



JOB No.: TCS00874/16

CEDD CONTRACT NO. CV/2012/05
DEVELOPMENT OF A BATHING BEACH AT LUNG MEI,
TAI PO

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
REPORT (JANUARY 2018)

PREPARED FOR
WELCOME CONSTRUCTION CO., LTD

Date	Reference No.	Prepared By	Certified By
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Version	Date	Remarks
1	7 February 2018	First Submission
2	12 February 2018	Amended according to the IEC's comments on 10 February 2018
3	13 February 2018	Amended according to the IEC's comments on 13 February 2018
4	5 March 2018	Amended according to the EPD's comments on 26 Feb and 2 Mar 2018

Environmental Permit No. EP-388/2010

Development of a Bathing Beach at Lung Mei, Tai Po

Independent Environmental Checker Verification


Reference Document/Plan

Document/ Plan to be Certified / Verified:	Monthly Environmental Monitoring and Audit Report (January 2018)
Date of Report:	5 March 2018
Date received by IEC:	23 March 2018

Reference EP Condition / Updated EM&A Manual Requirement

Environmental Permit Condition / Updated EM&A Manual Reference	Condition 4.4
Three hard copies and one electronic copy of monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of the reporting month. The EM&A Reports shall include a summary of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels). The submissions shall be certified by the ET Leader and verified by the IEC. Additional copies of the submission shall be provided to the Director upon request by the Director.	

IEC Verification

I hereby verify that the above referenced document/ plan complies with the above referenced condition of EP-388/2010.	
Mr Jovy Tam	Date: 27 March 2018
Independent Environmental Checker	

Our ref: P:\Projects\0206709 IEC for Lung Mei EM&A\07_ET Submission\23_Monthly EM&A Report\02_Jan 2018\20180323 v4

EXECUTIVE SUMMARY

- ES.01 Civil Engineering and Development Department (hereafter referred as “CEDD”) is the Project Proponent and the Permit Holder of *Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po* (hereinafter referred as “the Project”), which is a Designated Project to be implemented under Environmental Permit number EP-388/2010 (hereinafter referred as “the EP-388/2010” or “the EP”).
- ES.02 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) has been commissioned as the Environmental Team for the Project (hereinafter referred as “the ET”) to perform relevant Environmental Monitoring and Audit (EM&A) programme, including baseline and impact environmental monitoring in accordance with the EM&A Manual approved under the Environmental Impact Assessment Ordinance (EIAO).
- ES.03 According to the Approved Environmental Monitoring and Audit (EM&A) Manual [November 2007] (hereinafter referred as ‘the EM&A Manual’), air quality, construction noise and water quality monitoring should be required to be monitored for baseline and during the construction phase of the Project. In January 2018, an updated EM&A Manual (AUES Ref.: TCS00874/16/300/L0085 dated 11 January 2018) was prepared to update of noise and air sensitive receivers and recent site condition for the EM&A Programme and it was submitted and approved by EPD in January 2018.
- ES.04 This is the 2nd monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 January 2018** (hereinafter ‘the Reporting Period’). In the Reporting Period, the impact monitoring covered air quality, construction noise and water quality.

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

- ES.05 Environmental monitoring activities under the EM&A program in the Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Sessions ^{Note 1}
Air Quality	1-hour TSP	5
	24-hour TSP	5
Construction Noise	L _{Aeq(30min)} Daytime	4
Water Quality	Marine Water Sampling	6 ^{Note 2}
Inspection / Audit	ET Regular Environmental Site Inspection	2
	IEC Monthly Environmental Site Audit	1

Note:

- 1.) Total sessions are counted by monitoring days.
- 2.) The marine work under the Project was commenced on 24th January 2018.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

- ES.06 No exceedance of air quality and construction noise monitoring were recorded in this Reporting Period. For water quality monitoring, a total of 17 Action/ Limit Level exceedances of Suspended Solids were recorded which involved 3 monitoring days. NOEs were issued to relevant parties upon confirmation of the monitoring result. Since there were no marine works undertaken when exceedances were recorded, the investigation reports concluded that the exceedances were not project-related. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				No. of NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	-	-
	24-hour TSP	0	0	0	-	-
Construction Noise	L _{Aeq(30min)}	0	0	0	-	-
Water Quality	DO	0	0	0	-	-
	Turbidity	0	0	0	-	-

	SS	3	14	3	No marine works were undertaken and exceedances were considered as not project-related.	NA
	Chlorophyll- <i>a</i>	0	0	0	-	-

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT

ES.07 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 January 2018	0	0	N/A

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.08 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 January 2018	0	0	N/A

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 January 2018	0	0	N/A

REPORTING CHANGE

ES.09 There are no reporting changes were made under the EM&A programme in this Reporting Period.

SITE INSPECTION

ES.10 In the Reporting Period, joint site inspection and audit to evaluate site environmental performance was carried out by the CEDD, ET and the Contractor on **4 and 19 January 2018**. No non-compliance was noted within this reporting period.

FUTURE KEY ISSUES

ES.11 The forthcoming construction activities included tree transplanting, construction of groyne and installation of marine buoys. The potential environmental impacts arising from the forthcoming activities included construction waste, air quality, construction noise and water quality.

ES.12 In view of the marine work commencement, special attention should be paid on dredging works in which water quality mitigation measures such as erection of silt curtain should be properly implemented before commencement of the works.

ES.13 The Contractor was reminded that exposed slope should be covered and temporary drainage system should be maintained to prevent surface runoff entering the sea or public area.

ES.14 The dust mitigation measures should be fully implemented such as water spraying during dust work to minimize dust impact as appropriate. All dump trucks leaving the Site should be thoroughly washed by wheel washing facilities and provided with mechanical covers in good service condition.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1 Civil Engineering and Development Department (hereafter referred as “CEDD”) is the Project Proponent and the Permit Holder of *Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po* (hereinafter referred as “the Project”), which is a Designated Project to be implemented under Environmental Permit number EP-388/2010 (hereinafter referred as “the EP-388/2010” or “the EP”).
- 1.1.2 The major construction activities of the Project comprise construction of 200-metre long bathing beach with a groyne at each end, a shark prevention net; a public car park; retaining walls; and the associated roadworks, drainage and sewerage works. Layout plan of the Project is shown in *Appendix A*.
- 1.1.3 Furthermore, the project works is under Environmental Permit (EP) No. EP-388/2010 as a Designated Project and the designated works include:
- (i) Construction of a 200m long beach with a groyne at each end of the beach which includes dredging and sandfilling works;
 - (ii) Construction of one culvert at the eastern side of the beach and another small section of culvert and open drainage channel with gabion embankments at the western end, both to collect and divert surface runoff from upstream locations; and
 - (iii) Construction of a beach building with associated beach building facilities, kiosk and a carpark and associated road improvement works adjoining the facility.
- 1.1.4 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) has been commissioned as an Independent Environmental Team (hereinafter referred as “the ET”) to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties. As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions.
- 1.1.5 Baseline monitoring of air quality and noise were carried out during **7 June to 20 June 2017** and **7 June to 23 June 2017** respectively. The Baseline Monitoring Report for Air Quality and Noise (AUES Ref.: TCS00874/16/600/R0022v3 dated 7 Aug 2017) was verified by IEC and had been submitted to EPD for endorsement. Baseline water quality monitoring was from **23 September 2017 to 21 October 2017**. The Baseline Monitoring Report for Water Quality (AUES Ref.: TCS00874/16/600/R0036v2 dated 19 Dec 2017) was verified by IEC and had been submitted to EPD for endorsement. These baseline monitoring reports summarized the key findings of baseline condition and determined a set of Action and Limit Levels (A/L Levels) based on the baseline data. The A/L Levels will serve as the yardsticks for assessing the acceptability of the environmental impact during construction phase of the Project Works impact monitoring.
- 1.1.6 This is the **2nd** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 January 2018**.

1.2 REPORT STRUCTURE

- 1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

Section 1	Introduction
Section 2	Project Organization and Construction progress
Section 3	Summary of Impact Monitoring Requirements
Section 4	Air Quality Monitoring
Section 5	Construction Noise Monitoring
Section 6	Water Quality Monitoring
Section 7	Waste Management
Section 8	Ecology
Section 9	Site Inspection

- Section 10** Environmental Complaint and non-compliance
- Section 11** Implementation Status of Mitigation Measures
- Section 12** Conclusion and Recommendation

2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in [Appendix B](#).

2.2 CONSTRUCTION PROGRESS

2.2.1 The 3-month rolling construction program is enclosed in [Appendix C](#) and the major construction activities undertaken in the Reporting Period are listed below:-

- Construction of east groyne
- Relocation of permanent marine buoy

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summary of currently relevant permits, licenses, and/or notifications on environmental protection for this Project in this Reporting Period is presented in [Table 2-1](#).

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status		
		Permit no./Account no./ Ref. no.	From	To
1	Air pollution Control (Construction Dust) Regulation	Ref. Number: 418137	N/A	N/A
2	Chemical Waste Producer Registration	Waste Producers Number (WPN): WPN5213-728-W3437-01	21 August 2017	End of Project
3	Water Pollution Control Ordinance	License No.: WT00028905-2017	24 October 2017	31 October 2022
4	Waste Disposal (Charges for Disposal of Construction Waste) Regulation	Billing Account for Disposal of Construction Waste Account No. 7017686	3 July 2013	End of Project

2.3.2 The status of environmental submission under the EM&A Manual and EP requirement is presented in [Table 2-2](#).

Table 2-2 Status of Environmental Submission

Item	EP condition	Description	Status
1	2.4	Report for Capture and Relocation of Common Rat Snake	Approved by EPD on 15 Sep 2017 (EPD ref.: (15) in EP2/N5/C/46 Pt.6 dated 15 Sep 2017)
2	2.5	Landscape Plan	Submitted to EPD on 28 June 2017
3	4.3	Baseline Monitoring Report for Air Quality and Noise (AUES Ref.: TCS00874/16/600/R0022v3 dated 7 Aug 2017)	Approved by EPD on 8 Jan 2018 (EPD ref.: (36) in EP2/N5/C/46 Pt.6 dated 8 Jan 2018)
4		Baseline Monitoring Report for Water Quality (AUES Ref.: TCS00874/16/600/R0036v2 dated 19 Dec 2017)	Approved by EPD on 10 Jan 2018 (EPD ref.: (37) in EP2/N5/C/46 Pt.6 dated 10 Jan 2018)

3. SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the EM&A manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of the Project. A summary of the EM&A requirements for air quality, noise monitoring and water quality are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 According to the Project EM&A Manual, the Impact monitoring program covers the following environmental issues:

- Air Quality;
- Construction Noise; and
- Water Quality

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1* below.

Table 3-1 Summary of EM&A Impact Monitoring Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP • 24-hour TSP
Noise	<ul style="list-style-type: none"> • Leq (30min) in six consecutive Leq(5 min) between 07:00-19:00 on normal weekdays
Water Quality	<p>In-situ Measurements</p> <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Salinity (mg/L); • Temperature (°C); • Turbidity (NTU); • pH unit; • Current direction (degree); • Current speed (m/s); and • Water depth (m) <p>Laboratory Analysis</p> <ul style="list-style-type: none"> • Suspended Solids (mg/L); and • Chlorophyll-a (µg/L)

3.3 MONITORING LOCATIONS

Air Quality

3.3.1 There are air quality monitoring locations (A4 and A6) recommended in Section 3.1 of the EM&A Manual. During liaison with the landlord of A6, he refused to provide access and location for installation of High Volume Sampler (HVS). Therefore, alternative location (A7) was proposed by ET in accordance with Section 3.4 of the EM&A Manual. The proposed alternative locations are considered capable of effectively representing the baseline conditions at the impact monitoring locations. The proposal (*ref no.: TCS00874/16/300/L0016b*) for alternative monitoring locations was verified by IEC and it has been submitted to EPD for approval on 8 May 2017. The air quality monitoring locations are in *Table 3-2* and illustrated in *Appendix D*.

Table 3-2 Summary of Air Quality Monitoring Stations

Station ID	Location
A4	No. 101 Lung Mei Tsuen
A7	Hong Kong Eco-Farm

Construction Noise

3.3.2 According to Section 4.1 of the EM&A Manual, four designated noise sensitive receivers (N1, N2, N3 and N4) were recommended and they are listed in **Table 3-3** and illustrated in **Appendix D**.

Table 3-3 Designated Noise Monitoring Station according to the EM&A Manual

NSR	Location
N1	Village house - No. 165A Lung Mei
N2*	Village house - No. 103 Lung Mei
N3	Village house - No. 70 Lo Tsz Tin
N4	Village house - No. 79 Lo Tsz Tin

Remarks: (*)Noise monitoring should be conducted at N2a (i.e House No. 101 Lung Mei) if it is changed to residential use during construction phase.

3.3.3 As confirmed on the first day of baseline monitoring, N2a (House no. 101 Lung Mei) has been changed to residential use. Therefore, the noise monitoring is conducted at N2a and to replace N2. Moreover, due to the lack of accessibility of noise monitoring at NSR N3 (Village house – No. 70 Lo Tsz Tin), alternative location was proposed to replace N3 to carry out the noise monitoring. Having reviewed the surrounding condition, NSR N3a (Village house – No. 66C Lo Tsz Tin) was proposed with the rationales summarized in below.

- 1) The distance between N3 and N3a is about 18 meter apart and N3a locates at close proximity of the project site and major site activities which are likely to have noise impacts;
- 2) N3a is a village type residential house and it is a noise sensitive receiver (NSR);
- 3) Accessibility for noise monitoring work at N3a is available; and
- 4) Minimal disturbance would be only caused to the proposed monitoring location N3a.

3.3.4 The proposal (ref no.: TCS00874/16/300/L0016b) for alternative monitoring locations was verified by IEC and it has been submitted to EPD for approval on 8 May 2017. The noise monitoring stations are listed in **Table 3-4** and illustrated in **Appendix D**.

Table 3-4 Summary of Noise Monitoring Stations

Station ID	Description
N1	Village house - No. 165A Lung Mei
N2a	Village house - No. 101 Lung Mei
N3a	Village house - No. 66C Lo Tsz Tin
N4	Village house - No. 79 Lo Tsz Tin

Water Quality

3.3.5 According to *EM&A Manual Sections 5.1.2*, two Reference Stations (R1 and R2), three impact stations (I1, I2 and I3), three sensitive receivers (FCZ1, W1 and M1) and one Gradient station (G1), were identified to perform water quality monitoring. Detailed and co-ordination of water quality monitoring stations is described in **Table 3-5** and the graphical is shown in **Appendix D**.

Table 3-5 Location of Marine Water Quality Monitoring Station

Station	Coordinates		Description
	Easting	Northing	
G1	841483.9	835936.1	Gradient Station - to assist in the identification of the source of any impact.
R1	842307.4	835718.4	Reference Station - for the background water quality for Tolo Harbour as it is at the channel where the water exchange between the enclosed Plover Cove and Tolo Harbour take place. It is located at south of the Project dredging/sandfilling area.
R2	840739.4	836212.4	Reference Station - for the background water quality in the Plover Cove region. It is located at southwest of the Project dredging/sandfilling area.

Station	Coordinates		Description
	Easting	Northing	
I1	841338.5	836588.5	Impact Station - located outside the mixing zone of dredging/sandfilling works of the Project.
I2	841590.3	836601.2	Impact Station - located outside the mixing zone of dredging/sandfilling works of the Project.
I3	841807.0	836680.9	Impact Station - located outside the mixing zone of dredging/sandfilling works of the Project.
W1	841858.9	836571.0	Sensitive Receiver - located at the Water Sport Centre, which is about 0.25 km distance to the southeast of the dredging/sandfilling area.
M1	840822.2	836416.4	Sensitive Receiver - located at the Ting Kok SSSI, which is about 0.8 km distance to the west of the dredging/sandfilling area.
FCZ1	841180.6	835230.8	Sensitive Receiver - located at the Yim Tin Tsai East Fish Culture Zone, which is about 1.5 km distance to the southwest of the dredging/sandfilling area.

3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The monitoring frequency and period for impact monitoring are summarized below.

Air Quality Monitoring

3.4.2 Monitoring frequency for air quality impact monitoring is as follows:

- Parameters:
- 1-hour TSP
 - 24-hour TSP
- Frequency:
- 3 times every six days during course of works for 1-hour TSP
 - Once every 6 days during course of works throughout the construction period for 24-hour TSP
- Duration:
- Throughout the construction period

Noise Monitoring

3.4.3 Monitoring frequency for noise impact monitoring is as follows:

- Parameters:
- $L_{eq(30min)}$, L_{10} and L_{90} .
- Frequency:
- L_{eq} (30min) in 6 consecutive $L_{eq}(5min)$ for once a week during 07:00-19:00 on normal weekdays
 - L_{10} and L_{90} for reference
- Duration:
- Throughout the construction period

Water Quality (Marine) Monitoring

3.4.4 Monitoring frequency for water quality impact monitoring is as follows:

- Parameters: In-situ measurements including water depth, Dissolved Oxygen (DO) concentration (mg/L) & saturation (%), Salinity (mg/L), Temperature (°C) and Turbidity (NTU); and Suspended Solids (mg/L) and Chlorophyll-*a* (µg/L) are analyzed by HOKLAS-accredited laboratory.
- Frequency : Three days a week, at mid ebb and mid flood tides. The interval between 2 sets of monitoring will be more than 36 hours.
- Sampling Depth:
- (i) Three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m.
 - (ii) If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above sea bottom.
 - (iii) If the water depth is less than 3m, 1 sample at mid-depth is taken
- Duration: During the dredging and sand filling works

3.4.5 In addition to the water quality parameters, other relevant data will also be to measure and record,

which are included the location of the sampling stations, water depth, time, weather conditions, sea conditions, tidal stage, current water flow direction and speed, special phenomena and work activities undertaken around the monitoring and works area that may influence the monitoring results. Observations on any special phenomena and work underway at the Project site during the time of sampling will also be to record.

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable results to the HVS. The instrument should be calibrated regularly, and the 1-hour sampling shall be determined on yearly basis by the HVS to check the validity and accuracy of the results measured by direct reading method. The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.2 All equipment to be used for impact air quality monitoring is listed in **Table 3-6**.

Table 3-6 Air Quality Monitoring Equipment

Equipment	Model
24-Hour TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Calibration Kit Mode TE-5025A
1-Hour TSP	
Portable Dust Meter	Sibata LD-3B Laser Dust Meter

Noise Monitoring

3.5.3 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in ms⁻¹ for reference.

3.5.4 Noise monitoring equipment to be used for impact monitoring is listed in **Table 3-7**.

Table 3-7 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-31 or Rion NL-52
Acoustic Calibrator	B&K Type 4231 or Rion NC-74 or Rion NC-73
Portable Wind Speed Indicator (#)	Anemometer AZ Instrument 8908

(#) Wind speed is reference data only and there is no calibration certificate for portable wind speed indicator.

Water Quality Monitoring

3.5.5 For water quality monitoring, the equipment should fulfill the requirement under the EM&A Manual Section 5.1.1. The requirement is summarized in the following section.

3.5.6 Water quality monitoring equipment to be used for impact monitoring is listed in **Table 3-8**.

Table 3-8 Water Quality Monitoring Equipment

Equipment	Model
A Digital Global	GPS12 Garmin

Equipment	Model
Positioning System	
Water Depth Detector	Eagle Sonar CUDA 300
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampler
Thermometer & DO meter	YSI Professional Plus Multifunctional Meter
pH meter	
Turbidimeter	
Salinometer	
Current Meter	Valeport Ltd – Model 106 Self Recording/Direct Reading Current Meter
Storage Container	‘Willow’ 33-litre plastic cool box with Ice pad

3.6 MONITORING PROCEDURES

Air Quality

1-hour TSP

- 3.6.1 Operation of the 1-hour TSP meter will follow manufacturer’s Operation and Service Manual.
- 3.6.2 The 1-hour TSP monitor, brand named “Sibata LD-3B Laser Dust Meter” is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90⁰ light scattering. The 1-hour TSP monitor consists of the following:
- A pump to draw sample aerosol through the optic chamber where TSP is measured;
 - A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
 - A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.
- 3.6.3 The 1-hour TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument will be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.

24-hour TSP

- 3.6.4 The equipment used for 24-hour TSP measurement is the High Volume Sampler (hereinafter the “HVS”) brand named TISCH, Model TE-5170 TSP High Volume Air Sampler, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The HVS consists of the following:
- An anodized aluminum shelter;
 - A 8”x10” stainless steel filter holder;
 - A blower motor assembly;
 - A continuous flow/pressure recorder;
 - A motor speed-voltage control/elapsed time indicator;
 - A 7-day mechanical timer, and
 - A power supply of 220v/50 hz
- 3.6.5 For HVS for 24-hour TSP monitoring, the HVS is mounted in a metallic cage with a top for protection and also it is sat on the existing ground or the roof of building. The flow rate of the HVS between 0.6m³/min and 1.7m³/min will be properly set in accordance with the manufacturer’s instruction to within the range recommended in *EPA Code of Federal Regulation, Appendix B to Part 50*. Glass Fiber Filter 8" x 10" of TE-653 will be used for 24-Hour TSP monitoring and would be supplied by laboratory. The general procedures of sampling are described as below:-
- A horizontal platform with appropriate support to secure the samples against gusty wind

should be provided;

- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as building, must be at least twice the height that the obstacle protrudes above the sample;
- A minimum of 2 meters of separation from any supporting structure, measured horizontally is required;
- Before placing any filter media at the HVS, the power supply will be checked to ensure the sampler work properly;
- The filter paper will be set to align on the screen of HVS to ensure that the gasket formed an air tight seal on the outer edges of the filter. Then filter holder frame will be tightened to the filter hold with swing bolts. The holding pressure should be sufficient to avoid air leakage at the edge.
- The mechanical timer will be set for a sampling period of 24 hours (00:00 mid-night to 00:00 mid-night next day). Information will be recorded on the field data sheet, which would be included the sampling data, starting time, the weather condition at current and the filter paper ID with the initial weight;
- After sampling, the filter paper will be collected and transfer from the filter holder of the HVS to a sealed envelope and sent to a local HOKLAS accredited laboratory for quantifying.

3.6.6 All the sampled 24-hour TSP filters will be collected and put into the filter envelope provided by the laboratory. The sample will be kept in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C and delivery to the office within 48 hours and sent to laboratory for analysis. The sampled filter will be kept in the laboratory for six months prior to disposal.

3.6.7 The HVS used for 24-hour TSP monitoring will be calibrated before the commencement for sampling, and after in two months interval for 1 point checking of maintenance and six months interval for five points calibrate in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (TISCH Calibration Kit Model TE-5025A) to establish a relationship between the follow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, Qstd, in m³/min. Motor brushes of HVS will be regularly replaced of about five hundred hours per time.

Construction Noise

3.6.8 As referred to in the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804:1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

3.6.9 All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq_(30 min) in six consecutive Leq_(5 min) measurements will be used as the monitoring parameter for the time period between 07:00-19:00 hours on weekdays.

3.6.10 The sound level meter will be mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield will be fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point would normally be at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point would be at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.

3.6.11 Immediately prior to and following each noise measurement the accuracy of the sound level meter will be checked using an acoustic calibrator generating a known sound pressure level at a

known frequency. Measurements will be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.

- 3.6.12 Noise measurements will not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed will be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

Water Quality (Marine) Monitoring

- 3.6.13 Marine water quality monitoring will be conducted at the designated locations in accordance with EM&A Manual. The operating and analytical of sampling procedures are described as below:
- A Global Positioning System (GPS) will be used to ensure that the correct location was selected prior to sample collection. A portable, battery-operated echo sounder will be used for the determination of water depth at each designated monitoring station.
 - The marine water sampler will be lowered into the water body at a predetermined depth. The trigger system of the sampler is activated with a messenger and opening ends of the sampler are closed accordingly then the sample of water is collected.
 - During the sampling, the sampling container will be rinsed to use a portion of the marine water sample before the water sample is transferred to the container. Upon sampling completion, the container is sealed with a screw cap.
 - Before the sampling process, general information such as the date and time of sampling, weather condition and tidal condition as well as the personnel responsible for the monitoring will be recorded on the monitoring field data sheet.
 - In-situ measurement including water temperature, turbidity, dissolved oxygen, salinity, pH and water depth undertake at the identified monitoring point. At each station, marine water samples are collected at three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m. Samples at 1m below water surface and 1m above sea bottom are collected when the water depth is between 3m and 6m. Only 1 sample at mid-depth is taken when the water depth is below 3m.
 - For the in-situ measurement, two consecutive measurements of sampling depth, temperature, dissolved oxygen, salinity, turbidity and pH concentration will be measured at the sea. The YSI ProDSS Multifunctional Meter is retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set is more than 25% of the value of the first reading, the reading is discarded and further readings is taken.
 - Water sample would be collected by a water sampler and then filled in high-density polythene bottles. Before the water sample storage, the sampling bottles will be pre-rinsed with the same water sample. The sample bottles then is packed in cool-boxes (cooled at 4°C without being frozen), and delivered to HOKLAS accredited laboratory for the chemical analysis as followed APHA Standard Methods.
 - The laboratory has been comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples is analyzed as followed the HOKLAS accredited requirement.
- 3.6.14 During marine water sampling period, all in-situ measurement equipment will be calibrated at three months interval accordingly. Except for the Current Velocity and Direction water flow meter will be calibrated every two years as recommended by the manufactory. Available calibration certificates will be issued to ensure the performance of equipment to use for in-situ measurement.
- 3.6.15 Before each round of monitoring, the dissolved oxygen probe will be calibrated by wet bulb method; a zero check in distilled water will be performed with the turbidity and salinity probes; 4 and 10 values of the standard solution will be undertaken to check the accuracy of pH value.
- 3.6.16 The calibration certificates of monitoring equipment of air quality, construction noise and water quality are shown in [Appendix E](#).

LABORATORY ANALYSIS

3.6.17 Chemical analysis will be conducted for all water samples by a HOKALS accredited laboratory - ALS Technichem (HK) Pty Ltd. The chemicals analysis method and reporting limit is shown *Table 3-9*.

Table 3-9 Testing Method and Reporting Limit of the Chemical Analysis

Parameter	ALS Method Code	In-house Method Reference ¹	Reporting Limit
Total Suspended Solids	EA025	APHA 2540D	2 mg/L
Chlorophyll-a	EP008F	APHA 10200 H2&H3	0.1 µg/L

Note:

- The exact method shall depend on the laboratory accredited method. APHA = Standard Methods for the Examination of Water and Wastewater by the American Public Health Association.

3.7 METEOROLOGICAL INFORMATION

3.7.1 The meteorological information including wind direction, wind speed, humidity, rainfall, air pressure and temperature etc. during impact monitoring is extracted from the closest Hong Kong Observatory Station. To obtain the most appropriate meteorological information where available, Air Temperature/Pressure and Relative Humidity will be extracted from Tai Po Station and wind speed and direction will be extracted from Tai Mei Tuk Station.

3.8 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. A summary of the Action/Limit (A/L) Levels for air quality, construction noise and water quality are shown in *Table 3-10, 3-11* and *3-12* respectively.

