Civil Engineering and Development Department

Agreement No. CE 60/2017 (EP)

Environmental Team for Tung Chung New Town Extension (East) - Design and Construction

Monthly Environmental Monitoring & Audit Report for September 2018

October 2018

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Agreement No. CE60/2017 (EP) Environmental Team for Tung Chung New Town Extension (East) – Design and Construction

Monthly Environmental Monitoring & Audit Report for September 2018

Revision 1

Document Code: 0445700_Monthly EM&A Sep 18_v1.docx

Environmental Resources Management

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Client:	Project No:
Civil Engineering and Development Department	0445700
Summary: This document presents the Monthly EM&A Report for September 2018 for *Environmental Team for Tung Chung New Town Extension (East) – Design and Construction (Agreement No. CE 60/2017 [EP])*.	Date: 14 October 2018 Approved by:  Craig A. Reid *Partner*

Revision	Description	By	Checked	Approved	Date
1	Monthly EM&A Report (for September 2018)	Var	RC/JT	CAR	14/10/18

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ISO 9001 : 2008
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Civil Engineering and Development Department

Tung Chung New Town Extension

Environmental Certification Sheet for Environmental Permit No. EP-519/2016

Reference Document/Plan

Document/Plan to be Certified:	Monthly Environmental Monitoring & Audit Report for September 2018 (Revision 1)
Date of Report:	14 October 2018

Reference EP Condition

Environmental Permit Condition: Condition 3.5

The Permit Holder shall submit 4 hard copies and 1 electronic copy of Monthly EM&A Reports for the construction stage of the Project to the Director, within 2 weeks after the end of the reporting month. The monthly EM&A Reports shall include an executive summary of all environmental audit results, together with actions taken in the event of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels), complaints received and emergency events relating to violation of environmental legislation (such as illegal dumping and landfilling). The submissions shall be certified by the ET Leader and verified by the IEC as having complied with the requirements as set out in the updated EM&A Manual before submission to the Director. Additional copies of the Monthly EM&A Reports shall be provided upon request by the Director.

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-519/2016

Jovy Tam
Environmental Team Leader

Date: 14 October 2018

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OUR REF 198377-0072

YOUR REF

DATE 14 October 2018

Sustainable Lantau Office
Civil Engineering and Development Department
13/F, North Point Government Offices
333 Java Road, North Point
Hong Kong

For the attention of Mr. Eddie Lam / Mr. Colin Wong

Dear Sirs,

Agreement No. CE 59/2017 (EP)
Independent Environmental Checker for Tung Chung New Town Extension – Investigation

Monthly Environmental Monitoring & Audit Report for September 2018

We refer to the Monthly Environmental Monitoring & Audit Report for September 2018 for Tung Chung New Town Extension (East) dated October 2018 and certified by the Environmental Team Leader on 14 October 2018. Please note the submission is hereby verified, in accordance with the requirement stipulated in Condition 3.5 of EP-519/2016.

Should you have any query, please feel free to contact the undersigned at 2608 7314 (chuawo@bv.com) or our Ivan Ting at 9222 9490 (iec.tcnte@gmail.com)

Yours faithfully,
for and on behalf of
BLACK & VEATCH HONG KONG LIMITED

MANUEL CHUA
Independent Environmental Checker

c.c. ET Leader – ERM (Attn: Mr. Jovy Tam) [by Email: jovy.tam@erm.com]
Project Manager / TCE – AECOM (Attn: Mr. Robo Lo) [by Email: sre1.tce@gmail.com]

CONTENTS

ANNEXES

ABBREVIATIONS

C&D	Construction and Demolition
CAP	Contamination Assessment Plan
CEDD	Civil Engineering and Development Department
CWD	Chinese White Dolphin
DCM	Deep Cement Mixing
DO	Dissolved Oxygen
EIA	Environmental Impact Assessment
EIAO	Environmental Impact Assessment Ordinance
EIS	Ecologically Important Stream
EM&A	Environmental Monitoring and Audit
EP	Environmental Permit
EPD	Environmental Protection Department
ER	Engineer's Representative
ERM	ERM-Hong Kong, Limited
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
PDA	Planned Development Area
RAP	Remediation Action Plan
RR	Remediation Report
SS	Suspended Solid
TCB	Tung Chung Bay
TCE	Tung Chung East
TCNTE	Tung Chung New Town Extension
TCW	Tung Chung West
The Project	Tung Chung New Town Extension (East)
THW	Tai Ho Wan
TSP	Total Suspended Particulate
Updated EM&A Manual	Updated Environmental Monitoring and Audit Manual for Tung Chung New Town Extension prepared by ERM under Agreement No. CE 60/2017 (EP) and deposited to EPD under Environmental Permit No. EP-519/2016

Tung Chung New Town Extension (TCNTE) is one of the major initiatives under the Government's multi-pronged approach to increase land supply to meet Hong Kong's medium- to long-term needs for housing, economic and social developments. The Environmental Impact Assessment (EIA) Report for TCNTE (Register No. AEIAR-196/2016) was approved on 8 April 2016 and the Environmental Permit (EP) No. EP-519/2016, covering the construction and operation of TCNTE, was granted on 9 August 2016. The EIA Report and EP cover both Tung Chung East (TCE) and Tung Chung West (TCW). ERM-Hong Kong, Limited (ERM) is commissioned to undertake the role of Environmental Team (ET) for the construction and operation of TCE Project ("the Project") in accordance with the requirements specified in the EP, Updated Environmental Monitoring and Audit (EM&A) Manual, EIA Report of the TCNTE project and other relevant statutory requirements. The construction of the Project commenced on 9 July 2018.

This is the Monthly EM&A report presenting the EM&A works carried out during the period from 1 to 30 September 2018 for the Project in accordance with the Updated EM&A Manual. As informed by the Contractor, major activities in the reporting period are summarised in *Table 1* below, together with the key issues and the key mitigation measures:

Table 1 ***Major Activities in the Reporting Period***

Activities	Key Issues	Key Mitigation Measures
Land-based Works		
• Demolition of site office near Century Link and Man Tung Road • Removal of rock armour above +2.5mPD • Preparation works for diversion of existing box culvert	• Dust emission • Waste management for C&D Materials • Noise from barge and plant operation during normal working hours and restricted hours	• Good site practices • Regular water spraying on stockpiles • Sorting and reuse of C&D materials as far as practicable
Marine-based Works		
• Installation of pipe piles and sheet piles for ground investigation and wave protection measures • Removal of rock armour below +2.5mPD • Marine ground investigation works • Laying of geotextile and sand blanket for reclamation works and Deep Cement Mixing (DCM) trial embankment • Marine filling works • Diversion of existing box culvert	• Elevation in SS due to sediment loss from sand blanket laying and marine filling works • Disturbance to Chinese White Dolphin	• Provision of perimeter silt curtain for the Project • Implementation of Dolphin Watching for the marine-based works • Provision of a leading seawall of at least 200m before marine filling works

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

Air Quality Monitoring	6 sessions
Noise Monitoring	6 sessions
Water Quality Monitoring	13 sessions
Soft Shore Ecological Monitoring	1 session
Environmental Site Inspection	4 sessions
Environmental Management Meeting	1 session

Environmental auditing works, including weekly site inspections of construction works conducted by the ET, audit of works vessels and audit of implementation of Dolphin Watching Plan were conducted in the reporting period. Based on the audit results and the observation for the reporting period, environmental pollution control and mitigation measures for the Project were properly implemented.

Snapshots of EM&A Activities in the Reporting Period

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Soft Shore Ecological Monitoring conducted by ET</td><td>Inspection of Silt Curtain after Adverse Weather</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Water Quality Monitoring conducted by ET</td><td>Noise Monitoring conducted by ET</td></tr>
</table>

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Levels was recorded for construction air quality monitoring in the reporting period.

Breaches of Action and Limit Levels for Noise

No exceedance of Limit Levels was recorded for construction noise monitoring in the reporting period. However, Action Level was triggered from one (1) environmental complaint related to noise nuisance received on 11 September 2018 during the reporting period. Investigation was conducted for this noise nuisance in accordance with the Event and Action Plan and the complaint handling process as stated in the Complaint Management Plan. Based on the noise monitoring events conducted in the reporting period, there was no exceedance of limit levels. Nevertheless, the Contractor was reminded to reduce construction noise levels, as far as practicable, especially when working next to the residential areas around the Project.

Breaches of Action and Limit Levels for Water Quality

The water quality monitoring results obtained during the reporting period generally complied with the corresponding Action and Limit Levels stipulated in the Baseline Monitoring Report. Relevant investigation and follow-up actions were conducted according to the EM&A programme when the water quality in terms of Dissolved Oxygen (DO), Turbidity and Suspended Solids (SS) exceeded the corresponding Action and Limit Levels. The preliminary investigation findings suggested that the exceedances were not related to the Project.

Soft Shore Ecological Monitoring

The impact monitoring conducted during the reporting period showed that there was no evidence showing significant change in intertidal communities when compared against the data obtained during baseline monitoring. The ET will continue to observe the change in density or the distribution pattern of horseshoe crab, seagrass and intertidal soft shore communities taking into account natural fluctuation in the occurrence and distribution pattern such as due to seasonal change.

Environmental Complaints, Non-compliance & Summons

There was no notification of summons or prosecution recorded in the reporting period.

Three (3) environmental complaints were received in the reporting period. Investigations were conducted for each of the environmental complaints in accordance with the complaint handling process as stated in the Complaint Management Plan. Environmental complaints in the reporting period are summarized in *Table 2*.

Table 2 *Summary of Environmental Complaints*

	Complaint(s)	Investigation/Follow up action(s)
1	One environmental complaint related to noise nuisances at works area near Ying Tung Estate on 11 September 2018.	Based on the information provided by the ER and the Contractor, supplemented the regular/ad-hoc noise monitoring conducted around the Project area, there was no exceedance of noise limit levels and non-compliance was not observed. Nevertheless, the Contractor was reminded to reduce construction noise levels, as far as practicable, especially when working next to the residential areas around the Project. No construction works in the evenings / restricted hours would be allowed without a valid Construction Noise Permit. The ET will continue to check the implementation status of the mitigation measures and conduct noise monitoring as per EM&A requirements.
2	Two environmental complaints related to waste management for the demolition of site offices near Century Link and Man Tung Road were received on 12 and 26 September 2018.	Based on the information provided by the ER and the Contractor, supplemented the regular/ad-hoc site inspections conducted around the Project area, it was observed that the Contractor had fulfilled the requirements as stated in the Waste Management Plan to maintain temporary stockpiles and implemented trip-ticket system to ensure Construction and Demolition (C&D) materials were disposed properly. The Contractor also followed the waste management hierarchy as stated in the Waste Management Plan in handling the waste generated from the site clearance work for the site offices. Relevant waste materials from the site offices were reused, recovered and recycled where applicable. Nevertheless, the Contractor was reminded to implement all relevant mitigation measures of waste management implications and follow the requirements as stated in the approved Waste Management Plan. The ET will continue to check the construction works and the implementation status of the mitigation measures.

Reporting Change

There was no reporting change in the reporting period.

Upcoming Works for the Next Reporting Period

Works to be undertaken in the next monitoring period of October 2018 are summarized in *Table 3* below, together with the key issues and the key mitigation measures:

Table 3 Major Activities for the Next Reporting Period

Activities	Key Issues	Key Mitigation Measures
Land-based Works		
• Erection of chain link fence at Area 58 • Removal of rock armour above +2.5mPD • Preparation works for diversion of existing box culvert	• Dust emission • Waste management for C&D Materials • Noise from barge and plant operation during normal working hours and restricted hours	• Good site practices • Regular water spraying on stockpiles • Sorting and reuse of C&D materials as far as practicable
Marine-based Works		
• Installation of pipe piles and sheet piles for ground investigation and wave protection measures • Removal of rock armour below +2.5mPD • Installation of silt curtain near Tai Ho Wan • Laying of geotextile and sand blanket and ground improvement works for reclamation works and Deep Cement Mixing (DCM) trial embankment • Marine filling works • Diversion of existing box culvert • Marine ground investigation works	• Elevation in SS due to sediment loss from sand blanket laying and marine filling works • Disturbance to Chinese White Dolphin	• Provision of perimeter silt curtain for the Project • Implementation of Dolphin Watching for the marine-based works • Provision of a leading seawall of at least 200m before marine filling works

The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures. The ET will also recommend to the Contractor about the environmental toolbox topics on the abovementioned key issues for the next reporting period.

1 INTRODUCTION

1.1 BACKGROUND

Tung Chung New Town Extension (TCNTE) is one of the major initiatives under the Government's multi-pronged approach to increase land supply to meet Hong Kong's medium- to long-term needs for housing, economic and social developments. The Environmental Impact Assessment (EIA) Report for TCNTE (Register No. AEIAR-196/2016) was approved on 8 April 2016 and the Environmental Permit (EP) No. EP-519/2016, covering the construction and operation of TCNTE, was granted on 9 August 2016. The EIA Report and EP cover both Tung Chung East (TCE) and Tung Chung West (TCW).

ERM-Hong Kong, Limited (ERM) is commissioned to undertake the role of Environmental Team (ET) for the construction and operation of TCE Project ("the Project") in accordance with the requirements specified in the EP, Updated Environmental Monitoring and Audit (EM&A) Manual (1), EIA Report of the TCNTE project (2) and other relevant statutory requirements.

The TCE Project ("the Project") comprises the following elements:

1. Reclamation of the seabed by a non-dredged method at TCE to form a total of about 130 hectares of land;

2. Construction of about 4.9 kilometres of seawalls, with an eco-shoreline, three drainage box culvert outfalls, three circulation drains and a seawater intake at TCE;

3. Construction of a 470-metre (m) long multi-cell drainage box culvert at TCE;

4. Provision of infrastructure for Tung Chung Area 58, including construction of a single two-lane road with a footpath of about 270 m in length and the associated utility works;

5. Construction of roads, footbridges, drainage, sewerage, waterworks, sewage and salt water pumping stations, fresh water and salt water service reservoirs, and flood protection measures;

6. Provision of new cycle tracks connecting to the existing cycle track network;

7. Landscaping, reprovisioning and ancillary works; and

8. Implementation of environmental mitigation measures and environmental monitoring and audit works.

(1) ERM (2018a). Updated Environmental Monitoring and Audit Manual for Tung Chung New Town Extension. Deposited to EPD under EP-519/2016

(2) Arup (2015). *Op cit.*

The location of the Project, including the associated infrastructure works, is shown in *Figure 1.1*. The construction and the reclamation related marine works of the Project commenced on 9 and 13 July 2018, respectively.

1.2 SCOPE OF THE EM&A REPORT

This is the Monthly EM&A Report for the Project which summarises the key findings of the EM&A programme during the reporting period from 1 to 30 September 2018 for the construction works.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Project is shown in *Annex 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
Civil Engineering and Development Department	Senior Engineer	Eddie Lam	2231 4445
	Engineer	Colin Wong	2231 4417
Engineer's Representative (ER) (AECOM Asia Company Limited)	Principal Resident Engineer	Frankie Fan	9325 0903
	Senior Resident Engineer	Robo Lo	6622 1130
	Resident Engineer	Vincent Leung	9800 0448
	Senior Inspector of Works	C K Liu	9433 6255
Environmental Team (ET) (ERM-Hong Kong, Limited)	ET Leader	Jovy Tam	2271 3113
	Deputy ET Leader	Raymond Chow	2271 3114
Independent Environmental Checker (IEC) (Black & Veatch Hong Kong Limited)	IEC	Manuel Chua	2608 7314
	Deputy IEC	Ivan Ting	9222 9490
Contractor (Contract No. NL/2017/03 TCNTE – Reclamation and Advance Works) (Build King – SCT Joint Venture)	Site Agent	Keith Tse	9383 6173
	Construction Team Leader	Lee Wai Man	9481 6024
	Environmental Officer	Calvin Sze	9205 9277
	24-hour Complaint Hotline	-	9862 2910

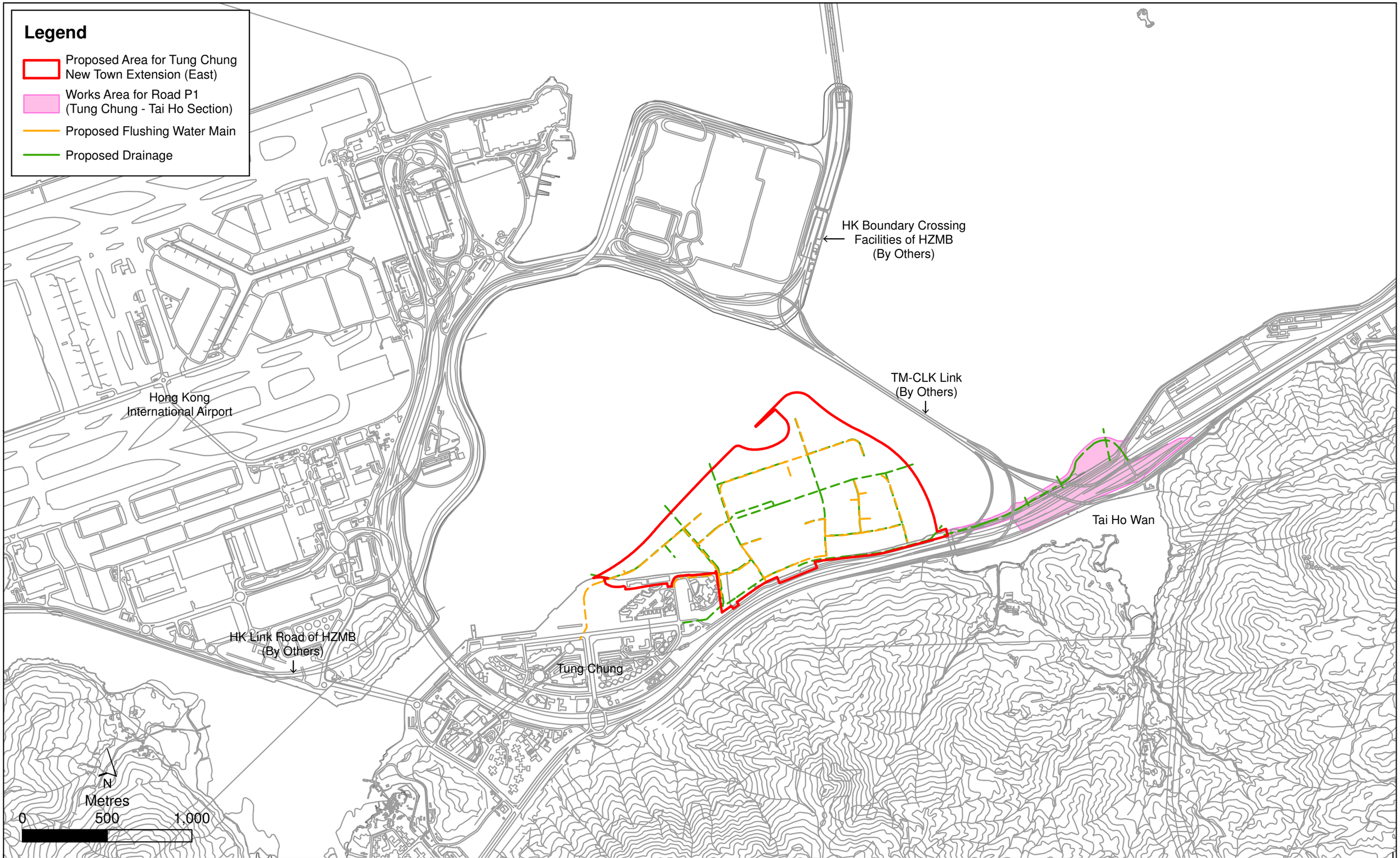

Figure 1.1

Location of the Tung Chung New Town Extensions (East) and its Associated Infrastructure Works

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Date: 11/10/2018

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1.4 SUMMARY OF CONSTRUCTION WORKS

As informed by the Contractor, details of the major works carried out in this reporting period are listed below:

Land-based Works:

- Demolition of site office near Century Link and Man Tung Road;
- Removal of rock armour above +2.5mPD; and
- Preparation works for diversion of existing box culvert.

Marine-based Works:

- Installation of pipe piles and sheet piles for ground investigation and wave protection measures;
- Removal of rock armour below +2.5mPD;
- Marine ground investigation works;
- Laying of geotextile and sand blanket for reclamation works and Deep Cement Mixing (DCM) trial embankment;
- Marine filling works; and
- Diversion of existing box culvert.

The environmental mitigation implementation schedule is presented in *Annex B*.

1.5 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

The status for all environmental aspects are presented in *Table 1.2*. The EM&A requirements remained unchanged during the reporting period.

Table 1.2 ***Summary of Status for the Environmental Aspects under the Updated EM&A Manual***

Parameters	Status
Air Quality	
Baseline Monitoring	The results of baseline air quality monitoring for TCE were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4
Impact Monitoring	On-going for TCE, monitoring conducted three times every six days
Noise	
Baseline Monitoring	The results of baseline noise monitoring for TCE were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4
Impact Monitoring	On-going for TCE, monitoring conducted once per week
Impact Monitoring for Road Traffic Noise during Operational Phase	To be conducted during operational phase
Fixed Noise Commissioning Test	To be implemented by the Contractor
Water Quality	
Baseline Monitoring	The results of baseline water quality monitoring for TCE were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4
Impact Monitoring	On-going for TCE, monitoring conducted three times per week
Waste Management	
Waste Monitoring	On-going
Land Contamination	
Contamination Assessment Plan (CAP), Remediation Action Plan (RAP) and Remediation Report (RR)	Pending environmental site investigation and lab testing works for TCW
Ecology	
Monitoring for Compensation Woodland	To be conducted when compensation woodland are planted
Monitoring for Emergent Plant inside the future River Park	To be conducted in the future River Park
Monitoring for Translocated Amphibians of Conservation Importance	To be conducted after translocation
Monitoring for Preserved/Transplanted Plant Species of Conservation Importance	To be conducted after preservation/ transplantation
Monitoring for Tung Chung Stream EIS and Wong Lung Hang EIS	To be conducted under TCW

Parameters	Status
Eco-shoreline Monitoring	To be conducted when eco-shoreline at TCE PDA and Road P1 is built
Tung Chung Bay and Tai Ho Wan Baseline Monitoring	The results of baseline soft shore ecological monitoring at Tung Chung Bay and Tai Ho Wan were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4
Tung Chung Bay and Tai Ho Wan Impact Monitoring	On-going for TCE, monitoring conducted quarterly
Landscape and Visual	
Baseline Monitoring	The results of baseline landscape and visual monitoring were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.4
Site Environmental Audit	
Regular Site Inspection	On-going
Dolphin Watching Plan implementation measures	Under implementation by the Contractor
Works Vessel Travel Route Plan implementation measures	Under implementation by the Contractor
Silt Curtain Deployment Plan implementation measures	Under implementation by the Contractor
Spill Response Plan implementation measures	Under implementation by the Contractor
Waste Management Plan implementation measures	Under implementation by the Contractor
Complaint Hotline and Email Channel	Under implementation by the Contractor
Environmental Log Book	On-going

Taking into account the construction works, impact monitoring of air quality, noise, water quality and waste management were carried out in the reporting period. The monitoring schedule of air quality, noise, water quality monitoring and soft shore ecological monitoring are provided in *Annex D2*, *Annex E2, Annex F2* and *Annex G1*, respectively.

The EM&A programme also involved environmental site inspections and related auditing conducted by the ET for checking the implementation of the required environmental mitigation measures recommended in the approved EIA Report and relevant EP submissions, including Dolphin Watching Plan, Works Vessel Travel Route Plan, Silt Curtain Deployment Plan, Spill Response Plan and Waste Management Plan. To promote the environmental awareness and enhance the environmental performance of the contractors, environmental trainings and regular environmental management meetings were conducted during the reporting period, which are summarized as below:

- One (1) environmental management meeting was held with the Contractor, ER, ET, IEC and CEDD on 26 September 2018; and
- Environmental toolbox trainings on noise control measure, dust control measure and handling of chemicals provided by the Contractor for the workers on 5, 12 and 19 September 2018.

1.6 STATUS OF STATUTORY ENVIRONMENTAL COMPLIANCE WITH THE ENVIRONMENTAL PERMIT

The status of statutory environmental compliance with the EP conditions under the EIAO, submission status under the EP and implementation status of mitigation measures are presented in *Table 1.3*.

Table 1.3 Status of Submissions and Implementation Status of Mitigation Measures under EP

EP Condition	Submission / Implementation Status	Status
2.1	Set up of Community and Professional Liaison Groups	Community and Professional Liaison Groups were set up.
2.1	Complaint Management Plan	Accepted by EPD
2.5	Employment of Qualified Ecologist(s)	Qualified Ecologists have been employed to carry out work relating to ecological aspects.
2.6	Employment of Surveillance Team	Surveillance Team has been employed to conduct regular site inspection.
2.11	Management Organizations	Accepted by EPD
2.12	Construction Works Schedule and Location Plans	Accepted by EPD
2.13	Works Vessel Travel Route Plan	Accepted by EPD
2.14	Eco-shoreline Implementation Plan	To be prepared no later than 3 months before the commencement of construction of the eco-shoreline at TCE
2.15	Dolphin Watching Plan	Accepted by EPD
2.16	Silt Curtain Deployment Plan	Accepted by EPD
2.17	Spill Response Plan	Accepted by EPD
2.18	Plan on Provision of Buffer Zones	To be prepared no later than 3 months before the commencement of construction works at Tung Chung Valley
2.19	River Park Plan	To be prepared no later than 3 months before the commencement of construction works at Tung Chung Valley
2.20	Habitat Enhancement and Translocation Plan for Amphibian Species of Conservation Importance	To be prepared no later than 3 months before the commencement of construction works at Tung Chung Valley
2.21	Detailed Preservation and/or Translocation Plan for Plant Species of Conservation Importance	To be prepared no later than 3 months before the commencement of construction works at Tung Chung Valley

EP Condition	Submission / Implementation Status	Status
2.22	Detailed Compensatory Woodland Planting Plan	To be prepared no later than 3 months before the commencement of construction works at Tung Chung Valley
2.23	Plan for Review of Use of New Low Noise Road Surfacing Material(s)	To be prepared no later than 3 months before the commencement of roadworks
2.24	Waste Management Plan	Accepted by EPD
2.25	(i) no dredging of marine sediment shall be carried out for the Project	Under implementation
	(ii) all reclamation filling works shall be carried out within a leading seawall of at least 200m; and	Under implementation
	(iii) silt curtains surrounding the reclamation area shall be deployed in accordance with the Silt Curtain Deployment Plan	Under implementation
2.26	Implement Silt Curtain Deployment Plan and Spill Response Plan	Under implementation
2.27	Implement dolphin exclusion zone of 250m around the reclamation site at Tung Chung East during the installation of the perimeter silt curtains and any re-deployment of the perimeter silt curtains by Qualified Ecologist(s)	Under implementation
2.28	Once the perimeter silt curtains are installed or re-deployed, the Dolphin Watching Plan shall be implemented as part of the EM&A programme	Under implementation
2.29	(i) no underwater blasting and percussive piling shall be carried out for the Project; and	Under implementation
	(ii) air compressors and other noisy equipment mounted on works vessels shall be acoustically-decoupled	Under implementation
2.30	Implement Works Vessel Travel Route Plan	Under implementation
	Implement Eco-shoreline Implementation Plan	To be implemented
	Implement Dolphin Watching Plan	Under implementation
2.31	Implement Plan on Provision of Buffer Zones, River Park Plan, Habitat Enhancement and Translocation Plan for Amphibian Species of Conservation Importance, Detailed Preservation and/or Translocation Plan for Plant Species of Conservation Importance and Detailed Compensatory Woodland Planting Plan	To be implemented
2.32	Implement Plan for review of the use of new road surfacing material(s)	To be implemented
	Implement Waste Management Plan	Under implementation

EP Condition	Submission / Implementation Status	Status
2.33	Install noise barriers and low noise road surfacing at the extended Chung Mun Road and Road D3 All noise mitigation measures implemented shall be properly maintained during the operation of the above roads	To be implemented
2.34	Implement a deodouriser with an odour removal efficiency of at least 95% shall be installed, operated and maintained within each sewage pumping station. The exhaust of the deodouriser shall be oriented away from sensitive receivers; and all odourous facilities of each sewage pumping station shall be enclosed and negative pressure shall be maintained within the facilities.	To be implemented
2.35	Enclose all the pumps inside a building structure	To be implemented
2.36	(i) a 100% standby pumping capacity shall be installed and maintained	To be implemented
	(ii) a 50% spare pumping capacity shall be installed and maintained	To be implemented
	(iii) dual-feed power supply shall be installed and maintained; and	To be implemented
	(iv) an emergency facility with a 6-hour storage capacity of average dry weather flow shall be installed and maintained.	To be implemented

1.7 STATUS OF OTHER STATUTORY ENVIRONMENTAL REQUIREMENTS

The environmental licenses and permits, including environmental permit, waste discharge license, registration as chemical waste producer and construction noise permit, which are valid in the reporting period are presented in *Annex C*. No non-compliance with environmental statutory requirements was recorded.

2 EM&A RESULTS FOR TUNG CHUNG EAST

The EM&A programme for the Project required environmental monitoring for air quality, noise, 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

2.1.1 Monitoring Requirements and Equipment

According to the Updated EM&A Manual (1) of the Project, impact air quality monitoring in terms of 1-hour Total Suspended Particulate (TSP) was conducted three (3) times every six (6) days when the highest dust impact was expected. The Action and Limit Levels of the air quality monitoring is provided in *Table 2.1* below.

Table 2.1 Action and Limit Levels for 1-hour TSP

Location	Action Level, $\mu g/m^3$	Limit Level, $\mu g/m^3$
Monitoring station for Tung Chung East	279	500

Portable direct reading dust meters were used to measure 1-hour TSP levels in undertaking the air quality monitoring for the Project. The proposed use of portable direct reading dust meters was submitted to IEC and obtained agreement from the IEC as stated in Section 5.5 of the Updated EM&A Manual. With the use of direct reading dust meter, it can allow prompt and direct results for the EM&A reporting and the implementation of the event and action plan. The portable direct reading dust meter would be calibrated every year against High Volume Sampler (HVS) to check the validity and accuracy of the results measured by direct reading method.

The monitoring location and equipment used in the impact air quality monitoring programme are summarized in *Table 2.2* and illustrated in *Figure 2.1*. Copies of the calibration certificates for the equipment are presented in *Annex D1*, which showed that the portable direct reading dust meter is capable of providing comparable results with that provided by a HVS.

(1) ERM (2018a). *Op cit.*

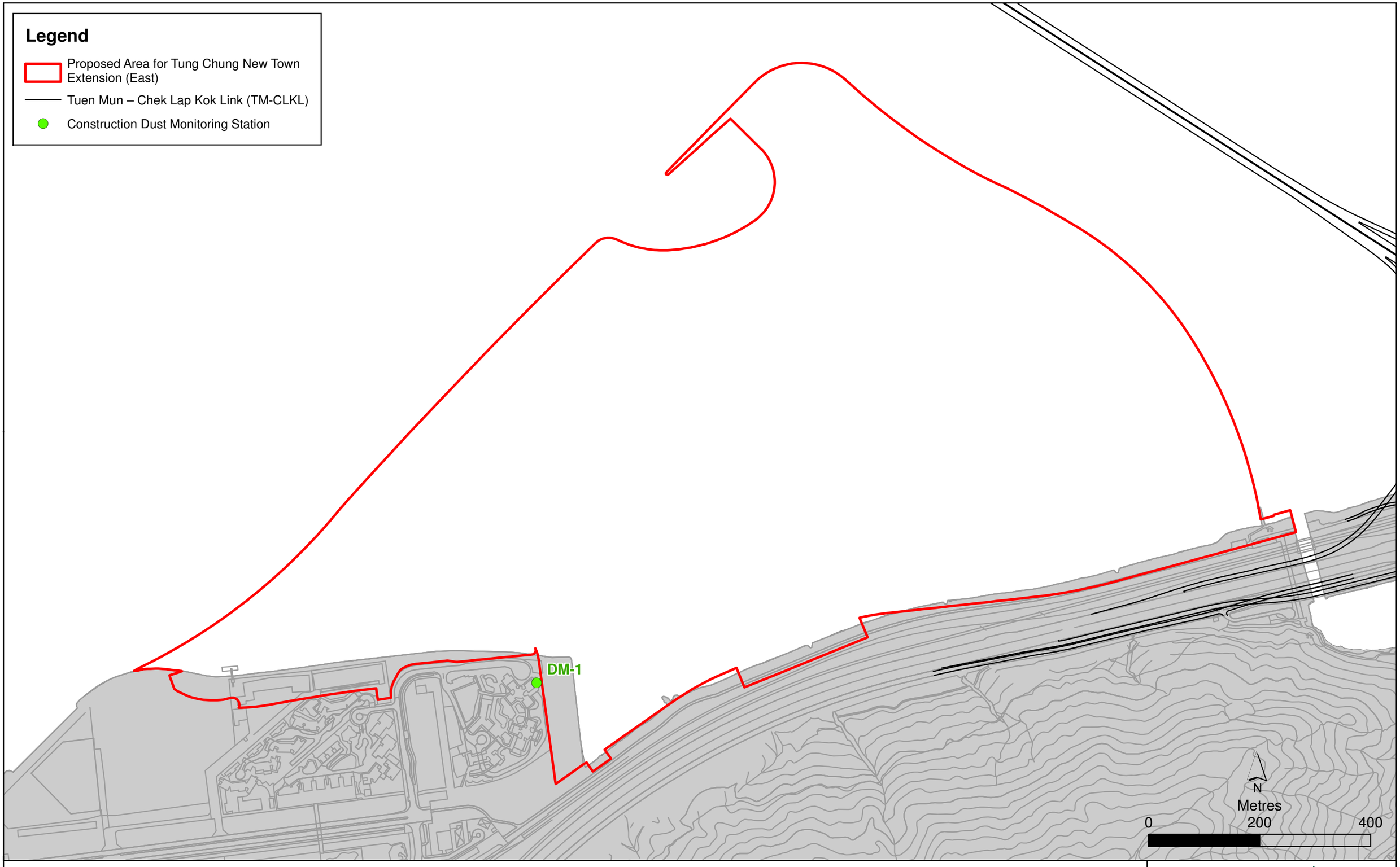

Figure 2.1

Construction Dust Monitoring Station Location

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Date: 11/10/2018

Environmental Resources Management

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Table 2.2 ***Air Quality Monitoring Details***

Monitoring Station	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
DM-1	Tung Chung Area 56 – Ying Tung Estate	1-hour TSP	Three times per six days during the construction period of the Project	3, 7, 13, 19, 24 & 29 Sep 2018	1-hour TSP Dust Meter SIBATA LD-5R (S/N: 620402)

Remark:
It should be noted that impact monitoring at other construction dust monitoring locations at TCE as stated in the Updated EM&A Manual will commence after the flat intake (for Monitoring Stations DM-2, DM-3 and DM-4).

2.1.2 Monitoring Schedule for the Reporting Month

The schedule for air quality monitoring during the reporting period is provided in *Annex D2*.

2.1.3 Results and Observations

The monitoring results for 1-hour TSP are summarized in *Table 2.3*. The monitoring data and the graphical presentation are provided in *Annex D3.*

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

Monitoring Station	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
DM-1	36	22-89	279	500

The major dust sources in the reporting period included excavation, craning, sand blanket laying and material handling works under the Project as well as nearby traffic emissions.

All the 1-hour TSP results were below the Action and Limit Levels at the monitoring location in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in *Annex D4*.

2.2 NOISE MONITORING

2.2.1 Monitoring Requirements and Equipment

According to the Updated EM&A Manual (1) of the Project, impact noise monitoring was conducted once per week during the construction phase of the Project. The Action and Limit Level for construction noise of the Project is provided in *Table 2.4* below.

(1) ERM (2018a). *Op cit.*

Table 2.4 Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700 - 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) *

Notes:
Limit level is exceeded when $L_{eq} \geq 75$ dB(A). If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.
* Reduce to 70 dB (A) for schools and 65 dB (A) during school examination periods.

Noise monitoring was performed using sound level meter at the designated monitoring stations NMS-CA-1A (1) and NMS-CA-4 (*Figure 2.2; Table 2.5*) in accordance with the requirements stipulated in the Updated EM&A Manual. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Details of the deployed equipment are provided in *Table 2.5*. Copies of the calibration certificates for the equipment are presented in *Annex E1*.

Table 2.5 Noise Monitoring Details

Monitoring Station (1)	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
NMS-CA-1A (2)	Residential premise in Tung Chung East – Century Link	30-minute measurement between 0700 and 1900 on normal weekdays (Monday to Saturday). L_{eq}, L_{10} and L_{90} would be recorded.	Once per week for 30 mins during the construction period of the Project	19, 24 and 29 September 2018	Sound Level Meter: Rion NL-52 (S/N: 00331805) Acoustic Calibrator: LARSON DAVIS CAL200 (S/N: 11333)
NMS-CA-4	Residential premise in the reclamation area next to Tung Chung East – Ying Tung Estate			3, 7, 13, 19, 24 and 29 September 2018	

Remarks:
(1) It should be noted that impact monitoring at other construction noise monitoring locations at TCE as stated in the Updated EM&A Manual will commence after the flat intake of residential premise in TCE (for Monitoring Station NMS-CA-1) and operation of schools (for Monitoring Stations NMS-CA-2 and NMS-CA-3).
(2) Impact monitoring at monitoring station NMS-CA-1A commenced on 19 September 2018 in view of the close vicinity of the construction works near the residential area at Century Link.

2.2.2 Monitoring Schedule for the Reporting Month

The schedule for noise monitoring during the reporting period is provided in *Annex E2*.

(1) Impact monitoring at monitoring station NMS-CA-1A commenced on 19 September 2018 in view of the close vicinity of the construction works near the residential area at Century Link.

