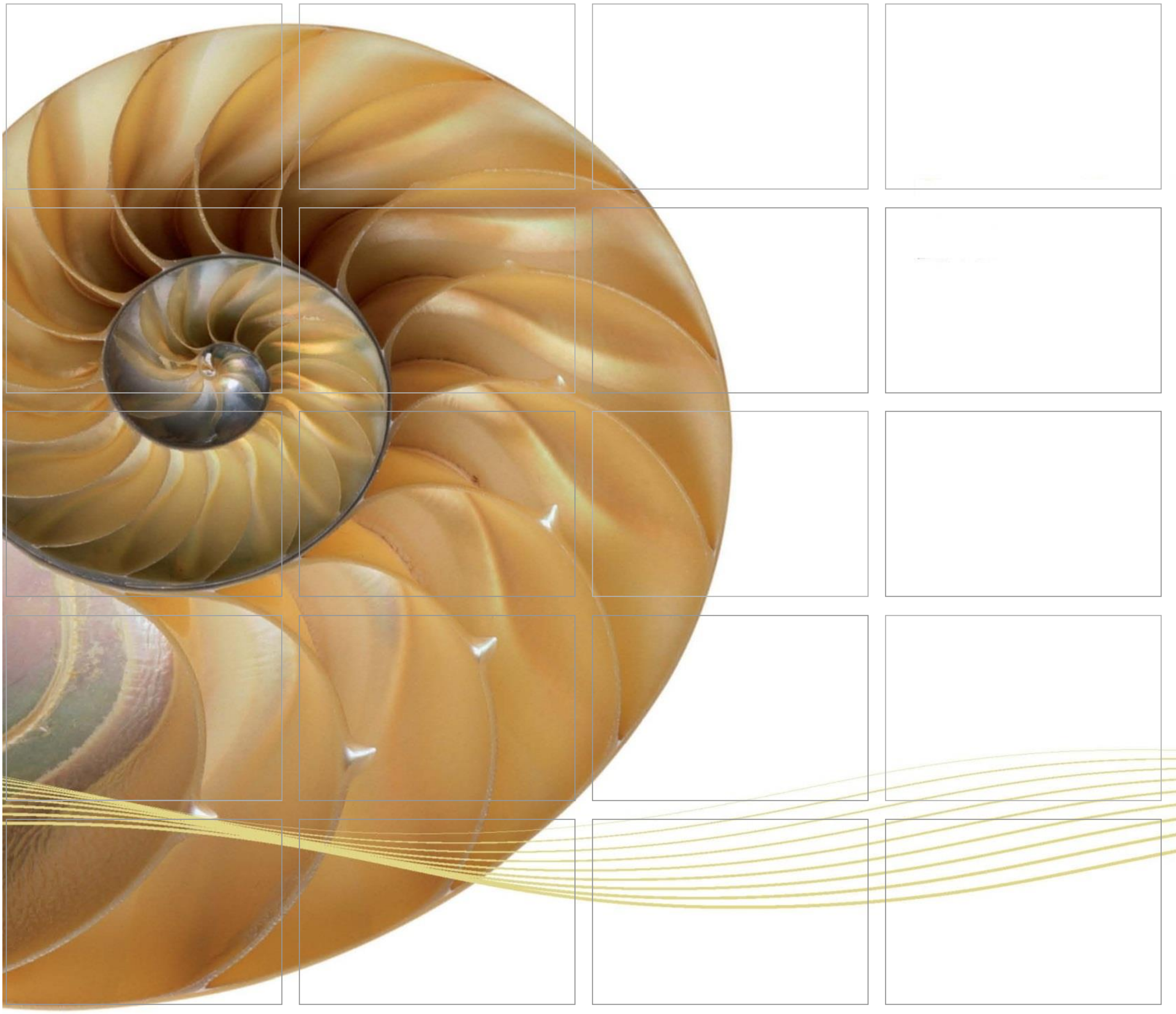
Report



Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section

Twenty-third Quarterly Environmental Monitoring & Audit (EM&A) Report

26 February 2020

Environmental Resources Management
2507, 25/F
One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone 2271 3000
Facsimile 2723 5660
www.erm.com

The business of sustainability

ERM

Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section

Twenty-third Quarterly Environmental Monitoring & Audit (EM&A) Report

Document Code: 0212330_23rd Quarterly EM&A_20200126.doc

Environmental Resources Management

2507, 25/F
One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660
E-mail: post.hk@erm.com
http://www.erm.com

Client: DBJV	Project No: 0212330
Summary: This document presents the Twenty-third Quarterly EM&A Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.	Date: 26 February 2020 Approved by: *Mr Craig Reid* *Partner* Certified by: *Dr Jasmine Ng* *ET Leader*

	23rd Quarterly EM&A Report	VAR	JN	CAR	26/02/20
Revision	Description	By	Checked	Approved	Date

Distribution

☐ Internal

☒ Public

☐ Confidential

RAMBOLL

Ref.: HYDHZMBEEM00_0_7912L.20

27 February 2020

By Fax (2293 6300) and By Post

AECOM
Supervising Officer Representative's Office
No.8 Mong Fat Street, Tuen Mun, N.T., Hong Kong

Attention: Mr. Roger Man

Dear Mr. Man,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2012/08
TM-CLKL – Northern Connection Sub-sea Tunnel Section
23rd Quarterly EM&A Summary Report for June 2019 to August 2019

Reference is made to the ET's submission of 23rd Quarterly EM&A Summary Report for June 2019 to August 2019 (ET's ref.: "*0212330_23rd Quarterly EM&A_20200126.doc*" dated 26 February 2019) certified by the ET Leader.

Please be informed that we have no adverse comments on the captioned report.

Thank you for your attention. Please do not hesitate to contact the undersigned or the ENPO Leader, Mr. Y. H. Hui, should you have any queries.

Yours sincerely,

F. C. Tsang
Independent Environmental Checker
Tuen Mun–Chek Lap Kok Link

c.c.

HyD	Mr. Patrick Ng	(By Fax: 3188 6614)
HyD	Mr. Cheng Pan	(By Fax: 3188 6614)
AECOM	Mr. Conrad Ng	(By Fax: 3922 9797)
ERM	Dr. Jasmine Ng	(By Fax: 2723 5660)
DBJV	Mr. Bryan Lee	(By Fax: 2293 7499)

Internal: DY, YH, ENPO Site

Q:\Projects\HYDHZMBEEM00\02_Proj_Mgt\02_Corr\2020\HYDHZMBEEM00_0_7912L.20.docx

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project) while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) in accordance with *Environmental Permit No. EP-354/2009/A*. Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO). Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B*, *EP-354/2009/C and EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

The construction phase of the Contract commenced on 1 November 2013 and will tentatively be completed in early 2020. The impact monitoring of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.

This is the Twenty-third Quarterly EM&A report presenting the EM&A works carried out during the period from 1 June 2019 to 31 August 2019 for the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section* (the "Contract") in accordance with the Updated EM&A Manual of the TM-CLK Link Project. As informed by the Contractor, the major activities in the reporting quarter included:

Land-based Works

- Construction of Thermal barrier – TBM tunnel;
- Construction of Walkway Corbel & Cover – TBM Tunnel;
- Road & Drainage works – Portion N-A;
- Backfilling – Portion N-A
- RC structure – Portion S-A;
- D-wall Removal – Portion S-A;
- E&M Platform Installation – Portion S-A
- STP Demolition – Portion S-C

Marine-based Works

- Seawall Modification Works – Portion S-B;
- Jetty dismantling Works – Portion S-C

A summary of monitoring and audit activities conducted in the reporting period is listed below:

24-hour TSP Monitoring	30 sessions
1-hour TSP Monitoring	30 sessions
Water Quality Monitoring	34 sessions
Impact Dolphin Monitoring	6 sessions
Joint Environmental Site Inspection	13 sessions

Implementation of Marine Mammal Exclusion Zone

Daily marine mammal exclusion zone was in effect during the period of silt curtain installation in open waters under this Contract. No sighting of the Indo-Pacific humpback dolphin (i.e. Chinese White Dolphin) was recorded in the reporting period during the exclusion zone monitoring.

Summary of Breaches of Action/Limit Levels

Breaches of Action and Limit Levels for Air Quality

Two (2) Action level and one (1) Limit Level exceedances of 1-hour TSP and were recorded in this reporting period. Investigation reports are provided in Appendix J.

Breaches of Action and Limit Levels for Water Quality

One hundred and six (106) Action level and eighteen (18) Limit Level exceedances of Dissolved Oxygen were recorded in this reporting period. One (1) Action Level exceedance for Depth-averaged suspended solids was recorded. Investigation reports are provided in Appendix J.

Dolphin Monitoring

Whilst one (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June and August 2019, no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations during the dolphin monitoring in this reporting quarter.

Environmental Complaints, Non-compliance & Summons

No non-compliance with EIA recommendations, EP conditions and other requirements associated with the construction of this Contract was recorded in this reporting period.

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

Reporting Change

There was no reporting change required in the reporting period.

Upcoming Works for the Next Reporting Period

Works to be undertaken in the coming quarterly period include the following:
Land-based Works

- Construction of Thermal barrier – TBM tunnel;
- Construction of Walkway Corbel & Cover – TBM Tunnel;
- Backfilling – Portion N-A
- RC structure – Portion S-A;
- Louver Installation – Portion S-A;
- Construction of Parapet – Portion S-C
- VST Tower Dismantling – Portion S-C

Marine-based Works

- Seawall Modification Works – Portion S-B

Future Key Issues

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are expected to be mainly associated with dust, marine ecology, marine water quality and waste management issues.

1 INTRODUCTION

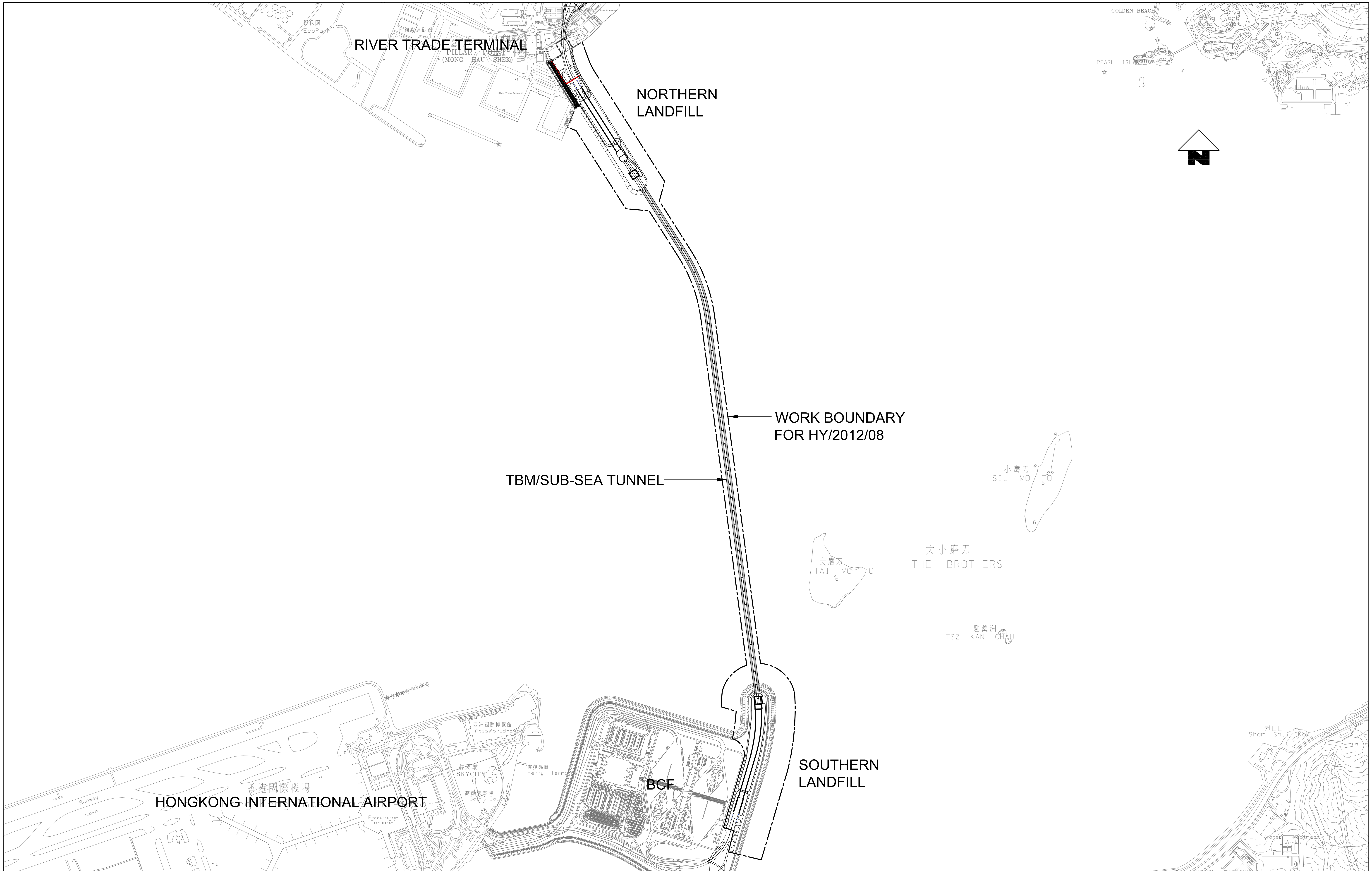
1.1 BACKGROUND

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong – Zhuhai – Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau – Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

An Environmental Impact Assessment (EIA) of TM-CLKL (the Project) was prepared in accordance with the EIA Study Brief (No. ESB-175/2007) and the *Technical Memorandum of the Environmental Impact Assessment Process* (*EIAO-TM*). The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number AEIAR-146/2009), an Environmental Permit (EP-354/2009) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (VEP) (EP-354/2009/A) was issued on 8 December 2010. Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B, EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of TM-CLKL while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) in accordance with Environmental Permit No. EP-354/2009/A. Ramboll Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

Layout of the Contract components is presented in *Figure 1.1*.



Rev.	Description	Date	Checked
A	FIRST ISSUE	11SEP13	PKV

Designed By: PKV
Drawn By: DAI
Approved By: SPo PP
Date: 11SEP2013

Main Contractor: Dragages HongKong — A member of the Bouygues Construction group; BOUYGUES TRAVAUX PUBLICS
Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Client: 路政署 HIGHWAYS DEPARTMENT

Contractor's Designer: ARUP Ove Arup & Partners Hong Kong Limited

Project: Contract No. HY/2012/08
Tuen Mun - Chek Lap Kok Link -
Northern Connection Sub-Sea Tunnel Section

Drawing Title: **Figure 1.1**

Drawing no.: TMCLKL8–DBJ–GEN–DWG–00174
Scale: 1:25000 @ A3
CADD Ref.: TMCLKL8–DBJ–GEN–DWG–00174–DFT–A
Issue Status: DFT (DRAFT)
Revision: A

The construction phase of the Contract commenced on 1 November 2013 and will tentatively be completed in early 2020. The impact monitoring phase of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.

1.2 SCOPE OF REPORT

This is the Twenty-third Quarterly EM&A Report under the *Contract No. HY/2012/08 Tuen Mun – Chek Lap Kok Link – Northern Connection Sub-sea Tunnel Section*. This report presents a summary of the environmental monitoring and audit works from 1 June 2019 to 31 August 2019.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Contract is shown in *Appendix A*. The key personnel contact names and contact details are summarized in *Table 1.1* below.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Highways Department	Engr 24/SD	Ken T.M. Cheng	2762 4062	3188 6614
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Roger Man	2293 6388	2293 6300
ENPO / IEC (Ramboll Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Dr. F.C. Tsang	3465 2851	3465 2899
Contractor (Dragages – Bouygues Joint Venture)	Deputy Environmental Manager	Bryan Lee	2293 7323	2293 7499
	24-hour hotline		2293 7330	
ET (ERM-HK)	ET Leader	Jasmine Ng	2271 3311	2723 5660

1.4 *SUMMARY OF CONSTRUCTION WORKS*

The construction phase of this Contract was commenced on 1 November 2013. The construction programme is shown in *Appendix B*.

As per DBJV's information, details of major construction works carried out in this reporting period are summarized in *Table 1.2*.

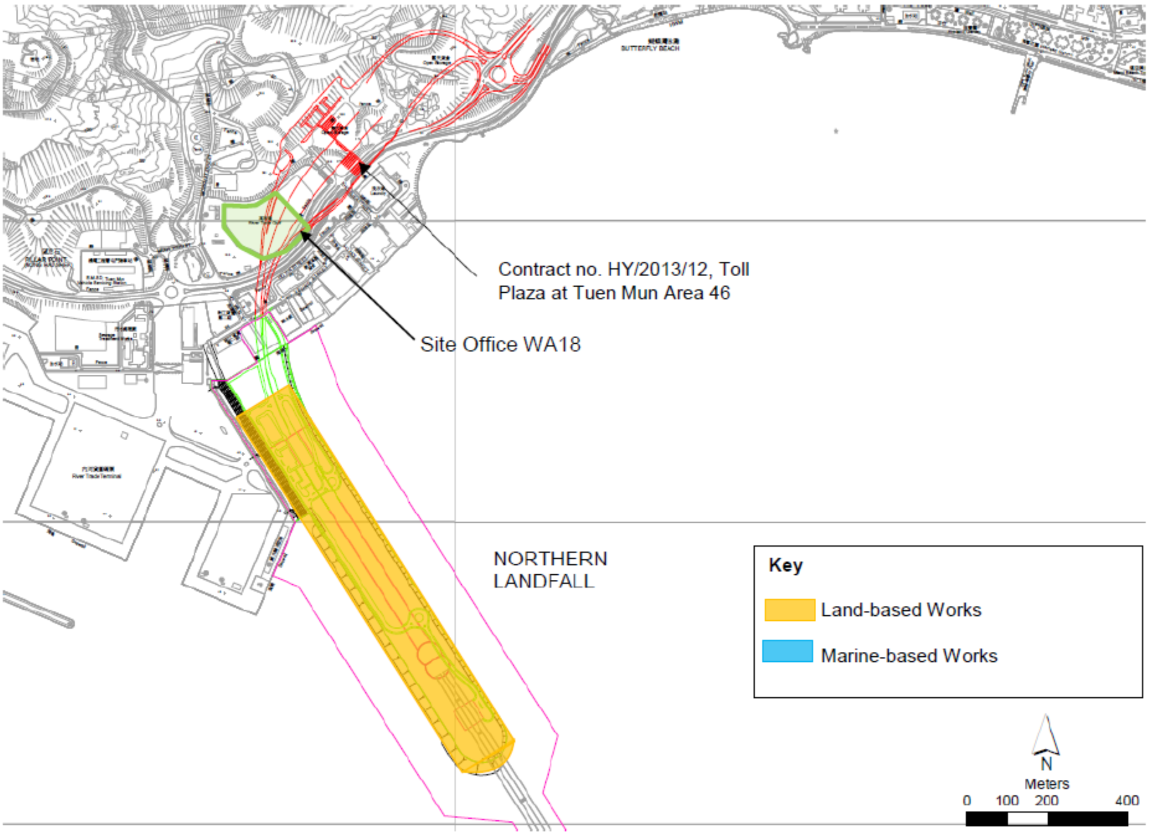
The general layout plan of the site showing the detailed works areas is shown in *Figure 1.2*. The Environmental Sensitive Receivers in the vicinity of the Contract are shown in *Figure 1.3*.

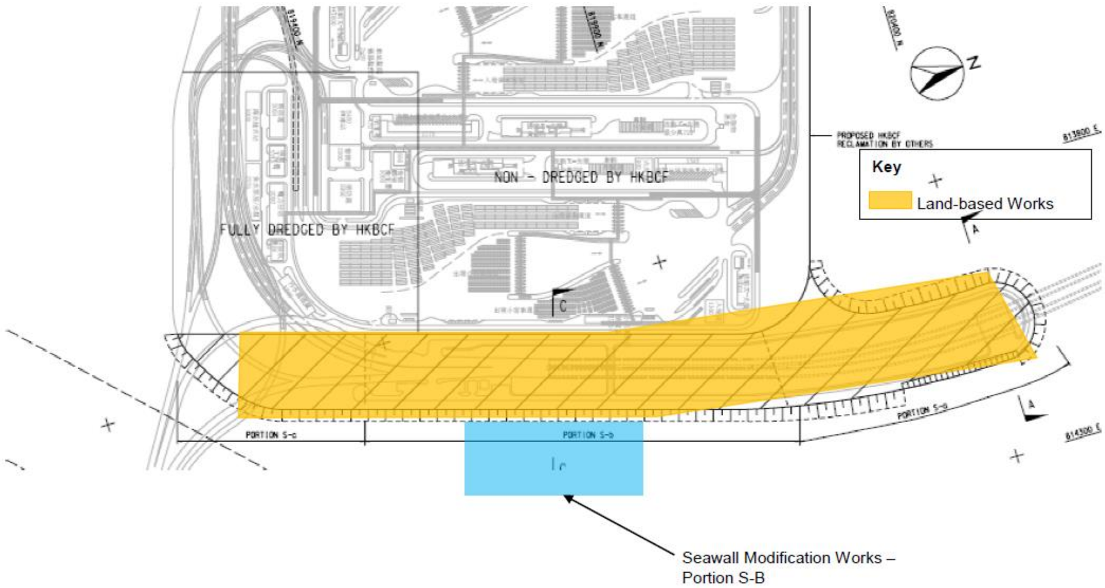
The implementation schedule of environmental mitigation measures is presented in *Appendix C*.

Table 1.2 Summary of Construction Activities Undertaken during the Reporting Period

Construction Activities Undertaken
Land-based Works
• Construction of Thermal barrier – TBM tunnel; • Construction of Walkway Corbel & Cover – TBM Tunnel; • Road & Drainage works – Portion N-A; • Backfilling – Portion N-A • RC structure – Portion S-A; • D-wall Removal – Portion S-A; • E&M Platform Installation – Portion S-A • STP Demolition – Portion S-C
Marine-based Works
• Seawall Modification Works – Portion S-B; • Jetty dismantling Works – Portion S-C

Figure 1.2 Locations of Construction Activities – June to August 2019





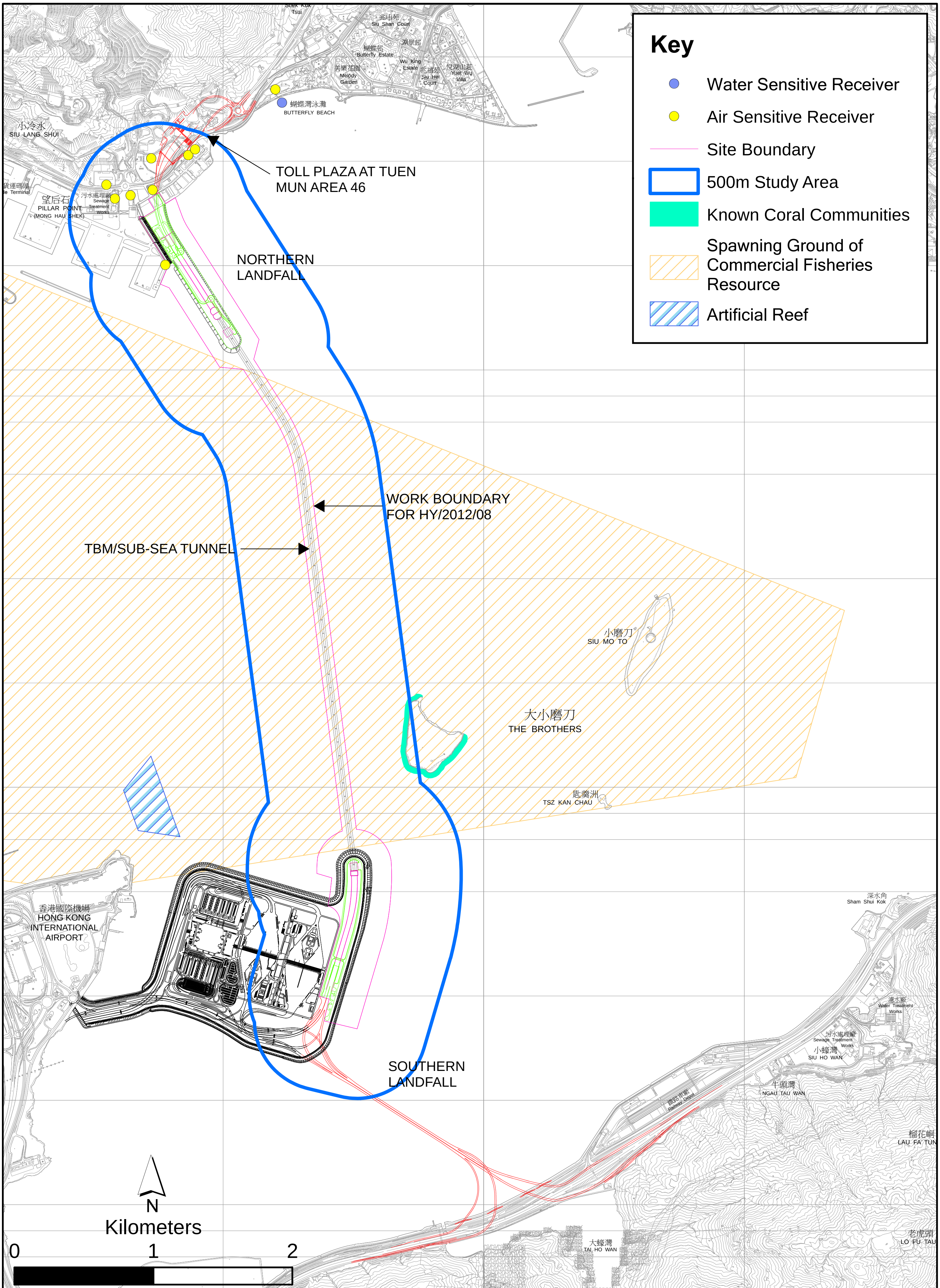


Figure 1.3

Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

File: T:\GIS\CONTRACT\0212330\Mxd\0212330_EMnA_Env_Sensitive_Receiver.mxd
Date: 15/4/2014

Environmental Resources Management

ERM

2 EM&A RESULTS

The EM&A programme required environmental monitoring for air quality, water quality and marine ecology as well as environmental site inspections for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts. The EM&A requirements and related findings for each component are summarized in the following sections

2.1 AIR QUALITY

As per the requirements under *Condition 2.4* of *EP-354/2009/D*, the Enhanced TSP Monitoring Plan has been prepared under *Contract No. HY/2012/08*. Details of the monitoring plan are presented in the *Enhanced TSP Monitoring Plan* (1).

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual and the *Enhanced TSP Monitoring Plan*, impact 1-hour TSP monitoring was conducted three (3) times in every six (6) days and impact 24-hour TSP monitoring was carried out once in every six (6) days when the highest dust impact was expected. 1-hr and 24-hr TSP monitoring frequency was increased to three times per day every three days and daily every three days respectively as excavation works for launching shaft commenced on 24 October 2014.

High volume samplers (HVSs) were used to carry out the 1-hour and 24-hour TSP monitoring in the reporting quarter at the five (5) air quality monitoring stations in accordance with the requirements stipulated in the Updated EM&A Manual (*Figure 2.1*; *Table 2.1*). Wind anemometer was installed at the rooftop of ASR5 for logging wind speed and wind direction. Details of the equipment deployed are provided in *Table 2.2*.

Table 2.1 Locations of Impact Air Quality Monitoring Stations and Monitoring Dates in this Reporting Period

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR1	1, 4, 7, 10, 13, 16, 19, 22, 25 and 28 June 2019	Tuen Mun Fireboat Station	Office	TSP monitoring • 1-hour Total Suspended Particulates (1-hour TSP, μg/m³), 3 times in every 6 days • 24-hour Total Suspended Particulates (24-hour TSP, μg/m³), daily for 24-hour in every 6 days Enhanced TSP monitoring (commenced on 24 October 2014) • 1-hour Total Suspended Particulates (1-hour TSP,
ASR5	1, 4, 7, 10, 13, 16, 19, 22, 25 and 28 July 2019	Pillar Point Fire Station	Office	
AQMS1	3, 6, 9, 12, 15, 18, 21, 24, 27 and 30 August 2019	Previous River Trade Golf	Bare ground	
ASR6		Butterfly Beach Laundry	Office	

(1) ERM (2013) Enhanced TSP Monitoring Plan. Submitted on 28 October 2013 and subsequently approved by EPD on 1 November 2013.

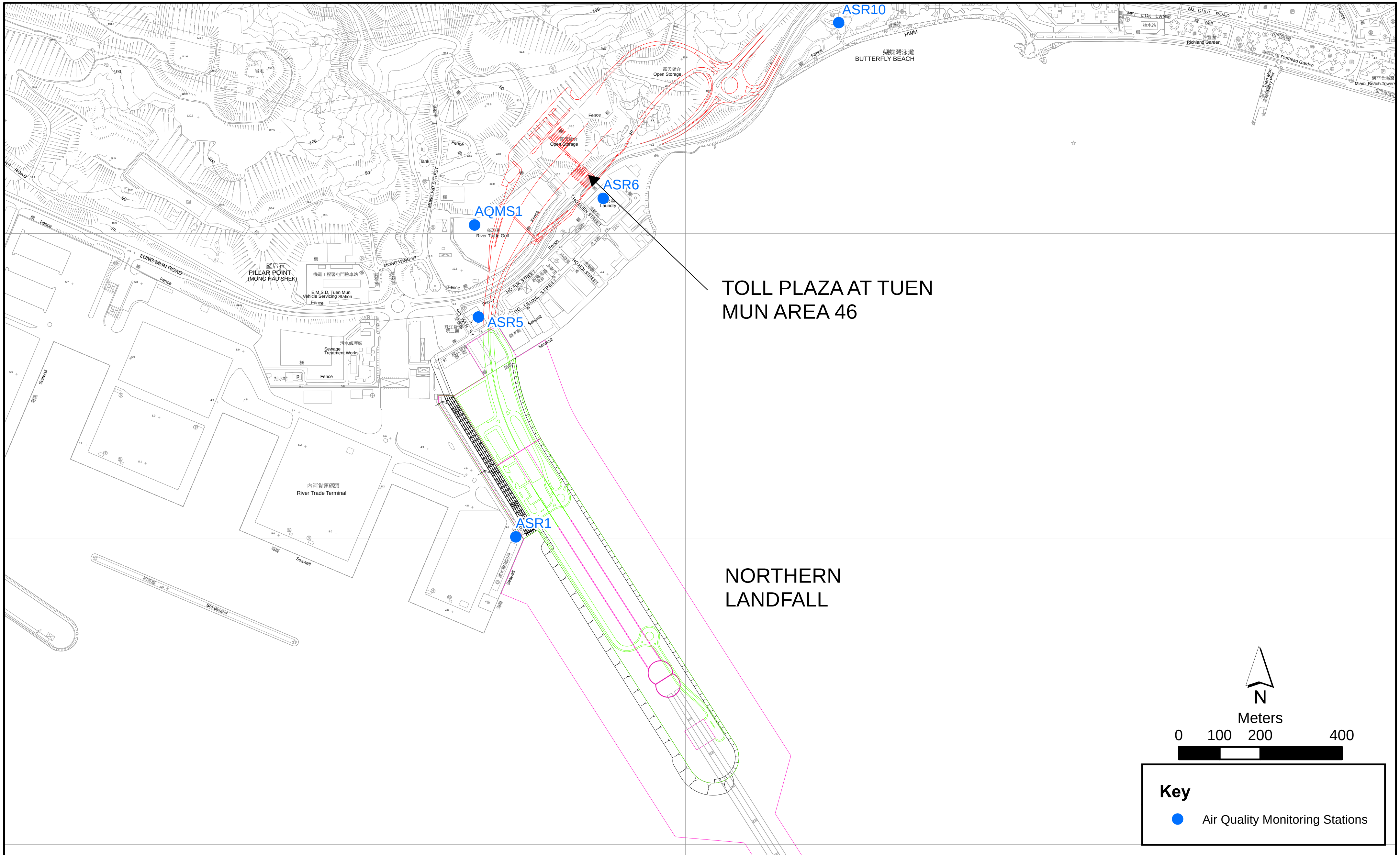


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

File: T:\GIS\CONTRACT\0212330\Mxd\0212330_ASR_for_Enhanced_TSP_monitoring.mxd
Date: 21/2/2014

Environmental Resources Management

ERM

Monitoring Station	Monitoring Dates	Location	Description	Parameters & Frequency
ASR10		Butterfly Beach Park	Recreational uses	µg/m³), 3 times in every 3 days • 24-hour Total Suspended Particulates (24-hour TSP, µg/m³), daily for 24-hour in every 3 days

Table 2.2 *Air Quality Monitoring Equipment*

Equipment	Brand and Model
High Volume Sampler (1-hour TSP and 24-hour TSP)	Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Sampler (Model No. TE-5170)
Wind Meter	Davis (Model: Vantage Pro 2 (S/N: AS160104014)
Wind Anemometer for calibration	Lutron (Model No. AM-4201)

2.1.2 *Action & Limit Levels*

The Action and Limit Levels of the air quality monitoring is provided in *Appendix D*. The Event and Action plan is presented in *Appendix H*.

2.1.3 *Monitoring Schedule for the Reporting Quarter*

The schedules for air quality monitoring in the reporting quarter are provided in *Appendix E*.

2.1.4 *Results and Observations*

Impact air quality monitoring was conducted at all designated monitoring stations in the reporting period under favourable weather conditions. The major dust sources in the reporting period include construction activities under the Contract as well as nearby traffic emissions.

The monitoring results for 1-hour TSP and 24-hour TSP are summarized in *Tables 2.3* and *2.4,* respectively. Monitoring results are presented graphically in *Appendix F* and detailed impact air quality monitoring data were reported in the *Sixty- eighth* to *Seventieth Monthly EM&A Report*.

Table 2.3 *Summary of 1-hour TSP Monitoring Results in this Reporting Period*

Month/Year	Station	Average (µg/m³)	Range (µg/m³)	Action Level (µg/m³)	Limit Level (µg/m³)
June to August 2019	ASR 1	78	13 - 646	331	500
	ASR 5	112	14 - 410	340	500
	AQMS1	66	14 - 183	335	500
	ASR6	91	14 - 372	338	500
	ASR10	50	14 - 151	337	500

Table 2.4 *Summary of 24-hour TSP Monitoring Results in this Reporting Period*

Month/Year	Station	Average (µg/m³)	Range (µg/m³)	Action Level (µg/m³)	Limit Level (µg/m³)
June to August	ASR 1	62	30 - 116	213	260

Month/Year	Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
2019	ASR 5	64	32 - 100	238	260
	AQMS1	43	26 - 68	213	260
	ASR6	51	25 - 82	238	260
	ASR10	35	18 - 90	214	260

Two (2) Action level and one (1) Limit Level exceedances of 1-hour TSP and were recorded in this reporting period. Investigation reports are provided in Appendix J. Summary of Exceedances for Air Quality Impact Monitoring in this Reporting Quarter is detailed in *Table 2.15*.

2.2 *WATER QUALITY MONITORING*

Seawall Modification Works at Portion S-B was carried out in this reporting period.

2.2.1 *Monitoring Requirements & Equipment*

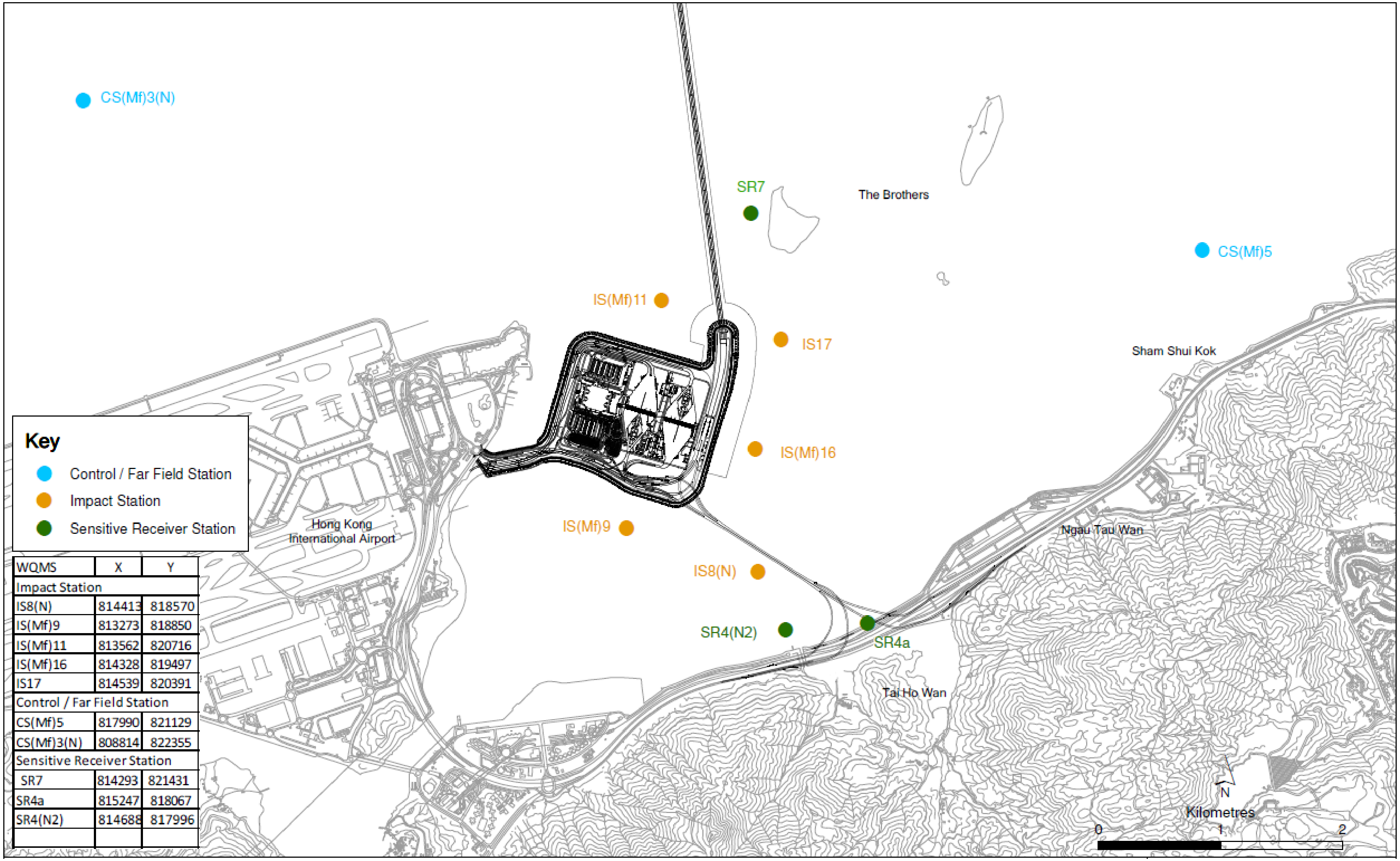
In accordance with the approved Environmental Review Report dated 21 March 2018 for the Change in Design of Vertical Seawall to Sloping Seawall on Southern Landfall, Updated Impact water quality monitoring programme and water quality monitoring stations IS17, SR7 and IS(Mf)11 specified under the EM&A Manual for HZMB HKBCF project will be adopted. (*Figure 2.2*; *Table 2.5*).

Results of water quality monitoring were adopted from the published EM&A data of Contract No. HY/2012/07 Tuen Mun-Chek Lap Kok Link – Southern Connection Viaduct Section .

The Action and Limit Levels of the water quality monitoring were adopted from the EM&A Manual for HZMB HKBCF project. The Action and Limit Levels are provided in Appendix D.

Table 2.5 ***Locations of Water Quality Monitoring Stations and the Corresponding Monitoring Requirements***

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS(Mf)11	Impact Station (Close to HKBCF construction site) 8	813562	820716	• Temperature(°C) • pH(pH unit) • Turbidity (NTU) • Water depth (m) • Salinity (ppt) • DO (mg/L and % of saturation) • SS (mg/L)	3 water depths: 1m below sea surface, mid-depth and 1m above	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of
IS17	Impact Station (Close to HKBCF construction site)	814539	820391			



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 2.2

Water Quality Monitoring Stations

Environmental Resources Management

ERM

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
SR7	Sensitive receivers (Tai Mo Do)	814293	821431		sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.	the Contract.
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850			
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497			
IS8(N)	Impact Station (Close to HKBCF construction site)	814413	818570			
SR4(N2)	Sensitive receiver (Tai Ho Inlet)	814688	817996			
SR4a	Sensitive receiver	815247	818067			
CS(Mf)3(N)	Control Station	808814	822355			
CS(Mf)5	Control Station	817990	821129			

*Notes:

In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded.

Water Quality Monitoring Station CS(Mf)3 was relocated to CS(Mf)3(N) since 2 May 2017.

Water Quality Monitoring Station SR4 was relocated to SR4(N) since 2 March 2018.

Water Quality Monitoring Station SR4(N) was relocated to SR4(N2) since 12 June 2019

Water Quality Monitoring Station IS8 was relocated to IS8(N) since 12 June 2019.

Table 2.6 summarizes the equipment used in the impact water quality monitoring programme.

Table 2.6 Water Quality Monitoring Equipment

Equipment	Model
Multi-Parameters	YSI ProDss 18A104824
Multi-Parameters	YSI ProDss 15M100005
Multi-Parameters	YSI ProDss 0001C6A7
Multi-Parameters	YSI ProDss 17H105557
Multi-Parameters	YSI ProDss 17E100747
Multi-Parameters	YSI ProDss 16H104234
Positioning Equipment	Furuno GP-170
Water Depth Detector	Lowrance Mark 5x / Garmin Striker 4

2.2.2 *Action & Limit Levels*

The Action and Limit levels of water quality impact monitoring are shown in *Appendix D*. The Event and Action plan is presented in *Appendix I*.

2.2.3 *Monitoring Schedule for the Reporting Period*

The schedules for water quality monitoring in the reporting quarter are provided in *Appendix E.*

2.2.4 *Results and Observations*

Impact water quality monitoring was conducted at all designated monitoring stations in the reporting quarter. Results and graphical presentations of impact water quality monitoring are presented in *Appendix G*. Detailed water quality monitoring data were reported in the *Sixty-eighth and Seventieth Monthly EM&A Report*.

2.3 DOLPHIN MONITORING

2.3.1 *Monitoring Requirements*

Impact dolphin monitoring is required to be conducted by a qualified dolphin specialist team to evaluate whether there have been any effects on the dolphins. In order to fulfil the EM&A requirements and make good use of available resources, the on-going impact line transect dolphin monitoring data collected by HyD's *Contract No. HY/2011/03 Hong Kong-Zhuhai-Macao Bridge. Hong Kong Link Road - Section between Scenic Hill and Hong Kong Boundary Crossing Facilities* on the monthly basis is adopted to avoid duplicates of survey effort.

2.3.2 *Monitoring Equipment*

Table 2.7 summarizes the equipment used for the impact dolphin monitoring.

Table 2.7 Dolphin Monitoring Equipment

Equipment	Model
Global Positioning System (GPS)	Garmin 18X-PC
	Geo One Phottix
Camera	Nikon D90 300m 2.8D fixed focus
	Nikon D90 20-300m zoom lens
Laser Binoculars	Infinitor LRF 1000
Marine Binocular	Bushell 7 x 50 marine binocular with compass and reticules
Vessel for Monitoring	65 foot single engine motor vessel with viewing platform 4.5m above water level

2.3.3 *Monitoring Parameter, Frequencies & Duration*

Dolphin monitoring should cover all transect lines in Northeast Lantau (NEL) and the Northwest Lantau (NWL) survey areas twice per month throughout the entire construction period. The monitoring data should be compatible with, and should be made available for, long-term studies of small cetacean ecology in Hong Kong. In order to provide a suitable long-term dataset for comparison, identical methodology and line transects employed in baseline dolphin monitoring was followed in the impact dolphin monitoring.

2.3.4 *Monitoring Location*

The impact dolphin monitoring was carried out in the NEL and NWL along the line transect as depicted in *Figure 2.3*. The co-ordinates of all transect lines are shown in *Table 2.8* below.

Table 2.8 Impact Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805476	820800*	14	Start Point	817537	820220
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150*	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500*	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850*	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150*	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000*	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321

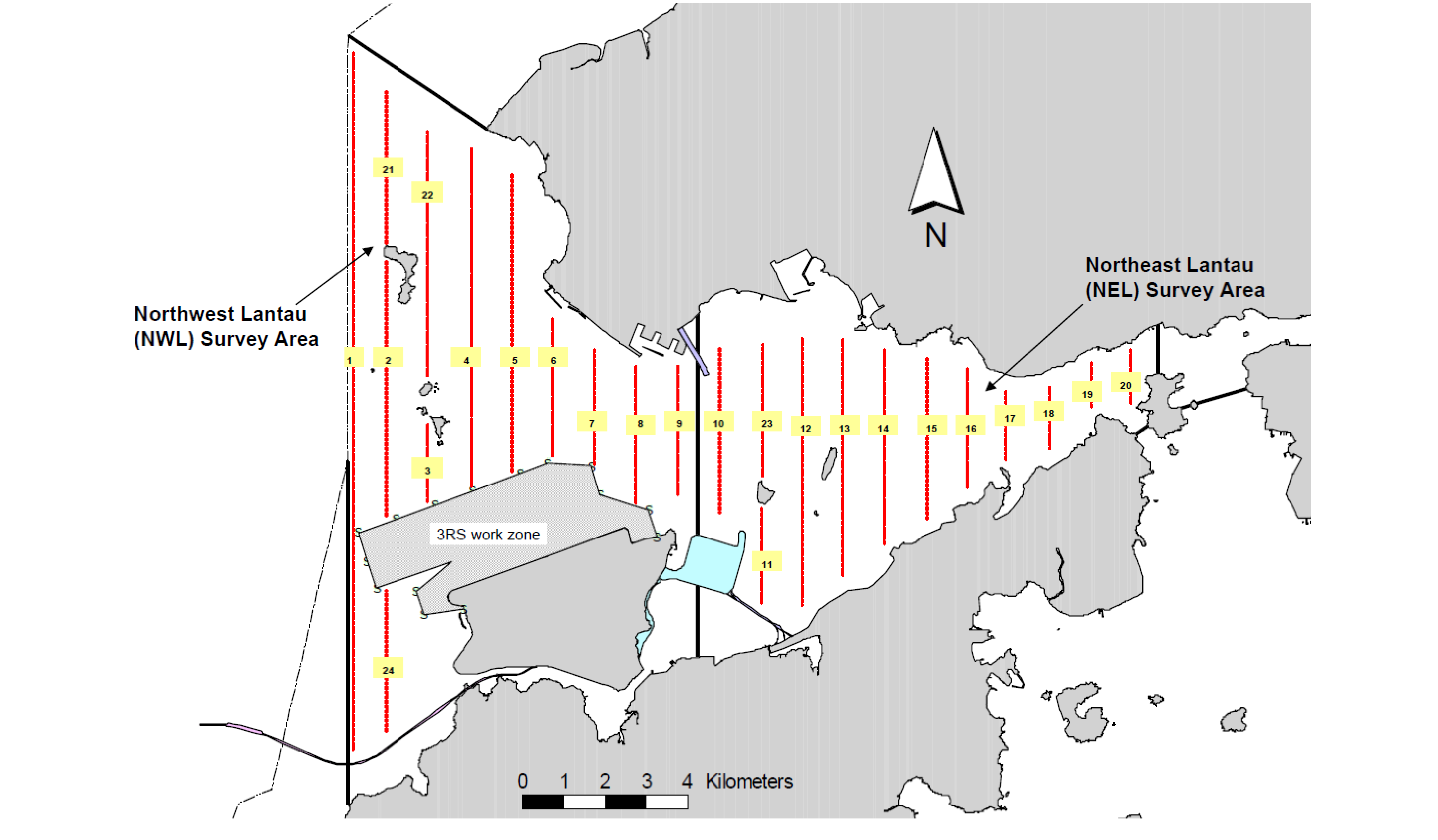


Figure 2.3

Layout of Transect Lines of Dolphin Monitoring in Northwest and Northeast Lantau Areas

File: T:\GIS\CONTRACT\0212330\Mxd\0212330_Transect_of_Dolphin_Monitoring.mxd
Date: 29/11/2013

Environmental
Resources
Management

ERM

Line No.		Easting	Northing	Line No.		Easting	Northing
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24*	Start Point	805476*	815900*
12	End Point	815542	824882	24*	End Point	805476*	819100*

Remarks: The coordinates of several starting and ending points have been revised since August 2017 due to the presence of a work zone to the north of the airport platform with intense construction activities in association with the construction of the third runway expansion for the Hong Kong International Airport. Co-ordinates in red and marked with asterisk are revised co-ordinates of transect line.

2.3.5 *Action & Limit Levels*

The Action and Limit levels of dolphin impact monitoring are shown in *Appendix D*. The Event and Action plan is presented in *Appendix I*.

2.3.6 *Monitoring Schedule for the Reporting Period*

The dolphin monitoring schedules for the reporting period are shown in *Appendix E*.

2.3.7 *Results & Observations*

A total of 785.23 km of survey effort was conducted, with 96.0% of the total survey effort being conducted under favourable weather conditions (ie Beaufort Sea State 3 or below with good visibility) in this reporting quarter. Amongst the two areas, 287.33 km and 497.90 km of survey effort were conducted from NEL and NWL survey areas, respectively. The total survey effort conducted on primary and secondary lines were 577.21 km and 208.02 km, respectively. The survey efforts are summarized in *Appendix H*.

A total of 4 groups of 8 Chinese White Dolphins sightings were recorded during the six sets of surveys in this reporting quarter. Three of the four dolphin sightings were made during on-effort search, and two of the three on-effort dolphin sightings were made on primary lines. During this reporting quarter, all dolphin groups were sighted in NWL, while no dolphin was sighted in NEL.

Encounter rates of Chinese White Dolphins are deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort

3 or below with good visibility) in the reporting quarter with the results and comparison with baseline results present in *Tables 2.9* and *2.10*.

Table 2.9 Individual Survey Event Encounter Rates

		Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	**Primary Lines Only**
NEL	Set 1 (3 & 6 Jun 2019)	0.00	0.00
	Set 2 (10 & 13 Jun 2019)	0.00	0.00
	Set 3 (16 & 18 Jul 2019)	0.00	0.00
	Set 4 (22 & 24 Jul 2019)	0.00	0.00
	Set 5 (13 & 14 Aug 2019)	0.00	0.00
	Set 6 (20 & 26, 29 Aug 2019)	0.00	0.00
NWL	Set 1 (3 & 6 Jun 2019)	3.73	9.32
	Set 2 (10 & 13 Jun 2019)	0.00	0.00
	Set 3 (16 & 18 Jul 2019)	0.00	0.00
	Set 4 (22 & 24 Jul 2019)	0.00	0.00
	Set 5 (13 & 14 Aug 2019)	0.00	0.00
	Set 6 (20 & 26, 29 Aug 2019)	0.00	0.00

Note: Dolphin Encounter Rates are deduced from the Two Sets of Surveys (Two Surveys in Each Set) in the reporting quarter in Northeast (NEL) and Northwest Lantau (NWL)

Table 2.10 Quarterly Average Encounter Rates

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		**Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)**	
	June – August 2019	**September – November 2011**	**June – August 2019**	**September – November 2011**
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	0.62 ± 1.52	9.85 ± 5.85	1.55 ± 3.80	44.66 ± 29.85

Note: Encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions.

Group size of Chinese White Dolphins ranged from 1 – 4 individuals per group in North Lantau region during June to August 2019. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in *Table 2.11*.

Table 2.11 Average Dolphin Group Size

	Average Dolphin Group Size	
	June – August 2019	**September – November 2011**
Overall	2.00 ± 1.41 (n = 4)	3.72 ± 3.13 (n = 66)
Northeast Lantau	---	3.18 ± 2.16 (n = 17)
Northwest Lantau	2.00 ± 1.41 (n = 4)	3.92 ± 3.40 (n = 49)

Whilst one limit level exceedance was observed for the quarterly dolphin monitoring data between June and August 2019, no unacceptable impact from the construction activities of this Contract was recorded from the general observations.

Although the dolphins infrequently occurred along the alignment of TM-CLKL Northern Connection Sub-Sea Tunnel Section in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL.

It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

2.3.8 Implementation of Marine Mammal Exclusion Zone

Daily marine mammal exclusion zone was in effect during the period of silt curtain installation in open waters under this Contract. No sighting of the Indo-Pacific humpback dolphin (i.e. Chinese White Dolphin) was recorded in the reporting period during the exclusion zone monitoring.

2.4 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. Thirteen (13) site inspections were carried out in the reporting quarter on 5, 12, 19 and 26 June 2019; 3, 10, 17, 24 and 31 July 2019; 7, 14, 21 and 28 August 2019.

Key observations during the site inspections in this reporting period are summarized in *Table 2.12*.

Table 2.12 Specific Observations and Recommendations during the Weekly Site Inspection in this Reporting Period

Inspection Date	Environmental Observations	Recommendations/ Remarks
5 June 2019	Works Area – Portion N-A • Cement bags should be covered with tarpaulin sheet. • Drip tray should be provided for the chemical containers. Works Area - Portion S-C • Food waste should be disposed of. Works Area - Portion S-B • Food waste in the cage should be disposed of. **Reminder from the SOR** Works Area – Portion S-A • Stagnant water should be cleared. • Stagnant water should be cleared. • Stagnant water should be cleared.	Works Area – Portion N-A • The Contractor was reminded to cover the cement bags with tarpaulin sheet. • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-C • The Contractor was reminded to dispose of the food waste. Works Area - Portion S-B • The Contractor was reminded to dispose of the food waste in the cage. **Reminder from the SOR** Works Area – Portion S-A • The Contractor was reminded to clear the stagnant water. • The Contractor was reminded to clear the stagnant water. • The Contractor was reminded to clear the stagnant water.
12 June 2019	Works Area – TBM tunnel • Drip tray should be provided for the chemical containers. Works Area - Portion S-B • Food waste should be disposed of. Works Area - Portion S-C • Food waste should be disposed of. **Reminder from the SOR** Works Area – TBM tunnel • The breaker tip should be wrapped. Works Area – Portion S-A • Stagnant water should be cleared. Works Area – Portion S-B • Stagnant water should be cleared.	Works Area – TBM tunnel • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-B • The Contractor was reminded to dispose of the food waste. Works Area - Portion S-C • The Contractor was reminded to dispose of the food waste. **Reminder from the SOR** Works Area – TBM tunnel • The Contractor was reminded to wrap the breaker tip. Works Area – Portion S-A • The Contractor was reminded to clear the stagnant water. Works Area – Portion S-B • The Contractor was reminded to clear the stagnant water.
19 June 2019	Works Area – Portion N-B • Food waste in the waste skip should be removed. Works Area - Portion S-B • Food waste in the waste skip should be removed. **Reminder from the SOR** Works Area – Portion N-C • Stagnant water trapped in the tray should be cleared.	Works Area – Portion N-B • The Contractor was reminded to remove the food waste in the waste skip. Works Area - Portion S-B • The Contractor was reminded to remove the food waste in the waste skip. **Reminder from the SOR** Works Area – Portion N-C • The Contractor was reminded to clear the stagnant water in the tray.

Inspection Date	Environmental Observations	Recommendations/ Remarks
26 June 2019	Works Area –TBM tunnel • Drip tray should be provided for the chemical containers. • Water spraying should be applied for dust control. Works Area - Portion S-A • Rubbish on the water barrier should be removed. • Cement bags should be covered with tarpaulin sheet. **Reminder from the SOR** Works Area –TBM tunnel • Water barriers should be capped with lids for mosquito control. Works Area - Portion S-A • Stagnant water trapped above the tarpaulin sheets should be cleared.	Works Area –TBM tunnel • The Contractor was reminded to provide drip tray for chemical containers. • The Contractor was reminded to apply water spraying for dust control. Works Area - Portion S-A • The Contractor was reminded to remove the rubbish on the water barrier. • The Contractor was reminded to cover the cement bags with tarpaulin sheets. **Reminder from the SOR** Works Area –TBM tunnel • The Contractor was reminded to cap the water barriers with lids for mosquito control. Works Area - Portion S-A • The Contractor was reminded to clear the stagnant water trapped above the tarpaulin sheets.
3 July 2019	Works Area – Portion TBM tunnel • The cherry picker should be fixed to prevent oil leakage. Works Area - Portion N-A • Construction waste beside the waste skip should be removed. • Drip tray should be provided for the chemical containers. Works Area - Portion S-A • Rubbish on the floor should be removed. Works Area - Portion S-B • Rubbish on the floor should be removed. **Reminder from the SOR** Works Area – TBM tunnel • Water barriers should be capped with lids for mosquito control. Works Area – TPortion S-C Water barriers should be capped with lids for mosquito control.	Works Area – Portion TBM tunnel • The Contractor was reminded to fix the cherri picker to prevent oil leakage. Works Area - Portion N-A • The Contractor was reminded to remove the construction waste beside the waste skip. • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-A • The Contractor was reminded to remove the rubbish on the floor. Works Area - Portion S-B • The Contractor was reminded to remove the rubbish on the floor. **Reminder from the SOR** Works Area – TBM tunnel • The Contractor was reminded to cap the water barriers with lids for mosquito control. Works Area – Portion S-C The Contractor was reminded to cap the water barriers with lids for mosquito control.
10 July 2019	Works Area – Portion S-A • Rubbish should be disposed of to maintain better housekeeping. Works Area - Portion S-C • Oil spillage on the floor should be cleared. **Reminder from the SOR** Works Area – Portion N-A • Larvacides should be sprayed for mosquito control.	Works Area – Portion S-A • The Contractor was reminded to dispose of the rubbish to maintain better housekeeping. Works Area - Portion S-C • The Contractor was reminded to clear the oil spillage on the floor. **Reminder from the SOR** Works Area – Portion N-A • The Contractor was reminded to spray larvacides for mosquito control.

Inspection Date	Environmental Observations	Recommendations/ Remarks
17 July 2019	Works Area – Portion S-A • Drip tray should be provided for the chemical containers. • Drip tray should be provided for the chemical containers. Works Area - Portion S-B • Wastewater should be diverted to the mud pit. **Reminder from the SOR** Works Area –TBM tunnel • The broken water barrier should be replaced. Works Area - Portion S-B • The breaker tip should be wrapped with noise insulation materials. Works Area - Portion S-C • Stagnant water at the pit should be cleared for mosquito control.	Works Area – Portion S-A • The Contractor was reminded to provide drip tray for the chemical containers. • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-B • The Contractor was reminded to divert the wastewater to the mud pit. **Reminder from the SOR** Works Area –TBM tunnel • The Contractor was reminded to replace the broken water barrier. Works Area - Portion S-B • The Contractor was reminded to wrap the breaker tip with noise insulation materials. Works Area - Portion S-C • The Contractor was reminded to clear the stagnant water at the pit for mosquito control.
24 July 2019	Works Area – Portion N-B • Food waste in the skip should be removed. Works Area - Portion N-A • Drip tray should be provided for the chemical drums. Works Area - Portion S-C • Food waste in the skip should be removed. **Reminder from the SOR** Works Area – Portion S-C The cover of the water barrier should be provided.	Works Area – Portion N-B • The Contractor was reminded to remove the food waste in the skip. Works Area - Portion N-A • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-C • The Contractor was reminded to remove the food waste in the skip. **Reminder from the SOR** Works Area – Portion S-C The Contractor was reminded to provide the cover of the water barrier.
31 July 2019	Works Area – TBM tunnel • Drip tray should be provided for the chemical drums. **Reminder from the SOR** Works Area - TBM tunnel • Broken water barrier should be removed.	Works Area – TBM tunnel • The Contractor was reminded to provide drip tray for the chemical containers. **Reminder from the SOR** • The Contractor was reminded to remove the broken water barrier.
7 August 2019	Works Area – Portion N-A • Food waste in the waste skip should be cleared. Works Area - Portion S-A • Label of general waste should be put on the skip. • Food waste should be cleared. • Food waste and stagnant water should be cleared.	Works Area – Portion N-A • The Contractor was reminded to clear the food waste in the waste skip. Works Area - Portion S-A • The Contractor was reminded to put the label of general waste on the skip. • The Contractor was reminded to clear the food waste. • The Contractor was reminded to clear the food waste and stagnant water.

Inspection Date	Environmental Observations	Recommendations/ Remarks
14 August 2019	Works Area – TBM tunnel • Water spraying should be applied for dust control. • Drip tray should be provided for the chemical containers. Works Area - Portion S-A • Better housekeeping should be maintained. • Cement bags should be covered with tarpaulin sheets. • Drip tray should be provided for the chemical containers. **Reminder from the SOR** Works Area – Portion S-A • Stagnant water above the H-beam should be cleared.	Works Area – TBM tunnel • The Contractor was reminded to apply water spraying for dust control. • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-A • The Contractor was reminded to maintain better housekeeping. • The Contractor was reminded to cover the cement bags with tarpaulin sheets. • The Contractor was reminded to provide drip tray for the chemical containers. **Reminder from the SOR** Works Area – Portion S-A • The Contractor was reminded to .clear the stagnant water above the H-Beam.
21 August 2019	Works Area – Portion N-A • Drip tray should be provided for the chemical containers. Works Area - Portion S-A • Waste should be removed and better housekeeping should be maintained. **Reminder from the SOR** Works Area – Portion N-A • Lifting eyes should be filled with sand.	Works Area – Portion N-A • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-A • The Contractor was reminded to remove the waste and maintain better housekeeping. **Reminder from the SOR** Works Area – Portion N-A • The Contractor was reminded to fill the lifting eyes with sand.
28 August 2019	Works Area – TBM tunnel • Better housekeeping should be maintained to prevent dust. • Drip tray should be provided for the chemical containers. Works Area - Portion S-A • Drip tray should be provided for the chemical containers. • Cement bags should be covered by tarpaulin sheets.	Works Area – TBM tunnel • The Contractor was reminded to maintain better housekeeping to prevent dust. • The Contractor was reminded to provide drip tray for the chemical containers. Works Area - Portion S-A • The Contractor was reminded to provide drip tray for the chemical containers. • The Contractor was reminded to cover cement bags with tarpaulin sheets.

The Contractor has rectified all of the observations as identified during environmental site inspections in the reporting quarter.

2.5 *WASTE MANAGEMENT STATUS*

The Contractor had submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

Wastes generated during this reporting period include mainly construction wastes (inert and non-inert). Reference has been made to the waste flow table prepared by the Contractor (*Appendix K*). The quantities of different types of wastes are summarized in *Table 2.13*.

Table 2.13 Quantities of Different Waste Generated in the Reporting Period

Month/Year	Inert Construction Waste (a) (tonnes)	Inert Construction Waste Re-used (tonnes)	Non-inert Construction Waste (b) (tonnes)	Recyclable Materials (c) (kg)	Chemical Wastes (kg)	Marine Sediment (m^3)		
						Category L	Category M (M_p & M_f)	Mixed (L+M)
June 2019	4,134	0	751	137,550	4,140	0	0	0
July 2019	3,821	0	730	445,570	0	0	0	0
August 2019	2,388	0	703	507,510	3,800	0	0	0

Notes:

(a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill.

(b) Non-inert construction wastes include general refuse disposed at landfill.

(c) Recyclable materials include metals, paper, cardboard, plastics, timber and others.

(d) Updated waste flow table is presented in quarterly report.

The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/ recycle of C&D materials and wastes. The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

2.6 *ENVIRONMENTAL LICENSES AND PERMITS*

The status of environmental licensing and permit is summarized in *Table 2.14* below.

Table 2.14 Summary of Environmental Licensing and Permit Status

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-354/2009/D	13 March 2015	Throughout the Contract	HyD	Application for VEP on 3 March 2015 to supersede EP-354/2009/C
Construction Dust Notification	363510	19 August 2013	Throughout the Contract	DBJV	Northern Landfall
Construction Dust Notification	403620	10 June 2016	Throughout the Contract	DBJV	Southern Landfall
Chemical Waste Registration	5213-422-D2516-02	18 January 2017	Throughout the Contract	DBJV	Northern Landfall
Chemical Waste Registration	5213-951-D2591-01	25 May 2016	Throughout the Contract	DBJV	Southern Landfall
Construction Waste Disposal Account	7018108	28 August 2013	Throughout the Contract	DBJV	Waste disposal in Contract No. HY/2012/08
Construction Waste Disposal Account	7021715	21 March 2019	14 July 2019	DBJV	Vessel Disposal
Construction Waste Disposal Account	7021715	4 July 2019	14 October 2019	DBJV	Vessel Disposal
Waste Water Discharge License	WT00019248-2014	5 June 2014	30 June 2019	DBJV	For site Portion N6 and Reclamation Area E
Waste Water Discharge License	WT00031435-2018	2 August 2018	31 August 2023	DBJV	Southern Landfall
Waste Water Discharge License	WT00034060-2019	25 July 2019	30 June 2024	DBJV	Northern Landfall (4 Discharge Point)
Marine Dumping Permit	EP/MD/20-013	19 May 2019	18 November 2019	DBJV	Type 1 (Open Sea Disposal)
Marine Dumping Permit	EP/MD/20-001	5 May 2019	4 June 2019	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Construction Noise Permit	GW-RW0406-18	27 April 2019	15 October 2019	DBJV	Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0063-19	20 February 2019	19 August 2019	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RW0374-19	20 August 2019	19 February 2020	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RS0224-19	25 March 2019	24 September 2019	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0179-19	27 April 2019	15 October 2019	DBJV	Urmston Road in front of Pillar Point

Notes:
HyD = Highways Department

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
DBJV = Dragages – Bouygues Joint Venture					
VEP = Variation of Environmental Permit					

2.7 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

In response to the site audit findings, the Contractors carried out all corrective actions.

A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in *Appendix C*. The necessary mitigation measures relevant to this Contract were implemented properly.

2.8 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

For air quality impact monitoring, a total of thirty monitoring events for both 1-hour TSP and 24-hour TSP were undertaken in which Two (2) Action level and one (1) Limit Level exceedances of 1-hour TSP and were recorded (*Table 2.15*).

Table 2.15 Summary of Exceedances for Air Quality Impact Monitoring in this Reporting Quarter

Station	Exceedance Level	Date of Exceedances		Number of Exceedances	
		1-hr TSP	24-hr TSP	1-hr TSP	24-hr TSP
AQMS1	Action Level	-	-	-	-
	Limit Level	-	-	-	-
ASR1	Action Level	-	-	-	-
	Limit Level	2019-07-28	-	1	-
ASR5	Action Level	2019-07-28	-	1	-
	Limit Level	-	-	-	-
ASR6	Action Level	2019-07-10	-	1	-
	Limit Level	-	-	-	-
ASR10	Action Level	-	-	-	-
	Limit Level	-	-	-	-
Total number of Action level Exceedances:				**2**	**0**
Total number of Limit level Exceedances:				**1**	**0**

For marine water quality impact monitoring, a total of thirty-four monitoring events were undertaken in which One hundred and six (106) Action level and eighteen (18) Limit Level exceedances of Dissolved Oxygen were recorded in this reporting period. One (1) Action Level exceedance for Depth-averaged suspended solids was recorded. (*Table 2.16*).

Table 2.16 Summary of Exceedances for Marine Water Quality Impact Monitoring in this Reporting Quarter

Station	Exceedance Level [a]	DO (Surface and Middle)		DO (Bottom)		Turbidity (depth-averaged)		SS (depth-averaged)	
		Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
IS17	**AL**	2019-07-12 2019-08-07 2019-08-21 2019-08-28 2019-08-30	2019-07-22 2019-07-24 2019-08-21 2019-08-28	2019-07-10 2019-07-17 2019-07-19 2019-07-22 2019-07-24 2019-07-29 2019-08-07 2019-08-14 2019-08-19 2019-08-21 2019-08-23 2019-08-28	2019-07-05 2019-07-12 2019-07-22 2019-07-24 2019-08-28	-	-	-	-
	LL	-	-	2019-07-12	-	-	-	-	-
IS(Mf)11	**AL**	2019-07-12 2019-07-22 2019-08-28 2019-08-30	2019-07-17 2019-07-22 2019-08-07 2019-08-19 2019-08-21 2019-08-28	2019-07-19 2019-07-29 2019-08-12 2019-08-19 2019-08-30	2019-07-08 2019-07-10 2019-07-17 2019-07-19 2019-08-12 2019-08-14 2019-08-19 2019-08-28	-	-	-	-
	LL	-	-	2019-07-12 2019-07-15 2019-07-17 2019-07-22 2019-07-24 2019-08-26 2019-08-28	2019-07-12 2019-07-15 2019-07-22 2019-07-24 2019-07-29 2019-08-26	-	-	-	-
SR7	**AL**	2019-08-30	2019-07-22 2019-07-24	2019-08-30	2019-07-19 2019-07-22	-	-	-	2019-08-28

Station	Exceedance Level [a]	DO (Surface and Middle)		DO (Bottom)		Turbidity (depth-averaged)		SS (depth-averaged)	
		Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
			2019-08-30		2019-07-24 2019-08-21 2019-08-28				
	LL	-	-	-	-	-	-	-	-
CS(Mf)5	**AL**	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
CS(Mf)3(N)	**AL**	-	-	-	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
IS(Mf)16	**AL**	2019-08-19 2019-08-28	2019-07-22	2019-07-12 2019-07-22 2019-08-14 2019-08-19	2019-07-22 2019-07-24	-	-	-	-
	LL	-	-	2019-07-29	-	-	-	-	-
SR4a	**AL**	2019-07-22 2019-08-19 2019-08-28 2019-08-30	-	2019-07-03 2019-07-12 2019-07-19 2019-07-22 2019-07-24 2019-08-19 2019-08-28 2019-08-30	2019-07-22 2019-07-29 2019-08-07 2019-08-28 2019-08-30	-	-	-	-
	LL	-	-	-	-	-	-	-	-
SR4(N2)	**AL**	2019-08-19 2019-08-28 2019-08-30	2019-07-22 2019-08-30	2019-07-17 2019-07-19 2019-07-22 2019-07-29 2019-08-19	2019-07-22 2019-07-24 2019-07-29	-	-	-	-
	LL	-	-	2019-08-28	-	-	-	-	-
IS8(N)	**AL**	2019-08-28 2019-08-30	-	2019-07-22 2019-07-24 2019-08-19	-	-	-	-	-

Station	Exceedance Level (a)	DO (Surface and Middle)		DO (Bottom)		Turbidity (depth-averaged)		SS (depth-averaged)	
		Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
				2019-08-28					
	LL	-	-	2019-07-29	-	-	-	-	-
IS(Mf)9	**AL**	2019-08-07	-	2019-07-29	-	-	-	-	-
	LL	-	-	-	-	-	-	-	-
	Total AL Exceedances:	**22**	**16**	**40**	**28**	**0**	**0**	**0**	**1**
	Total LL Exceedances:	**0**	**0**	**11**	**6**	**0**	**0**	**0**	**0**

Notes:
(a) AL = Action Level; LL = Limit Level

One (1) Limit Level exceedance was observed for the quarterly dolphin monitoring data between June and August 2019, whilst no unacceptable impact from the construction activities of the TM-CLKL Northern Connection Sub-sea Tunnel Section on Chinese White Dolphins was noticeable from general observations.

Cumulative statistics are provided in *Appendix J*.

2.9 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

The Environmental Complaint Handling Procedure is provided in *Figure 2.4*.

No environmental complaint was received in this reporting period.

No environmental summons was received in this reporting period.

Statistics on complaints, notifications of summons and successful prosecutions are summarized in *Appendix J*.

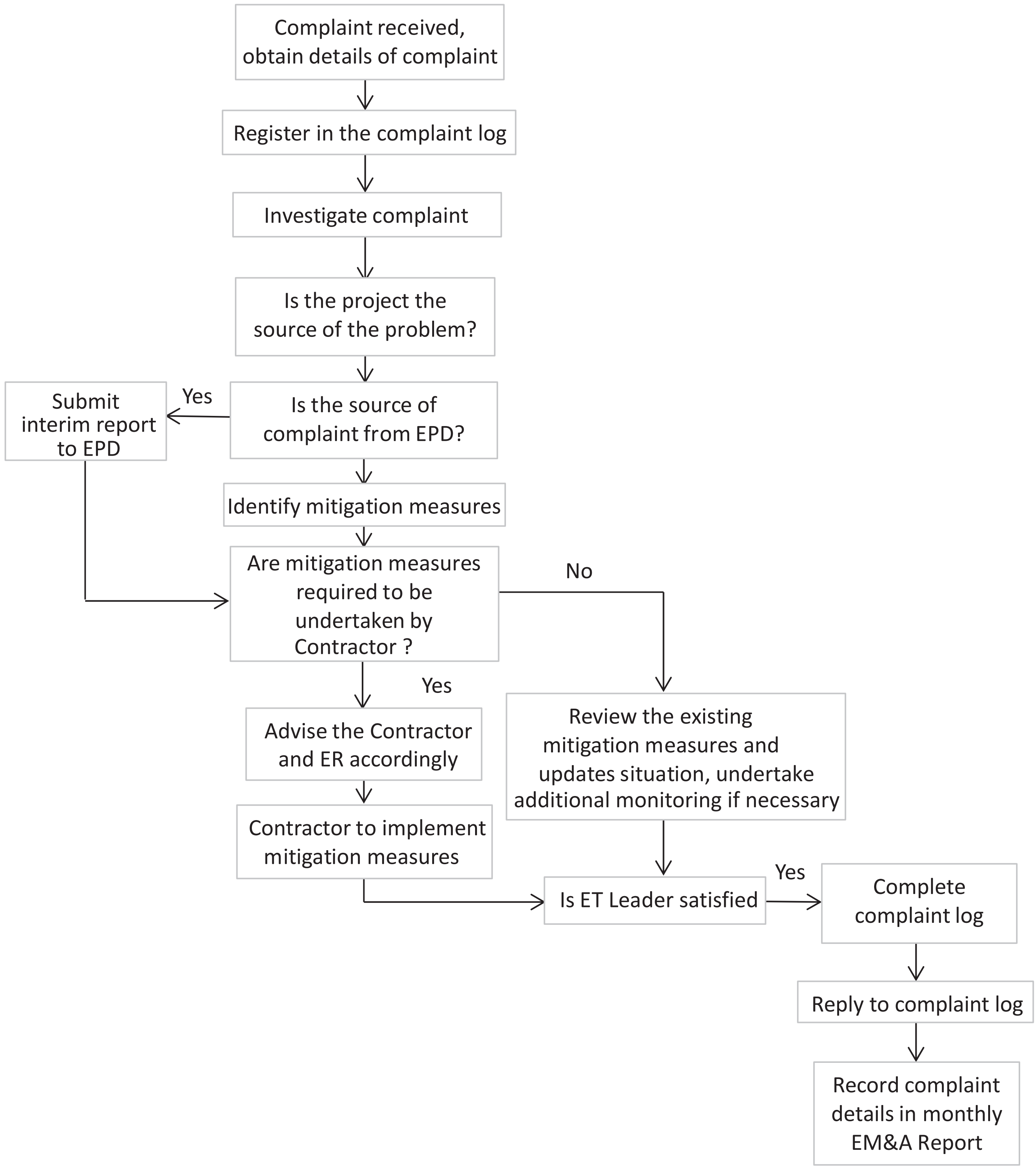


Figure 2.4

Environmental Complaint Handling Procedure

FILE: 0215660n2.cdr
DATE: 06/12/2013

Environmental Resources Management

ERM

3 FUTURE KEY ISSUES

3.1 CONSTRUCTION ACTIVITIES FOR THE COMING QUARTER

As informed by the Contractor, the major works for the Contract in the coming quarter are summarized in *Table 3.1*.

Table 3.1 Construction Works to Be Undertaken in the Coming Quarter

Works to be undertaken
Land-based Works • Construction of Thermal barrier – TBM tunnel; • Construction of Walkway Corbel & Cover – TBM Tunnel; • Backfilling – Portion N-A • RC structure – Portion S-A; • Louver Installation – Portion S-A; • Construction of Parapet – Portion S-C • VST Tower Dismantling – Portion S-C *Marine-based Works* • Seawall Modification Works – Portion S-B

3.2 KEY ISSUES FOR THE COMING QUARTER

Potential environmental impacts arising from the above upcoming construction activities in the coming quarterly period are expected to be mainly associated with dust, marine ecology, marine water quality and waste management issues.

3.3 MONITORING SCHEDULE FOR THE COMING QUARTER

Impact monitoring for air quality and marine ecology (include dolphin monitoring) are scheduled to continue for the next reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not considered to be necessary at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period.

4 *CONCLUSIONS*

This Twenty-third Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 June 2019 to 31 August 2019, in accordance with the Updated EM&A Manual and the requirements of *EP-354/2009/D*.

Air quality (including 1-hour TSP and 24-hour TSP), water quality and dolphin monitoring were carried out in the reporting period. Two (2) Action level and one (1) Limit Level exceedances of 1-hour TSP and were recorded in this reporting period.

One hundred and six (106) Action level and eighteen (18) Limit Level exceedances of Dissolved Oxygen were recorded in this reporting period. One (1) Action Level exceedance for Depth-averaged suspended solids was recorded.

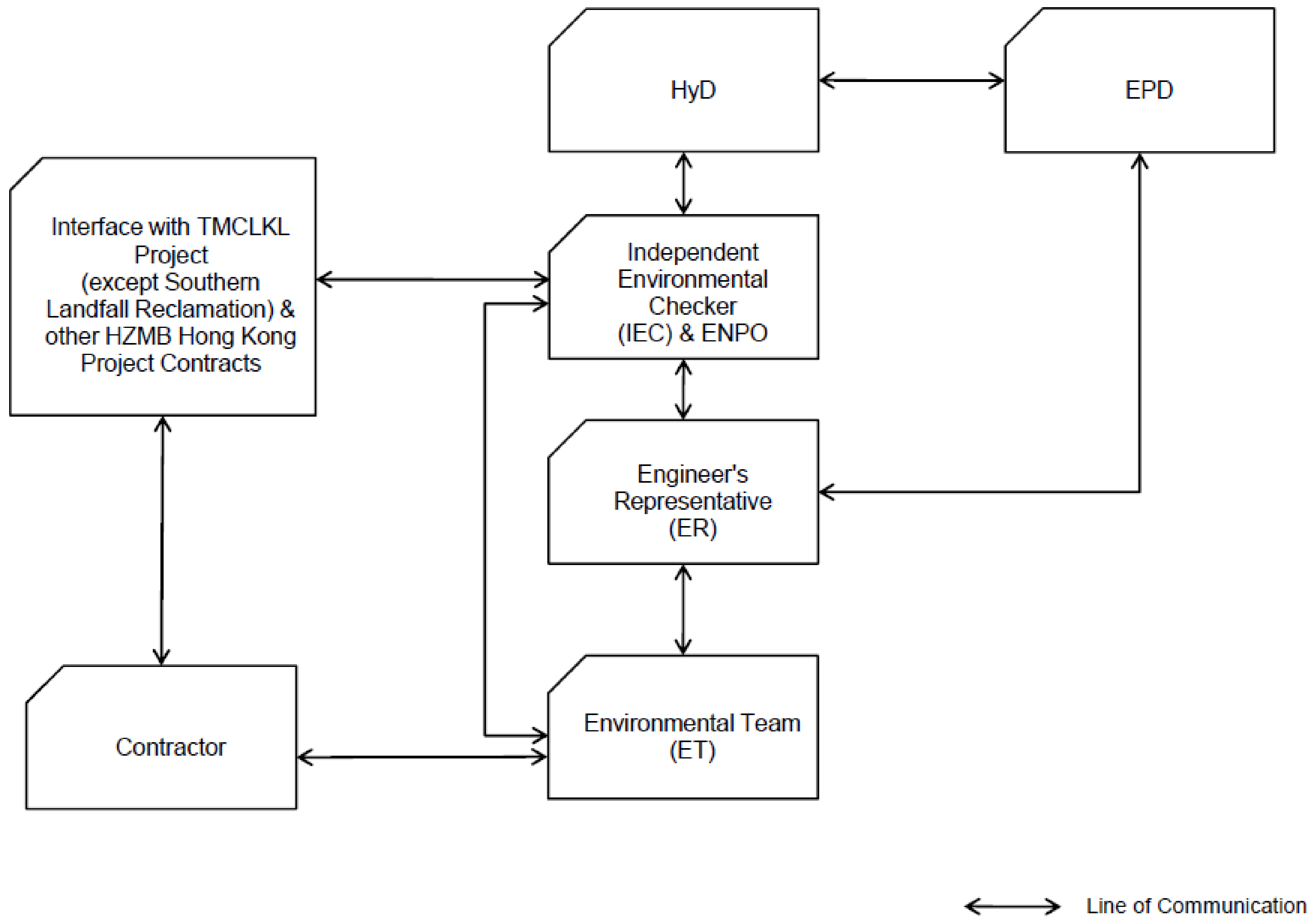
A total of 4 groups of 8 Chinese White Dolphins sightings were recorded during the six sets of surveys in this reporting quarter. Three of the four dolphin sightings were made during on-effort search, and two of the three on-effort dolphin sightings were made on primary lines. Whilst one limit level exceedance was observed for the quarterly dolphin monitoring data between June to August 2019, no unacceptable impact from the construction activities of this Contract was recorded from the general observations. Although the dolphins infrequently occurred along the alignment of TM-CLKL Northern Connection Sub-Sea Tunnel Section in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the construction works of the Contract, and whether suitable mitigation measure can be applied to improve the situation.

Thirteen weekly environmental site inspections were carried out in the reporting period. Recommendations on remedial actions provided for the deficiencies identified during the site audits were properly implemented by the Contractor. No non-compliance event was recorded during the reporting period.

The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not recommended at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A

Project Organization for Environmental Works



Appendix A1

Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section
Project Organization

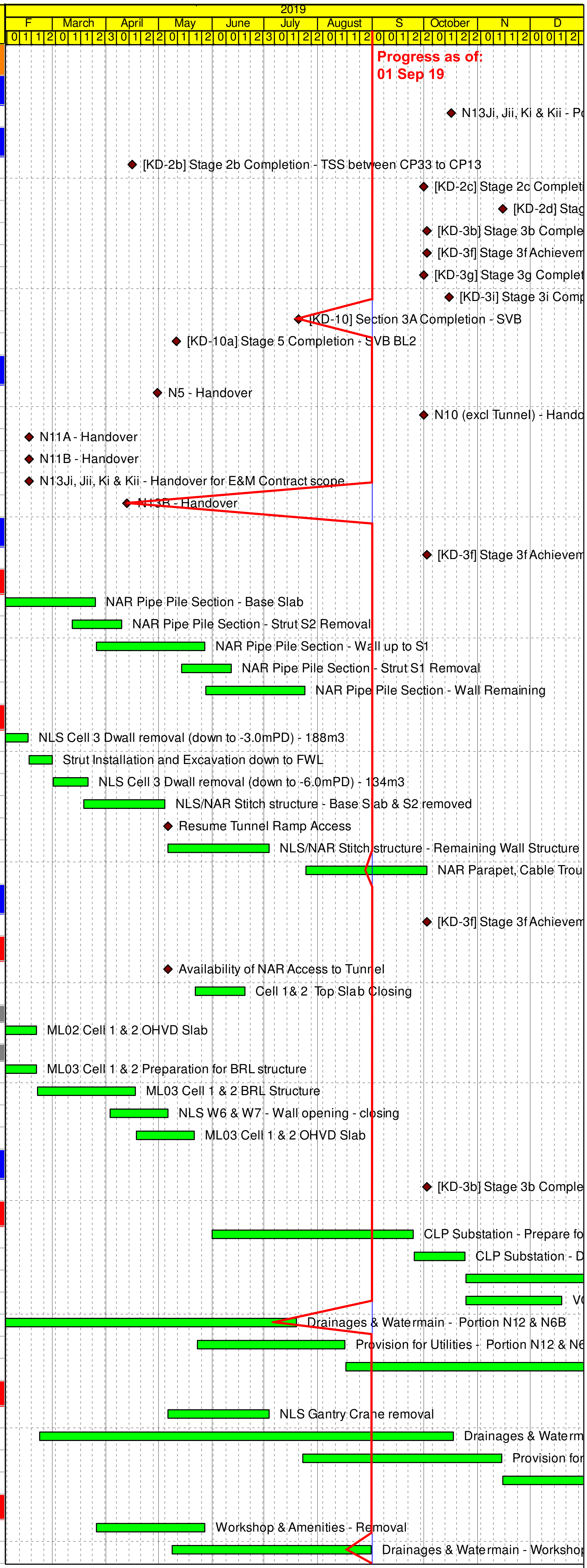
DATE: 06/03/2013

Environmental Resources Management
ERM

Appendix B

Construction Programme

Activity Name	Orig Dur	Start	Finish
TMCLKL Northern Connection Sub-sea Tunnel Section			
Possession / Access Dates			
N13Ji, Jii, Ki & Kii - Possession / Access (after E&M scope)	0	16-Oct-19	
Contract Key Dates			
[KD-2b] Stage 2b Completion - TSS between CP33 to CP13	0		15-Apr-19*
[KD-2c] Stage 2c Completion - Remaining TSS & TSA	0		30-Sep-19*
[KD-2d] Stage 2d Completion - MHS C&C Tunnel	0		15-Nov-19*
[KD-3b] Stage 3b Completion - NLF Provision for CLP, LV & I	0		02-Oct-19*
[KD-3f] Stage 3f Achievement - NLS/NAR - provide access	0		02-Oct-19*
[KD-3g] Stage 3g Completion - SVS Tunnel	0		30-Sep-19*
[KD-3i] Stage 3i Completion - South Approach Ramp	0		15-Oct-19*
[KD-10] Section 3A Completion - SVB	0		20-Jul-19*
[KD-10a] Stage 5 Completion - SVB BL2	0		11-May-19*
Portion Handover Dates			
N5 - Handover	0		30-Apr-19*
N10 (excl Tunnel) - Handover	0		30-Sep-19*
N11A - Handover	0		15-Feb-19*
N11B - Handover	0		15-Feb-19*
N13Ji, Jii, Ki & Kii - Handover for E&M Contract scope	0		15-Feb-19*
N13B - Handover	0		12-Apr-19*
North Approach Ramp			
[KD-3f] Stage 3f Achievement - NAR - provide access	0		02-Oct-19*
Access Ramp Section			
NAR Pipe Pile Section - Base Slab	48	22-Jan-19	25-Mar-19
NAR Pipe Pile Section - Strut S2 Removal	24	12-Mar-19	09-Apr-19
NAR Pipe Pile Section - Wall up to S1	48	26-Mar-19	27-May-19
NAR Pipe Pile Section - Strut S1 Removal	24	14-May-19	11-Jun-19
NAR Pipe Pile Section - Wall Remaining	48	28-May-19	24-Jul-19
NLS Interface (OAP-NAR-DWG-10442-B)			
NLS Cell 3 Dwall removal (down to -3.0mPD) - 188m3	18	18-Jan-19	14-Feb-19
Strut Installation and Excavation down to FWL	12	15-Feb-19	28-Feb-19
NLS Cell 3 Dwall removal (down to -6.0mPD) - 134m3	18	01-Mar-19	21-Mar-19
NLS/NAR Stitch structure - Base Slab & S2 removed	36	19-Mar-19	04-May-19
Resume Tunnel Ramp Access	0	06-May-19	
NLS/NAR Stitch structure - Remaining Wall Structure & Stru	48	06-May-19	03-Jul-19
NAR Parapet, Cable Trough	58	25-Jul-19	02-Oct-19*
North Launching Shaft			
[KD-3f] Stage 3f Achievement - NLS - provide access	0		02-Oct-19*
NLS Cell 1-3 Remaining Structure			
Availability of NAR Access to Tunnel	0		06-May-19
Cell 1& 2 Top Slab Closing	24	22-May-19	19-Jun-19
ML02			
ML02 Cell 1 & 2 OHVD Slab	24	16-Jan-19	19-Feb-19
ML03			
ML03 Cell 1 & 2 Preparation for BRL structure	24	16-Jan-19	19-Feb-19
ML03 Cell 1 & 2 BRL Structure	48	20-Feb-19	17-Apr-19
NLS W6 & W7 - Wall opening - closing	24	03-Apr-19	06-May-19
ML03 Cell 1 & 2 OHVD Slab	24	18-Apr-19	21-May-19
NLF Demobilization & At-grade works			
[KD-3b] Stage 3b Completion - NLF Provision for CLP, LV & I	0		02-Oct-19*
Portion N12 & Portion N6B			
CLP Substation - Prepare for CLP Consent for de-energizat	96	01-Jun-19	24-Sep-19
CLP Substation - De-energization	24	25-Sep-19	24-Oct-19
CLP Substation - Dismantling & Removal	178	25-Oct-19	01-Jun-20
VO-009 Temporary Protection Barrier - Dismantling & Remo	48	25-Oct-19	19-Dec-19
Drainages & Watermain - Portion N12 & N6B	144	17-Jan-19	19-Jul-19
Provision for Utilities - Portion N12 & N6B	72	23-May-19	16-Aug-19
Utilities parties coordination & Remaining Civil Provision - I	117	17-Aug-19	07-Jan-20
North Launching Shaft			
NLS Gantry Crane removal	48	06-May-19	03-Jul-19
Drainages & Watermain - NLS	194	21-Feb-19	17-Oct-19
Provision for Utilities - NLS	96	23-Jul-19	14-Nov-19
Utilities parties coordination & Remaining Civil Provision - I	43	15-Nov-19	07-Jan-20
Sloping Seawall			
Workshop & Amenities - Removal	48	26-Mar-19	27-May-19
Drainages & Watermain - Workshop & Amenities	96	09-May-19	31-Aug-19



Planned Milestone
Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

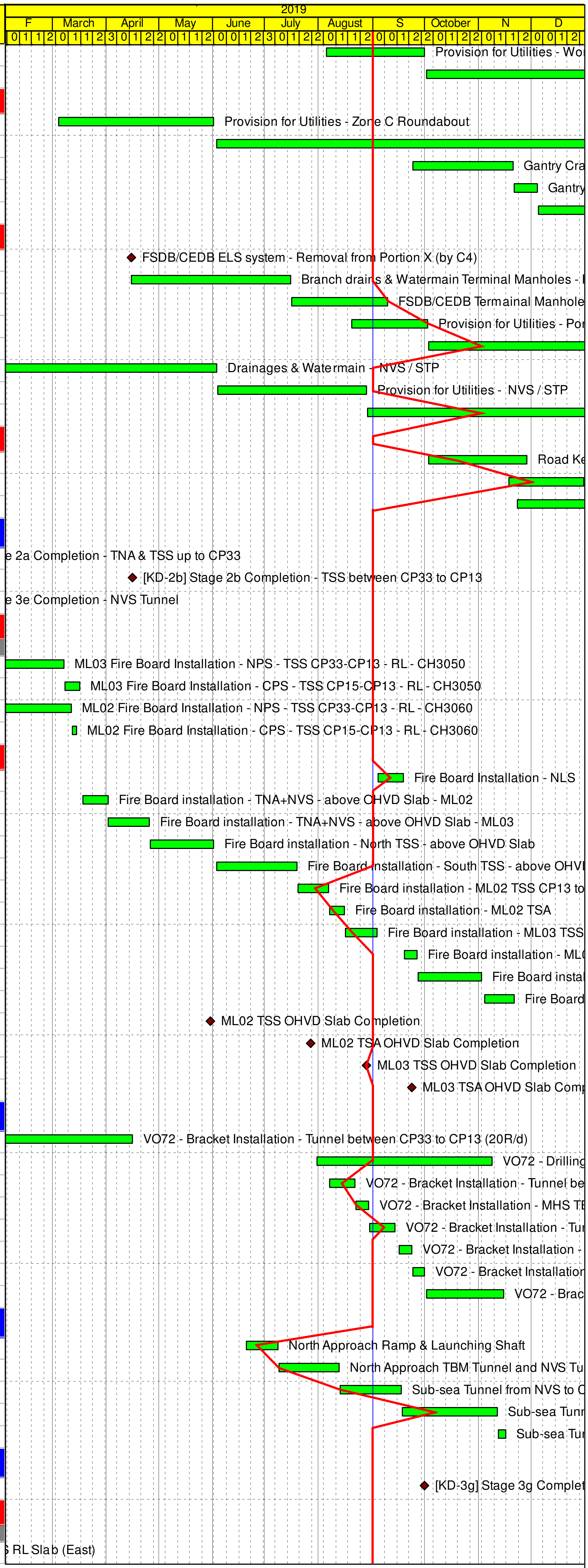
Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 28 Jul 2019

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Activity Name	Orig Dur	Start	Finish
Provision for Utilities - Workshop & Amenities	48	05-Aug-19	30-Sep-19
Utilities parties coordination & Remaining Civil Provision - \	80	02-Oct-19	07-Jan-20
Precast Segment Yard			
Provision for Utilities - Zone C Roundabout	72	04-Mar-19	01-Jun-19
Utilities parties coordination & Remaining Civil Provision - Z	180	03-Jun-19	07-Jan-20
Gantry Crane 2 & 3 - Dismantling	48	24-Sep-19	20-Nov-19
Gantry Crane 2 & 3 Area - Ground slab removal	12	21-Nov-19	04-Dec-19
Zone C Area - Final Compaction for Handover	22	05-Dec-19	02-Jan-20
NVS & STP (Portion N7 Interface)			
FSDB/CEDB ELS system - Removal from Portion X (by C4)	0	15-Apr-19*	
Branch drains & Watermain Terminal Manholes - FSDB/CE	72	15-Apr-19	15-Jul-19
FSDB/CEDB Termainal Manholes	48	16-Jul-19	09-Sep-19
Provision for Utilities - Portion N7 Interface	36	20-Aug-19	02-Oct-19
Utilities parties coordination & Remaining Civil Provision - N7	79	03-Oct-19	07-Jan-20
Drainages & Watermain - NVS / STP	144	30-Nov-18	03-Jun-19
Provision for Utilities - NVS / STP	72	04-Jun-19	28-Aug-19
Utilities parties coordination & Remaining Civil Provision - N	107	29-Aug-19	07-Jan-20
Northern Landfall - Overall			
Road Kerb Installation & Sub-base - NLF At-grade	48	03-Oct-19	28-Nov-19
Pavement - NLF At-grade	36	18-Nov-19	31-Dec-19
Street Furniture and Road Marking - NLF At-grade	36	23-Nov-19	07-Jan-20
Tunnel - Thermal Barrier			
[KD-2a] Stage 2a Completion - TNA & TSS up to CP33	0		15-Dec-18*
[KD-2b] Stage 2b Completion - TSS between CP33 to CP13	0		15-Apr-19*
[KD-3e] Stage 3e Completion - NVS Tunnel	0		15-Dec-18*
Fire board Installation below OHVD			
Fire Board between CP33 and CP13			
ML03 Fire Board Installation - NPS - TSS CP33-CP13 - RL	68	08-Dec-18	07-Mar-19
ML03 Fire Board Installation - CPS - TSS CP15-CP13 - RL	8	08-Mar-19	16-Mar-19
ML02 Fire Board Installation - NPS - TSS CP33-CP13 - RL	68	12-Dec-18	11-Mar-19
ML02 Fire Board Installation - CPS - TSS CP15-CP13 - RL	3	12-Mar-19	14-Mar-19
Fire board Installation above OHVD			
Fire Board Installation - NLS	12	04-Sep-19	18-Sep-19
Fire Board installation - TNA+NVS - above OHVD Slab - ML	13	18-Mar-19	01-Apr-19
Fire Board installation - TNA+NVS - above OHVD Slab - ML	17	02-Apr-19	25-Apr-19
Fire Board installation - North TSS - above OHVD Slab	30	26-Apr-19	01-Jun-19
Fire Board installation - South TSS - above OHVD Slab	39	03-Jun-19	19-Jul-19
Fire Board installation - ML02 TSS CP13 to SVS	15	20-Jul-19	06-Aug-19
Fire Board installation - ML02 TSA	8	07-Aug-19	15-Aug-19
Fire Board installation - ML03 TSS CP13 to SVS	16	16-Aug-19	03-Sep-19
Fire Board installation - ML03 TSA	7	19-Sep-19	26-Sep-19
Fire Board installation - MHS C&C below OHVD	30	27-Sep-19	02-Nov-19
Fire Board installation - MHS C&C above OHVD	16	04-Nov-19	21-Nov-19
ML02 TSS OHVD Slab Completion	0		30-May-19
ML02 TSA OHVD Slab Completion	0		27-Jul-19
ML03 TSS OHVD Slab Completion	0		28-Aug-19
ML03 TSA OHVD Slab Completion	0		23-Sep-19
Tunnel - Anchor / E&M Bracket (VO72)			
VO72 - Bracket Installation - Tunnel between CP33 to CP13	93	17-Dec-18	15-Apr-19
VO72 - Drilling & Anchor Installation - Remaining Tunnel	84	31-Jul-19	08-Nov-19
VO72 - Bracket Installation - Tunnel between CP13 to SVS N	13	07-Aug-19	21-Aug-19
VO72 - Bracket Installation - MHS TBM Tunnel ML02 (20R/d)	7	22-Aug-19	29-Aug-19
VO72 - Bracket Installation - Tunnel between CP13 to SVS N	13	30-Aug-19	13-Sep-19
VO72 - Bracket Installation - NLS	7	16-Sep-19	23-Sep-19
VO72 - Bracket Installation - MHS TBM Tunnel ML03 (20R/d)	6	24-Sep-19	30-Sep-19
VO72 - Bracket Installation - MHS C&C Tunnel	38	02-Oct-19	15-Nov-19
Tunnel Roadworks			
North Approach Ramp & Launching Shaft	15	20-Jun-19	08-Jul-19
North Approach TBM Tunnel and NVS Tunnel	30	09-Jul-19	12-Aug-19
Sub-sea Tunnel from NVS to CP33	30	13-Aug-19	17-Sep-19
Sub-sea Tunnel from CP33 to CP13	45	18-Sep-19	11-Nov-19
Sub-sea Tunnel from CP13 to SVS	5	12-Nov-19	16-Nov-19
ML02 South Ventilation Shaft			
[KD-3g] Stage 3g Completion - SVS Tunnel	0		30-Sep-19*
ML02 SVS Structure			
Tunnel Box			
ML02 SVS RL Slab (East)	18	04-Dec-18	24-Dec-18



Planned Milestone
Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 28 Jul 2019

香港寶嘉 Dragages Hong Kong
A member of the Bouygues Construction group
BOUYGUES TRAVAUX PUBLICS
Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Activity Name	Orig Dur	Start	Finish
ML02 SVS OHVD Slab	18	27-Dec-18	17-Jan-19
ML02 SVS Tunnel Roof Slab	15	18-Jan-19	04-Feb-19
ML02 SVS BRL (West) - Ramp / Backfill Removal	12	24-Apr-19	08-May-19
ML02 SVS BRL walls (West)	33	09-May-19	18-Jun-19
ML02 SVS RL Slab (West)	15	19-Jun-19	06-Jul-19
ML02 SVS West wall remaining after CP7	18	02-Sep-19	23-Sep-19
ML02 SVS Tunnel - Prepare for E&M Contractor Access	6	24-Sep-19	30-Sep-19
Above Tunnel Vent Duct			
ML02 SVS Tunnel Roof Wall (-28.70 to -21.90)	30	12-Feb-19	18-Mar-19
ML02 SVS Above Tunnel Roof Wall & Slab (-21.90 to -18.7	36	19-Mar-19	04-May-19
ML02 SVS Below BL2 Wall & Slab + Backfill (-18.70 to -6.9	60	06-May-19	17-Jul-19
ML02 SVS Dwall opening for Duct connection to SVB S1	24	18-Jul-19	14-Aug-19
ML02 SVS BL2 Wall & Slab (-6.95 to -0.45)	27	15-Aug-19	16-Sep-19
ML02 SVS Dwall opening for Duct connection to SVB S2	27	24-Sep-19	26-Oct-19
ML02 SVS BL1 Wall & Slab (-0.45 to +1.80)	30	28-Oct-19	30-Nov-19
ML02 SVS Duct Roof Wall & Slab	24	02-Dec-19	31-Dec-19
ML02 SVS Tunnel Roof to BBL2 W/P & Backfill (-21.90 to -	60	06-May-19	17-Jul-19
ML02 SVS BL2 W/P & Backfill (-8.00 to -0.65)	21	29-Aug-19	23-Sep-19
CP7 South Ventilation Shaft			
ML02 SVS			
ML02 SVS Access Ramp for CP7	6	12-Feb-19	18-Feb-19
ML02 SVS CP7 Dwall opening + Excavation (Bottom)	24	19-Feb-19	18-Mar-19
ML02 SVS CP7 Invert Slab, Wall & Middle Slab	15	19-Mar-19	04-Apr-19
ML02 SVS CP7 Temp Strut	6	06-Apr-19	12-Apr-19
ML02 SVS CP7 Bottom section backfilling	6	13-Apr-19	23-Apr-19
ML02 SVS CP7 Upper Excavation & modify arches	24	08-Jul-19	03-Aug-19
ML02 SVS CP7 Top section - Structure	24	05-Aug-19	31-Aug-19
ML03 South Ventilation Shaft			
ML03 SVS Structure			
Tunnel Box			
ML03 SVS RL Wall	30	19-Dec-18	25-Jan-19
ML03 SVS OHVD Slab	18	26-Jan-19	22-Feb-19
ML03 SVS ARL Wall	21	23-Feb-19	19-Mar-19
ML03 SVS Tunnel Roof Slab	15	20-Mar-19	06-Apr-19
Above Tunnel Vent Duct			
ML03 SVS Tunnel Roof Wall (-28.70 to -21.90)	30	08-Apr-19	17-May-19
ML03 SVS Above Tunnel Roof Wall & Slab	36	18-May-19	29-Jun-19
ML03 SVS Below BL2 Wall & Slab (-18.70 to -6.95)	50	02-Jul-19	28-Aug-19
ML03 SVS Dwall opening for Duct connection to SVB	18	29-Aug-19	19-Sep-19
ML03 SVS BL2 Duct Connection to SVB	30	20-Sep-19	26-Oct-19
ML03 SVS Dwall opening for Duct connection to SVB	18	04-Nov-19	23-Nov-19
ML03 SVS BL1 Duct connection to SVB	30	25-Nov-19	31-Dec-19
ML03 SVS Tunnel Roof to BBL2 W/P & Backfilli(-21.90 to -	45	16-Jul-19	05-Sep-19
ML03 SVS BL2 W/P & Backfill (-8.00 to -0.65)	24	05-Oct-19	02-Nov-19
South Ventilation Building			
Structure			
SVB - S1 Strut Removal	12	29-Jan-19	18-Feb-19
SVB - BL1 External Wall - Stage 2 & Precast + GL Slab	24	12-Feb-19	11-Mar-19
SVB - GL Wall + 1F Slab	24	12-Mar-19	09-Apr-19
SVB - 1F Wall + 2F Slab	24	26-Mar-19	26-Apr-19
SVB - 2F Wall + RF Slab	24	10-Apr-19	11-May-19
ABWF			
SVB - BL2 ABWF	40	21-Dec-18	15-Feb-19
SVB - BL1 ABWF	24	26-Mar-19	26-Apr-19
SVB - GF ABWF	24	27-Apr-19	27-May-19
SVB - 1F ABWF	24	14-May-19	11-Jun-19
SVB - 2F ABWF	24	28-May-19	25-Jun-19
SVB - Remaining ABWF	21	26-Jun-19	20-Jul-19
SVB - Roof Structure	60	22-Jul-19	30-Sep-19
SVB - Provide Access for BL2 Lower Plenum Rooms	0		15-Feb-19
SVB - Provide Access for BL1 Upper Attenuator Rooms	0		26-Apr-19
SVB - Provide Access for GF	0		27-May-19
SVB - Provide Access for 1F	0		11-Jun-19
SVB - Provide Access for Upper Plenum Rooms	0		25-Jun-19
KD-10a - SVB Structure Completion & Provide Access to BL2	0		11-May-19*
KD-10 - SVB Completion & Provide Access	0		20-Jul-19*
Portion N10 - Handover	0		30-Sep-19*