Table 3-10 Action and Limit Levels for Air Quality

Monitoring Station	Action Level (µg/m ³)		Limit Level (µg/m ³)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
A4	275	142	500	260
A7	274	141	500	260

Table 3-11 Action and Limit Levels for Construction Noise

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

Table 3-12 Action and Limit Levels for Water Quality

Monitoring Location	Depth Average of SS (mg/L)			
	Action Level		Limit Level	
I1	7.0	OR 120% of any reference stations at the same tide of the same day	7.5	OR 130% of any reference stations at the same tide of the same day
I2	7.0		8.1	
I3	8.3		15.0	
W1	8.0		8.6	
M1	10.0		11.0	
FCZ1	7.0		8.0	
Monitoring Location	Chlorophyll-a (µg/L)			
	Surface, Middle & Bottom		Limit Level	
I1	11.1		12.1	
I2	11.0		13.1	
I3	11.3		14.5	
W1	11.3		16.1	

M1	16.9	42.4
FCZ1	11.8	12.5

Monitoring Location	Dissolved Oxygen (mg/L)			
	Depth Average of Surface and Mid-depth		Bottom	
	Action Level	Limit Level	Action Level	Limit Level
I1	5.08	4.80	N/A	N/A
I2	5.26	4.88	3.64	3.37
I3	5.03	4.77	4.09	3.19
W1	4.67	4.54	2.41	2.33
M1	4.73	4.70	N/A	N/A
FCZ1	5	5	3.43	3.18

Monitoring Location	Depth Average of Turbidity (NTU)			
	Action Level		Limit Level	
I1	2.8	OR 120% of any reference stations at the same tide of the same day	2.9	OR 130% of any reference stations at the same tide of the same day
I2	3.5		7.7	
I3	2.6		3.0	
W1	2.9		3.3	
M1	5.2		6.6	
FCZ1	3.2		3.4	

Notes:

- (a) For DO, non-compliance of water quality limits occurs when monitoring result is lower than the limits
- (b) For SS, chlorophyll-*a* and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- (c) Both Action and Limit Levels for DO (surface and middle) in the FCZ1 are less than 5 mg/L.

Event Action Plan

3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in [Appendix F](#).

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.9.1 The impact monitoring data were handled by the ET's in-house data recording and management system.

3.9.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.

3.9.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4. AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 In the Reporting Period, air quality monitoring were performed at the proposed monitoring locations A4 and A7. The air quality monitoring schedule is presented in [Appendix G](#) and the monitoring results are summarized in the following sub-sections.

4.2 RESULTS OF AIR QUALITY MONITORING

4.2.1 In the Reporting Period, 5 sessions of 1-hour TSP and 24-hours TSP monitoring were carried out and the monitoring results are summarized in *Tables 4-1 to 4-4*. The detailed 24-hour TSP monitoring data are presented in [Appendix H](#) and the relevant graphical plots are shown in [Appendix I](#).

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results (A4)

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Jan-18	67	4-Jan-18	9:39	69	72	69
9-Jan-18	42	10-Jan-18	9:51	32	38	39
15-Jan-18	49	16-Jan-18	9:38	52	39	37
20-Jan-18	46	22-Jan-18	9:55	55	76	86
26-Jan-18	73	27-Jan-18	9:38	37	40	43
Average (Range)	55 (42 – 73)	Average (Range)		52 (32 – 86)		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results (A7)

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
3-Jan-18	57	4-Jan-18	13:11	65	70	68
9-Jan-18	49	10-Jan-18	9:38	32	33	38
15-Jan-18	55	16-Jan-18	9:57	42	46	45
20-Jan-18	55	22-Jan-18	9:46	54	75	91
26-Jan-18	68	27-Jan-18	9:29	33	39	42
Average (Range)	57 (49 – 68)	Average (Range)		52 (32 – 91)		

4.2.2 As shown in *Tables 4-1 to 4-2*, all the 1-hour TSP and 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

4.2.3 The meteorological data during the impact monitoring period are summarized in [Appendix J](#).

5. CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction noise quality monitoring were performed at the designated monitoring locations N1, N2a, N3a and N4. The noise quality monitoring schedule is presented in [Appendix G](#) and the monitoring results are summarized in the following sub-sections.

5.2 RESULTS OF NOISE MONITORING

5.2.1 In the Reporting Period, 4 sessions of noise monitoring were carried out at the designated locations. Free-field status were performed at N1 and N3a and façade correction (+3 dB(A)) has been added for the correction in according to the acoustical principles and EPD guidelines. The noise monitoring results at the designated locations are summarized in [Tables 5-1 to 5-4](#). The detailed noise monitoring data are presented in [Appendix H](#) and the relevant graphical plots are shown in [Appendix I](#).

Table 5-1 Construction Noise Monitoring Results of N1

Date	N1 (dB(A))		
	Start Time	L _{eq30min}	*Corrected L _{eq30min}
4-Jan-18	10:05	57	60
10-Jan-18	10:29	58	61
16-Jan-18	9:32	58	61
22-Jan-18	10:36	57	60

Remark: (*) A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.

Table 5-2 Construction Noise Monitoring Results of N2a

Date	N2a (dB(A))	
	Start Time	L _{eq30min}
4-Jan-18	9:32	58
10-Jan-18	9:58	61
16-Jan-18	10:05	57
22-Jan-18	10:06	61

Table 5-3 Construction Noise Monitoring Results of N3a

Date	N3a (dB(A))		
	Start Time	L _{eq30min}	*Corrected L _{eq30min}
4-Jan-18	10:39	71	74
10-Jan-18	11:05	54	57
16-Jan-18	10:05	51	54
22-Jan-18	11:10	53	56

Remark: (*) A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.

Table 5-4 Construction Noise Monitoring Results of N4

Date	N4 (dB(A))	
	Start Time	L _{eq30min}
4-Jan-18	11:12	60
10-Jan-18	11:37	57
16-Jan-18	10:37	56
22-Jan-18	11:42	59

5.2.2 As shown in [Table 5-1 to Table 5-4](#), all the measured results were below the environmental quality criteria. Furthermore, no complaint on construction noise was registered, indicating no exceedance of Action Level. No non-compliance was therefore found during the Reporting Period.

6. WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, the marine work of the Project was commenced on 24th January 2018 as per the notification to EPD. The water quality monitoring schedule is presented in [Appendix G](#) and the monitoring results are summarized in the following sub-sections.

6.1.2 As instructed by the Contractor, the impact water quality monitoring was commenced on 17th January 2018. Since the official date for marine work commencement was on 24th January 2018, the monitoring data collected during 17th to 23 January 2018 would be served as reference data.

6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In this Reporting Period, a total of 6 sampling days were performed for marine water monitoring at the nine designated locations. Monitoring results of 4 key parameters: dissolved oxygen (DO), turbidity, suspended solids and Chlorophyll-*a* are summarized in [Tables 6-1 to 6-5](#).

Table 6-1 Results Summary of Depth Average (Surface & Middle Layer) of DO (mg/L)

Tidal	Sampling date	G1	R1	R2	I1	I2	I3	W1	M1	FCZ1
Mid-Ebb	17-Jan-18*	7.72	7.64	7.69	7.94	7.97	8.26	7.86	7.44	7.99
	19-Jan-18*	7.84	8.24	7.55	7.98	8.03	8.09	7.63	6.89	7.57
	22-Jan-18*	7.83	7.76	7.54	7.57	7.50	7.60	7.27	7.54	7.75
	24-Jan-18	7.14	7.46	7.22	7.39	7.30	7.45	7.25	7.16	7.10
	26-Jan-18	7.64	7.73	7.47	7.54	7.56	7.18	7.46	7.51	7.56
	30-Jan-18	7.07	7.35	6.83	6.97	7.35	6.78	7.01	6.71	7.18
Mid-Flood	17-Jan-18*	7.64	7.34	7.82	7.92	7.97	7.98	7.68	6.84	7.88
	19-Jan-18*	7.74	7.49	7.44	7.90	7.89	7.89	7.75	7.23	7.64
	22-Jan-18*	7.69	7.57	7.40	7.70	7.79	7.58	7.54	6.97	7.48
	24-Jan-18	7.21	7.41	7.18	7.32	7.23	7.38	7.36	7.35	7.29
	26-Jan-18	7.98	7.92	8.00	8.08	8.09	7.70	7.99	8.03	8.08
	30-Jan-18	7.40	7.43	6.99	7.22	7.13	6.91	7.23	7.16	7.42

Remark: (*) Monitoring results provided for reference only

Table 6-2 Results Summary of Bottom Depth of DO (mg/L)

Tidal	Sampling date	G1	R1	R2	I1	I2	I3	W1	M1	FCZ1
Mid-Ebb	17-Jan-18*	7.38	6.81	7.60	N/A	6.72	7.15	6.67	N/A	7.72
	19-Jan-18*	6.89	7.03	6.47	N/A	7.85	8.00	6.68	N/A	6.72
	22-Jan-18*	6.32	7.81	6.88	N/A	7.31	6.69	6.50	N/A	6.78
	24-Jan-18	7.16	6.78	7.25	N/A	7.47	7.23	7.03	N/A	7.21
	26-Jan-18	7.02	7.00	7.13	N/A	7.07	6.51	6.77	N/A	7.62
	30-Jan-18	6.95	7.10	6.66	N/A	7.02	6.75	6.82	N/A	6.97
Mid-Flood	17-Jan-18*	6.82	6.58	7.38	N/A	8.05	6.95	7.03	N/A	7.85
	19-Jan-18*	7.03	6.65	6.69	N/A	7.67	7.71	6.59	N/A	6.61
	22-Jan-18*	6.96	6.78	6.74	N/A	6.72	6.68	6.35	N/A	6.31
	24-Jan-18	7.21	7.35	7.09	N/A	7.37	7.12	6.91	N/A	6.64
	26-Jan-18	7.54	7.40	7.66	N/A	7.58	7.03	7.30	N/A	8.22
	30-Jan-18	7.14	7.25	6.79	N/A	6.93	6.83	7.01	N/A	7.16

Remark: (*) Monitoring results provided for reference only

Table 6-3 Results Summary of Depth Average of Turbidity (NTU)

Tidal	Sampling date	G1	R1	R2	I1	I2	I3	W1	M1	FCZ1
Mid-Ebb	17-Jan-18*	2.3	2.7	2.2	1.9	3.1	2.8	3.0	2.6	2.1
	19-Jan-18*	1.6	1.2	1.6	1.1	1.2	1.2	1.7	2.3	1.7
	22-Jan-18*	1.5	1.4	1.3	1.8	1.4	1.4	1.6	2.4	1.7
	24-Jan-18	1.9	1.8	1.6	1.8	1.0	1.8	0.9	0.9	0.7
	26-Jan-18	0.8	1.4	1.0	0.5	0.5	1.0	0.8	0.7	0.5

	30-Jan-18	1.3	1.6	1.6	1.0	1.5	1.2	1.8	1.6	1.0
Mid-Flood	17-Jan-18*	2.7	3.4	2.2	2.3	2.4	2.3	2.2	2.6	2.7
	19-Jan-18*	1.9	1.7	1.7	1.3	1.6	1.3	1.6	2.2	1.8
	22-Jan-18*	1.3	1.7	1.9	1.4	1.4	1.5	1.9	2.0	1.8
	24-Jan-18	1.0	2.1	2.2	1.9	1.6	1.4	1.4	1.4	1.2
	26-Jan-18	0.6	0.8	0.9	0.6	0.8	0.8	0.8	0.9	0.7
	30-Jan-18	2.0	1.7	1.8	1.7	1.6	1.8	1.7	0.5	1.8

Remark: (*) Monitoring results provided for reference only

Table 6-4 Results Summary of Depth Average of Suspended Solids (mg/L)

Tidal	Sampling date	G1	R1	R2	I1	I2	I3	W1	M1	FCZ1
Mid-Ebb	17-Jan-18*	3.7	4.33	4.00	3.50	4.00	2.50	7.33	7.00	3.25
	19-Jan-18*	5.5	7.25	8.25	6.00	10.00	7.25	11.67	9.50	5.75
	22-Jan-18*	3.3	4.75	4.25	4.00	4.75	4.75	5.67	13.00	5.00
	24-Jan-18	12.5	6.00	8.00	10.00	10.00	9.00	6.33	2.50	2.75
	26-Jan-18	4.8	4.00	5.25	4.50	3.00	3.75	3.67	3.50	3.25
	30-Jan-18	7.8	10.25	6.00	9.00	9.25	8.75	12.67	11.50	11.50
Mid-Flood	17-Jan-18*	3.00	6.67	3.75	2.50	4.25	2.75	4.00	3.00	3.75
	19-Jan-18*	6.00	5.00	7.00	9.50	7.50	4.50	7.50	16.00	7.50
	22-Jan-18*	5.75	7.17	10.50	5.00	5.00	7.75	6.00	3.00	3.25
	24-Jan-18	8.17	12.50	12.50	7.50	6.25	6.75	4.33	2.00	5.00
	26-Jan-18	2.75	3.50	3.25	3.50	4.00	3.50	3.75	4.00	3.00
	30-Jan-18	10.75	8.00	10.75	11.50	12.25	15.50	9.33	4.50	12.50

Remark: (*) Monitoring results provided for reference only

Italic and bold value indicated Action Level exceedance

Underlined and bold value indicated Limit Level exceedance

Table 6-5 Results Summary of Depth Average of Chlorophyll-a (µg/L)

Tidal	Sampling date	G1	R1	R2	I1	I2	I3	W1	M1	FCZ1
Mid-Ebb	17-Jan-18*	4.2	3.55	2.70	3.70	4.20	3.63	3.45	2.40	3.30
	19-Jan-18*	4.5	4.05	3.18	3.70	4.08	3.85	4.25	1.70	4.40
	22-Jan-18*	1.9	1.88	1.53	2.25	2.48	2.75	2.17	2.80	1.75
	24-Jan-18	2.7	2.55	2.65	2.40	2.40	1.98	2.43	1.60	1.70
	26-Jan-18	1.8	1.73	1.65	1.55	1.85	2.13	1.63	1.40	1.80
	30-Jan-18	1.7	1.50	1.70	1.95	2.03	1.80	1.88	1.70	3.40
Mid-Flood	17-Jan-18*	3.45	3.70	3.63	4.00	4.28	4.00	3.15	1.25	3.98
	19-Jan-18*	5.35	4.63	4.20	5.05	4.93	4.35	4.55	0.60	4.90
	22-Jan-18*	4.00	2.52	2.33	2.30	1.93	1.88	2.62	0.60	2.20
	24-Jan-18	2.42	2.42	2.13	1.70	2.23	2.30	2.47	1.30	1.93
	26-Jan-18	3.20	2.95	2.55	3.30	3.20	2.88	2.80	0.85	2.48
	30-Jan-18	1.63	1.98	1.80	1.60	2.28	2.38	2.47	1.85	4.40

Remark: (*) Monitoring results provided for reference only

- 6.2.2 During the Reporting Period, field measurements showed that temperatures of marine water were within 15.5°C to 20.7°C; the salinity concentrations within 23.86 to 35.64 ppt and pH values within 7.68 to 8.52.
- 6.2.3 The monitoring results including in-situ measurements and laboratory testing results are provided in [Appendix H](#). The graphical plots are shown in [Appendix I](#).
- 6.2.4 A summary of exceedances for the four parameters: dissolved oxygen (DO), turbidity, suspended solids (SS) and chlorophyll-a are shown in [Table 6-6](#).

Table 6-6 Summary of Water Quality Exceedance

Station	DO (Ave of Top & mid-depth)		DO (Bottom Depth)		Turbidity (Depth Ave)		SS (Depth Ave)		Chlorophyll- <i>a</i> (Depth Ave)	
	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
I1	0	0	0	0	0	0	1	3	0	0
I2	0	0	0	0	0	0	1	3	0	0
I3	0	0	0	0	0	0	0	3	0	0
W1	0	0	0	0	0	0	0	2	0	0
M1	0	0	0	0	0	0	1	1	0	0
FCZ1	0	0	0	0	0	0	0	2	0	0
No of Exceedance	0	0	0	0	0	0	3	14	0	0

6.2.5 In this Reporting Period, three (3) Action Level (AL) exceedance and fourteen (14) Limit Level (LL) exceedances of Suspended Solids were recorded for the Project which involved 3 monitoring days. NOEs were issued to relevant parties upon confirmation of the monitoring result. Since there were no marine works undertaken when exceedances were recorded, the investigation reports concluded that the exceedances were not project-related.

7. WASTE MANAGEMENT

7.1 GENERAL

7.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

7.2 RECORDS OF WASTE QUANTITIES

7.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

7.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 7-1* and *7-2* and the Monthly Summary Waste Flow Table is shown in *Appendix K*. Whenever possible, materials were reused on-site as far as practicable.

Table 7-1 Summary of Quantities of Inert C&D Materials

Types of Waste	Quantity	Disposal Location
Total C&D Materials (Inert) ('000m ³)	0	NA
Reused in this Contract (Inert) ('000m ³)	0	NA
Reused in other Projects (Inert) ('000m ³)	0	NA
Disposal as Public Fill (Inert) ('000m ³)	0	NA

Table 7-2 Summary of Quantities of C&D Wastes

Types of Waste	Quantity	Disposal Location
Recycled Metal ('000kg)	0	NA
Recycled Paper / Cardboard Packing ('000kg)	0	NA
Recycled Plastic ('000kg)	0	NA
Chemical Wastes	0	NA
General Refuse ('000m ³)	0.078	NENT

8. ECOLOGY

8.1 ECOLOGY MONITORING (MARINE-BASED)

Fauna Translocation Surveys

- 8.1.1 In the Reporting Period, fauna translocations were conducted on 2nd, 4th, 5th, 15th and 16th January 2018. During the fauna translocation, 3 individuals of *Favonigobius reichei*, which is one of the particular target fish species listed on EP, were captured and relocated to Ting Kok East. Moreover, three target echinoderm species were recorded during fauna translocation. In total, 1069 individuals of *Archaster typicusm*; 20 individuals of *Holothuria atra* and 10 individuals of *Salmacis sphaeroides* were recorded and relocated to Ting Kok East.

Seahorse Translocation Surveys

- 8.1.2 The seahorse translocation work was conducted during the period of 17-20th January 2018. Two female seahorse *Hippocampus kuda* (*H. kuda*) with torso length of 3.3 cm and 4.2 cm were found on 20th January 2018 afternoon. Both two seahorses were captured, tagged underwater, put in Kordon Bags and translocated to Ting Kok East in the afternoon of the same day. Both captured seahorses are female with good health condition during translocation.
- 8.1.3 Post-translocation monitoring of the seahorse was commenced from 21 January 2018 in accordance with the endorsed method statement (Seahorses Translocation Plan (Version 1, 11 January 2018) refers). During the first 7 days post-translocation monitoring on 21 to 27 January 2018, the two tagged seahorses were not recorded but other seahorses were located at the Ting Kok East reception site in this reporting period. Therefore, option 2 monitoring program (according to the method statement) will be followed which shall be conducted three times per week during the second to fourth week. The result of post- translocation monitoring will be submitted as standalone apart from the EM&A Report.

9. SITE INSPECTION

9.1 REQUIREMENTS

9.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulation by EL Leader. The site inspection and audits should be conducted twice per month by ET.

9.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

9.2.1 In the Reporting Period, joint site inspection and audit to evaluate site environmental performance was carried out by the RE, ET and the Contractor on **4 and 19 January 2018**. No non-compliance was noted within this reporting period.

9.2.2 The findings / deficiencies that observed during the weekly site inspection are listed in **Table 9-1**.

Table 9-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
19 December 2017 (Last reporting period)	<ul style="list-style-type: none"> Exposed slope was observed next to the channel, the Contractor should cover the slope with tarpaulin sheet to minimize muddy runoff. 	<ul style="list-style-type: none"> The exposed slope was hard paved and covered with impervious sheets to minimize muddy runoff.
	<ul style="list-style-type: none"> Free standing chemical containers were observed, the Contactor should place the chemical container with drip tray underneath to prevent leakage on ground and contamination. 	<ul style="list-style-type: none"> The chemical containers were removed from site.
4 January 2018	<ul style="list-style-type: none"> The Contractor was reminded to cover the stockpile of fill material with impervious sheet to minimize dust impact. 	Reminder Only
19 January 2018	<ul style="list-style-type: none"> The site hoarding was observed less than 2.4m, the Contractor was advised to modify the hoarding with not less than 2.4 m high from ground level. (west box culvert) 	<ul style="list-style-type: none"> To be followed.
	<ul style="list-style-type: none"> As the wet season is coming, the Contractor was reminded to enhance the mitigation measures for the prevention of surface runoff from slope getting into the sea. 	Reminder Only

10. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

10.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

10.1.1 In the Reporting Period, no environmental complaint, summons and prosecution was received.

10.1.2 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for the project. The statistical summary table of environmental complaint is presented in *Tables 10-1, 10-2 and 10-3*.

Table 10-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 January 2018	0	0	NA

Table 10-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 31 January 2018	0	0	NA

Table 10-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 31 January 2018	0	0	NA

11. IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water, ecology and waste etc. and they are summarized presented in *Appendix L*.

11.1.2 The Contractor had been implementing the required environmental mitigation measures according to the Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by the Contractor in this Reporting Month are summarized in *Table 11-1*.

Table 11-1 Environmental Mitigation Measures in the Reporting Month

Issues	Environmental Mitigation Measures
Construction Noise	<ul style="list-style-type: none"> • Regularly to maintain all plants, so only the good condition plants are used on-site ; • If possible, all mobile plants onsite operation has located far from NSRs; • When machines and plants (such as trucks) is not in using, it was switched off; • Wherever possible, plant was prevented oriented directly the nearby NSRs; • Provided quiet powered mechanical equipment to use onsite; • Moveable noise barriers were temporary used for construction work; and • Weekly noise monitoring was conducted to ensure construction noise meet the criteria.
Air Quality	<ul style="list-style-type: none"> • Any stockpile of dusty material was covered entirely with impervious sheeting or sprayed with water so as to maintain the entire surface wet; • The construction plants regularly maintained to avoid the emissions of black smoke; • The construction plants switched off when it not in use; • Where a vehicle leaving the works site is carrying a load of dusty materials, the load has covered entirely with clean impervious sheeting; and • Before any vehicle leaving the works site, wheel watering has been performed.
Water Quality	<ul style="list-style-type: none"> • Impervious sheeting was paved on exposed soil surfaces to reduce the potential of soil erosion; • Debris and refuse generated on-site collected daily; • Stockpiles of the cement and other construction materials were covered when not being used; • Oils and fuels are stored in designated areas with locks; • The chemical waste storage as sealed area provided with locks; • Sedimentation facilities was provided to remove silt particles from groundwater; • Sand bags were provided surrounding the boundary of working site to prevent wastewater or site surface water runoff get into public areas; and • Portable chemical toilets are provided on-site. A licensed contractor is regularly disposal and maintenance of these facilities.
Waste and Chemical Management	<ul style="list-style-type: none"> • Excavated material reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising kept to a minimum and be handled, transported and disposed of in a suitable manner; • Disposal of C&D wastes to any designed public filling facility and/or landfill followed a trip ticket system; and • Chemical waste handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	<ul style="list-style-type: none"> • The site is generally kept tidy and clean. • Mosquito control is performed to prevent mosquito breeding on site.

11.2 IMPACT FORECAST

11.2.1 Construction activities to be undertaken in **February 2018** should be included below:-

- Tree transplanting from Lung Mei to Pak Shek Kok's receptor site
- Site formation works at Section 3 of the Work,
- Supply and installation of permanent marine buoys
- Site formation works at Western Open Channel
- Construction of east groyne

11.2.2 Potential environmental impacts arising from the works include:

- Construction waste
- Air quality
- Construction noise
- Water quality (particularly site runoff during rainy seasons)

11.2.3 Environmental mitigation measures will be properly implemented and maintained as per the Mitigation Implementation Schedule in **Appendix L** to ensure site environmental performance is acceptable.

12. CONCLUSIONS AND RECOMMENTATIONS

12.1 CONCLUSIONS

- 12.1.1 This is the 2nd monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from 1 to 31 January 2018.
- 12.1.2 In this Reporting Period, no construction noise monitoring results that triggered the Limit Level was recorded. No NOE or the associated corrective actions were therefore issued. Moreover, no noise complaint (which is an Action Level exceedance) was received by the CEDD, EPD and the Contractor.
- 12.1.3 In this Reporting Period, no air quality monitoring exceedance was recorded. No NOE or the associated corrective actions were therefore issued.
- 12.1.4 For marine water quality monitoring, three (3) Action Level (AL) exceedance and fourteen (14) Limit Level (LL) exceedances of Suspended Solids were recorded for the Project which involved 3 monitoring days. NOEs were issued to relevant parties upon confirmation of the monitoring result. Since there were no marine works undertaken when exceedances were recorded, the investigation reports concluded that the exceedances were not project-related.
- 12.1.5 In the Reporting Period, joint site inspection and audit to evaluate site environmental performance was carried out by the RE, ET and the Contractor on 4 and 19 January 2018. No non-compliance was noted within this reporting period.
- 12.1.6 No environmental complaints, notification of summons or successful prosecution were received in this Reporting Period.