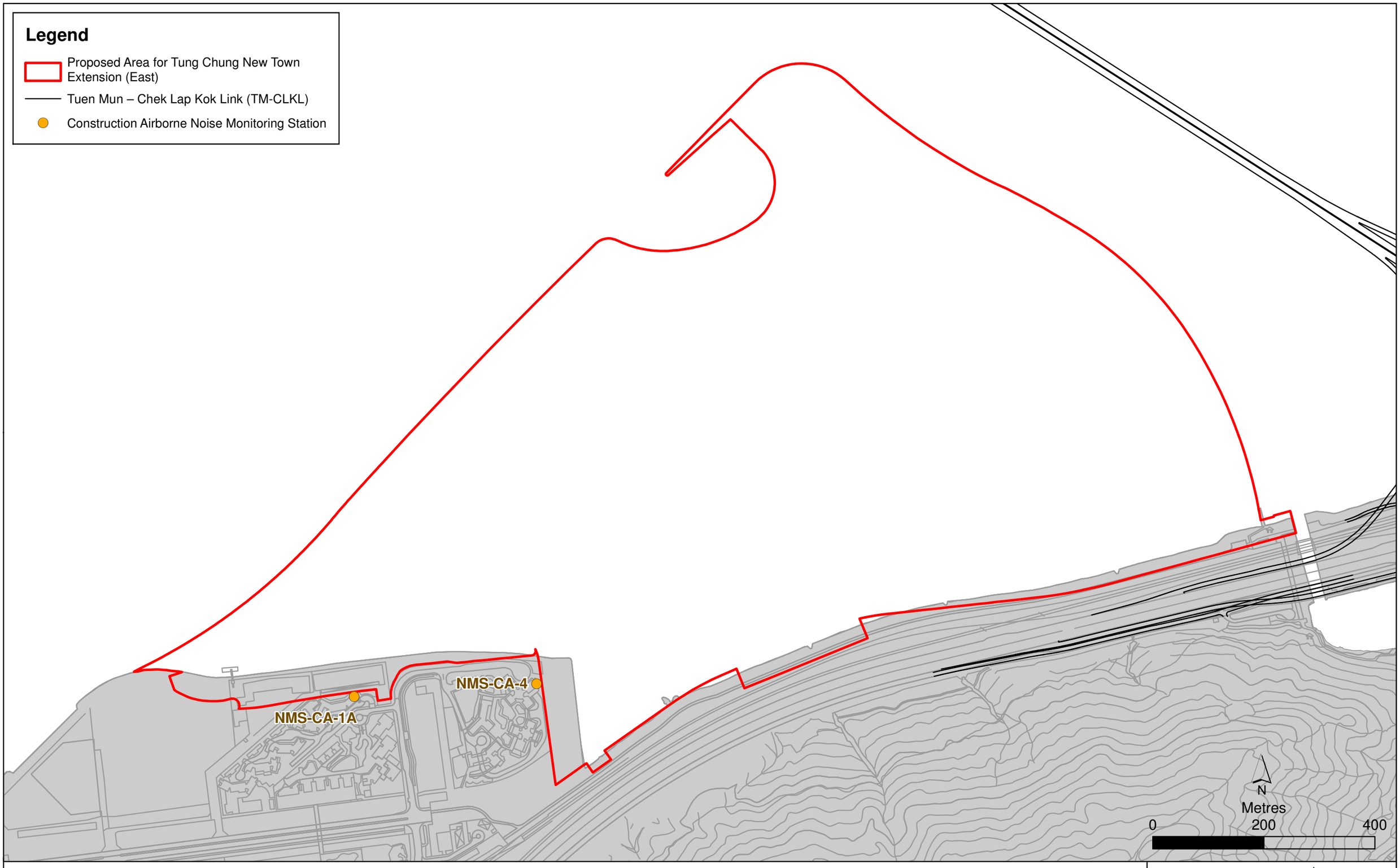

Figure 2.2

Construction Airborne Noise Monitoring Station Location

File: T:\GIS\CONTRACT\0445700\mxd\0445700_Construction_Airborne_Noise_MS_CA4.mxd
Date: 11/10/2018

Environmental Resources Management

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2.2.3 *Results and Observations*

Results for noise monitoring are summarized in *Table 2.6*. The monitoring data and the graphical presentation are provided in *Annex E3*.

Table 2.6 Summary of Construction Noise Monitoring Results in the Reporting Period

Monitoring Station	Average , dB(A), $L_{eq\ (30mins)}$	Range, dB(A), $L_{eq\ (30mins)}$	Limit Level, dB(A), $L_{eq\ (30mins)}$
NMS-CA-1A	71.2	68.9-72.1	75
NMS-CA-4	65.2	62.1-69.1	75

Major noise sources during the noise monitoring included noise from crane and breaker operation (for monitoring station NMS-CA-1A), welding, excavation works, armour rock removal, sheet piling and grab barge works, nearby traffic noise and aircraft noise and nearby concurrent project. It should be noted that the temporary crane and breaker operation was conducted near the monitoring station NMS-CA-1A during the monitoring events and the monitoring results were observed to be higher when compared to those recorded for the monitoring station NMS-CA-4. The ET will keep on checking whether noise mitigation measures are properly implemented for the works of the Project.

No noise Limit Level exceedance was recorded in the reporting period. However, Action Level was triggered from one (1) environmental complaint related to noise nuisance received on 11 September 2018 during the reporting period. Investigation was conducted for the complaint in accordance with the Event and Action Plan (*Annex E4*) and the details are provided in Section *2.9*.

2.3 *WATER QUALITY MONITORING*

2.3.1 *Monitoring Requirements and Equipment*

Impact water quality monitoring was carried out to ensure that any deterioration of water quality was detected, and that timely action was taken to rectify the situation. Impact water quality monitoring was undertaken three days per week since the commencement of marine works during the reporting period in accordance with the Updated EM&A Manual. Each impact water quality monitoring was scheduled such that the interval between two impact water quality monitoring was more than 36 hours to record representative water quality data throughout the week during the marine works.

Two (2) replicate *in-situ* measurements and samples were collected at each monitored water depth of each designated monitoring stations. Dissolved Oxygen (DO), pH value, salinity, temperature and turbidity were measured *in-situ* whereas the level of suspended solids (SS) were determined by ALS Technichem (HK) Pty Ltd which is a HOKLAS accredited laboratory.

The Action and Limit Levels of the water quality monitoring are provided in *Table 2.7*.

Table 2.7 Action and Limit Levels for Water Quality

Parameters	Action Level	Limit Level
DO in mg/L (Surface, Middle & Bottom)	Surface and Middle 5.9 mg/L [1] Bottom 5.6 mg/L	Surface and Middle 4 mg/L [1] Bottom 2 mg/L
SS in mg/L (Depth-averaged)	13.5 mg/L or 120% of upstream control station at the same tide of the same day, whichever is higher. [2]	23.5 mg/L or 130% of upstream control station at the same tide of the same day, whichever is higher. [2]
Turbidity in NTU (Depth-averaged)	17.1 NTU or 120% of upstream control station at the same tide of the same day, whichever is higher. [2]	23.5 NTU or 130% of upstream control station at the same tide of the same day, whichever is higher. [2]

Notes:
(1) For DO, non-compliance occurs when monitoring results is lower than the limits.
(2) For SS and Turbidity, non-compliance occurs when monitoring results is larger than the limits

The locations of the monitoring stations under the Project are shown in *Figure 2.3* and *Table 2.8*.

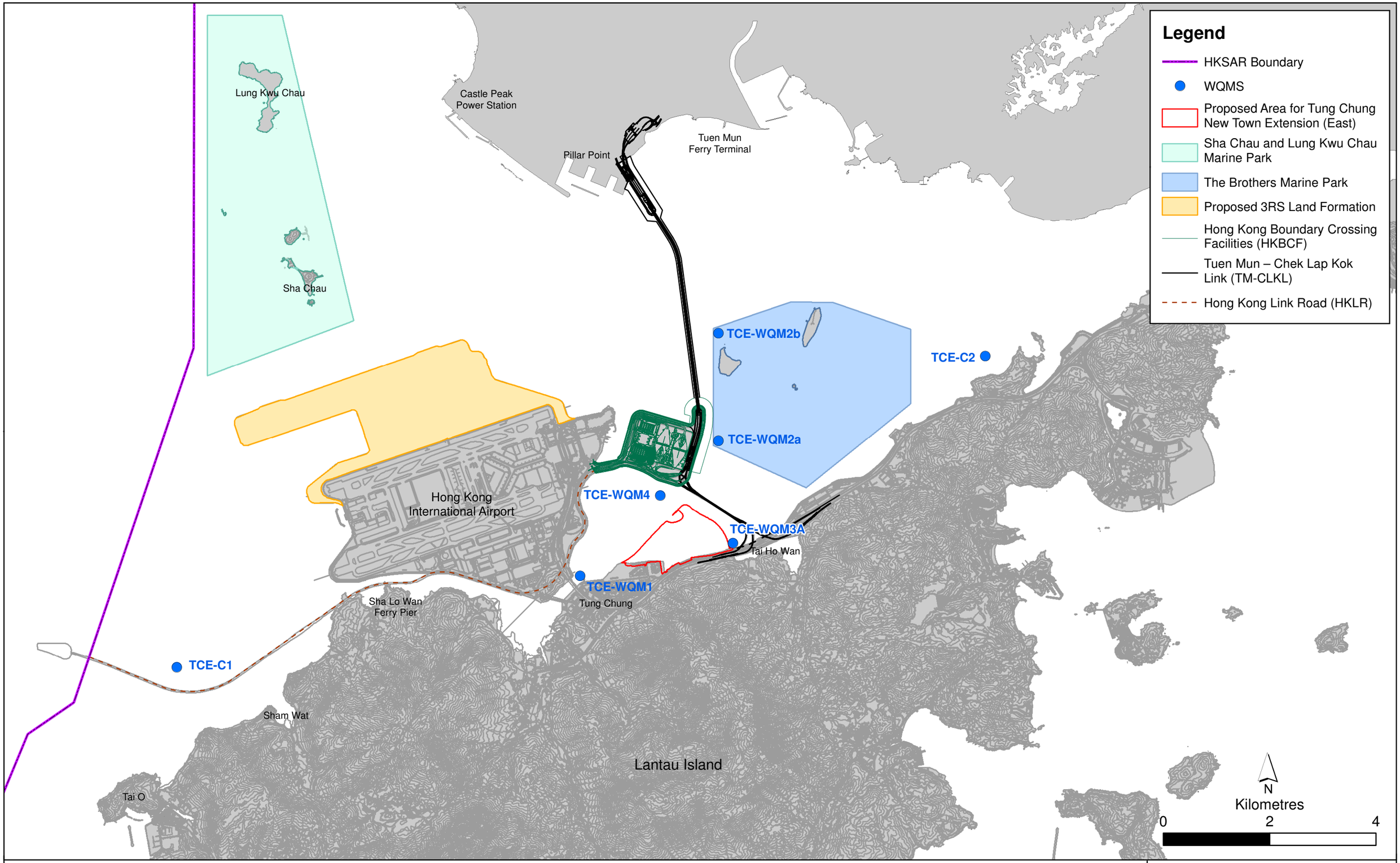

Figure 2.3

Water Quality Monitoring Locations

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Date: 23/10/2018

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Table 2.8 Locations of Impact Water Quality Monitoring Stations and the Corresponding Monitoring Requirements

Monitoring Station	Description	Coordinates		Parameters (1)	Frequency	Depth
		Easting	Northing			
TCE-WQM1	Near Airport Channel	811838	817341	• Dissolved Oxygen (DO) (mg/L and % saturation) • Temperature (°C) • Turbidity (NTU) • Salinity (ppt) • pH • Water depth (m) • Suspended Solid (SS) (mg/L)	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Project	3 water depths: 1m below sea surface, mid-depth and 1m above seabed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted
TCE-WQM2a	Marine Park 1	814439	819879			
TCE-WQM2b	Marine Park 2	814439	821905			
TCE-WQM3A	Outlet of Tai Ho Wan	814705	817859			
TCE-WQM4	HKBCF	813344	818849			
TCE-C1	Control Station - Outside Airport Channel	804247	815620			
TCE-C2	Control Station - Sunny Bay	819460	821473			

Notes:
(1) In addition to the abovementioned parameters, other relevant data shall also be recorded, including monitoring location / position, time, water depth, tidal stages, weather conditions and any special phenomena or work underway at the construction site.

Table 2.9 summarizes the equipment used in the impact water quality monitoring works. Copies of the calibration certificates are attached in *Annex F1*.

Table 2.9 Water Quality Monitoring Equipment

Equipment	Model
Water Sampler	Kahlsico Water Samplers
Multi-parameter Water Quality System (measurement of DO, Temperature, Turbidity, Salinity and pH) (Note 1)	YSI ProDSS (S/N: 16H104233; S/N: 16H104234; S/N: 17E100747; S/N: 17H105557) YSI 6920 v2 (S/N: 0001C6A7; S/N: 00019CB2)

Note 1: Two of the multi-parameter water quality systems were used at each monitoring station during each survey day.

2.3.2 Monitoring Schedule for the Reporting Month

The schedule for water quality monitoring during the reporting period is provided in *Annex F2*.

2.3.3 Results and Observations

A total of 13 monitoring events for impact water quality monitoring were conducted at all designated monitoring stations during the reporting period. The monitoring event during mid-ebb tide on 15 September 2018 was cancelled due to the issue of Strong Wind Signal No.3 of Typhoon Mangkhut. Impact water quality monitoring results and graphical presentations are provided in *Annex F3*.

Action level and limit level exceedances were recorded for water quality impact monitoring in the reporting period and the event and action plan (*Annex F4*) was undertaken. Investigations on the action and limit level exceedances were conducted and summarized in *Table 2.10* below.

Table 2.10 Details of Exceedances Recorded for Water Quality Monitoring

Group	Date	Tide	Parameter	Station	Type	Remarks
1	01 Sep 2018	ME	DO (S&M)	All stations	Action	The exceedances were not considered as caused by the construction of the Project due to the following reasons: • Areas of reclamation related marine works undertaken under the Project were surrounded by silt curtain, which was inspected daily by the Contractor and endorsed by ER and observed to be in good condition and functioning well, except minor defect was found for silt curtain on 18, 20 and 22 September 2018 after the approach of typhoon Mangkhut. The defect was fixed on 23 September 2018 and inspected by the Contractor and endorsed by ER. • DO levels at the monitoring stations were higher than or similar to those at corresponding control/upstream stations. • No marine works were undertaken on 15 and 25 September 2018. • During summer season, the marine water experienced temperature and salinity stratification, where layers of water build up with different levels of temperature and salinity which prevent mixing of water masses, leading to hypoxia (low oxygen levels) at the sea bottom.
		ME	DO (B)	TCE-WQM1	Action	
		ME	DO (B)	TCE-WQM2a	Action	
		ME	DO (B)	TCE-WQM2b	Action	
		ME	DO (B)	TCE-WQM3A	Action	
		MF	DO	All stations	Action	
	04 Sep 2018	ME	DO	All stations	Action	
		MF	DO	All stations	Action	
	06 Sep 2018	ME	DO	All stations	Action	
		MF	DO (S&M)	TCE-WQM2b	Action	
		MF	DO (S&M)	TCE-WQM4	Action	
		MF	DO (B)	TCE-WQM1	Action	
		MF	DO (B)	TCE-WQM2a	Action	
		MF	DO (B)	TCE-WQM2b	Action	
	08 Sep 2018	ME	DO	TCE-WQM1	Action	
		ME	DO	TCE-WQM2a	Action	
		ME	DO	TCE-WQM2b	Action	
		ME	DO (B)	TCE-WQM3A	Action	
		MF	DO (B)	TCE-WQM1	Action	
		MF	DO	TCE-WQM2a	Action	
		MF	DO	TCE-WQM2b	Action	
		MF	DO (B)	TCE-WQM3A	Action	
		MF	DO (S&M)	TCE-WQM4	Action	
	11 Sep 2018	ME	DO	All stations	Action	
		MF	DO (S&M)	TCE-WQM1	Action	
		MF	DO (S&M)	TCE-WQM2a	Action	
		MF	DO (S&M)	TCE-WQM2b	Limit	
		MF	DO (S&M)	TCE-WQM3A	Action	
		MF	DO (S&M)	TCE-WQM4	Action	
		MF	DO (B)	All stations	Action	
	13 Sep 2018	ME	DO	All stations	Action	
		MF	DO	All stations	Action	
	15 Sep 2018	MF	DO	All stations	Action	
	18 Sep 2018	ME	DO (S&M)	TCE-WQM3A	Action	
	20 Sep 2018	ME	DO	TCE-WQM1	Action	
		ME	DO (B)	TCE-WQM2a	Action	
		ME	DO (B)	TCE-WQM2b	Action	
		MF	DO (B)	TCE-WQM2b	Action	
	22 Sep 2018	ME	DO (B)	TCE-WQM1	Action	
		ME	DO (B)	TCE-WQM2a	Action	
		ME	DO (B)	TCE-WQM3A	Action	
		MF	DO	TCE-WQM2b	Action	
		MF	DO (B)	TCE-WQM1	Action	
		MF	DO (B)	TCE-WQM2a	Action	
	25 Sep 2018	ME	DO (B)	TCE-WQM1	Action	
		ME	DO	TCE-WQM2b	Action	
		ME	DO	TCE-WQM3A	Action	
		MF	DO (B)	TCE-WQM1	Action	

Group	Date	Tide	Parameter	Station	Type	Remarks
		MF	DO (B)	TCE-WQM2a	Action	
		MF	DO	TCE-WQM2b	Action	
		MF	DO	TCE-WQM3A	Action	
	27 Sep 2018	ME	DO	All stations	Action	
		MF	DO	All stations	Action	
	29 Sep 2018	ME	DO (S&M)	TCE-WQM1	Action	
		ME	DO	TCE-WQM2a	Action	
		ME	DO	TCE-WQM2b	Action	
		ME	DO	TCE-WQM4	Action	
		MF	DO	TCE-WQM1	Action	
		MF	DO	TCE-WQM2a	Action	
		MF	DO	TCE-WQM2b	Action	
		MF	DO (S&M)	TCE-WQM3A	Action	
		MF	DO	TCE-WQM4	Action	
2	01 Sep 2018	ME	SS	TCE-WQM1	Action	The exceedances were not considered as caused by the construction of the Project due to the following reasons: • Areas of reclamation related marine works undertaken under the Project were surrounded by silt curtain, which was inspected daily by the Contractor and endorsed by ER and observed to be in good condition and functioning well. • Monitoring stations are located nearby the shore. In view of the rainy weather, surface runoff from the nearby land mass to the sea might be resulted, thus increasing the levels of Suspended Solids of the water.
		ME	SS	TCE-WQM3A	Action	
3	08 Sep 2018	ME	SS	TCE-WQM2b	Action	The exceedances were not considered as caused by the construction of the Project due to the following reasons: • Areas of reclamation related marine works undertaken under the Project were surrounded by silt curtain, which was inspected daily by the Contractor and endorsed by ER and observed to be in good condition and functioning well. • The monitoring stations are located further away from the Project works area when compared with monitoring stations TCE-WQM3A and TCE-WQM4 where exceedances were not recorded.
		MF	SS	TCE-WQM2b	Action	
	11 Sep 2018	ME	SS	TCE-WQM1	Action	
		MF	SS	TCE-WQM2b	Action	
	13 Sep 2018	ME	SS	TCE-WQM2a	Action	
		MF	SS	TCE-WQM2a	Action	
		MF	SS	TCE-WQM2b	Limit	
	29 Sep 2018	ME	SS	TCE-WQM1	Action	
		MF	SS	TCE-WQM2a	Action	

Group	Date	Tide	Parameter	Station	Type	Remarks
4	27 Sep 2018	MF	SS	TCE-WQM3A	Action	The exceedances were not considered as caused by the construction of the Project due to the following reasons: • Areas of reclamation related marine works undertaken under the Project were surrounded by silt curtain, which was inspected daily by the Contractor and endorsed by ER and observed to be in good condition and functioning well. • Site observations confirmed no silt plumes or observable issues during marine works on 27 September 2018, including installation of pipe pile and sheet pile, sand filling and geotextile laying.
		MF	Turbidity	TCE-WQM3A	Action	

ME: Mid-ebb; MF: Mid-flood
DO(B): Bottom-depth DO; DO (S&M): Surface and middle-depth averaged DO
All Stations: TCE-WQM1, TCE-WQM2a, TCE-WQM2b, TCE-WQM3A and TCE-WQM4

Based on the preliminary investigation conducted for each of the monitoring day with potential action and limit level exceedances with the Contractor, the ER and the IEC, there is no evidence showing the exceedances were related to the Project. Nevertheless, the Contractor was reminded to implement all relevant mitigation measures for the marine works, including regular checking of silt curtain integrity and maintain good site practice. The ET will keep on checking monitoring data, plant, equipment and Contractor's working methods. The ET will also conduct further investigation, including the review of water quality monitoring data from adjacent projects, to substantiate the exceedances were not considered as caused by the construction of the Project.

2.4 SOFT SHORE ECOLOGICAL MONITORING

2.4.1 Monitoring Requirements

According to the Updated EM&A Manual (1) of the Project, impact soft shore ecological monitoring has to be conducted quarterly at each survey location at Tung Chung Bay (TCB) and Tai Ho Wan (THW) covering wet and dry seasons during the marine construction of the Project. The soft shore ecological monitoring consisted of qualitative walk-through surveys, quantitative transect surveys and sedimentation rate monitoring at the accessible survey locations of TCB and THW.

For qualitative walk-through surveys, the accessible shoreline of TCB and THW at each of the three shore heights: 2 m, 1.5 m and 1 m above Chart Datum was surveyed, and organisms encountered were recorded and their relative abundance noted. In particular, active search of horseshoe crabs and

(1) ERM (2018a). *Op cit.*

seagrasses were conducted to confirm whether these species are present along the sites.

For quantitative transect survey, one 50 – 100 m horizontal (belt) transect (actual length subject to the site conditions) was surveyed at each of the three shore heights: 2 m, 1.5 m and 1 m above Chart Datum of each survey location. On each transect, five quadrats (50 cm x 50 cm) were placed randomly in each transect to assess the abundance and distribution of flora and fauna. For each quadrat, surface layer to 5 cm depth was sieved and microbenthic organisms (e.g. crustaceans) were recorded and identified. Density of organisms was expressed as individuals / m^2. Areas with seagrass were also recorded and identified and other information, such as the percentage cover, were also recorded. Sessile animals such as barnacles and oysters in each quadrat were not counted but estimated as percentage cover on the rock surface. All species of algae (encrusting, foliose and filamentous) were also identified and recorded by estimating the percentage cover on the rock surface. All organisms were identified to the lowest possible taxonomic level (at least Genus level). Species encountered outside the quadrat but in the vicinity of survey transect were also recorded.

For sedimentation rate monitoring, to avoid disturbance to the mudflat and nuisance to navigation, no fixed marker/monitoring rod was installed at the monitoring stations. A high precision Global Navigation Satellite System (GNSS) real time location fixing system (or equivalent technology) was used to locate the station in the precision of 1 mm, which is reasonable under flat mudflat topography with uneven mudflat surface only at micro level.

Measurements were taken directly on the mudflat surface. The Real Time Kinematic GNSS (RTK GNSS) surveying technology was used to measure mudflat surface levels and 3D coordinates of a survey point. The RTK GNSS survey was calibrated against a reference station in the field before and after each survey. The reference station is a survey control point established by the Lands Department of the HKSAR Government or traditional land surveying methods using professional surveying instruments such as total station, level and/or geodetic global navigation satellite system. The coordinates system is in HK1980 GRID system. The reference control station was surveyed and established by traditional land surveying methods using professional surveying instruments such as total station, level and/or geodetic GNSS. The accuracy was down to mm level and higher than the proposed RTK GNSS cm level so that the reference control station has relatively higher accuracy. As the reference control station has higher accuracy, it was set as true evaluation relative to the RTK GNSS measurement. All position and height correction were adjusted and corrected to the reference control station.

The precision of the measured mudflat surface level reading (vertical precision setting) was within 10 mm (standard deviation) after averaging the valid survey records of the XYZ HK1980 GRID coordinates. Each survey record at each station was computed by averaging at least three measurements that are within the above specified precision setting. Both digital data logging and

written records were collected in the field. Field data on station fixing and mudflat surface measurement were recorded.

2.4.2 *Monitoring Schedule for the Reporting Month*

The schedule for soft shore ecological monitoring during the reporting period is provided in *Annex G1*.

2.4.3 *Results and Observations*

Impact soft shore ecological monitoring was conducted at three (3) monitoring locations at Tung Chung Bay (TCB), situated in the eastern side (TCB1), southern side (TCB2) and western side (TCB3) as well as one (1) monitoring location at Tai Ho Wan (THW) as shown in *Figure 2.4* during the reporting period. Representative photographs taken during the impact monitoring are presented in *Figure 2.5*.

For qualitative walk-through surveys, horseshoe crabs and intertidal soft shore communities were recorded while seagrass beds were not observed during the impact monitoring. The survey results for each monitoring location are summarized in *Table 2.11* below and detailed in *Annex G2*.

Table 2.11 Summary of Qualitative Walk-through Surveys

Date and Time	Location	Horseshoe Crabs		Seagrass		No. of Other Intertidal Species
		No. of Species	No. of Individuals	No. of Species	Area Coverage (m^2)	
5/9/2018 08:30-12:30	TCB2	1	3	0	0	40
7/9/2018 11:00-14:30	THW	2	6	0	0	43
10/9/2018 13:30-17:00	TCB3	2	19	0	0	44
11/9/2018 14:00-17:30	TCB1	2	10	0	0	45

For quantitative transect surveys, a total of 4,071 individuals were recorded from all transects at monitoring stations TCB1-3 and THW. The most abundant group of intertidal soft shore communities recorded was gastropods, with a total of 3,842 individuals (relative abundance of 94.4% and density of 256 individual m^{-2}). The summary of the top three dominant species at each shore height of each monitoring station and the complete list of species and density recorded are presented in *Annex G2*. When compared with the results obtained during the baseline monitoring as presented in the Baseline Monitoring Report (1), higher number of intertidal species were

(1) ERM (2018b). Baseline Monitoring Report for Tung Chung New Town Extension (East). Submitted to EPD under EP-519/2016

Legend

- Proposed Area for Tung Chung New Town Extension (East)
- Marine Ecological Monitoring Location
- Hong Kong Boundary Crossing Facilities (HKBCF)
- Tuen Mun – Chek Lap Kok Link (TM-CLKL)
- Hong Kong Link Road (HKLR)

Hong Kong International Airport

Sha Lo Wan Ferry Pier

Tung Chung

TCB3

TCB2

TCB1

THW

N

Kilometres

0 1 2

Figure 2.4

Marine Ecological Monitoring (Intertidal Soft-shore Habitats)

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Date: 11/10/2018

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(a) Survey Location at TCB1

(b) Survey Location at TCB2

(c) Survey Location at TCB3

(d) Survey Location at THW

(e) Horseshoe crab *Carcinoscorpius rotundicauda* recorded at TCB2 during Qualitative Walk-through Survey

(f) Sedimentation Rate Monitoring

Figure 2.5 Representative Photographs Taken during the Impact Soft Shore Ecological Monitoring conducted in September 2018

Date: October 2018

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recorded at each monitoring location, though the abundance / density of intertidal communities was observed to be lowered. Nevertheless, there is no indication of change in composition of intertidal communities during the reporting period.

The mudflat surface levels at the four selected monitoring stations in September 2018 and the corresponding XYZ HK1980 GRID coordinates are presented in *Table 2.12*. When compared with the results obtained during the baseline monitoring as presented in the Baseline Monitoring Report (1), the sediment levels at each monitoring station generally increased. The ET will continue to observe the trend of change in sediment levels over time for further comparison and review.

Table 2.12 Results of Sedimentation Rate Monitoring

Monitoring Station	Northing (m)	Easting (m)	Z level at Sep 2018 (mPD)	Remarks
TCB1	816068.626	811129.309	1.545	Soft mudflat
TCB2	815812.382	810917.245	1.322	Soft mudflat
TCB3	816027.632	810696.839	1.314	Soft mudflat
THW	817472.067	815850.407	1.380	Soft mudflat

The impact monitoring results showed that there was no evidence showing significant change in intertidal communities when compared against the data obtained during baseline monitoring. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in *Annex G3*. The ET will continue to observe the change in density or the distribution pattern of horseshoe crab, seagrass and intertidal soft shore communities taking into account natural fluctuation in the occurrence and distribution pattern such as due to seasonal change.

2.5 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis with the Contractor and ER to monitor the implementation of proper environmental pollution control and mitigation measures for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts under the Project. In the reporting period, four (4) site inspections were carried out on 6, 13, 20 and 26 September 2018.

Key observations during the site inspections are summarized in *Table 2.13*.

(1) ERM (2018b). Op cit.

Table 2.13 Key Observations Identified during the Site Inspection in this Reporting Month

Inspection Date	Environmental Observations	Recommendations/ Remarks
6 September 2018	Ground Investigation (GI) platform (Dong Ah 107) • Stagnant water in drip tray GI platform (Dong Ah 105) • Stagnant water in drip tray • Chemicals without drip tray GI platform (Kong Yeung 88) • Stagnant water in lower deck	GI platform (Dong Ah 107) • The contractor was reminded to clear stagnant water. GI platform (Dong Ah 105) • The contractor was reminded to clear stagnant water; and • The contractor was reminded to place chemicals in drip tray. GI platform (Kong Yeung 88) • The contractor was reminded to clear stagnant water.
13 September 2018	Works Area near Man Tung Road • Accumulated debris at site Pak Mong Pier • Used chemicals at site	Works Area near Man Tung Road • The contractor was reminded to dispose of the accumulated debris. Pak Mong Pier • The contractor was reminded to regularly remove used chemicals.
20 September 2018	Works Area near Ying Tung Estate • A water-filled barrier was found to trap stagnant water • Chemicals without drip tray • Accumulated debris at site • Suspended chemical leakage • Stagnant water in drip tray • Diesel drum without chemical labels Works Area near Century Link • No noise barrier provided when working near residential areas	Works Area near Ying Tung Estate • The contractor was reminded to seal the opening of the barrier to avoid stagnant water; • The contractor was reminded to place chemicals in drip tray; • The contractor was reminded to remove accumulated debris; • The contractor was reminded to cover the ground by canvas and drill on the canvas to avoid soil contamination by chemicals; • The contractor was reminded to clear stagnant water in drip tray; • The contractor was reminded to provide labelling for chemicals. Works Area near Century Link • The contractor was reminded to provide noise barrier when working near residential areas to reduce noise nuisance from construction works.
26 September 2018	Vessel (Tat Fat 11) • Diesel drum without chemical labels • Stagnant water in tyres	Vessel (Tat Fat 11) • The contractor was reminded to provide labelling for chemicals. • The contractor was reminded to clear stagnant water in the tyres.

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

2.6 *WASTE MANAGEMENT STATUS*

The Contractor has registered as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

All dump trucks engaged on site was equipped with GPS during the reporting period. The Surveillance Team of the ET conducted regular site inspection on the dump trucks and their track records. Illegal dumping and landfilling of C&D materials were not recorded during the reporting period.

As informed by the Contractor, wastes generated during this reporting period include mainly imported fill, non-inert construction wastes and recyclable materials. Reference has been made to the waste flow table prepared by the Contractor. The quantities of different types of wastes are summarised in *Table 2.14*. It should be noted that the Contractor voluntarily engaged in tree clearance works after the approach of the Typhoon Mangkhut in mid-September 2018 and hence more non-inert construction wastes were generated in the reporting period.

Table 2.14 Quantities of Different Waste Generated

Month/ Year	Inert C&D Materials [(a)] (m^3)	Imported Fill (m^3)	Inert Construction Waste Re-used (m^3)	Non-inert Construction Waste [(b)] (m^3)	Recyclable Materials [(c)] (kg)	Chemical Wastes (kg)
9 to 31 Jul 18	0	6,665 [(d)]	0	20.7	0	0
1 to 31 Aug 18	0	20,036	0	110.1	96,740	0
1 to 30 Sep 18	0	14,086	0	356.3	11,120	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 and others.
(d) Updated figure is presented.

2.7 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

A summary of the Environmental Mitigation Implementation Schedule is presented in *Annex B*. The necessary mitigation measures were implemented properly for the Project.

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

Results for air quality monitoring (1-hour TSP) complied with the Action/ Limit levels in the reporting period. One (1) Action level exceedance for construction noise was recorded from one (1) environmental complaint related

to noise nuisance. No Project-related Action/ Limit level exceedances were recorded for water quality after preliminary investigation. Results for the soft shore ecological monitoring did not indicate any change in composition of intertidal communities when compared to the baseline monitoring results.

Cumulative statistics on exceedances is provided in *Annex H*.

2.9 *SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS*

There was no notification of summons or prosecution recorded in the reporting period.

One (1) environmental complaint related to noise nuisances at works area near Ying Tung Estate on 11 September 2018 and two (2) environmental complaints related to waste management for the demolition of site offices near Century Link and Man Tung Road on 12 and 26 September 2018 were received during the reporting period. Investigations were conducted for each of the environmental complaints in accordance with the complaint handling process as stated in the Complaint Management Plan.

Based on the information provided by the ER and the Contractor, supplemented the regular/ad-hoc noise monitoring conducted around the Project area, there was no exceedance of noise limit levels and non-compliance was not observed. Nevertheless, the Contractor was reminded to reduce construction noise levels, as far as practicable, especially when working next to the residential areas around the Project. No construction works in the evenings / restricted hours would be allowed without a valid Construction Noise Permit. The ET will continue to check the implementation status of the mitigation measures and conduct noise monitoring as per EM&A requirements.

Based on the information provided by the ER and the Contractor, supplemented the regular/ad-hoc site inspections conducted around the Project area, it was observed that the Contractor had fulfilled the requirements as stated in the Waste Management Plan to maintain temporary stockpiles and implemented trip-ticket system to ensure Construction and Demolition (C&D) materials were disposed properly. The Contractor also followed the waste management hierarchy as stated in the Waste Management Plan in handling the waste generated from the site clearance work for the site offices. Relevant waste materials from the site offices were reused, recovered and recycled where applicable. Nevertheless, the Contractor was reminded to implement all relevant mitigation measures of waste management implications and follow the requirements as stated in the approved Waste Management Plan. The ET will continue to check the construction works and the implementation status of the mitigation measures.

Statistics on complaints, notifications of summons, successful prosecutions are summarised in *Annex H*.

3 FUTURE KEY ISSUES

3.1 CONSTRUCTION PROGRAMME FOR THE COMING MONTH

As informed by the Contractor, the major works for the Project in October 2018 will be:

Land-based Works:

- Erection of chain link fence at Area 58;
- Removal of rock armour above +2.5mPD; and
- Preparation works for diversion of existing box culvert.

Marine-based Works:

- Installation of pipe piles and sheet piles for ground investigation and wave protection measures;
- Removal of rock armour below +2.5mPD;
- Installation of silt curtain near Tai Ho Wan;
- Laying of geotextile and sand blanket and ground improvement works for reclamation works and Deep Cement Mixing (DCM) trial embankment;
- Marine filling works;
- Diversion of existing box culvert; and
- Marine ground investigation works.

3.2 KEY ISSUES FOR THE COMING MONTH

Potential environmental impacts arising from the above upcoming construction activities in the next reporting period of October 2018 are mainly associated with noise from barge and plant operation during normal working hours and restricted hours, elevation in SS due to sediment loss from sand blanket laying and marine filling works, disturbance to Chinese White Dolphin (CWD) during marine works, and waste management for C&D materials. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures. The ET will also recommend to the Contractor about the environmental toolbox topics on the abovementioned key issues for the coming month.

3.3 MONITORING SCHEDULE FOR THE COMING MONTH

The tentative schedules for environmental monitoring in October 2018 are provided in *Annex I*.

This EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 to 30 September 2018 in accordance with the Updated EM&A Manual and the requirements of the Environmental Permit (*EP-519/2016)*.

Air quality (1-hour TSP), noise, water quality (DO, turbidity and SS) and soft shore ecological monitoring were carried out in the reporting period.

Results for 1-hour TSP complied with the Action and Limit levels in the reporting period. One (1) Action level exceedance for construction noise was recorded from one (1) environmental complaint related to noise nuisance in the reporting period. No Project-related Action/ Limit level exceedances were recorded for water quality after preliminary investigation. Results for the soft shore ecological monitoring did not indicate any change in composition of intertidal communities when compared to the baseline monitoring results.

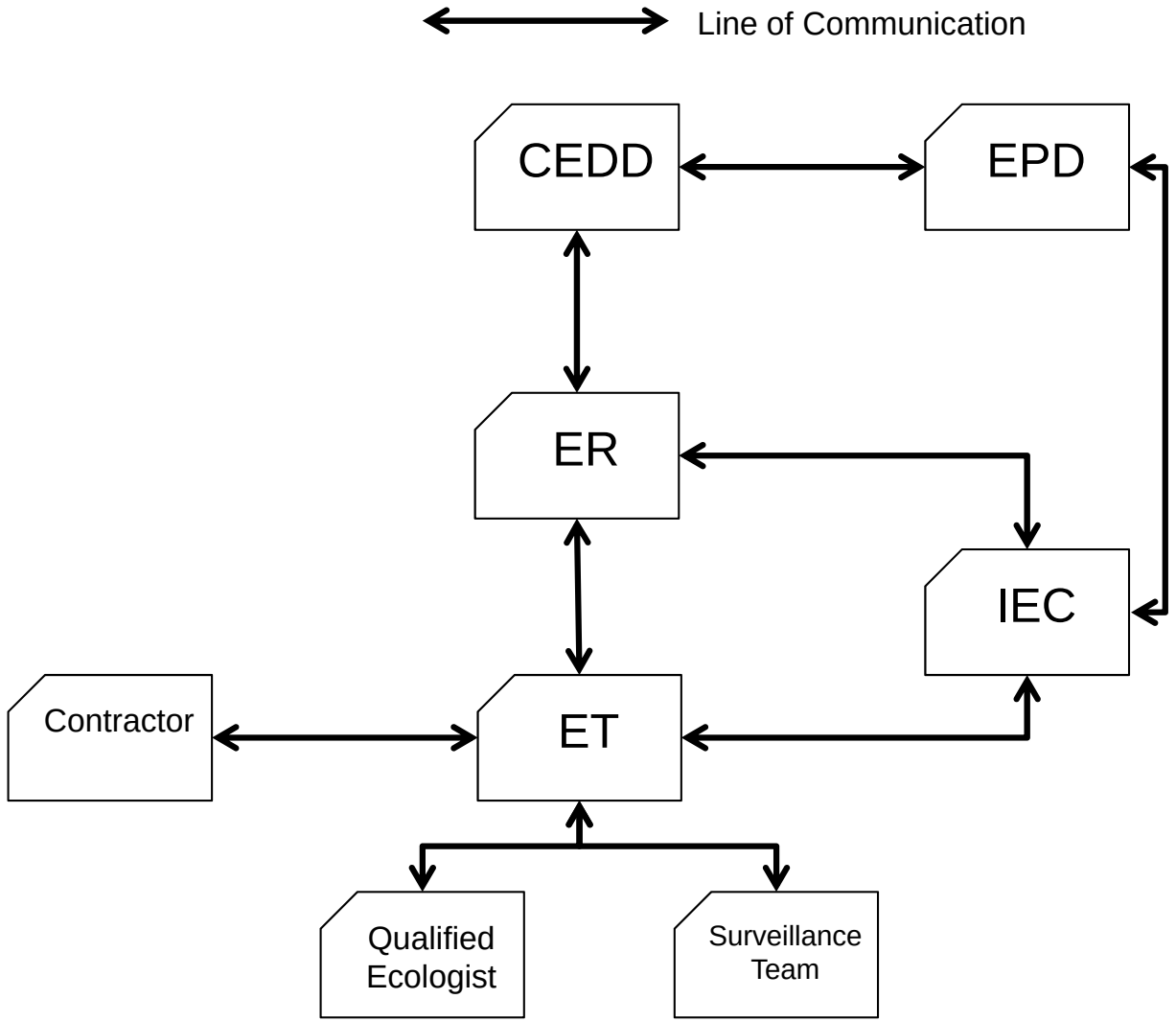
Environmental site inspections were carried out during the reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site inspections.

