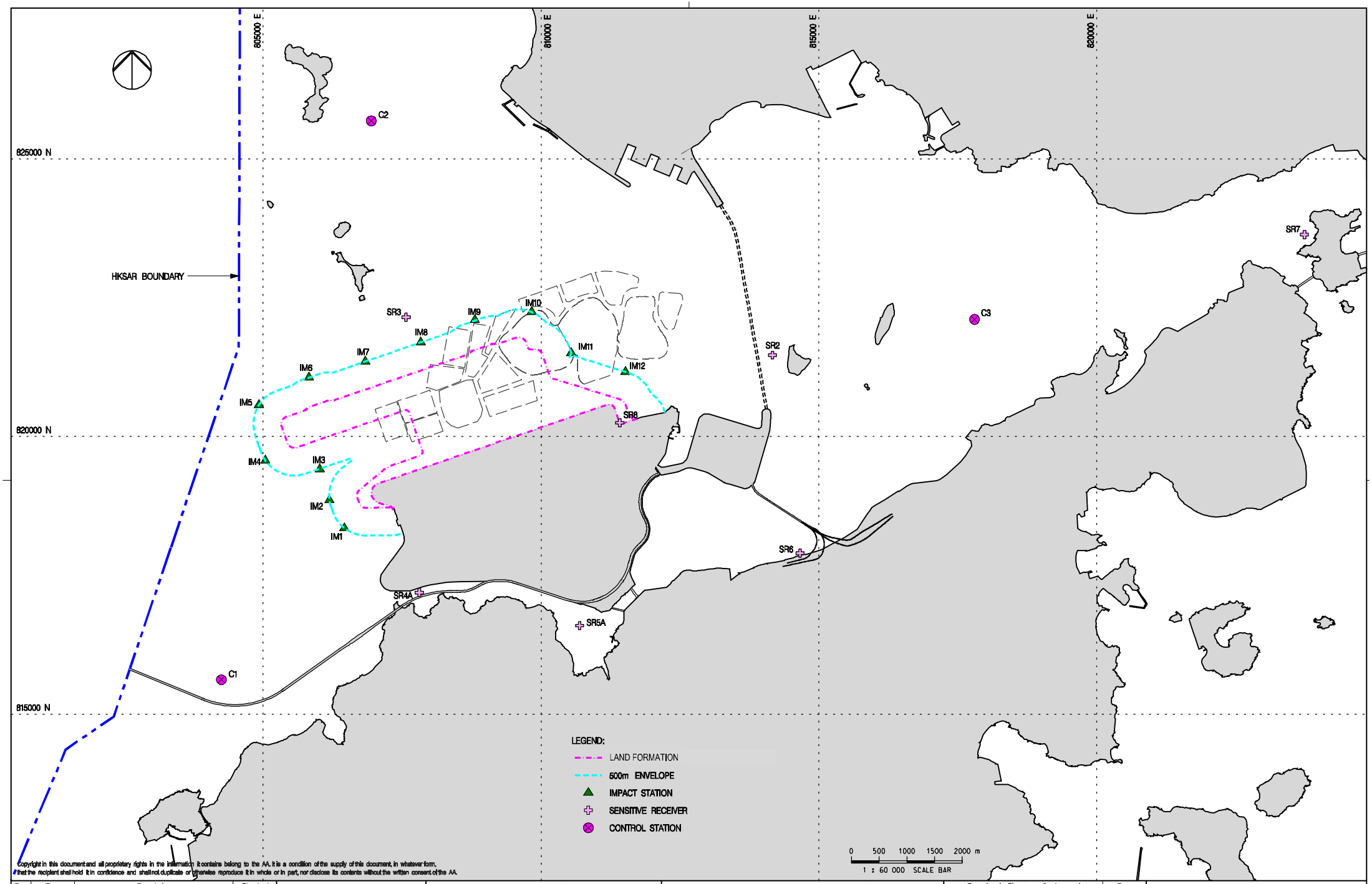

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	DC
B	04MAY16	GENERAL REVISION	RO
C	06JUN16	GENERAL REVISION	LC
D	02AUG17	GENERAL REVISION	RO

HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

WATER QUALITY MONITORING STATIONS

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

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

Drawing No.

FIGURE 2.2

Scale at A3 1 : 60000

Rev. D

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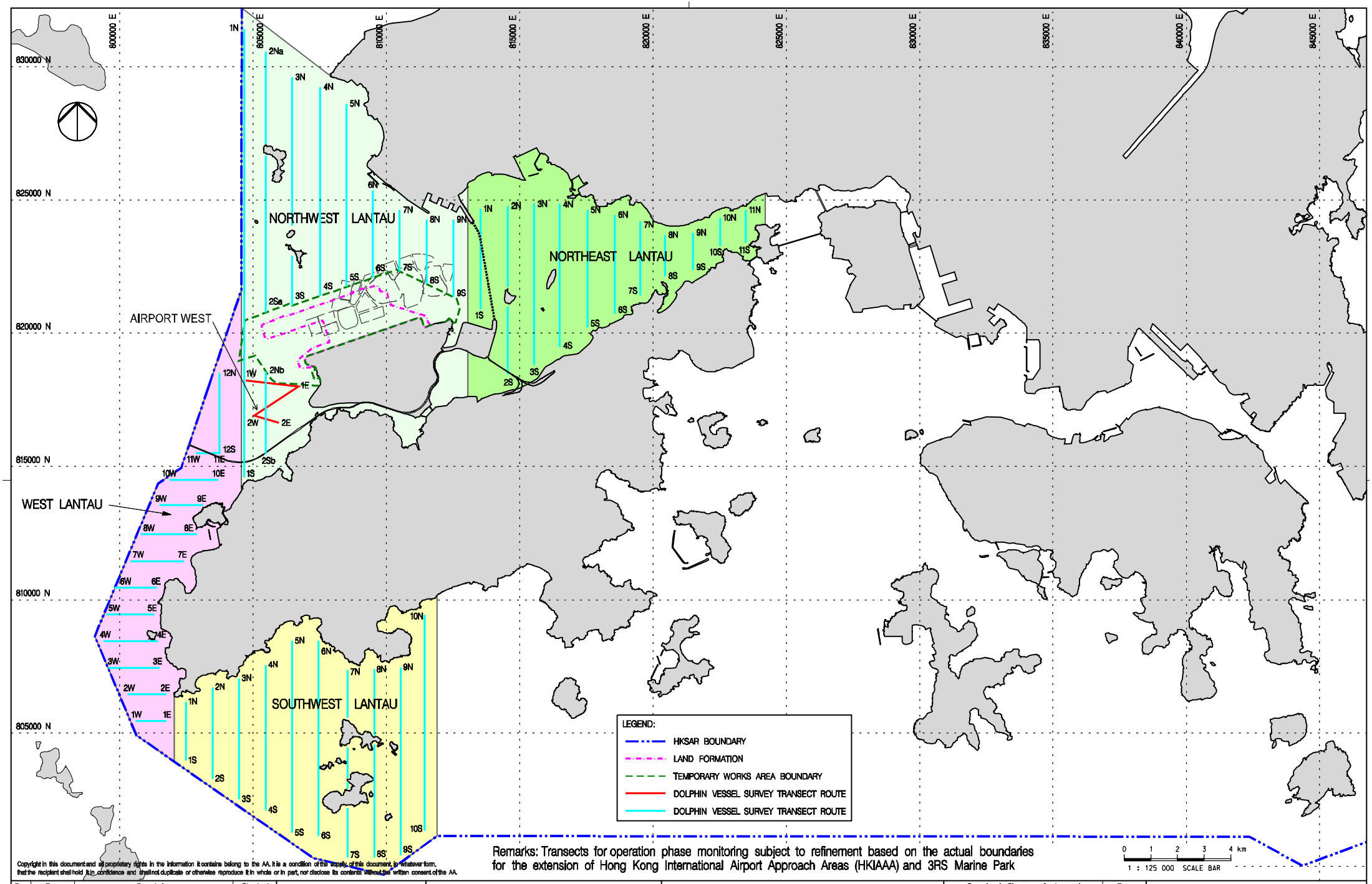

Remarks: Transects for operation phase monitoring subject to refinement based on the actual boundaries for the extension of Hong Kong International Airport Approach Areas (HKIAAA) and 3RS Marine Park

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

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	01MAR17
Checkers	JC / TK	01MAR17
Approver	EC	01MAR17

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

Drawing No.

FIGURE 2.3

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Rev. D

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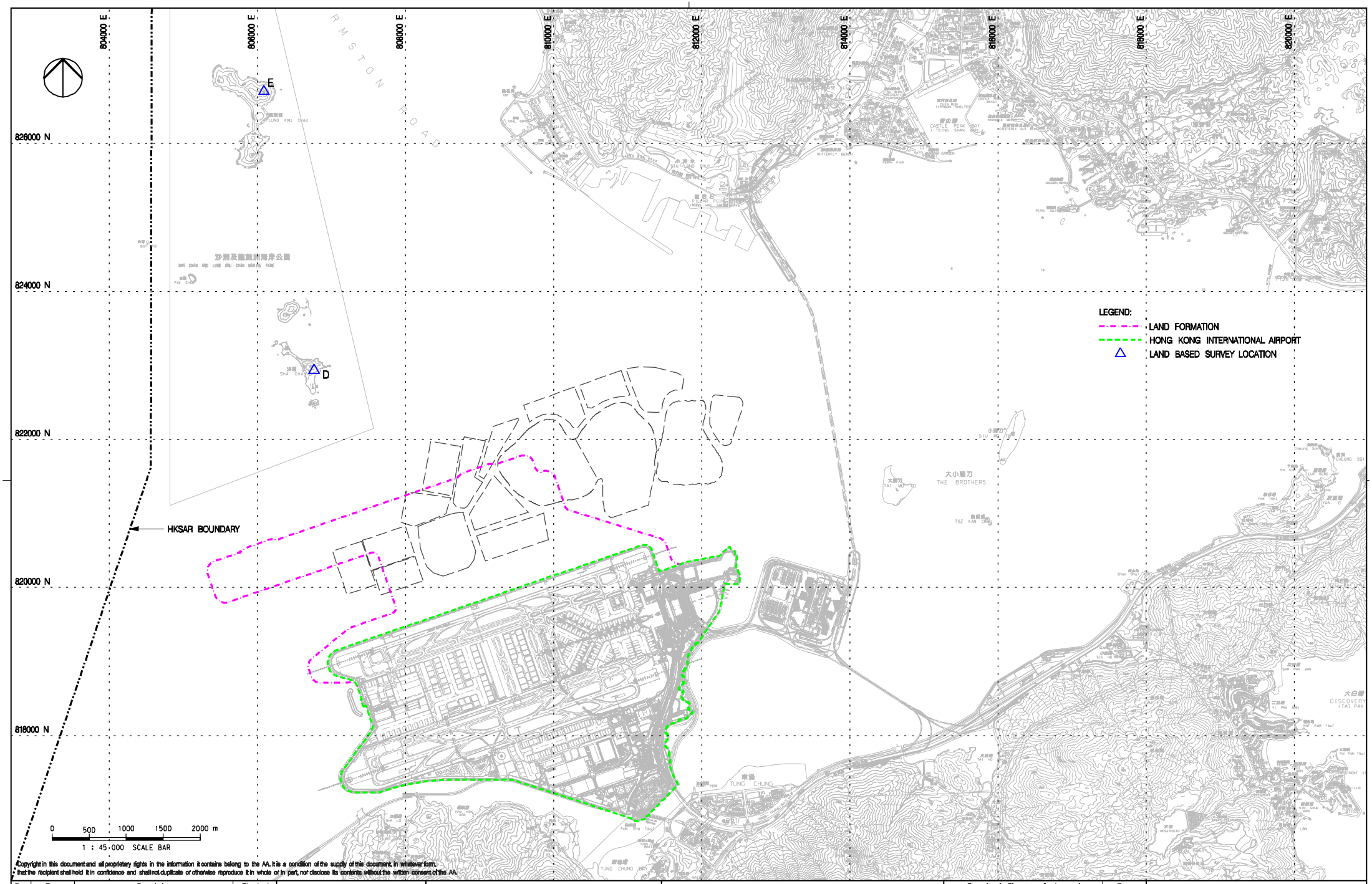

Rev.	Date	Description	Checked
A	02DEC15	FIRST ISSUE	JC
B	06FEB17	GENERAL REVISION	JC

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

LAND BASED DOLPHIN MONITORING IN BASELINE AND CONSTRUCTION PHASES

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Design	JC	06FEB17
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Approver	EC	06FEB17

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

Drawing No.

FIGURE 2.4

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Rev. B

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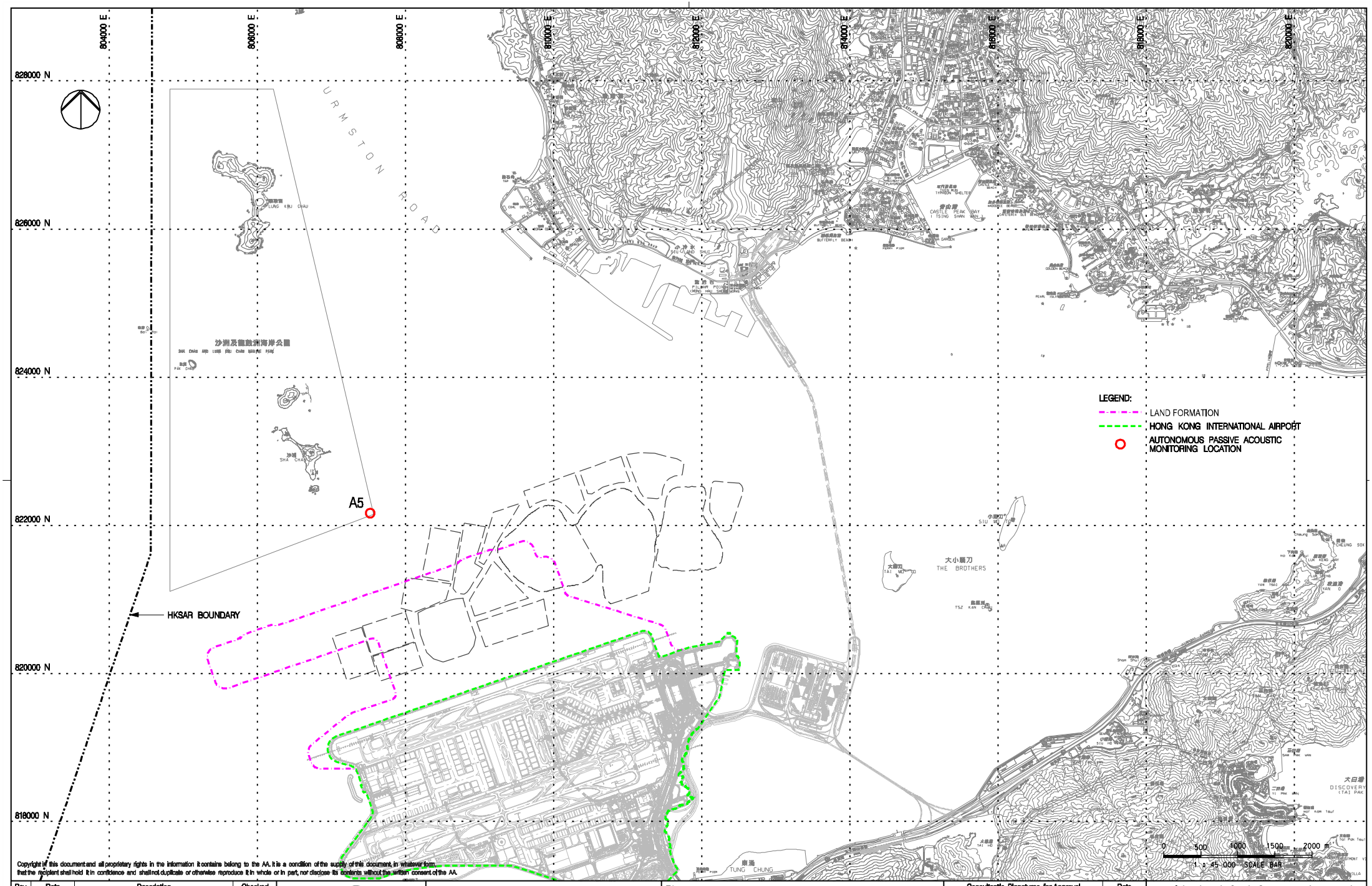

Rev.	Date	Description	Checked
A	29AUG17	FIRST ISSUE	JT

HONG KONG INTERNATIONAL AIRPORT

MOTT MACDONALD

Title

LOCATION FOR AUTONOMOUS PASSIVE ACOUSTIC MONITORING

Consultant's Signatures for Approval		Date
Design	JC	29AUG17
Checkers	JC / TK	29AUG17
Approver	EC	29AUG17

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

Drawing No.

FIGURE 2.5

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Rev. A

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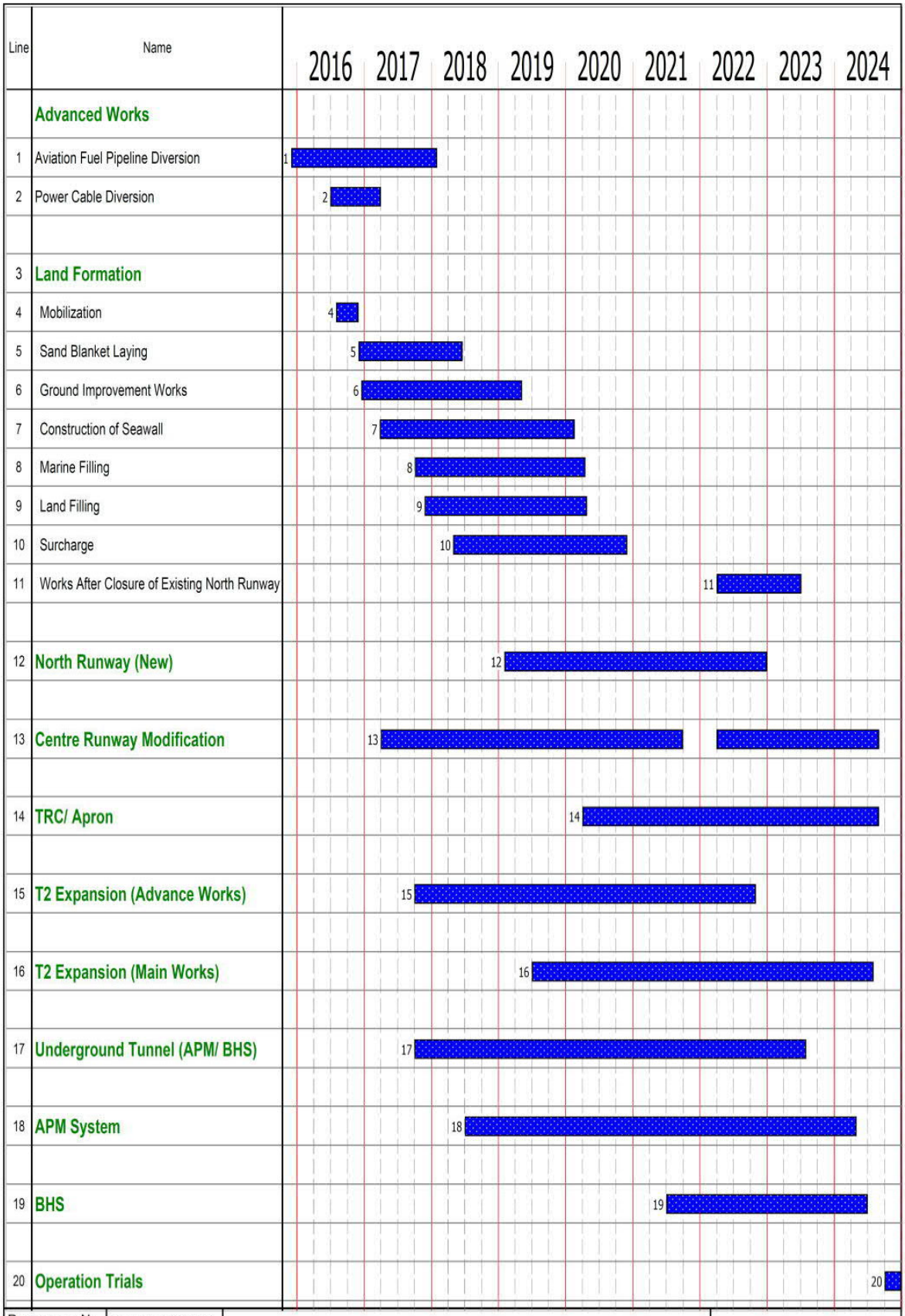
Appendix A. Construction Programme and Contract Description



Programme No.	3-AAP-EPP-0-A0
Revision/Date	'A'/(12-Jul-16)
Prepared	VT
Checked	PY

3RS Phasing Programme

香港國際機場 HONG KONG INTERNATIONAL AIRPORT

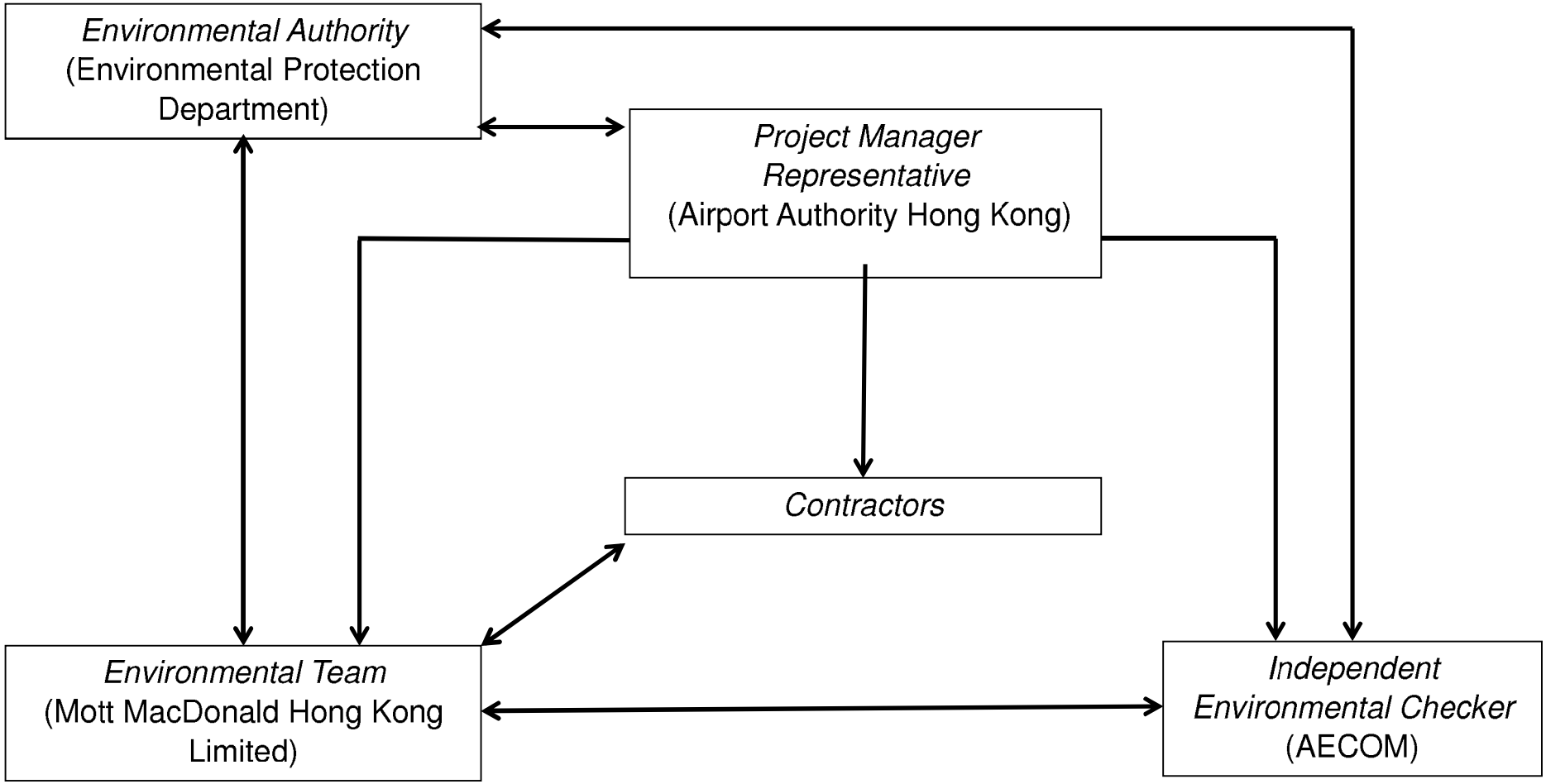
Contract Description

Contract No.	Contract Title	Contractor	Key Construction Activities
P560 (R)	Aviation Fuel Pipeline Diversion Works	Langfang Huayuan Mechanical and Electrical Engineering Co., Ltd.	Diversion of the existing submarine aviation fuel pipelines will use a horizontal directional drilling (HDD) method forming two rock drill holes by drilling through bedrock from a launching site located at the west of the airport island to a daylighting point adjacent to the offshore receiving platform at Sha Chau. Two new pipelines will be installed through the drilled tunnels. The total length is approximately 5 km. Drilling works will proceed from the HDD launching site at the airport island.
3201	Deep Cement Mixing (Package 1)	Penta-Ocean-China State-Dong-Ah Joint Venture	The works covered by the Contract 3201, 3202, 3203, 3204 and 3205 comprise ground improvement of seabed using Deep Cement Mixing (DCM) method, the major construction activities including without limitation the following • Geophysical surveys; • Supply and placing of geotextile and sand blanket under seawalls; • Supply, maintenance, installation and removal of silt curtain systems; • Preliminary construction trails; • Supply and installation of DCM clusters within the works areas; and • Coring, sampling and testing of DCM treated soils and reporting works.
3202	Deep Cement Mixing (Package 2)	Samsung-BuildKing Joint Venture	
3203	Deep Cement Mixing (Package 3)	Sambo E&C Co.,Ltd	
3204	Deep Cement Mixing (Package 4)	CRBC-SAMBO Joint Venture	
3205	Deep Cement Mixing (Package 5)	Bachy Soletanche- Sambo Joint Venture	
3206	Reclamation Contract	ZHEC-CCCC-CDC Joint Venture	The works covered by the Contract 3206 comprise the formation of approximately 650 hectares of land north of the existing airport island for the project, the major construction activities including without limitation the following • Site clearance and demolition; • Geotechnical and ground improvement works;

Contract No.	Contract Title	Contractor	Key Construction Activities
			• Seawall construction; • Marine and land filling works; and • Civil works.
3212	11 kV Submarine Cable Diversion	Hong Kong Marine Contractors Limited	The works covered by the Contract 3212 comprise the submarine cable diversion, the major construction activities including without limitation the following • Forming a marine approach trench; • Conduct a diver survey; • Laying and burying the new 11kV submarine cable; and • Post-Laid Burial (PLB) and protection operations.
3213	CLP Cable Diversion Enabling Works	Wing Hing Construction Company	CLP cable diversion enabling works of Sha Chau South, Sheung Sha Chau and Lung Kwu Chau at Hong Kong International Airport Landside. The major construction activities including without limitation the following: • Geotechnical instrumentation and monitoring of the Works; • Temporary removal of armour rock and underlayers of existing seawall and subsequent reinstatement to its original condition; • Construction of the concrete cable trough embedded at about 3m below the surface of the existing seawall; and • Supply, installation, maintenance, and subsequent removal of temporary generator sets for temporary power supply with associated fuel supply and pump system located at Sheung Sha Chau, Sha Chau South and Lung Kwu Chau Islands.
3301	North Runway Crossover Taxiway	FJT-CHEC-ZHEC Joint Venture	The works covered by the Contract 3301 comprise the construction of a new dual taxiway across the existing north runway and utility services and cable ducting systems. The major construction activities include without limitation the following: • Construction of a new dual taxiway; • Cable ducting works; • Extension of existing portable water supply system; and • All associated works.
3501	Antenna Farm and Sewage Pumping Station	Build King Construction Limited	The works covered by the Contract 3501 comprise the construction of antenna farm and sewage pumping station. The major construction activities include without limitation the following:

Contract No.	Contract Title	Contractor	Key Construction Activities
			• Civil and structural engineering works; • Building services works; • Architectural builder's works and finishes; • Trenchless excavation for sewage rising mains; and • All associated works.
3502	Terminal 2 APM Depot Modification Works	Build King Construction Limited	The works covered by the Contract 3502 comprise the modification of the existing Automatic People Mover (APM) Depot in the basement of T2, for the APM line running between T1 East Hall, West Hall and Midfield Concourse. The major construction activities include without limitation the following: • Removal of the existing steel guide rails; • Removal of the existing mass concrete fill and re-construction of the reinforced concrete fill; • Construction of separation walls and walkways; • Removal of re-provision of existing building services and airport systems; and • All associated testing and commissioning works.
3602	Existing APM System Modification Works	Niigata Transys Co., Ltd.	The works covered by the Contract 3602 comprise the detailed design, supply, manufacture, fabrication, implementation, testing and commissioning of the following modification works of the existing APM systems: • Modification of existing APM depot and APM cars; • Modification of existing T1 & T2 tunnels; and • Preparation of new APM depot.
3801	APM and BHS Tunnels on Existing Airport Island	China State Construction Engineering (HK) Ltd.	The works covered by the Contract 3801 comprise the construction of the APM and Baggage Handling System (BHS) tunnels on existing airport island. The major construction activities include without limitation the following: • Construction of APM and BHS tunnels; • Construction of ventilation building and associated infrastructure; and • Construction, testing and commissioning of sewerage pumping station; and • Civil and structural engineering works.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

EIA Ref.	EM&A Ref.	EP Condition	Environmental Protection Measures	Location / Duration of measures Timing of completion of measures	Mitigation Measures Implemented?^
				may be disassembled in phases	
Table 15.6	12.3	-	**CM6 -** Avoidance of excessive height and bulk of site buildings and structures.	New passenger concourse, terminal 2 expansion and other proposed airport related buildings and structures under the project; Upon handover and completion of works.	N/A
Table 15.6	12.3	-	**CM7** - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	All works areas for duration of works; Upon handover and completion of works. – may be disassembled in phases	I
Table 15.6	12.3	-	**CM8 -** All existing trees shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas.	All existing trees to be retained; Upon handover and completion of works.	I
Table 15.6	12.3	-	**CM9 -** Trees unavoidably affected by the works shall be transplanted where practical. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.	All existing trees to be affected by the works; Upon handover and completion of works.	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:

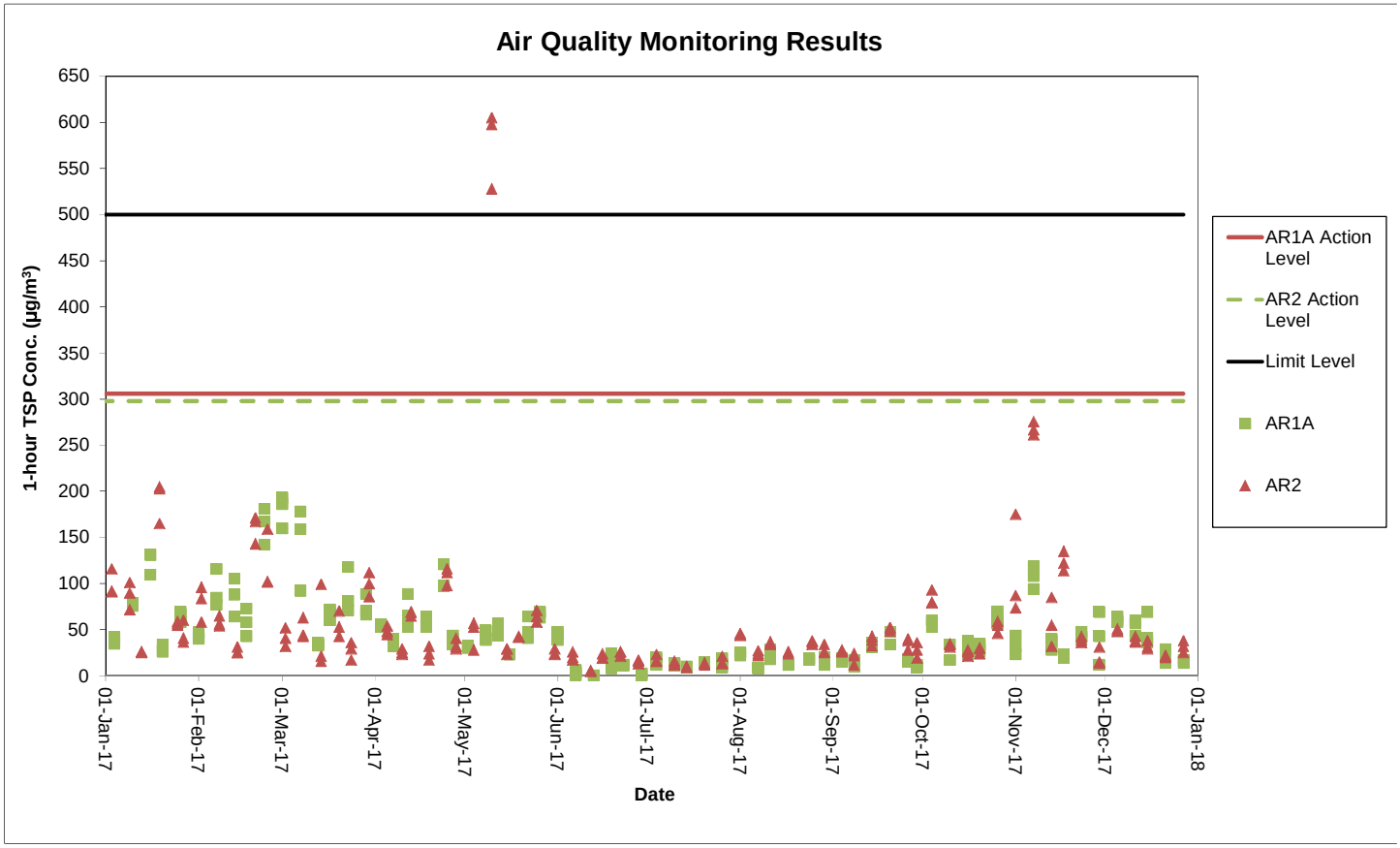
I= implemented where applicable;

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

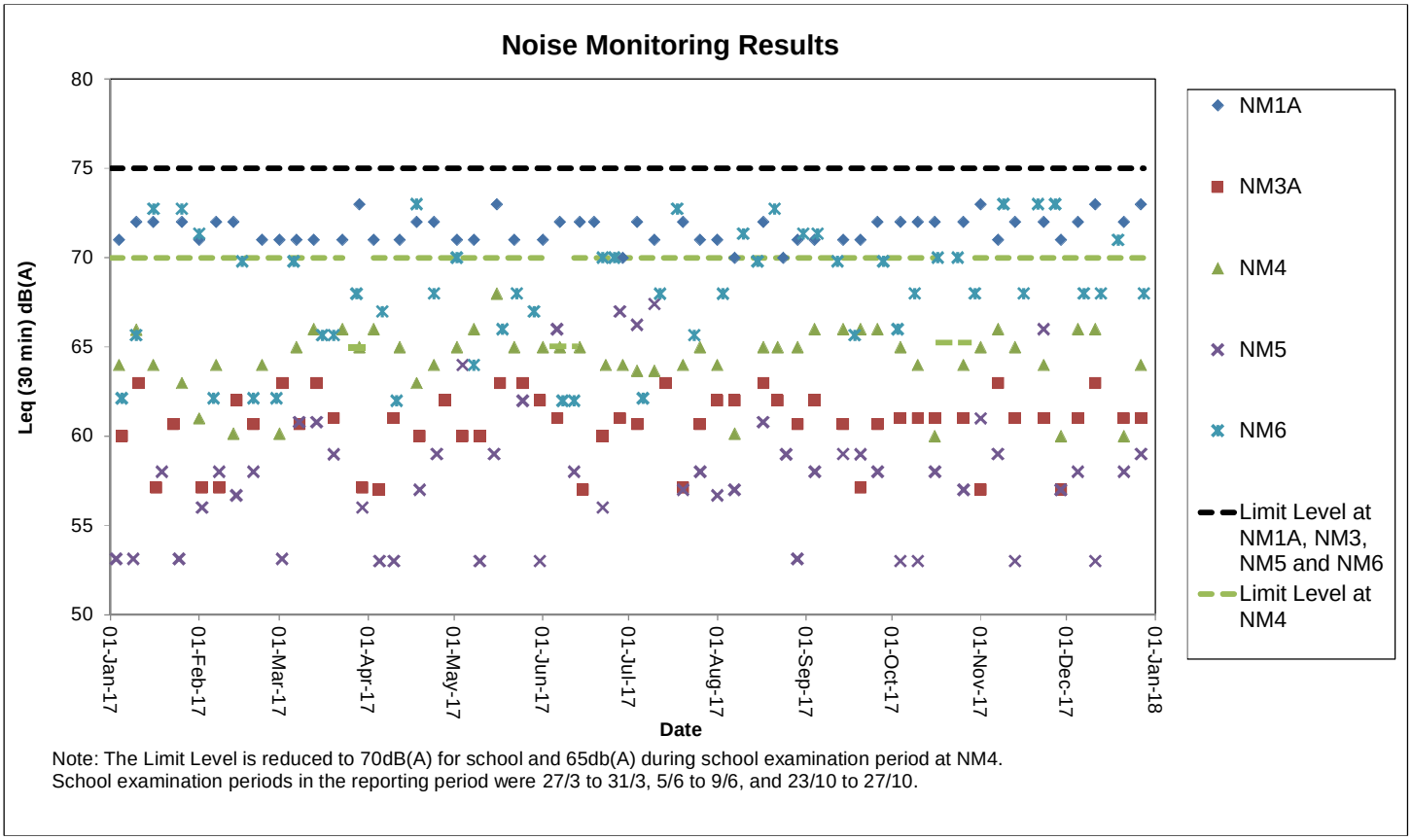
^ Checked by ET through site inspection and record provided by the Contractor.

Appendix D. Monitoring Results

Air Quality Monitoring Results

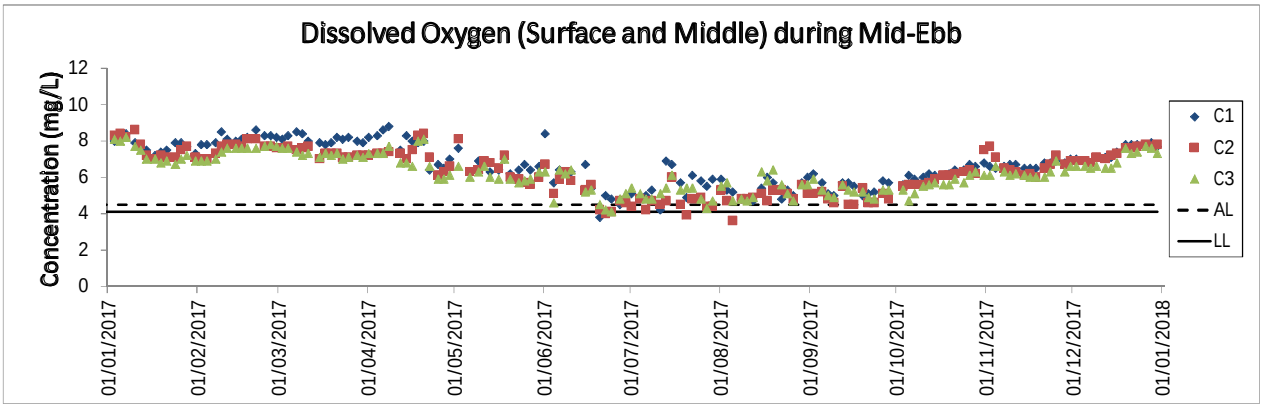

Air Quality Monitoring Results
1-hour TSP Conc. (µg/m³)
650
600
550
500
450
400
350
300
250
200
150
100
50
0
01-Jan-17
01-Feb-17
01-Mar-17
01-Apr-17
01-May-17
01-Jun-17
01-Jul-17
01-Aug-17
01-Sep-17
01-Oct-17
01-Nov-17
01-Dec-17
01-Jan-18
Date
AR1A Action Level
AR2 Action Level
Limit Level
AR1A
AR2

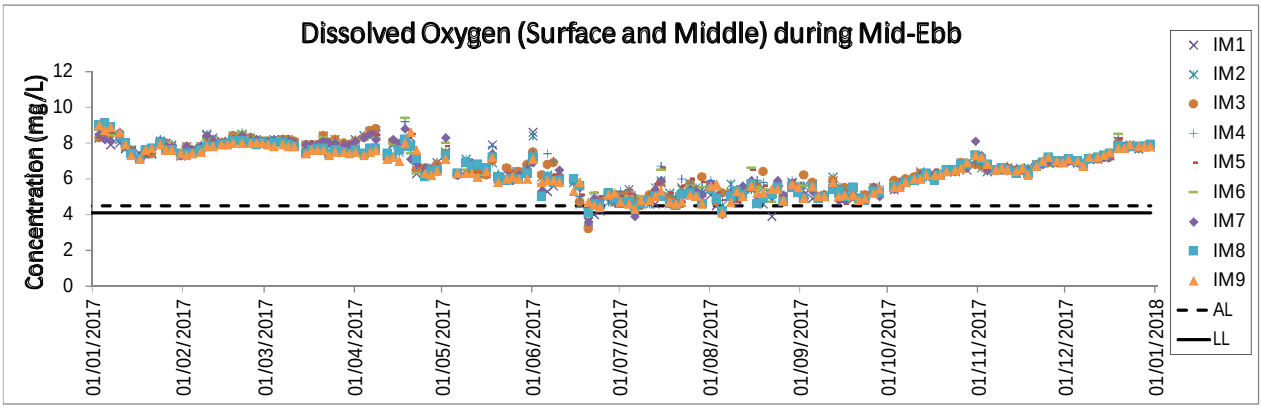
Noise Monitoring Results

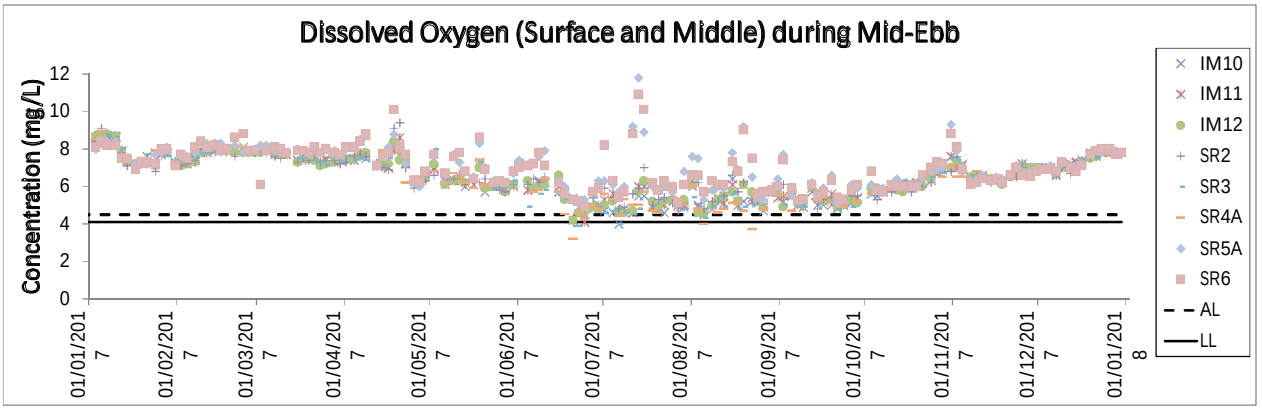


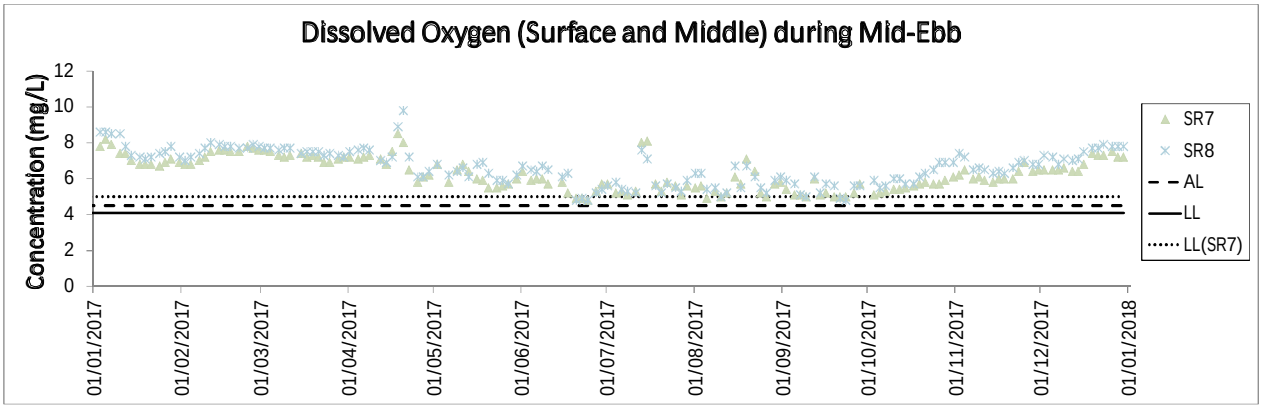
Note: The Limit Level is reduced to 70dB(A) for school and 65db(A) during school examination period at NM4.
School examination periods in the reporting period were 27/3 to 31/3, 5/6 to 9/6, and 23/10 to 27/10.