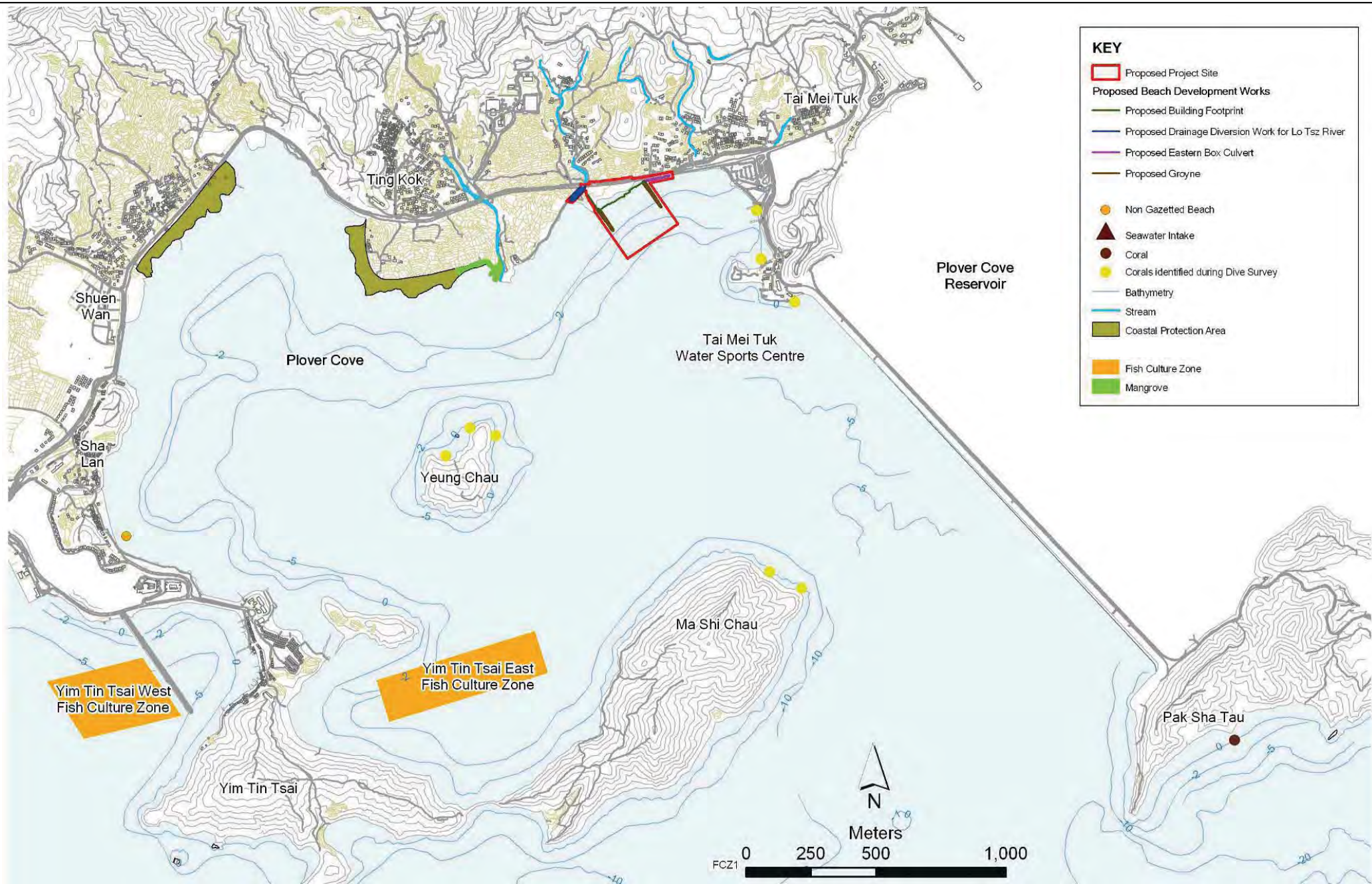
12.2 RECOMMENDATIONS

- 12.2.1 During the dry season; stockpile of dusty materials should be either covered entirely by impervious sheets; place in area sheltered on the top and three sides; or sprayed with water to maintain the entire surface wet at all the time. Also, all dump trucks entering or leaving the Project Site should be provided with mechanical covers in good service condition.
- 12.2.2 Water quality mitigation measures such as prevention of muddy water and other water quality pollutants via site surface water runoff get into public area should be avoided. Mitigation measures for water quality should be properly implemented.
- 12.2.3 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants and installation of temporary noise barrier at the construction noise predominate area should be fully implemented as accordance with the EM&A requirement.
- 12.2.4 As a general reminder, housekeeping of the site and site tidiness should be undertaken after every day work completion. Also, drip tray should be provided for chemical container to prevent land contamination. In addition, mosquito control should be kept to prevent mosquito breeding on site.

Appendix A

Layout plan of the Project

(The content of Appendix A is modified from the previous EM&A Manual - Development of a Bathing Beach at Lung Mei, Tai Po (Register No. AEIAR-123/2008): Environmental Monitoring and Audit (EM&A) Manual (November 2007))



KEY

- Proposed Project Site
- Proposed Beach Development Works
- Proposed Building Footprint
- Proposed Drainage Diversion Work for Lo Tsz River
- Proposed Eastern Box Culvert
- Proposed Groyne
- Non Gazetted Beach
- ▲ Seawater Intake
- Coral
- Corals identified during Dive Survey
- Bathymetry
- Stream
- Coastal Protection Area
- Fish Culture Zone
- Mangrove

Client CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Main Contractor 偉金建築有限公司 Welcome Construction Co., Ltd.	Agreement No.: CE 59/2005(EP) Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO	ENVIRONMENTAL MONITORING AND AUDIT MANUAL Figure Title: PROJECT LOCATION AND ENVIRONMENTAL SENSITIVE RECEIVERS	FIGURE 1.1 <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Checked</td> <td style="width: 25%;">TF</td> <td style="width: 25%;">Scale</td> <td style="width: 25%;">AS SHOWN</td> </tr> <tr> <td>Designed</td> <td>-</td> <td>Drawn</td> <td>AM</td> </tr> <tr> <td>Rev.</td> <td>1</td> <td>Date</td> <td>13/03/2007</td> </tr> </table>	Checked	TF	Scale	AS SHOWN	Designed	-	Drawn	AM	Rev.	1	Date	13/03/2007
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Designed	-	Drawn	AM													
Rev.	1	Date	13/03/2007													

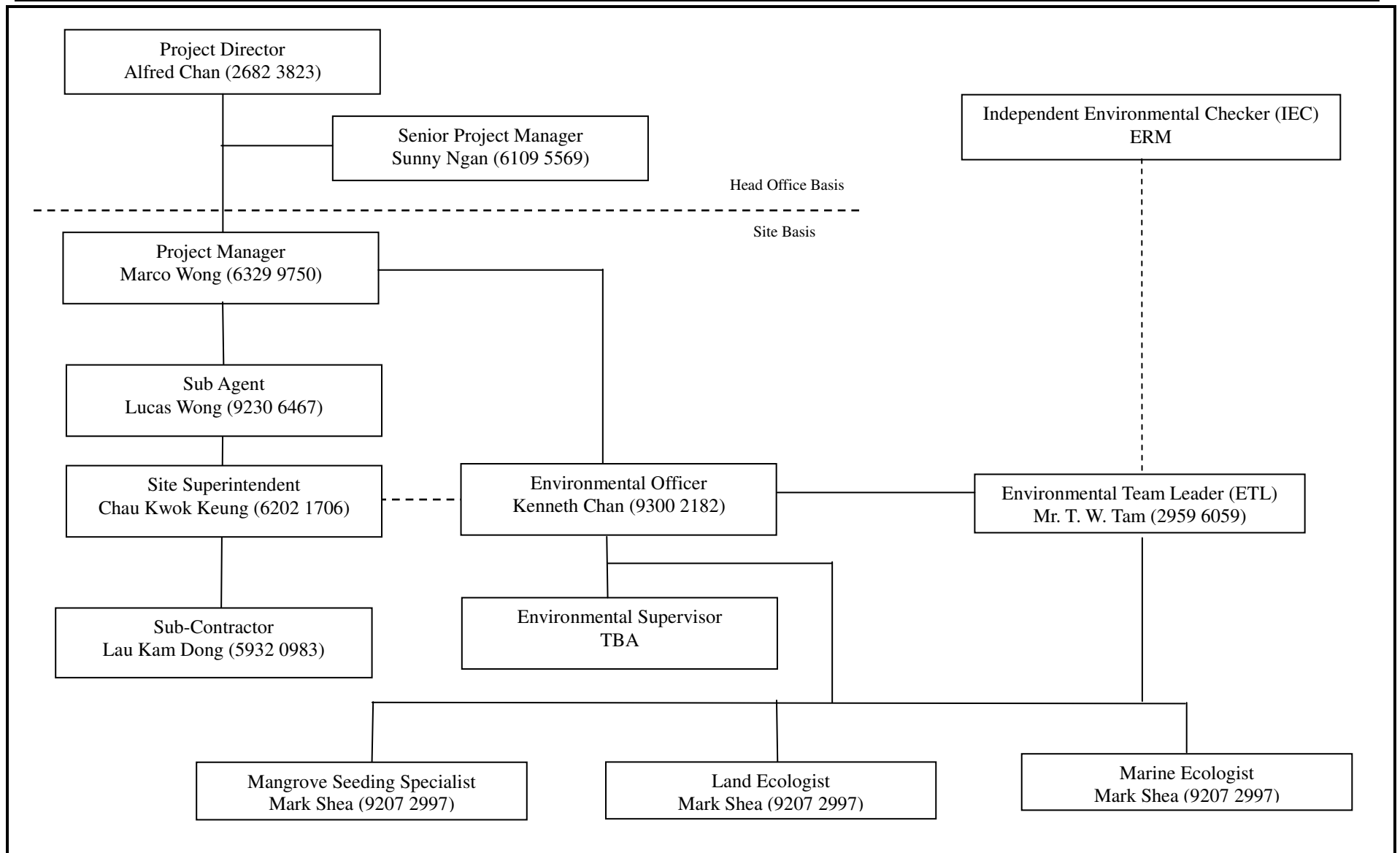
Appendix B

Organization structure and contact details

WELCOME CONSTRUCTION COMPANY LIMITED

偉金建築有限公司

Environmental Management Plan – Contract No.: CV/2012/05



Contact Details of Key Personnel – CV/2012/05

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
CEDD	Engineer's Representative	Mr. K F Chan	2762 5532	2714 2054
ERM	Independent Environmental Checker	Mr. Jovy Tam	2271 3113	2723 5660
Welcome	Project Manager	Mr. Marco Wong	6329 9750	2682 3222
Welcome	Sub-Agent	Mr. Lucas Wong	9230 6467	2682 3222
Welcome	Environmental Officer	Mr. Kenneth Chan	9300 2182	2682 3222
Welcome	Environmental Supervisor	Mr. K K Lau	6055 9878	2682 3222
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

CEDD (Engineer) – Civil Engineering and Development Department

Welcome (Main Contractor) – Welcome Construction Company Limited

ERM (IEC) – Environmental Resources Management

AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

3-Month Rolling Construction Program

Welcome Construction Co., Ltd

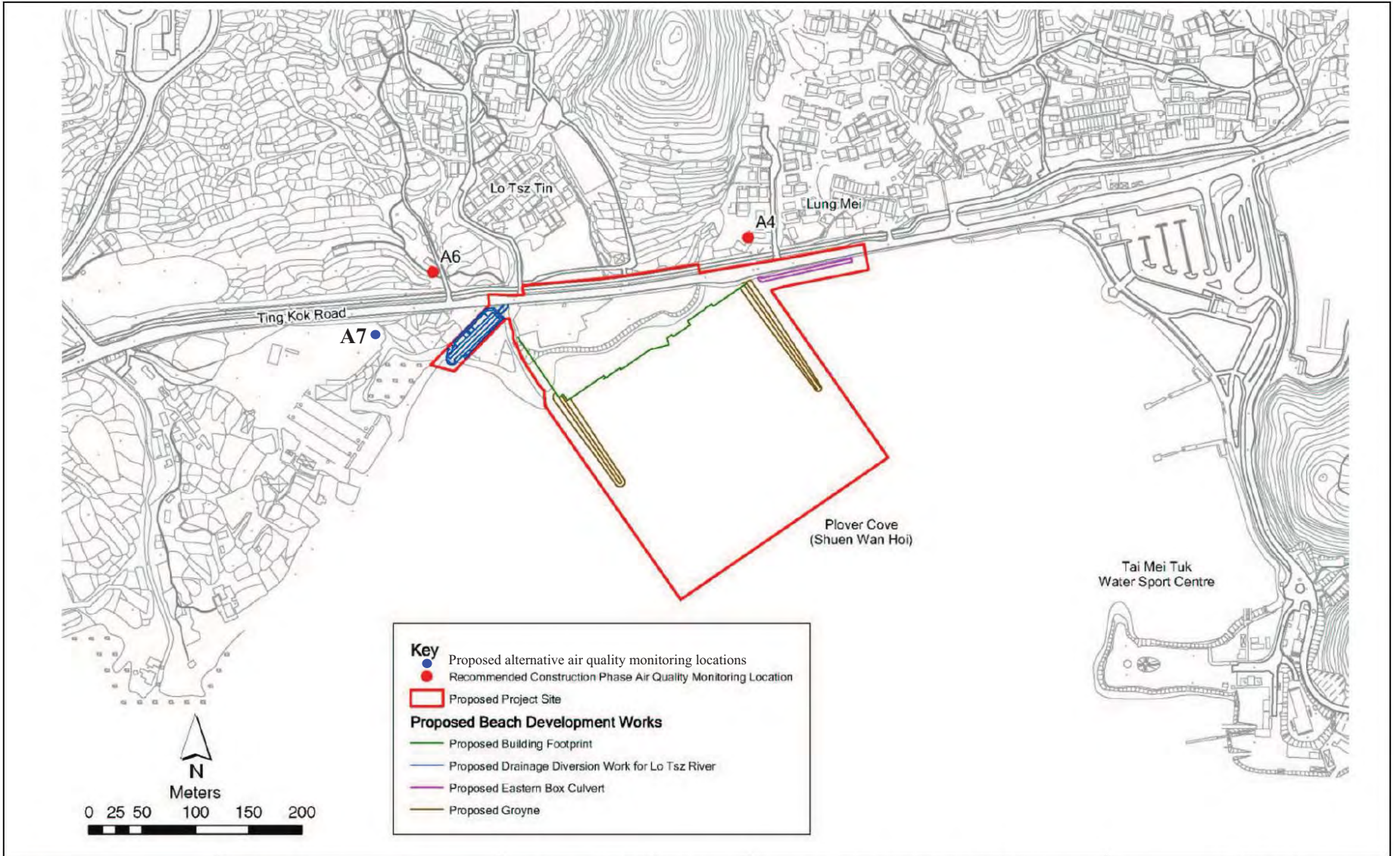
Contract No. CV/2012/05 Bathing Beach at Lung Mei
3-Month Rolling Programme (1-Jan-18 to 31-Mar-18)



Item	Description	Jan-18																															Feb-18																															Mar-18																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	Fauna relocation	█																																																																																												
2	Seahorse translocation	█																																																																																												
3	Dredging for Groynes																								█																																																																					
4	Dredging for Sea Bed																								█																																																																					
5	Supply and Installation of Permanent Moring Buoys																								█																																																																					
6	Tree Transplanting																								█																																																																					
7	Section 3, Site formation works	█																																																																																												
8	Section 3, Construction of Western Box Culvert																								█																																																																					
9	Section 3, Construction of Retaining Wall																								█																																																																					

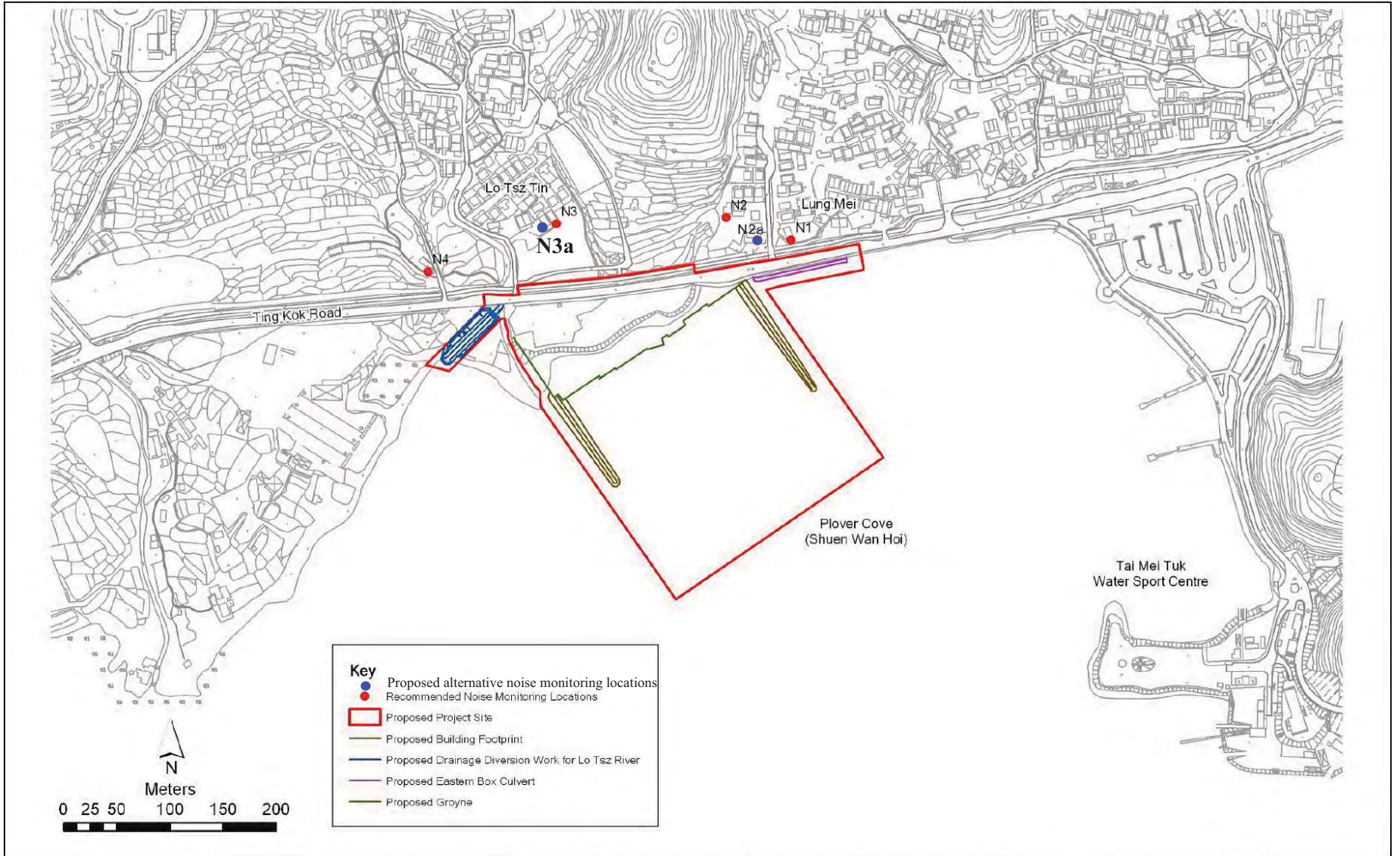
Appendix D



Monitoring Location

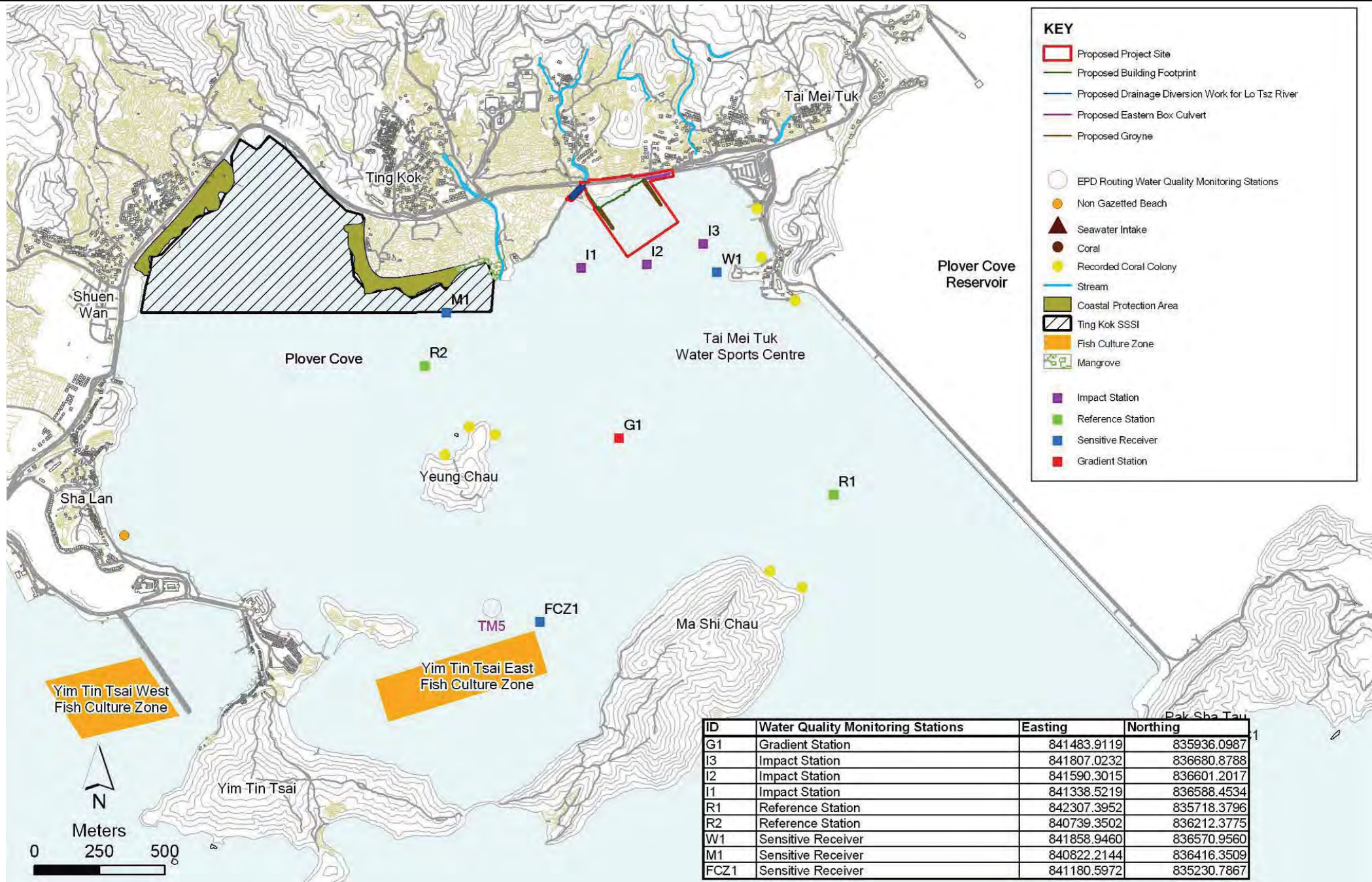
(The Figures of Appendix D are modified from the previous EM&A Manual - Development of a Bathing Beach at Lung Mei, Tai Po (Register No. AEIAR-123/2008): Environmental Monitoring and Audit (EM&A) Manual (November 2007))



Client  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Main Contractor  偉全建築有限公司 Welcome Construction Co., Ltd.	Agreement No.: CE 59/2005(EP)	ENVIRONMENTAL MONITORING AND AUDIT MANUAL	FIGURE 3.1		
		Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO	Figure Title: CONSTRUCTION PHASE AIR QUALITY MONITORING LOCATIONS	Checked: TF	Scale: AS SHOWN	Rev.: 2
				Designed: -	Drawn: KK	Date: 23/03/2007



Client  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	 偉全建築有限公司 Welcome Construction Co., Ltd.	Agreement No.: CE 59/2005(EP)	ENVIRONMENTAL MONITORING AND AUDIT MANUAL	FIGURE 4.1		
		Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO	Figure Title: CONSTRUCTION PHASE NOISE MONITORING LOCATIONS	Checked: TF	Scale: AS SHOWN	Rev.: 2
				Designed: -	Drawn: KK	Date: 29/08/2007



Photograph Records for Air Quality Monitoring

Air Quality Monitoring (24-Hour TSP & 1-Hour TSP)



A4



A7

Photograph Records for Noise Monitoring

Noise Monitoring

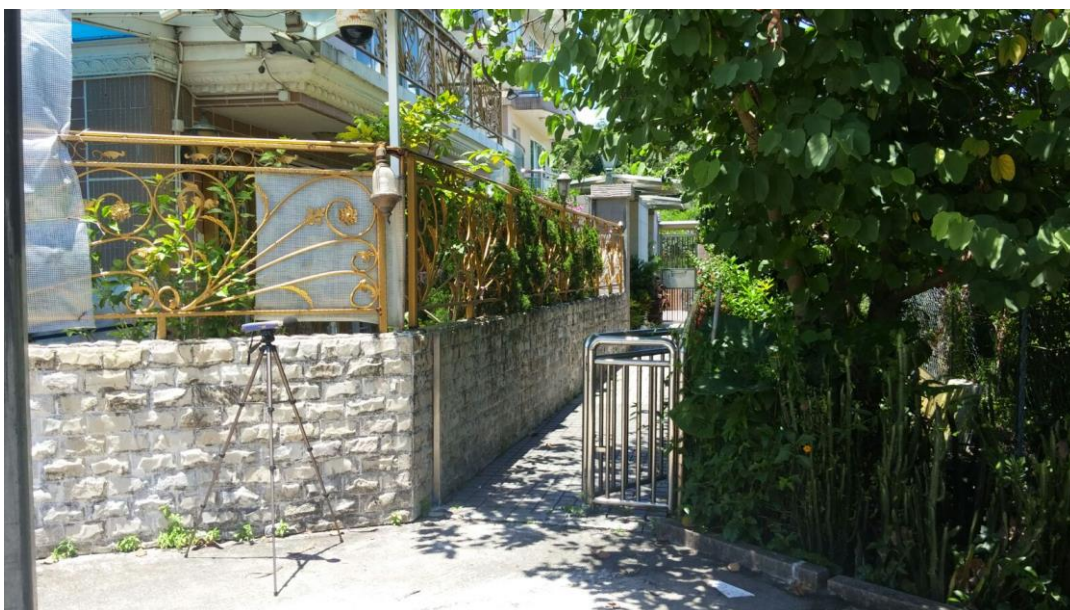


N1



N2a

Noise Monitoring



N3a



N4

Appendix E

Calibration Certificate of Monitoring Equipment

MONITORING EQUIPMENT CALIBRATION CERTIFICATES

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	TSP Sampler Calibration Spreadsheet for A4	30 Nov 17	30 Jan 18
2		TSP Sampler Calibration Spreadsheet for A7	30 Nov 17	30 Jan 18
3		Calibration Kit TISCH Model TE-5025A Orifice ID 1941 and Rootsmeter S/N 0438320	28 Feb 17	28 Feb 18
4		Laser Dust Monitor, Model LD-3B (Serial No. 2X6145) – EQ105	11 Jan 17 9 Jan 18	11 Jan 18 9 Jan 19
5		Laser Dust Monitor, Model LD-3B (Serial No. 3Y6501) – EQ111	20 Mar 17	20 Mar 18
6		Laser Dust Monitor, Model LD-3B (Serial No. 456660) – EQ117	20 Mar 17	20 Mar 18
7		Laser Dust Monitor, Model LD-3B (Serial No. 456662) – EQ118	15 May 17	15 May 18
8	Noise	Rion NL-31 Sound Level Meter (Serial No. 00410247) – EQ068	24 May 17	24 May 18
9		Rion NL-52 Sound Level Meter (Serial No. 01121362) – EQ011	24 May 17	24 May 18
10		Rion NL-52 Sound Level Meter (Serial No. 00921191) – EQ013	29 Jun 17	29 Jun 18
11		B&K Acoustical Calibrator 4231 (Serial No. 2713428) – EQ082	2 May 17	2 May 18
12		Rion Sound Level Calibrator NC-74 (Serial No. 34657231) – EQ087	25 Jul 17	25 Jul 18
13		Rion Sound Level Calibrator NC-73 (Serial No.: 10655561) - EQ085	25 Jul 17	25 Jul 18
14	Water	Valeport Ltd - Model 106 Current Meter (Serial No. 60011)	16 Jun 17	16 Jun 19
15		Multifunctional Meter – YSI Professional DSS (Serial No. 17B102764/17B100758) – EQW019	20 Oct 17	20 Jan 18
16		Multifunctional Meter – YSI Professional DSS (Serial No. 15H102620/15H103928) – EQW018	17 Jan 18	17 Apr 18

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : No. 101 Lung Mei Tsuen	Date of Calibration: 30-Nov-17
Location ID : A4	Next Calibration Date: 30-Jan-18
Name and Model: TISCH HVS Model TE-5170	Technician: Ip Ka Hing