There was no notification of summons or prosecution recorded in the reporting period. One (1) environmental complaint related to noise nuisances at works area near Ying Tung Estate and two (2) environmental complaints related to waste management for the demolition of site offices near Century Link and Man Tung Road were received on 11, 12 and 26 September 2018 during the reporting period. Investigations were conducted for each of the environmental complaints in accordance with the complaint handling process as stated in the Complaint Management Plan.

The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Annex A

Project Organisation


Line of Communication
CEDD
EPD
ER
IEC
Contractor
ET
Qualified Ecologist
Surveillance Team

Annex B

Environmental Mitigation Implementation Schedule

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Common Mitigation Measures (Applicable to ALL Project Components, including DPs and Non-DPs)							
Construction Dust Impact							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	• APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		• A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens,					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	• TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m^2 on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
Operational Noise (Road Traffic Noise)							
S4.5.4	N5	Provide a series of noise mitigation measures including low noise surfacing material, noise barriers, facades with no openable window, school boundary walls and architectural fins before occupation of the protected NSRs. Locations of noise mitigation measures are stated as following: Year 2023: • Facade with no openable window at B1-1 and B1-2 for TCE; TCV-6 for TCW • 1.5m long architectural fin at B1-1 and B1-2 for TCE • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45^{o} at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 Year 2025: • Facade with no openable window at B1-1, B1-2, D1-1,	Reduce operation noise from road traffic	Relevant government departments / Private developers	Refer to Figure 6.1, Figure 6.1a-b, Figure 6.2, Figures 6.2a-b, Figure 6.3, Figures 6.3a-d, Figure 6.4, and Figures 6.4a-e	Prior to operation of the Project for existing NSRs. While for mitigation measures to protect planned NSRs, it should be constructed before population intake of planned NSRs.	• TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		D1-2, D2-3 and D2-4 for TCE; TCV-6 for TCW • 1.5m long architectural fin at B1-1, B1-2 and D2-4 for TCE; TCV-1 for TCW • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45º along Road L3 • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45º at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 Year 2027: • Facade with no openable window at A1-1, A1-2, A2-1, A2-2, A2-3, A2-4, B1-1, B1-2, D1-1, D1-2, D2-3 and D2-4 for TCE; TCV-6 for TCW • 1.5m long architectural fin at A2-1, A2-4, B1-1, B1-2 and D2-4 for TCE; • 1.8m long architectural fin at A1-1, A1-2, A2-1 and A2-4 • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45º along Road L3 • Approx. 50m long, 4m high school boundary wall at					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45^{o} at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 Year 2045: • Facade with no openable window at A1-1, A1-2, A2-1, A2-2, A2-3, A2-4, B1-1, B1-2, C1-1, C2-1, C2-2, D1-1, D1-2, D2-3, D2-4, E1-4 and E1-5 for TCE; TCV-1 and TCV-6 for TCW • 1.5m long architectural fin at A2-1, A2-4, B1-1, B1-2, C1-1 and D2-4 for TCE; TCV-1 for TCW • 1.8m long architectural fin at A1-1, A1-2, A2-1, A2-4 and C1-1 • Approx. 100m long, 5m high absorptive vertical barrier along Road D3 • Approx. 50m long, 5m high absorptive vertical barrier with 3m cantilevered arm at 45^{o} along Road L7 • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45^{o} along Road L3 • Approx. 80m long, 4m high school boundary wall along Road L2 • Approx. 40m long, 3m high school boundary wall along Road L2					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		• Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45º at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30					
Operational Noise (Fixed Noise)							
S4.6.4	N6	For existing and planned NSRs which are located near to the proposed noise sources, the following tentative noise mitigation measures are considered: • All the pumps should be enclosed inside building structures; • Proper selection of quiet plant to reduce the tonality at NSRs; • Installation of silencer / acoustic enclosure / acoustic louvers for the exhaust of ventilation system. • For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts. • Openings of ventilation system should be located away from NSRs.	Reduce operation fixed noise	Relevant government departments / Future Operator	All plant rooms where practicable	Prior to operation of the Project	• Noise Control Ordinance and its TM, TM-EIAO
Operational Noise (Rail Noise)							

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
S4.8.4	N7	Before Phase 1 is occupied: • Facade with no openable windows for residential block at B1-2 • 1.5m long architectural fin at B1-2 Before Phase 3 is occupied: It should be noted that Railway Stations at TCE and TCW and its associated railway system is a Designated Project under Item A.2 of Schedule 2 of TM-EIAO. Hence, the proposed mitigation measures are tentative for cumulative assessment purpose in this EIA and all the mitigation measures will be revised by the railway operator during their Schedule 2 EIA. • Approx. 325m long, semi enclosure along the tracks of Tung Chung Line facing B0-2 and COM-1 • Approx. 210m long, semi enclosure along the tracks of Tung Chung Line facing A1-2 and C1-1 • Approx. 390m long, semi enclosure along the track of Tung Chung Line to Tung Chung direction facing C1-1 to C2-1 • Approx. 630m long, semi enclosure along the track of Tung Chung Line to Hong Kong direction facing C1-1 and C2-1	Reduce operation rail noise	Relevant government departments / Future Operator	Refer to Figure 6.1, Figure 6.1a-b, Figure 6.2, Figures 6.2a-b, Figure 6.3, Figures 6.3a-d, Figure 6.4, and Figures 6.4a-e	Prior to final population intake	• Noise Control Ordinance and its TM, TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Water Quality (Construction Phase)							
S5.4.3	W1	<u>*General Construction Activities*</u> In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below: • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	• Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction; • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		directed into foul sewers; • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		receivers nearby;and • Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea.					
S5.4.3	W2	*Sewage from workforce* • Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; • Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site.	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	• Water Pollution Control Ordinance • TM-DSS
S5.4.3	W3	*Construction Works and Bridge Works near Tung Chung Stream* • Use precast structures or other similar approaches	To prevent any construction works in river and avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.4.3	W4	*Construction Works of Sewage Pumping Stations* • A buffer zone of about 20m or about 30m will be zoned to	To avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where	Construction stage	• ProPECC PN1/94

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		prevent any construction works near river.			practicable		
S5.4.3	W5	*Construction Work of Fresh Water and Salt Water Reservoirs* • Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage.	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.4.3	W6	*Construction of Storm Water Management Facilities and Polder Scheme* • Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage.	To avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.4.3	W7	*Groundwater and Runoff for Tunnel Works* • Cut-and-Cover method for the underpass at Road D1 in Tung Chung East to minimise the intrusion of groundwater. Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage.	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.5.8	W8	*Good Management Practice in Construction Phase* The following good site management practices shall be adopted for the filling works: • Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; • The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over-dredging; • A perimeter silt curtain shall be installed during the entire	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • 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.					
S5.5.8	W9	• The recovered C&D materials for filling would be ensured no floating or non-inert material by visual inspection, quality assurance, etc.	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Water Quality (Operational Phase)							
S5.6.10	W10	The following mitigation measures will be implemented to TCV East, North and West SPS, upgraded CMRSPS, proposed TCE West SPS and TCE East SPS • 100% standby pump capacity with spare pump of 50% pump capacity • Dual-feed power supply • Wet well storage providing up to 6-hours ADWF capacity (equivalent to about 4 hours of response time during peak flow condition); and • Emergency communication mechanism amongst relevant government departments.	To prevent the impact due to the emergency discharge at TCW and TCE	DSD	Proposed Sewage Pumping Station at TCW and TCE	Operational Stage	• DSD's Sewerage Manual
S5.6.10	W11	The following mitigation measures will be implemented to gravity sewers and rising mains • Adopt high density polyethylene (HDPE) pipe for proposed gravity sewers and rising mains. • Further protection on proposed rising mains with concrete surround will be provided to mitigate the risk of bursting.	To minimize the risk of bursting and hence bursting discharge from gravity sewers and rising mains	DSD	Proposed rising mains within TCE and TCW	Operational Stage	-
S5.6.10	W12	*Maintenance Dredging for the Proposed Marina* Silt curtain should be deployed to reduce the sediment dispersion from the dredging inside the marina.	To reduce the sediment dispersion	Future operator	Proposed marina at TCE	Operational Stage	-

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Sewage and Sewerage Treatment Implications							
S6.5.4	SS1	*Emergency Discharge of Proposed TCV West SPS, TCV East SPS, TCV North SPS and Upgraded CMRSPS* The following mitigation measures will be implemented to TCV East, North and West SPS, and upgraded CMRSPS: • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments.	To prevent the impact due to the emergency discharge at TCW	DSD	Proposed Sewage Pumping Station at TCW	Operational stage	N/A
S6.5.4	SS2	*Emergency Discharge of Proposed TCE West SPS and TCE East SPS* In order to minimize the impact due to the emergency discharge, the following precautionary measures shall be included in the design of sewage pumping station: • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant	To minimize the impact due to the emergency discharge at TCE	DSD	Proposed Sewage Pumping Station at TCE	Operational stage	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		government departments.					
S6.5.4	SS3	The following mitigation measures will be implemented to prevent pipe bursting on Rising Mains within TCE and TCW: • Strong pipe – use HDPE pipe with welded joints • Concrete encasement – concrete surround all rising mains	To minimize the risk of bursting and hence bursting discharge from gravity sewers and rising mains	DSD	Proposed rising mains within TCE and TCW	Operational stage	N/A

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Waste Management (Construction Waste)							
S7.4.1	WM1	<u>Good Site Practices</u> The following good site practices are recommended throughout the construction activities: • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted.	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	• Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
S7.4.1	WM2	<u>Waste Reduction Measures</u> Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction: • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.	Reduce waste generation	Contractor	All construction sites	Construction stage	• Waste Disposal Ordinance
S7.4.1	WM3	<u>Storage of Waste</u> The following recommendation should be implemented to minimize the impacts: • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions;	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
S7.4.1	WM4	<u>Collection and Transportation of Waste</u> The following recommendation should be implemented to minimize the impacts: • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities.	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	• Waste Disposal Ordinance
S7.4.1	WM5	<u>Excavated and C&D Materials</u> Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials: • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; The recommended C&D materials handling should include:	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		• On-site sorting of C&D materials • Reuse of C&D materials • Use of Standard Formwork and Planning of Construction Materials purchasing					
S7.4.1	WM6	Provision of Wheel Wash Facilities Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM7	Excavated Contaminated Soil As a precaution, it is recommended that standard good site practice should be implemented during the construction phase to minimize any potential exposure to contaminated soils or groundwater.	Remediate contaminated soil	Contractor	All construction sites where applicable	Construction stage	• Practice Guide for Investigation and Remediation of Contaminated Land
S7.4.1	WM8	Excavated Marine Sediments Reference has been made to the sediment testing results. Possible mitigation measures to handle the contaminated/ uncontaminated sediment are summarized as follows. • All construction plant and equipment shall be designed and maintained to minimise the risk of silt, sediments, contaminants or other pollutants being released into the water column or deposited in the locations other than designated location. • All vessels shall be sized such that adequate draft 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. • Adequate freeboard shall be maintained on barges to	Handle excavated sediment	Contractor	All construction sites where applicable	Construction stage	• ETWB-TCW 34/2002

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		ensure that decks are not washed by wave action.					
S7.4.1	WM9	<u>Dumping of excavated sediment</u> • Keep and produce logs and other records to demonstrate compliance and ensure journeys are consistent with designated locations • Comply with the conditions in the dumping permit. • All bottom dumping vessels (hopper barges) shall be fitted with tight fittings seals to their bottom openings to prevent leakage of material. • The excavated sediment shall be placed into the disposal pit by bottom dumping. • Contaminated marine mud shall be transported by split barge of not less than $750m^3$ capacity and capable of rapid opening and discharge at the disposal site. • Discharge shall be undertaken rapidly and the hoppers shall be closed immediately. Sediment adhering to the sides of the hopper shall not be washed out of the hopper and the hopper shall remain closed until the barge returns to the disposal site. • For Type 3 special disposal treatment, sealing of contaminant with geosynthetic containment before dropping into designated mud pit. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping at the disposal site, thereby fulfilling the requirements for fully confined mud disposal.	Handle excavated sediment	Contractor	All construction sites where applicable	Construction stage	• ETWB-TCW 34/2002
S7.4.1	WM10	<u>Chemical Waste</u>	Control the chemical waste and ensure proper	Contractor	All construction	Construction stage	• Waste Disposal

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	storage, handling and disposal.		sites		(Chemical Waste) General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<u>General Refuse</u> • General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. • Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. • A reputable waste collector should be employed to remove general refuse on a daily basis.	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	• Waste Disposal Ordinance
S7.4.1	WM12	<u>Floating Refuse accumulated along the seawall</u> The floating refuse along seawall should be collected to avoid accumulation. In addition, proper seawall design should be employed, and regular checking and cleaning of floating refuse should be implemented.	Control floating refuse and ensure proper disposal	Contractor	Construction sites along seawall	Construction stage	• Waste Disposal Ordinance
Waste Management (Operational Waste)							
S7.4.2	WM13	<u>Illegal dumping and landfilling</u>	Prevent waste from	Relevant	All	Operational stage	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		As a Development Permission Area (DPA) plan will be issued by the Town Planning Board as a temporary measure before the formal Outline Zoning Plan (OZP) for Tung Chung New Town Extension is adopted, statutory right to guide and control the development and use of land would be authorised. Should there be illegal dumping and landfilling observed/ reported on nearby farmlands and riverbanks, the government authority should take all necessary actions including but not limited to prosecution to remediate the circumstances.	illegal dumping and landfilling	government departments	construction sites		
S7.4.2	WM14	<u>Municipal Solid Waste</u> • A reputable waste collector should be employed to remove general refuse on a daily basis. • A 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers.	Remove general refuse generated from the proposed development	FEHD/ Relevant Operators	All construction sites	Operational stage	• Waste Disposal Ordinance
S7.4.2	WM15	<u>Chemical Waste</u> • Localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas. • A licensed collector should be employed for the chemical waste collection and the chemical wastes should be disposed at an appropriate facility, such as Chemical Waste Treatment Centre (CWTC) in Tsing Yi. • Collection receipts issued by the licensed collector showing the quantities and types of chemical waste taken off-site and details of the treatment facility should be kept for record.	Reduce chemical waste due to waste handling	Contractors/ Relevant Operators	All construction sites	Operational stage	

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
S7.4.2	WM16	<u>Floating Refuse accumulated along seawall</u> • The floating refuse along seawall should be collected to avoid accumulation.	Control floating refuse and ensure proper disposal	MD	Along seawall	Operational stage	• Waste Disposal Ordinance
S7.4.2	WM17	<u>Floating Refuse inside Marina</u> • Floating refuse at the marina will be collected and disposed by the licensed waste collector and as required.	Reduce floating refuse washing up onto marina by currents and wind	Future operator	Marina	Operational stage	• Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Land Contamination							
S8.4.1	LC1	Undertaking environmental Site Inspection (SI) for all potentially contaminated sites as listed in the Contamination Assessment Plan (CAP).	Verify the land contamination potential before the commencement of construction	Project Proponent / Detailed Design Consultant / Private developer	All potentially contaminated sites as listed in the CAP	Prior to the construction stage	• Annex 19 of the TM-EIAO, Guidelines for Assessment of Impact On Sites of Cultural Heritage and Other Impacts (Section 3 : Potential Contaminated Land Issues); • Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management; • Guidance Notes for Contaminated Land Assessment and Remediation; and • Practice Guide for Investigation and Remediation of Contaminated Land

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
							• Recommendations in Health Risk Assessment
S8.4.2	LC2	Re-appraisal would be required for the surveyed sites, other remaining areas of the PDAs and the works areas for the associated infrastructures because the development of these sites/ areas would only commence a number of years later, which may allow changes in the land usage of these sites and may give rise to potential land contamination issues. The Project Proponent's appointed consultant would prepare a supplementary CAP presenting the findings of the re-appraisal and strategy of the recommended SI, if required, and submit to EPD for review and approval.	To assess the latest site situation and identify any potential additional hot spots and contaminated sites.	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining areas of the PDAs and works areas for the associated infrastructures	Prior to the construction stage	Ditto
S8.5	LC3	After approval of the supplementary CAP and upon completion of the SI works, the PP should prepare and submit a Contamination Assessment Report (CAR) for all potentially contaminated sites listed in the CAP to EPD for agreement.	Present the findings of SI and evaluate the level and extent of potential contamination	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining areas of the PDAs and works areas for the associated infrastructures	Prior to the construction stage	Ditto
S.8.5	LC4	Preparation and submission of Remediation Action Plan (RAP) to EPD for agreement if land contamination is confirmed.	Recommend appropriate mitigation measures for the contaminated soil and groundwater identified in the	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining	Prior to the construction stage	Ditto

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
			assessment if remediation is required		areas of the PDAs and works areas for the associated infrastructures		
S.8.5	LC5	Preparation and submission of Remediation Report (RR) to EPD for agreement.	Demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining areas of the PDAs and works areas for the associated infrastructures	Prior to the construction stage	Ditto

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Ecology (Design Phase)							
S9.8.1	EC1	Development under the Project have avoided all the recognised sites of conservation importance, including Country Parks,	To protect the recognised sites of conservation importance and habitats inside	PlanD	TCW	RODP	• Not available
S9.8.1	EC2	About 30m buffer zone at the two main branches and the joined outlet section of Tung Chung Stream; and about 20m buffer for the major tributary at Ngau Au of Tung Chung Stream	To protect the Tung Chung Stream	PlanD	Tung Chung Stream	RODP	• Not available
S9.8.2	EC3	Detailed designs should avoid the encroachment of important habitats (e.g. Fung Shui Wood) within the Project Site	To protect the important habitats within Project Site	PlanD	TCW	Design Phase	• Not available
S9.8.2	EC4	Detailed designs of noise barriers to prevent bird collision	To prevent bird collision	HyD	Noise barriers	Design Phase	• Guidelines on Design of Noise Barriers
S9.8.2	EC5	Measures and suitable designs of sewage pumping stations to prevent emergency discharge accidents in TCE and TCW • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments.	To protect the water bodies from impacts due to emergency discharge in TCE and TCW	DSD	Proposed and Upgraded Sewage pumping stations at TCE and TCW	Design Phase	• DSD standards

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Ecology (Construction Phase)							
S9.8.2	EC6	Adoption of non-dredged reclamation method	To maintain the marine water quality	Contractor	Reclamation area of TCE and Road P1	Construction phase	• EIA • Contractual requirements
S9.8.3	EC7	Compensation woodland planting	To compensate loss of woodland, fung shui wood and orchard	Contractor	Uphill of Sheung Lei Pai FSW and Tung Chung Road	Construction phase	• EIA • Contractual requirements
S9.8.3	EC8	Planting of emergent plant	To provide habitats for this Jhora Scrub Hopper, and to compensate the loss of their habitats (wet abandoned agricultural land) in northern section of Fong Yuen	DSD / Contractor	Inside the future River Park	Construction phase	• EIA • Contractual requirements
S9.8.3	EC9	Capture-and-translocation exercise	Minimize the potential impact to amphibian species of conservation importance including Romer's Tree Frog and Chinese Bullfrog due to site formation	For public works, provided by the government departments responsible for the construction of those public works or the site formation works . For TCV-1 and	Public works near the eastern branch of Tung Chung Stream, in particular 1) the River Park, 2) the Distributor Road along	Capture-and-translocation exercise before commencement of site formation	• EIA • Contractual requirements • Explanatory statement of the OZP (for private lots)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
				TCV-5, where the lands within mostly belong to private lots, the future project proponents of those private lots, via the established mechanism for land transaction application.	the eastern branch of Tung Chung Stream, 3) the road upgrade along the existing Shek Mun Kap Road, and 4) the attenuation and treatment ponds in TCV-k, TCV-e, TCV-l, TCV-c, and TCV-n. Also be required in private lands in TCV-1 and TCV-5		
S9.8.3	EC10	Preservation and/or Transplantation of plant species of conservation importance and the following monitoring of preserved/transplanted plant individuals	Protection of plant species of conservation importance	For public works, provided by the government departments responsible for the construction of those public works or the site formation works.	Within construction sites All areas for public works Also be required in private lands	For preservation and/or transplantation, before commencement of site formation.	• EIA • Contractual requirements • Explanatory statement of the OZP (for private lots)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
				For TCV-1, where the lands within mostly belong to private lots, the future project proponents of those private lots, via the established mechanism for land transaction application.	in TCV-1.		
S9.8.3	EC11	Defining and maintaining construction site boundaries (including erection of site hoarding, fences etc.)	Screen construction disturbance to the nearby habitats	Contractor	Along the boundary of construction sites and buffer zones of Tung Chung Streams, along the boundary of mature woodland and Fung Shui Wood, and along the boundary between TCV-6 and the middle section of Fong Yuen	Before commencement of site formation	• EIA • Contractual requirements
S9.8.3	EC12	Protection of Tung Chung Stream	Minimize the potential water pollution due to	Contractor	Within construction	Construction	• EIA

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
			construction of road crossings or other works near Tung Chung Stream		sites	phase	• Contractual requirements
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	• EIA • Contractual requirements
S9.8.4	EC14	Adopting Eco-shoreline design	To mitigate the impact of the marine loss	CEDD	Along future seawall	Construction stage	• EIA • Contractual requirements
S9.8.4	EC15	Strict enforcement on no-dumping	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	• EIA • Contractual requirements
S9.8.4	EC16	Spill response plan	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	• EIA • Contractual requirements
S.9.8.4	EC17	Control and minimization of marine traffic by including using larger-sized barges, land transportation of materials, reuse of excavation and C&D materials and speed limits &	Reduce marine traffic	Contractor	In reclamation area as well	Construction phase	• EIA • Contractual

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		regular routes of works vessels			as all works area and travel route of works vessels		requirements
S9.8.4	EC18	Dolphin exclusion zone and dolphin watching plan	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	• EIA • Contractual requirements
S9.8.4	EC19	Speed limits and regular routes of works vessels; Prepare and submit a "Works Vessel Travel Route Plan"	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	• EIA • Contractual requirements
S9.11.1	EC20	Monitoring of compensatory planting woodland	Monitor the survival of trees and establishment of the woodland	CEDD/ Contractor	Areas of compensatory woodland planting	Quarterly for 3 years after completion of planting works	• EIA • Contractual requirements
S9.11.1	EC21	Monitoring of translocated amphibians	Monitor the effectiveness of the translocation programme	Public works: Responsible government departments / Contractor Private lots: Private developers	Release sites for translocated amphibians	After translocation exercise. At least three surveys in each release site during the breeding season, preferably monthly between April and June,	• EIA • Contractual requirements • Explanatory statement of the OZP (for private lots)
S9.11.1	EC22	Monitoring of preserved / transplanted plant species	Monitor and evaluate	Public works:	Construction	After	• EIA

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
			the effectiveness of the preservation and transplantation programme.	Responsible government departments / Contractor Private lots: Private developers	sites for preserved plants; recipient sites for transplanted plants	transplantation or preservation. For transplanted individuals, for two years, monthly for the first year, and then quarterly for the second year. For the preserved individuals, monthly throughout the construction.	• Contractual requirements • Explanatory statement of the OZP (for private lots)
S9.11.1	EC23	Monitoring of Tung Chung Stream and Wong Lung Hang Stream EISs	Protect the EISs	Contractor	Tung Chung Stream and Wong Lung Hang Stream	Construction phase and post-construction phase	• EIA • Contractual requirements
9.11.2	EC24	Monitoring of Tung Chung Bay and Tai Ho Wan	Protect Tung Chung Bay and Tai Ho Wan	Contractor	Tung Chung Bay and Tai Ho Wan	Construction phase and post-construction phase	• EIA • Contractual requirements
Ecology (Operational Phase)							
S9.11.1	EC25	Monitoring of emergent plant inside River Park	Monitor the survival of emergent plant	DSD/ Contractor	Three months after completion of planting in future River Park	Quarterly for 2 years after completion of planting works	• EIA • Contractual requirements

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
9.11.2	EC26	Eco-shoreline monitoring	Monitor the colonisation and establishment of fauna and/or flora, water quality, and recruitments of fisheries species	CEDD/ Contractor	Eco-shoreline at TCE PDA reclamation	Post-construction phase, twice in wet and dry seasons respectively, at least 3 years, subject to review	• EIA • Contractual requirements

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

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Fisheries							
S10.8	F1	Good Site Practices	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	• EIA • Contractual requirements
S10.8	F2	No dumping	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	• EIA • Contractual requirements
S10.8	F3	Spill response plan	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	• EIA • Contractual requirements
S10.9	F4	Follow the mitigation measures proposed in the water quality assessment for the construction and operation phases of the project.	To protect the fisheries resources	Contractor	Waters in Northern Lantau	Construction phase and operation phase	• EIA • Contractual requirements
S10.9	F5	Follow the mitigation measure of eco-shoreline in ecology chapter for the construction and operation phases of the project.	To enhance the fisheries resources	Contractor	Eco-shorelines	Construction phase and operation phase	• EIA • Contractual requirements

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
Landscape and Visual (Construction Phase)							
S11.7 MM1	LV1	Optimisation of Construction Areas & Providing Temporary Landscape on Temporary Construction – Construction areas' control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised. It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
S11.7 MM2	LV2	Minimize Topographical Change – The footprint of construction elements and temporary works areas should be optimised to reduce topographical/ landform changes, as well as reduce land take and interference with natural terrain. Where there is a need to significantly cut into the existing landform, retaining walls and cut slopes should be considered as appropriate. To minimize landform changes and land resumption, earthworks and engineered slopes should be designed to be a visually interesting, compatible with the surrounding landscape and to mimic the natural contouring and terrain as appropriate.	Reduce topographical changes and minimize land resumption	Relevant Government Departments / Private Sector	Through-out TCW area	Prior to Construction & Construction Phase	• GEO Publication No/1/2011, Technical Guidelines on Landscape Treatment for Slopes
S11.7 MM3	LV3	Preservation of Potentially Registerable OVTs, Rare and Protective Vegetation – Exiting trees to be retained within the Project Site should be carefully protected during construction. In particular Potentially Registerable OVTs are considered to be preserved according to ETWB	Protect and Preserve Trees	Relevant Government Departments / Private Sector	Onsite, particularly for TCW area	Prior to Construction & Construction Phase	• ETWB TC(W) No.29/2004 and DEVB TC(W)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
		Technical Circular (Works) No. 29/2004. Rare and Protective Vegetation shall be protected following Forestry Regulations (Cap.96) and Protection of Endangered Species of Animals and Plants Ordinance (Cap.586). Detailed Tree Protection Specification shall be provided in the Contract Specification according to DEVB TCW No. 10/2013 Tree Preservation. Following DEVB (GLTM) Guidelines for Tree Preservation during Development, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained.					No.10/2013. • Greening, Landscape and Tree Management Section (GLTM) of the Development Bureau, Guidelines on Tree Preservation during Development (April, 2015)
S11.7 MM4	LV4	Transplanting of Existing Trees – Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor locations within the site and not held in a temporary nursery as far as possible. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with DEVB TCW 10/2013 and LAO PN 7/2007 and final locations of transplanted trees should be agreed prior to commencement of the work. For trees associated with highways e.g. roadside planting	Transplant Trees where suitable for transplantation	Relevant Government Departments / Private Sector	Onsite where possible, otherwise consider offsite locations	Prior to Construction & Construction Phase	• DEVB TC(W) No.10/2013 and LAO PN7/2007 • HyD HQ/GN/13 Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
		along highways, that are unavoidably affected and should be transplanted. HyD HQ/GN/13 'Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit' should be referred to.					Ambit • GLTM of the Development Bureau, Guidelines on Tree Preservation during Development (April, 2015)
S11.7 MM5	LV5	Screen hoarding – To reduce negative visual impact, construction site hoarding should be erected around the site to screen pedestrian level views into the construction area from visual sensitive receivers. Hoarding design should consider greening measures such as colour and form should be adopted to improve its visual appearance.	To screen undesirable views of the work site.	Relevant Government Departments / Private Sector	Through-out TCW and TCE areas	Construction Phase	
S11.7 MM6	LV6	Adopting Non-dredge Method for the Reclamation – In order to minimize the potential adverse impacts caused by the reclamation, a number of alternative construction methodologies has been critically examined. After considering all the options such as fully dredged, partially dredged and non-dredged methods for seawall construction and reclamation, non-dredged method for both the seawall construction and reclamation are recommended so as to minimize the generation of dredged sediment.	Minimize the potential adverse impacts caused by the reclamation	Relevant Government Departments / Private Sector	Through-out TCE area	Construction Phase	• Foreshore and Sea-bed (Reclamations) Ordinance (Cap.127)
S11.7 MM7	LV7	Protection of Natural Rivers and Streams – For all the natural rivers and streams inside the development area, in accordance with ETWB TCW 5/2005, consideration of protection measures should be made to minimize any impacts from the construction works, especially those	Protection of Natural Rivers and Streams Minimize the impacts from the construction works	Relevant Government Departments / Private Sector	Through-out TCW area	Prior to Construction & Construction Phase	• EPD ProPECC PN1/94 Construction Site Drainage. • DSD Technical

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
		development near Tung Chung Stream. According to the latest RODP, a 30m buffer zone will be zoned as "CA". Precast structures or other similar approaches will be used to prevent / minimise any construction works in river and thus to avoid any direct water quality impact. Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters.					Circular No. 2/2004. • ETWB TC(W) No.5/2005 Protection of natural streams/rivers from adverse impacts arising from construction works
S11.7 MM8	LV8	Preservation of Natural Coastline – The natural coastline along the proposed "RO" of the RODP in TCW should be preserved. The remaining natural shorelines in Tung Chung Bay including sandy shores close to the Tung Chung old pier will be conserved as a Waterfront Park according to the latest RODP.	Preservation of Natural Coastline	Relevant Government Departments	Onsite where possible	Prior to Construction & Construction Phase	
S11.7 MM9	LV9	Providing Natural Rock Material/ Planting for Artificial Seawall – There would be inevitable permanent losses of marine waters (seabed and water column), and direct impacts on existing artificial seawalls due to the reclamation. To minimize the impacts, the design of the future seawall like 'eco-shoreline' could be improved to provide high ecological functions and mitigate the impact of the loss. An 'eco-shoreline' is any shoreline which provides beneficial functions to the local ecosystem through a range of active or passive solutions, whilst providing coastal protection. By means of using natural rock materials for artificial seawall and considering to introduce a native vegetation buffer directly behind the top of seawalls as appropriate to create habitat, shelter and a source of food	Mitigate the impacts on existing artificial seawalls	Relevant Government Departments	Onsite where possible	Prior to Construction & Construction Phase	

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
		for benefiting both terrestrial and aquatic species along the foreshore, these measures can help to enhance the ecological functions and 'natural-look' of the shoreline, and the potential impacts will be mitigated.					
Landscape and Visual (Operational Phase)							
S11.7 MM10	LV10	Compensatory Planting – Compensatory planting for felled trees shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Removal Application process under DEVB TCW No. 10/2013 and LAO PN 7/2007. The location of compensatory planting is proposed at the potential open areas such as open spaces, amenity areas, open areas of the streetscapes including roadside planting, as well as the open areas within development lots. The species to be planted should be all native species, taken "Characteristics of Major Local Tree Species Propagated by AFCD" as a reference. A search of species to be planted will be conducted in a further detailed stage.	Compensate for trees and shrubs lost due to the Project	Relevant Government Departments / Private Sector	Onsite where possible, particular-ly for TCW area	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• DEVB TC(W) No.10/2013 and LAO PN 7/2007. • GLTM of the Development Bureau, Guidelines on Tree Preservation during Development (April, 2015)
S11.7 MM11	LV11	Woodland Restoration – A search of area to mitigate the loss of woodland has been conducted. Priority has been given to the practicability of compensation of woodland within the boundary of RODP. Given the nature of the project is to provide development opportunities to satisfy the needs for the society in general and the aspirations of local communities, compensation of woodland is only possible for the areas beyond the RODP. It is considered that the areas adjoining the woodlands near the existing services reservoirs, and hillsides to the east of Tung Chung Road, would be suitable locations. The advantage of these locations is that there are existing woodlands immediately	Reprovide areas of woodland to compensate for those areas of quality woodland lost	CEDD /AFCD	In areas identified and as agreed with AFCD	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• DEVB Technical Circular Works 10/2013- Tree Preservation • GLTM of the Development Bureau, Guidelines on Tree Preservation

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		downhill to the location and the Sheung Ling Pei Fung Shui Wood is further downhill behind Sheung Ling Pei Village, planting new woodland areas adjoining existing woodlands would form an ecological linkage and increase the overall habitat size, and hence would help to enhance the ecological and landscape values in the long run. It is noted that the compensation trees for landscape impacts will also be planted near the future service reservoirs. The tree species to be planted should be all native species for woodland compensation, and the two areas uphill to Sheung Ling Pei should also make reference to the existing tree species reported in Fung Shui Woods habitat.					during Development (April, 2015)
S11.7 MM12	LV12	Screen Planting – Tall screen/buffer trees and shrubs should be planted to screen proposed structures such as roads and buildings. This measure will form part of the compensatory planting and will improve compatibility with the surrounding environment and create a pleasant pedestrian environment.	To screen proposed structures Improve compatibility with the surrounding environment	Relevant Government Departments	Through-out the working sites of the TCW and TCE areas	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• HyD HQ/GN/15– Guidelines for Greening Works along Highways.
S11.7 MM13	LV13	Roadside Planting – Roadside greening is proposed alongside all roads within the possible developments. It will enhance local identity, if theme planting is used, and reduce visual impact through screening. At-grade road planting should be considered along central dividers and on road islands e.g. in the middle of roundabouts.	Soften the hard, straight edges and provide greening along the roads; Improve the visual amenity	Relevant Government Departments	Along new roads, and On appropriate viaducts	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• HyD HQ/GN/15– Guidelines for Greening Works along Highways. • Development Bureau Technical Circular Works No.2/2012 – Allocation of Space for Quality

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
							Greening on Roads

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S11.7 MM14	LV14	Aesthetic Design of Built Development – The planning of the revised RODP has considered reducing potential visual impacts, enhancing visual amenity and keeping visual corridors. The proposed development will ensure the building massing is compatible with its surroundings. To improve visual amenity, natural building materials could be used on building facades. For example, stone and timber should be considered for architectural features; light earthy tone colours such as shades of green, shades of grey, shades of brown and off-white should be considered for the façade treatment to reduce the visibility of the development components. The form, textures, finishes and colours of the proposed development components should aim to be compatible with the existing surroundings. It would only be implemented for public developments/projects.	Improve visual amenity of the new buildings, keep visual corridors and integrate as possible into the surrounding landscape	Relevant Government Departments	Through-out the TCW and TCE areas	Prior to Construction, Maintenance in Operation Phase	• Hong Kong Planning Standards and Guidelines (HKPSG) issued by the Planning Department (As at Aug 2011); • PNAP APP-152, Sustainable Building Design Guidelines
S11.7 MM15	LV15	Maximise Greening on Structures – The Government has been actively promoting greening in buildings and structures such as bridges to improve the environment. This includes actively implementing rooftop greening or vertical greening, as where practicable to enhance the cityscape and mitigate the heat island effect in urban areas. For the new built forms in TCW and TCE, it is considered the implementation of the following greening measures could alleviate the landscape and visual impacts of new development and help the development blend in with its surrounding landscape: • Sky Garden: Refuge floors or voids in building mass formed by partial removal of floor plates on certain building storeys or provision of freed up areas on certain building storeys provide opportunities for sky gardens for the proposed built development. It can allow views through the development to the background formed by the natural hillsides and	Maximise Greening coverage Enhance visual amenity, create visual corridors and integrate as possible into the surrounding landscape	Relevant Government Departments	On appropriate buildings and structures	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• Development Bureau Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects • PNAP APP-152, Sustainable Building Design Guidelines

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
		enhance the visual amenity effectively. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be referred to. For private developments, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. • Green Roof: The Architectural Services Department completed the Study on Green Roof Application in Hong Kong in 2007 which reviewed the latest concepts and design technology of green roof and recommended technical guidelines suitable for application in Hong Kong. The study will be taken into account to the new buildings to be built in TCW and TCE. Landscape and visual impact can be alleviated and the landscape and visual value can be enhanced. For private development, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be reference. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be referred to. For private developments, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. • Vertical Green: Planting of climbers to grow up					

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		vertical surfaces where appropriate (e.g. building edges), to soften hard structures and facilities. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be observed. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be reference. For private development, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. • Greening on infrastructure: Planting could be provided on infrastructure such as bridges where appropriate to enhance greenery to soften its built edges. Screen planting could be provided near infrastructure to reduce any undesirable visual impacts.					
S11.7 MM16	LV16	Noise barrier design – The visual impact of noise mitigation measures will be mitigated by appropriate detailed design, including suitable combination of transparent and sound absorbent materials, appropriate colour selection of panels and supporting structures, or provision of at-grade planting of trees, shrubs and/or climbers camouflage to the barriers, as well as design of supporting structures to incorporate a high level of quality and aesthetics. A combination of transparent panels at top and solid panels at bottom would lighten the visual impact, and at the same time maintain the attractiveness by using colourful panels. The noise barriers would be implemented for District Distributor Roads and Local Distributor Roads at both TCE and TCW area.	Minimize the visual impact from the structures of noise barriers	HyD	Noise barriers within the TCW and TCE areas	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• GLTM of the Development Bureau's Guidelines on Greening of Noise Barriers (April 2012). • Guidelines on Design of Noise Barriers by HyD and EPD in 2003