Water Quality Monitoring Results

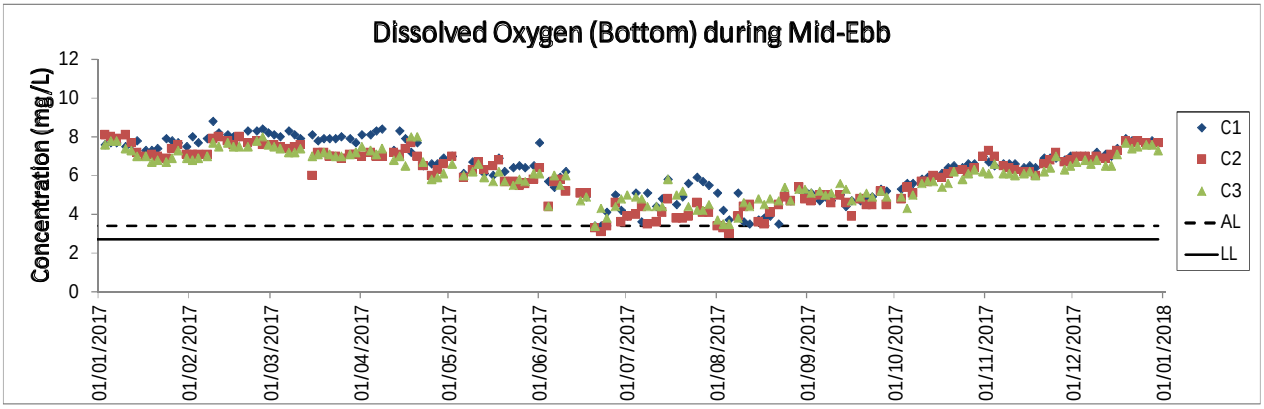


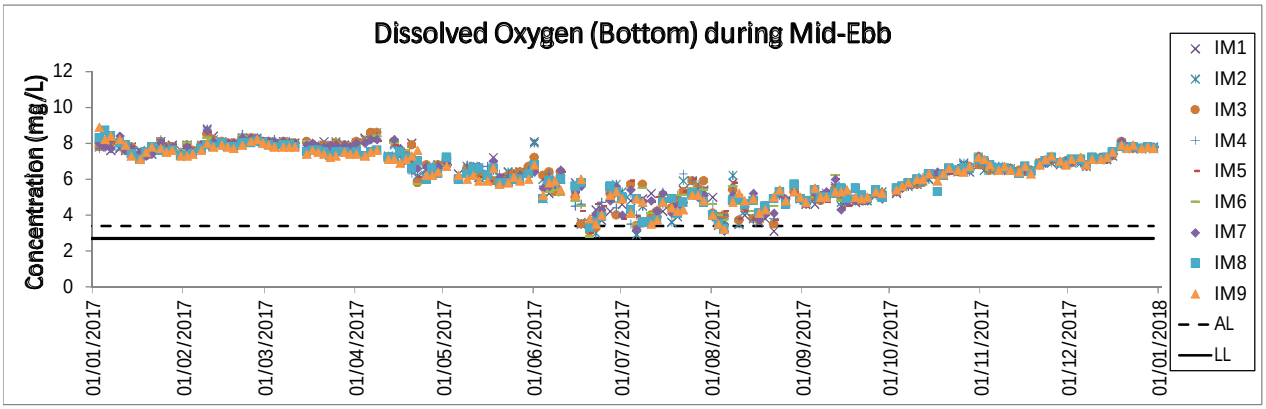


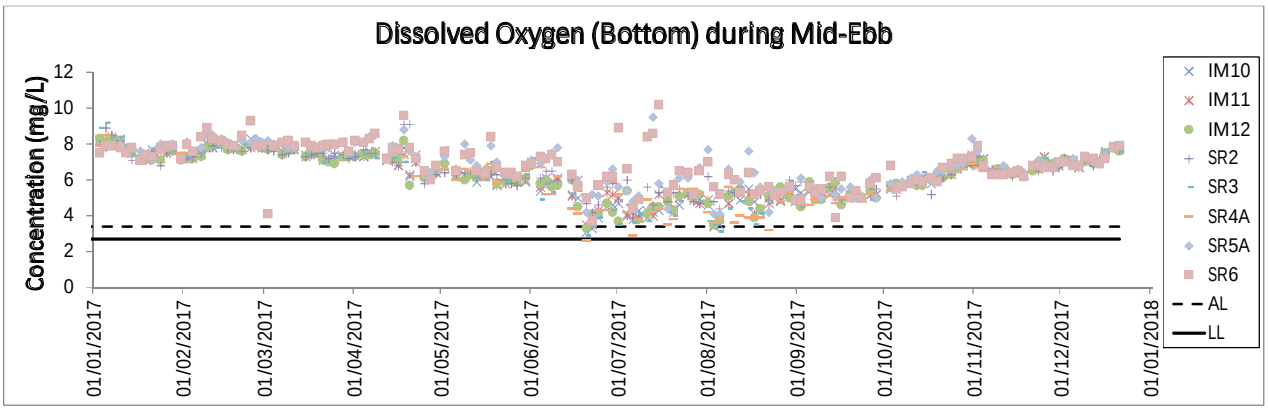


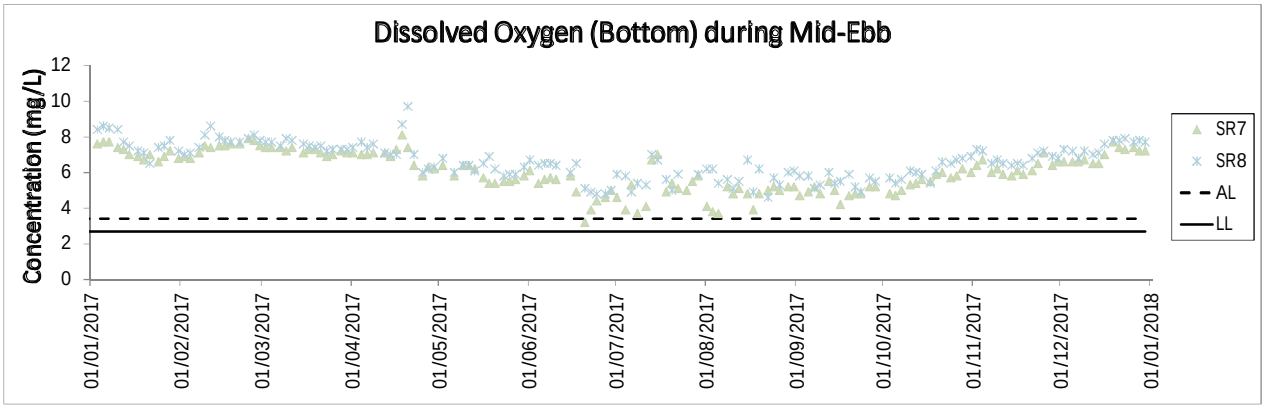


Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

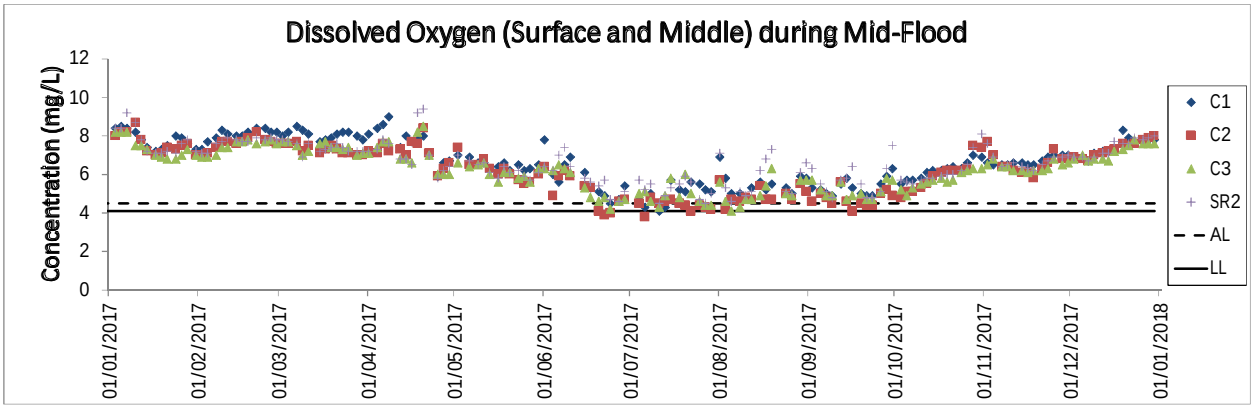


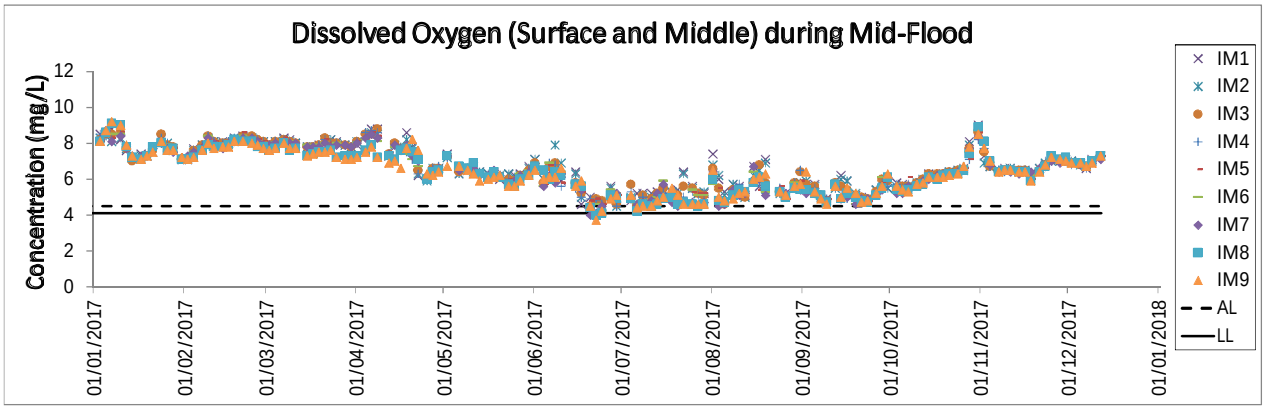


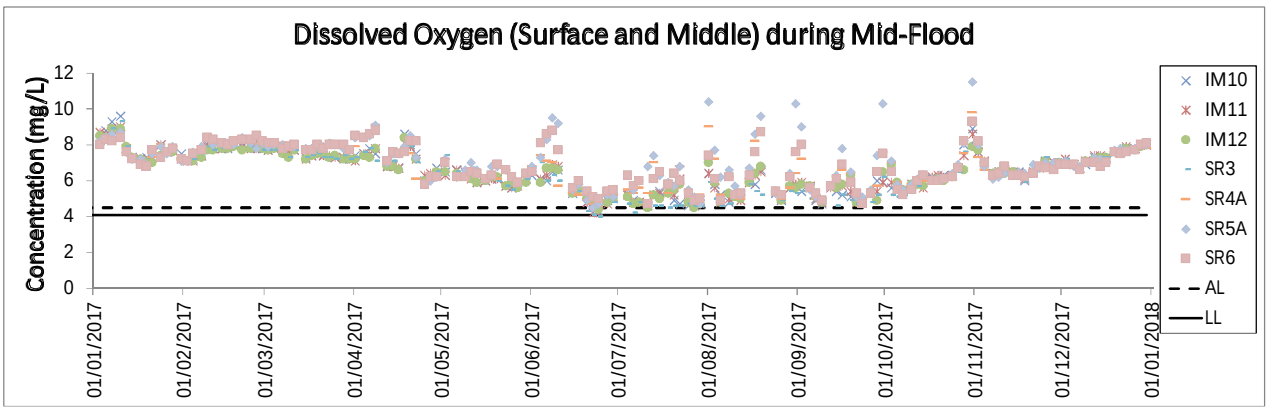


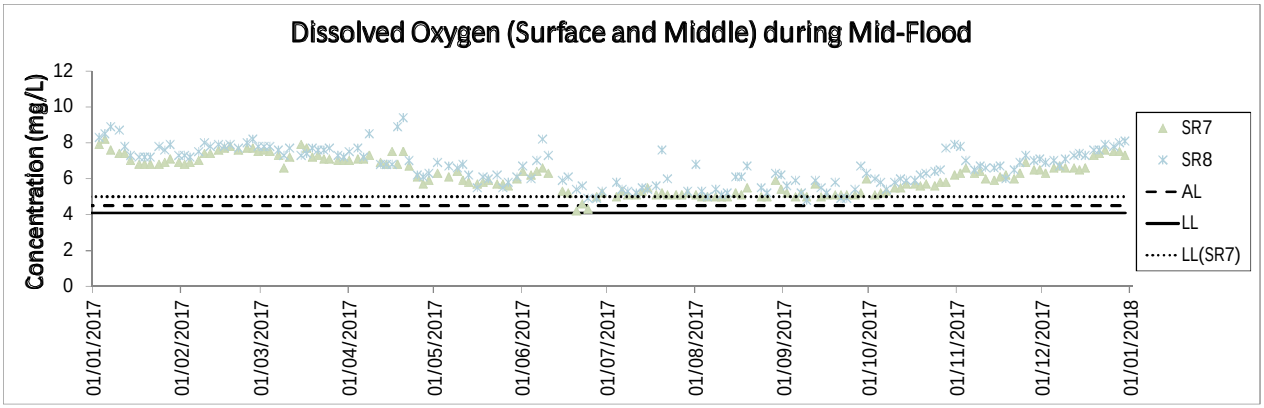


Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

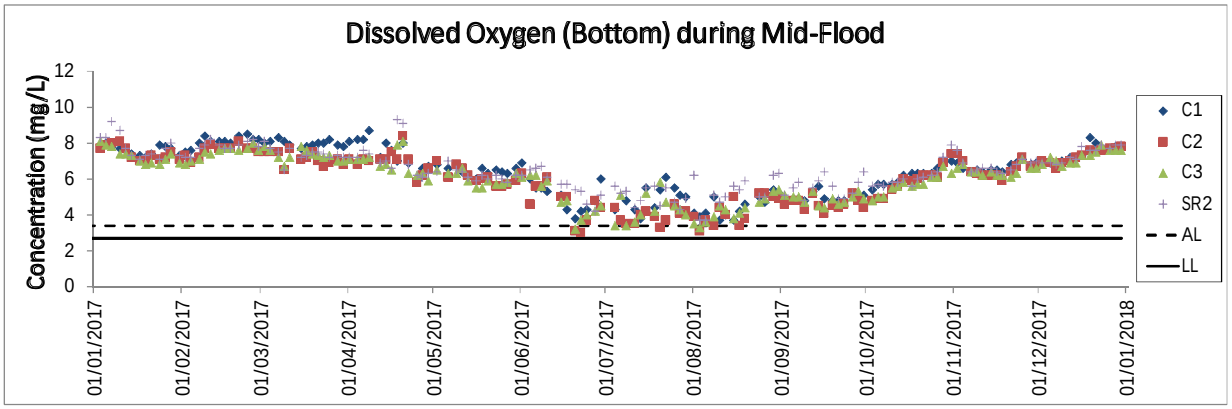


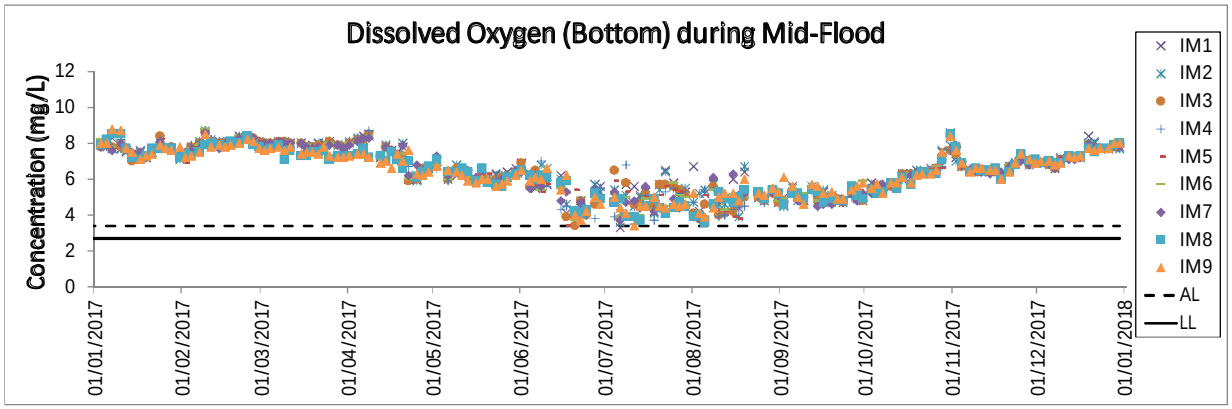


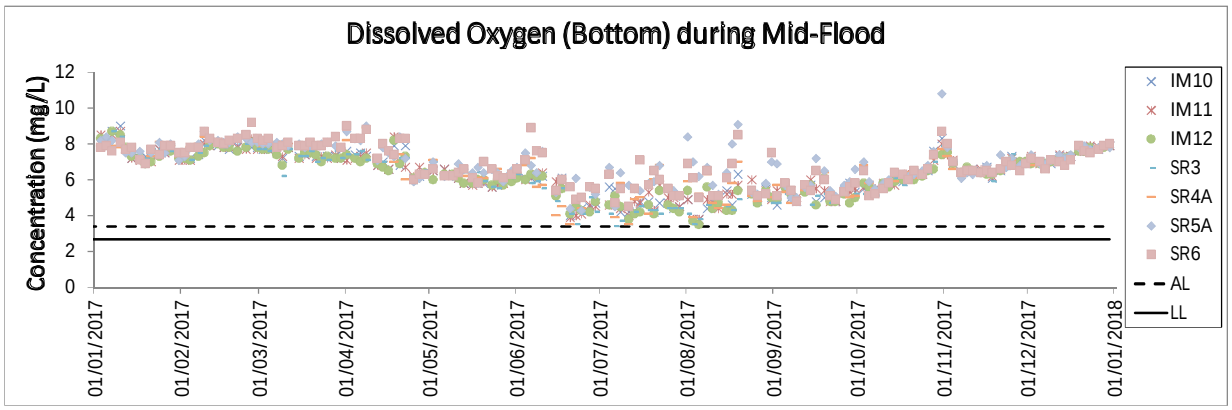


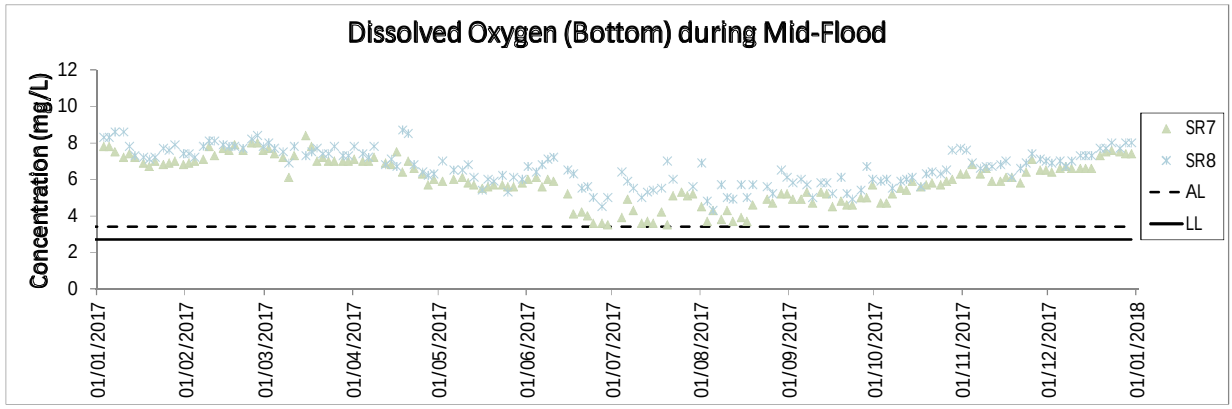


Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

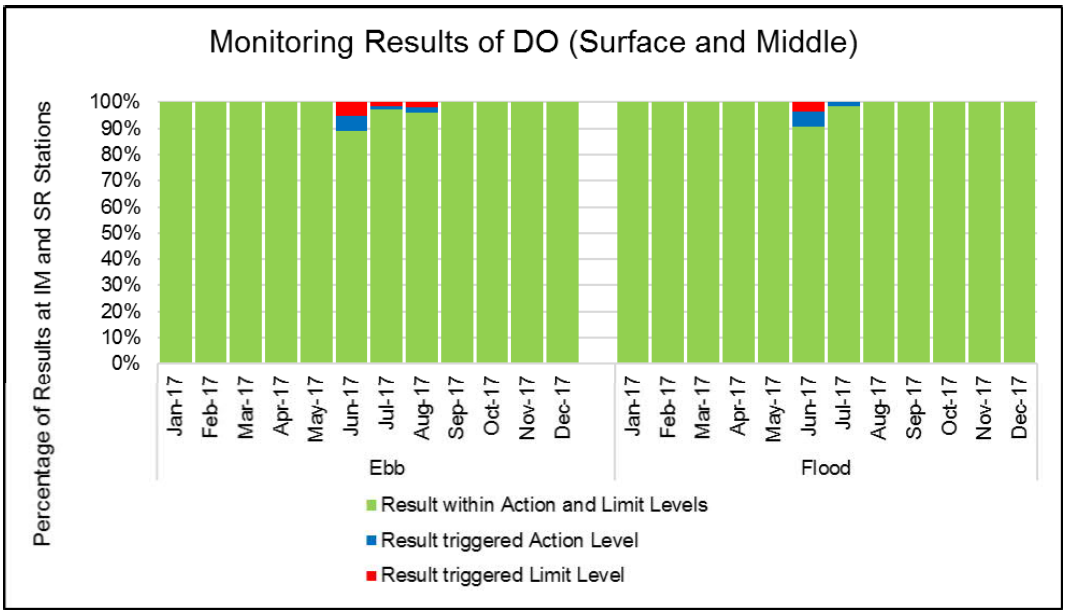


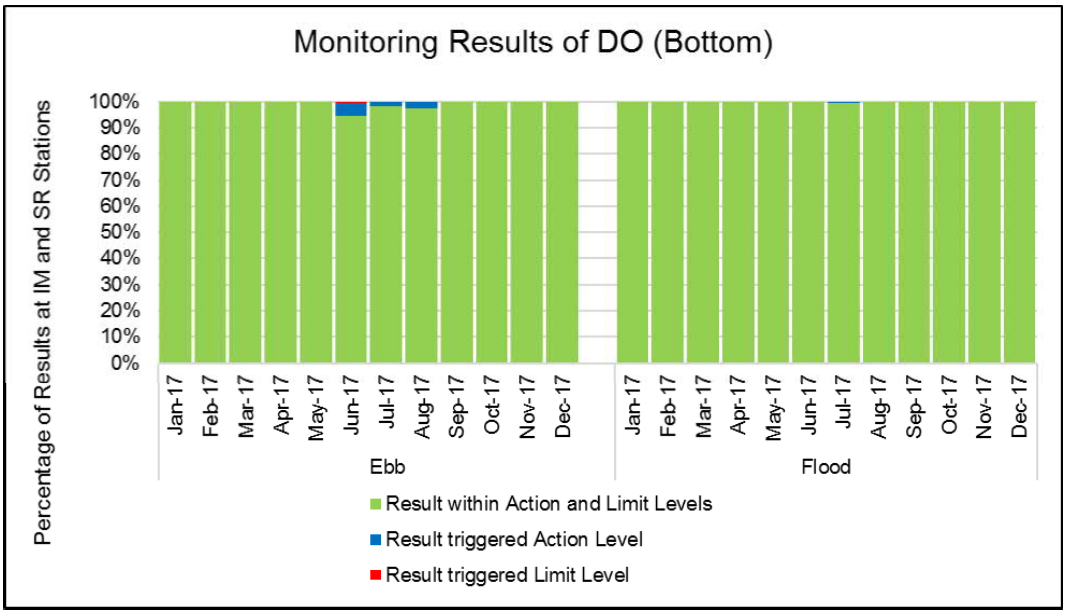




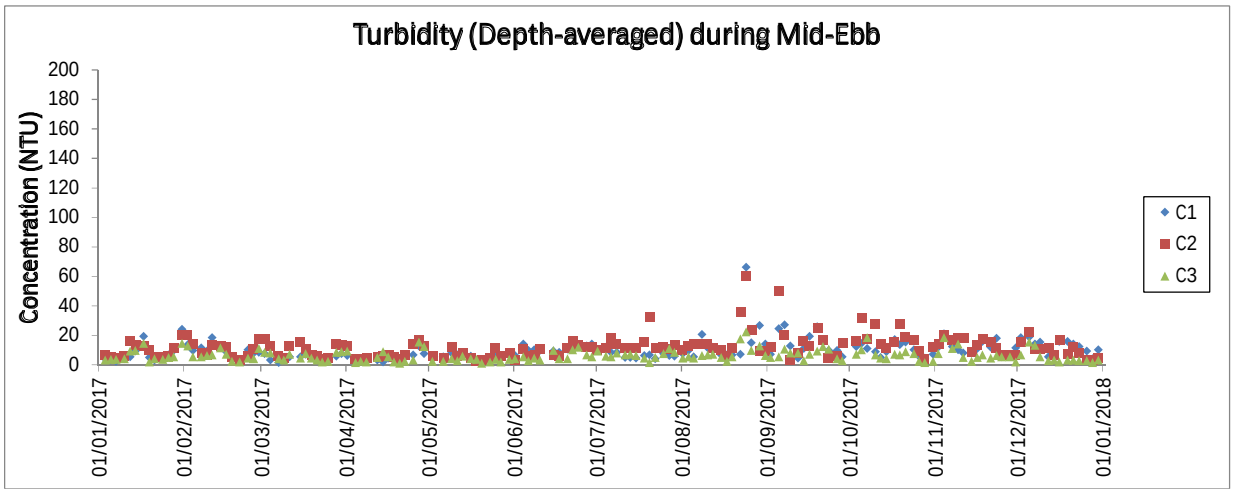


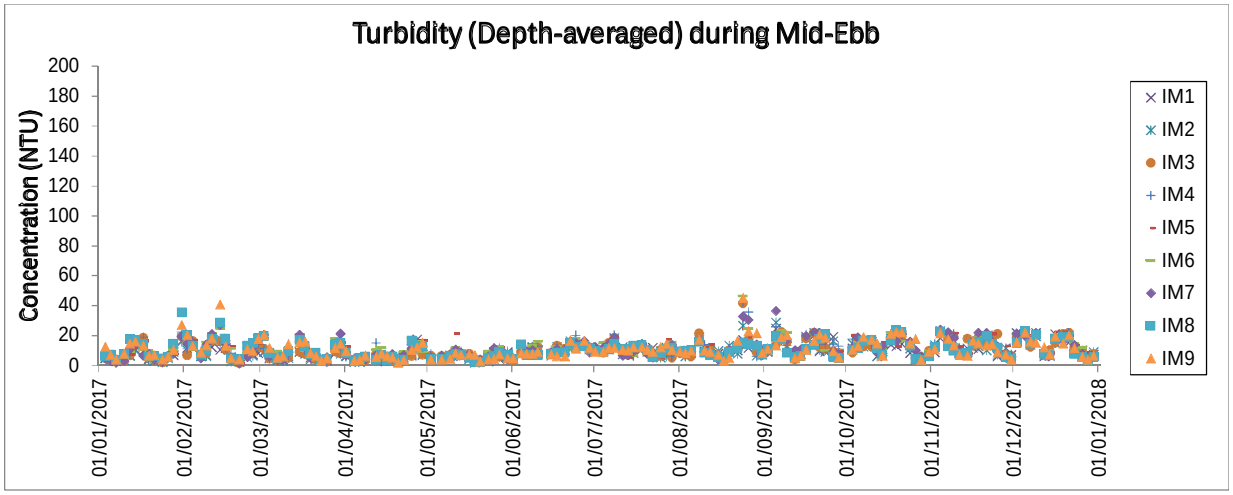
Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

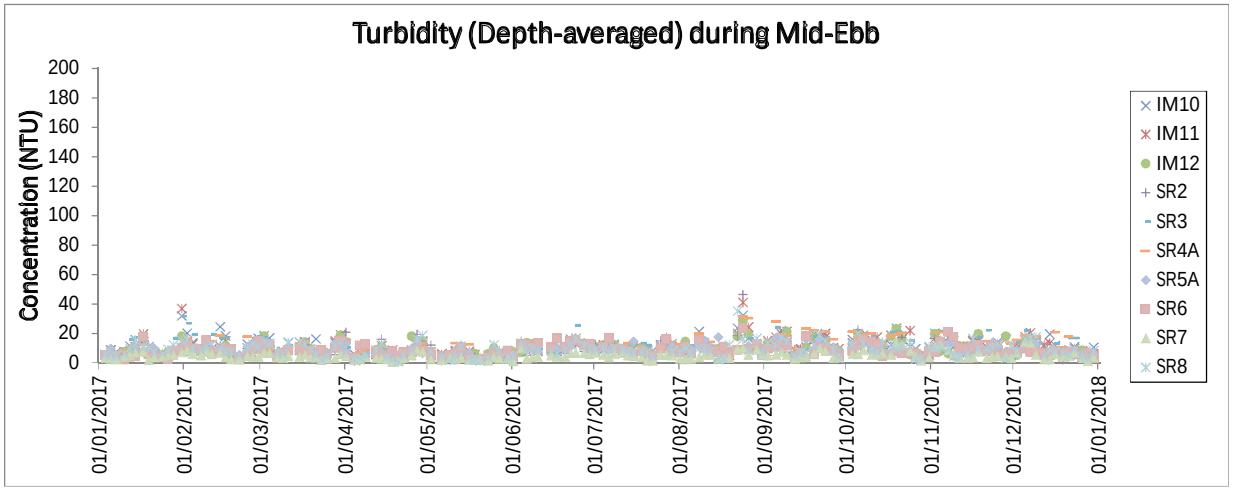




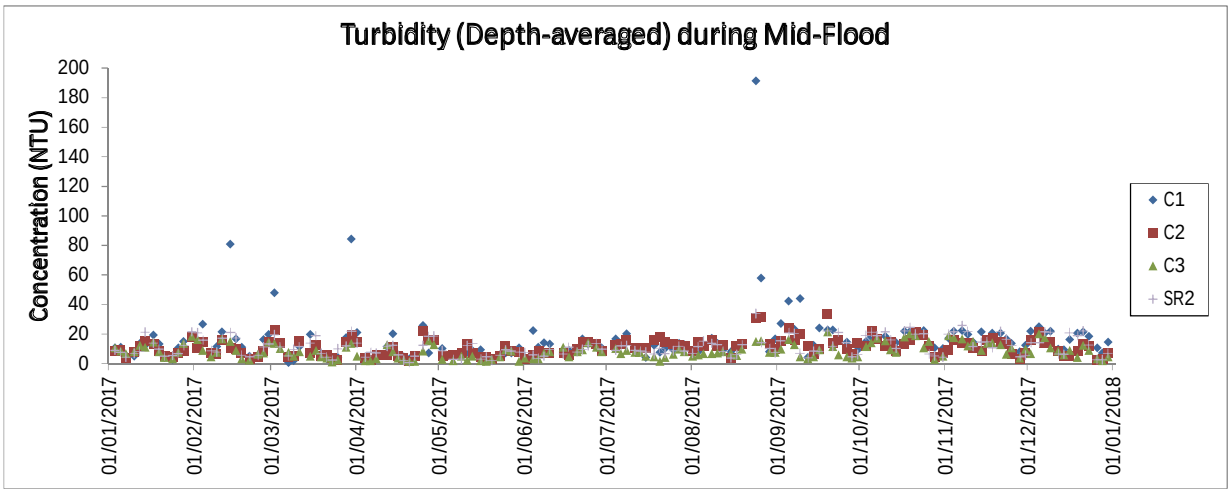
During the reporting period, 1.2% of the DO monitoring results at surface and middle water level and 0.4% of the DO monitoring results at bottom water level triggered the corresponding Action or Limit Level. All results triggering the corresponding Action or Limit level were collected during the wet season (April to October), particularly in June to August, which suggest the observation of seasonal effect on the DO monitoring results. Based on above observations, as well as the relevant investigation findings presented in the Construction Phase Monthly EM&A Reports, it is considered that the Project did not cause adverse impact on DO level at all water quality sensitive receivers.

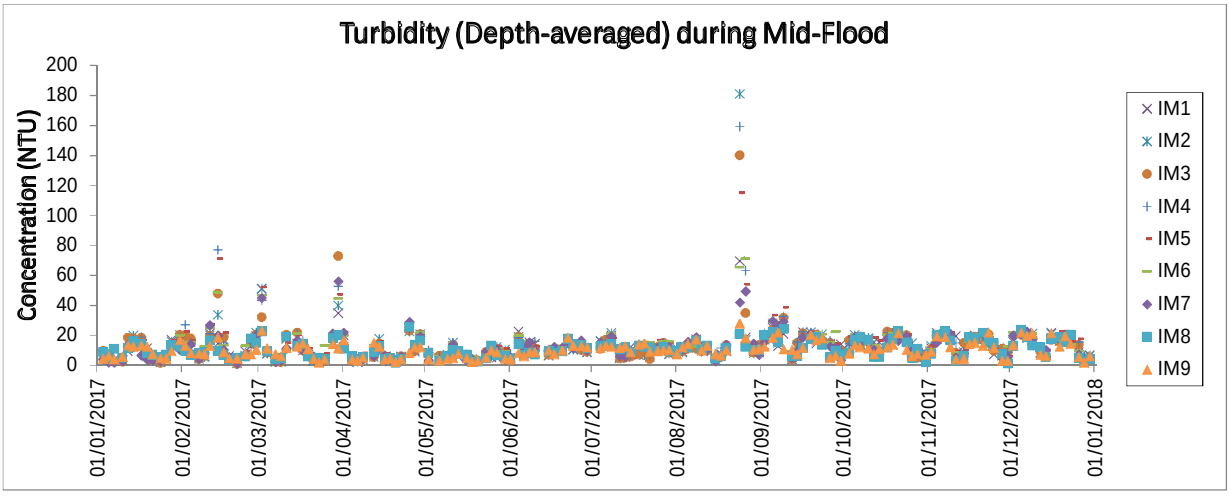


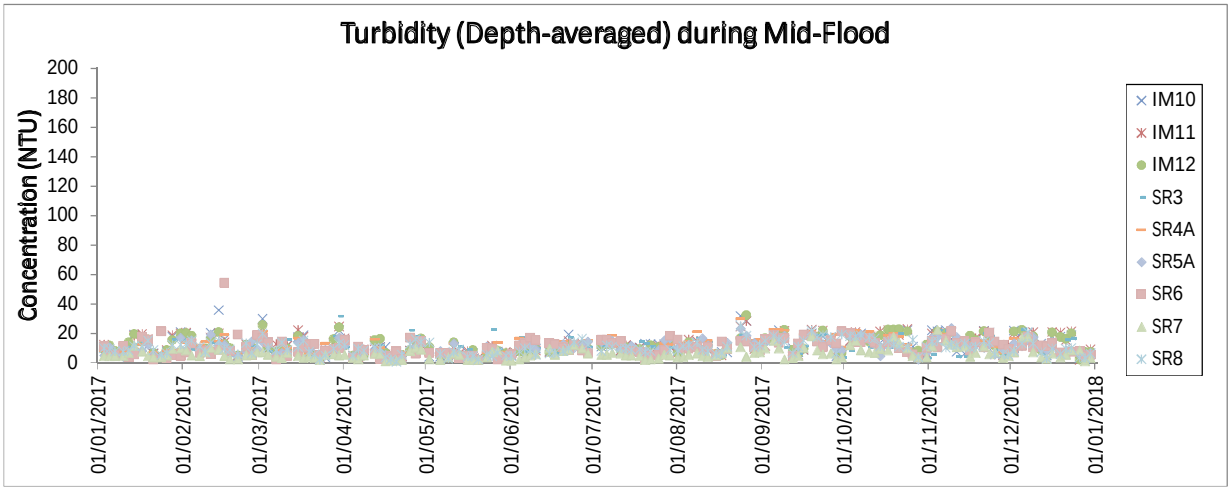




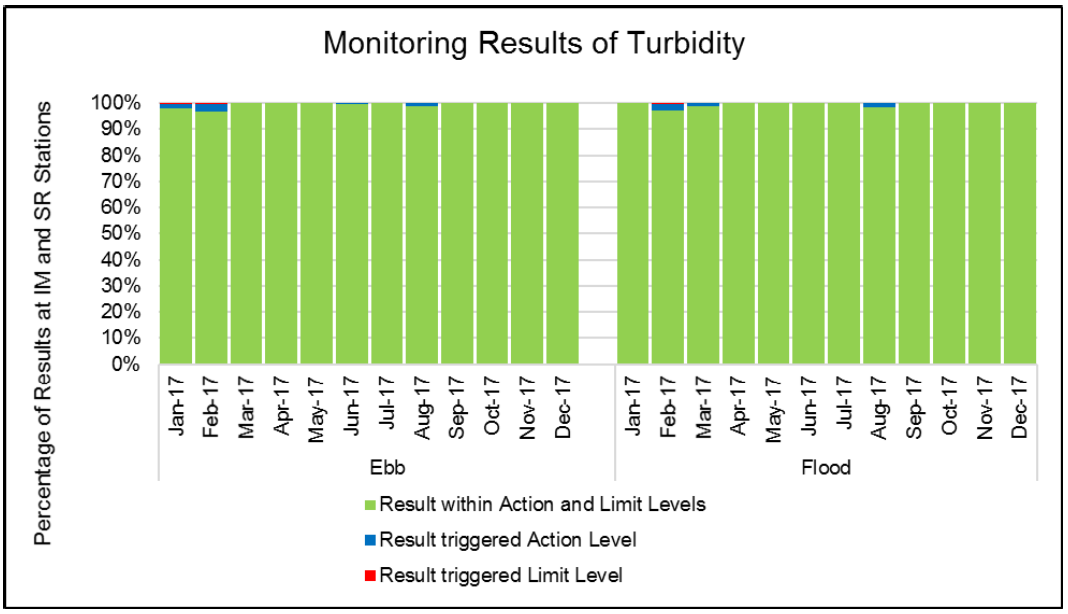
Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.



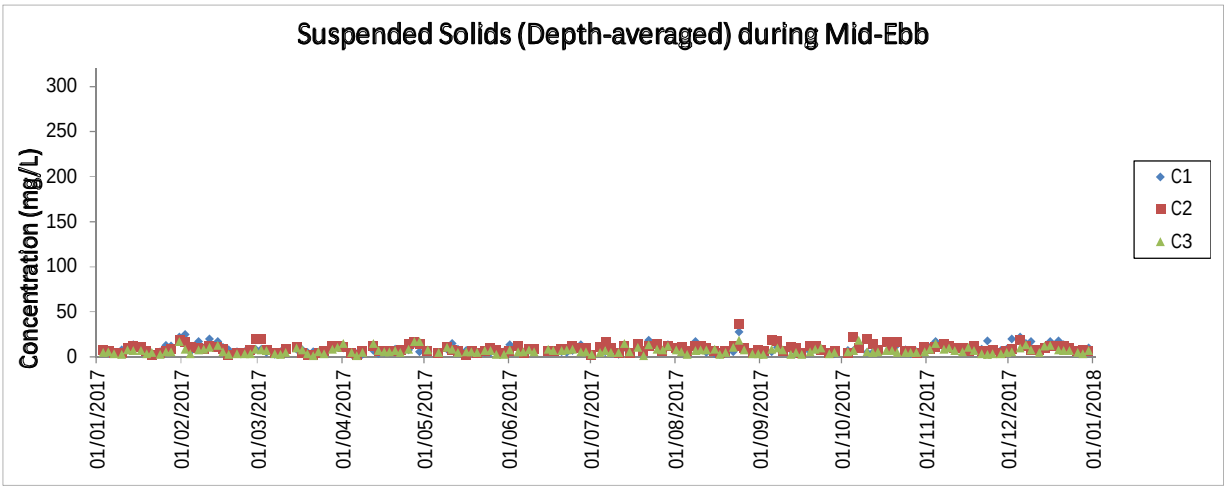


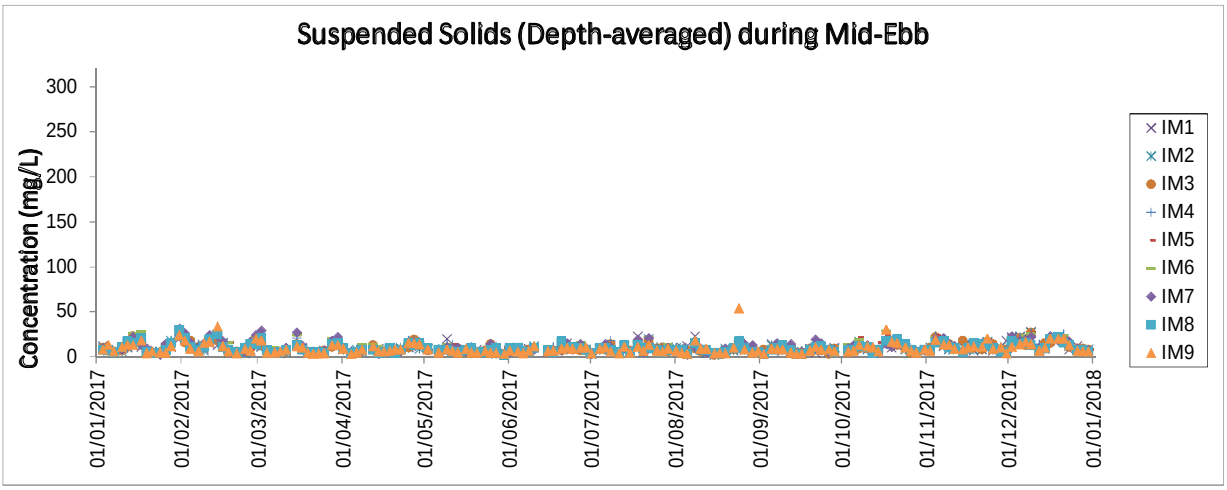


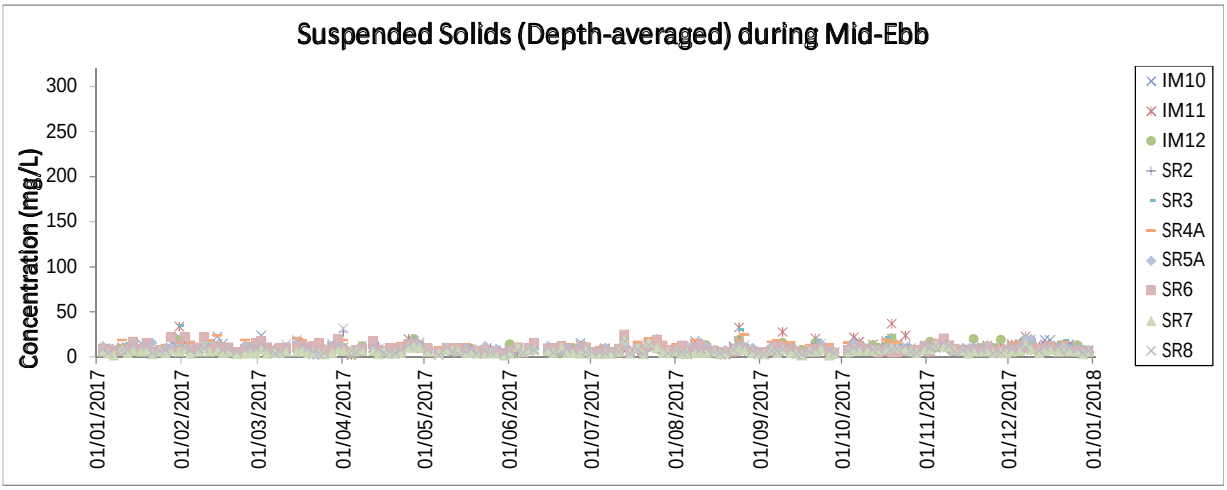
Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.



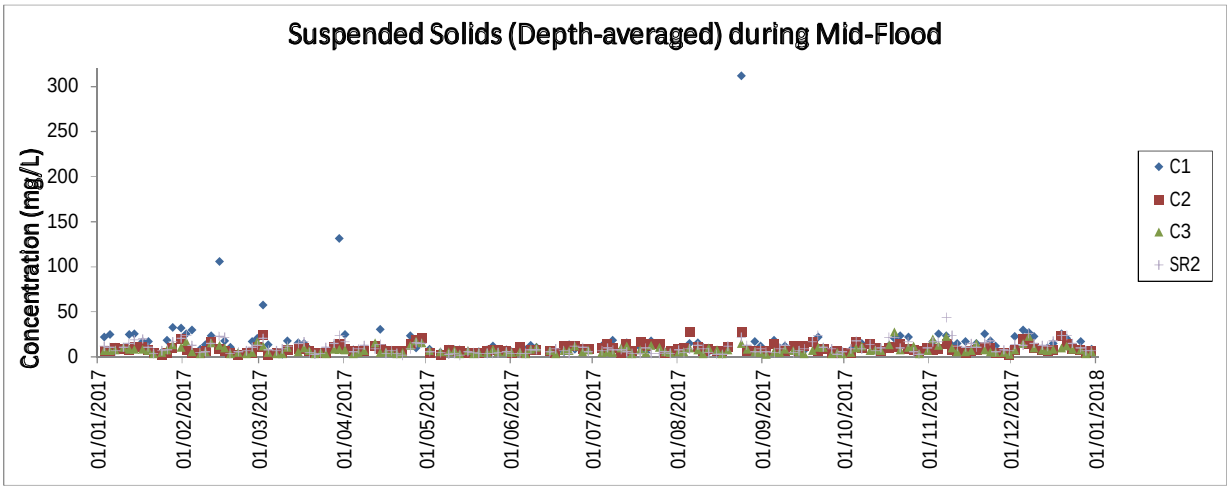
During the reporting period, 0.5% of the turbidity monitoring results triggered the corresponding Action or Limit Level. Due to the small number of results triggering the Action or Limit Level, and the relevant investigation findings presented in the Construction Phase Monthly EM&A Reports, it is considered that the Project did not cause adverse impact on turbidity level at all water quality sensitive receivers.

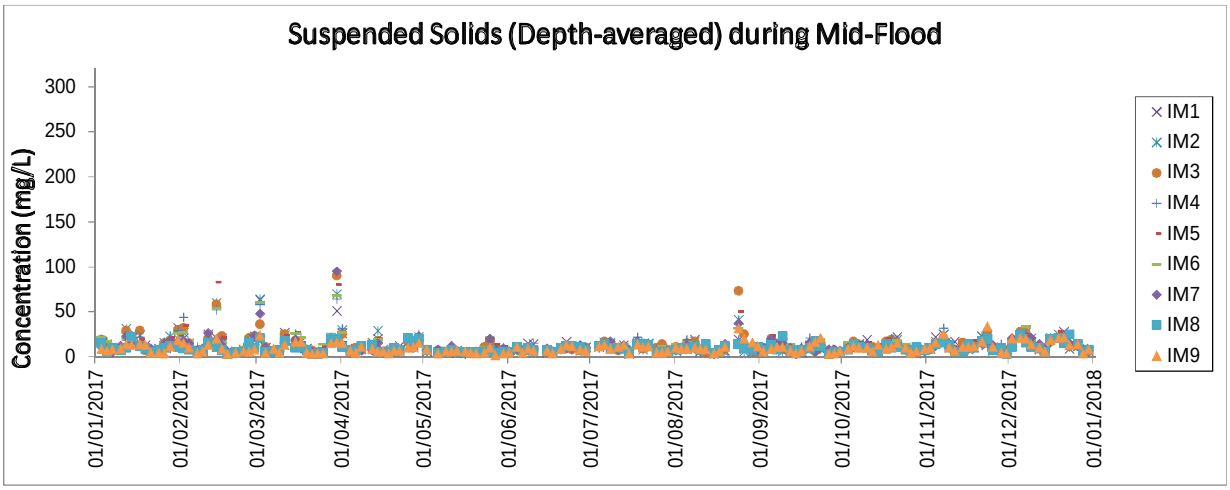


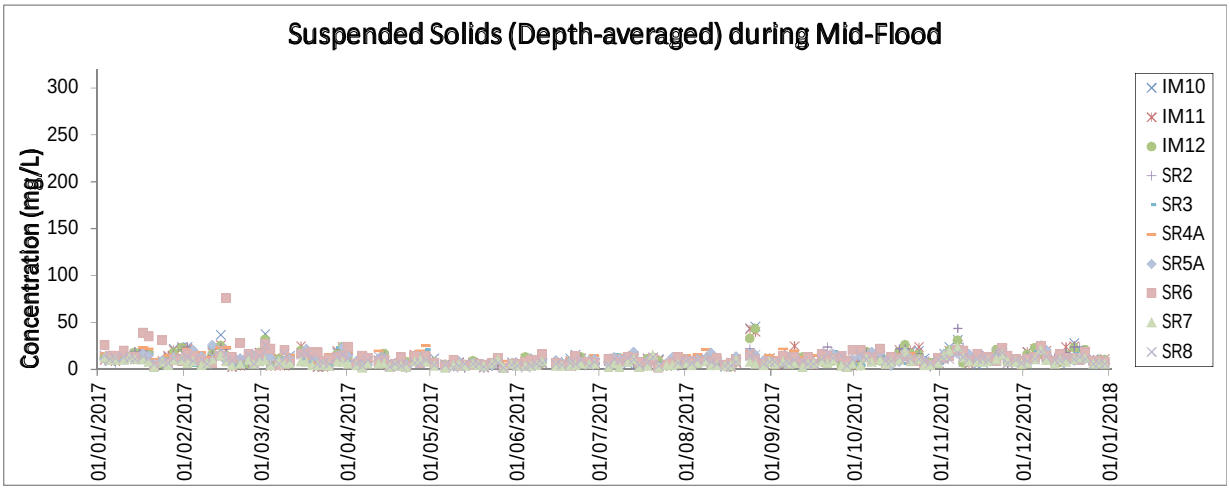




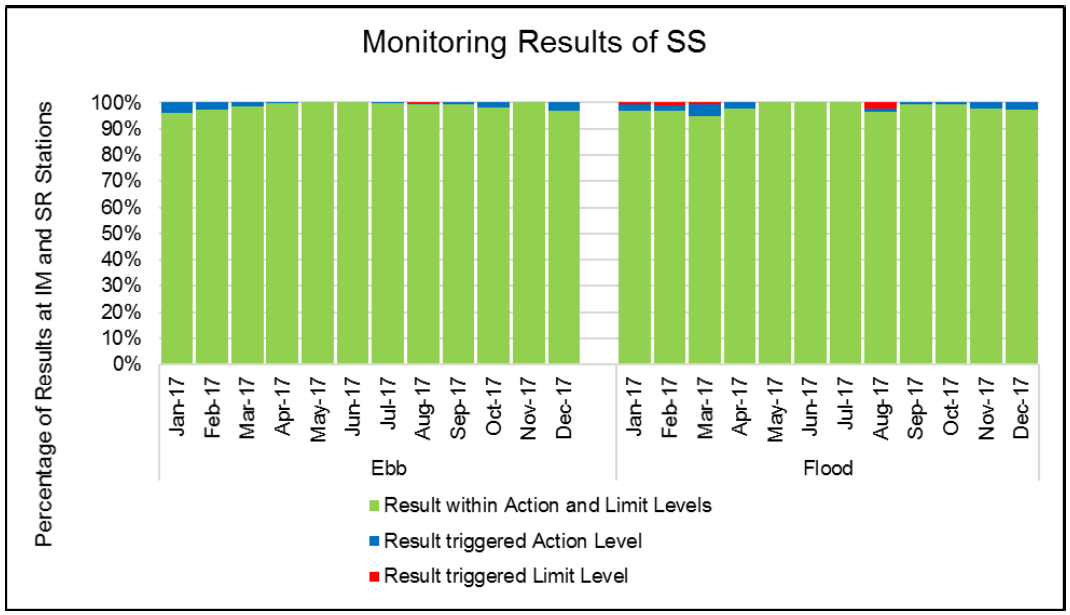
Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.