CONDITIONS

Sea Level Pressure (hPa)	1016.9	Corrected Pressure (mm Hg)	762.675
Temperature (°C)	21.8	Temperature (K)	295

CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope -> 2.11965
Model-> 5025A	Qstd Intercept -> -0.02696
Serial # -> 1941	

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.15	6.15	12.3	1.679	40	40.51	Slope = 24.5347 Intercept = -1.6777 Corr. coeff. = 0.9932
13	4.75	4.75	9.5	1.477	34	34.43	
10	4.00	4.00	8.0	1.357	30	30.38	
7	2.90	2.90	5.8	1.157	26	26.33	
5	1.60	1.60	3.2	0.863	20	20.25	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

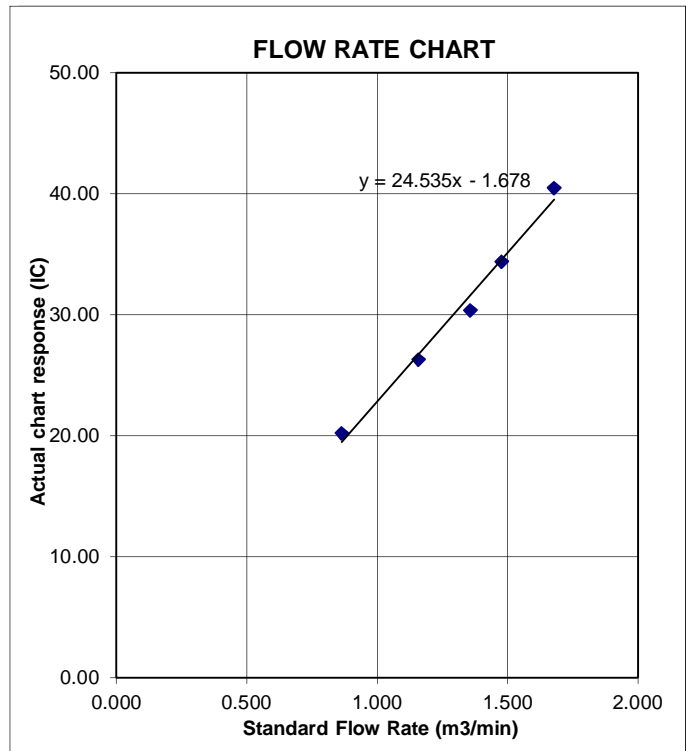
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Hong Kong Eco-Farm	Date of Calibration: 30-Nov-17
Location ID : A7	Next Calibration Date: 30-Jan-18
Name and Model: TISCH HVS Model TE-5170	Technician: Ip Ka Hing

CONDITIONS

Sea Level Pressure (hPa)	1016.9	Corrected Pressure (mm Hg)	762.675
Temperature (°C)	21.8	Temperature (K)	295

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.85	5.85	11.7	1.638	52	52.66	Slope = 34.1765 Intercept = -4.1893 Corr. coeff. = 0.9977
13	4.80	4.80	9.6	1.485	45	45.57	
10	3.70	3.70	7.4	1.305	40	40.51	
7	2.40	2.40	4.8	1.054	31	31.39	
5	1.55	1.55	3.1	0.849	25	25.32	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

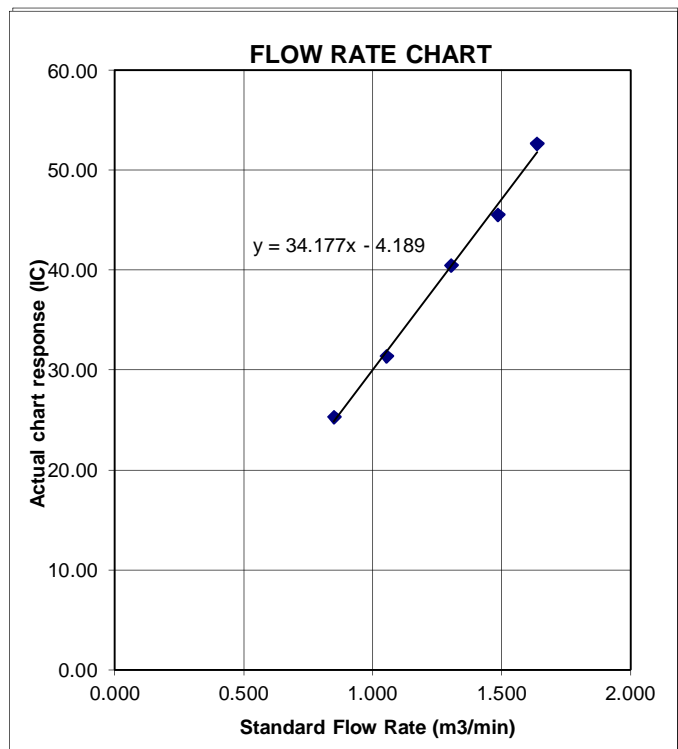
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure





TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE
 VILLAGE OF CLEVELAND, OH
 45002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Feb 28, 2017 Rootmeter S/N 0438320 Ta (K) - 294
 Operator Tisch Orifice I.D. - 1941 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER	ORIFICE
					DIFF Hg (mm)	DIFF H2O (in.)
1	NA	NA	1.00	1.4600	3.2	2.00
2	NA	NA	1.00	1.0410	6.4	4.00
3	NA	NA	1.00	0.9280	7.9	5.00
4	NA	NA	1.00	0.8840	8.7	5.50
5	NA	NA	1.00	0.7290	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9967	0.6827	1.4149	0.9957	0.6820	0.8851
0.9925	0.9534	2.0010	0.9915	0.9524	1.2517
0.9904	1.0672	2.2372	0.9894	1.0661	1.3995
0.9894	1.1192	2.3464	0.9884	1.1181	1.4678
0.9840	1.3499	2.8299	0.9830	1.3485	1.7702
Qstd slope (m) = 2.11965			Qa slope (m) = 1.32729		
intercept (b) = -0.02696			intercept (b) = -0.01686		
coefficient (r) = 0.99991			coefficient (r) = 0.99991		
y axis = SQRT[H2O(Pa/760)(298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

$$Vstd = \text{Diff. Vol} [(Pa - \text{Diff. Hg}) / 760] (298 / Ta)$$

$$Qstd = Vstd / \text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg}) / Pa]$$

$$Qa = Va / \text{Time}$$

For subsequent flow rate calculations:

$$Qstd = 1/m \{ [\text{SQRT} (H2O (Pa/760) (298/Ta))] - b \}$$

$$Qa = 1/m \{ [\text{SQRT} H2O (Ta/Pa)] - b \}$$



ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1703462
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 19-JAN-2017
		DATE OF ISSUE	: 23-JAN-2017
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories

Position

Richard Fung

General Manager

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group

11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1703462
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1703462-001	S/N: 2X6145	AIR	19-JAN-2017	S/N: 2X6145

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 2X6145
 Equipment Ref: EQ105
 Job Order HK1703462

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 25 November 2016

Equipment Verification Results:

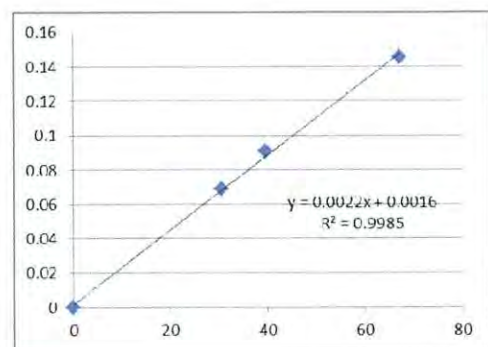
Testing Date: 9 January 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
3hr14min	09:10 ~ 12:24	20.6	1016.3	0.145	13025	67.2
1hr57min	12:30 ~ 14:27	20.6	1016.3	0.069	3586	30.6
1hr58min	14:35 ~ 16:33	20.6	1016.3	0.091	4709	39.6

Sensitivity Adjustment Scale Setting (Before Calibration) 581 (CPM)
 Sensitivity Adjustment Scale Setting (After Calibration) 580 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022
 Correlation Coefficient 0.9992
 Date of Issue 11 January 2017



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Martin Li Signature : [Signature] Date : 11 January 2017

QC Reviewer : Ben Tam Signature : [Signature] Date : 11 January 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 25-Nov-16
Location ID :	Calibration Room	Next Calibration Date: 25-Feb-17

CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	20.0	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.1	6.1	12.2	1.776	56	56.56	35.6871	-6.1123	0.9967
13	4.7	4.7	9.4	1.560	49	49.49			
10	3.6	3.6	7.2	1.368	43	43.43			
8	2.3	2.3	4.6	1.096	34	34.34			
5	1.4	1.4	2.8	0.859	23	23.23			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

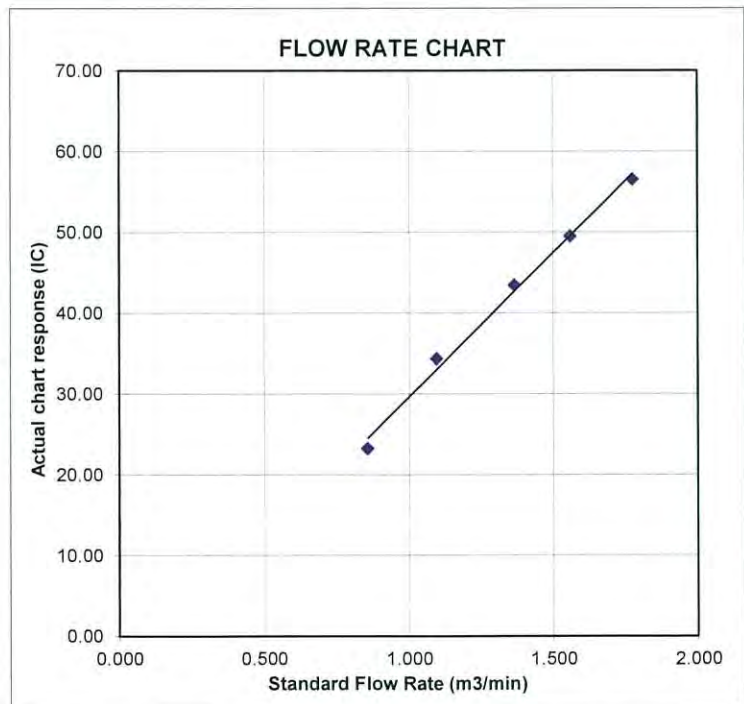
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1815073
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 5-JAN-2018
		DATE OF ISSUE	: 5-FEB-2018
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung  General Manager

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Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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Part of the **ALS Laboratory Group**

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Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1815073
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1815073-001	S/N: 2X6145	AIR	05-Jan-2018	S/N: 2X6145

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 2X6145
 Equipment Ref: EQ105
 Job Order HK1815073

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	511	4.0
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	598	4.9
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2111	16.5

Sensitivity Adjustment Scale Setting (Before Calibration) 583 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 583 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

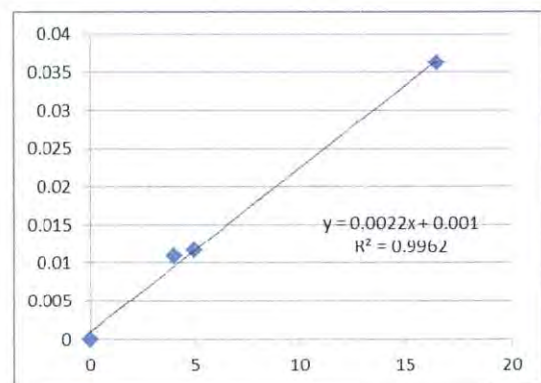
Correlation Coefficient 0.9981

Date of Issue 9 January 2018

Remarks:

- Strong** Correlation ($R > 0.8$)
- Factor 0.0022 should be apply for TSP monitoring

*If $R < 0.5$, repair or re-verification is required for the equipment



Operator : Martin Li Signature : [Signature] Date : 9 January 2018

QC Reviewer : Ben Tam Signature : [Signature] Date : 9 January 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 1-Dec-17
Location ID :	Calibration Room	Next Calibration Date: 1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239 Intercept = 0.7901 Corr. coeff. = 0.9971
13	5	5	10.0	1.518	48	48.44	
10	3.9	3.9	7.8	1.342	42	42.38	
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

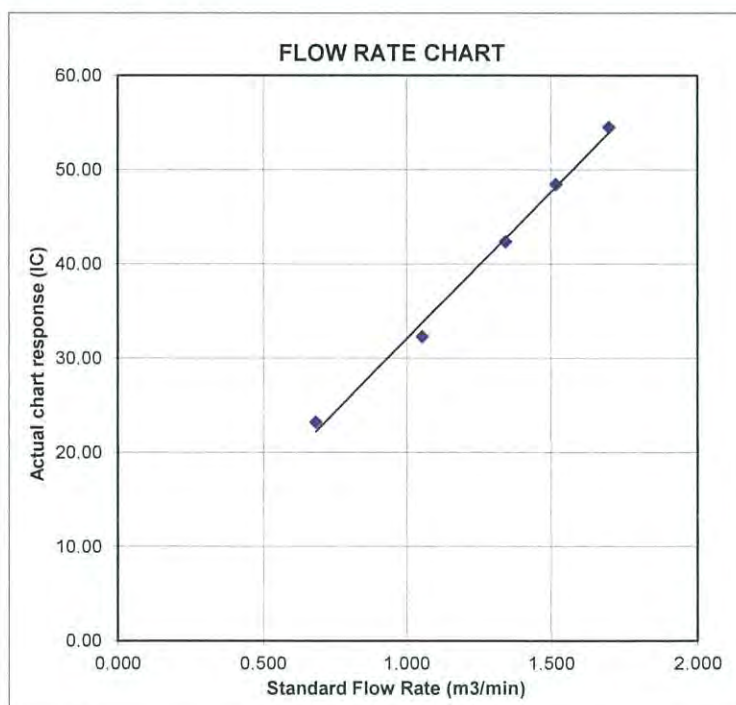
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1716579
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 20-APR-2017
		DATE OF ISSUE	: 25-APR-2017
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

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Signatories

Position

Richard Fung

General Manager

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Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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Part of the ALS Laboratory Group

11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1716579
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1716579-001	S/N: 3Y6501	AIR	20-APR-2017	S/N: 3Y6501

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 3Y6501
 Equipment Ref: EQ111
 Job Order HK1716579

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 23 February 2017

Equipment Verification Results:

Calibration Date: 16 March 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr02min	09:58 ~ 12:00	17.8	1016.4	0.037	2011	16.5
2hr07min	12:05 ~ 14:12	17.8	1016.4	0.031	1793	14.1
2hr02min	14:20 ~ 16:22	17.8	1016.4	0.026	1251	10.2

Sensitivity Adjustment Scale Setting (Before Calibration) 657 (CPM)

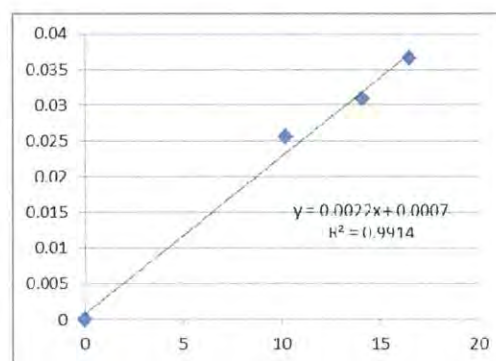
Sensitivity Adjustment Scale Setting (After Calibration) 657 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9957

Date of Issue 20 March 2017



Remarks:

1. **Strong** Correlation (R>0.8)
 2. Factor 0.0022 should be apply for TSP monitoring
- *If R<0.5, repair or re-verification is required for the equipment

Operator : Martin Li Signature : [Signature] Date : 20 March 2017

QC Reviewer : Ben Tam Signature : [Signature] Date : 20 March 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung Date of Calibration: 23-Feb-17
 Location ID : Calibration Room Next Calibration Date: 23-May-17

CONDITIONS

Sea Level Pressure (hPa)	1017.4	Corrected Pressure (mm Hg)	763.05
Temperature (°C)	17.9	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.2	6.2	12.4	1.797	56	56.79	36.1509	-8.0555	0.9984
13	5	5	10.0	1.616	49	49.69			
10	3.8	3.8	7.6	1.410	43	43.61			
8	2.4	2.4	4.8	1.124	33	33.47			
5	1.4	1.4	2.8	0.862	22	22.31			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

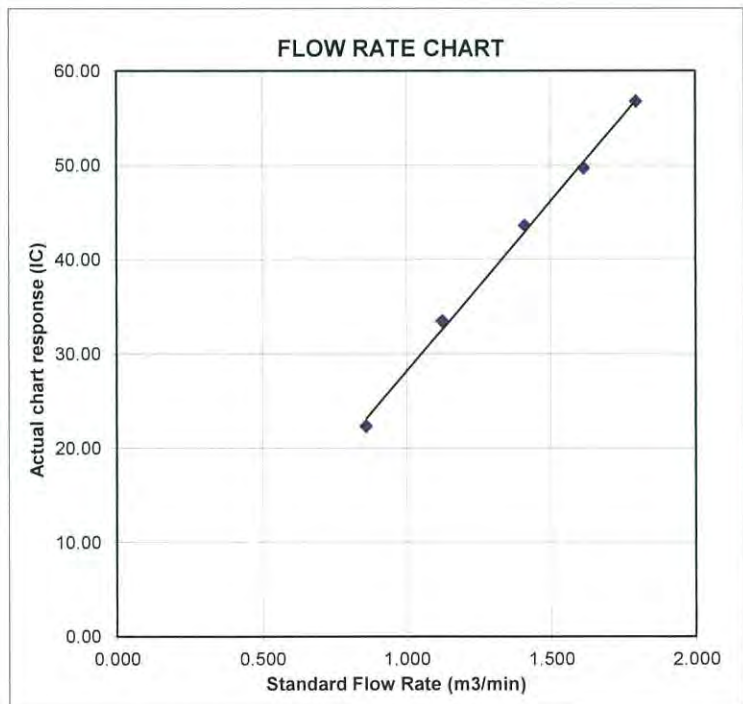
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1716583
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 20-APR-2017
		DATE OF ISSUE	: 25-APR-2017
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	Position
Richard Fung 	General Manager

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Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

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Part of the ALS Laboratory Group

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Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1716583
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1716583-001	S/N: 456660	AIR	20-APR-2017	S/N: 456660

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
Manufacturer: Sibata LD-3B
Serial No. 456660
Equipment Ref: EQ117
Job Order HK1716583

Standard Equipment:

Standard Equipment: Higher Volume Sampler
Location & Location ID: AUES office (calibration room)
Equipment Ref: HVS 018
Last Calibration Date: 23 February 2017

Equipment Verification Results:

Calibration Date: 16 March 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr02min	09:58 ~ 12:00	17.8	1016.4	0.037	2059	16.9
2hr07min	12:05 ~ 14:12	17.8	1016.4	0.031	1589	12.5
2hr02min	14:20 ~ 16:22	17.8	1016.4	0.026	1197	9.8

Sensitivity Adjustment Scale Setting (Before Calibration) 610 (CPM)

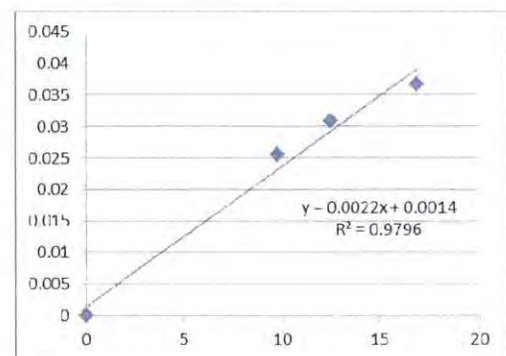
Sensitivity Adjustment Scale Setting (After Calibration) 610 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9897

Date of Issue 20 March 2017



Remarks:

1. **Strong** Correlation ($R > 0.8$)
 2. Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Martin Li Signature : [Signature] Date : 20 March 2017

QC Reviewer : Ben Tam Signature : [Signature] Date : 20 March 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung Date of Calibration: 23-Feb-17
 Location ID : Calibration Room Next Calibration Date: 23-May-17

CONDITIONS

Sea Level Pressure (hPa)	1017.4	Corrected Pressure (mm Hg)	763.05
Temperature (°C)	17.9	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.2	6.2	12.4	1.797	56	56.79	36.1509	-8.0555	0.9984
13	5	5	10.0	1.616	49	49.69			
10	3.8	3.8	7.6	1.410	43	43.61			
8	2.4	2.4	4.8	1.124	33	33.47			
5	1.4	1.4	2.8	0.862	22	22.31			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

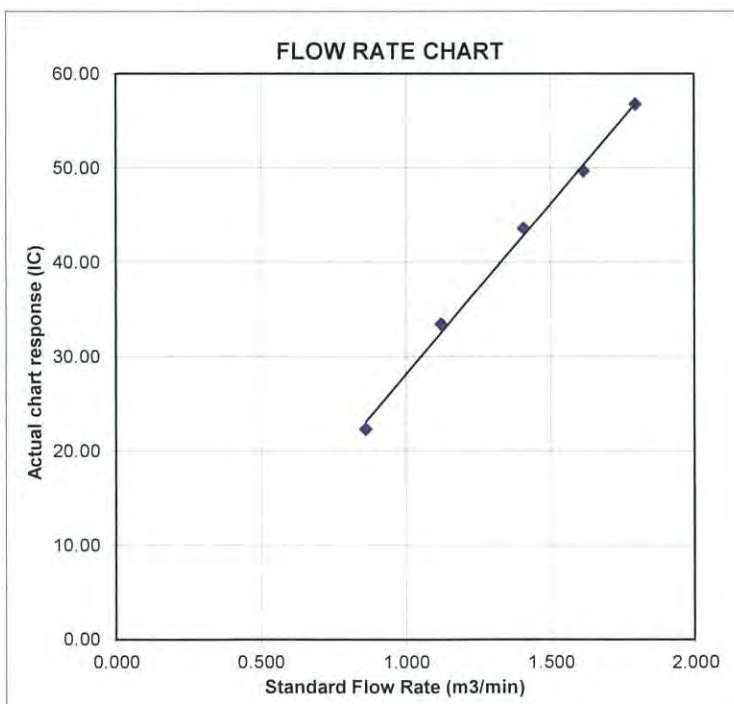
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1725634
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 16-JUN-2017
		DATE OF ISSUE	: 20-JUN-2017
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

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Signatories

Position

Richard Fung  General Manager

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group

11/F, Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1725634
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1725634-001	S/N: 456662	AIR	16-JUN-2017	S/N: 456662

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 456662
 Equipment Ref: EQ118
 Job Order HK1725634

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 23 February 2017

Equipment Verification Results:

Calibration Date: 11 & 12 May 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr16min	10:10 ~ 12:26	27.5	1013.8	0.034	2014	14.8
2hr19min	12:30 ~ 14:49	27.5	1013.8	0.036	2355	16.9
2hr13min	11:15 ~ 13:28	27.5	1010.9	0.029	1841	13.9

Sensitivity Adjustment Scale Setting (Before Calibration) 597 (CPM)

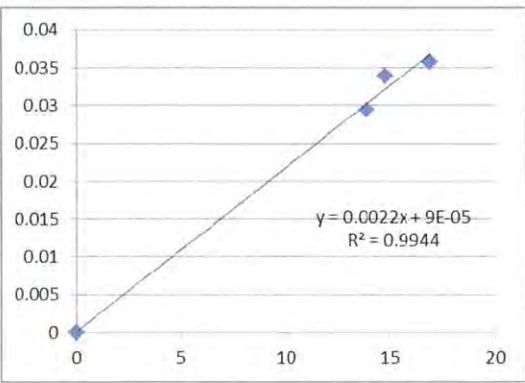
Sensitivity Adjustment Scale Setting (After Calibration) 597 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9972

Date of Issue 15 May 2017



Remarks:

- Strong** Correlation (R>0.8)
 - Factor 0.0022 should be apply for TSP monitoring
- *If R<0.5, repair or re-verification is required for the equipment

Operator : Martin Li Signature : [Signature] Date : 15 May 2017

QC Reviewer : Ben Tam Signature : [Signature] Date : 15 May 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 23-Feb-17
Location ID :	Calibration Room	Next Calibration Date: 23-May-17

CONDITIONS

Sea Level Pressure (hPa)	1017.4	Corrected Pressure (mm Hg)	763.05
Temperature (°C)	17.9	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.797	56	56.79	Slope = 36.1509 Intercept = -8.0555 Corr. coeff. = 0.9984
13	5	5	10.0	1.616	49	49.69	
10	3.8	3.8	7.6	1.410	43	43.61	
8	2.4	2.4	4.8	1.124	33	33.47	
5	1.4	1.4	2.8	0.862	22	22.31	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

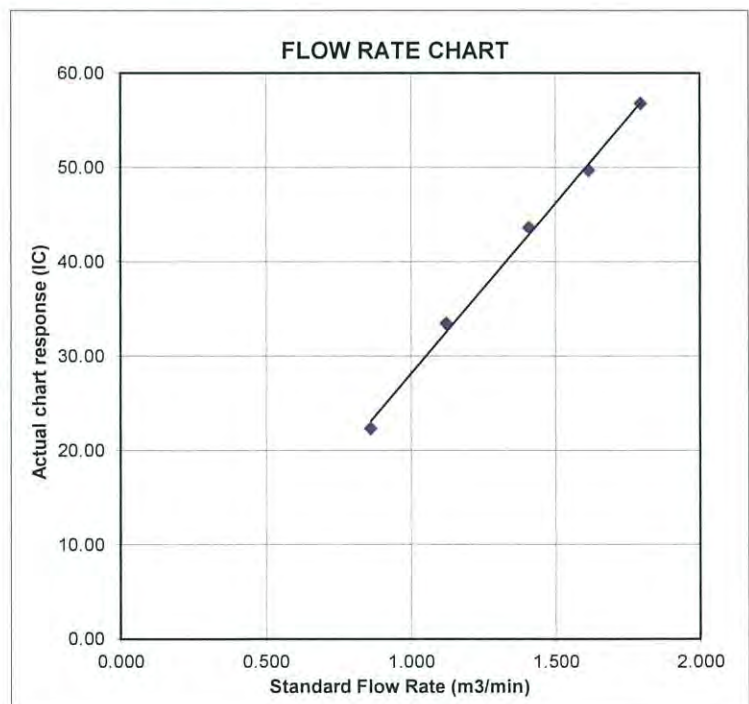
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Certificate of Calibration 校正證書

Certificate No. : C172795
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 16 May 2017
Description / 儀器名稱 : Sound Level Meter (EQ068)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-31
Serial No. / 編號 : 00410247
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(55 \pm 20)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 23 May 2017

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 : H T Wong
Technical Officer

Certified By : 
核證 : K C Lee
Engineer

Date of Issue : 24 May 2017
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書請先獲本實驗所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C172795

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 :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C170048
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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L _A	A	Fast	94.00	1	93.6	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L _A	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.7
				114.00		113.7

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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L _A	A	Fast	94.00	1	93.6	Ref.
			Slow			93.6	± 0.3

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Certificate of Calibration

校正證書

Certificate No. : C172795
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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L _A	A	Fast	94.00	63 Hz	67.2	-26.2 ± 1.5
					125 Hz	77.3	-16.1 ± 1.5
					250 Hz	84.8	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.7	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.6	-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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L _C	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.5	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	92.9	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration 校正證書

Certificate No. : C172795
證書編號

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 319841

- 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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

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Certificate of Calibration 校正證書

Certificate No. : C172793
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 16 May 2017
Description / 儀器名稱 : Sound Level Meter (EQ011)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 01121362
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

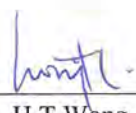
DATE OF TEST / 測試日期 : 23 May 2017

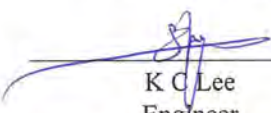
TEST RESULTS / 測試結果

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 : H T Wong
Technical Officer

Certified By : 
核證 : K C Lee
Engineer

Date of Issue : 24 May 2017
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C172793
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	C170048
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	93.2	± 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	93.2 (Ref.)
				104.00		103.2
				114.00		113.2

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	93.2	Ref.
			Slow			93.2	± 0.3

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Certificate of Calibration

校正證書

Certificate No. : C172793
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	66.9	-26.2 ± 1.5
					125 Hz	76.9	-16.1 ± 1.5
					250 Hz	84.5	-8.6 ± 1.4
					500 Hz	89.9	-3.2 ± 1.4
					1 kHz	93.2	Ref.
					2 kHz	94.4	+1.2 ± 1.6
					4 kHz	94.2	+1.0 ± 1.6
					8 kHz	92.1	-1.1 (+2.1 ; -3.1)
					12.5 kHz	88.7	-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	92.3	-0.8 ± 1.5
					125 Hz	93.0	-0.2 ± 1.5
					250 Hz	93.2	0.0 ± 1.4
					500 Hz	93.2	0.0 ± 1.4
					1 kHz	93.2	Ref.
					2 kHz	93.0	-0.2 ± 1.6
					4 kHz	92.4	-0.8 ± 1.6
					8 kHz	90.2	-3.0 (+2.1 ; -3.1)
					12.5 kHz	86.8	-6.2 (+3.0 ; -6.0)

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Certificate of Calibration

校正證書

Certificate No. : C172793
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 07549

- 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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Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 – 校正及檢測實驗室

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Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com



Certificate of Calibration 校正證書

Certificate No. : C173481
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 20 June 2017
Description / 儀器名稱 : Sound Level Meter (EQ013)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00921191
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 June 2017

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 : H T Wong
Technical Officer

Certified By : 
核證 : K C Lee
Engineer

Date of Issue : 29 June 2017
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C173481

證書編號

- 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.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C170048
CL281	Multifunction Acoustic Calibrator	PA160023

- Test procedure : MA101N.