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S11.7 MM17	LV17	Landscape Treatment for Polders & Attenuation Ponds – There would be polders and attenuation ponds in TCW. While they are primarily used for receiving and treating surface runoff and alleviating the flood risk during heavy rainfall, the design of those has provided an opportunity to have a synergy to enhance both the ecological and landscape values together. Depending on detailed design, part of these attenuation ponds (mainly the biofiltration zone) could be refined in an appropriate manner, without compromising its primary functions of treating surface runoff and flood protection, to incorporate ecological and landscape design such as planting of aquatic plants and butterfly foodplant for providing the landscape and ecological enhancement.	Enhance the landscape and visual value	DSD	Polders & Attenuation Ponds where possible	Prior to Construction, Construction Phase & Maintenance in Operation Phase	
Landscape and Visual (Construction & Operational Phase)							
S11.7 MM18	LV18	Landscaping on Slopes – Hydro seeding of modified slopes should be done as soon as grading works are completed to prevent erosion and subsequent loss of landscape resources and character. Woodland tree seedlings and/ or shrubs should be planted where gradient and site conditions allow. In addition, landscape planting should be provided for the retaining structures associated with modified slopes where condition allow.	Enhance landscape value, plant diversity and their visual appearance	CEDD	Onsite, particularly in TCW area	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• GEO Publication No.1/2011 Technical Guidelines on Landscape Treatment for Slopes by CEDD in 2011
S11.7 MM19	LV19	Landscape Treatment on Channelized Watercourses – For the channelized watercourses in Tung Chung Stream that will be dechannelized, the Drainage Services Department Practice Note No.1/2005 – Guidelines on Environmental Considerations for River Channel Design, should be considered and appropriate measures included ensuring the new watercourses match the existing as far as possible.	Avoid direct impacts on the watercourse Improve the visual amenity	CEDD	The channelized watercourses throughout the TCW area	Prior to Construction, Construction Phase & Maintenance in Operation Phase	• Drainage Services Department Practice Note No.1/2005 – Guidelines on Environmental

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		Measures can include enhancement planting to upgrade the channels as appropriate, including consideration of wetland planting along embankments where appropriate; as well as consideration of the best materials for the channel lining (e.g. gabion).					Considerations for River Channel Design
S11.7 MM20	LV20	Light Control – Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the construction stage. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.	Minimize negative glare impact to adjacent VSRs	Relevant Government Departments / Private Sector	Through-out the TCW and TCE areas	Construction Phase & Operation Phase	

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

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Cultural Heritage Impact (Construction and Operational Phase)							
S.12.5	CH1	Terrestrial Archaeology • Implement rescue excavations/ survey-cum-rescue excavations/ further surveys after land resumption and prior to any construction works (see **Figure 14.1** for the locations of rescue excavations/survey-cum-rescue excavations/further survey)	1) Rescue excavations to salvage archaeological data and cultural materials 2) Survey-cum-rescue excavations to better locate and design the follow up rescue excavations 3) Further surveys to obtain sufficient data for formulation of appropriate mitigation measures	Contractor / Future Private Developer	After land resumption and prior to any construction works	After land resumption and prior to any construction works	• Guidelines for Cultural Heritage Impact Assessment • TM-EIAO Annex 10 and Annex 19 • Antiquities and Monuments Ordinance
S.12.5	CH2	Terrestrial Archaeology • Implement watching brief during construction phase (see **Figure 14.1** for the locations of watching brief)	To identify and record any archaeological material or features revealed during construction phase	Contractor / Future Private Developer	During construction phase	During construction phase	

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

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EM&A Project							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	• EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	• EIAO Guidance Note No.4/2010 • TM-EIAO

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Works Vessel Travel Routes (Extracted from Works Vessel Travel Route Plan submitted under Condition 2.13 of the EP)							
S3.2	WVTR1	All works vessels shall be equipped with Global Positional System (GPS) or equivalent automatic identification system (AIS) for real time tracking and monitoring of their travel routing, speed and anchorage points. The system shall be capable to record and analyse the travel routing, speed and anchorage points.	Control EM&A Performance	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S3.3.1	WVTR2	1) Once approaching or leaving the entrance of the silt curtain, all vessels will travel at a speed no greater than 8 knots between the site and boundary of The Brothers Marine Park. The vessels can then navigate at normal speed (8-12 knots) after that distance unless other restrictions are imposed. 2) If any dolphins are sighted within 250m of a vessel then the vessel will slow down to a speed no greater than 5 knots for at least 3 minutes after the last sighting.	Protection of CWD	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S3.3.2	WVTR3	All captains and the supervising staff should undergo training to learn about local dolphins and porpoises. They should be trained to be aware of the protocol for dolphin friendly" vessel operation (refer to the Code of Conduct for Dolphin Watching Activities from AFCD).	Protection of CWD	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S3.3.2	WVTR4	Training on the requirements of the WVTRP would be provided for construction vessels' personnel to follow, which should include the details of the normal operational routings of the construction works vessels and reporting of deviations from the normal operational routings of the construction works vessels. The training course will be given to the licensed vessel captains by the trainers before commencement of work and refreshment course will be provided every quarter.	Protection of CWD	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements

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Deployment of Silt Curtain(s) (Extracted from Silt Curtain Deployment Plan submitted under Condition 2.16 of the EP)							
S4	SCD1	Before the start of the installation work, Qualified Ecologists with dolphin monitoring experience shall scan the exclusion zone for at least 30 minutes. If dolphins are observed in the exclusion zone, the installation work shall be delayed until the dolphins left the area.	Protection of CWD	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S4	SCD2	If dolphins are observed within the exclusion zone during the installation work, the relevant part of the work shall cease until the dolphins left the area.	Protection of CWD	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S5	SCD3	On-board supervisors will be assigned to check the condition of the silt curtain before commencement of works every day. An inspection checklist will be kept on site for record purpose.	Silt Curtain Integrity	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S5	SCD4	For the tentative arrangement of silt curtain under adverse weather, the silt curtain will not be temporary removed during adverse weather. However, related works will be suspended immediately if silt curtain is found any damaged.	Silt Curtain Integrity	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S5	SCD5	Diver inspection shall be carried out if necessary to inspect the installation and decommission of silt curtain to ensure proper installation and functioning of the silt curtain according to the design drawings. Nearby marine works will resume after repairing of the damaged silt curtains.	Silt Curtain Integrity	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements
S5	SCD6	Refuse around the silt curtain will be collected at regular intervals on a daily basis so that water behind the silt curtains will be kept free from floating debris.	Waste Management	Contractor	All marine construction sites	Construction stage	• EIA • Contractual requirements

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Post-planting Monitoring and Maintenance (Details to be provided after the submission of Detailed Compensatory Woodland Planting Plan as required under EP Condition 2.22)							

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Use of New Low Noise Road Surfacing Material(s) (Details to be provided after the submission of Plan for Review of Use of New Low Noise Road Surfacing Material(s) as required under EP Condition 2.23)							

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Follow-up actions to be taken by the Contractor and Dump Truck Drivers in case of Illegal Dumping and Landfilling of C&D Materials (Extracted from Waste Management Plan submitted under Condition 2.24 of the EP)							
S5.4	WM1	Investigation report will be prepared by the Contractor and submit to ER within 2 working days.	Control EM&A Performance	Contractor	All construction sites	Construction stage	• EP • Contractual requirements
S5.4	WM2	The Contractor will discuss with ER for the follow up actions (e.g. warning letter, cease operation, etc.) if required.	Control EM&A Performance	Contractor	All construction sites	Construction stage	• EP • Contractual requirements

Annex C

Status of Statutory Environmental Requirements

Annex C Status of Statutory Environmental Requirements

Contract No.	Description	Location	Ref No.	Status
General	Environmental Permit	TCNTE Works Area	EP-519/2016	Granted on 9 Aug 2016
Contract No. NL/2017/03	Waste Discharge License under Water Pollution Control Ordinance	Area A58, near Man Tung Road, Tung Chung	WT00031100-2018	Validity from 19 Jun 2018 to 30 Jun 2023
		Area WA1, near Ying Tung Road, Tung Chung	WT00031099-2018	Validity from 19 Jun 2018 to 30 Jun 2023
		Area WA2, near Cheung Tung Road, Tung Chung	WT00031101-2018	Validity from 19 Jun 2018 to 30 Jun 2023
	Billing Account for Disposal of Construction Waste	-	Application No. RT01957	Approved on 22 January 2018
	Registration as Chemical Waste Producer	Site Office for TCE	WPN-5213-950-B2528-01	Issued on 28 Feb 2018
		TCE Site Area	WPN-5213-950-B2528-02	Issued on 20 Apr 2018
	Construction Noise Permit	TCE Site Area near Siu Ho Wan	GW-RS0363-18	Validity from 9 May to 6 Nov 2018
		Site Office for TCE	GW-RS0405-18	Validity from 21 May to 17 Nov 2018
		Reclamation	GW-RS0737-18 (1)	Validity from 21 Aug to 23 Sep 2018
		Reclamation	GW-RS0862-18	Validity from 24 Sep to 18 Mar 2019

Note

(1) GW-RS0737-18 was superseded by GW-RS0862-18 since 24 September 2018.

Annex D

Air Quality

Annex D1

Calibration Certificates for Air Quality

PILOT TESTING

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

REPORT NO.	: HK1810148
PROJECT NAME	: PERFORMANCE CHECK / CALIBRATION OF DUST METER
DATE OF ISSUE	: 12/2/2018
CUSTOMER	: Envirotech Services Company
ADDRESS	: Rm. 113, 1/F., MY LOFT, 9 HOI WING ROAD, TUEN MUN, N.T.

REPORT NO.	: HK1810148
PROJECT ITEM NO.	: HK1810148-01
PERFORMANCE CHECK / CALIBRATED EQUIPMENT	
TYPE	: Digital Dust Indicator
MANUFACTURER	: SIBATA
MODEL NO.	: LD-5R
SERIAL NO.	: 620402
EQUIPMENT NO.	: ---
RECEIPT DATE	: 8/2/2018
PERFORMANCE CHECK / CALIBRATION DATE	: 9/2/2018

PERFORMANCE CHECK / CALIBRATION Information

CODE	Calibration Parameter	Method Procedure	Reference Method
Dust PC/CAL	Performance Check / Calibration of Dust Meter	CAL003	General Technical Requirements of Environmental Monitoring, Environmental Monitoring & Audit Guidelines for Development Projects in HK

Notes : 1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
2. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Approved Signatory :

Wong Po Yan Pauline
(Assistant Laboratory Manager)

Issue Date: 12/2/2018

PILOT TESTING

REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME	:	PERFORMANCE CHECK / CALIBRATION OF DUST METER
DATE OF ISSUE	:	12/2/2018
REPORT NO.	:	HK1810148

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE	:	Digital Dust Indicator
MANUFACTURER	:	SIBATA
MODEL NO.	:	LD-5R
SERIAL NO.	:	620402
EQUIPMENT NO.	:	---
SENSITIVITY ADJUSTMENT	:	---
PERFORMANCE CHECK / CALIBRATION DATE	:	9/2/2018

STANDARD EQUIPMENT

TYPE	:	HIGH VOLUME AIR SAMPLER
MANUFACTURER	:	TISCH
MODEL NO.	:	TE-5170
EQUIPMENT REF NO.	:	PTL_HV002
LAST CALIBRATION DATE	:	29/1/2018

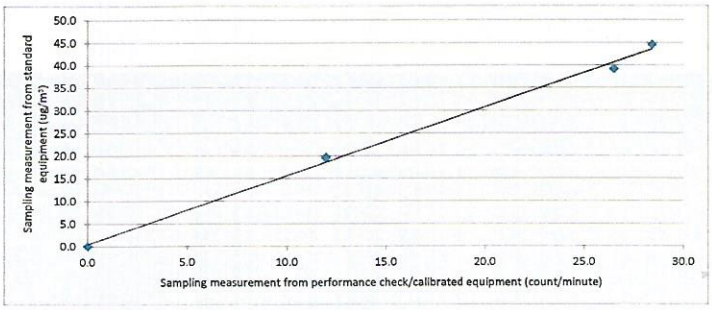
EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Sensitivity Adjustment Scale Setting (Before Performance check / Calibration): 754 CPM
Sensitivity Adjustment Scale Setting (After Performance check / Calibration): 754 CPM

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m^3 (Standard equipment) (Y - Axis)	Total Count[2] (Performance Check / Calibrated equipment)	Concentration in Count/Minute[3] (Performance Check / Calibrated equipment) (X - Axis)
Zero Check[1]	9/2/2018,9:05:00 AM	15.5	1017	0	0	0
1	9/2/2018,11:40:00 AM	15.5	1017	45	1705	28
2	9/2/2018,2:07:00 PM	15.5	1017	39	1590	27
3	9/2/2018,3:09:00 PM	15.5	1017	20	719	12

Linear Regression of Y on X

Slope (K- factor)	:	1.5
Correlation Coefficient	:	0.9983
Validity of Performance Check / Calibration Record	:	9/2/2019



Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
2. Total Count was measured by Digital Dust Indicator.
3. Count/minute was calcuated by (Total Count/60)
4. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
5. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: MA Ching Him, Jackey Signature: Date: 9/2/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 12/2/2018

SIBATA

SIBATA SCIENTIFIC TECHNOLOGY LTD.
1-1-62, Nakane, Soka, Saitama, 340-0005 Japan
TEL : 048-933-1582 FAX : 048-933-1591

CALIBRATION CERTIFICATE

Date: January 22th, 2018

Equipment Name	:	Digital Dust Indicator, Model LD-5R
Code No.	:	080000-72
Quantity	:	1 unit
Serial No.	:	620402
Sensitivity	:	0.001 mg/m3
Sensitivity Adjustment	:	754CPM
Scale Setting	:	January 19th, 2018

We hereby certify that the avobe mentioned instrment has been calibrated satisfactory.

Sincerely

SIBATA SCIENTIFIC TECHNOLOGY LTD.

R. Numata

Ryosuke Numata
Overseas Sales Division

Annex D2

Monitoring Schedule for Air Quality

Tung Chung New Town Extension (East)
Air Quality Monitoring Schedule (September 2018)

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

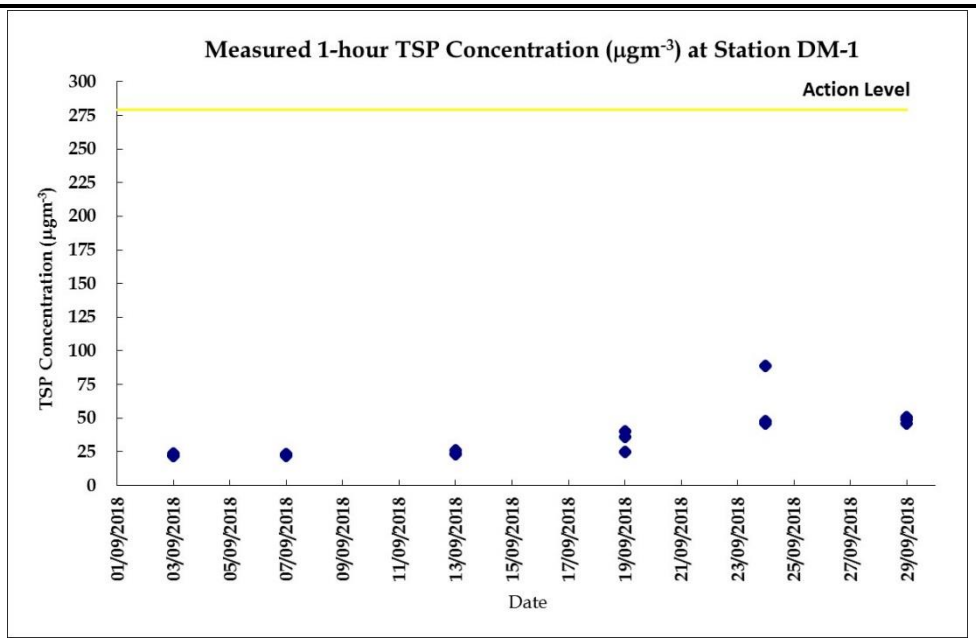
Annex D3

Monitoring Results for Air Quality

Table D3 Data for 1-hr TSP Monitoring at Station DM-1

Date	Start Time	Finish Time	Weather	1-hour TSP (μg/m³)
03-09-2018	13:00	14:00	Sunny	22
03-09-2018	14:00	15:00	Sunny	24
03-09-2018	15:00	16:00	Sunny	22
07-09-2018	13:01	14:01	Sunny	23
07-09-2018	14:01	15:01	Sunny	22
07-09-2018	15:01	16:01	Sunny	23
13-09-2018	13:14	14:14	Sunny	26
13-09-2018	14:14	15:14	Sunny	24
13-09-2018	15:14	16:14	Sunny	23
19-09-2018	13:24	14:24	Sunny	40
19-09-2018	14:24	15:24	Sunny	36
19-09-2018	15:24	16:24	Sunny	25
24-09-2018	13:18	14:18	Sunny	89
24-09-2018	14:18	15:18	Sunny	48
24-09-2018	15:18	16:18	Sunny	46
29-09-2018	13:13	14:13	Sunny	51
29-09-2018	14:13	15:13	Sunny	49
29-09-2018	15:13	16:13	Sunny	46

Figure D3 Graphical Presentation for 1-hr TSP Monitoring at Station DM-1



Annex D4

Event and Action Plan for Air Quality

Annex D4 Event and Action Plan for Air Quality

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action level exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET 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 Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Limit level exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER 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 Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Annex E

Noise

Annex E1

Calibration Certificates for Noise

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C183084
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-1101) Date of Receipt / 收件日期 : 30 May 2018

Description / 儀器名稱 : Precision Acoustic Calibrator
Manufacturer / 製造商 : LARSON DAVIS
Model No. / 型號 : CAL200
Serial No. / 編號 : 11333
Supplied By / 委託者 : Envirotech Services Co.
Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 June 2018

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Engineer

Certified By 核證 : H C Chan, Engineer

Date of Issue 簽發日期 : 14 June 2018

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C183084
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C173864
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C181288

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.8	± 0.2	± 0.2
114 dB, 1 kHz	113.8		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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Calibration & Testing Laboratory

Certificate of Calibration
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Certificate No. : C183089
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-1132) Date of Receipt / 收件日期 : 31 May 2018

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-52
Serial No. / 編號	:	00331805
Supplied By / 委託者	:	Envirotech Services Co. Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 10 June 2018

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee
Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 14 June 2018

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C183089
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C180024
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.2	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	94.2 (Ref.)
				104.00		104.2
				114.00		114.2

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.2	Ref.
			Slow			94.2	± 0.3

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Certificate of Calibration
校正證書

Certificate No. : C183089
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.9	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.5
					250 Hz	85.5	-8.6 ± 1.4
					500 Hz	91.0	-3.2 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	95.4	+1.2 ± 1.6
					4 kHz	95.2	+1.0 ± 1.6
					8 kHz	93.2	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.3	-0.8 ± 1.5
					125 Hz	94.0	-0.2 ± 1.5
					250 Hz	94.2	0.0 ± 1.4
					500 Hz	94.2	0.0 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	94.1	-0.2 ± 1.6
					4 kHz	93.4	-0.8 ± 1.6
					8 kHz	91.3	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 04870

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Annex E2

Monitoring Schedule for Noise

Tung Chung New Town Extension (East)
Noise Monitoring Schedule (September 2018)

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

Annex E3

Monitoring Results for Noise

Table E3.1 Data for Noise Monitoring at Station NMS-CA-1A during Normal Working Hours (0700-1900 hours)

Date & Time	$L_{eq\ (5min)}$	L_{10}	L_{90}	$L_{eq\ (30min)}$
19-09-2018 13:50	73.3	76.5	61.6	71.8
19-09-2018 13:55	72.5	75.4	63.9	
19-09-2018 14:00	72.2	74.7	66.7	
19-09-2018 14:05	70.8	74.6	58.8	
19-09-2018 14:10	70.5	73.6	61.5	
19-09-2018 14:15	71.0	74.0	65.0	
24-09-2018 14:01	73.1	75.8	68.8	72.1
24-09-2018 14:06	73.7	75.6	67.7	
24-09-2018 14:11	70.8	73.7	67.1	
24-09-2018 14:16	71.1	73.8	66.8	
24-09-2018 14:21	71.1	73.9	66.9	
24-09-2018 14:26	72.0	74.9	66.7	
29-09-2018 13:24	69.8	73.8	59.8	68.9
29-09-2018 13:29	65.3	68.9	59.0	
29-09-2018 13:34	61.7	64.6	57.6	
29-09-2018 13:39	68.8	71.7	59.7	
29-09-2018 13:44	68.4	71.9	59.8	
29-09-2018 13:49	72.4	75.8	62.3	

Figure E3.1 Graphical Presentation for Noise Monitoring at Station NMS-CA-1A

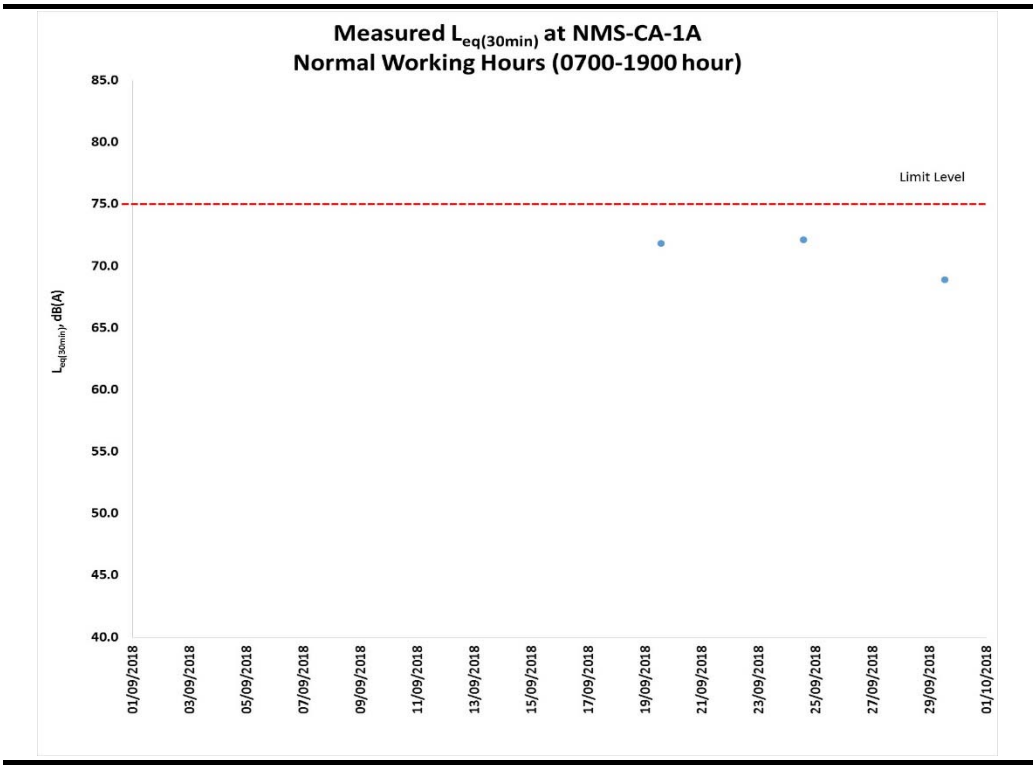
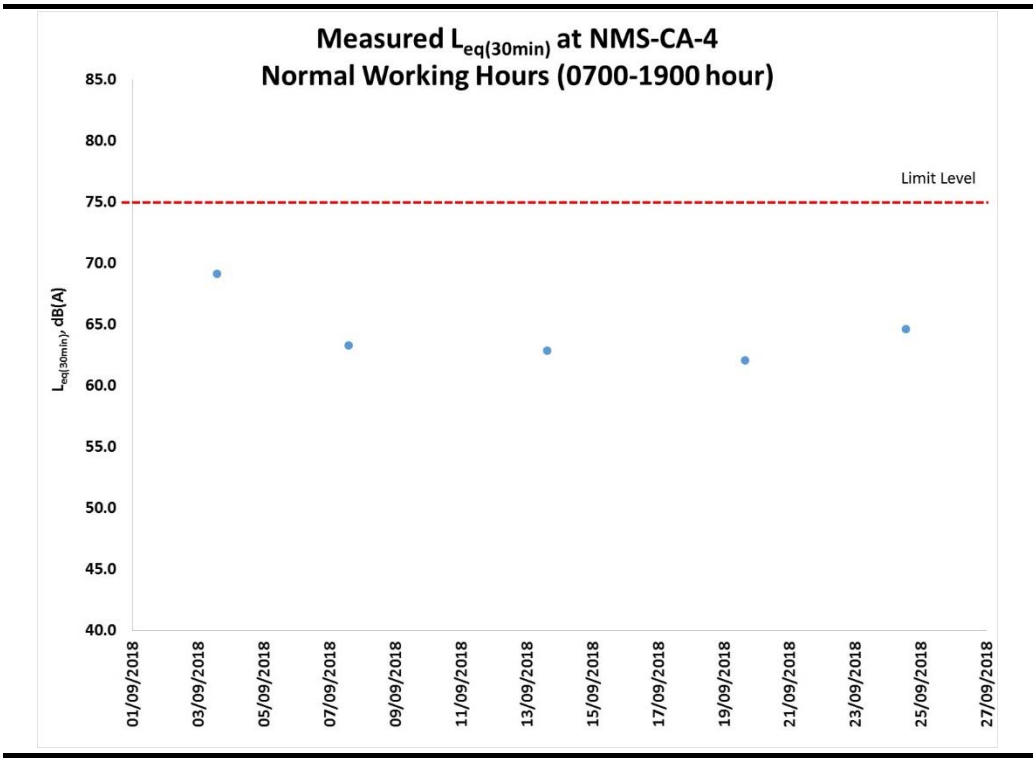


Table E3.2 Data for Noise Monitoring at Station NMS-CA-4 during Normal Working Hours (0700-1900 hours)

Date & Time	$L_{eq\ (5min)}$	L_{10}	L_{90}	$L_{eq\ (30min)}$
03-09-2018 14:00	66.9	67.8	60.5	69.1
03-09-2018 14:05	67.8	71.8	62.6	
03-09-2018 14:10	70.8	71.2	61.8	
03-09-2018 14:15	68.1	70.7	60.9	
03-09-2018 14:20	69.2	73.2	62.6	
03-09-2018 14:25	70.5	73.5	63.2	
07-09-2018 14:15	63.3	65.7	60.1	63.3
07-09-2018 14:20	63.8	66.9	58.3	
07-09-2018 14:25	60.0	61.9	56.6	
07-09-2018 14:30	65.2	68.4	58.2	
07-09-2018 14:35	63.5	67.2	58.1	
07-09-2018 14:40	62.4	65.3	56.7	
13-09-2018 15:00	62.5	65.5	56.6	62.8
13-09-2018 15:05	63.4	66.7	57.4	
13-09-2018 15:10	63.5	66.1	58.2	
13-09-2018 15:15	62.7	65.7	57.9	
13-09-2018 15:20	61.7	65.3	56.7	
13-09-2018 15:25	62.9	66.8	56.5	
19-09-2018 15:35	63.1	67.3	56.2	62.1
19-09-2018 15:40	58.3	60.4	55.9	
19-09-2018 15:45	61.7	65.3	55.0	
19-09-2018 15:50	62.4	66.5	54.8	
19-09-2018 15:55	61.7	64.8	57.5	
19-09-2018 16:00	63.5	66.5	56.5	
24-09-2018 13:17	61.8	63.1	57.0	64.6
24-09-2018 13:22	61.1	63.2	57.9	
24-09-2018 13:27	64.6	68.7	57.0	
24-09-2018 13:32	61.9	65.4	56.3	
24-09-2018 13:37	65.8	70.0	56.2	
24-09-2018 13:42	68.0	70.4	61.2	
29-09-2018 14:02	67.7	71.1	60.3	65.2
29-09-2018 14:07	64.4	67.8	56.5	
29-09-2018 14:12	63.6	66.7	55.2	
29-09-2018 14:17	63.2	68.1	53.3	
29-09-2018 14:22	64.9	69.1	55.0	
29-09-2018 14:27	65.6	70.1	55.1	

Figure E3.2 Graphical Presentation for Noise Monitoring at Station NMS-CA-4



Annex E4

Event and Action Plan for Noise

Annex E4 Event and Action Plan for Construction Noise

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action Level Exceedance	1. Notify IEC, ER and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level Exceedance	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Annex F

Water Quality

Annex F1

Calibration Certificates for Water Quality

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH060169
Date of Issue : 28 June 2018

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment	:	YSI ProDSS (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	16H104233
Date of Received	:	Jun 27, 2018
Date of Calibration	:	Jun 27, 2018 to Jun 27, 2018
Date of Next Calibration[(a)]	:	Sep 27, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[(b,c)]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[(d)] (pH Unit)	Tolerance[(e)](pH Unit)	Results
4.00	3.96	-0.04	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	10.11	0.10	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
12.6	12.5	-0.1	Satisfactory
37.4	37.5	0.1	Satisfactory
62.7	61.5	-1.2	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

(a) *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
(b) *The results relate only to the calibrated equipment as received*
(c) *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
(d) *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
(e) *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by QPT or quoted form relevant international standards.*

APPROVED SIGNATORY: _____
LAM Ho-yee, Emma
Assistant Laboratory Manager

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH060169
Date of Issue : 28 June 2018

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.03	0.03	Satisfactory
4.37	4.46	0.09	Satisfactory
5.96	6.10	0.14	Satisfactory
7.34	7.36	0.02	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.20 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)	Results
0.001	146.9	150.0	2.1	Satisfactory
0.01	1412	1398	-1.0	Satisfactory
0.1	12890	12724	-1.3	Satisfactory
0.5	58670	58012	-1.1	Satisfactory
1.0	111900	110847	-0.9	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.97	-0.3	Satisfactory
20	20.14	0.7	Satisfactory
30	30.28	0.9	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	0.1	--	--
10	10.16	1.6	Satisfactory
20	20.19	1.0	Satisfactory
100	98.84	-1.2	Satisfactory
800	793.16	-0.9	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH070142
Date of Issue : 26 July 2018

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin,
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment	:	YSI ProDSS (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	16H104234
Date of Received	:	Jul 25, 2018
Date of Calibration	:	Jul 25, 2018 to Jul 25, 2018
Date of Next Calibration[(a)]	:	Oct 25, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[(b,c)]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[(d)] (pH Unit)	Tolerance[(e)](pH Unit)	Results
4.00	4.02	0.02	Satisfactory
7.42	7.48	0.06	Satisfactory
10.01	10.04	0.03	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
10.0	10.1	0.1	Satisfactory
25.6	25.5	-0.1	Satisfactory
39.0	38.9	-0.1	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

(a) *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
(b) *The results relate only to the calibrated equipment as received*
(c) *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
(d) *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
(e) *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by QPT or quoted form relevant international standards.*

APPROVED SIGNATORY: _____
LAM Ho-yee, Emma
Assistant Laboratory Manager

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QUALITY PRO TEST-CONSULT LIMITED
Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong
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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.06	0.06	Satisfactory
4.99	4.92	-0.07	Satisfactory
6.40	6.38	-0.02	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.20 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)	Results
0.001	146.9	156.6	6.6	Satisfactory
0.01	1412	1381	-2.2	Satisfactory
0.1	12890	12411	-3.7	Satisfactory
0.5	58670	54019	-7.9	Satisfactory
1.0	111900	104782	-6.4	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.61	-3.9	Satisfactory
20	19.82	-0.9	Satisfactory
30	30.48	1.6	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	0.08	--	--
10	10.4	4.0	Satisfactory
20	20.82	4.1	Satisfactory
100	97.02	-3.0	Satisfactory
800	762.8	-4.7	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

[f] "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

[g] The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH060170
Date of Issue : 28 June 2018

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment	:	YSI ProDSS (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	17E100747
Date of Received	:	Jun 27, 2018
Date of Calibration	:	Jun 27, 2018 to Jun 27, 2018
Date of Next Calibration[a]	:	Sep 27, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	3.97	-0.03	Satisfactory
7.42	7.40	-0.02	Satisfactory
10.01	10.00	-0.01	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
12.6	12.3	-0.3	Satisfactory
37.4	37.5	0.1	Satisfactory
62.7	61.4	-1.3	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

(a) *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
(b) *The results relate only to the calibrated equipment as received*
(c) *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
(d) *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
(e) *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by QPT or quoted form relevant international standards.*

APPROVED SIGNATORY: _____
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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH060170
Date of Issue : 28 June 2018

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.02	0.02	Satisfactory
4.37	4.41	0.04	Satisfactory
5.96	6.12	0.16	Satisfactory
7.34	7.41	0.07	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.20 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)	Results
0.001	146.9	148.0	0.7	Satisfactory
0.01	1412	1438	1.8	Satisfactory
0.1	12890	12696	-1.5	Satisfactory
0.5	58670	57876	-1.4	Satisfactory
1.0	111900	111059	-0.8	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.99	-0.1	Satisfactory
20	20.09	0.4	Satisfactory
30	30.22	0.7	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	0.00	--	--
10	10.14	1.4	Satisfactory
20	20.30	1.5	Satisfactory
100	101.67	1.7	Satisfactory
800	818.83	2.4	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH070141
Date of Issue : 26 July 2018

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin,
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment	:	YSI ProDSS (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	17H105557
Date of Received	:	Jul 25, 2018
Date of Calibration	:	Jul 25, 2018 to Jul 26, 2018
Date of Next Calibration[a]	:	Oct 25, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	4.04	0.04	Satisfactory
7.42	7.48	0.06	Satisfactory
10.01	10.00	-0.01	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
10.0	10.2	0.2	Satisfactory
25.6	25.7	0.1	Satisfactory
39.0	39.2	0.2	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

[a] *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
[b] *The results relate only to the calibrated equipment as received*
[c] *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
[d] *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
[e] *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by QPT or quoted form relevant international standards.*

APPROVED SIGNATORY: _____
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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH070141
Date of Issue : 26 July 2018

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.08	0.08	Satisfactory
4.99	5.01	0.02	Satisfactory
6.40	6.43	0.03	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.20 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)	Results
0.001	146.9	152.8	4.0	Satisfactory
0.01	1412	1340	-5.1	Satisfactory
0.1	12890	12456	-3.4	Satisfactory
0.5	58670	54401	-7.3	Satisfactory
1.0	111900	104586	-6.5	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.63	-3.7	Satisfactory
20	19.76	-1.2	Satisfactory
30	30.56	1.9	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	0.07	--	--
10	9.36	-6.4	Satisfactory
20	20.97	4.8	Satisfactory
100	96.48	-3.5	Satisfactory
800	748.6	-6.4	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

專業化驗有限公司
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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH080234
Date of Issue : 21 August 2018

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment	:	YSI 6920 v2 (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	0001C6A7
Date of Received	:	Aug 20, 2018
Date of Calibration	:	Aug 20, 2018
Date of Next Calibration[a]	:	Nov 20, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	4.05	0.05	Satisfactory
7.42	7.46	0.04	Satisfactory
10.01	10.04	0.03	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
17.0	17.2	0.2	Satisfactory
26.3	26.2	-0.1	Satisfactory
54.3	53.8	-0.5	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

[a] *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
[b] *The results relate only to the calibrated equipment as received*
[c] *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
[d] *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
[e] *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by QPT or quoted form relevant international standards.*

APPROVED SIGNATORY: _____
LAM Ho-yee, Emma
Assistant Laboratory Manager

專業化驗有限公司
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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH080234
Date of Issue : 21 August 2018

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.06	0.06	Satisfactory
2.81	2.92	0.11	Satisfactory
4.18	4.23	0.05	Satisfactory
7.76	7.80	0.04	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.20 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)	Results
0.001	146.9	152.3	3.7	Satisfactory
0.01	1412	1427	1.1	Satisfactory
0.1	12890	12676	-1.7	Satisfactory
0.5	58670	57968	-1.2	Satisfactory
1.0	111900	108346	-3.2	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.98	-0.2	Satisfactory
20	19.97	-0.2	Satisfactory
30	30.10	0.3	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g](%)	Results
0	0.4	--	--
10	10.2	2.0	Satisfactory
20	20.3	1.5	Satisfactory
100	101.5	1.5	Satisfactory
800	821.7	2.7	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

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(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH080233
Date of Issue : 21 August 2018

PART A – CUSTOMER INFORMATION

Enovative Environmental Service Ltd.
Flat 2207, Yu Fun House,
Yu Chui Court, Shatin
New Territories, Hong Kong
Attn: Mr. Thomas WONG

PART B – DESCRIPTION

Name of Equipment	:	YSI 6920 v2 (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	00019CB2
Date of Received	:	Aug 20, 2018
Date of Calibration	:	Aug 20, 2018
Date of Next Calibration[a]	:	Nov 20, 2018

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Conductivity at 25°C	APHA 21e 2510 B
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	4.04	0.04	Satisfactory
7.42	7.43	0.01	Satisfactory
10.01	9.97	-0.04	Satisfactory

Tolerance of pH should be less than ±0.10 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
17.0	17.1	0.1	Satisfactory
26.3	26.2	-0.1	Satisfactory
54.3	54.0	-0.3	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

[a] *The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.*
[b] *The results relate only to the calibrated equipment as received*
[c] *The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.*
[d] *"Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.*
[e] *The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by QPT or quoted form relevant international standards.*

APPROVED SIGNATORY: _____
LAM Ho-yee, Emma
Assistant Laboratory Manager

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AH080233
Date of Issue : 21 August 2018

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.00	0.05	0.05	Satisfactory
2.81	2.93	0.12	Satisfactory
4.18	4.24	0.06	Satisfactory
7.76	7.81	0.05	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.20 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)	Results
0.001	146.9	152.5	3.8	Satisfactory
0.01	1412	1424	0.8	Satisfactory
0.1	12890	12688	-1.6	Satisfactory
0.5	58670	57972	-1.2	Satisfactory
1.0	111900	109256	-2.4	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.98	-0.2	Satisfactory
20	20.17	0.9	Satisfactory
30	30.24	0.8	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g](%)	Results
0	0.5	--	--
10	10.3	3.0	Satisfactory
20	21.2	6.0	Satisfactory
100	100.8	0.8	Satisfactory
800	797.6	-0.3	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