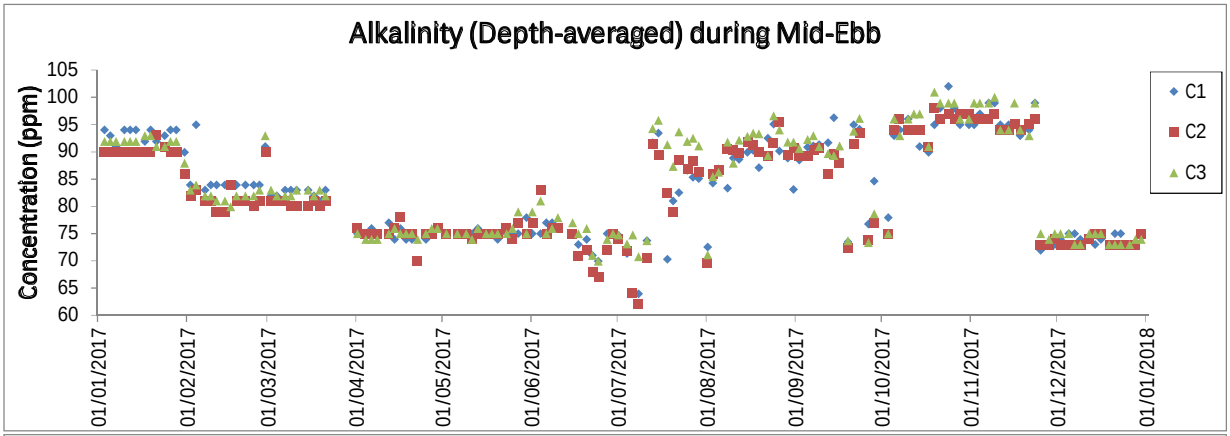


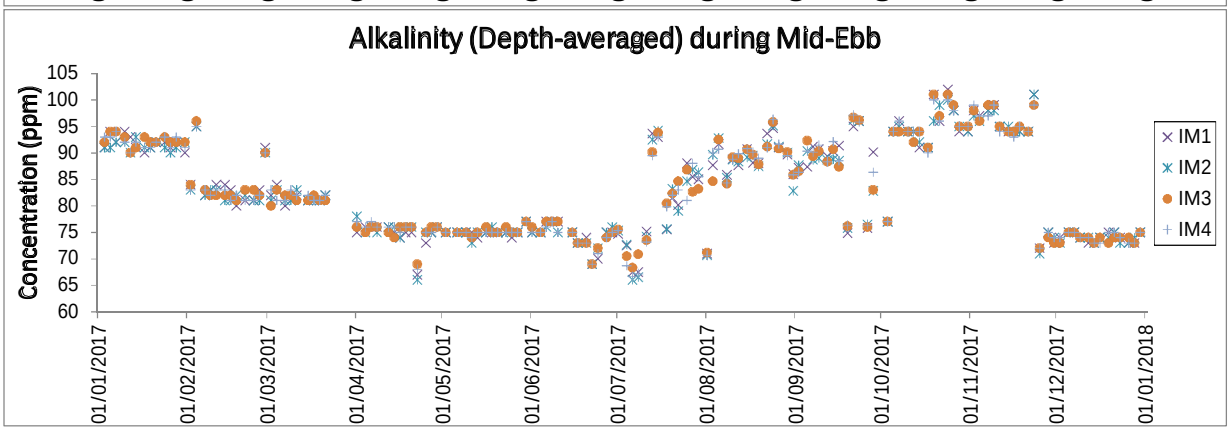


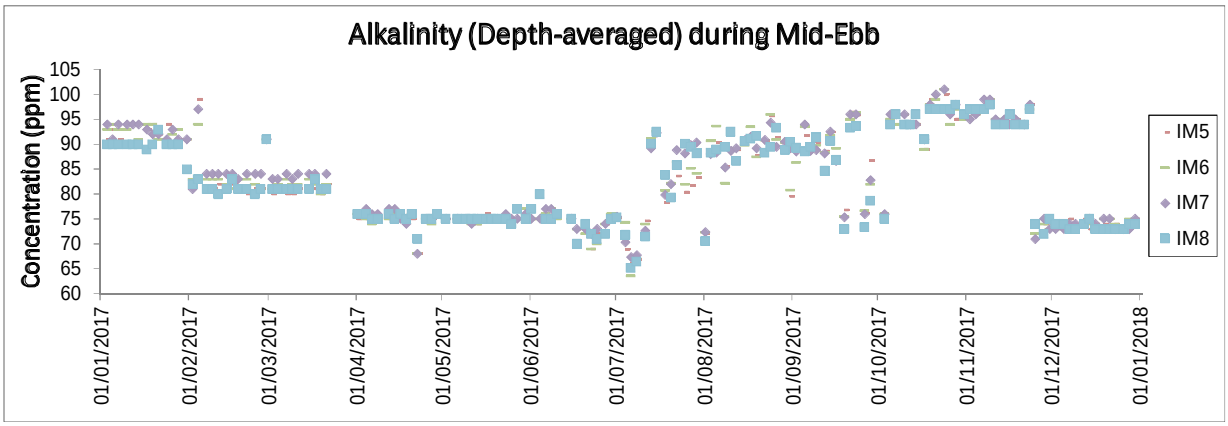
Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

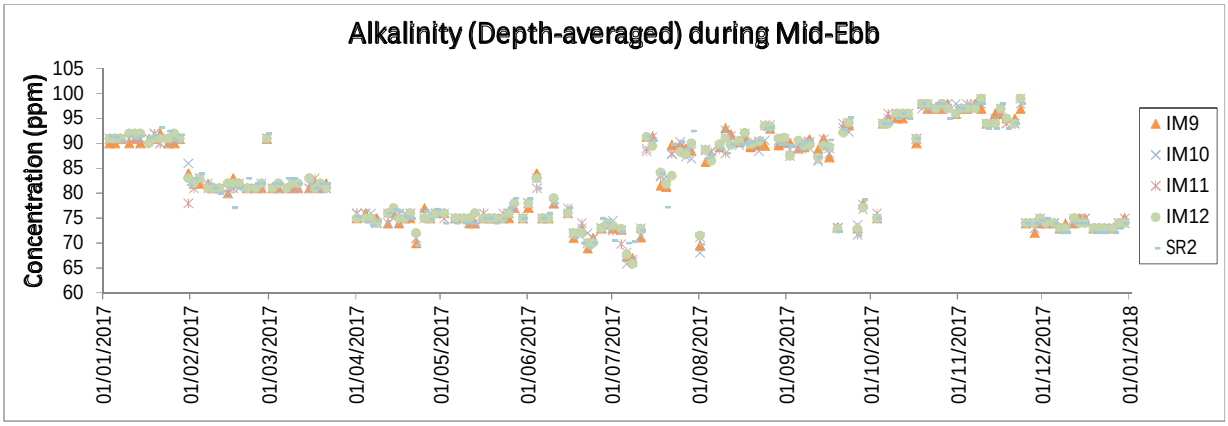


During the reporting period, 1.6% of the SS monitoring results triggered the corresponding Action or Limit Level. Due to the small number of results triggering the Action or Limit Level, and the relevant investigation findings presented in the Construction Phase Monthly EM&A Reports, it is considered that the Project did not cause adverse impact on SS level at all water quality sensitive receivers.

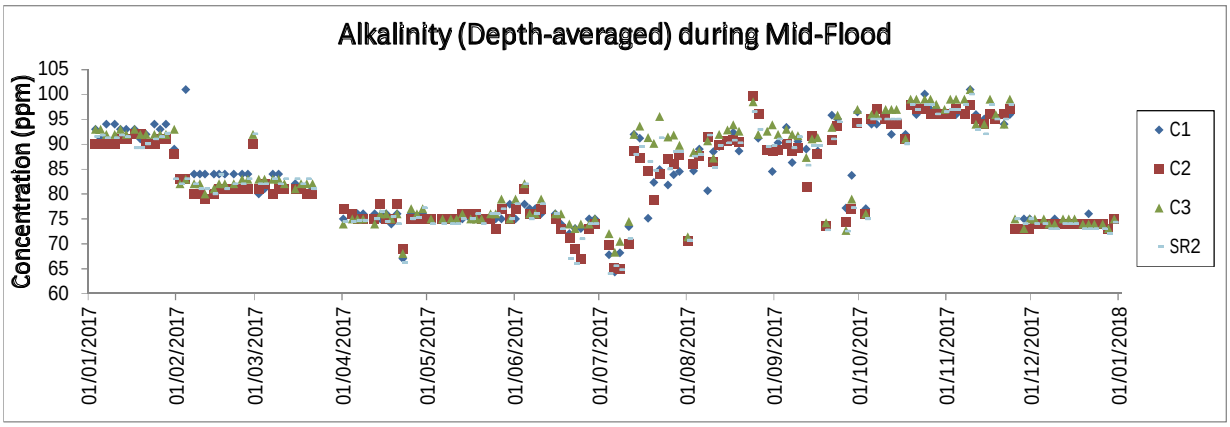


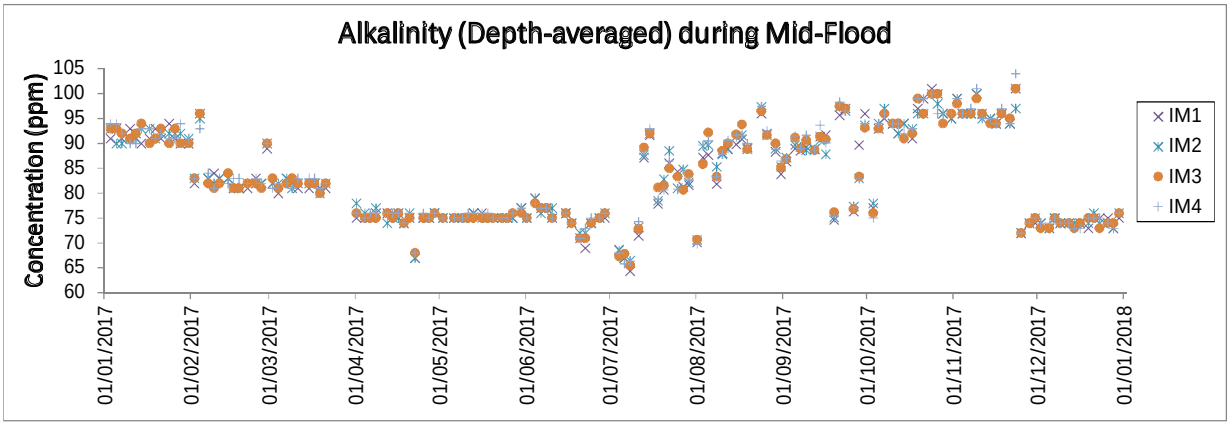


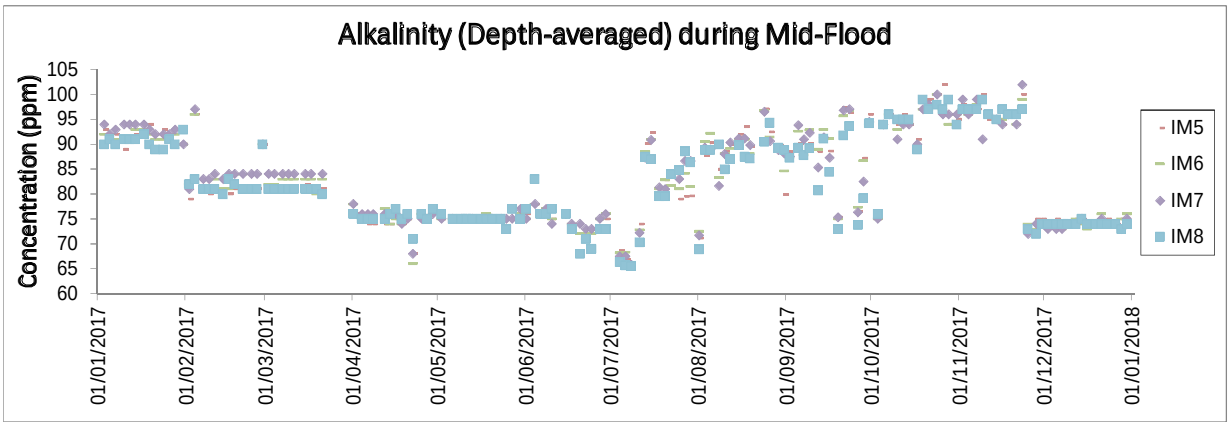


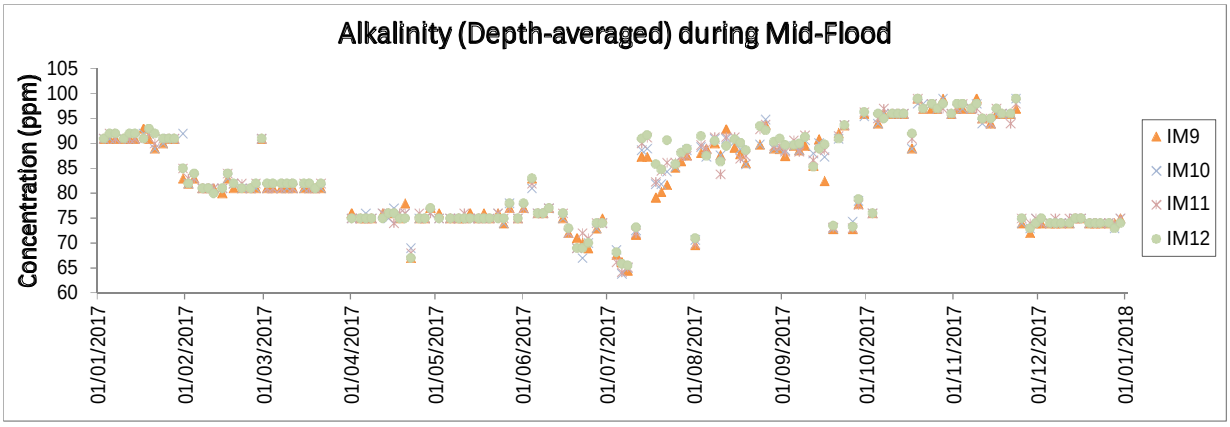


Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

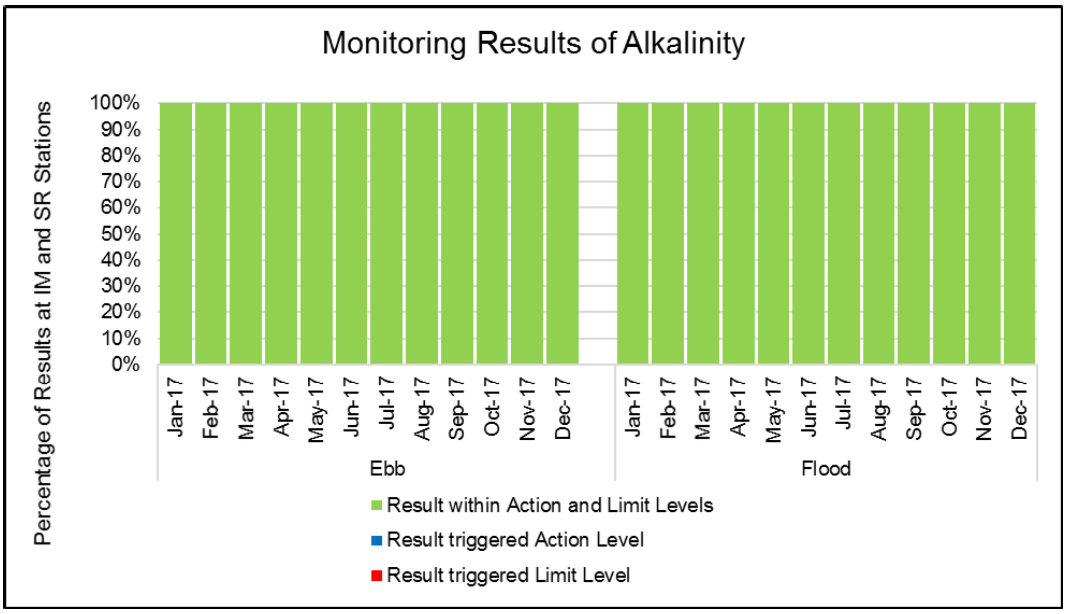




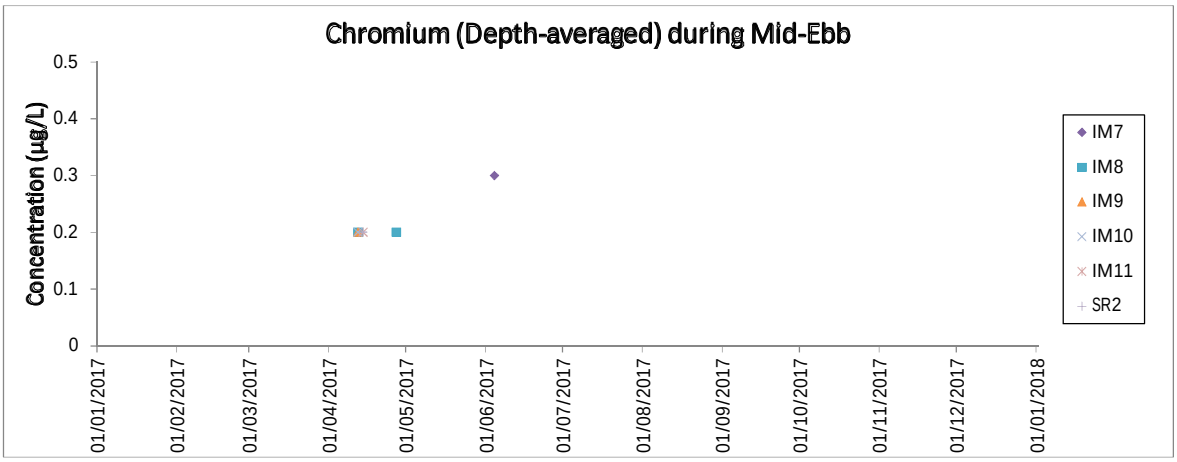


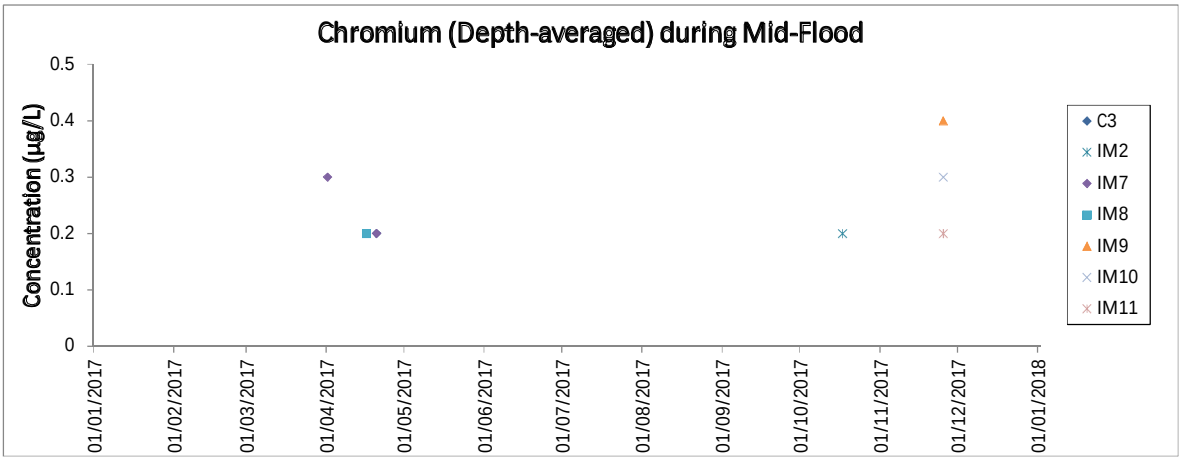


Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

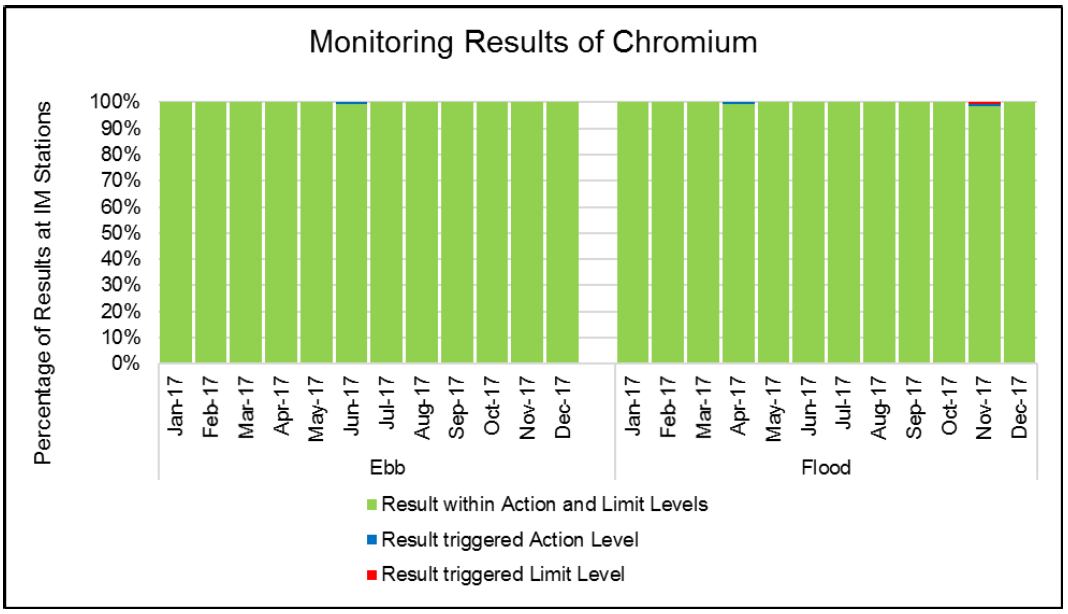


All alkalinity monitoring results in the reporting period were within the corresponding Action and Limit Levels.

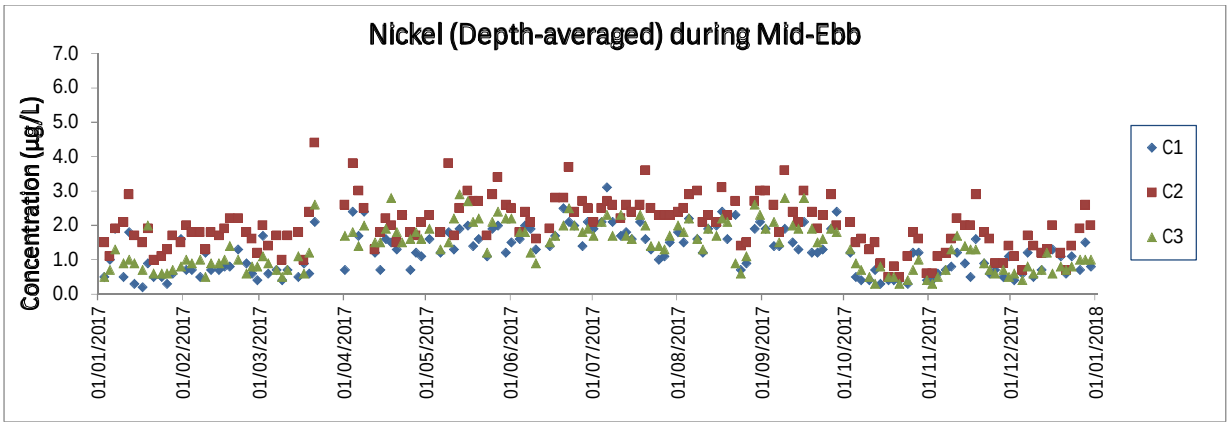


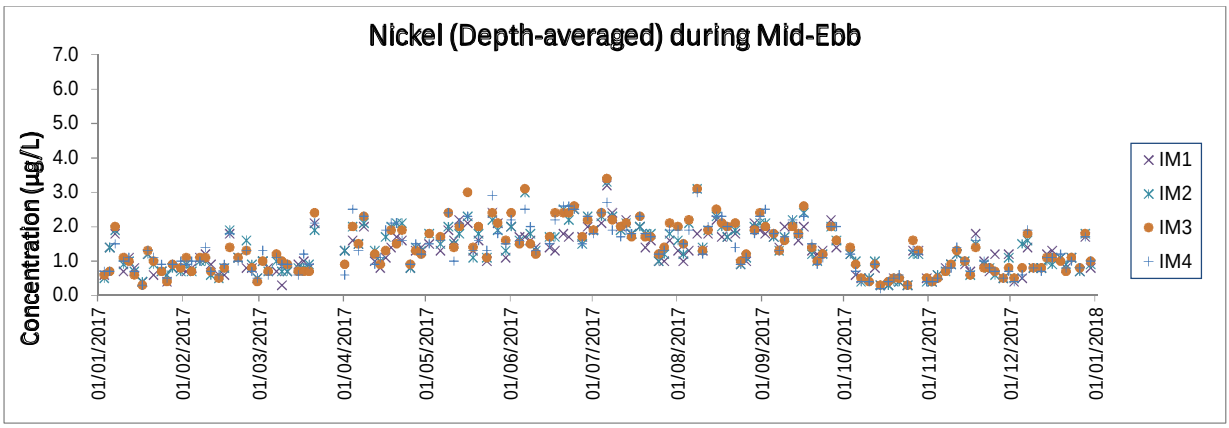


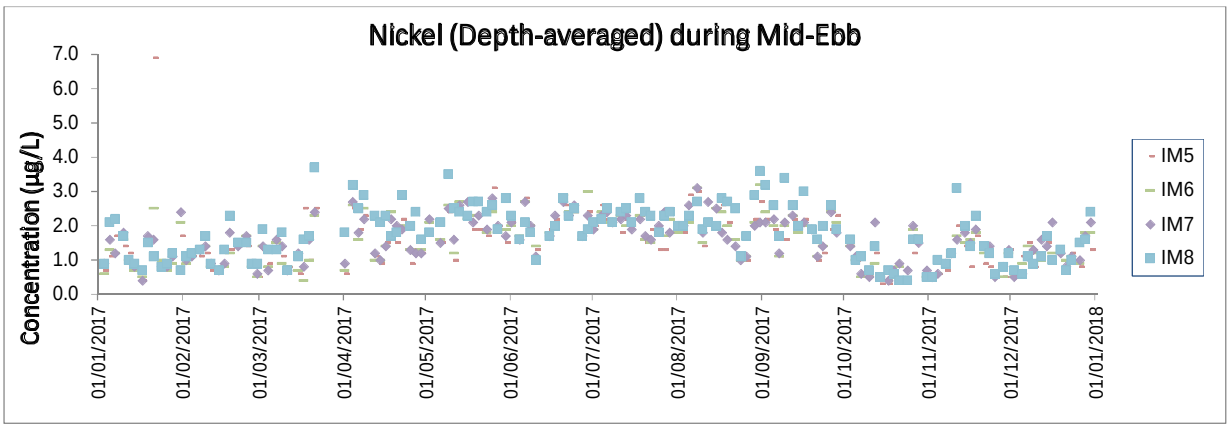
Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.
The monitoring results of Chromium at all other monitoring stations were below the reporting limit of 0.2 µg/L.

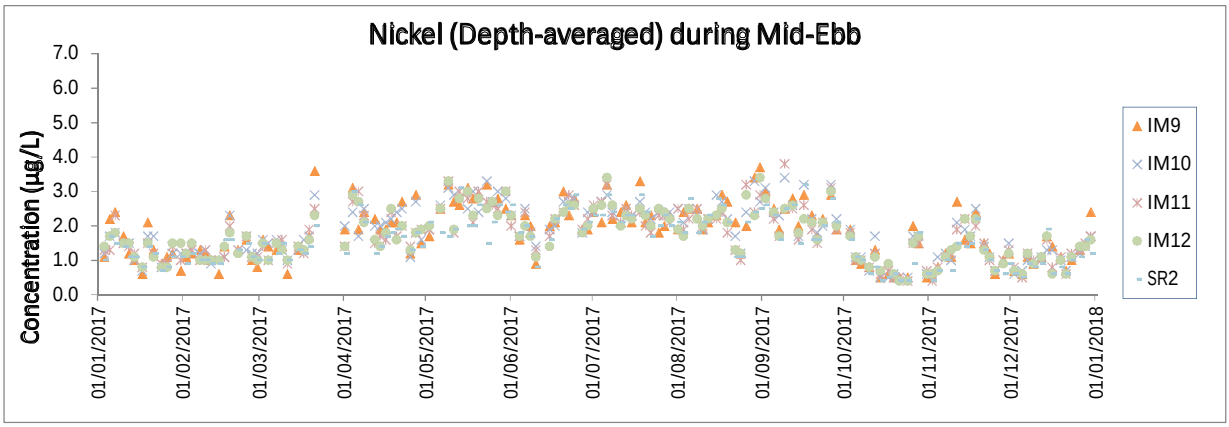


During the reporting period, 0.1% of the chromium monitoring results triggered the corresponding Action or Limit Level. It appeared that all cases were isolated with no observable temporal and spatial trend that might be related to Project activities.

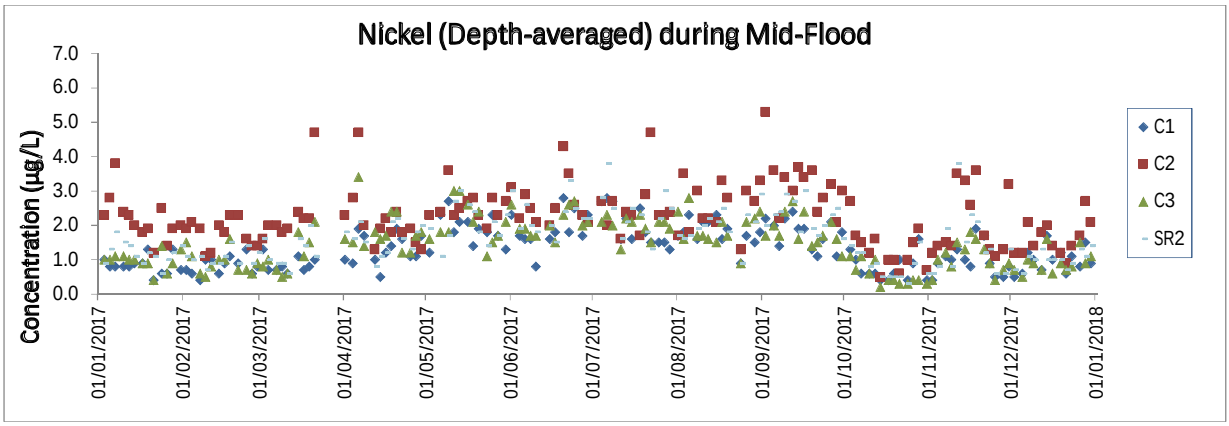


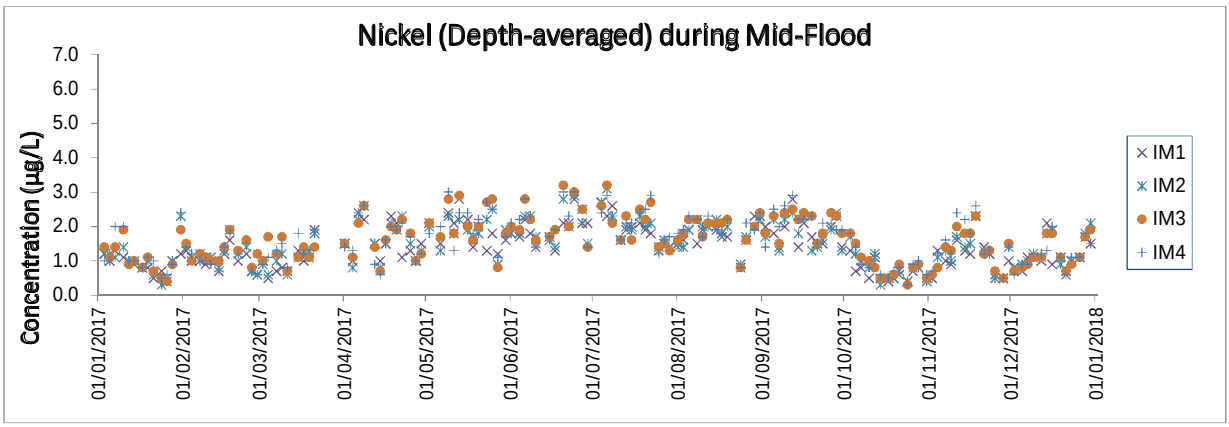


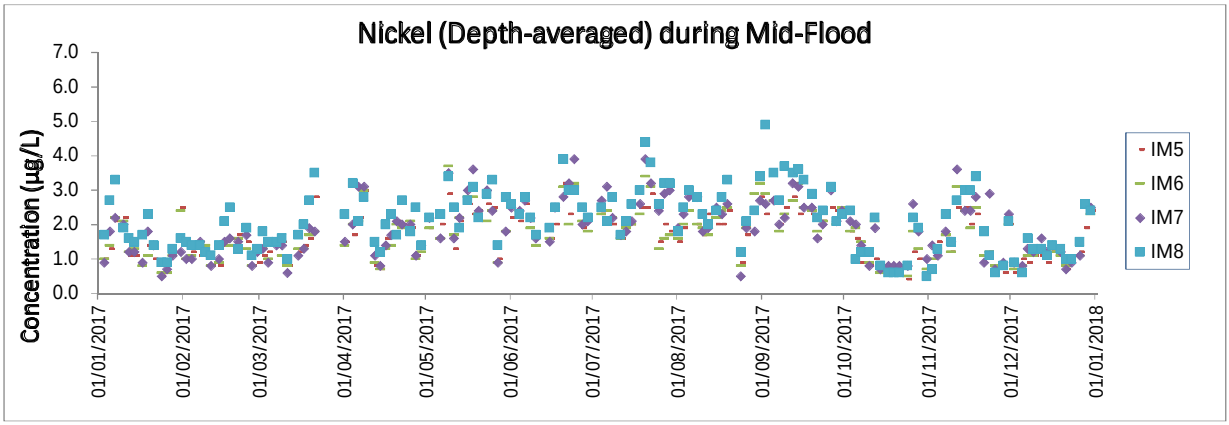


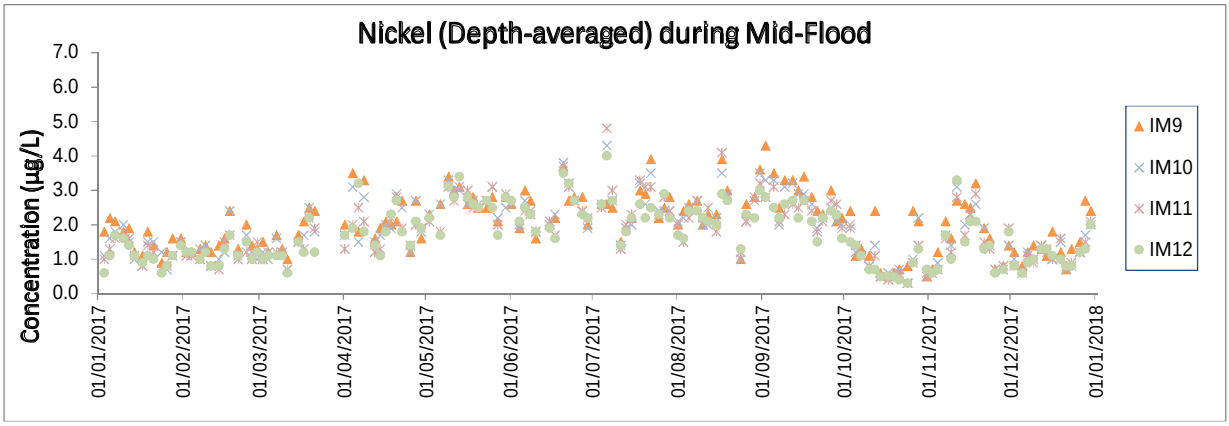


Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.

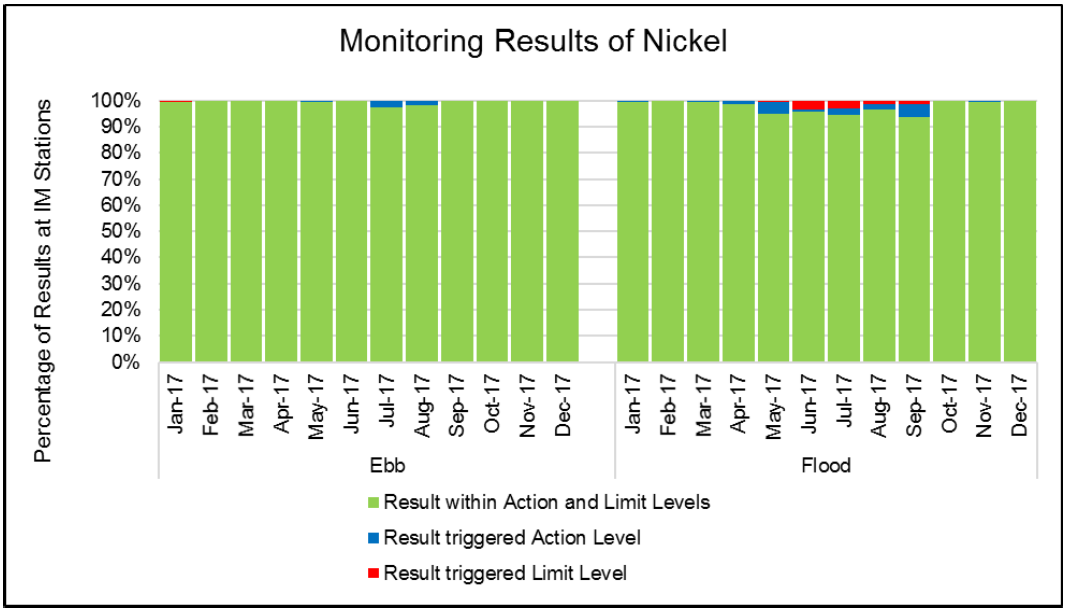








Note: The Action and Limit Levels can be referred to Table 2.6 of the Annual EM&A Report.



During the reporting period, 1.2% of the nickel monitoring results triggered the corresponding Action or Limit Level. From the graph, it is noted that the majority of cases were recorded in the wet season during mid-flood tide, which might suggest the existence of a seasonal, tide-specific effect that could have led to episodes of relatively high nickel concentrations, and is not related to the Project activities.

Combining the observations from the monitoring results of the two representative heavy metals for DCM works (chromium and nickel), the low percentage of results triggering corresponding Action or Limit Level, as well as the investigation findings which concluded that these cases were not related to the Project, this indicates that DCM activities during the reporting period did not cause adverse water quality impact.

Appendix E. Chinese White Dolphin Monitoring Results

Figure 1: Sightings Distribution of Chinese White Dolphins

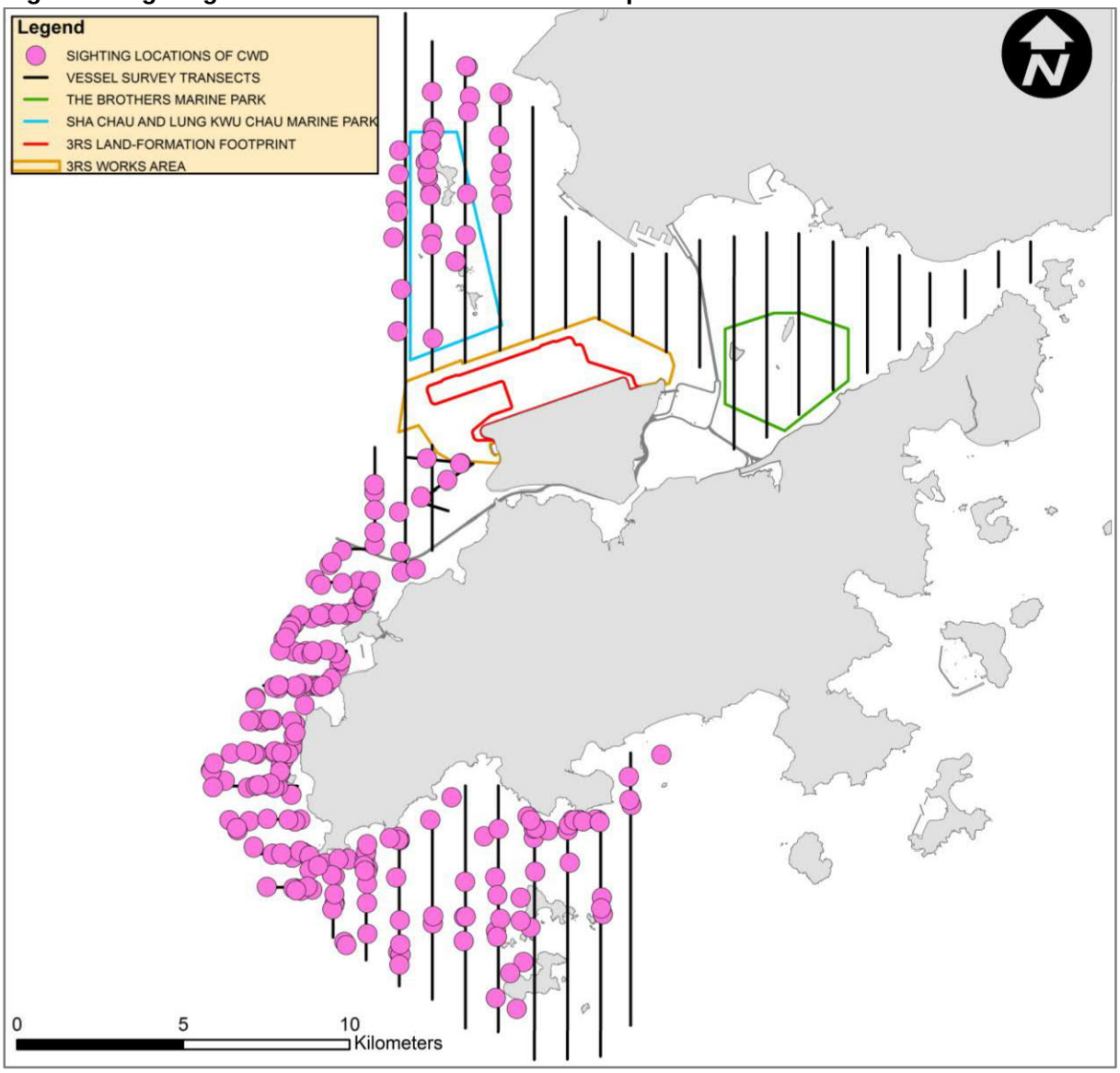
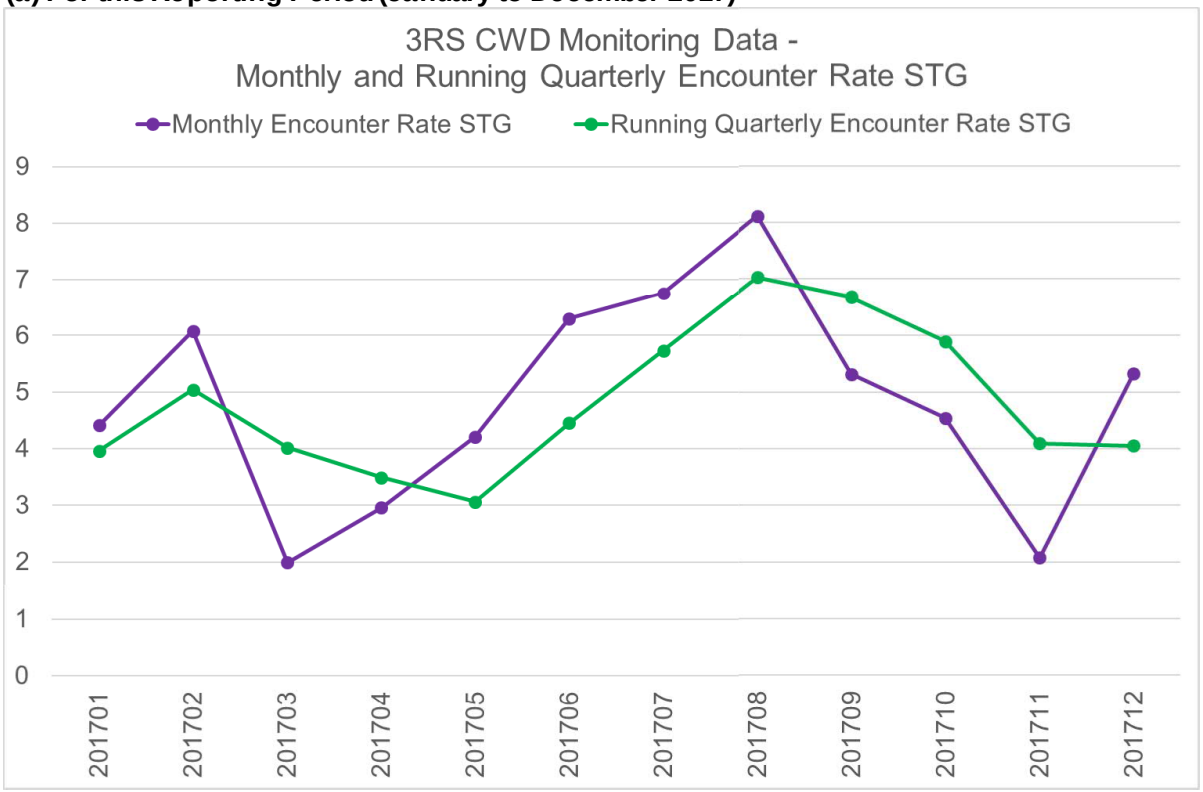


Figure 2: Graphical Presentation of Monthly and Running Quarterly STG
(a) For this Reporting Period (January to December 2017)



(b) For January 2016 to December 2017

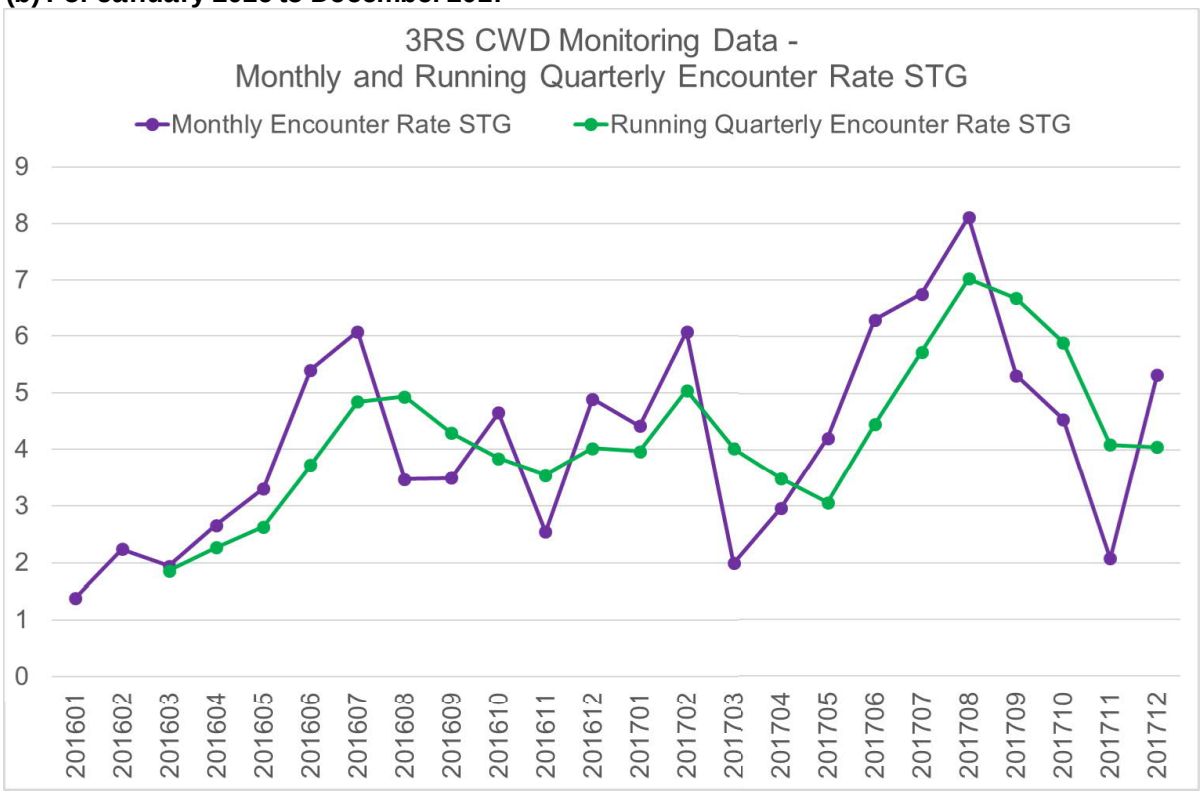
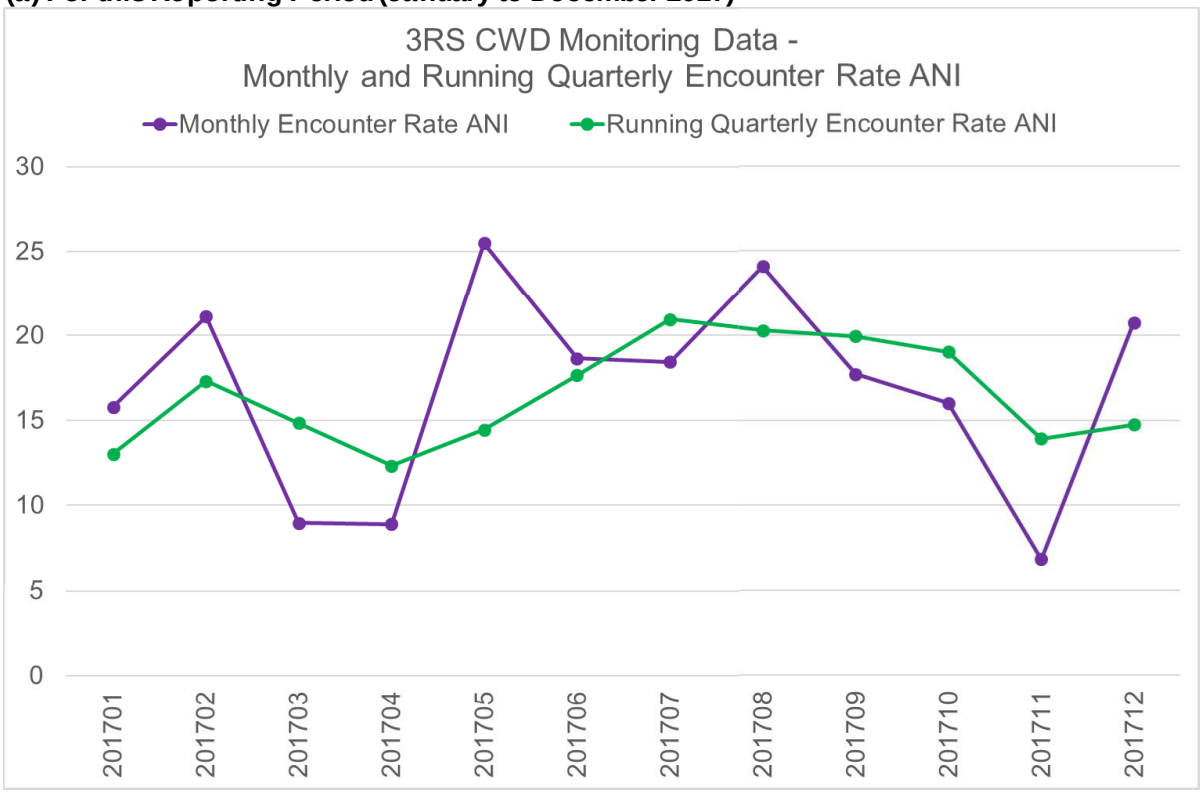


Figure 3: Graphical Presentation of Monthly and Running Quarterly ANI
(a) For this Reporting Period (January to December 2017)



(b) For January 2016 to December 2017

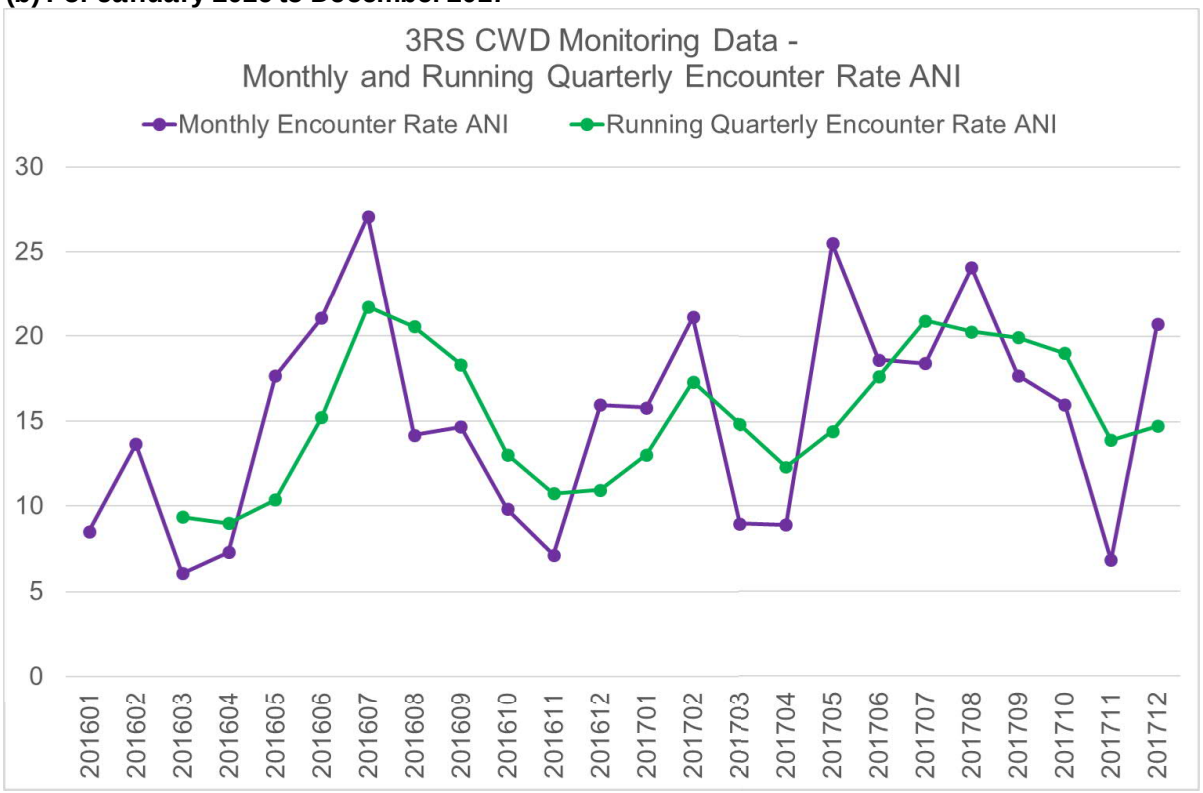
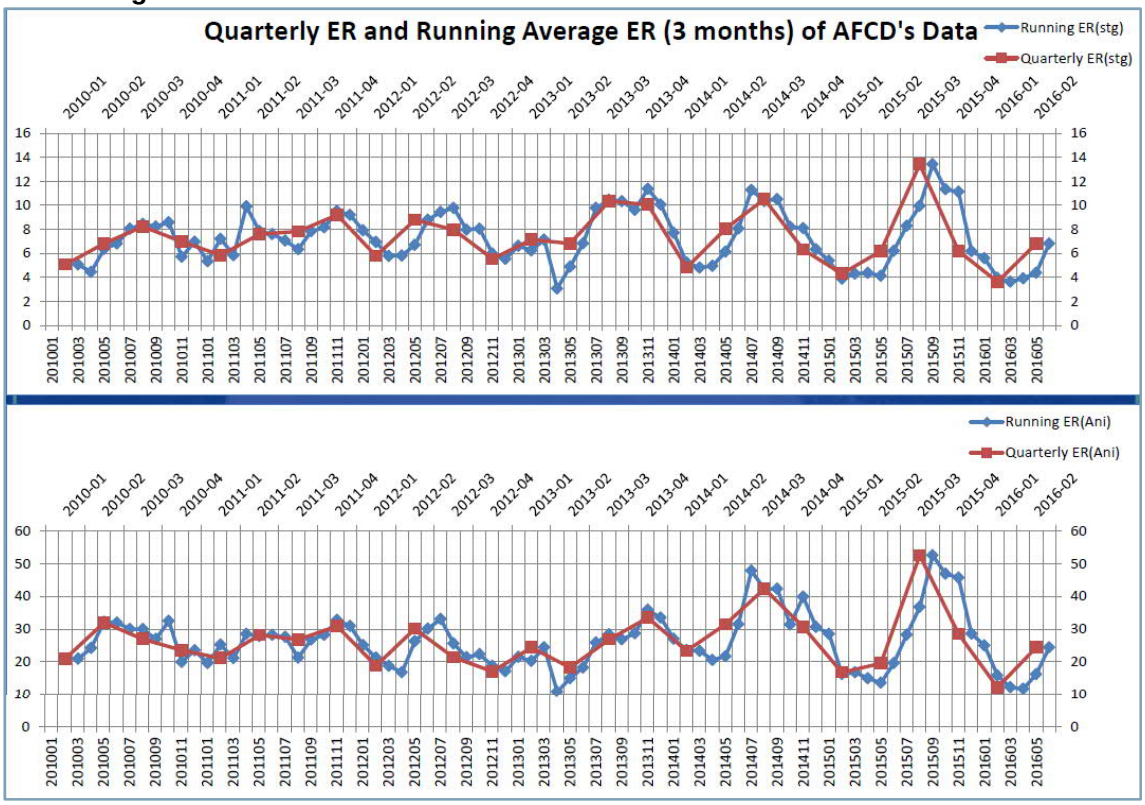
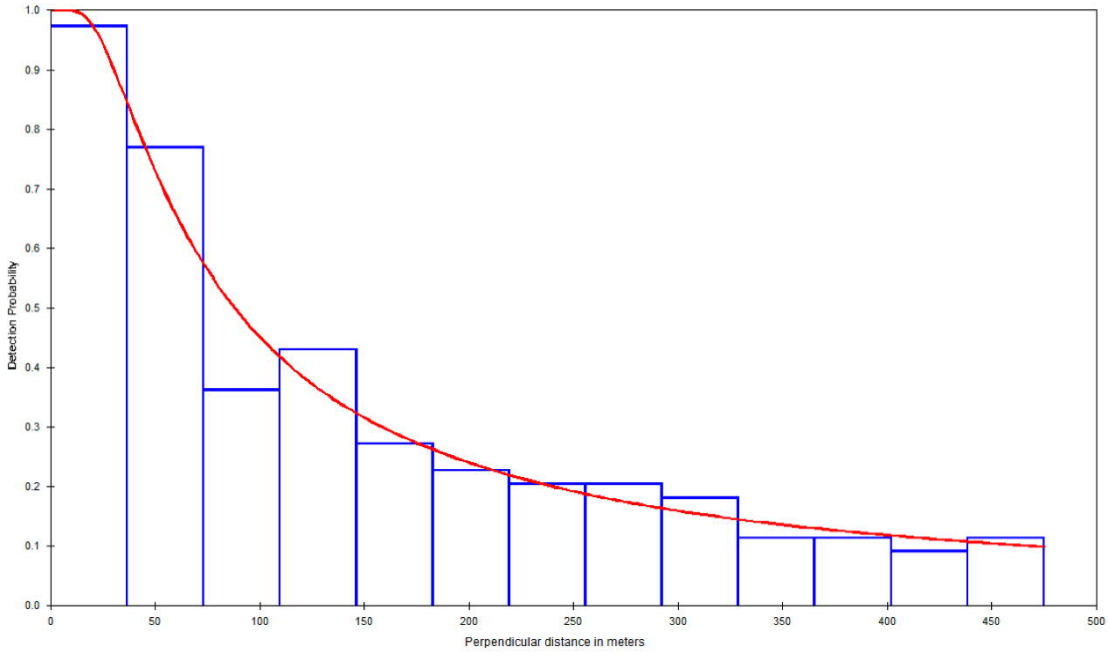


Figure 4: Quarterly Encounter Rates and Running Average Encounter Rates from AFCD's Monitoring Data



Source: from AFCD in mid-2016

Figure 5: Fitted Detection Function of the 2017 CWD Sightings, Pooled from All Western Hong Kong Survey Areas



Note: Detection function used a Hazard Rate model with a polynomial adjustment.