Planned Milestone
Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

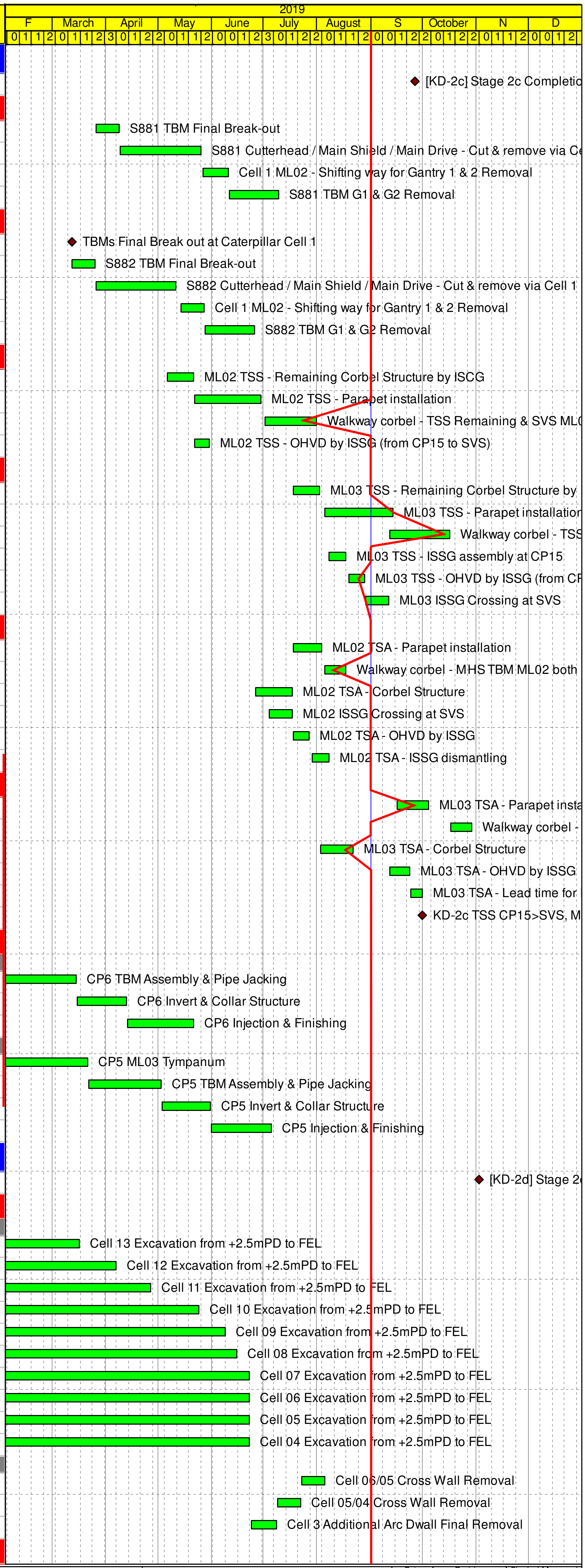
Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 28 Jul 2019

香港寶嘉 Dragages HongKong
A member of the Bouygues Construction group
BOUYGUES TRAVAUX PUBLICS
Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Activity Name	Orig Dur	Start	Finish
South Approach TBM Tunnel			
[KD-2c] Stage 2c Completion - Remaining TSS & TSA	0		26-Sep-19*
S881 TBM			
S881 TBM Final Break-out	14	26-Mar-19	08-Apr-19
S881 Cutterhead / Main Shield / Main Drive - Cut & remove	36	09-Apr-19	25-May-19
Cell 1 ML02 - Shifting way for Gantry 1 & 2 Removal	12	27-May-19	10-Jun-19
S881 TBM G1 & G2 Removal	24	11-Jun-19	09-Jul-19
S882 TBM			
TBMs Final Break out at Caterpillar Cell 1	0	12-Mar-19	
S882 TBM Final Break-out	14	12-Mar-19	25-Mar-19
S882 Cutterhead / Main Shield / Main Drive - Cut & remove	36	26-Mar-19	11-May-19
Cell 1 ML02 - Shifting way for Gantry 1 & 2 Removal	12	14-May-19	27-May-19
S882 TBM G1 & G2 Removal	24	28-May-19	25-Jun-19
ML02 TSS Internal Structure			
ML02 TSS - Remaining Corbel Structure by ISCG	13	06-May-19	21-May-19
ML02 TSS - Parapet installation	33	22-May-19	29-Jun-19
Walkway corbel - TSS Remaining & SVS ML02 both side	26	02-Jul-19	31-Jul-19
ML02 TSS - OHVD by ISSG (from CP15 to SVS)	8	22-May-19	30-May-19
ML03 TSS Internal Structure			
ML03 TSS - Remaining Corbel Structure by ISCG	14	18-Jul-19	02-Aug-19
ML03 TSS - Parapet installation	35	05-Aug-19	13-Sep-19
Walkway corbel - TSS Remaining & SVS ML03 both side	27	12-Sep-19	16-Oct-19
ML03 TSS - ISSG assembly at CP15	9	08-Aug-19	17-Aug-19
ML03 TSS - OHVD by ISSG (from CP15 to SVS)	9	19-Aug-19	28-Aug-19
ML03 ISSG Crossing at SVS	12	29-Aug-19	11-Sep-19
ML02 TSA Internal Structure			
ML02 TSA - Parapet installation	15	18-Jul-19	03-Aug-19
Walkway corbel - MHS TBM ML02 both sides	12	05-Aug-19	17-Aug-19
ML02 TSA - Corbel Structure	18	26-Jun-19	17-Jul-19
ML02 ISSG Crossing at SVS	12	04-Jul-19	17-Jul-19
ML02 TSA - OHVD by ISSG	9	18-Jul-19	27-Jul-19
ML02 TSA - ISSG dismantling	9	29-Jul-19	07-Aug-19
ML03 TSA Internal Structure			
ML03 TSA - Parapet installation	16	16-Sep-19	04-Oct-19
Walkway corbel - MHS TBM ML03 both sides	11	17-Oct-19	29-Oct-19
ML03 TSA - Corbel Structure	16	03-Aug-19	21-Aug-19
ML03 TSA - OHVD by ISSG	9	12-Sep-19	23-Sep-19
ML03 TSA - Lead time for Fire Proofing	6	24-Sep-19	30-Sep-19
KD-2c TSS CP15>SVS, MHS TBM Tunnel - Provide Access	0		30-Sep-19*
TSA Cross Passage			
CP6			
CP6 TBM Assembly & Pipe Jacking	42	01-Feb-19	14-Mar-19
CP6 Invert & Collar Structure	24	15-Mar-19	12-Apr-19
CP6 Injection & Finishing	28	13-Apr-19	21-May-19
CP5			
CP5 ML03 Tympanum	36	01-Feb-19	21-Mar-19
CP5 TBM Assembly & Pipe Jacking	42	22-Mar-19	02-May-19
CP5 Invert & Collar Structure	24	03-May-19	31-May-19
CP5 Injection & Finishing	28	01-Jun-19	05-Jul-19
MHS Cut-and-cover Tunnel			
[KD-2d] Stage 2d Completion - MHS C&C Tunnel	0		02-Nov-19*
N MHS C&C Caterpillar Excavation			
MHS C&C Cell 12 to 04			
Cell 13 Excavation from +2.5mPD to FEL	75	10-Dec-18	16-Mar-19
Cell 12 Excavation from +2.5mPD to FEL	80	24-Dec-18	06-Apr-19
Cell 11 Excavation from +2.5mPD to FEL	89	02-Jan-19	26-Apr-19
Cell 10 Excavation from +2.5mPD to FEL	105	09-Jan-19	24-May-19
Cell 09 Excavation from +2.5mPD to FEL	105	23-Jan-19	08-Jun-19
Cell 08 Excavation from +2.5mPD to FEL	105	30-Jan-19	15-Jun-19
Cell 07 Excavation from +2.5mPD to FEL	111	30-Jan-19	22-Jun-19
Cell 06 Excavation from +2.5mPD to FEL	123	16-Jan-19	22-Jun-19
Cell 05 Excavation from +2.5mPD to FEL	129	09-Jan-19	22-Jun-19
Cell 04 Excavation from +2.5mPD to FEL	140	24-Dec-18	22-Jun-19
Cross Wall Removal			
Cell 06/05 Cross Wall Removal	12	23-Jul-19	05-Aug-19
Cell 05/04 Cross Wall Removal	12	09-Jul-19	22-Jul-19
Cell 3 Additional Arc Dwall Final Removal	12	24-Jun-19	08-Jul-19
N MHS C&C Caterpillar Structure			



Planned Milestone
Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

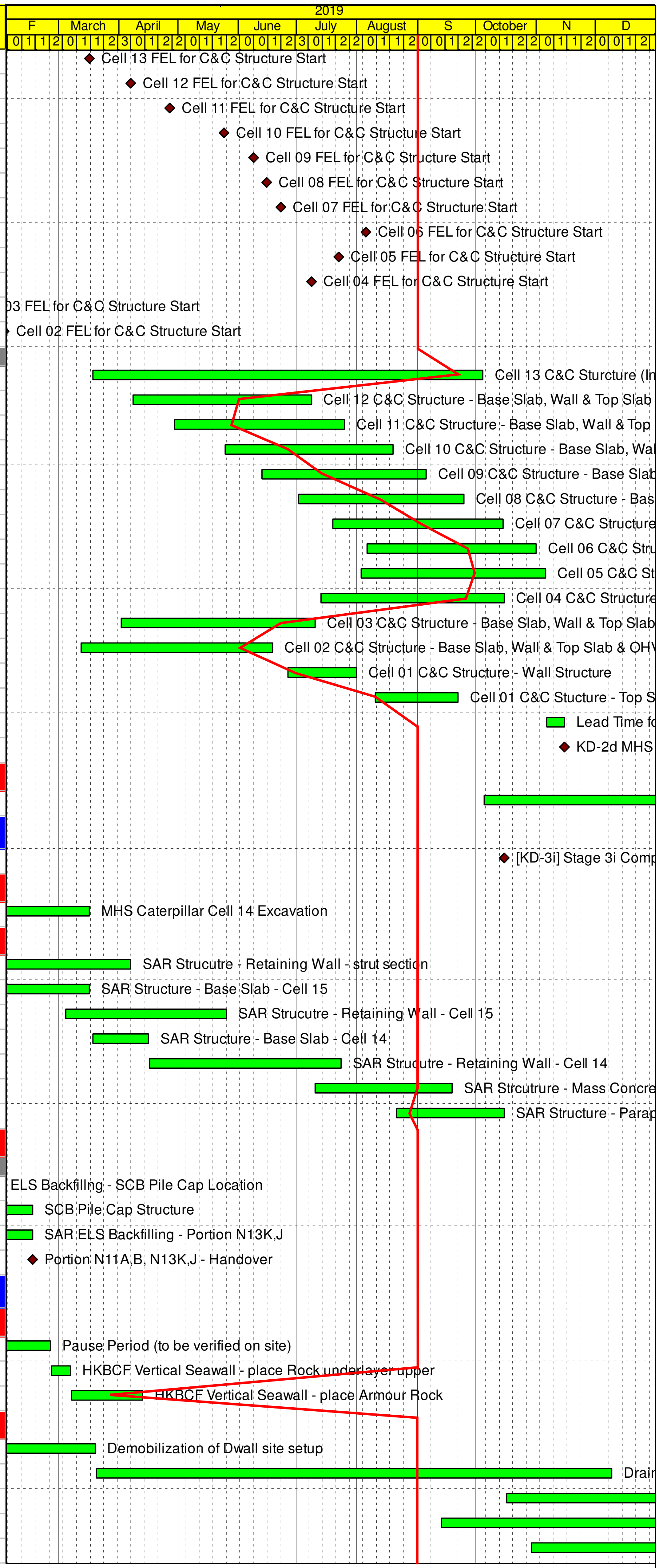
Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 28 Jul 2019

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Activity Name	Orig Dur	Start	Finish
Cell 13 FEL for C&C Structure Start	0		16-Mar-19
Cell 12 FEL for C&C Structure Start	0		06-Apr-19
Cell 11 FEL for C&C Structure Start	0		26-Apr-19
Cell 10 FEL for C&C Structure Start	0		24-May-19
Cell 09 FEL for C&C Structure Start	0		08-Jun-19
Cell 08 FEL for C&C Structure Start	0		15-Jun-19
Cell 07 FEL for C&C Structure Start	0		22-Jun-19
Cell 06 FEL for C&C Structure Start	0		05-Aug-19
Cell 05 FEL for C&C Structure Start	0		22-Jul-19
Cell 04 FEL for C&C Structure Start	0		08-Jul-19
Cell 03 FEL for C&C Structure Start	0		10-Jan-19
Cell 02 FEL for C&C Structure Start	0		31-Jan-19
Main Box Structure			
Cell 13 C&C Sturcture (In-situ) & system fwk assembly	163	18-Mar-19	04-Oct-19
Cell 12 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	08-Apr-19	08-Jul-19
Cell 11 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	29-Apr-19	25-Jul-19
Cell 10 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	25-May-19	19-Aug-19
Cell 09 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	13-Jun-19	05-Sep-19
Cell 08 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	02-Jul-19	24-Sep-19
Cell 07 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	19-Jul-19	14-Oct-19
Cell 06 C&C Structure - Base Slab, Wall & Top Slab & OH\	72	06-Aug-19	31-Oct-19
Cell 05 C&C Structure - Base Slab, Wall & Top Slab & OH\	78	03-Aug-19	05-Nov-19
Cell 04 C&C Structure - Base Slab, Wall & Top Slab & OH\	78	13-Jul-19	15-Oct-19
Cell 03 C&C Structure - Base Slab, Wall & Top Slab & OH\	78	02-Apr-19	10-Jul-19
Cell 02 C&C Structure - Base Slab, Wall & Top Slab & OH\	78	12-Mar-19	18-Jun-19
Cell 01 C&C Structure - Wall Structure	30	26-Jun-19	31-Jul-19
Cell 01 C&C Stucture - Top Slab and OHVD Slab	36	10-Aug-19	21-Sep-19
Lead Time for MHS C&C Thermal Barrier	9	06-Nov-19	15-Nov-19
KD-2d MHS C&C Tunnel - Provide Access	0		15-Nov-19*
MHS C&C Tunnel Backfilling			
MHS C&C Tunnel - Backfilling - Cell 13 to Cell 01	170	05-Oct-19	04-May-20
MHS Approach Ramp			
[KD-3i] Stage 3i Completion - South Approach Ramp	0		15-Oct-19*
MHS Approach Ramp Excavation			
MHS Caterpillar Cell 14 Excavation	75	10-Dec-18	16-Mar-19
MHS Approach Ramp Structure			
SAR Strucutre - Retaining Wall - strut section	92	10-Dec-18	06-Apr-19
SAR Structure - Base Slab - Cell 15	36	28-Jan-19	16-Mar-19
SAR Strucutre - Retaining Wall - Cell 15	66	04-Mar-19	25-May-19
SAR Structure - Base Slab - Cell 14	24	18-Mar-19	15-Apr-19
SAR Strucutre - Retaining Wall - Cell 14	78	16-Apr-19	23-Jul-19
SAR Strcturure - Mass Concrete	60	10-Jul-19	18-Sep-19
SAR Structure - Parapet & Walkway	45	21-Aug-19	15-Oct-19
VO73 SCB Foundation & Substructure			
Foundation			
SAR ELS Backfillng - SCB Pile Cap Location	8	03-Jan-19	11-Jan-19
SCB Pile Cap Structure	24	12-Jan-19	15-Feb-19
SAR ELS Backfilling - Portion N13K,J	14	24-Jan-19	15-Feb-19
Portion N11A,B, N13K,J - Handover	0		15-Feb-19
Southern Landfall - Surface			
HKBCF Seawall Modification (schedule TBC)			
Pause Period (to be verified on site)	90	27-Nov-18	24-Feb-19
HKBCF Vertical Seawall - place Rock underlayer upper	9	25-Feb-19	06-Mar-19
HKBCF Vertical Seawall - place Armour Rock	31	07-Mar-19	12-Apr-19
UU / At-grade works			
Demobilization of Dwall site setup	78	08-Dec-18	19-Mar-19
Drainage & Watermain - SLF	216	20-Mar-19	09-Dec-19
Drainage & Watermain - SLF Portion N13Ji, Jii, Ki & Kii	82	16-Oct-19	23-Jan-20
Provision for Utilities - SLF West	110	13-Sep-19	29-Jan-20
Provision for Utilities - SLF East	110	29-Oct-19	11-Mar-20



Planned Milestone
Planned Bar

TMCLK - Northern Connection Sub-sea Tunnel Section

Detailed Works Programme Rev. J

Three Months Rolling Programme Progress as of 28 Jul 2019

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Date	Revision	Checked	Approved
22-Dec-17	Rev. H	WYu	
05-Feb-18	Rev. I AC	WYu	
07-Mar-18	Rev. I	WYu	
18-Jul-18	Rev. J	WYu	

Appendix C

Environmental Mitigation and Enhancement Measure Implementation Schedules

Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Air Quality									
4.8.1	3.8	An effective watering programme of twice daily watering with complete coverage, is estimated to reduce by 50%. This is recommended for all areas in order to reduce dust levels to a minimum;	All areas / throughout construction period	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✔
4.8.1	3.8	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔
4.8. 1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✔
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔
4.8. 1	3.8	Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔
4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
4.8.1	3.8	Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		<>
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✔
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✔
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		<>
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit.	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		✔
WATER QUALITY									
Marine Works (Sequence A)									
6.1 Figure 6.2a Appendix D6a	Annex A	Construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. The protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2a and detailed in Appendix D6a. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation;	All areas/ prior to dredging and backfilling works	Contractor	TM-EIAO		Y		✔

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	a maximum of 50% public fill to be used for all seawall filling below +2.5mPD for TM-CLKL southern and northern landfalls.	TM-CLKL seawall filling	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 30% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL southern landfall	TM-CLKL southern landfall reclamation filling	Contractor	TM-EIAO		Y		N/A
6.1	-	a maximum of 100% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL northern landfall	TM-CLKL northern landfall reclamation filling	Contractor	TM-EIAO		Y		✓
6.1	-	Use of cage type silt curtains round allgrab dredgers during the HKBCF, HKLR and TM-CLKL southern reclamation works.	All areas dredging works	Contractor	TM-EIAO		Y		✓
	Figure 1.1 of Annex C	A layer of floating type silt curtain will be applied when dredging and reclamation works are being undertaken at Portion N-a as shown in Figure 1.1 of Annex C of the EM&A Manual.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	Trailer suction hopper dredgers shall not allow mud to overflow.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	The use of Lean Material Overboard (LMOB) systems shall be prohibited.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1 Figure 6.2b Appendix D6b	Annex A	For other parts of the reclamation works construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. It should be noted that the protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2b and detailed in Appendices D6b. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation; - Reclamation filling for Portion D of HKBCF; Reclamation filling for FSD berth of HKBCF; and - Reclamation dredging and filling for Portion 1 of HKLR;	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		✓
6.1	-	The filling material for the other parts of the works are the same as Sequence A;	All other areas/backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	5.7	Cage type silt curtain (with steel enclosure) shall be used for grab dredgers working in the site of HKBCF and TM- CLKL southern reclamation. Cage type silt curtains will be applied round all grab dredgers at other works area.	HKBCF, HKLR and TM-CLKL grab dredging	Contractor	TM-EIAO		Y		✓
6.1	Annex A	A layer of floating type silt curtain will be applied around all works as defined in Appendix D6b.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	TM-CLKL northern landfall: - Reclamation filling shall not proceed until at least 200m section of leading seawall at both the east and west sides of the reclamation are formed above +2.5 mPD, except for 100m gaps for marine access;	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
General Marine Works									

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Use of TMB for the construction of the submarine tunnel.	Tunnel works / Construction phase	Contractor	TM-EIAO		Y		N/A
6.1	-	Export dredged spoils from NWWCZ.	All areas as much as possible / dredging activities	Contractor	DASO Permit conditions		Y		✓
6.1	-	Where public fill is proposed for filling below +2.5mPD, the fine content in the public fill will be controlled to 25%	All areas/ backfilling works	Contractor	TM-EIAO		Y		N/A
6.1	-	Where sand fill is proposed for filling below +2.5mPD, the fine content in the sand fill will be controlled to 5%.	All areas/ backfilling works	Contractor	TM-EIAO		Y		N.A
6.1	-	Mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.	All areas/ throughout construction period	Contractor	Marine Fill Committee		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
					Guidelines. DASO permit conditions.				
6.1	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	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.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		N/A
6.1	-	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.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	5.2	Silt curtain shall have proved effectiveness from the producer and shall be fully maintained throughout the works by the contractor.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The daily maximum production rates shall not exceed those assumed in the water quality assessment.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The dredging and filling works shall be scheduled to spread the works evenly over a working day.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
Land Works									
6.1	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Sewage effluent and discharges from on- site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.1	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	5.8	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		N/A
6.1	-	The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		<>
6.1	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
					Ordinance				
6.1	-	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✔
6.1	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✔
6.1	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	✔
6.1	Section 5	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✔
Water Quality Monitoring									
6.1	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period. One year operation phase water quality monitoring at designated stations.	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	✔
ECOLOGY									
8.14	6.3	Specification for and implement pre, during and post construction dolphin abundance monitoring.	All Areas/Detailed Design/ during construction works/post construction	Design Consultant/ Contractor	TMEIA	Y	Y	Y	✔
8.14	6.3,6.5	Specification and implementation of 250m dolphin exclusion zone.	All dredging and reclamation areas/Detailed Design/during all reclamation and dredging works	Design Consultant/ Contractor	TMEIA	Y	Y		✔

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600m2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	N/A. To be implemented by AFCD.
8.14	6.3, 6.5	Specification and implementation of marine vessel control specifications	All areas/Detailed Design/during construction works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.14	6.3, 6.5	Design and implementation of acoustic decoupling methods for dredging and reclamation works	All areas/ Detailed Design/during dredging and reclamation works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.5	Audit coral translocation success	Post translocation	Contractor	TMEIA		Y		✓
7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		N/A.
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
7.13	6.5	Construction activities should be restricted to the proposed works boundary.	All areas / Throughout construction period	Contractor	TMEIA		Y		✓
LANDSCAPE AND VISUAL									

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
10.9	7.6	The colour and shape of the toll control buildings, ventilation building and administration building shall adopt a design which could blend it into the vicinity elements, and the details will be developed in detailed design stage (DM2)	All areas/detailed design	Design Consultant	TMEIA	Y			N/A
10.9	7.6	Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5)	All areas/detailed design	Design Consultant	TMEIA	Y			N/A
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		N/A
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	N/A
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The surplus surcharge should be transferred to a fill bank	Reclamation areas / after surcharge works	Contractor	TMEIA		Y		N/A
12.6	8.1	Rock armour from the existing seawall should be reused on the new sloping seawall as far as possible	All areas / throughout construction period	Contractor	TMEIA		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	No waste shall be burnt on site.	All areas / throughout construction period	Contractor	TMEIA		Y		✔
12.6	8.1	Provisions to be made in contract documents to allow and promote the use of recycled aggregates where appropriate.	Detailed Design	Design Consultant	TMEIA	Y			✔
12.6	8.1	The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation.	All areas / throughout construction period	Contractor	TMEIA		Y		✔
12.6	8.1	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		✔
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✔
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✔
12.6	8.1	Dredged marine mud shall be disposed of in a gazetted marine disposal ground under the requirements of the Dumping at Seas Ordinance.	Reclamation areas / throughout dredging works	Contractor	TMEIA		Y		✔
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✔

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	The Contractor should recycle as many C&D materials (this is a waste section) as possible on-site. The public fill and C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal. Where practicable, the concrete and masonry should be crushed and used as fill materials. Steel reinforcement bar should be collected for use by scrap steel mills. Different areas of the sites should be considered for segregation and storage activities.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All falsework will be steel instead of wood.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Chemical waste producers should register with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows: ƒ suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; ƒ Having a capacity of <450L unless the specifications have been approved by the EPD; and ƒ Displaying a label in English and Chinese according to the instructions prescribed in Schedule 2 of the Regulations. ƒ Clearly labelled and used solely for the storage of chemical wastes; ƒ Enclosed with at least 3 sides; ƒ Impermeable floor and bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest;	All areas / throughout construction period	Contractor	TMEIA		Y		<>

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
		ƒ Adequate ventilation; ƒ Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and ƒ Incompatible materials are adequately separated.							
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on-site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		N/A
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		<>
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
CULTURAL HERITAGE									
11.8	Section 9	EM&A in the form of audit of the mitigation measures	All areas / throughout construction period	Highways Department	EIAO-TM		Y		N/A

*** Remarks:**

✓	Compliance of Mitigation Measures
<>	Compliance of Mitigation but need improvement
x	Non-compliance of Mitigation Measures
▲	Non-compliance of Mitigation Measures but rectified by Contractor
Δ	Deficiency of Mitigation Measures but rectified by Contractor
N/A	Not Applicable in Reporting Period

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Appendix D

Summary of Action and Limit Levels

Table D1 ***Action and Limit Levels for 1-hour and 24-hour TSP***

Parameters	Action	Limit
24 Hour TSP Level in µg/m³	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214	260
1 Hour TSP Level in µg /m³	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337	500

Table D2 ***Action and Limit Levels for Water Quality***

Parameter	Action Level#	Limit Level#
DO in mg/L [(a)]	Surface and Middle **5.0 mg/L** Bottom **4.7 mg/L**	Surface and Middle **4.2 mg/L** Bottom **3.6 mg/L**
Turbidity in NTU (Depth-averaged [(b), (c)])	120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., **27.5 NTU**	130% of upstream control station at the same tide of the same day and 99%-ile of baseline data, i.e., **47.0 NTU**
SS in mg/L (Depth-averaged [(b), (c)])	120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., **23.5 mg/L**	130% of upstream control station at the same tide of the same day and 10mg/L for WSD Seawater Intakes at Tuen Mun and 99%-ile of baseline data, i.e., **34.4 mg/L**

Notes:

Baseline data: data from HKZMB Baseline Water Quality Monitoring between 6 and 31 October 2011.

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

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

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

(d) All figures given in the table are used for reference only, and EPD may amend the figures whenever it is considered as necessary

(e) The 1%-ile of baseline data for surface and middle DO is 4.2 mg/L, whilst for bottom DO is 3.6 mg/L.

(f) The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Table D3 Action and Limit Levels for Impact Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	STG < 70% of baseline & ANI < 70% of baseline	STG < 70% of baseline & ANI < 70% of baseline
Limit Level	[STG < 40% of baseline & ANI < 40% of baseline] and STG < 40% of baseline & ANI < 40% of baseline	

Notes:

1. STG means quarterly encounter rate of number of dolphin sightings, which is **6.00 in NEL** and **9.85 in NWL** during the baseline monitoring period
2. ANI means quarterly encounter rate of total number of dolphins, which is **22.19 in NEL** and **44.66 in NWL** during the baseline monitoring period
3. For North Lantau Social Cluster, AL will be trigger if NEL or NWL fall below the criteria; LL will be triggered if both NEL and NWL fall below the criteria.

Table D4 Derived Value of Action Level (AL) and Limit Level (LL)

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	STG < 4.2 & ANI< 15.5	STG < 6.9 & ANI < 31.3
Limit Level	NEL = [STG < 2.4 & ANI <8.9] and NWL = [STG < 3.9 & ANI <17.9]	

Appendix E

EM&A Monitoring Schedules

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - June 2019

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jun
						1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	Public Holiday 7-Jun	8-Jun
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
30-Jun						

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - July 2019

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Public Holiday 1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
28-Jul	29-Jul	30-Jul	31-Jul			
1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			Cancelled due to adverse weather.			

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Air Quality Impact Monitoring Schedule - August 2019

Air quality monitoring stations: ASR1, ASR5, ASR6, ASR10, AQMS1

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
						1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
	1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM		
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
		1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM			1-hour TSP - 3 times 24-hour TSP - 1 time Impact AQM	

HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Landfall
Impact Marine Water Quality Monitoring (WQM) Schedule (June 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1/Jun
2/Jun	3/Jun	4/Jun	5/Jun	6/Jun	7/Jun	8/Jun
	ebb tide 11:15 - 14:45 flood tide 4:27 - 7:57		ebb tide 12:34 - 16:04 flood tide 5:36 - 9:06			
9/Jun	10/Jun	11/Jun	12/Jun	13/Jun	14/Jun	15/Jun
	ebb tide 5:10 - 8:40 flood tide 10:15 - 13:45		ebb tide 7:38 - 11:08 flood tide 13:23 - 16:53		ebb tide 9:16 - 12:46 flood tide 15:46 - 19:16	
16/Jun	17/Jun	18/Jun	19/Jun	20/Jun	21/Jun	22/Jun
	ebb tide 11:18 - 14:48 flood tide 4:24 - 7:54		ebb tide 12:35 - 16:05 flood tide 5:33 - 9:03		ebb tide 13:51 - 17:21 flood tide 6:45 - 10:15	
23/Jun	24/Jun	25/Jun	26/Jun	27/Jun	28/Jun	29/Jun
	ebb tide 15:49 - 19:00 flood tide 9:02 - 12:32					
30/Jun						

HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Landfall
Impact Marine Water Quality Monitoring (WQM) Schedule (July 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Public Holiday 1/Jul	2/Jul	3/Jul	4/Jul	5/Jul	6/Jul
			ebb tide 11:39 - 15:09 flood tide 4:36 - 8:06		ebb tide 13:11 - 16:41 flood tide 6:07 - 9:37	
7/Jul	8/Jul	9/Jul	10/Jul	11/Jul	12/Jul	13/Jul
	ebb tide 15:43 - 18:45 flood tide 8:53 - 12:23		ebb tide 6:45 - 9:25 flood tide 11:46 - 15:16		ebb tide 8:05 - 11:35 flood tide 14:45 - 18:15	
14/Jul	15/Jul	16/Jul	17/Jul	18/Jul	19/Jul	20/Jul
	ebb tide 10:23 - 13:53 flood tide 3:20 - 6:50		ebb tide 11:42 - 15:12 flood tide 4:38 - 8:08		ebb tide 12:53 - 16:23 flood tide 5:54 - 9:24	
21/Jul	22/Jul	23/Jul	24/Jul	25/Jul	26/Jul	27/Jul
	ebb tide 14:32 - 18:02 flood tide 7:52 - 11:22		ebb tide 15:50 - 18:50 flood tide 9:41 - 13:11		ebb tide 6:50 - 9:49 flood tide 12:22 - 15:52	
28/Jul	29/Jul	30/Jul	31/Jul			
	ebb tide 9:05 - 12:35 flood tide 1:49 - 5:19		**Cancelled due to adverse weather.**			

HY/2012/08 - Tuen Mun - Chek Lap Kok Link - Northern Landfall
Impact Marine Water Quality Monitoring (WQM) Schedule (August 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1/Aug	2/Aug	3/Aug
					ebb tide 12:12 - 15:42 flood tide 5:13 - 8:43	
4/Aug	5/Aug	6/Aug	7/Aug	8/Aug	9/Aug	10/Aug
	ebb tide 14:32 - 18:02 flood tide 7:51 - 11:21		ebb tide 16:21 - 19:51 flood tide 10:09 - 13:39		ebb tide 6:26 - 9:56 flood tide 13:20 - 16:50	
11/Aug	12/Aug	13/Aug	14/Aug	15/Aug	16/Aug	17/Aug
	ebb tide 9:27 - 12:57 flood tide 2:15 - 5:45		ebb tide 10:47 - 14:17 flood tide 3:47 - 7:17		ebb tide 11:58 - 15:28 flood tide 5:07 - 8:37	
18/Aug	19/Aug	20/Aug	21/Aug	22/Aug	23/Aug	24/Aug
	ebb tide 13:27 - 16:57 flood tide 7:00 - 10:30		ebb tide 14:31 - 18:01 flood tide 8:24 - 11:54		ebb tide 16:00 - 19:30 flood tide 10:31 - 14:01	
25/Aug	26/Aug	27/Aug	28/Aug	29/Aug	30/Aug	31/Aug
	ebb tide 7:38 - 11:08 flood tide 15:13 - 18:43		ebb tide 9:32 - 13:02 flood tide 16:47 - 20:17		ebb tide 11:09 - 14:39 flood tide 18:04 - 21:34	

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - June 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jun
2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	Public Holiday 7-Jun	8-Jun
	Impact Dolphin Monitoring			**Impact Dolphin Monitoring**		
9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun	15-Jun
	Impact Dolphin Monitoring			**Impact Dolphin Monitoring**		
16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun	22-Jun
23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun	29-Jun
30-Jun						

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - July 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Public Holiday 1-Jul	2-Jul	3-Jul	4-Jul	5-Jul	6-Jul
7-Jul	8-Jul	9-Jul	10-Jul	11-Jul	12-Jul	13-Jul
14-Jul	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul
		Impact Dolphin Monitoring		**Impact Dolphin Monitoring**		
21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
	Impact Dolphin Monitoring		**Impact Dolphin Monitoring**			
28-Jul	29-Jul	30-Jul	31-Jul			

HY/2012/08 - Tuen Mun - Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Impact Dolphin Monitoring Survey Monitoring Schedule - August 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Aug	2-Aug	3-Aug
4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug
11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug
		Impact Dolphin Monitoring	**Impact Dolphin Monitoring**			
18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
		Impact Dolphin Monitoring				
25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug
	Impact Dolphin Monitoring			**Impact Dolphin Monitoring**		

Appendix F

Impact Air Quality Monitoring Results

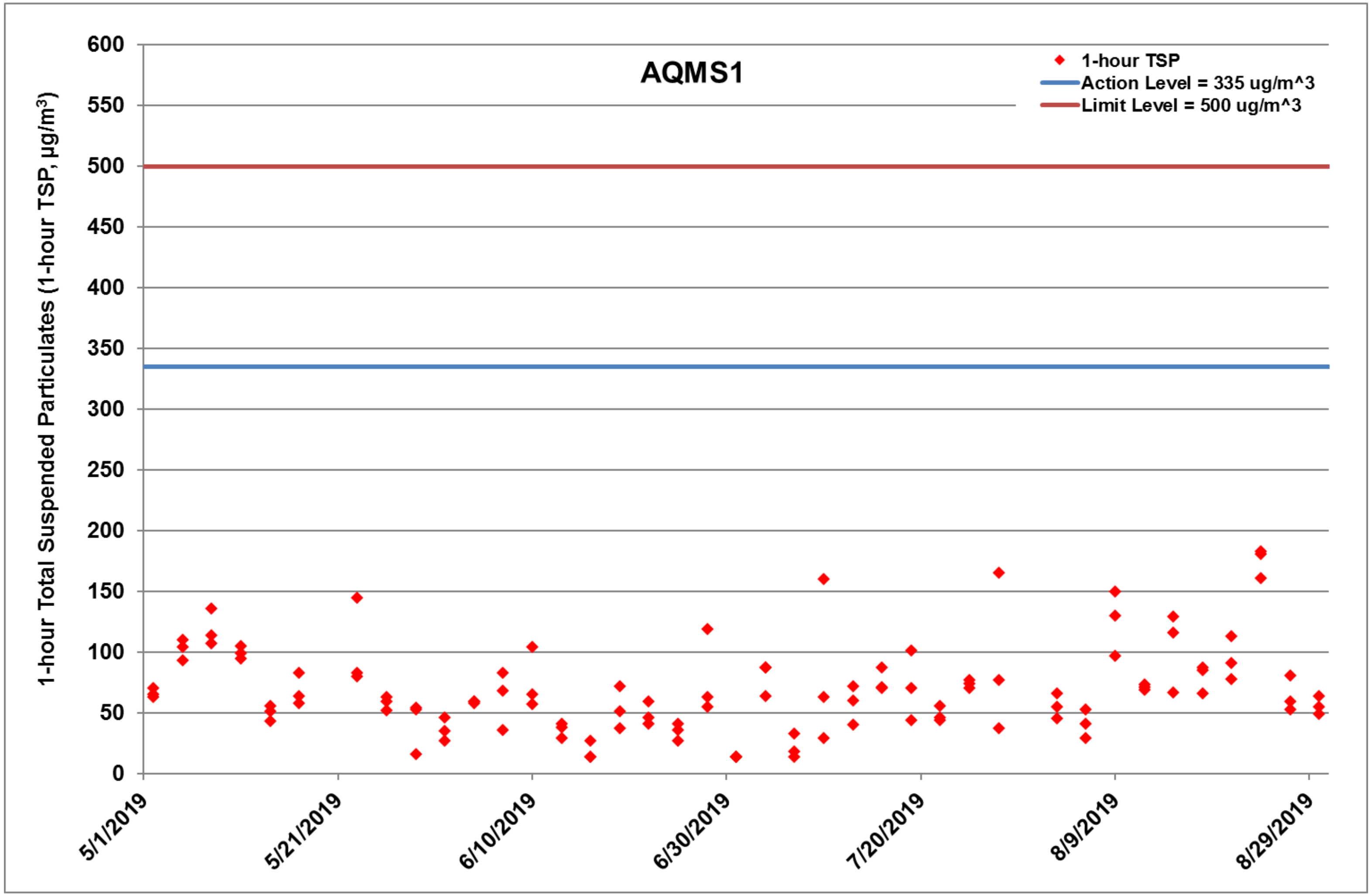


Figure F.1 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

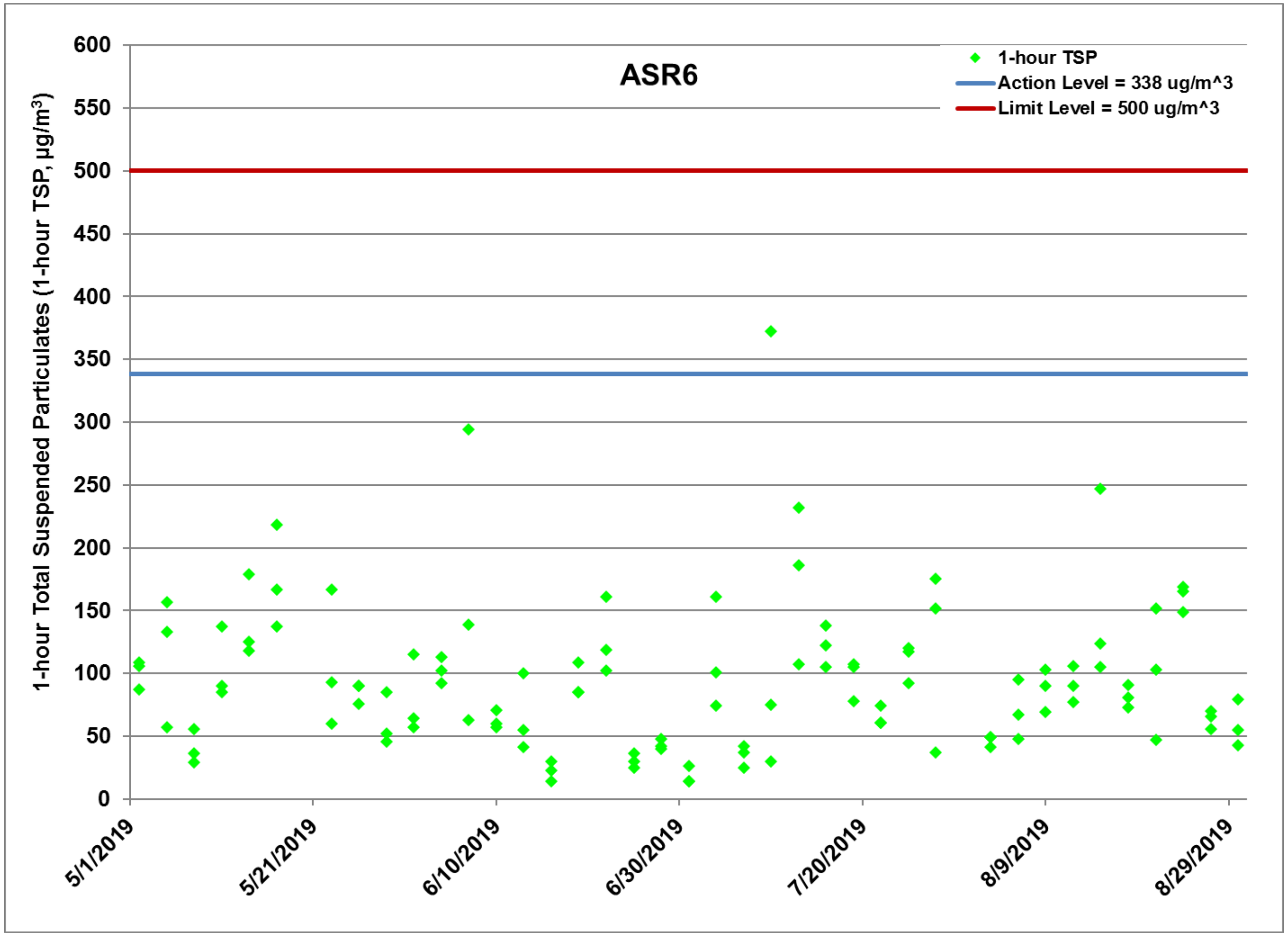


Figure F.2 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

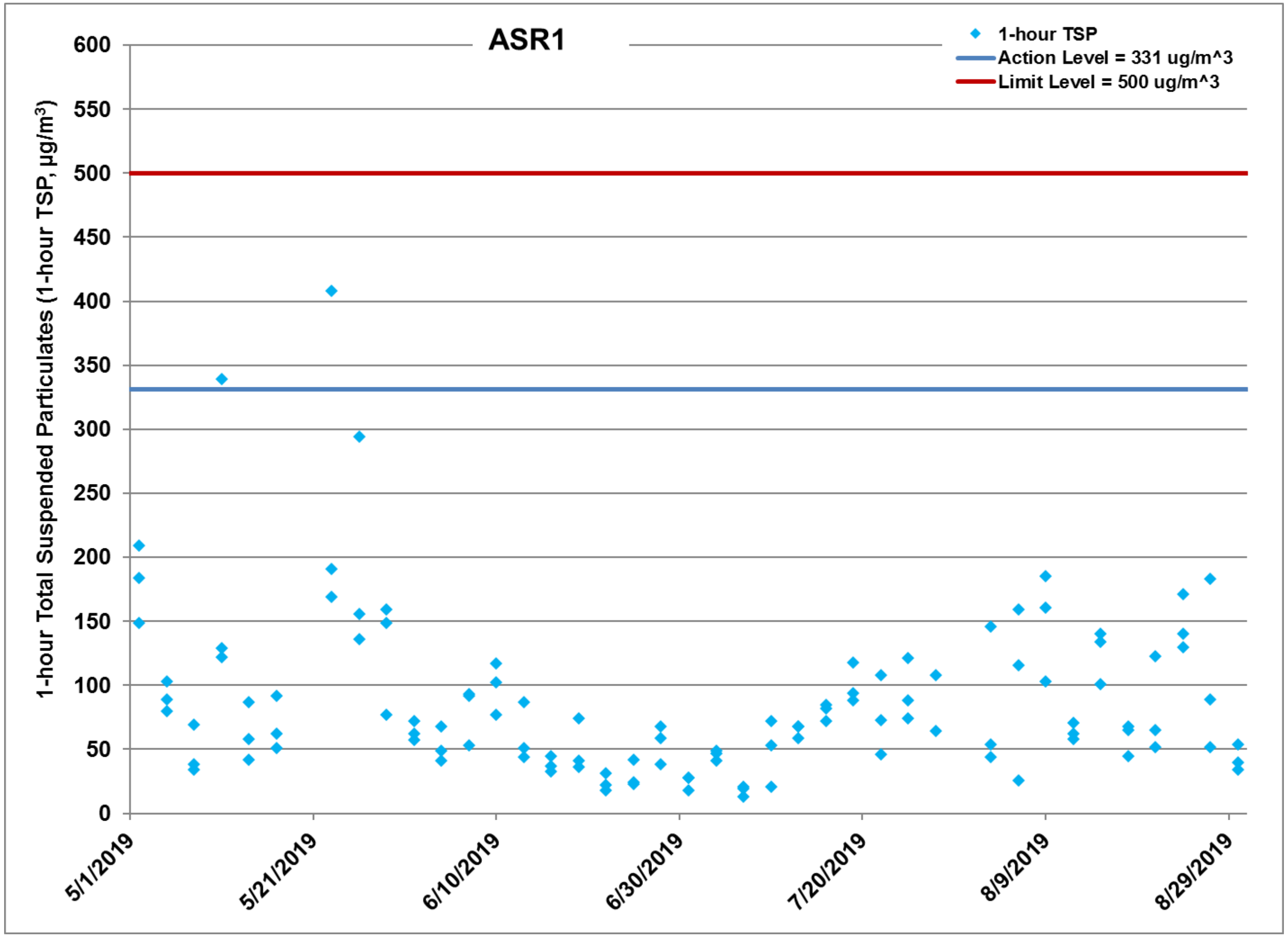


Figure F.3 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

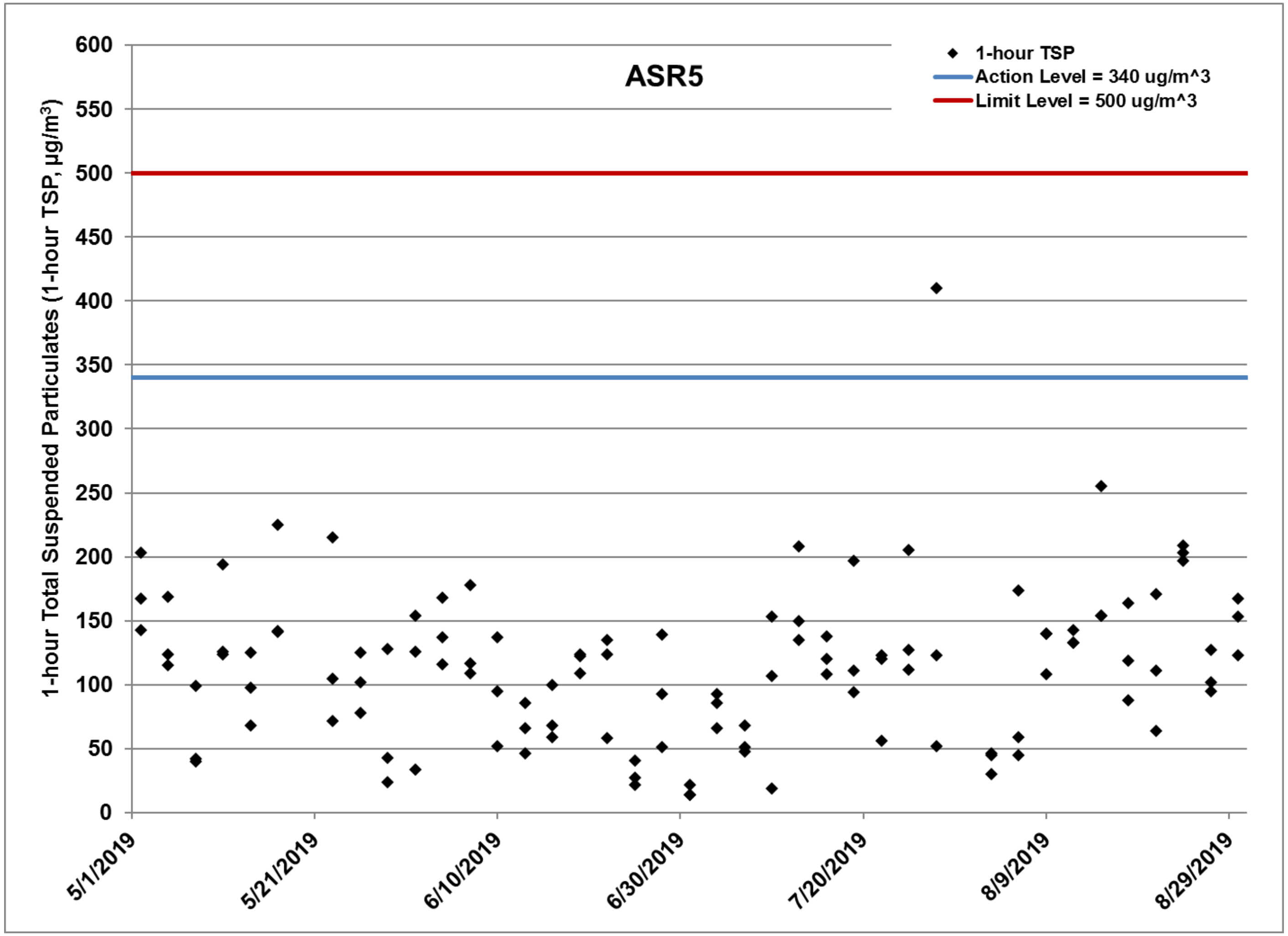


Figure F.4 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

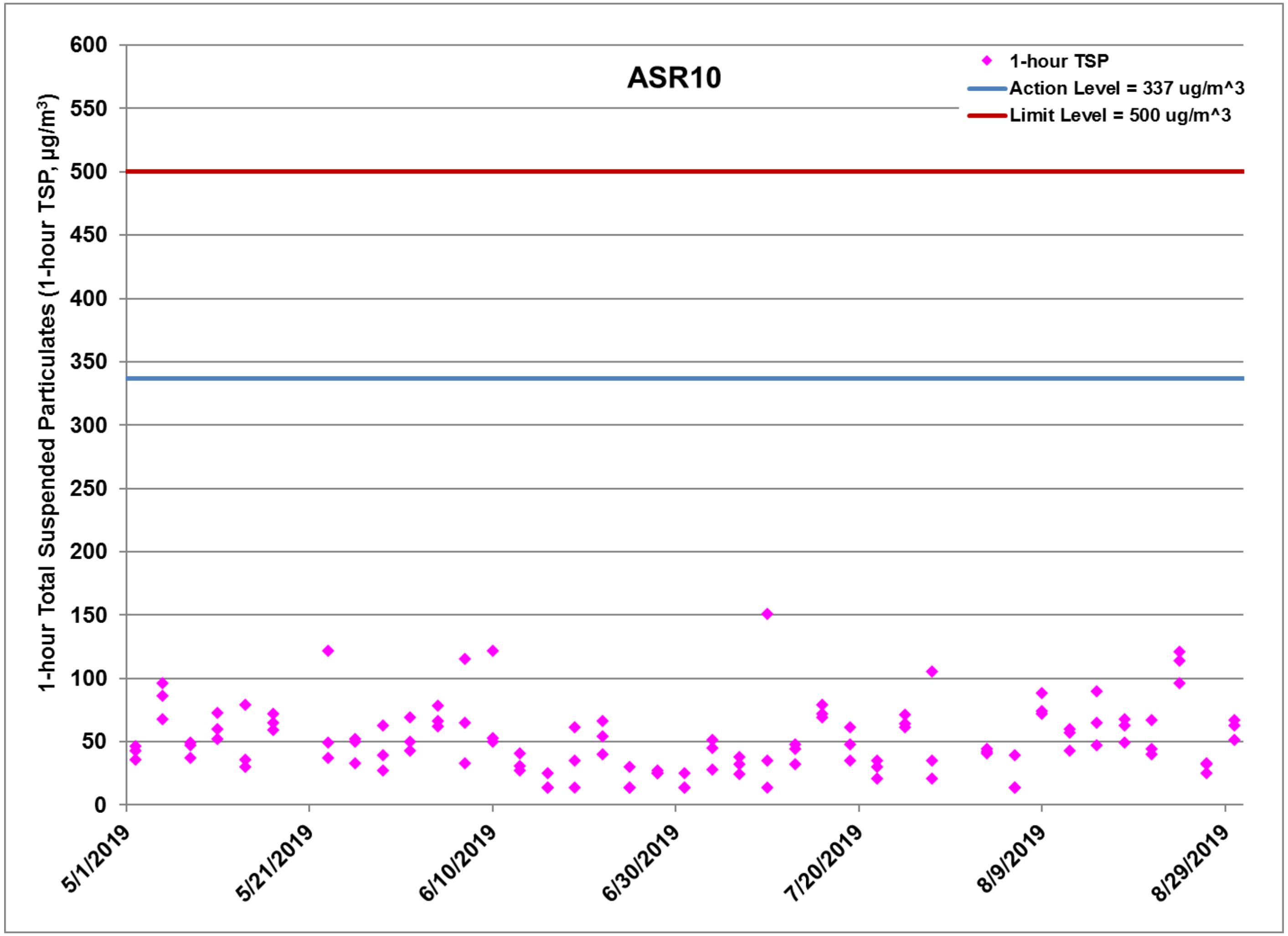


Figure F.5 Impact Monitoring – 1-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

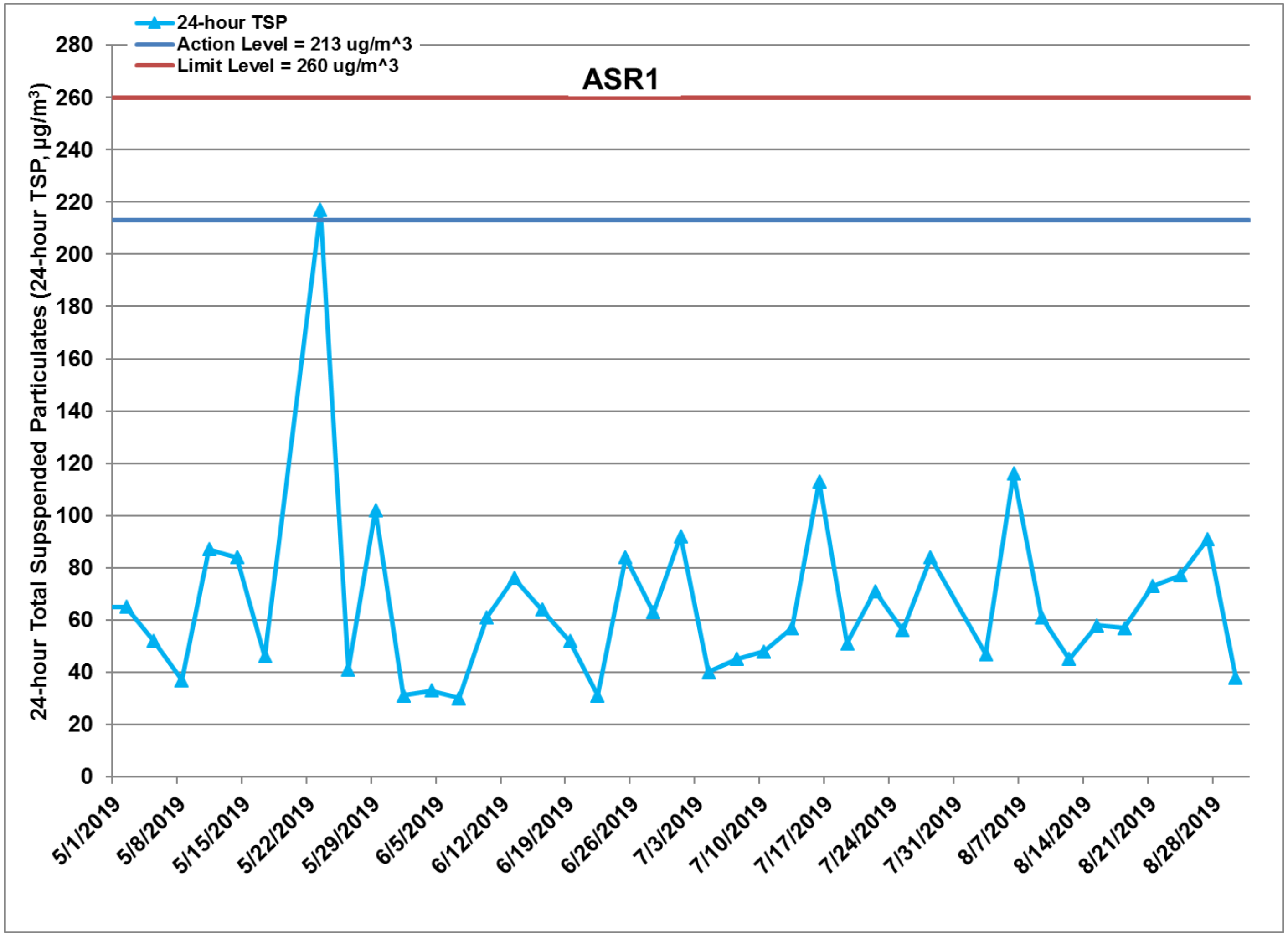


Figure F.6 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR1 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

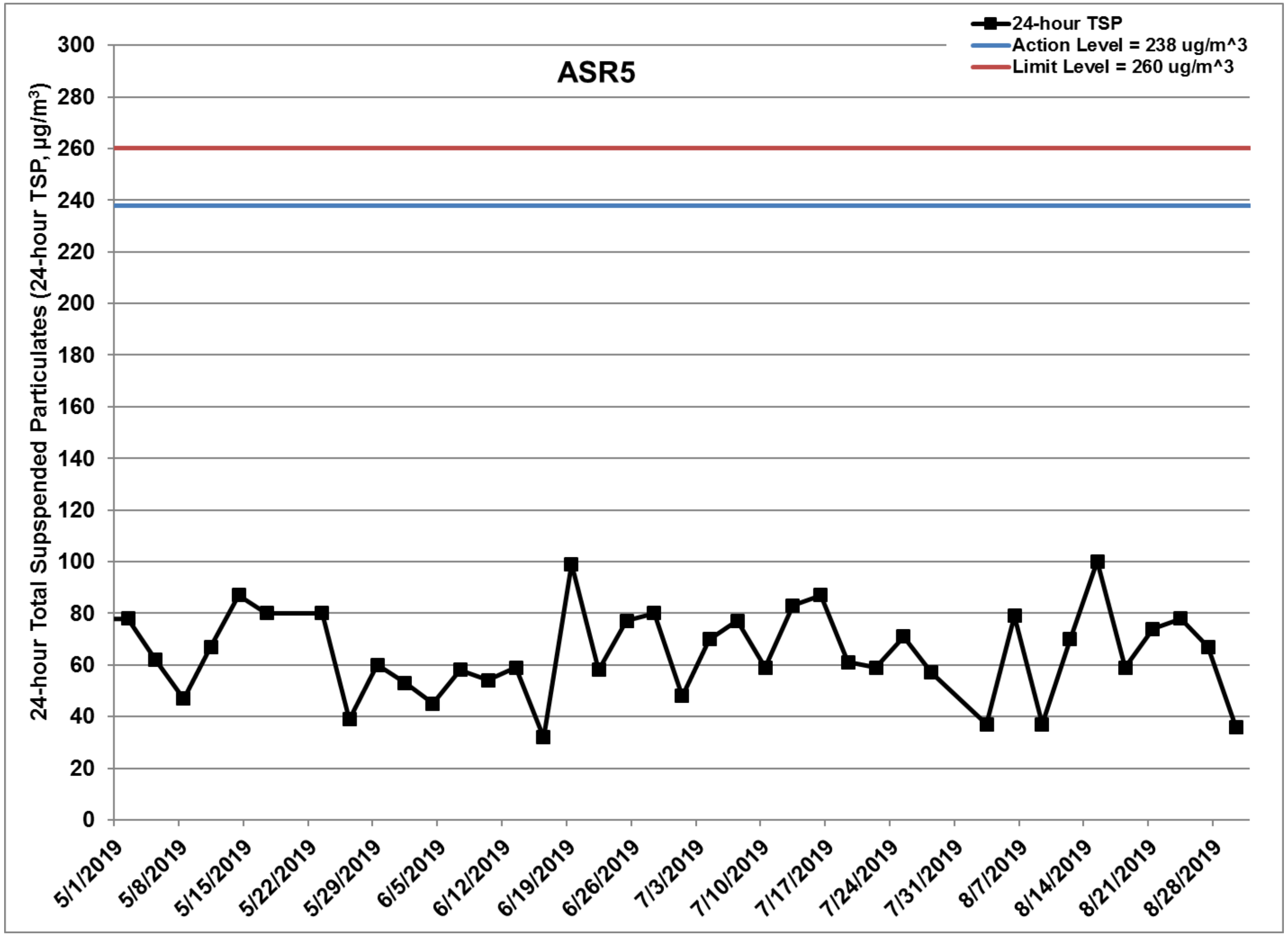


Figure F.7 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR5 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

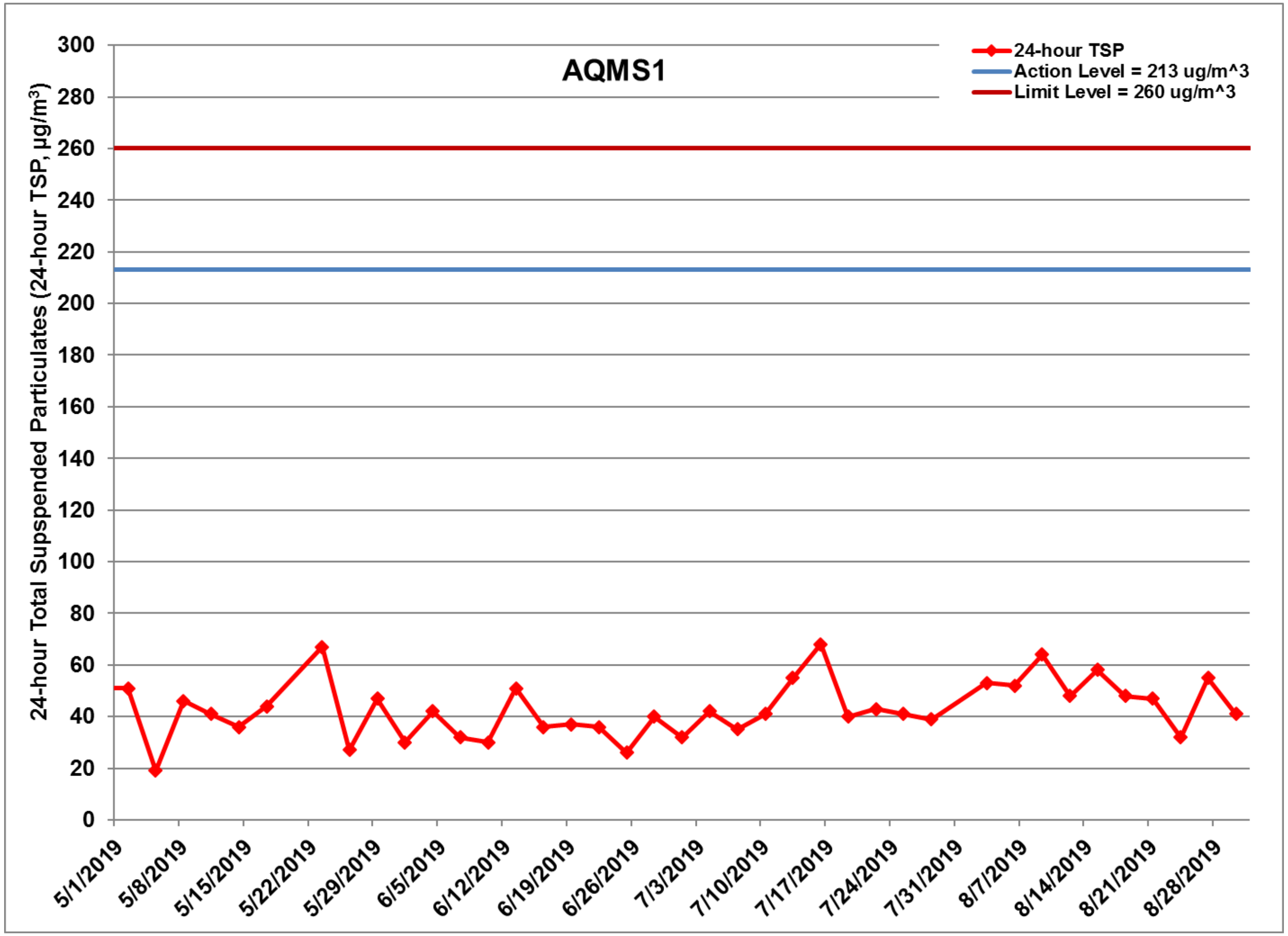


Figure F.8 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at AQMS1 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

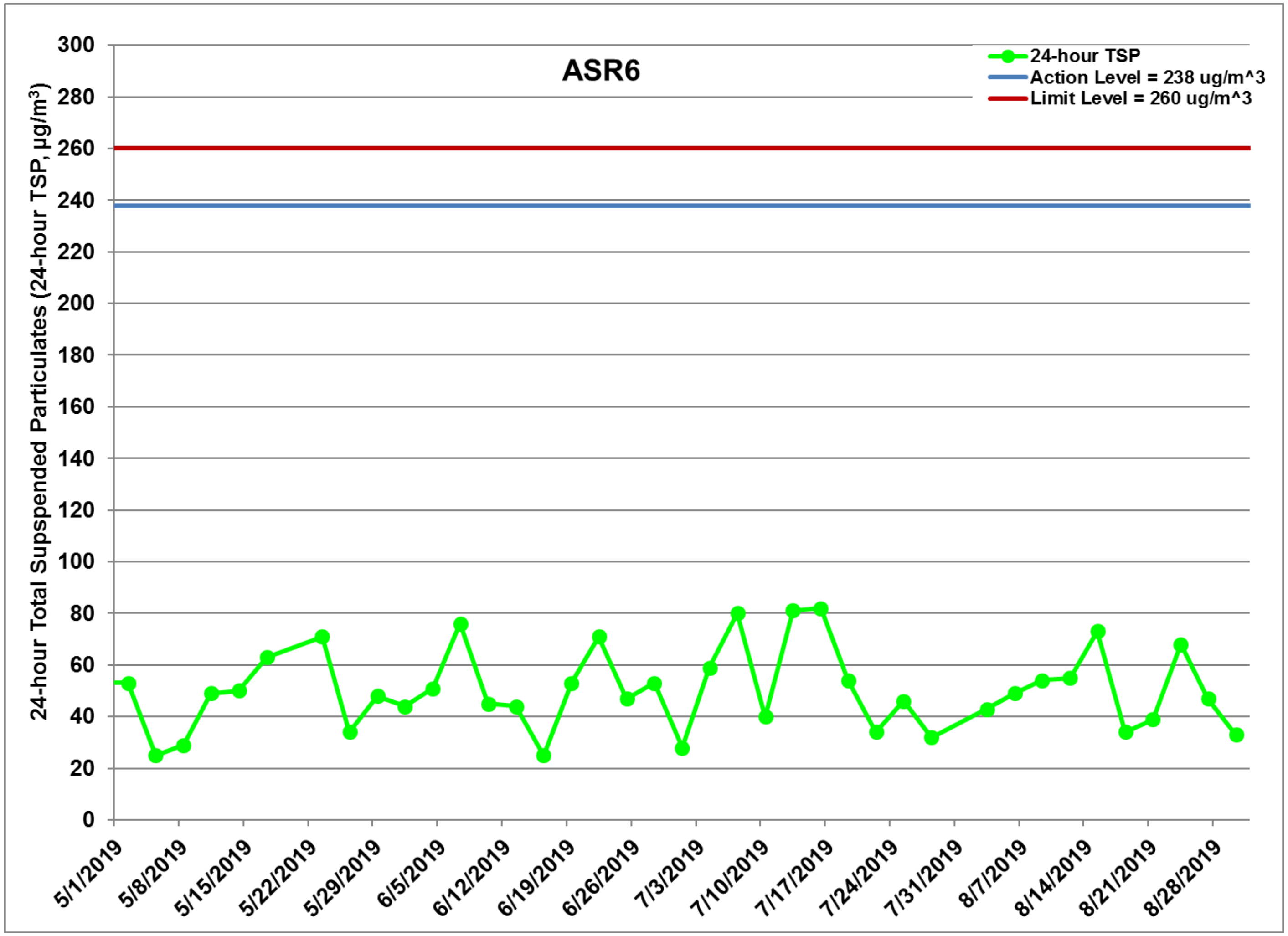


Figure F.9 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR6 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

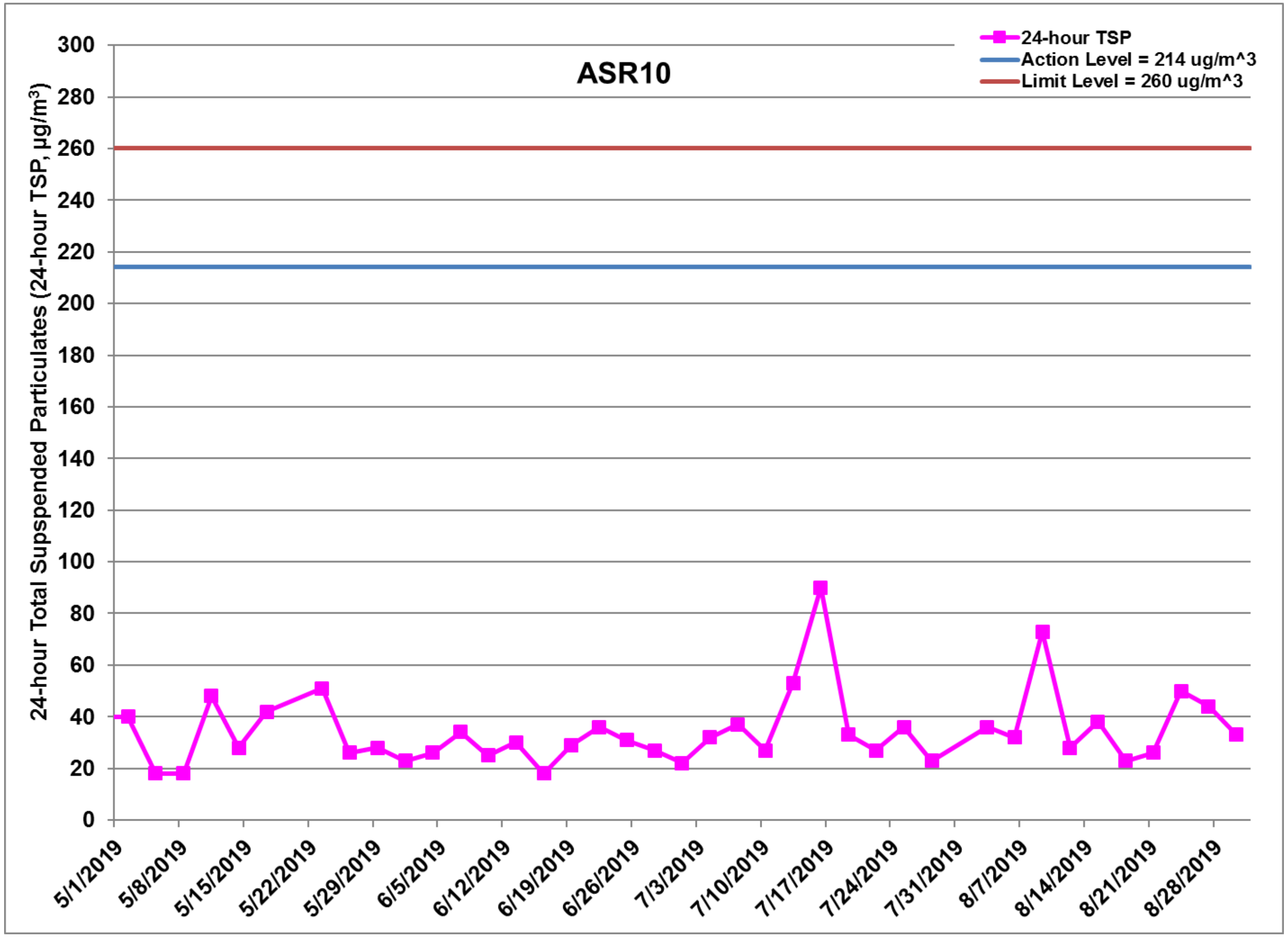


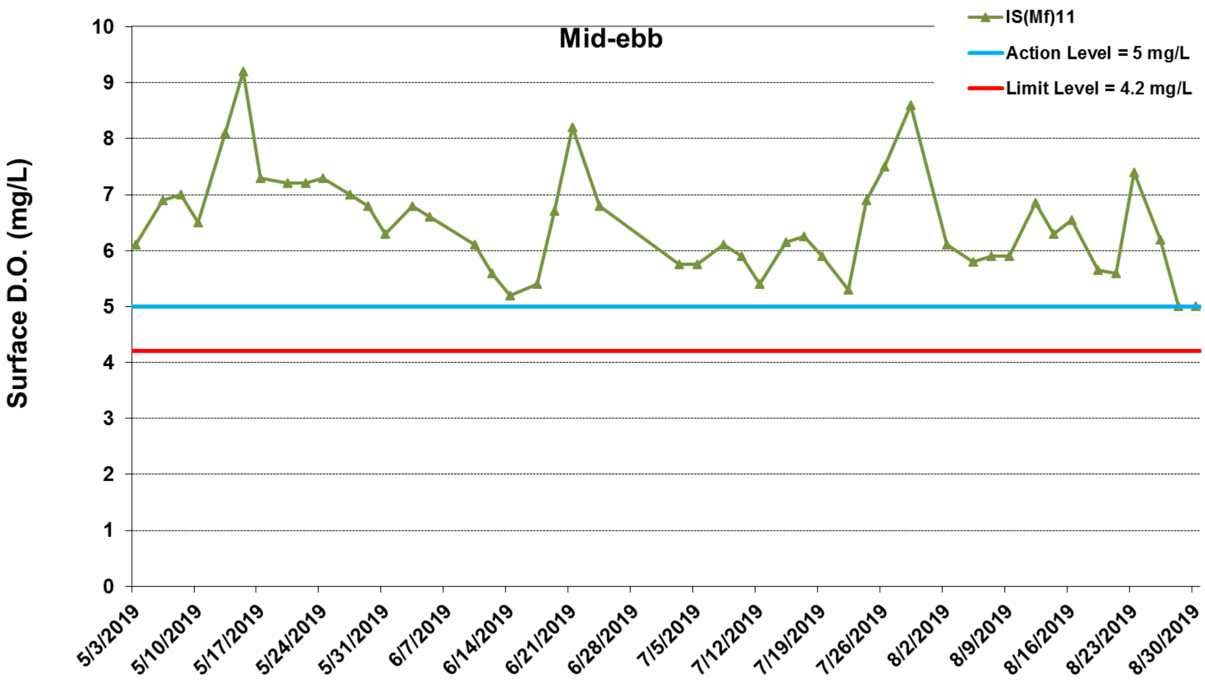
Figure F.10 Impact Monitoring – 24-hour Total Suspended Particulates (µg/m³) at ASR10 between 1 May 2019 and 31 August 2019 during impact monitoring period. The weather conditions during the monitoring period varied from sunny to cloudy. Major land-based construction activities included: Backfilling, Road & Drainage Works (1/5/2019 – 31/8/2019)

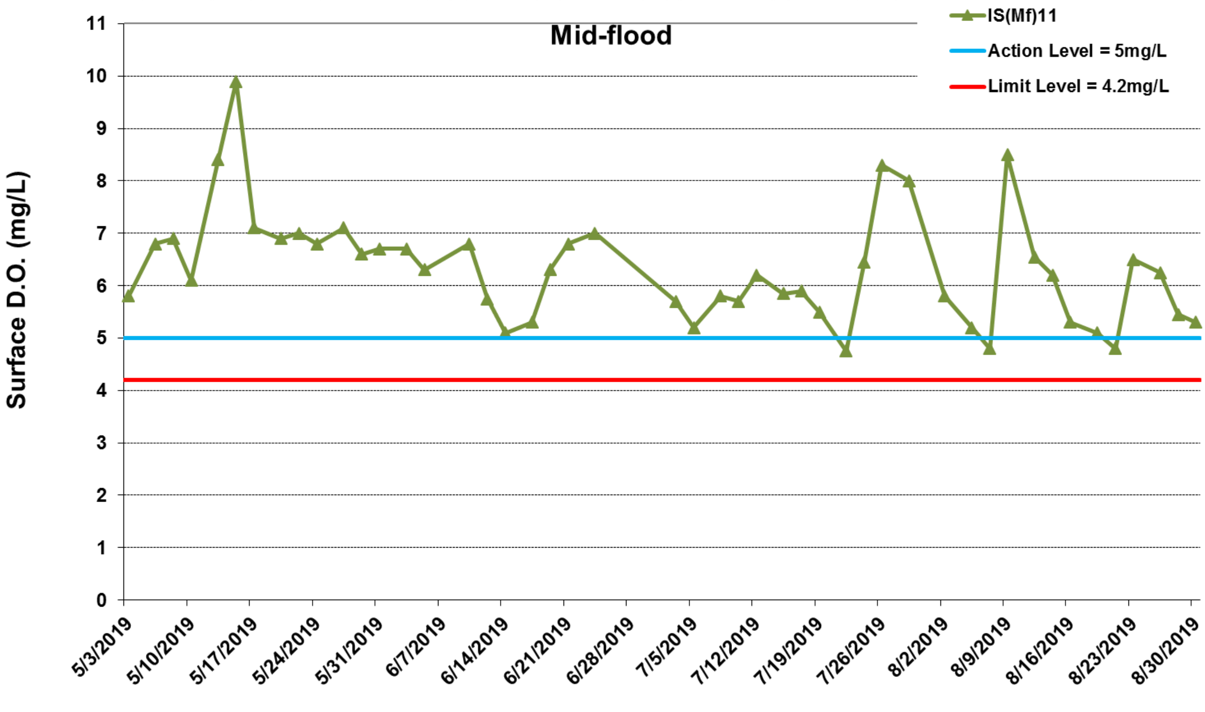
Ref: 0212330_Impact AQM graphs_August 2019_REV a.xlsx

ERM

Appendix J

Impact Water Quality Monitoring Results





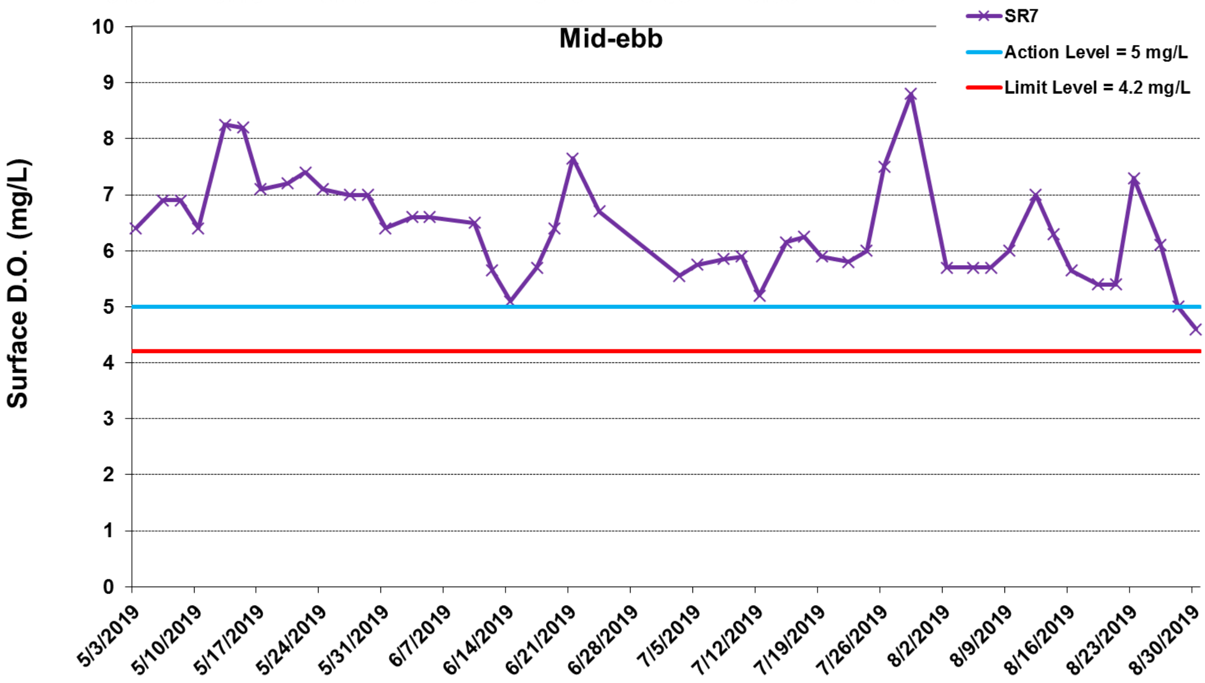
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

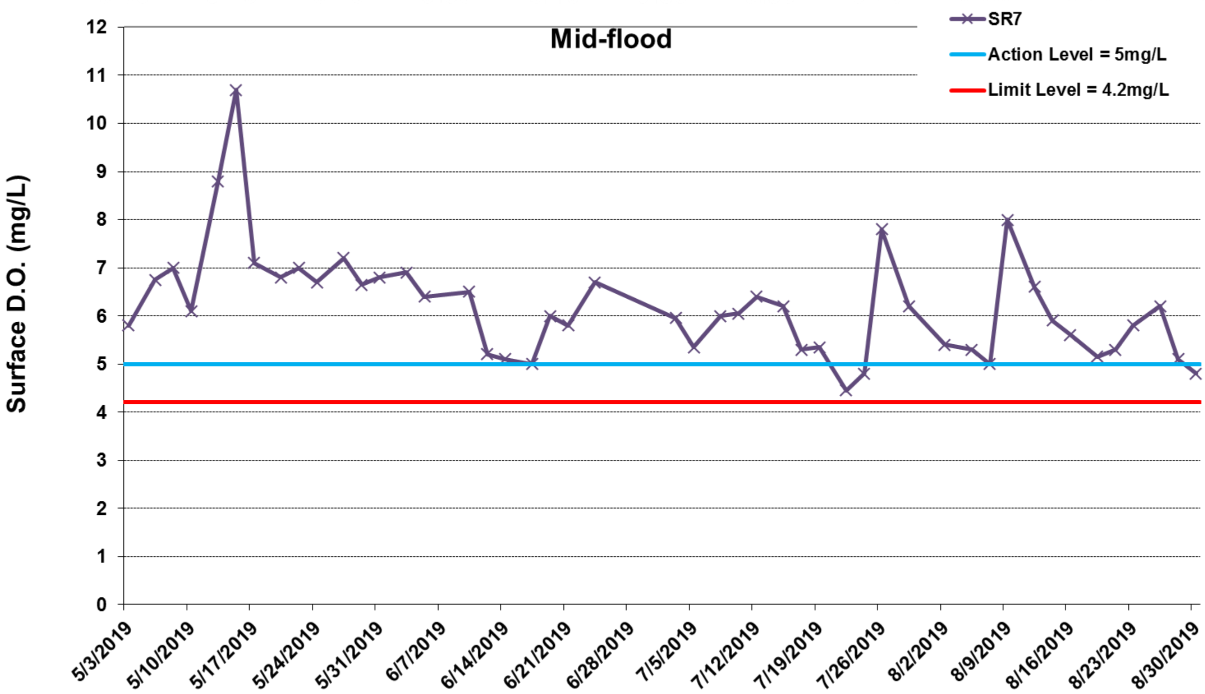
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G1 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at IS(Mf)11. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls





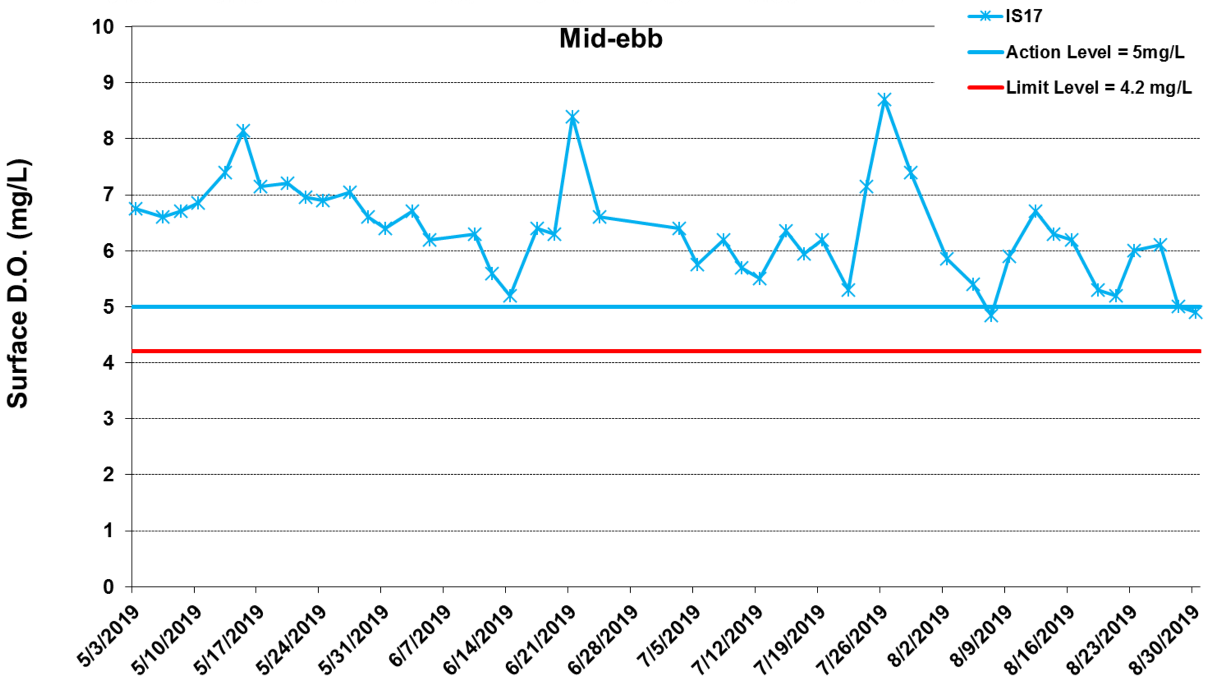
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

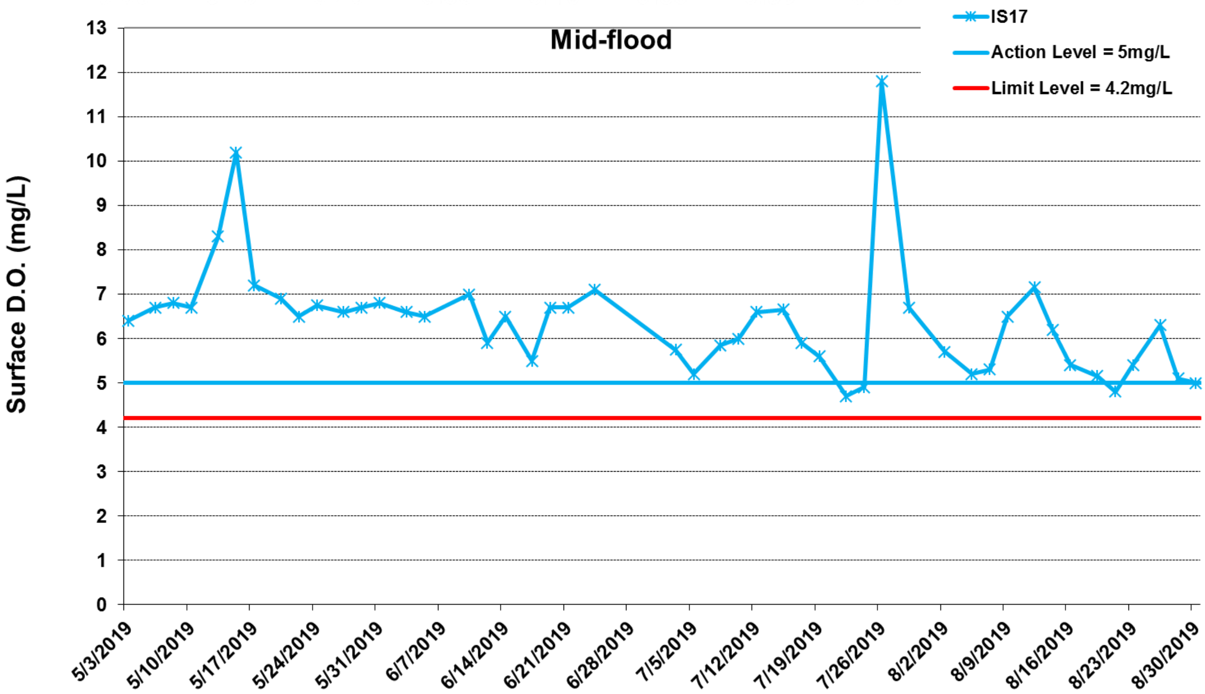
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G2 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at SR7. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls





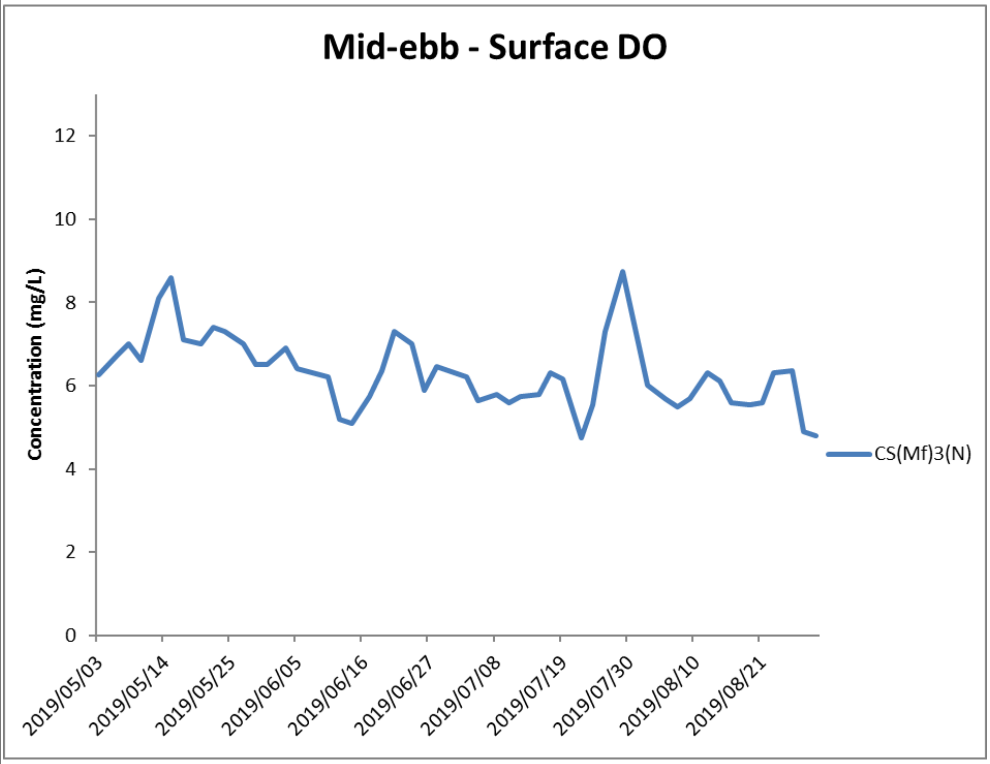
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

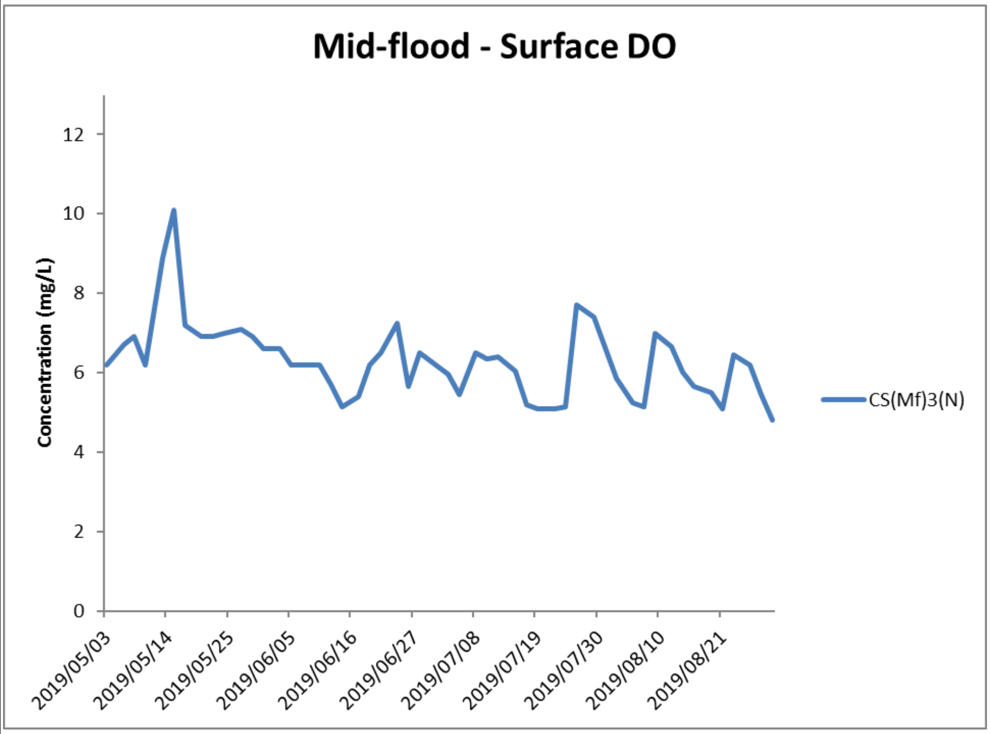
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G3 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at IS(Mf)11. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: *0212330_Impact-WQM_August2019_graphs_Rev a.xls*



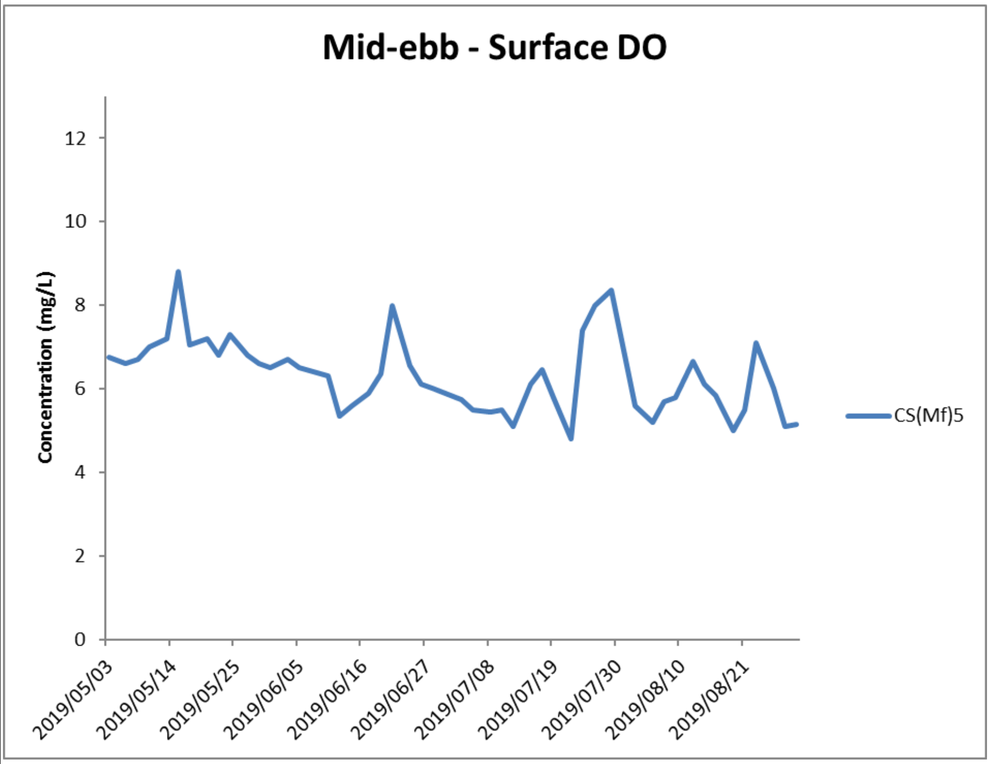


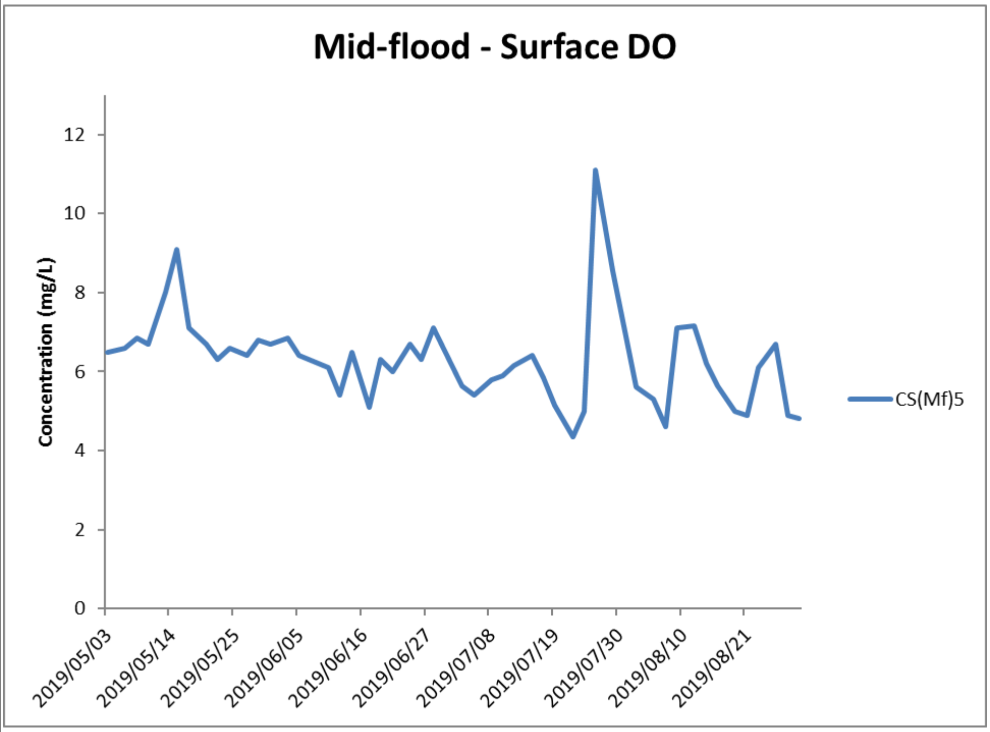
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G4 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at CS(Mf)3(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



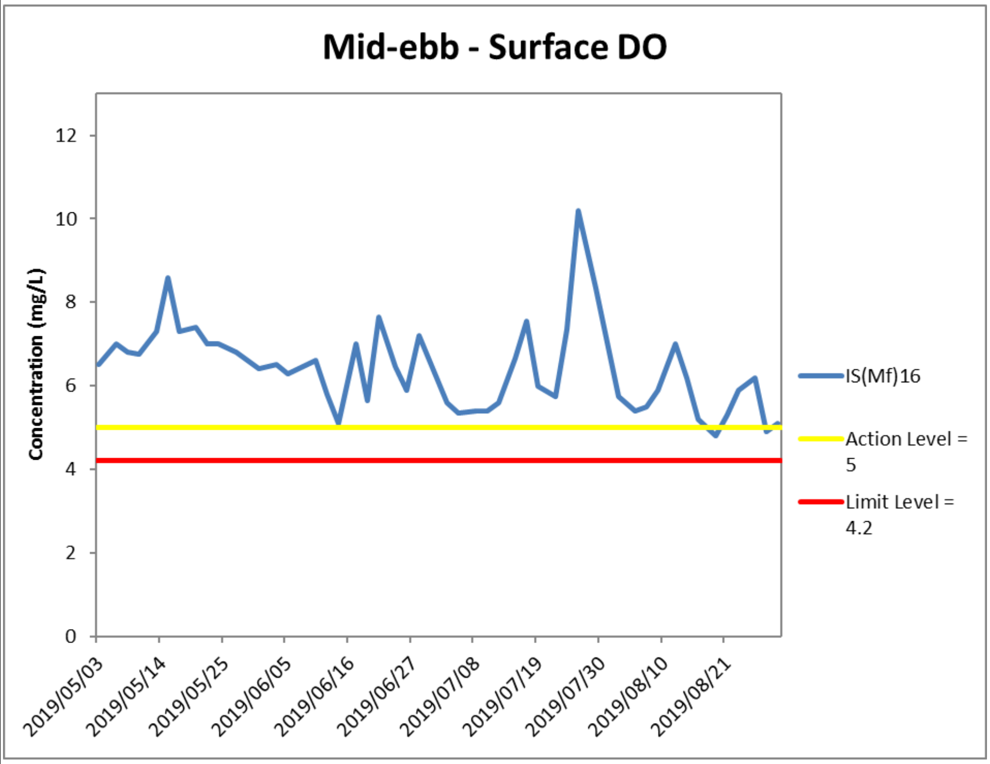


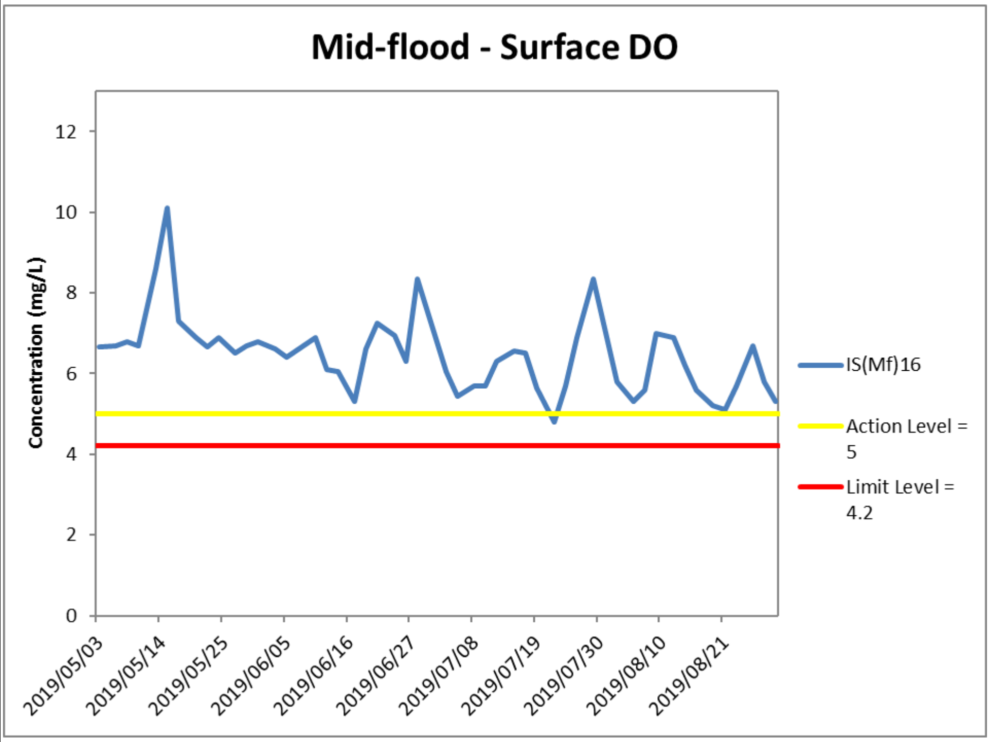
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G5 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at CS(Mf)5. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