(f) "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

(g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

Annex F2

Monitoring Schedule for Water Quality

Tung Chung New Town Extension (East)
Impact Marine Water Quality Monitoring (WQM) Schedule (September 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Sep
						ebb tide 14:44 - 18:14 flood tide 8:49 - 12:19
2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
		ebb tide 5:36 - 9:06 flood tide 13:14 - 16:44		ebb tide 8:13 - 11:43 flood tide 15:40 - 19:10		ebb tide 10:06 - 13:36 flood tide 17:05 - 20:35
9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep
		ebb tide 12:24 - 15:54 flood tide 5:53 - 9:23		ebb tide 13:44 - 17:14 flood tide 14:44 - 11:01		ebb tide 15:07 - 18:37 flood tide 09:22 - 12:52
16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep
		ebb tide 5:51 - 9:21 flood tide 18:31 - 21:01		ebb tide 9:01 - 11:46 flood tide 15:56 - 19:26		ebb tide 09:44 - 13:14 flood tide 16:45 - 20:15
23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep
		ebb tide 11:25 - 14:55 flood tide 17:48 - 21:18		ebb tide 12:30 - 16:00 flood tide 18:32 - 21:02		ebb tide 13:44 - 17:14 flood tide 09:02 - 11:25
30-Sep						

Annex F3

Monitoring Results for Water Quality

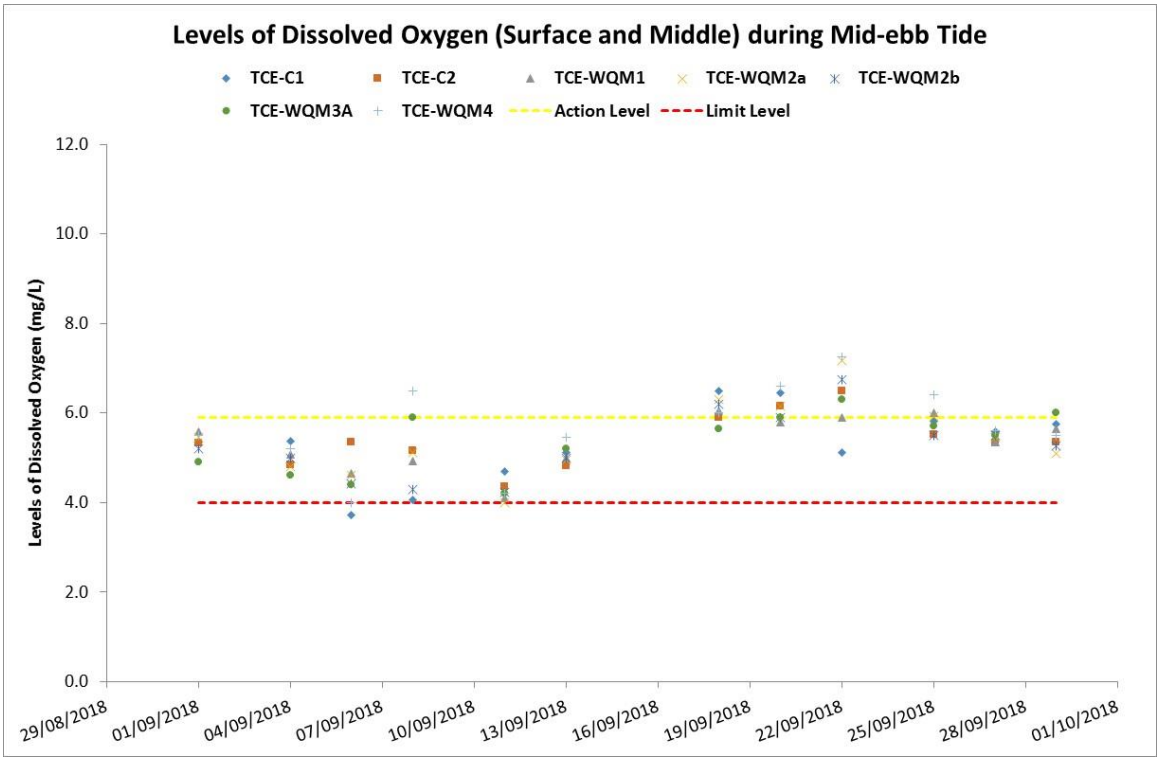

Figure 1: Levels of Dissolved Oxygen (Surface and Middle) (mg/L) recorded at Mid-ebb Tide during the Water Quality Monitoring between 1 and 30 September 2018

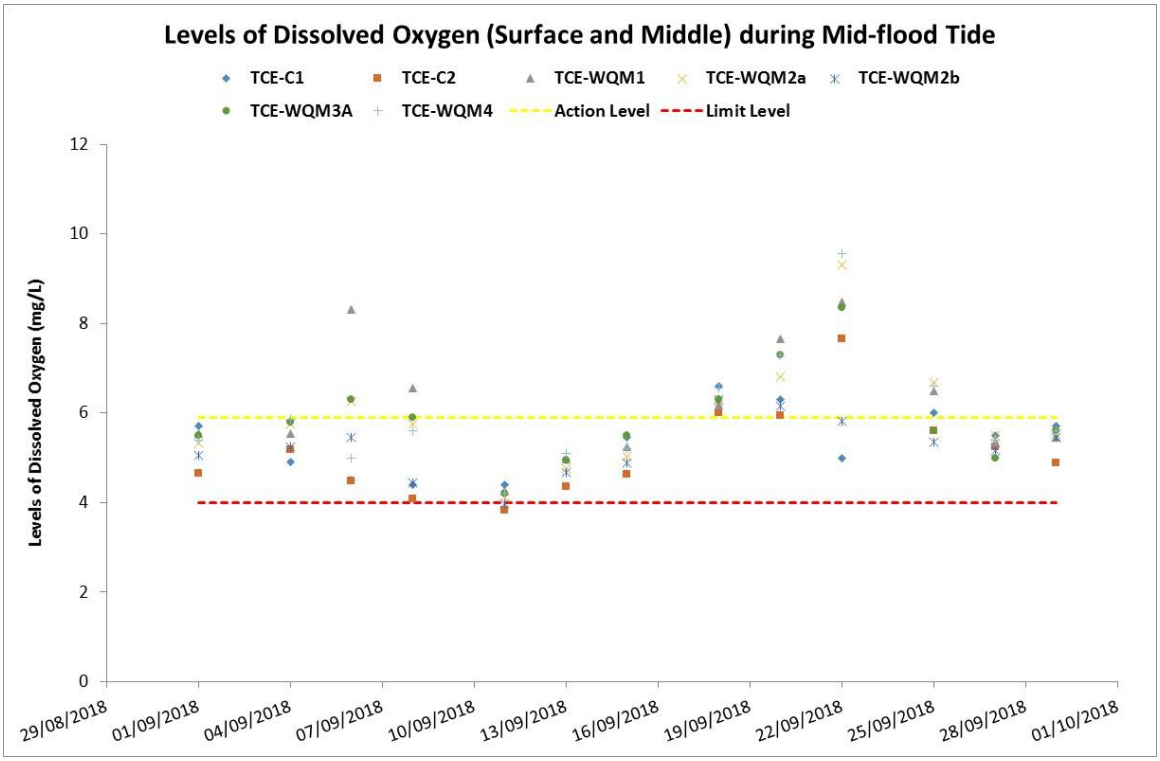

Figure 2: Levels of Dissolved Oxygen (Surface and Middle) (mg/L) recorded at Mid-flood Tide during the Water Quality Monitoring between 1 and 30 September 2018

Source: P:\Projects\0445700 CEDD ET for Tung Chung.JT\02_Deliverable\10 Monthly EM&A Report\

Date: September 2018

Environmental Resources Management

ERM

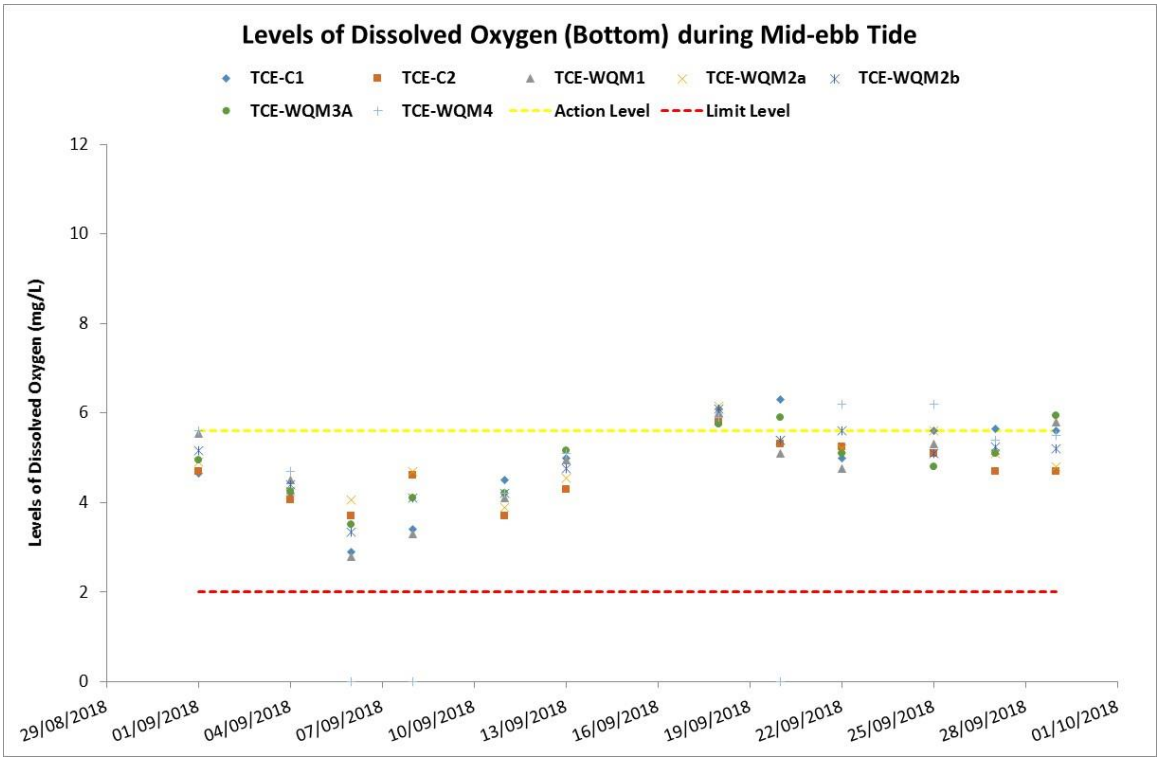

Figure 3: Levels of Dissolved Oxygen (Bottom) (mg/L) recorded at Mid-ebb Tide during the Water Quality Monitoring between 1 and 30 September 2018

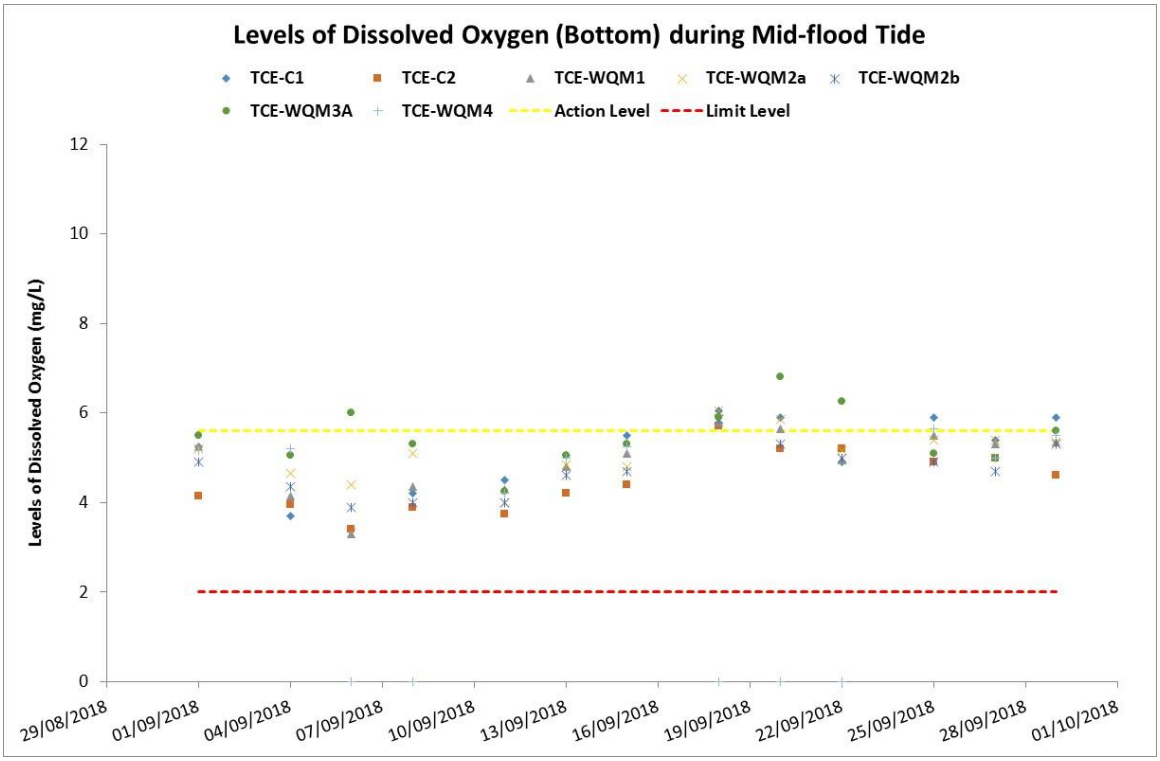

Figure 4: Levels of Dissolved Oxygen (Bottom) (mg/L) recorded at Mid-flood Tide during the Water Quality Monitoring between 1 and 30 September 2018

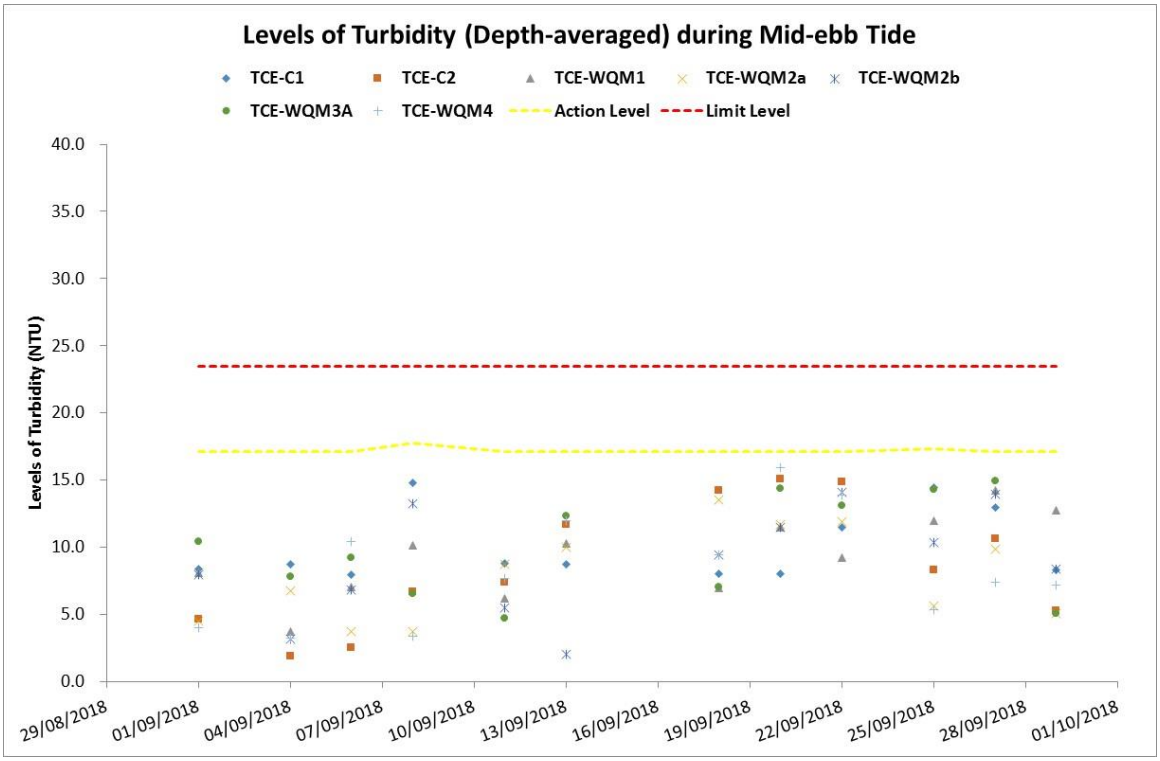

Figure 5: Levels of Turbidity (Depth-averaged) (NTU) recorded at Mid-ebb Tide during the Water Quality Monitoring between 1 and 30 September 2018

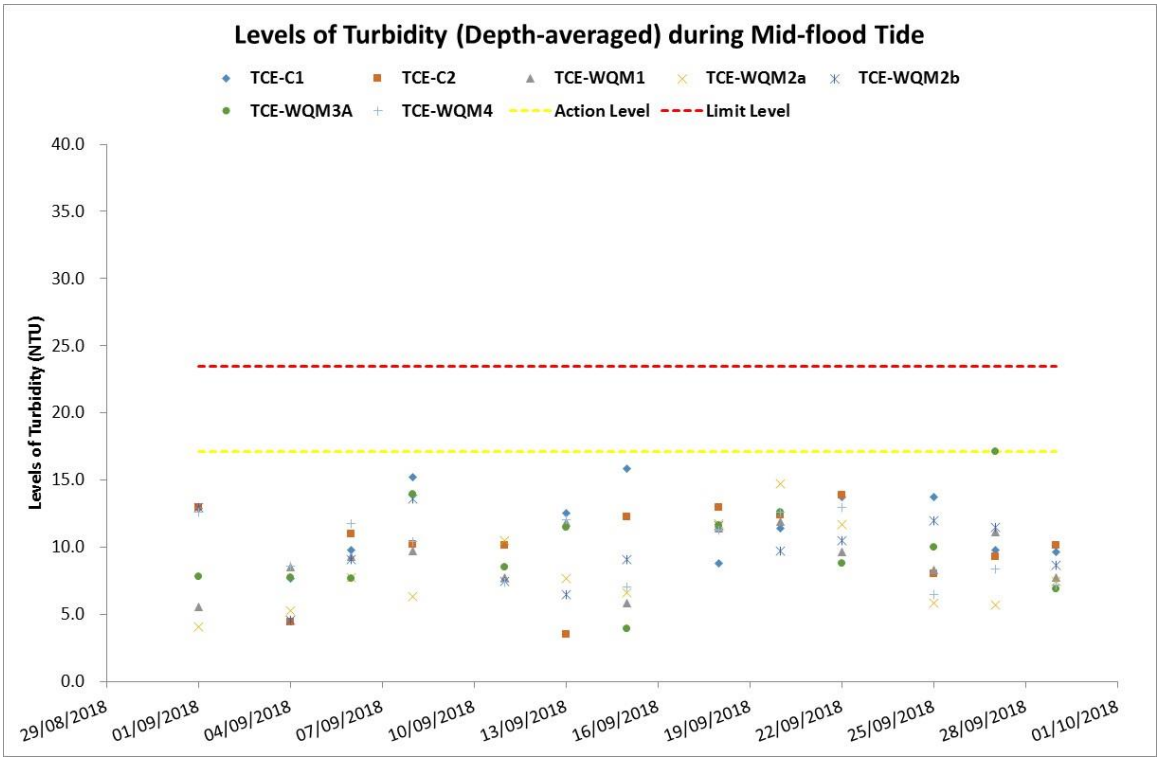

Figure 6: Levels of Turbidity (Depth-averaged) (NTU) recorded at Mid-flood Tide during the Water Quality Monitoring between 1 and 30 September 2018

Source: P:\Projects\0445700 CEDD ET for Tung Chung.JT\02_Deliverable\10 Monthly EM&A Report\

Date: September 2018

Environmental Resources Management

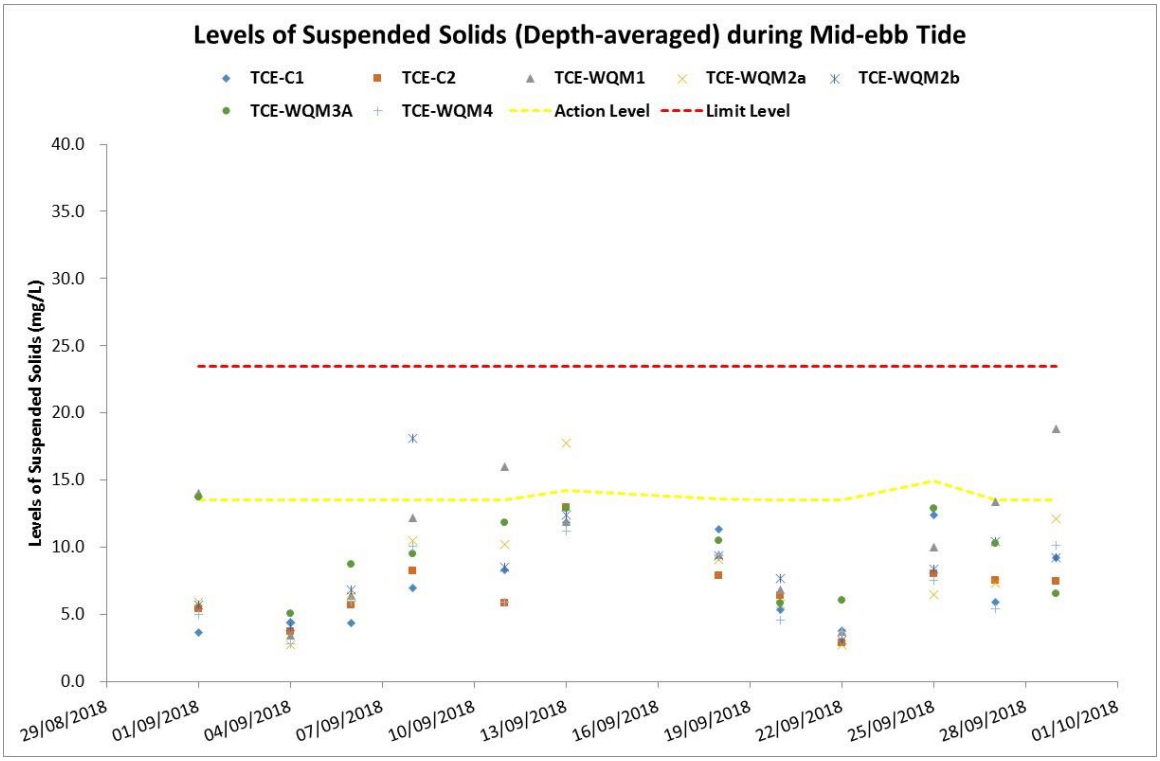

Figure 7: Levels of Suspended Solids (Depth-averaged) (mg/L) recorded at Mid-ebb Tide during the Water Quality Monitoring between 1 and 30 September 2018

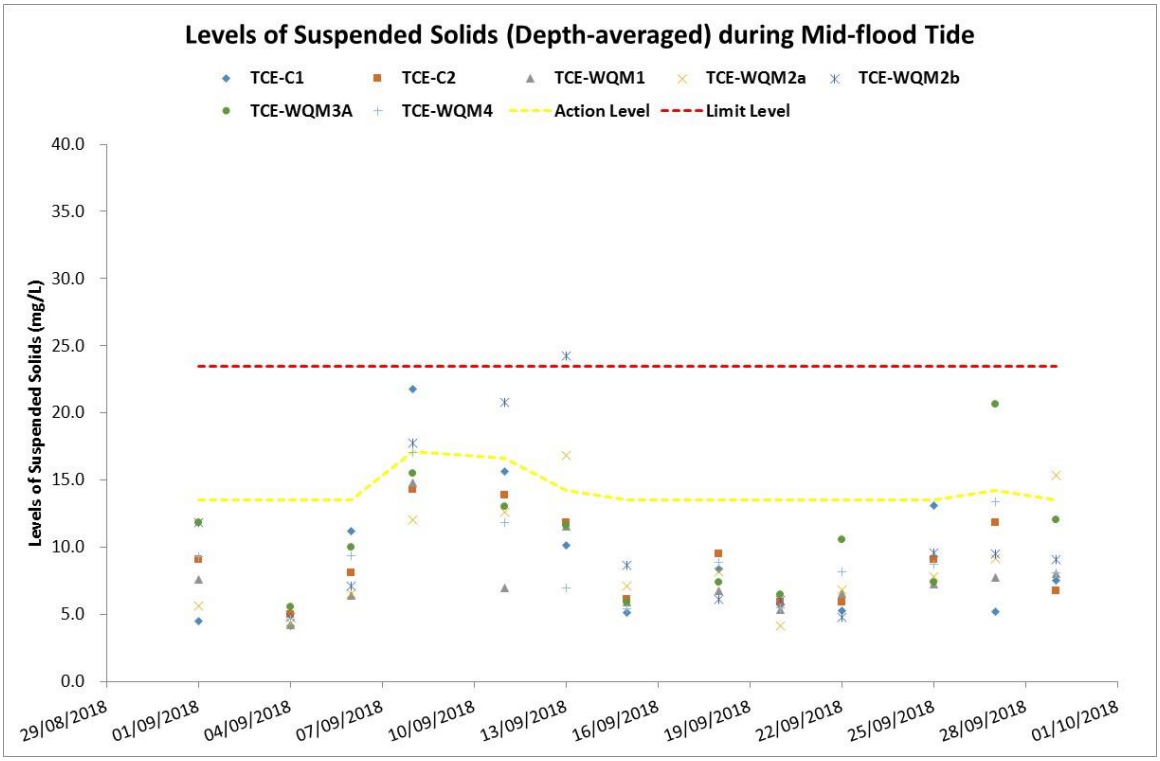

Figure 8: Levels of Suspended Solids (Depth-averaged) (mg/L) recorded at Mid-flood Tide during the Water Quality Monitoring between 1 and 30 September 2018