Figure 6: Quantitative Grid Analysis – SPSE and DPSE of CWDs with Corrected Survey Effort per km^2 from Dec 2015 to Dec 2016 and Year 2017

[SPSE = no. of on-effort dolphin sightings per 100 units of survey effort, DPSE = no. of dolphins per 100 units of survey effort]

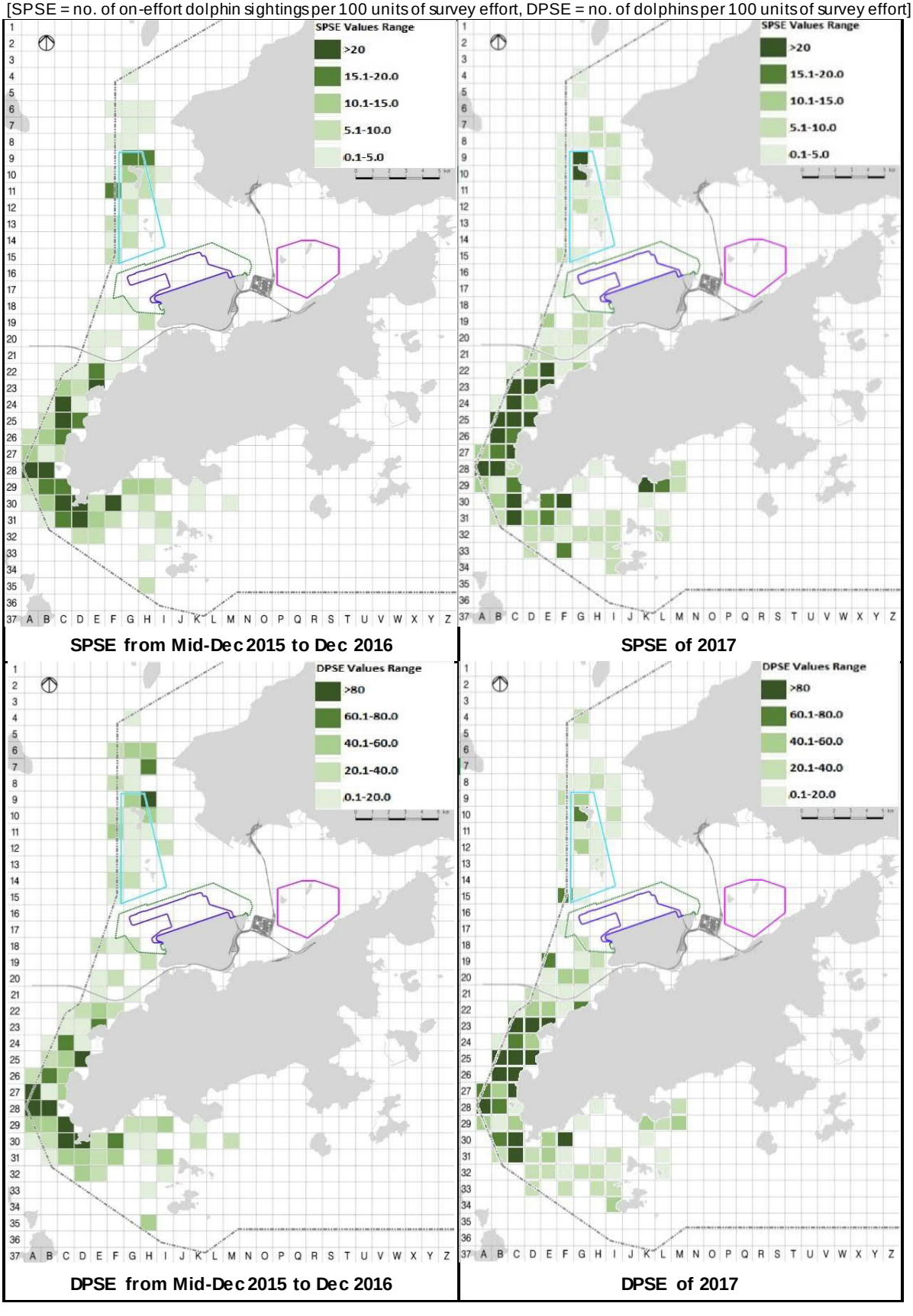
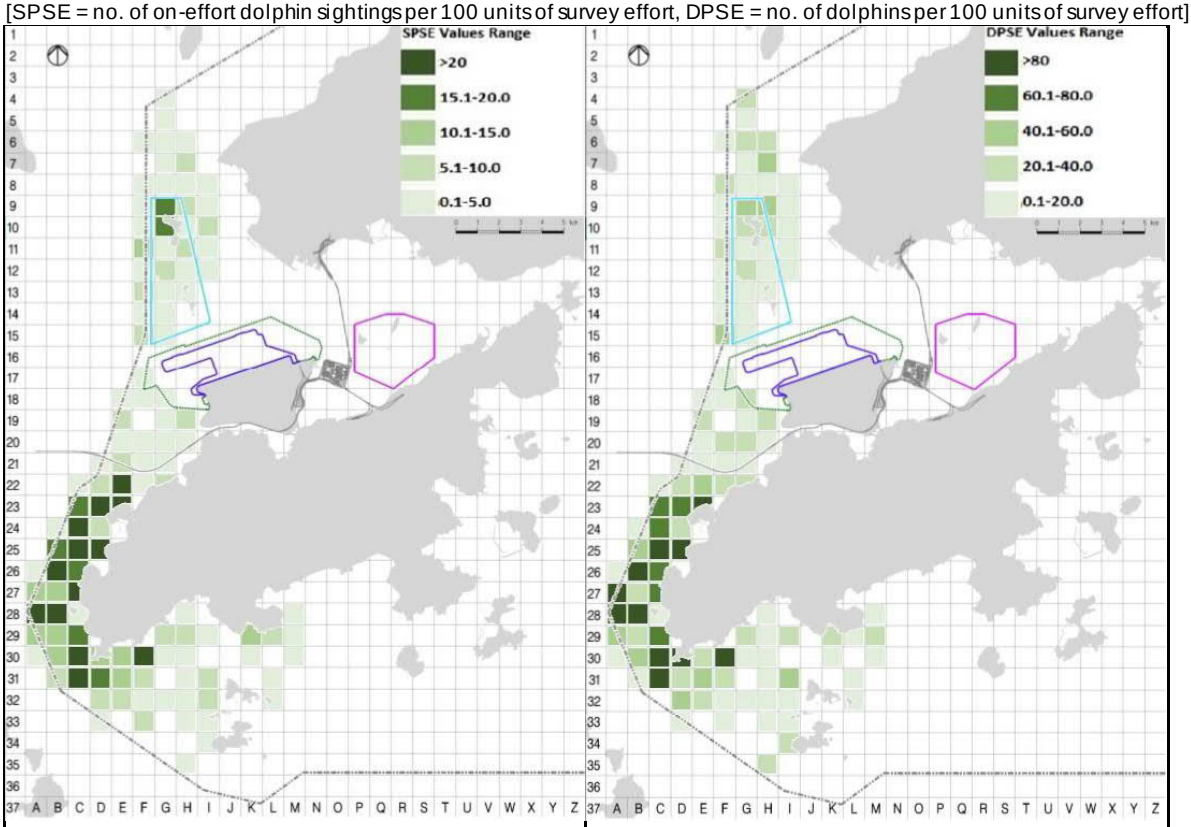


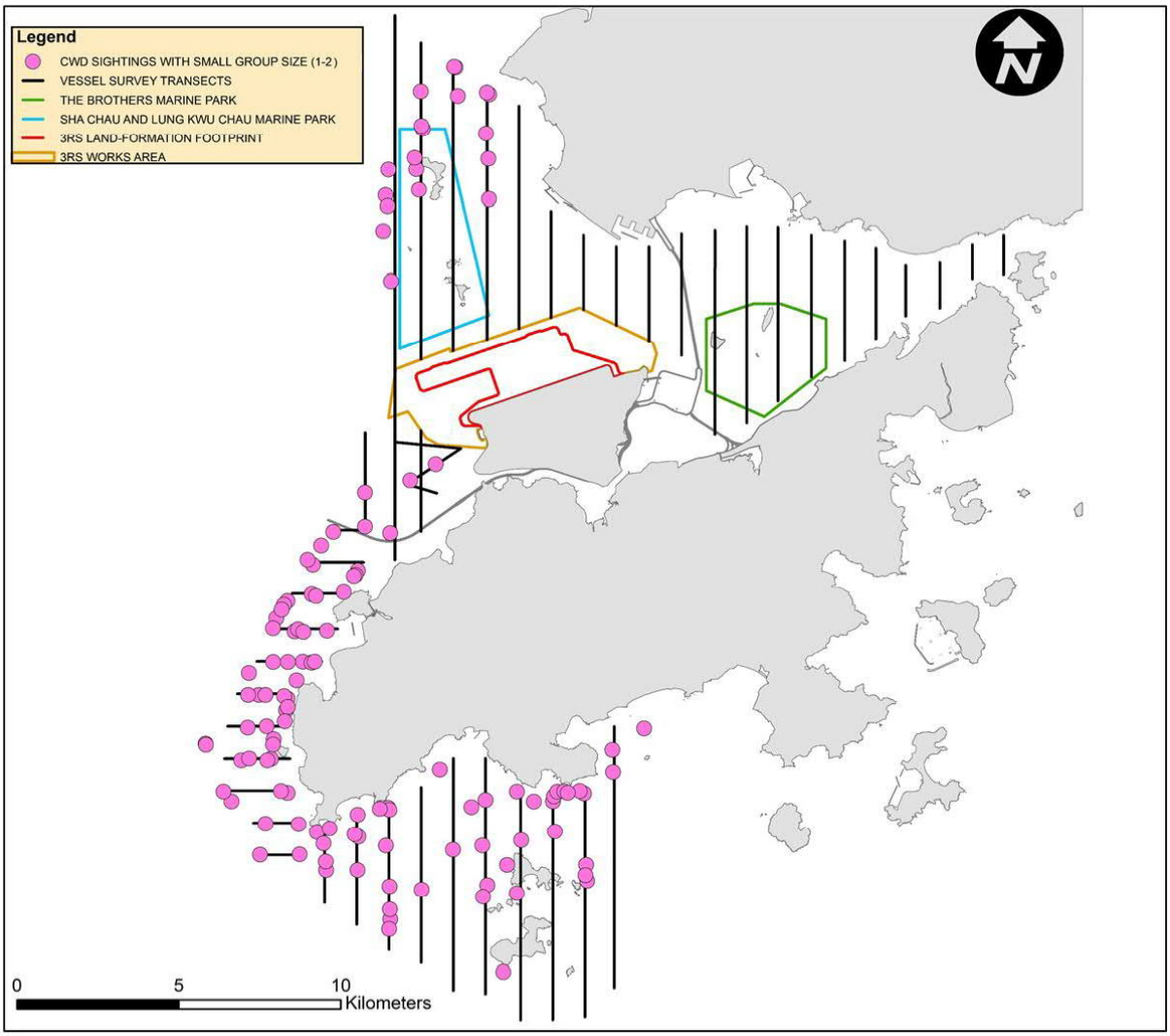
Figure 7: Cumulative SPSE and DPSE of CWDs with Corrected Survey Effort per km^2 from Dec 2015 to Dec 2017

[SPSE = no. of on-effort dolphin sightings per 100 units of survey effort, DPSE = no. of dolphins per 100 units of survey effort]



Cumulative SPSE from Mid-Dec 2015 to Dec 2017	Cumulative DPSE from Mid-Dec 2015 to Dec 2017

Figure 8: Sightings Distribution of Chinese White Dolphins with Different Group Sizes
(a) Small Group Size (1 to 2 dolphins)



(b) Medium Group Size (3 to 9 dolphins) and Large Group Size (10 or more dolphins)

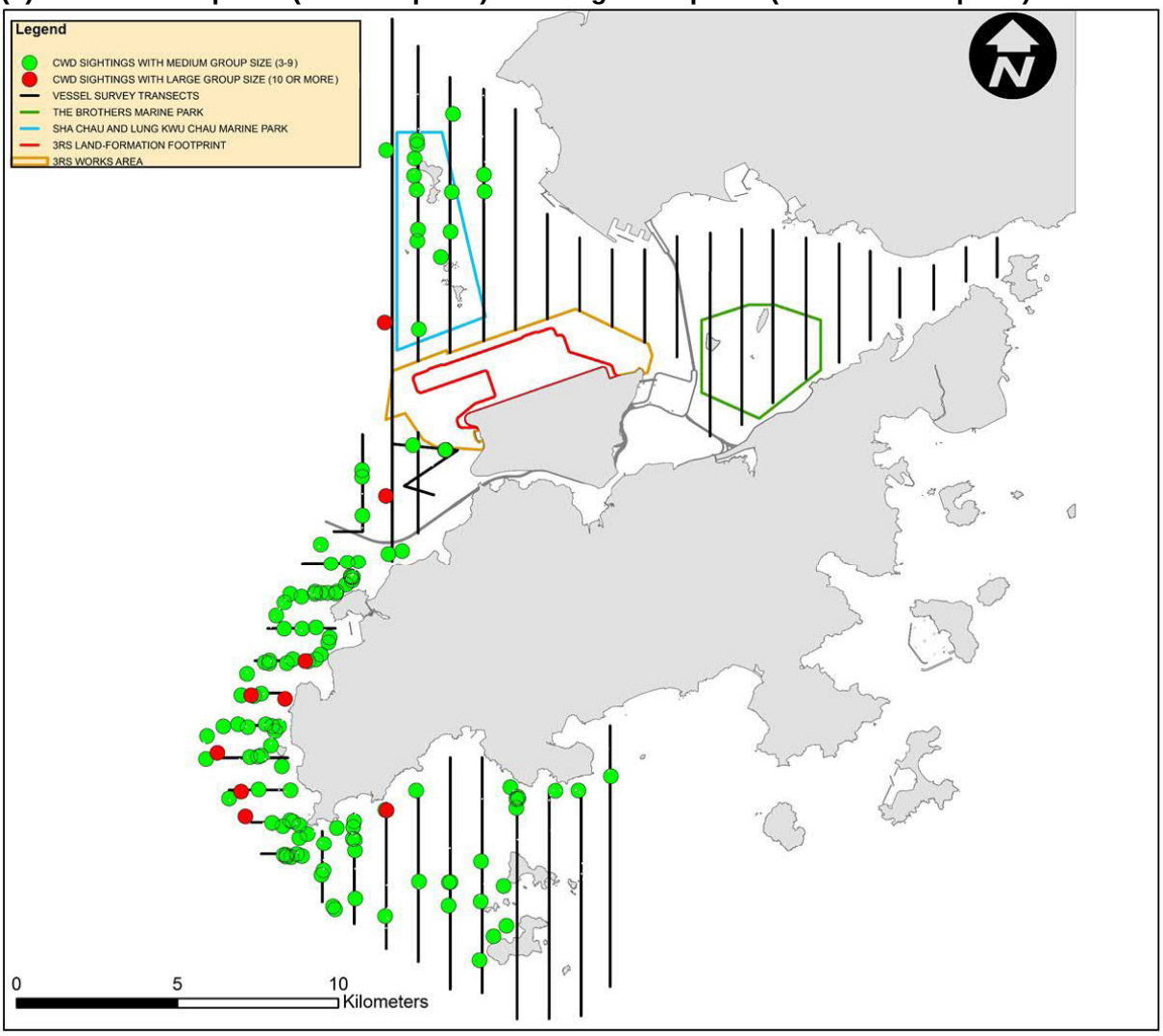


Figure 9: Sighting Locations of CWD Groups Engaged in Different Activities

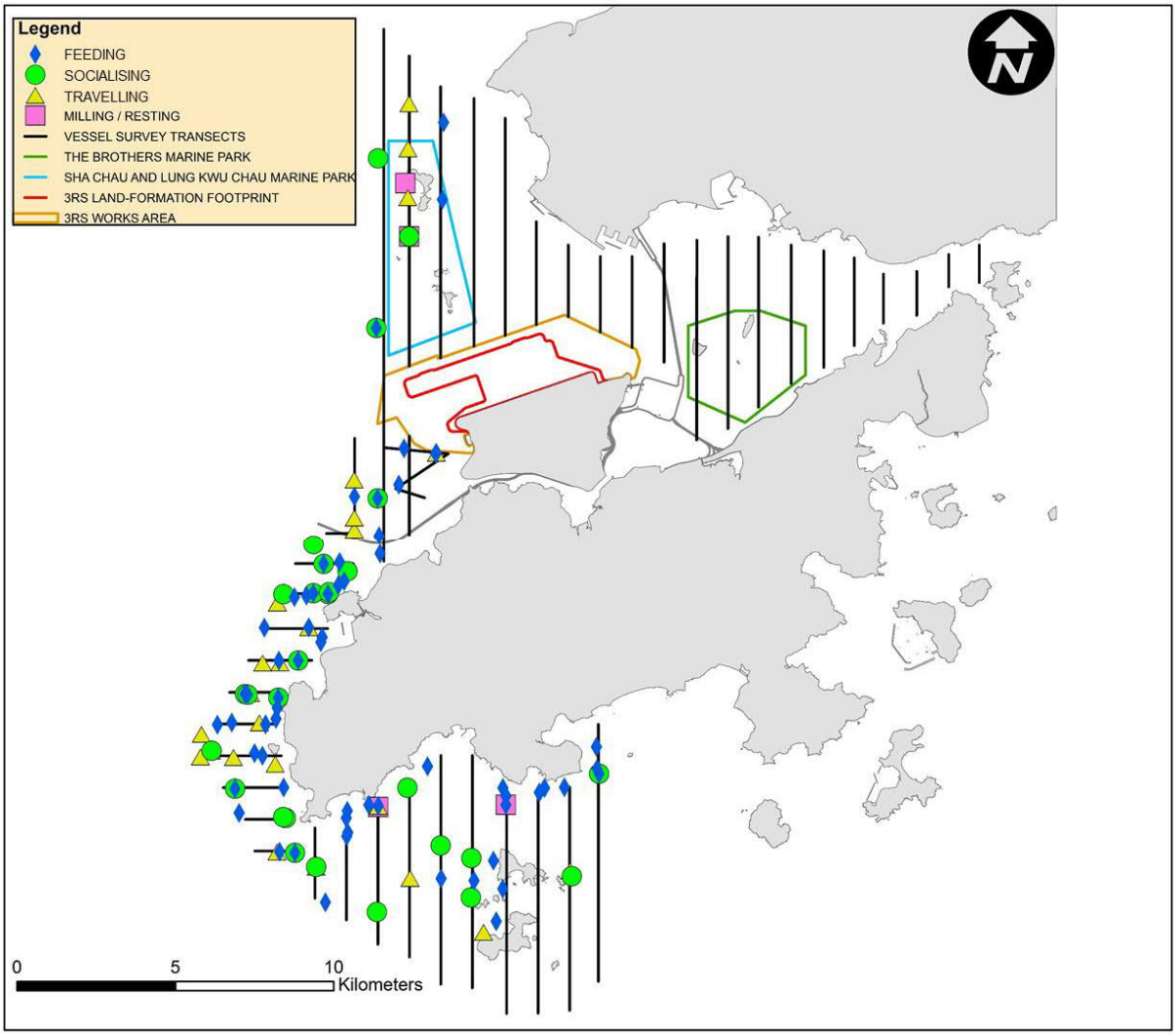


Figure 10: Sighting Locations of CWD Groups in Association with Fishing Boat

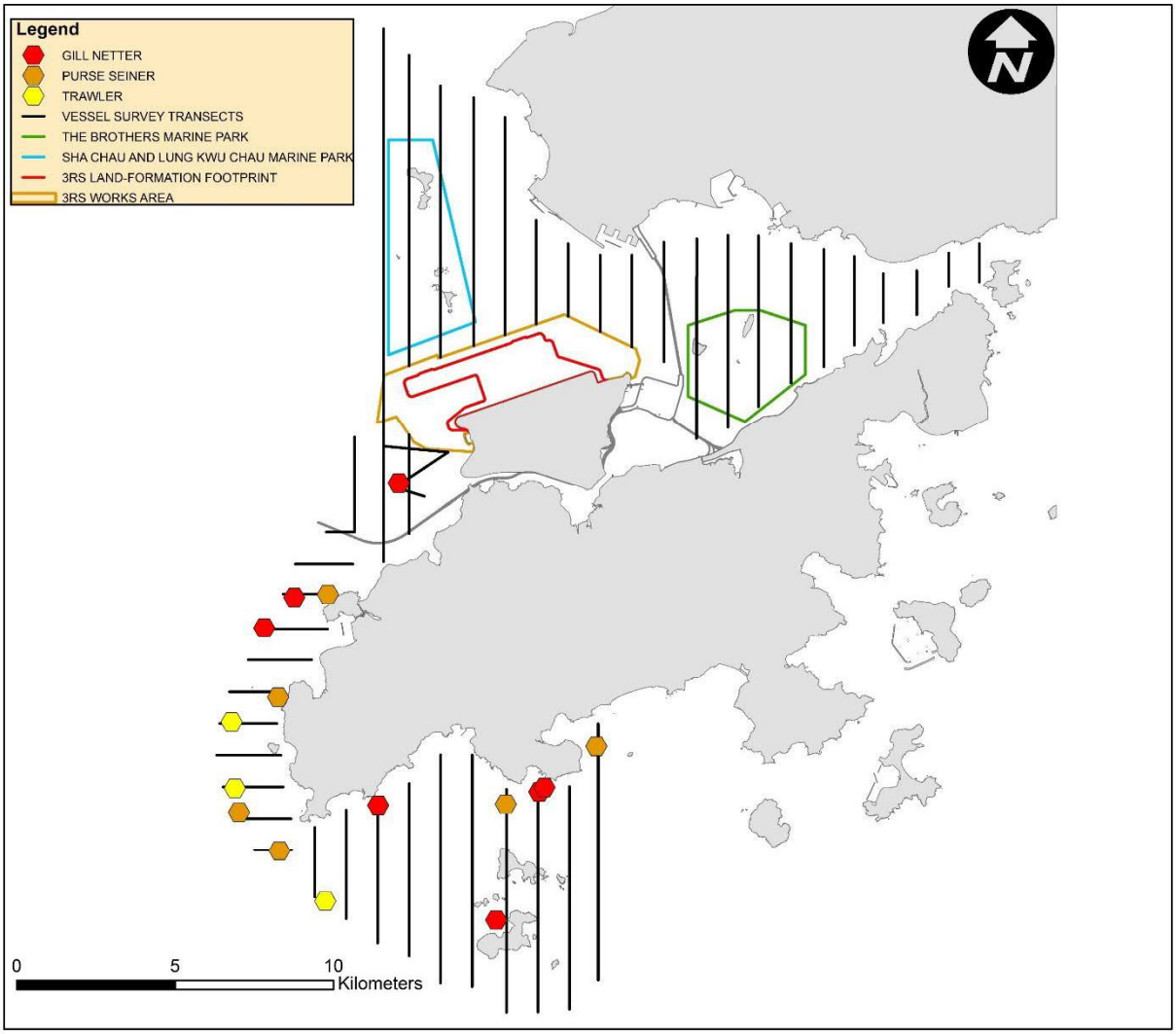


Figure 11: Sighting Locations of Mother-Calf Pairs

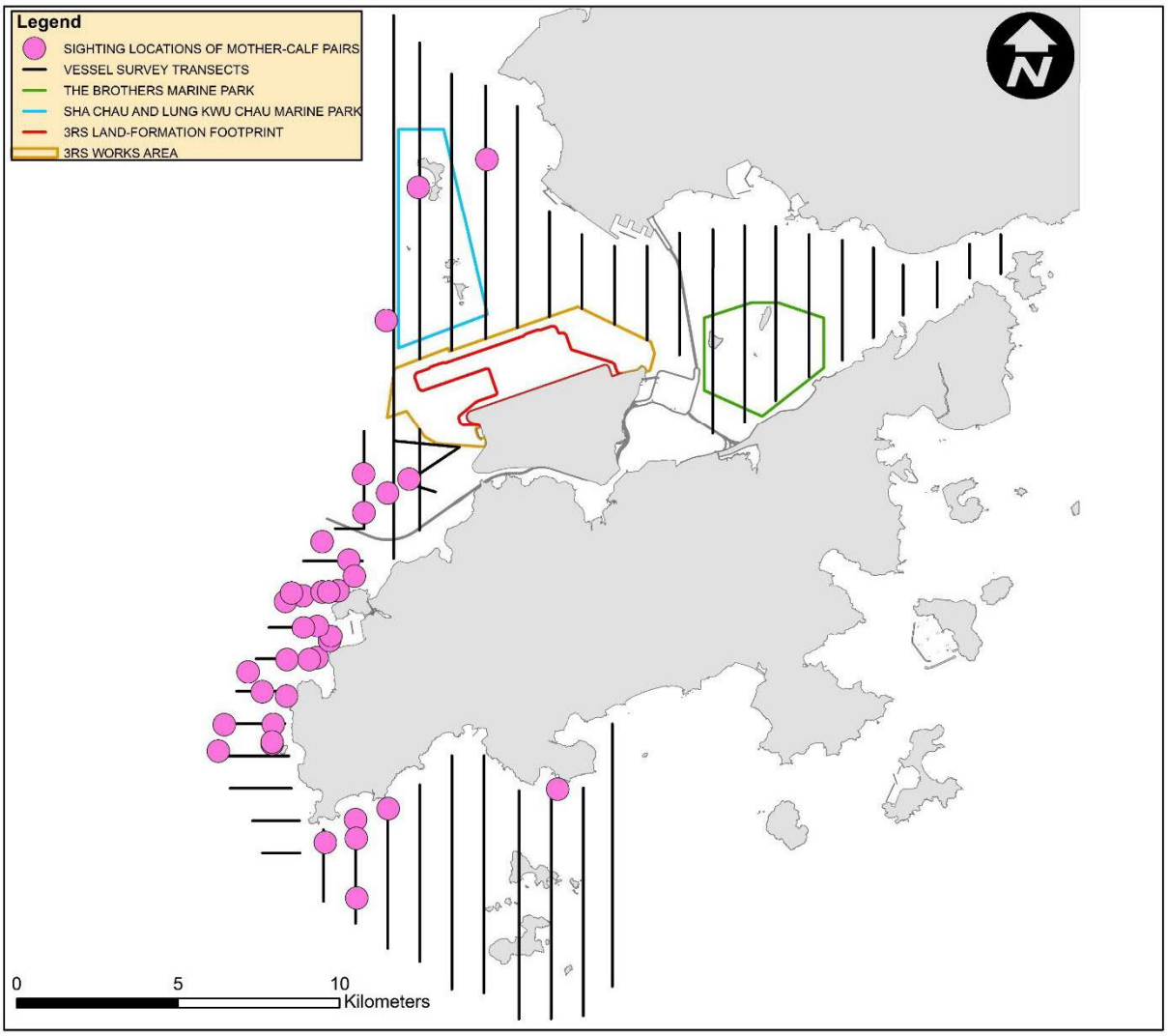
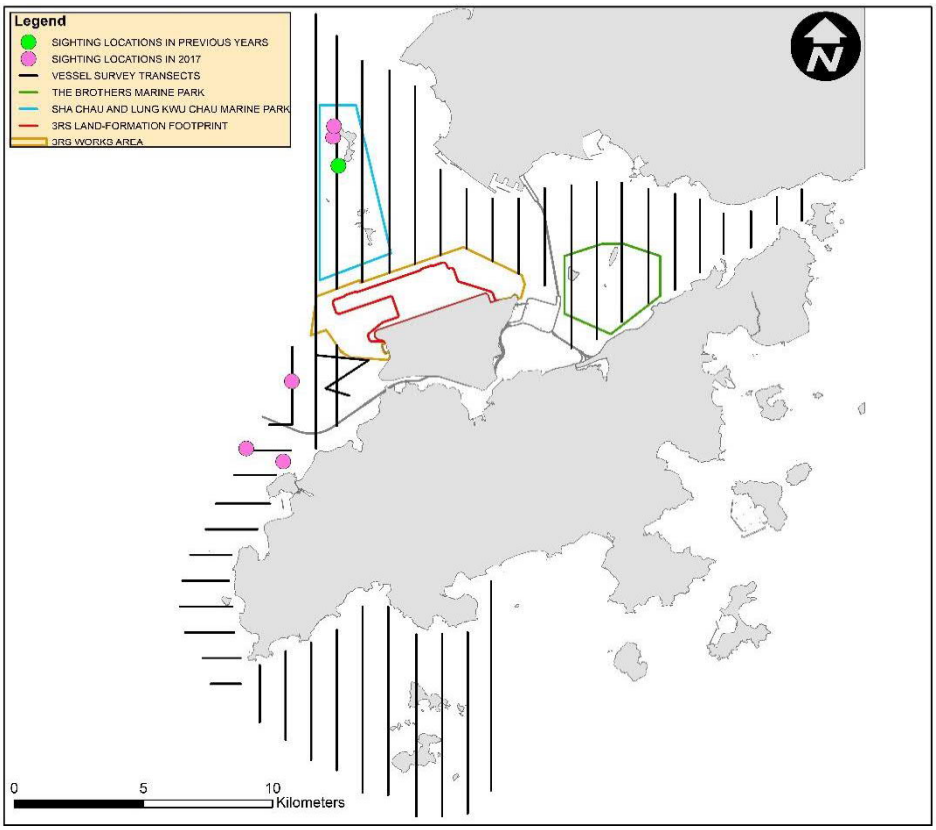


Figure 12 (batch): Photo Identification – Re-sighting Locations

NLMM016



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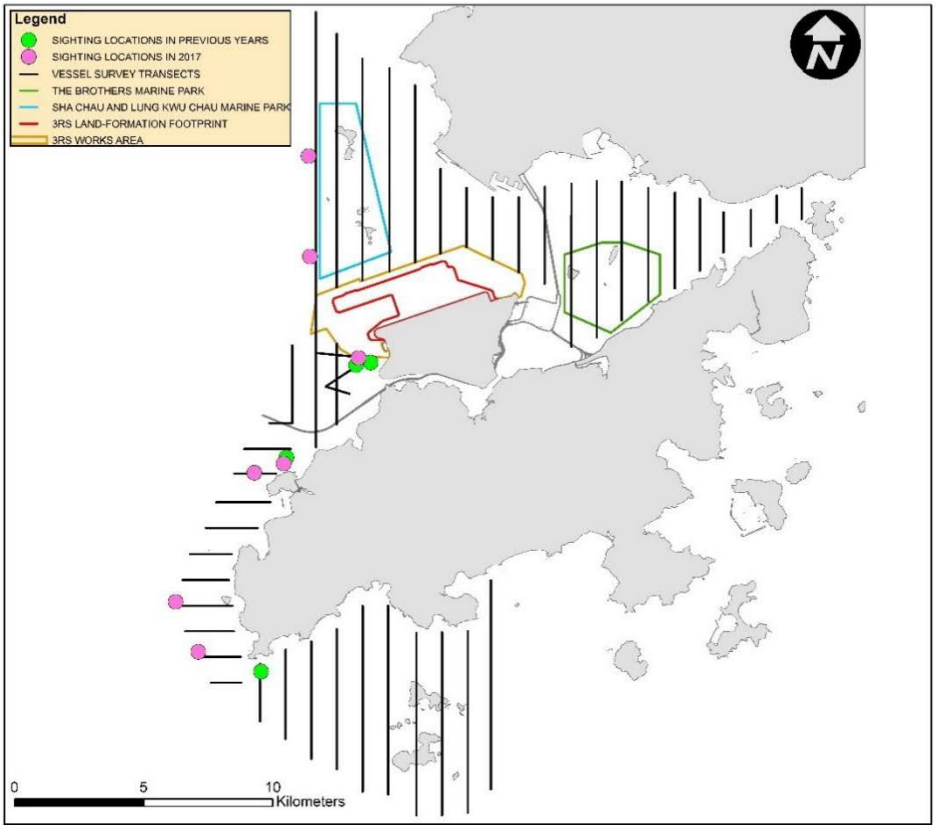

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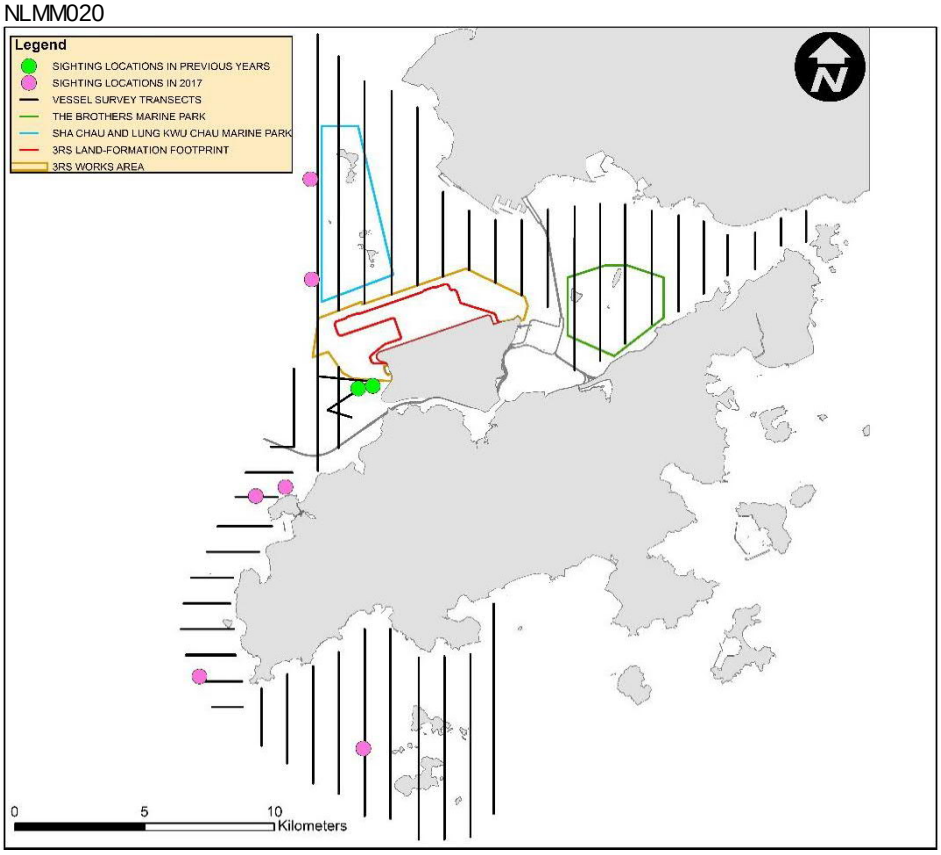

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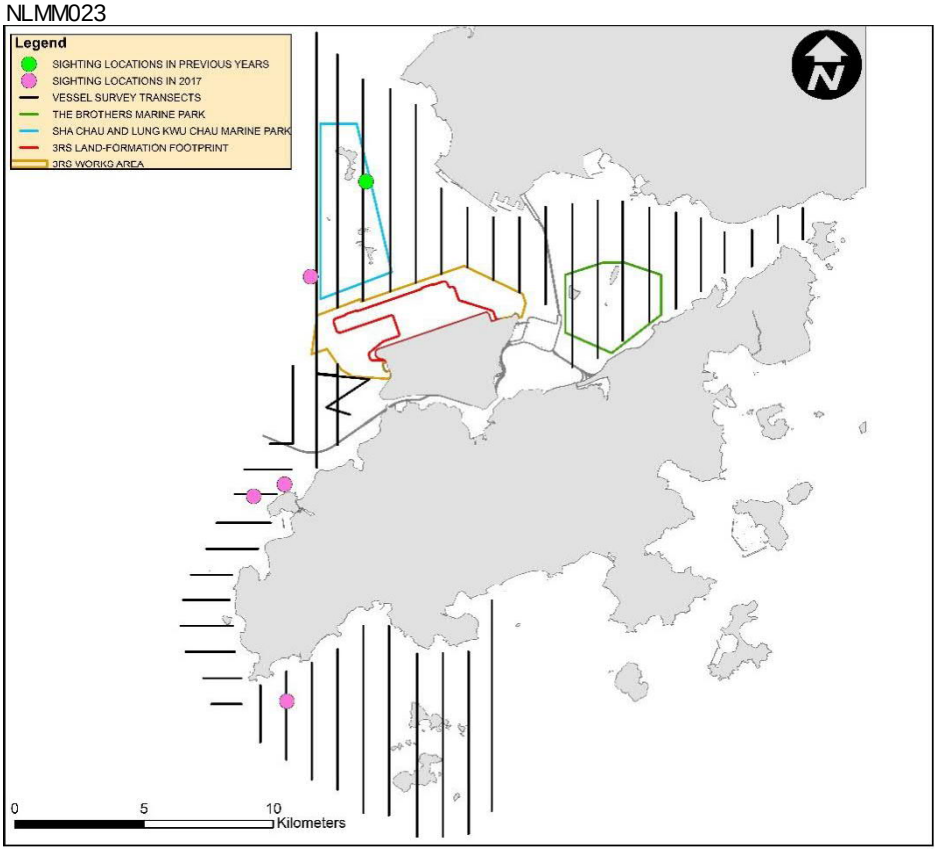

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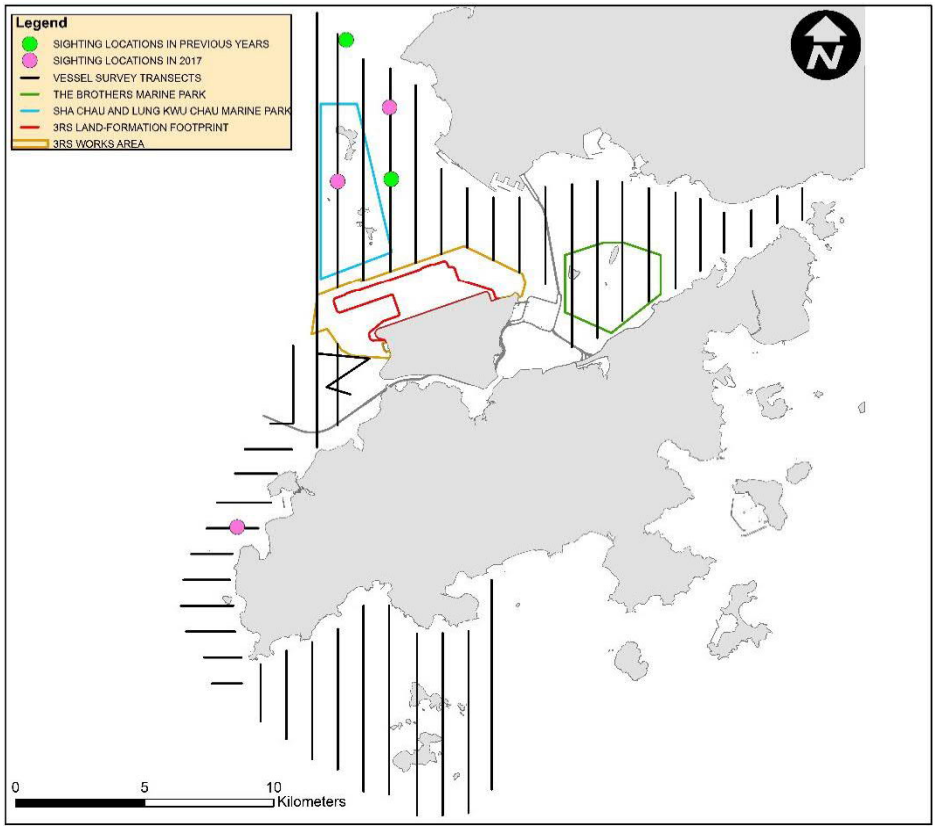

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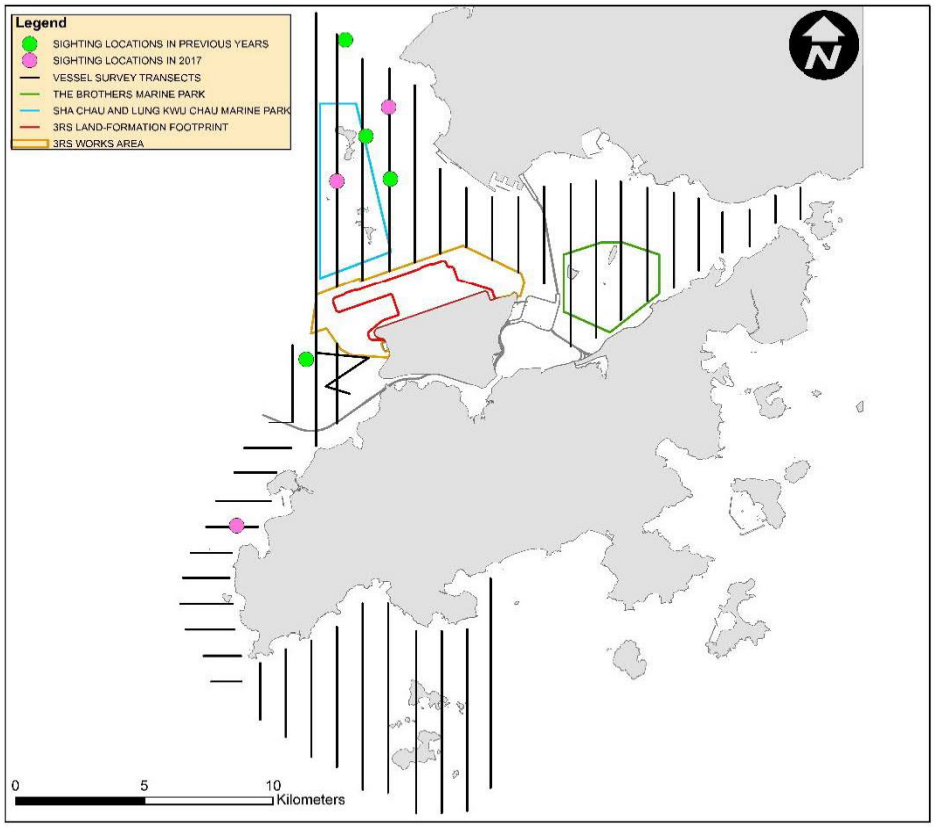