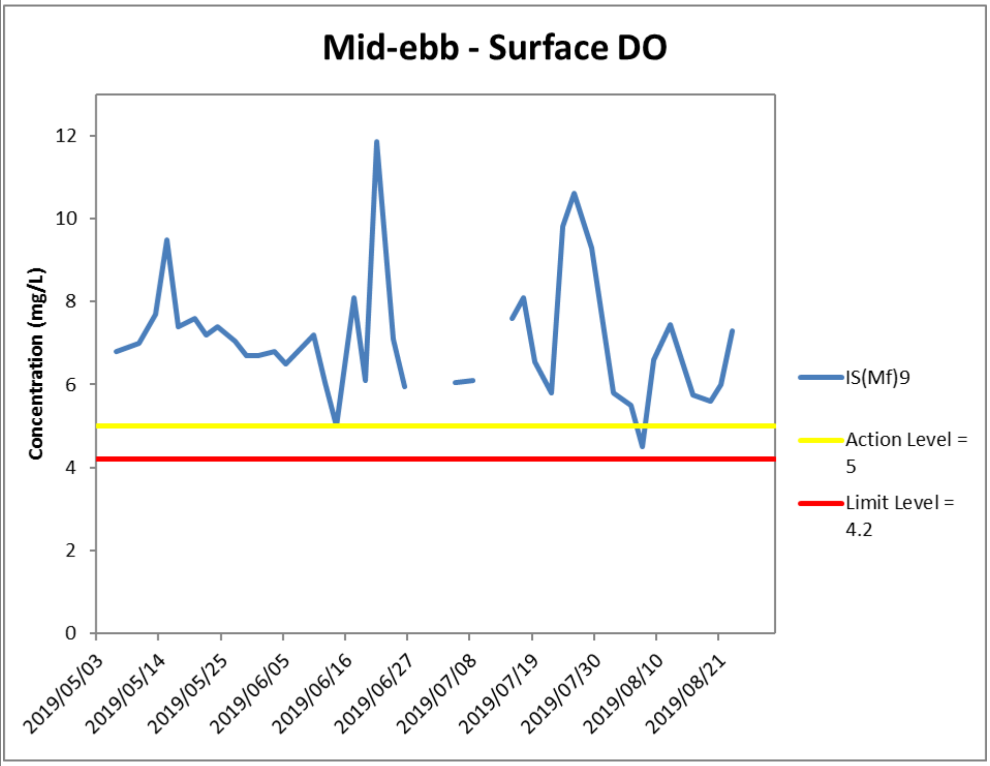


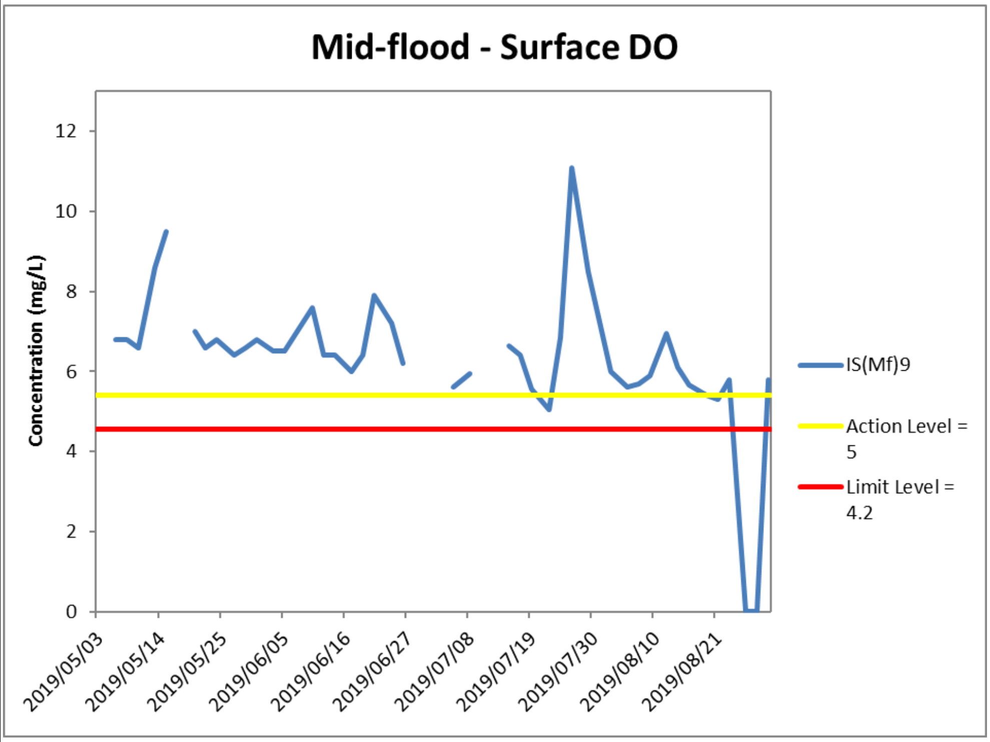
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G6 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at IS(Mf)16. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



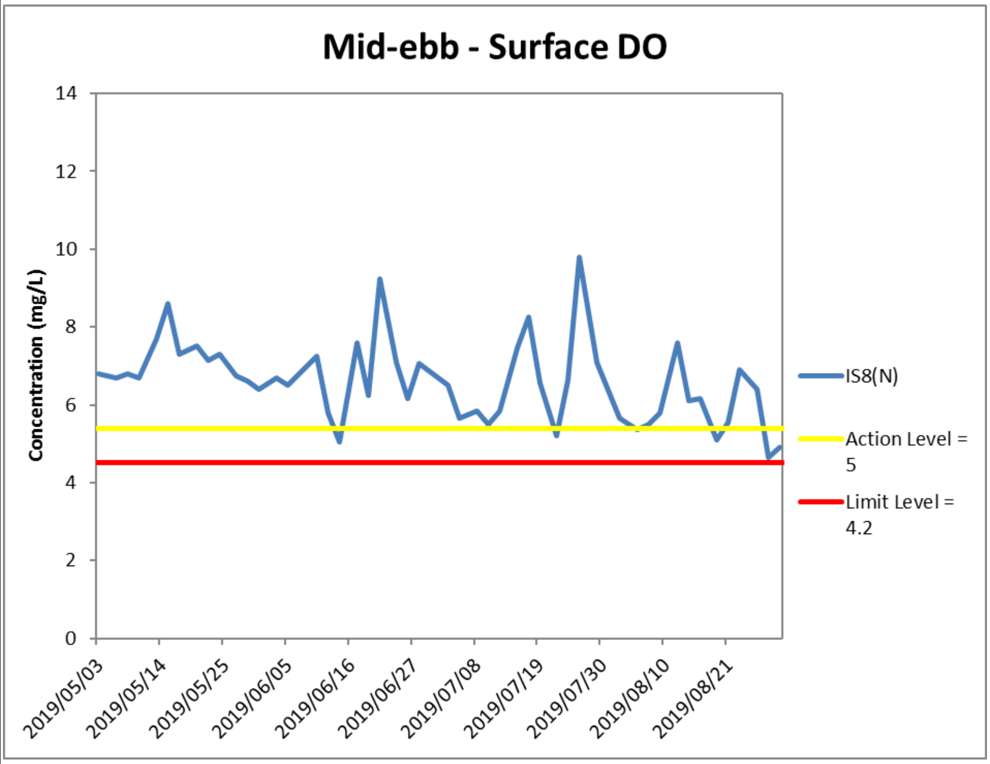


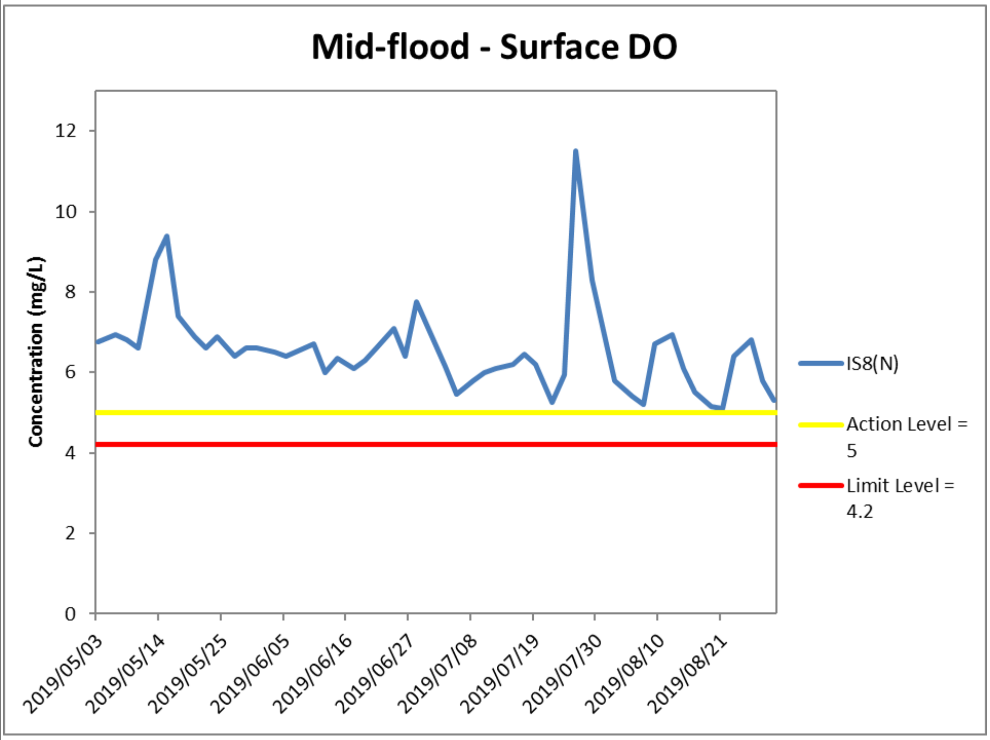
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G7 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at IS(Mf)9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: *0212330_Impact-WQM_August2019_graphs_Rev a.xls*



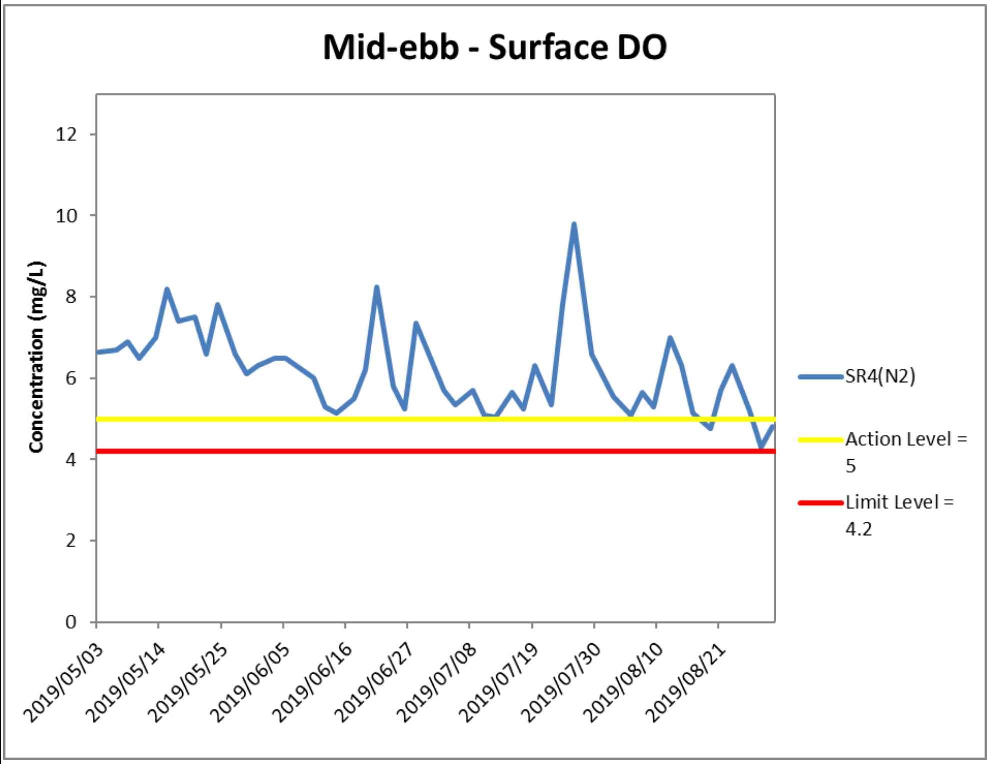


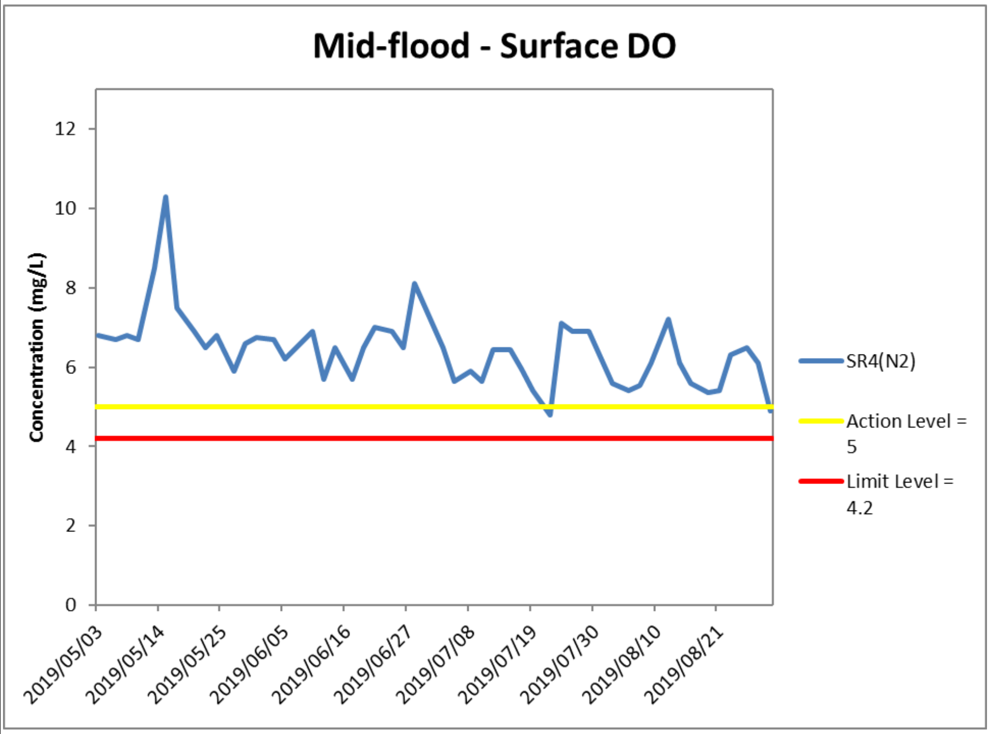
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G8 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at IS8(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



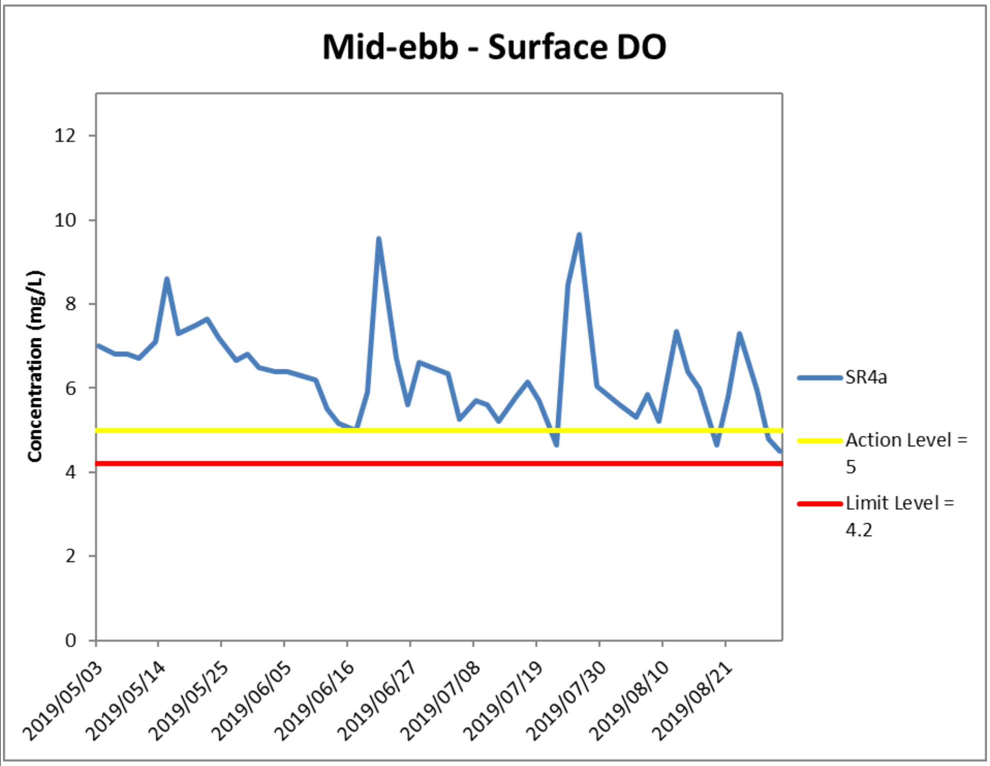


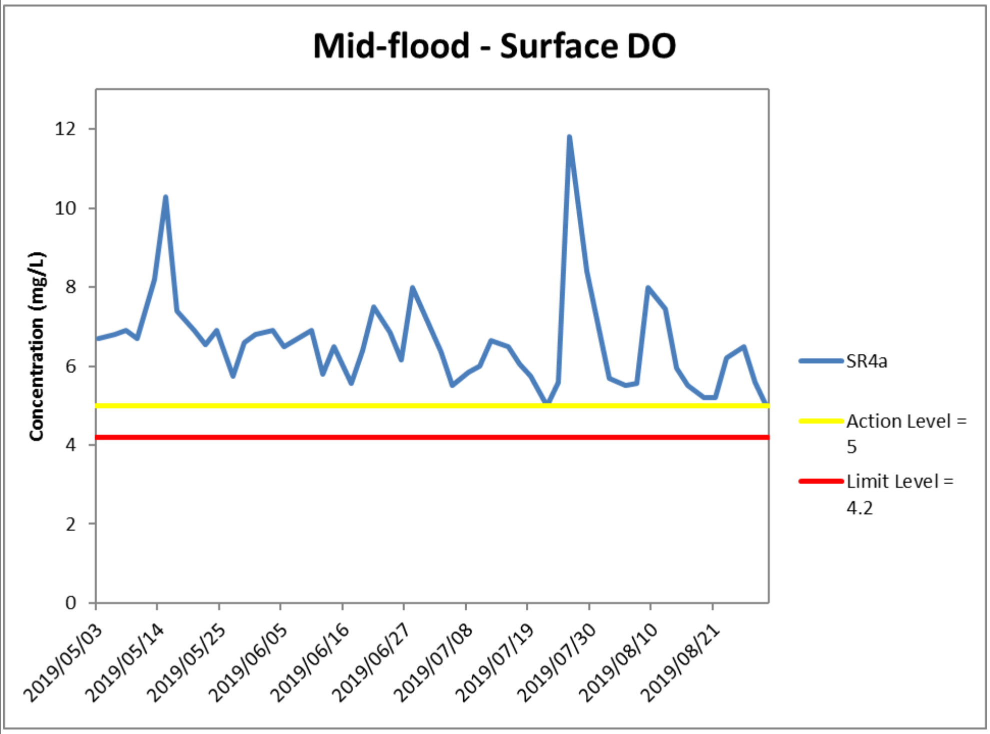
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G9 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at SR4(N2). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



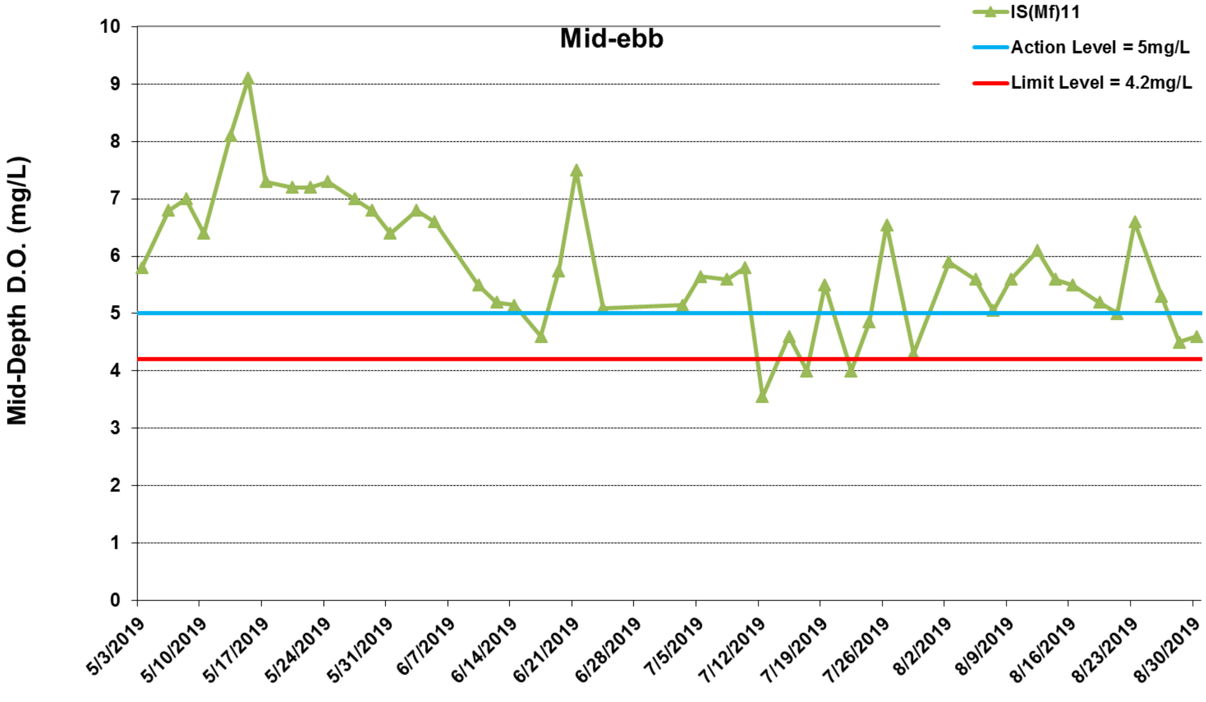


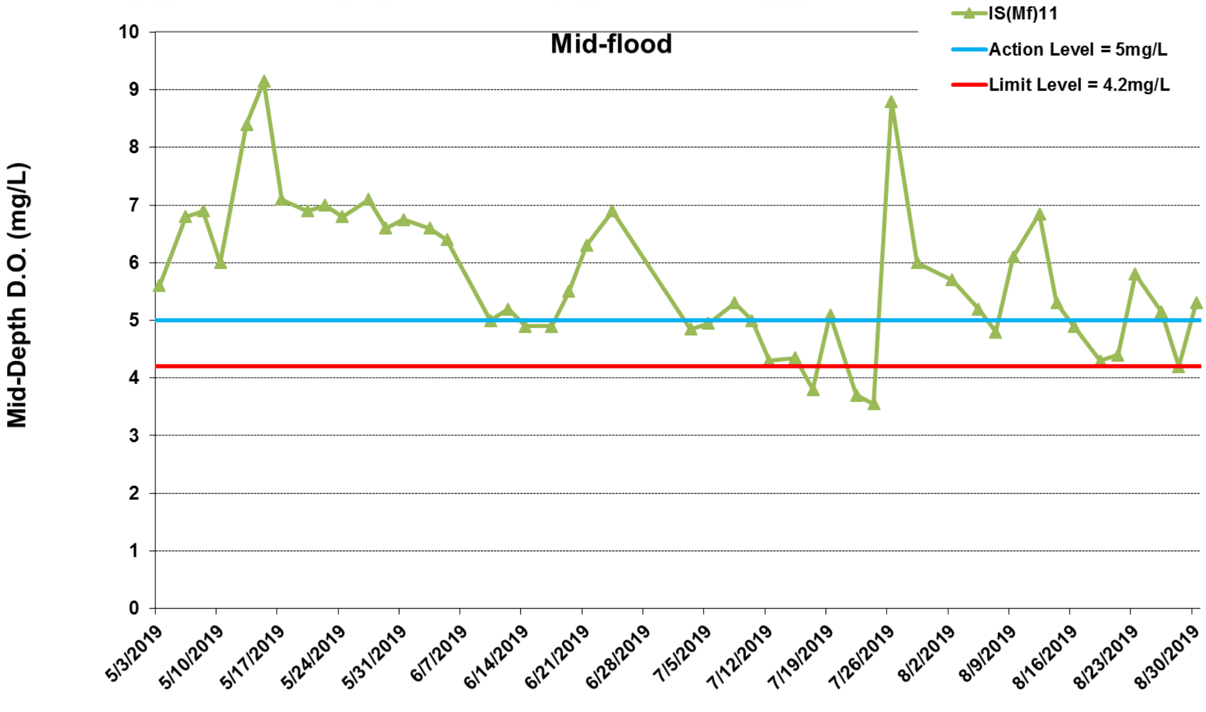
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G10 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in surface waters between 1 May 2019 and 31 August 2019 at SR4a. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls





* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

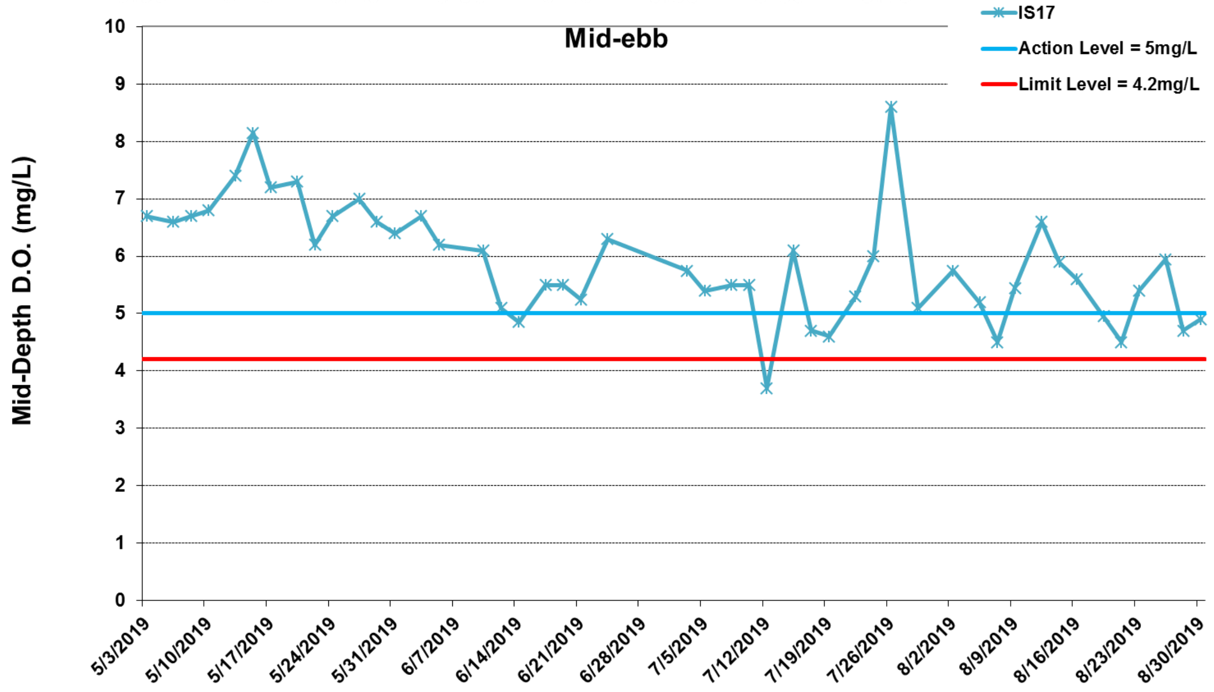
*No data for Stations SR7 due to shallow water depth (< 6m).

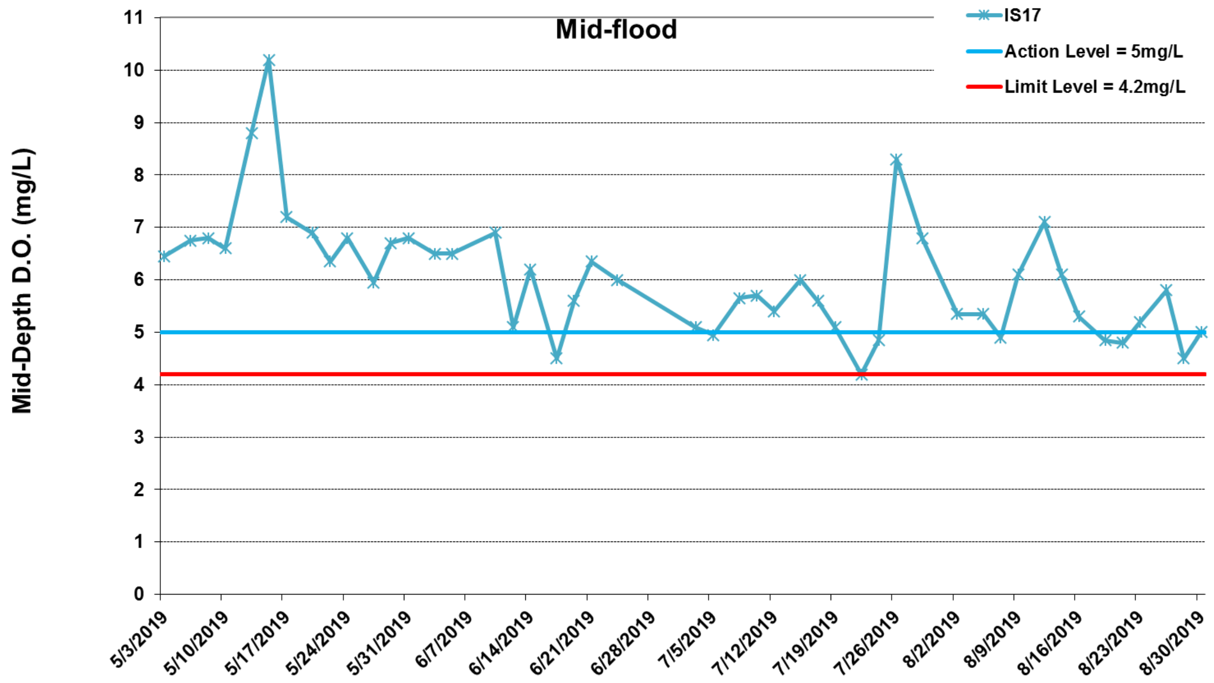
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G11 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 May 2019 and 31 August 2019 at IS(Mf)11. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: *0212330_Impact-WQM_August2019_graphs_Rev a.xls*





* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

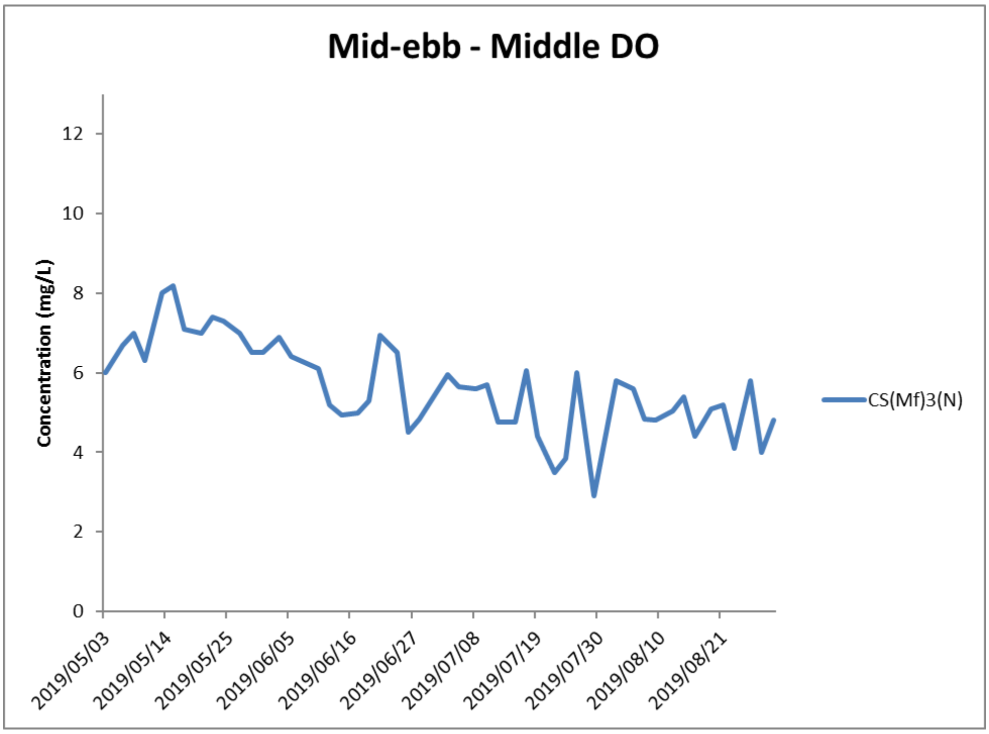
*No data for Stations SR7 due to shallow water depth (< 6m).

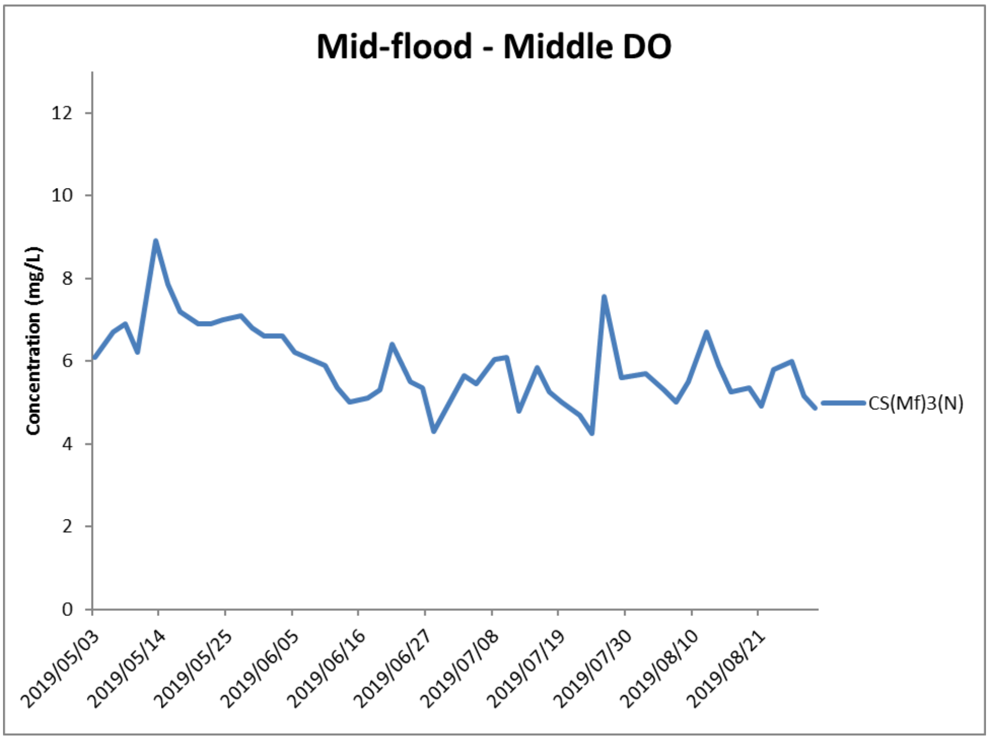
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G12 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 May 2019 and 31 August 2019 at IS17. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: *0212330_Impact-WQM_August2019_graphs_Rev a.xls*



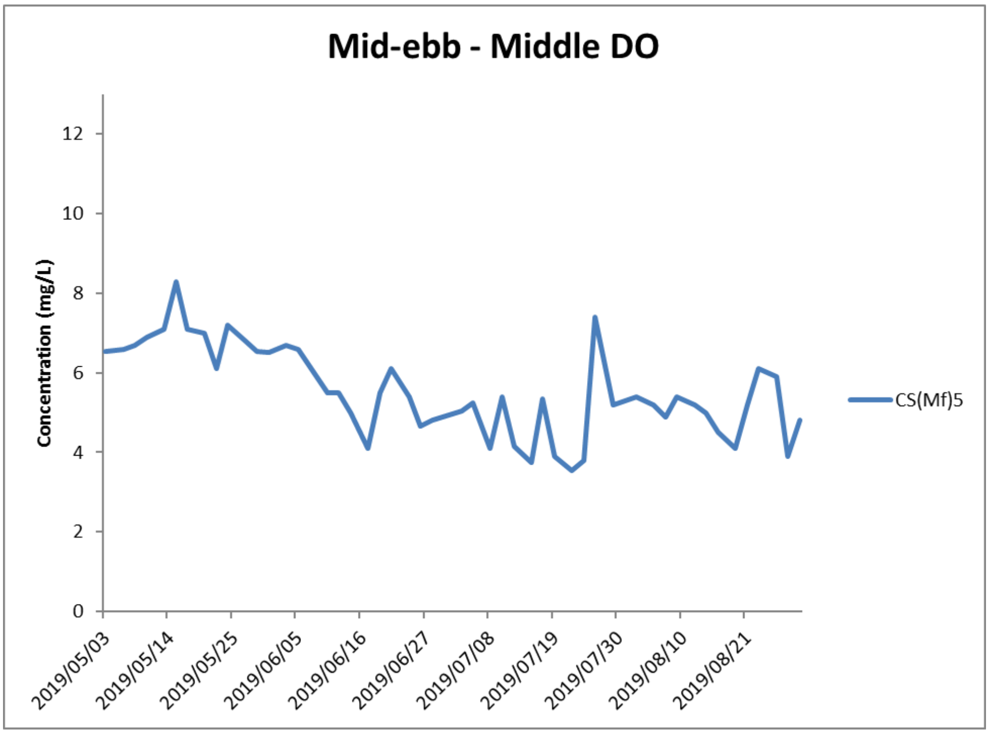


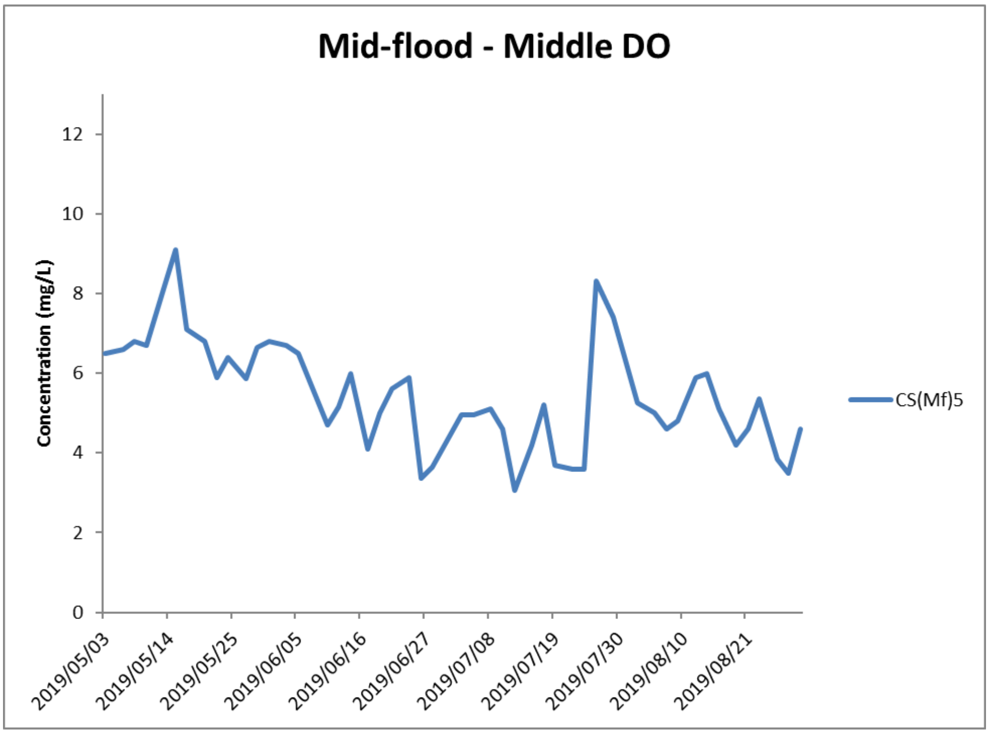
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G13 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 May 2019 and 31 August 2019 at CS(Mf)3(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



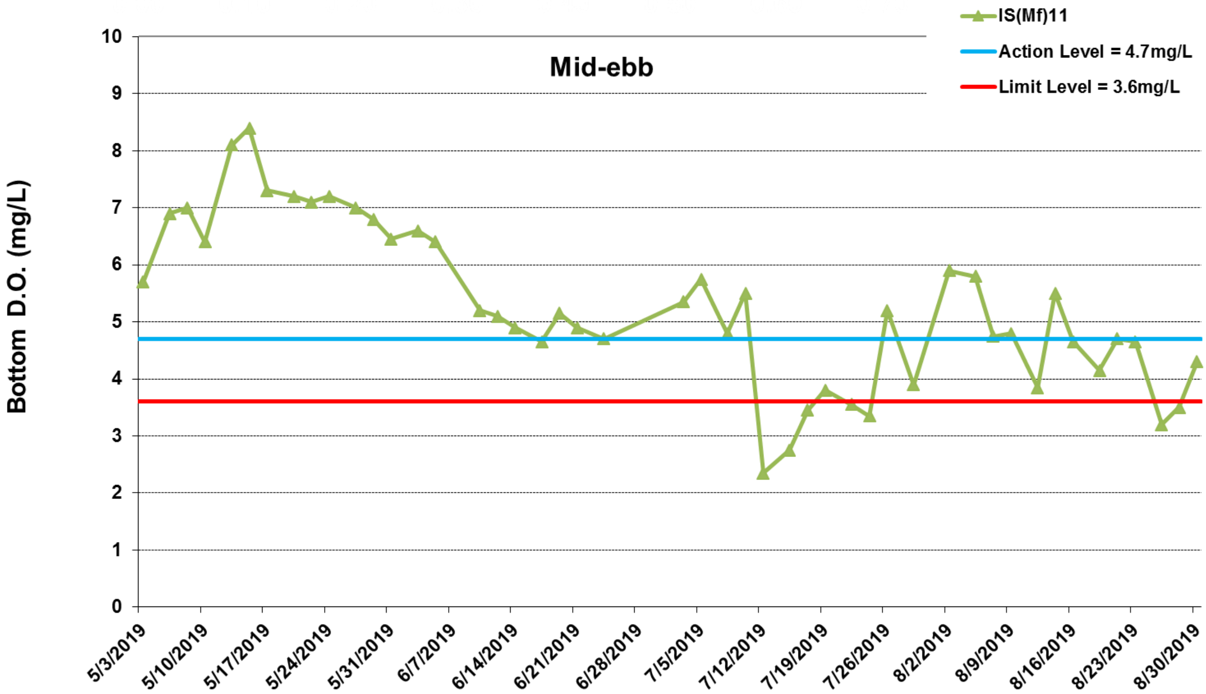


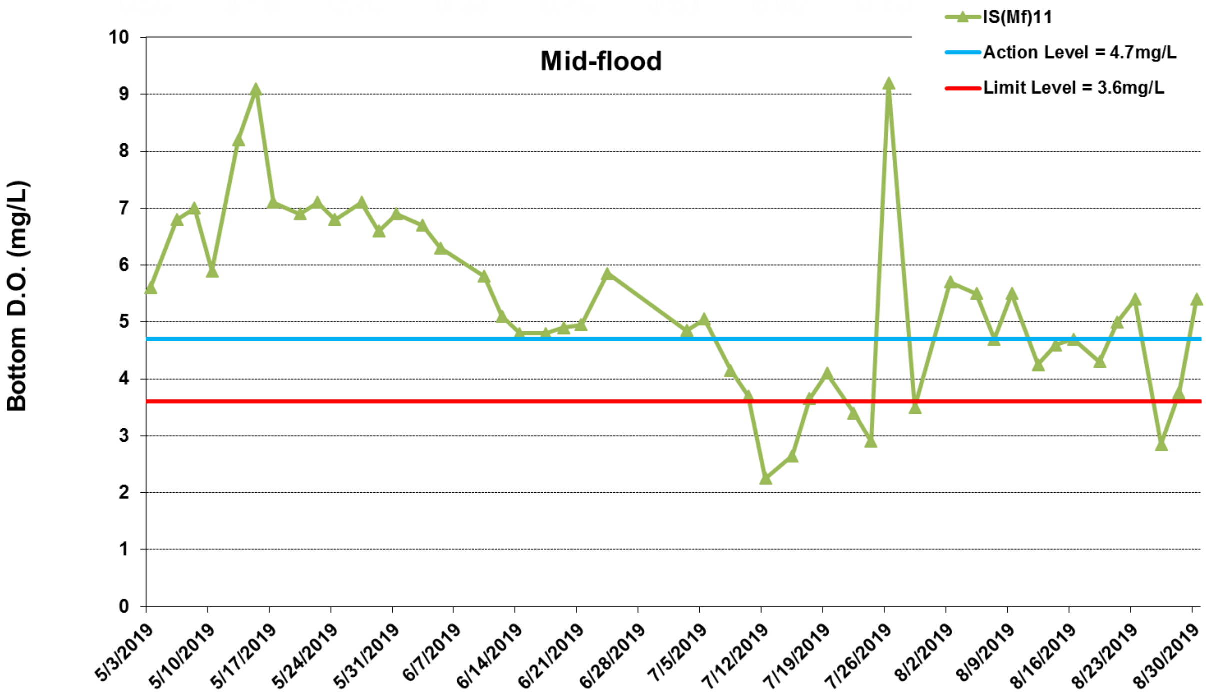
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G14 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters between 1 May 2019 and 31 August 2019 at CS(Mf)5. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls





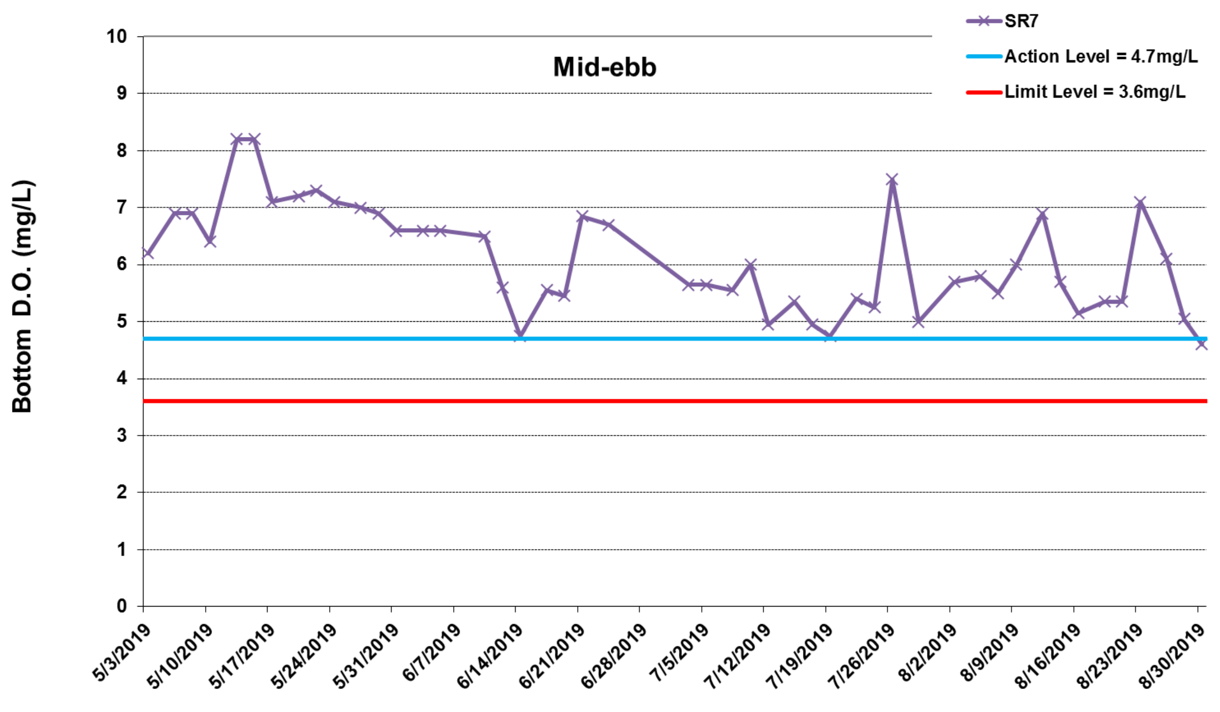
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

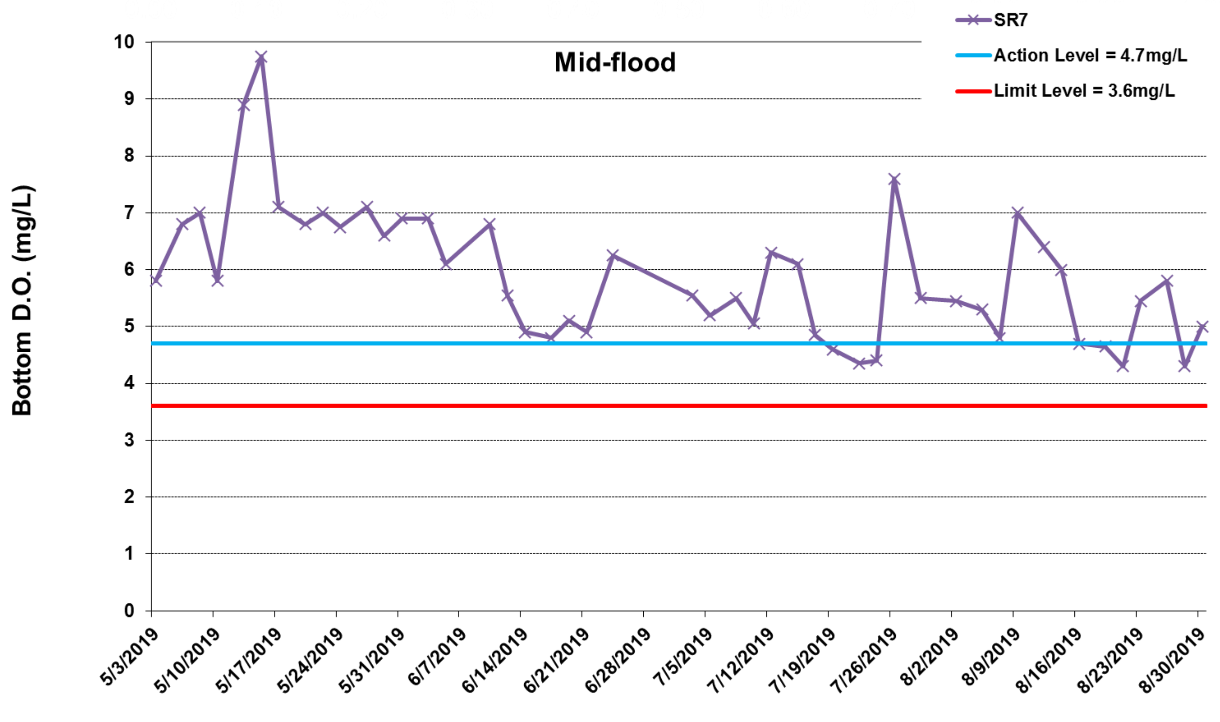
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G15 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at IS(Mf)11. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls





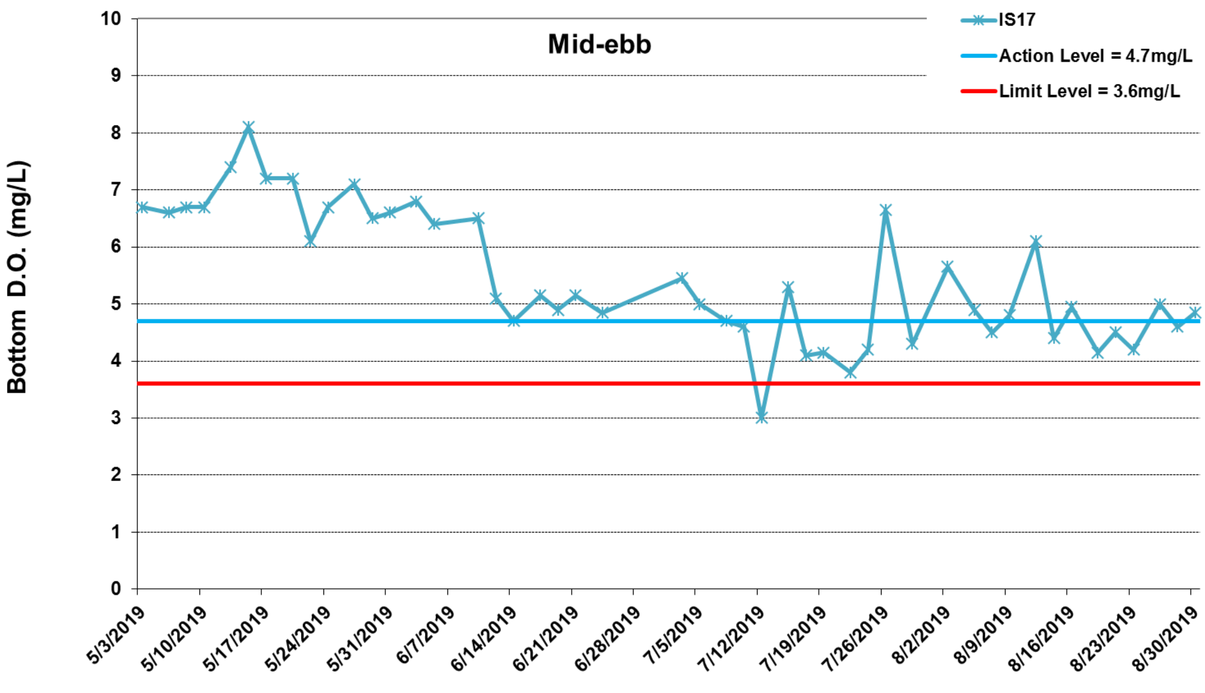
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

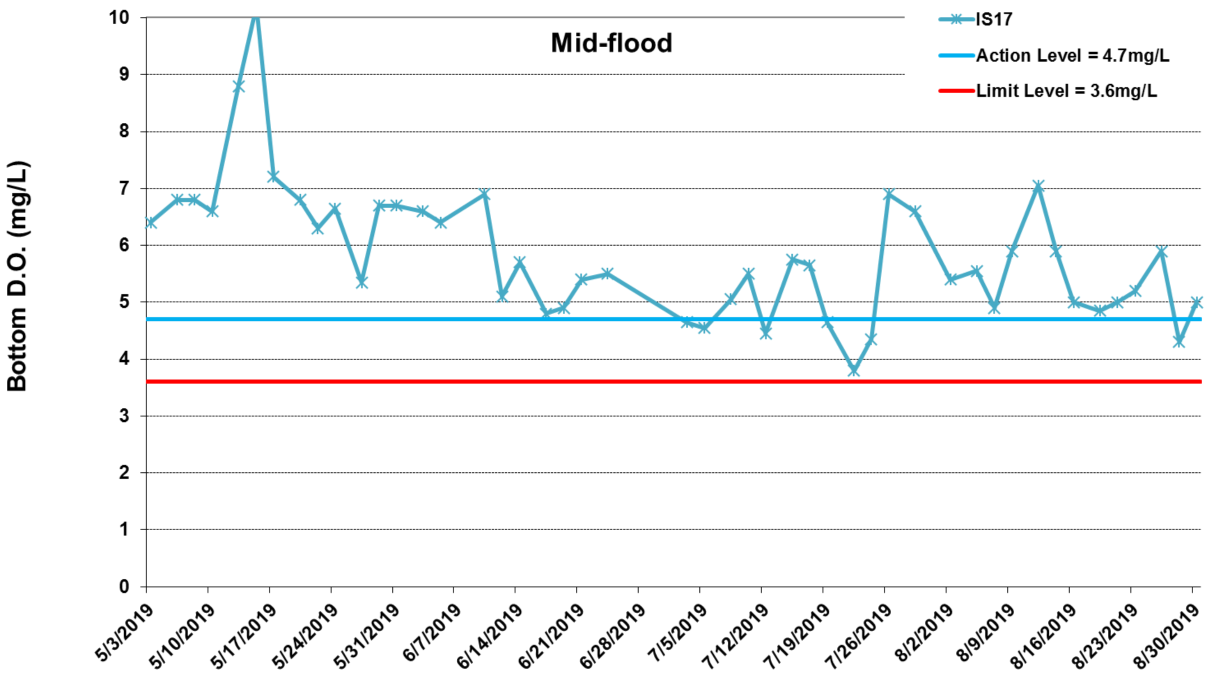
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G16 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at SR7. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls





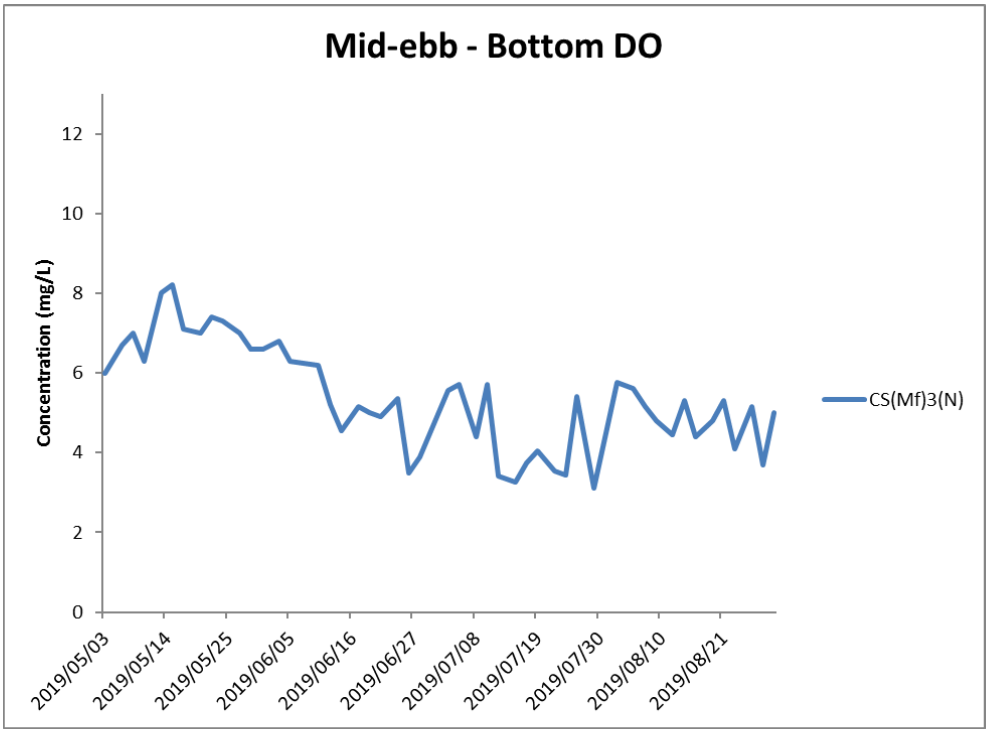
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

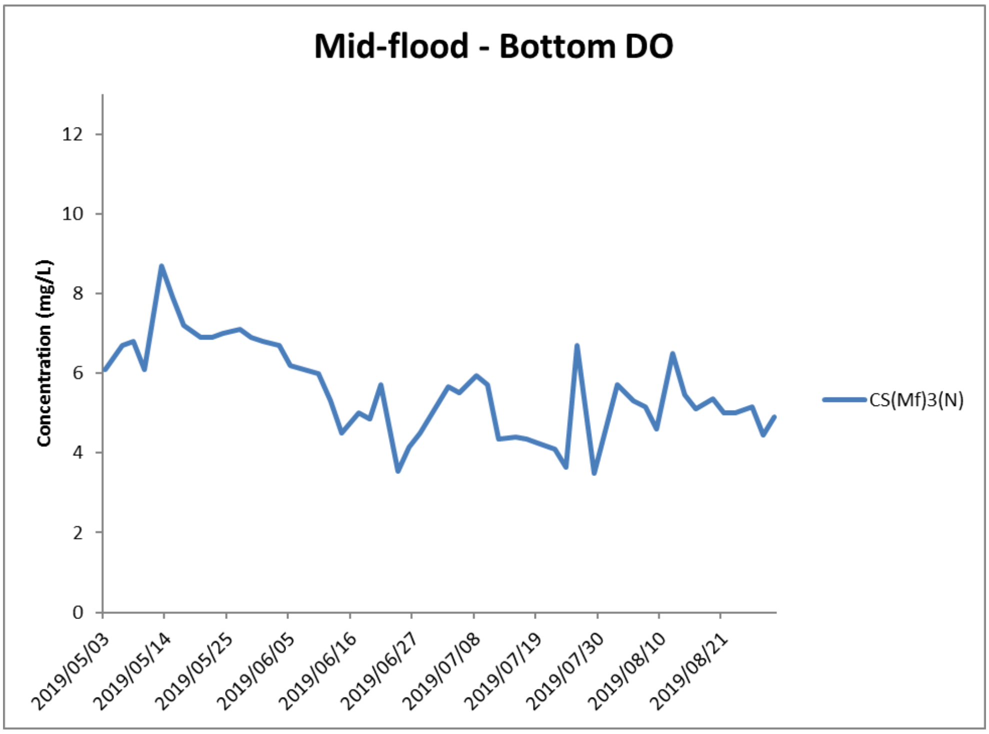
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G17 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at IS17. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: *0212330_Impact-WQM_August2019_graphs_Rev a.xls*



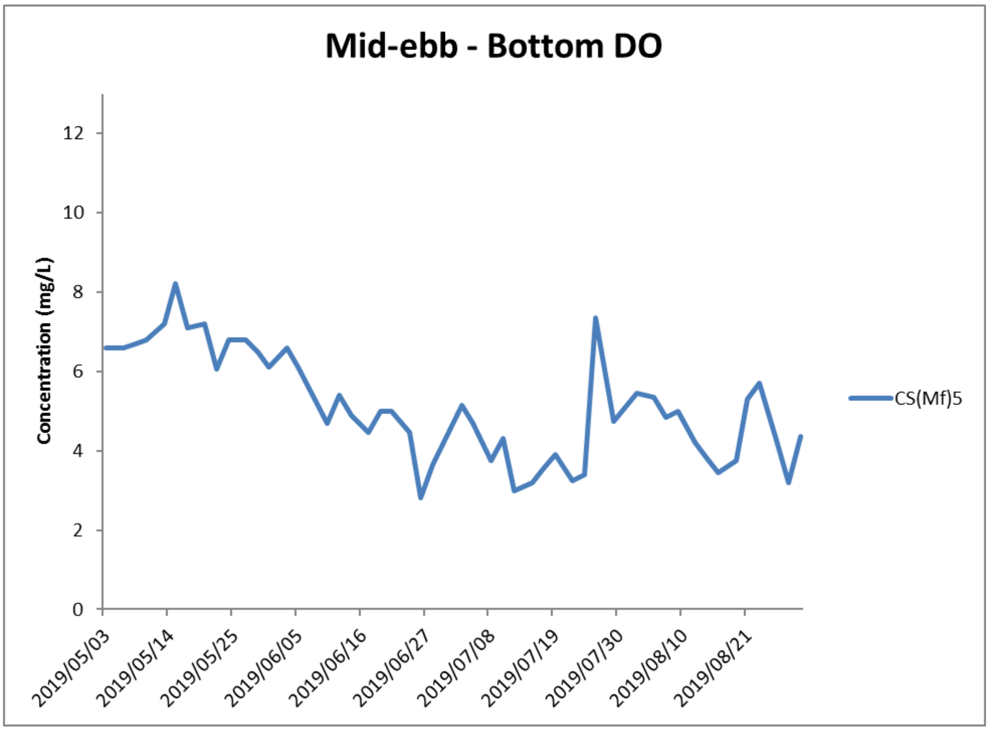


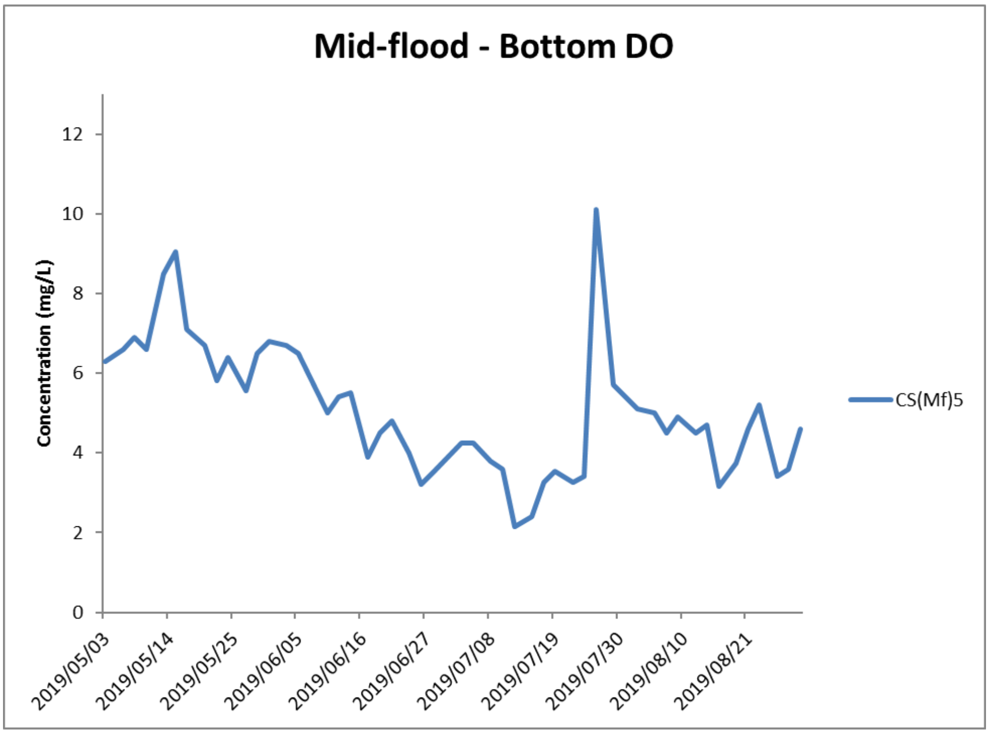
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G18 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at CS(Mf)3(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



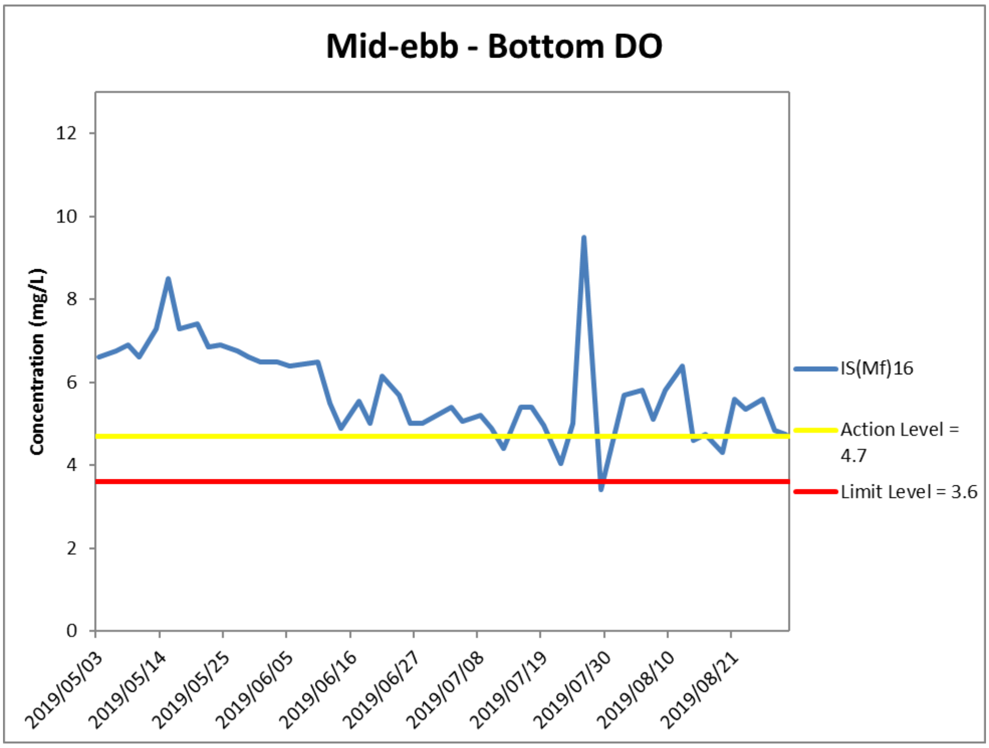


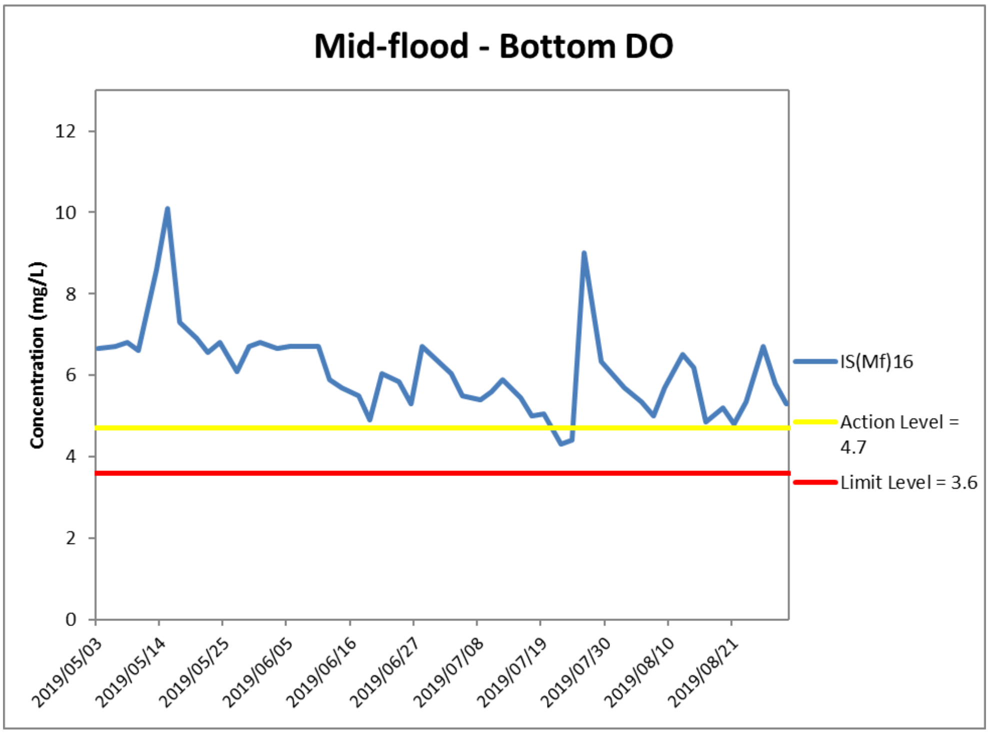
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G19 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at CS(Mf)5. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



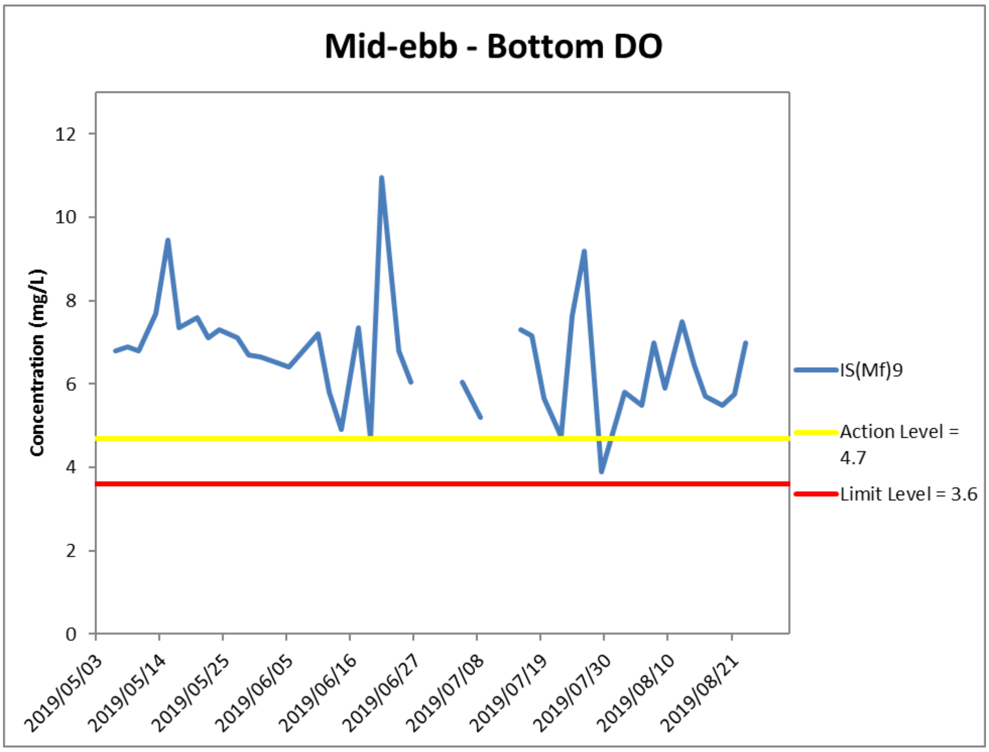


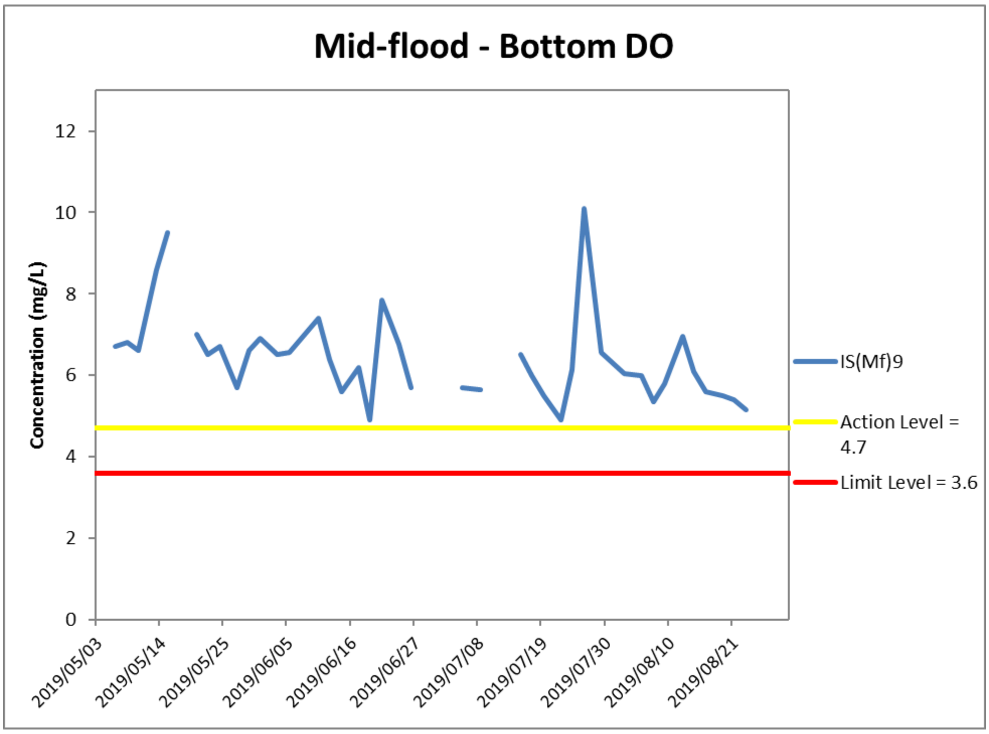
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G20 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at IS(Mf)16. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



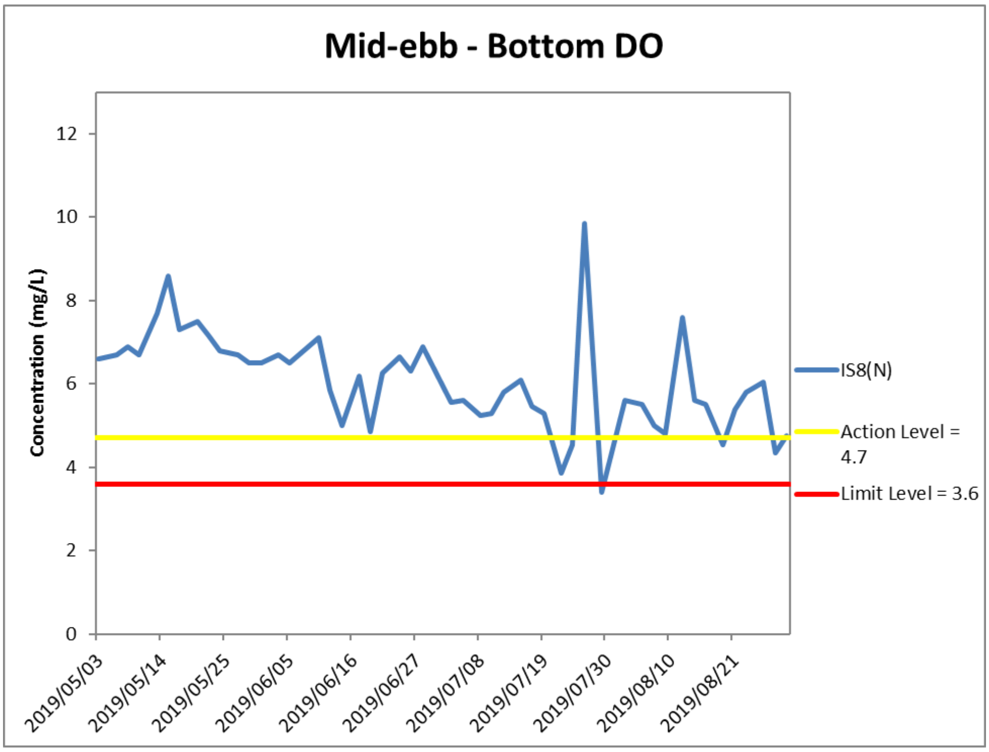


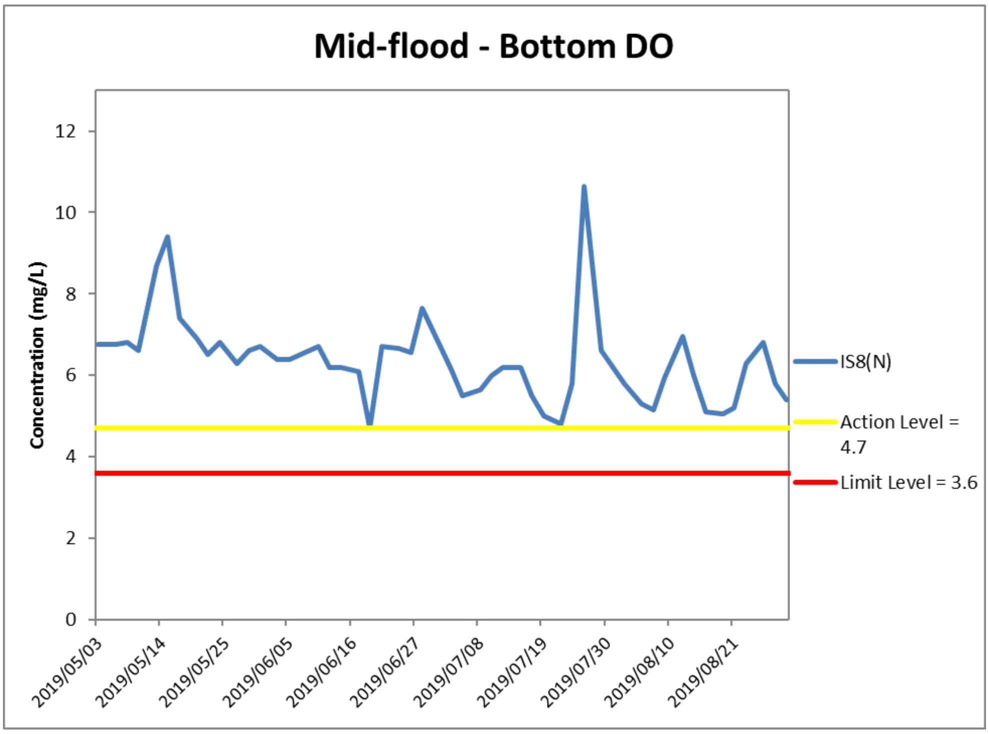
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G21 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at IS(Mf)9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



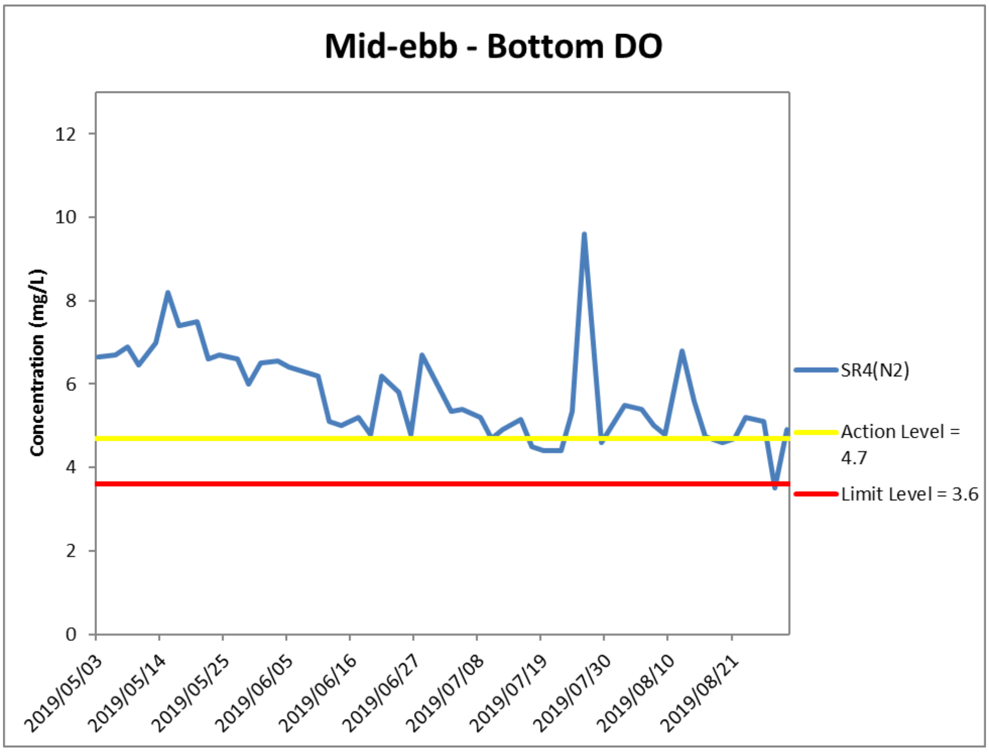


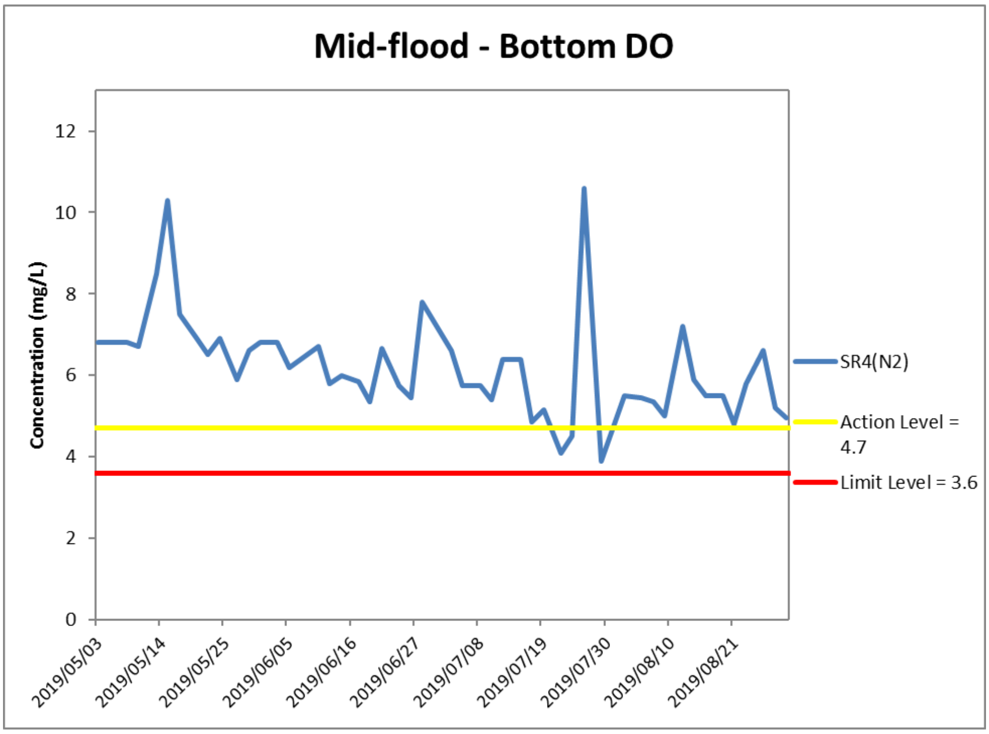
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G22 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at IS8(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



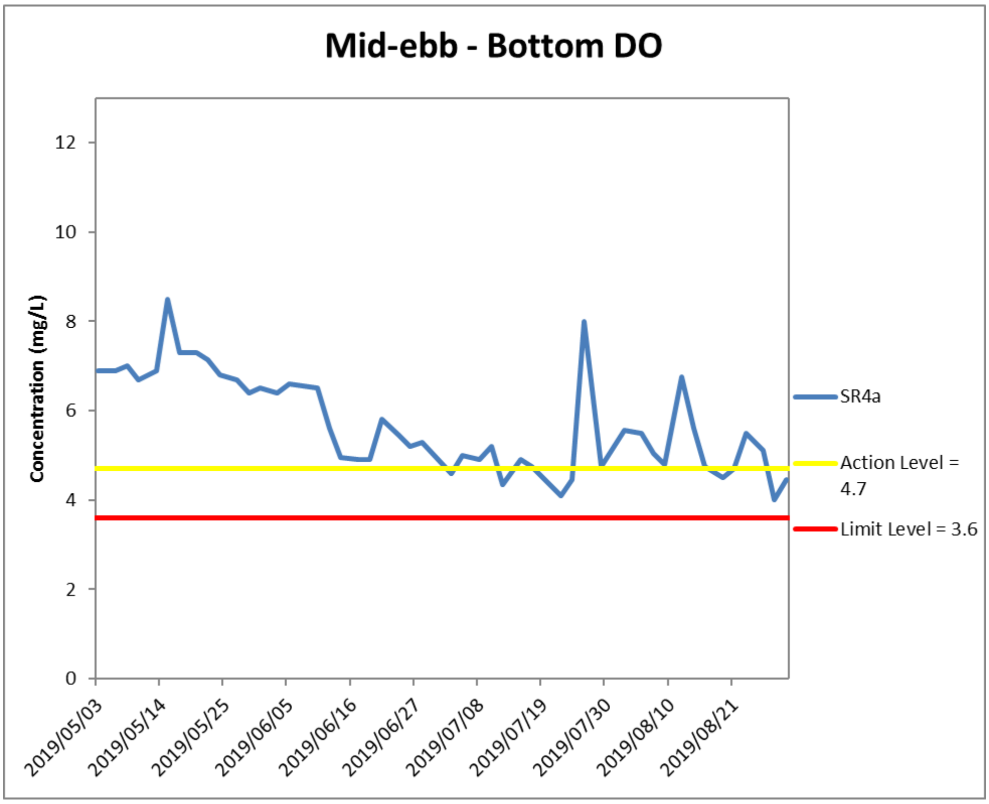


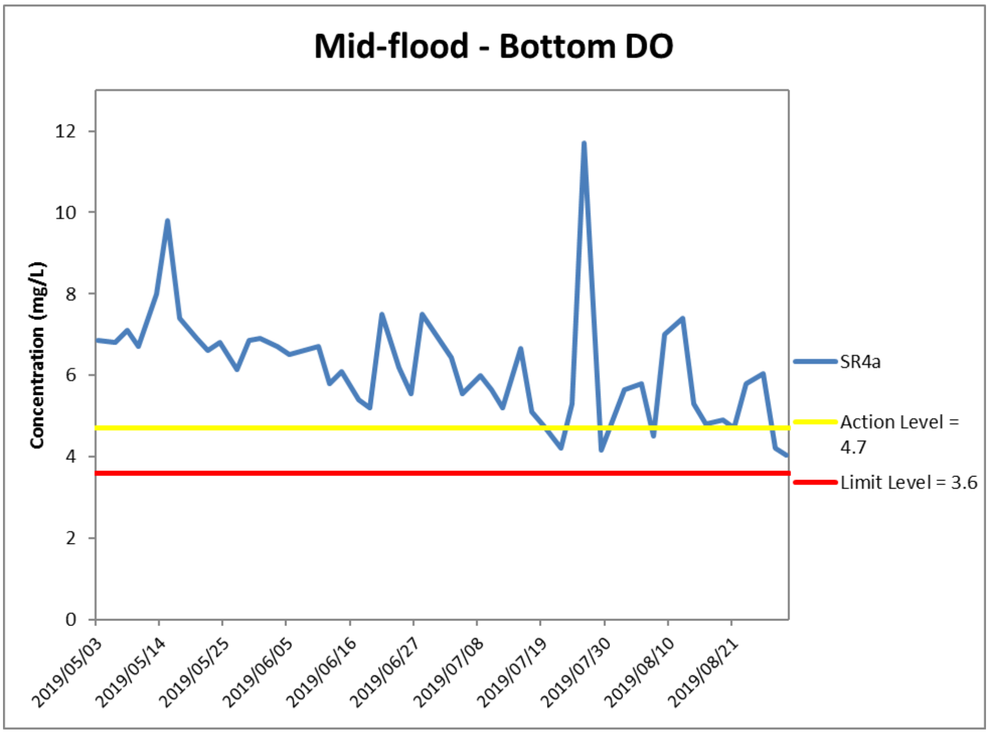
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G23 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at SR4(N2). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



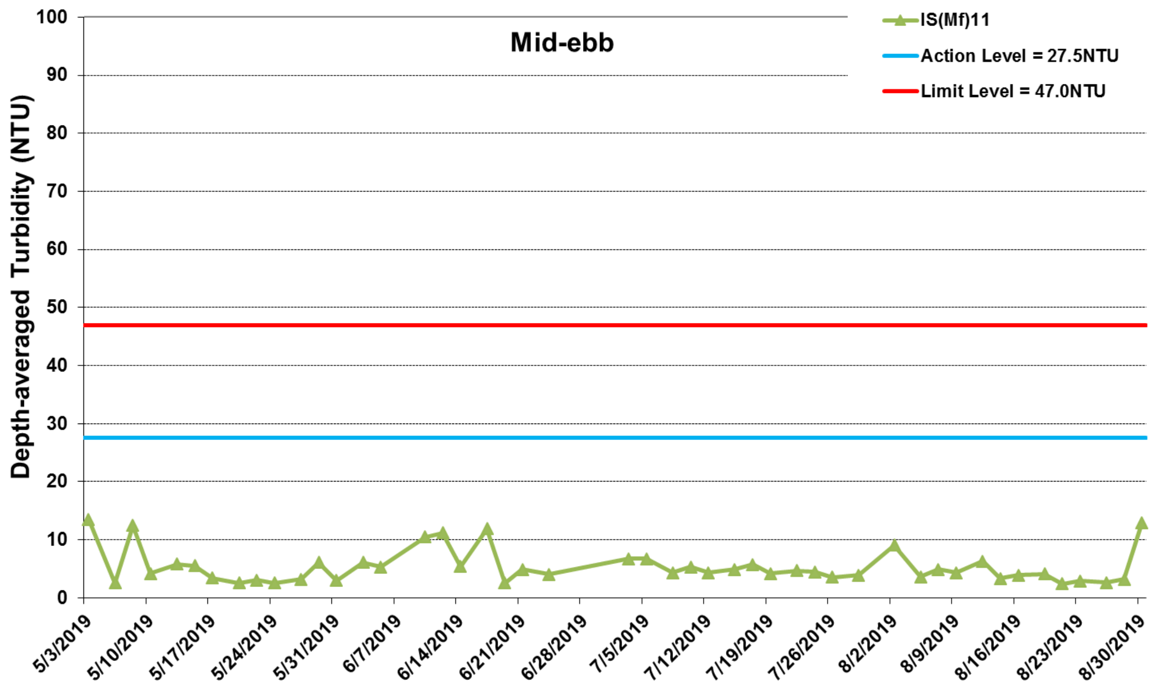


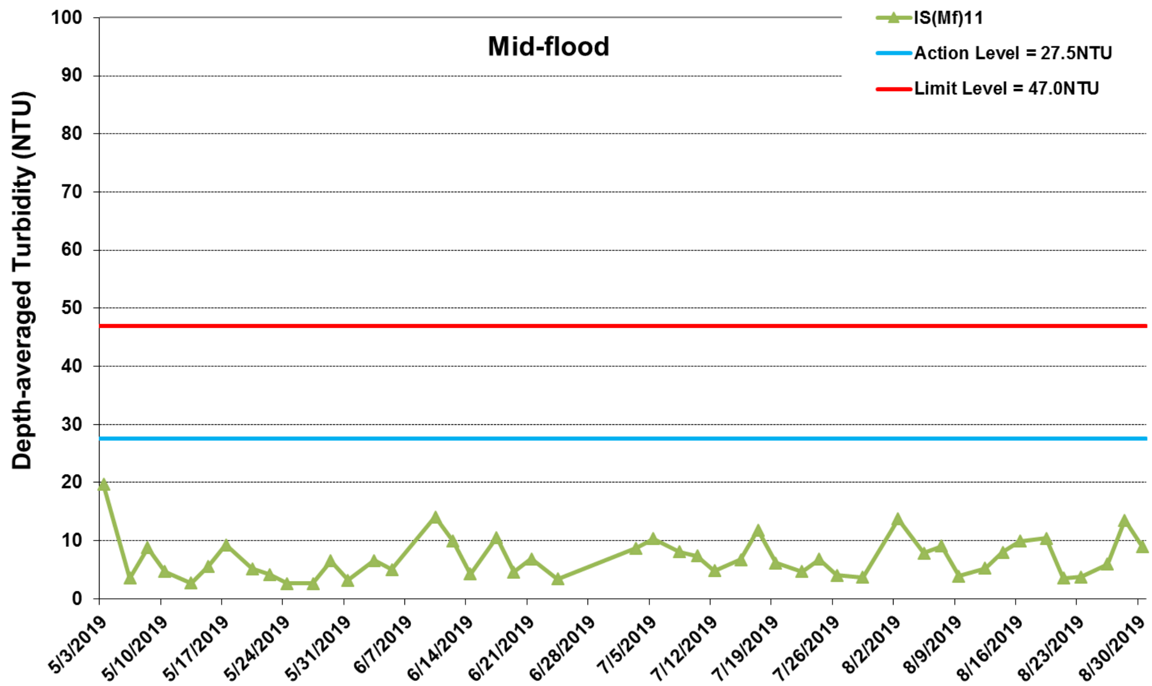
*Exceedances of Dissolved oxygen level are calculated based on average value of data from both Surface and Middle level, and bottom level separately.