- 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		104.3
				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

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C173481

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	68.0	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.5
					250 Hz	85.5	-8.6 ± 1.4
					500 Hz	90.9	-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	94.0	-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	87.8	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 10042

- 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.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C172284

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924)

Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱 : Acoustical Calibrator (EQ082)

Manufacturer / 製造商 : Brüel & Kjær

Model No. / 型號 : 4231

Serial No. / 編號 : 2713428

Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (55 ± 20)%

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

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

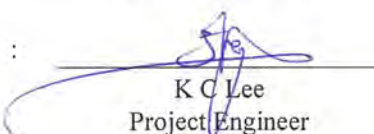
Tested By

測試


H T Wong
Technical Officer

Certified By

核證


K C Lee
Project Engineer

Date of Issue

簽發日期

2 May 2017

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號青山灣機樓四樓

Tel/電話: 2927 2606

Fax/傳真: 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C172284

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C163709
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

- Test procedure : MA100N.

- 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	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.1		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

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.



Certificate of Calibration 校正證書

Certificate No. : C174095
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924)

Date of Receipt / 收件日期 : 14 July 2017

Description / 儀器名稱 : Sound Calibrator
 Manufacturer / 製造商 : Rion
 Model No. / 型號 : NC-74
 Serial No. / 編號 : 34657231
 Supplied By / 委託者 : Action-United Environmental Services and Consulting
 Unit A, 20/F., Gold King Industrial Building,
 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
 Relative Humidity / 相對濕度 : (55 ± 20)%
 Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 22 July 2017

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


 H T Wong
 Technical Officer

Certified By
核證


 K C Lee
 Engineer

Date of Issue :
簽發日期

25 July 2017

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載經校正之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, Tsang Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號青洲灣機樓四樓

Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail 電郵: call@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C174095

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C173864
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

- Test procedure : MA100N.

- 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	94.1	± 0.3	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	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.



Certificate of Calibration 校正證書

Certificate No. : C174094
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 14 July 2017
Description / 儀器名稱 : Sound Level Calibrator (EQ085)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10655561
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 22 July 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification & user's specified acceptance criteria.
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 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 25 July 2017
簽發日期

The test equipment used for calibration are traceable to the nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Certificate of Calibration

校正證書

Certificate No. : C174094
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C173864
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

- Test procedure : MA100N.

- 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	93.9	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	User's Spec.	Uncertainty of Measured Value (Hz)
1	0.954	1 kHz ± 6 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- 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.

The test equipment used for calibration are traceable to the nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校準用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory

co 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

co 香港新界屯門安東一號青洲機樓四樓

Tel/電話: 2927 2008 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com



This document certifies that the instrument detailed below has been calibrated according to Valeport Limited's Standard Procedures, using equipment with calibrations traceable to UKAS or National Standards.

Calibration Certificate Number: 49714

Instrument Type: 106

Instrument Serial Number: 60011

Calibrated By: L.Bicknell

Date: 16/06/2017

Signed: 

Full details of the results from the calibration procedure applied to each fitted sensor are available, on request, via email. This summary certificate should be kept with the instrument.



Valeport Ltd | St Peter's Quay | Totnes | Devon | TQ9 5EW | UK
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E: sales@valeport.co.uk | www.valeport.co.uk



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK1811754
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	SUB-BATCH:	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	LABORATORY:	HONG KONG
		DATE RECEIVED:	11-Jan-2018
		DATE OF ISSUE:	17-Jan-2018

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: Conductivity, Dissolved Oxygen, pH, Salinity, Temperature and Turbidity
Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 15H102620/ 15H103928
Equipment No.: EQW018
Date of Calibration: 17 January, 2018

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Ms Lin Wai Yu, Iris
Assistant Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Work Order: HK1811754
Sub-Batch: 0
Date of Issue: 17-Jan-2018
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING



Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 15H102620/ 15H103928
Equipment No.: EQW018
Date of Calibration: 17 January, 2018 **Date of next Calibration:** 17 April, 2018

Parameters:

Conductivity

Method Ref: APHA (21st edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	156.7	+6.7
6667	6861	+2.9
12890	13120	+1.8
58670	56297	-4.0
Tolerance Limit (%)		±10.0

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.82	3.69	-0.13
5.60	5.51	-0.09
8.53	8.36	-0.17
Tolerance Limit (mg/L)		±0.20

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.13	+0.13
7.0	7.09	+0.09
10.0	9.90	-0.10
Tolerance Limit (pH unit)		±0.20

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

Ms Lin Wai Yu, Iris
 Assistant Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1811754
Sub-Batch: 0
Date of Issue: 17-Jan-2018
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING



Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 15H102620/ 15H103928
Equipment No.: EQW018
Date of Calibration: 17 January, 2018 **Date of next Calibration:** 17 April, 2018

Parameters:

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	10.60	+6.0
20	21.52	+7.6
30	32.67	+8.9
Tolerance Limit (%)		±10.0

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.5	8.9	-0.6
20.5	19.4	-1.1
38.0	36.7	-1.3
Tolerance Limit (°C)		±2.0

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.2	--
4	4.2	+5.0
40	38.1	-4.8
80	85.7	+7.1
400	407.6	+1.9
800	756.3	-5.5
Tolerance Limit (%)		±10.0

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

Ms Lin Wai Yu, Iris
Assistant Manager - Inorganics



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK1771561
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	SUB-BATCH:	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35- 41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	LABORATORY:	HONG KONG
		DATE RECEIVED:	17- Oct- 2017
		DATE OF ISSUE:	24- Oct- 2017

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test: Conductivity, Dissolved Oxygen, pH, Salinity, Temperature and Turbidity
Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 17B102764/17B100758
Equipment No.: EQW019
Date of Calibration: 20 October, 2017

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, *Wes*
Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1771561
Sub-Batch: 0
Date of Issue: 24- Oct- 2017
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING



Equipment Type: Multifunctional Meter
Brand Name: YSI
Model No.: Professional DSS
Serial No.: 17B102764/17B100758
Equipment No.: EQW019
Date of Calibration: 20 October, 2017 **Date of next Calibration:** 20 January, 2018

Parameters:

Conductivity

Method Ref: APHA (21st edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	139.6	- 5.0
6667	6224	- 6.6
12890	12244	- 5.0
58670	54757	- 6.7
Tolerance Limit (%)		± 10.0

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.80	2.90	+ 0.10
4.78	4.67	- 0.11
7.61	7.52	- 0.09
Tolerance Limit (mg/L)		± 0.20

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.10	+ 0.10
7.0	7.07	+ 0.07
10.0	9.94	- 0.06
Tolerance Limit (pH unit)		± 0.20

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


 Mr Chan Siu Ming, Vico
 Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1771561
 Sub-Batch: 0
 Date of Issue: 24- Oct- 2017
 Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING



Equipment Type: Multifunctional Meter
 Brand Name: YSI
 Model No.: Professional DSS
 Serial No.: 17B102764/17B100758
 Equipment No.: EQW019
 Date of Calibration: 20 October, 2017 Date of next Calibration: 20 January, 2018

Parameters:

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.91	- 0.9
20	20.08	+0.4
30	29.74	- 0.9
Tolerance Limit (%)		± 10.0

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.


Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.0	9.7	+0.7
21.0	21.8	+0.8
37.0	36.2	- 0.8
Tolerance Limit (°C)		± 2.0

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.7	--
4	4.3	+ 7.5
40	37.0	- 7.5
80	85.9	7.4
400	384.0	- 4.0
800	769.3	- 3.8
Tolerance Limit (%)		± 10.0

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


 Mr Chan Siu Ming, *Vico*
 Manager - Inorganics

Appendix F
Event and Action Plan

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	Contractor
Action Level Exceedance for One Sample	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the IEC and the ER; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor’s working method 	<ol style="list-style-type: none"> 1. Notify Contractor 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate
Action Level Exceedance for Two or More Consecutive Samples	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the IEC and ER; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 5. Discuss with IEC and Contractor on remedial action required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate
Limit Level Exceedance for One Sample	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the EPD and the ER; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 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

EVENT	ACTION			
	ET	IEC	ER	Contractor
	5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of results	remedial measures; 5. Supervise implementation of remedial measures		appropriate
Limit Level Exceedance for Two or More Consecutive Samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source(s) of impact; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, 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 action and keep IEC, EPD and ER informed of the result; 8. If exceedance stop, cease additional monitoring 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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

Event and Action Plan for Construction Noise

EXCEEDANCE	ACTION			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD and Contractor; 2. Identify source; 3. Carry out investigation; 4. Report the results of investigation to the IEC and Contractor; 5. Discuss with the Contractor and formulate remedial measures; 6. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals

Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	Contractor
Action Level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC and the Contractor; 4. Check monitoring data, all plant, equipment and the Contractor's working methods; 5. Discuss mitigation measures with the IEC and the Contractor; 	<ol style="list-style-type: none"> 1. Discuss with the ET and the Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET and the IEC and propose mitigation measures to the IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC and the Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with the IEC and the Contractor; 6. Ensure mitigation measures are implemented; 	<ol style="list-style-type: none"> 1. Discuss with the ET and the Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the noncompliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET and the IEC and propose mitigation measures to the IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one consecutive sampling day	<ol style="list-style-type: none"> 1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC, the Contractor and the EPD; 4. Check monitoring data, all plant, equipment and the Contractor's working methods; 5. Discuss mitigation measures with 	<ol style="list-style-type: none"> 1. Discuss with the ET / Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with the IEC, the ET and the Contractor on the proposed mitigation measures; 2. Request the Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 	<ol style="list-style-type: none"> 1. Inform the ER and confirm notification of the noncompliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET, the IEC and the ER and propose mitigation

EVENT	ACTION			
	ET	IEC	ER	Contractor
	the IEC, the ER and the Contractor; 6. Ensure mitigation measures are implemented.		4. Assess the effectiveness of the implemented mitigation measures.	measures to the IEC and the ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by more than one consecutive sampling days	1. Repeat <i>in-situ</i> measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform the IEC, the Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with the IEC, the ER and the Contractor; 6. Ensure mitigation measures are implemented;	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by the Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with the IEC, the ET and the Contractor on the proposed mitigation measures; 2. Request Contractor to critically review working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with the ET, the IEC and the ER and propose mitigation measures to the IEC and the ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, slow down or stop all or part of the construction activities.

Appendix G

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period

Date		Noise Monitoring (0700 – 1900)	Air Quality Monitoring		Water Quality
			1-hour TSP	24-hour TSP	
Mon	1-Jan-18				
Tue	2-Jan-18				
Wed	3-Jan-18			✓	
Thu	4-Jan-18	✓	✓		
Fri	5-Jan-18				
Sat	6-Jan-18				
Sun	7-Jan-18				
Mon	8-Jan-18				
Tue	9-Jan-18			✓	
Wed	10-Jan-18	✓	✓		
Thu	11-Jan-18				
Fri	12-Jan-18				
Sat	13-Jan-18				
Sun	14-Jan-18				
Mon	15-Jan-18			✓	
Tue	16-Jan-18	✓	✓		
Wed	17-Jan-18				✓
Thu	18-Jan-18				
Fri	19-Jan-18				✓
Sat	20-Jan-18			✓	
Sun	21-Jan-18				
Mon	22-Jan-18	✓	✓		✓
Tue	23-Jan-18				
Wed	24-Jan-18				✓
Thu	25-Jan-18				
Fri	26-Jan-18			✓	✓
Sat	27-Jan-18		✓		
Sun	28-Jan-18				
Mon	29-Jan-18				
Tue	30-Jan-18				✓
Wed	31-Jan-18				

✓	Monitoring Day
	Sunday or Public Holiday

Marine Water Quality Monitoring Schedule

Scheduled Monitoring Day		Tides of Tai Po Kau		Proposed Sampling Time (#)	
		Mid-Ebb	Mid-Flood	Mid-Ebb	Mid-Flood
17-Jan-18	Wed	13:02*	07:49	11:32 – 14:32	06:19 – 09:19
19-Jan-18	Fri	14:19*	08:55	12:49 – 15:49	07:25 – 10:25
22-Jan-18	Mon	16:34*	10:44	15:04 – 18:04	09:14 – 12:14
24-Jan-18	Wed	18:26	12:14	16:56 – 19:56	10:44 – 13:44
26-Jan-18	Fri	07:29	13:50	05:59 – 08:59	12:20 – 15:20
30-Jan-18	Tue	11:46*	17:40	10:16 – 13:16	16:10 – 19:10

Remark:

- The marine work was commenced on 24th January 2018.
- The water quality monitoring results on 17th, 19th & 22nd January 2018 were provided for reference only
- (*) The tidal range for the flood and ebb tide is less than 0.5m.
- (#) The water quality sampling will be undertaken within a 3-hour window of 1.5 hour before and 1.5 hour after mid flood and mid-ebb tides.

Impact Monitoring Schedule for next Reporting Period

Date		Noise Monitoring (0700 – 1900)	Air Quality Monitoring		Water Quality
			1-hour TSP	24-hour TSP	
Thu	1-Feb-18			✓	✓
Fri	2-Feb-18	✓	✓		
Sat	3-Feb-18				✓
Sun	4-Feb-18				
Mon	5-Feb-18				✓
Tue	6-Feb-18				
Wed	7-Feb-18			✓	✓
Thu	8-Feb-18	✓	✓		
Fri	9-Feb-18				
Sat	10-Feb-18				✓
Sun	11-Feb-18				
Mon	12-Feb-18				✓
Tue	13-Feb-18			✓	
Wed	14-Feb-18	✓	✓		(#)
Thu	15-Feb-18				(#)
Fri	16-Feb-18				(#)
Sat	17-Feb-18				(#)
Sun	18-Feb-18				(#)
Mon	19-Feb-18			✓	(#)
Tue	20-Feb-18	✓	✓		(#)
Wed	21-Feb-18				(#)
Thu	22-Feb-18				(#)
Fri	23-Feb-18				✓
Sat	24-Feb-18			✓	
Sun	25-Feb-18				
Mon	26-Feb-18	✓	✓		✓
Tue	27-Feb-18				
Wed	28-Feb-18				✓

Remark:

(#) The construction site will be closed during the Lunar New Year Holiday from 14th to 22nd February 2018 and there will be no marine work conducted. Therefore, no marine water quality monitoring will be carried out during the period from 14th to 22nd February 2018.

✓	Monitoring Day
	Sunday or Public Holiday

Marine Water Quality Monitoring Schedule

Scheduled Monitoring Day		Tides of Tai Po Kau		Proposed Sampling Time (#)	
		Mid-Ebb	Mid-Flood	Mid-Ebb	Mid-Flood
1-Feb-18	Thu	13:29	7:46	11:59 - 14:59	6:16 - 9:16
3-Feb-18	Sat	14:59	9:09	13:29 - 16:29	7:39 - 10:39
5-Feb-18	Mon	16:31	10:33	15:01 - 18:01	9:03 - 12:03
7-Feb-18	Wed	18:22	12:06	16:52 - 19:52	10:36 - 13:36
10-Feb-18	Sat	8:59*	14:44	7:29 - 10:29	13:14 - 16:14
12-Feb-18	Mon	10:50*	16:29	9:20 - 12:20	14:59 - 17:59
23-Feb-18	Fri	18:55	12:14	17:25 - 20:25	10:44 - 13:44
26-Feb-18	Mon	9:41*	15:21	8:11 - 11:11	13:51 - 16:51
28-Feb-18	Wed	11:41*	17:34	10:11 - 13:11	16:04 - 19:04

Remark:

(*) The tidal range for the flood and ebb tide is less than 0.5m.

(#) The water quality sampling will be undertaken within a 3-hour window of 1.5 hour before and 1.5 hour after mid flood and mid-ebb tides.

- The construction site will be closed during the Lunar New Year Holiday from 14th to 22th February 2018 and there will be no marine work conducted. Therefore, no marine water quality monitoring will be carried out during the period from 14th to 22nd February 2018.

Appendix H

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)	ACTION LEVEL (µg/m ³)	LIMIT LEVEL (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL				
A4 - Bahia Restaurant Chung King BBQ																	
3-Jan-18	22075	12388.31	12412.31	1440.00	22	36	29.0	17.1	1020.3	1.27	1829	2.6350	2.7582	0.1232	67	142	260
9-Jan-18	22078	12412.31	12436.31	1440.00	30	31	30.5	16.8	1020.4	1.33	1920	2.6470	2.7285	0.0815	42	142	260
15-Jan-18	22004	12436.31	12460.31	1440.00	29	33	31.0	15.3	1018.9	1.36	1953	2.5751	2.6707	0.0956	49	142	260
20-Jan-18	22149	12460.31	12483.94	1417.80	36	37	36.5	16.3	1019.5	1.58	2244	2.6362	2.7385	0.1023	46	142	260
26-Jan-18	22167	12483.94	12507.65	1422.60	34	35	34.5	15.3	1020.8	1.50	2139	2.6667	2.8230	0.1563	73	142	260
A7 - Hong Kong Eco-Farm																	
3-Jan-18	22076	9741.87	9765.41	1412.40	42	42	42.0	17.1	1020.3	1.37	1938	2.6163	2.7265	0.1102	57	141	260
9-Jan-18	22079	9765.41	9788.92	1410.60	41	42	41.5	16.8	1020.4	1.36	1916	2.6206	2.7138	0.0932	49	141	260
15-Jan-18	21917	9788.92	9812.78	1431.60	40	40	40.0	16.1	1020.4	1.31	1883	2.5705	2.6735	0.1030	55	141	260
20-Jan-18	22148	9812.78	9836.56	1426.80	39	40	39.5	16.3	1019.5	1.30	1854	2.6553	2.7573	0.1020	55	141	260
26-Jan-18	22166	9836.56	9860.48	1435.20	39	40	39.5	15.3	1020.8	1.30	1869	2.6796	2.8074	0.1278	68	141	260

1-hour TSP Monitoring Data

Date	Start Time	1 st reading	2 nd reading	3 rd reading	Action Level (µg/m ³)	Limit Level (µg/m ³)
A4 - Bahia Restaurant Chung King BBQ						
4-Jan-18	9:39	69	72	69	275	500
10-Jan-18	9:51	32	38	39	275	500
16-Jan-18	9:38	52	39	37	275	500
22-Jan-18	9:55	55	76	86	275	500
27-Jan-18	9:38	37	40	43	275	500
A7 - Hong Kong Eco-Farm						
4-Jan-18	13:11	65	70	68	274	500
10-Jan-18	9:38	32	33	38	274	500
16-Jan-18	9:57	42	46	45	274	500
22-Jan-18	9:46	54	75	91	274	500
27-Jan-18	9:29	33	39	42	274	500

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq ₃₀	façade correction	Limit Level (dB(A))
N1 - Village house - No. 165A Lung Mei																						
4-Jan-18	10:05	59.0	61.2	47.6	55.5	59.8	42.7	54.7	58.6	43.6	56.5	59.1	43.6	57.4	61.5	41.3	54.3	58.9	40.2	57	60	75
10-Jan-18	10:29	60.5	62.9	55.4	59.6	62.8	48.5	56.9	60.7	46.3	56.1	59.3	42.9	57.4	60.1	43.2	54.7	58.2	43.0	58	61	75
16-Jan-18	9:32	57.1	61.7	44.1	59.6	61.9	48.4	57.5	59.6	43.1	56.2	60.6	44.2	59.4	60.4	45.0	57.5	61.7	47.1	58	61	75
22-Jan-18	10:36	55.7	59.2	45.6	56.6	60.2	43.3	55.7	59.7	41.1	58.1	62.4	44.7	59.4	62.1	43.4	56.9	60.7	45.3	57	60	75
N2a - Village house - No. 101 Lung Mei																						
4-Jan-18	9:32	58.4	61.6	43.9	56.0	58.9	43.9	55.9	59.8	41.5	58.8	63.1	45.2	59.6	63.5	43.5	55.8	59.7	43.9	58	N/A	75
10-Jan-18	9:58	58.8	62.4	46.2	58.8	62.4	45.9	58.3	62.3	46.8	56.2	59.3	41.2	64.6	68.7	45.4	64.3	68.0	47.7	61	N/A	75
16-Jan-18	10:05	58.5	62.3	49.4	55.6	59.1	45.9	58.6	63.4	42.0	54.9	58.9	42.9	54.5	58.7	45.2	54.8	59.2	40.3	57	N/A	75
22-Jan-18	10:06	59.2	63.0	45.9	65.1	69.8	45.0	56.9	60.7	44.0	58.0	61.6	42.9	60.9	63.2	45.8	60.1	62.7	44.1	61	N/A	75
N3a - Village house - No. 66C Lo Tsz Tin																						
4-Jan-18	10:39	72.8	76.3	68.9	70.3	71.1	69.1	70.5	71.4	69.3	70.4	74.0	50.8	70.3	73.1	47.4	72.5	77.2	67.7	71	74	75
10-Jan-18	11:05	51.5	54.0	44.1	50.3	52.3	45.5	50.4	53.6	44.1	55.5	59.8	44.3	57.0	59.1	47.5	51.8	54.6	44.3	54	57	75
16-Jan-18	10:05	52.9	56.1	46.5	47.6	50.6	42.3	47.3	48.9	42.2	47.5	50.7	42.2	50.9	50.1	40.7	55.3	54.0	42.3	51	54	75
22-Jan-18	11:10	54.5	58.0	43.6	50.3	53.0	40.3	52.1	52.9	40.0	50.1	53.6	41.5	51.0	53.4	40.8	54.6	57.3	42.6	53	56	75
N4 - Village house - No. 79 Lo Tsz Tin																						
4-Jan-18	11:12	58.7	61.0	56.2	59.8	62.6	56.7	60.8	62.0	53.1	59.7	61.9	56.5	59.1	62.1	51.7	62.0	62.4	51.6	60	N/A	75
10-Jan-18	11:37	58.9	62.7	49.6	56.5	60.7	45.0	57.0	61.3	46.5	57.4	61.1	44.2	55.7	60.0	45.5	58.5	60.8	46.4	57	N/A	75
16-Jan-18	10:37	55.0	58.8	43.6	55.4	58.9	46.5	54.2	57.3	45.7	56.6	60.3	51.6	57.6	60.6	46.8	56.0	59.9	43.8	56	N/A	75
22-Jan-18	11:42	59.8	62.5	44.2	56.3	60.6	45.3	58.0	62.2	43.1	56.5	60.6	44.3	60.9	62.2	46.0	59.1	62.7	45.5	59	N/A	75

Remark:

Sound level meter set at N1 and N3a are made free-field measurement, façade correction (+3dB(A)) has added according to acoustical principles and EPD guidelines;