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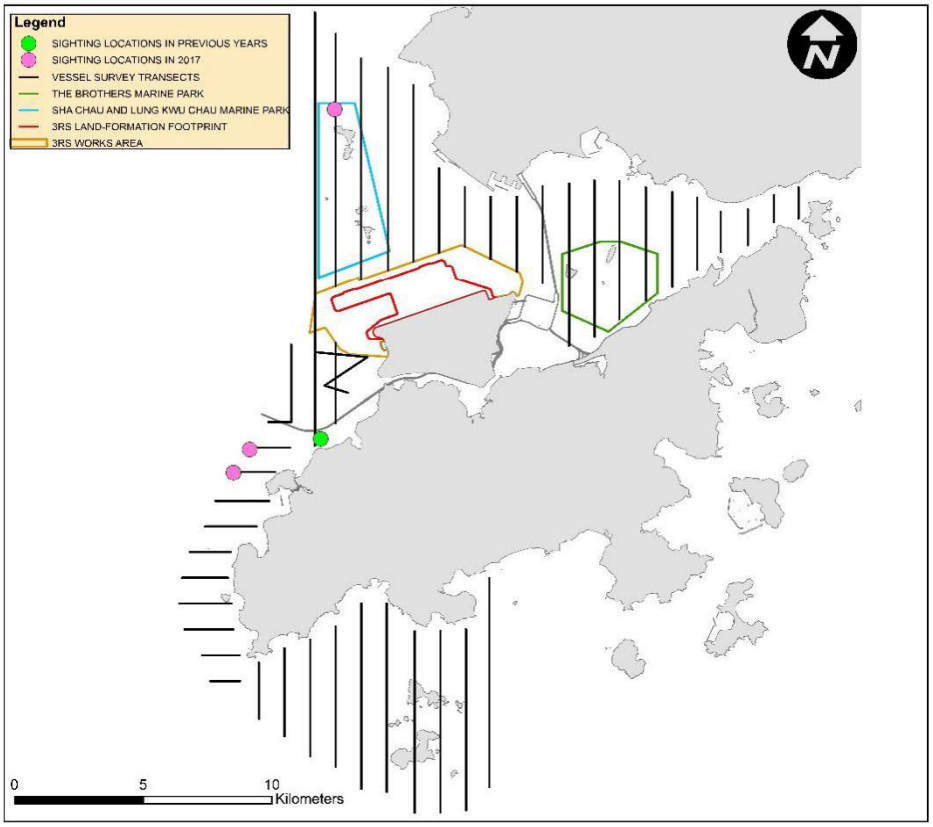

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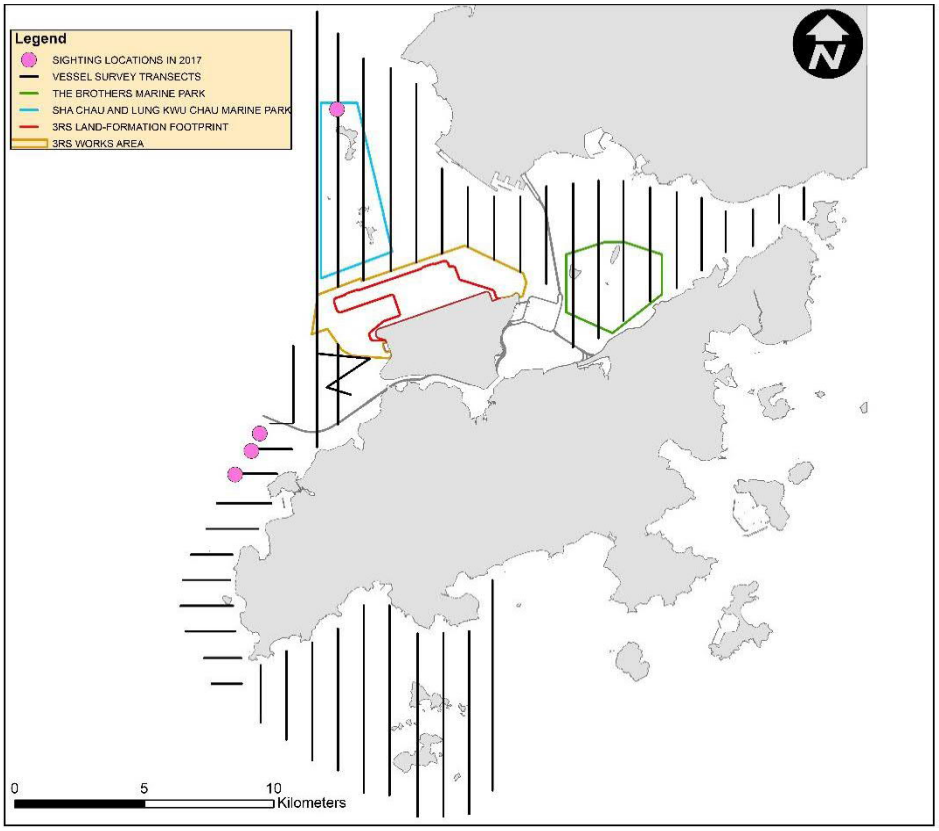

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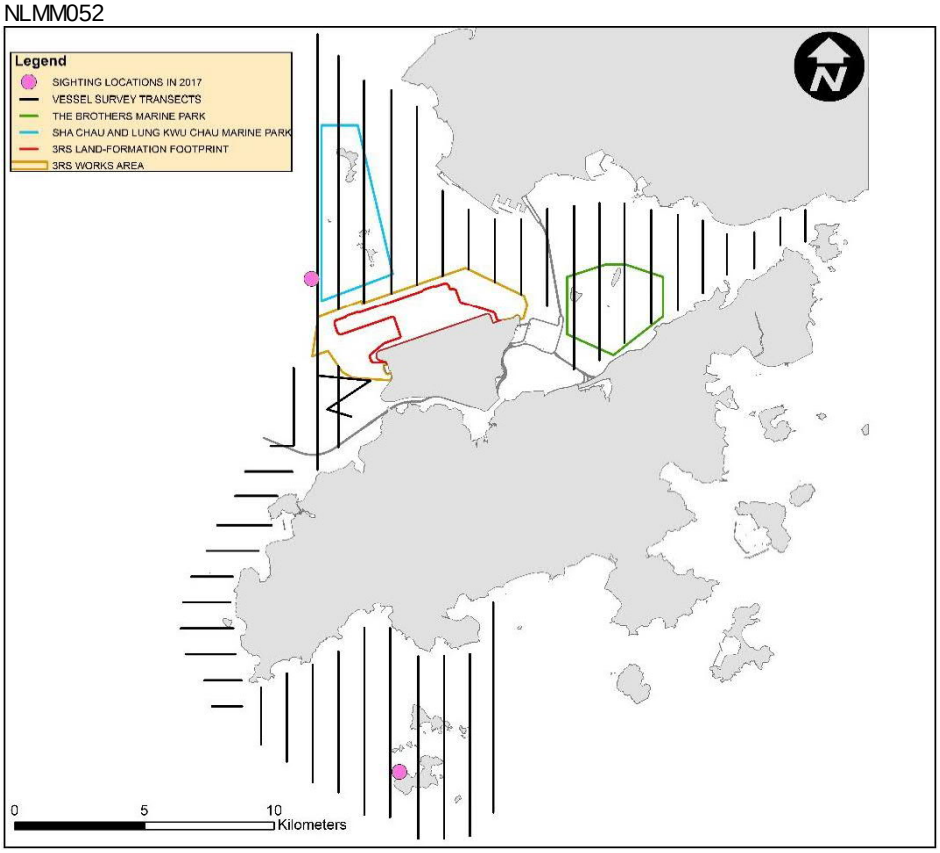

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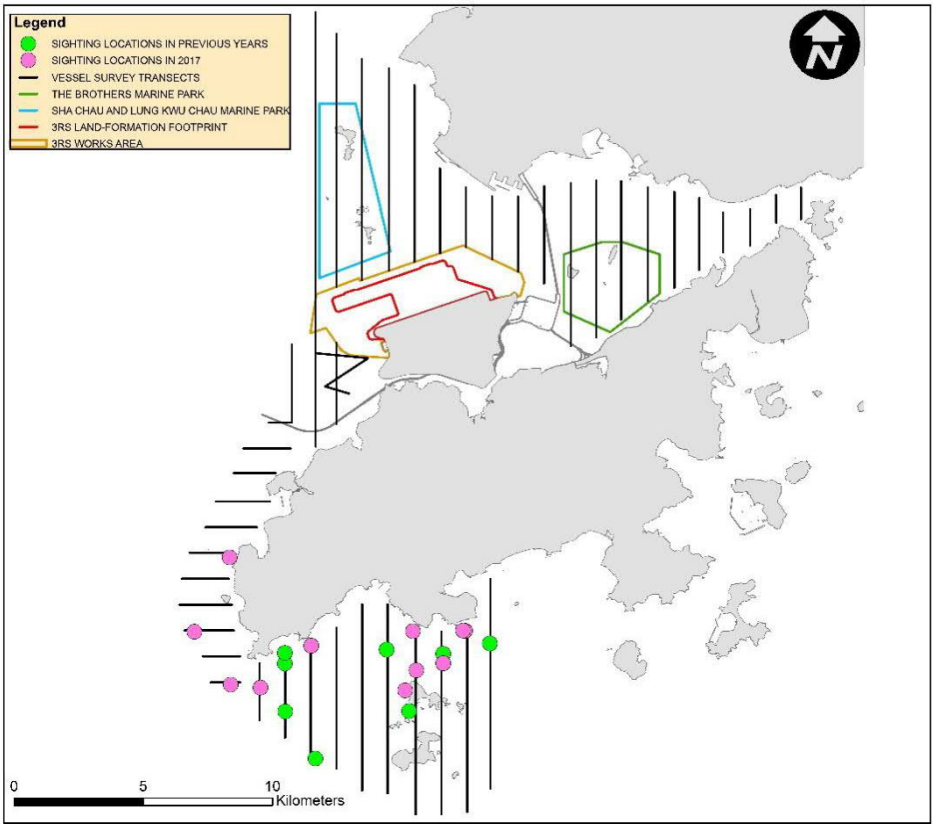

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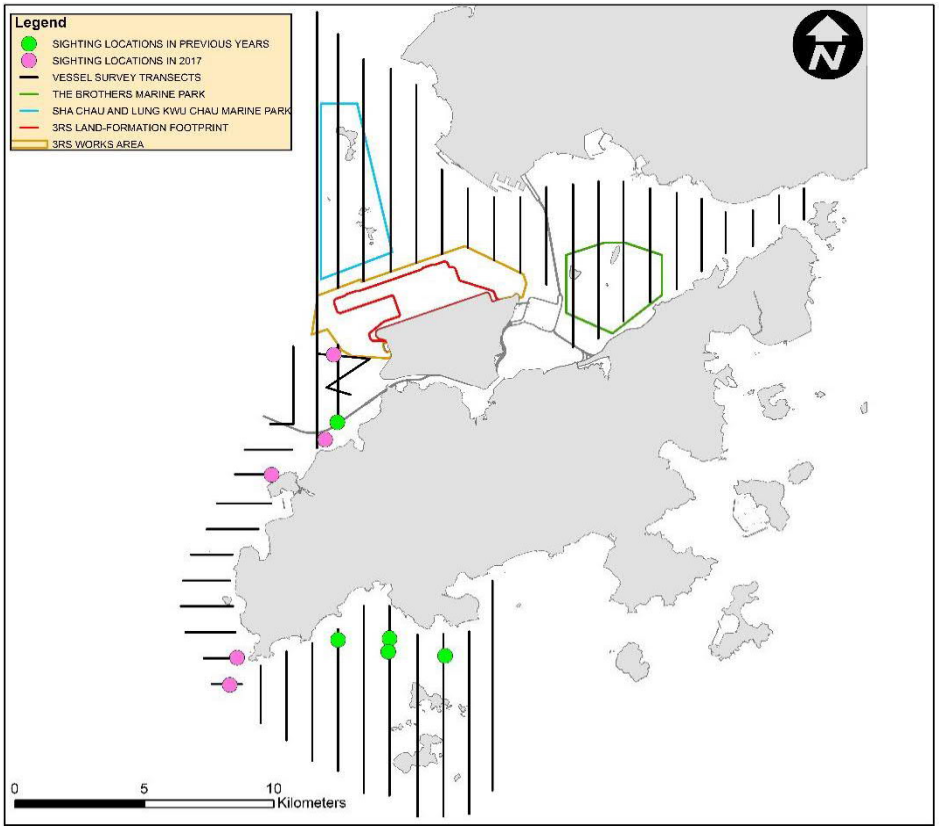

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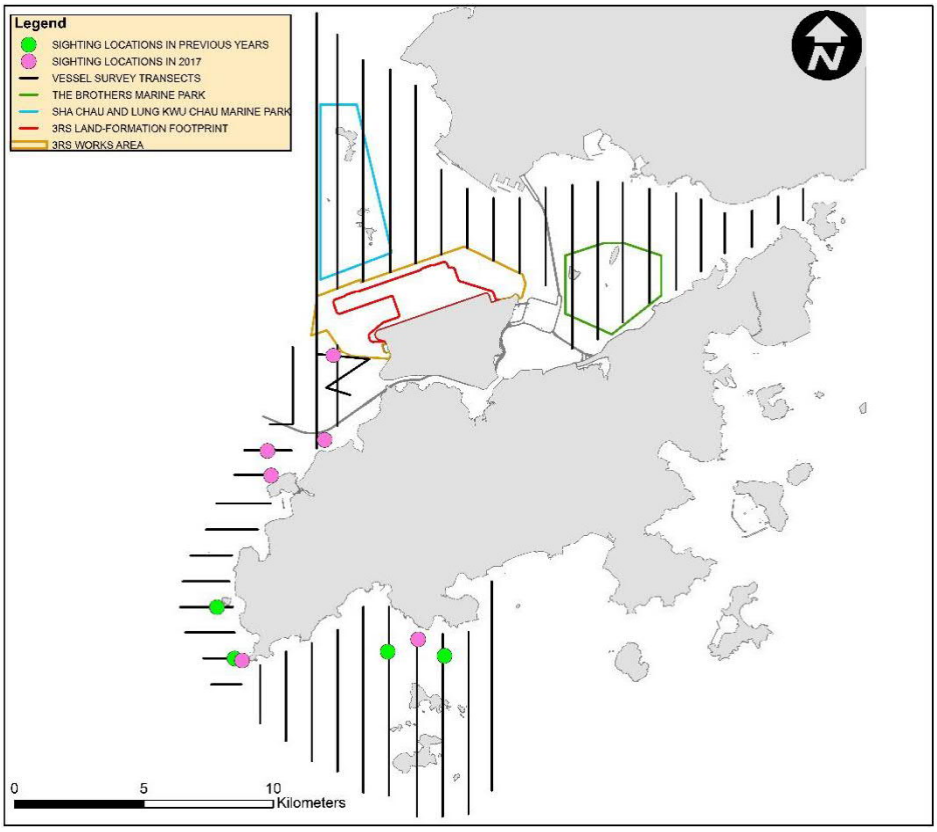

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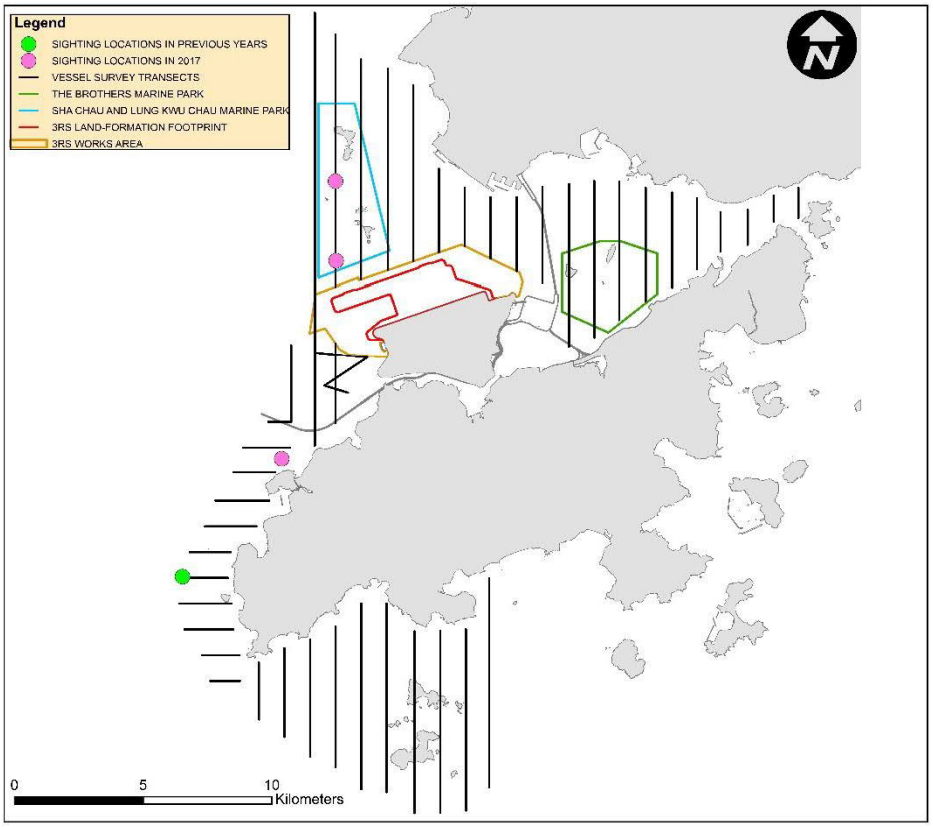

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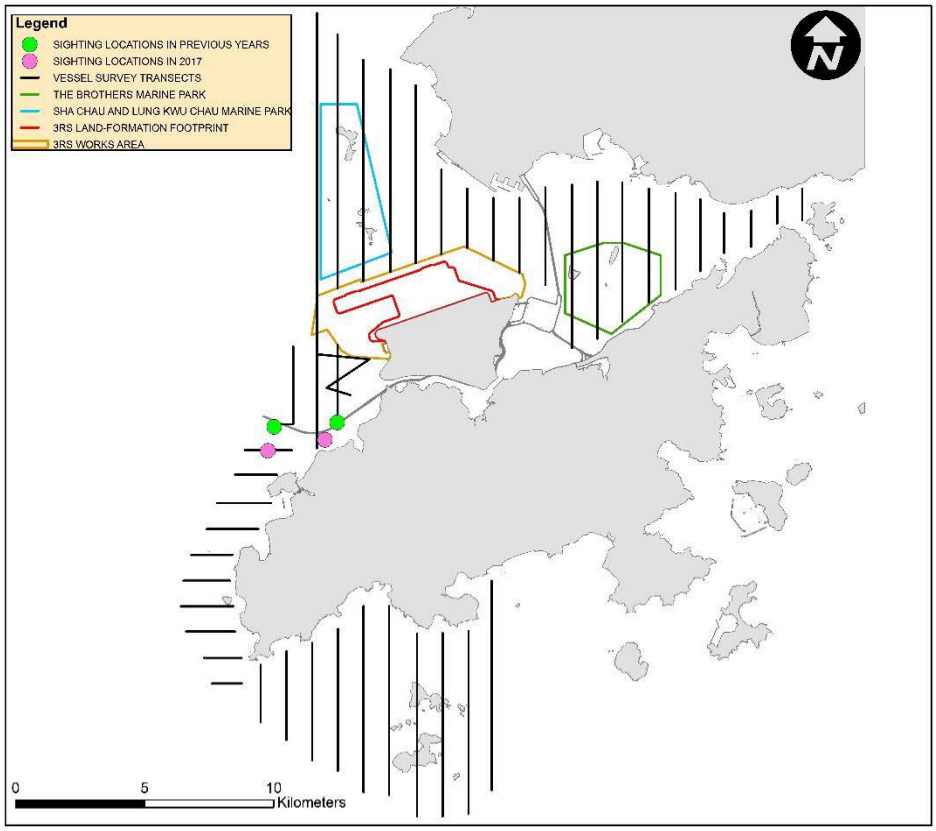

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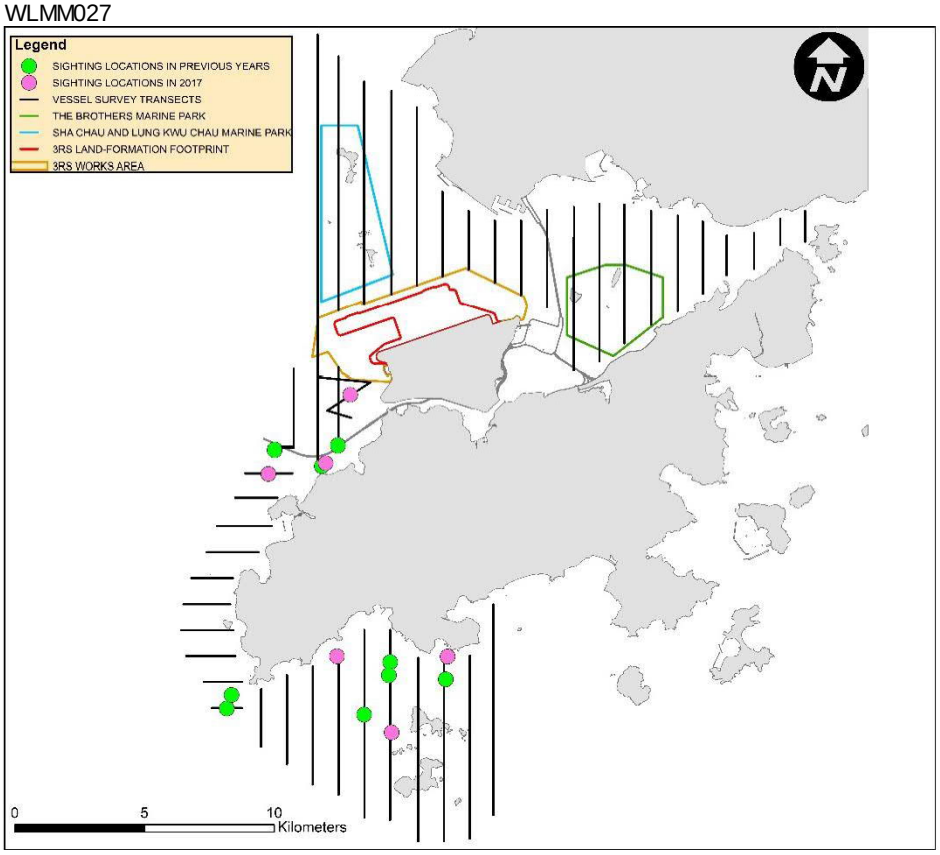

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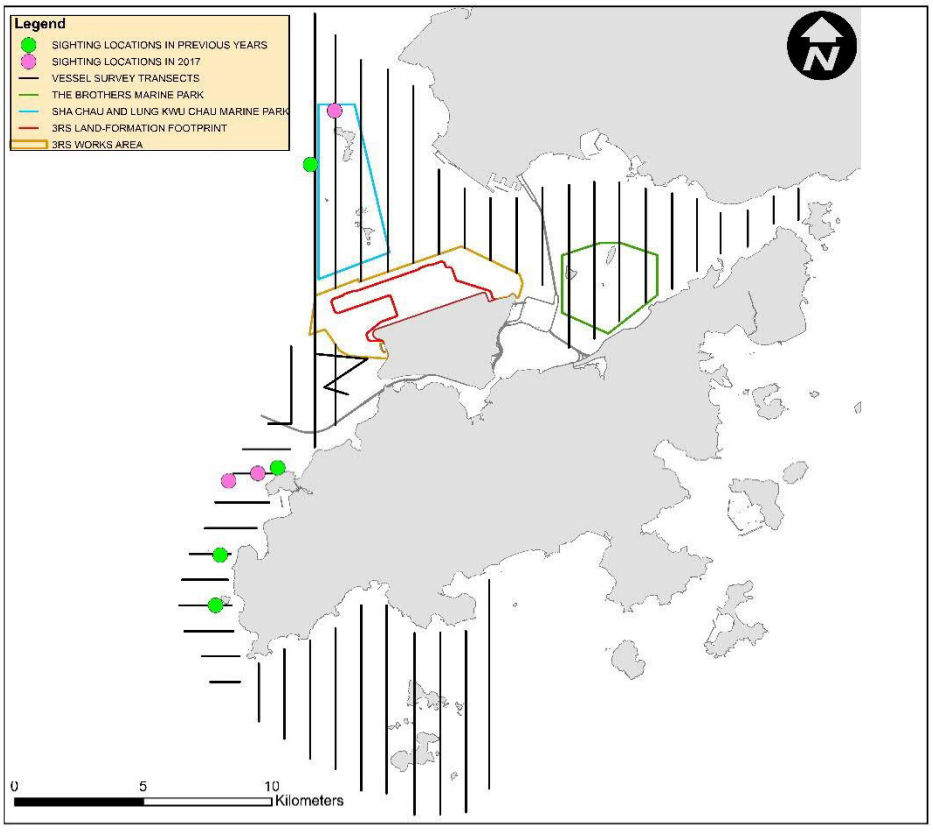

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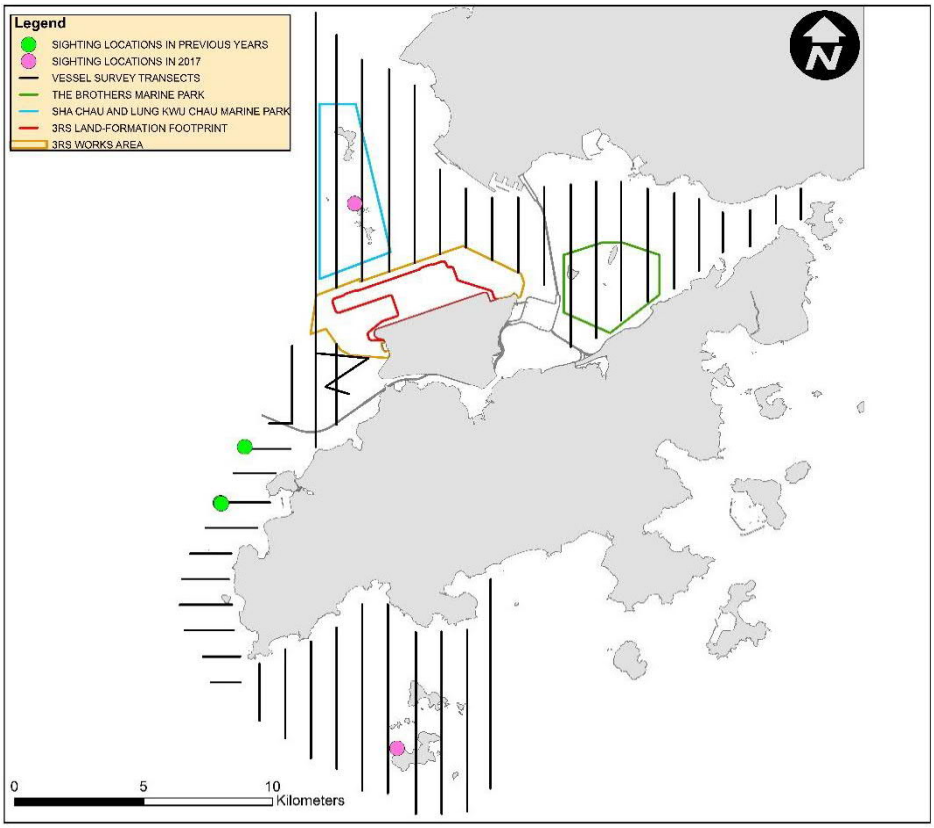

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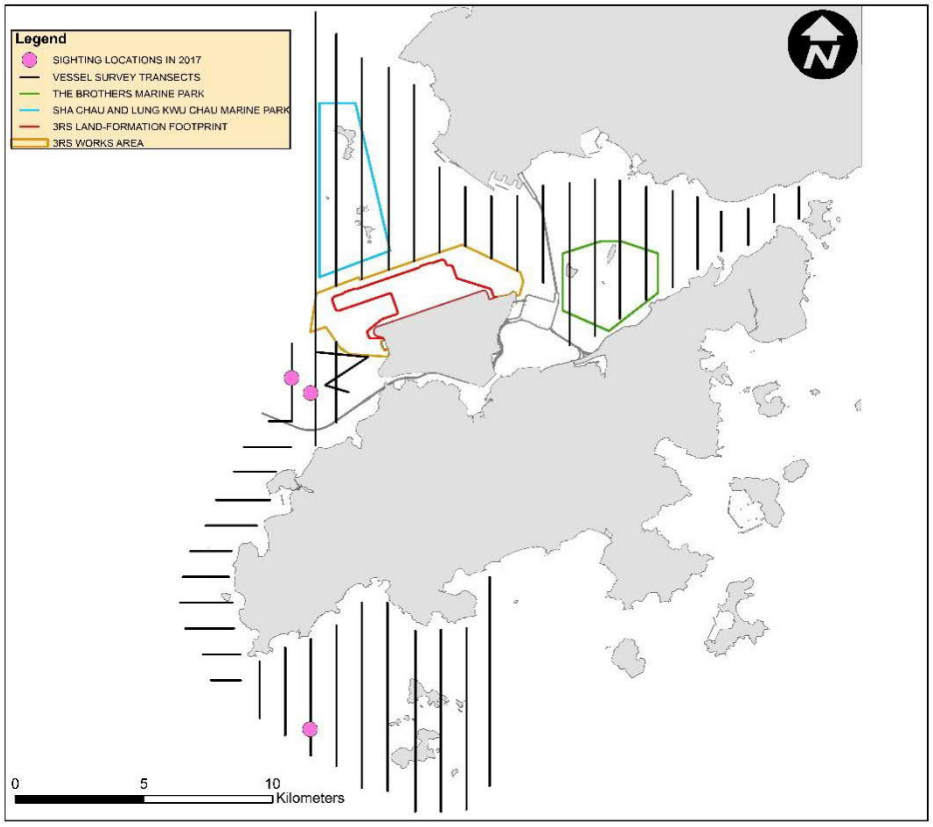

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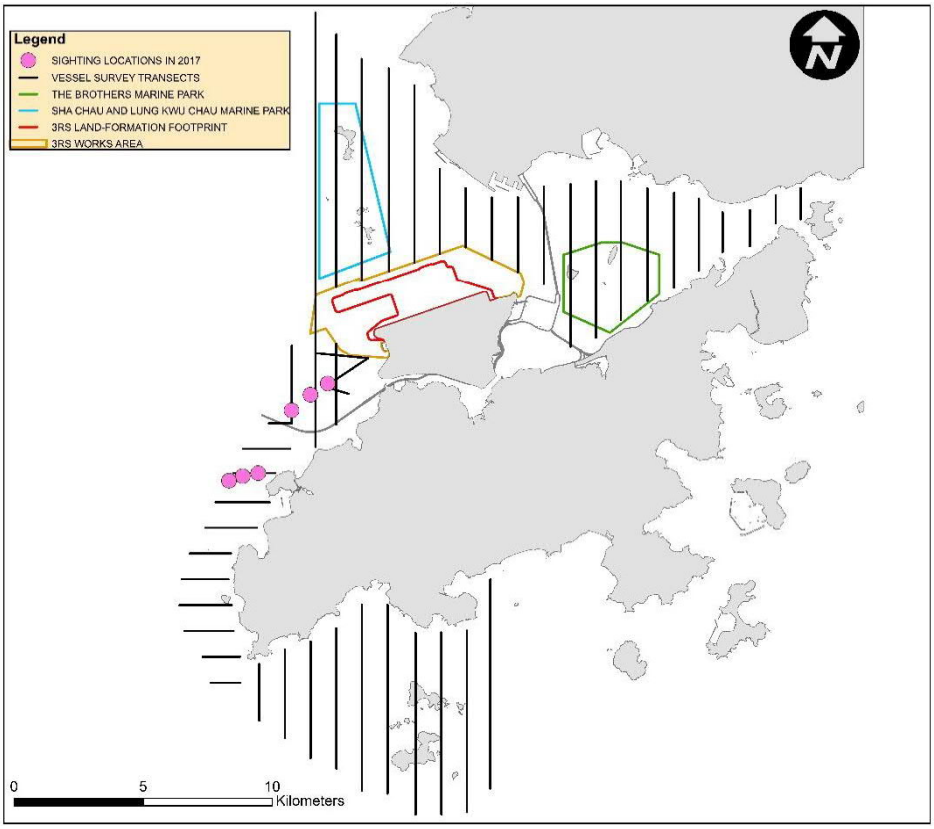

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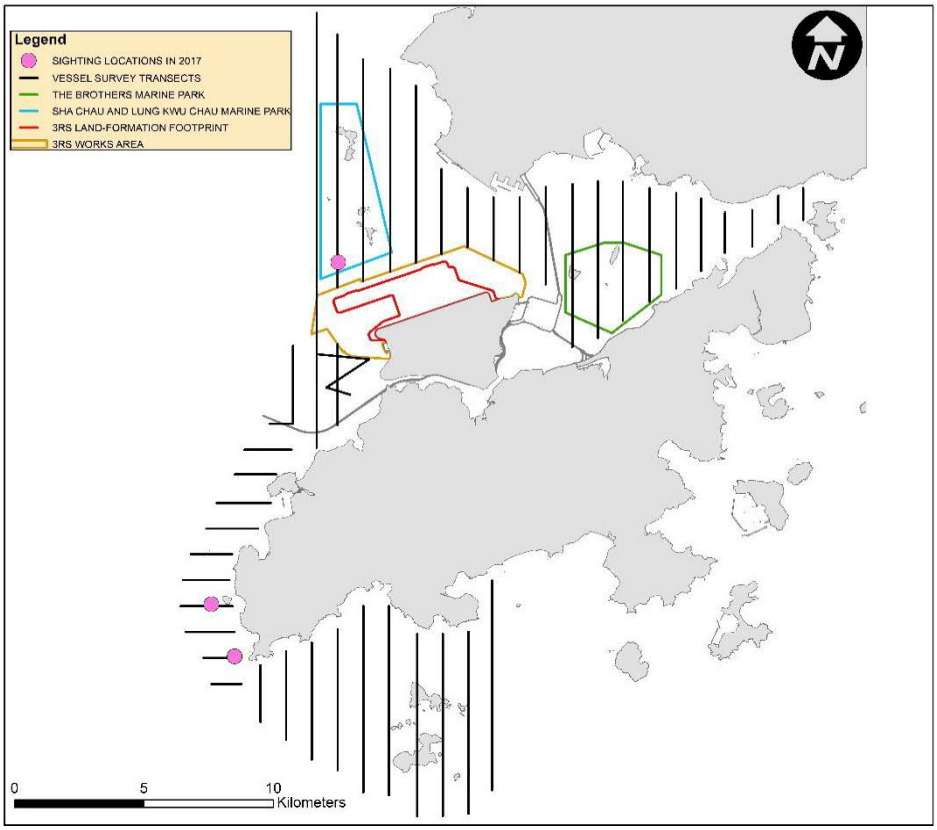


Figure 13: Plots of First Sightings of All CWD Groups (prior to filtering out short-track data) Obtained from Land-based Station at Lung Kwu Chau

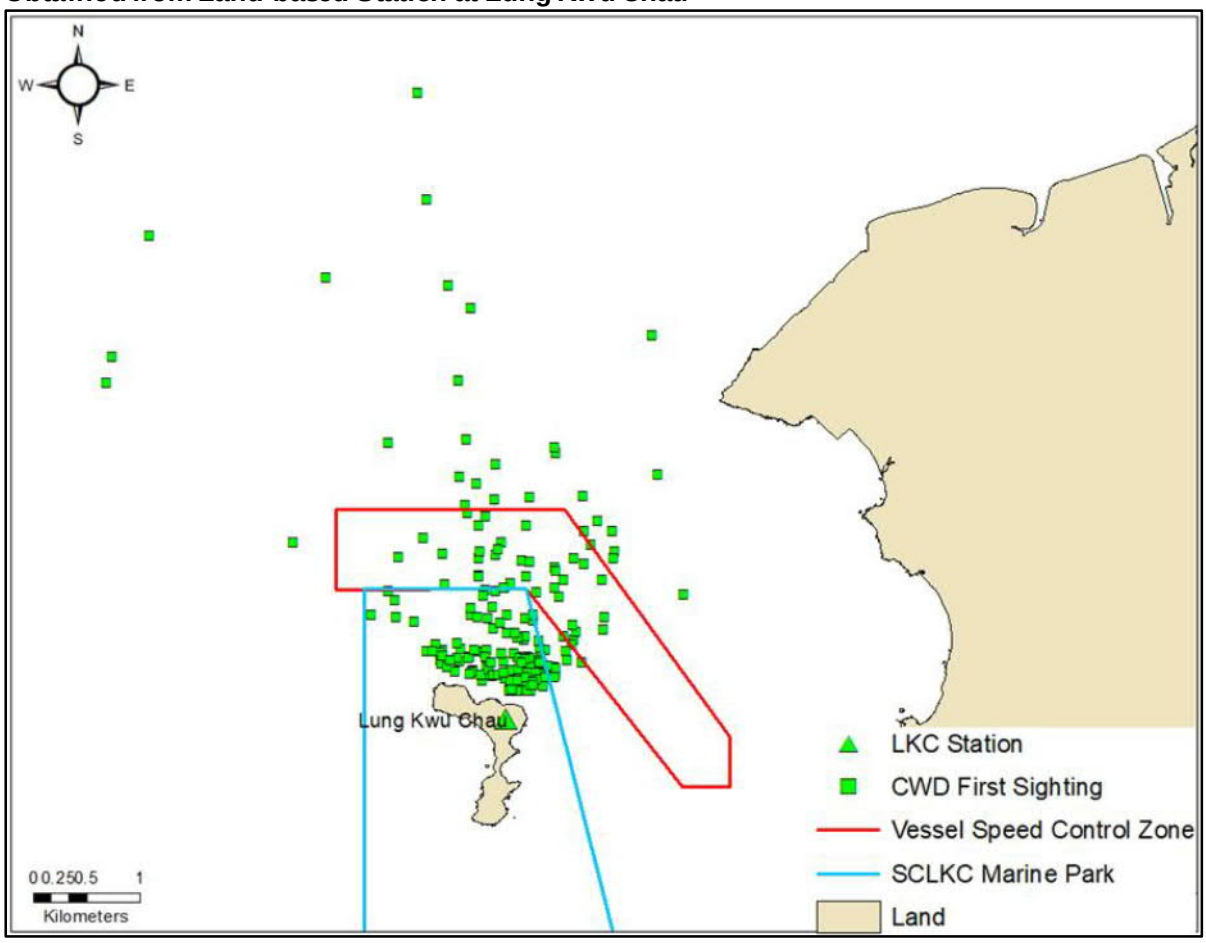


Figure 14: Plots of First Sightings of All CWD Groups (prior to filtering out short-track data) Obtained from Land-based Station at Sha Chau

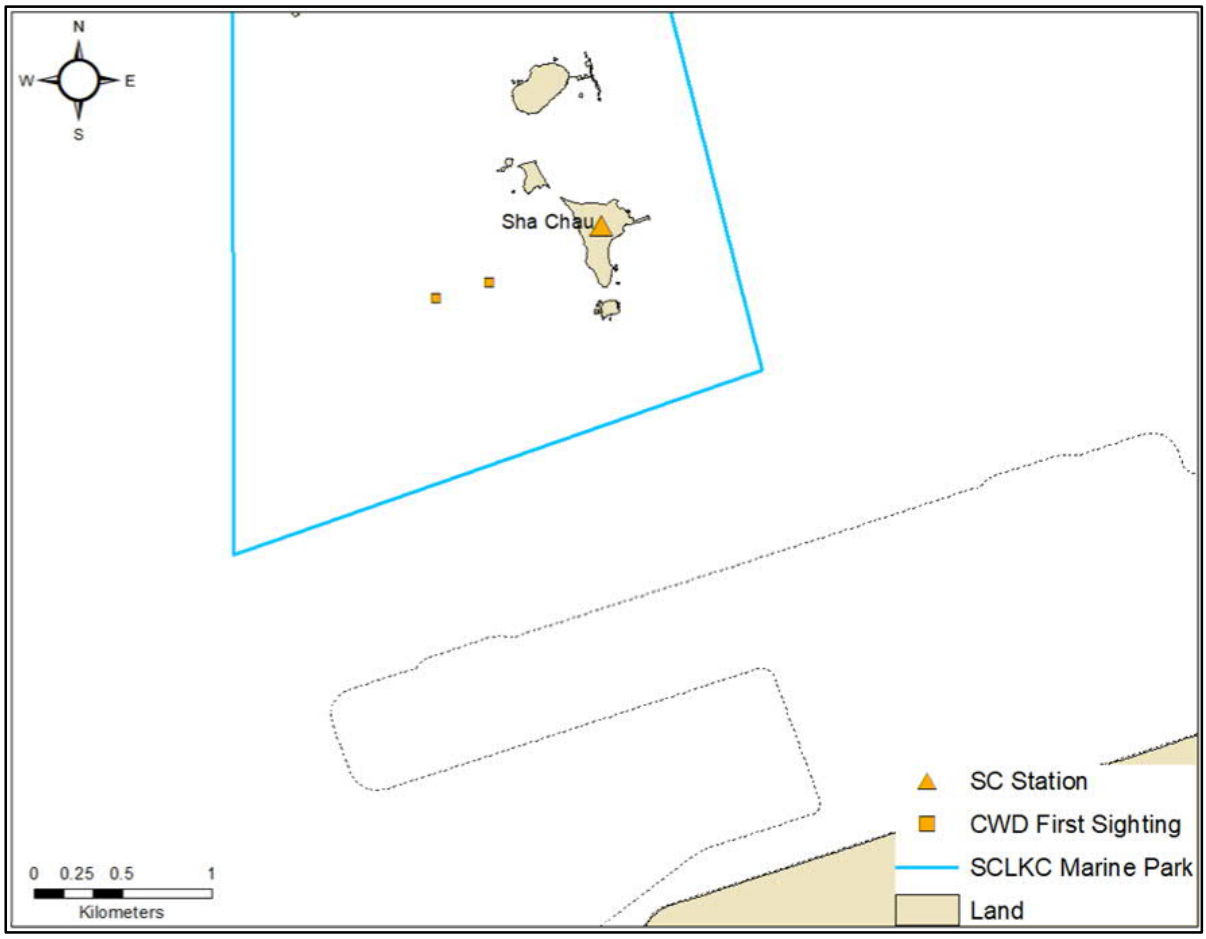


Figure 15: Total Duration of CWD Groups Tracked (per total effort time) from Lung Kwu Chau (prior to filtering short-track data) Based on Time of Day

[Time indicates the hour block during which CWD groups were tracked. The "n" in parentheses represents the number of days that survey effort was carried out during the associated hour block.]

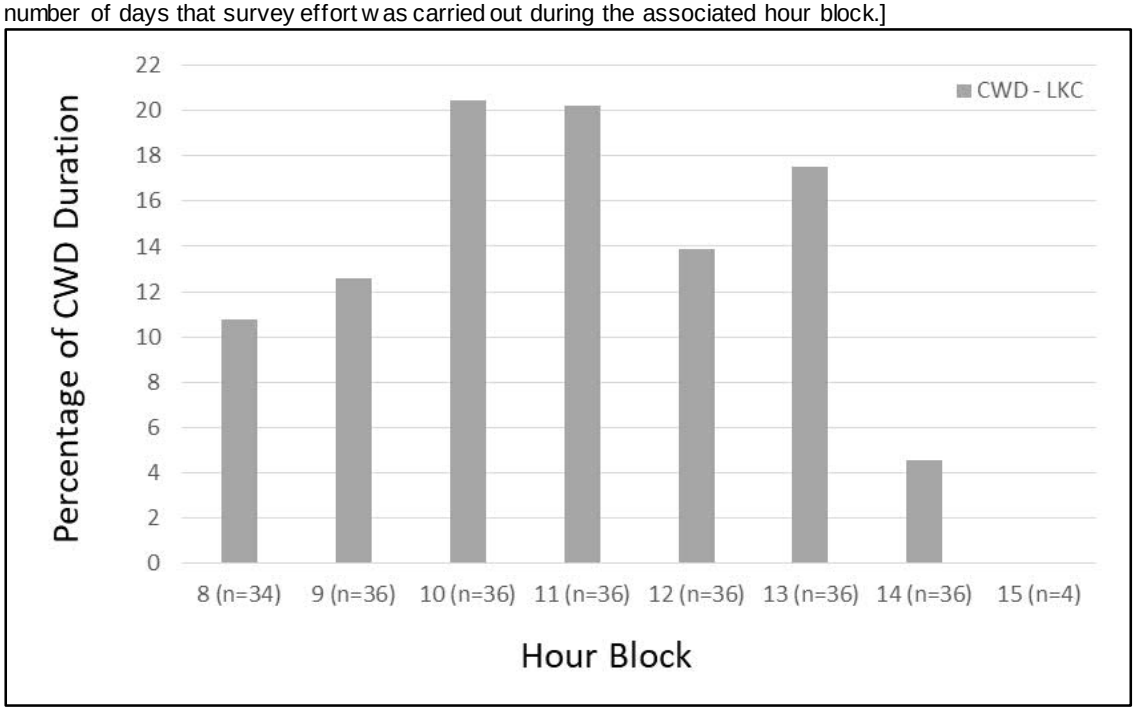


Figure 16: CWD Groups Sighted and Tracked from Lung Kwu Chau and Sha Chau Based on Month of the Year

[The numbers above the bars indicate the total number of CWD groups tracked per study period (prior to filtering data)]

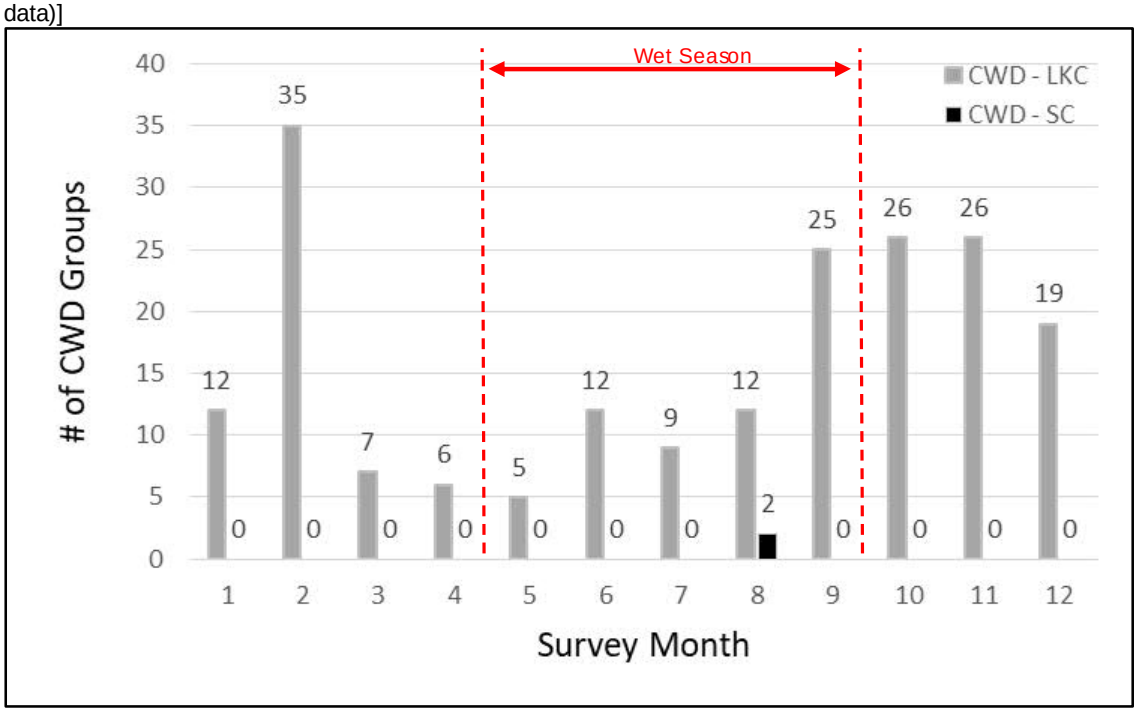


Figure 17: Plots of CWD Short-track Positions (Standardized Segments) relative to Group Size tracked within Sha Chau and Lung Kwu Chau Marine Park

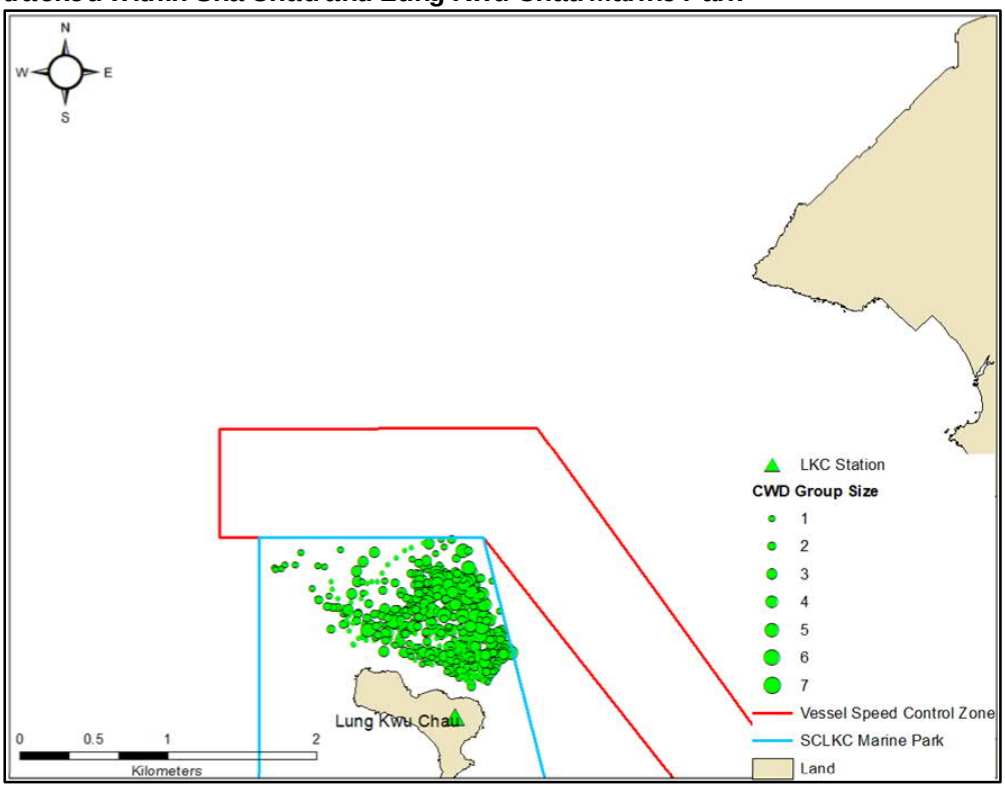


Figure 18: Plots of CWD Short-track Positions (Standardized Segments) relative to Group Size crossing the boundary of Sha Chau and Lung Kwu Chau Marine Park