Figure G24 Impact Monitoring – Mean Level of Dissolved Oxygen (mg/L) in bottom water between 1 May 2019 and 31 August 2019 at SR4a. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



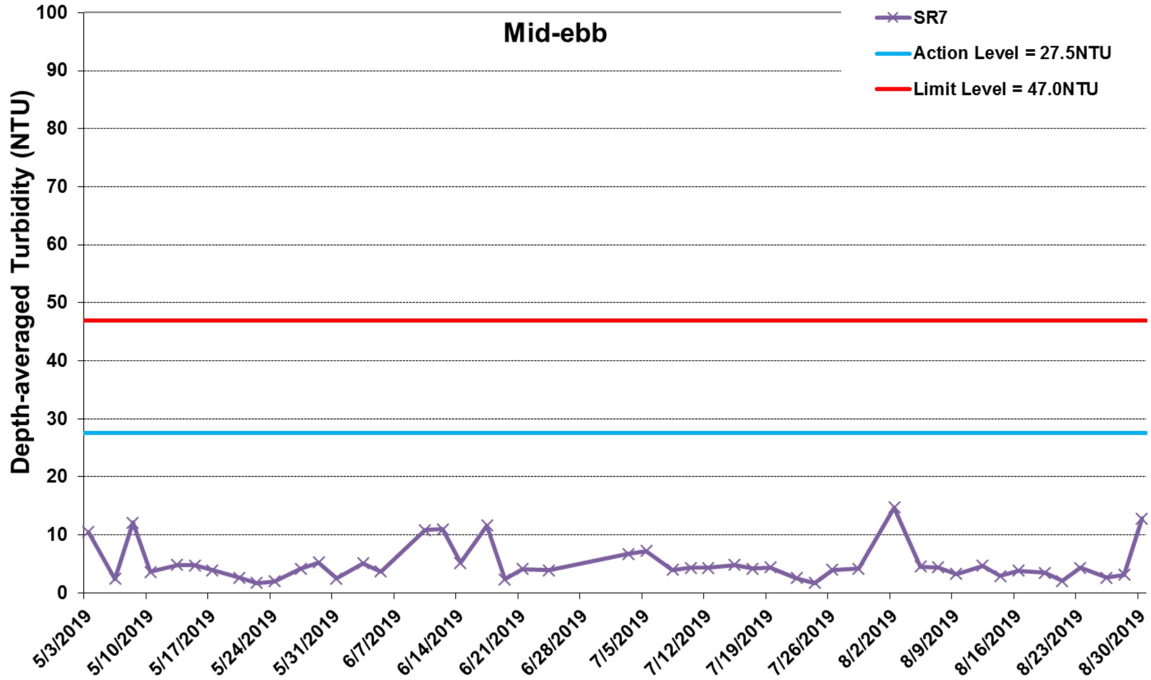


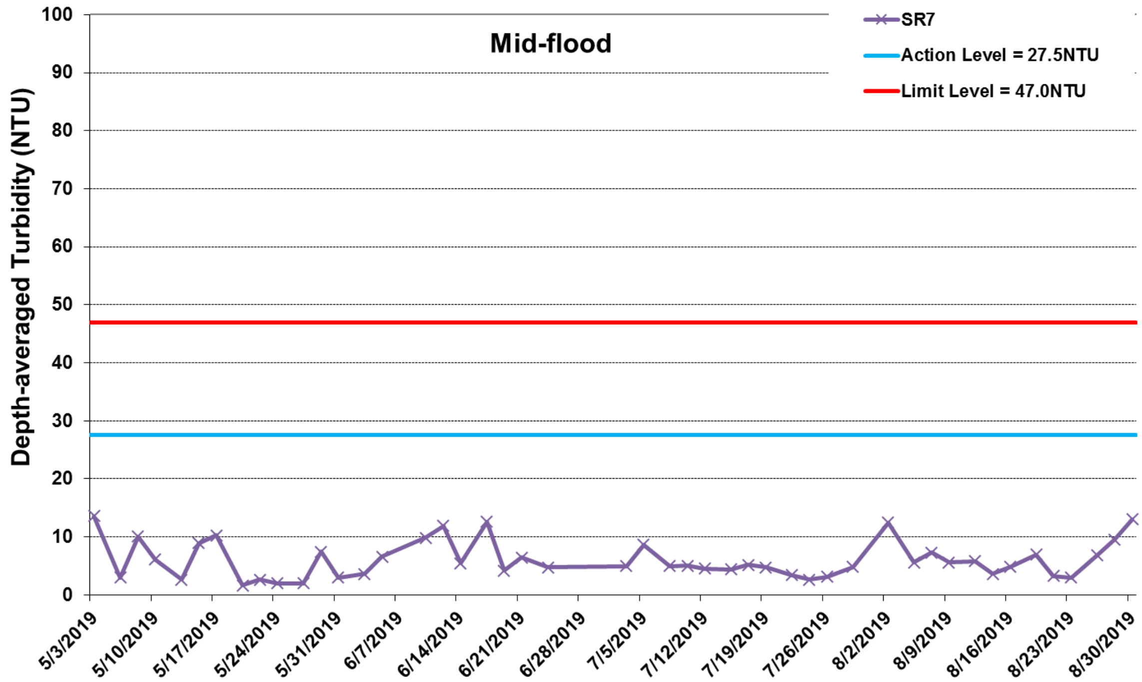
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Figure G25 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at IS(Mf)11. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



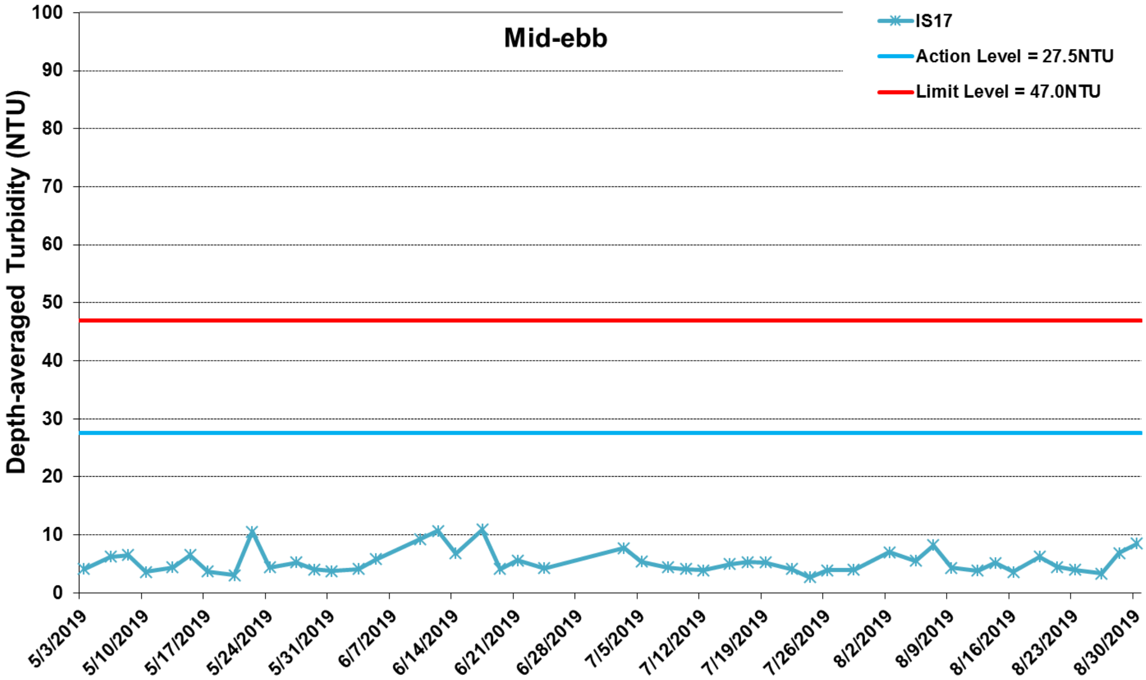


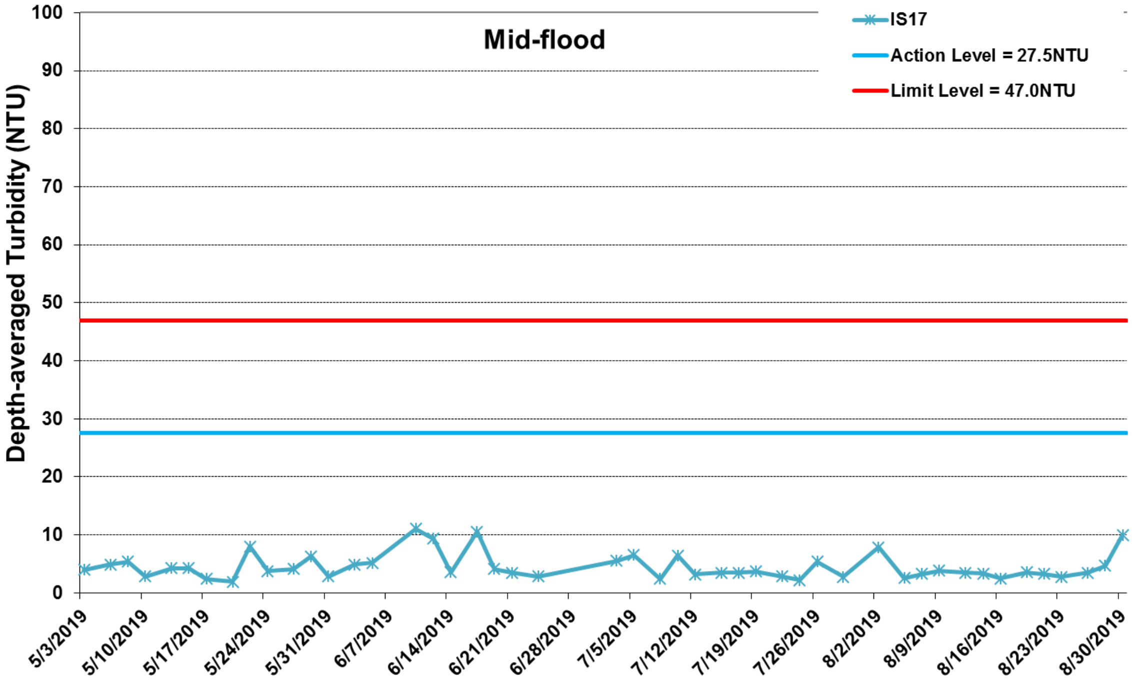
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Figure G26 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at SR7. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



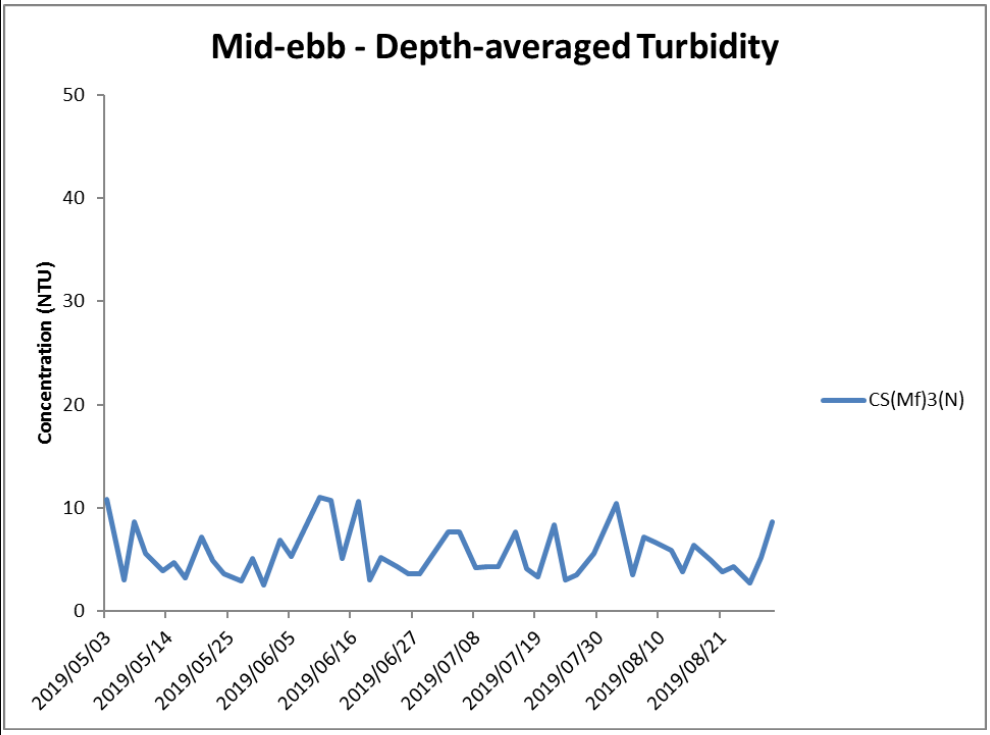


* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Figure G27 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at IS17. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



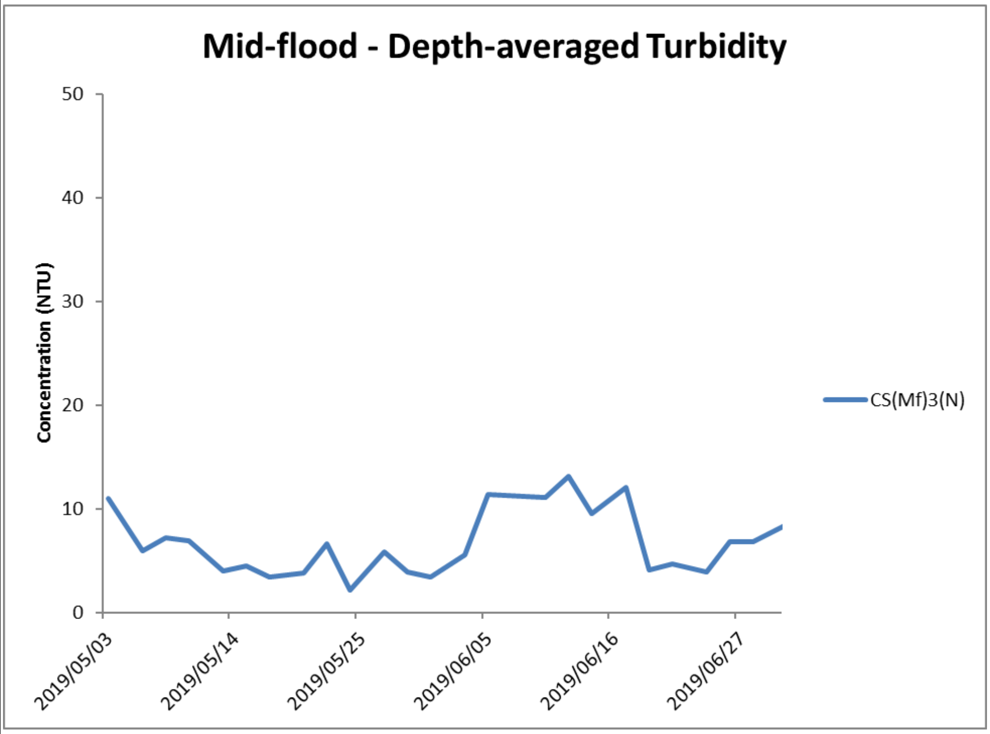
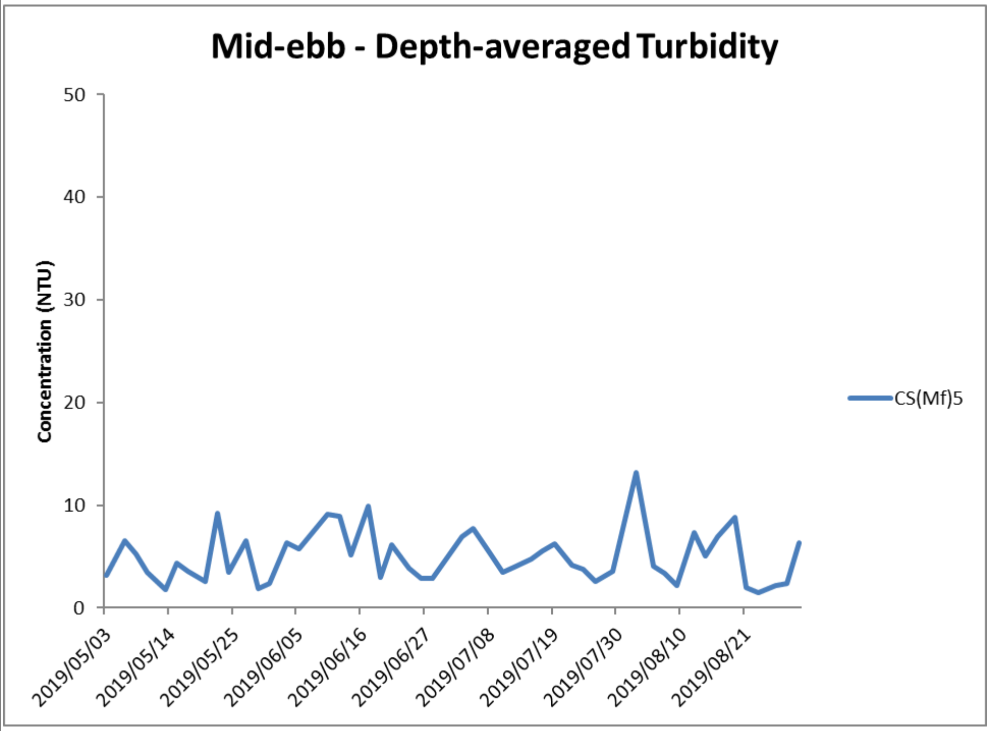


Figure G28 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at CS(Mf)3(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



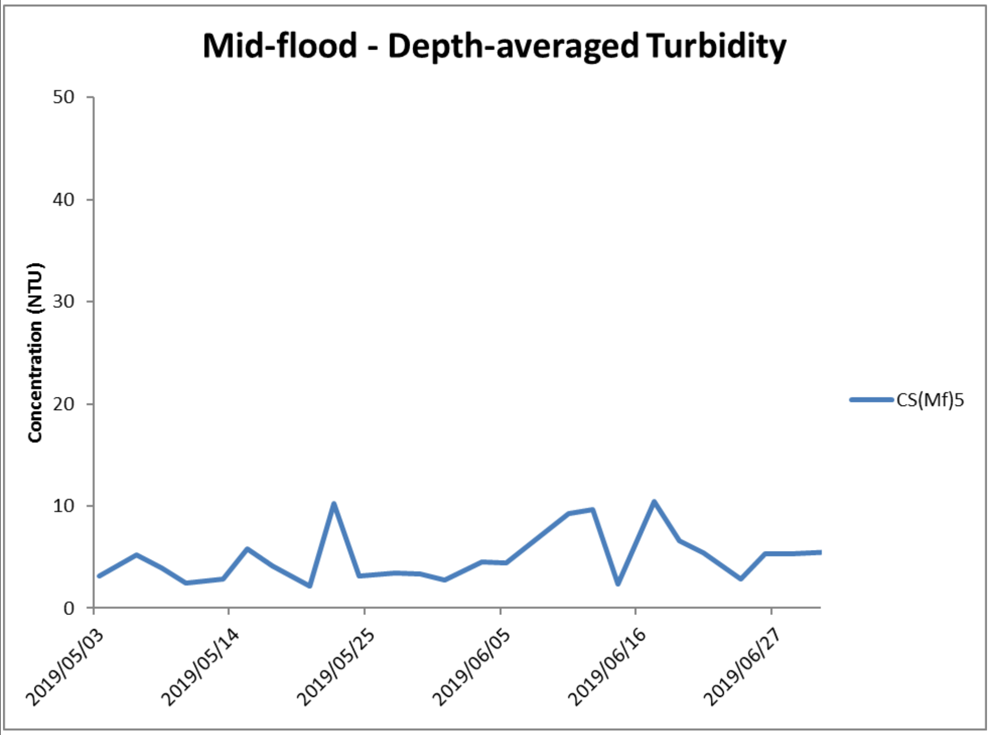
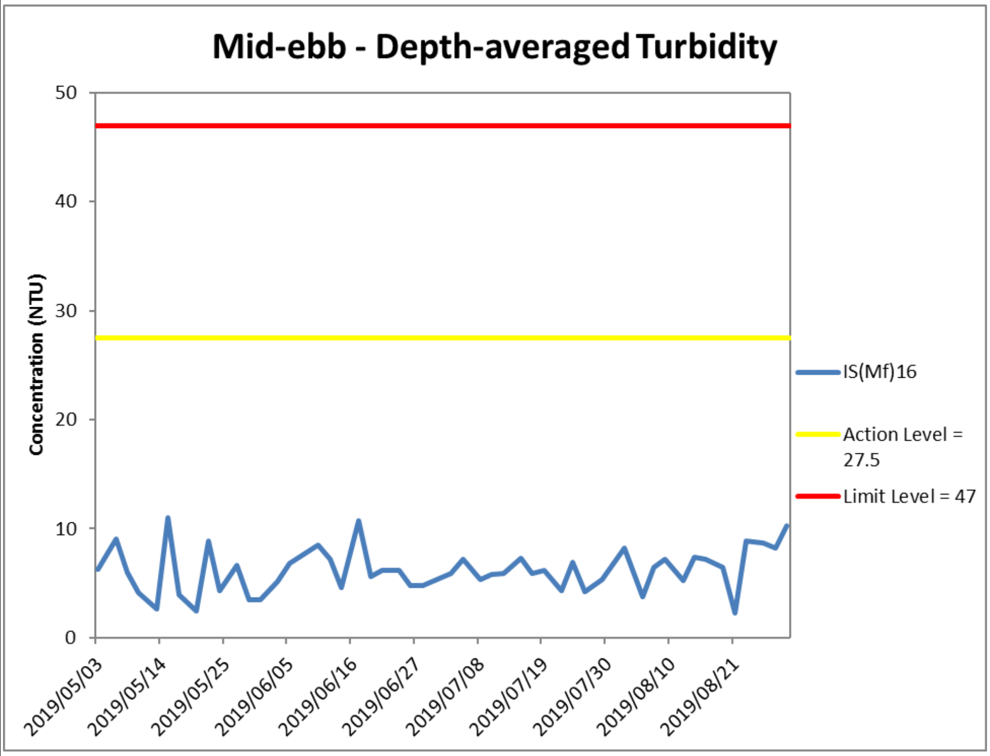


Figure G29 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at CS(Mf)5. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



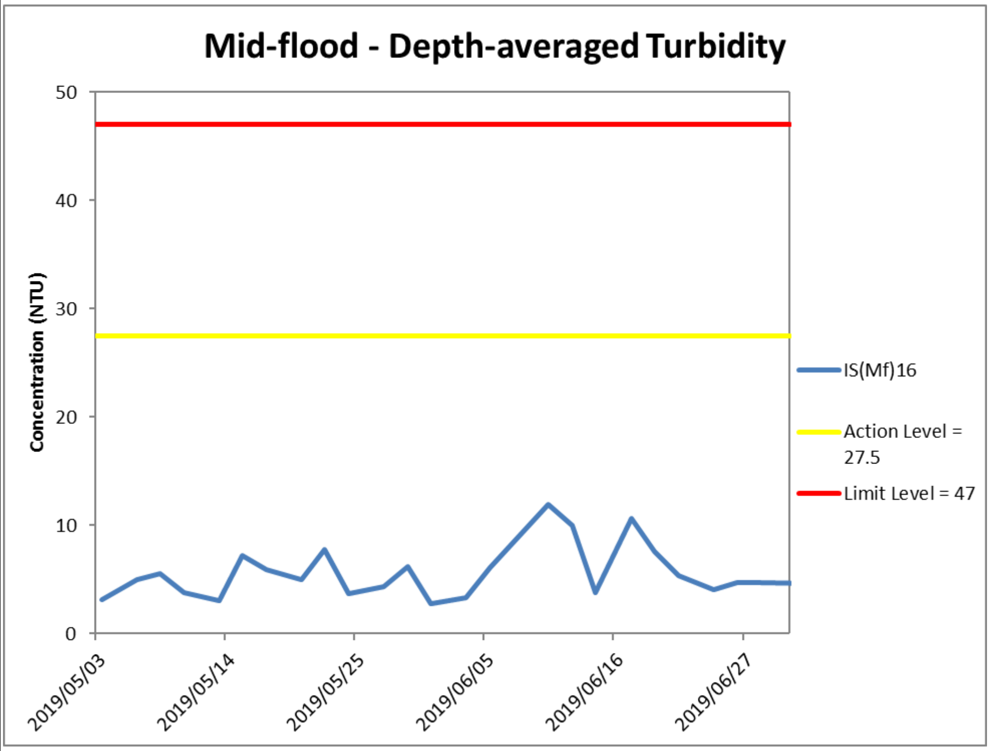
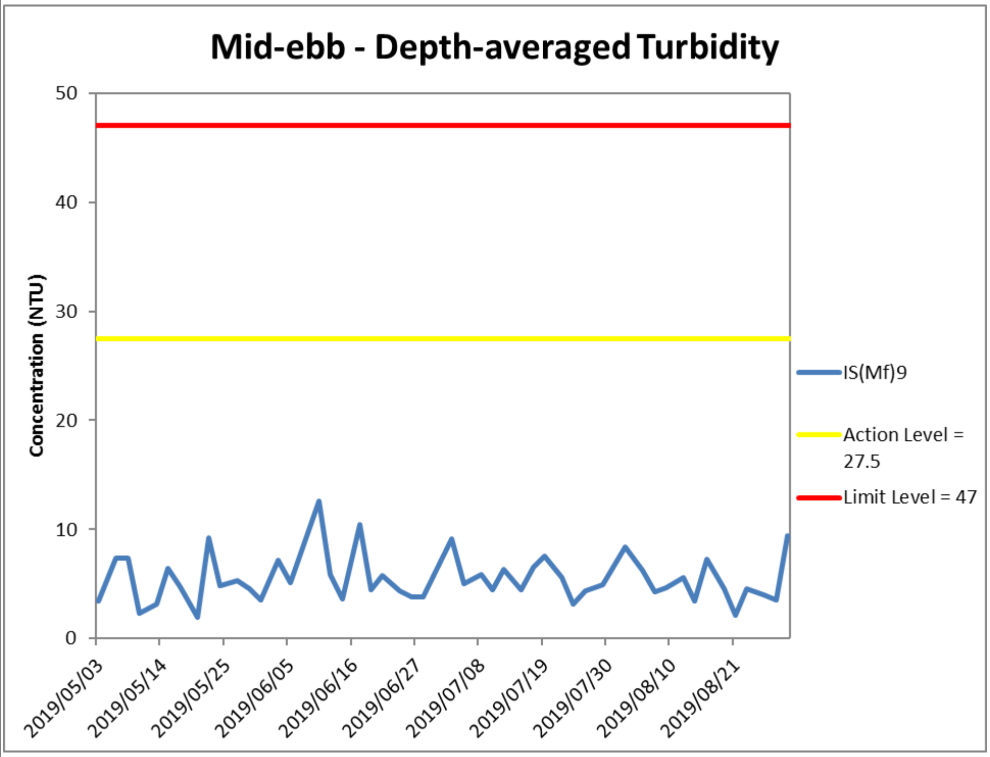


Figure G30 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at IS(Mf)16. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



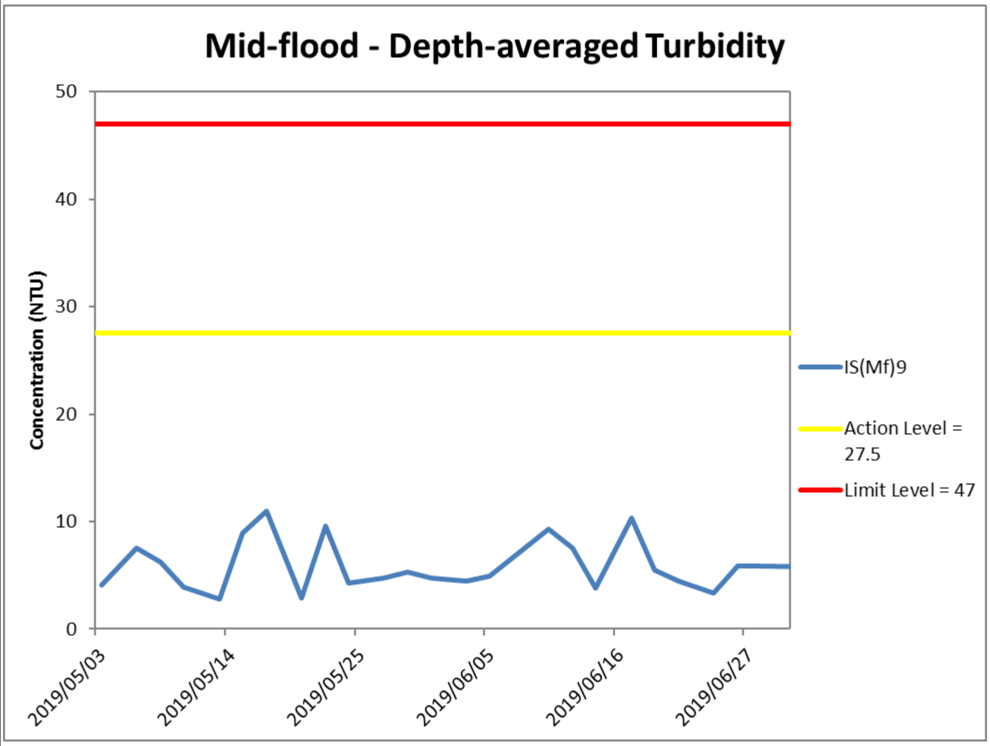
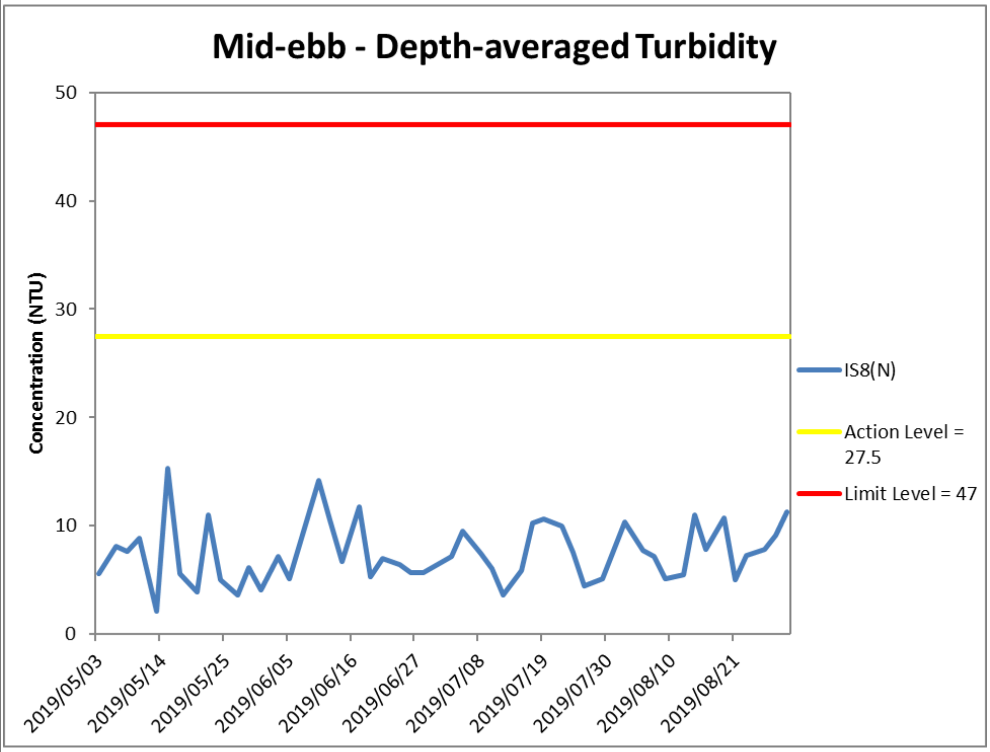


Figure G31 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at IS(Mf)9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



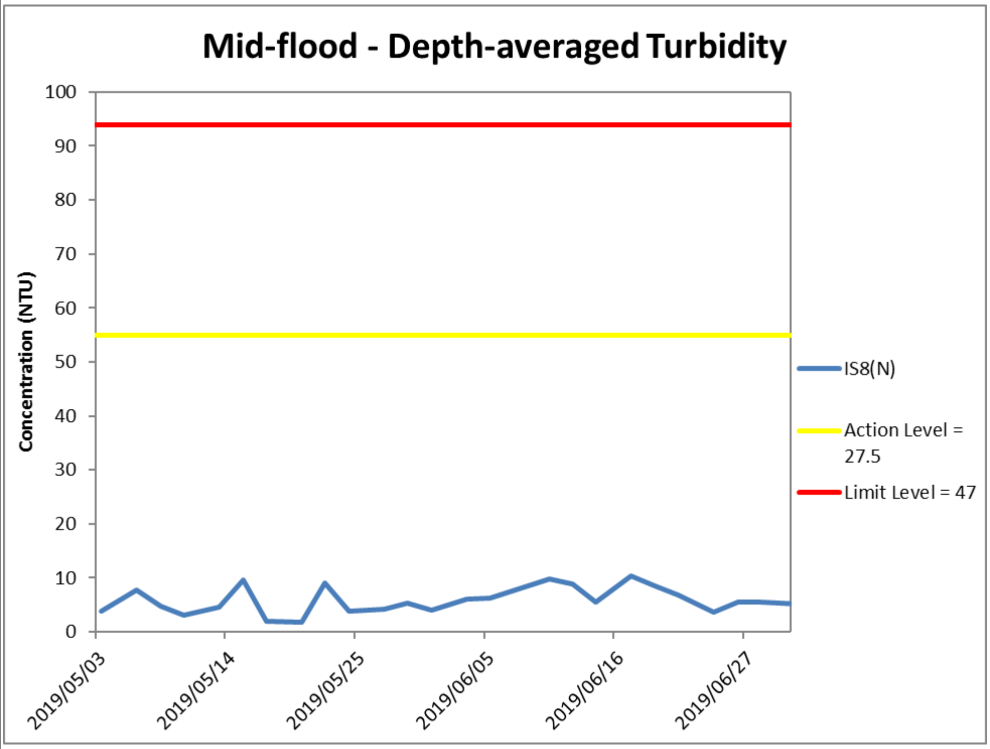
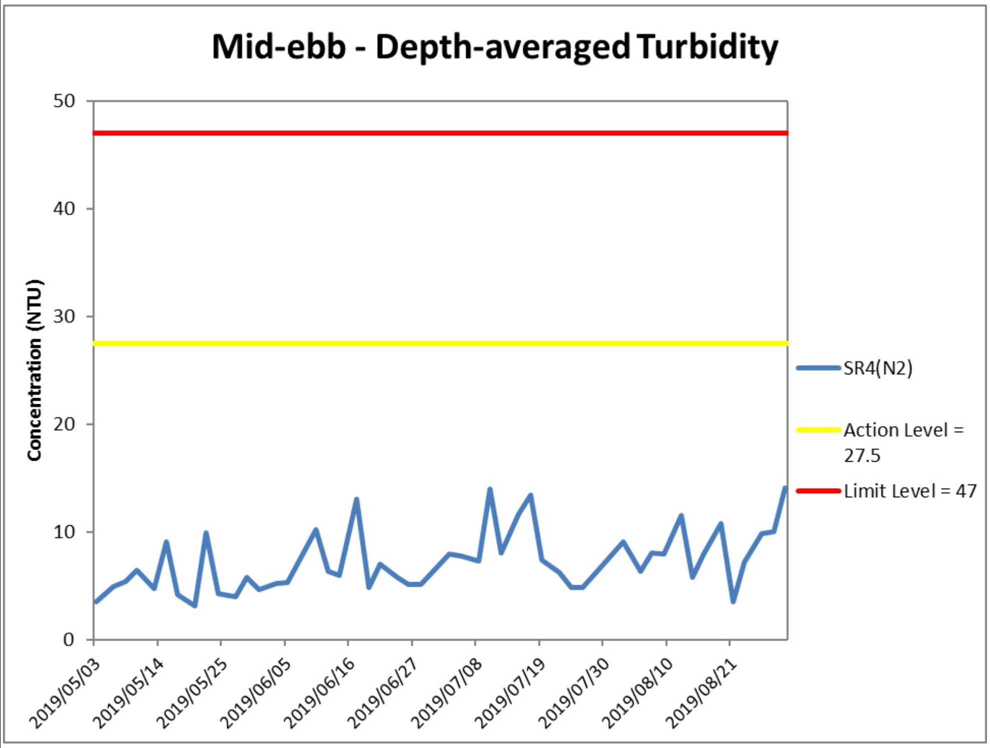


Figure G32 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at IS8(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



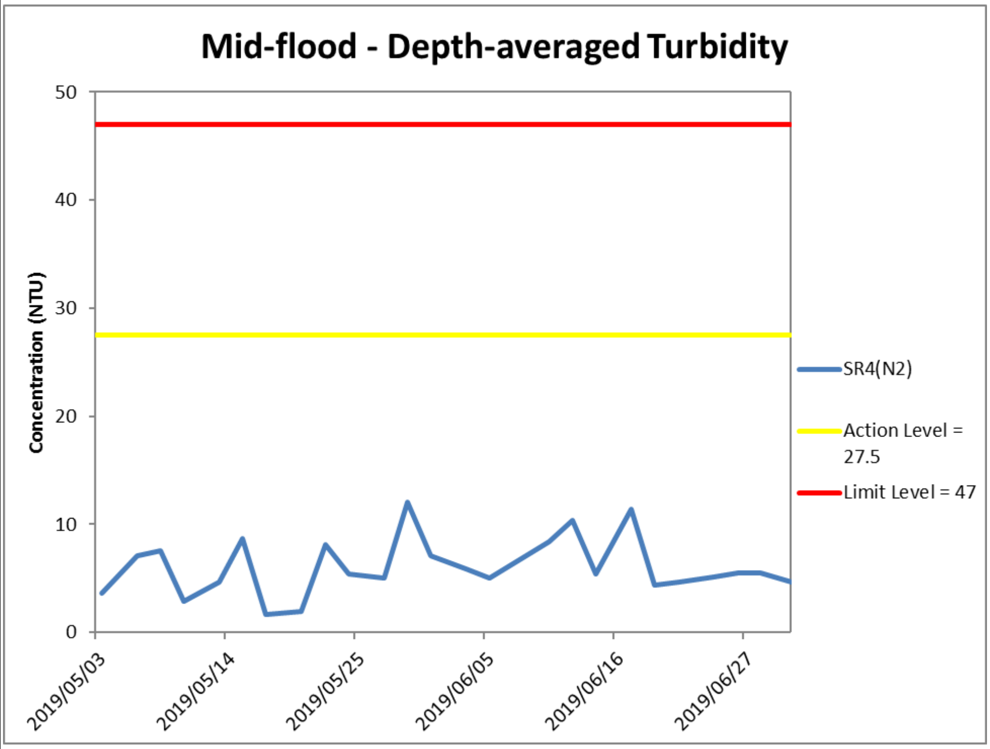
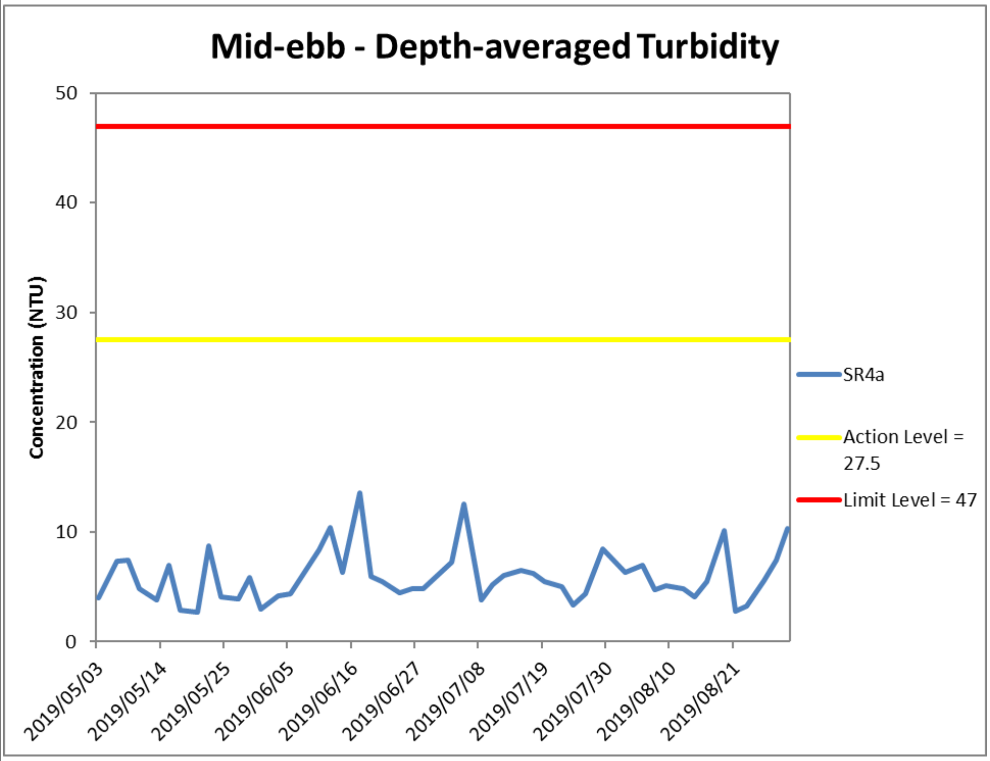


Figure G33 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at SR4(N2). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



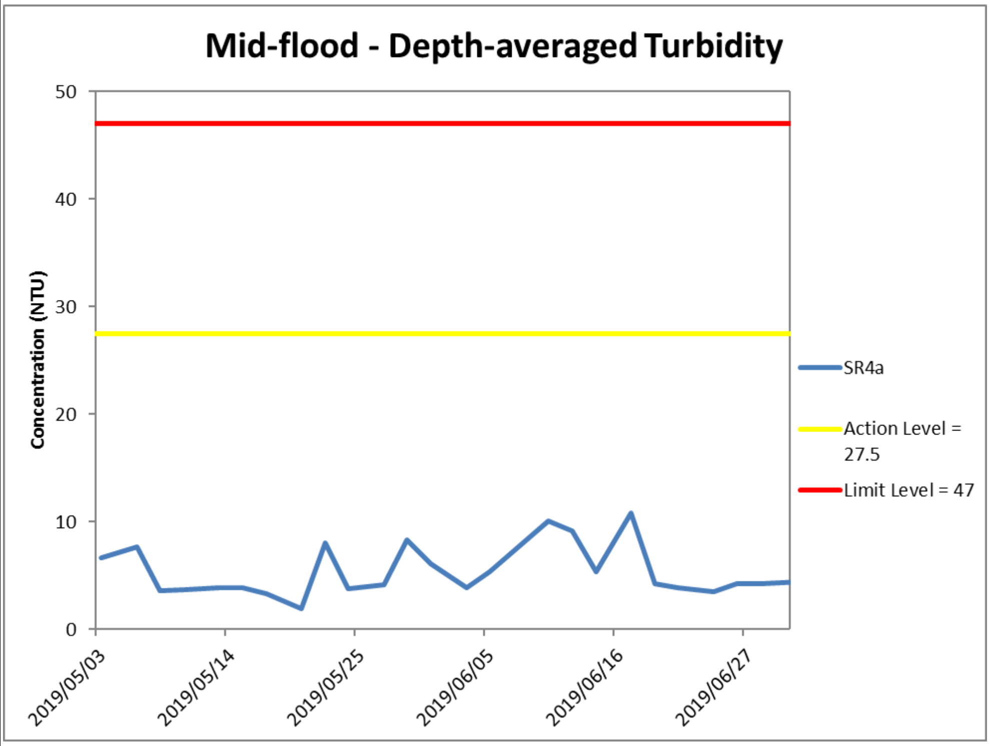
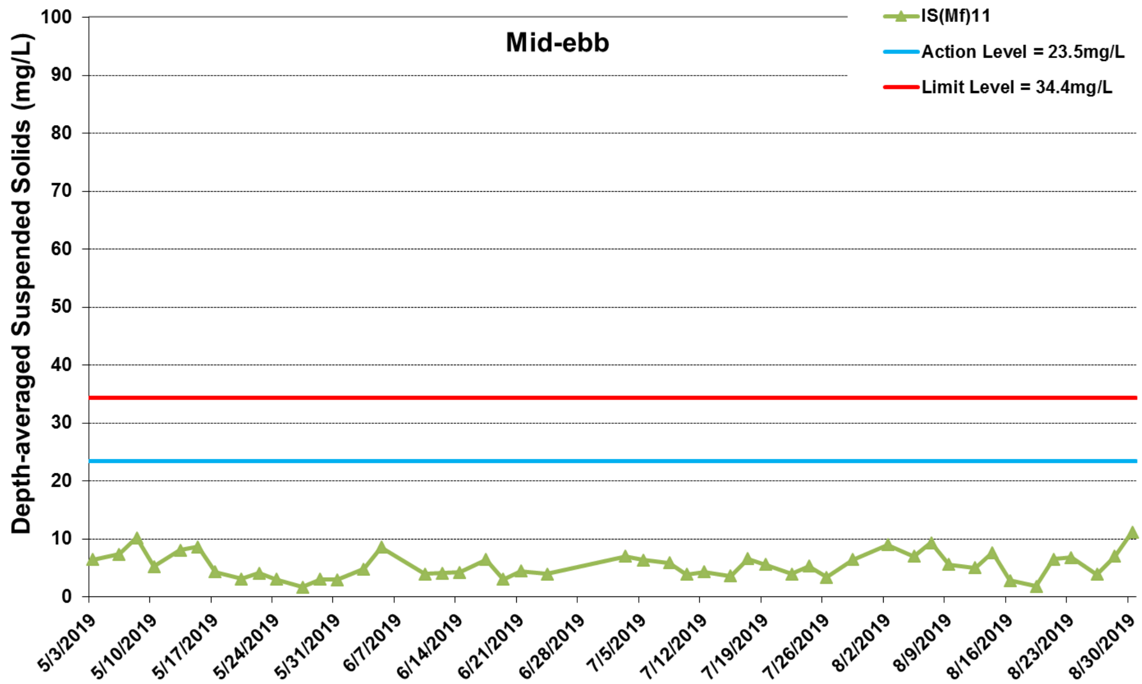
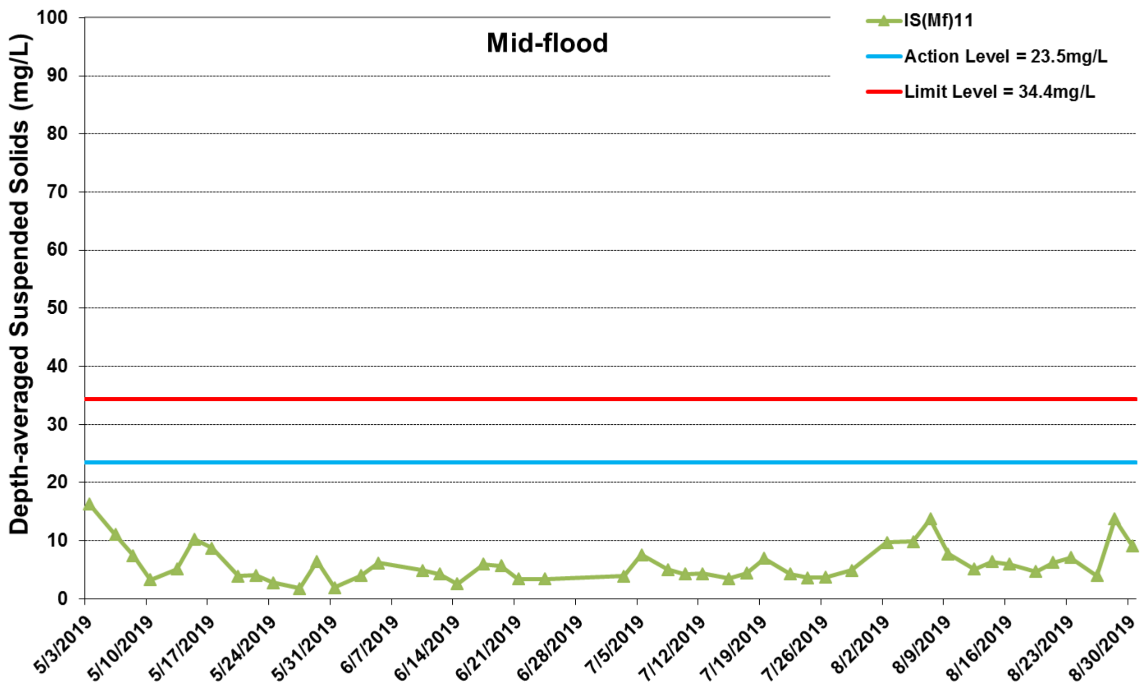


Figure G34 Impact Monitoring – Mean Depth-averaged Level of Turbidity (NTU) between 1 May 2019 and 31 August 2019 at SR4a. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



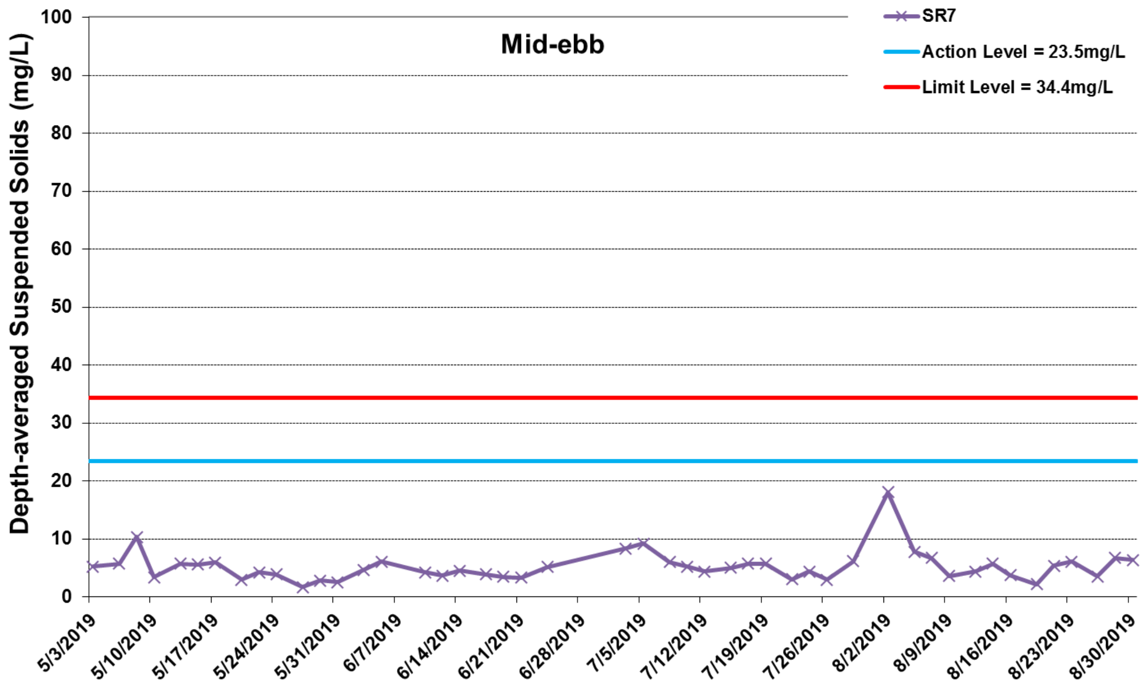


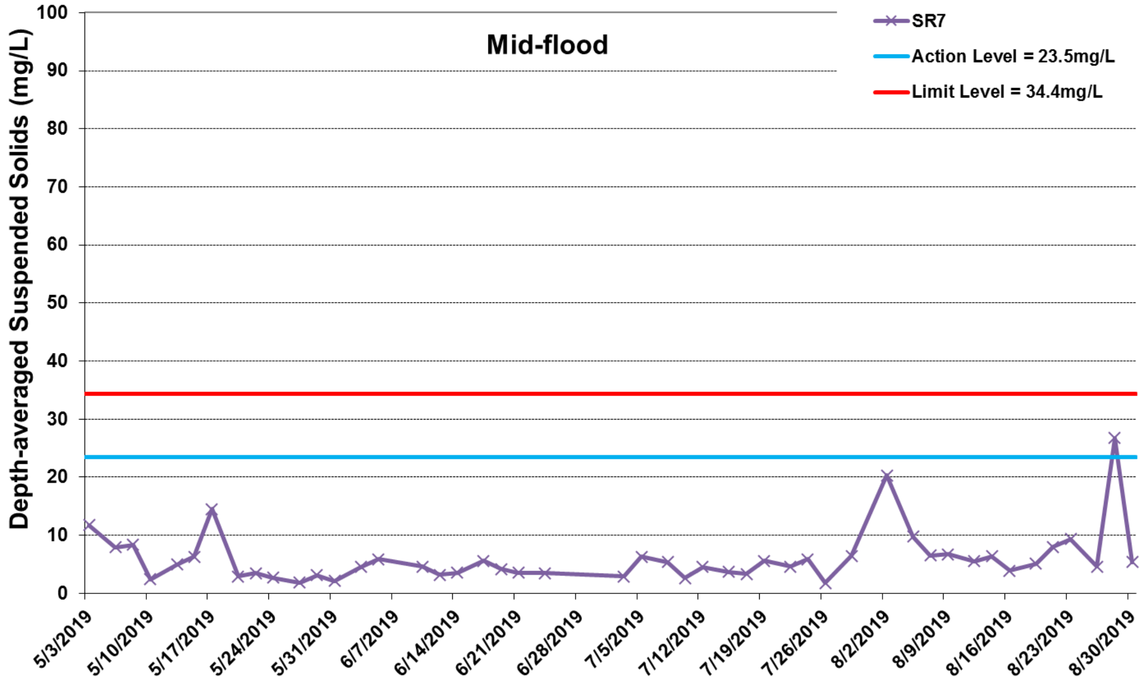
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Figure G35 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at IS(Mf)11. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



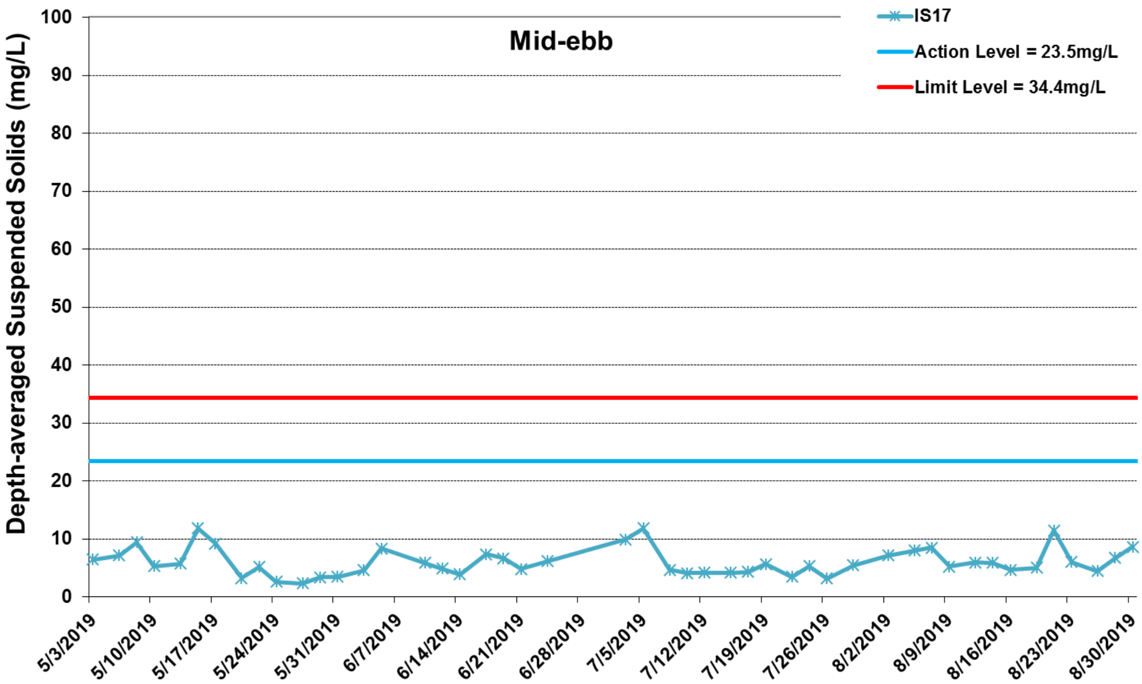


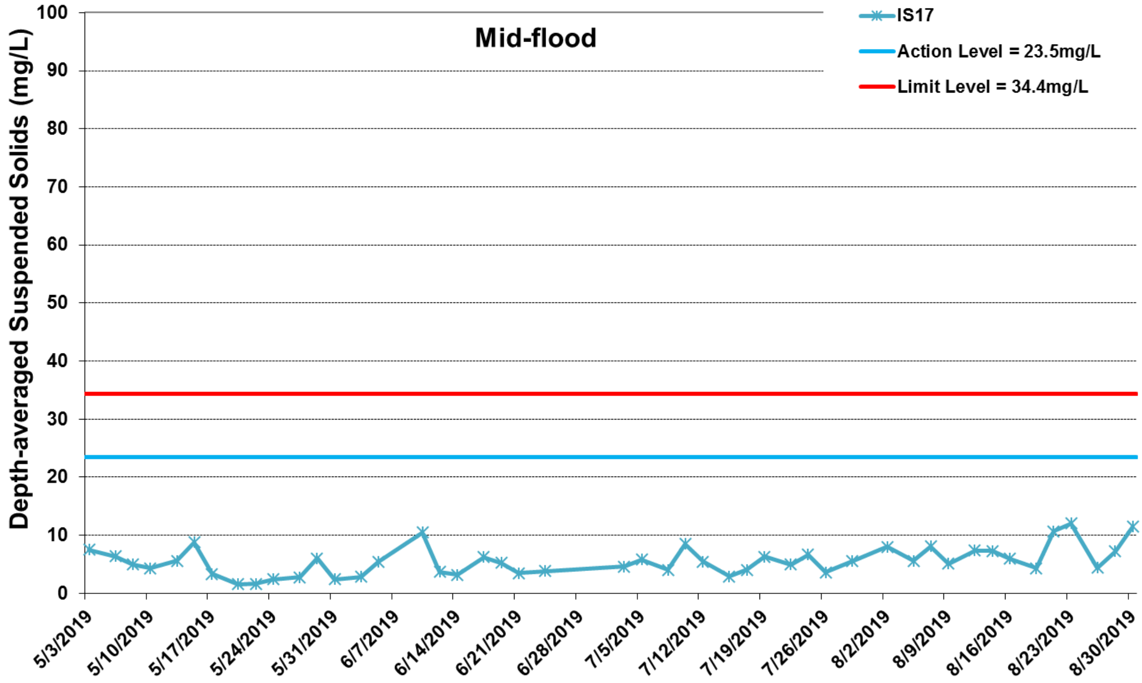
* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Figure G36 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at SR7. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



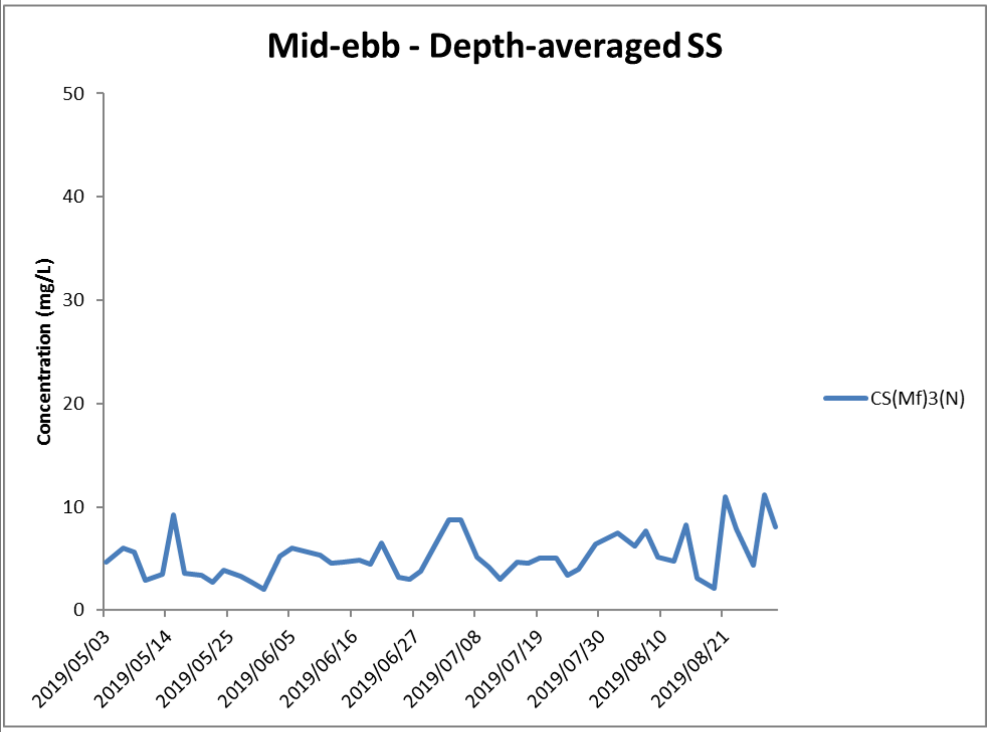


* The AL/LL for WQM stations, IS(Mf)11, IS17 and SR7, are adopted from HZMB HKBCF project.

Figure G37 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at IS17. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: *0212330_Impact-WQM_August2019_graphs_Rev a.xls*



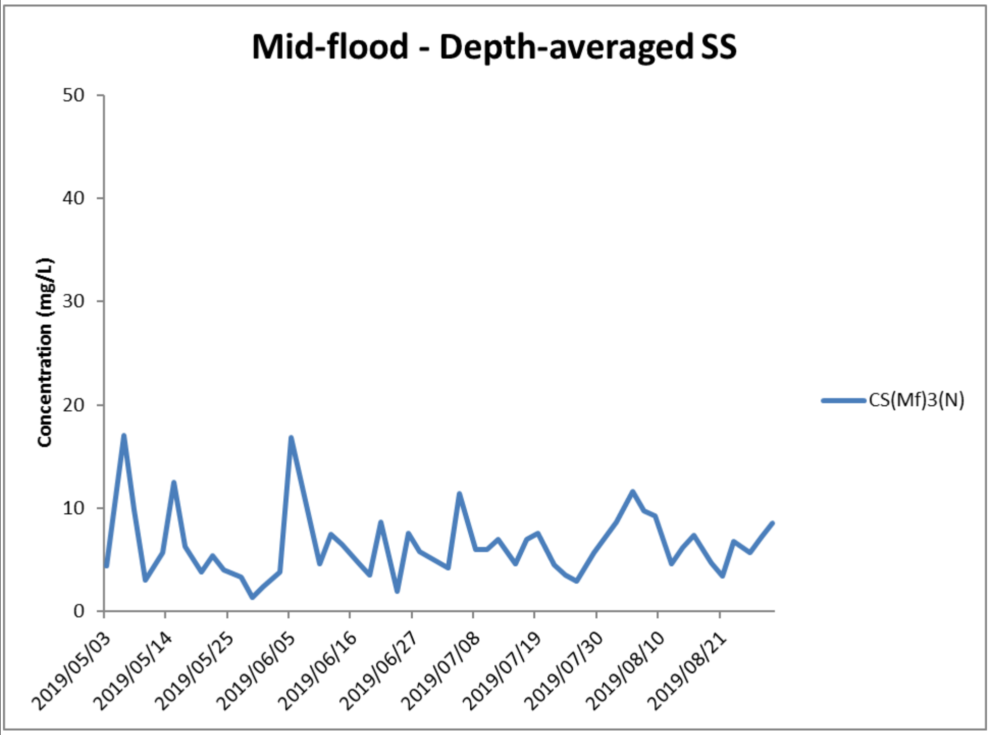
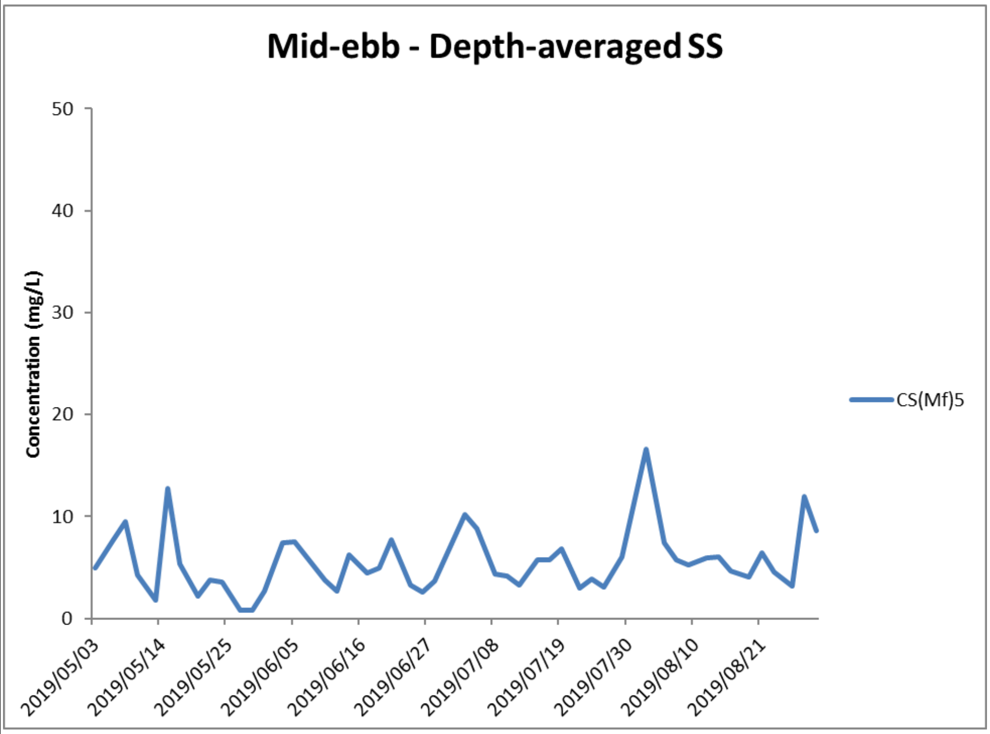


Figure G38 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at CS(Mf)3(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



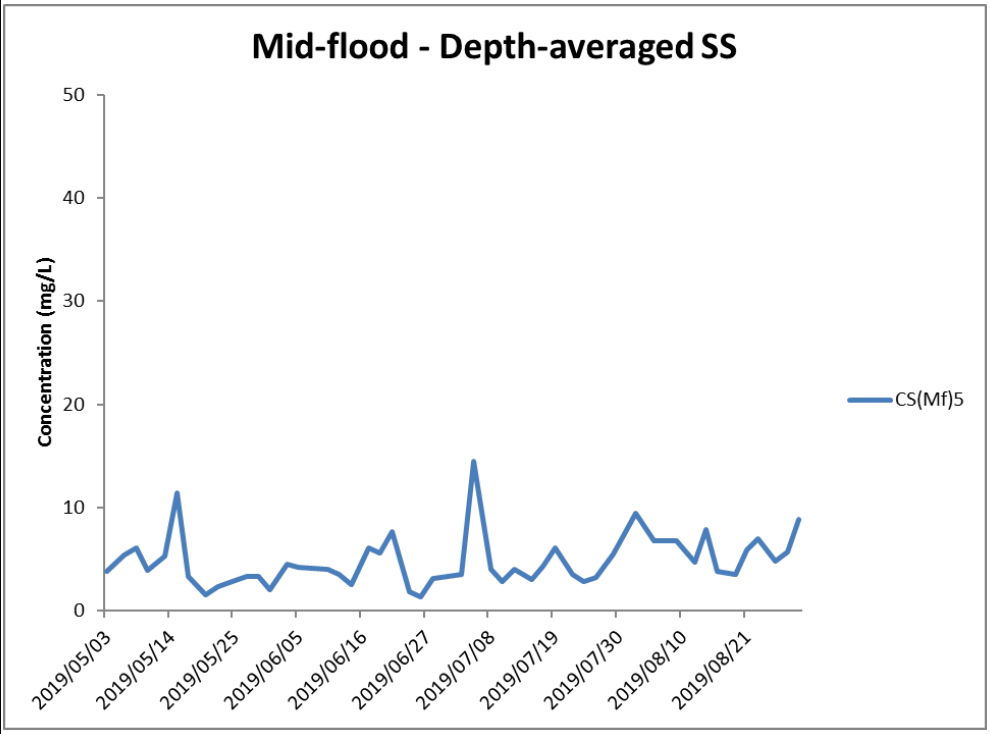
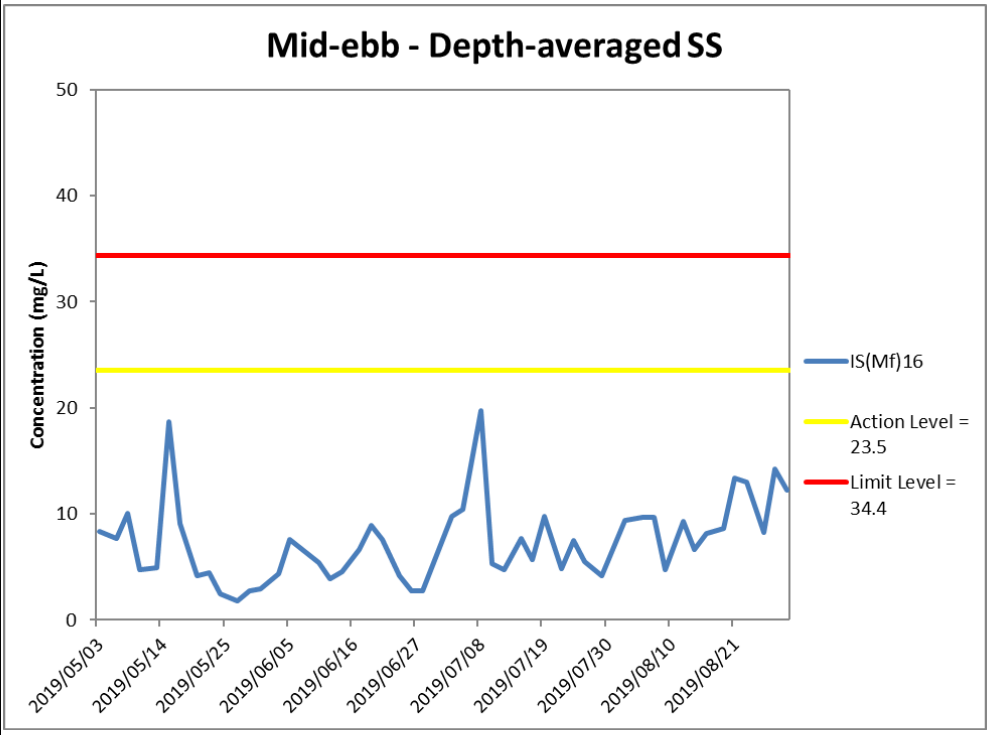


Figure G39 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at CS(Mf)5. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



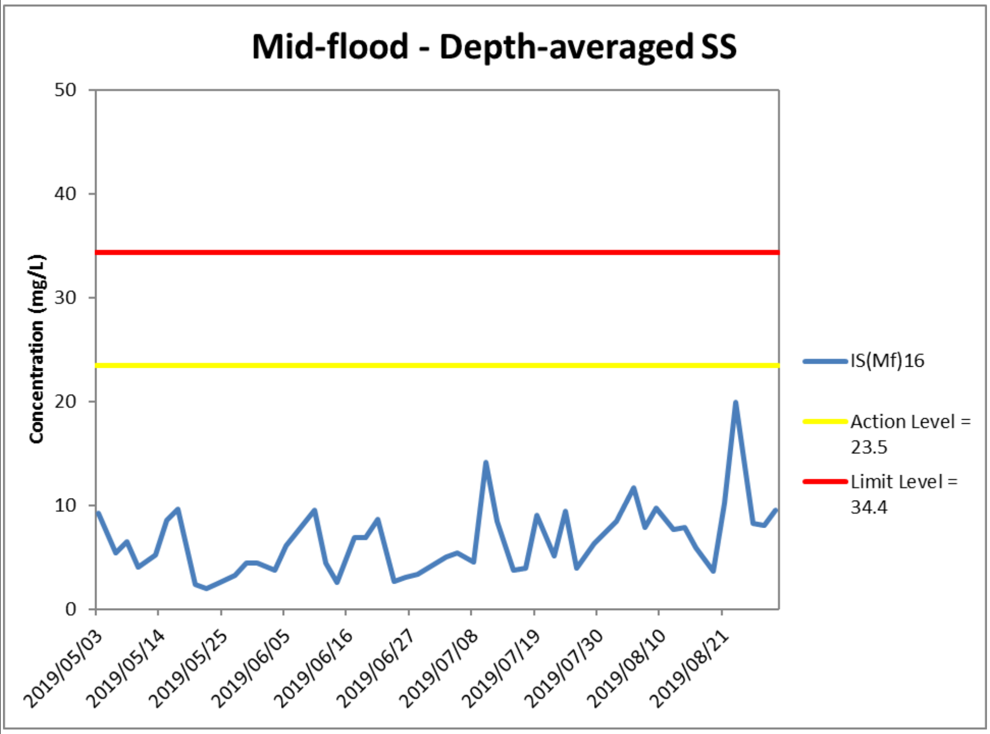
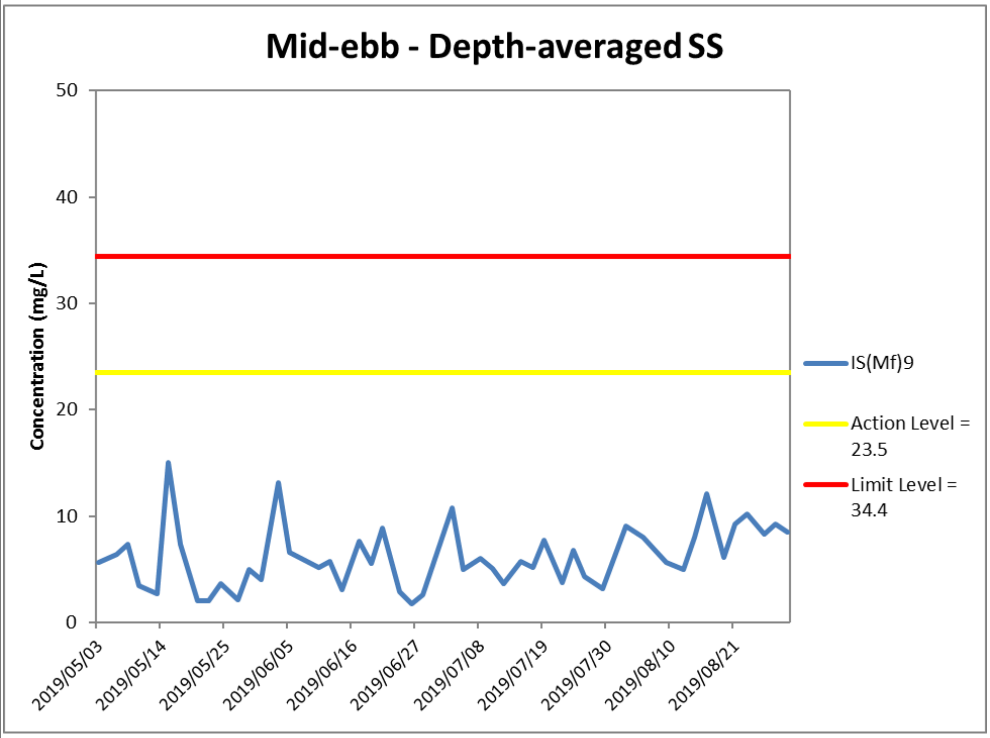


Figure G40 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at IS(Mf)16. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



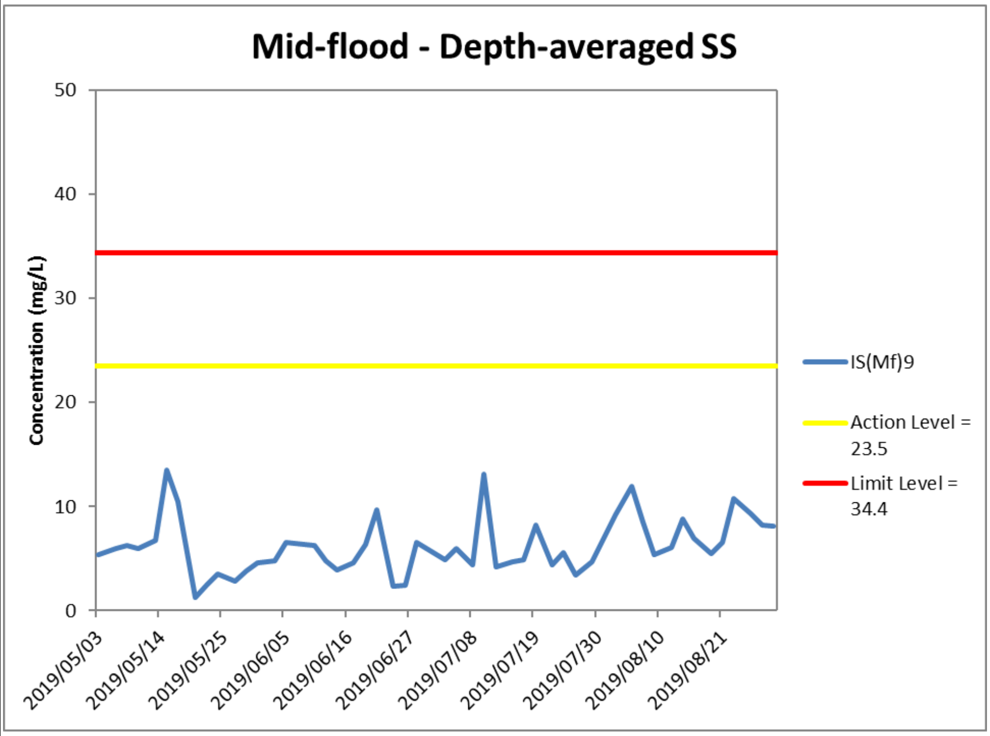
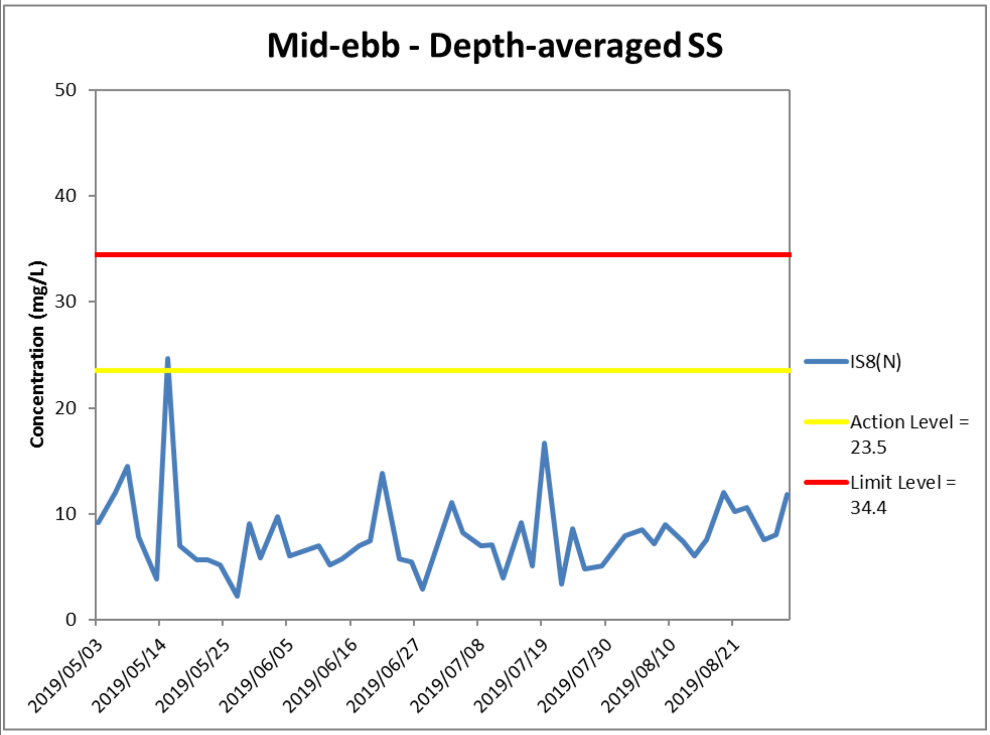


Figure G41 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at IS(Mf)9. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



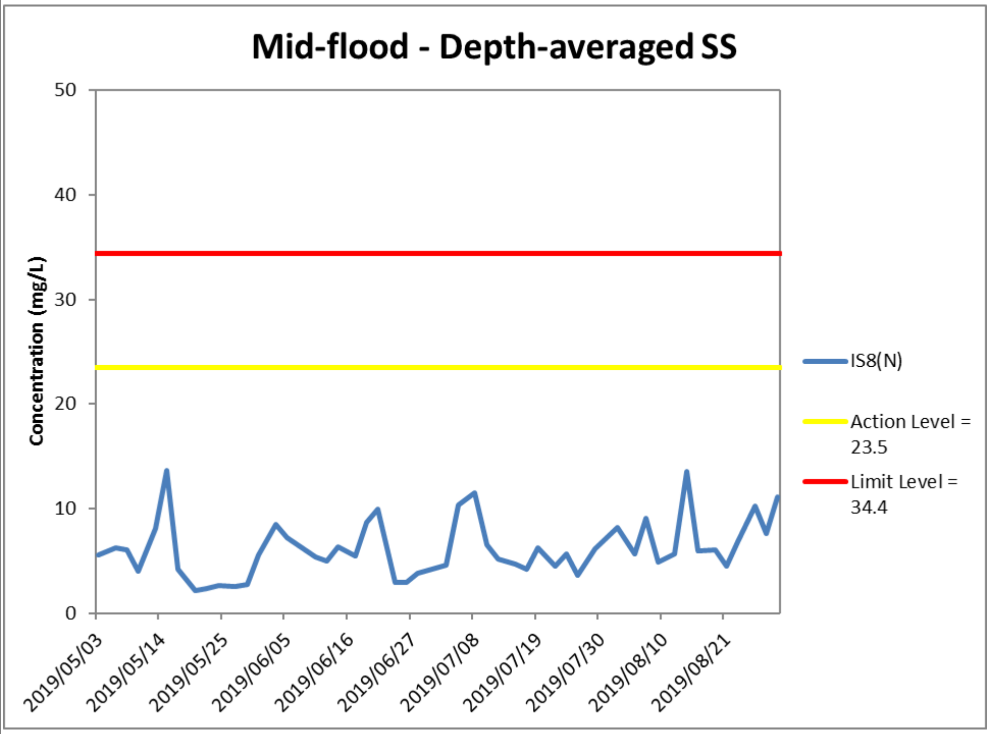
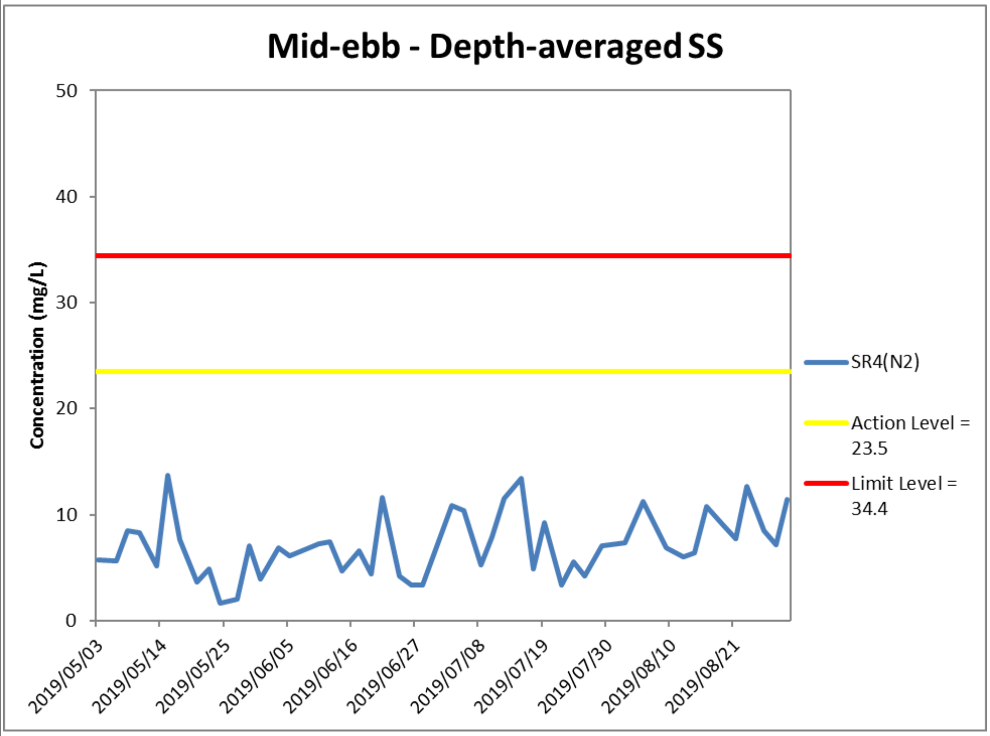


Figure G42 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at IS8(N). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



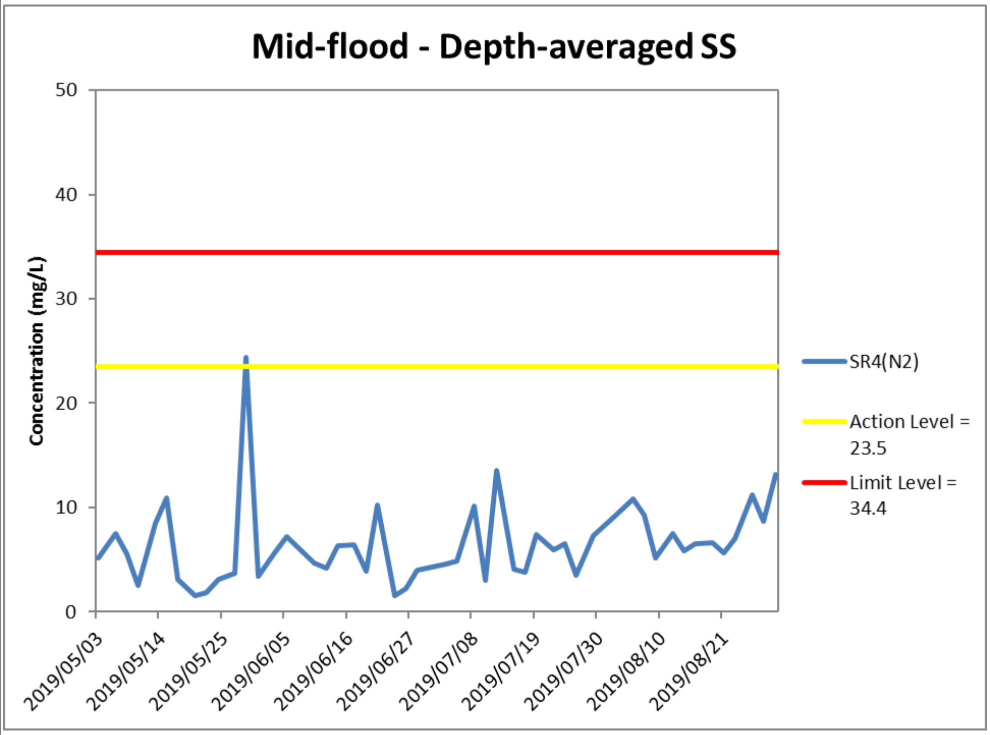
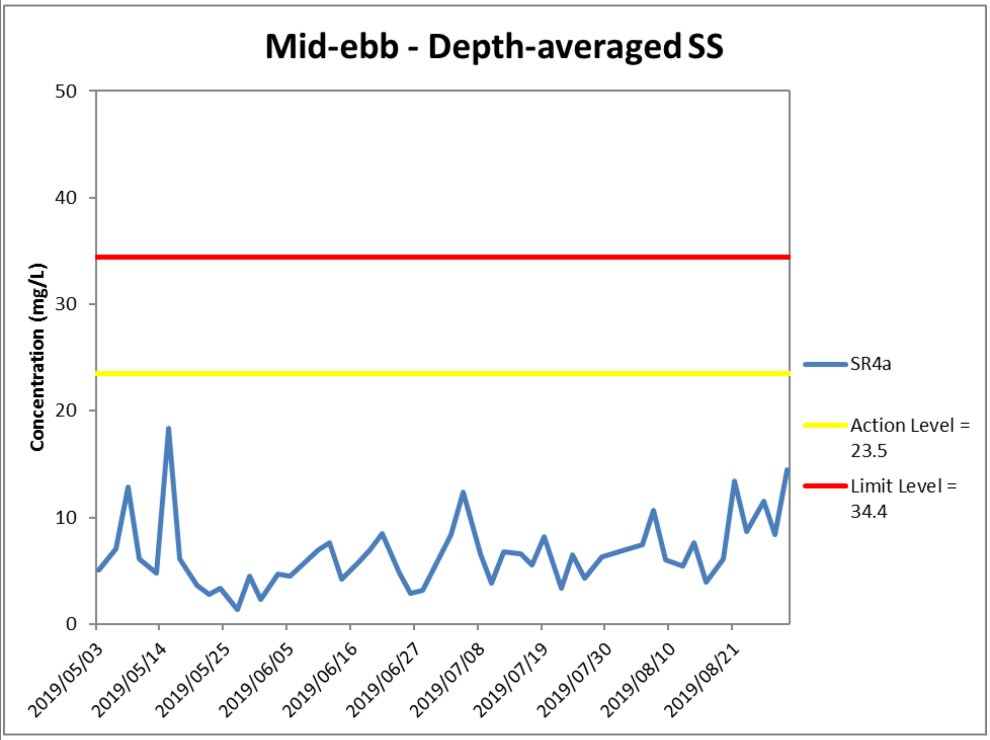


Figure G43 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at SR4(N2). The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls



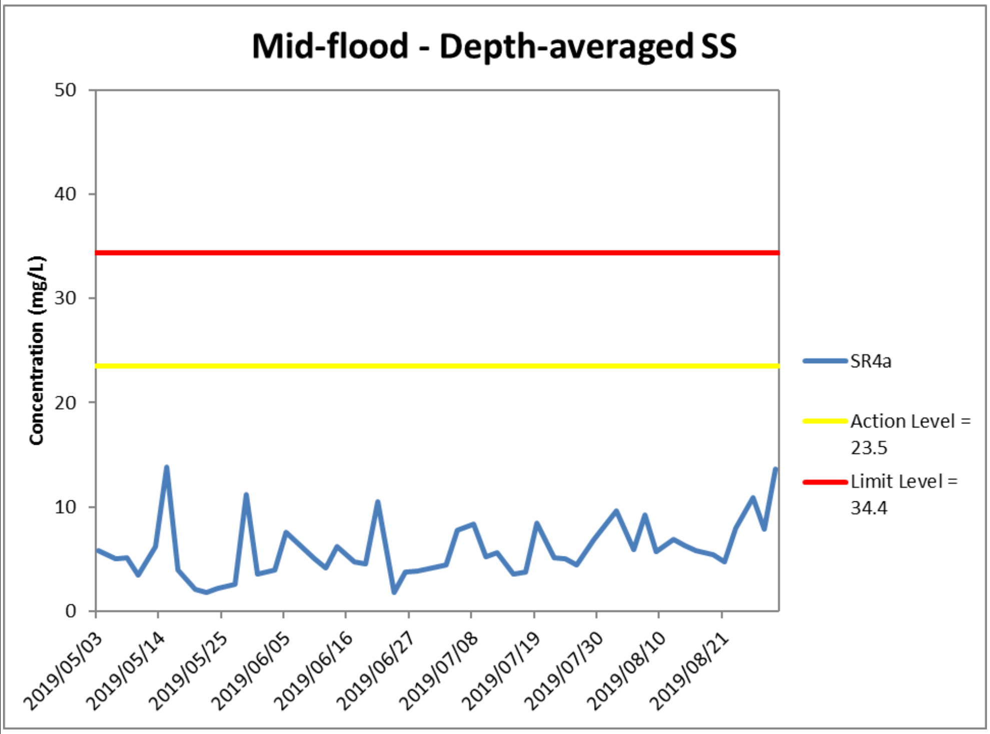


Figure G44 Impact Monitoring – Mean Depth-averaged Level of Suspended Solids (mg/L) between 1 May 2019 and 31 August 2019 at SR4a. The weather conditions during the monitoring period varied mostly from sunny to cloudy. Major marine works included: Jetty Removal at Portion S-C, Seawall Modification Works at Portion S-B (1/5/2019 – 31/8/2019).

ERM

Ref: 0212330_Impact-WQM_August2019_graphs_Rev a.xls

Appendix H

Impact Dolphin Monitoring Survey

Appendix H

Impact Dolphin Monitoring Survey

CONTRACT NO. HY/2012/08
Hong Kong-Zhuhai-Macao Bridge Tuen Mun – Chek Lap Kok Link (Northern Connection Sub-sea Tunnel Section) Dolphin Quarterly Monitoring

23rd Quarterly Progress Report (June-August 2019)
submitted to Dragages – Bouygues Joint Venture & ERM Hong Kong Ltd.

Submitted by
Samuel K.Y. Hung, Ph.D., Hong Kong Cetacean Research Project

6 December 2019

1. Introduction

1.1. As part of the Hong Kong-Zhuhai-Macao Bridge, the Tuen Mun-Chek Lap Kok Link (TM-CLKL) Northern Connection Sub-sea Tunnel Section (Contract no. HY/2012/08) comprises the sub-sea TBM tunnels (two tubes with cross passages) across the Urmston Road to connect Tuen Area 40 and Hong Kong Boundary Crossing Facilities (HKBCF) of approximately 4 km in length with dual 2-lane carriageway, the tunnels at both the southern landfall and the northern landfall for construction of approach roads to the sub-sea TBM tunnels of approximately 1.5 km in length, as well as the northern landfall reclamation of approximately 16.5 hectares and about 20.km long seawalls. Dragages – Bouygues Joint Venture (hereinafter called the "Contractor") was awarded as the main contractor for the Northern Connection Sub-sea Tunnel Section, and ERM Hong Kong Limited would serve as the Environmental Team to implement the Environmental Monitoring and Audit (EM&A) programme.

1.2. According to the updated EM&A Manual (for TM-CLKL), monthly line-transect vessel surveys for Chinese White Dolphin should be conducted to cover the Northwest (NWL) and Northeast Lantau (NEL) survey areas as in AFCD annual marine mammal monitoring programme. However, as such surveys have been undertaken by the HKLR03 and HKBCF projects in the same areas (i.e. NWL and NEL), a combined monitoring approach is recommended by the Highways Department, that the TM-CLKL EM&A project can utilize the monitoring data collected by HKLR03 or HKBCF project to avoid any redundancy in monitoring effort. Such exemption for the dolphin monitoring will end upon the completion of the dolphin monitoring carried out by HKLR03 contract.

1.3. In November 2013, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by ERM Hong Kong Limited as the dolphin specialist for the TM-CLKL Northern Connection Sub-sea Tunnel Section EM&A project. He is responsible for the dolphin monitoring study, including the data collection on Chinese White Dolphins during the construction phase (i.e. impact period) of the TM-CLKL project in Northwest Lantau (NWL) and Northeast Lantau (NEL) survey areas.

1.4. During the construction period of HKLR, the dolphin specialist would be in charge of reviewing and collating information collected by HKLR03 dolphin monitoring programme to examine any potential impacts of TM-CLKL construction works on the dolphins.

1.5. From the monitoring results, any changes in dolphin occurrence within the study area will be examined for possible causes, and appropriate actions and additional mitigation measures will be recommended as necessary.

1.6. This report is the 23rd quarterly progress report under the TM-CLKL construction phase dolphin monitoring programme submitted to the Contractor, summarizing the results of the surveys findings during the period of June to August 2019, utilizing the survey data collected by HKLR03 impact phase monitoring project.

2. Monitoring Methodology

2.1. Vessel-based Line-transect Survey

2.1.1. According to the requirement of the updated EM&A manual, dolphin monitoring programme should cover all transect lines in NEL and NWL survey areas (see Figure 1) twice per month throughout the entire construction period. The co-ordinates of all transect lines are shown in Table 1.

Table 1 Co-ordinates of transect lines conducted by HKLR03 project

Line No.		Easting	Northing		Line No.		Easting	Northing
1	Start Point	804671	815456		13	Start Point	816506	819480
1	End Point	804671	831404		13	End Point	816506	824859
2	Start Point	805476	820800		14	Start Point	817537	820220
2	End Point	805476	826654		14	End Point	817537	824613
3	Start Point	806464	821150		15	Start Point	818568	820735
3	End Point	806464	822911		15	End Point	818568	824433
4	Start Point	807518	821500		16	Start Point	819532	821420
4	End Point	807518	829230		16	End Point	819532	824209
5	Start Point	808504	821850		17	Start Point	820451	822125
5	End Point	808504	828602		17	End Point	820451	823671
6	Start Point	809490	822150		18	Start Point	821504	822371
6	End Point	809490	825352		18	End Point	821504	823761
7	Start Point	810499	822000		19	Start Point	822513	823268
7	End Point	810499	824613		19	End Point	822513	824321

8	Start Point	811508	821123		20	Start Point	823477	823402
8	End Point	811508	824254		20	End Point	823477	824613
9	Start Point	812516	821303		21	Start Point	805476	827081
9	End Point	812516	824254		21	End Point	805476	830562
10	Start Point	813525	821176		22	Start Point	806464	824033
10	End Point	813525	824657		22	End Point	806464	829598
11	Start Point	814556	818853		23	Start Point	814559	821739
11	End Point	814556	820992		23	End Point	814559	824768
12	Start Point	815542	818807		24	Start Point	805476	815900
12	End Point	815542	824882		24	End Point	805476	819100

2.1.2. The HKLR03 survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 22 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2018). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270^{o} and 90^{o} (in relation to the bow, which is defined as 0^{o}). One to two additional experienced observers were available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

2.1.4. During on-effort survey periods, the survey team recorded effort data including time, positions (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (*Garmin eTrex Legend*).

2.1.5. Data including time, position and vessel speed were also automatically and continuously logged by handheld GPS throughout the entire survey for subsequent review.

2.1.6. When dolphins were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin group to the transect line was later calculated from the initial sighting distance and angle.

2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as "primary" survey effort, while the survey effort conducted along the connecting lines between parallel lines was labeled as "secondary" survey effort. According to HKCRP long-term dolphin monitoring data, encounter rates of Chinese white dolphins deduced from effort and sighting data collected along primary and secondary lines were similar in NEL and NWL survey areas. Therefore, both primary and secondary survey effort were presented as on-effort survey effort in this report.

2.2. Photo-identification Work

2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the HKLR03 survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.

2.2.2. A professional digital camera (*Canon* EOS 7D model), equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.

2.2.3. All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995.

2.2.4. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features (Jefferson 2000).

2.2.5. All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database.

2.3. Data Analysis

2.3.1. Distribution Analysis – The line-transect survey data was integrated with the Geographic Information System (GIS) in order to visualize and interpret different spatial and temporal patterns of dolphin distribution using sighting positions. Location data of dolphin groups were plotted on map layers of Hong Kong using a desktop GIS (ArcView© 3.1) to examine their distribution patterns in details. The dataset was also stratified into different subsets to examine distribution patterns of dolphin groups with different categories of group sizes, young calves and activities.

2.3.2. Encounter rate analysis – Encounter rates of Chinese white dolphins (number of on-effort sightings per 100 km of survey effort, and total number of dolphins sighted on-effort per 100 km of survey effort) were calculated in NEL and NWL survey areas in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collect under Beaufort 3 or below condition would be used for the encounter rate analyses. Dolphin encounter rates were calculated in two ways for comparisons with the HZMB baseline monitoring results as well as to AFCD long-term marine mammal monitoring results.

Firstly, for the comparison with the HZMB baseline monitoring results, the encounter rates were calculated using primary survey effort alone. The average encounter rate of sightings (STG) and average encounter rate of dolphins (ANI) were deduced based on the encounter rates from six events during the present quarter (i.e. six sets of line-transect surveys in North Lantau), which was also compared with the one deduced from the six events during the baseline period (i.e. six sets of line-transect surveys in North Lantau).

Secondly, the encounter rates were calculated using both primary and secondary survey effort collected under Beaufort 3 or below condition as in AFCD long-term monitoring study. The encounter rate of sightings and dolphins were deduced by dividing the total number of on-effort sightings (STG) and total number of dolphins (ANI) by the amount of survey effort for the present quarterly period.

2.3.3. Quantitative grid analysis on habitat use – To conduct quantitative grid analysis of habitat use, positions of on-effort sightings of Chinese White Dolphins collected during the quarterly impact phase monitoring period were plotted onto 1-km^2 grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km^2) and dolphin densities (total number of dolphins from on-effort sightings per km^2) were then calculated for each 1 km by 1 km grid with the aid of GIS.

Sighting density grids and dolphin density grids were then further normalized with the amount of survey effort conducted within each grid. The total amount of survey effort spent on each grid was calculated by examining the survey coverage on each line-transect survey to determine how many times the grid was surveyed during the study period. For example, when the survey boat traversed through a specific grid 50 times, 50 units of survey effort were counted for that grid. With the amount of survey effort calculated for each grid, the sighting density and dolphin density of each grid were then normalized (i.e. divided by the unit of survey effort).

The newly-derived unit for sighting density was termed SPSE, representing the number of on-effort **s**ightings **p**er 100 units of **s**urvey **e**ffort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of **d**olphins **p**er 100 units of **s**urvey **e**ffort. Among the 1-km^2 grids that were partially covered by land, the percentage of sea area was calculated using GIS tools, and their SPSE and DPSE values were adjusted accordingly. The following formulae were used to estimate SPSE and DPSE in each 1-km^2 grid within the study area:

SPSE = ((S / E) x 100) / SA%
DPSE = ((D / E) x 100) / SA%

where S = total number of on-effort sightings
D = total number of dolphins from on-effort sightings
E = total number of units of survey effort
SA% = percentage of sea area

2.3.4. Behavioural analysis – When dolphins were sighted during vessel surveys, their behaviour was observed. Different activities were categorized (i.e. feeding, socializing, traveling, and milling/resting) and recorded on sighting datasheets. This data was then input into a separate database with sighting information, which can be used to determine the distribution of behavioural data with a desktop GIS. Distribution of sightings of dolphins engaged in different activities and behaviours would then be plotted on GIS and carefully examined to identify important areas for different activities of the dolphins.

2.3.5. Ranging pattern analysis – Location data of individual dolphins that occurred during the 3-month impact phase monitoring period were obtained from the dolphin sighting database and photo-identification catalogue. To deduce home ranges for individual dolphins using the fixed kernel methods, the program Animal Movement Analyst Extension, was loaded as an extension with ArcView© 3.1 along with another extension Spatial Analyst 2.0. Using the fixed kernel method, the program calculated kernel density estimates based on all sighting positions, and provided an active interface to display kernel density plots. The kernel estimator then calculated and displayed the overall ranging area at 95% UD level.

3. Monitoring Results

3.1. Summary of survey effort and dolphin sightings

3.1.1. During the period of June to August 2019, six sets of systematic line-transect vessel surveys were conducted under the HKLR03 monitoring works to cover all transect lines in NWL and NEL survey areas twice per month.

3.1.2. From these HKLR03 surveys, a total of 785.23 km of survey effort was collected, with 96.0% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility). Among the two areas, 287.33 km and 497.90 km of survey effort were conducted in NEL and NWL survey areas respectively.

3.1.3. The total survey effort conducted on primary lines was 577.21 km, while the effort on secondary lines was 208.02 km. Survey effort conducted on both primary and secondary lines were considered to be on-effort survey data. A summary table of the survey effort is shown in Appendix I.

3.1.4. During the six sets of HKLR03 monitoring surveys from June to August 2019, only four groups of eight Chinese White Dolphins were sighted. Three of the four dolphin sightings were made during on-effort search in this quarter, with two of them being made on primary lines. A summary table of dolphin sightings is shown in Appendix II.

3.1.5. In this quarterly period, all dolphin groups were sighted in NWL, and no dolphin was sighted at all in NEL. In fact, since August 2014, only two sightings of two lone dolphins were made respectively in NEL during HKLR03 monitoring surveys.

3.2. Distribution

3.2.1. Distribution of dolphin sightings made during the HKLR03 monitoring surveys from June to August 2019 is shown in Figure 1. Two of the four dolphin groups were sighted near Black Point, while the other two were sighted at the southwestern corner of NWL survey area, or just to the south of the HKLR09 bridge alignment (Figure 1). And as consistently recorded in the previous monitoring quarters, the dolphins were completely absent from the central and eastern portions of North Lantau waters (Figure 1).

3.2.2. Notably, all dolphin sightings were located far away from the TM-CLKL alignment as well as the HKBCF and HKLR03 reclamation sites (Figure 1). However, two groups of two lone dolphins were sighted near the HKLR09 alignment during the quarterly period.

3.2.3. Sighting distribution of dolphins during the present impact phase monitoring period (June-August 2019) was drastically different from the one during the baseline monitoring period (Figure 1). In the present quarter, dolphins have disappeared from the NEL region, which was in stark contrast to their frequent occurrence around the Brothers Islands, near Shum Shui Kok and in the vicinity of HKBCF reclamation site during the baseline period (Figure 1). The nearly complete abandonment of NEL region by the dolphins has been consistently recorded in the past six years of HKLR03 monitoring, which has resulted in zero to extremely low dolphin encounter rates in this area.

3.2.4. In NWL survey area, dolphin occurrence was also drastically different between the baseline and impact phase periods. During the present impact monitoring period, dolphins were sighted infrequently here, and only at the northwestern and southwestern corners of the North Lantau region. This was in contrary to their frequent occurrences throughout the area during the baseline period (Figure 1).

3.2.5. Another comparison in dolphin distribution was made between the six quarterly periods of summer months in 2014-19 (Figure 2). Among the six summer periods, dolphins were sighted regularly in NWL waters in 2014, but their usage was progressively reduced to very low levels in the five subsequent summer periods, with their occurrences mostly restricted to the western portion of North Lantau waters (Figure 2).

3.3. Encounter rate

3.3.1. During the present quarterly period, the encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data from the primary transect lines under favourable conditions (Beaufort 3 or below) for each set of the HKLR03 surveys in NEL and NWL are shown in Table 2. The average encounter rates deduced from the six sets of HKLR03 surveys were also compared with the ones deduced from the baseline monitoring period (September-November 2011) (Table 3).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during June-August 2019

SURVEY AREA	DOLPHIN MONITORING DATES	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)
		Primary Lines Only	Primary Lines Only
Northeast Lantau	Set 1 (3 & 6 Jun 2019)	0.00	0.00
	Set 2 (10 & 13 Jun 2019)	0.00	0.00
	Set 3 (16 & 18 Jul 2019)	0.00	0.00
	Set 4 (22 & 24 Jul 2019)	0.00	0.00
	Set 5 (13 & 14 Aug 2019)	0.00	0.00
	Set 6 (20 & 26, 29 Aug 2019)	0.00	0.00
Northwest Lantau	Set 1 (3 & 6 Jun 2019)	3.73	9.32
	Set 2 (10 & 13 Jun 2019)	0.00	0.00
	Set 3 (16 & 18 Jul 2019)	0.00	0.00
	Set 4 (22 & 24 Jul 2019)	0.00	0.00
	Set 5 (13 & 14 Aug 2019)	0.00	0.00
	Set 6 (20 & 26, 29 Aug 2019)	0.00	0.00

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (June-August 2019) and baseline monitoring period (September – November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	June – August 2019	September – November 2011	June – August 2019	September – November 2011
Northeast Lantau	0.0	6.00 ± 5.05	0.0	22.19 ± 26.81
Northwest Lantau	0.62 ± 1.52	9.85 ± 5.85	1.55 ± 3.80	44.66 ± 29.85

3.3.2. To facilitate the comparison with the AFCD long-term monitoring results, the encounter rates were also calculated for the present quarter using both primary and secondary survey effort. The encounter rates of sightings (STG) and dolphins (ANI) in NWL were 0.64 sightings and 1.50 dolphins per 100 km of survey effort respectively, while the encounter rates of sightings (STG) and dolphins (ANI) in NEL were both nil for this quarter.

3.3.3 In NEL, the average dolphin encounter rates (both STG and ANI) in the present three-month impact monitoring period were both zero with no on-effort sighting being made, and such extremely low occurrence of dolphins in NEL have been consistently recorded during the same summer quarters throughout the HKLR03 monitoring (Table 4).

Table 4. Comparison of average dolphin encounter rates in Northeast Lantau survey area from the same summer quarters of HKLR03 impact monitoring period and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
September-November 2011 (Baseline)	6.00 ± 5.05	22.19 ± 26.81
June-August 2013 (Impact)	0.88 ± 1.36	3.91 ± 8.36
June-August 2014 (Impact)	0.42 ± 1.04	1.69 ± 4.15
June-August 2015 (Impact)	0.44 ± 1.08	0.44 ± 1.08
June-August 2016 (Impact)	0.00	0.00
June-August 2017 (Impact)	0.00	0.00
June-August 2018 (Impact)	0.00	0.00
June-August 2019 (Impact)	0.00	0.00

Table 5. Comparison of average dolphin encounter rates in Northwest Lantau survey area from the same summer quarters of HKLR03 impact monitoring period and baseline monitoring period (September-November 2011) (Note: encounter rates deduced from the baseline monitoring period have been recalculated based only on survey effort and on-effort sighting data made along the primary transect lines under favourable conditions; ± denotes the standard deviation of the average encounter rates)

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)	**Encounter rate (ANI)** (no. of dolphins from all on-effort sightings per 100 km of survey effort)
September-November 2011 (Baseline)	9.85 ± 5.85	44.66 ± 29.85
June-August 2013 (Impact)	6.56 ± 3.68	27.00 ± 18.71
June-August 2014 (Impact)	4.74 ± 3.84	17.52 ± 15.12
June-August 2015 (Impact)	2.53 ± 3.20	9.21 ± 11.57
June-August 2016 (Impact)	1.72 ± 2.17	7.48 ± 10.98
June-August 2017 (Impact)	2.20 ± 2.88	6.58 ± 8.12
June-August 2018 (Impact)	1.16 ± 1.39	2.87 ± 3.32
June-August 2019 (Impact)	0.62 ± 1.52	1.55 ± 3.80

3.3.4. On the other hand, the average dolphin encounter rates (STG and ANI) in NWL during the present quarterly period were only tiny fractions of the ones recorded during the three-month baseline period (with reductions of 93.7% and 96.5% respectively), indicating a dramatic decline in dolphin usage of this survey area during the present quarterly period as compared to the baseline period (Table 5).

3.3.5. When comparing among the seven summer quarters since 2013, the quarterly encounter rates in 2019 continued to plummet to the lowest level among all summer quarters during the HKLR03 impact monitoring period (Table 5). Such dramatic drop in dolphin occurrence in NWL should raise serious concerns, and the temporal trend should be closely monitored in the upcoming monitoring quarters as the construction activities of HZMB works will soon be completed in coming months.

3.3.6. A two-way ANOVA with repeated measures and unequal sample size was conducted to examine whether there were any significant differences in the average encounter rates between the baseline and impact monitoring periods. The two variables that were examined included the two periods (baseline and impact phases) and two locations (NEL and NWL).

3.3.7. For the comparison between the baseline period and the present quarter (27th quarter of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were 0.0011 and 0.0062 respectively. If the alpha value is set at 0.05, significant differences were detected between the baseline and present quarters in both the average dolphin encounter rates of STG and ANI.

3.3.8. For the comparison between the baseline period and the cumulative quarters in impact phase (i.e. the first 27 quarters of the impact phase being assessed), the p-values for the differences in average dolphin encounter rates of STG and ANI were both 0.000000. Even if the alpha value is set at 0.00001, significant differences were still detected in both the average dolphin encounter rates of STG and ANI (i.e. between the two periods and the locations).

3.3.9. As indicated in both dolphin distribution patterns and encounter rates, dolphin usage has been significantly reduced in both NEL and NWL survey areas during the present quarterly period, and such low occurrence of dolphins has also been consistently documented in previous quarters of the past few years.

3.3.10. The dramatic decline in dolphin usage of North Lantau region raises serious concern, as the timing of the decline in dolphin usage in North Lantau waters coincided well with the construction schedule of the HZMB-related projects (Hung 2018). Apparently there has been no sign of recovery of dolphin usage even though almost all marine works associated with the HZMB construction have been completed, and the Brothers Marine Park has been established as a compensation measure for the permanent habitat loss in association with the HKBCF reclamation works.

3.4. Group size

3.4.1. Group size of Chinese White Dolphins ranged from one to four individuals per group in

North Lantau region during June to August 2019. The average dolphin group sizes from these three months were compared with the ones deduced from the baseline period in September to November 2011, as shown in Table 6.

Table 6. Comparison of average dolphin group sizes from impact monitoring period (June – August 2019) and baseline monitoring period (September – November 2011) (Note: ± denotes the standard deviation of the average group size)

	Average Dolphin Group Size	
	June – August 2019	**September – November 2011**
Overall	2.00 ± 1.41 (n = 4)	3.72 ± 3.13 (n = 66)
Northeast Lantau	---	3.18 ± 2.16 (n = 17)
Northwest Lantau	2.00 ± 1.41 (n = 4)	3.92 ± 3.40 (n = 49)

3.4.2. The average dolphin group size in NWL waters during June to August 2019 was much lower than the one recorded during the three-month baseline period, but it should also be noted that the sample size of only four dolphin groups in the present quarter was very small when compared to the 66 groups sighted during the baseline period (Table 6).

3.4.3. Notably, all four dolphin groups were small with 1-4 individuals per group only (Appendix II). This is in stark contrast to the baseline period when the larger groups were frequently sighted and evenly distributed in NWL, with a few also sighted in NEL waters.

3.5. Habitat use

3.5.1. From June to August 2019, only three grids in North Lantau waters recorded dolphin occurrence. The only grid with moderately high dolphin density was located near Black Point (Figures 3a and 3b). In contrast, the other two grids only recorded moderately low densities. Notably, all grids near TMCLKL alignment did not record any presence of dolphins at all during on-effort search in the present quarterly period (Figures 3a and 3b).

3.5.2. However, it should be emphasized that the amount of survey effort collected in each grid during the three-month period was fairly low (6-12 units of survey effort for most grids), and therefore the habitat use pattern derived from the three-month dataset should be treated with caution. A more complete picture of dolphin habitat use pattern should be examined when more survey effort for each grid is collected throughout the impact phase monitoring programme.