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
01-09-2018	Mid-Ebb	TCE-C1	Rainy	Moderate	15:51	8.6	Surface	1	1	27.9	7.9	16.0	5.9	84.2	4.9	3.0	5.4	8.4	3.7
									2	27.9	7.9	16.0	5.8	83.6	5.0	3.3			
							Middle	4.3	1	27.3	7.9	23.4	4.8	68.9	8.3	2.7			
									2	27.3	7.9	23.5	4.9	69.7	7.7	4.6			
							Bottom	7.6	1	26.6	7.9	27.5	4.6	67.2	12.4	4.0	4.7		
									2	26.6	7.9	27.5	4.7	68.5	12.1	4.5			
		TCE-C2	Rainy	Moderate	16:00	12.3	Surface	1	1	27.8	8.0	17.6	5.6	78.9	4.7	5.1	5.3	4.6	5.4
									2	27.8	8.0	17.8	5.6	78.8	4.3	4.9			
							Middle	6.15	1	27.6	8.0	22.1	5.1	73.0	5.0	6.1			
									2	27.6	8.0	22.3	5.0	72.0	4.1	6.5			
							Bottom	11.3	1	26.9	8.0	24.3	4.7	67.8	5.0	4.6	4.7		
									2	27.0	8.0	24.6	4.7	67.6	4.7	5.4			
		TCE-WQM1	Rainy	Moderate	14:44	8.6	Surface	1	1	27.7	8.0	19.5	5.6	79.2	6.7	12.0	5.6	8.1	14.0
									2	27.8	8.0	19.7	5.6	79.2	6.4	11.8			
							Middle	4.3	1	27.7	8.0	19.6	5.6	78.8	8.4	14.3			
									2	27.8	8.0	19.8	5.5	78.7	8.1	13.4			
							Bottom	7.6	1	27.7	8.0	19.6	5.6	78.9	9.6	15.3	5.6		
									2	27.8	8.0	19.9	5.5	78.7	9.4	17.3			
		TCE-WQM2a	Rainy	Moderate	15:22	7.6	Surface	1	1	27.8	8.0	17.8	5.7	79.7	3.4	7.3	5.5	4.5	5.9
									2	27.8	8.0	17.9	5.7	80.1	4.4	6.1			
							Middle	3.8	1	27.8	8.0	19.7	5.2	73.4	4.0	5.7			
									2	27.8	8.0	20.0	5.2	73.7	4.4	6.4			
							Bottom	6.6	1	27.4	7.9	23.0	4.9	70.2	5.5	6.0	4.9		
									2	27.4	8.0	23.2	4.9	69.9	5.5	4.0			
		TCE-WQM2b	Rainy	Moderate	15:36	10.2	Surface	1	1	28.1	7.9	13.0	5.3	73.4	2.7	2.5	5.2	8.0	5.7
									2	28.1	7.9	13.3	5.3	73.3	3.6	2.0			
							Middle	5.1	1	28.0	7.9	17.1	5.1	71.6	8.7	6.4			
									2	28.0	7.9	17.3	5.1	71.4	9.7	6.1			
							Bottom	9.2	1	28.0	7.9	17.1	5.2	72.3	10.8	8.5	5.2		
									2	28.0	7.9	17.3	5.1	72.0	12.2	8.8			
		TCE-WQM3A	Rainy	Moderate	15:10	4.2	Surface	1	1	27.8	7.9	18.6	4.9	69.6	9.9	14.8	4.9	10.5	13.7
									2	27.9	8.0	18.8	4.9	69.3	9.1	12.7			
							Bottom	3.2	1	27.8	7.9	19.9	5.0	70.4	11.5	13.0	5.0		
									2	27.8	8.0	20.1	4.9	70.0	11.3	14.4			
		TCE-WQM4	Rainy	Moderate	15:00	3.8	Surface	1	1	27.9	7.9	18.6	5.5	78.3	3.7	5.8	5.5	4.1	5.0
									2	27.9	8.0	18.9	5.5	78.1	3.3	5.4			
							Bottom	2.8	1	27.8	7.9	18.9	5.6	78.8	4.5	4.1	5.6		
									2	27.9	8.0	19.2	5.6	78.8	4.7	4.6			
	Mid-Flood	TCE-C1	Rainy	Moderate	11:13	9.2	Surface	1	1	28.0	7.8	15.7	5.9	82.0	6.3	3.9	5.7	12.9	4.5
									2	28.0	7.8	15.7	5.9	82.0	6.3	4.6			
							Middle	4.6	1	27.7	7.9	19.4	5.5	77.5	14.9	4.9			
									2	27.7	7.9	19.4	5.5	77.5	15.0	2.6			
							Bottom	8.2	1	27.3	7.9	24.2	5.3	75.8	17.6	4.8	5.3		
									2	27.3	7.9	24.2	5.2	75.6	17.3	6.4			
		TCE-C2	Rainy	Moderate	10:10	13	Surface	1	1	27.6	8.0	21.0	5.0	71.5	6.2	8.1	4.7	13.0	9.1
									2	27.6	8.0	20.7	5.0	71.3	6.3	6.6			
							Middle	6.5	1	26.4	8.0	26.9	4.3	61.6	6.6	7.7			
									2	26.4	8.0	26.5	4.3	61.7	7.0	9.1			
							Bottom	12	1	26.2	7.9	28.4	4.1	59.8	25.2	12.8	4.2		
									2	26.1	7.9	28.1	4.2	60.4	26.4	10.1			
		TCE-WQM1	Rainy	Moderate	12:01	9.8	Surface	1	1	27.8	8.0	18.6	5.8	82.3	3.3	7.2	5.6	5.6	7.6
									2	27.7	8.0	18.4	5.8	82.2	2.2	7.6			
							Middle	4.9	1	27.8	8.0	20.4	5.3	75.9	4.9	6.4			
									2	27.7	7.9	20.1	5.3	76.0	4.3	6.7			
							Bottom	8.8	1	27.8	8.0	21.1	5.2	74.9	9.5	9.4	5.3		
									2	27.7	7.9	20.9	5.3	75.0	9.3	8.5			
		TCE-WQM2a	Rainy	Moderate	10:59	7	Surface	1	1	27.9	8.0	18.0	5.6	78.3	4.8	4.2	5.3	4.1	5.6
									2	27.9	8.0	17.8	5.3	75.1	2.8	4.7			
							Middle	3.5	1	27.7	8.0	20.5	5.2	74.0	4.0	4.5			
									2	27.7	8.0	20.2	5.2	74.2	4.1	5.9			
							Bottom	6	1	27.7	8.0	20.9	5.2	74.1	4.2	7.2	5.2		
									2	27.7	8.0	20.6	5.2	74.2	4.5	7.3			
		TCE-WQM2b	Rainy	Moderate	10:41	9.2	Surface	1	1	27.8	8.0	20.2	5.1	72.8	9.3	6.2	5.1	13.0	11.9
									2	27.7	8.0	19.9	5.1	72.8	7.7	4.9			
							Middle	4.6	1	27.7	8.0	20.7	5.0	71.7	14.3	10.7			
									2	27.7	8.0	20.5	5.0	71.7	13.8	9.0			
							Bottom	8.2	1	27.6	8.0	21.9	4.9	70.5	16.5	18.5	4.9		
									2	27.6	8.0	21.6	4.9	70.6	16.4	21.8			
		TCE-WQM3A	Rainy	Moderate	11:36	4.3	Surface	1	1	28.0	8.0	17.6	5.5	77.5	7.4	10.3	5.5	7.8	11.9
									2	27.9	7.9	17.4	5.5	77.6	7.3	10.2			
							Bottom	3.3	1	27.9	8.0	17.8	5.5	77.6	8.4	12.9	5.5		
									2	27.9	7.9	17.5	5.5	77.9	8.2	14.0			
		TCE-WQM4	Rainy	Moderate	11:48	4.8	Surface	1	1	27.9	8.0	18.0	5.5	77.0	5.6	7.0	5.4	12.7	9.3
									2	27.9	7.9	17.8	5.3	74.8	5.2	7.1			
							Bottom	3.8	1	27.8	8.0	20.5	5.1	73.1	20.0	11.3	5.2		
									2	27.8	7.9	20.2	5.2	73.9	19.8	11.8			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
04-09-2018	Mid-Ebb	TCE-C1	Fine	Moderate	6:53	8.4	Surface	1.0	1	28.8	7.6	7.7	5.4	73.3	5.1	3.9	5.4	8.7	4.5
									2	28.8	7.6	7.7	5.4	73.1	5.0	4.0			
							Middle	4.2	1	28.4	7.7	9.8	5.3	72.4	8.7	4.4			
									2	28.4	7.7	9.8	5.4	72.9	8.3	4.4			
							Bottom	7.4	1	26.8	7.8	25.3	4.2	60.5	12.5	5.4	4.2		
									2	26.7	7.8	25.3	4.2	60.2	12.7	4.7			
		TCE-C2	Sunny	Moderate	6:46	12.3	Surface	1.0	1	28.2	7.8	12.8	5.0	69.1	1.6	2.9	4.9	1.9	3.7
									2	28.2	7.9	13.0	5.0	69.2	2.5	3.3			
							Middle	6.2	1	28.1	7.8	16.2	4.7	66.2	1.1	3.9			
									2	28.1	7.9	16.4	4.7	66.1	1.7	3.7			
							Bottom	11.3	1	25.5	7.9	28.2	4.1	58.8	1.7	4.3	4.1		
									2	25.6	8.0	28.3	4.0	57.9	2.6	4.2			
		TCE-WQM1	Sunny	Calm	8:07	8.2	Surface	1.0	1	28.2	7.9	13.8	5.2	72.2	2.7	3.1	5.1	3.7	3.5
									2	28.2	7.9	14.7	5.2	72.3	2.6	3.3			
							Middle	4.1	1	28.0	7.9	15.7	5.0	68.0	4.0	3.5			
									2	28.0	7.9	15.6	4.9	68.4	3.7	3.4			
							Bottom	7.2	1	27.8	7.9	16.1	4.5	62.3	4.8	3.9	4.5		
									2	27.8	8.0	17.1	4.5	63.1	4.5	3.5			
		TCE-WQM2a	Sunny	Calm	7:31	6.8	Surface	1.0	1	28.1	7.8	14.0	5.0	69.0	3.9	2.6	4.8	6.8	2.7
									2	28.1	7.9	14.1	5.0	69.4	4.5	3.0			
							Middle	3.4	1	28.1	7.8	15.4	4.6	64.0	6.6	2.7			
									2	28.2	7.9	16.6	4.6	63.9	6.7	2.6			
							Bottom	5.8	1	28.1	7.9	17.4	4.3	60.2	9.1	2.8	4.3		
									2	28.1	7.9	18.8	4.2	59.1	9.8	2.7			
		TCE-WQM2b	Sunny	Moderate	7:16	10.6	Surface	1.0	1	28.2	7.8	9.8	5.4	72.7	2.9	3.3	5.0	3.2	4.1
									2	28.2	7.8	10.4	5.4	73.0	3.4	2.9			
							Middle	5.3	1	28.3	7.8	12.8	4.6	62.8	2.7	4.4			
									2	28.3	7.9	13.1	4.6	63.2	3.0	4.1			
							Bottom	9.6	1	28.2	7.9	13.9	4.4	60.6	3.5	4.9	4.4		
									2	28.2	7.9	13.9	4.4	60.9	3.6	4.8			
		TCE-WQM3A	Sunny	Calm	7:43	4.1	Surface	1.0	1	28.1	7.8	12.8	4.5	62.2	5.1	4.0	4.6	7.8	5.1
									2	28.1	7.8	12.7	4.7	65.2	5.2	4.2			
							Bottom	3.1	1	28.0	7.8	16.5	4.3	60.2	10.5	6.2	4.3		
									2	28.0	7.8	16.8	4.2	59.4	10.4	6.0			
		TCE-WQM4	Sunny	Calm	7:54	3.7	Surface	1.0	1	28.2	7.9	14.4	5.2	73.0	2.0	3.2	5.2	3.2	2.9
									2	28.3	7.9	14.8	5.2	72.9	1.8	2.6			
							Bottom	2.7	1	28.3	7.8	16.0	4.7	65.6	4.3	2.7	4.7		
									2	28.3	7.9	16.5	4.7	65.7	4.8	2.9			
	Mid-Flood	TCE-C1	Cloudy	Moderate	14:35	8.0	Surface	1.0	1	29.3	7.6	7.5	5.1	69.0	5.8	4.3	4.9	7.7	4.2
									2	29.3	7.6	7.6	5.1	69.1	5.9	4.5			
							Middle	4.0	1	28.2	7.7	12.0	4.7	64.6	6.2	3.9			
									2	28.2	7.7	12.0	4.7	64.7	5.9	4.0			
							Bottom	7.0	1	26.6	7.8	25.7	3.7	53.4	11.1	3.8	3.7		
									2	26.6	7.8	25.8	3.7	53.3	11.3	4.4			
		TCE-C2	Sunny	Moderate	14:30	11.7	Surface	1.0	1	28.7	8.0	14.6	5.6	78.1	2.3	2.8	5.2	4.4	5.0
									2	28.7	7.9	14.4	5.5	77.5	3.4	3.3			
							Middle	5.9	1	28.4	8.0	17.4	4.8	68.5	3.4	4.8			
									2	28.3	7.9	17.3	4.8	67.7	5.0	4.6			
							Bottom	10.7	1	26.7	8.0	23.4	3.9	56.0	6.1	7.3	4.0		
									2	26.7	7.9	23.2	4.0	56.1	6.3	7.0			
		TCE-WQM1	Sunny	Calm	13:14	9.0	Surface	1.0	1	28.9	8.1	15.0	6.1	85.9	2.4	3.6	5.6	8.5	4.3
									2	28.9	8.0	14.8	6.1	85.5	3.3	4.0			
							Middle	4.5	1	28.6	8.0	16.4	5.0	70.3	8.8	4.0			
									2	28.5	7.9	16.2	5.0	69.8	10.0	4.3			
							Bottom	8.0	1	27.8	8.0	22.0	4.1	59.0	13.4	5.0	4.2		
									2	27.8	7.9	21.8	4.2	60.5	13.3	4.6			
		TCE-WQM2a	Sunny	Calm	13:51	6.4	Surface	1.0	1	29.1	8.0	11.7	5.8	80.9	2.7	3.6	5.8	5.3	4.4
									2	29.0	7.9	11.6	5.8	80.9	3.8	3.7			
							Middle	3.2	1	28.5	7.9	14.0	5.7	79.9	4.7	4.6			
									2	28.5	7.9	13.9	5.7	78.8	4.6	4.5			
							Bottom	5.4	1	27.9	7.9	17.6	4.6	65.3	7.9	4.9	4.7		
									2	27.9	7.9	17.5	4.7	65.4	7.9	5.1			
		TCE-WQM2b	Sunny	Moderate	14:04	10.8	Surface	1.0	1	29.0	7.9	12.0	5.4	75.6	3.1	3.7	5.3	4.6	4.8
									2	29.0	7.9	11.9	5.4	75.3	4.1	3.4			
							Middle	5.4	1	28.1	7.9	13.4	5.1	70.4	4.0	4.9			
									2	28.0	7.9	13.3	5.1	69.9	4.5	5.4			
							Bottom	9.8	1	27.5	7.9	17.6	4.3	60.1	5.9	5.7	4.4		
									2	27.5	7.9	17.5	4.4	61.2	5.9	5.6			
		TCE-WQM3A	Sunny	Calm	13:40	3.7	Surface	1.0	1	29.5	7.9	10.3	5.8	80.8	5.0	4.2	5.8	7.8	5.6
									2	29.5	7.9	10.1	5.8	80.6	5.8	4.4			
							Bottom	2.7	1	29.1	7.9	14.2	5.0	71.1	10.4	6.6	5.1		
									2	29.1	7.9	14.0	5.1	72.2	9.9	7.0			
		TCE-WQM4	Sunny	Calm	13:30	3.3	Surface	1.0	1	28.9	8.0	13.4	5.9	81.8	7.0	4.1	5.9	11.1	4.7
									2	28.9	7.9	13.4	5.8	80.9	7.5	4.6			
							Bottom	2.3	1	28.5	8.0	16.2	5.2	73.4	10.0	4.8	5.2		
									2	27.8	7.9	20.2	5.2	73.9	19.8	5.1			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
06-09-2018	Mid-Ebb	TCE-C1	Fine	Moderate	10:07	8.4	Surface	1	1	28.7	7.9	16.9	4.2	59.8	4.0	3.6	3.7	8.0	4.4
									2	28.7	7.9	17.0	4.3	60.3	3.9	4.4			
							Middle	4.2	1	26.6	7.9	25.5	3.2	45.9	6.7	4.1			
									2	26.6	7.9	25.5	3.2	46.0	6.6	4.4			
							Bottom	7.4	1	26.1	7.9	27.8	2.9	41.8	13.3	4.9	2.9		
									2	26.1	7.9	27.8	2.9	41.8	13.4	5.0			
		TCE-C2	Fine	Moderate	9:49	13.6	Surface	1	1	28.5	8.0	16.6	5.9	83.2	2.9	3.7	5.4	2.5	5.7
									2	28.6	8.0	16.6	5.9	83.6	2.9	4.2			
							Middle	6.8	1	27.5	7.9	21.0	4.8	68.7	2.0	5.7			
									2	27.5	8.0	21.0	4.8	68.8	2.0	6.3			
							Bottom	12.6	1	25.3	7.9	29.4	3.7	52.7	2.5	7.1	3.7		
									2	25.3	8.0	29.4	3.7	52.4	2.8	7.3			
		TCE-WQM1	Fine	Moderate	11:05	7.8	Surface	1	1	29.1	8.1	15.3	5.8	82.1	3.3	5.8	4.7	7.1	6.4
									2	29.1	8.1	16.5	5.8	83.1	3.3	5.5			
							Middle	3.9	1	27.3	7.9	23.7	3.5	50.8	5.3	6.5			
									2	27.3	8.0	23.3	3.5	50.6	5.2	6.5			
							Bottom	6.8	1	26.4	7.9	28.0	2.8	40.6	12.6	7.3	2.8		
									2	26.4	8.0	28.0	2.8	39.9	12.6	6.8			
		TCE-WQM2a	Fine	Moderate	10:29	7	Surface	1	1	28.2	8.0	21.6	5.2	74.5	3.1	5.4	4.6	3.7	6.4
									2	28.2	8.0	22.0	5.2	74.8	3.3	5.6			
							Middle	3.5	1	26.7	8.0	23.3	4.0	57.3	4.5	5.7			
									2	26.8	8.0	23.3	4.0	56.9	4.2	6.1			
							Bottom	6	1	26.2	8.0	26.4	4.1	58.7	3.4	7.5	4.1		
									2	26.4	8.0	26.6	4.0	58.0	3.8	7.9			
		TCE-WQM2b	Fine	Moderate	10:17	8.9	Surface	1	1	28.5	8.0	16.7	5.1	71.4	3.1	6.3	4.4	6.8	6.8
									2	28.5	8.1	16.6	5.0	70.9	3.4	5.7			
							Middle	4.45	1	27.3	7.9	21.2	3.8	54.6	4.6	6.4			
									2	27.3	7.9	21.2	3.8	54.2	4.3	6.1			
							Bottom	7.9	1	26.5	7.9	25.1	3.4	48.2	12.7	8.4	3.4		
									2	26.5	7.9	25.1	3.3	47.3	12.9	7.9			
		TCE-WQM3A	Fine	Moderate	10:43	3.8	Surface	1	1	28.3	7.9	18.4	4.4	62.8	8.9	7.4	4.4	9.2	8.8
									2	28.3	7.9	18.2	4.4	63.1	9.1	7.8			
							Bottom	2.8	1	27.2	7.9	22.2	3.5	50.5	9.3	9.5	3.5		
									2	27.3	7.9	22.1	3.5	50.0	9.6	10.3			
		TCE-WQM4	Fine	Moderate	10:53	2.9	Middle	1.45	1	27.8	7.8	20.8	4.0	57.5	10.4	6.2	4.0	10.4	6.0
									2	27.9	7.9	20.8	4.0	57.6	10.4	5.8			
	Mid-Flood	TCE-C1	Fine	Moderate	16:47	7.3	Surface	1	1	28.5	8.0	17.2	4.9	69.1	8.4	9.8	4.5	9.8	11.2
									2	28.5	8.0	17.2	4.9	69.1	8.4	10.3			
							Middle	3.65	1	27.6	7.9	20.4	4.1	58.1	8.4	11.1			
									2	27.6	7.9	20.4	4.1	58.2	8.3	11.6			
							Bottom	6.3	1	26.8	7.9	24.3	3.4	49.3	12.6	12.3	3.4		
									2	26.8	7.9	24.3	3.4	49.3	12.5	12.0			
		TCE-C2	Fine	Moderate	16:56	13.8	Surface	1	1	27.4	8.1	22.8	5.3	76.2	4.1	6.8	4.5	11.0	8.1
									2	27.4	8.0	22.5	5.4	75.9	4.0	7.0			
							Middle	6.9	1	25.5	8.0	28.5	3.6	51.9	9.4	7.0			
									2	25.5	8.0	28.6	3.6	52.0	9.2	7.4			
							Bottom	12.8	1	24.6	8.1	31.5	3.4	48.5	19.8	10.1	3.4		
									2	24.5	8.0	31.5	3.4	48.8	19.6	10.4			
		TCE-WQM1	Fine	Moderate	15:42	7.9	Surface	1	1	30.7	8.6	15.4	10.5	152.3	3.7	5.9	8.3	9.3	6.4
									2	30.7	8.5	14.1	10.5	151.7	3.6	5.7			
							Middle	3.95	1	28.6	8.2	19.0	6.1	88.0	7.1	6.0			
									2	28.6	8.1	19.0	6.1	87.7	7.0	5.6			
							Bottom	6.9	1	27.0	8.0	25.4	3.3	47.6	17.5	7.5	3.3		
									2	27.0	7.9	25.1	3.3	48.0	17.1	7.7			
		TCE-WQM2a	Fine	Moderate	16:17	6.9	Surface	1	1	29.5	8.4	17.4	7.7	111.2	3.8	4.6	6.3	7.8	6.6
									2	29.5	8.3	16.1	7.7	108.0	3.7	4.9			
							Middle	3.45	1	27.6	8.0	21.4	4.8	68.2	7.7	7.0			
									2	27.5	8.0	21.4	4.8	68.3	7.7	6.9			
							Bottom	5.9	1	27.3	8.0	22.7	4.4	63.5	11.9	7.9	4.4		
									2	27.2	7.9	22.7	4.4	63.4	11.7	8.2			
		TCE-WQM2b	Fine	Moderate	16:28	7.7	Surface	1	1	28.5	8.2	19.6	6.4	91.5	2.9	5.0	5.5	9.1	7.1
									2	28.5	8.1	19.4	6.4	91.6	2.9	5.3			
							Middle	3.85	1	27.3	8.0	22.1	4.5	64.0	5.3	6.6			
									2	27.2	7.9	22.1	4.5	64.0	5.2	7.1			
							Bottom	6.7	1	26.5	8.0	25.1	3.9	55.1	19.3	9.4	3.9		
									2	26.5	7.9	25.2	3.9	55.7	19.1	9.1			
		TCE-WQM3A	Fine	Moderate	16:06	3.2	Surface	1	1	28.5	8.2	19.5	6.3	90.7	7.5	8.6	6.3	7.7	10.0
									2	28.4	8.1	19.5	6.3	90.7	7.4	8.8			
							Bottom	2.2	1	28.4	8.1	19.6	6.0	86.1	8.1	11.1	6.0		
									2	28.3	8.0	19.7	6.0	85.6	7.8	11.5			
		TCE-WQM4	Fine	Moderate	15:56	2.7	Middle	1.35	1	28.0	8.0	21.3	5.0	71.7	11.8	9.6	5.0	11.8	9.4
									2	27.9	8.0	21.4	5.0	72.3	11.7	9.1			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
08-09-2018	Mid-Ebb	TCE-C1	Cloudy	Moderate	12:05	8.0	Surface	1	1	27.5	8.0	22.0	5.0	71.9	4.0	5.9	4.1	14.8	7.0
									2	27.5	8.0	22.0	5.0	72.0	4.0	6.2			
							Middle	4	1	25.8	7.9	28.4	3.1	44.4	15.5	5.8			
									2	25.8	7.9	28.4	3.1	44.4	15.4	6.4			
							Bottom	7	1	25.6	7.9	29.1	3.4	49.6	24.9	8.8	3.4		
									2	25.6	7.9	29.1	3.4	49.3	24.9	8.8			
		TCE-C2	Cloudy	Moderate	11:21	11.8	Surface	1	1	28.0	8.1	21.6	5.4	78.2	10.4	6.8	5.2	6.7	8.3
									2	28.0	8.1	21.6	5.4	78.2	10.8	6.7			
							Middle	5.9	1	27.3	8.1	23.4	4.9	70.2	7.0	8.7			
									2	27.3	8.1	23.4	4.9	69.9	7.6	9.2			
							Bottom	10.8	1	26.9	8.0	24.4	4.6	65.8	2.5	8.9	4.6		
									2	26.9	8.0	24.4	4.6	65.8	2.0	9.3			
		TCE-WQM1	Cloudy	Calm	12:52	8.3	Surface	1	1	28.8	8.2	21.1	6.1	88.5	6.2	10.6	4.9	10.2	12.2
									2	28.8	8.1	21.1	6.0	87.7	6.6	10.4			
							Middle	4.15	1	27.1	8.0	25.4	3.8	54.3	10.9	12.3			
									2	27.1	8.0	25.3	3.8	54.5	10.6	11.9			
							Bottom	7.3	1	26.5	8.0	27.8	3.3	47.5	13.3	14.2	3.3		
									2	26.5	8.0	27.8	3.3	47.8	13.3	13.8			
		TCE-WQM2a	Cloudy	Moderate	12:14	7.0	Surface	1	1	27.8	8.1	22.1	5.1	73.9	4.4	8.9	5.1	3.7	10.5
									2	27.7	8.1	22.1	5.2	74.0	4.4	9.2			
							Middle	3.5	1	27.6	8.1	22.5	5.1	72.7	3.8	11.0			
									2	27.6	8.1	22.6	5.1	72.8	3.2	10.8			
							Bottom	6	1	26.7	8.1	25.5	4.7	67.2	3.3	12.0	4.7		
									2	26.7	8.0	25.5	4.7	67.7	3.2	11.3			
		TCE-WQM2b	Cloudy	Moderate	12:01	11.2	Surface	1	1	27.5	8.1	22.5	4.5	65.0	8.4	12.9	4.3	13.3	18.1
									2	27.4	8.0	22.6	4.5	64.6	8.6	12.6			
							Middle	5.6	1	27.2	8.1	23.7	4.1	58.4	12.7	20.0			
									2	27.2	8.0	23.7	4.1	58.7	12.7	20.7			
							Bottom	10.2	1	27.2	8.1	23.9	4.1	58.4	18.6	20.9	4.1		
									2	27.1	8.0	23.9	4.1	59.1	18.6	21.4			
		TCE-WQM3A	Cloudy	Calm	12:30	4.1	Surface	1	1	28.8	8.2	19.4	5.9	84.9	4.7	8.8	5.9	6.6	9.5
									2	28.8	8.1	19.4	5.9	85.5	5.0	9.3			
							Bottom	3.1	1	27.6	8.0	22.4	4.1	58.4	8.2	10.1	4.1		
									2	27.7	8.0	22.5	4.1	59.2	8.3	9.9			
		TCE-WQM4	Cloudy	Calm	12:40	2.9	Middle	1.45	1	28.6	8.2	20.4	6.5	93.7	3.4	9.9	6.5	3.4	10.1
									2	28.6	8.1	20.4	6.5	94.1	3.4	10.3			
	Mid-Flood	TCE-C1	Cloudy	Moderate	18:22	7.2	Surface	1	1	27.6	7.9	21.6	4.8	68.1	12.2	19.5	4.4	15.2	21.8
									2	27.6	7.9	21.6	4.8	68.1	12.1	19.7			
							Middle	3.6	1	26.9	7.9	24.2	4.0	57.4	16.9	22.0			
									2	26.9	7.9	24.2	4.0	57.4	16.9	22.5			
							Bottom	6.2	1	26.9	7.9	24.5	4.2	59.8	16.6	23.9	4.2		
									2	26.9	7.9	24.5	4.2	59.7	16.6	23.2			
		TCE-C2	Cloudy	Moderate	18:28	10.8	Surface	1	1	26.5	8.0	25.9	4.2	59.9	3.8	10.2	4.1	10.2	14.3
									2	26.5	8.1	25.8	4.2	59.9	3.6	9.6			
							Middle	5.4	1	25.9	8.0	27.6	4.0	56.9	8.5	13.4			
									2	26.0	8.1	27.5	3.9	56.8	8.2	12.8			
							Bottom	9.8	1	25.4	8.0	29.3	3.9	56.3	18.6	20.3	3.9		
									2	25.4	8.1	29.2	3.9	56.1	18.6	19.5			
		TCE-WQM1	Cloudy	Calm	17:06	7.5	Surface	1	1	28.6	8.2	21.4	6.9	100.6	5.7	12.7	6.6	9.8	14.8
									2	28.6	8.3	21.4	6.9	100.8	5.7	12.7			
							Middle	3.75	1	28.3	8.2	21.9	6.2	90.1	8.4	15.1			
									2	28.3	8.3	21.9	6.2	90.1	8.3	14.7			
							Bottom	6.5	1	27.0	8.0	25.2	4.4	63.1	15.1	16.6	4.4		
									2	27.0	8.1	25.2	4.3	62.5	15.3	17.2			
		TCE-WQM2a	Cloudy	Moderate	17:43	6.8	Surface	1	1	27.9	8.1	21.1	5.9	84.6	2.7	9.2	5.8	6.3	12.0
									2	27.9	8.2	21.1	5.9	84.8	2.7	9.9			
							Middle	3.4	1	27.8	8.1	22.1	5.6	79.9	5.9	11.4			
									2	27.8	8.2	22.1	5.6	79.9	5.4	11.9			
							Bottom	5.8	1	27.6	8.1	22.7	5.1	73.0	10.4	15.1	5.1		
									2	27.6	8.1	22.7	5.1	72.9	10.8	14.7			
		TCE-WQM2b	Cloudy	Calm	17:55	10.3	Surface	1	1	27.3	8.0	22.7	4.7	67.4	9.5	12.5	4.5	13.6	17.8
									2	27.3	8.0	22.7	4.7	67.3	9.7	12.9			
							Middle	5.15	1	26.8	8.0	24.7	4.2	60.8	13.7	18.9			
									2	26.8	8.0	24.6	4.2	60.8	13.7	18.5			
							Bottom	9.3	1	26.6	8.0	25.7	4.0	57.5	17.8	21.8	4.0		
									2	26.6	8.0	25.7	4.0	57.5	17.1	22.0			
		TCE-WQM3A	Cloudy	Calm	17:31	3.5	Surface	1	1	28.1	8.1	21.5	5.9	85.2	11.5	10.8	5.9	14.0	15.5
									2	28.1	8.2	21.5	5.9	85.5	11.3	11.4			
							Bottom	2.5	1	27.8	8.1	22.3	5.3	76.1	16.8	19.6	5.3		
									2	27.8	8.2	22.3	5.3	75.8	16.2	20.1			
		TCE-WQM4	Cloudy	Calm	17:21	2.6	Middle	1.3	1	27.9	8.1	22.8	5.6	80.4	10.6	17.1	5.6	10.5	17.1
									2	27.9	8.2	22.7	5.6	80.3	10.3	17.0			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
11-09-2018	Mid-Ebb	TCE-C1	Fine	Moderate	13:09	8	Surface	1	1	27.3	8.0	22.0	4.9	70.0	6.1	6.9	4.7	8.8	8.4
									2	27.3	8.0	22.0	4.9	70.0	6.1	6.8			
							Middle	4	1	26.6	8.0	24.6	4.5	63.9	8.8	8.2			
									2	26.6	8.0	24.6	4.5	63.9	8.8	8.9			
							Bottom	7	1	26.3	8.0	26.8	4.5	64.9	11.6	9.6	4.5		
									2	26.3	8.0	26.8	4.5	64.9	11.6	9.7			
		TCE-C2	Fine	Moderate	13:30	12.4	Surface	1	1	27.2	8.1	25.6	4.9	71.2	6.0	4.4	4.4	7.4	5.9
									2	27.2	8.1	25.6	4.9	71.2	6.0	4.8			
							Middle	6.2	1	26.1	8.1	27.6	3.8	54.3	8.9	4.9			
									2	26.1	8.1	27.6	3.8	54.3	8.9	4.8			
							Bottom	11.4	1	25.6	8.1	28.8	3.7	52.5	7.3	8.0	3.7		
									2	25.6	8.1	28.8	3.7	52.5	7.3	8.3			
		TCE-WQM1	Fine	Moderate	12:25	8.5	Surface	1	1	27.0	8.0	25.4	4.1	59.7	4.0	15.4	4.1	6.2	16.0
									2	27.0	8.0	25.4	4.1	59.7	4.0	15.6			
							Middle	4.25	1	27.0	8.0	25.4	4.1	59.5	7.7	15.4			
									2	27.0	8.0	25.4	4.1	59.5	7.7	16.1			
							Bottom	7.5	1	27.0	8.0	25.4	4.1	59.5	7.0	17.1	4.1		
									2	27.0	8.0	25.4	4.1	59.5	7.0	16.6			
		TCE-WQM2a	Fine	Moderate	12:58	8.3	Surface	1	1	27.0	8.1	25.8	4.2	60.3	11.3	7.8	4.0	8.8	10.2
									2	27.0	8.1	25.8	4.2	60.3	11.3	8.2			
							Middle	4.15	1	26.2	8.1	27.4	3.8	55.2	8.9	9.3			
									2	26.2	8.1	27.4	3.8	55.2	8.9	9.4			
							Bottom	7.3	1	26.0	8.1	27.8	3.9	55.7	6.1	12.9	3.9		
									2	26.0	8.1	27.8	3.9	55.7	6.1	13.7			
		TCE-WQM2b	Fine	Moderate	13:11	9.2	Surface	1	1	27.2	8.0	24.2	4.3	62.5	5.0	8.6	4.2	5.5	8.5
									2	27.2	8.1	24.1	4.3	62.5	4.3	8.4			
							Middle	4.6	1	26.8	8.0	25.4	4.2	59.8	6.9	8.7			
									2	26.8	8.1	25.4	4.1	59.6	6.2	8.2			
							Bottom	8.2	1	26.7	8.0	25.7	4.2	61.1	5.2	9.0	4.2		
									2	26.7	8.1	25.7	4.2	60.7	5.3	8.1			
		TCE-WQM3A	Fine	Moderate	12:48	4.5	Surface	1	1	27.0	8.0	24.8	4.2	60.2	3.9	9.8	4.2	4.8	11.9
									2	27.0	8.0	24.8	4.2	60.2	3.9	10.6			
							Bottom	3.5	1	26.8	8.0	25.2	4.2	61.0	5.6	13.6	4.2		
									2	26.8	8.0	25.2	4.2	61.0	5.6	13.4			
		TCE-WQM4	Fine	Moderate	12:37	4.1	Surface	1	1	27.1	8.0	25.4	4.2	61.4	10.7	5.6	4.2	7.7	5.9
									2	27.1	8.0	25.4	4.2	61.4	10.7	5.7			
							Bottom	3.1	1	26.7	8.0	25.7	4.2	60.2	4.7	5.9	4.2		
									2	26.7	8.0	25.7	4.2	60.2	4.7	6.5			
	Mid-Flood	TCE-C1	Fine	Moderate	8:41	9.1	Surface	1	1	26.9	7.9	22.0	4.5	64.1	15.4	11.4	4.4	45.9	15.6
									2	26.9	7.9	22.0	4.5	64.1	15.4	11.5			
							Middle	4.55	1	26.5	8.0	25.6	4.3	61.8	46.9	21.4			
									2	26.5	8.0	25.6	4.3	61.8	46.9	22.0			
							Bottom	8.1	1	26.5	8.0	26.1	4.5	64.5	75.3	13.5	4.5		
									2	26.5	8.0	26.1	4.5	64.5	75.3	14.0			
		TCE-C2	Fine	Moderate	7:34	12.5	Surface	1	1	26.2	8.0	26.7	3.9	56.5	8.7	13.6	3.8	10.2	13.9
									2	26.3	8.0	26.6	3.9	56.4	8.5	14.2			
							Middle	6.25	1	25.8	8.0	28.1	3.8	54.3	10.0	14.5			
									2	25.9	8.0	28.0	3.7	53.8	9.7	13.8			
							Bottom	11.5	1	25.8	8.0	28.2	3.8	54.2	11.9	13.5	3.8		
									2	25.8	8.0	28.1	3.7	53.5	12.1	13.6			
		TCE-WQM1	Fine	Moderate	8:48	8.4	Surface	1	1	26.8	8.0	25.5	4.2	60.5	5.7	6.5	4.3	7.8	7.0
									2	26.8	8.0	25.4	4.2	60.4	5.5	7.1			
							Middle	4.2	1	26.7	8.0	25.8	4.3	61.6	8.8	7.1			
									2	26.7	8.0	25.7	4.3	61.4	8.8	6.6			
							Bottom	7.4	1	26.7	8.0	26.0	4.3	62.3	8.7	7.4	4.3		
									2	26.7	8.0	26.0	4.3	62.3	9.2	7.1			
		TCE-WQM2a	Fine	Moderate	8:11	8	Surface	1	1	26.7	8.0	24.7	4.2	59.7	5.9	11.9	4.1	10.5	12.7
									2	26.7	8.0	24.7	4.2	59.5	6.0	12.3			
							Middle	4	1	26.6	8.0	25.2	4.0	57.4	10.2	13.0			
									2	26.6	8.1	25.2	4.0	57.1	9.7	12.6			
							Bottom	7	1	26.4	8.0	26.2	4.0	57.8	15.8	12.9	4.0		
									2	26.4	8.1	26.1	4.0	57.2	15.6	13.2			
		TCE-WQM2b	Fine	Moderate	7:57	8.9	Surface	1	1	26.5	8.0	25.5	4.0	57.2	5.3	17.4	4.0	7.5	20.8
									2	26.6	8.0	25.5	4.0	57.1	5.9	18.3			
							Middle	4.45	1	26.4	8.0	26.0	4.0	56.8	6.3	22.4			
									2	26.4	8.1	25.9	3.9	56.5	6.3	21.9			
							Bottom	7.9	1	26.3	8.0	26.5	4.0	57.6	10.4	22.6	4.0		
									2	26.3	8.1	26.4	4.0	57.1	10.6	22.0			
		TCE-WQM3A	Fine	Moderate	8:24	4.5	Surface	1	1	26.7	8.0	24.4	4.2	60.0	8.6	12.2	4.2	8.5	13.0
									2	26.7	8.0	24.4	4.2	59.8	8.3	12.9			
							Bottom	3.5	1	26.6	8.0	24.6	4.3	60.8	8.7	13.2	4.3		
									2	26.6	8.0	24.5	4.2	60.7	8.5	13.8			
		TCE-WQM4	Fine	Moderate	8:35	4.3	Surface	1	1	26.7	8.0	24.5	4.2	60.0	5.2	10.4	4.2	7.4	11.9
									2	26.7	8.0	24.4	4.2	59.9	5.4	10.1			
							Bottom	3.3	1	26.5	8.0	25.7	4.2	59.8	9.5	13.2	4.2		
									2	26.6	8.0	25.7	4.2	59.8	9.6	13.7			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
13-09-2018	Mid-Ebb	TCE-C1	Cloudy	Moderate	15:02	9.3	Surface	1.0	1	27.3	8.0	23.2	5.4	77.5	4.9	10.1	5.1	8.7	11.9
									2	27.3	8.0	23.2	5.4	77.3	4.9	9.7			
							Middle	4.7	1	26.5	8.0	26.6	4.9	69.9	10.3	11.3			
									2	26.5	8.0	26.6	4.8	69.9	10.3	11.9			
							Bottom	8.3	1	26.4	8.0	26.8	5.0	71.8	11.0	14.2	5.0		
									2	26.4	8.0	26.8	5.0	72.0	11.0	14.0			
		TCE-C2	Cloudy	Moderate	15:10	12.6	Surface	1.0	1	27.4	8.1	25.5	5.1	74.5	14.5	11.1	4.8	11.7	13.0
									2	27.4	8.0	25.5	5.1	74.8	14.6	10.9			
							Middle	6.3	1	26.7	8.1	26.3	4.5	65.4	11.9	13.7			
									2	26.7	8.0	26.3	4.6	65.9	11.9	14.1			
							Bottom	11.6	1	26.0	8.1	28.1	4.3	61.4	8.9	14.3	4.3		
									2	26.0	8.0	28.2	4.3	62.5	8.3	13.7			
		TCE-WQM1	Cloudy	Moderate	13:44	9.2	Surface	1.0	1	27.2	8.0	25.3	5.1	73.2	11.8	10.5	5.0	10.3	11.9
									2	27.1	8.0	25.3	5.1	73.7	11.7	10.3			
							Middle	4.6	1	26.9	8.0	26.2	4.9	70.5	11.0	11.3			
									2	26.8	8.0	26.3	4.9	71.4	11.2	11.9			
							Bottom	8.2	1	26.7	8.0	26.7	4.9	70.5	8.0	13.6	5.0		
									2	26.7	8.0	26.7	5.0	72.4	8.0	13.7			
		TCE-WQM2a	Cloudy	Moderate	14:26	7.6	Surface	1.0	1	27.2	8.0	25.0	5.0	72.9	8.2	14.1	5.0	10.0	17.8
									2	27.2	8.0	25.1	5.1	73.6	8.2	14.4			
							Middle	3.8	1	26.8	8.0	25.6	4.8	69.9	9.0	18.7			
									2	26.8	8.0	25.7	4.9	70.1	9.7	19.3			
							Bottom	6.6	1	26.6	8.0	26.2	4.5	65.0	12.4	19.8	4.6		
									2	26.5	8.0	26.3	4.6	66.2	12.5	20.3			
		TCE-WQM2b	Cloudy	Moderate	14:41	8.9	Surface	1.0	1	27.5	8.0	24.3	5.2	75.7	3.9	10.8	5.0	2.0	12.4
									2	27.5	8.0	24.3	5.3	76.3	1.3	10.2			
							Middle	4.5	1	26.8	8.0	25.4	4.7	67.7	1.5	12.3			
									2	26.8	8.0	25.4	4.8	68.5	1.8	12.8			
							Bottom	7.9	1	26.8	8.0	25.6	4.7	67.7	1.2	14.4	4.8		
									2	26.8	8.0	25.7	4.8	68.9	2.5	14.0			
		TCE-WQM3A	Cloudy	Moderate	14:12	4.2	Surface	1.0	1	27.6	8.0	24.1	5.2	75.1	12.9	12.4	5.2	12.3	12.9
									2	27.6	8.0	24.2	5.2	75.8	12.3	11.5			
							Bottom	3.2	1	27.5	8.0	24.3	5.1	73.9	12.2	13.7	5.2		
									2	27.4	8.0	24.5	5.2	74.8	11.8	14.0			
		TCE-WQM4	Cloudy	Moderate	14:00	4.1	Surface	1.0	1	27.5	8.0	24.9	5.4	78.8	14.5	9.4	5.5	12.0	11.2
									2	27.5	8.0	25.0	5.5	79.5	14.6	9.7			
							Bottom	3.1	1	27.1	8.0	25.0	5.0	72.9	9.5	12.7	5.1		
									2	27.0	8.0	25.1	5.2	74.5	9.3	13.0			
	Mid-Flood	TCE-C1	Cloudy	Moderate	8:50	9.2	Surface	1.0	1	27.0	7.9	23.1	5.1	73.0	7.8	9.3	5.0	12.6	10.2
									2	27.0	7.9	23.1	5.1	73.0	7.7	8.9			
							Middle	4.6	1	26.5	8.0	25.7	4.8	68.9	12.2	9.9			
									2	26.6	8.0	25.6	4.8	69.1	12.7	10.0			
							Bottom	8.2	1	26.4	8.0	26.4	5.1	73.6	17.7	11.2	5.1		
									2	26.4	8.0	26.4	5.0	72.3	17.3	11.7			
		TCE-C2	Sunny	Moderate	9:15	13.2	Surface	1.0	1	26.6	8.0	25.8	4.5	65.4	3.9	8.8	4.4	3.5	11.9
									2	26.6	8.0	25.8	4.5	65.4	3.5	8.7			
							Middle	6.6	1	26.1	8.0	27.6	4.2	60.5	3.5	10.6			
									2	26.1	8.0	27.6	4.2	60.5	3.3	11.4			
							Bottom	12.2	1	26.1	8.0	27.8	4.2	60.2	3.4	15.4	4.2		
									2	26.1	8.0	27.8	4.2	60.2	3.4	16.3			
		TCE-WQM1	Cloudy	Moderate	10:40	9.6	Surface	1.0	1	27.0	8.0	25.0	5.0	72.6	12.2	10.4	5.0	11.8	11.5
									2	26.9	8.0	25.0	5.1	72.9	12.2	10.8			
							Middle	4.8	1	26.9	8.0	25.2	4.9	70.6	10.0	10.8			
									2	26.8	8.0	25.3	4.9	70.1	10.1	11.0			
							Bottom	8.6	1	26.8	8.0	25.4	4.9	70.1	13.1	12.9	4.8		
									2	26.8	8.0	25.4	4.7	67.9	13.4	13.3			
		TCE-WQM2a	Cloudy	Moderate	9:57	7.2	Surface	1.0	1	26.8	8.0	25.1	4.7	67.8	7.1	14.3	4.8	7.7	16.9
									2	26.8	8.0	25.1	4.8	68.7	7.7	14.9			
							Middle	3.6	1	26.8	8.0	25.1	4.7	67.9	8.2	15.5			
									2	26.8	8.0	25.1	4.8	68.9	8.8	15.7			
							Bottom	6.2	1	26.8	8.0	25.1	4.8	68.6	7.2	20.2	4.9		
									2	26.8	8.0	25.1	4.9	69.9	7.2	20.6			
		TCE-WQM2b	Sunny	Moderate	9:39	11.6	Surface	1.0	1	26.8	8.1	25.3	4.7	68.2	4.1	22.2	4.7	6.5	24.2
									2	26.8	8.0	25.4	4.8	68.7	2.2	22.6			
							Middle	5.8	1	26.7	8.1	25.5	4.6	66.0	5.9	23.9			
									2	26.6	8.0	25.6	4.6	66.6	5.7	23.6			
							Bottom	10.6	1	26.6	8.0	25.7	4.6	66.3	10.4	26.3	4.6		
									2	26.6	8.0	25.7	4.6	66.3	10.4	26.8			
		TCE-WQM3A	Cloudy	Moderate	10:12	4.4	Surface	1.0	1	26.8	8.0	25.0	4.9	70.8	11.8	9.5	5.0	11.5	11.7
									2	26.8	8.0	25.0	5.0	71.9	11.2	9.9			
							Bottom	3.4	1	26.8	8.0	25.0	5.0	71.8	11.4	13.6	5.1		
									2	26.7	8.0	25.1	5.1	73.6	11.6	13.6			
		TCE-WQM4	Cloudy	Moderate	10:25	4.0	Surface	1.0	1	27.0	8.0	24.8	5.1	72.9	13.4	6.4	5.1	12.0	7.0
									2	27.0	8.0	24.8	5.1	73.4	13.9	6.9			
							Bottom	3.0	1	26.8	8.0	25.1	5.0	71.2	10.5	7.3	5.0		
									2	26.8	8.0	25.1	5.0	72.6	10.3	7.4			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
15-09-2018	Mid-Flood	TCE-C1	Sunny	Moderate	11:32	8.6	Surface	1.0	1	27.7	8.0	21.1	5.5	78.8	13.5	6.6	5.5	15.8	5.1
									2	27.7	8.0	20.9	5.5	78.8	13.4	4.1			
							Middle	4.3	1	26.9	8.1	27.6	5.4	78.7	15.4	4.7			
									2	26.9	8.1	27.6	5.4	78.3	15.6	5.9			
							Bottom	7.6	1	26.9	8.1	28.0	5.5	80.9	18.5	5.0	5.5		
									2	26.9	8.1	28.0	5.5	81.1	18.6	4.4			
		TCE-C2	Sunny	Moderate	10:51	12.8	Surface	1.0	1	27.2	8.0	25.2	4.8	70.1	11.9	5.3	4.6	12.3	6.1
									2	27.3	8.0	25.2	4.8	69.9	11.8	5.0			
							Middle	6.4	1	26.6	8.0	27.6	4.5	65.0	12.7	6.1			
									2	26.6	8.1	27.6	4.4	64.6	12.7	6.0			
							Bottom	11.8	1	26.4	8.0	28.2	4.4	64.3	12.3	8.1	4.4		
									2	26.5	8.1	28.1	4.4	63.7	12.3	6.2			
		TCE-WQM1	Sunny	Moderate	12:06	8.8	Surface	1.0	1	28.0	8.0	24.5	5.4	79.7	6.6	6.3	5.3	5.9	5.9
									2	28.0	8.1	24.5	5.4	79.5	6.7	7.3			
							Middle	4.4	1	27.5	8.0	25.2	5.1	74.6	5.6	4.8			
									2	27.5	8.1	25.1	5.1	74.3	5.5	6.6			
							Bottom	7.8	1	27.5	8.0	25.3	5.1	74.5	5.0	5.8	5.1		
									2	27.5	8.1	25.3	5.1	73.8	5.7	4.5			
		TCE-WQM2a	Sunny	Moderate	11:30	7.2	Surface	1.0	1	27.7	8.0	24.1	5.1	74.1	3.8	6.1	5.0	6.6	7.1
									2	27.7	8.1	24.1	5.2	75.1	3.1	7.1			
							Middle	3.6	1	27.3	8.0	24.7	4.9	70.3	9.7	7.2			
									2	27.4	8.1	24.6	4.9	70.4	9.7	7.9			
							Bottom	6.2	1	27.1	8.0	25.4	4.8	69.1	6.8	7.8	4.8		
									2	27.2	8.1	25.4	4.8	69.9	6.7	6.7			
		TCE-WQM2b	Sunny	Moderate	11:17	9.5	Surface	1.0	1	27.5	8.0	24.4	5.0	71.8	12.6	8.3	4.9	9.1	8.6
									2	27.5	8.1	24.4	4.9	71.6	12.6	9.5			
							Middle	4.8	1	27.3	8.0	24.8	4.8	70.1	9.4	8.0			
									2	27.3	8.1	24.8	4.8	69.6	9.5	8.2			
							Bottom	8.5	1	27.0	8.0	25.9	4.7	68.7	5.1	9.7	4.7		
									2	27.0	8.1	25.8	4.7	67.6	5.2	8.1			
		TCE-WQM3A	Sunny	Moderate	11:42	4.1	Surface	1.0	1	28.0	8.0	23.0	5.5	79.8	4.5	6.8	5.5	4.0	5.9
									2	28.0	8.1	22.9	5.5	79.5	4.9	7.7			
							Bottom	3.1	1	27.7	8.0	23.7	5.3	77.3	3.1	4.1	5.3		
									2	27.8	8.1	23.7	5.3	76.7	3.3	5.0			
		TCE-WQM4	Sunny	Moderate	11:54	4.0	Surface	1.0	1	27.6	8.0	24.3	5.2	75.9	4.6	6.5	5.2	7.1	5.5
									2	27.7	8.1	24.3	5.2	75.8	4.5	6.2			
							Bottom	3.0	1	27.6	8.0	24.7	5.3	76.8	9.7	5.2	5.3		
									2	27.6	8.1	24.6	5.2	76.1	9.4	3.9			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
18-09-2018	Mid-Ebb	TCE-C1	Cloudy	Moderate	7:44	8.8	Surface	1.0	1	26.9	8.0	23.2	6.6	93.4	5.1	9.7	6.5	8.1	11.3
									2	26.9	8.0	23.2	6.6	93.4	5.1	9.8			
							Middle	4.4	1	26.8	8.0	23.4	6.4	91.7	6.6	11.3			
									2	26.8	8.0	23.4	6.4	91.7	6.5	11.7			
							Bottom	7.8	1	26.6	8.1	26.6	6.1	88.4	12.6	12.8	6.1		
									2	26.6	8.1	26.6	6.1	88.4	12.5	12.7			
		TCE-C2	Cloudy	Moderate	7:00	11.7	Surface	1.0	1	26.5	8.2	29.1	5.9	87.0	14.5	7.3	5.9	14.2	7.9
									2	26.4	8.1	29.1	5.9	86.8	14.7	7.2			
							Middle	5.9	1	26.5	8.2	29.2	5.9	86.3	14.3	7.8			
									2	26.5	8.1	29.2	5.9	86.0	14.6	7.5			
							Bottom	10.7	1	26.5	8.2	29.4	5.8	85.7	13.6	8.5	5.8		
									2	26.5	8.2	29.4	5.8	85.5	13.7	8.9			
		TCE-WQM1	Cloudy	Moderate	8:17	7.7	Surface	1.0	1	26.6	8.2	26.2	6.1	87.8	11.1	7.7	6.1	7.0	9.4
									2	26.6	8.2	26.3	6.1	87.9	11.7	7.5			
							Middle	3.9	1	26.6	8.2	27.1	6.0	87.3	6.1	9.2			
									2	26.6	8.2	27.2	6.0	87.6	6.3	9.1			
							Bottom	6.7	1	26.6	8.2	27.3	6.0	87.4	3.0	11.4	6.0		
									2	26.6	8.2	27.3	6.0	87.8	3.7	11.6			
		TCE-WQM2a	Cloudy	Moderate	7:43	7.3	Surface	1.0	1	26.5	8.2	27.3	6.3	91.8	13.6	7.3	6.3	13.5	9.1
									2	26.5	8.2	27.3	6.3	92.0	13.1	7.6			
							Middle	3.7	1	26.5	8.2	27.4	6.3	91.2	13.6	9.9			
									2	26.5	8.2	27.4	6.3	91.3	13.3	10.4			
							Bottom	6.3	1	26.5	8.2	28.1	6.1	89.3	13.9	9.9	6.2		
									2	26.5	8.2	28.2	6.2	89.6	13.7	9.6			
		TCE-WQM2b	Cloudy	Moderate	7:30	9.7	Surface	1.0	1	26.7	8.1	25.5	6.3	90.0	12.2	8.0	6.2	9.4	9.4
									2	26.7	8.2	25.5	6.2	89.9	12.3	8.3			
							Middle	4.9	1	26.6	8.1	26.1	6.2	88.9	11.5	9.7			
									2	26.6	8.2	26.1	6.1	88.7	11.3	10.1			
							Bottom	8.7	1	26.6	8.1	26.7	6.1	88.4	4.8	9.9	6.1		
									2	26.6	8.2	26.7	6.1	88.0	4.4	10.3			
		TCE-WQM3A	Cloudy	Moderate	7:56	4.3	Surface	1.0	1	26.7	8.2	27.3	5.6	81.9	11.9	9.9	5.7	7.1	10.5
									2	26.7	8.1	27.4	5.7	82.4	11.9	9.1			
							Bottom	3.3	1	26.7	8.2	27.4	5.7	83.1	2.8	11.7	5.8		
									2	26.7	8.2	27.5	5.8	83.7	1.6	11.3			
		TCE-WQM4	Cloudy	Moderate	8:06	4	Surface	1.0	1	26.6	8.2	26.6	6.0	87.4	12.0	8.4	6.0	9.5	9.4
									2	26.6	8.2	26.6	6.0	87.2	11.8	8.9			
							Bottom	3.0	1	26.6	8.2	27.3	5.9	86.1	7.0	10.4	5.9		
									2	26.6	8.2	27.4	5.9	86.3	7.0	10.0			
	Mid-Flood	TCE-C1	Cloudy	Moderate	19:52	8.7	Surface	1.0	1	27.7	8.0	19.9	6.7	94.9	4.1	7.9	6.6	8.8	8.4
									2	27.7	8.0	19.9	6.7	95.0	3.9	7.6			
							Middle	4.4	1	27.0	8.0	22.4	6.5	92.1	5.6	8.2			
									2	27.0	8.0	22.4	6.5	92.0	5.7	8.5			
							Bottom	7.7	1	26.7	8.0	26.4	6.1	87.9	16.7	9.1	6.1		
									2	26.6	8.1	26.8	6.0	86.6	16.8	9.1			
		TCE-C2	Cloudy	Moderate	19:45	13.5	Surface	1.0	1	26.9	8.2	27.3	6.2	91.0	14.8	7.9	6.0	13.0	9.5
									2	26.9	8.3	27.3	6.2	90.8	14.4	7.8			
							Middle	6.8	1	26.6	8.2	28.6	5.8	85.4	13.6	9.4			
									2	26.6	8.3	28.5	5.8	85.0	13.3	9.1			
							Bottom	12.5	1	26.5	8.2	29.3	5.7	83.9	10.8	11.3	5.7		
									2	26.6	8.3	29.2	5.7	83.3	11.0	11.5			
		TCE-WQM1	Cloudy	Moderate	18:31	7.8	Surface	1.0	1	27.8	8.1	26.0	6.4	93.8	13.6	4.8	6.2	11.4	6.8
									2	27.8	8.2	26.0	6.4	93.4	13.8	4.9			
							Middle	3.9	1	27.2	8.1	26.7	6.0	87.1	11.7	6.0			
									2	27.2	8.2	26.7	5.9	86.9	11.3	6.5			
							Bottom	6.8	1	26.9	8.1	27.0	5.8	84.9	9.0	9.3	5.8		
									2	26.9	8.2	27.0	5.8	84.5	9.2	9.0			
		TCE-WQM2a	Cloudy	Moderate	19:02	7.8	Surface	1.0	1	27.2	8.1	24.8	6.4	92.2	14.4	6.9	6.3	11.8	8.2
									2	27.2	8.2	24.7	6.4	92.3	14.2	7.0			
							Middle	3.9	1	26.8	8.1	26.3	6.1	88.7	12.9	7.6			
									2	26.8	8.2	26.3	6.1	88.3	12.7	8.2			
							Bottom	6.8	1	26.7	8.1	27.0	6.1	87.8	8.3	9.7	6.1		
									2	26.7	8.2	27.0	6.0	87.3	8.3	9.6			
		TCE-WQM2b	Cloudy	Moderate	19:18	9.4	Surface	1.0	1	27.4	8.1	22.6	6.5	92.9	14.5	5.6	6.3	11.7	6.1
									2	27.4	8.2	22.6	6.5	92.7	14.3	5.4			
							Middle	4.7	1	26.9	8.1	25.8	6.1	88.4	10.4	6.0			
									2	26.9	8.2	25.8	6.1	87.8	10.0	5.6			
							Bottom	8.4	1	26.6	8.1	27.6	5.9	85.4	10.6	7.1	5.9		
									2	26.7	8.2	27.6	5.8	84.9	10.1	6.9			
		TCE-WQM3A	Cloudy	Moderate	18:51	4	Surface	1.0	1	27.4	8.1	24.7	6.3	91.4	12.9	7.2	6.3	11.6	7.4
									2	27.4	8.2	24.7	6.3	91.1	12.7	6.7			
							Bottom	3.0	1	27.3	8.1	26.7	5.9	87.0	10.2	8.1	5.9		
									2	27.3	8.2	26.7	5.9	86.1	10.7	7.7			
		TCE-WQM4	Cloudy	Moderate	18:41	2.8	Middle	1.4	1	27.7	8.1	24.6	6.6	95.4	11.2	9.1	6.6	11.3	8.9
									2	27.7	8.2	24.6	6.5	94.9	11.3	8.7			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
20-09-2018	Mid-Ebb	TCE-C1	Fine	Moderate	10:21	8.9	Surface	1.0	1	28.6	8.0	12.0	6.5	90.2	5.3	4.8	6.5	8.1	5.4
									2	28.6	8.0	12.0	6.5	90.3	5.2	5.4			
							Middle	4.5	1	28.4	8.0	13.6	6.4	88.9	6.2	5.4			
									2	28.4	8.0	13.6	6.4	89.0	6.2	5.1			
							Bottom	7.9	1	28.3	8.0	15.6	6.3	88.6	12.7	5.6	6.3		
									2	28.3	8.0	16.4	6.3	88.6	12.7	5.8			
		TCE-C2	Fine	Moderate	9:47	12.8	Surface	1.0	1	27.9	8.2	18.3	6.5	91.4	15.8	6.1	6.2	15.1	6.4
									2	27.9	8.2	18.4	6.5	91.5	15.8	6.4			
							Middle	6.4	1	27.5	8.2	23.5	5.8	83.7	15.9	6.0			
									2	27.5	8.2	23.6	5.8	83.7	15.9	6.2			
							Bottom	11.8	1	26.9	8.3	27.7	5.3	77.1	13.5	6.7	5.3		
									2	26.9	8.3	27.8	5.3	77.1	13.6	7.0			
		TCE-WQM1	Fine	Calm	11:12	8.3	Surface	1.0	1	28.7	8.2	19.2	6.5	92.6	15.9	5.4	5.8	11.5	6.8
									2	28.7	8.2	19.2	6.5	92.9	15.9	5.3			
							Middle	4.2	1	27.0	8.2	27.6	5.1	75.1	11.1	6.4			
									2	27.1	8.2	27.6	5.1	75.2	11.3	6.0			
							Bottom	7.3	1	26.9	8.3	28.3	5.1	75.0	7.4	8.8	5.1		
									2	26.9	8.3	28.3	5.1	75.0	7.3	9.1			
		TCE-WQM2a	Fine	Moderate	10:32	7.2	Surface	1.0	1	28.3	8.2	20.9	6.5	93.6	15.5	4.0	6.2	11.7	5.8
									2	28.3	8.2	20.7	6.5	93.9	15.5	4.3			
							Middle	3.6	1	27.9	8.2	23.8	5.8	84.0	12.7	4.8			
									2	27.9	8.2	23.7	5.8	84.2	12.8	5.2			
							Bottom	6.2	1	27.1	8.2	26.4	5.4	78.5	6.8	8.3	5.4		
									2	27.1	8.2	26.4	5.4	78.4	6.7	8.0			
		TCE-WQM2b	Fine	Moderate	10:16	11.0	Surface	1.0	1	28.2	8.2	17.9	6.1	86.5	14.8	6.6	5.9	11.5	7.7
									2	28.2	8.2	17.9	6.1	86.5	14.7	6.9			
							Middle	5.5	1	27.3	8.2	23.9	5.7	81.5	15.3	7.0			
									2	27.4	8.2	23.9	5.7	81.8	15.4	7.3			
							Bottom	10.0	1	27.1	8.3	26.6	5.4	79.0	4.2	8.8	5.4		
									2	27.1	8.3	26.4	5.4	79.0	4.5	9.3			
		TCE-WQM3A	Fine	Calm	10:49	3.9	Surface	1.0	1	27.9	8.2	21.3	5.9	84.0	14.6	4.7	5.9	14.4	5.8
									2	27.9	8.2	21.6	5.9	84.3	14.6	5.3			
							Bottom	2.9	1	28.3	8.2	20.9	5.9	85.0	14.1	6.5	5.9		
									2	28.4	8.2	20.8	5.9	85.2	14.2	6.8			
		TCE-WQM4	Fine	Calm	11:00	2.8	Middle	1.4	1	28.4	8.2	20.1	6.6	94.7	15.9	4.4	6.6	15.9	4.6
									2	28.4	8.2	20.2	6.6	94.7	15.9	4.7			
	Mid-Flood	TCE-C1	Cloudy	Moderate	17:20	8.8	Surface	1.0	1	28.6	8.0	17.5	6.6	93.4	8.3	4.8	6.3	11.4	5.7
									2	28.6	8.0	17.5	6.6	93.6	8.3	5.3			
							Middle	4.4	1	27.7	8.0	21.7	6.0	85.8	13.3	6.0			
									2	27.7	8.0	21.7	6.0	85.9	13.2	6.3			
							Bottom	7.8	1	27.3	8.0	25.4	5.9	86.3	12.7	5.7	5.9		
									2	27.3	8.0	25.4	5.9	86.2	12.7	6.2			
		TCE-C2	Fine	Moderate	17:11	11.9	Surface	1.0	1	28.3	8.2	22.0	6.5	93.8	14.9	4.5	6.0	12.4	5.9
									2	28.3	8.2	22.0	6.5	93.6	14.9	4.7			
							Middle	6.0	1	27.1	8.3	28.0	5.4	78.7	13.1	4.9			
									2	27.1	8.3	27.9	5.4	78.9	13.4	5.3			
							Bottom	10.9	1	27.0	8.3	29.8	5.2	77.5	9.2	7.9	5.2		
									2	27.0	8.3	29.8	5.2	77.4	9.1	8.2			
		TCE-WQM1	Fine	Calm	15:57	8.1	Surface	1.0	1	29.2	8.4	19.7	8.0	116.6	14.4	4.9	7.7	11.9	5.4
									2	29.3	8.4	19.6	8.0	116.7	14.6	4.7			
							Middle	4.1	1	28.6	8.3	20.8	7.3	105.1	11.9	4.8			
									2	28.6	8.4	20.7	7.3	105.5	12.1	5.1			
							Bottom	7.1	1	27.7	8.3	25.2	5.7	82.6	9.2	6.2	5.7		
									2	27.7	8.3	25.2	5.6	82.1	9.1	6.6			
		TCE-WQM2a	Fine	Moderate	16:32	6.8	Surface	1.0	1	28.6	8.3	19.1	7.3	105.3	15.5	3.3	6.8	14.7	4.2
									2	28.8	8.3	19.1	7.3	105.5	15.4	3.6			
							Middle	3.4	1	28.0	8.2	21.8	6.3	90.6	15.7	4.1			
									2	28.0	8.2	21.7	6.3	90.8	15.7	3.9			
							Bottom	5.8	1	27.7	8.2	23.2	5.9	84.8	13.3	4.9	5.9		
									2	27.7	8.2	23.4	5.8	84.5	12.7	5.2			
		TCE-WQM2b	Fine	Moderate	16:44	11.4	Surface	1.0	1	29.1	8.2	16.2	6.7	95.0	14.3	4.1	6.2	9.7	6.1
									2	29.1	8.2	16.5	6.7	95.3	14.3	4.8			
							Middle	5.7	1	27.4	8.2	24.4	5.6	80.5	9.5	5.9			
									2	27.4	8.2	24.4	5.6	80.6	9.4	5.6			
							Bottom	10.4	1	27.3	8.2	27.5	5.3	77.8	5.5	8.2	5.3		
									2	27.2	8.2	27.5	5.3	77.8	5.3	7.8			
		TCE-WQM3A	Fine	Calm	16:21	4.0	Surface	1.0	1	29.4	8.3	15.7	7.3	104.7	14.4	6.3	7.3	12.7	6.5
									2	29.5	8.3	15.7	7.3	104.8	14.5	5.7			
							Bottom	3.0	1	28.7	8.2	19.2	6.8	97.2	10.5	6.8	6.8		
									2	28.7	8.2	19.3	6.8	97.5	11.2	7.0			
		TCE-WQM4	Fine	Calm	16:10	2.7	Middle	1.4	1	29.1	8.3	19.4	7.3	105.4	12.5	5.7	7.3	12.6	5.5
									2	29.1	8.3	19.2	7.3	106.0	12.7	5.3			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
22-09-2018	Mid-Ebb	TCE-C1	Fine	Moderate	10:14	7.9	Surface	1	1	28.7	7.9	23.7	5.1	75.9	10.0	2.9	5.1	11.5	3.8
									2	28.4	7.8	24.0	5.2	76.9	10.3	3.2			
							Middle	4	1	28.7	7.9	23.7	5.1	74.6	11.3	3.6			
									2	28.5	7.8	24.0	5.1	75.0	11.9	3.9			
							Bottom	6.9	1	28.7	7.9	23.7	5.0	74.4	12.7	4.5	5.0		
									2	28.5	7.8	24.0	5.0	74.2	12.8	4.8			
		TCE-C2	Fine	Moderate	10:28	12.4	Surface	1	1	28.7	8.4	17.5	7.3	103.2	13.9	2.3	6.5	14.9	2.9
									2	28.6	8.4	17.5	7.3	103.5	13.9	2.6			
							Middle	6.2	1	28.0	8.3	24.3	5.7	83.6	15.3	2.5			
									2	28.0	8.3	24.3	5.7	83.5	15.3	2.7			
							Bottom	11.4	1	27.5	8.3	28.5	5.2	77.8	15.5	3.4	5.3		
									2	27.5	8.3	28.4	5.3	77.9	15.5	3.7			
		TCE-WQM1	Fine	Calm	11:57	8.7	Surface	1	1	29.1	8.4	17.2	7.0	100.0	6.5	3.2	5.9	9.2	3.7
									2	29.1	8.4	17.2	7.0	100.4	6.2	2.9			
							Middle	4.4	1	27.4	8.3	26.5	4.8	69.9	8.9	3.9			
									2	27.4	8.3	26.5	4.8	70.0	9.0	4.4			
							Bottom	7.7	1	27.4	8.3	26.8	4.8	69.7	12.2	3.9	4.8		
									2	27.4	8.3	26.8	4.7	69.7	12.4	4.0			
		TCE-WQM2a	Fine	Calm	11:21	7.4	Surface	1	1	29.3	8.4	17.9	7.9	113.7	7.5	2.4	7.2	11.9	2.7
									2	29.3	8.4	17.9	8.0	115.3	7.5	2.3			
							Middle	3.7	1	28.6	8.3	19.5	6.4	91.2	13.9	3.1			
									2	28.5	8.3	19.5	6.4	91.2	13.8	2.7			
							Bottom	6.4	1	27.8	8.2	23.9	5.2	75.7	14.5	2.6	5.2		
									2	27.9	8.2	24.1	5.2	75.3	14.2	3.3			
		TCE-WQM2b	Fine	Moderate	11:05	10.7	Surface	1	1	28.9	8.3	17.0	6.9	97.9	11.3	2.3	6.8	14.1	3.1
									2	28.9	8.3	17.0	6.9	98.4	11.4	2.4			
							Middle	5.4	1	28.6	8.3	17.5	6.6	93.8	15.3	2.4			
									2	28.6	8.3	17.5	6.6	93.9	15.3	3.7			
							Bottom	9.7	1	28.0	8.3	22.2	5.6	80.5	15.8	3.6	5.6		
									2	28.0	8.3	22.3	5.6	80.2	15.6	4.2			
		TCE-WQM3A	Fine	Calm	11:33	3.9	Surface	1	1	28.8	8.3	17.8	6.3	90.1	11.7	4.5	6.3	13.1	6.1
									2	28.9	8.3	17.9	6.3	89.9	11.6	5.1			
							Bottom	2.9	1	28.3	8.2	21.0	5.1	74.2	14.4	7.4	5.1		
									2	28.2	8.2	21.2	5.1	74.1	14.6	7.3			
		TCE-WQM4	Fine	Calm	11:44	3.2	Surface	1	1	29.0	8.4	18.1	7.2	104.0	13.0	2.5	7.3	13.9	3.7
									2	29.0	8.4	18.0	7.3	104.2	13.1	2.7			
							Bottom	2.2	1	28.7	8.3	19.7	6.2	89.7	14.8	4.6	6.2		
									2	28.6	8.3	19.8	6.2	89.3	14.6	5.0			
	Mid-Flood	TCE-C1	Fine	Moderate	18:03	7.3	Surface	1	1	28.6	7.8	23.7	5.0	74.1	10.9	4.0	5.0	13.7	5.3
									2	28.4	7.8	23.9	5.0	74.0	11.0	4.3			
							Middle	3.65	1	28.6	7.8	24.1	5.0	73.2	13.6	4.8			
									2	28.3	7.8	24.4	5.0	73.0	13.2	4.6			
							Bottom	6.3	1	28.5	7.8	24.5	4.9	72.6	16.9	7.3	4.9		
									2	28.3	7.8	24.8	4.9	72.5	16.7	6.5			
		TCE-C2	Fine	Moderate	18:13	11.6	Surface	1	1	29.3	8.5	18.2	9.0	129.7	12.5	5.2	7.7	13.9	5.9
									2	29.3	8.5	18.2	9.0	129.8	12.5	5.0			
							Middle	5.8	1	28.4	8.3	20.9	6.3	90.4	14.7	6.0			
									2	28.4	8.3	20.8	6.3	90.7	14.7	6.2			
							Bottom	10.6	1	27.6	8.3	26.9	5.2	77.2	14.3	6.6	5.2		
									2	27.6	8.3	26.9	5.2	77.0	14.4	6.4			
		TCE-WQM1	Fine	Calm	16:46	8.4	Surface	1	1	29.7	8.7	18.1	9.7	141.7	5.5	5.4	8.5	9.6	6.6
									2	29.9	8.7	17.9	9.8	142.5	5.9	5.9			
							Middle	4.2	1	28.8	8.5	19.5	7.2	104.0	10.9	6.4			
									2	28.9	8.5	19.5	7.2	104.0	10.8	6.8			
							Bottom	7.4	1	27.7	8.4	25.4	5.0	72.8	12.4	7.3	5.0		
									2	27.7	8.4	25.3	4.9	72.3	12.3	7.6			
		TCE-WQM2a	Fine	Moderate	17:23	6.6	Surface	1	1	29.8	8.7	18.0	10.8	156.5	10.4	5.5	9.3	11.7	6.8
									2	29.9	8.7	18.0	10.8	156.6	10.4	5.0			
							Middle	3.3	1	28.3	8.5	19.1	7.8	111.3	10.9	7.2			
									2	28.4	8.5	19.1	7.8	111.8	11.2	6.7			
							Bottom	5.6	1	28.3	8.3	24.6	5.1	75.7	13.8	8.0	5.2		
									2	28.3	8.3	24.0	5.2	75.6	13.7	8.4			
		TCE-WQM2b	Fine	Moderate	17:40	10.1	Surface	1	1	29.2	8.3	15.8	6.7	96.0	6.1	3.6	5.8	10.5	4.8
									2	29.2	8.3	15.8	6.8	96.1	6.2	4.1			
							Middle	5.05	1	27.6	8.3	26.4	4.9	72.0	10.6	4.3			
									2	27.6	8.3	26.4	4.9	71.9	10.6	4.5			
							Bottom	9.1	1	27.5	8.3	27.8	5.0	73.7	14.8	5.8	5.0		
									2	27.5	8.3	27.8	5.0	73.5	14.9	6.3			
		TCE-WQM3A	Fine	Calm	17:12	3.5	Surface	1	1	29.4	8.5	18.4	8.3	120.5	5.8	7.7	8.4	8.8	10.6
									2	29.3	8.5	18.4	8.4	121.2	6.5	8.1			
							Bottom	2.5	1	28.4	8.2	21.3	6.2	89.4	11.5	13.1	6.3		
									2	28.4	8.3	21.1	6.3	91.2	11.4	13.4			
		TCE-WQM4	Fine	Calm	17:02	2.4	Middle	1.2	1	29.3	8.6	18.5	9.5	137.4	12.9	8.4	9.6	13.0	8.2
									2	29.3	8.6	18.4	9.6	138.7	13.1	7.9			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
25-09-2018	Mid-Ebb	TCE-C1	Cloudy	Moderate	14:19	8.8	Surface	1	1	28.7	8.0	22.4	5.9	86.6	13.1	11.4	5.8	14.5	12.4
									2	28.7	7.9	22.5	5.9	87.0	13.3	11.0			
							Middle	4.4	1	28.6	8.0	22.5	5.7	83.9	13.0	11.9			
									2	28.6	7.9	22.6	5.8	84.3	13.1	12.3			
							Bottom	7.8	1	28.6	8.0	22.7	5.6	81.5	17.0	14.1	5.6		
									2	28.6	7.9	22.7	5.6	82.0	17.2	13.9			
		TCE-C2	Cloudy	Moderate	12:48	13.4	Surface	1	1	28.6	8.1	23.1	5.8	85.7	5.0	7.3	5.5	8.3	8.1
									2	28.6	8.1	23.2	5.9	85.9	4.8	7.4			
							Middle	6.7	1	28.0	8.1	25.5	5.2	76.6	8.4	8.4			
									2	28.0	8.0	25.6	5.2	76.7	8.6	7.8			
							Bottom	12.4	1	27.9	8.1	28.0	5.1	76.1	11.4	8.6	5.1		
									2	27.9	8.1	28.0	5.1	76.0	11.8	8.8			
		TCE-WQM1	Cloudy	Moderate	14:15	7.8	Surface	1	1	29.0	8.1	21.6	6.4	93.8	5.8	6.9	6.0	12.0	10.0
									2	29.0	8.0	21.6	6.4	94.2	5.7	7.0			
							Middle	3.9	1	28.3	8.0	23.0	5.6	82.0	11.2	10.1			
									2	28.3	7.9	23.0	5.6	82.2	11.1	9.9			
							Bottom	6.8	1	28.0	8.0	23.6	5.3	76.7	19.1	13.1	5.3		
									2	28.1	7.9	23.6	5.3	77.1	19.0	13.2			
		TCE-WQM2a	Cloudy	Moderate	13:39	6.8	Surface	1	1	28.6	8.1	22.6	6.1	89.7	5.7	5.1	5.9	5.7	6.5
									2	28.6	8.0	22.7	6.2	90.0	5.5	4.9			
							Middle	3.4	1	28.3	8.1	23.4	5.7	83.3	6.1	6.7			
									2	28.3	8.0	23.5	5.7	83.5	5.7	6.7			
							Bottom	5.8	1	28.2	8.1	23.6	5.6	81.5	5.7	7.4	5.6		
									2	28.3	8.0	23.7	5.6	81.7	5.3	7.9			
		TCE-WQM2b	Cloudy	Moderate	13:25	10.5	Surface	1	1	28.5	8.0	21.8	5.7	83.0	5.3	7.4	5.5	10.4	8.4
									2	28.5	7.9	21.9	5.7	83.3	5.2	6.6			
							Middle	5.25	1	28.1	8.0	23.4	5.3	77.0	10.3	8.5			
									2	28.2	8.0	23.5	5.3	77.4	10.5	9.4			
							Bottom	9.5	1	28.0	8.0	24.0	5.1	74.1	15.6	9.3	5.1		
									2	28.1	8.0	24.0	5.1	74.5	15.4	9.0			
		TCE-WQM3A	Cloudy	Moderate	13:53	3.9	Surface	1	1	28.6	8.0	21.3	5.7	82.2	11.4	11.7	5.7	14.3	12.9
									2	28.7	7.9	21.2	5.7	82.4	11.7	12.3			
							Bottom	2.9	1	28.3	8.0	22.8	4.8	69.5	17.1	13.5	4.8		
									2	28.3	7.9	22.9	4.8	69.9	17.1	14.0			
		TCE-WQM4	Cloudy	Moderate	14:03	3.6	Surface	1	1	28.8	8.1	21.7	6.4	93.5	5.3	6.4	6.4	5.4	7.6
									2	28.8	8.0	21.8	6.4	93.9	5.1	5.9			
							Bottom	2.6	1	28.7	8.1	21.8	6.2	90.6	5.6	8.7	6.2		
									2	28.7	8.0	21.9	6.2	91.1	5.4	9.2			
	Mid-Flood	TCE-C1	Cloudy	Moderate	19:18	9.2	Surface	1	1	28.7	8.0	22.4	6.0	88.1	13.0	11.3	6.0	13.8	13.1
									2	28.7	7.9	22.5	6.0	88.1	12.8	11.6			
							Middle	4.6	1	28.6	8.0	22.5	6.0	87.0	14.0	12.3			
									2	28.7	7.9	22.5	6.0	87.1	13.6	12.8			
							Bottom	8.2	1	28.6	8.0	22.6	5.9	86.4	14.6	15.6	5.9		
									2	28.6	7.9	22.6	5.9	86.4	14.6	15.2			
		TCE-C2	Cloudy	Moderate	19:06	13.2	Surface	1	1	28.4	8.1	23.6	5.9	86.7	5.8	8.6	5.6	8.0	9.1
									2	28.4	7.9	23.6	5.9	86.7	5.8	8.6			
							Middle	6.6	1	28.2	8.1	24.4	5.3	77.5	7.8	9.0			
									2	28.2	7.9	24.5	5.3	77.6	7.9	8.6			
							Bottom	12.2	1	27.8	8.1	26.1	4.9	71.6	10.1	9.7	4.9		
									2	27.8	7.9	26.2	4.9	71.7	10.6	9.9			
		TCE-WQM1	Cloudy	Calm	17:49	8.1	Surface	1	1	28.8	8.1	22.2	6.5	95.8	7.1	6.6	6.5	8.3	7.3
									2	28.8	8.0	22.3	6.6	96.0	6.9	6.6			
							Middle	4.05	1	28.7	8.1	22.3	6.4	94.2	6.3	7.4			
									2	28.8	8.0	22.4	6.5	94.6	6.4	7.8			
							Bottom	7.1	1	28.3	8.0	23.0	5.5	79.9	11.7	7.5	5.5		
									2	28.4	7.9	23.0	5.5	80.1	11.5	7.7			
		TCE-WQM2a	Cloudy	Moderate	18:25	6.8	Surface	1	1	28.7	8.2	22.3	6.9	100.6	5.2	6.7	6.7	5.8	7.8
									2	28.7	8.0	22.3	6.9	100.7	5.3	7.0			
							Middle	3.4	1	28.6	8.1	22.4	6.4	94.2	5.6	8.1			
									2	28.6	8.0	22.5	6.5	94.8	5.3	8.3			
							Bottom	5.8	1	28.3	8.1	23.5	5.4	79.1	6.8	8.4	5.4		
									2	28.4	7.9	23.6	5.4	79.6	6.7	8.3			
		TCE-WQM2b	Cloudy	Moderate	18:37	8.4	Surface	1	1	28.4	8.0	22.4	5.5	80.3	7.0	6.9	5.4	12.0	9.6
									2	28.4	7.9	22.4	5.5	80.5	7.1	7.1			
							Middle	4.2	1	28.3	8.0	23.0	5.2	75.7	12.2	8.6			
									2	28.3	7.9	23.1	5.2	75.7	12.4	8.6			
							Bottom	7.4	1	28.0	8.0	24.7	4.9	71.8	16.6	13.4	4.9		
									2	28.0	7.9	24.9	4.9	71.9	16.5	13.0			
		TCE-WQM3A	Cloudy	Moderate	18:14	3	Surface	1	1	28.3	8.0	22.7	5.6	81.3	9.2	6.1	5.6	10.0	7.4
									2	28.3	7.9	22.7	5.6	81.8	9.2	6.4			
							Bottom	2	1	28.2	8.1	23.9	5.1	75.2	10.7	8.4	5.1		
									2	28.3	7.9	24.0	5.1	75.0	10.8	8.6			
		TCE-WQM4	Cloudy	Calm	18:00	3.2	Surface	1	1	28.7	8.1	22.2	6.6	96.4	5.8	7.8	6.6	6.5	8.7
									2	28.7	8.0	22.3	6.6	96.8	5.8	8.1			
							Bottom	2.2	1	28.6	8.1	22.6	5.6	82.5	7.1	9.6	5.7		
									2	28.6	7.9	22.7	5.7	83.5	7.1	9.4			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
27-09-2018	Mid-Ebb	TCE-C1	Fine	Moderate	13:36	8.8	Surface	1.0	1	28.2	8.1	18.8	5.8	82.5	7.6	4.8	5.6	13.0	5.9
									2	28.2	8.1	18.8	5.8	82.5	7.5	5.0			
							Middle	4.4	1	27.5	8.1	26.3	5.4	78.4	12.9	5.9			
									2	27.5	8.1	26.3	5.3	78.3	12.6	5.6			
							Bottom	7.8	1	27.5	8.1	27.8	5.7	83.6	18.5	6.8	5.7		
									2	27.5	8.1	27.8	5.6	83.2	18.9	7.2			
		TCE-C2	Fine	Moderate	14:01	12.4	Surface	1.0	1	28.7	8.0	22.2	5.6	81.1	4.9	6.7	5.3	10.6	7.5
									2	28.7	8.1	22.2	5.5	80.9	5.0	6.6			
							Middle	6.2	1	28.2	8.0	24.6	5.1	74.6	12.6	7.9			
									2	28.1	8.2	24.7	5.1	74.4	12.0	8.1			
							Bottom	11.4	1	27.7	8.0	27.7	4.7	69.1	14.5	8.0	4.7		
									2	27.6	8.2	27.8	4.7	69.2	14.8	7.9			
		TCE-WQM1	Fine	Calm	15:31	9.0	Surface	1.0	1	28.4	7.9	22.0	5.5	80.1	7.7	10.4	5.4	14.3	13.4
									2	28.4	8.1	22.0	5.5	80.2	7.2	10.3			
							Middle	4.5	1	28.2	7.9	22.7	5.2	75.8	16.4	14.5			
									2	28.2	8.1	22.7	5.2	75.9	13.8	14.9			
							Bottom	8.0	1	28.2	7.9	23.1	5.1	74.8	20.2	15.3	5.2		
									2	28.1	8.1	23.1	5.2	74.9	20.2	15.1			
		TCE-WQM2a	Fine	Moderate	14:50	7.2	Surface	1.0	1	28.6	7.9	22.6	5.6	81.9	5.7	5.7	5.5	9.9	7.4
									2	28.6	8.1	22.6	5.6	82.0	5.3	6.0			
							Middle	3.6	1	28.4	7.9	23.2	5.4	78.5	8.4	6.6			
									2	28.4	8.1	23.1	5.2	76.7	7.7	7.2			
							Bottom	6.2	1	28.2	7.9	23.7	5.1	74.6	16.1	9.4	5.1		
									2	28.2	8.1	23.8	5.1	75.0	16.2	9.2			
		TCE-WQM2b	Fine	Moderate	14:37	11.5	Surface	1.0	1	29.1	7.9	20.4	5.7	82.6	5.8	6.2	5.5	14.0	10.5
									2	29.2	8.1	20.3	5.7	82.5	5.7	5.9			
							Middle	5.8	1	28.4	7.9	21.4	5.3	76.6	15.1	10.0			
									2	28.4	8.1	21.4	5.3	76.7	15.2	10.4			
							Bottom	10.5	1	28.3	7.9	22.0	5.2	76.2	20.9	14.9	5.3		
									2	28.3	8.1	22.1	5.3	76.5	21.0	15.3			
		TCE-WQM3A	Fine	Calm	15:05	4.5	Surface	1.0	1	28.5	7.9	21.8	5.5	79.8	10.4	8.6	5.5	15.0	10.3
									2	28.5	8.1	21.8	5.5	79.7	9.9	8.9			
							Bottom	3.5	1	28.2	7.9	22.8	5.1	73.7	19.7	11.5	5.1		
									2	28.2	8.1	22.8	5.1	73.6	19.8	12.2			
		TCE-WQM4	Fine	Calm	15:16	4.1	Surface	1.0	1	28.7	7.9	22.0	5.6	81.9	4.5	4.8	5.6	7.4	5.5
									2	28.6	8.1	22.0	5.6	81.5	4.0	5.0			
							Bottom	3.1	1	28.4	7.9	22.8	5.4	78.4	10.5	6.0	5.4		
									2	28.4	8.1	22.7	5.4	79.2	10.6	6.0			
	Mid-Flood	TCE-C1	Cloudy	Moderate	19:33	9.3	Surface	1.0	1	28.1	8.0	16.7	5.8	81.6	9.2	3.7	5.5	9.8	5.2
									2	28.1	8.0	16.7	5.8	81.6	9.2	4.3			
							Middle	4.7	1	27.5	8.1	26.6	5.2	75.7	9.9	4.7			
									2	27.5	8.1	26.6	5.2	75.7	9.9	5.1			
							Bottom	8.3	1	27.5	8.1	27.4	5.4	79.4	10.2	6.9	5.4		
									2	27.5	8.1	27.4	5.4	79.4	10.2	6.4			
		TCE-C2	Cloudy	Moderate	19:51	13.1	Surface	1.0	1	28.5	8.1	21.5	5.5	79.3	3.9	9.5	5.3	9.3	11.9
									2	28.5	8.1	21.5	5.5	79.3	3.9	9.8			
							Middle	6.6	1	28.0	8.1	25.0	5.0	72.8	8.4	12.2			
									2	28.0	8.1	25.0	5.0	72.8	8.4	12.6			
							Bottom	12.1	1	27.9	8.1	25.6	5.0	73.7	15.6	13.2	5.0		
									2	27.9	8.1	25.6	5.0	73.7	15.6	13.8			
		TCE-WQM1	Cloudy	Calm	18:33	8.6	Surface	1.0	1	28.4	8.1	22.2	5.4	78.8	7.8	4.3	5.4	11.1	7.8
									2	28.4	8.1	22.2	5.4	78.8	7.8	4.1			
							Middle	4.3	1	28.3	8.1	22.4	5.3	76.6	9.6	6.8			
									2	28.3	8.1	22.4	5.3	76.6	9.6	7.3			
							Bottom	7.6	1	28.3	8.1	22.6	5.3	76.5	15.9	11.8	5.3		
									2	28.3	8.1	22.6	5.3	76.5	15.9	12.3			
		TCE-WQM2a	Cloudy	Moderate	19:09	7.8	Surface	1.0	1	28.4	8.1	22.5	5.6	81.1	4.4	7.7	5.5	5.7	9.1
									2	28.4	8.1	22.5	5.6	81.1	4.4	8.3			
							Middle	3.9	1	28.4	8.1	22.8	5.4	78.9	5.5	9.2			
									2	28.4	8.1	22.8	5.4	78.9	5.5	9.4			
							Bottom	6.8	1	28.3	8.1	23.4	5.4	78.2	7.3	9.9	5.4		
									2	28.3	8.1	23.4	5.4	78.2	7.3	10.3			
		TCE-WQM2b	Cloudy	Moderate	19:22	12.0	Surface	1.0	1	28.4	8.1	20.9	5.3	77.2	6.1	7.7	5.2	11.5	9.5
									2	28.4	8.1	20.9	5.3	77.2	6.1	7.9			
							Middle	6.0	1	28.2	8.1	22.9	5.0	73.2	12.0	9.7			
									2	28.2	8.1	22.9	5.0	73.2	12.0	9.3			
							Bottom	11.0	1	27.8	8.1	26.7	4.7	69.4	16.3	11.0	4.7		
									2	27.8	8.1	26.7	4.7	69.4	16.3	11.4			
		TCE-WQM3A	Cloudy	Calm	18:56	4.2	Surface	1.0	1	28.2	8.1	22.8	5.0	72.8	15.3	19.7	5.0	17.2	20.7
									2	28.2	8.1	22.8	5.0	72.8	15.3	19.3			
							Bottom	3.2	1	28.2	8.1	23.4	5.0	73.1	19.0	22.1	5.0		
									2	28.2	8.1	23.4	5.0	73.1	19.0	21.5			
		TCE-WQM4	Cloudy	Calm	18:46	3.7	Surface	1.0	1	28.4	8.1	22.5	5.4	78.6	6.1	10.7	5.4	8.4	13.4
									2	28.4	8.1	22.5	5.4	78.6	6.1	11.0			
							Bottom	2.7	1	28.3	8.1	23.1	5.0	72.9	10.7	16.1	5.0		
									2	28.3	8.1	23.1	5.0	72.9	10.7	15.7			