Impact Water Quality Monitoring Result														
Sampling Date: 17-Jan-18														
Date / Time	Location	Tide*	Water Depth	Sampling Depth	Current Direction	Current Speed	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS	Chlorophyll-a
			m	m	degrees	m/s	°C	mg/L	%	NTU	ppt	unit	mg/L	µg/L
12:35	G1	ME	6.1	1.00	127	0.092	17.7	7.93	100.8	1.82	31.87	8.3	3	3.7
				3.05			17.6	8.01	101.6	1.84	31.88	8.33	4	4.1
				5.10			17.1	7.45	93.7	2.31	32.04	8.63	4	4.6
							17.1	7.47	93.9	2.31	32.02	8.63	3	4.4
							17.1	7.38	92.7	2.63	32.04	8.61	5	4.4
12:45	R1	ME	6.8	1.00	257	0.167	17.2	7.89	99.4	2.14	31.99	8.25	4	3.7
				3.40			17.2	7.94	99.9	2.13	32	8.28	5	3.5
				5.80			17	7.37	92.6	2.64	32.18	8.5	3	3
							16.9	7.36	92.3	2.28	32.2	8.5	4	3.1
							16.7	6.82	85.3	3.44	32.38	8.52	5	3.5
12:15	R2	ME	5.2	1.00	134	0.083	17.4	7.66	96.9	1.97	31.92	8.22	5	2.5
				4.20			17.4	7.72	97.7	1.95	31.93	8.3	5	2.6
							17.1	7.59	95.4	2.37	32.03	8.51	3	2.9
							17.1	7.6	95.6	2.38	32.02	8.52	3	2.8
							17.7	7.91	100.7	1.93	31.91	7.67	4	3.5
12:01	I1	ME	2.8	1.40	71	0.054	17.6	7.96	101	1.93	31.91	7.71	3	3.9
							17.1	7.93	99.8	2.33	31.99	7.88	3	4
							17.1	8	100.7	2.2	31.94	7.89	4	4.3
							16.8	6.74	84.5	3.82	32.29	8.42	5	4.2
							16.8	6.7	84	4.21	32.3	8.41	4	4.3
11:53	I2	ME	5.3	1.00	334	0.248	17.3	8.27	104.3	1.97	31.86	7.82	4	3.9
				4.30			17.3	8.25	104.1	1.94	31.86	7.84	2	2.9
							16.9	7.31	91.6	3.36	32.24	8.19	2	3.6
							16.8	6.98	87.5	3.74	32.26	8.18	2	4.1
							17.5	8.01	101.4	1.85	31.91	8.2	4	3.1
11:45	I3	ME	4.9	1.00	82	0.156	17.4	8.03	101.6	1.87	31.92	8.25	4	3
				3.90			17	7.71	96.8	2.28	32.13	8.39	8	3.4
							16.9	7.68	96.4	2.37	32.14	8.42	10	3.5
							16.8	6.67	83.6	4.64	32.3	8.68	10	3.6
							16.8	6.67	83.6	4.71	32.3	8.68	8	4.1
12:58	W1	ME	7.4	1.00	66	0.110	18.4	7.42	95.7	2.7	31.87	7.67	8	2.2
				3.70			18.4	7.45	95.9	2.54	31.86	7.69	6	2.6
				6.40			17.6	7.94	100.7	1.84	31.84	8.26	2	3.4
							17.6	8.03	101.8	1.82	31.84	8.28	3	3.5
							17.1	7.7	96.8	2.39	31.95	8.51	4	3.2
12:08	M1	ME	0.6	0.30	124	0.126	17.1	7.73	97.3	2.34	31.96	8.51	4	3.1
							17.2	8.1	102	2.21	31.84	8.26	2	4
							17.2	8.12	102.3	2.2	31.84	8.26	4	3.8
							16.9	7.21	90.4	2.61	32.2	8.23	3	3.3
							16.8	7.13	89.4	2.81	32.25	8.24	3	3.4
9:39	G1	MF	6.4	1.00	140	0.135	16.8	6.81	85.3	3.4	32.16	8.26	3	3.1
				3.20			16.9	6.82	85.5	2.92	32.14	8.25	3	3.1
				5.40			17.1	7.78	97.7	2.29	31.95	8.19	5	4
							17.1	7.84	98.6	2.2	31.9	8.18	7	4.2
							16.7	6.92	86.5	3.54	32.37	8.19	6	3.5
9:50	R1	MF	7.2	1.00	252	0.205	16.7	6.8	85.1	3.53	32.37	8.19	8	3.5
				3.60			16.7	6.58	82.3	4.34	32.39	8.18	7	3.2
				6.20			16.7	6.57	82.2	4.4	32.39	8.18	7	3.8
							17.5	7.8	98.6	2.06	31.78	8.06	4	3.5
							17.5	7.84	99.2	2.05	31.81	8.06	3	3.8
9:20	R2	MF	5.5	1.00	271	0.090	16.9	7.39	92.6	2.38	32.03	8.16	3	3.6
				4.50			16.9	7.36	92.3	2.37	32.04	8.16	5	3.6
							17.4	7.9	99.7	2.25	31.88	8.26	2	4.2
							17.3	7.93	100.1	2.29	31.88	8.27	3	3.8
							17.2	7.97	100.5	2.22	31.88	7.8	5	4.3
9:06	I1	MF	2.9	1.45	239	0.087	17.2	7.97	100.4	2.23	31.87	7.8	3	4.3
							17	8.05	101	2.51	31.96	7.88	5	4.3
							17	8.04	100.9	2.54	31.98	7.89	4	4.2
							17.3	7.96	100.3	2.33	31.84	7.95	3	5.1
							17.2	8	100.8	2.32	31.85	7.94	3	4
8:57	I2	MF	4.9	1.00	227	0.280	17.2	6.99	88	2.16	31.97	8.06	3	3.5
				3.90			17.2	6.91	87	2.19	31.97	8.07	2	3.4
							17.4	7.48	94.6	1.85	31.82	8.41	2	3.4
							17.3	7.55	95.2	1.88	31.87	8.42	3	2.9
							17.1	7.84	98.5	1.97	31.98	8.52	4	3.3
8:43	I3	MF	4.7	1.00	40	0.087	17.1	7.84	98.6	1.97	31.98	8.52	4	3.3
				3.70			17.1	7.84	98.6	1.97	31.98	8.52	5	3.1
							16.9	7.06	88.5	2.64	32.19	8.56	5	3
							16.8	6.99	87.6	2.85	32.22	8.56	5	3.2
							17.4	6.84	86.4	2.79	31.78	8.2	3	1.3
10:03	W1	MF	7.9	1.00	164.5	0.057	17.4	6.83	86.2	2.4	31.78	8.18	3	1.2
				3.95			17.4	7.85	99.2	3.12	31.84	7.92	3	4
				6.90			17.4	7.9	99.9	3.1	31.84	7.93	2	3.8
							17.2	8	100.7	2.17	31.89	7.95	4	4
							17.1	7.69	96.7	2.3	31.92	7.96	6	4.1
9:12	M1	MF	0.7	0.35	343	0.207	17.4	7.85	99.2	3.12	31.84	7.92	3	4
							17.4	7.9	99.9	3.1	31.84	7.93	2	3.8
							17.2	8	100.7	2.17	31.89	7.95	4	4
							17.1	7.69	96.7	2.3	31.92	7.96	6	4.1
							17.4	7.85	99.2	3.12	31.84	7.92	3	4
9:32	FCZ1	MF	4.3	1.00	258	0.136	17.4	7.85	99.2	3.12	31.84	7.92	3	4
				3.30			17.4	7.9	99.9	3.1	31.84	7.93	2	3.8
							17.2	8	100.7	2.17	31.89	7.95	4	4
							17.1	7.69	96.7	2.3	31.92	7.96	6	4.1
							17.4	7.85	99.2	3.12	31.84	7.92	3	4

Remarks: MF - Middle Flood tide
 ME - Middle Ebb tide

For SS, if the monitoring result is less than Limit of Report 2mg/L, the result value will be assumed as 2 for the calculation.

For Chlorophyll-a, if the monitoring result is less than Limit of Report 0.1µg/L, the result value will be assumed as 0.1 for the calculation.

Impact Water Quality Monitoring Result															
Sampling Date: 19-Jan-18															
Date / Time	Location	Tide*	Water Depth	Sampling Depth	Current Direction	Current Speed	Temp	DO Conc	DO Saturatio n	Turbidit y	Salinity	pH	SS	Chlorophyll-a	
			m	m	degrees	m/s	°C	mg/L	%	NTU	ppt	unit	mg/L	µg/L	
13:54	G1	ME	5.3	1.00	201	0.083	17.7	7.83	101.5	1.34	35.26	8.22	3	4.6	
				18.2			7.85	102.5	1.38	35.11	8.24	3	4.4		
				16.9			6.9	88.4	1.73	35.47	8.19	8	4.2		
				16.9			6.87	87.9	1.78	35.49	8.19	8	4.7		
14:05	R1	ME	5.6	1.00	160	0.123	17.3	8.23	105.9	1.22	35.3	8.28	7	4.2	
				17.4			8.24	106.3	1.16	35.26	8.29	7	4.1		
				16.5			7.1	90.4	1.31	35.87	8.18	8	4.1		
				16.5			6.96	88.5	1.21	35.75	8.18	7	3.8		
13:37	R2	ME	4.2	1.00	190	0.147	17.7	7.53	97.6	1.17	35.23	8.2	8	3	
				18			7.56	98.6	1.13	35.13	8.22	8	2.8		
				16.9			6.46	82.7	2.13	35.55	8.19	9	3.6		
				16.9			6.48	83	2.08	35.54	8.18	8	3.3		
13:26	I1	ME	2.3	1.15	333	0.054	17.7	7.95	103.2	1.14	35.21	8.28	6	3.6	
							17.7	8	103.8	1.12	35.22	8.28	6	3.8	
13:21	I2	ME	4.6	1.00	320	0.188	17.3	8.03	103.5	1.17	35.28	8.27	10	4.4	
				17.4			8.03	103.5	1.14	35.23	8.27	10	4.2		
				17.2			7.84	100.7	1.26	35.36	8.27	10	3.7		
				17.2			7.85	100.9	1.26	35.37	8.26	10	4		
13:14	I3	ME	4.3	1.00	105	0.103	17.4	8.09	104.4	1.13	35.28	8.28	7	4	
				17.4			8.09	104.4	1.12	35.26	8.28	6	4		
				17.2			7.97	102.5	1.23	35.38	8.27	8	3.7		
				17.2			8.03	103.3	1.25	35.33	8.27	8	3.7		
14:14	W1	ME	7.4	1.00	89	0.110	17.4	8.06	103.8	1.17	35.29	8.26	12	4.2	
				17.4			8.08	104.2	1.16	35.28	8.27	11	4.8		
				16.9			7.19	92	1.4	35.51	8.2	12	4.7		
				17			7.18	92	1.29	35.46	8.2	11	4.6		
13:31	M1	ME	0.7	0.35	147	0.127	16.6	6.72	85.6	2.64	35.69	8.19	12	3.4	
							16.6	6.63	84.5	2.6	35.68	8.18	12	3.8	
							18.4	6.88	90.2	2.2	34.77	8.16	9	1.6	
							18.4	6.89	90.3	2.42	34.76	8.16	10	1.8	
13:45	FCZ1	ME	4.1	1.00	282	0.089	18.1	7.49	97.8	1.56	35.18	8.21	6	4.8	
				18			7.64	99.7	1.57	35.17	8.24	4	4.3		
				17.4			6.75	87	1.87	35.42	8.2	7	4.4		
				17.1			6.68	85.7	1.89	35.43	8.19	6	4.1		
10:03	G1	MF	5.9	1.00	145	0.074	17.6	7.73	100	1.33	35.26	8.23	3	5.5	
				17.8			7.74	100.5	1.3	35.22	8.24	4	5.6		
				16.9			6.92	88.5	2.61	35.52	8.18	8	5.1		
				16.9			7.14	91.3	2.53	35.5	8.19	9	5.2		
10:10	R1	MF	5.7	1.00	231	0.157	17	7.45	95.5	1.3	35.43	8.21	6	5.2	
				17.1			7.52	96.4	1.22	35.38	8.22	4	4.5		
				16.5			6.65	84.5	2.14	35.69	8.17	5	4.5		
				16.5			6.64	84.5	2.17	35.69	8.17	5	4.3		
9:49	R2	MF	5.2	1.00	196	0.174	17.3	7.41	95.5	1.51	35.36	8.18	6	1.3	
				17.5			7.46	96.4	1.46	35.3	8.19	7	4.5		
				16.9			6.64	84.9	2.03	35.53	8.16	8	5.8		
				17			6.73	86.3	1.97	35.45	8.17	7	5.2		
9:39	I1	MF	2.8	1.40	317	0.097	17.7	7.89	102.4	1.36	35.2	8.26	10	5	
							17.7	7.9	102.4	1.3	35.23	8.26	9	5.1	
9:31	I2	MF	4.8	1.00	128	0.103	17.5	7.88	101.7	1.31	35.26	8.26	6	4.3	
				17.5			7.9	102	1.31	35.26	8.26	5	4.8		
				17.3			7.65	98.5	1.83	35.36	8.24	9	5.2		
				17.3			7.68	98.9	1.86	35.33	8.24	10	5.4		
9:24	I3	MF	4.6	1.00	149	0.231	17.7	7.87	102.1	1.31	35.21	8.24	4	4.3	
				17.7			7.91	102.5	1.29	35.24	8.25	5	3.9		
				17.2			7.67	98.7	1.4	35.39	8.21	5	4.7		
				17.4			7.75	100	1.34	35.31	8.22	4	4.5		
10:20	W1	MF	7.8	1.00	256	0.179	17.3	7.94	102.2	1.07	35.3	8.25	4	4.1	
				17.5			7.92	102.2	1.05	35.25	8.26	5	4.8		
				17			7.53	96.4	1.43	35.48	8.2	7	5.3		
				17.1			7.6	97.5	1.27	35.4	8.22	7	4.4		
9:44	M1	MF	0.6	0.30	197	0.085	16.6	6.59	84	2.34	35.67	8.17	10	4.5	
							16.7	6.58	83.9	2.18	35.66	8.17	12	4.2	
							18	7.24	94.3	2.15	35.06	8.2	16	0.6	
							18	7.21	93.9	2.22	35.07	8.2	16	0.6	
9:56	FCZ1	MF	4.5	1.00	213	0.144	18.2	7.62	99.6	1.24	35.14	8.21	6	4.6	
				18.1			7.65	100	1.19	35.15	8.24	7	4.3		
				17			6.48	83	2.35	35.43	8.12	8	5.1		
				17			6.74	86.4	2.46	35.37	8.16	9	5.6		

Remarks: MF - Middle Flood tide
 ME - Middle Ebb tide

For SS, if the monitoring result is less than Limit of Report 2mg/L, the result value will be assumed as 2 for the calculation.

For Chlorophyll-a, if the monitoring result is less than Limit of Report 0.1µg/L, the result value will be assumed as 0.1 for the calculation.

Impact Water Quality Monitoring Result														
Sampling Date: 22-Jan-18														
Date / Time	Location	Tide*	Water Depth	Sampling Depth	Current Direction	Current Speed	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS	Chlorophyll-a
			m	m	degrees	m/s	°C	mg/L	%	NTU	ppt	unit	mg/L	µg/L
15:38	G1	ME	5.3	1.00	113	0.115	19.1	7.82	104	1.55	35.15	8.26	4	2.2
				2.65			19	7.83	104	1.54	35.16	8.27	3	2.2
				4.30			17.3	6.35	81.8	1.54	35.53	8.18	3	1.6
							17.3	6.29	81.1	1.41	35.52	8.17	3	1.5
							19	7.72	102.6	1.33	35.13	8.27	6	2.1
15:45	R1	ME	5.7	1.00	217	0.122	18.9	7.8	103.5	1.27	35.16	8.27	4	2
				2.85			17.6	7.83	101.6	1.43	35.39	8.28	5	1.6
				4.70			17.5	7.78	100.7	1.44	35.42	8.28	4	1.8
							18.8	7.51	99.4	1.24	35.1	8.24	5	1.4
							18.7	7.57	100.1	1.22	35.12	8.25	4	1.4
15:25	R2	ME	4.2	1.00	212	0.220	18.1	6.86	89.8	1.33	35.28	8.25	4	1.7
				3.20			18	6.9	90.2	1.37	35.31	8.24	4	1.6
							19.8	7.55	101.9	1.76	35.06	8.24	5	2.3
15:16	I1	ME	2.5	1.25	145	0.118	19.3	7.59	101.5	1.78	35.28	8.24	3	2.2
							18.5	7.48	99	1.34	35.89	8.25	3	2.8
15:12	I2	ME	4.6	1.00	251	0.267	18.6	7.52	99.5	1.38	35.72	8.26	3	2.2
				3.60			17.4	7.32	94.5	1.53	35.46	8.26	7	2.1
							17.3	7.3	94.2	1.54	35.48	8.26	6	2.8
							18.3	7.61	100	1.53	35.45	8.3	6	2.4
15:07	I3	ME	4.4	1.00	134	0.184	18.4	7.59	99.7	1.56	35.31	8.3	5	2.3
				3.40			17.4	6.71	86.6	1.18	35.48	8.19	4	2.7
							17.3	6.66	85.8	1.22	35.51	8.19	4	3.6
							19.5	7.45	99.8	1.03	35.06	8.24	4	2.3
15:53	W1	ME	7.5	1.00	128	0.138	19.4	7.48	100.1	1.02	35.08	8.24	5	2.3
				3.75			17.3	7.08	91.4	1.74	35.46	8.25	3	2.2
				6.50			17.3	7.06	91.1	1.78	35.48	8.24	5	2
							17	6.53	83.7	2.05	35.58	8.18	8	2.1
							16.9	6.46	82.7	2.12	35.6	8.17	9	2.1
15:26	M1	ME	0.8	0.40	162	0.112	20.7	7.54	103.2	2.37	34.89	8.21	14	2.9
							20.7	7.54	103.2	2.38	34.9	8.21	12	2.7
15:32	FCZ1	ME	4.3	1.00	211	0.117	19.2	7.66	102.2	1.23	35.08	8.25	6	1.6
				3.30			18.7	7.83	103.5	1.24	35.22	8.26	4	1.4
							17.7	6.78	88	2.15	35.38	8.25	5	2.1
							17.6	6.77	87.9	2.05	35.42	8.24	5	1.9
11:28	G1	MF	5.6	1.00	114	0.178	18.5	7.66	100.9	1.24	35.16	8.24	4	6
				2.80			18.4	7.71	101.4	1.28	35.2	8.24	2	5.6
				4.60										
							17.8	7.14	92.9	1.39	35.33	8.16	8	2.1
							17.7	6.78	88	1.43	35.37	8.16	9	2.3
11:36	R1	MF	6.2	1.00	212	0.162	17.9	7.57	98.7	1.36	35.35	8.27	7	2.8
				3.10			17.9	7.64	99.6	1.37	35.33	8.27	7	2.6
				5.20			17.4	7.53	97.3	1.68	35.43	8.25	7	2.6
							17.4	7.55	97.5	1.72	35.44	8.25	6	2.7
							17.1	6.8	87.4	1.94	35.52	8.23	8	2.2
11:15	R2	MF	4.2	1.00	91	0.195	17	6.75	86.6	1.95	35.55	8.22	8	2.2
				3.20			18.3	7.36	96.5	1.71	35.22	8.24	10	2
							18.2	7.44	97.5	1.74	35.22	8.25	10	2.2
							17.5	6.76	87.4	1.99	35.42	8.19	12	2.6
11:07	I1	MF	2.6	1.30	67	0.127	17.4	6.71	86.7	1.96	35.43	8.19	10	2.5
							18.2	7.69	100.8	1.36	35.22	8.26	5	2.3
11:02	I2	MF	4.7	1.00	161	0.150	18.2	7.71	101	1.34	35.21	8.26	5	2.3
				3.70			18.3	7.78	101.9	1.31	35.21	8.27	6	1.8
							18.3	7.8	102.3	1.34	35.2	8.27	5	1.8
							17.3	6.8	87.6	1.55	35.5	8.21	4	2
10:55	I3	MF	4.3	1.00	286	0.128	17.3	6.63	85.4	1.58	35.51	8.19	5	2.1
				3.30			18.5	7.58	99.8	1.71	35.11	8.28	9	2.4
							18.4	7.58	99.6	1.69	35.12	8.28	8	2.2
							17.3	6.68	86.1	1.34	35.5	8.2	7	1.3
							17.3	6.68	86.1	1.35	35.49	8.2	7	1.6
11:48	W1	MF	7.4	1.00	144	0.070	18.3	7.48	98.1	1.58	35.17	8.24	6	2.8
				3.70			18.3	7.53	98.6	1.57	35.16	8.24	6	2.6
				6.40			17.5	7.56	97.8	1.78	35.4	8.25	6	2.1
							17.5	7.59	98.2	1.81	35.39	8.26	7	2.8
							17	6.36	81.6	2.27	35.57	8.17	6	2.5
							17	6.34	81.2	2.21	35.58	8.16	5	2.9
11:12	M1	MF	0.5	0.25	169	0.127	19.1	6.96	92.5	2	34.98	8.17	3	0.6
							19.1	6.97	92.6	2.09	34.99	8.17	3	0.6
11:22	FCZ1	MF	4.5	1.00	349	0.163	18.7	7.45	98.4	1.46	35.13	8.21	3	2.3
				3.50			18.6	7.51	99.1	1.47	35.17	8.22	4	2.2
							17.7	6.36	82.6	2.22	35.38	8.21	3	2.1
							17.6	6.25	81	2.23	35.41	8.2	3	2.2

Remarks: MF - Middle Flood tide
ME - Middle Ebb tide

For SS, if the monitoring result is less than Limit of Report 2mg/L, the result value will be assumed as 2 for the calculation.

For Chlorophyll-a, if the monitoring result is less than Limit of Report 0.1µg/L, the result value will be assumed as 0.1 for the calculation.

Impact Water Quality Monitoring Result														
Sampling Date: 24-Jan-18														
Date / Time	Location	Tide*	Water Depth	Sampling Depth	Current Direction	Current Speed	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS	Chlorophyll-a
			m	m	degrees	m/s	°C	mg/L	%	NTU	ppt	unit	mg/L	µg/L
17:46	G1	ME	5.3	1.00	318	0.121	18.2	7.14	93.5	1.86	35.28	8.27	11	2.4
				2.65			18.2	7.14	93.5	1.87	35.29	8.27	11	2.6
				4.30			18.2	7.15	93.7	2.02	35.29	8.28	15	2.8
							18.2	7.16	93.8	1.98	35.29	8.28	13	2.9
17:54	R1	ME	6	1.00	351	0.189	18	7.29	95.1	1.77	35.33	8.29	7	2
				3.00			18	7.31	95.4	1.8	35.33	8.29	5	2.5
				5.00			17.9	7.62	99.4	1.85	35.37	8.32	6	2.4
							18	7.63	99.5	1.8	35.37	8.32	6	2.6
							17.8	6.81	88.6	1.91	35.41	8.29	5	3.2
							17.7	6.74	87.6	1.85	35.43	8.29	7	2.6
17:34	R2	ME	4.2	1.00	199	0.149	18.8	7.21	95.3	1.36	35.09	8.27	6	2.8
				3.20			18.8	7.22	95.5	1.41	35.11	8.27	6	3
							18.7	7.25	95.8	1.79	35.14	8.28	9	2.9
							18.7	7.24	95.6	1.89	35.15	8.28	11	1.9
17:27	I1	ME	2.5	1.25	92	0.092	18.6	7.38	97.1	1.85	34.82	8.29	11	2.4
							18.6	7.4	97.3	1.83	34.84	8.29	9	2.4
17:22	I2	ME	4.6	1.00	34	0.331	18.4	7.29	95.6	0.94	34.67	8.28	10	2.3
				3.60			18.4	7.31	95.8	0.93	34.9	8.28	9	2.3
							18.1	7.46	97.5	0.98	35.3	8.3	11	2.7
							18.1	7.47	97.7	0.97	35.3	8.3	10	2.3
17:17	I3	ME	4.4	1.00	317	0.052	18.5	7.44	97.9	1.71	35.06	8.26	9	2.2
				3.40			18.4	7.45	98	1.74	35.19	8.27	9	2.1
							18.2	7.27	95.2	1.82	35.3	8.28	9	1.8
							18.1	7.19	94.1	1.85	35.32	8.28	9	1.8
18:05	W1	ME	7.5	1.00	96	0.223	18.2	7.26	95	1	35.14	8.28	6	2.3
				3.75			18.2	7.27	95.1	0.96	35.18	8.28	6	2.2
				6.50			18	7.25	94.7	0.75	35.31	8.28	6	2.2
							18	7.21	94.2	0.86	35.32	8.28	7	2.3
							18	7.05	92	1	35.33	8.27	6	2.8
							18	7.01	91.6	1.11	35.33	8.27	7	2.8
17:31	M1	ME	0.8	0.40	149	0.234	18.5	7.15	94.1	0.88	35.16	8.28	3	1.6
							18.5	7.16	94.2	0.96	35.16	8.28	2	1.6
17:40	FCZ1	ME	4.3	1.00	357	0.177	18.9	7.1	94	0.49	35.07	8.23	2	1.8
				3.30			18.9	7.1	94.1	0.48	35.06	8.23	2	1.4
							18.4	7.21	94.8	0.91	35.25	8.26	4	1.7
							18.4	7.21	94.7	0.98	35.26	8.27	3	1.9
12:59	G1	MF	6.1	1.00	139	0.153	18	7.2	94	0.75	35.31	8.26	4	2.5
				3.05			18	7.21	94.1	0.77	35.31	8.26	5	2.6
				5.10			18	7.22	94.1	1.22	35.6	8.26	11	2.4
							18	7.22	94.1	1.16	35.6	8.26	10	2.6
							18	7.21	94.1	1.19	35.32	8.27	9	2
							18	7.21	94.1	1.12	35.32	8.27	10	2.4
13:08	R1	MF	6.3	1.00	218	0.092	17.8	7.28	94.6	2.14	35.35	8.28	12	2.7
				3.15			17.8	7.37	95.8	2.15	35.35	8.28	10	2.5
				5.30			17.7	7.49	97.4	2.27	35.38	8.28	13	2.3
							17.7	7.48	97.2	2.25	35.39	8.28	13	2.2
							17.6	7.37	95.5	2.01	35.46	8.28	13	2.4
							17.5	7.33	94.9	2.05	35.47	8.27	14	2.4
12:46	R2	MF	4.3	1.00	235	0.148	18.5	7.18	94.4	2.28	35.2	8.26	11	2.2
				3.30			18.5	7.18	94.5	2.23	35.2	8.26	12	2.1
							18.4	7.12	93.5	2.23	35.23	8.26	14	2.2
							18.3	7.05	92.6	2.24	35.25	8.26	13	2
12:36	I1	MF	2.6	1.30	345	0.180	18.4	7.29	95.9	1.94	35.18	8.26	8	1.5
							18.4	7.35	96.6	1.95	35.18	8.27	7	1.9
12:30	I2	MF	4.8	1.00	282	0.176	18.4	7.22	94.7	1.21	34.74	8.22	5	2.3
				3.80			18.4	7.24	94.9	1.23	34.78	8.23	4	2.3
							18.3	7.36	96.6	1.85	35.2	8.25	9	2
							18.2	7.37	96.7	1.91	35.23	8.25	7	2.3
12:25	I3	MF	4.4	1.00	166	0.060	18.4	7.37	96.9	1.25	35.12	8.16	4	2.4
				3.40			18.4	7.38	97	1.29	35.15	8.16	6	2.1
							18.2	7.15	93.6	1.55	35.27	8.19	8	2.4
							18.1	7.08	92.6	1.58	35.29	8.2	9	2.3
13:19	W1	MF	7.4	1.00	25	0.120	18.4	7.29	95.8	1.16	35.06	8.27	5	2.2
				3.70			18.4	7.32	96.2	1.15	35.1	8.27	5	2.2
				6.40			18.2	7.42	97.1	1.28	35.25	8.28	4	2.5
							18.2	7.39	96.8	1.31	35.26	8.28	4	2.3
							18	6.92	90.4	1.6	35.33	8.27	4	2.7
							17.9	6.89	89.9	1.66	35.35	8.26	4	2.9
12:41	M1	MF	0.7	0.35	78	0.219	18.4	7.34	96.5	1.45	35.23	8.28	2	1.4
							18.4	7.35	96.6	1.43	35.23	8.28	2	1.2
12:53	FCZ1	MF	4.6	1.00	219	0.062	18.7	7.27	96	1.38	35.16	8.25	6	1.3
				3.60			18.7	7.3	96.3	1.36	35.16	8.25	5	2.1
							18.1	6.58	86.1	1.1	35.35	8.27	4	2.1
							18.2	6.7	87.9	1.14	35.3	8.27	5	2.2

Remarks: MF - Middle Flood tide

ME - Middle Ebb tide

For SS, if the monitoring result is less than Limit of Report 2mg/L, the result value will be assumed as 2 for the calculation.