3.5.3. When compared with the habitat use patterns during the baseline period, dolphin usage in NEL and NWL has drastically diminished in both areas during the present impact monitoring period (Figure 4). During the baseline period, many grids between Siu Mo To and Shum Shui Kok in NEL recorded moderately high to high dolphin densities, which was in stark contrast to the complete absence of dolphins there during the present impact phase period (Figure 4).

3.5.4. The density patterns were also very different in NWL between the baseline and impact phase monitoring periods, with high dolphin usage throughout the area, especially around Sha Chau, near Black Point, to the west of the airport, as well as between Pillar Point and airport platform during the baseline period. In contrast, only one grid with moderately high density was located near Black Point during the present impact phase period (Figure 4).

3.6. Mother-calf pairs

3.6.1. During the present quarterly period, no young calf was sighted at all among the four groups of dolphins.

3.7. Activities and associations with fishing boats

3.7.1. Among the four dolphin groups, only one of them was engaged in feeding activity, while none of them was engaged in socializing, traveling or milling/resting activity during the quarterly period. The lone dolphin group engaged in feeding activity was located to the southwest corner of the NWL survey area (Figure 5).

3.7.2. Moreover, none of the four dolphin groups was found to be associated with any operating fishing vessel during the present impact phase period.

3.8. Summary of photo-identification works

3.8.1. From June to August 2019, about 300 digital photographs of Chinese White Dolphins were taken during the HKLR03 impact phase monitoring surveys for the photo-identification work.

3.8.2. In total, six individuals sighted six times altogether were identified (see summary table in Appendix III and photographs of identified individuals in Appendix IV). All of these re-sightings were made in NWL, and were re-sighted only once during the quarterly monitoring period (Appendix III).

3.8.3. Notably, one of the identified individuals (NL123) was also sighted in WL waters during the HKLR09 monitoring surveys under the same three-month period of June to August 2019.

3.9. Individual range use

3.9.1. Ranging patterns of the six individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

3.9.2. All identified dolphins sighted in the present quarter were utilizing NWL waters only, but have completely avoided NEL waters where many of them have utilized as their core areas in the past (Appendix V). This is in contrary to the extensive movements between NEL and NWL survey areas observed in the earlier impact monitoring quarters as well as the baseline period.

3.9.3. Moreover, only one individual (NL123) had extended its range use to WL waters during the quarterly period, even though such movements between North and West Lantau have been quite frequent in the past several years of HKLR03 dolphin monitoring (Appendix V).

4. Conclusion

4.1. During this quarter of dolphin monitoring, no adverse impact from the activities of the TMCLKL construction project on Chinese White Dolphins was noticeable from general observations.

4.2. Although the dolphins infrequently occurred along the alignment of TMCLKL southern connection viaduct in the past and during the baseline monitoring period, it is apparent that dolphin usage has been significantly reduced in NEL, and many individuals have shifted away from the important habitat around the Brothers Islands.

4.3. It is critical to monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether suitable mitigation measure can be applied to revert the situation.

5. References

- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., and Thomas, L. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, London.

- Hung, S. K. 2018. Monitoring of marine mammals in Hong Kong waters – data collection: final report (2017-18). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department of Hong Kong SAR Government, 174 pp.

- Jefferson, T. A. 2000. Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. Wildlife Monographs 144:1-65.

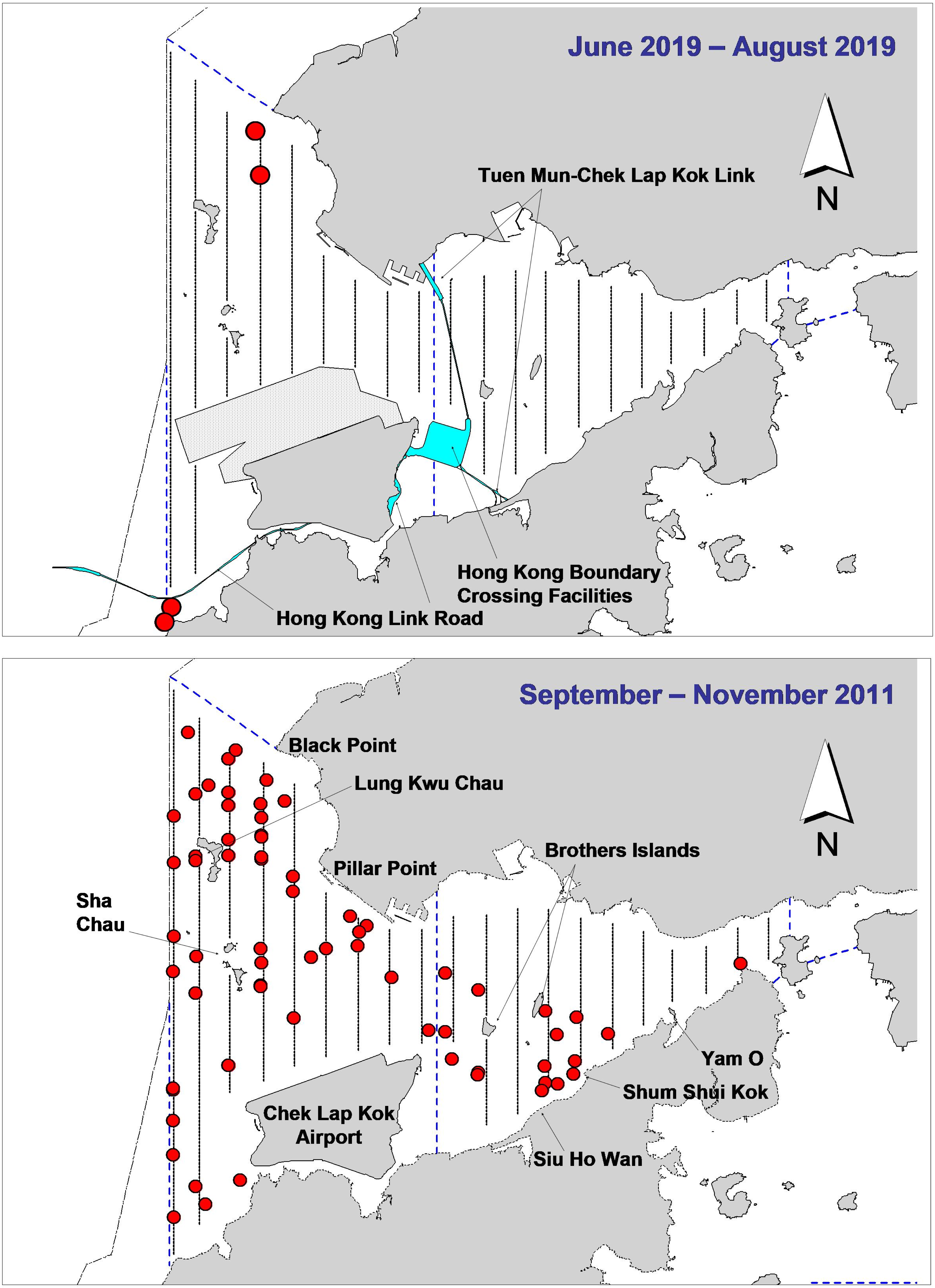


Figure 1. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during HKLR03 monitoring surveys (top) and baseline monitoring surveys (bottom)

Figure 2. Distribution of Chinese white dolphin sightings in Northwest and Northeast Lantau during the past six summer quarters (June-August) of HKLR03 monitoring period in 2014-19

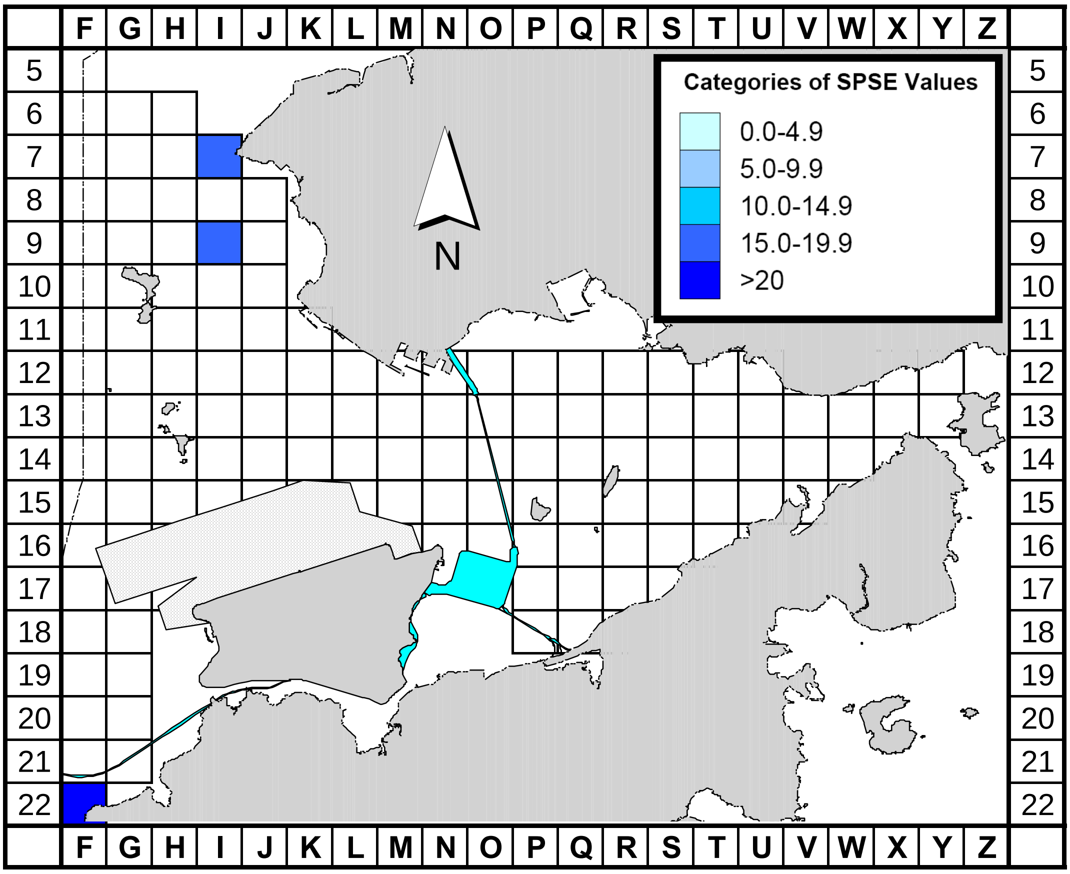


Figure 3a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (June-August 19) (SPSE = no. of on-effort sightings per 100 units of survey effort)

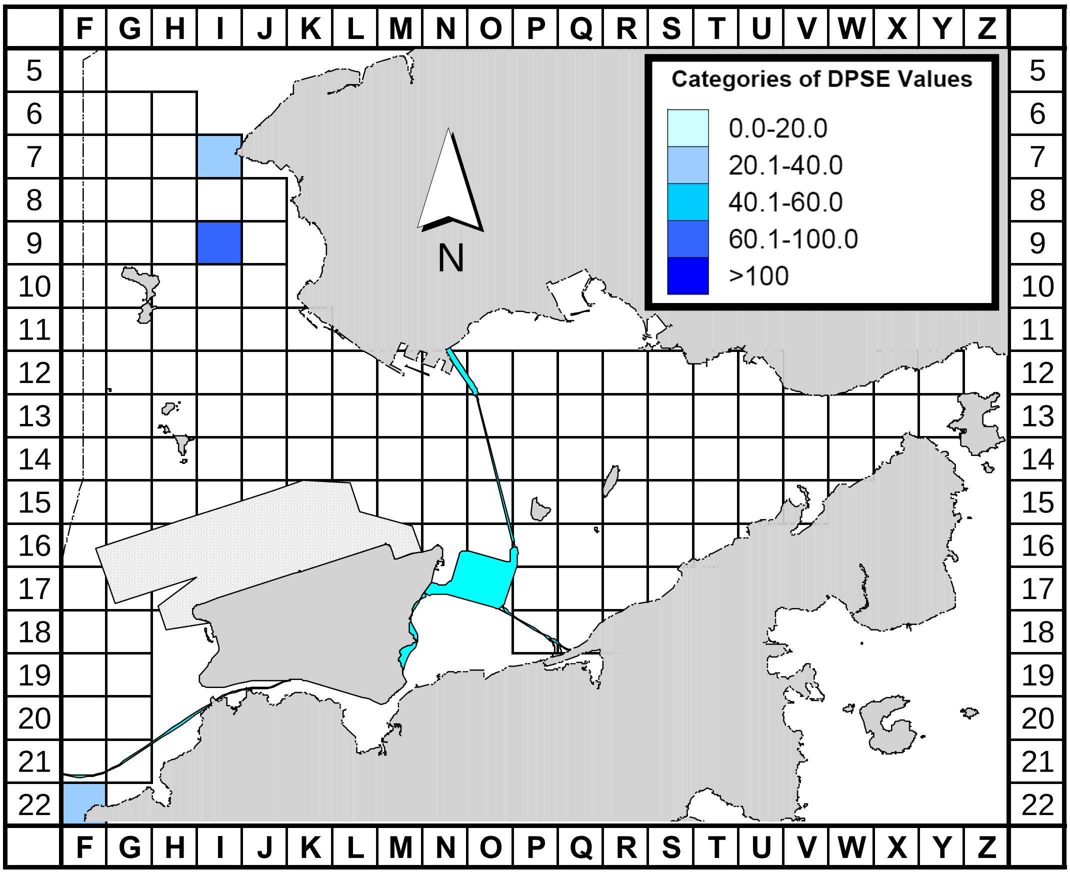


Figure 3b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (June-August 19) (DPSE = no. of dolphins per 100 units of survey effort)

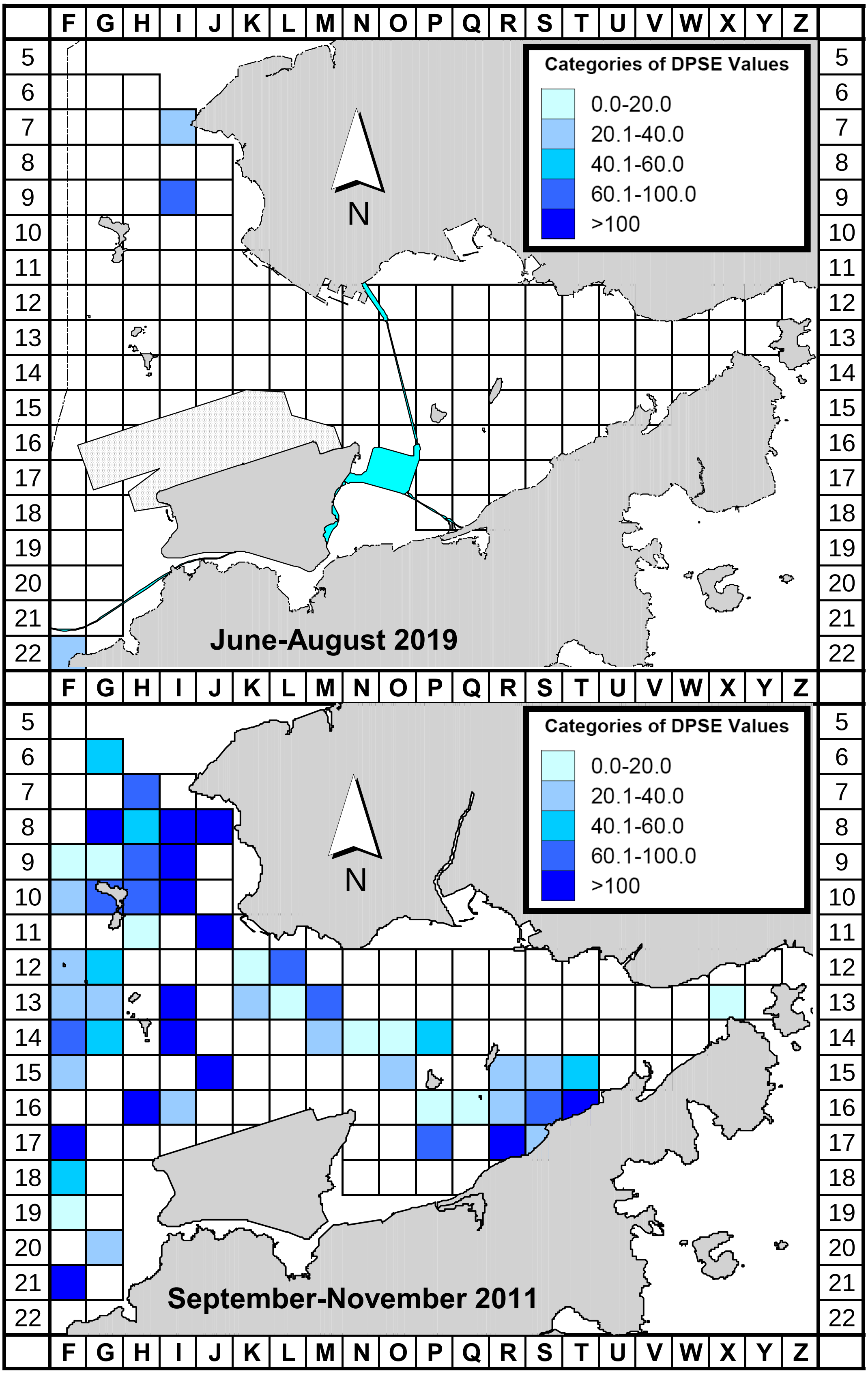
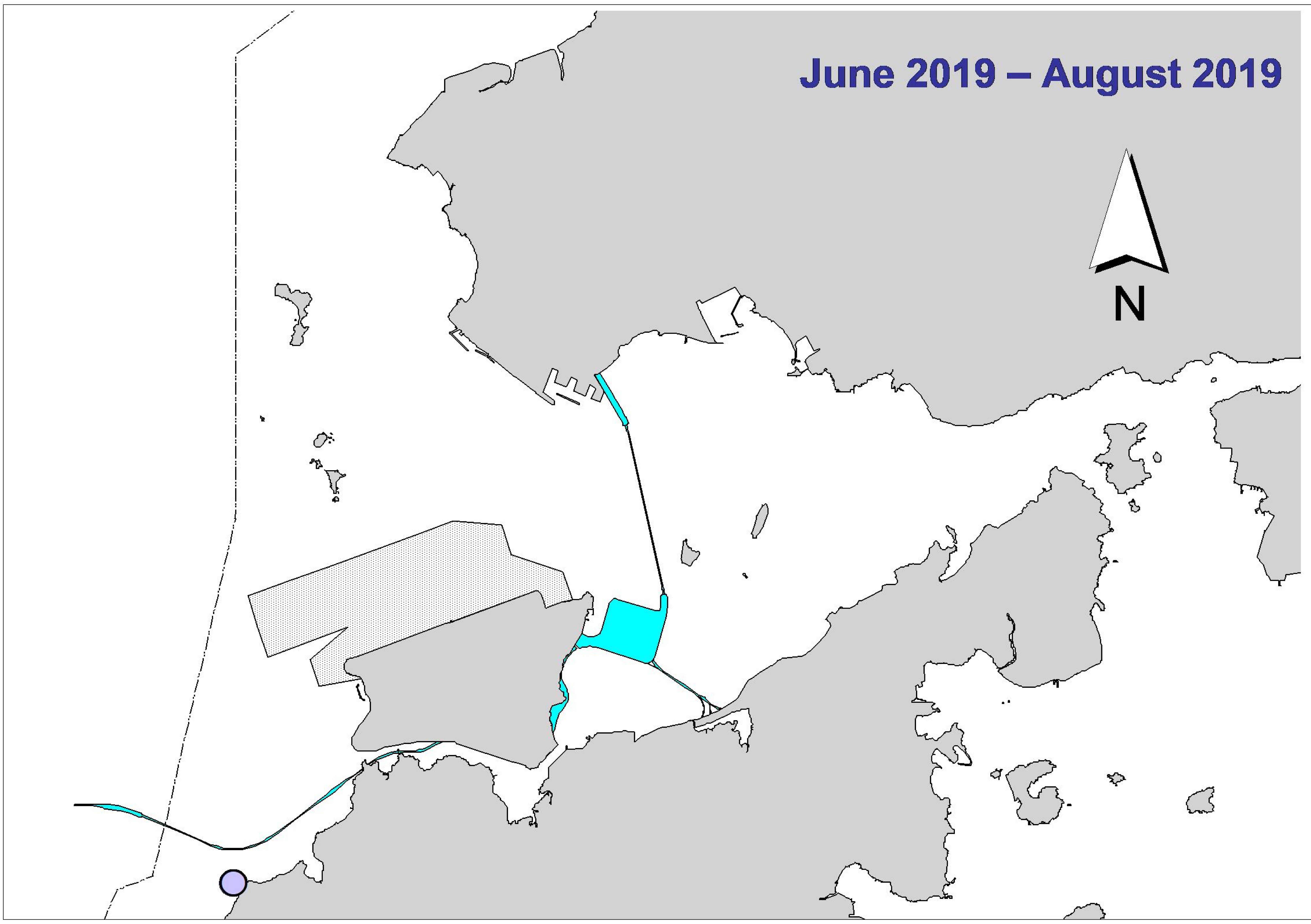


Figure 4. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between the impact monitoring period (June - August 2019) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)



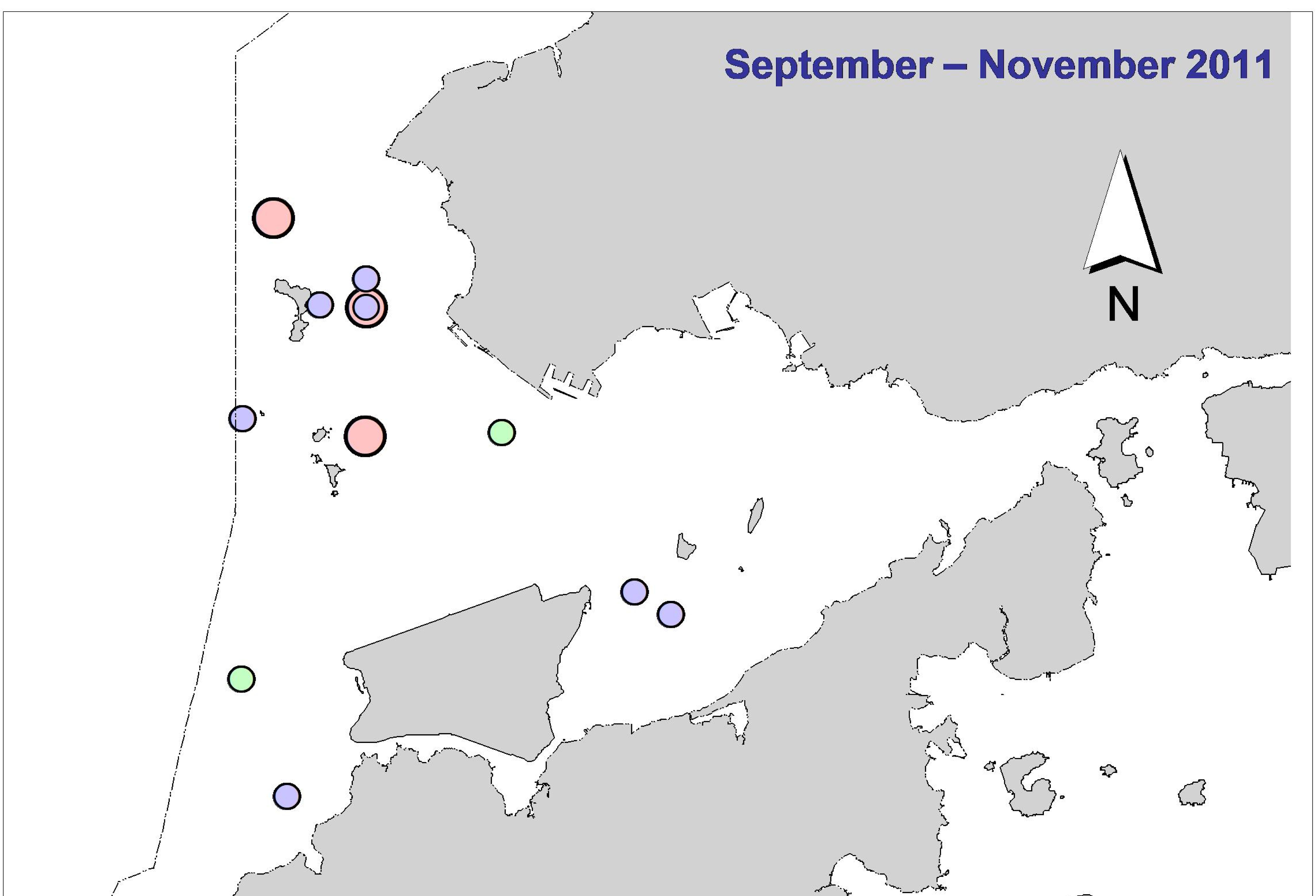


Figure 5. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 monitoring surveys (top) and baseline monitoring surveys (bottom)

Appendix I. HKLR03 Survey Effort Database (June-August 2019)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
3-Jun-19	NW LANTAU	3	25.81	SUMMER	STANDARD36826	HKLR	P
3-Jun-19	NW LANTAU	4	1.66	SUMMER	STANDARD36826	HKLR	P
3-Jun-19	NW LANTAU	3	11.38	SUMMER	STANDARD36826	HKLR	S
3-Jun-19	NW LANTAU	4	0.55	SUMMER	STANDARD36826	HKLR	S
3-Jun-19	NE LANTAU	2	24.60	SUMMER	STANDARD36826	HKLR	P
3-Jun-19	NE LANTAU	3	11.37	SUMMER	STANDARD36826	HKLR	P
3-Jun-19	NE LANTAU	2	11.83	SUMMER	STANDARD36826	HKLR	S
3-Jun-19	NE LANTAU	3	2.10	SUMMER	STANDARD36826	HKLR	S
6-Jun-19	NW LANTAU	2	8.26	SUMMER	STANDARD36826	HKLR	P
6-Jun-19	NW LANTAU	3	19.60	SUMMER	STANDARD36826	HKLR	P
6-Jun-19	NW LANTAU	4	3.70	SUMMER	STANDARD36826	HKLR	P
6-Jun-19	NW LANTAU	2	5.99	SUMMER	STANDARD36826	HKLR	S
6-Jun-19	NW LANTAU	3	4.25	SUMMER	STANDARD36826	HKLR	S
10-Jun-19	NW LANTAU	3	17.00	SUMMER	STANDARD36826	HKLR	P
10-Jun-19	NW LANTAU	4	10.53	SUMMER	STANDARD36826	HKLR	P
10-Jun-19	NW LANTAU	5	0.60	SUMMER	STANDARD36826	HKLR	P
10-Jun-19	NW LANTAU	3	7.07	SUMMER	STANDARD36826	HKLR	S
10-Jun-19	NW LANTAU	4	4.80	SUMMER	STANDARD36826	HKLR	S
10-Jun-19	NE LANTAU	2	19.40	SUMMER	STANDARD36826	HKLR	P
10-Jun-19	NE LANTAU	3	15.46	SUMMER	STANDARD36826	HKLR	P
10-Jun-19	NE LANTAU	2	8.04	SUMMER	STANDARD36826	HKLR	S
10-Jun-19	NE LANTAU	3	5.72	SUMMER	STANDARD36826	HKLR	S
13-Jun-19	NW LANTAU	2	24.25	SUMMER	STANDARD36826	HKLR	P
13-Jun-19	NW LANTAU	3	8.10	SUMMER	STANDARD36826	HKLR	P
13-Jun-19	NW LANTAU	2	10.05	SUMMER	STANDARD36826	HKLR	S
16-Jul-19	NW LANTAU	2	22.62	SUMMER	STANDARD36826	HKLR	P
16-Jul-19	NW LANTAU	3	5.34	SUMMER	STANDARD36826	HKLR	P
16-Jul-19	NW LANTAU	2	9.44	SUMMER	STANDARD36826	HKLR	S
16-Jul-19	NW LANTAU	3	0.80	SUMMER	STANDARD36826	HKLR	S
18-Jul-19	NW LANTAU	0	4.07	SUMMER	STANDARD36826	HKLR	P
18-Jul-19	NW LANTAU	1	3.86	SUMMER	STANDARD36826	HKLR	P
18-Jul-19	NW LANTAU	2	24.87	SUMMER	STANDARD36826	HKLR	P
18-Jul-19	NW LANTAU	1	2.20	SUMMER	STANDARD36826	HKLR	S
18-Jul-19	NW LANTAU	2	8.80	SUMMER	STANDARD36826	HKLR	S
18-Jul-19	NE LANTAU	2	30.03	SUMMER	STANDARD36826	HKLR	P
18-Jul-19	NE LANTAU	3	5.56	SUMMER	STANDARD36826	HKLR	P
18-Jul-19	NE LANTAU	2	11.89	SUMMER	STANDARD36826	HKLR	S
22-Jul-19	NW LANTAU	1	7.40	SUMMER	STANDARD36826	HKLR	P
22-Jul-19	NW LANTAU	2	19.85	SUMMER	STANDARD36826	HKLR	P
22-Jul-19	NW LANTAU	1	4.40	SUMMER	STANDARD36826	HKLR	S
22-Jul-19	NW LANTAU	2	7.65	SUMMER	STANDARD36826	HKLR	S
22-Jul-19	NE LANTAU	2	27.91	SUMMER	STANDARD36826	HKLR	P
22-Jul-19	NE LANTAU	3	5.70	SUMMER	STANDARD36826	HKLR	P
22-Jul-19	NE LANTAU	2	10.29	SUMMER	STANDARD36826	HKLR	S
22-Jul-19	NE LANTAU	3	2.80	SUMMER	STANDARD36826	HKLR	S
24-Jul-19	NW LANTAU	2	34.15	SUMMER	STANDARD36826	HKLR	P
24-Jul-19	NW LANTAU	3	9.95	SUMMER	STANDARD36826	HKLR	S
13-Aug-19	NE LANTAU	2	34.82	SUMMER	STANDARD36826	HKLR	P
13-Aug-19	NE LANTAU	3	2.90	SUMMER	STANDARD36826	HKLR	P
13-Aug-19	NE LANTAU	2	9.78	SUMMER	STANDARD36826	HKLR	S
13-Aug-19	NE LANTAU	3	1.90	SUMMER	STANDARD36826	HKLR	S

Appendix I. (cont'd)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
13-Aug-19	NW LANTAU	2	0.84	SUMMER	STANDARD36826	HKLR	P
13-Aug-19	NW LANTAU	3	24.00	SUMMER	STANDARD36826	HKLR	P
13-Aug-19	NW LANTAU	4	7.90	SUMMER	STANDARD36826	HKLR	P
13-Aug-19	NW LANTAU	2	0.90	SUMMER	STANDARD36826	HKLR	S
13-Aug-19	NW LANTAU	3	8.66	SUMMER	STANDARD36826	HKLR	S
13-Aug-19	NW LANTAU	4	1.40	SUMMER	STANDARD36826	HKLR	S
14-Aug-19	NW LANTAU	2	27.12	SUMMER	STANDARD36826	HKLR	P
14-Aug-19	NW LANTAU	2	14.88	SUMMER	STANDARD36826	HKLR	S
20-Aug-19	NW LANTAU	2	27.37	SUMMER	STANDARD36826	HKLR	P
20-Aug-19	NW LANTAU	3	5.80	SUMMER	STANDARD36826	HKLR	P
20-Aug-19	NW LANTAU	2	11.23	SUMMER	STANDARD36826	HKLR	S
26-Aug-19	NW LANTAU	2	17.21	SUMMER	STANDARD138716	HKLR	P
26-Aug-19	NW LANTAU	3	11.36	SUMMER	STANDARD138716	HKLR	P
26-Aug-19	NW LANTAU	2	6.10	SUMMER	STANDARD138716	HKLR	S
26-Aug-19	NW LANTAU	3	4.13	SUMMER	STANDARD138716	HKLR	S
26-Aug-19	NE LANTAU	1	4.21	SUMMER	STANDARD138716	HKLR	P
26-Aug-19	NE LANTAU	2	26.68	SUMMER	STANDARD138716	HKLR	P
26-Aug-19	NE LANTAU	3	0.27	SUMMER	STANDARD138716	HKLR	P
26-Aug-19	NE LANTAU	1	1.10	SUMMER	STANDARD138716	HKLR	S
26-Aug-19	NE LANTAU	2	4.11	SUMMER	STANDARD138716	HKLR	S
26-Aug-19	NE LANTAU	3	0.97	SUMMER	STANDARD138716	HKLR	S
29-Aug-19	NE LANTAU	2	2.61	SUMMER	STANDARD36826	HKLR	P
29-Aug-19	NE LANTAU	3	2.42	SUMMER	STANDARD36826	HKLR	P
29-Aug-19	NE LANTAU	2	1.90	SUMMER	STANDARD36826	HKLR	S
29-Aug-19	NE LANTAU	3	0.96	SUMMER	STANDARD36826	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (June-August 2019)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Lines)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
3-Jun-19	1	1138	4	NW LANTAU	3	121	ON	HKLR	827734	807488	SUMMER	NONE	P
6-Jun-19	1	1312	1	NW LANTAU	3	77	ON	HKLR	814894	804681	SUMMER	NONE	P
16-Jul-19	1	1152	2	NW LANTAU	2	197	ON	HKLR	829052	807326	SUMMER	NONE	S
24-Jul-19	1	1330	1	NW LANTAU	2	ND	OFF	HKLR	814451	804453	SUMMER	NONE	

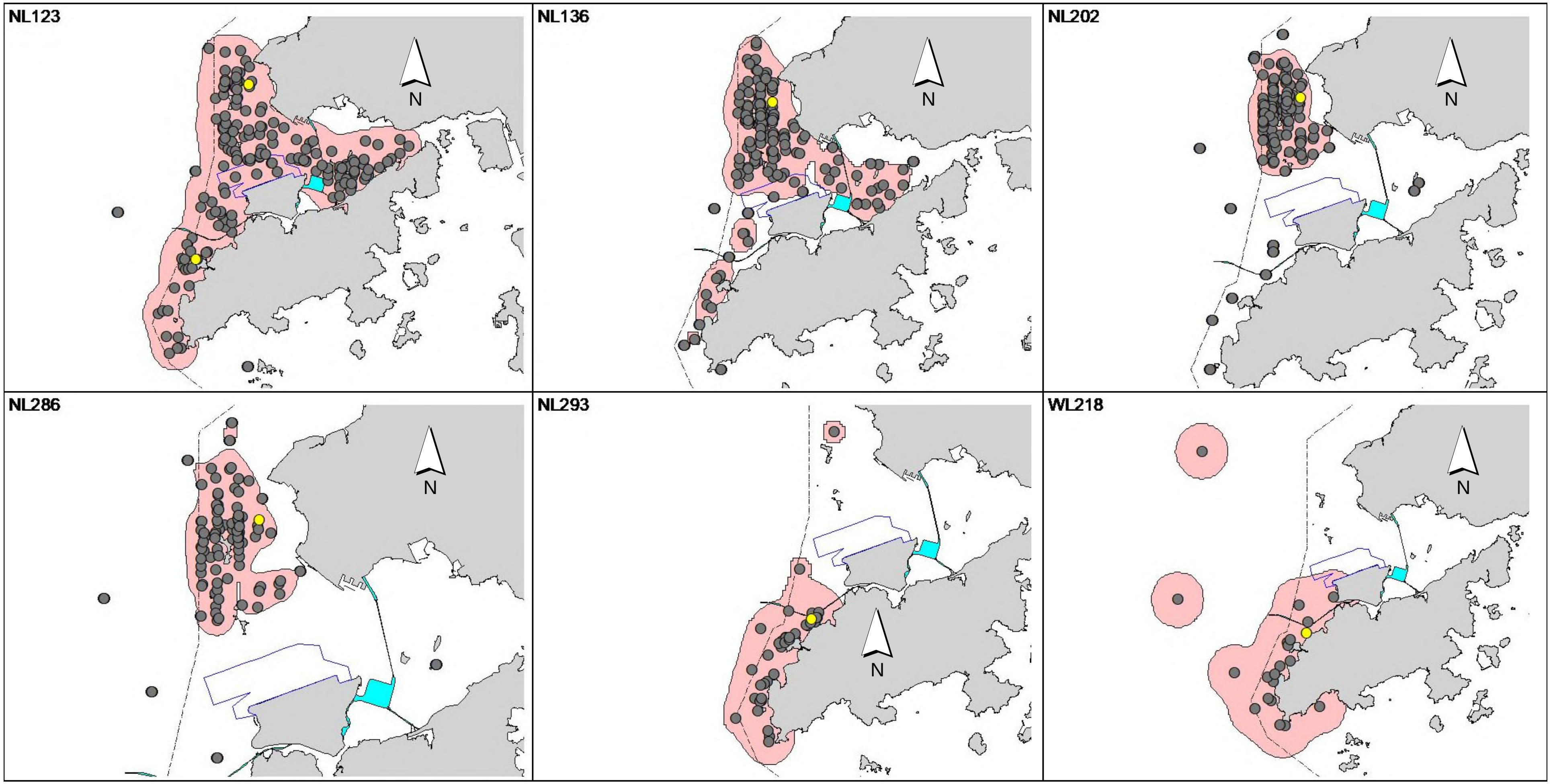
Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in June-August 2019

ID#	DATE	STG#	AREA
NL123	03/06/19	1	NW LANTAU
NL136	03/06/19	1	NW LANTAU
NL202	03/06/19	1	NW LANTAU
NL286	03/06/19	1	NW LANTAU
NL293	06/06/19	1	NW LANTAU
WL218	24/07/19	1	NW LANTAU

Appendix IV. Six individual dolphins that were identified between June and August 2019 under HKLR03 monitoring surveys

Appendix IV. (cont'd)

Appendix V. Ranging patterns (95% kernel ranges) of six individual dolphins that were sighted during HKLR03 monitoring period (note: yellow dots indicate sightings made in June-August 2019 during HKLR03 monitoring surveys)



Appendix I

Event and Action Plan

Event and Action Plan for Impact Air Monitoring

	Action			
	ET [(a)]	IEC [(a)]	SOR [(a)]	Contractor(s)
Action Level Exceedance				
	1. Identify the source. 2. Repeat measurement to confirm finding. If two consecutive measurements exceed Action Level, the exceedance is then confirmed. 3. Inform the IEC and the SOR. 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Discuss with the IEC and the Contractor on remedial actions required. 7. If exceedance continues, arrange meeting with the IEC and the SOR. 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET. 2. Check the Contractor's working method. 3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Ensure remedial measures properly implemented.	1. Rectify any unacceptable practice 2. Amend working methods if appropriate 3. If the exceedance is confirmed to be Project related, submit proposals for remedial actions to IEC within 3 working days of notification 4. Implement the agreed proposals 5. Amend proposal if appropriate

	Action			
	ET (a)	**IEC (a)**	**SOR (a)**	**Contractor(s)**
Limit Level Exceedance				
	1. Identify the source. 2. Repeat measurement to confirm finding. If two consecutive measurements exceed Limit Level, the exceedance is then confirmed. 3. Inform the IEC, the SOR, the DEP and the Contractor. 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 7. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken. 8. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results. 9. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR on the effectiveness of the proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. If the exceedance is confirmed to be Project related after investigation, in consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. If the exceedance is confirmed to be Project related after investigation, submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate. 5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated.

Note: (a) ET – Environmental Team; IEC – Independent Environmental Checker; SOR – Supervising Officer's Representative

Event & Action Plan for Impact Water Quality Monitoring

Event	ET Leader	IEC	SOR	Contractor
Action level being exceeded by one sampling day	1. Repeat *in situ* measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and SOR; 4. Check monitoring data, all plant, equipment and Contractor's working methods.	1. Check monitoring data submitted by ET and Contractor's working methods.	1. Confirm receipt of notification of non-compliance in writing; 2. Notify Contractor.	1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level;	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures are properly implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Supervising Officer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of additional mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR; 5. Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	1. Repeat measurement on next day of exceedance to confirm findings;	1. Check monitoring data submitted by ET and	1. Confirm receipt of notification of failure in	1. Inform the SOR and confirm notification of the

Event	ET Leader	IEC	SOR	Contractor
	2. Identify source(s) of impact; 3. Inform IEC, Contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor;	Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly.	writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods.	non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days;	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SOR accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Note: ET – Environmental Team, IEC – Independent Environmental Checker, SOR – Supervising Officer's Representative

Event / Action Plan for Impact Dolphin Monitoring

EVENT	ACTION			
	ET	**IEC**	**SOR**	**Contractor**
Action Level	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SOR and Contractor; 5. Check monitoring data. 6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and finding with the ET and the Contractor.	1. Discuss monitoring with the IEC and any other measures proposed by the ET; 2. If SOR is satisfied with the proposal of any other measures, SOR to signify the agreement in writing on the measures to be implemented.	1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SOR; 3. Implement the agreed measures.
Limit Level	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences;	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, SOR and	1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If SOR is satisfied with the	1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and SOR the necessity of additional dolphin monitoring and any other

EVENT	ACTION			
	ET	**IEC**	**SOR**	**Contractor**
	3. Identify source(s) of impact; 4. Inform the IEC, SOR and Contractor of findings; 5. Check monitoring data; 6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.	Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise SOR the results and findings accordingly.	proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

Note: ET – Environmental Team, IEC – Independent Environmental Checker, SOR – Supervising Officer's Representative

Appendix J

Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Table J1 *Cumulative Statistics on Exceedances*

Monitoring Parameters	Action/Limit Level	Total No. recorded in this reporting quarter	Total No. recorded since Contract commencement
1-Hr TSP	Action	2	93
	Limit	1	7
24-Hr TSP	Action	0	10
	Limit	0	4
Water Quality	Action	107	128
	Limit	18	19
Impact Dolphin	Action	0	11
Monitoring	Limit	1	16

Table J2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
This Reporting Period (June to August 2019)	0	0	0
Total No. received since Contract commencement	16	1	0

Email message

Environmental Resources Management

2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660

To	Ramboll Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Air Quality Impact Monitoring
Date	19 July 2019

ERM

Dear Sir or Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

0212330_10July2019_1hrTSP_Station ASR6

One Action Level Exceedance was recorded on 10 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Air Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_10July2019_1hrTSP_Station ASR6** **[Total No. of Exceedances = 1]**	
Date	10 July 2019 (Measured) 18 July 2019 (Laboratory results received by ERM)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10 and AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	24-hr TSP ($\mu g/m^3$)	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214
	1-hr TSP ($\mu g/m^3$)	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337
Limit Levels	1-hr TSP ($\mu g/m^3$)	500
	24-hr TSP ($\mu g/m^3$)	260
Measured Levels	Action Level Exceedance for 1-hr TSP is observed at ASR6 (372 µg/m3) during 1415 – 1515 hrs.	
Works Undertaken (at the time of monitoring event)	On 10 July 2019, Dismantling of Flying Beam was carried out at Portion N-A.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance is unlikely to be due to this Contract, in view of the following: • According to the construction information provided by the Contractor, the majority of construction works on 10 July 2019 was Dismantling of Flying Beam at Portion N-A. During the period of the land-based construction works, the Contractor has implemented the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual (e.g. water spraying on exposed soil within the Project site and associated works areas). • On 10 July 2019, only Dismantling of Flying Beam was carried out on site. No dusty works are carried out. • The exceedance is unlikely to be due to this Contract as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Based on the above, the exceedance is unlikely to be due to this Contract.	

Actions Taken / To Be Taken	According to the photo record provided by the Contractor, dust suppression measures were properly implemented. Water spraying was applied to prevent dust. Photos are provided in Annex A. The Contractor has been reminded to implement the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual including watering to maintain all exposed road surfaces and dust sources wet, use of sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site throughout the construction period.
Remarks	The monitoring results, wind data, water spraying record and the locations of air quality monitoring stations are attached.

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 10/7/2019

Water truck was used for water spraying to prevent dust. (Works Area Portion N-C)

Water truck was used for water spraying to prevent dust. (Works Area Portion N-A)

Air quality monitoring results on 10/7/2019								
Project	Contract	Date	Station	Weather	Start time	Parameters	Results	Unit
TMCLKL	HY/2012/08	10/7/2019	AQMS1	Sunny	13:49	1-hour TSP	160	ug/m3
TMCLKL	HY/2012/08	10/7/2019	AQMS1	Sunny	14:51	1-hour TSP	63	ug/m3
TMCLKL	HY/2012/08	10/7/2019	AQMS1	Sunny	15:53	1-hour TSP	29	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR1	Sunny	13:37	1-hour TSP	72	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR1	Sunny	14:39	1-hour TSP	53	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR1	Sunny	15:41	1-hour TSP	21	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR10	Sunny	13:02	1-hour TSP	14	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR10	Sunny	14:04	1-hour TSP	151	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR10	Sunny	15:06	1-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR5	Sunny	13:25	1-hour TSP	107	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR5	Sunny	14:27	1-hour TSP	153	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR5	Sunny	15:29	1-hour TSP	19	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR6	Sunny	13:13	1-hour TSP	75	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR6	Sunny	14:15	1-hour TSP	372	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR6	Sunny	15:17	1-hour TSP	30	ug/m3
TMCLKL	HY/2012/08	10/7/2019	AQMS1	Sunny	16:55	24-hour TSP	41	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR1	Sunny	16:43	24-hour TSP	48	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR10	Sunny	16:08	24-hour TSP	27	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR5	Sunny	16:31	24-hour TSP	59	ug/m3
TMCLKL	HY/2012/08	10/7/2019	ASR6	Sunny	16:19	24-hour TSP	40	ug/m3

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
19/07/10	0:00	0.9	195
19/07/10	1:00	0.9	235
19/07/10	2:00	1.8	197
19/07/10	3:00	2.2	194
19/07/10	4:00	1.3	223
19/07/10	5:00	0.4	203
19/07/10	6:00	1.8	200
19/07/10	7:00	1.8	192
19/07/10	8:00	1.8	195
19/07/10	9:00	1.3	223
19/07/10	10:00	2.7	193
19/07/10	11:00	1.8	203
19/07/10	12:00	3.6	203
19/07/10	13:00	1.3	268
19/07/10	14:00	3.1	198
19/07/10	15:00	0.9	272
19/07/10	16:00	0	-
19/07/10	17:00	0	-
19/07/10	18:00	0	-
19/07/10	19:00	0	-
19/07/10	20:00	0.9	63
19/07/10	21:00	0.9	96
19/07/10	22:00	0.9	59
19/07/10	23:00	0.4	62

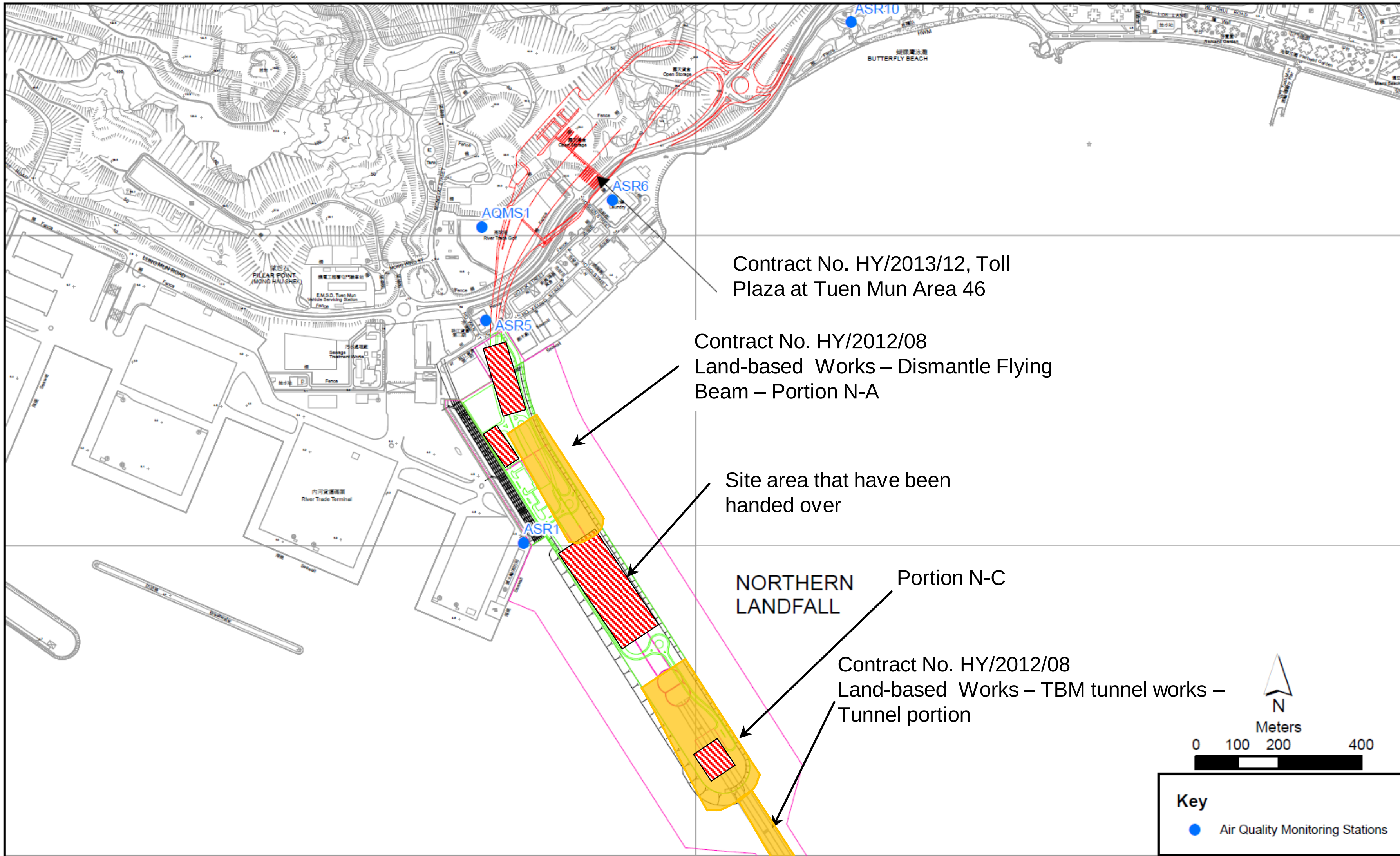


Figure 1

Indicative Construction Works Area on 10 July 2019

DATE: 06/03/2013

Environmental Resources Management

ERM

Dragages Hong Kong Dragages - Bouygues Joint Venture	Contract No. HY/2012/08 Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section	**Weekly Water Spraying Record** **每週灑水檢查記錄**

Site Location **地盤位置:** __Northern Landfall____

Date **日期:** 08 Jul 2019 to 至 14 Jul 2019

	Time 時間	Monday 星期一	Tuesday 星期二	Wednesday 星期三	Thursday 星期四	Friday 星期五	Saturday 星期六	Sunday 星期日
1	8:00 – 8:45	✓	✓	✓	✓	✓	✓	✓
2	8:45 – 9:30	✓	✓	✓	✓	✓	✓	✓
3	9:30 – 10:15	✓	✓	✓	✓	✓	✓	✓
4	10:15 – 11:00	✓	✓	✓	✓	✓	✓	✓
5	11:00 – 11:45	✓	✓	✓	✓	✓	✓	✓
6	11:45 – 12:30	✓	✓	✓	✓	✓	✓	✓
7	12:30 – 13:15	✓	✓	✓	✓	✓	✓	✓
8	13:15 – 14:00	✓	✓	✓	✓	✓	✓	✓
9	14:00 – 14:45	✓	✓	✓	✓	✓	✓	✓
10	14:45 – 15:30	✓	✓	✓	✓	✓	✓	✓
11	15:30 – 16:45	✓	✓	✓	✓	✓	✓	✓
12	16:45 – 17:30	✓	✓	✓	✓	✓	✓	✓
	Verified by Site Foreman 地盤科文簽署確認	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]	[signature]

Night shift 夜間工作 (if necessary 如需要)								
	17:30 – 19:00							
	19:00 – 20:30							
	20:30 – 22:00							
	22:00 – 23:00							

*Please - tick (√) in the box if complete the spraying of water.
circle (O) in the box if it is raining.

*如果 - 已經完成灑水,請於方格內加上剔號(√)。
是下雨天, 請於方格內加上圓圈(O)。

Remarks:
(1) Pursuant to EP Clause 3.15, the Permit Holder shall undertake watering at least 12 times per day on all exposed soil within the Project site and associated work areas in Tuen Mun area throughout the construction phase.
(2) Spraying position includes the main haul road, open area, slopes, stockpiles and any other dusty materials.
(3) If it is raining, no water spraying is needed.
(4) The no of spraying will be increased due to site condition.

備註:
(1) 根據環境許可證 3.15 條例，在整個施工階段內，許可證持有人須每天至少 12 次在屯門區項目工地和相關的工作區域內的所有暴露土壤灑水。
(2) 灑水位置包括主要運輸道路，空曠地帶，斜坡，存料堆，以及任何其他產生塵埃物料。
(3) 當下雨時，地盤將不需要灑水。
(4) 如果地盤情況更改或有需要時，灑水次數會相應增加。

Email message

Environmental Resources Management

2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660

To	Ramboll Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Air Quality Impact Monitoring
Date	9 August 2019

ERM

Dear Sir or Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

0212330_28July2019_1hrTSP_Station ASR1
0212330_28July2019_1hrTSP_Station ASR5

One Action Level and one Limit Level Exceedances were recorded on 28 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Air Quality Impact Monitoring
Notification of Exceedance

Log No.	**Action Level Exceedance** **0212330_28July2019_1hrTSP_Station ASR5** **Limit Level Exceedance** **0212330_28July2019_1hrTSP_Station ASR1** **[Total No. of Exceedances = 2]**	
Date	28 July 2019 (Measured) 8 August 2019 (Laboratory results received by ERM)	
Monitoring Station	ASR1, ASR5, ASR6, ASR10 and AQMS1	
Parameter(s) with Exceedance(s)	1-hr TSP	
Action Levels	24-hr TSP (µg/m^3)	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214
	1-hr TSP (µg/m^3)	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337
Limit Levels	1-hr TSP (µg/m^3)	500
	24-hr TSP (µg/m^3)	260
Measured Levels	Action Level Exceedance for 1-hr TSP is observed at ASR5 (410 µg/m3) during 0930 – 1030 hrs. Limit Level Exceedance for 1-hr TSP is observed at ASR1 (646 µg/m3) during 0942 – 1042 hrs.	
Works Undertaken (at the time of monitoring event)	On 28 July 2019, no construction works was carried out on site.	
Possible Reason for Action or Limit Level Exceedance(s)	The exceedance is unlikely to be due to this Contract, in view of the following: • According to the construction information provided by the Contractor, no construction works was carried out on site on 28 July 2019 • The exceedance is unlikely to be due to this Contract as dust suppression measures were implemented properly on site. Water spraying was applied on site to prevent dust. Water spraying was also applied on exposed soil within the Project site and associated works areas. Materials having the potential to create dust was covered by clean tarpaulin sheet. Based on the above, the exceedance is unlikely to be due to this Contract.	
Actions Taken / To Be Taken	The Contractor has been reminded to implement the required mitigation measures as per the EP, approved EIA and Updated EM&A Manual including watering to maintain all exposed road surfaces and dust sources wet, use of sprinklers for water spraying, covering the materials having the potential to create dust by clean tarpaulin, use of water truck and watering on all exposed soil within the Project site throughout the construction period.	
Remarks	The monitoring results and the locations of air quality monitoring stations are attached.	

ERM

Annex A Photos provided by the Contractor

*Note: Photos taken on 28/7/2019

Water truck was used for water spraying to prevent dust. (Works Area Portion N-A)

Exposed soil are covered by tarpaulin sheet. (Works Area Portion N-C)

Air quality monitoring results on 28/7/2019								
Project	Contract	Date	Station	Weather	Start time	Parameters	Results	Unit
TMCLKL	HY/2012/08	28/7/2019	AQMS1	Sunny	8:51	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	28/7/2019	AQMS1	Sunny	9:33	1-hour TSP	165	ug/m3
TMCLKL	HY/2012/08	28/7/2019	AQMS1	Sunny	10:55	1-hour TSP	77	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR1	Sunny	8:40	1-hour TSP	64	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR1	Sunny	9:42	1-hour TSP	646	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR1	Sunny	10:44	1-hour TSP	108	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR10	Sunny	8:05	1-hour TSP	21	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR10	Sunny	9:07	1-hour TSP	105	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR10	Sunny	10:09	1-hour TSP	35	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR5	Sunny	8:28	1-hour TSP	52	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR5	Sunny	9:30	1-hour TSP	410	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR5	Sunny	10:32	1-hour TSP	123	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR6	Sunny	8:16	1-hour TSP	37	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR6	Sunny	9:18	1-hour TSP	175	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR6	Sunny	10:20	1-hour TSP	152	ug/m3
TMCLKL	HY/2012/08	28/7/2019	AQMS1	Sunny	11:57	24-hour TSP	39	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR1	Sunny	11:46	24-hour TSP	84	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR10	Sunny	11:11	24-hour TSP	23	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR5	Sunny	11:34	24-hour TSP	57	ug/m3
TMCLKL	HY/2012/08	28/7/2019	ASR6	Sunny	11:22	24-hour TSP	32	ug/m3

Meteorological Data for Impact Monitoring in the reporting period			
Date (yy-mm-dd)	**Time (24hrs)**	**Average of Wind Speed (m/s)**	**Average of Wind Direction(degree)**
19/07/28	0:00	0	-
19/07/28	1:00	0	-
19/07/28	2:00	0	-
19/07/28	3:00	0	-
19/07/28	4:00	0	-
19/07/28	5:00	0	-
19/07/28	6:00	0	-
19/07/28	7:00	0	-
19/07/28	8:00	1.3	271
19/07/28	9:00	0.9	199
19/07/28	10:00	0	-
19/07/28	11:00	0	-
19/07/28	12:00	0.4	115
19/07/28	13:00	1.3	202
19/07/28	14:00	0.9	203
19/07/28	15:00	1.8	131
19/07/28	16:00	0.4	180
19/07/28	17:00	0.4	101
19/07/28	18:00	0.9	89
19/07/28	19:00	0.4	80
19/07/28	20:00	0.4	79
19/07/28	21:00	0.4	95
19/07/28	22:00	0	-
19/07/28	23:00	0.9	61

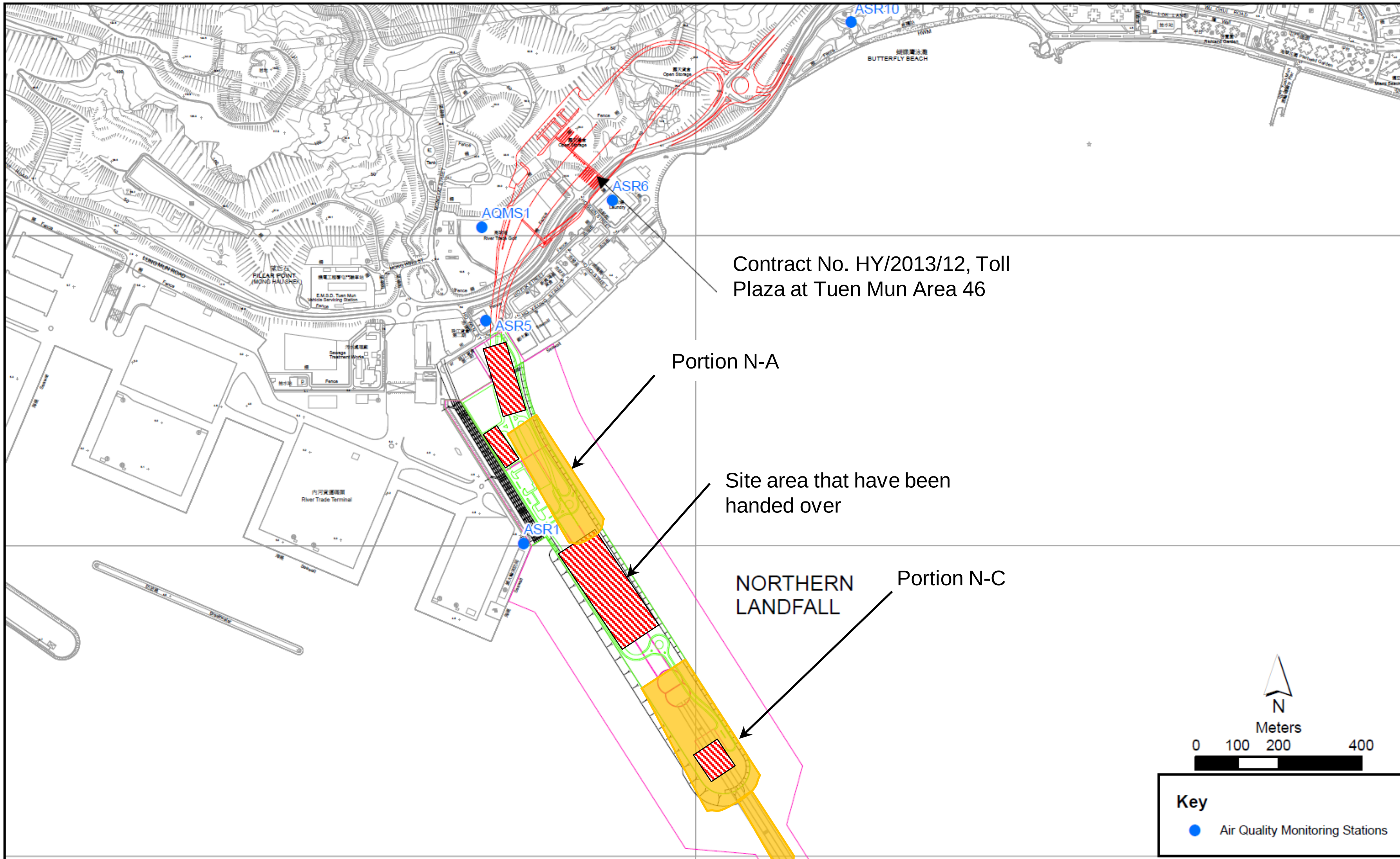


Figure 1

Indicative Construction Works Area on 28 July 2019

DATE: 06/03/2013

Environmental Resources Management

ERM

Dragages Hong Kong 香港寶嘉 | Dragages - Bouygues Joint Venture 寶嘉 · 布依格聯營

Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section

Weekly Water Spraying Record
每週灑水檢查記錄

Site Location 地盤位置: __Northern Landfall____

Date 日期: 22 Jul 2019 to 至 28 Jul 2019

	Time 時間	Monday 星期一	Tuesday 星期二	Wednesday 星期三	Thursday 星期四	Friday 星期五	Saturday 星期六	Sunday 星期日
1	8:00 – 8:45	√	√	√	√	√	√	√
2	8:45 – 9:30	√	√	√	√	√	√	√
3	9:30 – 10:15	√	√	√	√	√	√	√
4	10:15 – 11:00	√	√	√	√	√	√	√
5	11:00 – 11:45	√	√	√	√	√	√	√
6	11:45 – 12:30	√	√	√	√	√	√	√
7	12:30 – 13:15	√	√	√	√	√	√	√
8	13:15 – 14:00	√	√	√	√	√	√	√
9	14:00 – 14:45	√	√	√	√	√	√	√
10	14:45 – 15:30	√	√	√	√	√	√	√
11	15:30 – 16:45	√	√	√	√	√	√	√
12	16:45 – 17:30	√	√	√	√	√	√	√
	Verified by Site Foreman 地盤科文簽署確認	周	周	周	周	周	周	周

Night shift 夜間工作 (if necessary 如需要)								
	17:30 – 19:00							
	19:00 – 20:30							
	20:30 – 22:00							
	22:00 – 23:00							

*Please - tick (√) in the box if complete the spraying of water.
circle (O) in the box if it is raining.

*如果 - 已經完成灑水，請於方格內加上剔號(√)。
是下雨天， 請於方格內加上圓圈(O)。

Remarks:

(1) Pursuant to EP Clause 3.15, the Permit Holder shall undertake watering at least 12 times per day on all exposed soil within the Project site and associated work areas in Tuen Mun area throughout the construction phase.
(2) Spraying position includes the main haul road, open area, slopes, stockpiles and any other dusty materials.
(3) If it is raining, no water spraying is needed.
(4) The no of spraying will be increased due to site condition.

備註:

(1) 根據環境許可證 3. 15 條例，在整個施工階段內，許可證持有人須每天至少 12 次在屯門區項目工地和相關的工作區域內的所有暴露土壤灑水。
(2) 灑水位置包括主要運輸道路，空曠地帶，斜坡，存料堆，以及任何其他產生塵埃物料。
(3) 當下雨時，地盤將不需要灑水。
(4) 如果地盤情況更改或有需要時，灑水次數會相應增加。

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

ERM

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	12 July 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_14 June 2019_ Middle DO_E_Station IS17
0212330_14 June 2019_ Middle DO_E_Station IS17
0212330_14 June 2019_ Middle DO_F_Station IS(Mf)11
0212330_14 June 2019_ Middle DO_F_Station IS(Mf)11

A total of Four Action Level Exceedances were recorded on 14 June 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

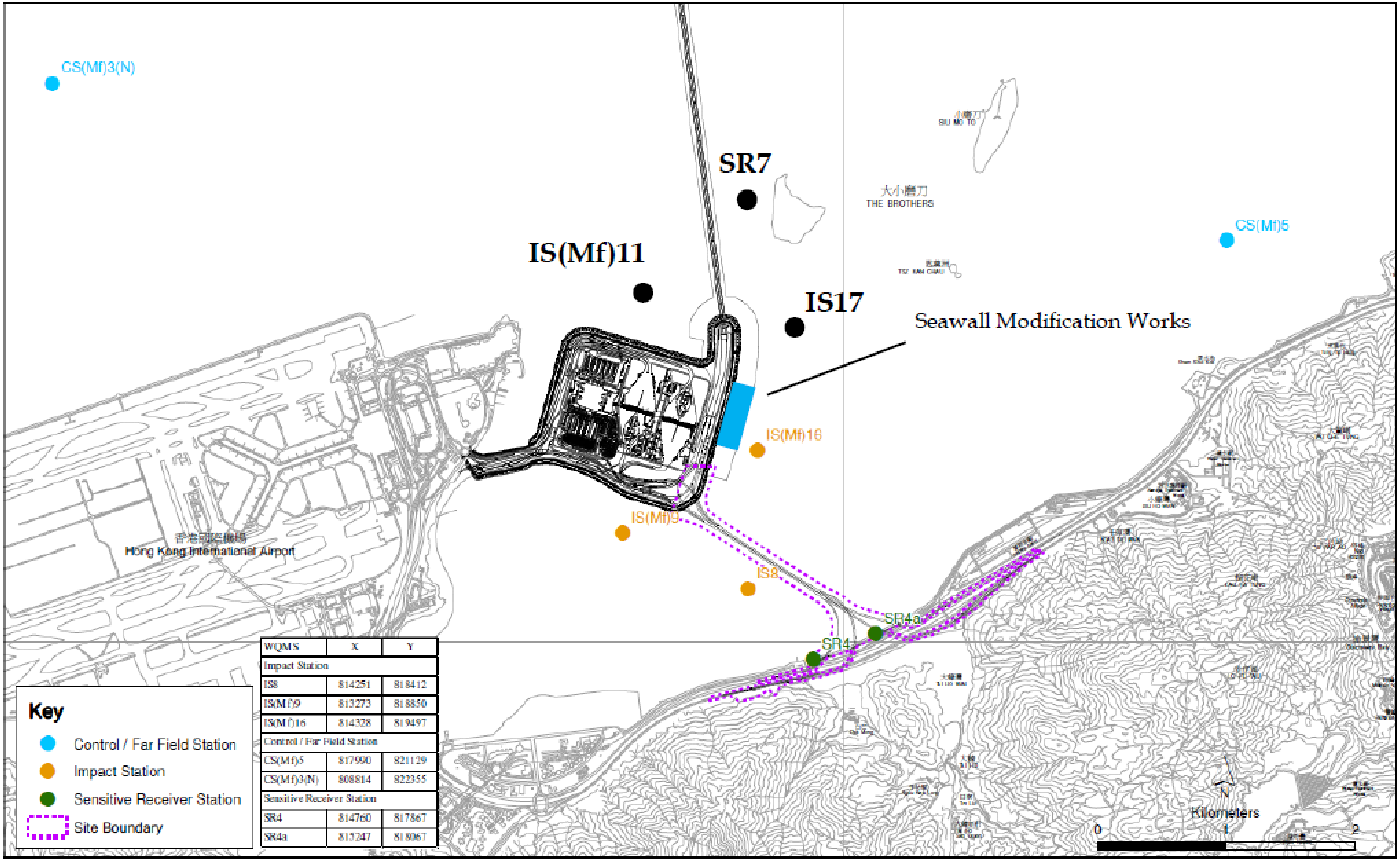
CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_14 June 2019_ Middle DO_E_Station IS17** **0212330_14 June 2019_ Middle DO_E_Station IS17** **0212330_14 June 2019_ Middle DO_F_Station IS(Mf)11** **0212330_14 June 2019_ Middle DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 4]**		
Date	14 June 2019 (Measured) 17 June 2019 (*In situ* results received by ERM) 24 June 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N), IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at IS17 (4.8 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS17 (4.9 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.9 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.9 mg/L) during mid- flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, seawall modification works was carried out on 14 June 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • Silt curtain has been deployed to mitigate the water quality impact. • Apart from observed exceedances, SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day. • IS17 and IS(Mf)11 are far away (>1 km) from the Marine works area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded at IS(Mf)16. Therefore, the exceedance is unlikely to be related to this Contract.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 14 June 2019 and locations of water quality monitoring stations are attached.		

Project	Works	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS(Mf)11	11:10	Surface	1	1	28.4	7.7	9.2	5.2	5.1	6.4	5.4	4.8	4.2
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS(Mf)11	11:10	Surface	1	2	28.4	7.7	9.2	5.2		6.4		4.5	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS(Mf)11	11:10	Middle	2	1	28.3	7.7	9.2	5.1		4.8		4.6	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS(Mf)11	11:10	Middle	2	2	28.3	7.7	9.2	5.2		4.8		3.7	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS(Mf)11	11:10	Bottom	3	1	28.3	7.7	9.2	4.9		4.8		3.8	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS(Mf)11	11:10	Bottom	3	2	28.3	7.7	9.2	4.9		4.9		4.0	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	SR7	11:02	Surface	1	1	28.4	7.8	9.7	5.1	4.9	6.2	5.2	3.8	4.6
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	SR7	11:02	Surface	1	2	28.4	7.8	9.7	5.1		6.3		4.6	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	SR7	11:02	Middle	2	1									
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	SR7	11:02	Middle	2	2									
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	SR7	11:02	Bottom	3	1	28.4	7.8	10.1	4.7		4.1		5.4	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	SR7	11:02	Bottom	3	2	28.4	7.8	10.1	4.8		4.1		4.4	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS17	12:12	Surface	1	1	28.5	7.8	11.1	5.2	4.9	5.0	6.8	3.5	3.9
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS17	12:12	Surface	1	2	28.5	7.8	11.1	5.2		4.9		4.0	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS17	12:12	Middle	2	1	28.5	7.8	11.1	4.8		5.3		4.0	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS17	12:12	Middle	2	2	28.5	7.8	11.1	4.9		5.3		2.8	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS17	12:12	Bottom	3	1	28.6	7.8	11.2	4.7		10.2		5.1	
TMCLKL	HY/2012/08	2019/06/14	Mid-Ebb	IS17	12:12	Bottom	3	2	28.6	7.8	11.2	4.7		10.1		3.9	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS(Mf)11	17:18	Surface	1	1	28.4	7.9	13.7	5.1	4.9	3.9	4.3	2.4	2.6
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS(Mf)11	17:18	Surface	1	2	28.5	7.9	13.7	5.1		4.0		3.4	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS(Mf)11	17:18	Middle	2	1	29.0	7.9	13.1	4.9		4.3		1.6	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS(Mf)11	17:18	Middle	2	2	29.0	7.9	13.1	4.9		4.3		1.9	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS(Mf)11	17:18	Bottom	3	1	29.5	7.9	12.7	4.8		4.5		3.6	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS(Mf)11	17:18	Bottom	3	2	29.4	7.9	12.7	4.8		4.5		2.5	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	SR7	17:25	Surface	1	1	28.5	7.8	12.0	5.1	5.0	4.3	5.5	3.3	3.5
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	SR7	17:25	Surface	1	2	28.5	7.8	12.0	5.1		4.3		4.0	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	SR7	17:25	Middle	2	1									
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	SR7	17:25	Middle	2	2									
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	SR7	17:25	Bottom	3	1	28.5	7.9	11.6	4.9		6.6		2.6	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	SR7	17:25	Bottom	3	2	28.5	7.9	11.6	4.9		6.7		4.2	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS17	16:19	Surface	1	1	28.5	7.9	13.9	6.5	6.1	3.8	3.6	2.4	3.2
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS17	16:19	Surface	1	2	28.6	7.9	13.8	6.5		4.0		2.3	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS17	16:19	Middle	2	1	29.1	7.9	12.7	6.2		3.9		4.8	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS17	16:19	Middle	2	2	29.1	7.9	12.7	6.2		3.7		4.3	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS17	16:19	Bottom	3	1	29.0	7.9	12.8	5.7		3.0		2.1	
TMCLKL	HY/2012/08	2019/06/14	Mid-flood	IS17	16:19	Bottom	3	2	29.0	7.9	12.8	5.7		3.0		3.3	

Note: Indicates Ex 2017/11/01
Indicates Ex 2017/11/01



WQMS	X	Y
Impact Station		
IS8	814251	818412
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4	814760	817867
SR4a	815247	818067

Figure 2.2

Water Quality Monitoring Stations

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

ERM

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	12 July 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_17 June 2019_ Middle DO_E_Station IS(Mf)11
0212330_17 June 2019_ Middle DO_E_Station IS(Mf)11
0212330_17 June 2019_ Bottom DO_E_Station IS(Mf)11
0212330_17 June 2019_ Middle DO_F_Station IS(Mf)11
0212330_17 June 2019_ Middle DO_F_Station IS(Mf)11
0212330_17 June 2019_ Middle DO_F_Station IS17
0212330_17 June 2019_ Middle DO_F_Station IS17

A total of Seven Action Level Exceedances were recorded on 17 June 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

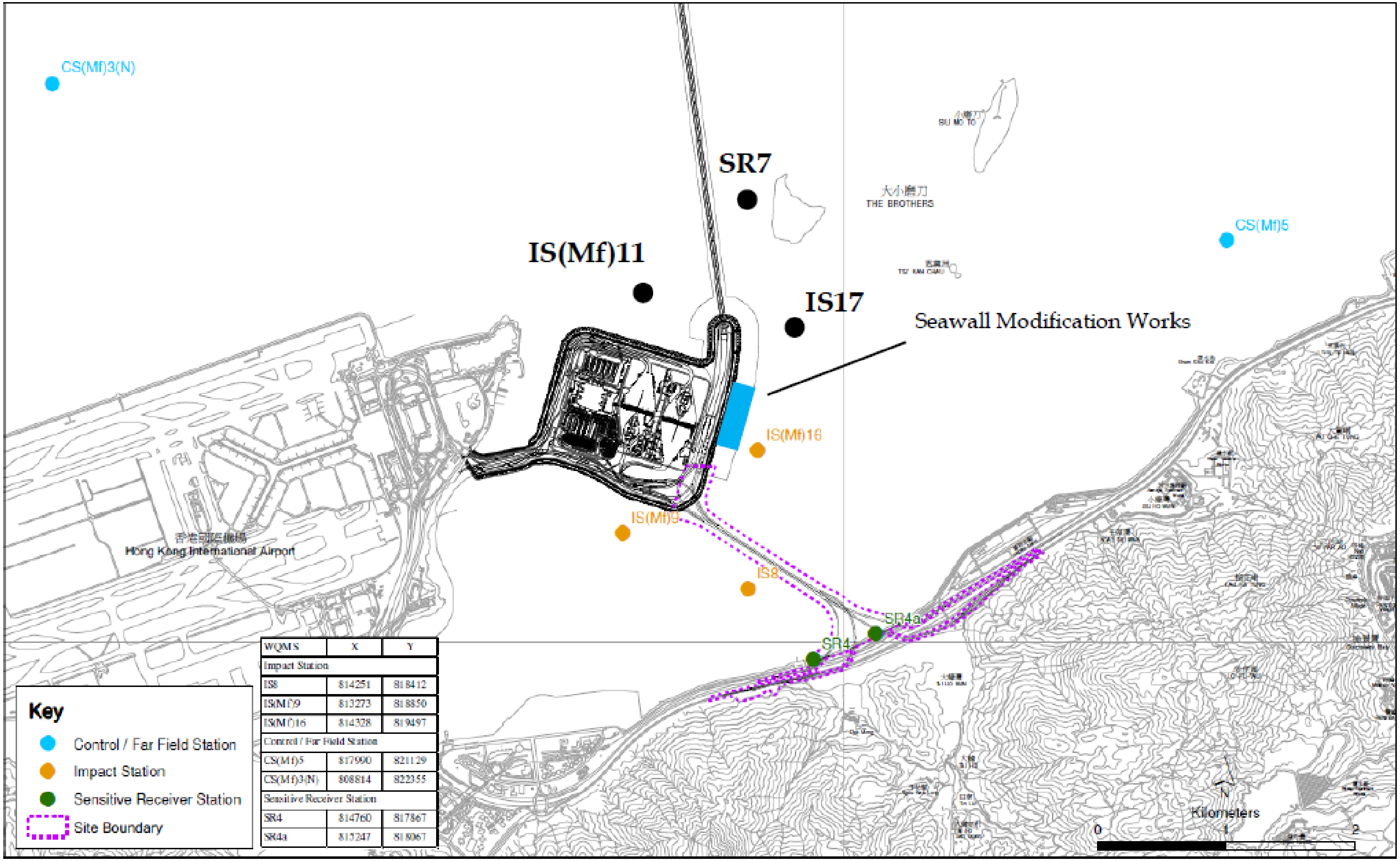
CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_17 June 2019_ Middle DO_E_Station IS(Mf)11** **0212330_17 June 2019_ Middle DO_E_Station IS(Mf)11** **0212330_17 June 2019_ Bottom DO_E_Station IS(Mf)11** **0212330_17 June 2019_ Middle DO_F_Station IS(Mf)11** **0212330_17 June 2019_ Middle DO_F_Station IS(Mf)11** **0212330_17 June 2019_ Middle DO_F_Station IS17** **0212330_17 June 2019_ Middle DO_F_Station IS17** **[Total No. of Exceedances = 7]**		
Date	17 June 2019 (Measured) 19 June 2019 (*In situ* results received by ERM) 25 June 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N), IS8, IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at IS(Mf)11 (4.6 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.6 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.6 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.9 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.9 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.5 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.5 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, seawall modification works was carried out on 17 June 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • Silt curtain has been deployed to mitigate the water quality impact. • Apart from observed exceedances, SS levels at all other monitoring stations were in compliance with the Action and Limit Levels during both mid-flood and mid-ebb tides on the same day. • IS17 and IS(Mf)11 are far away (>1 km) from the Marine works area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded at IS(Mf)16. Therefore, the exceedance is unlikely to be related to this Contract.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 17 June 2019 and locations of water quality monitoring stations are attached.		

Project	Works	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS(Mf)11	11:56	Surface	1	1	27.9	7.6	16.0	5.4	4.9	10.6	11.9	6.0	6.5
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS(Mf)11	11:56	Surface	1	2	27.9	7.7	16.0	5.4		10.6		6.0	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS(Mf)11	11:56	Middle	2	1	27.5	7.7	18.9	4.6		12.7		5.8	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS(Mf)11	11:56	Middle	2	2	27.5	7.7	18.8	4.6		12.8		6.4	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS(Mf)11	11:56	Bottom	3	1	27.3	7.7	22.4	4.7		12.4		6.7	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS(Mf)11	11:56	Bottom	3	2	27.3	7.7	22.4	4.6		12.4		7.9	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	SR7	12:50	Surface	1	1	28.0	7.7	15.3	5.7	5.6	10.1	11.6	3.1	3.9
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	SR7	12:50	Surface	1	2	28.0	7.7	15.3	5.7		9.9		3.3	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	SR7	12:50	Middle	2	1									
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	SR7	12:50	Middle	2	2									
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	SR7	12:50	Bottom	3	1	27.5	7.7	19.4	5.6		13.2		4.6	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	SR7	12:50	Bottom	3	2	27.5	7.7	19.4	5.5		13.1		4.7	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS17	11:47	Surface	1	1	27.9	7.8	18.0	6.4	5.7	10.0	10.9	7.5	7.4
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS17	11:47	Surface	1	2	27.9	7.8	18.1	6.4		10.0		6.9	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS17	11:47	Middle	2	1	27.6	7.8	19.3	5.5		11.2		7.7	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS17	11:47	Middle	2	2	27.6	7.8	19.3	5.5		11.2		7.2	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS17	11:47	Bottom	3	1	26.9	7.7	26.2	5.2		11.6		8.0	
TMCLKL	HY/2012/08	2019/06/17	Mid-Ebb	IS17	11:47	Bottom	3	2	26.9	7.7	26.2	5.1		11.6		7.1	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS(Mf)11	6:46	Surface	1	1	27.6	7.7	16.7	5.3	5.0	9.9	10.6	7.0	6.0
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS(Mf)11	6:46	Surface	1	2	27.6	7.7	16.8	5.3		10.0		6.3	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS(Mf)11	6:46	Middle	2	1	27.4	7.7	19.9	4.9		10.8		5.5	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS(Mf)11	6:46	Middle	2	2	27.4	7.7	19.6	4.9		10.8		4.8	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS(Mf)11	6:46	Bottom	3	1	27.4	7.7	19.8	4.8		10.9		6.1	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS(Mf)11	6:46	Bottom	3	2	27.4	7.7	19.7	4.8		10.9		6.1	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	SR7	6:54	Surface	1	1	27.4	7.7	19.2	5.0	4.9	11.5	12.6	5.6	5.6
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	SR7	6:54	Surface	1	2	27.4	7.7	19.1	5.0		11.6		5.7	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	SR7	6:54	Middle	2	1									
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	SR7	6:54	Middle	2	2									
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	SR7	6:54	Bottom	3	1	27.3	7.7	22.3	4.8		13.7		5.8	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	SR7	6:54	Bottom	3	2	27.3	7.7	22.3	4.8		13.6		5.3	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS17	7:02	Surface	1	1	27.6	7.8	18.7	5.5	4.9	9.8	10.6	6.9	6.3
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS17	7:02	Surface	1	2	27.6	7.8	18.8	5.5		9.8		7.2	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS17	7:02	Middle	2	1	27.5	7.7	20.1	4.5		10.3		5.6	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS17	7:02	Middle	2	2	27.4	7.7	20.1	4.5		10.4		6.4	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS17	7:02	Bottom	3	1	27.0	7.7	22.0	4.8		11.4		5.8	
TMCLKL	HY/2012/08	2019/06/17	Mid-flood	IS17	7:02	Bottom	3	2	27.0	7.7	21.4	4.8		11.8		5.7	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8	814251	818412
IS(Mf)9	813273	818850
IS(Mf)16	814328	819497
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR4	814760	817867
SR4a	815247	818067

Figure 1

Water Quality Monitoring Stations

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	23 July 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_3 July 2019_ Bottom DO_E_Station SR4a

A total of one Action Level Exceedance was recorded on 3 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK – NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

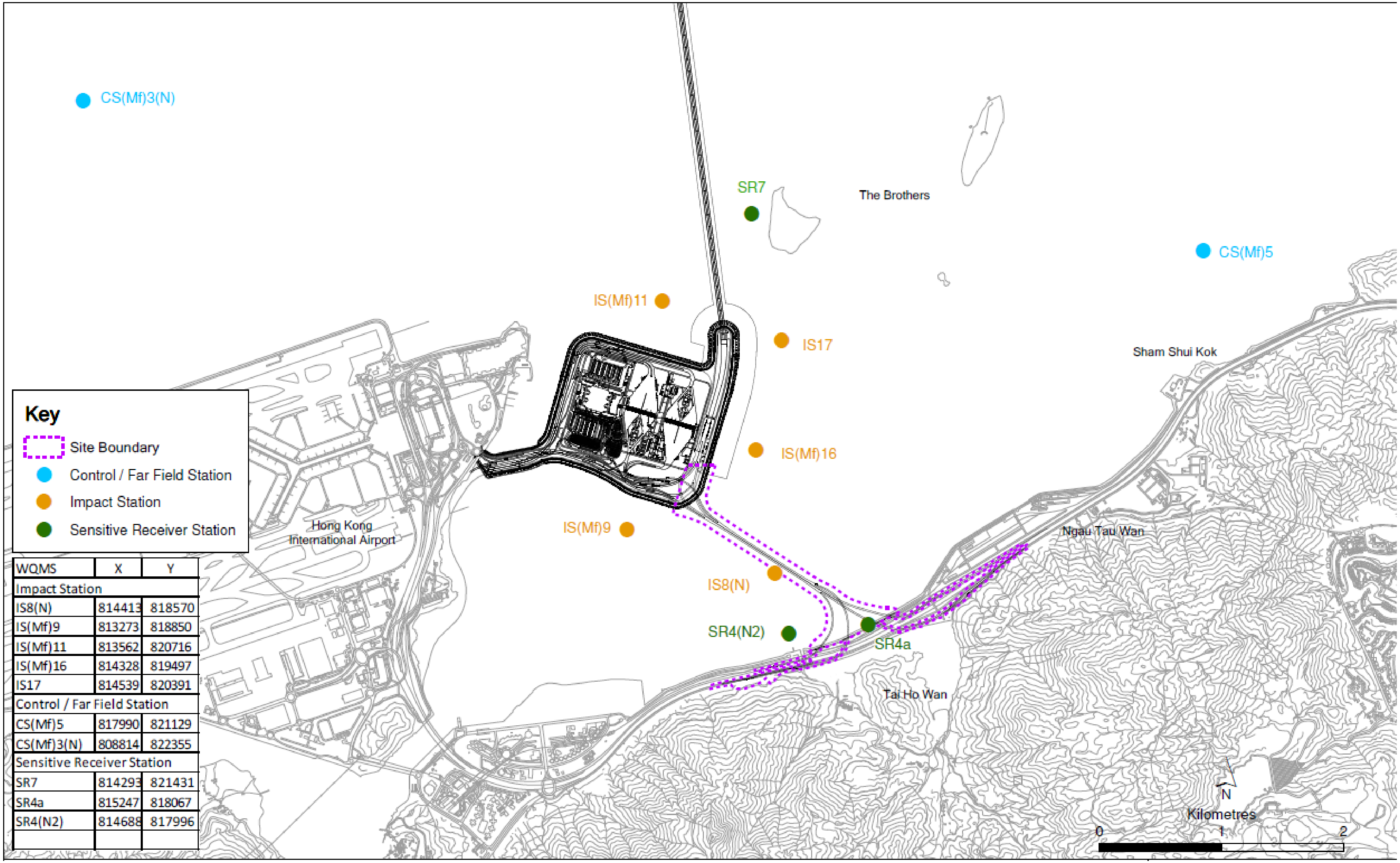
Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3">0212330_3 July 2019_ Bottom DO_E_Station SR4a
[Total No. of Exceedances = 1]</td></tr>
<tr><td>Date</td><td colspan="3">3 July 2019 (Measured)
5 July 2019 (In situ results received by ERM)
12 July 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO is observed at SR4a (4.6 mg/L) during mid-ebb tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, Removal of Jetty was carried out on 3 July 2019.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="3">The exceedances are unlikely to be due to the Project, in view of the following:
• All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.
• SR4a is far away (>2 km) from the Removal of Jetty (Figure 1), thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedance is unlikely to be related to this Contract.
• No effluent discharge was observed on site.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="3">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="3">The monitoring results on 3 July 2019 and locations of water quality monitoring stations are attached.</td></tr>
</table>

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^oC)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Surface	1	1	27.6	7.8	21.2	5.8	5.4	6.3	6.9	8.1	10.2
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Surface	1	2	28.1	8.0	20.8	5.7		5.6		8.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Middle	2	1	27.4	7.8	22.5	5.1		7.5		11.3	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Middle	2	2	27.9	8.0	22.1	5.0		7.0		11.5	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Bottom	3	1	27.4	7.8	22.6	5.2	5.2	8.0		11.4	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)5	13:39	Bottom	3	2	27.9	8.0	22.2	5.1		7.2		11.1	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Surface	1	1	27.6	7.9	20.7	6.2	6.1	5.0	7.7	8.7	8.8
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Surface	1	2	28.2	8.0	20.3	6.2		4.2		8.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Middle	2	1	27.5	7.8	21.3	6.0		9.8		8.5	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Middle	2	2	28.0	8.0	20.9	5.9		9.9		8.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Bottom	3	1	27.5	7.8	22.4	5.6	5.6	8.9		9.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	CS(Mf)3(N)	12:50	Bottom	3	2	28.1	8.0	21.9	5.5		8.3		8.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Surface	1	1	27.4	7.9	22.9	5.6	5.6	6.5	5.9	9.5	9.8
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Surface	1	2	27.9	8.1	22.4	5.6		6.2		9.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Bottom	3	1	27.1	7.8	24.2	5.5	5.4	5.9		9.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)16	12:07	Bottom	3	2	27.6	8.0	23.8	5.3		5.0		10.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Surface	1	1	27.6	8.0	21.2	6.4	6.4	5.2	7.3	7.9	8.4
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Surface	1	2	28.1	8.1	20.8	6.3		4.7		7.6	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Bottom	3	1	27.3	7.8	23.9	4.7	4.6	9.6		8.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4a	11:58	Bottom	3	2	27.8	8.0	23.4	4.5		9.6		9.2	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Surface	1	1	27.6	7.8	21.7	5.7	5.7	7.3	8.0	9.7	10.9
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Surface	1	2	28.1	8.0	21.2	5.7		7.7		10.1	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Bottom	3	1	27.5	7.8	22.2	5.4	5.4	7.7		11.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR4(N2)	11:54	Bottom	3	2	28.1	8.0	21.8	5.3		9.3		11.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Surface	1	1	27.7	8.0	21.4	6.5	6.5	7.4	7.2	10.8	11.1
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Surface	1	2	28.3	8.2	20.9	6.5		7.1		11.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Bottom	3	1	27.5	7.8	22.8	5.6	5.6	7.2		11.2	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS8(N)	11:48	Bottom	3	2	28.0	8.0	22.3	5.5		7.0		11.3	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Surface	1	1					6.8		9.2		10.8
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Surface	1	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Middle	2	1	27.6	7.8	20.4	6.8		9.1		10.6	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Middle	2	2	28.2	8.0	19.9	6.7		9.2		10.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)9	11:40	Bottom	3	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)11	13:14	Surface	1	1	27.6	7.8	21.3	5.8	5.5	6.1	6.7	6.4	7.0
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)11	13:14	Surface	1	2	28.1	8.0	20.9	5.7		5.5		6.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)11	13:14	Middle	2	1	27.4	7.8	22.4	5.2		7.4		6.6	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)11	13:14	Middle	2	2	27.9	8.0	22.0	5.1		7.2		6.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)11	13:14	Bottom	3	1	27.3	7.8	22.7	5.4	5.4	7.1		7.6	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS(Mf)11	13:14	Bottom	3	2	27.9	8.0	22.2	5.3		7.1		7.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR7	13:21	Surface	1	1	27.6	7.8	21.4	5.6	5.6	6.9	6.7	8.0	8.4
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR7	13:21	Surface	1	2	28.1	8.0	21.1	5.5		6.3		7.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR7	13:21	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR7	13:21	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR7	13:21	Bottom	3	1	27.6	7.8	21.5	5.7	5.7	7.1		9.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	SR7	13:21	Bottom	3	2	28.1	8.0	21.1	5.6		6.6		8.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS17	12:13	Surface	1	1	27.5	7.9	21.5	6.4	6.1	7.1	7.7	8.5	9.9
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS17	12:13	Surface	1	2	28.1	8.1	21.1	6.4		6.7		8.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS17	12:13	Middle	2	1	27.3	7.9	22.1	5.8		8.5		10.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS17	12:13	Middle	2	2	27.8	8.1	21.7	5.7		8.1		10.4	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS17	12:13	Bottom	3	1	27.4	7.9	24.0	5.5	5.5	8.0		10.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-Ebb	IS17	12:13	Bottom	3	2	27.9	8.1	23.6	5.4		7.7		11.1	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)5	5:32	Surface	1	1	27.6	7.8	20.7	5.7	5.3	2.6	5.6	3.1	3.5
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)5	5:32	Surface	1	2	28.1	8.0	20.3	5.6		2.7		3.4	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)5	5:32	Middle	2	1	27.2	7.7	23.9	5.0		4.1		3.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)5	5:32	Middle	2	2	27.7	8.0	23.5	4.9		4.5		3.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)5	5:32	Bottom	3	1	26.5	7.7	27.1	4.3	4.3	9.8		3.5	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)5	5:32	Bottom	3	2	27.0	7.9	26.7	4.2		9.8		3.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)3(N)	6:23	Surface	1	1	27.7	7.8	19.1	6.0	5.8	3.0	9.6	4.0	4.2
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)3(N)	6:23	Surface	1	2	28.3	8.0	18.8	5.9		2.4		4.3	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)3(N)	6:23	Middle	2	1	27.8	7.8	20.5	5.7		12.7		3.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)3(N)	6:23	Middle	2	2	28.4	8.0	20.1	5.6		13.0		4.2	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)3(N)	6:23	Bottom	3	1	27.8	7.8	20.6	5.7	5.7	13.3		4.2	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	CS(Mf)3(N)	6:23	Bottom	3	2	28.4	8.0	20.2	5.6		13.4		4.5	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)16	7:10	Surface	1	1	27.6	7.9	21.5	6.1	6.1	4.6	4.6	5.0	5.0
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)16	7:10	Surface	1	2	28.1	8.1	21.2	6.0		4.1		5.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)16	7:10	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)16	7:10	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)16	7:10	Bottom	3	1	27.5	7.9	21.7	6.1	6.1	4.8		5.1	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)16	7:10	Bottom	3	2	28.1	8.1	21.3	6.0		4.9		4.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4a	7:18	Surface	1	1	27.7	7.9	21.3	6.4	6.4	4.4	4.6	4.1	4.5
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4a	7:18	Surface	1	2	28.2	8.1	20.9	6.3		4.5		4.4	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4a	7:18	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4a	7:18	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4a	7:18	Bottom	3	1	27.7	7.9	21.8	6.5	6.5	4.6		4.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4a	7:18	Bottom	3	2	28.2	8.1	21.4	6.4		4.8		4.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4(N2)	7:25	Surface	1	1	27.5	7.9	20.6	6.5	6.5	3.7	3.9	4.4	4.6
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4(N2)	7:25	Surface	1	2	28.1	8.1	20.2	6.5		3.8		4.1	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4(N2)	7:25	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4(N2)	7:25	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4(N2)	7:25	Bottom	3	1	27.5	7.9	20.7	6.6	6.6	4.0		4.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR4(N2)	7:25	Bottom	3	2	28.1	8.1	20.3	6.6		3.9		5.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS8(N)	7:30	Surface	1	1	27.7	7.9	21.1	6.2	6.2	5.2	4.9	4.0	4.6
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS8(N)	7:30	Surface	1	2	28.3	8.1	20.7	6.1		5.4		4.3	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS8(N)	7:30	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS8(N)	7:30	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS8(N)	7:30	Bottom	3	1	27.7	7.9	21.1	6.2	6.2	4.6		4.9	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS8(N)	7:30	Bottom	3	2	28.3	8.1	20.7	6.1		4.5		5.3	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)9	7:38	Surface	1	1					6.4		5.8		4.9
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)9	7:38	Surface	1	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)9	7:38	Middle	2	1	27.6	7.9	21.4	6.4		5.6		5.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)9	7:38	Middle	2	2	28.1	8.1	21.0	6.3		5.9		4.8	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)9	7:38	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)9	7:38	Bottom	3	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)11	6:00	Surface	1	1	27.6	7.9	21.2	5.7	5.3	4.6	8.7	4.1	3.9
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)11	6:00	Surface	1	2	28.1	8.0	20.9	5.7		3.8		3.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)11	6:00	Middle	2	1	27.1	7.8	24.3	4.9		9.9			
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)11	6:00	Middle	2	2	27.6	8.0	24.0	4.8		9.2			
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)11	6:00	Bottom	3	1	27.0	7.8	24.7	4.9	4.9	11.5		3.6	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS(Mf)11	6:00	Bottom	3	2	27.5	8.0	24.3	4.8		13.2		4.2	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR7	5:55	Surface	1	1	27.5	7.8	20.0	6.0	6.0	4.4	4.9	3.3	2.9
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR7	5:55	Surface	1	2	28.1	8.0	19.6	5.9		3.6		3.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR7	5:55	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR7	5:55	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR7	5:55	Bottom	3	1	27.4	7.8	22.0	5.6	5.6	6.1		2.7	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	SR7	5:55	Bottom	3	2	27.9	7.9	21.7	5.5		5.6		2.6	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS17	7:01	Surface	1	1	27.5	7.9	21.7	5.8	5.4	3.5	5.5	4.3	4.6
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS17	7:01	Surface	1	2	28.0	8.0	21.3	5.7		3.6		4.4	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS17	7:01	Middle	2	1	27.1	7.8	23.4	5.1		4.6			
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS17	7:01	Middle	2	2	27.7	8.0	23.0	5.1		3.7			
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS17	7:01	Bottom	3	1	26.8	7.8	25.9	4.7	4.7	8.9		5.0	
TMCLKL	HY/2012/08	2019/07/03	Mid-flood	IS17	7:01	Bottom	3	2	27.3	8.0	25.5	4.6		8.8		4.7	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	23 July 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_5 July 2019_ Bottom DO_F_Station IS17

A total of one Action Level Exceedance was recorded on 5 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

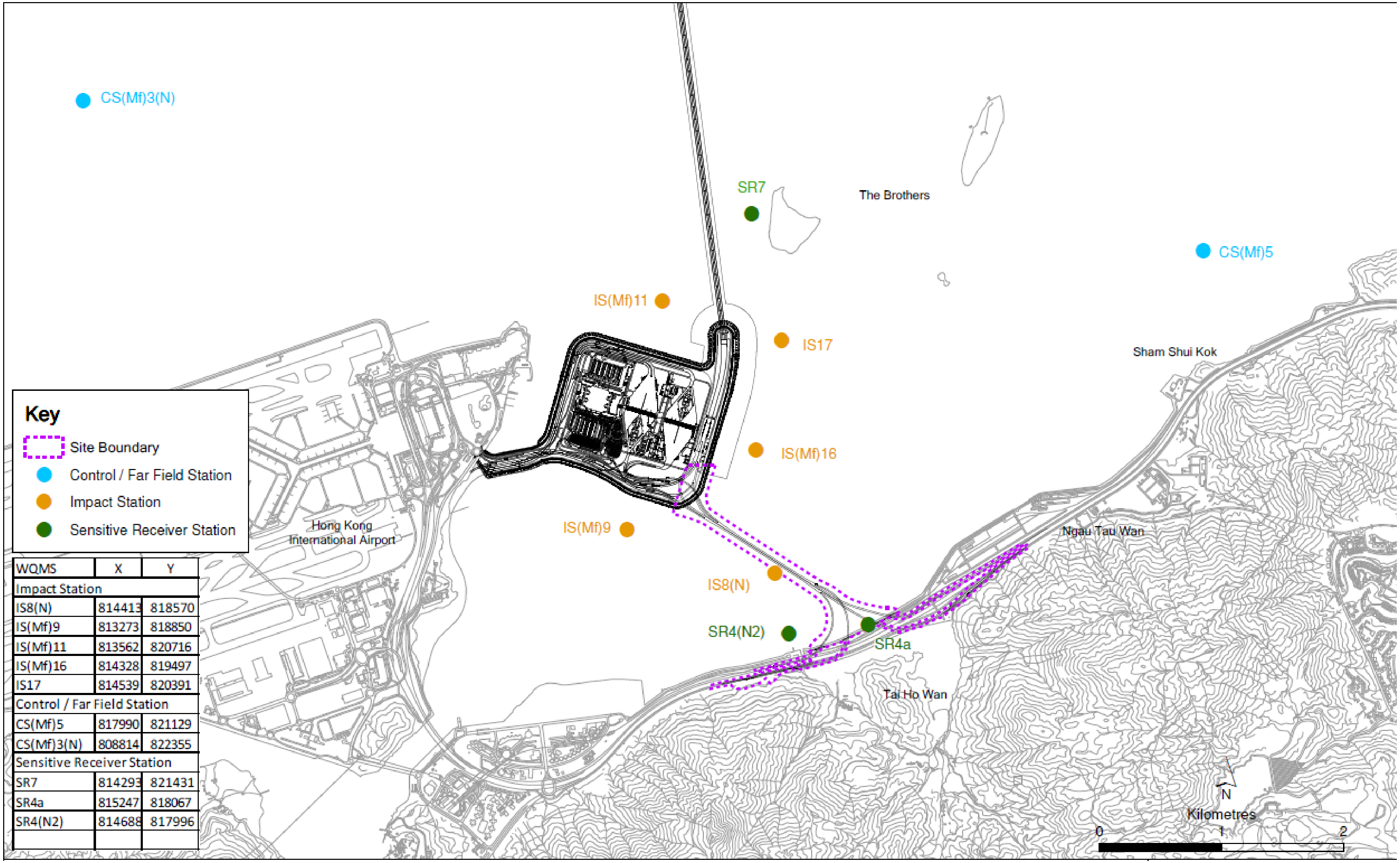
Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_5 July 2019_ Bottom DO_F_Station IS17** **[Total No. of Exceedances = 1]**		
Date	5 July 2019 (Measured) 7 July 2019 (*In situ* results received by ERM) 16 July 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at IS17 (4.6 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Removal of Jetty was carried out on 5 July 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS17 is far away (>1.5 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedance is unlikely to be related to this Contract. • Bottom-depth DO levels at IS17 were similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • No effluent discharge was observed on site.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 5 July 2019 and locations of water quality monitoring stations are attached.		