Date	Tide	Station	Weather Condition	Sea Condition	Sampling Time	Water Depth (m)	Water Level	Sampling depth (m)	Replicate	Water Temperature (°C)	pH	Salinity (ppt)	Dissolved Oxygen (DO) (mg/L)	DO Saturation (%)	Turbidity (NTU)	Suspended Solids (SS) (mg/L)	Depth-averaged		
																	DO (mg/L)	Turbidity (NTU)	SS (mg/L)
29-09-2018	Mid-Ebb	TCE-C1	Foggy	Moderate	15:29	9.6	Surface	1.0	1	28.3	7.8	22.8	5.9	85.8	7.6	7.3	5.8	8.4	9.2
									2	28.3	7.8	22.8	5.9	85.8	7.4	7.0			
							Middle	4.8	1	28.0	7.8	23.0	5.6	81.3	8.7	8.4			
									2	28.0	7.8	23.0	5.6	81.3	8.7	8.0			
							Bottom	8.6	1	28.0	7.8	23.0	5.6	81.7	8.8	12.2	5.6		
									2	28.0	7.8	23.0	5.6	81.5	8.9	12.5			
		TCE-C2	Foggy	Moderate	14:52	11.8	Surface	1.0	1	28.9	7.9	23.2	6.1	89.7	2.6	6.5	5.4	5.3	7.5
									2	28.9	7.9	23.1	6.1	89.8	2.6	6.1			
							Middle	5.9	1	27.5	7.9	28.6	4.6	67.9	6.5	7.5			
									2	27.5	7.9	28.6	4.6	67.8	6.5	6.9			
							Bottom	10.8	1	27.5	7.9	28.9	4.7	70.1	6.8	8.7	4.7		
									2	27.5	7.9	28.9	4.7	69.9	6.8	9.1			
		TCE-WQM1	Foggy	Calm	13:45	10.2	Surface	1.0	1	28.1	7.8	23.0	5.6	81.9	8.6	17.7	5.7	12.8	18.8
									2	28.1	7.8	23.0	5.6	81.9	8.5	17.9			
							Middle	5.1	1	28.0	7.8	23.1	5.7	82.2	13.4	19.4			
									2	28.0	7.8	23.1	5.7	82.1	13.3	18.6			
							Bottom	9.2	1	28.0	7.8	23.1	5.8	84.1	16.5	19.7	5.8		
									2	28.0	7.8	23.1	5.8	83.9	16.4	19.4			
		TCE-WQM2a	Foggy	Moderate	14:17	6.9	Surface	1.0	1	28.0	7.8	23.7	5.3	77.2	5.4	11.1	5.1	5.1	12.2
									2	28.0	7.8	23.7	5.3	77.3	5.3	11.3			
							Middle	3.5	1	27.6	7.9	26.8	4.9	71.6	4.4	11.8			
									2	27.6	7.9	26.8	4.9	71.6	4.3	12.2			
							Bottom	5.9	1	27.5	7.9	27.9	4.8	70.7	5.6	13.1	4.8		
									2	27.5	7.9	27.9	4.8	70.6	5.6	13.4			
		TCE-WQM2b	Foggy	Moderate	14:29	11.5	Surface	1.0	1	28.0	7.9	24.5	5.3	77.2	6.2	6.5	5.3	8.4	9.2
									2	28.0	7.9	24.5	5.3	77.2	6.2	7.2			
							Middle	5.8	1	27.9	7.9	24.6	5.3	76.8	8.5	9.7			
									2	27.9	7.9	24.6	5.2	76.7	8.5	9.9			
							Bottom	10.5	1	27.9	7.9	25.1	5.2	76.3	10.6	11.4	5.2		
									2	27.9	7.9	25.1	5.2	76.4	10.3	10.7			
		TCE-WQM3A	Foggy	Calm	14:06	4.5	Surface	1.0	1	28.6	7.9	22.4	6.0	86.9	5.0	5.4	6.0	5.1	6.5
									2	28.6	7.9	22.3	6.0	87.0	4.9	5.1			
							Bottom	3.5	1	28.5	7.9	22.5	6.0	86.9	5.2	8.0	6.0		
									2	28.5	7.9	22.5	5.9	86.7	5.2	7.6			
		TCE-WQM4	Foggy	Calm	13:56	4.1	Surface	1.0	1	28.2	7.8	22.9	5.5	80.5	6.8	9.6	5.5	7.2	10.1
									2	28.3	7.8	22.9	5.5	80.5	6.7	9.7			
							Bottom	3.1	1	28.1	7.8	23.0	5.5	80.1	7.7	10.5	5.5		
									2	28.1	7.8	23.0	5.5	80.0	7.6	10.7			
	Mid-Flood	TCE-C1	Foggy	Moderate	9:28	9.3	Surface	1.0	1	28.1	7.8	22.9	5.7	82.3	8.1	6.8	5.7	9.7	7.5
									2	28.1	7.8	22.9	5.7	82.4	8.1	6.4			
							Middle	4.7	1	28.0	7.8	23.0	5.7	82.8	8.6	7.8			
									2	28.0	7.8	23.0	5.7	82.3	8.4	8.4			
							Bottom	8.3	1	28.1	7.8	23.0	5.9	85.5	12.2	8.1	5.9		
									2	28.1	7.8	23.0	5.9	85.2	12.5	7.7			
		TCE-C2	Foggy	Moderate	9:23	12.8	Surface	1.0	1	27.7	7.9	25.1	5.2	75.2	4.7	5.6	4.9	10.1	6.8
									2	27.7	7.9	25.1	5.1	75.0	4.5	6.1			
							Middle	6.4	1	27.4	7.9	28.7	4.6	68.2	11.5	6.3			
									2	27.4	7.9	28.7	4.6	68.2	11.6	6.4			
							Bottom	11.8	1	27.4	7.9	28.8	4.6	68.9	14.2	8.2	4.6		
									2	27.4	7.9	28.8	4.6	68.8	14.2	8.1			
		TCE-WQM1	Foggy	Moderate	10:37	10.9	Surface	1.0	1	27.9	7.8	22.7	5.5	80.1	6.2	6.4	5.5	7.7	8.0
									2	27.9	7.8	22.7	5.5	80.1	6.2	5.8			
							Middle	5.5	1	27.9	7.8	22.8	5.4	78.3	7.1	8.8			
									2	27.9	7.8	22.8	5.4	78.3	7.1	8.9			
							Bottom	9.9	1	27.9	7.8	23.3	5.4	77.6	9.8	8.9	5.4		
									2	27.9	7.8	23.4	5.3	77.4	10.0	9.3			
		TCE-WQM2a	Foggy	Moderate	10:02	6.7	Surface	1.0	1	27.9	7.9	22.7	5.6	80.3	9.2	13.8	5.6	7.5	15.3
									2	27.9	7.9	22.7	5.6	80.4	9.1	14.0			
							Middle	3.4	1	27.9	7.9	22.8	5.5	80.2	7.1	15.4			
									2	27.9	7.9	22.8	5.5	80.2	7.0	15.2			
							Bottom	5.7	1	27.8	7.9	24.6	5.4	78.1	6.3	16.9	5.4		
									2	27.8	7.9	24.6	5.3	77.6	6.2	16.7			
		TCE-WQM2b	Foggy	Moderate	9:48	10.9	Surface	1.0	1	27.8	7.9	23.2	5.6	80.5	6.2	7.2	5.5	8.7	9.1
									2	27.8	7.9	23.2	5.6	80.5	6.2	7.9			
							Middle	5.5	1	27.7	7.9	24.2	5.3	76.6	8.8	9.3			
									2	27.7	7.9	24.2	5.3	76.6	8.4	8.9			
							Bottom	9.9	1	27.7	7.9	24.6	5.3	76.9	11.1	10.6	5.3		
									2	27.7	7.9	24.6	5.3	76.7	11.3	10.8			
		TCE-WQM3A	Foggy	Moderate	10:14	3.5	Surface	1.0	1	27.9	7.9	22.5	5.6	80.7	5.9	12.2	5.6	6.9	12.1
									2	27.9	7.9	22.5	5.6	80.6	5.9	11.7			
							Bottom	2.5	1	27.8	7.9	22.7	5.6	80.2	7.9	12.4	5.6		
									2	27.8	7.9	22.7	5.6	80.1	8.0	12.0			
		TCE-WQM4	Foggy	Moderate	10:25	4.5	Surface	1.0	1	27.8	7.8	22.7	5.6	80.9	5.7	8.2	5.6	7.2	8.1
									2	27.8	7.8	22.7	5.6	80.9	5.7	7.8			
							Bottom	3.5	1	27.8	7.8	23.3	5.5	79.2	8.7	8.3	5.5		
									2	27.8	7.8	23.3	5.5	79.0	8.7	8.0			