For Chlorophyll-a, if the monitoring result is less than Limit of Report 0.1µg/L, the result value will be assumed as 0.1 for the calculation.

Impact Water Quality Monitoring Result														
Sampling Date: 26-Jan-18														
Date / Time	Location	Tide*	Water Depth	Sampling Depth	Current Direction	Current Speed	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS	Chlorophyll-a
			m	m	degrees	m/s	°C	mg/L	%	NTU	ppt	unit	mg/L	µg/L
12:56	G1	ME	5.4	1.00	213	0.069	18.1	7.62	99.6	0.6	35.22	8.24	5	1.9
				2.70			18.2	7.65	100.1	0.49	35.18	8.25	4	1.9
				4.40			17.8	6.98	90.9	1.05	35.39	8.23	4	1.8
							17.9	7.05	91.9	1.06	35.36	8.22	6	1.6
13:03	R1	ME	5.8	1.00	163	0.123	18	7.72	100.7	0.88	35.26	8.26	2	1.7
				2.90			18	7.74	100.9	0.91	35.25	8.26	2	1.8
				4.80			17.3	7.01	90.4	1.91	35.57	8.23	5	1.7
							17.3	6.98	90	1.92	35.57	8.23	7	1.7
12:46	R2	ME	5.4	1.00	173	0.047	18.1	7.47	97.6	0.89	35.1	8.24	4	1.7
				4.40			18.1	7.47	97.6	0.92	35.06	8.24	4	1.8
							18	7.13	93.1	1.13	35.32	8.22	6	1.6
							18	7.13	93	1.14	35.32	8.23	7	1.5
12:38	I1	ME	2.7	1.35	256	0.214	18.1	7.52	98.4	0.53	35.19	8.25	4	1.7
							18.1	7.55	98.7	0.49	35.18	8.25	5	1.4
12:34	I2	ME	5.5	1.00	39	0.114	18.1	7.55	98.7	0.51	35.18	8.25	2	1.9
				4.50			18.1	7.56	98.8	0.52	35.18	8.25	3	1.8
							17.7	7.05	91.6	0.42	35.44	8.22	3	1.9
							17.7	7.08	91.9	0.41	35.42	8.23	4	1.8
12:30	I3	ME	5.1	1.00	172	0.081	18	7.16	93.4	1	35.31	8.19	3	3.2
				4.10			18.1	7.19	94	0.7	35.25	8.2	3	2.1
							17.8	6.5	84.6	1.19	35.43	8.18	5	2.9
							17.8	6.52	84.8	1.11	35.44	8.18	4	0.3
13:12	W1	ME	7.6	1.00	203	0.169	18.1	7.66	100.2	0.58	35.22	8.25	3	1.4
				3.80			18.1	7.66	100.1	0.58	35.22	8.25	4	1.6
				6.60			17.8	7.26	94.5	0.67	35.34	8.25	4	1.8
							17.8	7.27	94.6	0.68	35.36	8.25	2	1.6
							17.6	6.77	87.8	1.15	35.47	8.23	5	1.8
							17.5	6.76	87.6	1.16	35.49	8.23	4	1.6
12:41	M1	ME	0.7	0.35	289	0.125	18.3	7.59	99.4	0.66	35.03	8.22	4	1.2
							18.3	7.43	97.4	0.68	35.01	8.22	3	1.6
12:51	FCZ1	ME	4.6	1.00	96	0.135	18.3	7.56	99	0.49	35.14	8.25	3	1.7
				3.60			18.3	7.56	99	0.48	35.13	8.25	3	1.5
							18.2	7.62	99.8	0.53	35.2	8.25	4	1.9
							18.2	7.61	99.7	0.48	35.18	8.25	3	2.1
8:31	G1	MF	5.8	1.00	201	0.120	17.8	7.93	103.1	0.32	35.31	8.21	4	3.2
				2.90			17.9	8.03	104.7	0.28	35.44	8.23	2	2.8
				4.80			17.5	7.51	97.2	0.79	35.46	8.27	3	3.4
							17.6	7.57	98.2	0.84	35.51	8.26	2	3.4
8:42	R1	MF	6.3	1.00	63	0.161	17.4	8.27	107	0.38	35.69	8.3	2	3.8
				3.15			17.1	8.34	107.2	0.32	35.61	8.3	3	2.7
				5.30			17.3	7.52	98.7	0.68	35.64	8.35	3	3
							17.3	7.53	98.2	0.73	35.65	8.37	4	2.7
							17.9	7.41	96.7	1.37	35.67	8.27	6	2.8
							17.8	7.39	96.3	1.27	35.67	8.27	3	2.7
8:10	R2	MF	4.5	1.00	312	0.047	17.8	8	103.9	0.63	35.2	8.28	4	2.9
				3.50			17.8	8	103.9	0.69	35.16	8.28	3	2.2
							17.7	7.66	99.4	1.19	35.42	8.26	4	2.5
							17.7	7.65	99.3	1.14	35.42	8.27	2	2.6
7:55	I1	MF	2.6	1.30	149	0.091	17.8	8.05	104.7	0.52	35.29	8.29	4	3.3
							17.8	8.11	105.4	0.68	35.28	8.29	3	3.3
7:46	I2	MF	4.3	1.00	223	0.236	17.8	8.08	105	0.73	35.28	8.29	3	3.5
				3.30			17.8	8.09	105.1	0.7	35.28	8.29	5	3.2
							17.6	7.55	97.9	0.82	35.54	8.26	3	3
							17.4	7.6	98.2	0.82	35.52	8.27	5	3.1
7:32	I3	MF	4.4	1.00	310	0.123	17.7	7.68	99.7	0.79	35.41	8.23	4	2.6
				3.40			17.8	7.71	100.3	0.78	35.35	8.24	3	2.7
							17.5	7.02	90.9	0.89	35.53	8.22	4	2.6
							17.5	7.04	91.1	0.91	35.54	8.22	3	3.6
8:53	W1	MF	7.6	1.00	69	0.147	17.8	8.19	106.5	0.23	35.32	8.29	<2	2.9
				3.80			17.8	8.18	106.4	0.22	35.32	8.29	<2	2.8
				6.60			17.5	7.79	100.8	0.46	35.44	8.29	2	2
							17.5	7.8	100.9	0.35	35.46	8.29	3	3.4
							17.3	7.3	94.1	1.7	35.57	8.27	6	2.8
							17.2	7.29	93.9	1.66	35.75	8.27	4	2.9
8:16	M1	MF	0.6	0.30	217	0.131	18	8.1	105.7	0.95	35.29	8.26	4	0.8
							18	7.95	103.7	0.92	35.27	8.26	4	0.9
8:07	FCZ1	MF	4.6	1.00	71	0.124	18	8.06	105.3	0.62	35.4	8.29	4	2.3
				3.60			18	8.1	105.7	0.63	35.39	8.29	3	2.7
							17.9	8.2	106.9	0.82	35.46	8.29	2	2.5
							17.9	8.24	107.4	0.81	35.33	8.29	3	2.4

Remarks: MF - Middle Flood tide

ME - Middle Ebb tide

For SS, if the monitoring result is less than Limit of Report 2mg/L, the result value will be assumed as 2 for the calculation.

For Chlorophyll-a, if the monitoring result is less than Limit of Report 0.1µg/L, the result value will be assumed as 0.1 for the calculation.

Impact Water Quality Monitoring Result														
Sampling Date: 30-Jan-18														
Date / Time	Location	Tide*	Water Depth	Sampling Depth	Current Direction	Current Speed	Temp	DO Conc	DO Saturation	Turbidity	Salinity	pH	SS	Chlorophyll-a
			m	m	degrees	m/s	°C	mg/L	%	NTU	ppt	unit	mg/L	µg/L
12:36	G1	ME	5.4	1.00	114	0.370	16.5	7.08	89.7	1.28	35.29	8.21	8	1.6
				2.70			16.5	7.05	89.4	1.31	35.31	8.21	8	1.3
				4.40			16.5	6.95	88.2	1.39	35.32	8.22	8	1.7
							16.5	6.94	88.1	1.41	35.32	8.22	7	2
							16.7	7.38	94	1.48	35.39	8.24	10	1.2
12:41	R1	ME	5.9	1.00	327	0.116	16.7	7.32	93.3	1.39	35.4	8.24	10	1.4
				2.95			16.8	7.1	90.7	1.92	35.42	8.25	11	1.6
				4.90			16.8	7.1	90.8	1.8	35.43	8.25	10	1.8
							16.3	6.86	86.5	1.64	35.21	8.16	5	1.7
							16.3	6.8	85.8	1.52	35.21	8.16	6	1.8
12:25	R2	ME	5.2	1.00	277	0.260	16.2	6.68	84.1	1.63	35.19	8.16	7	1.8
				4.20			16.2	6.63	83.5	1.6	35.18	8.16	6	1.5
							16.5	6.98	88.4	1.04	35.21	8.2	10	1.8
12:19	I1	ME	2.9	1.45	187	0.340	16.5	6.96	88.2	1.01	35.24	8.2	8	2.1
							16.6	7.37	93.7	1.63	35.32	8.2	9	2
12:14	I2	ME	5.1	1.00	125	0.219	16.7	7.32	93.1	1.49	35.33	8.2	10	2.1
				4.10			16.7	7.03	89.5	1.5	35.35	8.21	10	2.1
							16.7	7.01	89.3	1.56	35.35	8.21	8	1.9
12:10	I3	ME	4.8	1.00	53	0.227	16.5	6.79	86	0.92	35.22	8.09	7	1.7
				3.80			16.5	6.77	85.8	0.9	35.21	8.09	7	1.8
							16.6	6.74	85.8	1.46	35.3	8.15	10	1.9
							16.7	6.76	85.9	1.53	35.31	8.16	11	1.8
12:49	W1	ME	7	1.00	321	0.135	16.7	7.2	91.6	1.75	35.33	8.21	12	1.7
				3.50			16.7	7.15	91.1	1.76	35.35	8.21	12	1.8
				6.00			16.8	6.85	87.4	1.9	35.35	8.22	14	2
							16.8	6.85	87.3	1.83	35.35	8.22	12	2.1
							16.8	6.82	87	1.87	35.35	8.22	13	1.8
12:23	M1	ME	0.6	0.30	341	0.107	16	6.72	84.4	1.61	35.15	8.16	12	1.8
							16	6.69	84	1.59	35.13	8.16	11	1.6
12:31	FCZ1	ME	4.4	1.00	211	0.204	16.4	7.23	91.4	1.01	35.19	8.19	10	3.4
				3.40			16.4	7.12	90	1	35.22	8.19	11	3.5
							16.5	6.99	88.6	0.92	35.24	8.2	13	3.2
							16.5	6.95	88.1	0.92	35.24	8.2	12	3.5
16:39	G1	MF	5.8	1.00	194	0.181	16.5	7.44	94.4	2.2	35.31	8.25	10	1.7
				2.90			16.5	7.36	93.3	2.13	35.31	8.25	12	1.6
				4.80			16.6	7.14	90.7	1.74	35.33	8.25	11	1.6
							16.6	7.14	90.6	1.82	35.33	8.25	10	1.6
16:46	R1	MF	6.4	1.00	268	0.039	16.7	7.55	96	1.56	35.39	8.26	6	2
				3.20			16.7	7.49	95.3	1.57	35.39	8.26	5	1.9
				5.40			16.7	7.35	93.6	1.62	35.4	8.26	7	2
							16.7	7.33	93.4	1.64	35.4	8.27	8	2.1
							16.8	7.26	92.6	1.77	35.42	8.27	12	2.1
16:30	R2	MF	5.2	1.00	86	0.141	16.8	7.24	92.4	1.82	35.42	8.26	10	1.8
				4.20			16	7.03	88.2	1.75	35.19	8.19	8	1.9
							16	6.94	87	1.76	35.19	8.19	10	1.9
							16.1	6.8	85.5	1.89	35.2	8.19	12	1.8
16:24	I1	MF	2.8	1.40	201	0.077	16.1	6.77	85.2	1.86	35.21	8.19	13	1.6
							16.5	7.27	92.1	1.66	35.26	8.23	12	1.7
							16.5	7.16	90.8	1.66	35.27	8.23	11	1.5
16:19	I2	MF	5.1	1.00	321	0.079	16.7	7.14	90.9	1.47	35.32	8.22	10	2.2
				4.10			16.7	7.11	90.5	1.5	35.33	8.23	10	2.4
							16.8	6.93	88.4	1.63	35.36	8.24	14	2.2
							16.8	6.93	88.4	1.65	35.36	8.24	15	2.3
16:15	I3	MF	4.7	1.00	257	0.187	16.6	6.92	87.9	1.71	35.29	8.2	14	2.3
				3.70			16.6	6.89	87.5	1.63	35.29	8.2	15	2.2
							16.6	6.83	86.8	1.92	35.31	8.21	17	2.3
							16.6	6.82	86.7	2.02	35.31	8.21	16	2.7
							16.6	7.58	96.3	1.44	35.29	8.22	7	2.4
16:53	W1	MF	7.2	1.00	312	0.140	16.6	7.19	91.3	1.4	35.3	8.22	6	2.5
				3.60			16.6	7.08	90.1	1.58	35.34	8.22	11	2.3
				6.20			16.7	7.06	89.8	1.64	35.34	8.22	10	2.4
							16.7	7.02	89.4	1.93	35.36	8.22	11	2.7
							16.7	7	89.2	2.12	35.36	8.22	11	2.5
16:28	M1	MF	0.9	0.45	132	0.305	15.5	7.18	89.2	0.46	35.09	8.18	5	1.9
							15.6	7.14	88.8	0.46	35.11	8.18	4	1.8
							16.3	7.44	94	1.9	35.26	8.22	13	4.3
16:35	FCZ1	MF	4.7	1.00	281	0.199	16.3	7.39	93.4	1.89	35.25	8.22	13	4.8
				3.70			16.4	7.16	90.6	1.61	35.25	8.23	12	4.2
							16.4	7.15	90.5	1.61	35.25	8.23	12	4.3
							16.4	7.15	90.5	1.61	35.25	8.23	12	4.3

Remarks: MF - Middle Flood tide
 ME - Middle Ebb tide

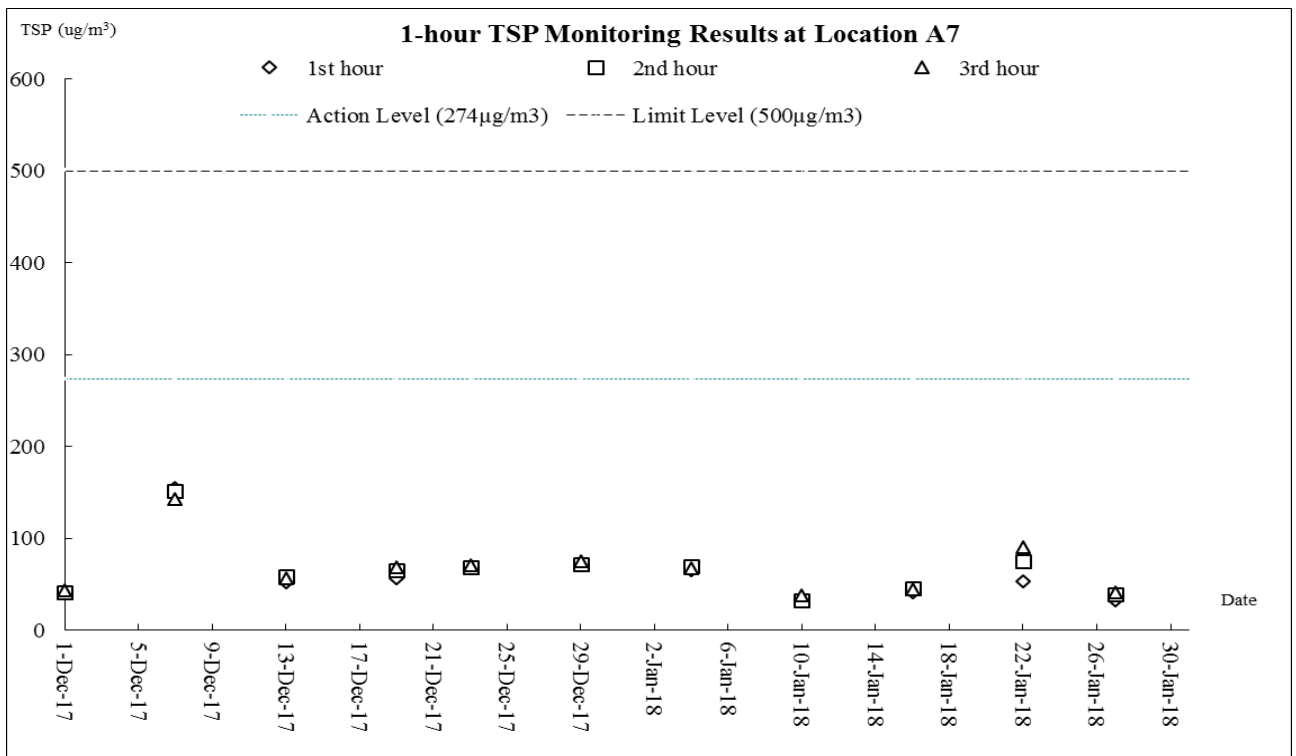
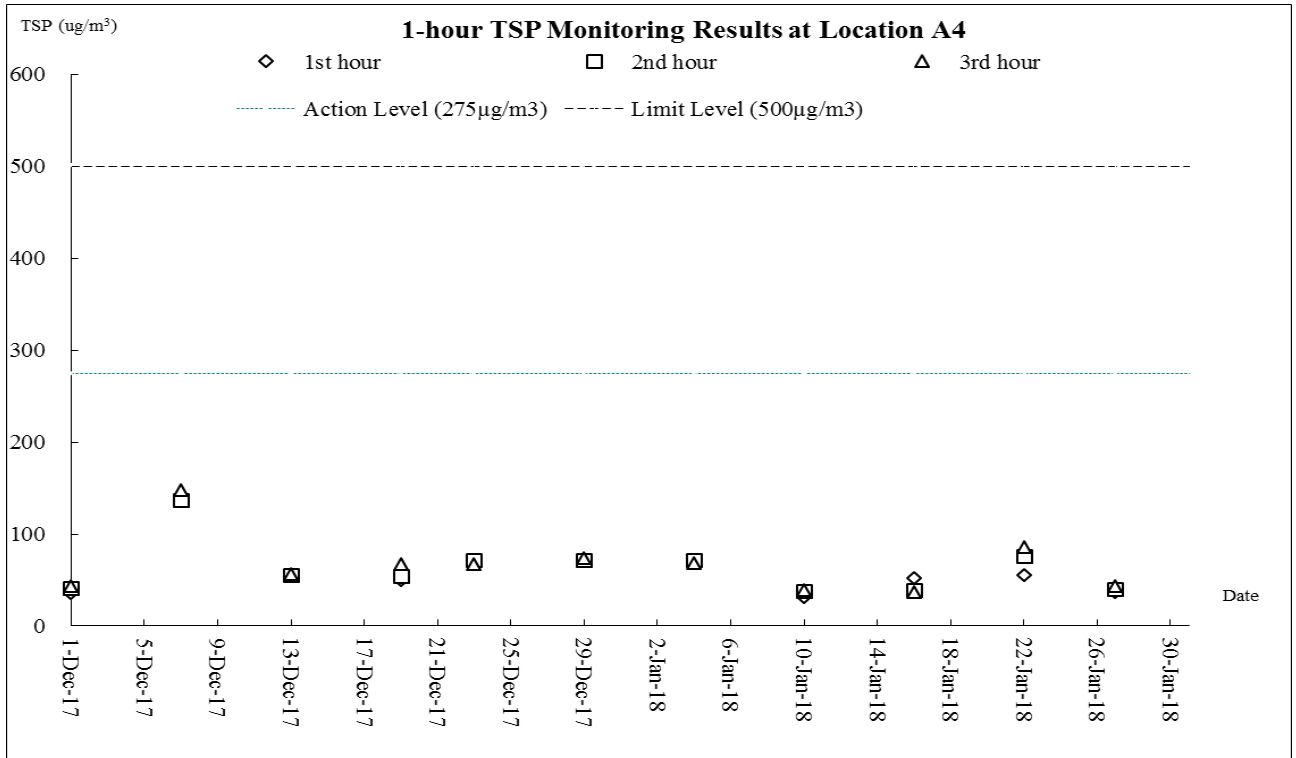
For SS, if the monitoring result is less than Limit of Report 2mg/L, the result value will be assumed as 2 for the calculation.

For Chlorophyll-a, if the monitoring result is less than Limit of Report 0.1µg/L, the result value will be assumed as 0.1 for the calculation.

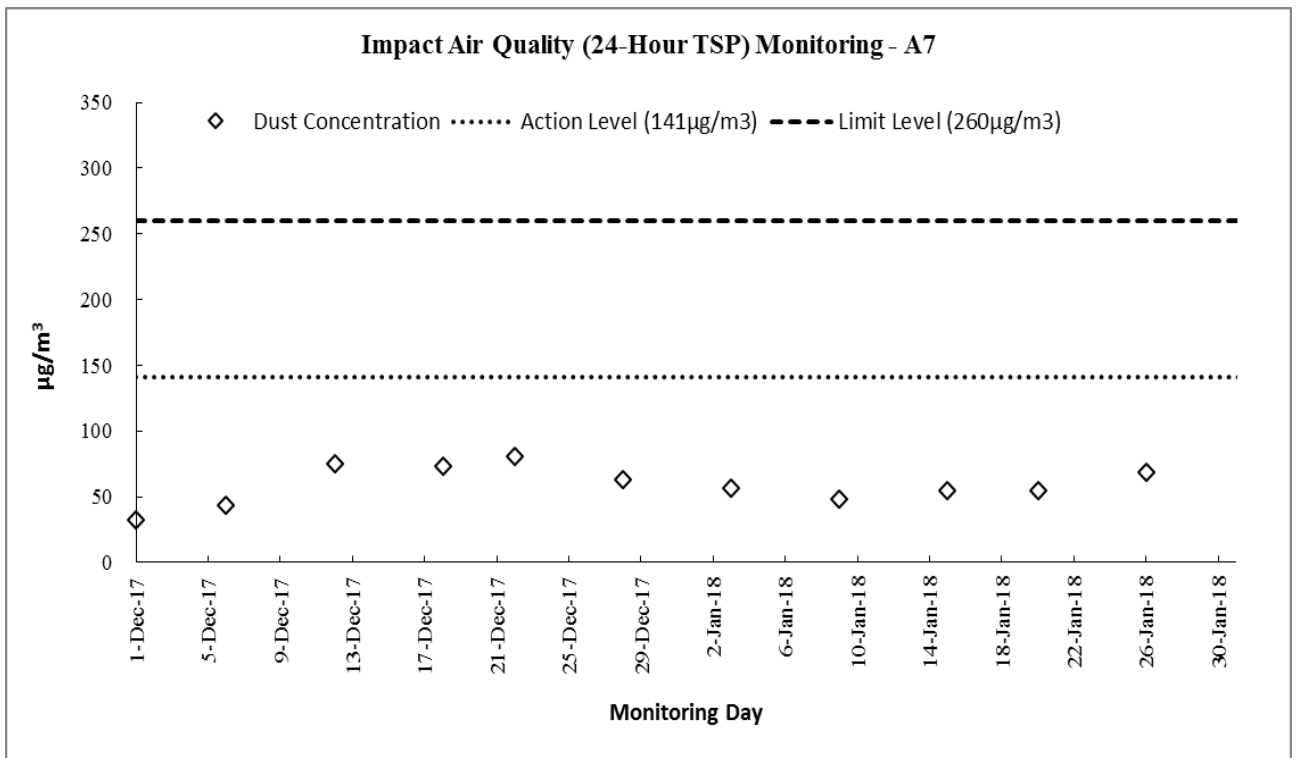
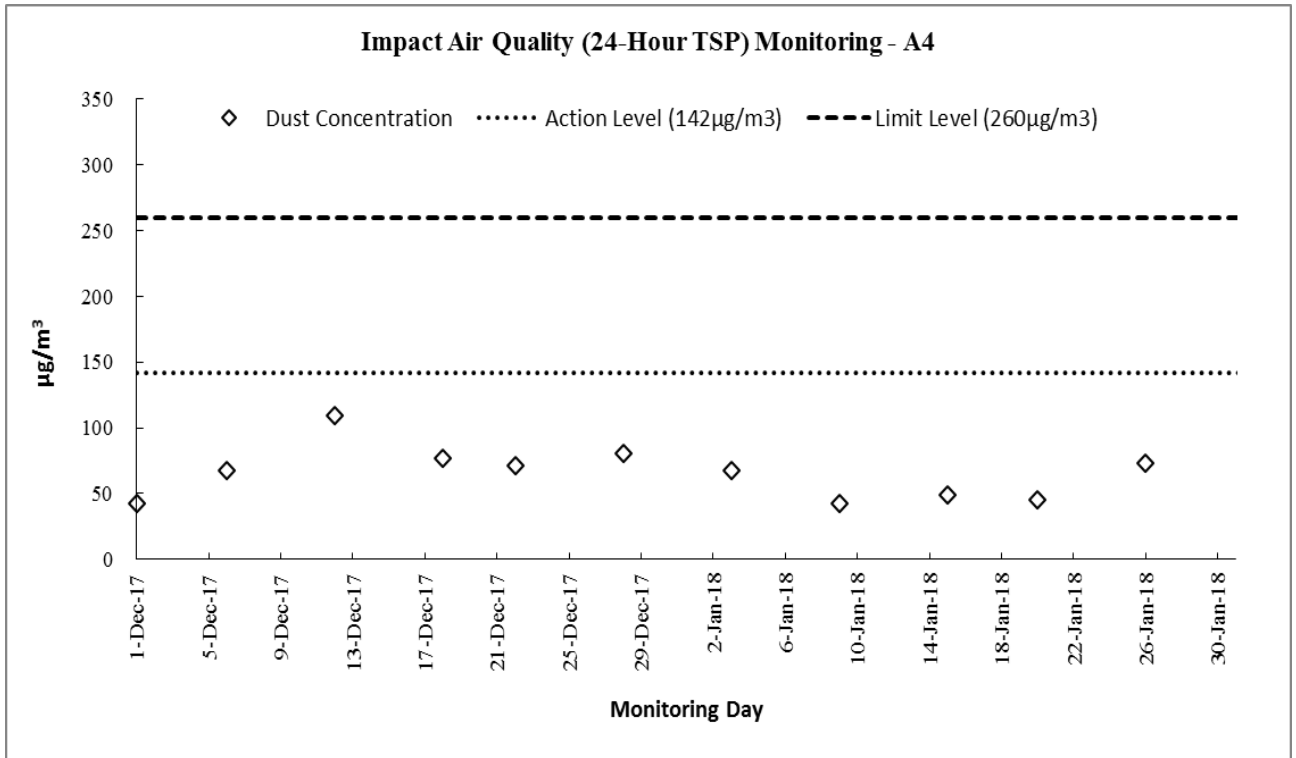
Appendix I