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)5	15:02	Surface	1	1	28.1	7.7	16.6	5.5	5.4	7.5	7.8	8.5	8.9
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)5	15:02	Surface	1	2	28.7	7.9	16.2	5.5		6.4		8.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)5	15:02	Middle	2	1	27.8	7.7	17.4	5.3		8.0		8.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)5	15:02	Middle	2	2	28.3	7.9	17.1	5.2		7.0		8.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)5	15:02	Bottom	3	1	27.3	7.7	21.8	4.7	4.7	9.0		9.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)5	15:02	Bottom	3	2	27.8	7.9	21.4	4.7		8.7		9.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)3(N)	14:19	Surface	1	1	28.3	7.7	14.7	5.7	5.7	6.2	7.6	8.1	8.8
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)3(N)	14:19	Surface	1	2	28.9	7.8	14.4	5.6		5.6		8.0	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)3(N)	14:19	Middle	2	1	28.2	7.7	15.2	5.7		8.5		8.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)3(N)	14:19	Middle	2	2	28.7	7.8	14.8	5.6		7.8		8.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)3(N)	14:19	Bottom	3	1	28.2	7.7	15.8	5.8	5.7	8.9		9.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	CS(Mf)3(N)	14:19	Bottom	3	2	28.8	7.9	15.5	5.6		8.7		10.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)16	13:33	Surface	1	1	27.9	7.7	18.8	5.3	5.4	7.3	7.2	9.5	10.4
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)16	13:33	Surface	1	2	28.5	7.9	18.3	5.4		6.7		9.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)16	13:33	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)16	13:33	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)16	13:33	Bottom	3	1	27.6	7.7	20.2	5.1	5.1	7.8		11.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)16	13:33	Bottom	3	2	28.2	7.9	19.9	5.0		7.1		11.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4a	13:24	Surface	1	1	27.9	7.7	17.6	5.3	5.3	6.6	12.5	12.1	12.4
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4a	13:24	Surface	1	2	28.5	7.9	17.2	5.2		6.7		11.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4a	13:24	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4a	13:24	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4a	13:24	Bottom	3	1	27.7	7.7	19.2	5.1	5.0	17.2		13.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4a	13:24	Bottom	3	2	28.3	7.9	18.8	4.9		19.6		12.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4(N2)	13:20	Surface	1	1	28.2	7.7	17.4	5.4	5.4	7.6	7.8	10.4	10.4
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4(N2)	13:20	Surface	1	2	28.7	7.9	17.0	5.3		6.7		10.5	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4(N2)	13:20	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4(N2)	13:20	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4(N2)	13:20	Bottom	3	1	28.0	7.7	17.6	5.5	5.4	8.7		10.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR4(N2)	13:20	Bottom	3	2	28.5	7.9	17.3	5.3		8.2		10.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS8(N)	13:17	Surface	1	1	28.1	7.8	18.0	5.7	5.7	8.4	9.6	7.2	8.3
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS8(N)	13:17	Surface	1	2	28.7	7.9	17.6	5.6		7.9		7.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS8(N)	13:17	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS8(N)	13:17	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS8(N)	13:17	Bottom	3	1	28.0	7.8	18.7	5.7	5.6	11.2		9.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS8(N)	13:17	Bottom	3	2	28.5	7.9	18.4	5.5		10.7		9.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)9	13:12	Surface	1	1	28.4	7.8	17.2	6.1	6.1	4.5	5.0	4.8	5.0
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)9	13:12	Surface	1	2	29.0	8.0	16.8	6.0		4.5		4.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)9	13:12	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)9	13:12	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)9	13:12	Bottom	3	1	28.3	7.8	17.9	6.1	6.1	5.9		5.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)9	13:12	Bottom	3	2	28.9	8.0	17.5	6.0		5.1		5.3	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)11	13:47	Surface	1	1	28.4	7.7	15.3	5.8	5.7	4.5	6.7	5.8	6.4
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)11	13:47	Surface	1	2	28.9	7.9	15.0	5.7		3.8		6.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)11	13:47	Middle	2	1	28.0	7.7	16.6	5.7		8.2		6.3	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)11	13:47	Middle	2	2	28.6	7.9	16.2	5.6		8.0		6.5	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)11	13:47	Bottom	3	1	28.0	7.7	16.7	5.8	5.8	8.2		6.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS(Mf)11	13:47	Bottom	3	2	28.6	7.9	16.3	5.7		7.7		6.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR7	14:42	Surface	1	1	28.3	7.7	15.9	5.8	5.8	7.0	7.2	9.0	9.2
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR7	14:42	Surface	1	2	28.9	7.9	15.5	5.7		6.3		8.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR7	14:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR7	14:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR7	14:42	Bottom	3	1	28.3	7.7	16.1	5.7	5.7	8.2		9.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	SR7	14:42	Bottom	3	2	28.8	7.9	15.8	5.6		7.3		9.5	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS17	13:48	Surface	1	1	28.4	7.7	15.4	5.8	5.6	5.6	5.4	8.8	11.9
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS17	13:48	Surface	1	2	28.9	7.9	15.1	5.7		4.8		9.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS17	13:48	Middle	2	1	28.0	7.7	18.5	5.4		5.8		12.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS17	13:48	Middle	2	2	28.6	7.9	18.0	5.4		5.2		13.1	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS17	13:48	Bottom	3	1	27.6	7.7	18.2	5.1	5.0	5.4		13.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-Ebb	IS17	13:48	Bottom	3	2	28.2	7.9	18.2	4.9		5.3		14.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)5	7:31	Surface	1	1	28.0	7.6	15.3	5.4	5.2	4.0	5.1	10.6	14.5
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)5	7:31	Surface	1	2	28.6	7.8	15.0	5.4		3.3		10.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)5	7:31	Middle	2	1	27.7	7.6	19.7	5.0		3.8		13.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)5	7:31	Middle	2	2	28.3	7.9	19.3	4.9		3.9		14.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)5	7:31	Bottom	3	1	26.8	7.6	25.7	4.3	4.3	8.5		18.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)5	7:31	Bottom	3	2	27.4	7.8	25.2	4.2		7.2		18.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)3(N)	8:14	Surface	1	1	28.0	7.6	15.8	5.5	5.5	10.9	12.2	10.6	11.4
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)3(N)	8:14	Surface	1	2	28.5	7.8	15.5	5.4		10.6		10.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)3(N)	8:14	Middle	2	1	28.0	7.6	15.8	5.5		11.8		11.3	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)3(N)	8:14	Middle	2	2	28.5	7.8	15.5	5.4		11.5		11.0	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)3(N)	8:14	Bottom	3	1	28.0	7.6	15.9	5.6	5.5	13.7		12.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	CS(Mf)3(N)	8:14	Bottom	3	2	28.5	7.8	15.6	5.4		14.7		12.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)16	9:00	Surface	1	1	27.9	7.7	16.8	5.5	5.5	5.6	4.8	4.2	5.4
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)16	9:00	Surface	1	2	28.5	7.9	16.5	5.4		4.6		3.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)16	9:00	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)16	9:00	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)16	9:00	Bottom	3	1	27.9	7.7	17.5	5.6	5.5	4.5		6.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)16	9:00	Bottom	3	2	28.5	7.9	17.1	5.4		4.4		6.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4a	9:09	Surface	1	1	28.0	7.7	16.0	5.6	5.5	5.4	5.5	6.5	7.8
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4a	9:09	Surface	1	2	28.5	7.8	15.7	5.4		4.4		6.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4a	9:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4a	9:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4a	9:09	Bottom	3	1	27.9	7.7	17.1	5.6	5.6	6.4		8.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4a	9:09	Bottom	3	2	28.5	7.9	16.8	5.5		5.8		9.0	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4(N2)	9:13	Surface	1	1	28.0	7.6	15.5	5.7	5.7	4.6	4.4	4.8	4.8
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4(N2)	9:13	Surface	1	2	28.6	7.8	15.2	5.6		4.0		4.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4(N2)	9:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4(N2)	9:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4(N2)	9:13	Bottom	3	1	28.0	7.7	15.8	5.8	5.8	4.8		4.8	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR4(N2)	9:13	Bottom	3	2	28.5	7.8	15.5	5.7		4.0		5.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS8(N)	9:19	Surface	1	1	28.0	7.7	15.9	5.5	5.5	8.5	9.0	9.6	10.3
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS8(N)	9:19	Surface	1	2	28.5	7.8	15.5	5.4		7.8		9.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS8(N)	9:19	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS8(N)	9:19	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS8(N)	9:19	Bottom	3	1	27.9	7.7	16.9	5.6	5.5	9.8		11.0	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS8(N)	9:19	Bottom	3	2	28.5	7.8	16.7	5.4		9.7		11.3	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)9	9:26	Surface	1	1	27.9	7.7	16.5	5.7	5.6	5.6	5.3	4.1	6.0
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)9	9:26	Surface	1	2	28.5	7.8	16.2	5.5		4.9		3.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)9	9:26	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)9	9:26	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)9	9:26	Bottom	3	1	27.9	7.7	16.6	5.8	5.7	5.7		8.3	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)9	9:26	Bottom	3	2	28.5	7.9	16.3	5.6		5.0		7.9	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)11	8:44	Surface	1	1	27.8	7.7	17.0	5.2	5.1	6.6	10.3	6.2	7.6
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)11	8:44	Surface	1	2	28.4	7.9	16.6	5.2		6.0		5.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)11	8:44	Middle	2	1	27.6	7.7	20.0	5.0		10.9		7.6	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)11	8:44	Middle	2	2	28.2	7.9	19.6	4.9		10.6		7.5	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)11	8:44	Bottom	3	1	27.6	7.7	20.4	5.1	5.1	13.7		9.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS(Mf)11	8:44	Bottom	3	2	28.2	7.9	20.0	5.0		14.1		9.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR7	7:49	Surface	1	1	27.9	7.6	16.7	5.4	5.4	5.8	8.7	6.4	6.3
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR7	7:49	Surface	1	2	28.4	7.8	16.4	5.3		5.2		6.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR7	7:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR7	7:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR7	7:49	Bottom	3	1	27.6	7.6	18.2	5.3	5.2	11.9		6.2	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	SR7	7:49	Bottom	3	2	28.2	7.8	17.9	5.1		11.7		6.5	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS17	8:53	Surface	1	1	27.9	7.7	16.9	5.2	5.1	4.4	6.5	5.4	5.8
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS17	8:53	Surface	1	2	28.5	7.9	16.5	5.2		3.6		5.1	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS17	8:53	Middle	2	1	27.7	7.7	18.8	5.0		5.0		6.0	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS17	8:53	Middle	2	2	28.2	7.9	18.0	4.9		4.7		5.7	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS17	8:53	Bottom	3	1	27.5	7.7	22.1	4.6	4.6	10.6		6.4	
TMCLKL	HY/2012/08	2019/07/05	Mid-flood	IS17	8:53	Bottom	3	2	28.1	7.8	21.7	4.5		10.6		6.2	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	23 July 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_8 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of one Action Level Exceedance was recorded on 8 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

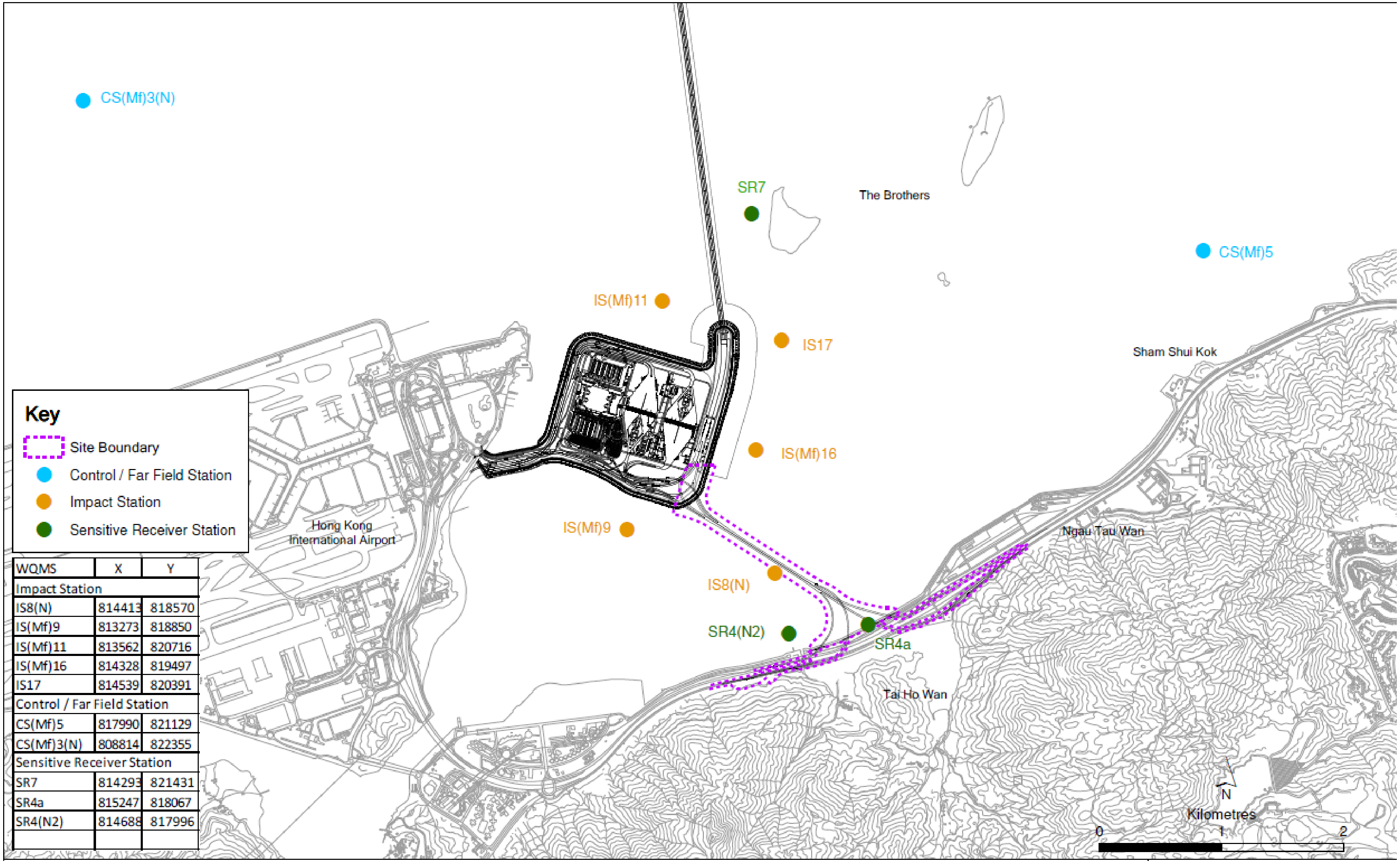
Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_8 July 2019_ Bottom DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 1]**		
Date	8 July 2019 (Measured) 9 July 2019 (*In situ* results received by ERM) 16 July 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at IS(Mf)11 (4.2 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Removal of Jetty was carried out on 8 July 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS(Mf)11 is far away (>2 km) from the Removal of Jetty (*Figure 1*), thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedance is unlikely to be related to this Contract. • Bottom-depth DO levels at IS(Mf)11 was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • No effluent discharge was observed on site.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 8 July 2019 and locations of water quality monitoring stations are attached.		

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)5	17:46	Surface	1	1	29.1	7.9	15.1	5.4	4.8	4.4	5.3	4.3	4.4
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)5	17:46	Surface	1	2	28.5	7.9	15.4	5.5		4.6		4.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)5	17:46	Middle	2	1	28.1	7.8	19.3	4.1		4.9		4.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)5	17:46	Middle	2	2	27.6	7.9	19.7	4.1		5.1		4.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)5	17:46	Bottom	3	1	27.4	7.8	23.3	3.7	3.8	6.2		4.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)5	17:46	Bottom	3	2	26.9	7.8	23.8	3.8		6.4		4.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)3(N)	16:56	Surface	1	1	29.3	7.9	13.5	5.8	5.7	4.0	4.2	3.5	5.2
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)3(N)	16:56	Surface	1	2	28.7	7.9	13.8	5.8		3.9		3.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)3(N)	16:56	Middle	2	1	29.2	7.9	13.8	5.6		4.3		5.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)3(N)	16:56	Middle	2	2	28.6	7.9	14.1	5.6		4.2		4.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)3(N)	16:56	Bottom	3	1	28.7	7.8	17.7	4.4	4.4	4.5		6.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	CS(Mf)3(N)	16:56	Bottom	3	2	28.1	7.8	18.0	4.4		4.4		6.6	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)16	16:15	Surface	1	1	28.9	7.9	16.4	5.4	5.4	5.1	5.3	16.4	19.7
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)16	16:15	Surface	1	2	28.3	7.9	16.8	5.4		5.2		16.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)16	16:15	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)16	16:15	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)16	16:15	Bottom	3	1	28.7	7.9	17.2	5.2	5.2	5.6		22.6	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)16	16:15	Bottom	3	2	28.2	7.9	17.1	5.2		5.4		23.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4a	16:05	Surface	1	1	29.3	7.9	14.5	5.7	5.7	3.4	3.8	6.3	6.6
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4a	16:05	Surface	1	2	28.7	7.9	14.8	5.7		3.3		5.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4a	16:05	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4a	16:05	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4a	16:05	Bottom	3	1	29.0	7.9	15.1	4.9	4.9	4.4		7.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4a	16:05	Bottom	3	2	28.4	7.9	15.6	4.9		4.2		7.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4(N2)	15:59	Surface	1	1	29.3	7.9	14.6	5.7	5.7	6.3	7.3	4.5	5.3
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4(N2)	15:59	Surface	1	2	28.8	7.9	15.0	5.7		6.1		4.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4(N2)	15:59	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4(N2)	15:59	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4(N2)	15:59	Bottom	3	1	29.1	7.9	15.3	5.2	5.2	8.5		6.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR4(N2)	15:59	Bottom	3	2	28.5	7.9	15.6	5.2		8.2		5.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS8(N)	15:53	Surface	1	1	29.3	7.9	15.1	5.8	5.9	7.2	7.5	6.8	7.0
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS8(N)	15:53	Surface	1	2	28.7	8.0	15.4	5.9		7.2		6.5	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS8(N)	15:53	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS8(N)	15:53	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS8(N)	15:53	Bottom	3	1	29.0	7.9	15.5	5.2	5.3	7.7		7.4	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS8(N)	15:53	Bottom	3	2	28.4	7.9	15.8	5.3		7.7		7.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)9	15:44	Surface	1	1	29.7	8.0	14.3	6.1	6.1	3.8	5.9	5.1	6.0
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)9	15:44	Surface	1	2	29.1	8.0	14.6	6.1		3.7		4.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)9	15:44	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)9	15:44	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)9	15:44	Bottom	3	1	28.9	7.8	15.0	5.2	5.2	7.8		6.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)9	15:44	Bottom	3	2	28.3	7.9	15.3	5.2		8.1		7.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)11	17:20	Surface	1	1	29.4	7.9	12.5	6.1	5.9	3.5	4.3	3.5	5.9
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)11	17:20	Surface	1	2	28.8	8.0	12.8	6.1		3.4		3.6	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)11	17:20	Middle	2	1	29.2	7.9	13.8	5.6		5.0		6.5	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)11	17:20	Middle	2	2	28.6	7.9	14.1	5.6		4.8		6.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)11	17:20	Bottom	3	1	29.2	7.8	18.5	4.7	4.8	4.2		8.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS(Mf)11	17:20	Bottom	3	2	28.6	7.8	18.7	4.9		4.9		7.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR7	17:27	Surface	1	1	29.4	7.9	13.1	5.8	5.9	3.6	4.0	5.1	6.0
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR7	17:27	Surface	1	2	28.8	7.9	13.3	5.9		3.6		4.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR7	17:27	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR7	17:27	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR7	17:27	Bottom	3	1	29.2	7.9	14.0	5.5	5.6	4.3		6.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	SR7	17:27	Bottom	3	2	28.6	7.9	14.2	5.6		4.4		7.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS17	16:21	Surface	1	1	29.6	8.0	12.6	6.2	5.9	3.4	4.4	3.4	4.7
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS17	16:21	Surface	1	2	29.1	8.0	12.9	6.2		3.4		3.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS17	16:21	Middle	2	1	29.2	7.9	14.6	5.5		4.8		4.6	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS17	16:21	Middle	2	2	28.6	7.9	15.0	5.5		4.7		5.1	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS17	16:21	Bottom	3	1	29.0	7.9	19.5	4.7	4.7	5.1		6.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-Ebb	IS17	16:21	Bottom	3	2	28.5	7.9	19.7	4.7		5.1		5.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)5	9:40	Surface	1	1	28.4	7.9	12.9	5.8	5.5	2.5	5.6	3.5	4.0
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)5	9:40	Surface	1	2	29.0	7.8	12.8	5.8		2.9		3.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)5	9:40	Middle	2	1	28.0	7.8	16.7	5.1		2.5		4.4	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)5	9:40	Middle	2	2	28.5	7.8	16.4	5.1		2.8		4.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)5	9:40	Bottom	3	1	27.1	7.8	24.7	3.8	3.8	11.3		4.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)5	9:40	Bottom	3	2	27.7	7.8	24.2	3.8		11.5		4.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)3(N)	10:32	Surface	1	1	28.8	8.0	11.6	6.5	6.3	3.0	6.9	6.0	6.0
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)3(N)	10:32	Surface	1	2	29.4	7.9	11.1	6.5		3.2		5.6	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)3(N)	10:32	Middle	2	1	28.6	8.0	13.0	6.1		4.6		5.6	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)3(N)	10:32	Middle	2	2	29.2	7.9	12.7	6.0		4.6		6.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)3(N)	10:32	Bottom	3	1	28.3	8.0	14.2	5.9	6.0	13.1		6.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	CS(Mf)3(N)	10:32	Bottom	3	2	29.0	7.9	13.8	6.0		13.1		6.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)16	11:13	Surface	1	1	28.3	8.0	15.1	5.7	5.7	10.7	8.0	3.3	4.5
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)16	11:13	Surface	1	2	28.8	7.9	14.7	5.7		10.6		3.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)16	11:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)16	11:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)16	11:13	Bottom	3	1	28.0	8.0	16.4	5.4	5.4	5.3		5.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)16	11:13	Bottom	3	2	28.6	7.9	15.9	5.4		5.4		5.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4a	11:23	Surface	1	1	28.4	8.0	14.4	5.9	5.9	4.1	4.7	6.9	8.3
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4a	11:23	Surface	1	2	29.0	7.9	14.2	5.8		4.3		7.2	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4a	11:23	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4a	11:23	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4a	11:23	Bottom	3	1	28.2	8.0	15.1	6.0	6.0	5.0		9.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4a	11:23	Bottom	3	2	28.7	7.9	14.9	6.0		5.2		9.5	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4(N2)	11:28	Surface	1	1	28.4	8.0	14.3	6.0	5.9	4.6	4.2	10.3	10.2
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4(N2)	11:28	Surface	1	2	29.0	7.9	14.0	5.8		4.7		10.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4(N2)	11:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4(N2)	11:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4(N2)	11:28	Bottom	3	1	28.3	8.0	14.5	5.8	5.8	3.9		9.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR4(N2)	11:28	Bottom	3	2	28.9	7.9	14.2	5.7		3.6		10.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS8(N)	11:35	Surface	1	1	28.4	8.0	14.1	5.8	5.8	3.1	4.3	11.2	11.5
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS8(N)	11:35	Surface	1	2	29.0	7.9	13.8	5.8		3.0		10.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS8(N)	11:35	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS8(N)	11:35	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS8(N)	11:35	Bottom	3	1	28.3	8.0	14.8	5.7	5.7	5.3		12.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS8(N)	11:35	Bottom	3	2	28.8	7.8	14.5	5.6		5.6		11.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)9	11:42	Surface	1	1	28.4	8.0	14.3	6.0	6.0	5.9	8.1	4.3	4.4
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)9	11:42	Surface	1	2	29.0	7.9	14.1	5.9		6.0		4.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)9	11:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)9	11:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)9	11:42	Bottom	3	1	28.2	8.0	15.0	5.7	5.7	10.3		4.5	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)9	11:42	Bottom	3	2	28.8	7.9	14.8	5.6		10.0		4.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)11	10:07	Surface	1	1	28.4	8.0	14.0	5.8	5.6	4.2	8.1	4.2	5.0
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)11	10:07	Surface	1	2	29.0	7.8	13.5	5.8		4.0		4.4	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)11	10:07	Middle	2	1	28.1	8.0	15.6	5.3		7.9		5.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)11	10:07	Middle	2	2	28.7	7.8	15.3	5.3		7.7		5.0	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)11	10:07	Bottom	3	1	27.2	7.9	22.4	4.2	4.2	12.4		5.7	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS(Mf)11	10:07	Bottom	3	2	28.0	7.8	21.7	4.1		12.3		5.5	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR7	10:00	Surface	1	1	28.4	8.0	12.9	6.0	6.0	3.4	5.0	5.1	5.4
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR7	10:00	Surface	1	2	29.0	7.8	12.5	6.0		3.1		5.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR7	10:00	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR7	10:00	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR7	10:00	Bottom	3	1	28.0	8.0	16.4	5.5	5.5	6.5		5.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	SR7	10:00	Bottom	3	2	28.6	7.9	16.1	5.5		6.8		5.5	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS17	11:06	Surface	1	1	28.4	8.0	14.7	5.9	5.8	2.3	2.4	3.3	4.1
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS17	11:06	Surface	1	2	28.9	7.9	14.4	5.8		2.5		3.1	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS17	11:06	Middle	2	1	28.1	8.0	15.2	5.7		2.3		3.9	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS17	11:06	Middle	2	2	28.7	7.8	14.9	5.6		2.1		4.3	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS17	11:06	Bottom	3	1	27.9	8.0	18.3	5.1	5.1	2.7		4.8	
TMCLKL	HY/2012/08	2019/07/08	Mid-flood	IS17	11:06	Bottom	3	2	28.4	7.9	17.8	5.0		2.6		5.0	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	23 July 2019

ERM

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_10 July 2019_ Bottom DO_E_Station IS17
0212330_10 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of two Action Level Exceedances were recorded on 10 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

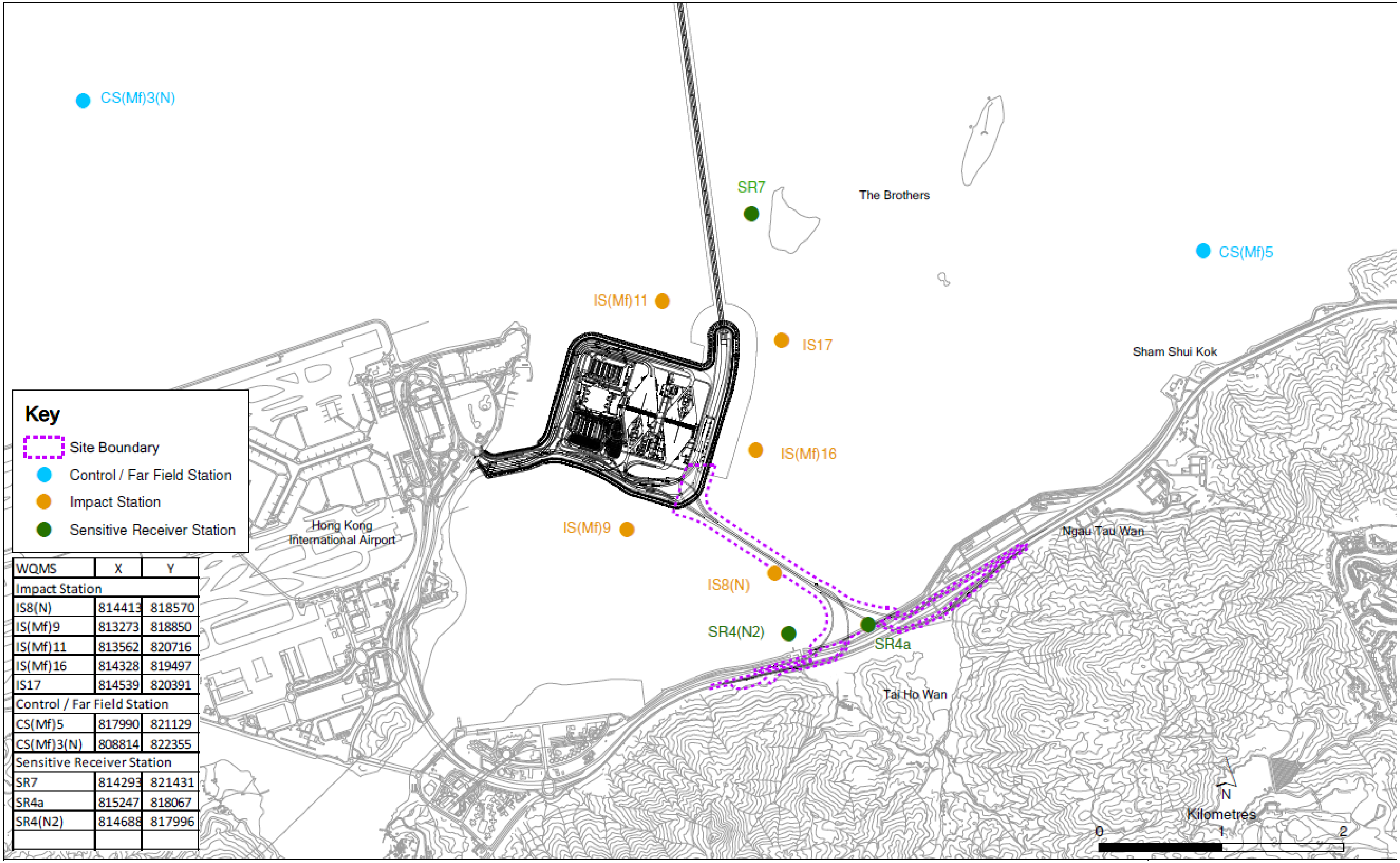
Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_10 July 2019_ Bottom DO_E_Station IS17** **0212330_10 July 2019_ Bottom DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 2]**		
Date	10 July 2019 (Measured) 11 July 2019 (*In situ* results received by ERM) 17 July 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at IS17 (4.6 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (3.7 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Removal of Jetty was carried out on 10 July 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS(Mf)11 and IS17 are far away (>1.5 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedance is unlikely to be related to this Contract. • Bottom-depth DO levels at IS(Mf)11 and IS17 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • No effluent discharge was observed.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 10 July 2019 and locations of water quality monitoring stations are attached.		

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)5	7:10	Surface	1	1	28.9	7.9	12.8	5.5	5.5	3.9	3.5	3.0	4.2
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)5	7:10	Surface	1	2	28.9	7.9	12.8	5.5		3.9		3.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)5	7:10	Middle	2	1	29.0	7.9	13.6	5.4		3.7		3.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)5	7:10	Middle	2	2	29.0	7.9	13.6	5.4		3.7		3.3	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)5	7:10	Bottom	3	1	28.2	7.8	19.4	4.3	4.3	2.8		6.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)5	7:10	Bottom	3	2	28.2	7.8	19.4	4.3		2.8		6.4	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)3(N)	8:08	Surface	1	1	29.1	7.9	12.1	5.6	5.7	4.3	4.3	3.8	4.1
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)3(N)	8:08	Surface	1	2	29.1	7.9	12.1	5.6		4.3		4.3	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)3(N)	8:08	Middle	2	1	29.0	7.9	13.4	5.7		4.3		4.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)3(N)	8:08	Middle	2	2	29.0	7.9	13.4	5.7		4.3		4.4	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)3(N)	8:08	Bottom	3	1	29.0	7.9	13.9	5.7	5.7	4.2		4.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	CS(Mf)3(N)	8:08	Bottom	3	2	29.0	7.9	13.9	5.7		4.2		4.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)16	8:38	Surface	1	1	28.9	7.9	14.9	5.4	5.4	5.3	5.8	5.2	5.4
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)16	8:38	Surface	1	2	28.9	7.9	14.9	5.4		5.3		4.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)16	8:38	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)16	8:38	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)16	8:38	Bottom	3	1	28.5	7.8	17.6	4.9	4.9	6.2		5.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)16	8:38	Bottom	3	2	28.5	7.8	17.6	4.9		6.2		5.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4a	8:47	Surface	1	1	29.1	7.9	14.0	5.6	5.6	4.9	5.2	3.5	3.9
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4a	8:47	Surface	1	2	29.1	7.9	14.0	5.6		4.9		3.9	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4a	8:47	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4a	8:47	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4a	8:47	Bottom	3	1	29.0	7.9	14.6	5.2	5.2	5.5		4.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4a	8:47	Bottom	3	2	29.0	7.9	14.6	5.2		5.5		3.9	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4(N2)	8:52	Surface	1	1	29.0	7.8	14.3	5.1	5.1	7.3	14.0	7.2	7.9
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4(N2)	8:52	Surface	1	2	29.0	7.8	14.3	5.1		7.3		6.9	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4(N2)	8:52	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4(N2)	8:52	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4(N2)	8:52	Bottom	3	1	28.8	7.8	16.0	4.7	4.7	20.6		8.9	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR4(N2)	8:52	Bottom	3	2	28.8	7.8	16.0	4.7		20.6		8.6	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS8(N)	8:58	Surface	1	1	29.0	7.9	14.1	5.5	5.5	5.3	6.1	7.2	7.1
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS8(N)	8:58	Surface	1	2	29.0	7.9	14.1	5.5		5.3		7.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS8(N)	8:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS8(N)	8:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS8(N)	8:58	Bottom	3	1	29.0	7.9	14.6	5.3	5.3	6.8		6.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS8(N)	8:58	Bottom	3	2	29.0	7.9	14.6	5.3		6.8		7.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)9	9:05	Surface	1	1					5.8		4.5		5.1
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)9	9:05	Surface	1	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)9	9:05	Middle	2	1	28.9	7.9	14.1	5.8		4.5		5.3	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)9	9:05	Middle	2	2	28.9	7.9	14.1	5.8		4.5		4.9	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)9	9:05	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)9	9:05	Bottom	3	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)11	7:42	Surface	1	1	29.2	7.9	10.0	5.9	5.9	3.2	5.3	4.0	3.9
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)11	7:42	Surface	1	2	29.2	7.9	10.0	5.9		3.2		4.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)11	7:42	Middle	2	1	29.2	7.9	12.3	5.8		4.4		4.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)11	7:42	Middle	2	2	29.2	7.9	12.3	5.8		4.4		3.6	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)11	7:42	Bottom	3	1	29.2	7.9	22.4	5.5	5.5	8.3		3.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS(Mf)11	7:42	Bottom	3	2	29.2	7.9	22.4	5.5		8.3		3.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR7	7:36	Surface	1	1	29.2	7.9	10.5	5.9	5.9	4.3	4.4	4.7	5.3
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR7	7:36	Surface	1	2	29.2	7.9	10.5	5.9		4.3		5.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR7	7:36	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR7	7:36	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR7	7:36	Bottom	3	1	29.2	7.9	10.8	6.0	6.0	4.4		5.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	SR7	7:36	Bottom	3	2	29.2	7.9	10.8	6.0		4.4		5.5	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS17	8:31	Surface	1	1	29.1	7.9	10.9	5.7	5.6	4.2	4.1	3.9	4.1
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS17	8:31	Surface	1	2	29.1	7.9	10.9	5.7		4.2		3.6	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS17	8:31	Middle	2	1	29.0	7.9	13.1	5.5		4.2		3.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS17	8:31	Middle	2	2	29.0	7.9	13.1	5.5		4.2		3.7	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS17	8:31	Bottom	3	1	28.6	7.8	18.4	4.6	4.6	4.0		4.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-Ebb	IS17	8:31	Bottom	3	2	28.6	7.8	18.4	4.6		4.0		5.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)5	13:41	Surface	1	1	28.4	7.9	12.7	5.9	5.3	2.7	3.0	2.7	2.8
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)5	13:41	Surface	1	2	29.0	7.9	12.4	5.9		2.7		2.9	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)5	13:41	Middle	2	1	27.9	7.8	17.3	4.6		3.2		3.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)5	13:41	Middle	2	2	28.4	7.9	16.9	4.6		3.2		2.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)5	13:41	Bottom	3	1	26.9	7.8	23.5	3.6	3.6	3.2		2.6	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)5	13:41	Bottom	3	2	27.5	7.8	22.6	3.6		3.2		2.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)3(N)	12:47	Surface	1	1	28.7	7.9	6.9	6.4	6.2	5.3	9.3	5.2	6.0
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)3(N)	12:47	Surface	1	2	29.3	7.9	6.7	6.3		5.3		5.4	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)3(N)	12:47	Middle	2	1	28.6	7.9	9.9	6.1		4.2		5.5	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)3(N)	12:47	Middle	2	2	29.2	7.9	9.8	6.1		4.3		5.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)3(N)	12:47	Bottom	3	1	28.5	7.8	12.6	5.7	5.7	18.2		6.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	CS(Mf)3(N)	12:47	Bottom	3	2	29.1	7.9	12.3	5.7		18.3		7.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)16	12:12	Surface	1	1	28.4	7.9	13.6	5.7	5.7	13.9	13.2	14.3	14.2
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)16	12:12	Surface	1	2	29.0	7.9	13.2	5.7		13.7		14.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)16	12:12	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)16	12:12	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)16	12:12	Bottom	3	1	28.3	7.8	14.4	5.6	5.6	12.6		14.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)16	12:12	Bottom	3	2	28.9	7.9	13.9	5.6		12.5		14.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4a	12:03	Surface	1	1	28.4	7.9	12.9	6.0	6.0	3.8	4.6	5.7	5.3
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4a	12:03	Surface	1	2	29.0	7.9	12.6	6.0		3.8		5.5	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4a	12:03	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4a	12:03	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4a	12:03	Bottom	3	1	28.4	7.8	13.5	5.7	5.7	5.4		4.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4a	12:03	Bottom	3	2	29.0	7.9	13.2	5.6		5.4		5.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4(N2)	11:58	Surface	1	1	28.5	7.8	13.7	5.7	5.7	4.6	5.5	3.0	3.0
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4(N2)	11:58	Surface	1	2	29.0	7.9	13.4	5.6		4.2		3.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4(N2)	11:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4(N2)	11:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4(N2)	11:58	Bottom	3	1	28.4	7.8	13.9	5.4	5.4	6.6		3.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR4(N2)	11:58	Bottom	3	2	29.0	7.8	13.6	5.4		6.6		2.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS8(N)	11:52	Surface	1	1	28.5	7.9	12.4	6.0	6.0	3.8	4.2	6.4	6.6
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS8(N)	11:52	Surface	1	2	29.1	7.9	12.2	6.0		3.9		6.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS8(N)	11:52	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS8(N)	11:52	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS8(N)	11:52	Bottom	3	1	28.5	7.9	12.8	6.0	6.0	4.5		7.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS8(N)	11:52	Bottom	3	2	29.1	7.9	12.4	6.0		4.6		6.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)9	11:47	Surface	1	1					6.0		5.5		13.1
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)9	11:47	Surface	1	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)9	11:47	Middle	2	1	28.4	7.9	12.5	6.0		5.7		13.2	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)9	11:47	Middle	2	2	29.0	7.9	12.2	6.0		5.3		13.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)9	11:47	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)9	11:47	Bottom	3	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)11	13:13	Surface	1	1	28.4	7.9	12.8	5.7	5.4	4.0	7.4	3.6	4.3
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)11	13:13	Surface	1	2	29.0	7.9	12.5	5.7		4.2		4.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)11	13:13	Middle	2	1	28.1	7.8	15.9	5.0		5.5		4.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)11	13:13	Middle	2	2	28.7	7.9	15.4	5.0		5.6		4.3	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)11	13:13	Bottom	3	1	27.5	7.8	22.2	3.8	3.7	12.3		5.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS(Mf)11	13:13	Bottom	3	2	28.1	7.8	21.7	3.6		12.5		4.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR7	13:21	Surface	1	1	28.6	7.9	11.3	6.1	6.1	3.1	5.0	2.5	2.6
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR7	13:21	Surface	1	2	29.2	7.9	11.0	6.0		3.1		2.8	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR7	13:21	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR7	13:21	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR7	13:21	Bottom	3	1	28.1	7.8	15.6	5.0	5.1	6.9		2.5	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	SR7	13:21	Bottom	3	2	28.6	7.8	14.5	5.1		6.9		2.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS17	12:18	Surface	1	1	28.6	7.9	12.4	6.0	5.9	3.1	6.5	6.4	8.5
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS17	12:18	Surface	1	2	29.2	7.9	12.1	6.0		3.2		6.4	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS17	12:18	Middle	2	1	28.5	7.9	13.4	5.7		4.9		7.1	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS17	12:18	Middle	2	2	29.0	7.9	13.1	5.7		5.0		6.7	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS17	12:18	Bottom	3	1	28.3	7.8	15.1	5.5	5.5	11.3		12.0	
TMCLKL	HY/2012/08	2019/07/10	Mid-flood	IS17	12:18	Bottom	3	2	28.9	7.9	14.8	5.5		11.2		12.4	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email
message

Environmental
Resources
Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	25 July 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_12 July 2019_ Bottom DO_E_Station IS(Mf)16
0212330_12 July 2019_ Bottom DO_E_Station SR4a
0212330_12 July 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_12 July 2019_ Surface & Middle DO_E_Station IS17
0212330_12 July 2019_ Bottom DO_F_Station IS17

Limit Level Exceedance
0212330_12 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_12 July 2019_ Bottom DO_E_Station IS17
0212330_12 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of five Action Level and three Limit Level Exceedances were recorded on 12 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

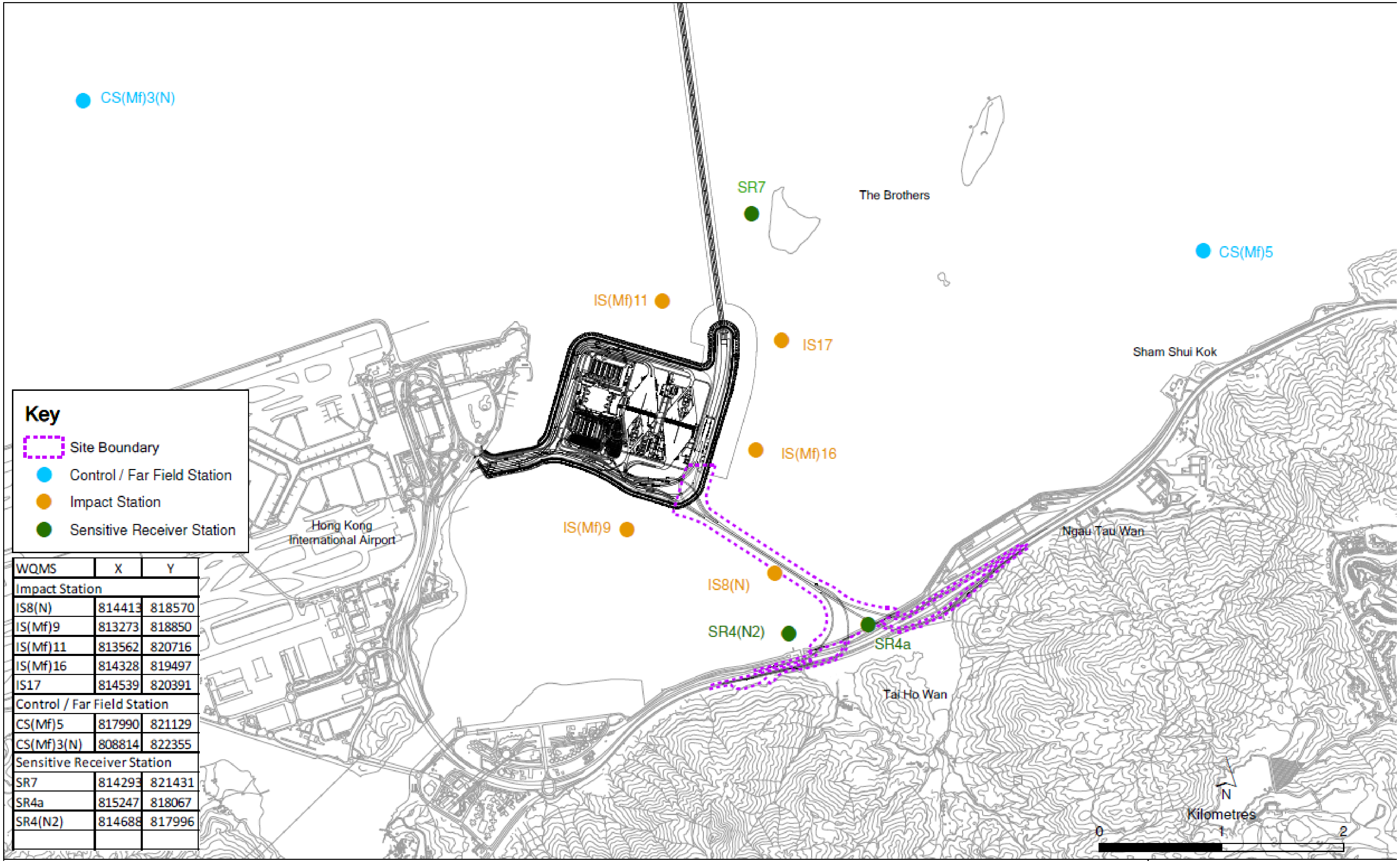
Log No.	**Action Level Exceedance** **0212330_12 July 2019_ Bottom DO_E_Station IS(Mf)16** **0212330_12 July 2019_ Bottom DO_E_Station SR4a** **0212330_12 July 2019_ Surface & Middle DO_E_Station IS(Mf)11** **0212330_12 July 2019_ Surface & Middle DO_E_Station IS17** **0212330_12 July 2019_ Bottom DO_F_Station IS17** **Limit Level Exceedance** **0212330_12 July 2019_ Bottom DO_E_Station IS(Mf)11** **0212330_12 July 2019_ Bottom DO_E_Station IS17** **0212330_12 July 2019_ Bottom DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 8]**		
Date	12 July 2019 (Measured) 14 July 2019 (*In situ* results received by ERM) 22 July 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at IS(Mf)16 (4.4 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at SR4a (4.4 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.5 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (2.4 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS17 (4.6 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS17 (3.0 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (2.3 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.5 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, no marine works was carried out on 12 July 2019.		

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • No marine works was carried out on 12 July 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS17, SR4a and IS(Mf)11 are far away (>1.5 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. • Bottom-depth DO levels at IS17, IS(Mf)16 and IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Limit Level. • Surface & Middle-depth DO levels at IS17 and IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 12 July 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Surface	1	1	28.7	7.8	12.3	5.1	4.6	4.3	3.9	2.8	3.3
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Surface	1	2	28.2	7.9	12.8	5.1		4.3		3.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Middle	2	1	27.8	7.8	18.9	4.1		2.8		2.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Middle	2	2	27.3	7.8	19.4	4.2		2.7		2.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Bottom	3	1	26.0	7.8	27.9	2.9	3.0	4.7		4.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)5	8:55	Bottom	3	2	25.5	7.8	28.4	3.1		4.7		4.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Surface	1	1	29.4	7.9	9.1	5.7	5.3	4.3	4.3	2.8	3.0
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Surface	1	2	28.8	8.0	9.4	5.8		4.3		3.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Middle	2	1	28.8	7.8	13.4	4.7		3.4		3.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Middle	2	2	28.2	8.0	13.7	4.8		3.6		2.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Bottom	3	1	27.9	7.7	21.6	3.5	3.4	5.2		3.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	CS(Mf)3(N)	10:08	Bottom	3	2	27.2	7.9	22.3	3.3		4.8		2.8	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Surface	1	1	29.1	7.9	13.7	5.6	5.6	3.8	5.9	3.9	4.8
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Surface	1	2	28.6	8.1	14.1	5.6		3.8		3.7	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Bottom	3	1	28.2	7.8	20.1	4.4	4.4	7.8		5.8	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)16	10:42	Bottom	3	2	27.4	8.0	21.0	4.4		8.0		5.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Surface	1	1	28.9	7.9	13.4	5.2	5.2	5.1	6.1	6.3	6.8
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Surface	1	2	28.3	8.0	13.8	5.2		5.1		6.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Bottom	3	1	28.5	7.8	15.7	4.3	4.4	6.9		7.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4a	10:53	Bottom	3	2	28.1	8.0	16.1	4.4		7.1		7.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Surface	1	1	28.9	7.8	13.9	5.0	5.1	7.0	8.1	9.1	11.5
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Surface	1	2	28.3	8.0	14.2	5.1		7.1		8.7	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Bottom	3	1	28.8	7.8	14.4	4.9	4.9	9.1		14.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR4(N2)	10:57	Bottom	3	2	28.2	8.0	14.8	4.9		9.1		14.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Surface	1	1	29.3	7.9	12.9	5.8	5.9	3.1	3.7	3.6	4.0
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Surface	1	2	28.7	8.1	13.2	5.9		3.1		3.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Bottom	3	1	29.1	7.9	13.5	5.8	5.8	4.2		4.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS8(N)	11:05	Bottom	3	2	28.6	8.1	13.8	5.8		4.2		4.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Surface	1	1					5.2		6.4		3.7
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Surface	1	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Middle	2	1	29.0	7.9	14.2	5.2		6.3		3.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Middle	2	2	28.4	8.0	14.5	5.2		6.4		3.7	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)9	11:13	Bottom	3	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)11	9:36	Surface	1	1	29.4	7.8	10.1	5.4	4.5	4.3	4.4	2.7	4.3
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)11	9:36	Surface	1	2	28.8	8.0	10.4	5.4		4.2		2.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)11	9:36	Middle	2	1	28.0	7.8	18.3	3.5		4.1		4.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)11	9:36	Middle	2	2	27.4	8.0	18.8	3.6		4.1		4.5	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)11	9:36	Bottom	3	1	26.3	7.7	28.2	2.4	2.4	4.7		5.5	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS(Mf)11	9:36	Bottom	3	2	25.7	7.9	29.0	2.3		4.7		5.4	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR7	9:28	Surface	1	1	29.4	7.8	9.7	5.2	5.2	4.5	4.3	4.2	4.4
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR7	9:28	Surface	1	2	28.8	8.0	10.0	5.2		4.5		3.8	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR7	9:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR7	9:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR7	9:28	Bottom	3	1	29.0	7.8	12.0	4.9	5.0	4.2		4.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	SR7	9:28	Bottom	3	2	28.4	7.9	12.3	5.0		4.1		5.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS17	10:35	Surface	1	1	29.1	7.9	12.2	5.5	4.6	3.5	3.9	3.1	4.2
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS17	10:35	Surface	1	2	28.5	8.1	12.6	5.5		3.5		3.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS17	10:35	Middle	2	1	28.0	7.8	18.7	3.7		3.9		3.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS17	10:35	Middle	2	2	27.4	7.9	19.2	3.7		4.0		4.2	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS17	10:35	Bottom	3	1	27.4	7.7	23.9	3.1	3.0	4.1		5.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-Ebb	IS17	10:35	Bottom	3	2	26.7	7.8	24.6	2.9		4.5		5.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)5	16:59	Surface	1	1	29.9	8.0	10.5	6.1	4.6	3.1	2.9	3.8	4.0
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)5	16:59	Surface	1	2	29.3	8.1	10.8	6.2		3.2		3.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)5	16:59	Middle	2	1	27.2	7.8	22.6	3.0		2.7		4.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)5	16:59	Middle	2	2	26.7	8.0	23.4	3.1		2.7		3.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)5	16:59	Bottom	3	1	25.6	7.8	30.1	2.1	2.2	3.0		4.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)5	16:59	Bottom	3	2	25.0	8.0	31.2	2.2		2.9		4.4	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)3(N)	16:06	Surface	1	1	30.3	7.9	3.5	6.4	5.6	9.2	6.9	7.3	7.0
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)3(N)	16:06	Surface	1	2	29.7	8.1	3.6	6.4		9.1		6.7	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)3(N)	16:06	Middle	2	1	29.2	7.7	10.0	4.8		5.5		6.7	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)3(N)	16:06	Middle	2	2	28.6	7.9	10.3	4.8		5.7		7.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)3(N)	16:06	Bottom	3	1	28.8	7.7	13.7	4.3	4.4	5.7		7.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	CS(Mf)3(N)	16:06	Bottom	3	2	28.1	7.9	14.0	4.4		5.9		7.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)16	15:28	Surface	1	1	29.6	8.0	12.6	6.3	6.3	5.6	8.2	5.6	8.4
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)16	15:28	Surface	1	2	29.1	8.1	13.0	6.3		5.5		5.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)16	15:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)16	15:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)16	15:28	Bottom	3	1	29.3	7.9	13.8	5.9	5.9	10.8		11.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)16	15:28	Bottom	3	2	28.7	8.1	14.2	5.9		10.9		11.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4a	15:16	Surface	1	1	29.9	8.0	12.3	6.6	6.7	3.1	3.9	4.4	5.6
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4a	15:16	Surface	1	2	29.3	8.1	12.6	6.7		3.2		4.4	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4a	15:16	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4a	15:16	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4a	15:16	Bottom	3	1	28.9	7.8	15.0	5.2	5.2	4.6		6.6	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4a	15:16	Bottom	3	2	28.3	8.0	15.5	5.2		4.7		7.0	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4(N2)	15:07	Surface	1	1	29.3	8.0	13.6	6.4	6.5	2.5	3.6	7.4	13.5
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4(N2)	15:07	Surface	1	2	28.7	8.1	14.0	6.5		2.5		7.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4(N2)	15:07	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4(N2)	15:07	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4(N2)	15:07	Bottom	3	1	29.3	8.0	13.7	6.4	6.4	4.9		19.7	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR4(N2)	15:07	Bottom	3	2	28.7	8.0	14.1	6.4		4.6		19.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS8(N)	14:56	Surface	1	1	29.7	7.9	12.1	6.1	6.1	3.1	3.9	4.2	5.1
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS8(N)	14:56	Surface	1	2	29.2	8.1	12.5	6.1		3.2		4.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS8(N)	14:56	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS8(N)	14:56	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS8(N)	14:56	Bottom	3	1	29.7	7.9	12.5	6.2	6.2	4.7		5.8	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS8(N)	14:56	Bottom	3	2	29.2	8.1	12.8	6.2		4.5		6.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)9	14:47	Surface	1	1					5.5		7.4		4.2
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)9	14:47	Surface	1	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)9	14:47	Middle	2	1	29.1	7.9	14.8	5.4		7.4		4.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)9	14:47	Middle	2	2	28.5	8.1	15.2	5.5		7.3		4.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)9	14:47	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)9	14:47	Bottom	3	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)11	16:32	Surface	1	1	30.1	7.9	7.5	6.2	5.3	3.2	4.9	3.9	4.3
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)11	16:32	Surface	1	2	29.5	8.1	7.7	6.2		3.3		3.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)11	16:32	Middle	2	1	28.3	7.8	16.8	4.3		3.5		3.9	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)11	16:32	Middle	2	2	27.8	8.0	17.1	4.3		3.4		3.8	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)11	16:32	Bottom	3	1	26.3	7.7	27.6	2.3	2.3	7.8		5.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS(Mf)11	16:32	Bottom	3	2	25.7	7.9	28.5	2.2		7.9		5.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR7	16:39	Surface	1	1	30.3	7.9	6.8	6.4	6.4	4.2	4.6	4.1	4.5
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR7	16:39	Surface	1	2	29.7	8.1	7.0	6.4		4.2		4.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR7	16:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR7	16:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR7	16:39	Bottom	3	1	30.2	7.9	9.3	6.3	6.3	5.2		4.8	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	SR7	16:39	Bottom	3	2	29.5	8.1	9.3	6.3		4.6		5.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS17	15:34	Surface	1	1	29.8	8.0	11.7	6.6	6.0	2.6	3.2	6.1	5.5
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS17	15:34	Surface	1	2	29.3	8.1	12.0	6.6		2.8		6.3	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS17	15:34	Middle	2	1	29.0	7.8	13.9	5.4		3.4		5.2	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS17	15:34	Middle	2	2	28.5	8.0	14.3	5.4		3.4		5.4	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS17	15:34	Bottom	3	1	28.2	7.8	17.3	4.4	4.5	3.4		5.1	
TMCLKL	HY/2012/08	2019/07/12	Mid-flood	IS17	15:34	Bottom	3	2	27.7	8.0	17.8	4.5		3.5		4.7	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	6 August 2019

ERM

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_15 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_15 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of two Limit Level Exceedances were recorded on 15 July 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

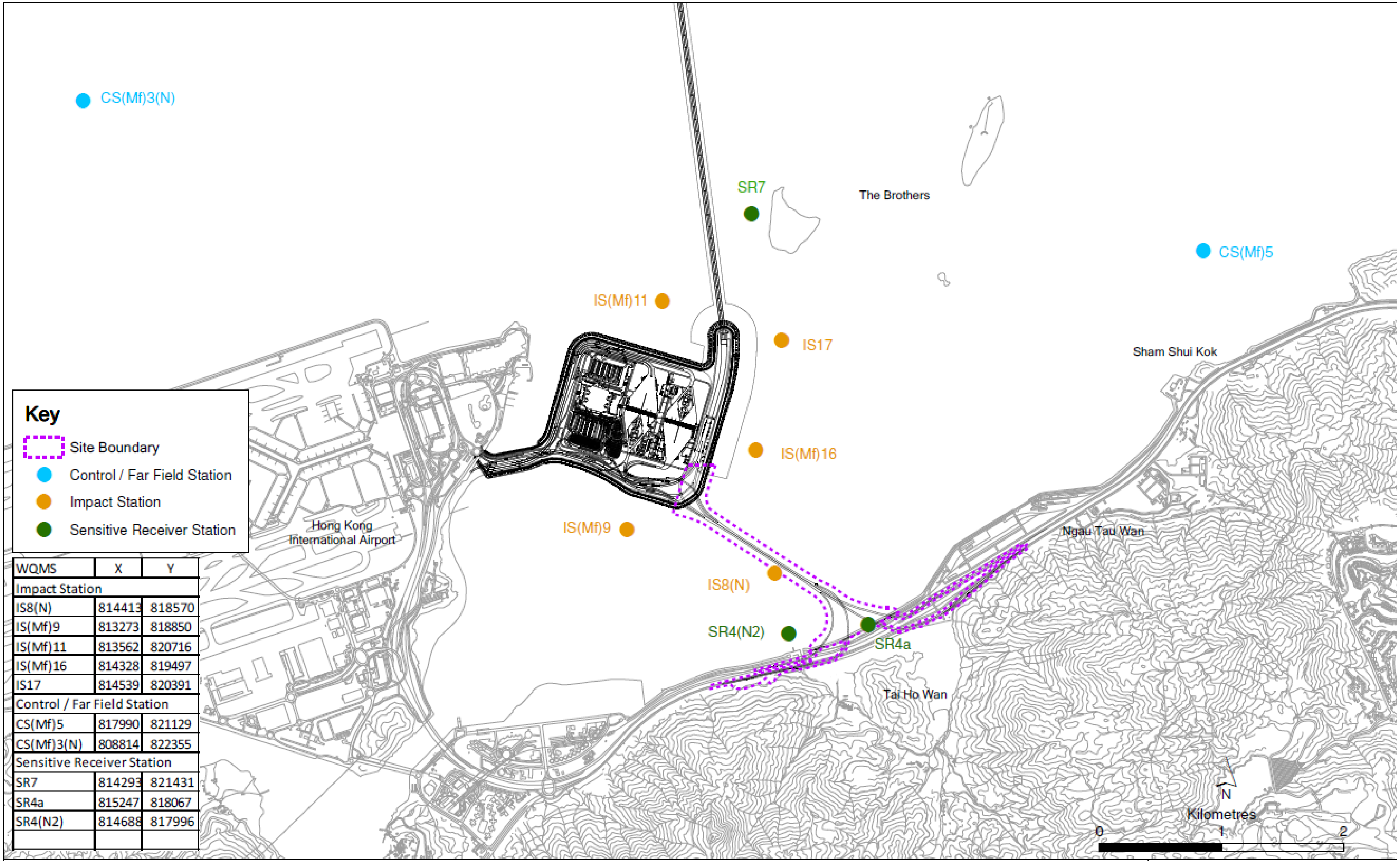
Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**0212330_15 July 2019_ Bottom DO_E_Station IS(Mf)11** **0212330_15 July 2019_ Bottom DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 2]**		
Date	15 July 2019 (Measured) 16 July 2019 (*In situ* results received by ERM) 23 July 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Limit Level Exceedance for DO is observed at IS(Mf)11 (2.8 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (2.7 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, no marine works was carried out on 15 July 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • No marine works was carried out on 15 July 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS(Mf)11 are far away (>2 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. • Bottom-depth DO levels at IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Limit Level.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 15 July 2019 and locations of water quality monitoring stations are attached.		

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)5	12:20	Surface	1	1	28.7	8.0	10.5	6.1	4.9	3.6	4.8	3.7	5.7
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)5	12:20	Surface	1	2	29.3	8.0	10.2	6.1		3.6		3.8	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)5	12:20	Middle	2	1	26.1	7.9	23.4	3.7		5.3		6.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)5	12:20	Middle	2	2	26.6	7.9	22.8	3.8		5.2		6.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)5	12:20	Bottom	3	1	25.4	7.9	27.5	3.2	3.2	5.9		6.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)5	12:20	Bottom	3	2	26.0	7.8	26.6	3.2		5.1		6.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)3(N)	11:36	Surface	1	1	28.7	7.9	10.2	5.8	5.3	3.6	7.7	4.9	4.7
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)3(N)	11:36	Surface	1	2	29.3	7.9	10.0	5.8		3.3		4.5	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)3(N)	11:36	Middle	2	1	27.9	7.8	14.6	4.7		5.0		4.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)3(N)	11:36	Middle	2	2	28.4	7.8	14.0	4.8		4.9		4.8	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)3(N)	11:36	Bottom	3	1	26.1	7.8	25.5	3.3	3.3	15.3		4.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	CS(Mf)3(N)	11:36	Bottom	3	2	26.7	7.8	24.9	3.2		14.1		4.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)16	10:49	Surface	1	1	29.0	8.0	11.3	6.6	6.7	5.4	7.3	6.8	7.7
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)16	10:49	Surface	1	2	29.6	8.0	11.0	6.7		4.4		6.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)16	10:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)16	10:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)16	10:49	Bottom	3	1	27.8	7.9	16.3	5.4	5.4	10.1		8.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)16	10:49	Bottom	3	2	28.4	7.9	15.8	5.4		9.2		8.5	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4a	10:40	Surface	1	1	28.4	8.0	10.8	5.8	5.8	6.2	6.6	4.3	6.6
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4a	10:40	Surface	1	2	28.4	8.0	10.8	5.8		6.2		4.0	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4a	10:40	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4a	10:40	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4a	10:40	Bottom	3	1	28.0	7.8	15.1	4.9	4.9	7.3		9.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4a	10:40	Bottom	3	2	28.6	7.8	14.6	4.9		6.5		8.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4(N2)	10:36	Surface	1	1	28.6	7.8	11.2	5.6	5.7	10.9	11.6	8.9	13.4
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4(N2)	10:36	Surface	1	2	29.3	7.8	10.9	5.7		9.4		9.3	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4(N2)	10:36	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4(N2)	10:36	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4(N2)	10:36	Bottom	3	1	28.3	7.8	13.9	5.2	5.2	13.2		17.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR4(N2)	10:36	Bottom	3	2	28.8	7.8	13.6	5.1		12.9		17.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS8(N)	10:30	Surface	1	1	29.0	8.1	10.2	7.4	7.5	6.7	5.9	9.2	9.2
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS8(N)	10:30	Surface	1	2	29.6	8.1	9.9	7.5		5.7		9.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS8(N)	10:30	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS8(N)	10:30	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS8(N)	10:30	Bottom	3	1	28.4	7.9	13.5	6.1	6.1	6.1		9.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS8(N)	10:30	Bottom	3	2	29.0	8.0	13.0	6.1		5.0		9.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)9	10:23	Surface	1	1	29.3	8.1	9.6	7.6	7.6	4.0	4.5	4.7	5.7
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)9	10:23	Surface	1	2	29.9	8.1	9.4	7.6		4.7		4.5	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)9	10:23	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)9	10:23	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)9	10:23	Bottom	3	1	29.1	8.1	10.1	7.3	7.3	4.8		6.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)9	10:23	Bottom	3	2	29.6	8.1	9.8	7.3		4.5		6.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)11	11:07	Surface	1	1	28.8	7.9	8.6	6.1	5.4	4.2	4.9	2.7	3.6
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)11	11:07	Surface	1	2	29.4	7.9	8.4	6.2		4.5		2.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)11	11:07	Middle	2	1	27.9	7.8	13.4	4.5		4.2		3.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)11	11:07	Middle	2	2	28.5	7.8	13.0	4.7		4.3		3.8	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)11	11:07	Bottom	3	1	25.0	7.8	30.2	2.8	2.8	6.5		4.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS(Mf)11	11:07	Bottom	3	2	25.5	7.8	29.4	2.7		5.6		4.3	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR7	12:01	Surface	1	1	28.3	7.9	9.0	6.1	6.2	4.6	4.9	3.8	5.0
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR7	12:01	Surface	1	2	28.9	7.8	8.7	6.2		4.4		3.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR7	12:01	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR7	12:01	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR7	12:01	Bottom	3	1	28.1	7.8	13.3	5.4	5.4	5.2		6.4	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	SR7	12:01	Bottom	3	2	28.7	7.8	12.9	5.3		5.2		6.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS17	10:56	Surface	1	1	28.8	7.9	9.7	6.3	6.2	3.6	5.0	3.2	4.2
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS17	10:56	Surface	1	2	29.4	8.0	9.5	6.4		3.1		3.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS17	10:56	Middle	2	1	28.5	7.9	11.8	6.1		4.8		4.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS17	10:56	Middle	2	2	29.1	8.0	11.6	6.1		4.9		4.4	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS17	10:56	Bottom	3	1	27.7	7.9	17.1	5.3	5.3	6.7		5.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-Ebb	IS17	10:56	Bottom	3	2	28.3	7.9	16.7	5.3		6.8		5.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)5	4:26	Surface	1	1	28.7	7.9	7.6	6.4	5.3	4.2	4.9	2.7	3.0
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)5	4:26	Surface	1	2	29.3	8.0	7.4	6.4		4.4		3.0	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)5	4:26	Middle	2	1	26.8	7.9	21.6	4.2		2.5		3.3	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)5	4:26	Middle	2	2	27.4	7.9	21.1	4.2		2.6		3.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)5	4:26	Bottom	3	1	24.5	7.8	31.7	2.4	2.4	7.9		2.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)5	4:26	Bottom	3	2	25.1	7.8	30.7	2.4		8.0		3.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)3(N)	5:12	Surface	1	1	28.5	7.8	7.3	6.0	6.0	5.0	6.8	4.2	4.6
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)3(N)	5:12	Surface	1	2	29.1	7.8	7.1	6.1		4.1		4.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)3(N)	5:12	Middle	2	1	28.5	7.8	7.8	5.8		4.9		4.5	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)3(N)	5:12	Middle	2	2	29.1	7.8	7.6	5.9		4.0		4.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)3(N)	5:12	Bottom	3	1	27.8	7.7	15.4	4.4	4.4	11.9		5.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	CS(Mf)3(N)	5:12	Bottom	3	2	28.4	7.7	15.0	4.4		11.1		4.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)16	5:57	Surface	1	1	28.7	8.0	9.3	6.5	6.6	4.0	4.2	3.0	3.7
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)16	5:57	Surface	1	2	29.3	8.0	9.0	6.6		4.2		2.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)16	5:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)16	5:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)16	5:57	Bottom	3	1	28.1	7.8	14.6	5.5	5.5	4.2		4.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)16	5:57	Bottom	3	2	28.7	7.8	14.2	5.4		4.5		4.5	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4a	6:06	Surface	1	1	28.8	7.9	9.3	6.5	6.5	4.2	4.3	3.3	3.6
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4a	6:06	Surface	1	2	29.4	7.9	9.1	6.5		4.1		3.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4a	6:06	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4a	6:06	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4a	6:06	Bottom	3	1	28.7	7.9	9.6	6.7	6.7	4.2		3.8	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4a	6:06	Bottom	3	2	29.3	7.9	9.3	6.6		4.8		4.0	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4(N2)	6:11	Surface	1	1	28.7	7.9	8.8	6.4	6.5	4.4	4.7	3.1	4.1
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4(N2)	6:11	Surface	1	2	29.3	7.9	8.6	6.5		4.3		3.4	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4(N2)	6:11	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4(N2)	6:11	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4(N2)	6:11	Bottom	3	1	28.7	7.9	9.0	6.4	6.4	5.1		4.7	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR4(N2)	6:11	Bottom	3	2	29.3	7.9	8.7	6.4		5.0		5.0	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS8(N)	6:16	Surface	1	1	28.7	7.9	9.2	6.2	6.2	5.5	5.5	3.0	4.7
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS8(N)	6:16	Surface	1	2	29.3	7.9	8.9	6.2		5.5		3.3	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS8(N)	6:16	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS8(N)	6:16	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS8(N)	6:16	Bottom	3	1	28.7	7.9	10.5	6.2	6.2	5.7		6.3	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS8(N)	6:16	Bottom	3	2	29.3	7.9	10.2	6.2		5.3		6.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)9	6:22	Surface	1	1	28.7	7.9	9.1	6.6	6.7	3.8	4.0	3.4	4.7
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)9	6:22	Surface	1	2	29.3	8.0	8.9	6.7		3.3		3.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)9	6:22	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)9	6:22	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)9	6:22	Bottom	3	1	28.7	7.9	10.0	6.5	6.5	4.8		6.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)9	6:22	Bottom	3	2	29.3	7.9	9.8	6.5		4.2		5.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)11	5:44	Surface	1	1	28.5	7.9	9.3	5.8	5.1	4.2	6.8	3.1	3.5
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)11	5:44	Surface	1	2	29.1	7.9	9.1	5.9		4.3		3.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)11	5:44	Middle	2	1	27.5	7.8	17.1	4.3		6.1		3.5	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)11	5:44	Middle	2	2	28.1	7.9	16.8	4.4		5.1		3.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)11	5:44	Bottom	3	1	25.7	7.8	27.0	2.7	2.7	10.9		3.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS(Mf)11	5:44	Bottom	3	2	26.2	7.8	26.3	2.6		9.9		3.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR7	4:46	Surface	1	1	28.8	7.9	7.9	6.2	6.2	4.4	4.4	3.5	3.7
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR7	4:46	Surface	1	2	29.4	7.9	7.6	6.2		4.3		3.4	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR7	4:46	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR7	4:46	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR7	4:46	Bottom	3	1	28.6	7.9	8.7	6.1	6.1	4.4		4.0	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	SR7	4:46	Bottom	3	2	29.2	7.9	8.4	6.1		4.4		3.8	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS17	5:51	Surface	1	1	28.7	8.0	8.8	6.6	6.3	3.6	3.5	3.1	2.9
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS17	5:51	Surface	1	2	29.3	8.0	8.6	6.7		3.6		2.9	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS17	5:51	Middle	2	1	28.5	7.9	12.2	6.0		3.5		2.6	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS17	5:51	Middle	2	2	29.1	7.9	11.8	6.0		3.6		3.2	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS17	5:51	Bottom	3	1	28.2	7.9	13.1	5.7	5.8	3.1		3.1	
TMCLKL	HY/2012/08	2019/07/15	Mid-flood	IS17	5:51	Bottom	3	2	28.8	7.9	12.6	5.8		3.4		2.7	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	6 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_17 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_17 July 2019_ Bottom DO_E_Station IS17
0212330_17 July 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_17 July 2019_ Bottom DO_F_Station IS(Mf)11

Limit Level Exceedance
0212330_17 July 2019_ Bottom DO_E_Station IS(Mf)11

A total of four Action Level and one Limit Level exceedances were recorded on 17 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

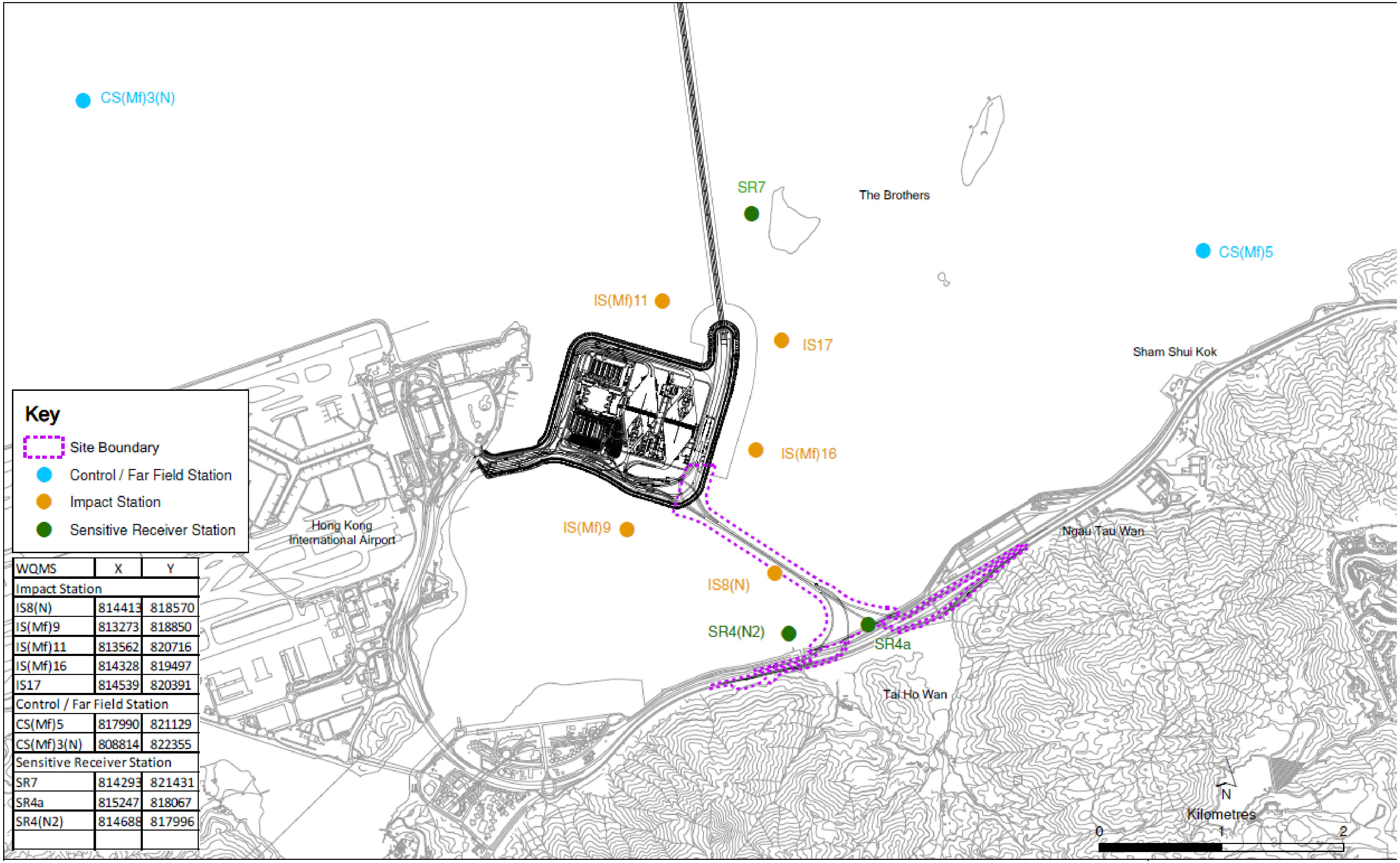
Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**Action Level Exceedance** **0212330_17 July 2019_ Bottom DO_E_Station SR4(N2)** **0212330_17 July 2019_ Bottom DO_E_Station IS17** **0212330_17 July 2019_ Surface & Middle DO_F_Station IS(Mf)11** **0212330_17 July 2019_ Bottom DO_F_Station IS(Mf)11** **Limit Level Exceedance** **0212330_17 July 2019_ Bottom DO_E_Station IS(Mf)11** **[Total No. of Exceedances = 5]**		
Date	17 July 2019 (Measured) 19 July 2019 (*In situ* results received by ERM) 23 July 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at SR4(N2) (4.5 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (3.5 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS17 (4.1 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.9 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS(Mf)11 (3.7 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, no marine works was carried out on 17 July 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • No marine works was carried out on 17 July 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • SR4(N2), IS17, IS(Mf)11 are far away (>1.5 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. • The DO pattern at IS(Mf)11 was similar to the control station where the bottom-depth DO levels were generally lower. Lower bottom-depth DO levels may be possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 17 July 2019 and locations of water quality monitoring stations are attached.		

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Surface	1	1	28.5	7.9	18.7	6.5	5.9	3.0	5.5	7.2	5.7
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Surface	1	2	27.9	7.9	18.7	6.4		4.1		7.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Middle	2	1	28.1	7.9	19.3	5.4		4.9		5.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Middle	2	2	27.5	7.9	19.7	5.3		5.7		5.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Bottom	3	1	25.6	7.7	28.4	3.5	3.6	7.4		4.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)5	13:40	Bottom	3	2	25.0	7.7	29.2	3.6		8.0		4.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Surface	1	1	29.9	8.0	11.6	6.3	6.2	2.2	4.1	5.1	4.5
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Surface	1	2	29.3	8.0	11.9	6.3		2.4		4.6	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Middle	2	1	29.7	8.0	12.2	6.1		3.4		4.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Middle	2	2	29.1	8.0	12.6	6.0		3.4		4.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Bottom	3	1	27.0	7.9	22.9	3.7	3.8	6.6		4.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	CS(Mf)3(N)	12:53	Bottom	3	2	26.4	7.9	23.6	3.8		6.6		4.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Surface	1	1	29.5	8.0	14.4	7.6	7.6	4.7	5.9	4.7	5.7
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Surface	1	2	28.9	8.0	14.8	7.5		5.6		5.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Bottom	3	1	27.9	7.8	19.6	5.4	5.4	6.2		6.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)16	12:09	Bottom	3	2	27.3	7.8	20.1	5.4		7.1		7.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Surface	1	1	28.9	7.8	14.7	6.2	6.2	3.0	6.2	6.1	5.5
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Surface	1	2	28.3	7.8	15.1	6.1		4.0		5.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Bottom	3	1	27.6	7.7	20.7	4.7	4.8	8.5		5.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4a	11:59	Bottom	3	2	27.0	7.7	21.2	4.8		9.3		4.9	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Surface	1	1	28.5	7.7	16.6	5.3	5.3	11.5	13.4	5.7	4.9
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Surface	1	2	27.9	7.7	17.1	5.2		12.3		5.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Bottom	3	1	27.6	7.7	20.8	4.5	4.5	15.8		4.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR4(N2)	11:55	Bottom	3	2	27.0	7.7	21.4	4.5		14.1		4.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Surface	1	1	29.6	8.1	14.2	8.3	8.3	7.1	10.3	6.4	5.1
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Surface	1	2	29.0	8.1	14.6	8.2		7.9		6.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Bottom	3	1	28.1	7.8	18.6	5.4	5.5	12.9		3.6	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS8(N)	11:48	Bottom	3	2	27.6	7.8	18.9	5.5		13.3		4.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Surface	1	1	29.6	8.0	13.1	8.1	8.1	4.5	6.5	5.8	5.2
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Surface	1	2	29.0	8.0	13.5	8.1		5.5		6.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Bottom	3	1	29.1	7.9	14.7	7.1	7.2	7.8		4.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)9	11:42	Bottom	3	2	28.5	7.9	15.1	7.2		8.2		4.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)11	13:15	Surface	1	1	29.5	8.0	11.8	6.3	5.1	3.1	5.8	8.1	6.6
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)11	13:15	Surface	1	2	28.9	8.0	12.1	6.2		3.3		7.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)11	13:15	Middle	2	1	27.6	7.9	19.7	4.0		6.7		6.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)11	13:15	Middle	2	2	27.1	7.9	20.3	4.0		7.7		6.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)11	13:15	Bottom	3	1	25.9	7.9	27.4	3.4	3.5	6.3		5.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS(Mf)11	13:15	Bottom	3	2	25.4	7.9	28.2	3.5		7.4		5.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR7	13:22	Surface	1	1	29.3	8.0	12.3	6.3	6.3	2.8	4.2	5.8	5.8
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR7	13:22	Surface	1	2	28.7	8.0	12.6	6.2		2.8		5.9	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR7	13:22	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR7	13:22	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR7	13:22	Bottom	3	1	28.2	7.9	15.0	4.9	5.0	5.0		5.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	SR7	13:22	Bottom	3	2	27.6	7.9	15.0	5.0		6.2		5.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS17	12:16	Surface	1	1	29.0	7.8	14.2	6.0	5.3	6.8	5.3	5.1	4.4
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS17	12:16	Surface	1	2	28.4	7.8	14.5	5.9		6.3		4.6	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS17	12:16	Middle	2	1	28.0	7.7	18.1	4.7		4.9		4.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS17	12:16	Middle	2	2	27.4	7.7	18.7	4.7		4.6		4.6	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS17	12:16	Bottom	3	1	27.0	7.7	21.8	4.1	4.1	4.9		3.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-Ebb	IS17	12:16	Bottom	3	2	26.4	7.7	22.5	4.1		4.2		3.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)5	5:38	Surface	1	1	29.1	8.0	11.6	5.9	5.5	4.0	11.6	4.6	4.3
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)5	5:38	Surface	1	2	28.5	8.0	11.9	5.8		4.7		4.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)5	5:38	Middle	2	1	27.5	8.0	21.7	5.2		3.2		4.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)5	5:38	Middle	2	2	26.9	8.0	22.3	5.2		3.2		4.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)5	5:38	Bottom	3	1	25.2	7.8	30.0	3.2	3.3	29.7		4.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)5	5:38	Bottom	3	2	24.6	7.8	30.9	3.3		24.8		4.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)3(N)	6:27	Surface	1	1	28.8	7.8	9.5	5.2	5.2	3.8	5.6	5.5	7.0
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)3(N)	6:27	Surface	1	2	28.2	7.8	9.9	5.2		4.7		5.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)3(N)	6:27	Middle	2	1	28.9	7.8	10.4	5.3		4.3		7.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)3(N)	6:27	Middle	2	2	28.3	7.8	10.7	5.2		5.1		6.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)3(N)	6:27	Bottom	3	1	28.1	7.8	17.0	4.3	4.4	7.6		8.6	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	CS(Mf)3(N)	6:27	Bottom	3	2	27.5	7.8	17.5	4.4		8.1		8.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)16	7:10	Surface	1	1	29.1	8.1	13.6	6.5	6.5	3.6	5.5	4.2	3.9
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)16	7:10	Surface	1	2	28.5	8.1	14.2	6.5		4.5		4.9	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)16	7:10	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)16	7:10	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)16	7:10	Bottom	3	1	28.2	7.9	17.5	5.0	5.0	6.7		3.6	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)16	7:10	Bottom	3	2	27.6	7.9	17.9	5.0		7.3		3.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4a	7:20	Surface	1	1	29.0	8.0	12.5	6.1	6.1	3.5	4.5	4.1	3.8
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4a	7:20	Surface	1	2	28.4	8.0	12.9	6.0		4.5		3.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4a	7:20	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4a	7:20	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4a	7:20	Bottom	3	1	28.5	7.9	15.5	5.1	5.1	5.0		3.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4a	7:20	Bottom	3	2	28.0	7.9	16.0	5.1		5.0		3.9	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4(N2)	7:25	Surface	1	1	29.1	8.0	13.1	6.0	6.0	4.0	4.8	4.1	3.8
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4(N2)	7:25	Surface	1	2	28.5	8.0	13.4	5.9		4.6		4.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4(N2)	7:25	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4(N2)	7:25	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4(N2)	7:25	Bottom	3	1	28.6	7.9	15.9	4.8	4.9	5.0		3.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR4(N2)	7:25	Bottom	3	2	28.0	7.9	16.3	4.9		5.7		3.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS8(N)	7:31	Surface	1	1	29.1	8.0	12.0	6.5	6.5	3.4	6.1	3.8	4.2
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS8(N)	7:31	Surface	1	2	28.5	8.0	12.4	6.4		4.5		4.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS8(N)	7:31	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS8(N)	7:31	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS8(N)	7:31	Bottom	3	1	28.7	7.9	14.9	5.5	5.5	7.9		4.3	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS8(N)	7:31	Bottom	3	2	28.1	7.9	15.3	5.5		8.6		4.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)9	7:39	Surface	1	1	29.0	8.0	12.9	6.4	6.4	5.9	6.1	4.6	4.9
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)9	7:39	Surface	1	2	28.4	8.0	13.2	6.4		5.7		4.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)9	7:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)9	7:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)9	7:39	Bottom	3	1	28.9	8.0	14.0	6.0	6.0	6.3		5.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)9	7:39	Bottom	3	2	28.2	8.0	14.4	6.0		6.4		5.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)11	6:04	Surface	1	1	29.0	8.0	11.2	5.9	4.9	4.0	11.8	4.2	4.4
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)11	6:04	Surface	1	2	28.4	8.0	11.5	5.9		4.9		4.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)11	6:04	Middle	2	1	26.7	7.9	24.0	3.8		11.8		4.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)11	6:04	Middle	2	2	26.2	7.9	24.6	3.8		12.2		4.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)11	6:04	Bottom	3	1	26.2	7.9	26.5	3.6	3.7	20.6		4.6	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS(Mf)11	6:04	Bottom	3	2	25.6	7.9	27.2	3.7		17.4		5.1	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR7	5:57	Surface	1	1	29.1	7.8	10.8	5.3	5.3	4.2	5.2	3.5	3.3
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR7	5:57	Surface	1	2	28.5	7.8	11.1	5.3		5.1		3.7	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR7	5:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR7	5:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR7	5:57	Bottom	3	1	28.7	7.8	12.8	4.9	4.9	5.3		3.2	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	SR7	5:57	Bottom	3	2	28.1	7.8	13.1	4.8		6.1		2.8	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS17	7:02	Surface	1	1	28.8	8.0	14.4	5.9	5.8	3.3	3.5	4.6	4.0
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS17	7:02	Surface	1	2	28.2	8.0	14.8	5.9		3.3		4.4	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS17	7:02	Middle	2	1	28.4	8.0	16.4	5.6		3.7		4.0	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS17	7:02	Middle	2	2	27.8	8.0	16.8	5.6		3.6		3.5	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS17	7:02	Bottom	3	1	28.2	8.0	16.7	5.7	5.7	3.4		3.9	
TMCLKL	HY/2012/08	2019/07/17	Mid-flood	IS17	7:02	Bottom	3	2	27.6	8.0	17.3	5.6		3.4		3.7	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental
Resources
Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	6 August 2019

ERM

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_19 July 2019_ Bottom DO_E_Station SR4a
0212330_19 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_19 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_19 July 2019_ Bottom DO_E_Station IS17
0212330_19 July 2019_ Bottom DO_F_Station IS(Mf)11
0212330_19 July 2019_ Bottom DO_F_Station SR7
0212330_19 July 2019_ Bottom DO_F_Station IS17

A total of seven Action Level exceedances were recorded on 19 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK – NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

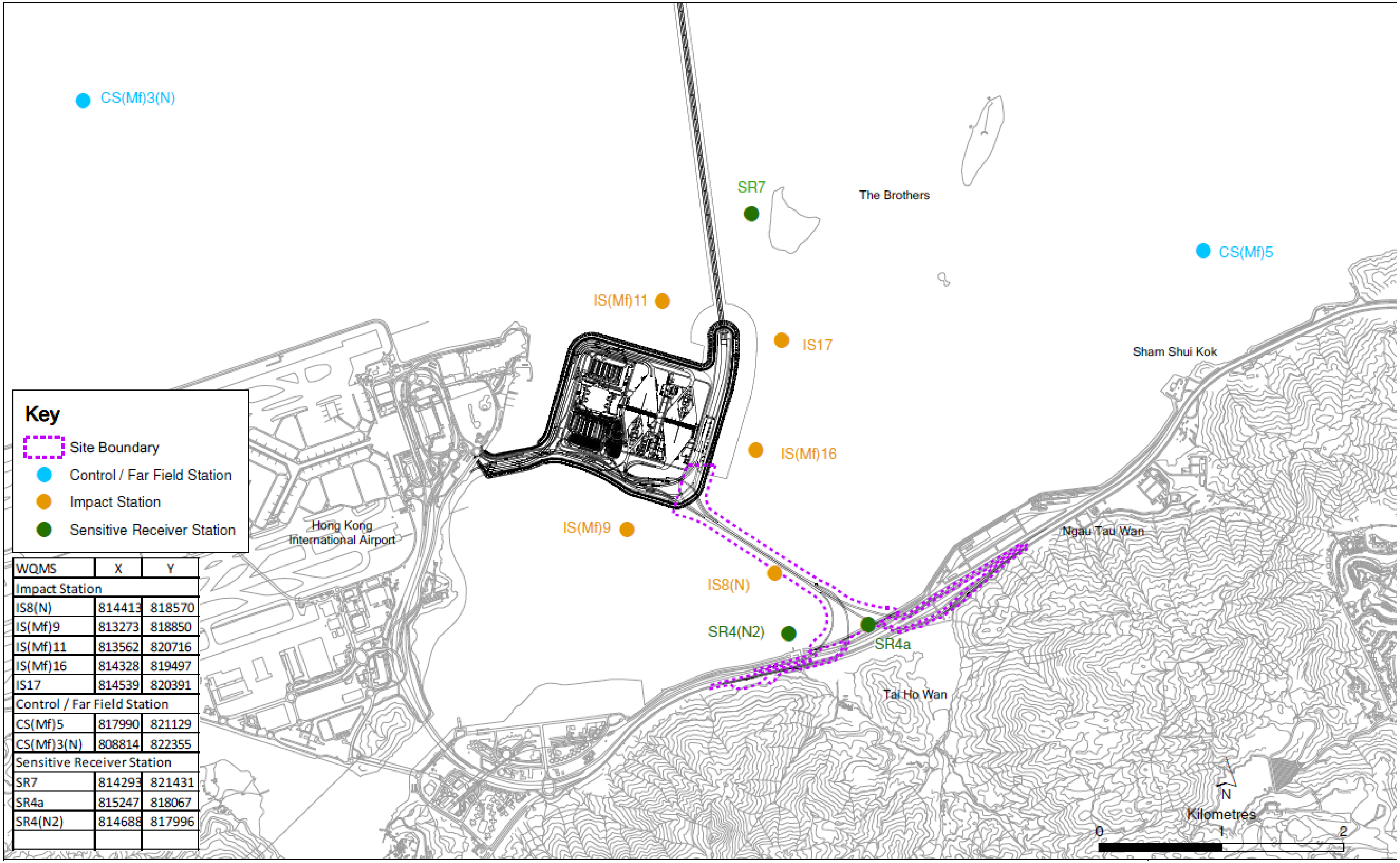
Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_19 July 2019_ Bottom DO_E_Station SR4a
0212330_19 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_19 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_19 July 2019_ Bottom DO_E_Station IS17
0212330_19 July 2019_ Bottom DO_F_Station IS(Mf)11
0212330_19 July 2019_ Bottom DO_F_Station SR7
0212330_19 July 2019_ Bottom DO_F_Station IS17
[Total No. of Exceedances = 7]</td></tr>
<tr><td>Date</td><td colspan="3">19 July 2019 (Measured)
22 July 2019 (In situ results received by ERM)
29 July 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO is observed at SR4a (4.5 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at SR4(N2) (4.4 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at IS(Mf)11 (3.8 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at IS17 (4.2 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at IS(Mf)11 (4.1 mg/L) during mid-flood tide.
Action Level Exceedance for DO is observed at SR7 (4.6 mg/L) during mid-flood tide.
Action Level Exceedance for DO is observed at IS17 (4.7 mg/L) during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, no marine works was carried out on 19 July 2019.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="3">The exceedances are unlikely to be due to the Project, in view of the following:
No marine works was carried out on 15 July 2019.
All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.
SR4a, SR4(N2), IS17, SR7 and IS(Mf)11 are far away (>1.5 km) from the Removal of Jetty (Figure 1), thus the observed exceedance should not be affected by the marine works under this Contract.
Bottom-depth DO levels at IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level.</td></tr>
<tr><td>Actions Taken / To Be Taken</td><td colspan="3">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="3">The monitoring results on 19 July 2019 and locations of water quality monitoring stations are attached.</td></tr>
</table>

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Surface	1	1	28.6	8.0	16.5	5.8	4.9	3.1	6.2	5.3	6.8
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Surface	1	2	28.0	8.0	16.9	5.8		3.2		5.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Middle	2	1	26.7	7.9	24.3	3.9		6.7		6.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Middle	2	2	26.1	7.9	25.0	3.9		6.6		5.9	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Bottom	3	1	25.3	7.9	29.6	3.8	3.9	8.9		9.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)5	14:52	Bottom	3	2	24.8	7.9	30.3	4.0		8.8		9.4	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Surface	1	1	29.2	8.0	12.9	6.2	5.3	2.2	3.3	4.0	5.0
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Surface	1	2	28.6	8.0	13.3	6.1		2.5		4.4	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Middle	2	1	27.6	7.9	20.1	4.4		3.3		5.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Middle	2	2	27.0	7.9	20.8	4.4		3.2		4.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Bottom	3	1	27.5	7.9	23.3	4.0	4.1	4.4		5.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	CS(Mf)3(N)	14:13	Bottom	3	2	27.0	7.9	23.9	4.1		4.1		6.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Surface	1	1	28.8	8.1	18.0	5.9	6.0	6.5	6.2	9.0	9.8
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Surface	1	2	28.3	8.1	18.2	6.1		6.5		8.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Bottom	3	1	27.2	8.0	23.1	4.9	5.0	5.9		10.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)16	13:24	Bottom	3	2	26.6	8.0	23.7	5.0		5.9		10.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Surface	1	1	28.6	8.0	17.9	5.7	5.7	4.4	5.5	5.4	8.2
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Surface	1	2	28.1	8.0	18.3	5.7		4.5		5.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Bottom	3	1	28.1	8.0	22.1	4.5	4.5	6.6		11.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4a	13:15	Bottom	3	2	27.5	8.0	22.9	4.5		6.6		11.3	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Surface	1	1	29.2	8.0	16.1	6.3	6.3	4.3	7.4	6.5	9.3
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Surface	1	2	28.7	8.1	16.5	6.3		4.4		6.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Bottom	3	1	27.8	7.9	20.2	4.4	4.4	10.4		11.6	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR4(N2)	13:11	Bottom	3	2	27.2	7.9	20.8	4.4		10.4		12.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Surface	1	1	28.9	8.2	17.6	6.6	6.6	8.6	10.6	14.4	16.7
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Surface	1	2	28.3	8.2	18.1	6.5		8.9		13.9	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Bottom	3	1	28.1	8.0	21.0	5.3	5.3	12.5		19.4	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS8(N)	13:04	Bottom	3	2	27.6	8.0	21.3	5.3		12.5		19.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Surface	1	1	28.9	8.1	16.5	6.6	6.6	4.2	7.6	5.0	7.7
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Surface	1	2	28.3	8.1	17.0	6.5		4.6		5.3	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Bottom	3	1	28.6	8.0	17.8	5.6	5.7	10.8		10.4	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)9	12:57	Bottom	3	2	28.0	8.0	18.5	5.7		10.8		10.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)11	13:42	Surface	1	1	29.1	8.0	13.2	5.9	5.7	3.0	4.2	4.6	5.6
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)11	13:42	Surface	1	2	28.5	8.0	13.6	5.9		3.0		5.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)11	13:42	Middle	2	1	28.8	8.0	15.1	5.5		3.6		6.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)11	13:42	Middle	2	2	28.2	8.0	15.5	5.5		3.6		5.9	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)11	13:42	Bottom	3	1	26.3	7.9	27.1	3.8	3.8	6.0		6.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS(Mf)11	13:42	Bottom	3	2	25.7	7.9	27.9	3.8		6.1		5.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR7	14:35	Surface	1	1	29.2	8.0	13.2	5.9	5.9	3.5	4.4	5.0	5.8
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR7	14:35	Surface	1	2	28.6	8.0	13.5	5.9		3.6		4.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR7	14:35	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR7	14:35	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR7	14:35	Bottom	3	1	27.6	7.9	20.6	4.7	4.8	5.2		6.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	SR7	14:35	Bottom	3	2	27.1	7.9	20.8	4.8		5.3		6.5	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS17	13:32	Surface	1	1	29.5	8.0	11.9	6.2	5.4	4.2	5.3	4.1	5.7
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS17	13:32	Surface	1	2	28.9	8.0	12.3	6.2		4.2		4.3	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS17	13:32	Middle	2	1	27.7	7.9	20.3	4.6		4.5		5.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS17	13:32	Middle	2	2	27.1	7.9	20.9	4.6		4.7		5.3	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS17	13:32	Bottom	3	1	26.5	7.9	25.4	4.2	4.2	6.9		7.6	
TMCLKL	HY/2012/08	2019/07/19	Mid-Ebb	IS17	13:32	Bottom	3	2	25.9	7.9	26.2	4.1		7.0		7.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)5	7:17	Surface	1	1	28.4	8.0	16.3	5.2	4.4	4.1	5.6	5.0	6.1
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)5	7:17	Surface	1	2	27.8	7.9	16.8	5.1		4.1		5.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)5	7:17	Middle	2	1	26.4	7.9	25.6	3.7		3.5		6.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)5	7:17	Middle	2	2	25.8	7.9	26.4	3.7		3.5		6.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)5	7:17	Bottom	3	1	25.1	7.9	30.3	3.5	3.6	9.2		6.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)5	7:17	Bottom	3	2	24.5	7.9	31.2	3.6		9.2		7.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)3(N)	8:06	Surface	1	1	28.8	7.9	11.2	5.1	5.1	3.8	6.6	5.9	7.6
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)3(N)	8:06	Surface	1	2	28.2	7.9	11.5	5.1		4.0		6.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)3(N)	8:06	Middle	2	1	28.5	7.9	14.6	5.0		3.9		6.5	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)3(N)	8:06	Middle	2	2	27.9	7.9	15.0	5.0		4.2		6.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)3(N)	8:06	Bottom	3	1	27.6	7.9	20.8	4.3	4.3	11.8		10.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	CS(Mf)3(N)	8:06	Bottom	3	2	27.0	7.9	21.3	4.2		11.6		10.3	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)16	8:51	Surface	1	1	28.4	8.0	17.2	5.7	5.7	10.0	11.2	7.0	9.0
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)16	8:51	Surface	1	2	27.8	8.0	17.7	5.6		10.3		6.6	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)16	8:51	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)16	8:51	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)16	8:51	Bottom	3	1	28.4	8.0	20.2	5.0	5.1	12.3		11.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)16	8:51	Bottom	3	2	27.7	8.0	20.8	5.1		12.0		11.4	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4a	8:58	Surface	1	1	28.8	8.0	15.1	5.8	5.8	4.3	5.9	7.3	8.5
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4a	8:58	Surface	1	2	28.2	8.0	15.6	5.7		4.5		7.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4a	8:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4a	8:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4a	8:58	Bottom	3	1	28.0	7.9	18.9	4.7	4.8	7.2		9.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4a	8:58	Bottom	3	2	27.4	7.9	19.5	4.8		7.7		9.6	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4(N2)	9:06	Surface	1	1	28.5	8.0	16.7	5.4	5.4	6.3	8.9	5.2	7.4
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4(N2)	9:06	Surface	1	2	27.9	8.0	17.2	5.4		6.5		4.9	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4(N2)	9:06	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4(N2)	9:06	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4(N2)	9:06	Bottom	3	1	28.5	8.0	18.0	5.1	5.2	11.5		9.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR4(N2)	9:06	Bottom	3	2	27.9	8.0	18.5	5.2		11.1		9.9	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS8(N)	9:11	Surface	1	1	28.8	8.1	15.7	6.2	6.2	3.2	5.0	5.7	6.2
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS8(N)	9:11	Surface	1	2	28.2	8.1	16.1	6.2		3.4		5.9	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS8(N)	9:11	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS8(N)	9:11	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS8(N)	9:11	Bottom	3	1	28.2	8.0	17.9	5.0	5.0	6.9		6.6	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS8(N)	9:11	Bottom	3	2	27.6	7.9	18.4	5.0		6.4		6.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)9	9:19	Surface	1	1	28.6	8.0	15.7	5.6	5.6	4.3	4.5	6.7	8.3
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)9	9:19	Surface	1	2	28.0	8.0	16.1	5.5		4.5		6.5	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)9	9:19	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)9	9:19	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)9	9:19	Bottom	3	1	28.4	8.0	17.1	5.5	5.5	4.7		10.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)9	9:19	Bottom	3	2	27.8	8.0	17.7	5.5		4.5		9.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)11	8:35	Surface	1	1	28.4	8.0	16.9	5.5	5.3	3.3	6.1	5.6	6.9
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)11	8:35	Surface	1	2	27.8	8.0	17.4	5.5		3.6		5.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)11	8:35	Middle	2	1	27.9	8.0	19.3	5.1		3.3		6.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)11	8:35	Middle	2	2	27.3	8.0	19.9	5.1		3.3		5.8	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)11	8:35	Bottom	3	1	26.5	8.0	25.3	4.1	4.1	11.9		9.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS(Mf)11	8:35	Bottom	3	2	25.9	8.0	26.0	4.1		11.4		9.3	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR7	7:41	Surface	1	1	28.8	7.9	13.8	5.4	5.4	3.8	4.7	4.7	5.6
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR7	7:41	Surface	1	2	28.2	7.9	14.2	5.3		4.1		5.1	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR7	7:41	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR7	7:41	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR7	7:41	Bottom	3	1	27.9	7.9	19.9	4.6	4.6	5.4		6.3	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	SR7	7:41	Bottom	3	2	27.2	7.9	21.0	4.6		5.6		6.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS17	8:43	Surface	1	1	28.3	8.0	17.8	5.6	5.4	4.1	3.7	6.1	6.3
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS17	8:43	Surface	1	2	27.7	8.0	18.3	5.6		4.2		6.0	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS17	8:43	Middle	2	1	27.8	8.0	20.4	5.1		3.3		6.4	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS17	8:43	Middle	2	2	27.2	8.0	21.0	5.1		3.5		6.2	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS17	8:43	Bottom	3	1	26.8	8.0	24.2	4.6	4.7	3.4		6.7	
TMCLKL	HY/2012/08	2019/07/19	Mid-flood	IS17	8:43	Bottom	3	2	26.2	8.0	24.9	4.7		3.7		6.5	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

ERM

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	8 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_22 July 2019_ Bottom DO_E_Station IS(Mf)16
0212330_22 July 2019_ Surface & Middle DO_E_Station SR4a
0212330_22 July 2019_ Bottom DO_E_Station SR4a
0212330_22 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_22 July 2019_ Bottom DO_E_Station IS8(N)
0212330_22 July 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_22 July 2019_ Bottom DO_E_Station IS17
0212330_22 July 2019_ Surface & Middle DO_F_Station IS(Mf)16
0212330_22 July 2019_ Bottom DO_F_Station IS(Mf)16
0212330_22 July 2019_ Bottom DO_F_Station SR4a
0212330_22 July 2019_ Surface & Middle DO_F_Station SR4(N2)
0212330_22 July 2019_ Bottom DO_F_Station SR4(N2)
0212330_22 July 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_22 July 2019_ Surface & Middle DO_F_Station SR7
0212330_22 July 2019_ Bottom DO_F_Station SR7
0212330_22 July 2019_ Surface & Middle DO_F_Station IS17
0212330_22 July 2019_ Bottom DO_F_Station IS17

Limit Level Exceedance
0212330_22 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_22 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of seventeen Action Level and two Limit Level exceedances were recorded on 22 July 2019.