Annex F4

Event and Action Plan for Water Quality

Annex F4 Event and Action Plan for Water Quality

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action level exceedance for one sampling day	1. Inform IEC, Contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; and 3. Discuss remedial measures with IEC and Contractor and ER.	1. Discuss with ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; 3. Supervise the implementation of agreed remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4.Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with ER, ET and IEC and purpose remedial measures to IEC and ER; and 7. Implement the agreed mitigation measures.
Action level exceedance for more than one consecutive sampling days	1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Check monitoring data, all plant, equipment and Contractor's working methods; 4. Discuss remedial measures with IEC, contractor and ER 5. Ensure remedial measures are implemented	1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with ET, IEC and Contractor on the proposed mitigation measures; 2. Make agreement on the remedial measures to be implemented ; and 3. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of remedial measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed mitigation measures.

Event	Action			
	ET	IEC	ER	Contractor
Limit level exceedance for one sampling day	1. Repeat measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Rectify unacceptable practice; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Consider changes of working methods; 6. Discuss mitigation measures with IEC, ER and Contractor; and 7. Ensure the agreed remedial measures are implemented	1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; and 4. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures.
Limit level exceedance for more than one consecutive sampling days	1. Inform IEC, contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; 3. Discuss mitigation measures with IEC, ER and Contractor; and 4. Ensure mitigation measures are implemented; and 5. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days	1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures.	1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; 4. Discuss with ET and IEC on the effectiveness of the implemented mitigation measures; and 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the dredging activities until no exceedance of Limit level.	1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures. 7. As directed by the ER, to slow down or stop all or part of the dredging activities until no exceedance of Limit level.

Annex G

Soft Shore Ecology

Annex G1

Monitoring Schedule for Soft Shore Ecology

Tung Chung New Town Extension (East)
Soft Shore Ecological Monitoring Schedule (September 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1/Sep
2/Sep	3/Sep	4/Sep	5/Sep	6/Sep	7/Sep	8/Sep
			Soft Shore Monitoring at Tung Chung Bay		**Soft Shore Monitoring at Tai Ho Bay**	
9/Sep	10/Sep	11/Sep	12/Sep	13/Sep	14/Sep	15/Sep
	Soft Shore Monitoring at Tung Chung Bay	**Soft Shore Monitoring at Tung Chung Bay**				
16/Sep	17/Sep	18/Sep	19/Sep	20/Sep	21/Sep	22/Sep
23/Sep	24/Sep	25/Sep	26/Sep	27/Sep	28/Sep	29/Sep
30/Sep						

Annex G2

Monitoring Results for Soft Shore Ecology

Table G2.1 Results for Horseshoe Crabs during Qualitative Walk-through Surveys in September 2018

Sighting #	Species	Prosomal Width (cm)	Total Length (cm)
Monitoring Date: 11 September 2018 14:00-17:30			
Monitoring Station: TCB1			
1	*Tachypleus tridentatus*	6.5	12.3
2	*Carcinoscorpius rotundicauda*	2.6	5.3
3	*Carcinoscorpius rotundicauda*	2.4	5.1
4	*Tachypleus tridentatus*	1.8	4.0
5	*Tachypleus tridentatus*	4.8	8.9
6	*Tachypleus tridentatus*	1.8	3.3
7	*Tachypleus tridentatus*	1.8	3.5
8	*Tachypleus tridentatus*	3.4	6.9
9	*Tachypleus tridentatus*	1.8	3.0
10	*Tachypleus tridentatus*	1.8	3.3
	Mean (Range)	**2.9 (1.8-6.5)**	**5.6 (3.0-12.3)**
Monitoring Date: 5 September 2018 08:30-12:30			
Monitoring Station: TCB2			
1	*Carcinoscorpius rotundicauda*	2.8	6.1
2	*Carcinoscorpius rotundicauda*	4.8	10.0
3	*Carcinoscorpius rotundicauda*	6.4	13.1
	Mean (Range)	**4.7 (2.8-6.4)**	**9.7 (6.1-13.1)**
Monitoring Date: 10 September 2018 13:30-17:00			
Monitoring Station: TCB3			
1	*Carcinoscorpius rotundicauda*	4.2	8.2
2	*Tachypleus tridentatus*	0.6	0.8
3	*Tachypleus tridentatus*	0.6	0.8
4	*Carcinoscorpius rotundicauda*	2.9	5.9
5	*Tachypleus tridentatus*	2.8	5.2
6	*Tachypleus tridentatus*	4.6	8.6
7	*Carcinoscorpius rotundicauda*	1.9	4.0
8	*Tachypleus tridentatus*	1.5	2.1
9	*Tachypleus tridentatus*	1.9	3.3
10	*Tachypleus tridentatus*	2.1	3.4
11	*Carcinoscorpius rotundicauda*	1.8	4.0
12	*Tachypleus tridentatus*	1.3	2.3
13	*Tachypleus tridentatus*	1.6	2.6
14	*Tachypleus tridentatus*	2.0	2.4
15	*Tachypleus tridentatus*	2.4	3.7
16	*Tachypleus tridentatus*	2.0	3.8
17	*Tachypleus tridentatus*	1.9	3.5
18	*Tachypleus tridentatus*	1.8	3.2
19	*Tachypleus tridentatus*	2.4	4.0
	Mean (Range)	**2.1 (0.6-4.6)**	**3.8 (0.8-8.6)**
Monitoring Date: 7 September 2018 11:00-14:30			
Monitoring Station: THW			
1	*Tachypleus tridentatus*	2.0	3.4
2	*Tachypleus tridentatus*	1.6	3.3
3	*Carcinoscorpius rotundicauda*	2.5	5.1
4	*Tachypleus tridentatus*	1.6	2.4
5	*Tachypleus tridentatus*	3.0	6.3
6	*Tachypleus tridentatus*	2.6	4.7
	Mean (Range)	**2.2 (1.6-3.0)**	**4.2 (2.4-6.3)**

Table G2.2 Results for Other Intertidal Soft Shore Communities during Qualitative Walk-through Surveys in September 2018

Monitoring Station	Shore Height *	No. of Species
TCB1	H	35
	M	34
	L	33
	Overall	**45**
TCB2	H	29
	M	30
	L	32
	Overall	**40**
TCB3	H	24
	M	33
	L	31
	Overall	**44**
THW	H	29
	M	29
	L	32
	Overall	**43**

*** H: +2mCD; M: +1.5mCD; L: +1mCD**

Table G2.3 Results for Other Intertidal Soft Shore Communities during Quantitative Transect Surveys in September 2018

Monitoring Station	Shore Height *	Top Three Dominant Species		Density (ind. / m²)
TCB1	H	1	*Cerithidea cingulata*	177.6
		2	*Cerithidea diadjariensis*	175.2
		3	*Batillaria multiformis*	44.0
	M	1	*Cerithidea cingulata*	125.6
		2	*Cerithidea diadjariensis*	118.4
		3	*Monodonta labio*	54.4
	L	1	*Batillaria zonalis*	53.6
		2	*Lunella coronata*	10.4
		3	*Cellana grata / Monodonta labio / Ceratonereis* sp.	4.8
TCB2	H	1	*Cerithidea cingulata*	14.4
		2	*Monodonta labio*	9.6
		3	*Cerithidea microptera*	3.2
	M	1	*Cerithidea cingulata*	219.2
		2	*Batillaria multiformis*	16.8
		3	*Monodonta labio / Sipunculus* sp.	3.2
	L	1	*Cerithidea cingulata*	100.0
		2	*Batillaria multiformis*	38.4
		3	*Oligochaete sp.*	13.6
TCB3	H	1	*Cerithidea cingulata*	441.6
		2	*Batillaria multiformis*	356.0
		3	*Batillaria zonalis*	112.8
	M	1	*Batillaria multiformis*	122.4
		2	*Cerithidea cingulata*	32.8
		3	*Monodonta labio*	18.4
	L	1	*Batillaria multiformis*	24.8
		2	*Lunella coronata*	12.0
		3	*Echinolittorina malaccana / Sipunculus* sp.	6.4
THW	H	1	*Nassarius festivus*	267.2
		2	*Cerithidea cingulata*	13.6
		3	*Batillaria multiformis*	8.8
	M	1	*Cerithidea cingulata*	48.8
		2	*Batillaria multiformis*	27.2
		3	*Cerithidea diadjariensis*	12.0
	L	1	*Batillaria multiformis*	104.8
		2	*Cerithidea cingulata*	23.2
		3	*Cerithidea diadjariensis*	12.8

*** H: +2mCD; M: +1.5mCD; L: +1mCD**

Group	Species	TCB1			TCB2			TCB3			THW		
		H	M	L	H	M	L	H	M	L	H	M	L
Barnacle	*Balanus amphitrite*	++	+	+	++	+	+	++	+	+	+	+	+
Bivalve	*Anomalocardia squamosa*			+			+						+
Bivalve	*Barbatia virescens*			+					+	+			
Bivalve	*Circe* sp.							+					+
Bivalve	*Coecella chinensis*			+									
Bivalve	*Cyclina sinensis*							+	+	+		+	+
Bivalve	*Ervilia* sp.										+	+	+
Bivalve	*Geloina erosa*	+	+	+	+	+	+	+	+	+	++	+	+
Bivalve	*Glauconome chinensis*									+			
Bivalve	*Gafrarium tumidum*					+				+			
Bivalve	*Hiatula diphos*										+	+	
Bivalve	*Laternula anatina*				+	+	+	+	+	+			
Bivalve	*Saccostrea cucullata*	++	++	++	++	++	++	++	++	++	+	+	+
Bivalve	*Septifer virgatus*	+	+	+		+	+		+				
Bivalve	*Tapes variegatus*	+		+			+		+	+			
Chiton	*Acanthopleura japonica*			+						+			
Crab	*Clistocoeloma* sp.				+								
Crab	*Hemigrapsus sanguineus*	+	+		+	+	+	+	+		++	+	+
Crab	*Ilyoplax* spp.												+
Crab	*Macrophthalmus* sp.	+	+	+	+	+	+		+	+	+	+	+
Crab	*Metaplazx longipes*												+
Crab	*Metapograpsus frontalis*	+	+	+	+	+	+		+	+	+	+	+
Crab	*Parasesarma pictum*										+	+	
Crab	*Perisesarma bidens*	++	+		+	+	+		+		+	+	+
Crab	*Scopimera globosa*		+		+	++	+	+				+	+
Crab	*Uca borealis*	+	+	+		+		+				+	+
Crab	*Uca lactea*	++	++		++	++	++	++	++		++	++	++
Crab	*Uca paradussumieri*										+		
Crab	*Uca splendida*				+								
Crab	*Varuna litterata*											+	
Fish	*Terapon jarbua*	+			+	+					+	+	+
Fish	*Periophthalmus cantonensis*	+	+	+	++	++	+	+	+		+	+	+
Gastropod	*Batillaria multiformis*	++	++	++	++	++	++	++	++	++	++	++	++
Gastropod	*Batillaria zonalis*	+	+	+	+	+	+	+	+	+	++	++	++
Gastropod	*Cellana grata*	+	+	+		+	+		+	+	+		+
Gastropod	*Cerithidea cingulata*	+	+	+	+	+	+	+	+	+	++	++	++
Gastropod	*Cerithidea diadjariensis*	+	+								++	++	++
Gastropod	*Cerithidea microptera*			+	+						+	+	+
Gastropod	*Cerithidea rhizophorarum*		+										
Gastropod	*Clithon* spp.	+	+	+	+		+	+	+	+	+	+	+
Gastropod	*Echinolittorina radiata*						+						
Gastropod	*Echinolittorina malaccana*									+			
Gastropod	*Littoraria articulata*	++	+	+	++	+	+	++	+	+	+		
Gastropod	*Littoraria melanostoma*	+			+	+	+	+	+		+		
Gastropod	*Lunella coronata*	+	+	+			+	+	+	+			
Gastropod	*Mitra* sp.							+				+	
Gastropod	*Monodonta labio*	++	++	+	++	+	+	+	++	+			
Gastropod	*Monodonta neritoides*									+			
Gastropod	*Nassarius festivus*	+	+	+		+	+		+	+	+	+	+
Gastropod	*Nerita polita*	+	+	+	+	+	+		+	+		+	+
Gastropod	*Nipponacmea concinna*		+	+									
Gastropod	*Patelloida pygmaea*		+										
Gastropod	*Peasiella* spp.						+						
Gastropod	*Planaxis sulcatus*	+	+		+		+			+	+		
Gastropod	*Terebralia palustris*										+		
Gastropod	*Terebralia sulcata*	+	+	+	+	+	+	+	+	+			
Hermit Crab	*Clibanarius* sp.	+	+	+	+	+	+	+	+	+	+	+	+
Horseshoe Crab	*Carcinoscorpius rotundicauda*	+				+			+				
Horseshoe Crab	*Tachypleus tridentatus*	+	+	+				+	+	+		+	+
Sea Slater	*Ligia oceanica*	+			+	+						+	+
Seaslug	*Onchidium* sp.	+	+	+							+		
Worm	*Ampharetidae* sp.								+				
Worm	*Ceratonereis* sp.	+	+	+									
Worm	*Echiura* spp.							+	+	+			+
Worm	*Oligochaete* sp.	+	+	+	+	+	+		+				+
Worm	*Siphonosoma* sp.									+			
Worm	*Sipunculus* sp.	+	+	+	+	+	+		+	+	+		
Worm	Ribbon Worm sp.			+									

Remarks: '+' denotes the species was relatively rare at the area;
++' denotes the species was relatively abundant at the area.

Group	Species	TCB1																	
		H1	H2	H3	H4	H5	Density (ind. / m^2 or % cover)	M1	M2	M3	M4	M5	Density (ind. / m^2 or % cover)	L1	L2	L3	L4	L5	Density (ind. / m^2 or % cover)
Barnacle	*Balanus amphitrite*																<5%		<5%
Bivalve	*Anomalocardia squamosa*																		
Bivalve	*Barbatia virescens*																1		0.8
Bivalve	*Cyclina sinensis*																		
Bivalve	*Ervilia* **sp.**																		
Bivalve	*Geloina erosa*	3		4		1	6.4	1				1	1.6	1					0.8
Bivalve	*Glauconome chinensis*																		
Bivalve	*Laternula anatina*																		
Bivalve	*Saccostrea cucullata*				<5%	<5%	<5%			5%	5%		<5%	20%	10%	10%	5%	<5%	10%
Bivalve	*Tapes variegatus*	1					0.8												
Chiton	*Acanthopleura japonica*																2		1.6
Crab	*Hemigrapsus sanguineus*																		
Crab	*Metapograpsus frontalis*																		
Crab	*Perisesarma bidens*																		
Crab	*Scopimera globosa*							1				1	1.6						
Crab	*Uca borealis*										1		0.8				2		1.6
Crab	*Uca lactea*																		
Crab	*Uca splendida*																		
Gastropod	*Batillaria multiformis*	9		3	29	14	44.0	2	5	13	25	3	38.4						
Gastropod	*Batillaria zonalis*	4	9	20			26.4	22		1	1	23	37.6	1		5	47	14	53.6
Gastropod	*Cellana grata*									3	5		6.4				6		4.8
Gastropod	*Cerithidea cingulata*	38		121	53	10	177.6	92	28		36	1	125.6			1	1	1	2.4
Gastropod	*Cerithidea diadjariensis*	63	23	63	48	22	175.2	40	38	14	47	9	118.4						
Gastropod	*Cerithidea microptera*													1					0.8
Gastropod	*Cerithidea rhizophorarum*							1					0.8						
Gastropod	*Clithon* **spp.**	2				1	2.4	2			4		4.8			1	2		2.4
Gastropod	*Echinolittorina radiata*																		
Gastropod	*Echinolittorina malaccana*																		
Gastropod	*Littoraria articulata*																		
Gastropod	*Lunella coronata*							6		2	6		11.2	7	1	2	2	1	10.4
Gastropod	*Mitra* **sp.**																		
Gastropod	*Monodonta labio*							6		32	30		54.4				6		4.8
Gastropod	*Monodonta neritoides*																		
Gastropod	*Nassarius festivus*		5				4.0	1					0.8		1	2	1	1	4.0
Gastropod	*Nerita polita*																		
Gastropod	*Nipponacmea concinna*										1		0.8						
Gastropod	*Terebralia palustris*																		
Hermit Crab	*Clibanarius* **sp.**			1			0.8					1	0.8						
Horseshoe Crab	*Tachypleus tridentatus*																		
Seaslug	*Onchidium* **sp.**									2			1.6				3		2.4
Worm	*Ceratonereis* **sp.**																6		4.8
Worm	*Echiura* **spp.**																		
Worm	*Oligochaete* **sp.**																3		2.4
Worm	*Sipunculus* **sp.**											1	0.8	3			2		4.0

Group	Species	TCB2																	
		H1	H2	H3	H4	H5	Density (ind. / m^2 or % cover)	M1	M2	M3	M4	M5	Density (ind. / m^2 or % cover)	L1	L2	L3	L4	L5	Density (ind. / m^2 or % cover)
Barnacle	*Balanus amphitrite*									<5%		<5%	<5%			<5%	<5%	<5%	<5%
Bivalve	*Anomalocardia squamosa*													1				1	1.6
Bivalve	*Barbatia virescens*																		
Bivalve	*Cyclina sinensis*																		
Bivalve	*Ervilia* **sp.**																		
Bivalve	*Geloina erosa*					1	0.8	1			2		2.4		1				0.8
Bivalve	*Glauconome chinensis*																		
Bivalve	*Laternula anatina*																		
Bivalve	*Saccostrea cucullata*	5%					<5%		15%	15%	10%	20%	12%			5%	<5%	50%	12%
Bivalve	*Tapes variegatus*													1					0.8
Chiton	*Acanthopleura japonica*																		
Crab	*Hemigrapsus sanguineus*																	1	0.8
Crab	*Metapograpsus frontalis*			1		1	1.6												
Crab	*Perisesarma bidens*					3	2.4											1	0.8
Crab	*Scopimera globosa*																		
Crab	*Uca borealis*																		
Crab	*Uca lactea*	2					1.6									3	2		4.0
Crab	*Uca splendida*				1		0.8												
Gastropod	*Batillaria multiformis*		1	1			1.6	5			2	14	16.8	4		14	5	25	38.4
Gastropod	*Batillaria zonalis*											2	1.6			1		5	4.8
Gastropod	*Cellana grata*																2	10	9.6
Gastropod	*Cerithidea cingulata*			1		17	14.4	99	44		47	84	219.2	10	28	7	39	41	100.0
Gastropod	*Cerithidea diadjariensis*																		
Gastropod	*Cerithidea microptera*			2	2		3.2												
Gastropod	*Cerithidea rhizophorarum*																		
Gastropod	*Clithon* **spp.**																		
Gastropod	*Echinolittorina radiata*														4				3.2
Gastropod	*Echinolittorina malaccana*																		
Gastropod	*Littoraria articulata*					1	0.8												
Gastropod	*Lunella coronata*														1			14	12.0
Gastropod	*Mitra* **sp.**																		
Gastropod	*Monodonta labio*			2		10	9.6				4		3.2		15				12.0
Gastropod	*Monodonta neritoides*																		
Gastropod	*Nassarius festivus*														1			4	4.0
Gastropod	*Nerita polita*																		
Gastropod	*Nipponacmea concinna*																		
Gastropod	*Terebralia palustris*																		
Hermit Crab	*Clibanarius* **sp.**																		
Horseshoe Crab	*Tachypleus tridentatus*																		
Seaslug	*Onchidium* **sp.**																		
Worm	*Ceratonereis* **sp.**																		
Worm	*Echiura* **spp.**																		
Worm	*Oligochaete* **sp.**	2		1			2.4	1			2		2.4	4		7	1	5	13.6
Worm	*Sipunculus* **sp.**					1	0.8				4		3.2		2				1.6

Group	Species	TCB3																	
		H1	H2	H3	H4	H5	Density (ind. / m^2 or % cover)	M1	M2	M3	M4	M5	Density (ind. / m^2 or % cover)	L1	L2	L3	L4	L5	Density (ind. / m^2 or % cover)
Barnacle	*Balanus amphitrite*												<5%						<5%
Bivalve	*Anomalocardia squamosa*																		
Bivalve	*Barbatia virescens*									2	1		2.4					1	0.8
Bivalve	*Cyclina sinensis*	3	1	1			4.0				1		0.8					2	1.6
Bivalve	*Ervilia* **sp.**																		
Bivalve	*Geloina erosa*	2					1.6	1					0.8						
Bivalve	*Glauconome chinensis*													1	1	1		1	3.2
Bivalve	*Laternula anatina*							2		2			3.2		1		2		2.4
Bivalve	*Saccostrea cucullata*	<5%	<5%	<5%			<5%	0.1	0.2	0.3	<5%	<5%	<5%		5%	10%	40%	50%	10%
Bivalve	*Tapes variegatus*								1	1			1.6	1				2	2.4
Chiton	*Acanthopleura japonica*																1		0.8
Crab	*Hemigrapsus sanguineus*								2				1.6						
Crab	*Metapograpsus frontalis*																		
Crab	*Perisesarma bidens*																		
Crab	*Scopimera globosa*																		
Crab	*Uca borealis*																		
Crab	*Uca lactea*																		
Crab	*Uca splendida*																		
Gastropod	*Batillaria multiformis*	69	17	92	177	90	356.0	60		26		67	122.4			2	13	16	24.8
Gastropod	*Batillaria zonalis*	17		13	66	45	112.8	9					7.2						
Gastropod	*Cellana grata*															1			0.8
Gastropod	*Cerithidea cingulata*	121	32	131	133	135	441.6	17		24			32.8						
Gastropod	*Cerithidea diadjariensis*																		
Gastropod	*Cerithidea microptera*																		
Gastropod	*Cerithidea rhizophorarum*																		
Gastropod	*Clithon* **spp.**	1		1	3		4.0												
Gastropod	*Echinolittorina radiata*																		
Gastropod	*Echinolittorina malaccana*															1		7	6.4
Gastropod	*Littoraria articulata*																		
Gastropod	*Lunella coronata*							6	1	5	2		11.2			3	4	8	12.0
Gastropod	*Mitra* **sp.**	1					0.8												
Gastropod	*Monodonta labio*							5	11	7			18.4						
Gastropod	*Monodonta neritoides*															1	1		1.6
Gastropod	*Nassarius festivus*								2		1		2.4			2			1.6
Gastropod	*Nerita polita*								1	1			1.6			1			0.8
Gastropod	*Nipponacmea concinna*																		
Gastropod	*Terebralia palustris*																		
Hermit Crab	*Clibanarius* **sp.**																		
Horseshoe Crab	*Tachypleus tridentatus*			1	1		1.6												
Seaslug	*Onchidium* **sp.**																		
Worm	*Ceratonereis* **sp.**																		
Worm	*Echiura* **spp.**	1					0.8	2	2	2			4.8				2	3	4.0
Worm	*Oligochaete* **sp.**										1		0.8						
Worm	*Sipunculus* **sp.**													4				4	6.4

Group	Species	THW																	
		H1	H2	H3	H4	H5	Density (ind. / m^2 or % cover)	M1	M2	M3	M4	M5	Density (ind. / m^2 or % cover)	L1	L2	L3	L4	L5	Density (ind. / m^2 or % cover)
Barnacle	***Balanus amphitrite***											<5%	<5%				<5%		<5%
Bivalve	***Anomalocardia squamosa***															1			0.8
Bivalve	***Barbatia virescens***																		
Bivalve	***Cyclina sinensis***																		
Bivalve	***Ervilia* sp.**		1				0.8		1				0.8						
Bivalve	***Geloina erosa***	15	13	5	8	1	33.6	5	1	3	1	2	9.6		3	2		1	4.8
Bivalve	***Glauconome chinensis***																		
Bivalve	***Laternula anatina***																		
Bivalve	***Saccostrea cucullata***					<5%	<5%			<5%			<5%						
Bivalve	***Tapes variegatus***																		
Chiton	***Acanthopleura japonica***																		
Crab	***Hemigrapsus sanguineus***																		
Crab	***Metapograpsus frontalis***																		
Crab	***Perisesarma bidens***																		
Crab	***Scopimera globosa***																		
Crab	***Uca borealis***																		
Crab	***Uca lactea***	10	1				8.8			1			0.8						
Crab	***Uca splendida***																		
Gastropod	***Batillaria multiformis***			6	1	4	8.8			30		4	27.2	24	41	28	28	10	104.8
Gastropod	***Batillaria zonalis***													1		4	3		6.4
Gastropod	***Cellana grata***																		
Gastropod	***Cerithidea cingulata***		17				13.6					61	48.8			17	8	4	23.2
Gastropod	***Cerithidea diadjariensis***			9			7.2			15			12.0		16				12.8
Gastropod	***Cerithidea microptera***	2					1.6				5		4.0						
Gastropod	***Cerithidea rhizophorarum***																		
Gastropod	***Clithon* spp.**			1			0.8									1			0.8
Gastropod	***Echinolittorina radiata***																		
Gastropod	***Echinolittorina malaccana***																		
Gastropod	***Littoraria articulata***																		
Gastropod	***Lunella coronata***																		
Gastropod	***Mitra* sp.**																		
Gastropod	***Monodonta labio***																		
Gastropod	***Monodonta neritoides***																		
Gastropod	***Nassarius festivus***			29	305		267.2	3	3			3	7.2			1			0.8
Gastropod	***Nerita polita***																		
Gastropod	***Nipponacmea concinna***																		
Gastropod	***Terebralia palustris***	1					0.8												
Hermit Crab	***Clibanarius* sp.**																		
Horseshoe Crab	***Tachypleus tridentatus***																		
Seaslug	***Onchidium* sp.**																		
Worm	***Ceratonereis* sp.**																		
Worm	***Echiura* spp.**																		
Worm	***Oligochaete* sp.**																1	1	1.6
Worm	***Sipunculus* sp.**																		

Annex G3

Event and Action Plan for Soft Shore Ecology

Annex G3 Event and Action Plan for Soft Shore Ecological Monitoring

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Density or the distribution pattern of horseshoe crab, seagrass and intertidal soft shore communities recorded in the impact or post-construction monitoring are significantly lower than or different from those recorded in the baseline monitoring.	1. Review historical data to ensure differences are as a result of natural variation or previously observed seasonal differences; 2. Identify source(s) of impact; 3. Inform the IEC, ER and Contractor; 4. Check monitoring data; 5. Discuss additional monitoring and any other measures, with the IEC, ER and Contractor.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review proposals for additional monitoring and any other measures submitted by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures; 4. Resubmit proposals of remedial actions if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Annex H

Cumulative Statistics on Exceedances, Environmental Complaints, Notification of Summons and Status of Prosecutions

Table H1 *Cumulative Statistics on Exceedances*

		Total No. recorded in this reporting period	Total No. recorded since project commencement
Air Quality (1-hr TSP)	Action	0	0
	Limit	0	0
Noise	Action	1	4
	Limit	0	0
Water Quality	Action	0	0
	Limit	0	0
Marine Ecology	Action	0	0
	Limit	0	0

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

Table H2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Prosecutions
This Reporting Period (1 – 30 Sep 2018)	3	0	0
Total no. received since project commencement	6	0	0

Annex I

Monitoring Schedule for the Next Reporting Period

Tung Chung New Town Extension (East)
Impact Marine Water Quality Monitoring (WQM) Schedule (October 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct
		ebb tide 16:53 - 19:00 flood tide 11:34 - 15:04		ebb tide 7:00 - 10:02 flood tide 14:31 - 18:01		ebb tide 8:57 - 12:27 flood tide 15:58 - 19:28
7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct
		ebb tide 11:20 - 14:50 flood tide 5:02 - 8:32		ebb tide 12:40 - 16:10 flood tide 6:39 - 10:09		ebb tide 13:59 - 17:29 flood tide 08:18 - 11:48
14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct
		ebb tide 3:39 - 7:09 flood tide 16:04 - 18:34		ebb tide 6:34 - 9:32 flood tide 14:40 - 18:10		ebb tide 08:17 - 11:47 flood tide 15:34 - 19:04
21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct
		ebb tide 10:17 - 13:47 flood tide 4:12 - 7:42		ebb tide 11:29 - 14:59 flood tide 5:36 - 9:06		ebb tide 12:48 - 16:18 flood tide 07:06 - 10:36
28-Oct	29-Oct	30-Oct	31-Oct			
		ebb tide 14:30 - 17:00 flood tide 10:10 - 13:40				

Tung Chung New Town Extension (East)
Air Quality and Noise Monitoring Schedule (October 2018)

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