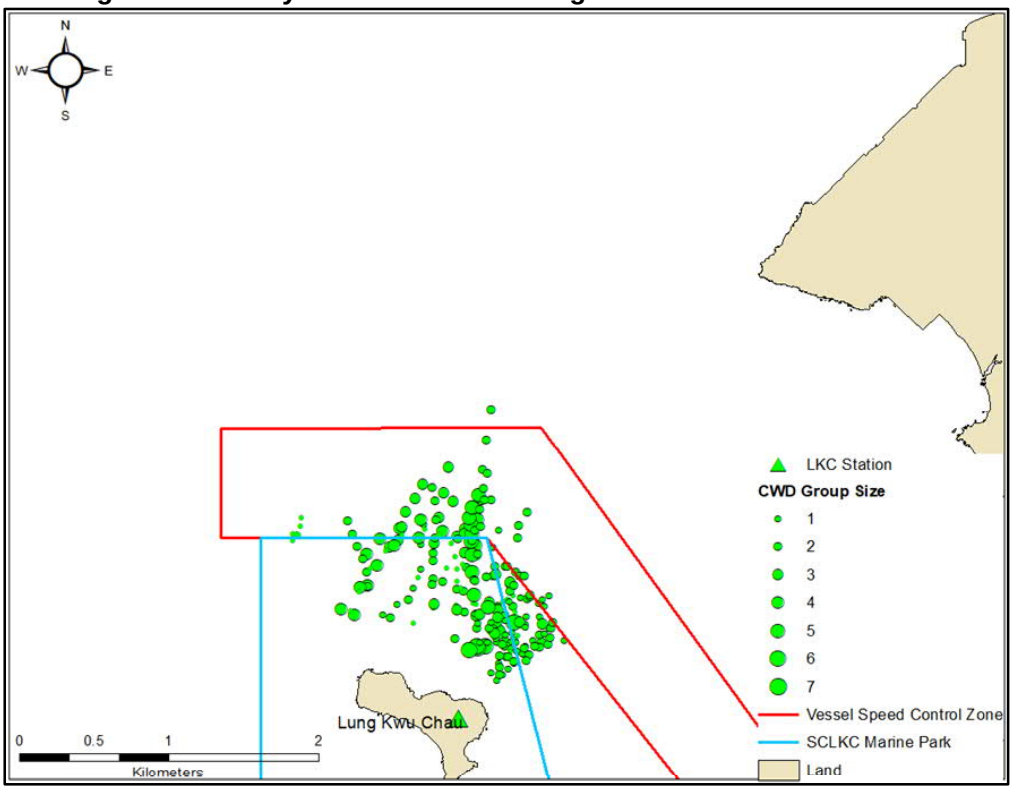


Figure 19: Plots of CWD Short-track Positions (Standardized Segments) relative to Group Size tracked outside Sha Chau and Lung Kwu Chau Marine Park

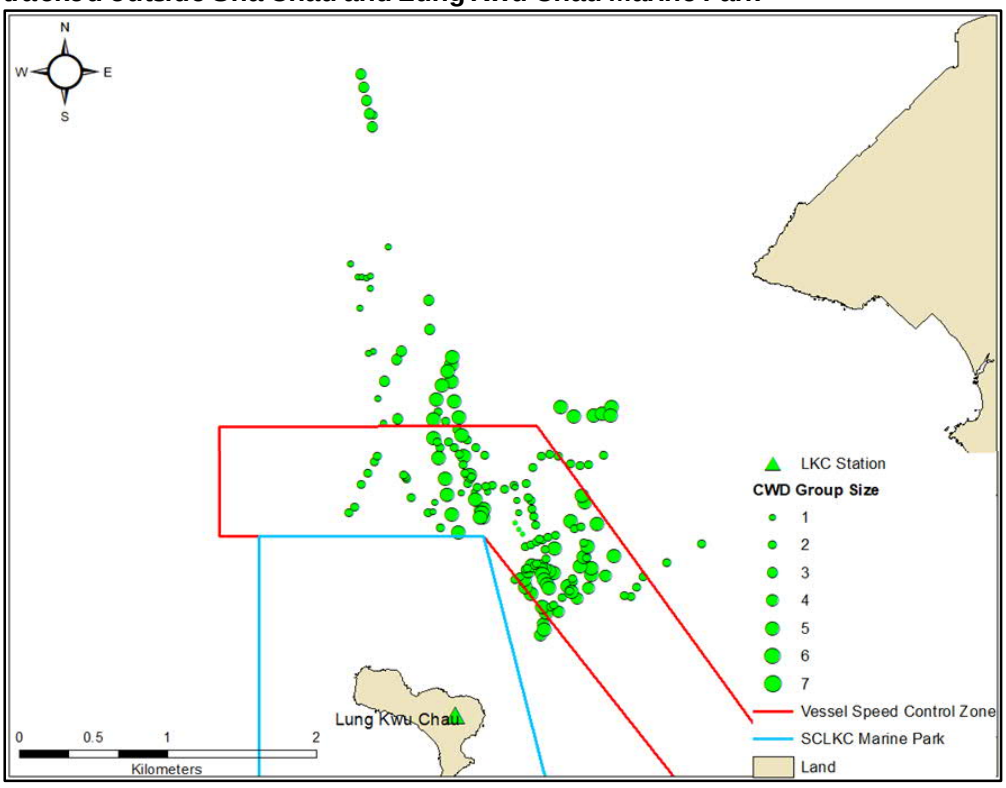


Figure 20: Percentages of CWD Behavioural States, excluding Unknown Category, recorded from Lung Kwu Chau

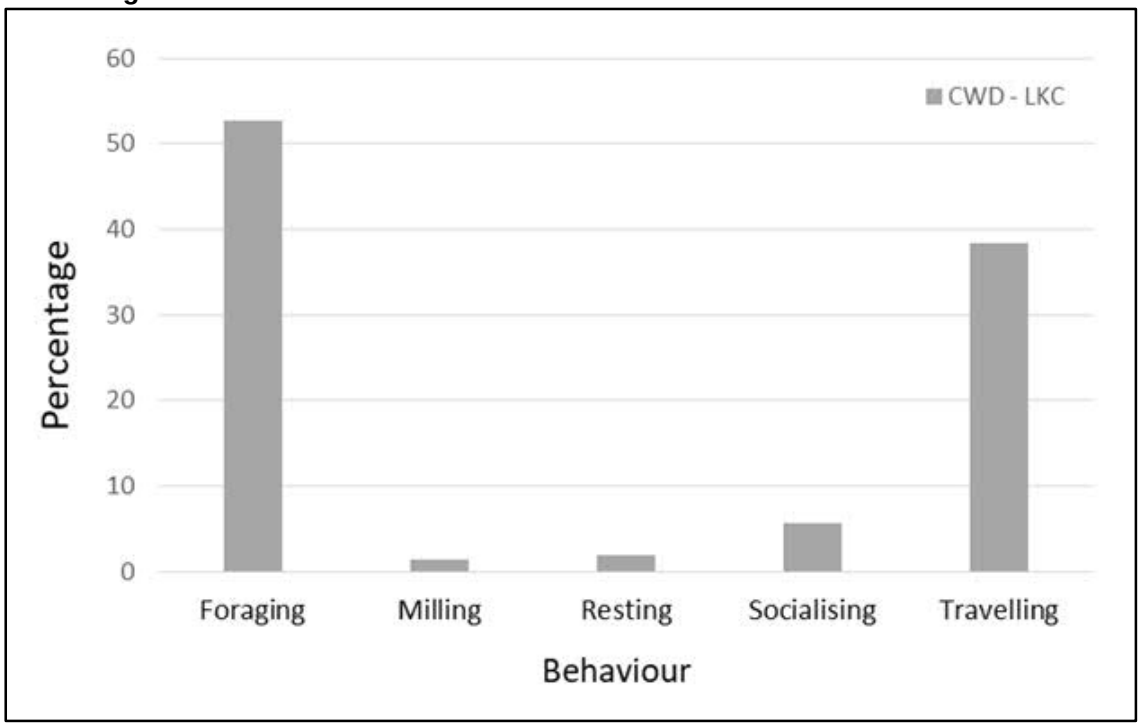


Figure 21: Plots of All Vessel Positions and All CWD Positions (prior to filtering out short-track data) obtained from Lung Kwu Chau in 2017

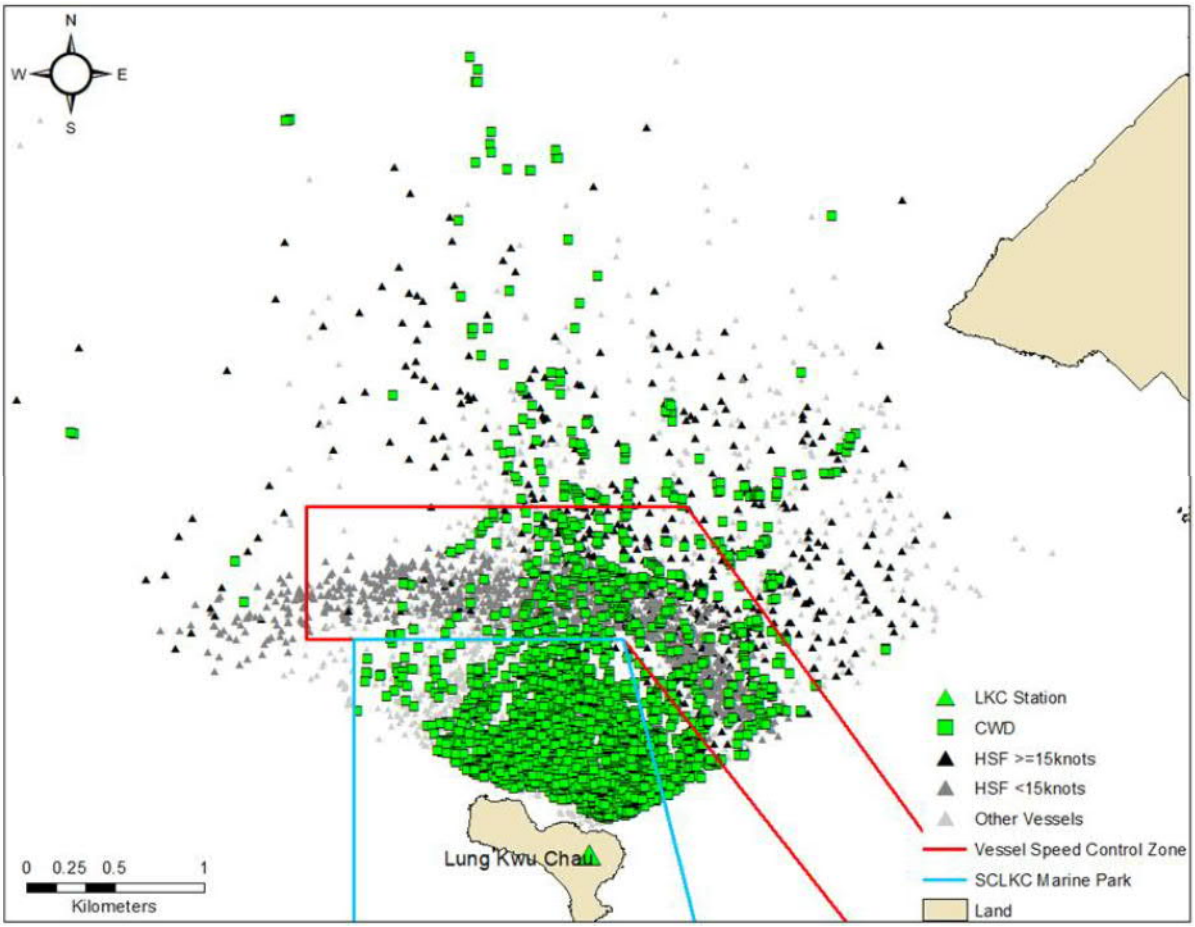


Figure 22: Plots of All Vessel Positions and All CWD Positions (prior to filtering out short-track data) obtained from Sha Chau in 2017

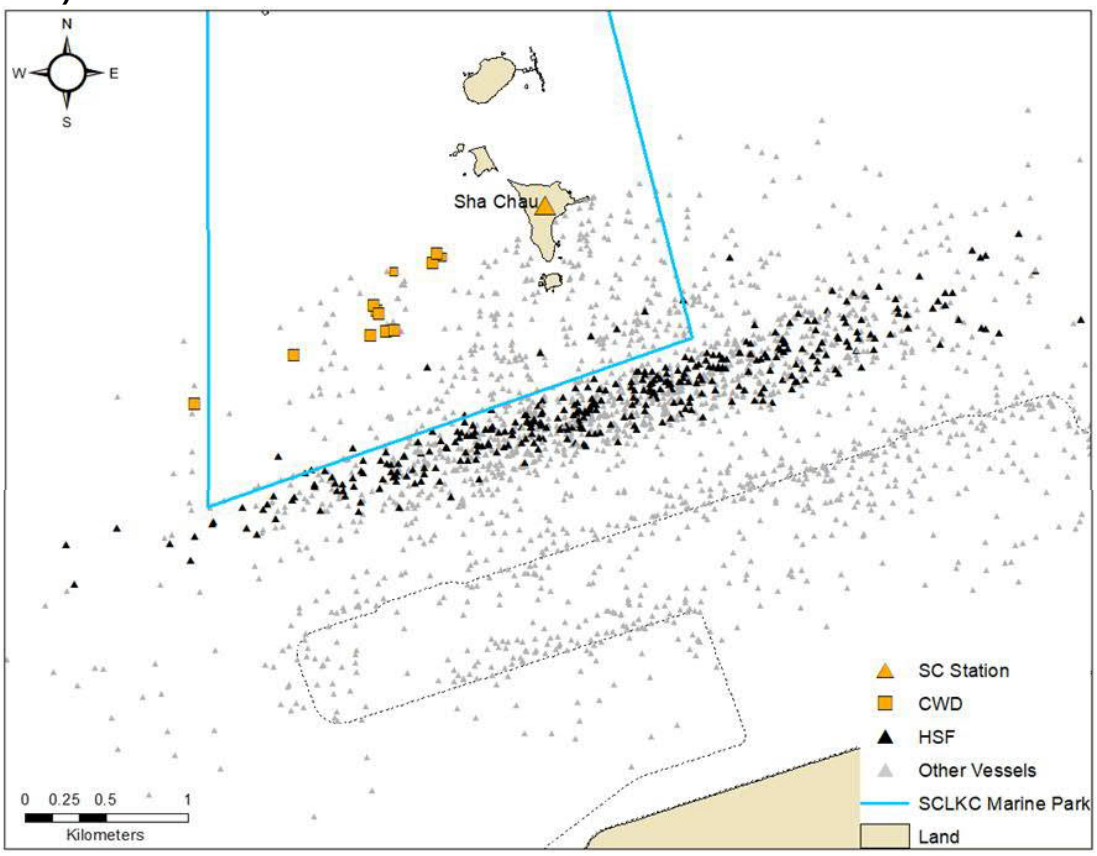
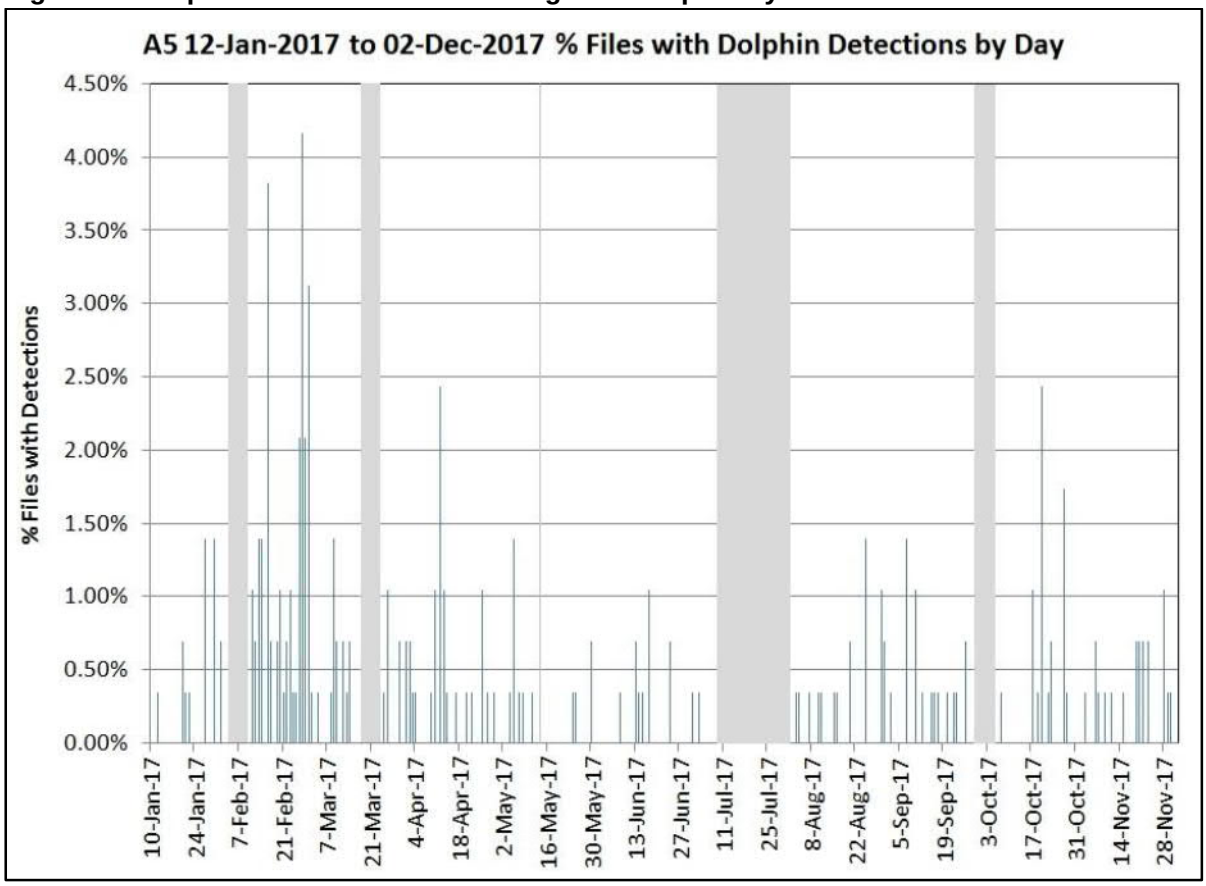


Figure 23: Dolphin Detections as Percentage of Files per day in 2017



[Grey shading indicates no recording]

Figure 24: Dolphin Detections by Hour of Day in 2017

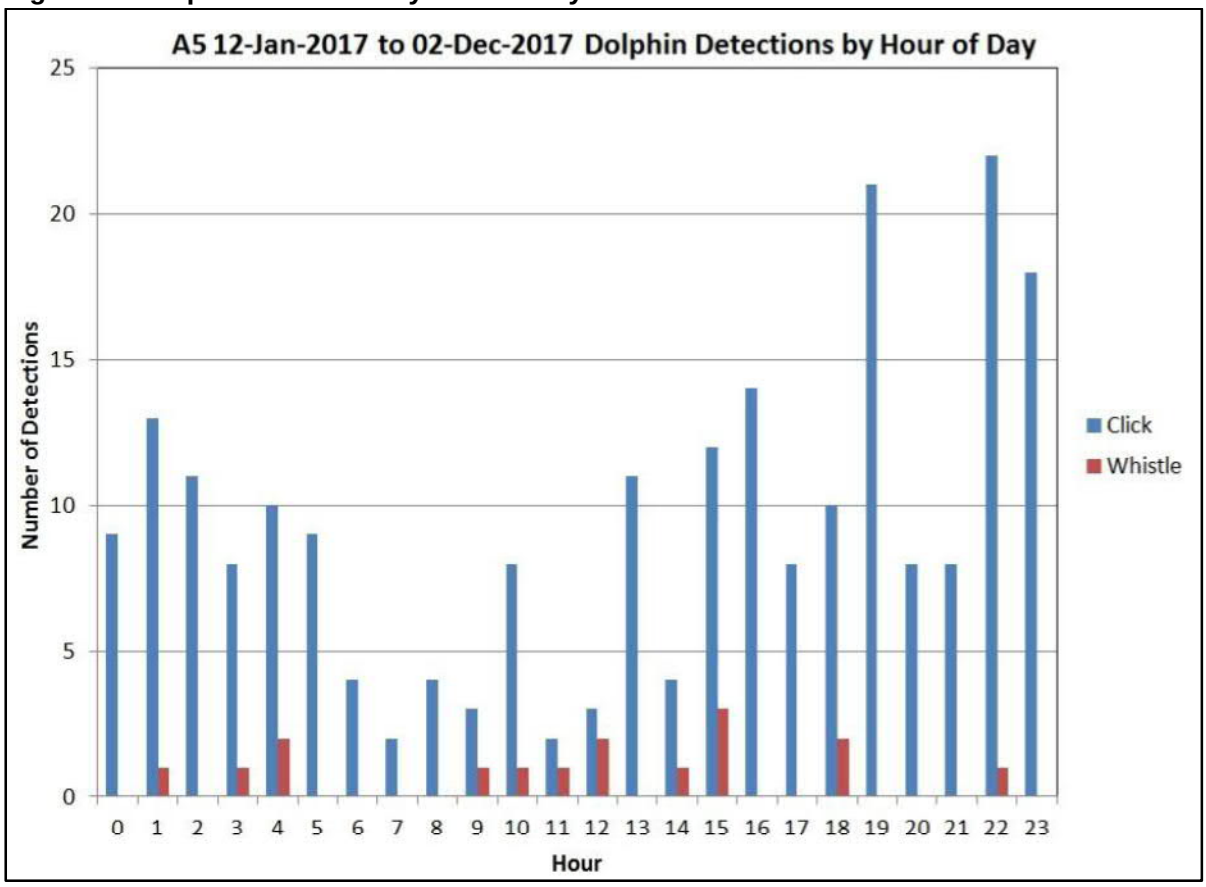


Figure 25: Dolphin Detections by Hour of Day in 2016 to 2017

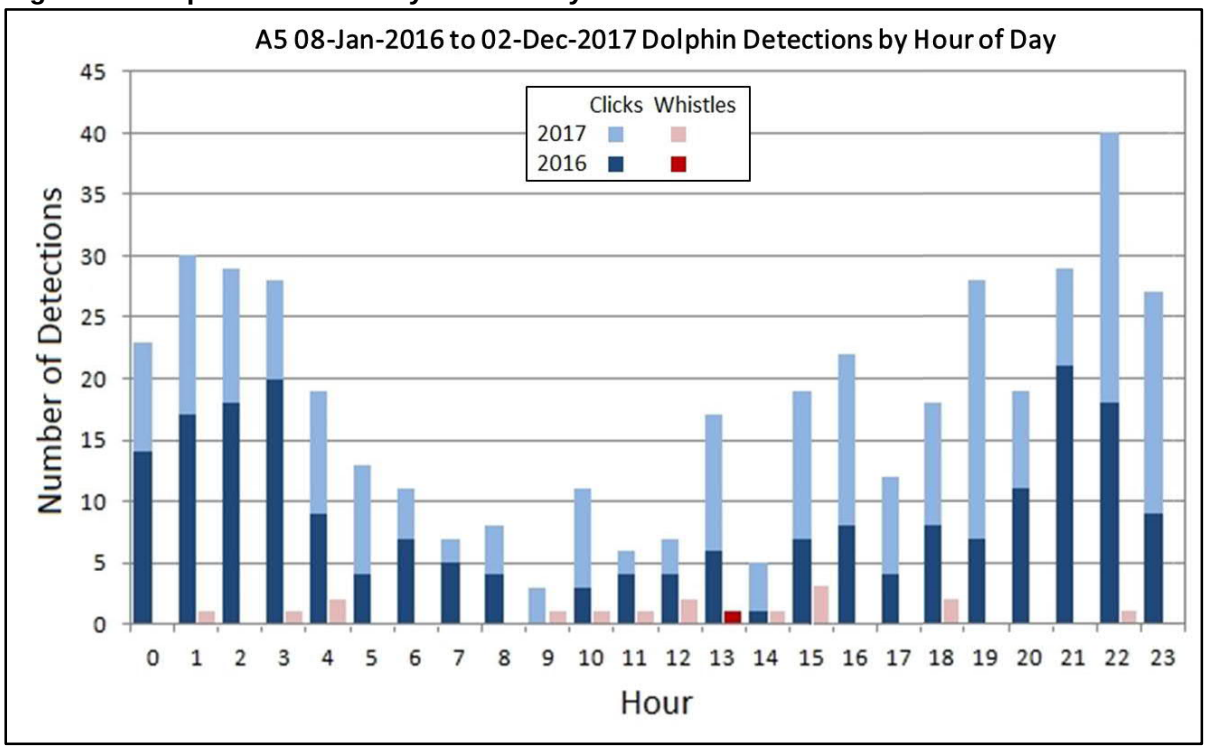


Figure 26: Dolphin Detections by Hour of Day and Solar Season in 2017

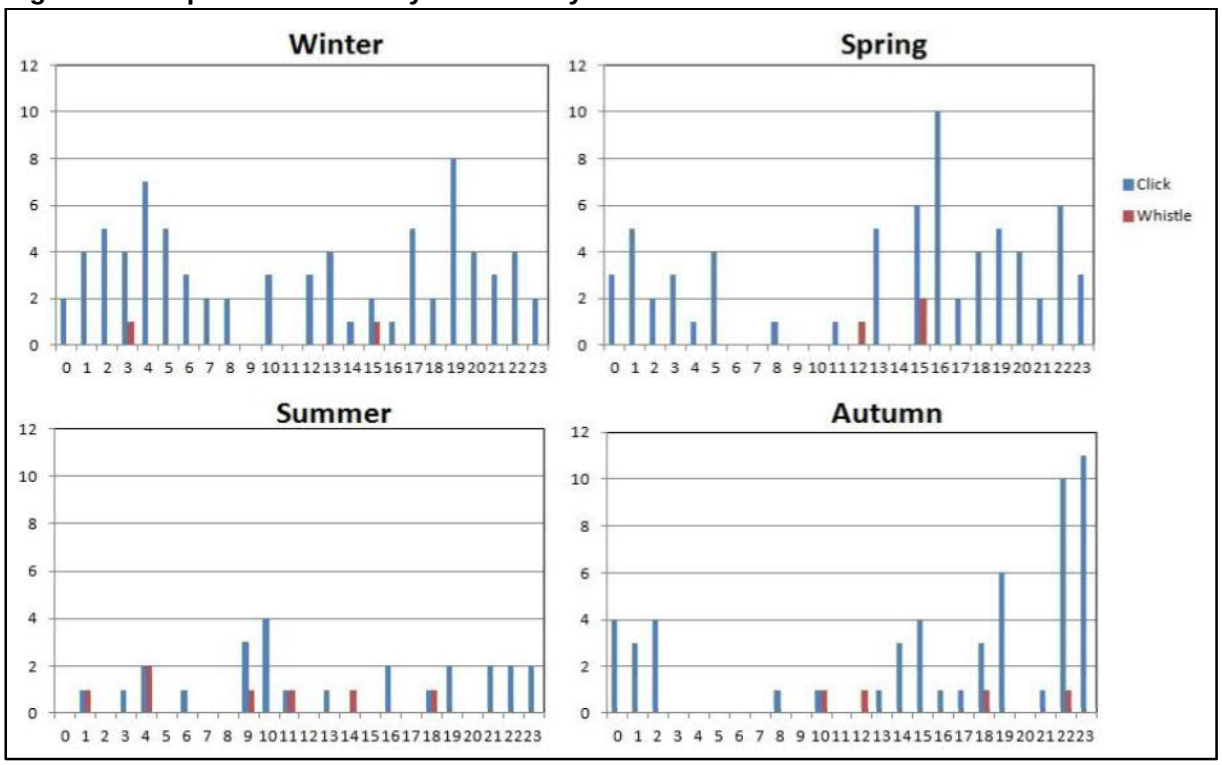
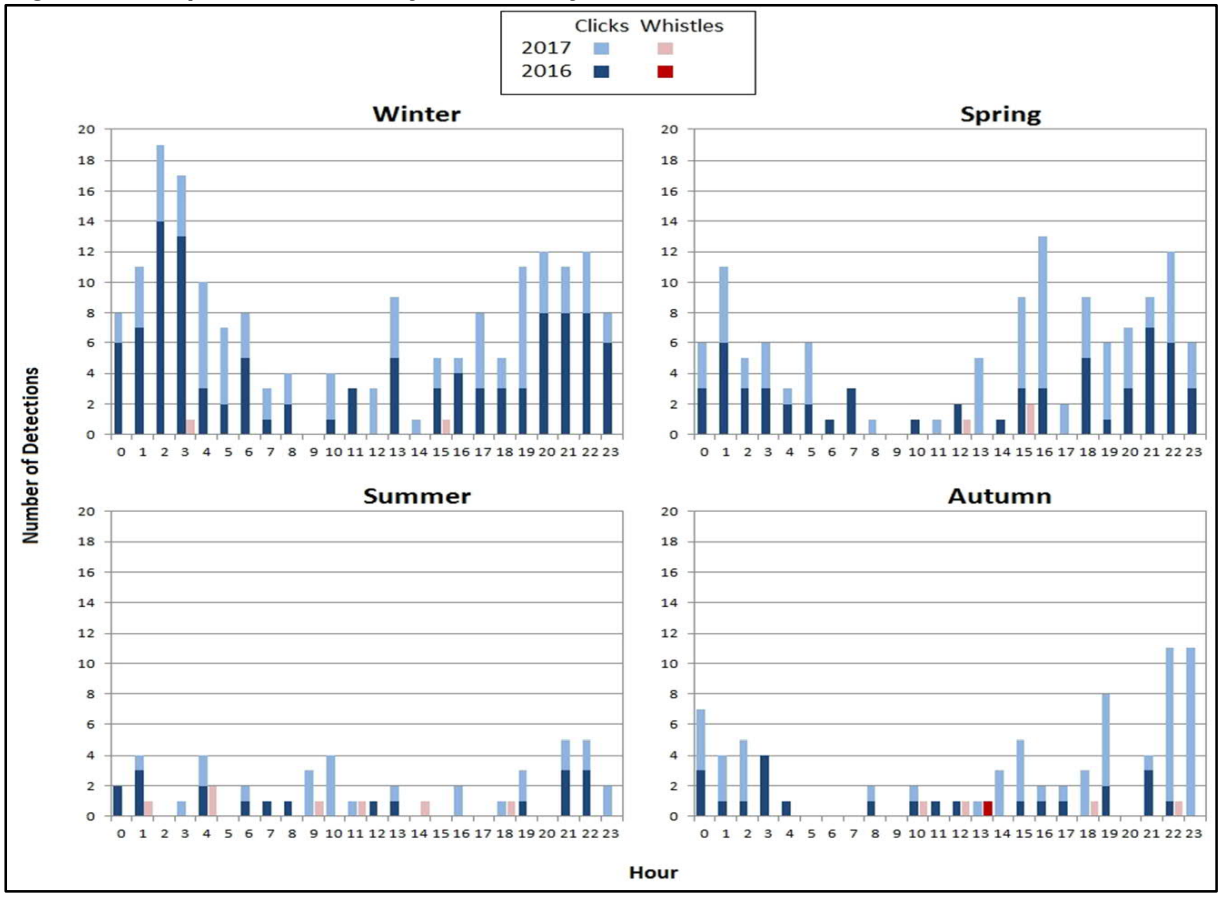
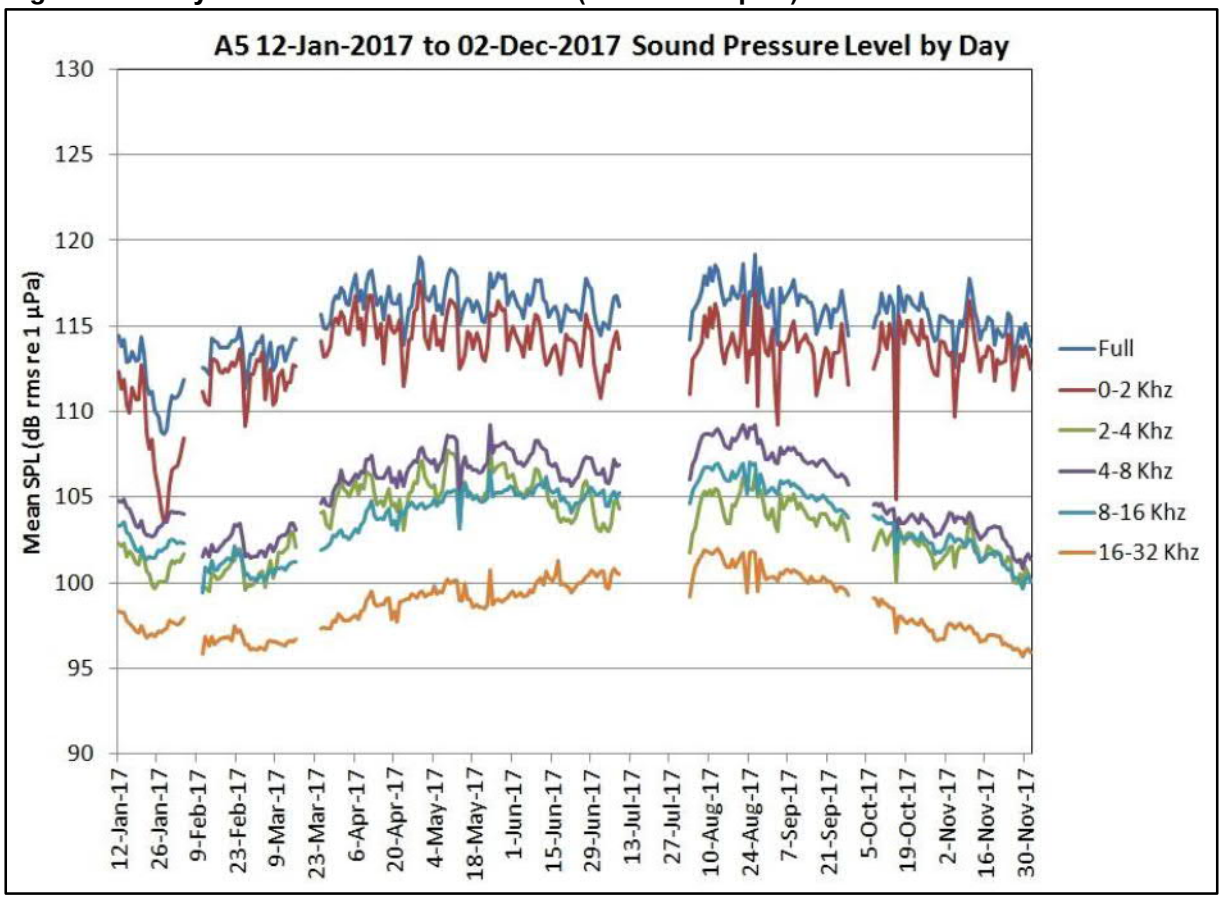


Figure 27: Dolphin Detections by Hour of Day and Solar Season in 2016 to 2017



[Figure 26 & Figure 27: Winter = Dec-Jan-Feb, Spring = Mar-Apr-May, Summer = Jun-Jul-Aug, Autumn = Sep-Oct-Nov]

Figure 28: Daily Mean Sound Pressure Level (dB rms re 1 µPa) recorded in 2017



[Blank area represents no recording]

Figure 29: Sound Pressure Level (SPL) by Hour of Day recorded in 2017

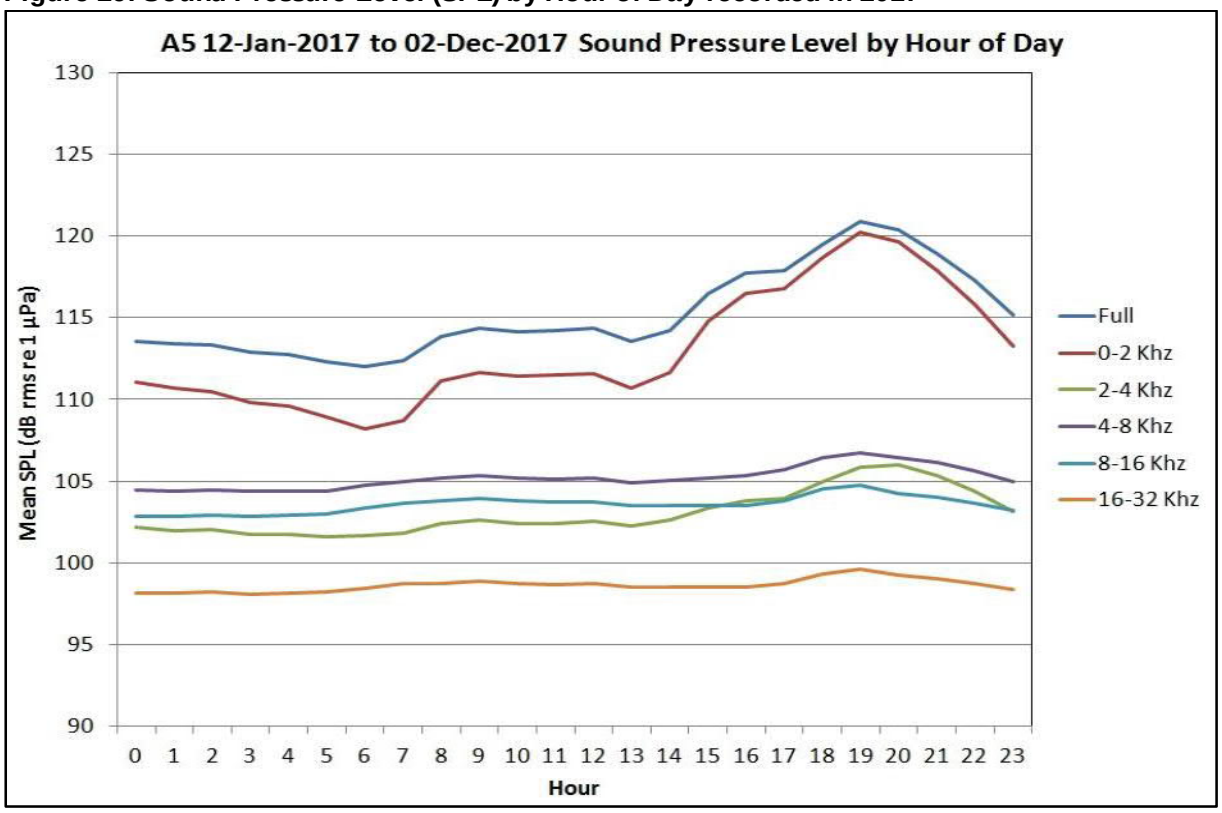


Figure 30: Sound Pressure Level (SPL) by Hour of Day and Solar Season recorded in 2017
[Spring = Mar-Apr-May, Summer = Jun-Jul-Aug, Autumn = Sep-Oct-Nov, Winter = Dec-Jan-Feb]

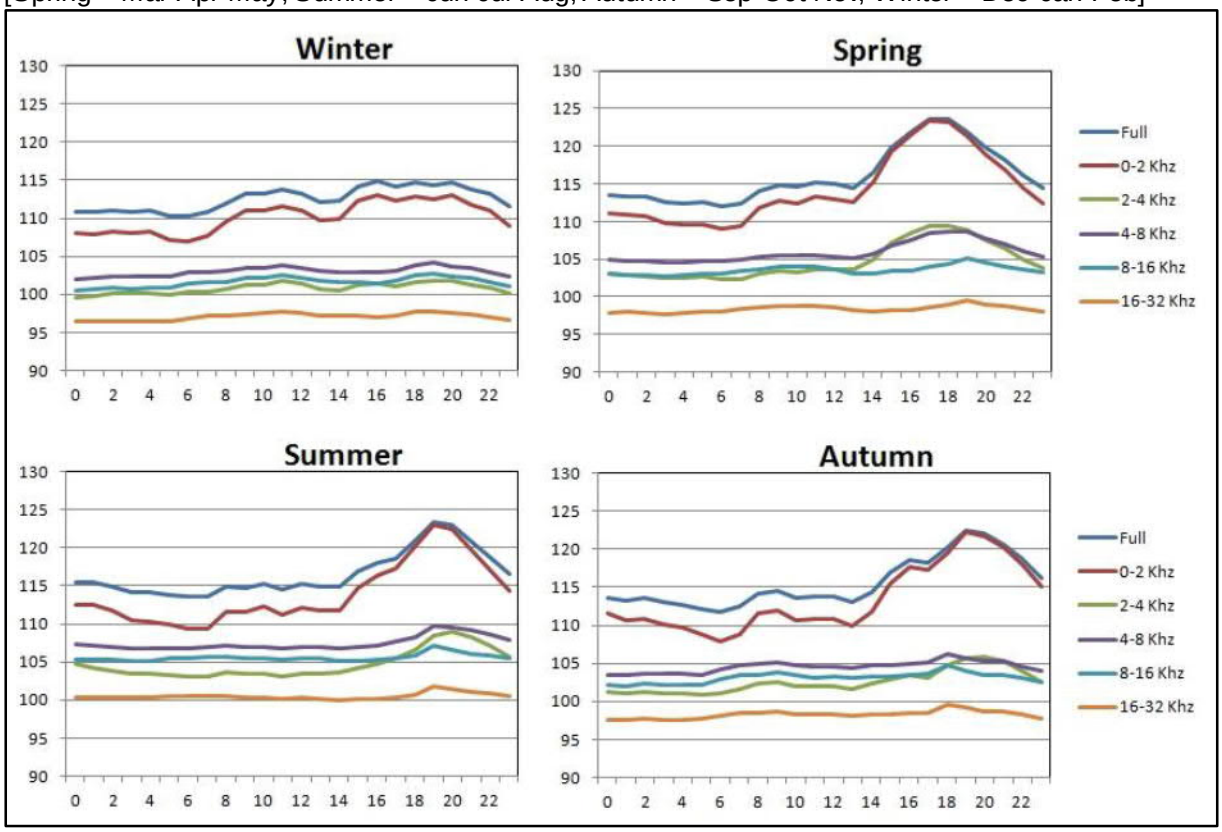


Table 1: CWD Encounter Rates by Survey Areas

Survey Area	Encounter Rate (STG)		Encounter Rate (ANI)	
	2016	2017	2016	2017
NEL	0	0	0	0
NWL	2.32	2.41	9.51	8.14
AW	2.81	4.55	11.23	14.57
WL	11.85	17.85	44.27	67.94
SWL	3.46	5.00	13.99	15.39
Combined	3.44	4.80	13.44	16.8

Table 2: Summary of Monthly and Running Quarterly Encounter Rates STG and ANI

Encounter Rate	Winter		Spring			Summer			Autumn			Winter
	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
Monthly STG	4.41	6.08	1.99	2.96	4.21	6.30	6.76	8.11	5.32	4.54	2.07	5.33
Monthly ANI	15.78	21.12	8.97	8.89	25.49	18.64	18.45	24.06	17.73	16.02	6.82	20.77
Running Quarterly STG	3.96	5.04	4.02	3.49	3.06	4.45	5.73	7.03	6.68	5.90	4.09	4.05
Running Quarterly ANI	13.02	17.31	14.85	12.33	14.46	17.65	20.95	20.30	19.97	19.05	13.91	14.75

Table 3: CWD Line Transects Parameters and Estimates of Density and Abundance for Western Hong Kong based on 3RS Project Data (January 2017 – December 2017)

Time Period	Stratum	No. Stgs.	Average Group Size*	Trackline Detection Prob. - g(0)#	Individual Density (no./100km^2)	Abundance	95% CI (Abund.)	%CV
Jan-Dec 2017	AW	5	2.6	1.0	40.55	2	1-4	43.9
Jan-Dec 2017	DB	1	2.6	1.0	2.31	1	0-4	97.5
Jan-Dec 2017	NEL	0	n/a	1.0	0.00	0	n/a	n/a
Jan-Dec 2017	NWL	37	2.6	1.0	16.59	14	9-23	23.6
Jan-Dec 2017	SWL	65	2.6	1.0	33.57	22	14-35	23.0
Jan-Dec 2017	WL	113	2.6	1.0	132.22	36	23-58	23.8
Jan-Dec 2017	**Pooled^**	**221**	**2.6**	**1.0**	**27.33**	**71**	**48-102**	**19.9**
Jan-Dec 2017	Winter^	55	2.6	1.0	43.57	79	44-139	29.3
Jan-Dec 2017	Spring^	37	2.6	1.0	22.00	40	24-66	26.4
Jan-Dec 2017	Summer^	78	2.6	1.0	61.85	112	74-169	21.3
Jan-Dec 2017	Autumn^	46	2.6	1.0	34.47	62	38-100	24.7

From Jefferson (2000)

* The Distance software gives the option for the user to either pool or stratify group size among different strata . (Thomas et al., 2010). In this case, small sample sizes for some strata (<10) could lead to very inaccurate abundance/density estimates, and thus the approach of pooling is considered more robust for this line transect analysis.

^ Pooled abundance not including Airport West (AW). Note that the pooled estimates do not necessarily add up to the sum of the individual stratum estimates, as these are computed separately.