Email message

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

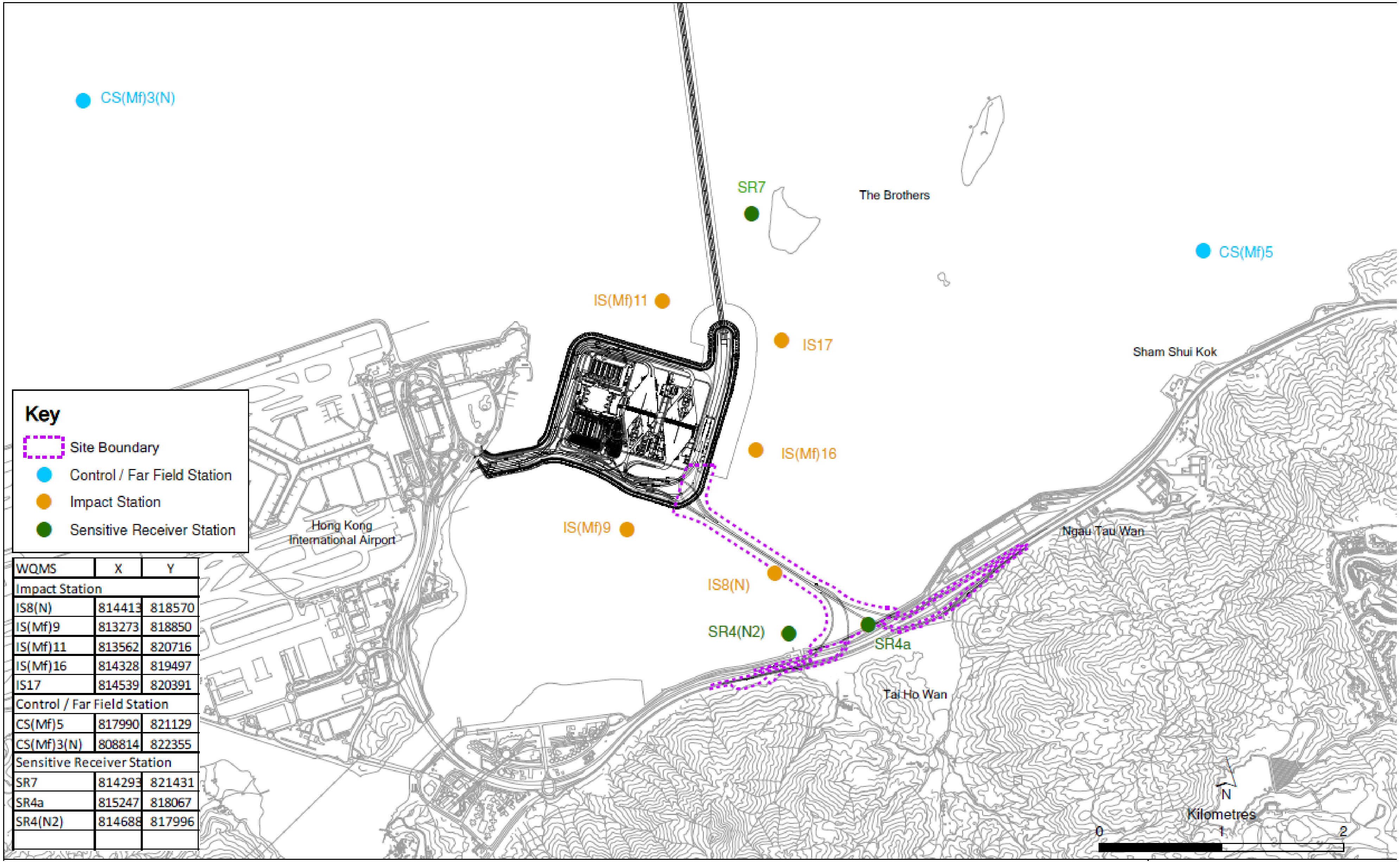
Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_22 July 2019_ Bottom DO_E_Station IS(Mf)16
0212330_22 July 2019_ Surface & Middle DO_E_Station SR4a
0212330_22 July 2019_ Bottom DO_E_Station SR4a
0212330_22 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_22 July 2019_ Bottom DO_E_Station IS8(N)
0212330_22 July 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_22 July 2019_ Bottom DO_E_Station IS17
0212330_22 July 2019_ Surface & Middle DO_F_Station IS(Mf)16
0212330_22 July 2019_ Bottom DO_F_Station IS(Mf)16
0212330_22 July 2019_ Bottom DO_F_Station SR4a
0212330_22 July 2019_ Surface & Middle DO_F_Station SR4(N2)
0212330_22 July 2019_ Bottom DO_F_Station SR4(N2)
0212330_22 July 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_22 July 2019_ Surface & Middle DO_F_Station SR7
0212330_22 July 2019_ Bottom DO_F_Station SR7
0212330_22 July 2019_ Surface & Middle DO_F_Station IS17
0212330_22 July 2019_ Bottom DO_F_Station IS17
<u>Limit Level Exceedance</u>
0212330_22 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_22 July 2019_ Bottom DO_F_Station IS(Mf)11
[Total No. of Exceedances = 19]</td></tr>
<tr><td>Date</td><td colspan="3">22 July 2019 (Measured)
24 July 2019 (In situ results received by ERM)
30 July 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
</table>

Measured Levels	Action Level Exceedance for DO is observed at IS(Mf)16 (4.1 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at SR4a (4.7 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at SR4a (4.1 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at SR4(N2) (4.4 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS8(N) (3.9 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.7 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS17 (3.8 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)16 (4.8 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS(Mf)16 (4.3 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR4a (4.2 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR4(N2) (4.8 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR4(N2) (4.1 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS(Mf)11 (4.2 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR7 (4.5 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR7 (4.4 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.5 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (3.8 mg/L) during mid-flood tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (3.6 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (3.4 mg/L) during mid-flood tide.
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, there was no marine works on 22 July 2019.
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • No marine works was carried out on 22 July 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS(Mf)16, SR4a, IS8(N), IS17 and IS(Mf)11 are far away (>1.5 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. • Bottom-depth DO levels at IS(Mf)16, SR4a, IS8(N), IS17 and IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Limit Level. • Surface & Middle-depth DO levels at IS(Mf)16, SR4a, IS8(N), IS17 and IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 22 July 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	15:40	Surface	1	1	27.0	7.7	19.3	4.8	4.2	2.4	4.2	3.1	3.0
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	15:40	Surface	1	2	26.7	7.7	20.9	4.8		2.3		2.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	15:40	Middle	2	1	25.5	7.7	26.2	3.4		4.5		3.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	15:40	Middle	2	2	25.8	7.7	27.3	3.7		4.5		3.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	15:40	Bottom	3	1	24.7	7.6	29.9	3.3	3.3	6.1		2.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)5	15:40	Bottom	3	2	24.6	7.7	30.0	3.2		5.3		2.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	15:45	Surface	1	1	27.5	7.6	14.9	4.8	4.1	2.9	8.4	4.2	5.0
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	15:45	Surface	1	2	27.5	7.6	14.6	4.7		2.9		4.4	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	15:45	Middle	2	1	26.0	7.6	24.0	3.5		7.8		5.0	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	15:45	Middle	2	2	25.8	7.6	22.9	3.5		7.1		5.1	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	15:45	Bottom	3	1	25.7	7.6	25.3	3.5	3.6	14.4		5.6	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	CS(Mf)3(N)	15:45	Bottom	3	2	25.7	7.6	25.3	3.6		15.2		5.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	15:00	Surface	1	1	27.4	7.7	18.1	5.7	5.8	3.7	4.4	4.8	4.9
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	15:00	Surface	1	2	27.5	7.8	17.9	5.8		3.4		4.5	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	15:00	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	15:00	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	15:00	Bottom	3	1	26.1	7.6	24.6	4.1	4.1	5.2		4.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)16	15:00	Bottom	3	2	26.4	7.6	23.1	4.0		5.1		5.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4a	14:49	Surface	1	1	27.1	7.6	18.8	4.6	4.7	4.6	5.1	2.9	3.4
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4a	14:49	Surface	1	2	27.0	7.6	18.1	4.7		4.6		3.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4a	14:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4a	14:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4a	14:49	Bottom	3	1	26.7	7.6	20.9	4.1	4.1	5.6		3.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4a	14:49	Bottom	3	2	27.0	7.6	20.9	4.1		5.4		3.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	14:45	Surface	1	1	27.7	7.7	17.4	5.3	5.4	4.5	6.2	2.8	3.4
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	14:45	Surface	1	2	27.5	7.7	16.8	5.4		5.1		3.1	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	14:45	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	14:45	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	14:45	Bottom	3	1	27.0	7.6	20.3	4.4	4.4	8.3		3.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR4(N2)	14:45	Bottom	3	2	27.0	7.7	19.7	4.4		7.0		3.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	14:39	Surface	1	1	27.6	7.7	17.9	5.2	5.2	9.4	10.0	3.4	3.4
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	14:39	Surface	1	2	27.7	7.7	17.5	5.2		8.4		3.5	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	14:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	14:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	14:39	Bottom	3	1	26.4	7.6	22.8	3.8	3.9	11.6		3.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS8(N)	14:39	Bottom	3	2	26.3	7.6	22.9	3.9		10.7		3.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	14:33	Surface	1	1	27.6	7.7	17.8	5.8	5.8	3.6	5.6	3.6	3.8
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	14:33	Surface	1	2	27.6	7.7	17.7	5.8		3.6		3.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	14:33	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	14:33	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	14:33	Bottom	3	1	27.2	7.6	19.1	4.7	4.8	7.5		3.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)9	14:33	Bottom	3	2	27.2	7.6	19.1	4.8		7.6		4.0	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)11	16:10	Surface	1	1	27.6	7.6	14.7	5.3	4.7	3.6	4.7	4.0	4.0
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)11	16:10	Surface	1	2	27.7	7.7	14.1	5.3		3.0		3.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)11	16:10	Middle	2	1	26.6	7.6	20.3	4.1		4.0		4.4	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)11	16:10	Middle	2	2	26.4	7.6	22.0	3.9		4.3		3.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)11	16:10	Bottom	3	1	25.0	7.6	28.5	3.6	3.6	6.6		3.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS(Mf)11	16:10	Bottom	3	2	24.9	7.6	29.3	3.5		6.7		4.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR7	16:17	Surface	1	1	27.9	7.7	14.5	5.8	5.8	2.3	2.6	3.2	3.0
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR7	16:17	Surface	1	2	27.9	7.7	14.5	5.8		2.7		3.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR7	16:17	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR7	16:17	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR7	16:17	Bottom	3	1	27.5	7.6	15.5	5.4	5.4	2.7		2.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	SR7	16:17	Bottom	3	2	27.6	7.7	15.2	5.4		2.6		2.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS17	15:06	Surface	1	1	27.6	7.7	16.3	5.4	5.3	3.3	4.1	4.4	3.5
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS17	15:06	Surface	1	2	27.6	7.7	14.9	5.2		3.3		4.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS17	15:06	Middle	2	1	27.3	7.7	18.7	5.4		3.5		2.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS17	15:06	Middle	2	2	27.3	7.7	19.7	5.2		3.5		3.0	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^oC)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS17	15:06	Bottom	3	1	24.8	7.6	29.3	3.8	3.8	6.1		3.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-Ebb	IS17	15:06	Bottom	3	2	24.8	7.7	29.7	3.8		4.9		3.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)5	9:00	Surface	1	1	26.9	7.6	19.1	4.3	4.0	2.8	2.9	3.1	3.6
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)5	9:00	Surface	1	2	27.0	7.6	18.0	4.4		3.0		3.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)5	9:00	Middle	2	1	25.7	7.6	25.2	3.6		2.4		3.5	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)5	9:00	Middle	2	2	25.7	7.6	25.3	3.6		2.4		3.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)5	9:00	Bottom	3	1	24.5	7.6	30.5	3.2	3.3	3.4		3.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)5	9:00	Bottom	3	2	24.6	7.6	30.5	3.3		3.4		3.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)3(N)	9:57	Surface	1	1	27.7	7.5	9.3	5.1	4.9	4.8	5.1	3.5	4.5
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)3(N)	9:57	Surface	1	2	27.7	7.6	9.0	5.1		4.9		3.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)3(N)	9:57	Middle	2	1	27.4	7.6	14.1	4.7		3.6		4.5	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)3(N)	9:57	Middle	2	2	27.5	7.6	13.7	4.7		4.2		4.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)3(N)	9:57	Bottom	3	1	26.5	7.6	21.2	4.1	4.1	6.7		5.1	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	CS(Mf)3(N)	9:57	Bottom	3	2	26.6	7.5	20.9	4.1		6.4		4.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)16	10:41	Surface	1	1	27.1	7.6	18.4	4.7	4.8	3.4	4.0	4.1	5.2
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)16	10:41	Surface	1	2	27.3	7.7	17.5	4.9		3.5		4.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)16	10:41	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)16	10:41	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)16	10:41	Bottom	3	1	26.3	7.6	22.5	4.4	4.3	4.5		6.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)16	10:41	Bottom	3	2	26.9	7.6	21.4	4.2		4.7		6.0	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4a	10:52	Surface	1	1	27.4	7.7	16.6	5.0	5.0	3.3	5.3	4.6	5.2
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4a	10:52	Surface	1	2	27.4	7.7	16.3	5.0		3.2		4.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4a	10:52	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4a	10:52	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4a	10:52	Bottom	3	1	26.6	7.6	20.9	4.2	4.2	7.4		5.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4a	10:52	Bottom	3	2	26.6	7.6	21.0	4.2		7.4		5.5	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4(N2)	10:57	Surface	1	1	27.3	7.6	18.6	4.9	4.8	4.3	6.9	5.5	6.0
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4(N2)	10:57	Surface	1	2	27.2	7.6	17.8	4.7		4.5		5.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4(N2)	10:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4(N2)	10:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4(N2)	10:57	Bottom	3	1	26.7	7.6	20.7	4.1	4.1	8.7		6.4	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR4(N2)	10:57	Bottom	3	2	26.8	7.6	20.6	4.1		10.1		6.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS8(N)	11:04	Surface	1	1	27.6	7.7	16.2	5.3	5.3	3.5	5.0	4.2	4.5
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS8(N)	11:04	Surface	1	2	27.5	7.7	16.3	5.2		3.4		4.1	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS8(N)	11:04	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS8(N)	11:04	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS8(N)	11:04	Bottom	3	1	27.1	7.6	19.0	4.8	4.8	7.0		4.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS8(N)	11:04	Bottom	3	2	27.3	7.7	18.5	4.8		6.2		4.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)9	11:11	Surface	1	1	27.4	7.7	17.0	5.1	5.1	3.9	4.1	4.3	4.5
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)9	11:11	Surface	1	2	27.4	7.7	17.0	5.0		3.9		4.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)9	11:11	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)9	11:11	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)9	11:11	Bottom	3	1	27.2	7.7	17.8	4.9	4.9	4.2		4.8	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)9	11:11	Bottom	3	2	27.2	7.7	17.6	4.9		4.4		4.5	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)11	9:32	Surface	1	1	27.2	7.6	17.8	4.7	4.2	3.2	4.7	4.0	4.2
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)11	9:32	Surface	1	2	27.3	7.7	16.9	4.8		3.0		4.3	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)11	9:32	Middle	2	1	26.2	7.6	22.9	3.7		5.1		4.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)11	9:32	Middle	2	2	26.1	7.6	23.3	3.7		5.8		4.4	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)11	9:32	Bottom	3	1	24.9	7.6	28.9	3.5	3.4	5.8		4.1	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS(Mf)11	9:32	Bottom	3	2	25.5	7.7	28.7	3.3		5.1		4.4	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR7	9:24	Surface	1	1	27.1	7.6	18.0	4.5	4.5	3.2	3.4	4.4	4.6
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR7	9:24	Surface	1	2	27.0	7.6	18.3	4.4		3.3		4.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR7	9:24	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR7	9:24	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR7	9:24	Bottom	3	1	26.6	7.6	20.2	4.4	4.4	3.6		5.1	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	SR7	9:24	Bottom	3	2	26.9	7.6	18.6	4.3		3.4		4.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS17	10:33	Surface	1	1	26.9	7.7	19.3	4.7	4.5	2.7	2.8	5.0	5.0
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS17	10:33	Surface	1	2	26.9	7.7	19.3	4.7		2.9		4.9	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS17	10:33	Middle	2	1	26.4	7.7	21.5	4.2		2.5		4.7	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS17	10:33	Middle	2	2	26.5	7.6	21.3	4.2		2.5		4.6	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS17	10:33	Bottom	3	1	25.4	7.7	27.1	3.8	3.8	3.3		5.2	
TMCLKL	HY/2012/08	2019/07/22	Mid-flood	IS17	10:33	Bottom	3	2	25.6	7.6	25.9	3.8		3.0		5.4	



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	8 August 2019

ERM

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_24 July 2019_ Bottom DO_E_Station SR4a
0212330_24 July 2019_ Bottom DO_E_Station IS8(N)
0212330_24 July 2019_ Bottom DO_E_Station IS17
0212330_24 July 2019_ Bottom DO_F_Station IS(Mf)16
0212330_24 July 2019_ Bottom DO_F_Station SR4(N2)
0212330_24 July 2019_ Surface & Middle DO_F_Station SR7
0212330_24 July 2019_ Bottom DO_F_Station SR7
0212330_24 July 2019_ Surface & Middle DO_F_Station IS17
0212330_24 July 2019_ Bottom DO_F_Station IS17

Limit Level Exceedance
0212330_24 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_24 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of nine Action Level and two Limit Level exceedances were recorded on 24 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

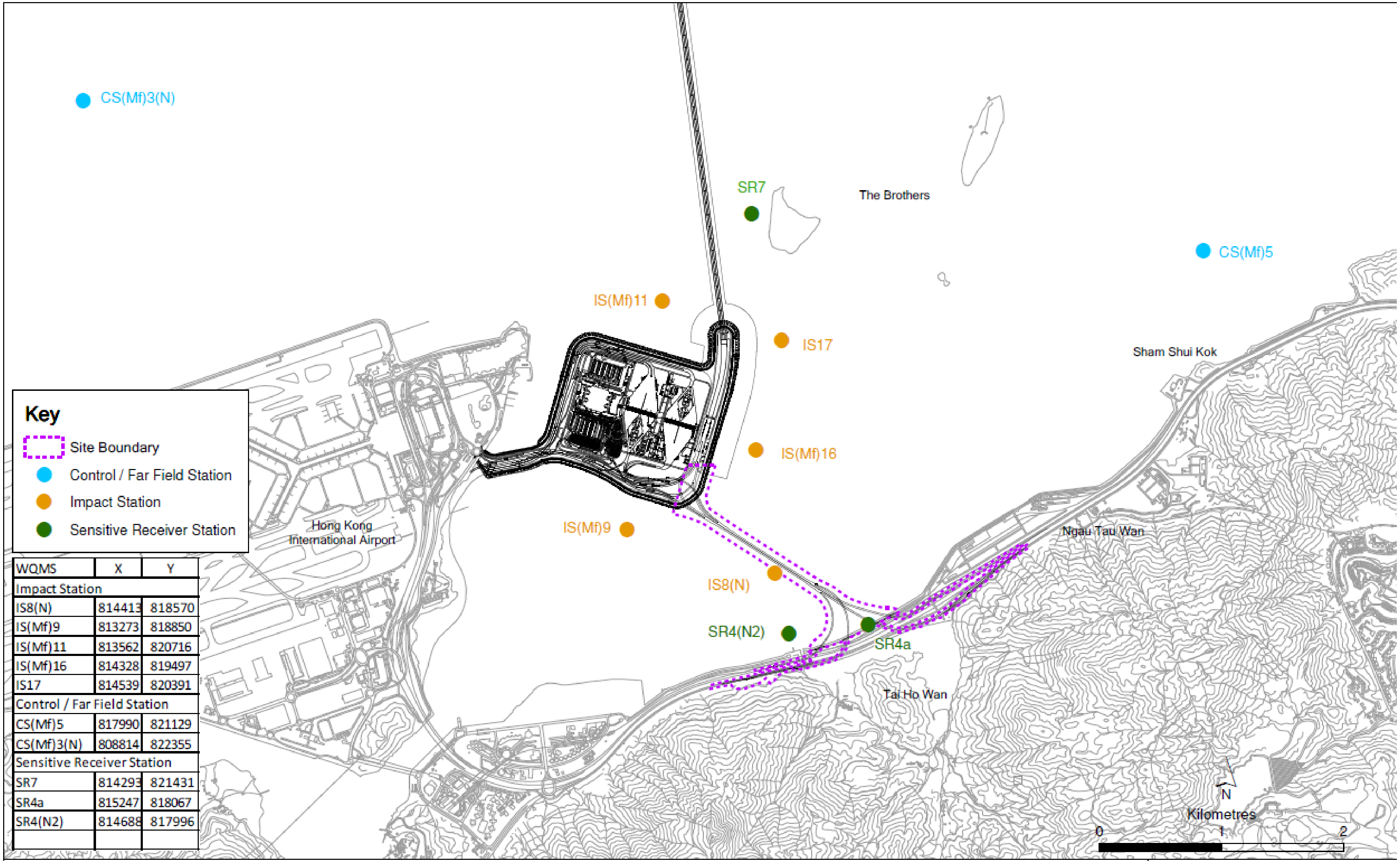
Log No.	**Action Level Exceedance** **0212330_24 July 2019_ Bottom DO_E_Station SR4a** **0212330_24 July 2019_ Bottom DO_E_Station IS8(N)** **0212330_24 July 2019_ Bottom DO_E_Station IS17** **0212330_24 July 2019_ Bottom DO_F_Station IS(Mf)16** **0212330_24 July 2019_ Bottom DO_F_Station SR4(N2)** **0212330_24 July 2019_ Surface & Middle DO_F_Station SR7** **0212330_24 July 2019_ Bottom DO_F_Station SR7** **0212330_24 July 2019_ Surface & Middle DO_F_Station IS17** **0212330_24 July 2019_ Bottom DO_F_Station IS17** **Limit Level Exceedance** **0212330_24 July 2019_ Bottom DO_E_Station IS(Mf)11** **0212330_24 July 2019_ Bottom DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 11]**		
Date	24 July 2019 (Measured) 26 July 2019 (*In situ* results received by ERM) 1 August 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO is observed at SR4a (4.5 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS8(N) (4.6 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.2 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at IS(Mf)16 (4.4 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR4(N2) (4.5 mg/L) during mid-ebb tide. Action Level Exceedance for DO is observed at SR7 (4.8 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at SR7 (4.4 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.9 mg/L) during mid-flood tide. Action Level Exceedance for DO is observed at IS17 (4.4 mg/L) during mid-flood tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (3.4 mg/L) during mid-ebb tide. Limit Level Exceedance for DO is observed at IS(Mf)11 (2.9 mg/L) during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, no marine works was carried out on 24 July 2019.		

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Project, in view of the following: • No marine works was carried out on 24 July 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • SR4(N2), IS17, IS(Mf)11 are far away (>1.5 km) from the Removal of Jetty *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. • Bottom-depth DO levels at IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Limit Level. • Surface & Middle-depth DO levels at IS(Mf)11 were similar to the corresponding control stations, CS(Mf)3(N), during both mid-ebb and mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 24 July 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Surface	1	1	28.5	8.0	19.5	7.3	5.6	4.7	3.8	3.6	3.9
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Surface	1	2	28.5	8.0	19.5	7.5		4.4		3.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Middle	2	1	26.4	7.8	25.2	3.9		2.0		3.8	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Middle	2	2	25.6	7.8	26.5	3.7		2.2		3.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Bottom	3	1	25.0	7.7	30.5	3.4	3.4	4.8		4.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)5	17:48	Bottom	3	2	25.2	7.8	29.5	3.4		4.4		4.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Surface	1	1	28.1	7.8	16.9	5.6	4.7	1.1	3.1	3.8	3.4
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Surface	1	2	28.1	7.8	17.0	5.5		1.2		3.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Middle	2	1	26.7	7.7	21.7	4.0		2.8		3.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Middle	2	2	26.4	7.7	23.5	3.7		2.6		3.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Bottom	3	1	26.0	7.7	26.3	3.4	3.5	5.5		3.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	CS(Mf)3(N)	17:03	Bottom	3	2	26.0	7.7	26.6	3.5		5.1		3.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Surface	1	1	28.0	8.0	20.7	7.3	7.4	6.3	7.0	7.2	7.5
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Surface	1	2	28.3	8.0	20.2	7.4		6.7		7.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Bottom	3	1	26.6	7.8	23.9	5.0	5.0	7.6		7.8	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)16	16:20	Bottom	3	2	26.6	7.8	23.7	5.0		7.2		7.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Surface	1	1	28.7	8.2	19.5	8.4	8.5	2.1	3.4	6.4	6.5
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Surface	1	2	28.0	8.1	20.2	8.5		2.8		6.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Bottom	3	1	27.1	7.8	22.6	4.5	4.5	4.3		6.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4a	16:09	Bottom	3	2	27.0	7.8	22.8	4.4		4.3		6.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Surface	1	1	28.0	8.0	20.5	7.8	7.9	3.5	4.9	5.3	5.6
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Surface	1	2	28.3	8.0	20.1	7.9		3.2		5.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Bottom	3	1	27.5	7.9	21.5	5.4	5.4	6.5		6.0	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR4(N2)	16:05	Bottom	3	2	27.3	7.8	21.9	5.3		6.2		5.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Surface	1	1	28.0	8.0	20.4	6.6	6.7	6.9	7.6	8.2	8.7
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Surface	1	2	28.0	8.0	20.4	6.7		6.7		8.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Bottom	3	1	26.9	7.7	23.1	4.6	4.6	8.4		9.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS8(N)	15:57	Bottom	3	2	27.2	7.7	23.1	4.5		8.2		9.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Surface	1	1	29.2	8.2	19.2	9.7	9.8	2.5	3.2	6.4	6.7
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Surface	1	2	28.5	8.2	19.5	9.9		3.3		6.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Bottom	3	1	28.4	8.0	19.5	7.7	7.7	3.2		7.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)9	15:50	Bottom	3	2	28.1	8.0	19.7	7.6		3.6		7.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)11	16:33	Surface	1	1	28.7	8.0	17.5	6.9	5.9	2.2	4.5	4.6	5.3
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)11	16:33	Surface	1	2	28.8	7.9	17.4	6.9		2.0		4.8	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)11	16:33	Middle	2	1	27.2	7.8	22.1	5.0		3.4		4.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)11	16:33	Middle	2	2	27.2	7.8	22.0	4.7		3.3		5.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)11	16:33	Bottom	3	1	25.6	7.7	26.2	3.4	3.4	8.0		6.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS(Mf)11	16:33	Bottom	3	2	25.5	7.7	28.4	3.3		7.9		6.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR7	17:28	Surface	1	1	27.7	7.8	17.5	6.1	6.0	1.4	1.7	2.9	4.4
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR7	17:28	Surface	1	2	27.8	7.8	17.9	5.9		1.8		3.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR7	17:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR7	17:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR7	17:28	Bottom	3	1	27.4	7.8	21.0	5.3	5.3	1.8		5.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	SR7	17:28	Bottom	3	2	27.6	7.8	20.9	5.2		1.9		5.8	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS17	16:26	Surface	1	1	28.2	7.9	19.3	7.1	6.6	1.8	2.7	4.7	5.3
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS17	16:26	Surface	1	2	28.1	7.9	19.3	7.2		1.9		4.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS17	16:26	Middle	2	1	27.7	7.9	21.0	5.9		1.7		5.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS17	16:26	Middle	2	2	27.7	7.9	21.0	6.1		1.9		5.4	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS17	16:26	Bottom	3	1	25.8	7.8	27.6	4.2	4.2	4.5		6.0	
TMCLKL	HY/2012/08	2019/07/24	Mid-Ebb	IS17	16:26	Bottom	3	2	25.8	7.8	27.5	4.2		4.3		5.8	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)5	11:00	Surface	1	1	27.7	7.8	19.7	5.1	4.3	1.7	3.5	2.3	2.9
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)5	11:00	Surface	1	2	27.4	7.8	20.4	4.9		1.7		2.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)5	11:00	Middle	2	1	26.2	7.7	25.6	3.7		1.3		2.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)5	11:00	Middle	2	2	25.8	7.8	26.7	3.5		2.8		3.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)5	11:00	Bottom	3	1	25.2	7.7	29.6	3.4	3.4	6.7		3.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)5	11:00	Bottom	3	2	25.3	7.7	29.5	3.4		6.9		3.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)3(N)	11:44	Surface	1	1	28.2	7.7	14.7	5.2	4.7	1.6	2.2	3.3	3.5
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)3(N)	11:44	Surface	1	2	28.2	7.7	14.6	5.1		1.7		2.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)3(N)	11:44	Middle	2	1	27.5	7.7	19.5	4.3		1.2		3.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)3(N)	11:44	Middle	2	2	27.4	7.7	19.5	4.2		1.4		3.8	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)3(N)	11:44	Bottom	3	1	26.7	7.7	22.7	3.6	3.7	3.6		3.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	CS(Mf)3(N)	11:44	Bottom	3	2	26.8	7.7	21.8	3.7		3.4		3.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)16	12:32	Surface	1	1	27.3	7.9	20.3	5.8	5.7	3.8	3.7	8.0	9.5
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)16	12:32	Surface	1	2	27.4	7.8	20.2	5.6		3.7		7.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)16	12:32	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)16	12:32	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)16	12:32	Bottom	3	1	26.6	7.8	24.0	4.4	4.4	3.6		10.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)16	12:32	Bottom	3	2	27.2	7.8	23.6	4.4		3.7		11.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4a	12:42	Surface	1	1	27.8	8.0	19.3	5.6	5.6	5.4	4.4	4.8	5.0
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4a	12:42	Surface	1	2	27.5	7.9	19.6	5.6		5.4		4.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4a	12:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4a	12:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4a	12:42	Bottom	3	1	27.8	7.8	22.3	5.3	5.3	3.3		5.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4a	12:42	Bottom	3	2	27.8	7.8	22.3	5.3		3.6		5.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4(N2)	12:46	Surface	1	1	28.2	8.0	19.0	7.1	7.1	5.5	5.4	6.8	6.6
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4(N2)	12:46	Surface	1	2	28.9	8.0	18.5	7.1		5.2		7.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4(N2)	12:46	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4(N2)	12:46	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4(N2)	12:46	Bottom	3	1	27.1	7.7	22.6	4.5	4.5	5.3		6.4	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR4(N2)	12:46	Bottom	3	2	27.3	7.7	22.2	4.5		5.4		6.0	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS8(N)	12:51	Surface	1	1	27.2	7.8	21.8	5.9	6.0	5.8	5.9	7.1	5.7
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS8(N)	12:51	Surface	1	2	27.9	7.9	20.3	6.0		5.4		7.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS8(N)	12:51	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS8(N)	12:51	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS8(N)	12:51	Bottom	3	1	27.1	7.8	22.3	5.8	5.8	6.2		4.0	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS8(N)	12:51	Bottom	3	2	27.7	7.9	20.6	5.8		6.2		4.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)9	12:59	Surface	1	1	28.1	7.9	19.3	7.0	6.9	4.3	4.8	4.8	5.6
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)9	12:59	Surface	1	2	27.9	7.9	19.7	6.7		4.1		5.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)9	12:59	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)9	12:59	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)9	12:59	Bottom	3	1	27.8	7.9	19.9	6.1	6.2	5.4		6.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)9	12:59	Bottom	3	2	27.9	7.9	19.7	6.2		5.2		6.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)11	12:18	Surface	1	1	28.5	7.9	17.7	6.6	5.0	2.0	6.8	2.9	3.6
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)11	12:18	Surface	1	2	28.5	7.9	17.6	6.3		1.9		2.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)11	12:18	Middle	2	1	25.9	7.8	26.9	3.5		6.8		3.9	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)11	12:18	Middle	2	2	26.0	7.8	26.6	3.6		6.9		4.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)11	12:18	Bottom	3	1	25.3	7.7	29.2	2.8	2.9	11.6		4.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS(Mf)11	12:18	Bottom	3	2	25.4	7.7	28.8	3.0		11.4		3.7	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR7	11:19	Surface	1	1	27.3	7.8	21.1	4.8	4.8	2.6	2.6	4.7	5.9
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR7	11:19	Surface	1	2	27.2	7.8	21.4	4.8		2.6		4.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR7	11:19	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR7	11:19	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR7	11:19	Bottom	3	1	27.1	7.7	21.7	4.5	4.4	2.6		7.2	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	SR7	11:19	Bottom	3	2	27.0	7.8	22.2	4.3		2.6		7.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS17	12:25	Surface	1	1	27.4	7.8	21.4	4.9	4.9	4.0	2.2	4.9	6.6
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS17	12:25	Surface	1	2	27.2	7.8	21.6	4.9		4.1		5.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS17	12:25	Middle	2	1	26.9	7.8	22.0	4.9		1.5		6.1	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS17	12:25	Middle	2	2	26.7	7.8	22.0	4.8		1.5		6.3	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS17	12:25	Bottom	3	1	26.3	7.8	25.5	4.3	4.4	1.1		8.6	
TMCLKL	HY/2012/08	2019/07/24	Mid-flood	IS17	12:25	Bottom	3	2	26.7	7.8	25.1	4.4		1.2		8.8	

Note: Indicates Exc 2017/11/01
Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental
Resources
Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	9 August 2019

ERM

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_29 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_29 July 2019_ Bottom DO_E_Station IS(Mf)9
0212330_29 July 2019_ Bottom DO_E_Station IS17
0212330_29 July 2019_ Bottom DO_F_Station SR4a
0212330_29 July 2019_ Bottom DO_F_Station SR4(N2)

Limit Level Exceedance
0212330_29 July 2019_ Bottom DO_E_Station IS(Mf)16
0212330_29 July 2019_ Bottom DO_E_Station IS8(N)
0212330_29 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_29 July 2019_ Bottom DO_F_Station IS(Mf)11

A total of five Action Level and four Limit Level exceedances were recorded on 29 July 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_29 July 2019_ Bottom DO_E_Station SR4(N2)
0212330_29 July 2019_ Bottom DO_E_Station IS(Mf)9
0212330_29 July 2019_ Bottom DO_E_Station IS17
0212330_29 July 2019_ Bottom DO_F_Station SR4a
0212330_29 July 2019_ Bottom DO_F_Station SR4(N2)
<u>Limit Level Exceedance</u>
0212330_29 July 2019_ Bottom DO_E_Station IS(Mf)16
0212330_29 July 2019_ Bottom DO_E_Station IS8(N)
0212330_29 July 2019_ Bottom DO_E_Station IS(Mf)11
0212330_29 July 2019_ Bottom DO_F_Station IS(Mf)11
[Total No. of Exceedances = 9]</td></tr>
<tr><td>Date</td><td colspan="3">29 July 2019 (Measured)
31 July 2019 (In situ results received by ERM)
8 August 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO is observed at SR4(N2) (4.6 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at IS(Mf)9 (3.9 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at IS(Mf)11 (3.9 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at IS17 (4.3 mg/L) during mid-ebb tide.
Action Level Exceedance for DO is observed at SR4a (4.2 mg/L) during mid-flood tide.
Action Level Exceedance for DO is observed at SR4(N2) (3.9 mg/L) during mid-flood tide.
Limit Level Exceedance for DO is observed at IS(Mf)16 (3.4 mg/L) during mid-ebb tide.
Limit Level Exceedance for DO is observed at IS8(N) (3.4 mg/L) during mid-ebb tide.
Limit Level Exceedance for DO is observed at IS(Mf)11 (3.5 mg/L) during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, no marine works was carried out on 29 July 2019.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="3">The exceedances are unlikely to be due to the Project, in view of the following:
No marine works was carried out on 29 July 2019.
All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.
SR4(N2), SR4a IS17, IS(Mf)11 are far away (>1.5 km) from the Removal of Jetty (Figure 1), thus the observed exceedance should not be affected by the marine works under this Contract.
Bottom-depth DO levels at SR4(N2), IS(Mf)9, IS(Mf)11, IS17, SR4a, IS(Mf)16 and IS8(N) were similar to the corresponding control stations, CS(Mf)3(N), during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Limit Level.</td></tr>
</table>

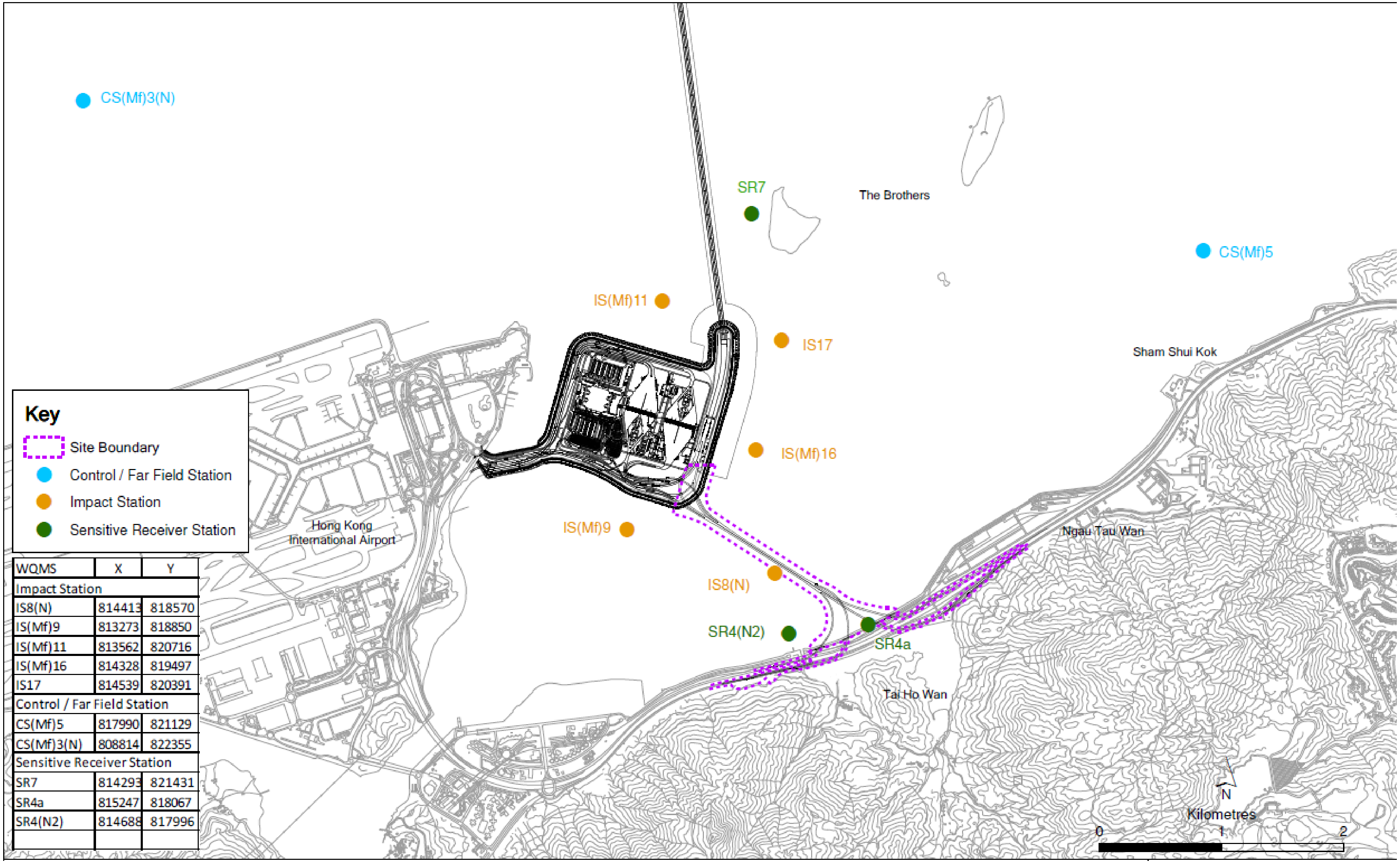
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 29 July 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Surface	1	1	27.6	8.2	19.0	8.3	6.8	2.9	3.5	5.9	6.0
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Surface	1	2	27.7	8.2	19.0	8.4		2.9		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Middle	2	1	26.5	7.9	23.1	5.2		4.4		5.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Middle	2	2	26.5	7.9	23.2	5.2		4.3		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Bottom	3	1	25.6	7.9	27.5	4.8	4.8	3.3		6.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)5	11:01	Bottom	3	2	25.6	7.8	27.5	4.7		3.4		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Surface	1	1	27.9	8.3	17.4	8.7	5.8	2.6	5.6	5.6	6.4
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Surface	1	2	27.9	8.3	17.3	8.8		2.6		4.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Middle	2	1	25.2	7.7	28.0	2.9		5.5		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Middle	2	2	25.2	7.7	28.0	2.9		5.5		7.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Bottom	3	1	25.0	7.7	29.0	3.1	3.1	8.7		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	CS(Mf)3(N)	10:12	Bottom	3	2	25.0	7.7	29.0	3.1		8.7		7.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Surface	1	1	28.5	8.3	16.6	8.3	8.4	3.4	5.3	5.1	4.2
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Surface	1	2	28.5	8.3	16.7	8.4		3.4		5.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Bottom	3	1	25.3	7.8	28.3	3.4	3.4	7.2		2.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)16	9:32	Bottom	3	2	25.3	7.8	28.3	3.4		7.2		3.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Surface	1	1	27.3	8.0	19.6	5.9	6.1	5.5	8.5	6.2	6.3
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Surface	1	2	27.4	8.0	19.5	6.2		5.5		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Bottom	3	1	26.5	7.8	23.7	4.8	4.8	11.4		6.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4a	9:22	Bottom	3	2	26.5	7.8	23.7	4.7		11.4		7.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Surface	1	1	28.2	8.1	16.8	6.6	6.6	4.4	6.7	5.5	7.1
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Surface	1	2	28.2	8.1	16.8	6.6		4.3		6.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Bottom	3	1	27.0	7.8	21.5	4.6	4.6	9.0		7.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR4(N2)	9:18	Bottom	3	2	27.1	7.8	21.5	4.6		8.9		8.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Surface	1	1	27.8	8.1	18.9	7.1	7.1	3.1	5.1	4.3	5.1
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Surface	1	2	27.8	8.1	18.8	7.1		3.1		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Bottom	3	1	26.0	7.8	25.8	3.4	3.4	7.1		4.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS8(N)	9:13	Bottom	3	2	26.0	7.8	25.9	3.4		7.0		5.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Surface	1	1	28.6	8.4	15.5	9.3	9.3	2.5	5.0	3.2	3.2
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Surface	1	2	28.6	8.4	15.4	9.3		2.5		2.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Bottom	3	1	26.5	7.7	23.8	3.9	3.9	7.4		3.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)9	9:06	Bottom	3	2	26.4	7.7	23.8	3.9		7.4		3.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)11	10:35	Surface	1	1	27.8	8.2	17.9	8.6	6.5	3.1	3.9	4.6	6.5
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)11	10:35	Surface	1	2	27.8	8.2	17.9	8.6		3.1		5.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)11	10:35	Middle	2	1	26.0	7.8	24.4	4.3		3.9		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)11	10:35	Middle	2	2	26.1	7.8	24.3	4.3		3.9		6.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)11	10:35	Bottom	3	1	25.6	7.8	26.7	3.9	3.9	4.8		7.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS(Mf)11	10:35	Bottom	3	2	25.6	7.8	26.7	3.9		4.8		8.2	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR7	10:42	Surface	1	1	27.7	8.3	18.2	8.8	8.8	3.0	4.2	6.4	6.2
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR7	10:42	Surface	1	2	27.7	8.3	18.2	8.8		3.0		6.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR7	10:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR7	10:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR7	10:42	Bottom	3	1	26.4	7.9	23.5	5.0	5.0	5.4		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	SR7	10:42	Bottom	3	2	26.4	7.9	23.5	5.0		5.4		6.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS17	9:38	Surface	1	1	27.6	8.2	19.1	7.4	6.3	2.5	4.0	6.3	5.5
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS17	9:38	Surface	1	2	27.6	8.2	19.1	7.4		2.5		6.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS17	9:38	Middle	2	1	26.7	7.9	22.3	5.1		3.6		5.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS17	9:38	Middle	2	2	26.7	7.9	22.3	5.1		3.5		5.0	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^oC)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS17	9:38	Bottom	3	1	25.5	7.8	27.2	4.3	4.3	5.9		4.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-Ebb	IS17	9:38	Bottom	3	2	25.5	7.8	27.3	4.3		5.9		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Surface	1	1	27.5	8.2	17.8	8.5	8.0	3.1	3.0	5.9	5.5
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Surface	1	2	27.6	8.2	17.8	8.6		3.1		6.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Middle	2	1	26.9	8.0	22.6	7.4		3.3		5.0	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Middle	2	2	26.9	8.0	22.6	7.4		3.3		5.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Bottom	3	1	25.5	7.9	28.1	5.7	5.7	2.5		4.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)5	2:33	Bottom	3	2	25.5	7.9	28.2	5.7		2.4		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Surface	1	1	27.8	8.2	15.3	7.4	6.5	3.9	5.1	4.6	5.7
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Surface	1	2	27.8	8.2	15.3	7.4		3.9		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Middle	2	1	27.3	8.0	18.9	5.6		4.3		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Middle	2	2	27.3	8.0	18.9	5.6		4.3		6.0	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Bottom	3	1	25.9	7.7	25.6	3.5	3.5	7.1		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	CS(Mf)3(N)	3:37	Bottom	3	2	25.9	7.7	25.6	3.5		7.1		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Surface	1	1	28.0	8.2	16.9	8.3	8.4	3.3	3.3	6.9	6.3
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Surface	1	2	28.0	8.2	16.9	8.4		3.4		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Bottom	3	1	26.9	8.0	22.1	6.4	6.4	3.2		6.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)16	4:23	Bottom	3	2	26.9	8.0	22.1	6.3		3.2		5.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Surface	1	1	28.4	8.3	16.8	8.4	8.4	3.8	6.6	6.4	6.9
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Surface	1	2	28.4	8.3	16.8	8.4		3.9		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Bottom	3	1	26.9	7.8	22.3	4.2	4.2	9.3		8.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4a	4:34	Bottom	3	2	26.9	7.8	22.3	4.1		9.3		7.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Surface	1	1	27.9	8.1	18.2	6.9	6.9	4.3	6.2	6.2	7.3
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Surface	1	2	27.9	8.1	18.2	6.9		4.4		7.2	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Bottom	3	1	27.1	7.7	21.7	3.9	3.9	8.1		8.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR4(N2)	4:39	Bottom	3	2	27.1	7.7	21.7	3.9		8.1		7.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Surface	1	1	28.0	8.3	16.7	8.3	8.3	3.0	3.4	5.4	6.2
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Surface	1	2	28.0	8.3	16.7	8.3		3.0		5.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Bottom	3	1	27.3	8.0	20.3	6.6	6.6	3.8		6.4	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS8(N)	4:45	Bottom	3	2	27.3	8.0	20.3	6.6		3.8		7.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Surface	1	1	28.3	8.3	15.8	8.5	8.5	2.7	3.1	4.7	4.7
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Surface	1	2	28.3	8.3	15.8	8.5		2.7		3.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Bottom	3	1	27.3	8.0	20.0	6.6	6.6	3.4		5.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)9	4:52	Bottom	3	2	27.4	8.0	19.9	6.5		3.5		4.7	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)11	3:10	Surface	1	1	28.0	8.2	17.0	8.0	7.0	2.8	3.7	3.4	4.9
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)11	3:10	Surface	1	2	28.0	8.2	16.9	8.0		2.8		4.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)11	3:10	Middle	2	1	27.1	8.0	21.0	6.0		3.3		4.9	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)11	3:10	Middle	2	2	27.1	8.0	21.0	6.0		3.4		5.0	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)11	3:10	Bottom	3	1	25.1	7.7	27.9	3.5	3.5	4.9		5.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS(Mf)11	3:10	Bottom	3	2	25.2	7.7	27.9	3.5		4.8		6.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR7	3:03	Surface	1	1	27.2	8.0	19.9	6.2	6.2	4.2	4.8	6.1	6.4
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR7	3:03	Surface	1	2	27.2	8.0	19.9	6.2		4.2		5.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR7	3:03	Middle	2	1									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR7	3:03	Middle	2	2									
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR7	3:03	Bottom	3	1	26.8	7.9	21.6	5.5	5.5	5.5		6.6	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	SR7	3:03	Bottom	3	2	26.9	7.9	21.5	5.5		5.4		7.5	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS17	4:16	Surface	1	1	27.4	8.0	20.1	6.7	6.8	3.1	2.8	5.3	5.5
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS17	4:16	Surface	1	2	27.4	8.0	20.1	6.7		3.1		4.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS17	4:16	Middle	2	1	27.0	8.0	21.6	6.8		2.8		5.8	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS17	4:16	Middle	2	2	27.0	8.1	21.6	6.8		2.7		6.1	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS17	4:16	Bottom	3	1	26.6	8.0	23.2	6.6	6.6	2.6		5.3	
TMCLKL	HY/2012/08	2019/07/29	Mid-flood	IS17	4:16	Bottom	3	2	26.6	8.0	23.3	6.6		2.5		6.3	

Note: Indicates Exc 2017/11/01

Indicates Exc 2017/11/01



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	14 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_7 August 2019_ Surface & Middle DO_E_Station IS(Mf)9
0212330_7 August 2019_ Surface & Middle DO_E_Station IS17
0212330_7 August 2019_ Bottom DO_E_Station IS17
0212330_7 August 2019_ Bottom DO_F_Station SR4a
0212330_7 August 2019_ Surface & Middle DO_F_Station IS(Mf)11

A total of five Action Level exceedances were recorded on 7 August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

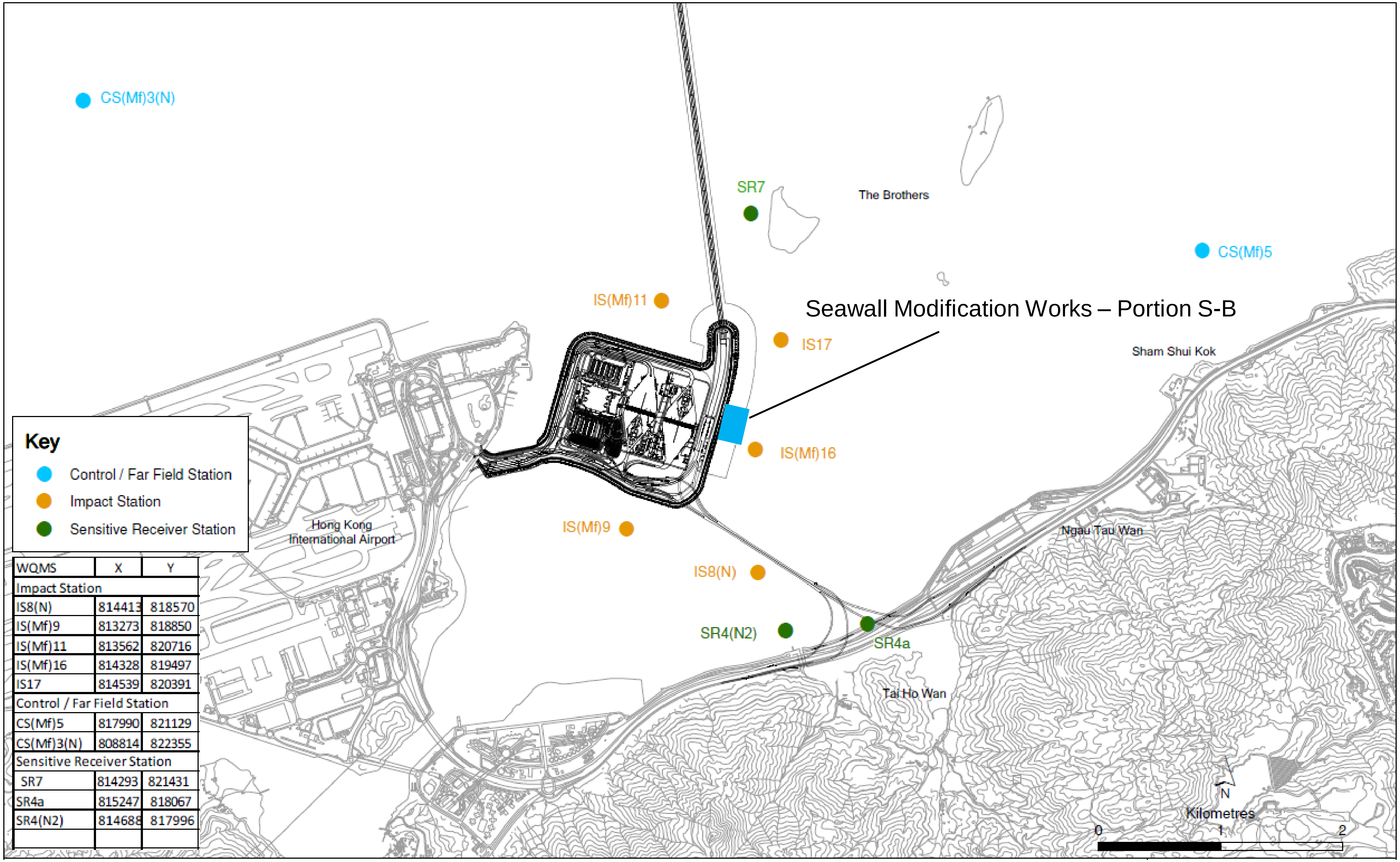
<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_7 August 2019_ Surface & Middle DO_E_Station IS(Mf)9
0212330_7 August 2019_ Surface & Middle DO_E_Station IS17
0212330_7 August 2019_ Bottom DO_E_Station IS17
0212330_7 August 2019_ Bottom DO_F_Station SR4a
0212330_7 August 2019_ Surface & Middle DO_F_Station IS(Mf)11
[Total No. of Exceedances = 5]</td></tr>
<tr><td>Date</td><td colspan="3">7 August 2019 (Measured)
8 August 2019 (In situ results received by ERM)
16 August 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO (4.6 mg/L) is observed at IS(Mf)9 at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.7 mg/L) is observed at IS17 at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.5 mg/L) is observed at IS17 at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.5 mg/L) is observed at SR4a at Bottom Level during mid-flood tide.
Action Level Exceedance for DO (4.8 mg/L) is observed at IS(Mf)11 at Surface & Middle Level during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, no marine works was carried out on 7 August 2019.</td></tr>
</table>

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: • No marine works was carried out on 7 August 2019. • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS(Mf)9, SR4a and IS(Mf)11 are far away (>2 km) from the Seawall Modification Works Area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedances are unlikely to be related to this Contract. • Surface & Middle-depth DO levels at IS(Mf)11 was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • Bottom DO levels at SR4a was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom DO levels at the corresponding control station were below Action Level. • As reported by the marine mammal observer, no discharge of organic matters into waters from landside works area was recorded. Moreover, no exceedance was recorded at IS(Mf)16 which is the closest station to the Seawall Modification Works Area during both mid-ebb and mid-flood tide. Therefore, exceedances recorded at IS(Mf)9 and IS17 during mid-ebb tide and SR4a and IS(Mf)11 during mid-flood tide are unlikely to be caused by the marine works of this Contract.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 7 August 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Surface	1	1	28.7	7.8	21.8	5.7	5.3	3.8	3.4	6.1	5.7
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Surface	1	2	28.7	7.9	21.4	5.7		3.8		5.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Middle	2	1	27.9	7.8	24.2	4.9		3.5		5.2	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Middle	2	2	27.9	7.9	23.7	4.9		3.5		5.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Bottom	3	1	27.7	7.8	25.7	4.8	4.9	2.8		5.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)5	18:10	Bottom	3	2	27.7	7.9	25.1	4.9		2.7		6.0	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Surface	1	1	28.9	7.7	18.3	5.5	5.2	3.9	7.1	7.8	7.7
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Surface	1	2	28.9	7.8	18.0	5.5		3.8		8.1	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Middle	2	1	28.0	7.8	21.7	4.8		6.2		8.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Middle	2	2	28.0	7.8	21.4	4.9		6.2		8.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Bottom	3	1	28.0	7.8	23.3	5.1	5.2	11.3		6.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	CS(Mf)3(N)	17:25	Bottom	3	2	28.0	7.9	22.9	5.2		11.3		6.2	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Surface	1	1	28.4	7.8	21.6	5.5	5.5	5.5	6.5	9.8	9.7
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Surface	1	2	28.4	7.9	21.6	5.5		5.5		10.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Bottom	3	1	28.1	7.8	22.3	5.1	5.1	7.4		9.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)16	16:47	Bottom	3	2	28.1	7.8	21.9	5.1		7.5		8.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Surface	1	1	28.5	7.8	20.8	5.8	5.9	4.5	4.7	11.3	10.7
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Surface	1	2	28.5	7.9	20.4	5.9		4.6		10.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Bottom	3	1	28.1	7.8	21.6	4.9	5.1	4.8		10.2	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4a	16:39	Bottom	3	2	28.2	7.8	21.2	5.2		4.9		10.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Surface	1	1	28.5	7.8	20.9	5.6	5.7	6.5	8.1	9.8	9.1
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Surface	1	2	28.5	7.8	20.6	5.7		6.4		10.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Bottom	3	1	28.3	7.8	21.5	5.0	5.0	9.8		8.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR4(N2)	16:35	Bottom	3	2	28.3	7.8	21.1	5.0		9.7		7.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Surface	1	1	28.4	7.8	21.4	5.5	5.5	6.5	7.2	7.1	7.2
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Surface	1	2	28.4	7.9	21.0	5.5		6.5		6.1	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Bottom	3	1	28.1	7.8	22.2	5.0	5.0	7.9		7.4	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS8(N)	16:30	Bottom	3	2	28.1	7.9	21.8	5.0		7.9		8.1	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Surface	1	1	27.6	7.8	25.1	4.5	4.5	3.3	4.3	7.6	6.9
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Surface	1	2	27.6	7.8	25.1	4.5		3.3		6.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Bottom	3	1	28.0	7.8	21.0	7.0	7.0	5.3		6.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)9	16:22	Bottom	3	2	28.0	7.8	21.0	7.0		5.3		6.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)11	17:48	Surface	1	1	29.1	7.8	18.3	6.0	5.5	4.1	4.9	5.5	9.4
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)11	17:48	Surface	1	2	29.1	7.8	18.0	5.8		4.1		5.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)11	17:48	Middle	2	1	28.4	7.7	20.6	5.0		5.1		14.4	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)11	17:48	Middle	2	2	28.4	7.8	20.3	5.1		5.1		12.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)11	17:48	Bottom	3	1	27.9	7.8	23.4	4.7	4.8	5.5		8.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS(Mf)11	17:48	Bottom	3	2	27.9	7.8	23.0	4.8		5.5		9.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR7	17:54	Surface	1	1	28.7	7.8	20.5	5.7	5.7	4.1	4.4	5.5	6.7
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR7	17:54	Surface	1	2	28.7	7.9	20.1	5.7		4.2		4.8	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR7	17:54	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR7	17:54	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR7	17:54	Bottom	3	1	28.5	7.8	21.0	5.4	5.5	4.6		8.4	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	SR7	17:54	Bottom	3	2	28.5	7.9	20.8	5.6		4.6		8.2	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS17	16:52	Surface	1	1	28.0	7.8	22.8	4.8	4.7	4.8	8.2	9.3	8.5
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS17	16:52	Surface	1	2	28.0	7.8	22.4	4.9		4.9		8.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS17	16:52	Middle	2	1	27.6	7.8	25.1	4.5		8.4		9.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS17	16:52	Middle	2	2	27.6	7.8	24.6	4.5		8.4		9.2	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS17	16:52	Bottom	3	1	27.6	7.8	25.2	4.5	4.5	11.4		6.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-Ebb	IS17	16:52	Bottom	3	2	27.6	7.8	24.7	4.5		11.4		7.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)5	10:29	Surface	1	1	28.0	7.8	21.3	4.6	4.6	4.0	6.2	6.5	6.8
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)5	10:29	Surface	1	2	27.6	7.8	21.3	4.6		4.0		5.8	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)5	10:29	Middle	2	1	27.6	7.8	24.6	4.6		4.0		6.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)5	10:29	Middle	2	2	27.6	7.8	24.2	4.6		4.0		6.8	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)5	10:29	Bottom	3	1	27.5	7.8	26.5	4.5	4.5	10.6		7.0	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)5	10:29	Bottom	3	2	27.4	7.8	26.0	4.5		10.6		7.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)3(N)	11:19	Surface	1	1	28.2	7.7	19.8	5.0	5.1	5.1	5.8	9.1	9.7
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)3(N)	11:19	Surface	1	2	28.4	7.8	19.2	5.3		5.2		8.1	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)3(N)	11:19	Middle	2	1	28.2	7.7	19.9	5.0		6.0		10.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)3(N)	11:19	Middle	2	2	28.2	7.8	19.5	5.0		6.1		9.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)3(N)	11:19	Bottom	3	1	28.3	7.7	20.1	5.2	5.2	6.2		10.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	CS(Mf)3(N)	11:19	Bottom	3	2	28.2	7.8	19.6	5.1		6.2		9.8	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)16	12:23	Surface	1	1	28.5	7.8	20.7	5.6	5.6	5.9	8.1	8.7	7.9
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)16	12:23	Surface	1	2	28.5	7.9	20.3	5.6		5.9		7.7	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)16	12:23	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)16	12:23	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)16	12:23	Bottom	3	1	28.0	7.8	21.6	5.0	5.0	10.4		7.1	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)16	12:23	Bottom	3	2	28.0	7.8	21.2	5.0		10.3		8.0	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4a	12:32	Surface	1	1	28.6	7.7	20.4	5.5	5.6	3.6	5.2	9.2	9.2
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4a	12:32	Surface	1	2	28.6	7.8	20.1	5.6		3.6		8.2	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4a	12:32	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4a	12:32	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4a	12:32	Bottom	3	1	28.0	7.7	21.7	4.5	4.5	6.7		9.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4a	12:32	Bottom	3	2	28.0	7.8	21.3	4.5		6.7		9.9	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4(N2)	12:36	Surface	1	1	28.5	7.7	20.4	5.5	5.6	3.6	3.9	10.2	9.3
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4(N2)	12:36	Surface	1	2	28.4	7.8	20.0	5.6		3.6		9.2	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4(N2)	12:36	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4(N2)	12:36	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4(N2)	12:36	Bottom	3	1	28.2	7.7	20.7	5.3	5.4	4.1		8.4	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR4(N2)	12:36	Bottom	3	2	28.3	7.8	20.3	5.4		4.1		9.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS8(N)	12:41	Surface	1	1	28.3	7.7	20.8	5.2	5.2	5.6	7.6	9.7	9.1
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS8(N)	12:41	Surface	1	2	28.3	7.8	20.4	5.2		5.6		9.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS8(N)	12:41	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS8(N)	12:41	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS8(N)	12:41	Bottom	3	1	28.3	7.7	21.0	5.1	5.2	9.5		8.4	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS8(N)	12:41	Bottom	3	2	28.2	7.8	20.5	5.2		9.5		8.8	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)9	12:49	Surface	1	1	28.4	7.7	20.7	5.7	5.7	7.0	8.1	8.6	8.5
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)9	12:49	Surface	1	2	28.4	7.8	20.3	5.7		7.0		8.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)9	12:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)9	12:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)9	12:49	Bottom	3	1	28.3	7.7	20.8	5.3	5.4	9.3		8.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)9	12:49	Bottom	3	2	28.3	7.8	20.5	5.4		9.2		8.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)11	10:55	Surface	1	1	28.0	7.8	21.9	4.8	4.8	8.0	9.1	8.6	13.7
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)11	10:55	Surface	1	2	27.9	7.8	21.7	4.8		8.0		8.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)11	10:55	Middle	2	1	27.9	7.8	22.0	4.8		7.3		9.4	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)11	10:55	Middle	2	2	27.9	7.8	21.7	4.8		7.3		10.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)11	10:55	Bottom	3	1	27.7	7.8	23.9	4.7	4.7	11.9		24.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS(Mf)11	10:55	Bottom	3	2	27.7	7.8	23.5	4.7		11.9		21.0	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR7	10:48	Surface	1	1	28.2	7.8	21.2	5.0	5.0	4.5	7.3	4.0	6.5
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR7	10:48	Surface	1	2	28.1	7.8	20.9	5.0		4.5		5.0	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR7	10:48	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR7	10:48	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR7	10:48	Bottom	3	1	27.9	7.8	22.7	4.8	4.8	10.1		8.1	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	SR7	10:48	Bottom	3	2	27.9	7.8	22.3	4.8		10.1		9.0	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS17	12:01	Surface	1	1	28.3	7.8	21.3	5.3	5.1	2.5	3.2	7.9	8.1
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS17	12:01	Surface	1	2	28.3	7.8	21.0	5.3		2.6		8.8	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS17	12:01	Middle	2	1	28.0	7.8	22.3	4.9		3.5		8.5	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS17	12:01	Middle	2	2	28.0	7.8	22.0	4.9		3.5		7.6	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS17	12:01	Bottom	3	1	27.9	7.8	22.8	4.9	4.9	3.7		8.3	
TMCLKL	HY/2012/08	2019/08/07	Mid-flood	IS17	12:01	Bottom	3	2	27.9	7.8	22.4	4.9		3.6		7.3	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	16 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_12 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_12 August 2019_ Bottom DO_F_Station IS(Mf)11

A total of two Action Level exceedances were recorded on 12 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

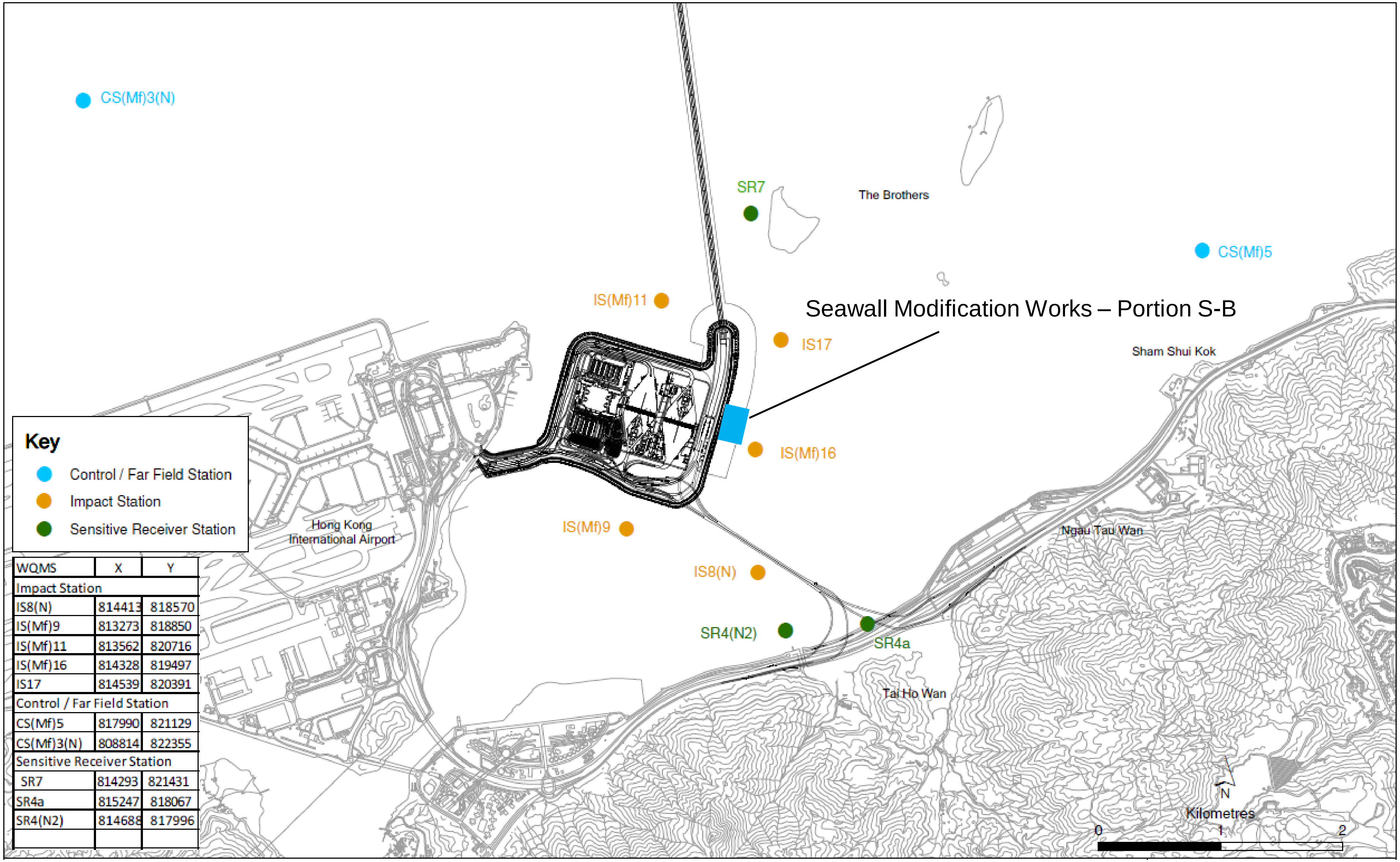
Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_12 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_12 August 2019_ Bottom DO_F_Station IS(Mf)11
[Total No. of Exceedances = 2]</td></tr>
<tr><td>Date</td><td colspan="3">12 August 2019 (Measured)
15 August 2019 (In situ results received by ERM)
21 August 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO (3.9 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.3 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, Seawall Modification Works was carried out on 12 August 2019.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="3">The exceedances are unlikely to be due to the Contract, in view of the following:
All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.
No discharge of organic matters into waters from landside works area was recorded.
IS(Mf)11 is far away (>2 km) from the Seawall Modification Works Area (Figure 1), thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedance is unlikely to be related to this Contract.
Bottom-depth DO levels at IS(Mf)11 was similar to the corresponding control stations, CS(Mf)5, during both mid-ebb and mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level.</td></tr>
<tr><td>Actions Taken/ To Be Taken</td><td colspan="3">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="3">The monitoring results on 12 August 2019 and locations of water quality monitoring stations are attached.</td></tr>
</table>

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)5	11:20	Surface	1	1	29.9	8.0	16.6	6.7	5.9	5.2	7.3	5.5	5.9
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)5	11:20	Surface	1	2	29.9	7.9	16.9	6.6		5.3		5.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)5	11:20	Middle	2	1	28.6	7.9	20.7	5.2		6.1		6.0	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)5	11:20	Middle	2	2	28.6	7.8	21.1	5.2		6.2		5.0	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)5	11:20	Bottom	3	1	27.9	7.9	27.4	4.3	4.2	10.5		6.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)5	11:20	Bottom	3	2	27.9	7.8	28.4	4.1		10.5		7.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)3(N)	10:36	Surface	1	1	29.8	8.0	15.2	6.3	5.7	5.8	5.9	5.1	4.7
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)3(N)	10:36	Surface	1	2	29.8	7.9	15.4	6.3		5.5		5.2	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)3(N)	10:36	Middle	2	1	29.1	7.9	19.6	5.1		5.7		4.6	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)3(N)	10:36	Middle	2	2	29.1	7.8	20.0	5.0		5.7		3.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)3(N)	10:36	Bottom	3	1	28.7	7.9	23.3	4.5	4.5	6.5		4.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	CS(Mf)3(N)	10:36	Bottom	3	2	28.7	7.8	23.7	4.4		6.3		5.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)16	9:57	Surface	1	1	30.0	8.1	17.5	7.0	7.0	6.7	5.2	10.4	9.3
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)16	9:57	Surface	1	2	30.0	8.0	17.8	7.0		6.9		11.2	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)16	9:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)16	9:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)16	9:57	Bottom	3	1	29.7	8.0	19.1	6.4	6.4	3.7		7.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)16	9:57	Bottom	3	2	29.7	7.9	19.5	6.4		3.5		7.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4a	9:47	Surface	1	1	30.1	8.1	16.1	7.4	7.4	3.2	4.8	5.1	5.4
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4a	9:47	Surface	1	2	30.1	8.0	16.4	7.3		3.4		5.3	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4a	9:47	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4a	9:47	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4a	9:47	Bottom	3	1	30.0	8.1	16.9	6.8	6.8	6.3		6.2	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4a	9:47	Bottom	3	2	30.0	8.0	17.2	6.7		6.3		5.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4(N2)	9:42	Surface	1	1	30.2	8.1	16.5	7.0	7.0	11.0	11.5	6.6	6.1
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4(N2)	9:42	Surface	1	2	30.2	8.0	16.8	7.0		10.2		6.3	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4(N2)	9:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4(N2)	9:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4(N2)	9:42	Bottom	3	1	30.2	8.1	16.6	6.8	6.8	12.1		6.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR4(N2)	9:42	Bottom	3	2	30.2	8.0	16.9	6.8		12.7		4.9	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS8(N)	9:37	Surface	1	1	30.2	8.1	16.6	7.6	7.6	5.7	5.5	9.4	7.4
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS8(N)	9:37	Surface	1	2	30.2	8.1	16.9	7.6		5.7		8.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS8(N)	9:37	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS8(N)	9:37	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS8(N)	9:37	Bottom	3	1	30.2	8.1	16.6	7.6	7.6	5.3		6.0	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS8(N)	9:37	Bottom	3	2	30.2	8.1	16.9	7.6		5.2		5.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)9	9:28	Surface	1	1	30.2	8.1	16.8	7.5	7.5	4.2	5.6	5.5	5.0
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)9	9:28	Surface	1	2	30.2	8.1	17.1	7.4		4.4		6.2	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)9	9:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)9	9:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)9	9:28	Bottom	3	1	30.2	8.1	16.7	7.5	7.5	6.9		3.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)9	9:28	Bottom	3	2	30.2	8.1	17.1	7.5		6.9		4.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)11	10:57	Surface	1	1	30.1	8.0	15.0	6.9	6.5	4.7	6.3	4.2	5.1
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)11	10:57	Surface	1	2	30.1	7.9	15.3	6.8		4.7		4.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)11	10:57	Middle	2	1	29.9	8.0	15.7	6.1		5.8		5.9	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)11	10:57	Middle	2	2	29.9	7.9	16.0	6.1		5.9		4.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)11	10:57	Bottom	3	1	28.0	7.9	27.0	3.9	3.9	8.4		5.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS(Mf)11	10:57	Bottom	3	2	28.0	7.8	27.6	3.8		8.4		5.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR7	11:03	Surface	1	1	30.1	8.0	15.1	7.0	7.0	4.4	4.7	3.5	4.4
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR7	11:03	Surface	1	2	30.1	7.9	15.3	7.0		4.5		4.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR7	11:03	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR7	11:03	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR7	11:03	Bottom	3	1	30.0	8.0	15.2	6.9	6.9	4.8		4.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	SR7	11:03	Bottom	3	2	30.0	7.9	15.5	6.9		4.9		5.0	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS17	10:03	Surface	1	1	29.9	8.0	16.6	6.7	6.7	4.2	3.8	6.2	5.9
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS17	10:03	Surface	1	2	29.9	7.9	16.9	6.7		4.9		6.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS17	10:03	Middle	2	1	29.6	8.0	16.9	6.6		3.3		5.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS17	10:03	Middle	2	2	29.6	7.9	17.2	6.6		3.9		5.8	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS17	10:03	Bottom	3	1	29.5	8.0	19.7	6.1	6.1	3.1		5.3	
TMCLKL	HY/2012/08	2019/08/12	Mid-Ebb	IS17	10:03	Bottom	3	2	29.5	7.9	19.9	6.1		3.5		6.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)5	3:10	Surface	1	1	30.0	8.0	15.8	7.2	6.5	3.0	4.8	3.9	4.7
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)5	3:10	Surface	1	2	30.0	8.0	16.1	7.1		2.7		4.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)5	3:10	Middle	2	1	29.2	8.0	20.1	5.9		3.1		4.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)5	3:10	Middle	2	2	29.2	7.9	20.4	5.9		3.1		5.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)5	3:10	Bottom	3	1	28.0	7.8	27.7	4.5	4.5	8.7		5.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)5	3:10	Bottom	3	2	28.0	7.8	28.3	4.5		8.4		4.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)3(N)	4:03	Surface	1	1	29.9	8.0	14.7	6.7	6.7	5.7	8.2	6.1	4.6
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)3(N)	4:03	Surface	1	2	29.9	7.9	14.9	6.6		5.6		4.3	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)3(N)	4:03	Middle	2	1	29.9	8.1	15.2	6.7		7.1		5.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)3(N)	4:03	Middle	2	2	29.9	7.9	15.4	6.7		7.9		4.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)3(N)	4:03	Bottom	3	1	29.9	8.0	16.1	6.5	6.5	11.4		3.9	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	CS(Mf)3(N)	4:03	Bottom	3	2	29.9	7.9	16.3	6.5		11.6		3.3	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)16	4:43	Surface	1	1	29.9	8.1	16.7	6.9	6.9	3.7	3.9	7.6	7.7
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)16	4:43	Surface	1	2	29.9	7.9	17.0	6.9		4.4		7.0	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)16	4:43	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)16	4:43	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)16	4:43	Bottom	3	1	29.8	8.0	17.6	6.5	6.5	3.4		7.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)16	4:43	Bottom	3	2	29.8	7.9	17.9	6.5		4.2		8.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4a	4:52	Surface	1	1	30.3	8.1	16.5	7.4	7.5	4.4	5.2	6.2	6.9
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4a	4:52	Surface	1	2	30.3	8.0	16.8	7.5		5.1		7.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4a	4:52	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4a	4:52	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4a	4:52	Bottom	3	1	30.3	8.1	16.8	7.4	7.4	5.3		7.6	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4a	4:52	Bottom	3	2	30.3	7.9	17.1	7.4		5.8		6.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4(N2)	4:57	Surface	1	1	30.1	8.1	16.3	7.2	7.2	4.0	4.1	7.7	7.5
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4(N2)	4:57	Surface	1	2	30.1	8.0	16.6	7.2		4.0		7.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4(N2)	4:57	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4(N2)	4:57	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4(N2)	4:57	Bottom	3	1	30.1	8.1	16.4	7.2	7.2	4.1		7.3	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR4(N2)	4:57	Bottom	3	2	30.1	8.0	16.7	7.2		4.1		7.8	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS8(N)	5:02	Surface	1	1	29.9	8.1	16.0	7.0	7.0	3.3	7.5	3.9	5.7
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS8(N)	5:02	Surface	1	2	29.9	7.9	16.3	6.9		4.1		4.2	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS8(N)	5:02	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS8(N)	5:02	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS8(N)	5:02	Bottom	3	1	29.9	8.1	16.0	7.0	7.0	11.4		7.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS8(N)	5:02	Bottom	3	2	29.9	7.9	16.3	6.9		11.1		7.2	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)9	5:09	Surface	1	1	29.9	8.1	16.3	7.0	7.0	5.5	5.7	6.1	6.0
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)9	5:09	Surface	1	2	29.9	7.9	16.6	6.9		5.3		6.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)9	5:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)9	5:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)9	5:09	Bottom	3	1	29.9	8.1	16.4	7.0	7.0	6.0		5.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)9	5:09	Bottom	3	2	29.9	7.9	16.7	6.9		5.8		5.9	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)11	3:36	Surface	1	1	29.8	8.0	15.0	6.6	6.7	4.1	5.3	4.6	5.1
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)11	3:36	Surface	1	2	29.8	7.9	15.2	6.5		4.9		5.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)11	3:36	Middle	2	1	30.0	8.1	15.9	6.9		3.8		5.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)11	3:36	Middle	2	2	30.0	8.0	16.2	6.8		3.6		4.5	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)11	3:36	Bottom	3	1	28.0	7.9	22.7	4.3	4.3	7.4		4.9	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS(Mf)11	3:36	Bottom	3	2	28.0	7.8	22.7	4.2		7.8		6.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR7	3:30	Surface	1	1	29.9	8.0	14.6	6.6	6.6	3.9	5.8	6.0	5.5
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR7	3:30	Surface	1	2	29.9	7.9	14.9	6.6		3.8		5.4	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR7	3:30	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR7	3:30	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR7	3:30	Bottom	3	1	29.9	8.0	15.7	6.4	6.4	7.9		5.0	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	SR7	3:30	Bottom	3	2	29.9	7.9	15.9	6.4		7.5		5.7	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS17	4:36	Surface	1	1	30.0	8.1	16.3	7.1	7.1	3.5	3.5	7.5	7.4
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS17	4:36	Surface	1	2	30.0	8.0	16.6	7.2		4.1		7.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS17	4:36	Middle	2	1	30.0	8.1	16.3	7.1		3.2		7.9	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS17	4:36	Middle	2	2	30.0	8.0	16.6	7.1		3.9		8.1	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS17	4:36	Bottom	3	1	30.0	8.1	16.7	7.1	7.1	3.0		7.6	
TMCLKL	HY/2012/08	2019/08/12	Mid-flood	IS17	4:36	Bottom	3	2	30.0	7.9	17.0	7.0		3.1		6.2	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental
Resources
Management
ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	20 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_14 August 2019_ Bottom DO_E_Station IS(Mf)16
0212330_14 August 2019_ Bottom DO_E_Station IS17
0212330_14 August 2019_ Bottom DO_F_Station IS(Mf)11

A total of three Action Level exceedances were recorded on 14 August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

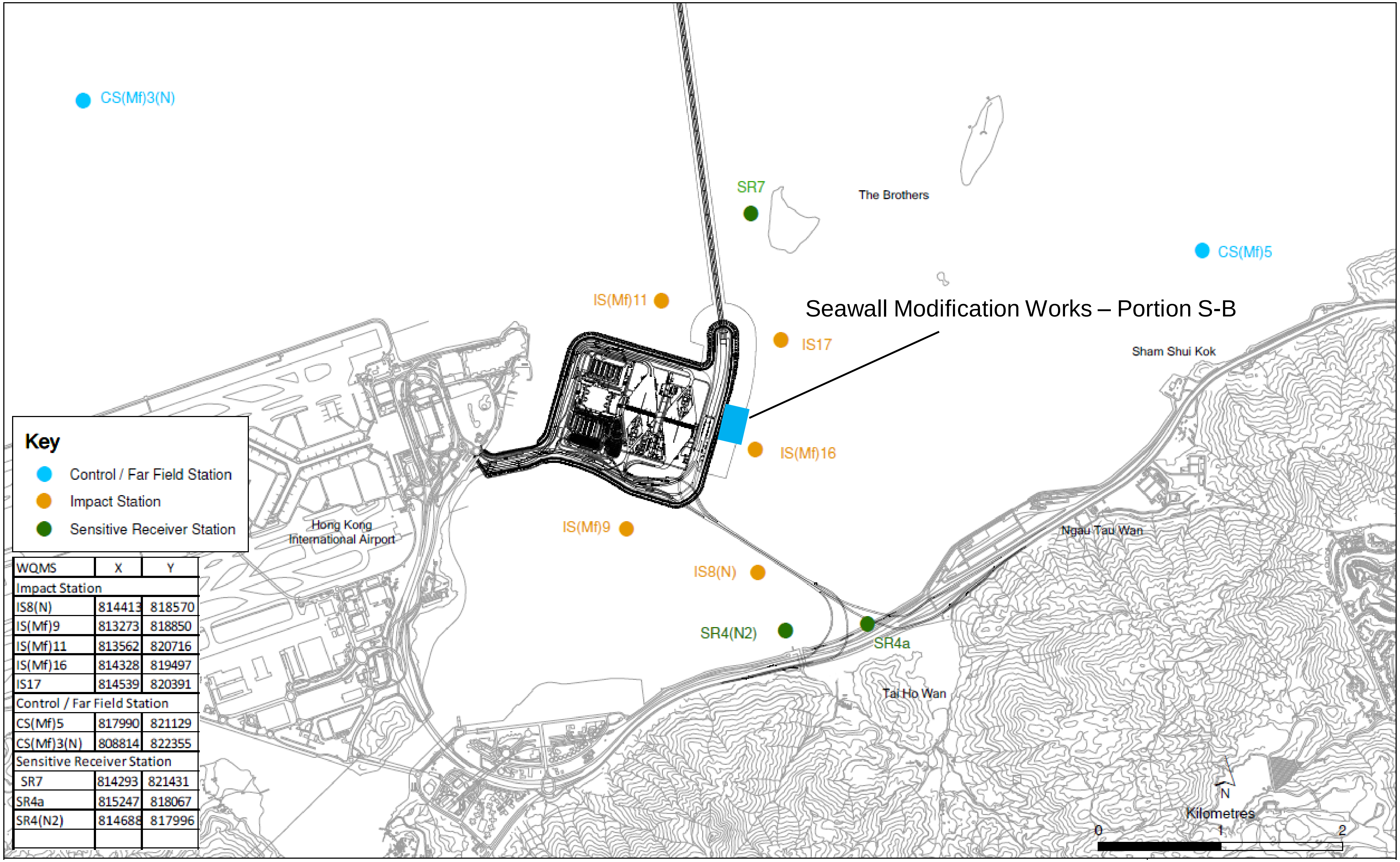
Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_14 August 2019_ Bottom DO_E_Station IS(Mf)16
0212330_14 August 2019_ Bottom DO_E_Station IS17
0212330_14 August 2019_ Bottom DO_F_Station IS(Mf)11
[Total No. of Exceedances = 3]</td></tr>
<tr><td>Date</td><td colspan="3">14 August 2019 (Measured)
16 August 2019 (In situ results received by ERM)
23 August 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO (4.6 mg/L) is observed at IS(Mf)16 at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.4 mg/L) is observed at IS17 at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.6 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, Seawall Modification Works was carried out on 14 August 2019.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="3">The exceedances are unlikely to be due to the Contract, in view of the following:
All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.
No discharge of organic matters into waters from landside works area was recorded.
IS(Mf)11 is far away (>2 km) from the Seawall Modification Works Area (Figure 1), thus the observed exceedance should not be affected by the marine works under this Contract. Therefore, the exceedance is unlikely to be related to this Contract.
The DO pattern at IS(Mf)16 and IS17 during mid-ebb tide and IS(Mf)11 during mid-flood tide were similar to the their corresponding control station where the bottom-depth DO levels were generally lower. Lower bottom-depth DO levels may be possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level.</td></tr>
<tr><td>Actions Taken/ To Be Taken</td><td colspan="3">No immediate action is considered necessary. The ET will monitor for future trends in exceedances.</td></tr>
<tr><td>Remarks</td><td colspan="3">The monitoring results on 14 August 2019 and locations of water quality monitoring stations are attached.</td></tr>
</table>

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Surface	1	1	30.1	8.0	18.4	6.1	5.6	3.0	5.1	4.2	6.1
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Surface	1	2	30.0	8.0	18.4	6.1		3.0		4.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Middle	2	1	29.3	7.9	21.1	5.0		4.5		4.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Middle	2	2	29.3	7.9	21.2	5.0		4.6		5.7	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Bottom	3	1	28.0	7.9	26.6	3.8	3.8	7.7		8.8	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)5	12:46	Bottom	3	2	28.0	7.9	26.6	3.8		7.6		9.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Surface	1	1	30.6	7.9	16.4	6.1	5.8	2.9	3.8	7.0	8.3
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Surface	1	2	30.6	7.9	16.5	6.1		2.9		6.8	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Middle	2	1	29.7	7.9	18.9	5.4		3.9		6.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Middle	2	2	29.7	7.9	18.9	5.4		3.8		8.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Bottom	3	1	29.6	7.9	19.7	5.3	5.3	4.5		10.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	CS(Mf)3(N)	12:03	Bottom	3	2	29.7	7.9	19.6	5.3		4.5		10.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Surface	1	1	30.1	8.0	18.5	6.2	6.2	4.8	7.4	5.1	6.6
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Surface	1	2	30.2	8.0	18.5	6.2		4.8		5.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Bottom	3	1	28.6	7.9	24.5	4.6	4.6	9.9		7.8	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)16	11:16	Bottom	3	2	28.6	7.9	24.4	4.6		9.9		8.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Surface	1	1	30.4	8.0	17.4	6.4	6.4	3.2	4.1	6.6	7.6
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Surface	1	2	30.4	8.0	17.3	6.4		3.2		7.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Bottom	3	1	30.0	7.9	18.6	5.6	5.6	4.9		8.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4a	11:05	Bottom	3	2	30.0	7.9	18.6	5.6		4.9		8.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Surface	1	1	30.5	8.0	17.4	6.3	6.3	3.3	5.8	5.1	6.4
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Surface	1	2	30.5	8.0	17.4	6.3		3.3		6.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Bottom	3	1	30.0	7.9	18.8	5.6	5.6	8.2		7.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR4(N2)	11:00	Bottom	3	2	30.0	7.9	18.8	5.6		8.2		6.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Surface	1	1	30.4	8.0	18.2	6.1	6.1	9.9	11.0	4.3	6.0
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Surface	1	2	30.4	8.0	18.2	6.1		9.9		4.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Bottom	3	1	29.9	8.0	19.0	5.6	5.6	12.2		7.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS8(N)	10:55	Bottom	3	2	29.9	8.0	19.0	5.6		12.1		8.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Surface	1	1	30.6	8.1	17.7	6.6	6.6	3.3	3.5	7.5	8.0
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Surface	1	2	30.6	8.1	17.7	6.6		3.3		7.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Bottom	3	1	30.4	8.1	17.8	6.5	6.5	3.6		7.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)9	10:48	Bottom	3	2	30.4	8.1	17.8	6.4		3.6		9.0	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)11	11:31	Surface	1	1	30.2	8.0	16.9	6.3	6.0	2.7	3.4	4.6	7.6
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)11	11:31	Surface	1	2	30.2	8.0	17.0	6.3		2.6		5.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)11	11:31	Middle	2	1	29.7	7.9	18.4	5.6		3.3		7.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)11	11:31	Middle	2	2	29.7	7.9	18.4	5.6		3.2		8.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)11	11:31	Bottom	3	1	29.6	7.9	19.0	5.5	5.5	4.2		10.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS(Mf)11	11:31	Bottom	3	2	29.6	7.9	19.0	5.5		4.2		10.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR7	12:26	Surface	1	1	30.2	7.9	16.8	6.3	6.3	2.2	2.9	5.4	5.7
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR7	12:26	Surface	1	2	30.2	8.0	16.8	6.3		2.2		5.6	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR7	12:26	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR7	12:26	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR7	12:26	Bottom	3	1	29.8	7.9	18.7	5.7	5.7	3.6		5.8	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	SR7	12:26	Bottom	3	2	29.8	7.9	18.6	5.7		3.5		6.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS17	11:22	Surface	1	1	30.3	8.0	18.5	6.3	6.1	4.9	5.2	5.0	5.9
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS17	11:22	Surface	1	2	30.3	8.0	18.5	6.3		4.9		4.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS17	11:22	Middle	2	1	29.9	8.0	19.1	5.9		3.8		4.7	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS17	11:22	Middle	2	2	29.9	8.0	19.0	5.9		3.8		5.6	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS17	11:22	Bottom	3	1	28.5	7.9	25.0	4.4	4.4	6.8		7.7	
TMCLKL	HY/2012/08	2019/08/14	Mid-Ebb	IS17	11:22	Bottom	3	2	28.5	7.9	25.0	4.4		6.8		7.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)5	4:38	Surface	1	1	30.1	7.9	16.8	6.2	6.1	3.2	2.4	6.3	7.9
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)5	4:38	Surface	1	2	30.1	7.9	16.8	6.2		3.2		7.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)5	4:38	Middle	2	1	29.9	7.9	19.2	6.0		2.0		8.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)5	4:38	Middle	2	2	29.9	7.9	19.2	6.0		2.0		7.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)5	4:38	Bottom	3	1	28.5	7.9	25.3	4.7	4.7	2.0		9.7	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)5	4:38	Bottom	3	2	28.5	7.9	25.3	4.7		2.0		8.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)3(N)	5:56	Surface	1	1	29.9	7.9	16.6	6.0	6.0	4.2	5.9	4.3	6.2
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)3(N)	5:56	Surface	1	2	29.9	7.9	16.6	6.0		4.2		5.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)3(N)	5:56	Middle	2	1	29.9	7.9	17.1	5.9		4.0		6.6	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)3(N)	5:56	Middle	2	2	29.9	7.9	17.1	5.9		4.0		6.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)3(N)	5:56	Bottom	3	1	29.7	7.9	18.9	5.5	5.5	9.4		7.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	CS(Mf)3(N)	5:56	Bottom	3	2	29.7	7.9	18.9	5.4		9.3		7.6	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)16	6:18	Surface	1	1	30.0	8.0	18.0	6.2	6.2	3.5	3.5	6.9	7.9
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)16	6:18	Surface	1	2	30.0	8.0	18.1	6.2		3.5		7.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)16	6:18	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)16	6:18	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)16	6:18	Bottom	3	1	30.0	8.0	18.0	6.2	6.2	3.6		8.0	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)16	6:18	Bottom	3	2	30.0	8.0	18.0	6.2		3.5		9.0	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4a	6:27	Surface	1	1	30.2	8.0	17.5	5.9	6.0	4.1	5.6	5.5	6.4
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4a	6:27	Surface	1	2	30.2	8.0	17.5	6.0		4.1		6.0	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4a	6:27	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4a	6:27	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4a	6:27	Bottom	3	1	29.9	7.9	18.7	5.3	5.3	7.1		6.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4a	6:27	Bottom	3	2	29.9	7.9	18.7	5.3		7.1		7.7	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4(N2)	6:32	Surface	1	1	30.1	8.0	17.2	6.1	6.1	3.5	4.4	6.4	5.8
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4(N2)	6:32	Surface	1	2	30.1	8.0	17.2	6.1		3.4		5.6	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4(N2)	6:32	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4(N2)	6:32	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4(N2)	6:32	Bottom	3	1	30.0	8.0	18.0	5.9	5.9	5.4		6.0	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR4(N2)	6:32	Bottom	3	2	30.0	8.0	18.0	5.9		5.3		5.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS8(N)	6:38	Surface	1	1	30.0	8.0	17.3	6.1	6.1	4.1	4.7	10.0	13.6
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS8(N)	6:38	Surface	1	2	30.0	8.0	17.3	6.1		4.2		10.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS8(N)	6:38	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS8(N)	6:38	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS8(N)	6:38	Bottom	3	1	30.0	8.0	17.5	6.0	6.0	5.3		17.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS8(N)	6:38	Bottom	3	2	30.0	8.0	17.5	6.0		5.3		16.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)9	6:45	Surface	1	1	29.9	8.0	17.3	6.1	6.1	4.8	5.9	6.3	8.9
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)9	6:45	Surface	1	2	29.9	8.0	17.3	6.1		4.9		6.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)9	6:45	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)9	6:45	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)9	6:45	Bottom	3	1	29.9	8.0	17.8	6.1	6.1	6.9		11.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)9	6:45	Bottom	3	2	29.9	8.0	17.8	6.1		7.0		11.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)11	6:00	Surface	1	1	30.1	8.0	17.2	6.2	5.8	3.6	8.0	4.4	6.4
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)11	6:00	Surface	1	2	30.1	8.0	17.2	6.2		3.6		4.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)11	6:00	Middle	2	1	29.5	8.0	20.6	5.3		4.8		7.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)11	6:00	Middle	2	2	29.5	8.0	20.7	5.3		4.8		6.5	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)11	6:00	Bottom	3	1	28.7	7.9	24.5	4.6	4.6	15.7		8.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS(Mf)11	6:00	Bottom	3	2	28.7	7.9	24.5	4.6		15.7		7.3	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR7	4:58	Surface	1	1	30.0	7.9	17.1	5.9	5.9	3.6	3.6	5.8	6.4
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR7	4:58	Surface	1	2	30.0	7.9	17.1	5.9		3.6		5.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR7	4:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR7	4:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR7	4:58	Bottom	3	1	29.9	7.9	17.4	6.0	6.0	3.6		6.9	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	SR7	4:58	Bottom	3	2	29.9	7.9	17.4	6.0		3.6		7.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS17	6:11	Surface	1	1	30.0	8.0	18.0	6.2	6.2	3.4	3.3	7.1	7.3
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS17	6:11	Surface	1	2	30.0	8.0	18.0	6.2		3.4		6.4	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS17	6:11	Middle	2	1	30.0	8.0	18.1	6.1		3.4		6.2	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS17	6:11	Middle	2	2	30.0	8.0	18.2	6.1		3.4		6.7	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS17	6:11	Bottom	3	1	29.8	8.0	18.9	5.9	5.9	3.1		8.1	
TMCLKL	HY/2012/08	2019/08/14	Mid-flood	IS17	6:11	Bottom	3	2	29.8	8.0	18.9	5.9		3.1		9.2	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

ERM

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	30 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_19 August 2019_ Surface & Middle DO_E_Station IS(Mf)16
0212330_19 August 2019_ Bottom DO_E_Station IS(Mf)16
0212330_19 August 2019_ Surface & Middle DO_E_Station SR4a
0212330_19 August 2019_ Bottom DO_E_Station SR4a
0212330_19 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0212330_19 August 2019_ Bottom DO_E_Station SR4(N2)
0212330_19 August 2019_ Bottom DO_E_Station IS8(N)
0212330_19 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_19 August 2019_ Bottom DO_E_Station IS17
0212330_19 August 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_19 August 2019_ Bottom DO_F_Station IS(Mf)11

A total of eleven Action Level exceedances were recorded on 19 August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

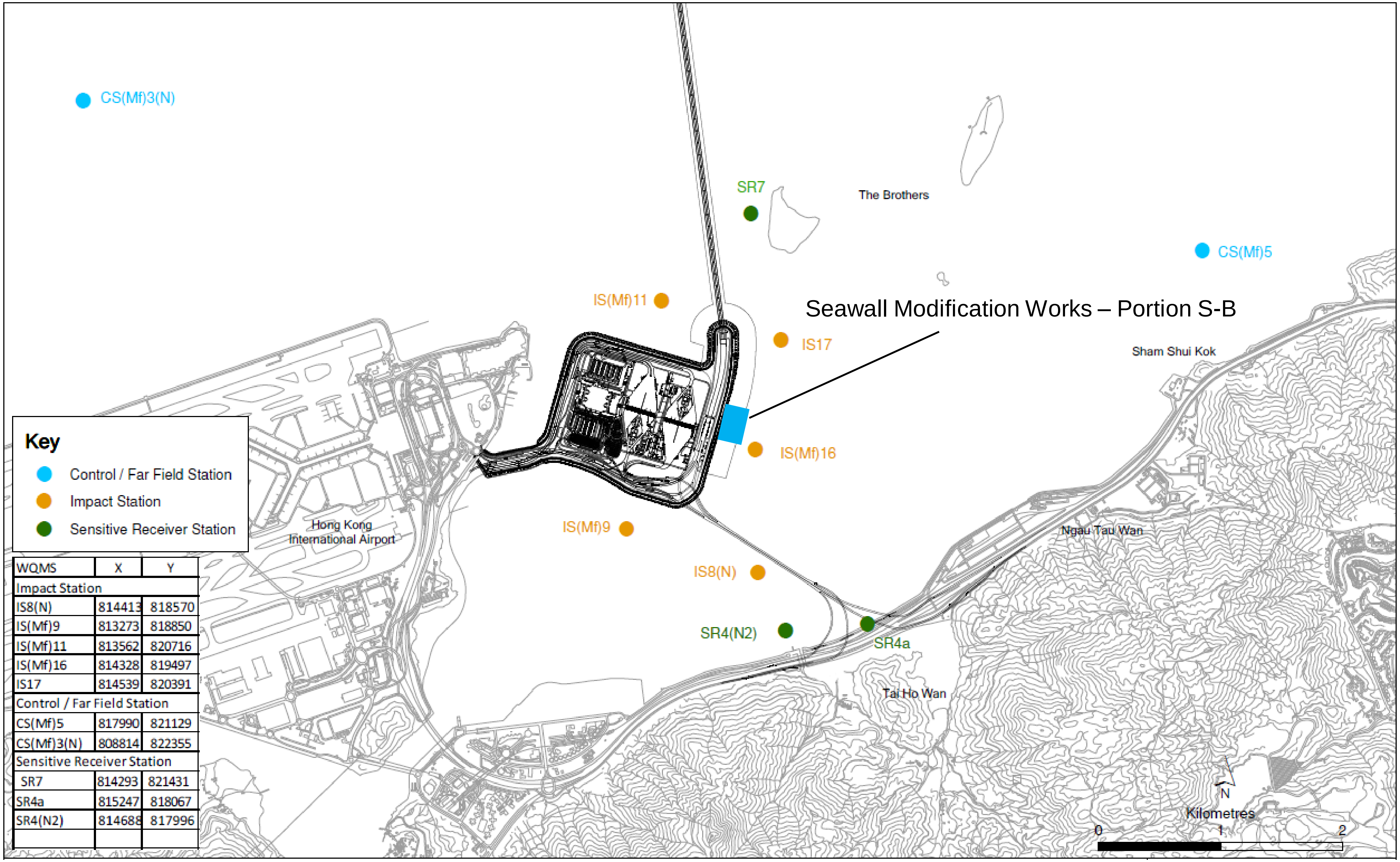
Log No.	**Action Level Exceedance** **0212330_19 August 2019_ Surface & Middle DO_E_Station IS(Mf)16** **0212330_19 August 2019_ Bottom DO_E_Station IS(Mf)16** **0212330_19 August 2019_ Surface & Middle DO_E_Station SR4a** **0212330_19 August 2019_ Bottom DO_E_Station SR4a** **0212330_19 August 2019_ Surface & Middle DO_E_Station SR4(N2)** **0212330_19 August 2019_ Bottom DO_E_Station SR4(N2)** **0212330_19 August 2019_ Bottom DO_E_Station IS8(N)** **0212330_19 August 2019_ Bottom DO_E_Station IS(Mf)11** **0212330_19 August 2019_ Bottom DO_E_Station IS17** **0212330_19 August 2019_ Surface & Middle DO_F_Station IS(Mf)11** **0212330_19 August 2019_ Bottom DO_F_Station IS(Mf)11** **[Total No. of Exceedances = 11]**		
Date	19 August 2019 (Measured) 21 August 2019 (*In situ* results received by ERM) 28 August 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO (4.8 mg/L) is observed at IS(Mf)16 at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.3 mg/L) is observed at IS(Mf)16 at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.7 mg/L) is observed at SR4a at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.5 mg/L) is observed at SR4a at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.8 mg/L) is observed at SR4(N2) at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.6 mg/L) is observed at SR4(N2) at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.6 mg/L) is observed at IS8(N) at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.2 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.2 mg/L) is observed at IS17 at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.7 mg/L) is observed at IS(Mf)11 at Surface & Middle Level during mid-flood tide. Action Level Exceedance for DO (4.3 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-flood tide..		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Seawall Modification Works was carried out on 19 August 2019.		