Table 4: Average Group Sizes of CWDs by Survey Areas

Survey Area	Average Group Size of CWDs
NEL	0
NWL	3.28
AW	3.20
WL	3.67
SWL	2.89
Overall	3.35 ± 2.59

Table 5: Average Group Sizes of CWDs by Seasons

Solar Season	Average Group Size of CWDs
Spring	4.69
Summer	2.83
Autumn	3.25
Winter	3.39

Table 6: Percentage of CWD Groups recorded as Exhibiting Various Behaviours/Activities, and recorded as having Association with Fishing Boat

Survey Area	Year	Activity				
		Feeding	Travelling	Socialising	Resting/Milling	Fishing Boat Association
AW	2016	75%	-	-	-	-
	2017	80%	20%			20%
NEL	2016	-	-	-	-	-
	2017	-	-	-	-	-
NWL	2016	41%	15%	9%	9%	7%
	2017	15%	8%	10%	3%	-
WL	2016	33%	31%	5%	8%	4%
	2017	23%	12%	12%	-	8%
SWL	2016	48%	13%	11%	8%	13%
	2017	28%	6%	10%	1%	9%

Table 7: Summary of Photo Identification

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
NLMM001	11/05/2017	3	WL
NLMM002	25/10/2017	1	NWL
	14/12/2017	1	NWL
NLMM004	12/01/2017	1	NWL
	23/03/2017	1	NWL
		2	NWL
	05/04/2017	1	NWL
		2	NWL
	06/12/2017	5	NWL
	14/12/2017	1	NWL
NLMM005	18/09/2017	2	NWL
	14/12/2017	1	NWL
NLMM006	08/06/2017	1	NWL
NLMM010	25/10/2017	1	NWL
NLMM011	15/11/2017	1	NWL
NLMM012	15/11/2017	1	NWL
NLMM013	08/06/2017	1	NWL
	14/07/2017	1	NWL
NLMM015	05/01/2017	1	WL
	21/03/2017	2	WL
	27/10/2017	3	WL
NLMM016	05/01/2017	1	WL
	05/04/2017	1	NWL
		2	NWL
	18/04/2017	1	WL
	07/12/2017	3	WL
NLMM017	12/01/2017	1	NWL
	23/03/2017	1	NWL
		2	NWL
NLMM019	21/03/2017	2	WL
	11/05/2017	8	WL
	12/07/2017	1	NWL
	12/09/2017	4	WL
		5	WL
	18/09/2017	1	NWL
	21/11/2017	1	AW
NLMM020	21/03/2017	2	WL
	12/07/2017	1	NWL
	21/08/2017	4	SWL
	12/09/2017	4	WL
		5	WL
	18/09/2017	1	NWL
NLMM022	18/09/2017	1	NWL
NLMM023	11/05/2017	1	WL
	11/07/2017	13	SWL
	12/09/2017	5	WL
	18/09/2017	1	NWL
NLMM027	22/08/2017	7	WL
	25/10/2017	1	NWL
	14/12/2017	2	NWL
NLMM028	22/08/2017	7	WL
	25/10/2017	1	NWL
	14/12/2017	2	NWL
NLMM033	22/08/2017	3	WL
		6	WL
	25/10/2017	2	NWL
NLMM034	11/07/2017	2	WL
		5	WL

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
NLMM037	12/01/2017	1	NWL
	23/03/2017	1	NWL
		2	NWL
	18/09/2017	3	NWL
	15/11/2017	1	NWL
	14/12/2017	1	NWL
NLMM039	15/11/2017	1	NWL
NLMM040	22/08/2017	6	WL
NLMM041	22/08/2017	6	WL
NLMM042	18/09/2017	1	NWL
NLMM049	07/11/2017	1	NWL
NLMM050	14/07/2017	2	NWL
NLMM051	22/08/2017	3	WL
		6	WL
	19/09/2017	1	WL
	25/10/2017	2	NWL
NLMM052	18/09/2017	1	NWL
	20/09/2017	1	SWL
NLMM053	18/09/2017	1	NWL
NLMM054	07/11/2017	1	NWL
NLMM055	06/12/2017	1	NWL
NLMM056	06/12/2017	4	NWL
NLMM057	06/12/2017	4	NWL
NLMM058	06/12/2017	4	NWL
NLMM059	06/12/2017	4	NWL
SLMM002	05/01/2017	7	WL
SLMM003	26/07/2017	4	SWL
SLMM007	05/01/2017	7	WL
	06/02/2017	3	WL
	11/05/2017	9	WL
SLMM010	05/01/2017	5	WL
	19/01/2017	6	SWL
	16/02/2017	10	WL
	11/05/2017	10	SWL
	20/07/2017	1	SWL
SLMM011	17/02/2017	2	SWL
	21/03/2017	2	WL
		3	WL
	11/05/2017	11	SWL
	28/06/2017	5	WL
	20/07/2017	1	SWL
SLMM012	20/09/2017	1	SWL
		2	SWL
SLMM014	05/01/2017	7	WL
	16/02/2017	10	WL
	20/03/2017	1	SWL
		3	SWL
	22/06/2017	2	SWL
		3	SWL
		6	SWL
		7	SWL
	22/08/2017	9	WL
	07/12/2017	5	WL
	08/12/2017	2	SWL
SLMM015	21/03/2017	2	WL
		3	WL
	04/05/2017	1	SWL
	21/08/2017	1	SWL
	11/09/2017	2	SWL
	19/10/2017	2	SWL

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
SLMM017	11/09/2017	2	SWL
	20/09/2017	1	SWL
		2	SWL
SLMM018	17/02/2017	2	SWL
		3	SWL
	23/10/2017	2	SWL
	07/12/2017	5	WL
SLMM021	19/01/2017	6	SWL
	21/03/2017	2	WL
		3	WL
	26/04/2017	1	SWL
	19/10/2017	2	SWL
SLMM022	16/02/2017	10	WL
	05/05/2017	4	WL
		5	WL
SLMM023	05/05/2017	4	WL
		5	WL
	11/05/2017	3	WL
		8	WL
	21/08/2017	1	SWL
	22/08/2017	9	WL
	26/10/2017	8	WL
SLMM025	16/02/2017	11	WL
SLMM027	11/05/2017	3	WL
		8	WL
	07/06/2017	2	SWL
SLMM028	21/03/2017	1	WL
	18/04/2017	5	WL
	05/05/2017	5	WL
	06/12/2017	3	NWL
	07/12/2017	1	AW
SLMM030	21/03/2017	1	WL
	21/07/2017	7	WL
	19/10/2017	1	SWL
	26/10/2017	1	WL
	06/12/2017	3	NWL
	07/12/2017	1	AW
SLMM031	17/02/2017	2	SWL
		3	SWL
	21/03/2017	2	WL
	07/06/2017	1	SWL
	26/10/2017	10	SWL
SLMM034	15/08/2017	3	SWL
	21/08/2017	1	SWL
SLMM036	05/01/2017	1	WL
	16/02/2017	10	WL
	21/03/2017	2	WL
	07/06/2017	3	SWL
	20/09/2017	3	SWL
SLMM037	19/01/2017	6	SWL
	21/03/2017	2	WL
	20/09/2017	1	SWL
	26/10/2017	2	WL
SLMM040	22/06/2017	1	SWL
	11/07/2017	7	WL
	21/07/2017	5	WL
SLMM045	21/07/2017	7	WL
	22/08/2017	2	WL
SLMM047	16/02/2017	10	WL
	11/05/2017	8	WL
SLMM048	28/12/2017	3	WL

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
SLMM049	16/02/2017	3	WL
		10	WL
	07/12/2017	4	WL
SLMM050	20/09/2017	1	SWL
		2	SWL
SLMM052	05/01/2017	7	WL
	16/02/2017	10	WL
	05/05/2017	4	WL
		5	WL
	11/05/2017	10	SWL
	07/06/2017	2	SWL
	28/12/2017	8	SWL
SLMM053	06/12/2017	2	NWL
SLMM055	26/04/2017	4	SWL
SLMM056	11/05/2017	11	SWL
SLMM057	22/06/2017	1	SWL
	15/08/2017	5	SWL
SLMM058	22/06/2017	5	SWL
SLMM059	26/07/2017	5	SWL
SLMM060	15/08/2017	2	SWL
SLMM061	15/08/2017	3	SWL
SLMM062	15/08/2017	5	SWL
SLMM063	15/08/2017	7	SWL
SLMM064	21/08/2017	5	SWL
WLMM001	05/01/2017	6	WL
	19/01/2017	8	WL
	11/05/2017	3	WL
		7	WL
	11/07/2017	10	WL
		13	SWL
	21/11/2017	2	SWL
	07/12/2017	2	WL
WLMM003	16/02/2017	10	WL
	11/07/2017	13	SWL
	22/08/2017	7	WL
WLMM004	05/05/2017	4	WL
		5	WL
	07/06/2017	2	SWL
WLMM006	11/07/2017	12	SWL
	20/07/2017	3	WL
WLMM007	13/01/2017	1	SWL
		2	SWL
	16/02/2017	10	WL
	05/05/2017	1	WL
	11/05/2017	6	WL
	07/12/2017	4	WL
WLMM008	21/03/2017	2	WL
		3	WL
	11/05/2017	7	WL
	22/06/2017	1	SWL
	26/07/2017	3	SWL
	22/08/2017	11	SWL
WLMM009	09/06/2017	4	SWL
	28/06/2017	8	WL
	11/07/2017	12	SWL
	20/07/2017	3	WL
WLMM011	21/03/2017	1	WL
	22/08/2017	8	WL
		10	SWL
	20/09/2017	3	SWL
WLMM013	21/07/2017	2	WL

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
WLMM015	11/07/2017	9	WL
	21/07/2017	2	WL
WLMM017	16/02/2017	10	WL
WLMM018	11/05/2017	8	WL
WLMM019	19/09/2017	2	WL
	24/10/2017	1	NWL
	25/10/2017	1	NWL
WLMM020	15/08/2017	5	SWL
		7	SWL
WLMM021	06/01/2017	1	SWL
	27/10/2017	1	WL
WLMM024	21/11/2017	1	AW
WLMM025	16/02/2017	10	WL
WLMM026	26/10/2017	1	WL
	06/12/2017	3	NWL
WLMM027	22/06/2017	4	SWL
	21/08/2017	2	SWL
	22/08/2017	1	AW
	20/09/2017	3	SWL
	26/10/2017	1	WL
	06/12/2017	3	NWL
WLMM028	11/07/2017	10	WL
	19/09/2017	6	WL
WLMM029	19/09/2017	6	WL
WLMM030	18/04/2017	2	WL
		3	WL
	25/10/2017	2	NWL
WLMM032	19/09/2017	6	WL
WLMM038	11/07/2017	5	WL
WLMM040	09/06/2017	1	WL
WLMM042	11/05/2017	3	WL
WLMM043	16/02/2017	4	WL
	21/03/2017	1	WL
	05/05/2017	1	WL
	09/06/2017	1	WL
	21/07/2017	5	WL
		7	WL
WLMM046	21/08/2017	3	SWL
	19/09/2017	1	WL
WLMM047	21/07/2017	7	WL
WLMM049	20/09/2017	1	SWL
	06/12/2017	5	NWL
WLMM051	14/08/2017	3	WL
WLMM052	28/06/2017	2	WL
WLMM053	18/09/2017	1	NWL
WLMM054	18/04/2017	7	SWL
	15/08/2017	1	SWL
	19/09/2017	8	SWL
	26/10/2017	1	WL
WLMM056	16/02/2017	10	WL
	20/09/2017	1	SWL
	27/10/2017	1	WL
WLMM060	19/01/2017	3	WL
	16/02/2017	1	AW
	18/04/2017	2	WL
		3	WL
WLMM062	26/10/2017	5	WL
WLMM063	19/01/2017	3	WL
	07/06/2017	2	SWL
	28/12/2017	3	WL

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
WLMM064	05/01/2017	1	WL
	26/04/2017	3	SWL
	06/12/2017	1	NWL
WLMM065	05/01/2017	1	WL
	26/10/2017	4	WL
		6	WL
	27/10/2017	2	WL
	17/11/2017	1	WL
WLMM066	05/01/2017	1	WL
	26/10/2017	4	WL
		6	WL
	27/10/2017	2	WL
	17/11/2017	1	WL
WLMM067	05/01/2017	2	WL
	11/07/2017	12	SWL
WLMM068	05/01/2017	2	WL
	19/01/2017	3	WL
	18/04/2017	2	WL
		3	WL
WLMM069	13/01/2017	2	SWL
WLMM070	13/01/2017	2	SWL
	11/05/2017	11	SWL
WLMM071	19/01/2017	3	WL
	06/02/2017	1	WL
	16/02/2017	1	AW
	18/04/2017	2	WL
		3	WL
	06/12/2017	1	NWL
WLMM072	19/01/2017	3	WL
	18/04/2017	2	WL
WLMM073	16/02/2017	10	WL
	11/05/2017	8	WL
WLMM074	21/03/2017	3	WL
WLMM075	18/04/2017	2	WL
	27/10/2017	2	WL
WLMM076	05/05/2017	1	WL
	22/06/2017	1	SWL
	26/07/2017	5	SWL
WLMM077	05/05/2017	1	WL
WLMM078	05/05/2017	1	WL
	22/06/2017	1	SWL
	26/07/2017	5	SWL
WLMM079	05/05/2017	4	WL
		5	WL
	11/07/2017	7	WL
	26/07/2017	4	SWL
	12/09/2017	3	WL
WLMM080	11/05/2017	2	WL
WLMM081	11/05/2017	2	WL
WLMM082	11/05/2017	2	WL
		4	WL
WLMM083	11/05/2017	2	WL
WLMM085	11/05/2017	4	WL
WLMM086	11/05/2017	5	WL
	09/06/2017	1	WL
		3	WL
WLMM087	11/05/2017	5	WL
WLMM089	11/05/2017	8	WL
	22/08/2017	7	WL
WLMM090	09/06/2017	1	WL
WLMM091	28/06/2017	3	WL
	26/10/2017	7	WL

Individual ID	Date of sighting (dd/mm/yyyy)	Sighting No.	Area
WLMM092	28/06/2017	3	WL
WLMM093	28/06/2017	6	WL
	26/10/2017	7	WL
WLMM094	28/06/2017	6	WL
	26/10/2017	7	WL
WLMM095	28/06/2017	6	WL
WLMM096	28/06/2017	8	WL
	19/09/2017	1	WL
WLMM097	11/07/2017	1	WL
WLMM098	11/07/2017	1	WL
WLMM099	11/07/2017	3	WL
WLMM100	11/07/2017	10	WL
	12/09/2017	3	WL
	24/10/2017	1	NWL
WLMM101	22/08/2017	4	WL
	19/09/2017	1	WL
WLMM102	19/09/2017	1	WL
WLMM103	19/09/2017	2	WL
WLMM104	26/10/2017	2	WL
WLMM105	26/10/2017	8	WL
WLMM106	26/10/2017	8	WL
WLMM107	26/10/2017	8	WL
	28/12/2017	2	WL
	28/12/2017	3	WL

Table 8: Land-based Survey, Theodolite Effort and CWD Group Summary

Land-based Station	# of Survey Sessions	Survey Effort (hh:mm)	# CWD Groups Sighted	CWD Group Sighting per Survey Hr	# Groups After Filtering	# of 10-minutes segments
Sha Chau	24	144:00	2	0.014	1	1
Lung Kwu Chau	36	216:25	194	0.896	90	156
TOTAL	**60**	**360:25**	**196**	**0.544**	**91**	**157**

Table 9: CWD Groups Sighted and Tracked from Land-based Stations by Survey Month

Month	No. of Survey Days	# of CWD Groups per Sha Chau Station	# of CWD Groups per Lung Kwu Chau Station	TOTAL
January 2017	Sha Chau: 2 Lung Kwu Chau: 3	12 (6%)	0	**12**
February 2017	Sha Chau: 2 Lung Kwu Chau: 3	35 (18%)	0	**35**
March 2017	Sha Chau: 2 Lung Kwu Chau: 3	7 (4%)	0	**7**
April 2017	Sha Chau: 2 Lung Kwu Chau: 3	6 (3%)	0	**6**
May 2017	Sha Chau: 2 Lung Kwu Chau: 3	5 (3%)	0	**5**
June 2017	Sha Chau: 2 Lung Kwu Chau: 3	12 (6%)	0	**12**
July 2017	Sha Chau: 2 Lung Kwu Chau: 3	9 (5%)	0	**9**
August 2017	Sha Chau: 2 Lung Kwu Chau: 3	12 (6%)	2 (100%)	**14**
September 2017	Sha Chau: 2 Lung Kwu Chau: 3	25 (13%)	0	**25**
October 2017	Sha Chau: 2 Lung Kwu Chau: 3	26 (13%)	0	**26**
November 2017	Sha Chau: 2 Lung Kwu Chau: 3	26 (13%)	0	**26**
December 2017	Sha Chau: 2 Lung Kwu Chau: 3	19 (10%)	0	**19**
TOTAL	**Sha Chau: 24** **Lung Kwu Chau: 36**	**194**	**2**	**196**

Table 10: Land-based CWD Focal Group Size Summary

Station	n (sample size)	Minimum # Individuals	Maximum # Individuals	Mean Grp Size	Standard Deviation
Sha Chau	**1**	**2**	**2**	**2**	**0**
Lung Kwu Chau	**156**	**1**	**7**	**3.03**	**1.58**
Inside SCLKCMP boundary	88	1	7	2.73	1.51
Crossing SCLKCMP boundary	39	1	7	2.93	1.45
Outside SCLKCMP boundary	29	1	6	4.05	1.54

Table 11: CWD Mean Swimming Speed, Reorientation Rate, and Linearity based on Vessel Presence record from Lung Kwu Chau in 2017

Vessel Type	Sample Size	Mean Speed (Std. dev.)	Mean Reorientation Rate (Std. dev.)	Mean Linearity (Std. dev.)
No Vessel	129	2.83 (1.26)	25.35 (19.60)	0.83 (0.20)
High Speed Ferry	3	2.47 (1.24)	12.57 (5.65)	0.96 (0.03)
High Speed Ferry Under Speed Restriction	8	2.44 (0.95)	32.66 (19.11)	0.76 (0.24)
Other	16	2.35 (1.70)	46.11 (22.21)	0.56 (0.30)

Table 12: Summary of PAM Deployments and Dolphin Detections in 2017

Site	Dep #	Data start (dd/mm/yyyy)	Data end (dd/mm/yyyy)	# recording days	# files	Days with dolphins (%)	Files with dolphins (%)
A5	1	12/01/2017	04/02/2017	24	6769	7 (29%)	15 (0.2%)
A5	2	11/02/2017	17/03/2017	35	9792	25 (71%)	86 (0.9%)
A5	3	25/03/2017	13/05/2017	50	14260	23 (46%)	43 (0.3%)
A5	4	14/05/2017	09/07/2017	57	16370	11 (19%)	16 (0.10%)
A5	5	03/08/2017	28/09/2017	57	16370	22 (39%)	35 (0.21%)
A5	6	07/10/2017	02/12/2017	57	16370	21 (37%)	41 (0.25%)

Table 13: Summary of Dolphin Sightings within the DEZ in 2017

Date	Works Area* and Type of Works Suspended	Location of the DEZ Monitoring Station	Time of Initial Sighting of Dolphin Group	Time of Last Sighting of Dolphin Group
17/02/2017	DCM works at Area A3	22°19.489N, 113°53.746E	08:51	08:53
15/07/2017	DCM works at Area D6	22°18.838N, 113°53.754E	09:11	10:00
15/07/2017	DCM works at Area A8	22°19.110N, 113°52.884E	09:12	09:25
28/08//2017	DCM works at Area D6	22°18.837N, 113°53.770E	14:12	14:17
20/09/2017	DCM works at Area F1	22°19.498N, 113°56.135E	15:04	15:04
19/12/2017	DCM works at Area F1	22°19.349N, 113°56.224E	09:02	09:25

*Note: Please refer to **Figure 1.2** for the location of works area.

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

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
05-Jan-17	AW	2	4.860	WINTER	32166	3RS ET
05-Jan-17	WL	1	12.529	WINTER	32166	3RS ET
05-Jan-17	WL	2	14.382	WINTER	32166	3RS ET
05-Jan-17	SWL	2	6.010	WINTER	32166	3RS ET
06-Jan-17	SWL	1	1.300	WINTER	32166	3RS ET
06-Jan-17	SWL	2	61.200	WINTER	32166	3RS ET
06-Jan-17	SWL	3	1.800	WINTER	32166	3RS ET
09-Jan-17	NWL	1	6.900	WINTER	32166	3RS ET
09-Jan-17	NWL	2	60.460	WINTER	32166	3RS ET
09-Jan-17	NWL	3	15.640	WINTER	32166	3RS ET
10-Jan-17	DB	2	8.740	WINTER	32166	3RS ET
10-Jan-17	DB	3	5.630	WINTER	32166	3RS ET
10-Jan-17	DB	4	4.630	WINTER	32166	3RS ET
10-Jan-17	NEL	2	2.100	WINTER	32166	3RS ET
10-Jan-17	NEL	3	29.220	WINTER	32166	3RS ET
10-Jan-17	NEL	4	16.680	WINTER	32166	3RS ET
12-Jan-17	NWL	2	20.090	WINTER	32166	3RS ET
12-Jan-17	NWL	3	61.010	WINTER	32166	3RS ET
12-Jan-17	NWL	4	0.700	WINTER	32166	3RS ET
13-Jan-17	SWL	2	27.517	WINTER	32166	3RS ET
13-Jan-17	SWL	3	28.899	WINTER	32166	3RS ET
13-Jan-17	SWL	4	5.330	WINTER	32166	3RS ET
19-Jan-17	AW	1	4.590	WINTER	32166	3RS ET
19-Jan-17	WL	2	7.198	WINTER	32166	3RS ET
19-Jan-17	WL	3	14.132	WINTER	32166	3RS ET
19-Jan-17	WL	4	11.030	WINTER	32166	3RS ET
19-Jan-17	SWL	3	5.883	WINTER	32166	3RS ET
19-Jan-17	SWL	4	1.000	WINTER	32166	3RS ET
20-Jan-17	DB	3	19.100	WINTER	32166	3RS ET
20-Jan-17	NEL	2	23.300	WINTER	32166	3RS ET
20-Jan-17	NEL	3	22.000	WINTER	32166	3RS ET
20-Jan-17	NEL	4	1.600	WINTER	32166	3RS ET
06-Feb-17	AW	2	2.940	WINTER	32166	3RS ET
06-Feb-17	AW	3	1.930	WINTER	32166	3RS ET
06-Feb-17	WL	2	17.000	WINTER	32166	3RS ET
06-Feb-17	WL	3	9.790	WINTER	32166	3RS ET
06-Feb-17	WL	4	3.530	WINTER	32166	3RS ET
06-Feb-17	SWL	4	2.540	WINTER	32166	3RS ET
06-Feb-17	SWL	5	4.350	WINTER	32166	3RS ET
07-Feb-17	DB	2	4.830	WINTER	32166	3RS ET
07-Feb-17	DB	3	6.020	WINTER	32166	3RS ET
07-Feb-17	DB	4	8.150	WINTER	32166	3RS ET
07-Feb-17	NEL	2	5.800	WINTER	32166	3RS ET
07-Feb-17	NEL	3	25.760	WINTER	32166	3RS ET
07-Feb-17	NEL	4	11.470	WINTER	32166	3RS ET
07-Feb-17	NEL	5	4.270	WINTER	32166	3RS ET
09-Feb-17	SWL	2	0.900	WINTER	32166	3RS ET
09-Feb-17	SWL	3	14.170	WINTER	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
09-Feb-17	SWL	4	15.230	WINTER	32166	3RS ET
09-Feb-17	SWL	5	32.400	WINTER	32166	3RS ET
10-Feb-17	NEL	1	3.300	WINTER	32166	3RS ET
10-Feb-17	NEL	2	8.030	WINTER	32166	3RS ET
10-Feb-17	NEL	3	34.170	WINTER	32166	3RS ET
10-Feb-17	NEL	4	2.000	WINTER	32166	3RS ET
10-Feb-17	DB	2	8.790	WINTER	32166	3RS ET
10-Feb-17	DB	3	8.940	WINTER	32166	3RS ET
10-Feb-17	DB	4	0.970	WINTER	32166	3RS ET
16-Feb-17	AW	1	4.727	WINTER	32166	3RS ET
16-Feb-17	WL	1	18.363	WINTER	32166	3RS ET
16-Feb-17	WL	2	3.100	WINTER	32166	3RS ET
16-Feb-17	WL	3	6.070	WINTER	32166	3RS ET
17-Feb-17	SWL	1	37.700	WINTER	32166	3RS ET
17-Feb-17	SWL	2	29.260	WINTER	32166	3RS ET
20-Feb-17	NWL	1	27.200	WINTER	32166	3RS ET
20-Feb-17	NWL	2	48.100	WINTER	32166	3RS ET
21-Feb-17	NWL	3	14.170	WINTER	32166	3RS ET
21-Feb-17	NWL	4	38.720	WINTER	32166	3RS ET
21-Feb-17	NWL	5	21.810	WINTER	32166	3RS ET
06-Mar-17	NWL	1	5.000	SPRING	32166	3RS ET
06-Mar-17	NWL	2	17.100	SPRING	32166	3RS ET
06-Mar-17	NWL	3	50.100	SPRING	32166	3RS ET
06-Mar-17	NWL	4	3.700	SPRING	32166	3RS ET
10-Mar-17	DB	2	15.180	SPRING	32166	3RS ET
10-Mar-17	DB	3	3.920	SPRING	32166	3RS ET
10-Mar-17	NEL	1	1.000	SPRING	32166	3RS ET
10-Mar-17	NEL	2	11.750	SPRING	32166	3RS ET
10-Mar-17	NEL	3	34.250	SPRING	32166	3RS ET
13-Mar-17	AW	2	4.720	SPRING	32166	3RS ET
13-Mar-17	WL	2	12.180	SPRING	32166	3RS ET
13-Mar-17	WL	3	20.820	SPRING	32166	3RS ET
13-Mar-17	SWL	2	12.500	SPRING	32166	3RS ET
14-Mar-17	SWL	3	22.600	SPRING	32166	3RS ET
14-Mar-17	SWL	4	18.780	SPRING	32166	3RS ET
14-Mar-17	SWL	5	16.020	SPRING	32166	3RS ET
20-Mar-17	SWL	2	36.220	SPRING	32166	3RS ET
20-Mar-17	SWL	3	26.040	SPRING	32166	3RS ET
21-Mar-17	AW	1	4.850	SPRING	32166	3RS ET
21-Mar-17	WL	1	9.950	SPRING	32166	3RS ET
21-Mar-17	WL	2	19.076	SPRING	32166	3RS ET
21-Mar-17	WL	3	2.334	SPRING	32166	3RS ET
21-Mar-17	SWL	2	0.380	SPRING	32166	3RS ET
21-Mar-17	SWL	3	6.430	SPRING	32166	3RS ET
23-Mar-17	NWL	1	32.614	SPRING	32166	3RS ET
23-Mar-17	NWL	2	43.766	SPRING	32166	3RS ET
24-Mar-17	DB	2	8.740	SPRING	32166	3RS ET
24-Mar-17	DB	3	10.460	SPRING	32166	3RS ET
24-Mar-17	NEL	3	27.720	SPRING	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
24-Mar-17	NEL	4	18.880	SPRING	32166	3RS ET
05-Apr-17	NWL	1	3.000	SPRING	32166	3RS ET
05-Apr-17	NWL	2	38.728	SPRING	32166	3RS ET
05-Apr-17	NWL	3	32.700	SPRING	32166	3RS ET
10-Apr-17	AW	2	1.920	SPRING	32166	3RS ET
10-Apr-17	AW	3	1.090	SPRING	32166	3RS ET
10-Apr-17	AW	4	1.810	SPRING	32166	3RS ET
10-Apr-17	WL	3	24.720	SPRING	32166	3RS ET
10-Apr-17	WL	4	8.880	SPRING	32166	3RS ET
10-Apr-17	SWL	2	8.940	SPRING	32166	3RS ET
10-Apr-17	SWL	3	3.360	SPRING	32166	3RS ET
11-Apr-17	SWL	1	20.090	SPRING	32166	3RS ET
11-Apr-17	SWL	2	32.090	SPRING	32166	3RS ET
11-Apr-17	SWL	3	4.900	SPRING	32166	3RS ET
12-Apr-17	NEL	1	13.483	SPRING	32166	3RS ET
12-Apr-17	NEL	2	26.217	SPRING	32166	3RS ET
12-Apr-17	NEL	3	7.300	SPRING	32166	3RS ET
12-Apr-17	DB	2	7.700	SPRING	32166	3RS ET
12-Apr-17	DB	3	11.100	SPRING	32166	3RS ET
18-Apr-17	AW	3	4.870	SPRING	32166	3RS ET
18-Apr-17	WL	2	25.679	SPRING	32166	3RS ET
18-Apr-17	WL	3	4.960	SPRING	32166	3RS ET
18-Apr-17	SWL	1	0.821	SPRING	32166	3RS ET
18-Apr-17	SWL	2	5.049	SPRING	32166	3RS ET
24-Apr-17	NEL	2	26.150	SPRING	32166	3RS ET
24-Apr-17	NEL	3	20.650	SPRING	32166	3RS ET
24-Apr-17	DB	2	16.790	SPRING	32166	3RS ET
24-Apr-17	DB	3	1.710	SPRING	32166	3RS ET
25-Apr-17	NWL	2	1.100	SPRING	32166	3RS ET
25-Apr-17	NWL	3	35.320	SPRING	32166	3RS ET
25-Apr-17	NWL	4	38.880	SPRING	32166	3RS ET
26-Apr-17	SWL	1	1.400	SPRING	32166	3RS ET
26-Apr-17	SWL	2	40.231	SPRING	32166	3RS ET
26-Apr-17	SWL	3	20.409	SPRING	32166	3RS ET
04-May-17	SWL	1	1.190	SPRING	32166	3RS ET
04-May-17	SWL	2	43.260	SPRING	32166	3RS ET
04-May-17	SWL	3	17.450	SPRING	32166	3RS ET
05-May-17	AW	1	5.010	SPRING	32166	3RS ET
05-May-17	WL	2	24.605	SPRING	32166	3RS ET
05-May-17	WL	3	7.320	SPRING	32166	3RS ET
05-May-17	SWL	1	2.630	SPRING	32166	3RS ET
05-May-17	SWL	2	4.260	SPRING	32166	3RS ET
08-May-17	NWL	3	51.352	SPRING	32166	3RS ET
08-May-17	NWL	4	24.048	SPRING	32166	3RS ET
09-May-17	NEL	2	40.300	SPRING	32166	3RS ET
09-May-17	NEL	3	7.100	SPRING	32166	3RS ET
09-May-17	DB	2	20.900	SPRING	32166	3RS ET
11-May-17	AW	1	4.590	SPRING	32166	3RS ET
11-May-17	WL	1	13.043	SPRING	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
11-May-17	WL	2	2.621	SPRING	32166	3RS ET
11-May-17	WL	3	7.059	SPRING	32166	3RS ET
11-May-17	WL	4	5.220	SPRING	32166	3RS ET
11-May-17	SWL	2	0.520	SPRING	32166	3RS ET
11-May-17	SWL	3	2.050	SPRING	32166	3RS ET
11-May-17	SWL	4	2.970	SPRING	32166	3RS ET
17-May-17	NWL	1	8.700	SPRING	32166	3RS ET
17-May-17	NWL	2	60.600	SPRING	32166	3RS ET
17-May-17	NWL	3	6.300	SPRING	32166	3RS ET
22-May-17	NEL	2	6.960	SPRING	32166	3RS ET
22-May-17	NEL	3	27.140	SPRING	32166	3RS ET
22-May-17	NEL	4	12.700	SPRING	32166	3RS ET
22-May-17	DB	2	6.860	SPRING	32166	3RS ET
22-May-17	DB	3	11.640	SPRING	32166	3RS ET
23-May-17	SWL	2	26.840	SPRING	32166	3RS ET
23-May-17	SWL	3	33.160	SPRING	32166	3RS ET
07-Jun-17	SWL	2	33.230	SUMMER	32166	3RS ET
07-Jun-17	SWL	3	27.200	SUMMER	32166	3RS ET
07-Jun-17	SWL	4	1.900	SUMMER	32166	3RS ET
08-Jun-17	NWL	2	29.074	SUMMER	32166	3RS ET
08-Jun-17	NWL	3	26.566	SUMMER	32166	3RS ET
08-Jun-17	NWL	4	18.660	SUMMER	32166	3RS ET
08-Jun-17	NWL	5	1.100	SUMMER	32166	3RS ET
09-Jun-17	AW	1	1.040	SUMMER	32166	3RS ET
09-Jun-17	AW	2	3.900	SUMMER	32166	3RS ET
09-Jun-17	WL	1	2.850	SUMMER	32166	3RS ET
09-Jun-17	WL	2	5.782	SUMMER	32166	3RS ET
09-Jun-17	WL	3	13.859	SUMMER	32166	3RS ET
09-Jun-17	WL	4	8.589	SUMMER	32166	3RS ET
09-Jun-17	WL	5	0.920	SUMMER	32166	3RS ET
09-Jun-17	SWL	2	0.521	SUMMER	32166	3RS ET
09-Jun-17	SWL	3	1.399	SUMMER	32166	3RS ET
09-Jun-17	SWL	4	4.060	SUMMER	32166	3RS ET
12-Jun-17	DB	2	1.520	SUMMER	32166	3RS ET
12-Jun-17	DB	3	6.350	SUMMER	32166	3RS ET
12-Jun-17	DB	4	10.730	SUMMER	32166	3RS ET
12-Jun-17	NEL	2	1.100	SUMMER	32166	3RS ET
12-Jun-17	NEL	3	28.890	SUMMER	32166	3RS ET
12-Jun-17	NEL	4	7.910	SUMMER	32166	3RS ET
15-Jun-17	DB	2	1.530	SUMMER	32166	3RS ET
15-Jun-17	DB	3	17.070	SUMMER	32166	3RS ET
15-Jun-17	NEL	1	4.600	SUMMER	32166	3RS ET
15-Jun-17	NEL	2	37.200	SUMMER	32166	3RS ET
22-Jun-17	SWL	2	25.837	SUMMER	32166	3RS ET
22-Jun-17	SWL	3	29.935	SUMMER	32166	3RS ET
22-Jun-17	SWL	4	2.840	SUMMER	32166	3RS ET
23-Jun-17	NWL	2	37.550	SUMMER	32166	3RS ET
23-Jun-17	NWL	3	31.360	SUMMER	32166	3RS ET
23-Jun-17	NWL	4	4.790	SUMMER	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
23-Jun-17	NEL	2	4.930	SUMMER	32166	3RS ET
23-Jun-17	NEL	3	2.930	SUMMER	32166	3RS ET
28-Jun-17	AW	2	4.750	SUMMER	32166	3RS ET
28-Jun-17	WL	2	4.697	SUMMER	32166	3RS ET
28-Jun-17	WL	3	16.707	SUMMER	32166	3RS ET
28-Jun-17	WL	4	8.280	SUMMER	32166	3RS ET
28-Jun-17	SWL	3	4.960	SUMMER	32166	3RS ET
11-Jul-17	AW	2	4.860	SUMMER	32166	3RS ET
11-Jul-17	WL	2	12.725	SUMMER	32166	3RS ET
11-Jul-17	WL	3	13.429	SUMMER	32166	3RS ET
11-Jul-17	WL	4	2.400	SUMMER	32166	3RS ET
11-Jul-17	SWL	2	1.616	SUMMER	32166	3RS ET
11-Jul-17	SWL	3	3.150	SUMMER	32166	3RS ET
12-Jul-17	NWL	1	16.730	SUMMER	32166	3RS ET
12-Jul-17	NWL	2	27.170	SUMMER	32166	3RS ET
12-Jul-17	NWL	3	30.520	SUMMER	32166	3RS ET
12-Jul-17	NWL	4	0.700	SUMMER	32166	3RS ET
13-Jul-17	DB	2	10.290	SUMMER	32166	3RS ET
13-Jul-17	DB	3	8.410	SUMMER	32166	3RS ET
13-Jul-17	NEL	2	4.253	SUMMER	32166	3RS ET
13-Jul-17	NEL	3	27.477	SUMMER	32166	3RS ET
13-Jul-17	NEL	4	14.770	SUMMER	32166	3RS ET
14-Jul-17	NWL	2	29.960	SUMMER	32166	3RS ET
14-Jul-17	NWL	3	33.840	SUMMER	32166	3RS ET
14-Jul-17	NWL	4	9.330	SUMMER	32166	3RS ET
20-Jul-17	SWL	2	9.500	SUMMER	32166	3RS ET
20-Jul-17	SWL	3	39.350	SUMMER	32166	3RS ET
20-Jul-17	SWL	4	12.780	SUMMER	32166	3RS ET
20-Jul-17	SWL	5	1.030	SUMMER	32166	3RS ET
21-Jul-17	AW	2	3.510	SUMMER	32166	3RS ET
21-Jul-17	AW	3	1.320	SUMMER	32166	3RS ET
21-Jul-17	WL	2	13.854	SUMMER	32166	3RS ET
21-Jul-17	WL	3	10.040	SUMMER	32166	3RS ET
21-Jul-17	WL	4	7.050	SUMMER	32166	3RS ET
21-Jul-17	SWL	3	1.970	SUMMER	32166	3RS ET
21-Jul-17	SWL	4	4.660	SUMMER	32166	3RS ET
25-Jul-17	NEL	2	31.060	SUMMER	32166	3RS ET
25-Jul-17	NEL	3	15.740	SUMMER	32166	3RS ET
25-Jul-17	DB	2	6.400	SUMMER	32166	3RS ET
25-Jul-17	DB	3	6.457	SUMMER	32166	3RS ET
25-Jul-17	DB	4	5.843	SUMMER	32166	3RS ET
26-Jul-17	SWL	2	41.124	SUMMER	32166	3RS ET
26-Jul-17	SWL	3	11.530	SUMMER	32166	3RS ET
26-Jul-17	SWL	4	9.430	SUMMER	32166	3RS ET
04-Aug-17	NWL	1	11.000	SUMMER	32166	3RS ET
04-Aug-17	NWL	2	20.300	SUMMER	32166	3RS ET
04-Aug-17	NWL	3	42.293	SUMMER	32166	3RS ET
04-Aug-17	NWL	4	0.300	SUMMER	32166	3RS ET
08-Aug-17	NWL	3	16.760	SUMMER	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
08-Aug-17	NWL	4	57.140	SUMMER	32166	3RS ET
08-Aug-17	NWL	5	0.800	SUMMER	32166	3RS ET
09-Aug-17	DB	2	1.100	SUMMER	32166	3RS ET
09-Aug-17	DB	3	9.130	SUMMER	32166	3RS ET
09-Aug-17	DB	4	8.570	SUMMER	32166	3RS ET
09-Aug-17	NEL	2	29.120	SUMMER	32166	3RS ET
09-Aug-17	NEL	3	11.010	SUMMER	32166	3RS ET
09-Aug-17	NEL	4	4.470	SUMMER	32166	3RS ET
09-Aug-17	NEL	5	2.600	SUMMER	32166	3RS ET
14-Aug-17	AW	3	1.820	SUMMER	32166	3RS ET
14-Aug-17	AW	4	2.840	SUMMER	32166	3RS ET
14-Aug-17	WL	3	12.390	SUMMER	32166	3RS ET
14-Aug-17	WL	4	20.110	SUMMER	32166	3RS ET
14-Aug-17	SWL	3	12.400	SUMMER	32166	3RS ET
15-Aug-17	SWL	2	24.510	SUMMER	32166	3RS ET
15-Aug-17	SWL	3	29.836	SUMMER	32166	3RS ET
15-Aug-17	SWL	4	0.740	SUMMER	32166	3RS ET
21-Aug-17	SWL	1	2.600	SUMMER	32166	3RS ET
21-Aug-17	SWL	2	48.228	SUMMER	32166	3RS ET
21-Aug-17	SWL	3	7.160	SUMMER	32166	3RS ET
21-Aug-17	SWL	4	1.530	SUMMER	32166	3RS ET
22-Aug-17	AW	0	1.880	SUMMER	32166	3RS ET
22-Aug-17	AW	1	2.410	SUMMER	32166	3RS ET
22-Aug-17	WL	1	9.997	SUMMER	32166	3RS ET
22-Aug-17	WL	2	9.174	SUMMER	32166	3RS ET
22-Aug-17	WL	3	12.400	SUMMER	32166	3RS ET
22-Aug-17	WL	4	0.900	SUMMER	32166	3RS ET
22-Aug-17	SWL	1	1.940	SUMMER	32166	3RS ET
22-Aug-17	SWL	2	0.252	SUMMER	32166	3RS ET
22-Aug-17	SWL	3	3.154	SUMMER	32166	3RS ET
25-Aug-17	DB	2	14.360	SUMMER	32166	3RS ET
25-Aug-17	DB	3	3.840	SUMMER	32166	3RS ET
25-Aug-17	NEL	1	1.900	SUMMER	32166	3RS ET
25-Aug-17	NEL	2	34.960	SUMMER	32166	3RS ET
25-Aug-17	NEL	3	9.940	SUMMER	32166	3RS ET
11-Sep-17	SWL	1	9.330	AUTUMN	32166	3RS ET
11-Sep-17	SWL	2	51.970	AUTUMN	32166	3RS ET
12-Sep-17	SWL	3	5.564	AUTUMN	32166	3RS ET
12-Sep-17	SWL	4	1.334	AUTUMN	32166	3RS ET
12-Sep-17	WL	2	23.366	AUTUMN	32166	3RS ET
12-Sep-17	WL	3	8.530	AUTUMN	32166	3RS ET
12-Sep-17	WL	4	0.590	AUTUMN	32166	3RS ET
12-Sep-17	AW	2	4.850	AUTUMN	32166	3RS ET
13-Sep-17	NEL	1	5.293	AUTUMN	32166	3RS ET
13-Sep-17	NEL	2	41.007	AUTUMN	32166	3RS ET
13-Sep-17	NEL	3	1.200	AUTUMN	32166	3RS ET
13-Sep-17	DB	2	11.610	AUTUMN	32166	3RS ET
13-Sep-17	DB	3	7.190	AUTUMN	32166	3RS ET
14-Sep-17	DB	2	0.960	AUTUMN	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
14-Sep-17	DB	3	9.150	AUTUMN	32166	3RS ET
14-Sep-17	DB	4	5.740	AUTUMN	32166	3RS ET
14-Sep-17	DB	5	2.150	AUTUMN	32166	3RS ET
14-Sep-17	NEL	2	21.130	AUTUMN	32166	3RS ET
14-Sep-17	NEL	3	24.570	AUTUMN	32166	3RS ET
14-Sep-17	NEL	4	1.500	AUTUMN	32166	3RS ET
18-Sep-17	NWL	1	1.020	AUTUMN	32166	3RS ET
18-Sep-17	NWL	2	26.330	AUTUMN	32166	3RS ET
18-Sep-17	NWL	3	19.210	AUTUMN	32166	3RS ET
18-Sep-17	NWL	4	22.550	AUTUMN	32166	3RS ET
19-Sep-17	AW	2	2.890	AUTUMN	32166	3RS ET
19-Sep-17	AW	3	1.840	AUTUMN	32166	3RS ET
19-Sep-17	WL	1	3.460	AUTUMN	32166	3RS ET
19-Sep-17	WL	2	4.998	AUTUMN	32166	3RS ET
19-Sep-17	WL	3	7.760	AUTUMN	32166	3RS ET
19-Sep-17	WL	4	13.081	AUTUMN	32166	3RS ET
19-Sep-17	SWL	2	3.010	AUTUMN	32166	3RS ET
19-Sep-17	SWL	3	3.250	AUTUMN	32166	3RS ET
19-Sep-17	SWL	4	5.750	AUTUMN	32166	3RS ET
20-Sep-17	SWL	2	13.420	AUTUMN	32166	3RS ET
20-Sep-17	SWL	3	38.810	AUTUMN	32166	3RS ET
20-Sep-17	SWL	4	4.360	AUTUMN	32166	3RS ET
21-Sep-17	NWL	1	4.500	AUTUMN	32166	3RS ET
21-Sep-17	NWL	2	67.480	AUTUMN	32166	3RS ET
09-Oct-17	NEL	2	12.420	AUTUMN	32166	3RS ET
09-Oct-17	NEL	3	30.880	AUTUMN	32166	3RS ET
09-Oct-17	NEL	4	3.500	AUTUMN	32166	3RS ET
09-Oct-17	DB	2	0.900	AUTUMN	32166	3RS ET
09-Oct-17	DB	3	11.560	AUTUMN	32166	3RS ET
09-Oct-17	DB	4	5.640	AUTUMN	32166	3RS ET
18-Oct-17	NEL	2	43.800	AUTUMN	32166	3RS ET
18-Oct-17	NEL	3	3.000	AUTUMN	32166	3RS ET
18-Oct-17	DB	1	0.300	AUTUMN	32166	3RS ET
18-Oct-17	DB	2	15.030	AUTUMN	32166	3RS ET
18-Oct-17	DB	3	2.470	AUTUMN	32166	3RS ET
19-Oct-17	SWL	2	3.260	AUTUMN	32166	3RS ET
19-Oct-17	SWL	3	32.800	AUTUMN	32166	3RS ET
19-Oct-17	SWL	4	26.700	AUTUMN	32166	3RS ET
23-Oct-17	SWL	2	19.370	AUTUMN	32166	3RS ET
23-Oct-17	SWL	3	41.060	AUTUMN	32166	3RS ET
23-Oct-17	SWL	4	2.300	AUTUMN	32166	3RS ET
24-Oct-17	NWL	2	35.250	AUTUMN	32166	3RS ET
24-Oct-17	NWL	3	39.850	AUTUMN	32166	3RS ET
25-Oct-17	NWL	1	2.320	AUTUMN	32166	3RS ET
25-Oct-17	NWL	2	48.270	AUTUMN	32166	3RS ET
25-Oct-17	NWL	3	23.420	AUTUMN	32166	3RS ET
26-Oct-17	AW	2	4.880	AUTUMN	32166	3RS ET
26-Oct-17	WL	2	25.367	AUTUMN	32166	3RS ET
26-Oct-17	WL	3	7.387	AUTUMN	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
26-Oct-17	SWL	2	6.890	AUTUMN	32166	3RS ET
27-Oct-17	SWL	2	3.450	AUTUMN	32166	3RS ET
27-Oct-17	SWL	3	3.360	AUTUMN	32166	3RS ET
27-Oct-17	WL	2	5.730	AUTUMN	32166	3RS ET
27-Oct-17	WL	3	20.457	AUTUMN	32166	3RS ET
27-Oct-17	WL	4	7.333	AUTUMN	32166	3RS ET
27-Oct-17	AW	2	4.890	AUTUMN	32166	3RS ET
06-Nov-17	NEL	2	37.700	AUTUMN	32166	3RS ET
06-Nov-17	NEL	3	9.600	AUTUMN	32166	3RS ET
06-Nov-17	DB	1	1.800	AUTUMN	32166	3RS ET
06-Nov-17	DB	2	12.443	AUTUMN	32166	3RS ET
06-Nov-17	DB	3	4.157	AUTUMN	32166	3RS ET
07-Nov-17	NWL	2	5.860	AUTUMN	32166	3RS ET
07-Nov-17	NWL	3	53.860	AUTUMN	32166	3RS ET
07-Nov-17	NWL	4	14.980	AUTUMN	32166	3RS ET
15-Nov-17	NWL	2	13.220	AUTUMN	32166	3RS ET
15-Nov-17	NWL	3	55.550	AUTUMN	32166	3RS ET
15-Nov-17	NWL	4	5.100	AUTUMN	32166	3RS ET
16-Nov-17	DB	2	6.730	AUTUMN	32166	3RS ET
16-Nov-17	DB	3	9.810	AUTUMN	32166	3RS ET
16-Nov-17	DB	4	2.260	AUTUMN	32166	3RS ET
16-Nov-17	NEL	2	12.810	AUTUMN	32166	3RS ET
16-Nov-17	NEL	3	31.090	AUTUMN	32166	3RS ET
16-Nov-17	NEL	4	2.100	AUTUMN	32166	3RS ET
17-Nov-17	AW	2	2.920	AUTUMN	32166	3RS ET
17-Nov-17	AW	3	1.800	AUTUMN	32166	3RS ET
17-Nov-17	WL	1	1.082	AUTUMN	32166	3RS ET
17-Nov-17	WL	2	18.218	AUTUMN	32166	3RS ET
17-Nov-17	WL	3	1.660	AUTUMN	32166	3RS ET
17-Nov-17	WL	4	12.240	AUTUMN	32166	3RS ET
17-Nov-17	SWL	3	16.340	AUTUMN	32166	3RS ET
17-Nov-17	SWL	4	2.360	AUTUMN	32166	3RS ET
20-Nov-17	SWL	2	3.100	AUTUMN	32166	3RS ET
20-Nov-17	SWL	3	24.410	AUTUMN	32166	3RS ET
20-Nov-17	SWL	4	22.590	AUTUMN	32166	3RS ET
21-Nov-17	AW	3	4.660	AUTUMN	32166	3RS ET
21-Nov-17	WL	2	1.000	AUTUMN	32166	3RS ET
21-Nov-17	WL	3	22.000	AUTUMN	32166	3RS ET
21-Nov-17	WL	4	10.500	AUTUMN	32166	3RS ET
21-Nov-17	SWL	2	3.860	AUTUMN	32166	3RS ET
21-Nov-17	SWL	3	12.600	AUTUMN	32166	3RS ET
21-Nov-17	SWL	4	2.190	AUTUMN	32166	3RS ET
22-Nov-17	SWL	3	4.100	AUTUMN	32166	3RS ET
22-Nov-17	SWL	4	18.741	AUTUMN	32166	3RS ET
22-Nov-17	SWL	5	27.459	AUTUMN	32166	3RS ET
06-Dec-17	NWL	2	38.557	WINTER	32166	3RS ET
06-Dec-17	NWL	3	33.211	WINTER	32166	3RS ET
07-Dec-17	AW	2	4.662	WINTER	32166	3RS ET
07-Dec-17	WL	2	8.193	WINTER	32166	3RS ET

DATE	AREA	BEAU	KM SEARCHED	SEASON	VESSEL	TYPE
07-Dec-17	WL	3	25.630	WINTER	32166	3RS ET
07-Dec-17	SWL	2	1.930	WINTER	32166	3RS ET
07-Dec-17	SWL	3	4.795	WINTER	32166	3RS ET
08-Dec-17	SWL	3	27.200	WINTER	32166	3RS ET
08-Dec-17	SWL	4	23.990	WINTER	32166	3RS ET
08-Dec-17	SWL	5	11.760	WINTER	32166	3RS ET
13-Dec-17	NEL	2	46.600	WINTER	32166	3RS ET
13-Dec-17	DB	2	11.530	WINTER	32166	3RS ET
13-Dec-17	DB	3	7.160	WINTER	32166	3RS ET
14-Dec-17	NWL	2	63.690	WINTER	32166	3RS ET
14-Dec-17	NWL	3	11.210	WINTER	32166	3RS ET
18-Dec-17	SWL	3	10.240	WINTER	32166	3RS ET
18-Dec-17	SWL	4	35.830	WINTER	32166	3RS ET
18-Dec-17	SWL	5	17.000	WINTER	32166	3RS ET
21-Dec-17	DB	3	9.500	WINTER	32166	3RS ET
21-Dec-17	DB	4	9.050	WINTER	32166	3RS ET
21-Dec-17	NEL	2	10.490	WINTER	32166	3RS ET
21-Dec-17	NEL	3	25.110	WINTER	32166	3RS ET
21-Dec-17	NEL	4	10.900	WINTER	32166	3RS ET
28-Dec-17	AW	2	4.810	WINTER	32166	3RS ET
28-Dec-17	WL	2	32.373	WINTER	32166	3RS ET
28-Dec-17	WL	3	0.910	WINTER	32166	3RS ET
28-Dec-17	SWL	2	5.346	WINTER	32166	3RS ET
28-Dec-17	SWL	3	1.280	WINTER	32166	3RS ET