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • No discharge of organic matters into waters from landside works area was recorded. • IS(Mf)11, SR4a, SR4(N2) and IS8(N) are far away (>1.5 km) from the Seawall Modification Works Area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Therefore, the exceedance is unlikely to be related to this Contract. • The DO pattern at IS(Mf)16, SR4a, SR4(N2), IS8(N), IS(Mf)11 and IS17 during mid-ebb tide and IS(Mf)11 during mid-flood tide were similar to the their corresponding control station where the bottom-depth DO levels were generally lower. Lower bottom-depth DO levels may be possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. • Bottom-depth DO levels at IS(Mf)11 was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • Surface & Middle-depth DO levels at IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • As reported by the marine mammal observer, no discharge of organic matters into waters from landside works area was recorded. Therefore, the exceedance recorded at IS(Mf)16 during mid-ebb tide is likely to be due to natural fluctuation of water quality and is unlikely to be related to this Contract. Exceedances recorded at SR4a, SR4(N2), IS8(N), IS(Mf)11 and IS17 during mid-ebb tide and IS(Mf)11 during mid-flood tide are unlikely to be related to this Contract as these stations are further than IS(Mf)16.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 19 August 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Surface	1	1	28.2	8.0	22.2	5.0	4.6	3.8	8.9	3.8	4.0
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Surface	1	2	28.9	7.9	21.8	5.0		4.1		3.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Middle	2	1	26.6	8.0	26.8	4.1		8.2		3.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Middle	2	2	27.3	7.9	26.4	4.1		8.0		3.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Bottom	3	1	25.8	8.1	30.1	3.8	3.8	14.4		4.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)5	15:37	Bottom	3	2	26.5	7.9	29.7	3.7		14.6		4.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Surface	1	1	28.9	8.0	19.6	5.6	5.3	3.0	4.9	1.9	2.1
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Surface	1	2	29.7	7.9	19.2	5.5		3.1		1.9	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Middle	2	1	28.0	8.0	22.9	5.1		4.8		2.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Middle	2	2	28.8	7.9	22.4	5.1		4.9		2.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Bottom	3	1	27.5	8.0	24.5	4.9	4.8	6.5		2.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	CS(Mf)3(N)	14:43	Bottom	3	2	28.3	7.9	24.0	4.7		6.9		2.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Surface	1	1	27.8	8.1	23.3	4.8	4.8	7.8	6.4	9.2	8.7
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Surface	1	2	28.6	7.9	22.9	4.8		7.2		8.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Bottom	3	1	26.2	8.0	28.5	4.4	4.3	5.2		8.5	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)16	13:56	Bottom	3	2	27.0	7.9	28.1	4.2		5.4		8.2	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Surface	1	1	27.8	8.0	22.9	4.6	4.7	8.6	10.1	8.9	6.1
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Surface	1	2	28.5	7.9	22.6	4.7		8.2		8.3	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Bottom	3	1	27.6	8.0	23.7	4.5	4.5	11.9		3.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4a	13:47	Bottom	3	2	28.4	7.9	23.3	4.5		11.8		3.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Surface	1	1	28.0	8.0	22.3	4.7	4.8	10.0	10.8	8.4	9.0
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Surface	1	2	28.7	7.9	22.0	4.8		10.0		8.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Bottom	3	1	27.8	8.0	22.8	4.6	4.6	11.7		9.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR4(N2)	13:42	Bottom	3	2	28.6	7.9	22.5	4.6		11.6		9.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Surface	1	1	27.9	8.1	22.9	5.1	5.1	10.6	10.7	14.4	12.1
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Surface	1	2	28.6	7.9	22.7	5.1		10.4		13.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Bottom	3	1	27.6	8.1	23.8	4.6	4.6	10.9		10.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS8(N)	13:36	Bottom	3	2	28.3	7.9	23.5	4.5		10.9		9.9	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Surface	1	1	28.7	8.0	21.4	5.6	5.6	3.9	4.6	8.1	6.1
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Surface	1	2	29.5	8.0	21.1	5.6		4.1		7.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Bottom	3	1	28.4	8.0	21.6	5.5	5.5	5.2		4.5	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)9	13:30	Bottom	3	2	29.1	8.0	21.3	5.5		5.1		4.0	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)11	15:07	Surface	1	1	29.3	8.1	19.7	5.7	5.4	2.3	4.1	2.4	1.8
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)11	15:07	Surface	1	2	30.1	7.9	19.4	5.6		2.4		2.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)11	15:07	Middle	2	1	28.6	8.1	20.5	5.2		3.3		1.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)11	15:07	Middle	2	2	29.4	7.9	20.1	5.2		3.4		1.5	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)11	15:07	Bottom	3	1	26.3	8.1	28.6	4.2	4.2	6.4		1.5	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS(Mf)11	15:07	Bottom	3	2	27.1	7.9	28.0	4.1		6.9		1.3	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR7	15:16	Surface	1	1	28.5	8.1	20.9	5.4	5.4	2.9	3.5	1.9	2.2
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR7	15:16	Surface	1	2	29.3	7.9	20.5	5.4		3.0		1.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR7	15:16	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR7	15:16	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR7	15:16	Bottom	3	1	28.2	8.1	21.5	5.4	5.4	4.0		2.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	SR7	15:16	Bottom	3	2	29.0	7.9	21.2	5.3		4.0		2.9	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS17	14:03	Surface	1	1	28.8	8.0	20.2	5.3	5.1	3.8	6.3	2.7	5.0
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS17	14:03	Surface	1	2	29.6	7.9	20.0	5.3		3.9		3.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS17	14:03	Middle	2	1	27.8	8.0	22.4	5.0		6.2		4.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS17	14:03	Middle	2	2	28.4	7.9	22.3	4.9		6.5		4.2	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS17	14:03	Bottom	3	1	27.0	8.1	26.8	4.2	4.2	8.9		7.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-Ebb	IS17	14:03	Bottom	3	2	27.9	7.9	26.6	4.1		8.3		7.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Surface	1	1	28.8	7.8	20.1	5.0	4.6	3.3	6.6	3.1	3.6
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Surface	1	2	28.0	8.0	20.4	5.0		3.3		2.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Middle	2	1	27.6	7.8	25.7	4.2		4.9		3.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Middle	2	2	26.8	8.0	26.2	4.2		4.9		3.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Bottom	3	1	26.7	7.8	29.5	3.7	3.8	11.5		4.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)5	7:56	Bottom	3	2	25.9	8.0	29.9	3.8		11.5		4.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Surface	1	1	28.4	8.0	17.0	5.5	5.4	3.7	4.3	5.5	4.7
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Surface	1	2	29.2	7.9	16.7	5.5		3.7		5.2	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Middle	2	1	28.2	8.0	19.2	5.4		4.6		4.2	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Middle	2	2	29.0	7.8	18.9	5.3		4.7		4.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Bottom	3	1	28.2	8.0	19.4	5.4	5.4	4.6		4.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	CS(Mf)3(N)	8:44	Bottom	3	2	29.0	7.9	19.1	5.3		4.7		4.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Surface	1	1	28.0	8.1	21.6	5.2	5.2	4.5	6.0	2.6	3.6
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Surface	1	2	28.7	7.9	21.3	5.2		4.9		2.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Bottom	3	1	27.8	8.1	22.2	5.3	5.2	7.4		4.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)16	9:28	Bottom	3	2	28.6	8.0	21.8	5.1		7.3		4.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Surface	1	1	28.0	8.1	21.2	5.2	5.2	4.7	6.6	5.2	5.4
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Surface	1	2	28.7	7.9	20.9	5.2		4.8		4.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Bottom	3	1	27.9	8.1	21.9	4.9	4.9	8.2		5.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4a	9:37	Bottom	3	2	28.6	8.0	21.6	4.9		8.8		5.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Surface	1	1	28.0	8.1	21.1	5.4	5.4	4.4	4.9	8.6	6.6
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Surface	1	2	28.8	7.9	20.7	5.3		4.4		8.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Bottom	3	1	28.0	8.1	21.2	5.5	5.5	5.9		4.3	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR4(N2)	9:42	Bottom	3	2	28.7	7.9	20.8	5.5		5.0		4.8	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Surface	1	1	28.0	8.1	21.1	5.2	5.2	5.3	7.0	5.0	6.1
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Surface	1	2	28.8	7.9	20.7	5.1		5.9		4.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Bottom	3	1	27.8	8.1	22.0	5.1	5.1	8.5		7.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS8(N)	9:49	Bottom	3	2	28.6	7.9	21.6	5.0		8.2		7.2	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Surface	1	1	28.1	8.1	21.3	5.4	5.4	4.4	6.3	5.5	5.5
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Surface	1	2	28.9	7.9	20.9	5.4		4.7		5.3	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Bottom	3	1	28.0	8.1	21.6	5.5	5.5	8.0		5.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)9	9:56	Bottom	3	2	28.7	7.9	21.3	5.5		8.1		5.4	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)11	8:20	Surface	1	1	28.7	7.9	20.5	5.1	4.7	4.5	10.4	4.9	4.7
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)11	8:20	Surface	1	2	28.7	7.9	20.5	5.1		4.5		4.9	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)11	8:20	Middle	2	1	28.0	7.9	24.6	4.3		13.5		4.9	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)11	8:20	Middle	2	2	28.0	7.9	24.6	4.3		13.5		4.9	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)11	8:20	Bottom	3	1	27.9	7.9	24.9	4.3	4.3	13.2		4.3	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS(Mf)11	8:20	Bottom	3	2	27.9	7.9	24.9	4.3		13.2		4.2	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR7	8:13	Surface	1	1	28.6	7.9	19.8	5.2	5.2	5.3	6.9	4.8	5.1
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR7	8:13	Surface	1	2	27.8	8.0	20.2	5.1		5.0		4.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR7	8:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR7	8:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR7	8:13	Bottom	3	1	28.2	7.9	23.0	4.6	4.7	8.5		5.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	SR7	8:13	Bottom	3	2	27.4	8.0	23.5	4.7		8.9		5.7	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS17	9:21	Surface	1	1	28.0	8.1	21.7	5.2	5.0	3.6	3.6	3.2	4.3
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS17	9:21	Surface	1	2	28.7	7.9	21.3	5.1		3.6		3.5	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS17	9:21	Middle	2	1	27.7	8.1	22.7	4.9		3.5		4.2	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS17	9:21	Middle	2	2	28.4	7.9	22.6	4.8		3.7		4.6	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS17	9:21	Bottom	3	1	27.4	8.1	23.8	4.9	4.9	3.5		5.1	
TMCLKL	HY/2012/08	2019/08/19	Mid-flood	IS17	9:21	Bottom	3	2	28.2	7.9	23.4	4.8		3.5		5.3	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



Key

- Control / Far Field Station
- Impact Station
- Sensitive Receiver Station

WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	30 August 2019

ERM

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_21 August 2019_ Surface & Middle DO_E_Station IS17
0212330_21 August 2019_ Bottom DO_E_Station IS17
0212330_21 August 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_21 August 2019_ Bottom DO_F_Station SR7
0212330_21 August 2019_ Surface & Middle DO_F_Station IS17

A total of five Action Level exceedances were recorded on 21 August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

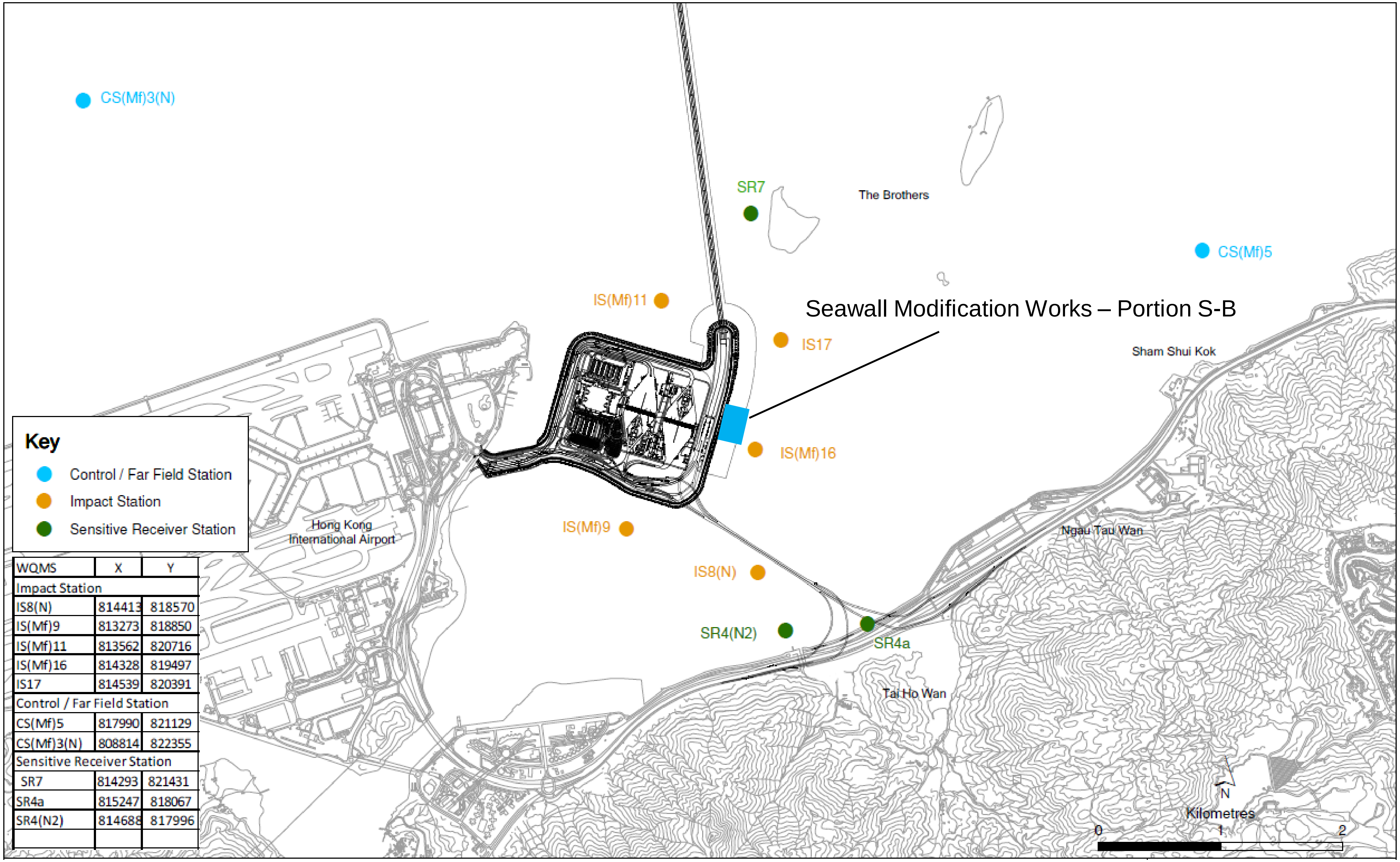
Log No.	**Action Level Exceedance** **0212330_21 August 2019_ Surface & Middle DO_E_Station IS17** **0212330_21 August 2019_ Bottom DO_E_Station IS17** **0212330_21 August 2019_ Surface & Middle DO_F_Station IS(Mf)11** **0212330_21 August 2019_ Bottom DO_F_Station SR7** **0212330_21 August 2019_ Surface & Middle DO_F_Station IS17** **[Total No. of Exceedances = 5]**		
Date	21 August 2019 (Measured) 23 August 2019 (*In situ* results received by ERM) 30 August 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO (4.9 mg/L) is observed at IS17 at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.5 mg/L) is observed at IS17 at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.6 mg/L) is observed at IS(Mf)11 at Surface & Middle Level during mid-flood tide. Action Level Exceedance for DO (4.3 mg/L) is observed at SR7 at Bottom Level during mid-flood tide. Action Level Exceedance for DO (4.8 mg/L) is observed at IS17 at Surface & Middle Level during mid-flood tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Seawall Modification Works was carried out on 21 August 2019.		

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • IS(Mf)11, IS17 and SR7 are far away (>1.5 km) from the Seawall Modification Works Area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, IS(Mf)16 is closer to the works area and no exceedance was recorded. Therefore, the exceedance is unlikely to be related to this Contract. • Bottom-depth DO levels at SR7 was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • Surface & Middle-depth DO levels at IS17 and IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • As reported by the marine mammal observer, no discharge of organic matters into waters from landside works area was recorded. Moreover, no exceedance was recorded at IS(Mf)16 which is the closest station to the Seawall Modification Works Area during mid-ebb tide. Therefore, exceedances recorded at IS17 during mid-ebb tide are unlikely to be caused by the marine works of this Contract.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 21 August 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)5	16:28	Surface	1	1	29.4	8.0	21.7	5.5	5.4	1.6	2.0	8.8	6.4
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)5	16:28	Surface	1	2	29.4	8.0	21.7	5.5		1.3		8.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)5	16:28	Middle	2	1	28.7	8.0	23.1	5.2		1.4		6.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)5	16:28	Middle	2	2	28.7	8.0	23.1	5.2		1.6		6.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)5	16:28	Bottom	3	1	28.6	8.0	23.5	5.3	5.3	2.9		4.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)5	16:28	Bottom	3	2	28.6	8.0	23.5	5.3		2.9		4.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)3(N)	15:44	Surface	1	1	29.6	8.0	21.0	5.6	5.4	3.5	3.8	9.9	11.0
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)3(N)	15:44	Surface	1	2	29.6	8.0	21.0	5.6		3.5		9.4	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)3(N)	15:44	Middle	2	1	28.7	8.0	23.0	5.2		3.2		9.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)3(N)	15:44	Middle	2	2	28.7	8.0	23.1	5.2		3.2		10.4	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)3(N)	15:44	Bottom	3	1	28.6	8.0	23.6	5.3	5.3	4.8		13.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	CS(Mf)3(N)	15:44	Bottom	3	2	28.6	8.0	23.5	5.3		4.8		12.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)16	14:58	Surface	1	1	28.5	8.0	24.2	5.3	5.3	1.5	2.2	12.0	13.4
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)16	14:58	Surface	1	2	28.5	8.0	24.2	5.3		1.5		11.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)16	14:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)16	14:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)16	14:58	Bottom	3	1	28.1	8.0	24.7	5.6	5.6	3.0		14.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)16	14:58	Bottom	3	2	28.1	8.0	24.7	5.6		2.9		14.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4a	14:49	Surface	1	1	29.1	8.0	23.1	5.8	5.8	1.5	2.8	17.1	13.4
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4a	14:49	Surface	1	2	29.1	8.0	23.1	5.8		1.5		17.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4a	14:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4a	14:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4a	14:49	Bottom	3	1	28.2	7.9	24.4	4.7	4.7	4.1		9.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4a	14:49	Bottom	3	2	28.2	7.9	24.4	4.7		4.2		9.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4(N2)	14:45	Surface	1	1	29.4	7.9	22.7	5.7	5.7	2.9	3.6	6.1	7.7
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4(N2)	14:45	Surface	1	2	29.4	7.9	22.7	5.7		2.9		5.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4(N2)	14:45	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4(N2)	14:45	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4(N2)	14:45	Bottom	3	1	28.2	7.9	24.3	4.7	4.7	4.2		9.4	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR4(N2)	14:45	Bottom	3	2	28.2	7.9	24.3	4.7		4.2		9.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS8(N)	14:39	Surface	1	1	29.1	7.9	23.2	5.5	5.6	4.3	5.0	11.7	10.3
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS8(N)	14:39	Surface	1	2	29.1	7.9	23.2	5.6		4.2		11.3	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS8(N)	14:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS8(N)	14:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS8(N)	14:39	Bottom	3	1	28.9	7.9	23.5	5.4	5.4	5.8		8.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS8(N)	14:39	Bottom	3	2	28.9	7.9	23.5	5.4		5.8		9.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)9	14:33	Surface	1	1	29.3	8.1	23.0	6.0	6.0	2.3	2.1	9.6	9.2
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)9	14:33	Surface	1	2	29.3	8.1	23.0	6.0		2.4		8.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)9	14:33	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)9	14:33	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)9	14:33	Bottom	3	1	28.9	8.2	23.3	5.8	5.8	1.8		9.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)9	14:33	Bottom	3	2	28.9	8.1	23.3	5.7		1.9		8.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)11	15:12	Surface	1	1	29.9	8.0	20.7	5.6	5.3	1.2	2.4	4.4	6.5
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)11	15:12	Surface	1	2	29.9	8.0	20.7	5.6		1.2		4.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)11	15:12	Middle	2	1	28.7	7.9	23.3	5.0		2.8		5.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)11	15:12	Middle	2	2	28.7	7.9	23.3	5.0		2.8		5.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)11	15:12	Bottom	3	1	27.7	7.9	25.6	4.7	4.7	3.2		9.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS(Mf)11	15:12	Bottom	3	2	27.7	7.9	25.6	4.7		3.2		9.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR7	16:08	Surface	1	1	29.2	8.1	22.0	5.4	5.4	1.3	2.1	4.8	5.4
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR7	16:08	Surface	1	2	29.2	8.1	22.0	5.4		1.3		4.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR7	16:08	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR7	16:08	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR7	16:08	Bottom	3	1	28.4	8.1	23.8	5.4	5.4	2.8		5.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	SR7	16:08	Bottom	3	2	28.4	8.1	23.8	5.3		2.8		6.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS17	15:04	Surface	1	1	28.9	8.0	23.8	5.2	4.9	2.9	4.5	10.5	11.5
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS17	15:04	Surface	1	2	28.9	8.0	23.7	5.2		2.8		9.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS17	15:04	Middle	2	1	28.0	8.0	25.4	4.5		4.7		11.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS17	15:04	Middle	2	2	28.0	8.0	25.4	4.5		4.7		11.0	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS17	15:04	Bottom	3	1	27.1	7.9	27.1	4.5	4.5	5.9		13.3	
TMCLKL	HY/2012/08	2019/08/21	Mid-Ebb	IS17	15:04	Bottom	3	2	27.1	7.9	27.2	4.5		6.0		12.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)5	9:19	Surface	1	1	28.4	8.0	23.2	4.9	4.8	1.1	1.5	3.6	5.8
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)5	9:19	Surface	1	2	28.4	8.0	23.2	4.9		1.1		3.4	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)5	9:19	Middle	2	1	27.9	8.0	24.6	4.6		1.3		5.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)5	9:19	Middle	2	2	27.9	8.0	24.6	4.6		1.3		6.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)5	9:19	Bottom	3	1	27.4	8.0	25.9	4.6	4.6	2.1		8.3	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)5	9:19	Bottom	3	2	27.4	8.0	25.9	4.6		2.1		7.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)3(N)	10:07	Surface	1	1	29.2	8.0	20.5	5.1	5.0	1.6	3.4	2.6	3.4
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)3(N)	10:07	Surface	1	2	29.2	8.0	20.5	5.1		1.5		2.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)3(N)	10:07	Middle	2	1	28.5	8.0	22.6	4.9		4.3		3.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)3(N)	10:07	Middle	2	2	28.5	8.0	22.6	4.9		4.3		3.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)3(N)	10:07	Bottom	3	1	28.5	8.0	22.7	5.0	5.0	4.4		4.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	CS(Mf)3(N)	10:07	Bottom	3	2	28.5	8.0	22.7	5.0		4.4		3.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)16	10:54	Surface	1	1	28.5	8.0	23.2	5.1	5.1	2.1	3.2	13.1	10.3
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)16	10:54	Surface	1	2	28.5	8.0	23.2	5.1		2.1		12.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)16	10:54	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)16	10:54	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)16	10:54	Bottom	3	1	28.0	8.0	24.0	4.8	4.8	4.3		7.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)16	10:54	Bottom	3	2	28.0	8.0	24.1	4.8		4.3		7.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4a	11:04	Surface	1	1	29.0	8.0	22.6	5.2	5.2	1.2	2.0	4.7	4.7
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4a	11:04	Surface	1	2	29.0	8.0	22.6	5.2		1.2		4.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4a	11:04	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4a	11:04	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4a	11:04	Bottom	3	1	28.4	8.0	23.4	4.7	4.7	2.7		4.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4a	11:04	Bottom	3	2	28.4	8.0	23.4	4.7		2.7		4.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4(N2)	11:08	Surface	1	1	29.4	8.0	22.6	5.4	5.4	2.6	3.1	4.0	5.7
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4(N2)	11:08	Surface	1	2	29.4	8.0	22.6	5.4		2.5		4.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4(N2)	11:08	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4(N2)	11:08	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4(N2)	11:08	Bottom	3	1	28.4	8.0	23.5	4.8	4.8	3.6		6.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR4(N2)	11:08	Bottom	3	2	28.4	8.0	23.5	4.8		3.5		7.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS8(N)	11:13	Surface	1	1	29.1	8.0	22.8	5.1	5.1	2.8	3.5	5.4	4.5
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS8(N)	11:13	Surface	1	2	29.1	8.0	22.8	5.1		2.8		5.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS8(N)	11:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS8(N)	11:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS8(N)	11:13	Bottom	3	1	28.2	8.0	23.7	5.2	5.2	4.2		4.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS8(N)	11:13	Bottom	3	2	28.2	8.0	23.7	5.2		4.2		3.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)9	11:20	Surface	1	1	28.4	8.1	23.1	5.3	5.3	1.7	1.9	5.7	6.6
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)9	11:20	Surface	1	2	28.4	8.1	23.1	5.3		1.7		5.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)9	11:20	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)9	11:20	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)9	11:20	Bottom	3	1	28.4	8.1	23.2	5.4	5.4	2.1		7.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)9	11:20	Bottom	3	2	28.4	8.1	23.3	5.4		2.1		7.8	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)11	10:40	Surface	1	1	28.3	8.1	23.6	4.8	4.6	2.0	3.5	4.6	6.3
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)11	10:40	Surface	1	2	28.3	8.1	23.6	4.8		2.0		4.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)11	10:40	Middle	2	1	27.7	8.2	25.0	4.4		4.1		5.7	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)11	10:40	Middle	2	2	27.7	8.2	25.0	4.4		4.1		5.4	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)11	10:40	Bottom	3	1	27.6	8.3	25.3	5.0	5.0	4.5		9.2	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS(Mf)11	10:40	Bottom	3	2	27.7	8.2	25.1	5.0		4.4		8.5	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR7	9:39	Surface	1	1	28.7	8.0	21.9	5.3	5.3	2.3	3.3	6.2	8.0
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR7	9:39	Surface	1	2	28.7	8.0	21.9	5.3		2.3		6.3	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR7	9:39	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR7	9:39	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR7	9:39	Bottom	3	1	27.5	8.1	25.9	4.3	4.3	4.2		10.1	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	SR7	9:39	Bottom	3	2	27.5	8.1	25.9	4.3		4.2		9.3	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS17	10:47	Surface	1	1	28.0	8.1	24.3	4.8	4.8	3.6	3.3	7.6	10.7
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS17	10:47	Surface	1	2	28.0	8.1	24.3	4.8		3.6		7.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS17	10:47	Middle	2	1	28.0	8.1	24.3	4.8		3.2		10.9	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS17	10:47	Middle	2	2	28.0	8.1	24.3	4.8		3.2		10.6	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS17	10:47	Bottom	3	1	28.0	8.1	24.4	5.0	5.0	3.0		14.0	
TMCLKL	HY/2012/08	2019/08/21	Mid-flood	IS17	10:47	Bottom	3	2	28.0	8.1	24.4	5.0		3.1		13.0	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	30 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance
0212330_23 August 2019_ Bottom DO_E_Station IS17

A total of one Action Level exceedance was recorded on 23 August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

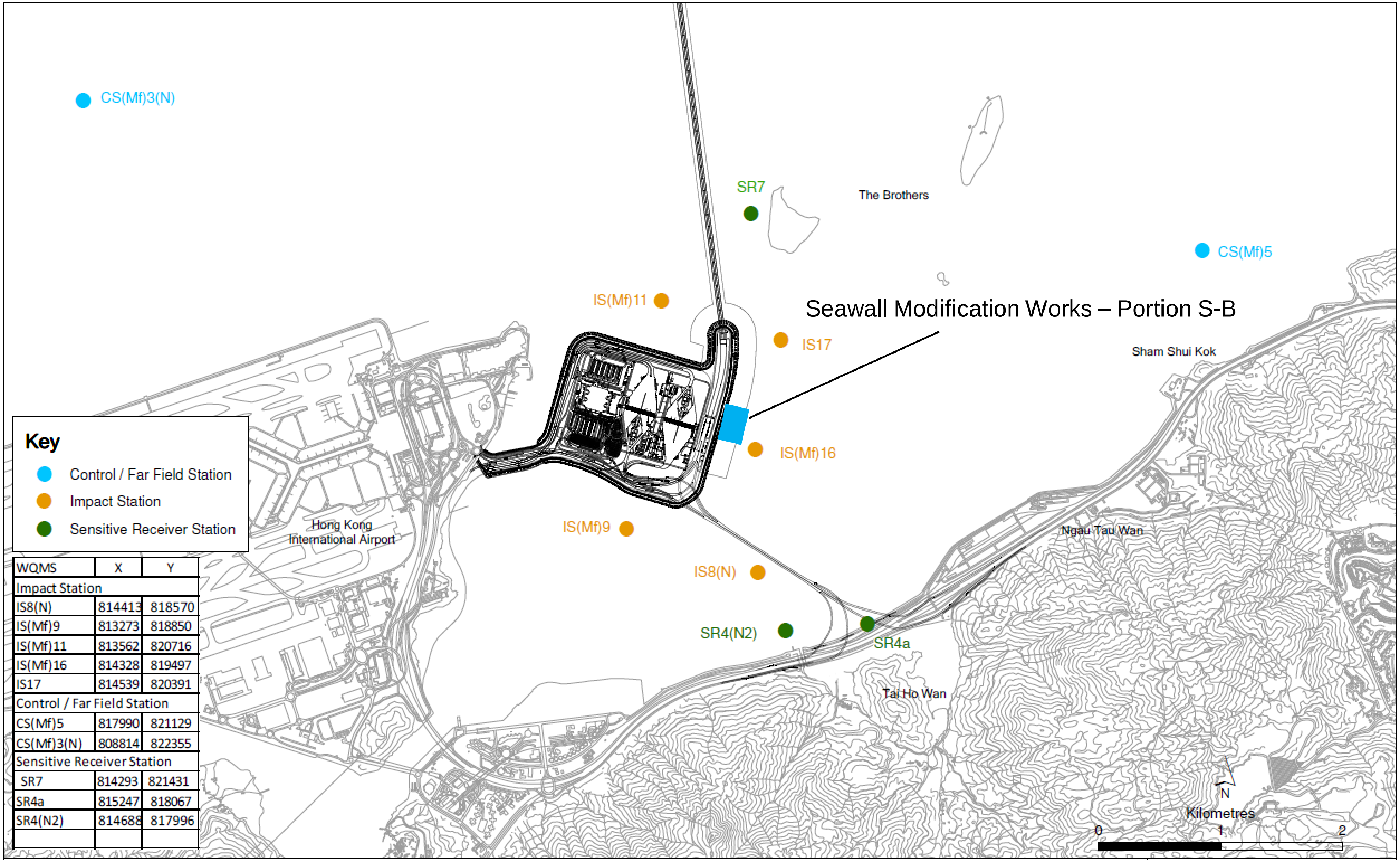
Marine Water Quality Impact Monitoring
Notification of Exceedance

Log No.	**Action Level Exceedance** **0212330_23 August 2019_ Bottom DO_E_Station IS17** **[Total No. of Exceedances = 1]**		
Date	23 August 2019 (Measured) 26 August 2019 (*In situ* results received by ERM) 3 September 2019 (Laboratory results received by ERM)		
Monitoring Station	CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11		
Parameter(s) with Exceedance(s)	Dissolved Oxygen (mg/L)		
Action Levels	DO	Surface and Middle 5.0 mg/L	Bottom 4.7 mg/L
Limit Levels	DO	Surface and Middle 4.2 mg/L	Bottom 3.6 mg/L
Measured Levels	Action Level Exceedance for DO (4.2 mg/L) is observed at IS17 at Bottom Level during mid-ebb tide.		
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Seawall Modification Works was carried out on 23 August 2019.		
Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • No discharge of organic matters into waters from landside works area was recorded. • Bottom-depth DO levels at IS17 was similar to the corresponding control stations, CS(Mf)3(N), during mid-ebb tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level.		
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.		
Remarks	The monitoring results on 23 August 2019 and locations of water quality monitoring stations are attached.		

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)5	17:57	Surface	1	1	29.0	8.4	20.1	7.1	6.6	1.5	1.5	5.6	4.5
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)5	17:57	Surface	1	2	29.0	8.4	20.1	7.1		1.5		5.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)5	17:57	Middle	2	1	27.8	8.4	23.5	6.1		1.3		4.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)5	17:57	Middle	2	2	27.9	8.4	23.4	6.1		1.3		4.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)5	17:57	Bottom	3	1	27.1	8.4	26.5	5.7	5.7	1.7		3.4	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)5	17:57	Bottom	3	2	27.1	8.4	26.5	5.7		1.6		3.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)3(N)	17:12	Surface	1	1	29.4	8.4	16.4	6.3	5.2	3.2	4.3	6.5	7.9
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)3(N)	17:12	Surface	1	2	29.4	8.4	16.3	6.3		3.2		6.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)3(N)	17:12	Middle	2	1	27.4	8.4	25.6	4.1		4.2		7.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)3(N)	17:12	Middle	2	2	27.4	8.4	25.4	4.1		4.1		7.6	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)3(N)	17:12	Bottom	3	1	27.2	8.4	26.5	4.1	4.1	5.5		9.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	CS(Mf)3(N)	17:12	Bottom	3	2	27.2	8.4	26.5	4.1		5.5		9.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)16	16:28	Surface	1	1	28.4	8.5	23.5	5.9	5.9	8.7	8.9	10.4	13.0
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)16	16:28	Surface	1	2	28.4	8.5	23.4	5.9		8.7		10.0	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)16	16:28	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)16	16:28	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)16	16:28	Bottom	3	1	28.1	8.5	24.0	5.4	5.4	9.1		15.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)16	16:28	Bottom	3	2	28.0	8.5	24.1	5.3		9.1		16.4	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4a	16:18	Surface	1	1	29.3	8.5	20.3	7.3	7.3	2.1	3.3	6.3	8.7
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4a	16:18	Surface	1	2	29.3	8.5	20.3	7.3		2.2		6.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4a	16:18	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4a	16:18	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4a	16:18	Bottom	3	1	28.3	8.4	23.1	5.5	5.5	4.4		11.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4a	16:18	Bottom	3	2	28.3	8.4	23.2	5.5		4.4		11.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4(N2)	16:15	Surface	1	1	29.0	8.5	21.6	6.3	6.3	5.2	7.3	7.9	12.7
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4(N2)	16:15	Surface	1	2	29.0	8.5	21.7	6.3		5.2		8.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4(N2)	16:15	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4(N2)	16:15	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4(N2)	16:15	Bottom	3	1	28.2	8.4	23.5	5.2	5.2	9.3		17.0	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR4(N2)	16:15	Bottom	3	2	28.2	8.4	23.5	5.2		9.3		17.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS8(N)	16:09	Surface	1	1	29.1	8.6	21.8	6.9	6.9	5.8	7.3	8.7	10.7
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS8(N)	16:09	Surface	1	2	29.1	8.6	21.8	6.9		5.8		8.4	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS8(N)	16:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS8(N)	16:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS8(N)	16:09	Bottom	3	1	28.3	8.5	23.4	5.8	5.8	8.8		12.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS8(N)	16:09	Bottom	3	2	28.3	8.5	23.4	5.8		8.7		13.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)9	16:01	Surface	1	1	29.0	8.7	22.2	7.3	7.3	3.2	4.5	9.2	10.2
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)9	16:01	Surface	1	2	29.0	8.7	22.2	7.3		3.1		9.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)9	16:01	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)9	16:01	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)9	16:01	Bottom	3	1	28.8	8.6	22.6	7.0	7.0	5.9		10.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)9	16:01	Bottom	3	2	28.8	8.6	22.6	7.0		5.9		11.0	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)11	16:42	Surface	1	1	29.2	8.5	17.9	7.4	7.0	2.3	2.9	5.4	6.8
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)11	16:42	Surface	1	2	29.2	8.5	17.9	7.4		2.4		5.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)11	16:42	Middle	2	1	28.6	8.5	20.4	6.6		1.3		7.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)11	16:42	Middle	2	2	28.6	8.5	20.4	6.6		1.3		6.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)11	16:42	Bottom	3	1	26.5	8.4	28.6	4.7	4.7	5.0		8.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS(Mf)11	16:42	Bottom	3	2	26.5	8.4	28.6	4.6		5.0		7.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR7	17:38	Surface	1	1	29.4	8.5	16.1	7.3	7.3	2.9	4.3	5.7	6.1
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR7	17:38	Surface	1	2	29.4	8.5	16.1	7.3		2.9		5.6	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR7	17:38	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR7	17:38	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR7	17:38	Bottom	3	1	28.9	8.4	19.0	7.1	7.1	5.7		6.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	SR7	17:38	Bottom	3	2	28.9	8.4	19.1	7.1		5.7		6.7	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS17	16:34	Surface	1	1	28.3	8.5	21.7	6.0	5.7	2.1	4.0	4.5	6.0
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS17	16:34	Surface	1	2	28.4	8.5	21.7	6.0		2.1		4.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS17	16:34	Middle	2	1	28.0	8.5	23.3	5.4		3.3		5.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS17	16:34	Middle	2	2	27.9	8.5	23.4	5.4		3.3		5.1	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS17	16:34	Bottom	3	1	26.3	8.4	28.9	4.2	4.2	6.5		7.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-Ebb	IS17	16:34	Bottom	3	2	26.3	8.5	28.9	4.2		6.4		8.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)5	11:03	Surface	1	1	28.6	8.1	15.4	6.1	5.7	2.9	3.6	5.3	7.0
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)5	11:03	Surface	1	2	28.6	8.1	15.4	6.1		2.9		5.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)5	11:03	Middle	2	1	28.3	8.1	20.3	5.3		3.3		6.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)5	11:03	Middle	2	2	28.4	8.1	20.3	5.4		3.3		6.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)5	11:03	Bottom	3	1	28.0	8.1	23.0	5.2	5.2	4.7		8.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)5	11:03	Bottom	3	2	28.0	8.1	23.0	5.2		4.7		9.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)3(N)	11:52	Surface	1	1	29.1	8.2	13.0	6.4	6.1	2.3	4.1	5.7	6.8
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)3(N)	11:52	Surface	1	2	29.1	8.2	13.0	6.5		2.3		5.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)3(N)	11:52	Middle	2	1	28.6	8.1	17.0	5.8		4.0		6.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)3(N)	11:52	Middle	2	2	28.7	8.2	17.0	5.8		3.9		6.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)3(N)	11:52	Bottom	3	1	27.9	8.1	23.8	5.0	5.0	6.1		8.7	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	CS(Mf)3(N)	11:52	Bottom	3	2	27.9	8.1	23.8	5.0		6.2		8.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)16	12:35	Surface	1	1	28.4	8.3	21.7	5.7	5.7	3.6	4.5	14.2	20.0
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)16	12:35	Surface	1	2	28.4	8.3	21.7	5.7		3.6		13.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)16	12:35	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)16	12:35	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)16	12:35	Bottom	3	1	28.1	8.3	23.4	5.4	5.4	5.4		25.0	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)16	12:35	Bottom	3	2	28.1	8.3	23.4	5.3		5.3		26.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4a	12:44	Surface	1	1	28.7	8.3	20.2	6.2	6.2	2.2	3.1	7.7	7.9
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4a	12:44	Surface	1	2	28.7	8.3	20.2	6.2		2.1		7.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4a	12:44	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4a	12:44	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4a	12:44	Bottom	3	1	28.4	8.3	21.8	5.8	5.8	4.1		8.1	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4a	12:44	Bottom	3	2	28.3	8.3	21.8	5.8		4.0		8.0	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4(N2)	12:49	Surface	1	1	28.8	8.3	20.2	6.3	6.3	2.8	3.3	5.4	7.0
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4(N2)	12:49	Surface	1	2	28.8	8.3	20.2	6.3		2.8		5.7	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4(N2)	12:49	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4(N2)	12:49	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4(N2)	12:49	Bottom	3	1	28.4	8.3	21.3	5.8	5.8	3.7		8.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR4(N2)	12:49	Bottom	3	2	28.4	8.3	21.3	5.8		3.7		8.7	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS8(N)	12:54	Surface	1	1	28.8	8.3	20.0	6.4	6.4	2.2	3.9	3.7	6.8
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS8(N)	12:54	Surface	1	2	28.8	8.3	20.0	6.4		2.2		4.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS8(N)	12:54	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS8(N)	12:54	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS8(N)	12:54	Bottom	3	1	28.6	8.4	22.7	6.3	6.3	5.7		9.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS8(N)	12:54	Bottom	3	2	28.6	8.4	22.7	6.3		5.6		9.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)9	13:01	Surface	1	1	28.6	8.3	21.5	5.8	5.8	4.4	5.4	9.1	10.8
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)9	13:01	Surface	1	2	28.7	8.3	21.5	5.8		4.4		8.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)9	13:01	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)9	13:01	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)9	13:01	Bottom	3	1	28.4	8.3	23.3	5.2	5.2	6.3		12.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)9	13:01	Bottom	3	2	28.4	8.3	23.4	5.1		6.3		12.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)11	12:20	Surface	1	1	28.8	8.3	16.9	6.5	6.2	2.9	3.8	5.3	7.1
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)11	12:20	Surface	1	2	28.8	8.3	16.9	6.5		2.9		5.5	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)11	12:20	Middle	2	1	28.3	8.3	20.4	5.8		3.5		6.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)11	12:20	Middle	2	2	28.4	8.3	20.3	5.8		3.4		6.3	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)11	12:20	Bottom	3	1	28.0	8.3	22.4	5.4	5.4	5.0		9.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS(Mf)11	12:20	Bottom	3	2	28.0	8.3	22.3	5.4		5.0		9.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR7	11:24	Surface	1	1	28.5	8.1	18.4	5.8	5.8	2.8	3.0	7.7	9.4
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR7	11:24	Surface	1	2	28.5	8.1	18.4	5.8		2.8		7.0	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR7	11:24	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR7	11:24	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR7	11:24	Bottom	3	1	28.4	8.1	21.0	5.5	5.5	3.2		11.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	SR7	11:24	Bottom	3	2	28.3	8.1	21.2	5.4		3.2		10.9	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS17	12:27	Surface	1	1	28.1	8.3	23.4	5.4	5.3	2.8	2.8	15.6	12.1
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS17	12:27	Surface	1	2	28.1	8.3	23.4	5.4		2.8		14.8	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS17	12:27	Middle	2	1	27.7	8.3	24.4	5.2		3.1		11.2	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS17	12:27	Middle	2	2	27.7	8.3	24.4	5.2		3.1		11.4	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS17	12:27	Bottom	3	1	27.6	8.3	25.2	5.2	5.2	2.5		9.6	
TMCLKL	HY/2012/08	2019/08/23	Mid-flood	IS17	12:27	Bottom	3	2	27.6	8.3	25.0	5.2		2.5		9.7	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental
Resources
Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	30 August 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Limit Level Exceedance
0212330_26 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_26 August 2019_ Bottom DO_F_Station IS(Mf)11

A total of two Limit Level exceedances were recorded on 26 August 2019.

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

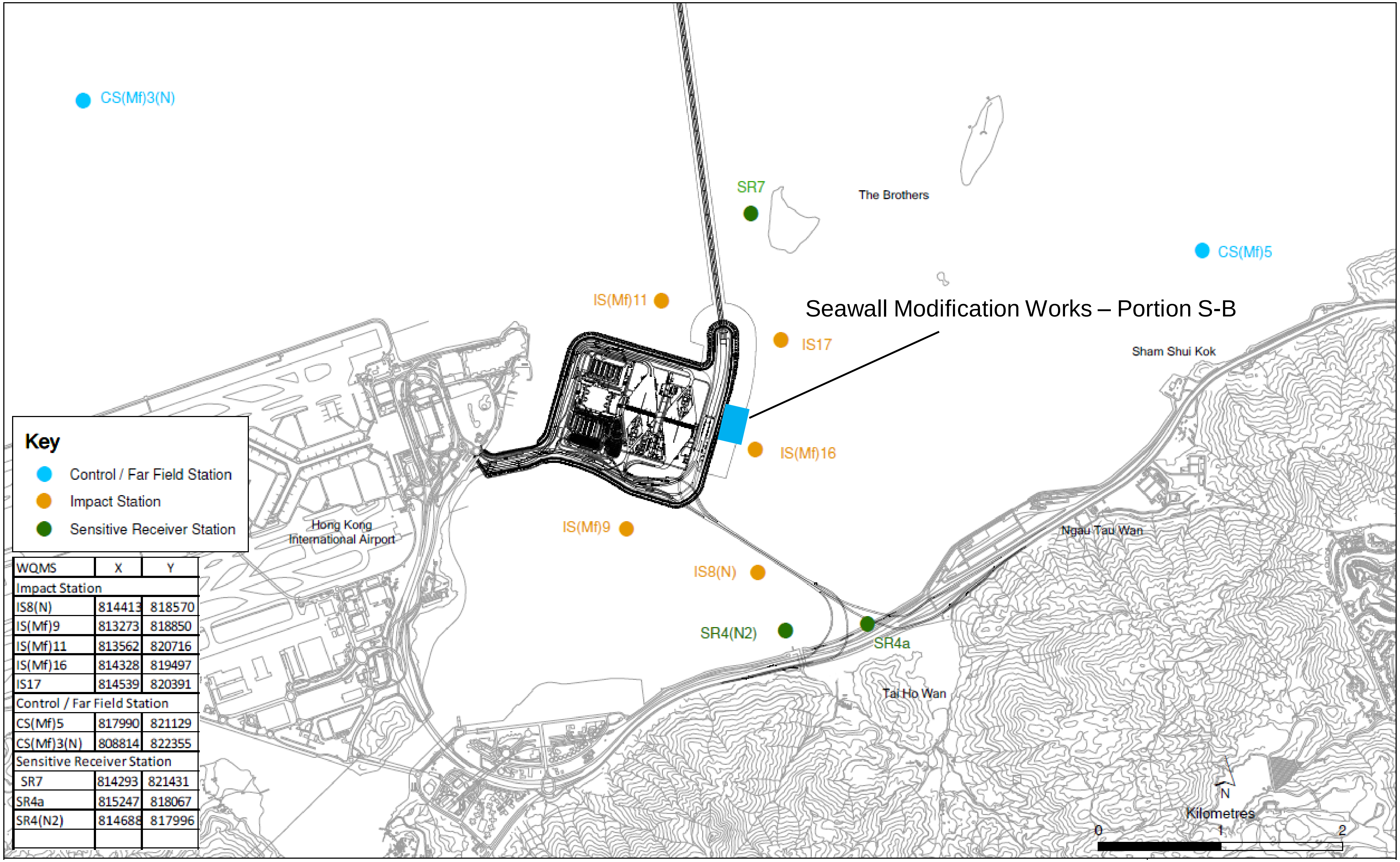
<table>
<tr><td>Log No.</td><td colspan="3"><u>Limit Level Exceedance</u>
0212330_26 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_26 August 2019_ Bottom DO_F_Station IS(Mf)11
[Total No. of Exceedances = 2]</td></tr>
<tr><td>Date</td><td colspan="3">26 August 2019 (Measured)
28 August 2019 (In situ results received by ERM)
4 September 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Limit Level Exceedance for DO (3.2 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-ebb tide.
Limit Level Exceedance for DO (2.9 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, Seawall Modification Works was carried out on 26 August 2019.</td></tr>
<tr><td>Possible Reason for Action or Limit Level Exceedance(s)</td><td colspan="3">The exceedances are unlikely to be due to the Contract, in view of the following:
All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day.
IS(Mf)11 is far away (>2 km) from the Seawall Modification Works Area (Figure 1), thus the observed exceedance should not be affected by the marine works under this Contract. Therefore, the exceedance is unlikely to be related to this Contract.
Bottom-depth DO levels at IS(Mf)11 were similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Limit Level.
The DO pattern at IS(Mf)11 was similar to the control station where the bottom-depth DO levels were generally lower. Lower bottom-depth DO levels may be possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level.
As reported by the marine mammal observer, no discharge of organic matters into waters from landside works area was recorded. Moreover, no exceedance was recorded at IS(Mf)16 which is the closest station to the Seawall Modification Works Area during both mid-ebb and mid-flood tide. Therefore, exceedances recorded at IS(Mf)11 during both mid-ebb and mid-flood tide are unlikely to be caused by the marine works of this Contract.</td></tr>
</table>

Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 26 August 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)5	8:10	Surface	1	1	28.3	7.9	19.8	6.0	6.0	1.6	2.2	3.6	3.2
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)5	8:10	Surface	1	2	28.3	7.9	20.2	6.0		1.7		3.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)5	8:10	Middle	2	1	28.3	7.9	20.3	5.9		1.6		4.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)5	8:10	Middle	2	2	28.3	7.9	20.7	5.9		1.6		3.9	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)5	8:10	Bottom	3	1	27.0	7.8	27.6	4.2	4.3	3.2		2.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)5	8:10	Bottom	3	2	27.0	7.8	28.3	4.3		3.3		1.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)3(N)	9:13	Surface	1	1	28.5	7.9	14.2	6.3	6.1	2.6	2.7	4.8	4.4
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)3(N)	9:13	Surface	1	2	28.5	7.8	14.5	6.4		2.5		4.5	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)3(N)	9:13	Middle	2	1	28.4	7.9	16.6	5.8		2.5		3.9	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)3(N)	9:13	Middle	2	2	28.5	7.8	16.8	5.8		2.5		4.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)3(N)	9:13	Bottom	3	1	27.8	7.9	22.8	5.1	5.2	2.9		4.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	CS(Mf)3(N)	9:13	Bottom	3	2	27.8	7.8	23.6	5.2		3.0		3.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)16	9:47	Surface	1	1	28.3	8.0	19.9	6.2	6.2	7.7	8.7	9.0	8.3
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)16	9:47	Surface	1	2	28.3	7.9	20.3	6.2		7.5		8.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)16	9:47	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)16	9:47	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)16	9:47	Bottom	3	1	28.3	8.0	22.3	5.6	5.6	9.5		8.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)16	9:47	Bottom	3	2	28.3	7.9	23.0	5.6		10.0		7.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4a	9:58	Surface	1	1	28.2	8.0	18.2	5.9	6.0	5.1	5.6	13.6	11.6
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4a	9:58	Surface	1	2	28.2	7.9	18.6	6.0		5.2		12.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4a	9:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4a	9:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4a	9:58	Bottom	3	1	28.3	7.9	22.5	5.1	5.1	5.9		10.6	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4a	9:58	Bottom	3	2	28.3	7.8	23.0	5.1		6.0		9.6	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4(N2)	10:04	Surface	1	1	28.4	7.9	16.3	5.2	5.2	11.1	9.9	7.0	8.5
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4(N2)	10:04	Surface	1	2	28.4	7.8	16.6	5.2		11.1		8.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4(N2)	10:04	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4(N2)	10:04	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4(N2)	10:04	Bottom	3	1	28.7	7.9	21.2	5.1	5.1	8.5		9.1	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR4(N2)	10:04	Bottom	3	2	28.8	7.8	21.5	5.1		8.7		10.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS8(N)	10:09	Surface	1	1	28.1	8.0	18.3	6.4	6.4	5.6	7.8	7.6	7.6
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS8(N)	10:09	Surface	1	2	28.1	7.9	18.7	6.4		5.5		7.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS8(N)	10:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS8(N)	10:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS8(N)	10:09	Bottom	3	1	28.4	8.0	20.8	6.1	6.1	10.1		8.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS8(N)	10:09	Bottom	3	2	28.4	7.9	21.2	6.0		10.1		7.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)9	10:17	Surface	1	1					5.9		4.1		8.3
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)9	10:17	Surface	1	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)9	10:17	Middle	2	1	28.5	7.9	19.7	5.9		4.1		8.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)9	10:17	Middle	2	2	28.5	7.8	19.9	5.9		4.0		7.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)9	10:17	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)9	10:17	Bottom	3	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)11	8:42	Surface	1	1	28.3	7.9	17.1	6.2	5.8	1.9	2.6	3.8	3.9
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)11	8:42	Surface	1	2	28.3	7.9	17.4	6.2		1.9		4.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)11	8:42	Middle	2	1	28.3	7.9	22.7	5.3		2.3		4.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)11	8:42	Middle	2	2	28.3	7.8	23.7	5.3		2.1		4.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)11	8:42	Bottom	3	1	25.9	7.8	30.1	3.2	3.2	3.9		3.6	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS(Mf)11	8:42	Bottom	3	2	25.9	7.8	30.7	3.2		3.6		2.6	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR7	8:34	Surface	1	1	28.4	7.9	17.1	6.1	6.1	2.2	2.7	2.9	3.6
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR7	8:34	Surface	1	2	28.4	7.8	17.4	6.1		2.0		3.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR7	8:34	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR7	8:34	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR7	8:34	Bottom	3	1	28.4	7.9	18.2	6.1	6.1	3.3		4.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	SR7	8:34	Bottom	3	2	28.4	7.8	19.1	6.1		3.1		3.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS17	9:41	Surface	1	1	28.3	8.0	18.5	6.1	6.0	2.9	3.3	5.2	4.4
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS17	9:41	Surface	1	2	28.3	7.9	18.9	6.1		3.0		4.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS17	9:41	Middle	2	1	28.3	7.9	19.6	5.9		3.2		5.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS17	9:41	Middle	2	2	28.3	7.9	20.0	6.0		3.3		5.7	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS17	9:41	Bottom	3	1	28.2	7.9	24.7	5.1	5.0	3.8		3.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-Ebb	IS17	9:41	Bottom	3	2	28.2	7.9	24.2	4.9		3.7		2.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)5	17:22	Surface	1	1	28.5	8.0	16.4	6.7	5.3	2.0	4.8	6.2	4.8
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)5	17:22	Surface	1	2	28.5	7.8	16.7	6.7		2.1		5.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)5	17:22	Middle	2	1	26.2	7.8	28.9	3.9		3.3		3.9	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)5	17:22	Middle	2	2	26.1	7.7	29.6	3.8		3.0		4.6	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)5	17:22	Bottom	3	1	25.0	7.8	31.4	3.4	3.4	9.3		3.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)5	17:22	Bottom	3	2	25.0	7.7	32.0	3.4		9.2		4.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)3(N)	16:29	Surface	1	1	28.7	7.8	14.9	6.2	6.1	3.2	6.8	6.2	5.6
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)3(N)	16:29	Surface	1	2	28.7	7.8	15.2	6.2		3.1		6.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)3(N)	16:29	Middle	2	1	28.6	7.8	16.1	6.0		5.2		6.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)3(N)	16:29	Middle	2	2	28.6	7.8	16.4	6.0		5.2		5.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)3(N)	16:29	Bottom	3	1	28.2	7.7	18.8	5.1	5.2	12.1		5.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	CS(Mf)3(N)	16:29	Bottom	3	2	28.2	7.7	19.1	5.2		12.0		4.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)16	15:53	Surface	1	1	28.5	7.9	17.2	6.7	6.7	3.4	6.4	8.9	8.3
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)16	15:53	Surface	1	2	28.5	7.9	17.5	6.7		3.2		8.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)16	15:53	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)16	15:53	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)16	15:53	Bottom	3	1	28.4	7.8	18.5	6.7	6.7	9.4		8.1	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)16	15:53	Bottom	3	2	28.4	7.8	18.8	6.7		9.7		7.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4a	15:42	Surface	1	1	28.2	8.0	15.9	6.5	6.5	5.7	6.6	10.4	10.9
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4a	15:42	Surface	1	2	28.2	7.9	16.6	6.5		5.6		11.5	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4a	15:42	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4a	15:42	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4a	15:42	Bottom	3	1	28.4	7.9	19.3	6.0	6.1	7.4		11.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4a	15:42	Bottom	3	2	28.5	7.9	19.5	6.1		7.6		10.7	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4(N2)	15:37	Surface	1	1	28.3	8.0	16.8	6.5	6.5	4.7	5.1	11.0	11.2
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4(N2)	15:37	Surface	1	2	28.3	7.9	17.2	6.5		4.6		10.0	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4(N2)	15:37	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4(N2)	15:37	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4(N2)	15:37	Bottom	3	1	28.4	7.9	18.5	6.6	6.6	5.6		12.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR4(N2)	15:37	Bottom	3	2	28.0	7.9	19.1	6.6		5.3		11.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS8(N)	15:31	Surface	1	1	28.5	8.0	16.8	6.8	6.8	8.6	6.4	9.2	10.2
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS8(N)	15:31	Surface	1	2	28.5	7.9	17.1	6.8		8.8		10.1	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS8(N)	15:31	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS8(N)	15:31	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS8(N)	15:31	Bottom	3	1	28.5	8.0	16.9	6.8	6.8	4.1		10.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS8(N)	15:31	Bottom	3	2	28.5	7.9	17.3	6.8		4.1		11.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)9	15:21	Surface	1	1					6.9		5.1		9.3
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)9	15:21	Surface	1	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)9	15:21	Middle	2	1	28.5	7.8	18.1	6.9		5.0		9.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)9	15:21	Middle	2	2	28.5	7.9	18.4	6.8		5.2		8.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)9	15:21	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)9	15:21	Bottom	3	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)11	16:54	Surface	1	1	28.5	7.9	17.4	6.2	5.7	3.2	6.0	3.2	4.0
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)11	16:54	Surface	1	2	28.5	7.8	17.8	6.3		3.1		4.2	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)11	16:54	Middle	2	1	28.1	7.9	22.0	5.2		3.9		3.9	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)11	16:54	Middle	2	2	28.1	7.8	22.4	5.1		3.6		4.9	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)11	16:54	Bottom	3	1	26.2	7.8	29.1	2.9	2.9	11.1		3.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS(Mf)11	16:54	Bottom	3	2	26.2	7.7	29.8	2.8		11.0		3.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR7	17:00	Surface	1	1	28.4	7.9	16.9	6.2	6.2	5.8	6.9	3.5	4.6
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR7	17:00	Surface	1	2	28.4	7.8	17.2	6.2		5.8		4.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR7	17:00	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR7	17:00	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR7	17:00	Bottom	3	1	28.3	7.9	19.4	5.9	5.8	8.0		5.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	SR7	17:00	Bottom	3	2	28.3	7.8	20.0	5.7		7.8		4.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS17	15:59	Surface	1	1	28.4	7.9	17.9	6.3	6.1	3.2	3.5	4.1	4.4
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS17	15:59	Surface	1	2	28.4	7.8	18.2	6.3		2.9		3.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS17	15:59	Middle	2	1	28.2	7.9	19.9	5.8		3.7		3.8	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS17	15:59	Middle	2	2	28.2	7.8	20.3	5.8		3.7		3.3	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS17	15:59	Bottom	3	1	28.1	7.9	20.3	5.9	5.9	3.6		6.4	
TMCLKL	HY/2012/08	2019/08/26	Mid-flood	IS17	15:59	Bottom	3	2	28.2	7.8	20.8	5.9		3.6		5.6	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	3 September 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance

0212330_28 August 2019_ Surface & Middle DO_E_Station IS(Mf)16
0212330_28 August 2019_ Surface & Middle DO_E_Station SR4a
0212330_28 August 2019_ Bottom DO_E_Station SR4a
0212330_28 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0212330_28 August 2019_ Surface & Middle DO_E_Station IS8(N)
0212330_28 August 2019_ Bottom DO_E_Station IS8(N)
0212330_28 August 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_28 August 2019_ Surface & Middle DO_E_Station IS17
0212330_28 August 2019_ Bottom DO_E_Station IS17
0212330_28 August 2019_ Bottom DO_F_Station SR4a
0212330_28 August 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_28 August 2019_ Bottom DO_F_Station IS(Mf)11
0212330_28 August 2019_ Bottom DO_F_Station SR7
0212330_28 August 2019_ Surface & Middle DO_F_Station IS17
0212330_28 August 2019_ Bottom DO_F_Station IS17
0212330_28 August 2019_ Depth-averaged SS_F_Station SR7

Limit Level Exceedance

0212330_28 August 2019_ Bottom DO_E_Station SR4(N2)
0212330_28 August 2019_ Bottom DO_E_Station IS(Mf)11

A total of sixteen Action Level and two Limit Level exceedances were recorded on 28 August 2019.

Email message

Regards,

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_28 August 2019_ Surface & Middle DO_E_Station IS(Mf)16
0212330_28 August 2019_ Surface & Middle DO_E_Station SR4a
0212330_28 August 2019_ Bottom DO_E_Station SR4a
0212330_28 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0212330_28 August 2019_ Surface & Middle DO_E_Station IS8(N)
0212330_28 August 2019_ Bottom DO_E_Station IS8(N)
0212330_28 August 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_28 August 2019_ Surface & Middle DO_E_Station IS17
0212330_28 August 2019_ Bottom DO_E_Station IS17
0212330_28 August 2019_ Bottom DO_F_Station SR4a
0212330_28 August 2019_ Surface & Middle DO_F_Station IS(Mf)11
0212330_28 August 2019_ Bottom DO_F_Station IS(Mf)11
0212330_28 August 2019_ Bottom DO_F_Station SR7
0212330_28 August 2019_ Surface & Middle DO_F_Station IS17
0212330_28 August 2019_ Bottom DO_F_Station IS17
0212330_28 August 2019_ Depth-averaged SS_F_Station SR7

<u>Limit Level Exceedance</u>
0212330_28 August 2019_ Bottom DO_E_Station SR4(N2)
0212330_28 August 2019_ Bottom DO_E_Station IS(Mf)11
[Total No. of Exceedances = 18]</td></tr>
<tr><td>Date</td><td colspan="3">28 August 2019 (Measured)
30 August 2019 (In situ results received by ERM)
6 September 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L), Suspended Solids(mg/L)</td></tr>
<tr><td rowspan="2">Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>SS</td><td colspan="2">120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., 23.5 mg/L</td></tr>
<tr><td rowspan="2">Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>SS</td><td colspan="2">130% of upstream control station at the same tide of the same day and 10mg/L for WSD Seawater Intakes at Tuen Mun and 99%-ile of baseline data, i.e., 34.4 mg/L</td></tr>
</table>

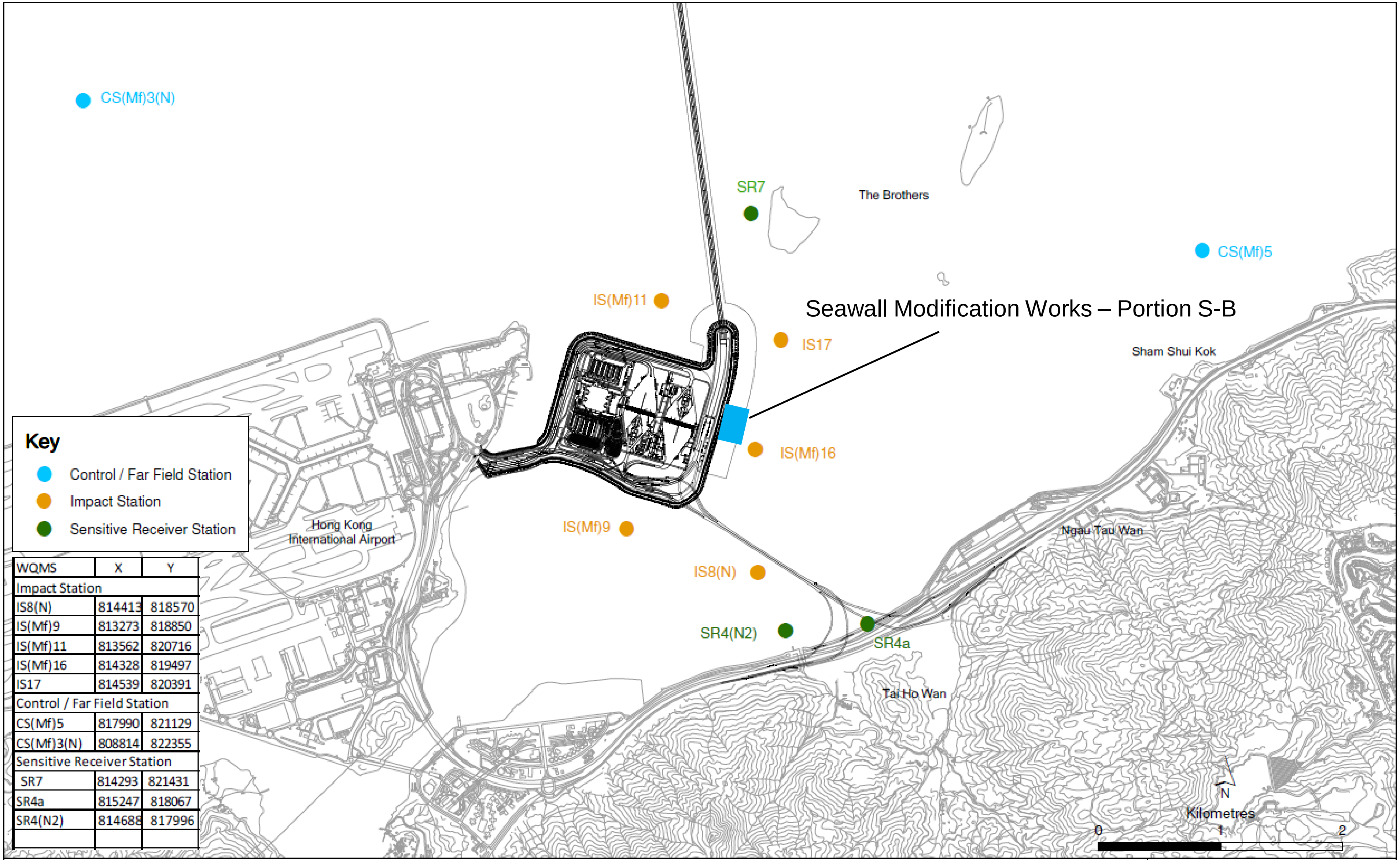
Measured Levels	Action Level Exceedance for DO (4.9 mg/L) is observed at IS(Mf)16 at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.8 mg/L) is observed at SR4a at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.0 mg/L) is observed at SR4a at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.3 mg/L) is observed at SR4(N2) at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.7 mg/L) is observed at IS8(N) at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.4 mg/L) is observed at IS8(N) at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.8 mg/L) is observed at IS(Mf)11 at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.9 mg/L) is observed at IS17 at Surface & Middle Level during mid-ebb tide. Action Level Exceedance for DO (4.6 mg/L) is observed at IS17 at Bottom Level during mid-ebb tide. Action Level Exceedance for DO (4.2 mg/L) is observed at SR4a at Bottom Level during mid-flood tide. Action Level Exceedance for DO (4.8 mg/L) is observed at IS(Mf)11at Surface & Middle Level during mid-flood tide. Action Level Exceedance for DO (3.8 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-flood tide. Action Level Exceedance for DO (4.3 mg/L) is observed at SR7 at Bottom Level during mid-flood tide. Action Level Exceedance for DO (4.8 mg/L) is observed at IS17 at Surface & Middle Level during mid-flood tide. Action Level Exceedance for DO (4.3 mg/L) is observed at IS17 at Bottom Level during mid-flood tide. Action Level Exceedance for Depth-averaged SS (26.8 mg/L) is observed at SR7 during mid-flood tide. Limit Level Exceedance for DO (3.5 mg/L) is observed at SR4(N2) at Bottom Level during mid-ebb tide. Limit Level Exceedance for DO (3.5 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-ebb tide.
Works Undertaken (at the time of monitoring event)	According to the information provided by the Contractor, Seawall Modification Works was carried out on 28 August 2019.

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: • SR4a, SR4(N2), IS8(N), IS(Mf)11 and SR7 is far away (>2 km) from the Seawall Modification Works Area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Therefore, the exceedance is unlikely to be related to this Contract. • Bottom-depth DO levels at SR4a, IS8(N) and IS17 was similar to the corresponding control stations, CS(Mf)3(N), during mid-ebb tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • Surface & Middle-depth DO levels at IS(Mf)16, SR4a, SR4(N2), IS8(N), IS(Mf)11 and IS17 was similar to the corresponding control stations, CS(Mf)3(N), during mid-ebb tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • The DO pattern at SR4(N2) and IS(Mf)11 during mid-ebb tide were similar to the their corresponding control station where the bottom-depth DO levels were generally lower. Lower bottom-depth DO levels may be possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. • Bottom-depth DO levels at SR4a, IS(Mf)11, SR7 and IS17 was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • Surface & Middle-depth DO levels at IS(Mf)11 and IS17 was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • For the exceedance of SS level at SR7 during mid-flood tide, SR7 is far away (>2km) from the Seawall Modification Works Area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Moreover, no exceedance of SS was recoded at IS(Mf)16 and IS17 during mid-flood tide, which are closer to the Seawall Modification Works Area than SR7. Therefore, the exceedance is unlikely to be related to this Contract. • As reported by the marine mammal observer, no discharge of organic matters into waters from landside works area was recorded. Therefore, the exceedance recorded at IS(Mf)16 is likely to be due to natural fluctuation of water quality and is unlikely to be related to this Contract. Exceedances recorded at IS(Mf)16, SR4a, SR4(N2), IS8(N), IS(Mf)11 and IS17 during mid-ebb tide and SR4a, IS(Mf)11, SR7 and IS17 during mid-flood tide are unlikely to be related to this Contract as these stations are further than IS(Mf)16.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 28 August 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Surface	1	1	27.7	7.8	23.3	5.1	4.5	2.1	2.3	16.9	12.0
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Surface	1	2	27.7	7.9	22.9	5.1		1.9		16.0	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Middle	2	1	25.9	7.8	28.8	3.9		1.5		12.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Middle	2	2	25.9	7.8	28.2	3.9		1.6		12.0	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Bottom	3	1	24.8	7.7	31.6	3.2	3.2	3.5		6.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)5	9:55	Bottom	3	2	24.8	7.7	30.9	3.2		3.4		7.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Surface	1	1	28.7	7.8	20.4	4.9	4.5	1.2	5.2	12.6	11.2
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Surface	1	2	28.7	7.8	20.0	4.9		1.2		11.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Middle	2	1	27.9	7.7	23.6	4.0		4.8		12.1	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Middle	2	2	27.9	7.7	23.1	4.0		4.9		11.1	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Bottom	3	1	27.2	7.7	26.0	3.7	3.7	9.3		10.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	CS(Mf)3(N)	11:16	Bottom	3	2	27.2	7.6	25.5	3.7		9.8		9.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Surface	1	1	28.3	7.8	22.7	4.9	4.9	7.8	8.2	19.2	14.3
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Surface	1	2	28.3	7.8	22.1	4.9		7.9		18.0	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Bottom	3	1	27.5	7.8	24.3	4.9	4.9	8.3		10.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)16	11:51	Bottom	3	2	27.8	7.8	24.3	4.8		8.9		9.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Surface	1	1	28.1	7.7	21.5	4.8	4.8	6.5	7.4	8.1	8.4
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Surface	1	2	28.1	7.8	21.1	4.8		6.1		7.1	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Bottom	3	1	27.4	7.7	24.7	4.0	4.0	8.9		9.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4a	12:01	Bottom	3	2	27.4	7.7	24.2	4.0		8.2		8.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Surface	1	1	28.2	7.7	21.9	4.3	4.3	9.4	10.0	7.0	7.2
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Surface	1	2	28.2	7.8	21.5	4.3		9.6		7.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Bottom	3	1	27.6	7.7	24.0	3.5	3.5	10.5		6.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR4(N2)	12:09	Bottom	3	2	27.6	7.7	23.7	3.5		10.6		7.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Surface	1	1	28.0	7.8	22.9	4.6	4.7	7.6	9.1	7.2	8.1
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Surface	1	2	28.0	7.7	22.4	4.7		7.3		8.3	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Bottom	3	1	27.5	7.7	24.4	4.2	4.4	10.7		8.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS8(N)	12:14	Bottom	3	2	27.7	7.7	23.4	4.5		10.8		8.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Surface	1	1					5.6		3.6		9.2
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Surface	1	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Middle	2	1	29.0	7.8	21.5	5.6		3.8		8.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Middle	2	2	29.0	7.8	21.1	5.6		3.3		9.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)9	12:22	Bottom	3	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)11	10:45	Surface	1	1	28.6	7.8	19.6	5.0	4.8	1.7	3.2	9.8	7.0
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)11	10:45	Surface	1	2	28.6	7.8	19.3	5.0		1.7		8.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)11	10:45	Middle	2	1	28.2	7.8	20.9	4.5		3.8		7.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)11	10:45	Middle	2	2	28.2	7.8	20.6	4.5		3.1		6.3	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)11	10:45	Bottom	3	1	26.0	7.8	28.7	3.5	3.5	4.4		5.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS(Mf)11	10:45	Bottom	3	2	26.0	7.7	28.2	3.5		4.4		4.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR7	10:37	Surface	1	1	28.4	7.7	20.9	5.0	5.0	2.8	3.2	8.1	6.7
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR7	10:37	Surface	1	2	28.4	7.6	20.4	5.0		2.5		8.1	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR7	10:37	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR7	10:37	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR7	10:37	Bottom	3	1	28.3	7.7	21.3	5.1	5.1	3.7		5.8	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	SR7	10:37	Bottom	3	2	28.3	7.5	20.9	5.0		3.6		4.8	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS17	11:42	Surface	1	1	28.3	7.8	21.1	5.0	4.9	4.8	6.9	8.3	6.7
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS17	11:42	Surface	1	2	28.3	7.8	20.7	5.0		4.8		7.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS17	11:42	Middle	2	1	27.9	7.8	22.4	4.7		7.2		6.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS17	11:42	Middle	2	2	27.9	7.8	22.1	4.7		7.2		5.6	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS17	11:42	Bottom	3	1	27.7	7.8	23.8	4.6	4.6	8.6		5.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-Ebb	IS17	11:42	Bottom	3	2	27.7	7.7	23.5	4.6		8.8		6.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Surface	1	1	27.8	7.8	24.0	4.9	4.2	2.5	8.1	5.8	5.7
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Surface	1	2	27.8	7.9	23.5	4.9		2.4		5.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Middle	2	1	25.4	7.8	30.1	3.5		10.9		5.3	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Middle	2	2	25.4	7.8	29.5	3.5		10.7		5.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Bottom	3	1	25.4	7.8	30.1	3.6	3.6	10.6		5.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)5	18:53	Bottom	3	2	25.4	7.8	29.5	3.6		11.3		6.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Surface	1	1	29.8	7.8	15.1	5.5	5.3	5.9	5.9	7.7	7.2
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Surface	1	2	29.8	7.8	14.9	5.4		5.1		7.8	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Middle	2	1	29.8	7.8	15.2	5.1		6.0		8.1	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Middle	2	2	29.8	7.7	14.9	5.2		5.9		7.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Bottom	3	1	28.2	7.7	19.9	4.5	4.5	6.2		5.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	CS(Mf)3(N)	17:56	Bottom	3	2	28.4	7.7	20.3	4.4		6.3		6.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Surface	1	1	28.7	7.9	22.0	5.8	5.8	9.1	10.4	8.4	8.1
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Surface	1	2	28.7	7.9	21.6	5.8		9.0		8.8	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Bottom	3	1	28.7	7.9	22.1	5.8	5.8	11.6		7.0	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)16	17:22	Bottom	3	2	28.6	7.8	21.7	5.8		11.9		8.0	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Surface	1	1	28.5	7.9	22.2	5.6	5.6	5.9	6.7	7.1	7.9
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Surface	1	2	28.5	7.9	21.7	5.6		5.7		7.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Bottom	3	1	28.1	7.8	23.0	4.2	4.2	7.9		8.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4a	17:12	Bottom	3	2	28.1	7.8	22.5	4.2		7.4		7.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Surface	1	1	29.4	7.9	21.2	6.1	6.1	7.9	10.6	9.1	8.7
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Surface	1	2	29.4	7.9	20.8	6.1		7.9		8.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Bottom	3	1	28.8	7.9	22.0	5.2	5.2	13.4		8.8	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR4(N2)	17:04	Bottom	3	2	28.8	7.8	21.7	5.2		13.0		7.8	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Surface	1	1	28.9	7.9	21.5	5.8	5.8	8.5	9.6	7.4	7.6
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Surface	1	2	28.9	7.9	21.1	5.8		8.5		6.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Bottom	3	1	28.9	7.9	21.5	5.8	5.8	11.0		8.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS8(N)	16:58	Bottom	3	2	28.9	7.8	21.1	5.8		10.2		7.9	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Surface	1	1					6.2		8.7		8.2
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Surface	1	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Middle	2	1	28.8	8.0	21.9	6.1		8.4		8.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Middle	2	2	28.8	7.9	21.5	6.2		8.9		7.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Bottom	3	1					#DIV/0!				
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)9	16:49	Bottom	3	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)11	18:21	Surface	1	1	29.1	7.8	18.7	5.5	4.8	4.7	13.6	7.5	13.7
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)11	18:21	Surface	1	2	29.1	7.8	18.3	5.4		4.6		6.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)11	18:21	Middle	2	1	27.4	7.8	24.3	4.1		11.1		5.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)11	18:21	Middle	2	2	27.4	7.8	23.9	4.3		11.0		6.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)11	18:21	Bottom	3	1	27.0	7.8	25.8	3.7	3.8	25.0		30.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS(Mf)11	18:21	Bottom	3	2	27.0	7.8	25.3	3.8		24.9		26.4	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR7	18:30	Surface	1	1	28.2	7.8	21.4	5.1	5.1	6.8	9.5	6.8	26.8
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR7	18:30	Surface	1	2	28.2	7.8	20.9	5.1		6.7		7.7	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR7	18:30	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR7	18:30	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR7	18:30	Bottom	3	1	27.7	7.8	24.2	4.3	4.3	12.5		44.1	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	SR7	18:30	Bottom	3	2	27.6	7.8	23.8	4.3		12.1		48.5	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS17	17:29	Surface	1	1	28.5	7.9	21.9	5.1	4.8	3.7	4.7	6.9	7.2
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS17	17:29	Surface	1	2	28.5	7.8	21.5	5.1		3.8		6.0	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS17	17:29	Middle	2	1	27.6	7.8	24.3	4.5		4.8		6.6	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS17	17:29	Middle	2	2	27.5	7.8	23.9	4.5		4.8		6.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS17	17:29	Bottom	3	1	27.5	7.8	24.6	4.3	4.3	6.0		9.2	
TMCLKL	HY/2012/08	2019/08/28	Mid-flood	IS17	17:29	Bottom	3	2	27.4	7.7	24.3	4.3		5.0		8.3	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507,
25/F One Harbourfront,
18 Tak Fung Street,
Hung Hom, Hong Kong
Telephone: (852) 2271 3113
Facsimile: (852) 2723 5660
E-mail: jasmine.ng@erm.com

To	Ramboll Hong Kong Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Water Quality Impact Monitoring
Date	9 September 2019

Dear Sir or Madam,

Please find the Notification of Exceedance (NOE) of the following Log no.:

Action Level Exceedance

0212330_30 August 2019_ Surface & Middle DO_E_Station SR4a
0212330_30 August 2019_ Bottom DO_E_Station SR4a
0212330_30 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0212330_30 August 2019_ Surface & Middle DO_E_Station IS8(N)
0212330_30 August 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_30 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_30 August 2019_ Surface & Middle DO_E_Station SR7
0212330_30 August 2019_ Bottom DO_E_Station SR7
0212330_30 August 2019_ Surface & Middle DO_E_Station IS17
0212330_30 August 2019_ Bottom DO_F_Station SR4a
0212330_30 August 2019_ Surface & Middle DO_F_Station SR4(N2)
0212330_30 August 2019_ Surface & Middle DO_F_Station SR7

A total of twelve Action Level exceedances were recorded on 30 August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Marine Water Quality Impact Monitoring
Notification of Exceedance

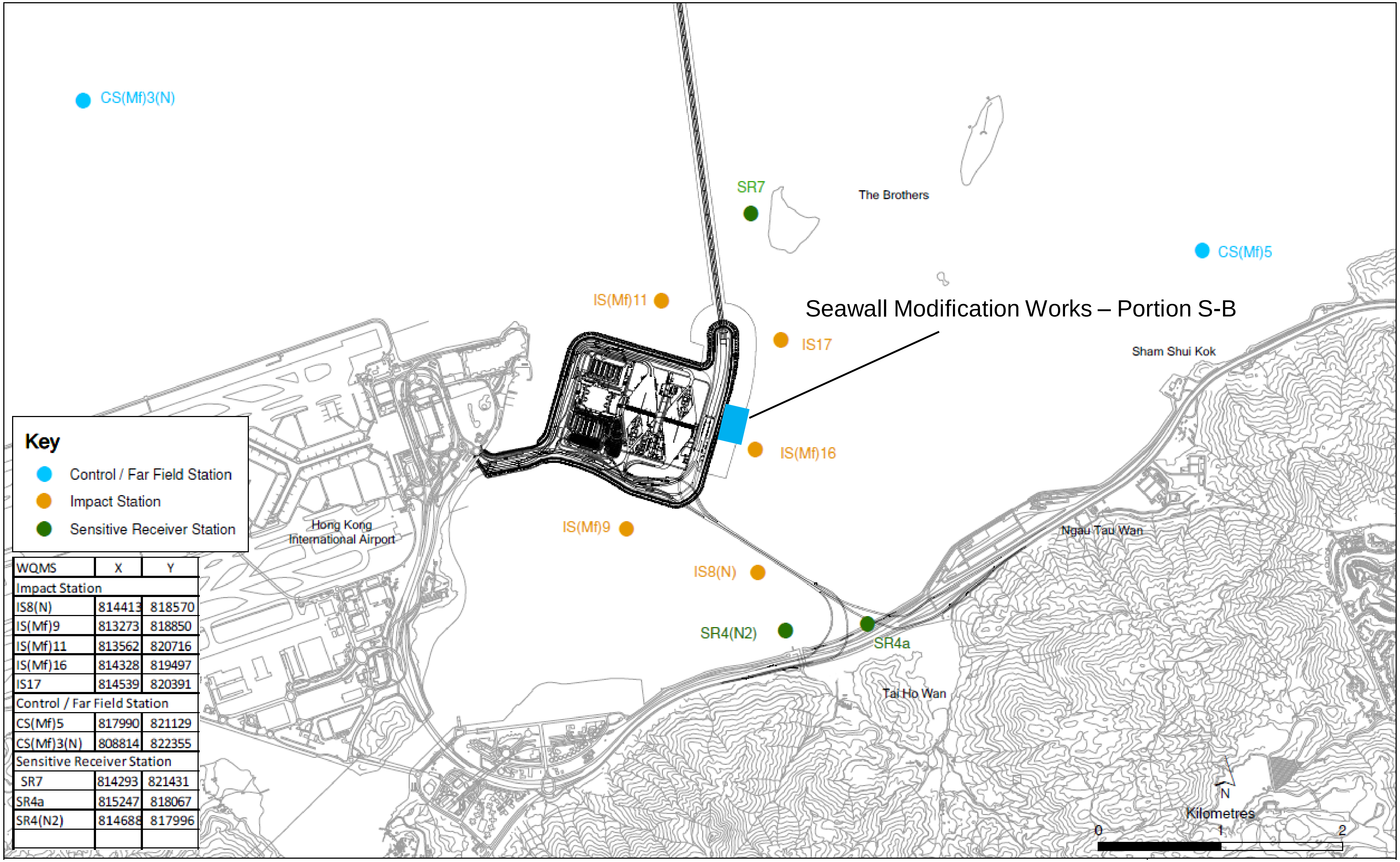
<table>
<tr><td>Log No.</td><td colspan="3"><u>Action Level Exceedance</u>
0212330_30 August 2019_ Surface & Middle DO_E_Station SR4a
0212330_30 August 2019_ Bottom DO_E_Station SR4a
0212330_30 August 2019_ Surface & Middle DO_E_Station SR4(N2)
0212330_30 August 2019_ Surface & Middle DO_E_Station IS8(N)
0212330_30 August 2019_ Surface & Middle DO_E_Station IS(Mf)11
0212330_30 August 2019_ Bottom DO_E_Station IS(Mf)11
0212330_30 August 2019_ Surface & Middle DO_E_Station SR7
0212330_30 August 2019_ Bottom DO_E_Station SR7
0212330_30 August 2019_ Surface & Middle DO_E_Station IS17
0212330_30 August 2019_ Bottom DO_F_Station SR4a
0212330_30 August 2019_ Surface & Middle DO_F_Station SR4(N2)
0212330_30 August 2019_ Surface & Middle DO_F_Station SR7
[Total No. of Exceedances = 12]</td></tr>
<tr><td>Date</td><td colspan="3">30 August 2019 (Measured)
3 September 2019 (In situ results received by ERM)
9 September 2019 (Laboratory results received by ERM)</td></tr>
<tr><td>Monitoring Station</td><td colspan="3">CS(Mf)5, SR4a, SR4(N2), IS8(N), IS(Mf)16, IS(Mf)9, CS(Mf)3(N), SR7, IS17, IS(Mf)11</td></tr>
<tr><td>Parameter(s) with Exceedance(s)</td><td colspan="3">Dissolved Oxygen (mg/L)</td></tr>
<tr><td>Action Levels</td><td>DO</td><td>Surface and Middle
5.0 mg/L</td><td>Bottom
4.7 mg/L</td></tr>
<tr><td>Limit Levels</td><td>DO</td><td>Surface and Middle
4.2 mg/L</td><td>Bottom
3.6 mg/L</td></tr>
<tr><td>Measured Levels</td><td colspan="3">Action Level Exceedance for DO (4.5 mg/L) is observed at SR4a at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.5 mg/L) is observed at SR4a at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.8 mg/L) is observed at SR4(N2) at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.9 mg/L) is observed at IS8(N) at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.8 mg/L) is observed at IS(Mf)11 at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.3 mg/L) is observed at IS(Mf)11 at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.6 mg/L) is observed at SR7 at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.6 mg/L) is observed at SR7 at Bottom Level during mid-ebb tide.
Action Level Exceedance for DO (4.9 mg/L) is observed at IS17 at Surface & Middle Level during mid-ebb tide.
Action Level Exceedance for DO (4.1 mg/L) is observed at SR4a at Bottom Level during mid-flood tide.
Action Level Exceedance for DO (4.9 mg/L) is observed at SR4(N2) at Surface & Middle Level during mid-flood tide.
Action Level Exceedance for DO (4.8 mg/L) is observed at SR7 at Surface & Middle Level during mid-flood tide.</td></tr>
<tr><td>Works Undertaken (at the time of monitoring event)</td><td colspan="3">According to the information provided by the Contractor, Seawall Modification Works was carried out on 30 August 2019.</td></tr>
</table>

Possible Reason for Action or Limit Level Exceedance(s)	The exceedances are unlikely to be due to the Contract, in view of the following: • All monitored parameters, except DO, at all monitoring stations were in compliance with the Action and Limit Levels during both mid-ebb and mid-flood tides on the same day. • SR4a, SR4(N2), IS8(N), IS(Mf)11 and SR7 are far away (>2 km) from the Seawall Modification Works Area *(Figure 1)*, thus the observed exceedance should not be affected by the marine works under this Contract. Therefore, the exceedance is unlikely to be related to this Contract. • Surface & Middle-depth DO levels at SR4a, SR4(N2), IS8(N), IS(Mf)11, SR7 and IS17 were similar to the corresponding control stations, CS(Mf)3(N), during mid-ebb tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • The DO pattern at SR4a, IS(Mf)11 and SR7 during mid-ebb tide were similar to the their corresponding control station where the bottom-depth DO levels were generally lower. Lower bottom-depth DO levels may be possibly caused by the stratification of seawater during summer when the freshwater discharged from the Pearl River tended to form a surface layer of lower salinity water, which is probably responsible for the lower Salinity recorded at the surface and middle levels compared to the higher Salinity recorded at the bottom level of the monitoring stations. The stratification of seawater in the water column is likely a contributing factor to the results of lower levels of DO at the bottom level. • Bottom-depth DO levels at SR4a was similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Bottom-depth DO levels at the corresponding control station were below Action Level. • Surface & Middle-depth DO levels at SR4(N2) and SR7 were similar to the corresponding control stations, CS(Mf)5, during mid-flood tide, in which the recorded Surface & Middle-depth DO levels at the corresponding control station were below Action Level. • As reported by the marine mammal observer, no discharge of organic matters into waters from landside works area was recorded. Moreover, no exceedance was recorded at IS(Mf)16 which is the closest station to the Seawall Modification Works Area during both mid-ebb and mid-flood tide. Therefore, exceedances recorded at SR4a, SR4(N2), IS8(N), IS(Mf)11, SR7 and IS17 during mid-ebb tide and SR4a, SR4(N2) and SR7 during mid-flood tide are unlikely to be caused by the marine works of this Contract.
Actions Taken / To Be Taken	No immediate action is considered necessary. The ET will monitor for future trends in exceedances.
Remarks	The monitoring results on 30 August 2019 and locations of water quality monitoring stations are attached.

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (°C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Surface	1	1	27.4	7.8	24.4	5.1	5.0	4.7	6.3	7.4	8.6
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Surface	1	2	27.4	7.8	24.3	5.2		4.7		8.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Middle	2	1	27.1	7.8	25.4	4.8		6.0		8.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Middle	2	2	27.1	7.8	25.4	4.8		6.1		8.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Bottom	3	1	26.5	7.8	27.7	4.4	4.4	8.3		8.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)5	11:23	Bottom	3	2	26.5	7.8	27.7	4.3		8.2		9.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Surface	1	1	27.8	7.8	23.5	4.8	4.8	7.1	8.7	8.4	8.1
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Surface	1	2	27.8	7.8	23.5	4.8		7.1		8.6	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Middle	2	1	27.7	7.8	24.2	4.8		9.2		9.2	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Middle	2	2	27.7	7.8	24.2	4.8		9.3		9.5	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Bottom	3	1	27.6	7.8	24.7	5.0	5.0	10.0		6.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	CS(Mf)3(N)	12:35	Bottom	3	2	27.6	7.8	24.7	5.0		9.3		5.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Surface	1	1	27.2	7.8	24.9	5.1	5.1	9.7	10.3	11.8	12.2
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Surface	1	2	27.4	7.8	24.7	5.1		9.4		12.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Bottom	3	1	26.8	7.8	27.2	4.8	4.8	11.0		12.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)16	13:07	Bottom	3	2	26.8	7.8	27.2	4.7		10.9		12.0	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Surface	1	1	27.4	7.8	24.7	4.5	4.5	10.2	10.3	12.7	14.5
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Surface	1	2	27.4	7.8	24.5	4.5		9.9		14.6	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Bottom	3	1	26.8	7.8	26.8	4.5	4.5	10.7		14.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4a	13:16	Bottom	3	2	26.8	7.8	26.8	4.4		10.4		16.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Surface	1	1	27.6	7.8	23.5	4.8	4.8	12.2	14.1	9.0	11.4
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Surface	1	2	27.6	7.8	23.5	4.8		11.9		10.2	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Bottom	3	1	27.1	7.8	24.9	4.9	4.9	16.2		13.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR4(N2)	13:21	Bottom	3	2	27.2	7.8	24.9	4.9		16.2		13.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Surface	1	1	27.6	7.8	24.0	4.9	4.9	9.2	11.3	11.8	11.8
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Surface	1	2	27.6	7.8	24.1	4.9		8.3		11.2	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Bottom	3	1	27.1	7.8	24.4	4.7	4.8	13.8		12.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS8(N)	13:27	Bottom	3	2	27.2	7.8	24.6	4.8		13.8		11.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Surface	1	1	27.8	7.8	24.3	5.1	5.1	9.7	9.5	7.9	8.5
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Surface	1	2	27.8	7.8	24.3	5.1		9.9		8.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Bottom	3	1	27.8	7.8	24.2	5.2	5.2	9.2		8.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)9	13:35	Bottom	3	2	27.8	7.8	24.2	5.1		9.1		8.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)11	12:02	Surface	1	1	27.8	7.8	23.7	5.0	4.8	6.9	13.0	13.9	11.2
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)11	12:02	Surface	1	2	27.8	7.8	23.7	5.0		7.0		12.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)11	12:02	Middle	2	1	27.2	7.8	24.7	4.6		15.7		11.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)11	12:02	Middle	2	2	27.4	7.8	24.6	4.6		15.5		10.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)11	12:02	Bottom	3	1	26.5	7.8	27.8	4.3	4.3	16.4		10.6	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS(Mf)11	12:02	Bottom	3	2	26.5	7.8	27.8	4.3		16.3		9.2	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR7	11:54	Surface	1	1	27.4	7.8	25.0	4.6	4.6	10.5	12.8	6.2	6.4
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR7	11:54	Surface	1	2	27.4	7.8	24.8	4.6		10.2		6.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR7	11:54	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR7	11:54	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR7	11:54	Bottom	3	1	27.3	7.8	25.4	4.6	4.6	15.9		6.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	SR7	11:54	Bottom	3	2	27.3	7.8	25.4	4.6		14.7		6.7	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS17	13:00	Surface	1	1	27.6	7.8	24.1	4.9	4.9	8.3	8.5	8.8	8.7
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS17	13:00	Surface	1	2	27.6	7.8	24.1	4.9		8.1		9.6	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS17	13:00	Middle	2	1	27.5	7.8	24.6	4.9		8.6		8.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS17	13:00	Middle	2	2	27.5	7.8	24.6	4.9		8.5		7.9	

Project	Contract	Date (yyyy-mm-dd)	Tide	Station	Start Time	Level	Lev_Cod	Replicate	Temperature (^{o}C)	pH	Salinity (ppt)	DO (mg/L)	Average DO (mg/L)	Turbidity (NTU)	Depth-Averaged Turbidity	SS (mg/L)	Depth-Averaged SS
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS17	13:00	Bottom	3	1	27.1	7.8	25.9	4.9	4.9	8.7		8.0	
TMCLKL	HY/2012/08	2019/08/30	Mid-Ebb	IS17	13:00	Bottom	3	2	27.1	7.8	25.8	4.8		8.6		8.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Surface	1	1	27.4	7.8	25.0	4.8	4.7	5.4	6.9	7.9	8.8
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Surface	1	2	27.4	7.8	25.1	4.8		5.4		7.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Middle	2	1	26.8	7.8	26.7	4.6		7.0		7.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Middle	2	2	27.0	7.8	26.1	4.6		7.0		7.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Bottom	3	1	26.6	7.8	27.3	4.6	4.6	8.6		11.7	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)5	19:52	Bottom	3	2	26.6	7.8	27.3	4.6		8.1		10.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Surface	1	1	28.7	7.7	18.4	4.8	4.8	11.1	13.6	8.9	8.6
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Surface	1	2	28.7	7.7	18.4	4.8		11.9		8.0	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Middle	2	1	28.6	7.7	18.7	4.9		13.9		9.2	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Middle	2	2	28.7	7.7	18.7	4.8		13.7		8.5	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Bottom	3	1	28.6	7.7	18.9	4.9	4.9	15.7		8.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	CS(Mf)3(N)	19:01	Bottom	3	2	28.6	7.7	18.9	4.9		15.3		7.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Surface	1	1	27.7	7.9	24.2	5.3	5.3	17.1	18.6	8.9	9.6
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Surface	1	2	27.7	7.9	24.2	5.3		17.8		8.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Bottom	3	1	27.7	7.9	24.5	5.3	5.3	19.9		10.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)16	18:27	Bottom	3	2	27.7	7.9	24.5	5.3		19.4		10.6	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Surface	1	1	27.6	7.9	24.0	5.0	5.0	10.4	12.4	14.5	13.7
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Surface	1	2	27.7	7.9	23.9	5.0		10.2		12.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Bottom	3	1	27.3	7.9	26.5	4.1	4.1	14.1		14.0	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4a	18:20	Bottom	3	2	27.3	7.9	26.5	4.0		14.8		13.2	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Surface	1	1	27.5	7.9	24.6	4.9	4.9	9.6	9.9	10.9	13.2
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Surface	1	2	27.5	7.9	24.4	4.9		9.9		12.3	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Bottom	3	1	27.4	7.9	24.8	5.0	5.0	9.9		13.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR4(N2)	18:17	Bottom	3	2	27.4	7.9	24.8	4.9		10.0		15.7	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Surface	1	1	27.7	7.9	24.3	5.3	5.3	10.3	10.6	10.4	11.2
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Surface	1	2	27.7	7.9	24.2	5.3		10.3		9.5	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Bottom	3	1	27.7	7.9	24.4	5.4	5.4	10.9		13.0	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS8(N)	18:13	Bottom	3	2	27.7	7.9	24.4	5.4		10.9		11.7	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Surface	1	1	27.7	8.0	24.5	5.8	5.8	16.8	18.0	8.9	8.2
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Surface	1	2	27.7	8.0	24.5	5.8		16.6		7.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Bottom	3	1	27.7	8.0	24.5	5.9	5.9	19.3		8.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)9	18:05	Bottom	3	2	27.7	8.0	24.5	5.8		19.3		7.7	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)11	18:40	Surface	1	1	27.9	7.9	23.3	5.3	5.3	6.9	9.0	9.0	9.2
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)11	18:40	Surface	1	2	28.0	7.9	22.8	5.3		6.8		8.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)11	18:40	Middle	2	1	27.6	7.9	24.4	5.3		9.4		8.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)11	18:40	Middle	2	2	27.6	7.9	24.4	5.3		9.8		7.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)11	18:40	Bottom	3	1	27.6	7.9	24.5	5.4	5.4	10.6		10.7	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS(Mf)11	18:40	Bottom	3	2	27.6	7.9	24.5	5.4		10.4		10.9	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR7	19:32	Surface	1	1	27.6	7.8	24.3	4.8	4.8	10.4	13.0	5.0	5.4
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR7	19:32	Surface	1	2	27.6	7.8	24.3	4.8		10.2		6.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR7	19:32	Middle	2	1									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR7	19:32	Middle	2	2									
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR7	19:32	Bottom	3	1	27.6	7.8	24.3	5.0	5.0	15.5		4.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	SR7	19:32	Bottom	3	2	27.6	7.8	24.3	5.0		16.0		5.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS17	18:35	Surface	1	1	27.9	7.8	23.2	5.0	5.0	6.0	10.0	12.0	11.5
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS17	18:35	Surface	1	2	27.9	7.8	23.0	5.0		5.7		10.4	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS17	18:35	Middle	2	1	27.7	7.9	24.0	5.0		7.3		11.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS17	18:35	Middle	2	2	27.7	7.9	23.9	5.0		7.8		12.1	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS17	18:35	Bottom	3	1	27.4	7.9	24.8	5.0	5.0	16.7		11.8	
TMCLKL	HY/2012/08	2019/08/30	Mid-flood	IS17	18:35	Bottom	3	2	27.5	7.9	24.7	5.0		16.3		10.9	

Note: Indicates Exceedance of Action Level
Indicates Exceedance of Limit Level



WQMS	X	Y
Impact Station		
IS8(N)	814413	818570
IS(Mf)9	813273	818850
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
Control / Far Field Station		
CS(Mf)5	817990	821129
CS(Mf)3(N)	808814	822355
Sensitive Receiver Station		
SR7	814293	821431
SR4a	815247	818067
SR4(N2)	814688	817996

Figure 1

Environmental Resources Management

ERM

Email message

Environmental Resources Management

2507, 25/F One Harbourfront
18 Tak Fung Street
Hunghom, Kowloon
Hong Kong
Telephone: (852) 2271 3000
Facsimile: (852) 2723 5660

To	Ramboll Hong Kong, Limited (ENPO)
From	ERM- Hong Kong, Limited
Ref/Project number	Contract No. HY/2012/08 Tuen Mun–Chek Lap Kok Link–Northern Connection Sub-sea Tunnel Section
Subject	Notification of Exceedance for Impact Dolphin Monitoring
Date	10 January 2019

ERM

Dear Sir or Madam,

Please find attached the Notification of Exceedance (NOE) of the following Log no.:

0212330_Jun2019/Aug2019_dolphin_STG&ANI_NEL&NWL

A total of one limit level exceedance was recorded in the quarterly impact dolphin monitoring data between June and August 2019.

Regards,

Jasmine

Dr Jasmine Ng
Environmental Team Leader

ERM-Hong Kong, Limited

CONTRACT NO. HY/2012/08
TUEN MUN – CHEK LAP KOK LINK –
NORTHERN CONNECTION SUB-SEA TUNNEL SECTION

Impact Dolphin Monitoring
Notification of Exceedance

Log No.	**0212330_ Jun2019/Aug2019_dolphin_STG&ANI_NEL&NWL** **[Total No. of Exceedances = 1 Limit Level Exceedance]**	
Date	June - August 2019 (monitored) 6 December 2019 (results received by ERM)	
Monitoring Area	Northeast Lantau (NEL) and Northwest Lantau (NWL)	
Parameter(s) with Exceedance(s)	Quarterly encounter rate of dolphin sightings (STG) Quarterly encounter rate of total number of dolphins (ANI)	
Action Levels	North Lantau Social cluster	NEL: STG < 4.2 & ANI < 15.5 or NWL: STG < 6.9 & ANI < 31.3
Limit Levels		NEL: STG < 2.4 & ANI < 8.9 and NWL: STG < 3.9 & ANI < 17.9
Recorded Levels	NEL	STG = 0 & ANI = 0
	NWL	STG = 0.62 & ANI = 1.55
	One Limit Level Exceedance was recorded in the quarterly impact dolphin monitoring at NEL and NWL between June to August 2019. The exceedance was reported in the approved *Seventieth Monthly EM&A Report* dated 12 September 2019.	
Statistical Analyses	Further to the review of the available and relevant dolphin monitoring data in the EM&A programme by this Contract, statistical analyses were conducted as follows: • A two-way ANOVA with repeated measures and unequal sample size was conducted using Period (2 levels: baseline vs impact – present impact quarter, June 2019 to August 2019) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and present impact monitoring quarter. By setting $\alpha = 0.05$ as the significance level in the statistical tests, significant differences in STG ($p = 0.0011$) and ANI ($p = 0.0062$) were detected between Periods. • A two-way ANOVA with repeated measures and unequal sample size was conducted using Cumulative Period (2 levels: baseline vs impact – cumulative quarters, December 2012 to August 2019) and Location (2 levels: NEL and NWL) as fixed factors to examine whether there were any significant differences in the average encounter rates between the baseline and cumulative impact monitoring quarter. By setting $\alpha = 0.00001$ as the significance level in the statistical tests, significant difference in STG ($p = 0.000000$) and in ANI ($p = 0.000000$) between Cumulative Period and Location were detected. *Note: The commencement date under *Contract No. HY/2012/08* is 1 November 2013.	
Works Undertaken (in the monitoring quarter)	In the quarter between June to August 2019, Seawall Modification Works was undertaken under Contract No. HY/2012/08.	

Possible Reason for Action or Limit Level Exceedance(s)	The potential factors that may have contributed to the observed exceedance are reviewed below: • Blocking of CWD travelling corridor: The *Monitoring of Marine Mammals in Hong Kong Waters (2018 – 19)* (1) reported that dolphin usage and traveling activities to the northern side of the airport (dolphin traveling corridor) are affected by frequent high-speed ferry traffic from Sky Pier (not related to this Contract), which is likely a major factor resulting in the decrease in dolphin abundances in North Lantau. • Marine works of the Contract: As per the findings from the EIA report (*Section 8.11.9*), the major influences on the Chinese White Dolphin (CWD) *Sousa chinensis* under this Contract are marine traffics, reclamation and dredging works. The Contractor implemented the marine traffic control in the reporting period as per the requirements in the *EP-354/2009/D* and the updated *EM&A Manual*. Most of the vessels of this Contract also worked within the site boundary, in which the area is seldom used by CWD. Disturbance from vessels of this Contract is considered minor. During this quarter of dolphin monitoring, no adverse impact on CWD due to the activities under this Contract was observed. • Impact on water quality: According to the findings in the water quality monitoring results at the impact monitoring stations between June 2019 and August 2019, there were one hundred and six (106) Action level and eighteen (18) Limit Level exceedances of Dissolved Oxygen exceedances and one (1) Action Level of Suspended Solids (SS) exceedances for water quality impact monitoring in the reporting period. The exceedances were considered not related to this Contract upon further investigation and the investigation reports are presented in *Appendix J of the 23rd Quarterly EM&A Report (June to August 2019).* In view of the above, marine ecological mitigation measures were considered properly implemented, and thus no unacceptable impact on CWD or its habitat was associated with this Contract in this quarter.
Actions Taken / To Be Taken	In the quarter between June and August 2019, Seawall Modification Works were carried out. The existing mitigation measures are recommended to be continuously implemented. Furthermore, it is also recommended to reduce the vessels for marine works as much as possible. The ET will monitor for future trends in exceedance(s). It was concluded that the HZMB works is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual marine contracts) cannot be quantified or separate from the other stress factors. The dolphin specialists of the Projects confirmed that the CWD sighting nearby north of Sha Chau and Lung Kwu Chau Marine Park has significantly declined. The reason for the decline was likely related to the re-routing of high-speed ferry from Skypier. ET shall keep reviewing the implementation status of the dolphin related mitigation measures and remind the contractors to ensure the relevant measures are fully implemented. The marine works of HZMB projects should be completed as soon as possible to reduce the overall duration of impacts and allow the dolphins population to recover as early as possible. The protection measures (e.g. speed limit control) for the BMP shall be implemented so as to provide a better habitat for dolphin recovery. It is noted that even though marine vessels may moor within the mooring site of BMP, commercial activities including loading / unloading / transhipment are not allowed except a permit is obtained. The HZMB works vessels should avoid the BMP. The marine works footprint and vessels for the marine works should also be reduced as much as possible, and vessels idling / mooring in other part of the North Lantau shall be avoided whenever possible.
Remarks	The results of impact dolphin monitoring, the status of implemented marine ecological mitigation measures are documented in the approved *Sixty-eighth* to *Seventieth Monthly EM&A Reports*.

(1) Hung S K Y (2019). Prepared for AFCD. Available at: https://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/files/Final_Report_2018_19.pdf

Appendix K

Waste Flow Table

Monthly Summary Waste Flow Table

Name of Department: HyD **Contract No. / Works Order No.: HY/2012/08**

Monthly Summary Waste Flow Table for August 2019 [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of Inert Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	2224.407	0.000	76.754	585.369	1562.284
Jan-2019	299.831	0.000	53.419	215.427	30.985
Feb-2019	133.335	0.000	46.021	67.707	19.607
Mar-2019	120.224	0.000	50.455	20.964	48.805
Apr-2019	130.329	0.000	58.956	0.000	71.373
May-2019	67.355	0.000	51.297	0.000	16.058
Jun-2019	4.134	0.000	0.000	0.000	4.134
Half Year Sub-total	755.208	0.000	260.148	304.098	190.962
Jul-2019	3.821	0.000	0.000	0.000	3.821
Aug-2019	2.388	0.000	0.000	0.000	2.388
Sep-2019					
Oct-2019					
Nov-2019					
Dec-2019					
Project Total Quantities	2985.824	0.000	336.902	889.467	1759.455

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	6763.82	6763.82	7.74	7.74	8.70	8.70	60.35	60.35	13.989
Jan-2019	394.55	394.55	0.00	0.00	0.00	0.00	0.00	0.00	0.538
Feb-2019	103.72	103.72	0.62	0.62	0.00	0.00	1.672	1.672	0.578
Mar-2019	88.20	88.20	0.46	0.46	0.00	0.00	0.00	0.00	0.692
Apr-2019	260.89	260.89	0.00	0.00	3.90	3.90	1.045	1.045	0.707
May-2019	0.66	0.66	0.66	0.66	0.00	0.00	0.00	0.00	0.798
Jun-2019	136.75	136.75	0.80	0.80	0.00	0.00	4.14	4.14	0.751
Half Year Sub-total	848.02	848.02	2.54	2.54	3.90	3.90	6.857	6.857	4.064
Jul-2019	444.37	444.37	1.20	1.20	0.00	0.00	0.00	0.00	0.730
Aug-2019	505.93	505.93	0.00	0.00	1.58	1.58	3.800	3.800	0.703
Sep-2019									
Oct-2019									
Nov-2019									
Dec-2019									
Project Total Quantities	8698.89	8698.89	11.48	11.48	14.18	14.18	71.007	71.007	19.486

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
3200.000	0.000	300.000	1000.000	2000.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
8000.00	10.00	15.00	65.00	20.000

Notes:

(1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).

(2) The waste flow table shall also include C&D materials to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m^3. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).