CWD Small Vessel Line-transect Survey

Sighting Data

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
05-Jan-17	1	1010	CWD	9	WL	2	822	ON	3RS ET	22.2934	113.8612	WINTER	NONE
05-Jan-17	2	1051	CWD	2	WL	2	1361	ON	3RS ET	22.2738	113.8482	WINTER	NONE
05-Jan-17	3	1118	CWD	2	WL	2	118	ON	3RS ET	22.2584	113.8381	WINTER	NONE
05-Jan-17	4	1150	CWD	1	WL	2	65	ON	3RS ET	22.2413	113.8339	WINTER	NONE
05-Jan-17	5	1208	CWD	1	WL	2	86	ON	3RS ET	22.2321	113.8316	WINTER	NONE
05-Jan-17	6	1223	CWD	1	WL	1	115	ON	3RS ET	22.2248	113.8374	WINTER	NONE
05-Jan-17	7	1315	CWD	11	WL	1	84	ON	3RS ET	22.2049	113.8249	WINTER	PAIR TRAWLER
05-Jan-17	8	1347	CWD	1	WL	1	49	ON	3RS ET	22.1961	113.8317	WINTER	NONE
05-Jan-17	9	1356	CWD	1	WL	1	59	ON	3RS ET	22.1960	113.8416	WINTER	NONE
05-Jan-17	10	1436	CWD	5	SWL	2	190	ON	3RS ET	22.1726	113.8527	WINTER	PAIR TRAWLER
06-Jan-17	1	1006	CWD	2	SWL	2	N/A	OFF	3RS ET	22.1938	113.8471	WINTER	NONE
06-Jan-17	2	1453	CWD	1	SWL	1	N/A	OFF	3RS ET	22.2230	113.9451	WINTER	NONE
12-Jan-17	1	1121	CWD	5	NWL	2	260	ON	3RS ET	22.3739	113.8775	WINTER	NONE
13-Jan-17	1	1016	CWD	3	SWL	3	N/A	OFF	3RS ET	22.1948	113.8538	WINTER	NONE
13-Jan-17	2	1036	CWD	11	SWL	3	435	ON	3RS ET	22.1998	113.8688	WINTER	NONE
13-Jan-17	3	1334	CWD	2	SWL	2	41	ON	3RS ET	22.1547	113.9030	WINTER	NONE
13-Jan-17	4	1434	CWD	1	SWL	3	44	ON	3RS ET	22.1847	113.9278	WINTER	NONE
19-Jan-17	1	0926	CWD	3	AW	1	23	ON	3RS ET	22.3010	113.8864	WINTER	NONE
19-Jan-17	2	1022	CWD	1	WL	3	383	ON	3RS ET	22.2791	113.8613	WINTER	NONE
19-Jan-17	3	1107	CWD	6	WL	2	690	ON	3RS ET	22.2594	113.8430	WINTER	GILLNETTER
19-Jan-17	4	1131	CWD	1	WL	3	950	ON	3RS ET	22.2504	113.8413	WINTER	NONE
19-Jan-17	5	1217	CWD	2	WL	3	N/A	OFF	3RS ET	22.2234	113.8320	WINTER	NONE
19-Jan-17	6	1403	CWD	4	SWL	3	69	ON	3RS ET	22.1951	113.8587	WINTER	NONE
19-Jan-17	7	1436	CWD	2	WL	3	N/A	OFF	3RS ET	22.2198	113.8341	WINTER	NONE
19-Jan-17	8	1439	CWD	3	WL	3	N/A	OFF	3RS ET	22.2218	113.8351	WINTER	NONE
06-Feb-17	1	1013	CWD	3	WL	3	854	ON	3RS ET	22.2826	113.8613	WINTER	NONE
06-Feb-17	2	1140	CWD	3	WL	2	243	ON	3RS ET	22.2237	113.8323	WINTER	NONE
06-Feb-17	3	1218	CWD	3	WL	3	23	ON	3RS ET	22.2147	113.8300	WINTER	NONE
16-Feb-17	1	0957	CWD	2	AW	1	16	ON	3RS ET	22.2920	113.8749	WINTER	GILLNETTER
16-Feb-17	2	1037	CWD	5	WL	1	220	ON	3RS ET	22.2953	113.8612	WINTER	NONE
16-Feb-17	3	1121	CWD	4	WL	1	58	ON	3RS ET	22.2628	113.8564	WINTER	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
16-Feb-17	4	1147	CWD	3	WL	1	244	ON	3RS ET	22.2602	113.8470	WINTER	NONE
16-Feb-17	5	1206	CWD	2	WL	1	53	ON	3RS ET	22.2535	113.8348	WINTER	NONE
16-Feb-17	6	1215	CWD	3	WL	1	20	ON	3RS ET	22.2504	113.8378	WINTER	NONE
16-Feb-17	7	1231	CWD	7	WL	1	173	ON	3RS ET	22.2418	113.8473	WINTER	NONE
16-Feb-17	8	1304	CWD	2	WL	1	19	ON	3RS ET	22.2414	113.8428	WINTER	NONE
16-Feb-17	9	1315	CWD	2	WL	1	31	ON	3RS ET	22.2382	113.8266	WINTER	NONE
16-Feb-17	10	1333	CWD	14	WL	1	226	ON	3RS ET	22.2308	113.8381	WINTER	PURSE SEINER
16-Feb-17	11	1420	CWD	2	WL	2	452	ON	3RS ET	22.2139	113.8244	WINTER	NONE
16-Feb-17	12	1449	CWD	1	WL	2	29	ON	3RS ET	22.2051	113.8191	WINTER	NONE
17-Feb-17	1	1048	FP	2	SWL	2	174	ON	3RS ET	22.1586	113.9356	WINTER	NONE
17-Feb-17	2	1238	CWD	3	SWL	1	1380	ON	3RS ET	22.2005	113.9079	WINTER	PURSE SEINER
17-Feb-17	3	1349	CWD	2	SWL	1	50	ON	3RS ET	22.1889	113.8879	WINTER	NONE
17-Feb-17	4	1551	CWD	1	SWL	1	N/A	OFF	3RS ET	22.2009	113.8934	WINTER	NONE
17-Feb-17	5	1559	CWD	1	SWL	1	N/A	OFF	3RS ET	22.2025	113.9121	WINTER	NONE
20-Feb-17	1	1137	CWD	1	NWL	2	259	ON	3RS ET	22.3819	113.8760	WINTER	NONE
21-Feb-17	1	1137	CWD	4	NWL	3	64	ON	3RS ET	22.3866	113.8776	WINTER	NONE
13-Mar-17	1	1130	CWD	4	WL	2	374	ON	3RS ET	22.2229	113.8269	SPRING	NONE
14-Mar-17	1	1045	FP	1	SWL	4	N/A	OFF	3RS ET	22.1827	113.9356	SPRING	NONE
14-Mar-17	2	1214	FP	1	SWL	5	N/A	ON	3RS ET	22.1461	113.9081	SPRING	NONE
20-Mar-17	1	1025	CWD	1	SWL	2	209	ON	3RS ET	22.2001	113.8688	SPRING	GILLNETTER
20-Mar-17	2	1211	FP	1	SWL	2	100	ON	3RS ET	22.1622	113.8978	SPRING	NONE
20-Mar-17	3	1257	CWD	1	SWL	2	36	ON	3RS ET	22.1846	113.9041	SPRING	NONE
20-Mar-17	4	1432	FP	3	SWL	3	108	ON	3RS ET	22.1470	113.9278	SPRING	NONE
20-Mar-17	5	1439	FP	2	SWL	3	63	ON	3RS ET	22.1472	113.9326	SPRING	NONE
20-Mar-17	6	1457	FP	2	SWL	3	24	ON	3RS ET	22.1816	113.9359	SPRING	NONE
21-Mar-17	1	1025	CWD	4	WL	1	202	ON	3RS ET	22.2603	113.8533	SPRING	PURSE SEINER
21-Mar-17	2	1214	CWD	13	WL	3	397	ON	3RS ET	22.1980	113.8262	SPRING	PURSE SEINER
21-Mar-17	3	1242	CWD	7	WL	2	1163	ON	3RS ET	22.1870	113.8386	SPRING	PURSE SEINER
23-Mar-17	1	1128	CWD	3	NWL	1	123	ON	3RS ET	22.3779	113.8767	SPRING	NONE
23-Mar-17	2	1222	CWD	3	NWL	1	19	ON	3RS ET	22.3733	113.8881	SPRING	NONE
05-Apr-17	1	1132	CWD	2	NWL	2	128	ON	3RS ET	22.3787	113.8765	SPRING	NONE
05-Apr-17	2	1147	CWD	3	NWL	2	16	ON	3RS ET	22.3827	113.8768	SPRING	NONE
11-Apr-17	1	1042	FP	1	SWL	1	336	ON	3RS ET	22.1801	113.9363	SPRING	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
11-Apr-17	2	1051	FP	6	SWL	1	3	ON	3RS ET	22.1699	113.9359	SPRING	NONE
11-Apr-17	3	1103	FP	5	SWL	1	43	ON	3RS ET	22.1561	113.9358	SPRING	NONE
11-Apr-17	4	1212	FP	5	SWL	2	363	ON	3RS ET	22.1480	113.9180	SPRING	NONE
18-Apr-17	1	1023	CWD	1	WL	3	17	ON	3RS ET	22.2698	113.8441	SPRING	NONE
18-Apr-17	2	1047	CWD	7	WL	2	580	ON	3RS ET	22.2605	113.8488	SPRING	NONE
18-Apr-17	3	1113	CWD	5	WL	2	277	ON	3RS ET	22.2578	113.8378	SPRING	NONE
18-Apr-17	4	1246	CWD	3	WL	2	278	ON	3RS ET	22.1873	113.8417	SPRING	NONE
18-Apr-17	5	1302	CWD	5	WL	2	450	ON	3RS ET	22.1870	113.8378	SPRING	NONE
18-Apr-17	6	1330	CWD	2	SWL	2	40	ON	3RS ET	22.1831	113.8499	SPRING	NONE
18-Apr-17	7	1406	CWD	2	SWL	2	512	ON	3RS ET	22.1925	113.8595	SPRING	NONE
26-Apr-17	1	1022	CWD	1	SWL	2	48	ON	3RS ET	22.2170	113.9356	SPRING	PURSE SEINER
26-Apr-17	2	1224	FP	2	SWL	2	89	ON	3RS ET	22.1526	113.9068	SPRING	NONE
26-Apr-17	3	1441	CWD	3	SWL	3	55	ON	3RS ET	22.1699	113.8684	SPRING	NONE
26-Apr-17	4	1456	CWD	2	SWL	3	755	ON	3RS ET	22.1692	113.8691	SPRING	NONE
04-May-17	1	1423	CWD	2	SWL	1	318	ON	3RS ET	22.2114	113.8839	SPRING	NONE
05-May-17	1	1032	CWD	11	WL	3	143	ON	3RS ET	22.2318	113.8279	SPRING	NONE
05-May-17	2	1121	CWD	3	WL	2	263	ON	3RS ET	22.2231	113.8363	SPRING	NONE
05-May-17	3	1135	CWD	1	WL	2	271	ON	3RS ET	22.2230	113.8263	SPRING	NONE
05-May-17	4	1211	CWD	5	WL	2	343	ON	3RS ET	22.2053	113.8398	SPRING	NONE
05-May-17	5	1305	CWD	7	WL	2	650	ON	3RS ET	22.1966	113.8405	SPRING	NONE
11-May-17	1	1041	CWD	1	WL	1	171	ON	3RS ET	22.2598	113.8467	SPRING	NONE
11-May-17	2	1118	CWD	9	WL	1	800	ON	3RS ET	22.2466	113.8511	SPRING	NONE
11-May-17	3	1148	CWD	13	WL	2	442	ON	3RS ET	22.2414	113.8442	SPRING	NONE
11-May-17	4	1217	CWD	6	WL	2	118	ON	3RS ET	22.2407	113.8333	SPRING	NONE
11-May-17	5	1228	CWD	6	WL	1	79	ON	3RS ET	22.2378	113.8266	SPRING	NONE
11-May-17	6	1236	CWD	7	WL	2	760	ON	3RS ET	22.2316	113.8287	SPRING	NONE
11-May-17	7	1315	CWD	9	WL	3	306	ON	3RS ET	22.2231	113.8195	SPRING	NONE
11-May-17	8	1335	CWD	11	WL	3	26	ON	3RS ET	22.2157	113.8177	SPRING	NONE
11-May-17	9	1432	CWD	6	WL	3	1021	ON	3RS ET	22.1867	113.8433	SPRING	NONE
11-May-17	10	1513	CWD	6	SWL	4	409	ON	3RS ET	22.1827	113.8498	SPRING	NONE
11-May-17	11	1543	CWD	4	SWL	3	354	ON	3RS ET	22.1967	113.8590	SPRING	NONE
23-May-17	1	1115	CWD	2	SWL	3	1472	ON	3RS ET	22.1802	113.9281	SPRING	NONE
23-May-17	2	1459	CWD	2	SWL	2	N/A	OFF	3RS ET	22.2029	113.8976	SPRING	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
07-Jun-17	1	1224	CWD	1	SWL	2	N/A	OFF	3RS ET	22.1766	113.9070	SUMMER	NONE
07-Jun-17	2	1249	CWD	6	SWL	2	125	ON	3RS ET	22.2030	113.9079	SUMMER	NONE
07-Jun-17	3	1507	CWD	2	SWL	2	116	ON	3RS ET	22.2007	113.8684	SUMMER	NONE
08-Jun-17	1	1202	CWD	2	NWL	3	362	ON	3RS ET	22.3993	113.8889	SUMMER	NONE
09-Jun-17	1	1106	CWD	5	WL	2	846	ON	3RS ET	22.2413	113.8450	SUMMER	NONE
09-Jun-17	2	1207	CWD	2	WL	4	138	ON	3RS ET	22.2311	113.8382	SUMMER	NONE
09-Jun-17	3	1240	CWD	3	WL	3	44	ON	3RS ET	22.2120	113.8372	SUMMER	NONE
09-Jun-17	4	1358	CWD	5	SWL	3	6	ON	3RS ET	22.1915	113.8592	SUMMER	NONE
22-Jun-17	1	1026	CWD	9	SWL	2	620	ON	3RS ET	22.2094	113.9364	SUMMER	NONE
22-Jun-17	2	1200	CWD	3	SWL	3	11	ON	3RS ET	22.2054	113.9266	SUMMER	NONE
22-Jun-17	3	1212	CWD	1	SWL	3	67	ON	3RS ET	22.2055	113.9258	SUMMER	NONE
22-Jun-17	4	1222	CWD	1	SWL	3	25	ON	3RS ET	22.2053	113.9191	SUMMER	NONE
22-Jun-17	5	1230	CWD	2	SWL	2	64	ON	3RS ET	22.2026	113.9178	SUMMER	NONE
22-Jun-17	6	1248	CWD	1	SWL	2	720	ON	3RS ET	22.1941	113.9184	SUMMER	NONE
22-Jun-17	7	1354	CWD	2	SWL	2	28	ON	3RS ET	22.1916	113.9083	SUMMER	NONE
22-Jun-17	8	1406	CWD	3	SWL	2	5	ON	3RS ET	22.2063	113.9061	SUMMER	NONE
23-Jun-17	1	1001	CWD	1	NWL	2	72	ON	3RS ET	22.3476	113.8690	SUMMER	NONE
23-Jun-17	2	1212	CWD	2	NWL	3	17	ON	3RS ET	22.4073	113.8882	SUMMER	NONE
28-Jun-17	1	1028	CWD	3	WL	3	869	ON	3RS ET	22.2694	113.8568	SUMMER	NONE
28-Jun-17	2	1047	CWD	3	WL	2	65	ON	3RS ET	22.2649	113.8580	SUMMER	NONE
28-Jun-17	3	1119	CWD	5	WL	3	49	ON	3RS ET	22.2480	113.8515	SUMMER	NONE
28-Jun-17	4	1141	CWD	2	WL	3	250	ON	3RS ET	22.2411	113.8454	SUMMER	NONE
28-Jun-17	5	1201	CWD	2	WL	3	4	ON	3RS ET	22.2321	113.8296	SUMMER	NONE
28-Jun-17	6	1214	CWD	5	WL	4	482	ON	3RS ET	22.2232	113.8342	SUMMER	NONE
28-Jun-17	7	1250	CWD	2	WL	3	441	ON	3RS ET	22.2144	113.8268	SUMMER	NONE
28-Jun-17	8	1330	CWD	5	WL	3	224	ON	3RS ET	22.1953	113.8375	SUMMER	NONE
28-Jun-17	9	1428	CWD	1	SWL	3	1164	ON	3RS ET	22.1831	113.8593	SUMMER	NONE
11-Jul-17	1	1038	CWD	2	WL	2	82	ON	3RS ET	22.2668	113.8592	SUMMER	NONE
11-Jul-17	2	1055	CWD	8	WL	2	19	ON	3RS ET	22.2608	113.8536	SUMMER	NONE
11-Jul-17	3	1133	CWD	2	WL	3	351	ON	3RS ET	22.2498	113.8403	SUMMER	NONE
11-Jul-17	4	1144	CWD	1	WL	2	8	ON	3RS ET	22.2500	113.8500	SUMMER	NONE
11-Jul-17	5	1159	CWD	4	WL	2	726	ON	3RS ET	22.2432	113.8488	SUMMER	NONE
11-Jul-17	6	1216	CWD	1	WL	2	17	ON	3RS ET	22.2414	113.8463	SUMMER	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
11-Jul-17	7	1242	CWD	2	WL	3	11	ON	3RS ET	22.2279	113.8378	SUMMER	NONE
11-Jul-17	8	1259	CWD	2	WL	3	196	ON	3RS ET	22.2185	113.8137	SUMMER	NONE
11-Jul-17	9	1318	CWD	2	WL	3	16	ON	3RS ET	22.2143	113.8333	SUMMER	NONE
11-Jul-17	10	1350	CWD	7	WL	4	324	ON	3RS ET	22.1969	113.8397	SUMMER	NONE
11-Jul-17	11	1414	CWD	3	WL	4	157	ON	3RS ET	22.1864	113.8401	SUMMER	NONE
11-Jul-17	12	1435	CWD	4	SWL	2	118	ON	3RS ET	22.1903	113.8499	SUMMER	NONE
11-Jul-17	13	1506	CWD	4	SWL	2	299	ON	3RS ET	22.1883	113.8593	SUMMER	NONE
12-Jul-17	1	0950	CWD	2	NWL	1	70	ON	3RS ET	22.3715	113.8673	SUMMER	NONE
12-Jul-17	2	1316	CWD	1	NWL	3	102	ON	3RS ET	22.3998	113.8983	SUMMER	NONE
14-Jul-17	1	0953	CWD	1	NWL	3	351	ON	3RS ET	22.3615	113.8666	SUMMER	NONE
14-Jul-17	2	1048	CWD	2	NWL	2	890	ON	3RS ET	22.2773	113.8689	SUMMER	NONE
14-Jul-17	3	1210	CWD	1	NWL	2	169	ON	3RS ET	22.3909	113.8780	SUMMER	NONE
20-Jul-17	1	1412	CWD	2	SWL	3	319	ON	3RS ET	22.1776	113.8785	SUMMER	NONE
20-Jul-17	2	1457	CWD	1	SWL	3	2226	ON	3RS ET	22.1900	113.8678	SUMMER	NONE
20-Jul-17	3	1524	CWD	3	WL	2	N/A	OFF	3RS ET	22.2178	113.8339	SUMMER	NONE
21-Jul-17	1	1032	CWD	5	WL	2	20	ON	3RS ET	22.2649	113.8585	SUMMER	NONE
21-Jul-17	2	1131	CWD	2	WL	3	65	ON	3RS ET	22.2318	113.8372	SUMMER	NONE
21-Jul-17	3	1151	CWD	2	WL	2	17	ON	3RS ET	22.2288	113.8383	SUMMER	NONE
21-Jul-17	4	1208	CWD	2	WL	3	190	ON	3RS ET	22.2182	113.8138	SUMMER	NONE
21-Jul-17	5	1223	CWD	2	WL	4	27	ON	3RS ET	22.2139	113.8322	SUMMER	NONE
21-Jul-17	6	1243	CWD	1	WL	4	62	ON	3RS ET	22.2048	113.8383	SUMMER	NONE
21-Jul-17	7	1310	CWD	6	WL	3	27	ON	3RS ET	22.1956	113.8425	SUMMER	NONE
25-Jul-17	1	1301	CWD	4	DB	4	N/A	OFF	3RS ET	22.4062	113.8941	SUMMER	NONE
26-Jul-17	1	1026	CWD	1	WL	2	N/A	OFF	3RS ET	22.2362	113.8409	SUMMER	NONE
26-Jul-17	2	1033	CWD	2	WL	2	N/A	OFF	3RS ET	22.2183	113.8339	SUMMER	NONE
26-Jul-17	3	1045	CWD	2	SWL	2	N/A	OFF	3RS ET	22.1948	113.8509	SUMMER	NONE
26-Jul-17	4	1056	CWD	3	SWL	2	252	ON	3RS ET	22.1999	113.8684	SUMMER	NONE
26-Jul-17	5	1301	CWD	7	SWL	2	234	ON	3RS ET	22.2036	113.9083	SUMMER	NONE
26-Jul-17	6	1411	FP	2	SWL	3	87	ON	3RS ET	22.1534	113.9183	SUMMER	NONE
26-Jul-17	7	1437	CWD	2	SWL	3	711	ON	3RS ET	22.2040	113.9181	SUMMER	GILLNETTER
04-Aug-17	1	1202	CWD	2	NWL	3	41	ON	3RS ET	22.4075	113.8878	SUMMER	NONE
04-Aug-17	2	1322	CWD	3	NWL	3	42	ON	3RS ET	22.3735	113.8980	SUMMER	NONE
04-Aug-17	3	1339	CWD	3	NWL	1	3	ON	3RS ET	22.3782	113.8978	SUMMER	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
08-Aug-17	1	1305	CWD	2	NWL	4	N/A	OFF	3RS ET	22.3817	113.8981	SUMMER	NONE
14-Aug-17	1	1121	CWD	1	WL	3	98	ON	3RS ET	22.2321	113.8264	SUMMER	NONE
14-Aug-17	2	1242	CWD	2	WL	4	149	ON	3RS ET	22.1874	113.8301	SUMMER	NONE
14-Aug-17	3	1252	CWD	4	WL	4	N/A	OFF	3RS ET	22.1920	113.8425	SUMMER	NONE
14-Aug-17	4	1316	CWD	1	SWL	3	N/A	OFF	3RS ET	22.1906	113.8491	SUMMER	NONE
15-Aug-17	1	1029	CWD	1	SWL	2	303	ON	3RS ET	22.2108	113.9358	SUMMER	NONE
15-Aug-17	2	1131	CWD	1	SWL	3	182	ON	3RS ET	22.1818	113.9276	SUMMER	NONE
15-Aug-17	3	1255	CWD	5	SWL	2	146	ON	3RS ET	22.1784	113.9041	SUMMER	NONE
15-Aug-17	4	1338	CWD	1	SWL	3	1090	ON	3RS ET	22.1901	113.8967	SUMMER	NONE
15-Aug-17	5	1343	CWD	8	SWL	3	477	ON	3RS ET	22.1853	113.8973	SUMMER	NONE
15-Aug-17	6	1407	CWD	1	SWL	2	783	ON	3RS ET	22.1756	113.8969	SUMMER	NONE
15-Aug-17	7	1455	CWD	3	SWL	2	11	ON	3RS ET	22.1794	113.8876	SUMMER	NONE
21-Aug-17	1	1232	CWD	3	SWL	3	156	ON	3RS ET	22.1673	113.9050	SUMMER	GILLNETTER
21-Aug-17	2	1333	CWD	2	SWL	2	29	ON	3RS ET	22.1789	113.8982	SUMMER	NONE
21-Aug-17	3	1344	CWD	8	SWL	2	713	ON	3RS ET	22.1741	113.8972	SUMMER	NONE
21-Aug-17	4	1431	CWD	8	SWL	2	174	ON	3RS ET	22.1729	113.8875	SUMMER	NONE
21-Aug-17	5	1516	CWD	3	SWL	2	15	ON	3RS ET	22.1796	113.8786	SUMMER	NONE
21-Aug-17	6	1539	CWD	2	SWL	2	126	ON	3RS ET	22.1665	113.8688	SUMMER	NONE
21-Aug-17	7	1549	CWD	2	SWL	2	28	ON	3RS ET	22.1720	113.8690	SUMMER	NONE
22-Aug-17	1	0943	CWD	1	AW	1	87	ON	3RS ET	22.2965	113.8825	SUMMER	NONE
22-Aug-17	2	1031	CWD	1	WL	1	37	ON	3RS ET	22.2776	113.8518	SUMMER	NONE
22-Aug-17	3	1043	CWD	2	WL	1	6	ON	3RS ET	22.2684	113.8457	SUMMER	NONE
22-Aug-17	4	1059	CWD	2	WL	1	140	ON	3RS ET	22.2656	113.8585	SUMMER	NONE
22-Aug-17	5	1112	CWD	1	WL	1	189	ON	3RS ET	22.2609	113.8550	SUMMER	NONE
22-Aug-17	6	1127	CWD	6	WL	1	84	ON	3RS ET	22.2602	113.8396	SUMMER	NONE
22-Aug-17	7	1202	CWD	4	WL	2	149	ON	3RS ET	22.2419	113.8404	SUMMER	NONE
22-Aug-17	8	1326	CWD	1	WL	3	31	ON	3RS ET	22.1875	113.8419	SUMMER	NONE
22-Aug-17	9	1335	CWD	4	WL	2	376	ON	3RS ET	22.1865	113.8386	SUMMER	NONE
22-Aug-17	10	1408	CWD	3	SWL	3	182	ON	3RS ET	22.1718	113.8533	SUMMER	NONE
22-Aug-17	11	1432	CWD	4	SWL	2	210	ON	3RS ET	22.1748	113.8594	SUMMER	NONE
11-Sep-17	1	1131	CWD	1	SWL	2	83	ON	3RS ET	22.2054	113.9212	AUTUMN	NONE
11-Sep-17	2	1344	CWD	4	SWL	1	780	ON	3RS ET	22.1795	113.8881	AUTUMN	NONE
12-Sep-17	1	1045	CWD	1	SWL	4	93	ON	3RS ET	22.1932	113.8584	AUTUMN	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
12-Sep-17	2	1110	CWD	3	SWL	3	N/A	OFF	3RS ET	22.1814	113.8492	AUTUMN	NONE
12-Sep-17	3	1211	CWD	4	WL	2	53	ON	3RS ET	22.2150	113.8309	AUTUMN	NONE
12-Sep-17	4	1347	CWD	3	WL	2	60	ON	3RS ET	22.2608	113.8471	AUTUMN	NONE
12-Sep-17	5	1358	CWD	3	WL	2	107	ON	3RS ET	22.2640	113.8582	AUTUMN	NONE
18-Sep-17	1	1009	CWD	15	NWL	2	248	ON	3RS ET	22.3365	113.8679	AUTUMN	NONE
18-Sep-17	2	1211	CWD	2	NWL	2	151	ON	3RS ET	22.4006	113.8778	AUTUMN	NONE
18-Sep-17	3	1345	CWD	1	NWL	3	65	ON	3RS ET	22.4003	113.8976	AUTUMN	NONE
19-Sep-17	1	1020	CWD	6	WL	1	860	ON	3RS ET	22.2745	113.8488	AUTUMN	NONE
19-Sep-17	2	1106	CWD	4	WL	2	57	ON	3RS ET	22.2652	113.8578	AUTUMN	NONE
19-Sep-17	3	1126	CWD	2	WL	2	428	ON	3RS ET	22.2603	113.8454	AUTUMN	NONE
19-Sep-17	4	1134	CWD	1	WL	3	30	ON	3RS ET	22.2573	113.8371	AUTUMN	NONE
19-Sep-17	5	1145	CWD	1	WL	3	18	ON	3RS ET	22.2497	113.8429	AUTUMN	NONE
19-Sep-17	6	1202	CWD	3	WL	3	73	ON	3RS ET	22.2408	113.8386	AUTUMN	NONE
19-Sep-17	7	1258	CWD	1	WL	4	113	ON	3RS ET	22.2053	113.8363	AUTUMN	NONE
19-Sep-17	8	1420	CWD	1	SWL	2	261	ON	3RS ET	22.2004	113.8659	AUTUMN	NONE
20-Sep-17	1	1215	CWD	7	SWL	2	305	ON	3RS ET	22.1643	113.9011	AUTUMN	NONE
20-Sep-17	2	1332	CWD	5	SWL	3	90	ON	3RS ET	22.1576	113.8969	AUTUMN	NONE
20-Sep-17	3	1434	CWD	3	SWL	2	496	ON	3RS ET	22.2053	113.8777	AUTUMN	NONE
20-Sep-17	4	1534	CWD	3	SWL	3	N/A	OFF	3RS ET	22.1931	113.8450	AUTUMN	NONE
21-Sep-17	1	0952	CWD	1	NWL	2	1308	ON	3RS ET	22.3786	113.8681	AUTUMN	NONE
21-Sep-17	2	1005	CWD	1	NWL	2	N/A	OFF	3RS ET	22.3685	113.8679	AUTUMN	NONE
21-Sep-17	3	1148	CWD	1	NWL	2	284	ON	3RS ET	22.3730	113.8773	AUTUMN	NONE
21-Sep-17	4	1204	CWD	2	NWL	2	124	ON	3RS ET	22.3901	113.8784	AUTUMN	NONE
19-Oct-17	1	1228	CWD	3	SWL	3	420	ON	3RS ET	22.2031	113.9085	AUTUMN	NONE
19-Oct-17	2	1351	CWD	4	SWL	3	176	ON	3RS ET	22.2053	113.9197	AUTUMN	GILLNETTER
19-Oct-17	3	1436	FP	1	SWL	3	11	ON	3RS ET	22.1671	113.9271	AUTUMN	NONE
23-Oct-17	1	1110	FP	2	SWL	3	105	ON	3RS ET	22.1654	113.9271	AUTUMN	NONE
23-Oct-17	2	1133	CWD	1	SWL	2	18	ON	3RS ET	22.2050	113.9222	AUTUMN	NONE
24-Oct-17	1	1114	CWD	3	NWL	2	1096	ON	3RS ET	22.3346	113.8782	AUTUMN	NONE
25-Oct-17	1	1126	CWD	5	NWL	2	178	ON	3RS ET	22.3628	113.8779	AUTUMN	NONE
25-Oct-17	2	1158	CWD	4	NWL	2	459	ON	3RS ET	22.3878	113.8775	AUTUMN	NONE
26-Oct-17	1	1024	CWD	6	WL	2	174	ON	3RS ET	22.2689	113.8519	AUTUMN	NONE
26-Oct-17	2	1052	CWD	5	WL	3	84	ON	3RS ET	22.2605	113.8508	AUTUMN	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
26-Oct-17	3	1116	CWD	2	WL	2	814	ON	3RS ET	22.2507	113.8338	AUTUMN	GILLNETTER
26-Oct-17	4	1142	CWD	2	WL	3	396	ON	3RS ET	22.2413	113.8383	AUTUMN	NONE
26-Oct-17	5	1206	CWD	3	WL	3	427	ON	3RS ET	22.2410	113.8320	AUTUMN	NONE
26-Oct-17	6	1233	CWD	3	WL	3	199	ON	3RS ET	22.2323	113.8309	AUTUMN	NONE
26-Oct-17	7	1301	CWD	6	WL	2	916	ON	3RS ET	22.2237	113.8239	AUTUMN	SHRIMP TRAWLER
26-Oct-17	8	1326	CWD	4	WL	2	67	ON	3RS ET	22.2140	113.8143	AUTUMN	NONE
26-Oct-17	9	1410	CWD	4	WL	2	57	ON	3RS ET	22.1962	113.8343	AUTUMN	NONE
26-Oct-17	10	1511	CWD	2	SWL	2	143	ON	3RS ET	22.1987	113.8593	AUTUMN	NONE
27-Oct-17	1	1236	CWD	5	WL	3	35	ON	3RS ET	22.2415	113.8334	AUTUMN	NONE
27-Oct-17	2	1304	CWD	4	WL	3	257	ON	3RS ET	22.2508	113.8474	AUTUMN	NONE
27-Oct-17	3	1402	CWD	1	WL	2	320	ON	3RS ET	22.2886	113.8613	AUTUMN	NONE
07-Nov-17	1	1211	CWD	3	NWL	3	5	ON	3RS ET	22.3622	113.8877	AUTUMN	NONE
15-Nov-17	1	0946	CWD	6	NWL	2	594	ON	3RS ET	22.3850	113.8683	AUTUMN	NONE
15-Nov-17	2	1314	CWD	1	NWL	3	4	ON	3RS ET	22.3705	113.8983	AUTUMN	NONE
17-Nov-17	1	1053	CWD	4	WL	2	668	ON	3RS ET	22.2504	113.8432	AUTUMN	NONE
20-Nov-17	1	1154	FP	2	SWL	3	122	ON	3RS ET	22.1564	113.9180	AUTUMN	NONE
21-Nov-17	1	0936	CWD	5	AW	3	46	ON	3RS ET	22.3009	113.8862	AUTUMN	NONE
21-Nov-17	2	1324	CWD	2	SWL	3	142	ON	3RS ET	22.1785	113.8689	AUTUMN	NONE
22-Nov-17	1	1121	CWD	2	SWL	3	21	ON	3RS ET	22.2048	113.9271	AUTUMN	NONE
06-Dec-17	1	1031	CWD	12	NWL	3	630	ON	3RS ET	22.2881	113.8684	WINTER	NONE
06-Dec-17	2	1113	CWD	4	NWL	3	100	ON	3RS ET	22.2719	113.8692	WINTER	NONE
06-Dec-17	3	1132	CWD	7	NWL	2	137	ON	3RS ET	22.2727	113.8733	WINTER	NONE
06-Dec-17	4	1236	CWD	5	NWL	3	494	ON	3RS ET	22.3596	113.8777	WINTER	NONE
06-Dec-17	5	1350	CWD	3	NWL	2	13	ON	3RS ET	22.3551	113.8848	WINTER	NONE
07-Dec-17	1	0929	CWD	5	AW	2	145	ON	3RS ET	22.3023	113.8765	WINTER	NONE
07-Dec-17	2	1058	CWD	3	WL	2	146	ON	3RS ET	22.2694	113.8601	WINTER	NONE
07-Dec-17	3	1126	CWD	1	WL	2	46	ON	3RS ET	22.2653	113.8580	WINTER	NONE
07-Dec-17	4	1238	CWD	3	WL	3	194	ON	3RS ET	22.2204	113.8146	WINTER	NONE
07-Dec-17	5	1407	CWD	2	WL	3	530	ON	3RS ET	22.1855	113.8498	WINTER	NONE
08-Dec-17	1	1213	FP	1	SWL	3	61	ON	3RS ET	22.1481	113.9173	WINTER	NONE
08-Dec-17	2	1258	CWD	1	SWL	5	343	ON	3RS ET	22.2053	113.9070	WINTER	NONE
14-Dec-17	1	1204	CWD	7	NWL	2	765	ON	3RS ET	22.3952	113.8884	WINTER	NONE
14-Dec-17	2	1327	CWD	2	NWL	3	127	ON	3RS ET	22.3888	113.8974	WINTER	NONE

DATE	STG #	TIME	CWD/FP	GP SZ	AREA	BEAU	PSD	EFFORT	TYPE	DEC LAT	DEC LON	SEASON	BOAT ASSOC.
18-Dec-17	1	1056	FP	2	SWL	4	135	ON	3RS ET	22.1511	113.9358	WINTER	NONE
21-Dec-17	1	0921	CWD	7	DB	4	N/A	OFF	3RS ET	22.4141	113.8911	WINTER	NONE
21-Dec-17	2	1014	CWD	1	DB	3	65	ON	3RS ET	22.4221	113.8818	WINTER	NONE
28-Dec-17	1	1044	CWD	1	WL	3	216	ON	3RS ET	22.2559	113.8364	WINTER	NONE
28-Dec-17	2	1102	CWD	3	WL	2	34	ON	3RS ET	22.2541	113.8354	WINTER	NONE
28-Dec-17	3	1146	CWD	4	WL	2	82	ON	3RS ET	22.2318	113.8249	WINTER	NONE
28-Dec-17	4	1244	CWD	4	WL	2	106	ON	3RS ET	22.2146	113.8276	WINTER	NONE
28-Dec-17	5	1303	CWD	3	WL	2	100	ON	3RS ET	22.2055	113.8302	WINTER	NONE
28-Dec-17	6	1322	CWD	2	WL	2	306	ON	3RS ET	22.2024	113.8215	WINTER	NONE
28-Dec-17	7	1332	CWD	3	WL	2	N/A	OFF	3RS ET	22.2030	113.8213	WINTER	NONE
28-Dec-17	8	1428	CWD	3	SWL	2	1182	ON	3RS ET	22.1918	113.8586	WINTER	NONE

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

CWD Land-based Theodolite Tracking

CWD Groups by Survey Date

Date	Station	Start Time	End Time	Duration	Beaufort Range	Visibility	No. of Focal Follow Dolphin Groups Tracked	Dolphin Group Size Range
9/Jan/17	Sha Chau	8:40	14:40	6:00	2	3	0	N/A
18/Jan/17	Lung Kwu Chau	8:40	14:40	6:00	2-3	3-4	3	1-5
20/Jan/17	Sha Chau	8:45	14:45	6:00	3	2	0	N/A
24/Jan/17	Lung Kwu Chau	8:33	14:33	6:00	2-3	3	1	4
25/Jan/17	Lung Kwu Chau	8:36	14:36	6:00	2-3	3	6	1-3
14/Feb/17	Sha Chau	8:34	14:34	6:00	2-3	1	0	N/A
15/Feb/17	Lung Kwu Chau	8:38	14:38	6:00	2-3	2	12	1-4
20/Feb/17	Lung Kwu Chau	8:45	14:45	6:00	1	3-4	0	N/A
27/Feb/17	Sha Chau	8:45	14:45	6:00	2-4	2	0	N/A
28/Feb/17	Lung Kwu Chau	8:47	15:02	6:15	1-2	2	12	1-7
20/Mar/17	Lung Kwu Chau	8:50	14:50	6:00	2	3	1	2
21/Mar/17	Lung Kwu Chau	8:47	14:47	6:00	2	3	0	N/A
24/Mar/17	Sha Chau	8:48	14:48	6:00	4	2	0	N/A
28/Mar/17	Lung Kwu Chau	8:41	14:41	6:00	2-3	2	5	1-4
29/Mar/17	Sha Chau	8:38	14:38	6:00	2-4	3	0	N/A
6/Apr/17	Sha Chau	8:35	14:35	6:00	2	3	0	N/A
7/Apr/17	Lung Kwu Chau	8:44	14:44	6:00	2	2-3	2	2
20/Apr/17	Lung Kwu Chau	8:50	14:50	6:00	1-2	2-4	4	2-3
25/Apr/17	Lung Kwu Chau	8:49	14:49	6:00	3-4	3-4	0	N/A
27/Apr/17	Sha Chau	8:50	14:50	6:00	2-4	1-4	0	N/A
17/May/17	Sha Chau	8:37	14:37	6:00	2	2	0	N/A
19/May/17	Lung Kwu Chau	8:39	14:39	6:00	1-3	2	0	N/A
22/May/17	Sha Chau	8:35	14:35	6:00	4	2-3	0	N/A
25/May/17	Lung Kwu Chau	8:40	14:40	6:00	3	2-3	1	5
29/May/17	Lung Kwu Chau	8:41	14:41	6:00	2-3	2	1	2
22/Jun/17	Lung Kwu Chau	8:44	14:44	6:00	2-3	2	0	N/A
23/Jun/17	Sha Chau	8:44	14:44	6:00	2-3	1-2	0	N/A
26/Jun/17	Lung Kwu Chau	8:37	14:37	6:00	1-3	2	5	3-5
27/Jun/17	Sha Chau	8:39	14:39	6:00	2-3	1-2	0	N/A
29/Jun/17	Lung Kwu Chau	8:46	14:46	6:00	2-3	1	4	2-5
5/Jul/17	Lung Kwu Chau	8:39	14:39	6:00	2-4	1	0	N/A

Date	Station	Start Time	End Time	Duration	Beaufort Range	Visibility	No. of Focal Follow Dolphin Groups Tracked	Dolphin Group Size Range
10/Jul/17	Lung Kwu Chau	8:44	14:44	6:00	2	2	5	1-6
14/Jul/17	Lung Kwu Chau	8:46	14:56	6:10	2-3	1	4	1-4
21/Jul/17	Sha Chau	8:46	14:46	6:00	2-3	2	0	N/A
24/Jul/17	Sha Chau	8:39	14:39	6:00	2	2	0	N/A
17/Aug/17	Lung Kwu Chau	8:39	14:39	6:00	2	2	2	1-4
18/Aug/17	Sha Chau	8:49	14:49	6:00	1-2	2	0	N/A
21/Aug/17	Lung Kwu Chau	9:10	15:10	6:00	2	2-3	6	1-6
22/Aug/17	Lung Kwu Chau	8:43	14:43	6:00	2-4	4	3	1-5
25/Aug/17	Sha Chau	8:46	14:46	6:00	2	2	2	1-2
6/Sep/17	Lung Kwu Chau	8:46	14:26	5:40	2	2-3	13	1-5
18/Sep/17	Lung Kwu Chau	8:42	15:02	6:20	2-3	3	4	1-3
22/Sep/17	Sha Chau	9:11	15:11	6:00	2-3	2	0	N/A
27/Sep/17	Lung Kwu Chau	8:51	14:51	6:00	2-3	3	6	1-4
28/Sep/17	Sha Chau	8:40	14:40	6:00	2	2	0	N/A
20/Oct/17	Lung Kwu Chau	8:52	14:52	6:00	2-3	2	4	1-4
23/Oct/17	Lung Kwu Chau	8:42	14:42	6:00	3-4	3	6	2-4
25/Oct/17	Sha Chau	8:46	14:46	6:00	2	3	0	N/A
26/Oct/17	Sha Chau	9:01	15:01	6:00	2	3	0	N/A
27/Oct/17	Lung Kwu Chau	8:48	14:48	6:00	2-3	2	6	1-6
2/Nov/17	Lung Kwu Chau	8:52	14:52	6:00	3	3	7	2-6
9/Nov/17	Sha Chau	8:40	14:40	6:00	2	2-3	0	N/A
16/Nov/17	Sha Chau	8:36	14:36	6:00	2-3	1-2	0	N/A
22/Nov/17	Lung Kwu Chau	8:48	14:48	6:00	4	2	4	3-11
23/Nov/17	Lung Kwu Chau	8:37	14:37	6:00	3-4	3	7	1-6
5/Dec/17	Sha Chau	8:38	14:38	6:00	2-3	3	0	N/A
11/Dec/17	Lung Kwu Chau	8:41	14:41	6:00	2-4	3	6	1-5
15/Dec/17	Lung Kwu Chau	8:40	14:40	6:00	2-3	2-3	6	2-4
28/Dec/17	Sha Chau	9:01	15:01	6:00	2	2-3	0	N/A
29/Dec/17	Lung Kwu Chau	9:09	15:09	6:00	2-3	3	4	1-3

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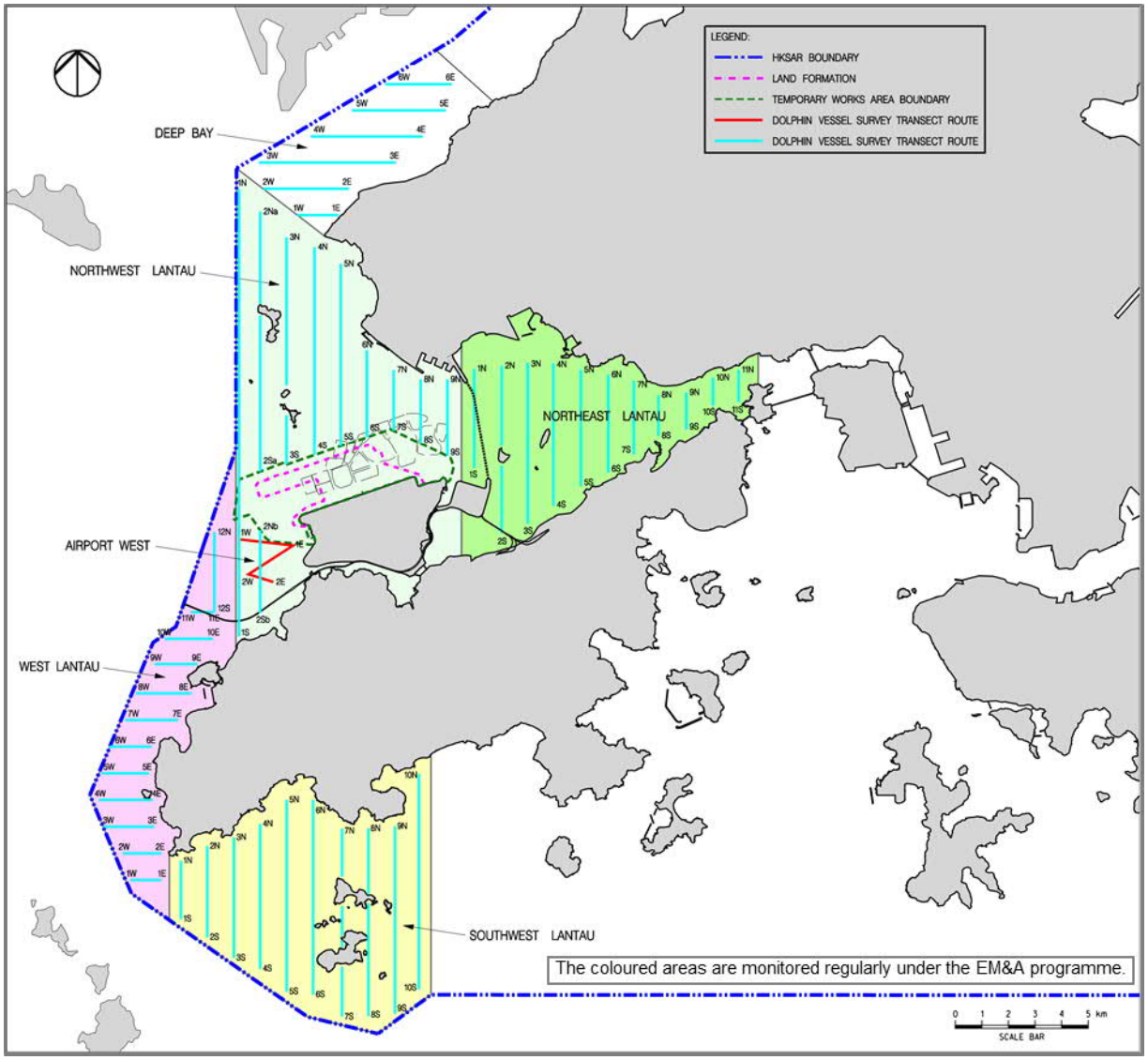

The additional survey in Deep Bay (DB) was conducted on a voluntary basis at the same frequency of two surveys per month.

All DB data were for reference and used only for density and abundance estimation.

(Note: The transect route in the DB survey area could not be fully travelled due to obstruction by the existing oyster culture rafts.)

Appendix F Summary of Post-translocation Monitoring and *Ad-hoc* Monitoring Results

Summary of the Post-Translocation Monitoring Surveys and *Ad-hoc* Surveys Conducted During the Reporting Period

	General Health Conditions [a]	% Change in Partial Mortality [b][c]	Triggering Action Level[d]	Triggering Limit Level[e]
First Round of Survey (January 2017)				
Control gorgonian corals (tagged)	3-5	⩽5% change for 10% of the tagged corals (Average PM: 9.0%)	No	No
Translocated gorgonian corals (tagged)	3-5	⩽10% change for 18.8% of the tagged corals (Average PM: 9.4%)		
Second Round of Survey (February 2017)				
Control gorgonian corals (tagged)	3-5	⩽5% change for 10% of the tagged corals (Average PM: 9.0%)	No	No
Translocated gorgonian corals (tagged)	3-5	⩽10% change for 18.8% of the tagged corals (Average PM: 9.4%)		
Third Round of Survey (March 2017)				
Control gorgonian corals (tagged)	4-5	⩽15% change for 95% of the tagged corals and >15% change for 5% of the tagged corals (Average PM: 19.3%)	No	No
Translocated gorgonian corals (tagged)	2-4	⩽15% change for 91.8% of the tagged corals and >15% change for 4.7% of the tagged corals (Average PM: 16.0%)		
Fourth Round of Survey (April 2017)				
Control gorgonian corals (tagged)	0-3 (Average: 1.9)	<25% change for 5% of the tagged corals and ⩾25% change for 95% of the tagged corals (Average PM: 73%)	No	No
Translocated gorgonian corals (tagged)	1-4 (Average: 2.0)	<25% change for 4.7% of the tagged corals and ⩾25% for 94.1% of tagged corals (Average PM: 73%)		
***Ad-hoc* Survey in June 2017**				
Control gorgonian corals (tagged)	0-4 (Average: 2.1)	<25% change for 5% of the tagged corals and ⩾25% change for 95% of the tagged corals (Average PM: 73.5%)	No	No
Translocated gorgonian corals (tagged)	0-4 (Average: 2.0)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 73.8%)		
***Ad-hoc* Survey in July 2017**				
Control gorgonian corals (tagged)	0-5 (Average: 2.9)	<25% change for 10% of the tagged corals and ⩾25% change	No	No

	General Health Conditions [(a)]	% Change in Partial Mortality [(b)(c)]	Triggering Action Level[(d)]	Triggering Limit Level[(e)]
		for 90% of the tagged corals (Average PM: 68.8%)		
Translocated gorgonian corals (tagged)	0-5 (Average: 3.0)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 72.7%)		
***Ad-hoc* Survey in September 2017**				
Control gorgonian corals (tagged)	0-5 (Average: 2.7)	<25% change for 10% of the tagged corals and ⩾25% change for 90% of the tagged corals (Average PM: 67.8%)	No	No
Translocated gorgonian corals (tagged)	0-4 (Average: 2.3)	<25% change for 5.9% of the tagged corals and ⩾25% change for 94.1% of the tagged corals (Average PM: 76.9%)		
Fifth Round of Survey in October 2017				
Control gorgonian corals (tagged)	0-5 (Average:2.4)	<25% change for 10% of the tagged corals and ⩾ 25% for 90% of the tagged corals (Average PM: 67.3%)	No	No
Translocated gorgonian corals (tagged)	0-4 (Average:2.5)	<25% change for 5.9% of the tagged corals and ⩾ 25% for 94.1% of the tagged corals (Average PM: 74.6%)		

Notes:

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

Appendix G. Summary of Environmental Complaints and Cumulative Statistics on Exceedances, Notification of Summons, and Prosecution

Summary of Environmental Complaints

Date of Complaint Received	Details	Analysis / Remedial Actions	Status
19 Jan 2017	A complaint regarding night time work and construction wastewater at Sheung Sha Chau on 12 Jan 2017.	It was found that a small amount (around 5 litres) of drilling fluid overflew from the containment pit on Sheung Sha Chau on 12 Jan 2017 due to a malfunctioning level sensor. The contractor had immediately confined and removed the leakage, and replaced the sensor with enhanced detection function. ET will continue to closely monitor the implementation and effectiveness of the preventive measures. According to the contractor's site record, no night time work was carried out at Sheung Sha Chau on 12 Jan 2017. The complaint regarding night time work was considered unjustified.	Closed
24 Apr 2017	A complaint regarding dolphin watching arrangement for implementation of DEZ in area of Contract 3204 for the period since early March 2017.	The DEZ monitoring arrangements of Contract 3204 for March and April 2017 were reviewed by the ET and IEC. It is noted that the arrangements had followed the DEZ Plan. The implementation of DEZ was also checked by the ET on-site during regular and ad-hoc site inspections for Contract 3204. The site practices had followed the proposed DEZ monitoring arrangements and in line with the DEZ Plan. The complaint was considered unfounded.	Closed
9 May 2017	A complaint regarding the intermittent release of exhaust air emissions from marine construction vessels of the Project.	No observations relating to dark smoke emission was found during ET's regular site inspections. ET will continue regular auditing to check for any dark smoke emission from construction vessels, and require the concerned contractor to take immediate action to rectify in case any dark smoke emission is observed.	Closed
22 May 2017	A complaint regarding alleged cement discharges from a construction vessel during reclamation activities of the Project.	ET reviewed the water quality monitoring results in April and May 2017 and no triggering of Action or Limit Levels for total alkalinity was recorded; hence, there was no indication suggesting significant discharge of cement into the marine environment. ET reminded and reiterated to the DCM contractors to ensure proper implementation of relevant precautionary and mitigation measures.	Closed

Date of Complaint Received	Details	Analysis / Remedial Actions	Status
8 Aug 2017	Two complaints regarding sand filling materials of Contract 3206.	ET conducted checking of test reports on particle size distribution of sand materials and witnessed sand sampling of the Project regularly to ensure the material used complies with the relevant EP conditions. To date, no non-compliance against the EP condition of a maximum of 10% fines content was identified.	Closed
5 Sep 2017			Closed
24 Nov 2017	A complaint regarding material dumping from construction vessel of Contract 3205.	According to ET's weekly and *ad-hoc* site inspections, it was observed that the contractor had provided adequate disposal facilities and arranged regular disposal. No observation relating to illegal dumping was found during regular and *ad-hoc* site inspections.	Closed

Cumulative Statistics for Valid Exceedances for the Environmental Monitoring

		Total no. recorded in the reporting month	Total no. recorded since the project commenced
1-hr TSP	Action	0	0
	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Waste	Action	0	0
	Limit	0	0
Water	Action	0	0
	Limit	0	0
CWD	Action	0	0
	Limit	0	0

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

Cumulative 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	7	1	0
From 28 December 2015 to end of the reporting period	0	8	1	0