Graphical Plots for Monitoring Results

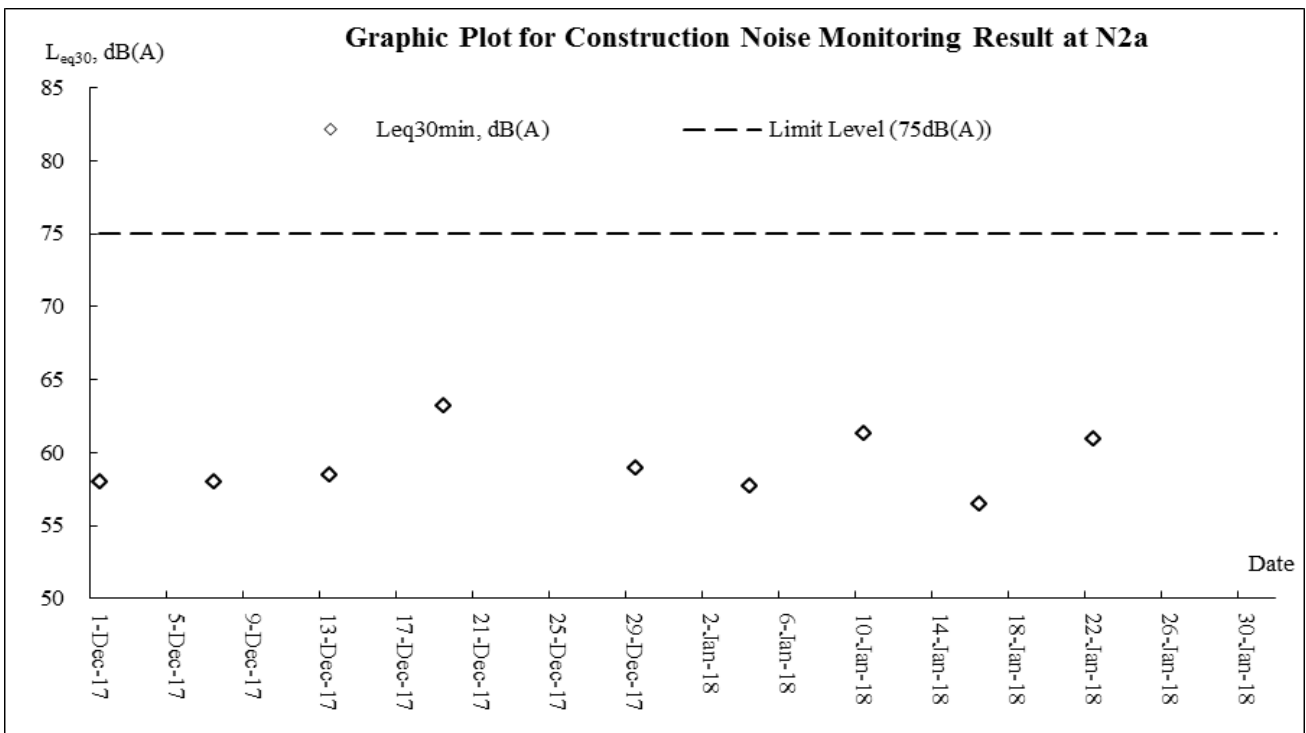
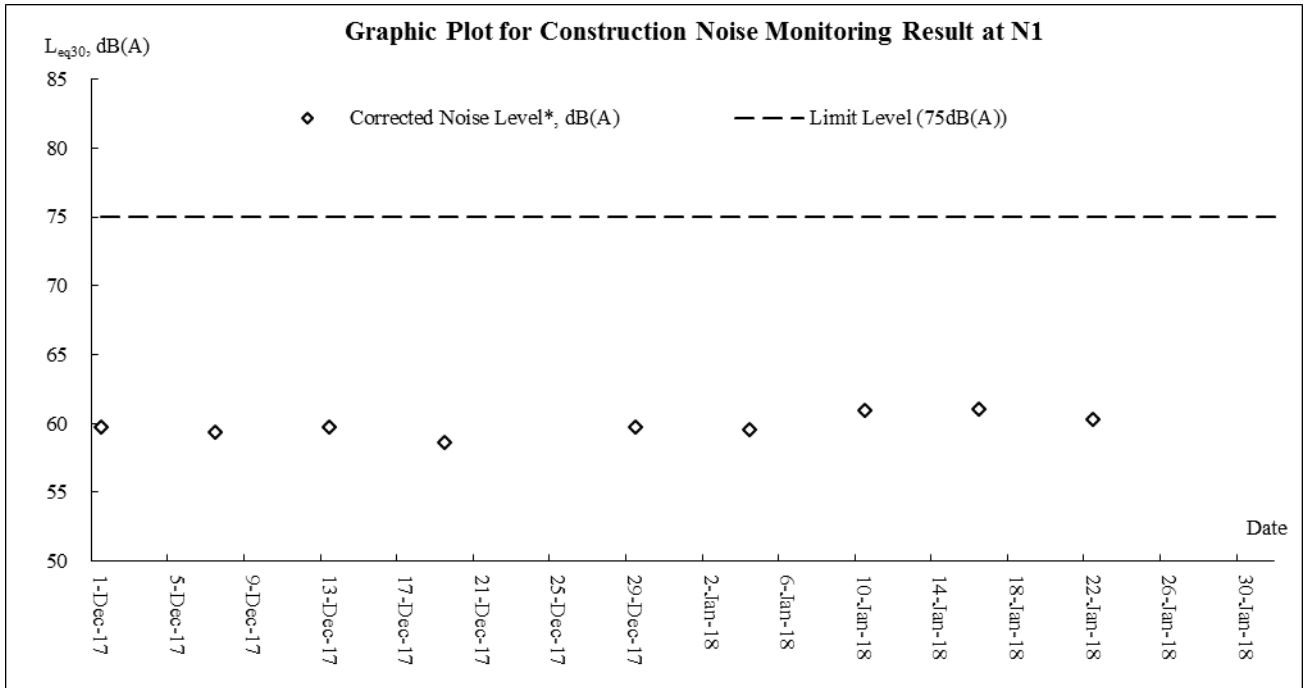
Air Quality – 1-hour TSP

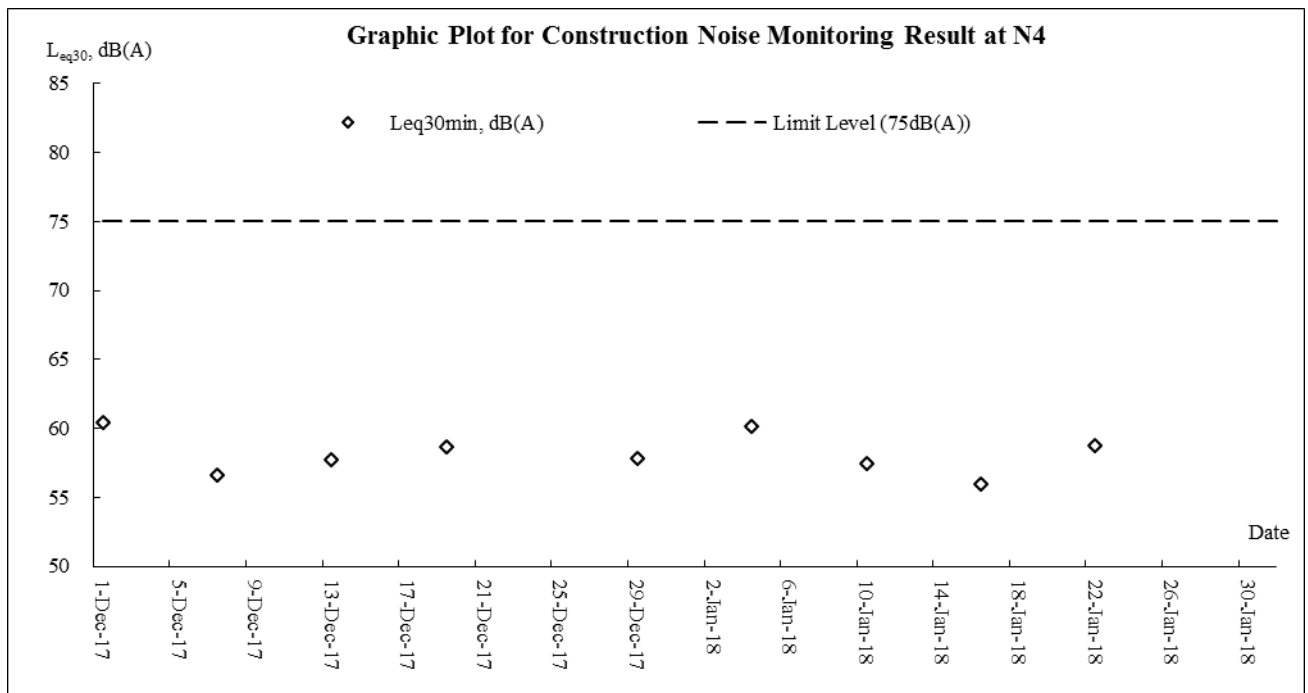
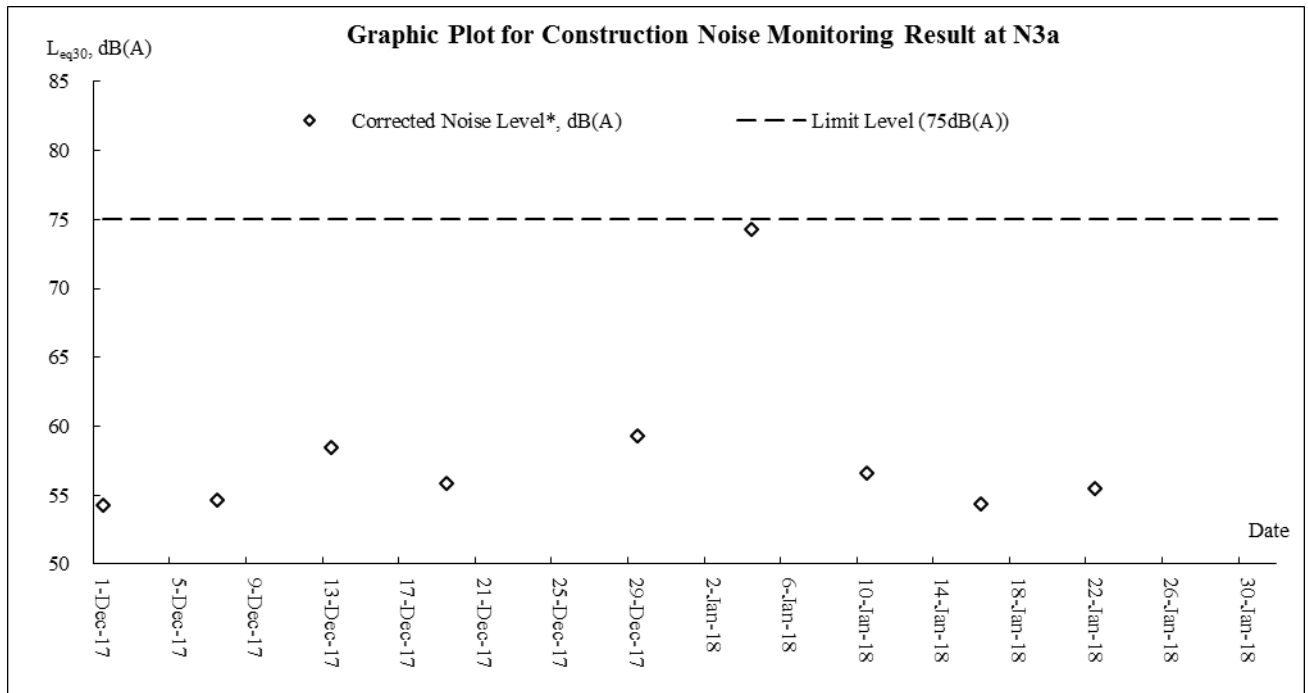


Air Quality – 24-hour TSP

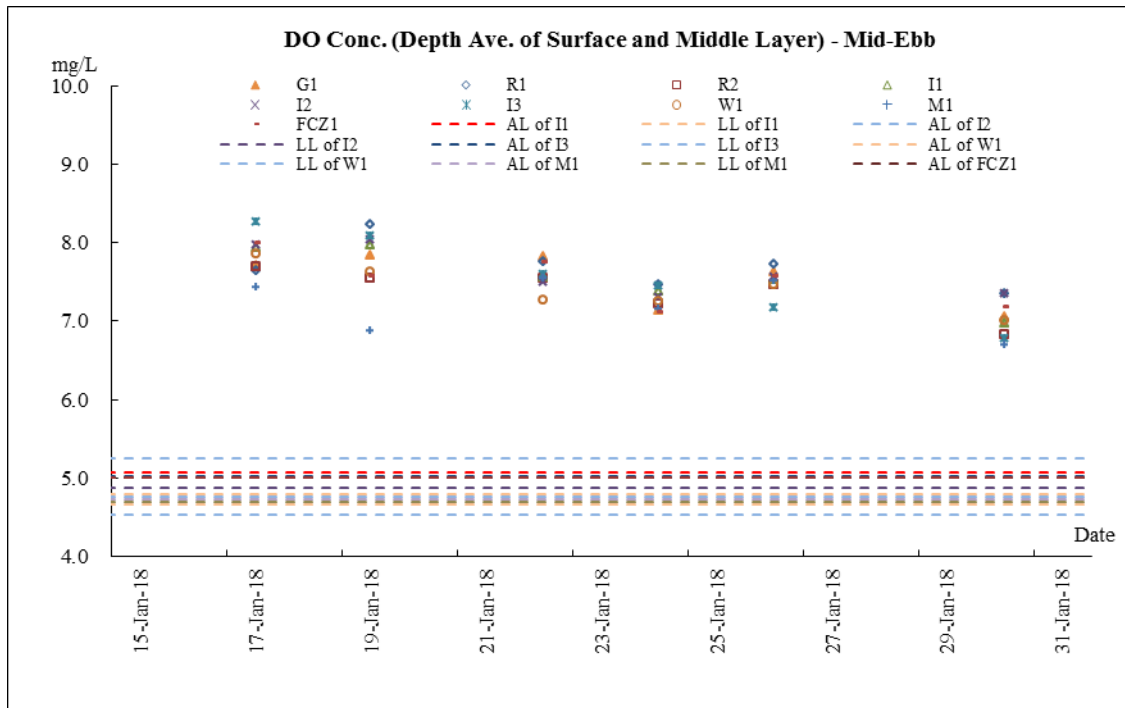


Construction Noise

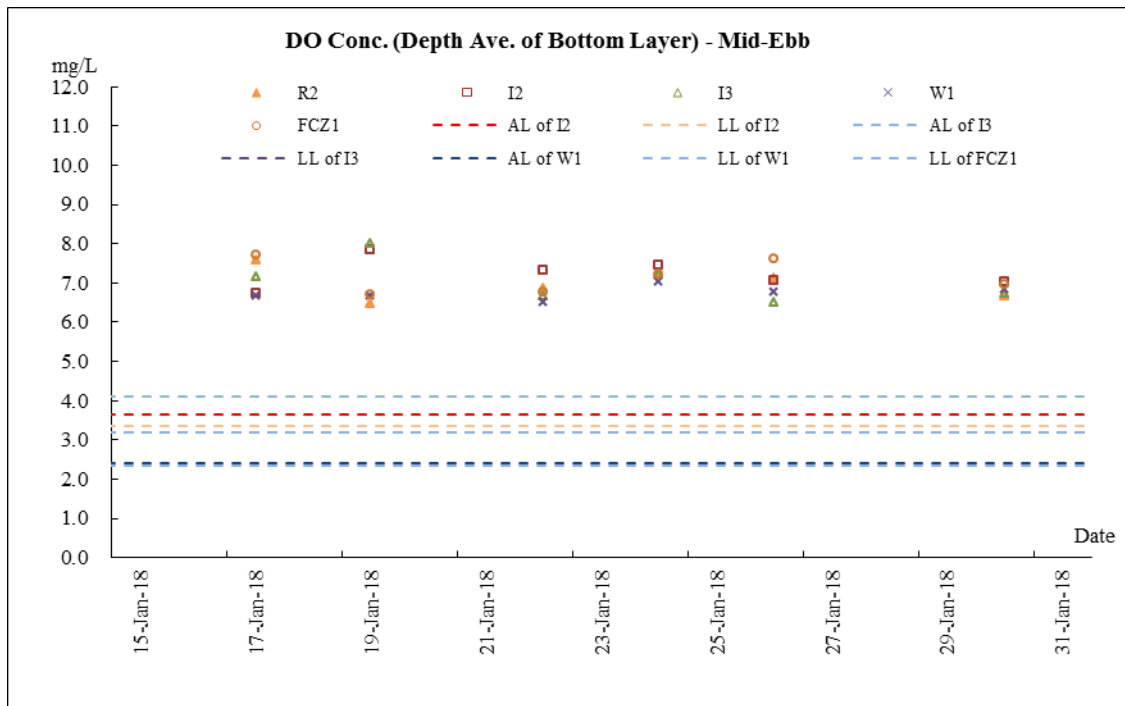




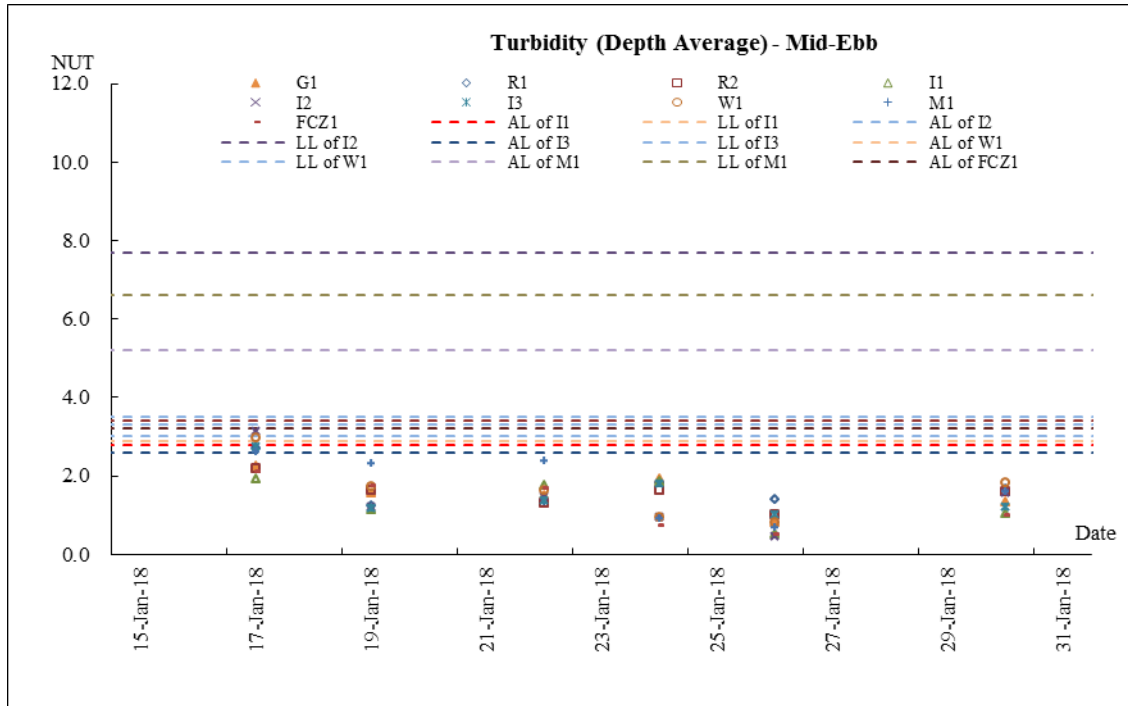
Water Quality



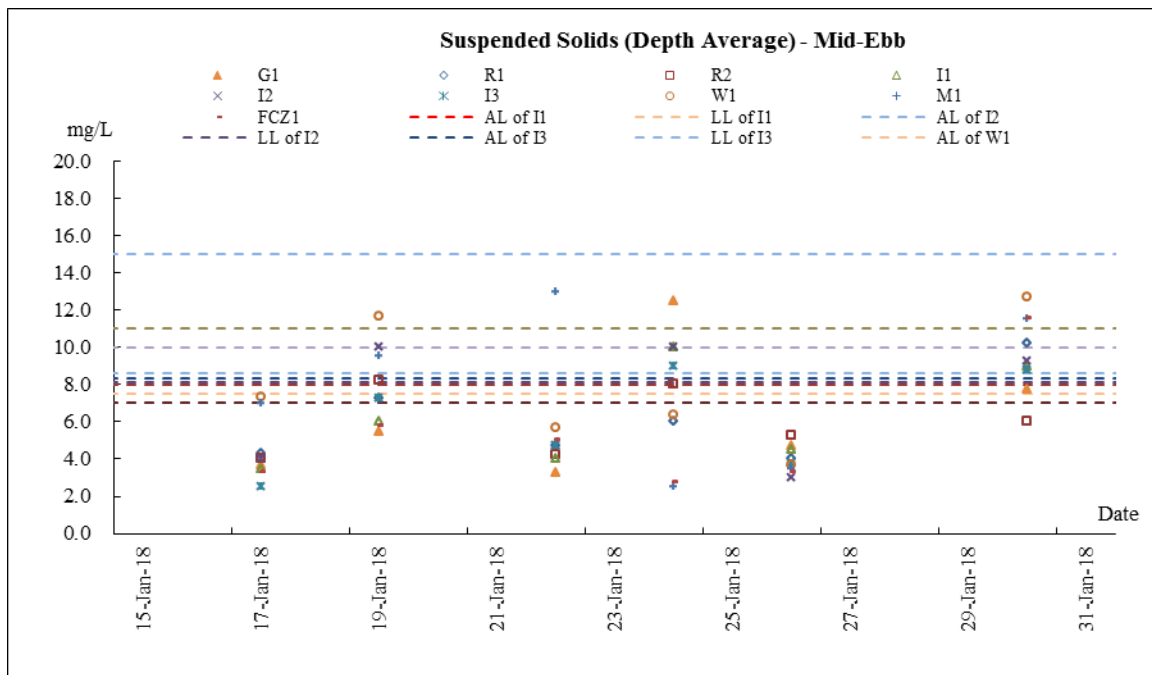
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



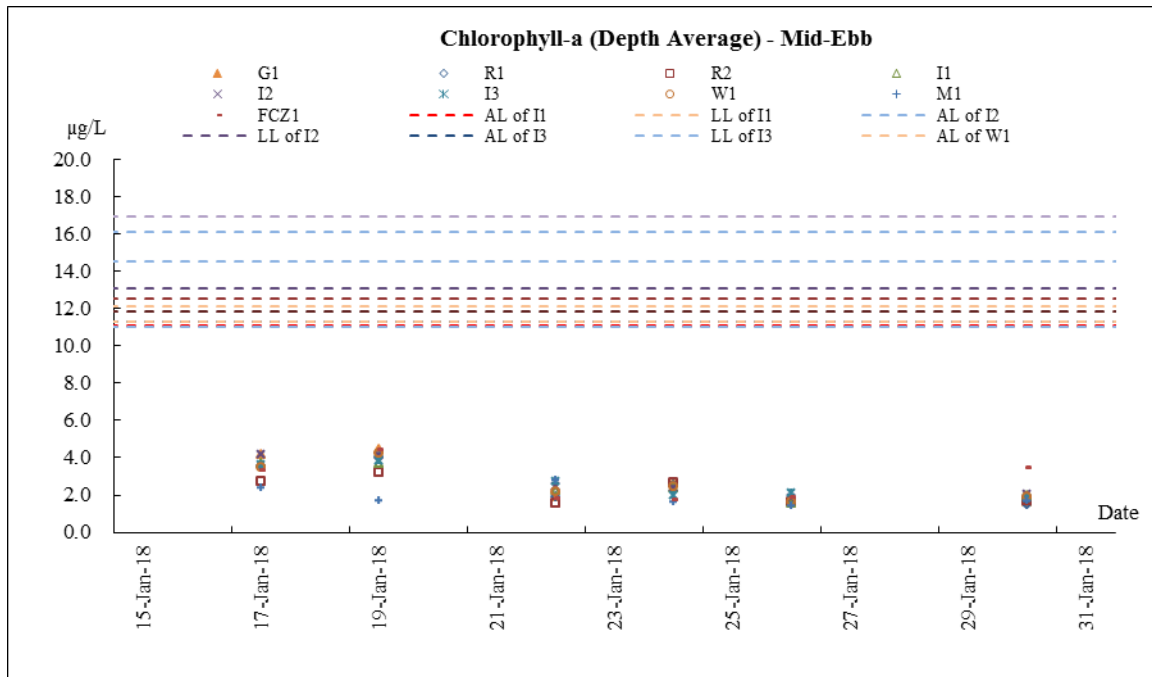
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



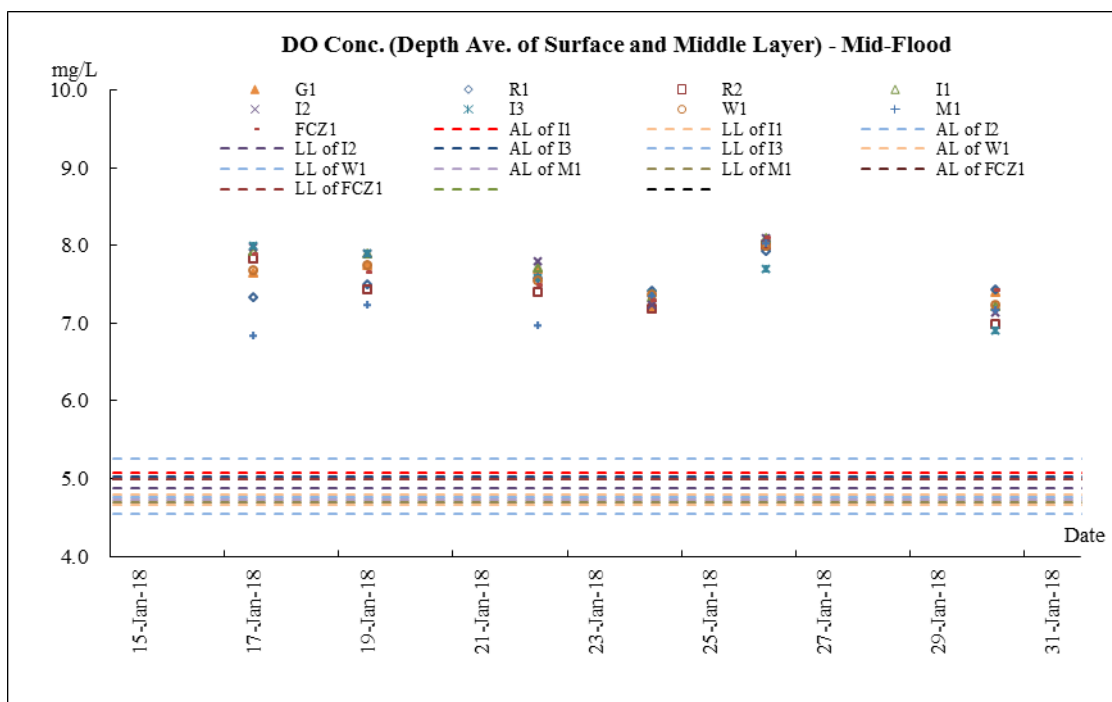
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



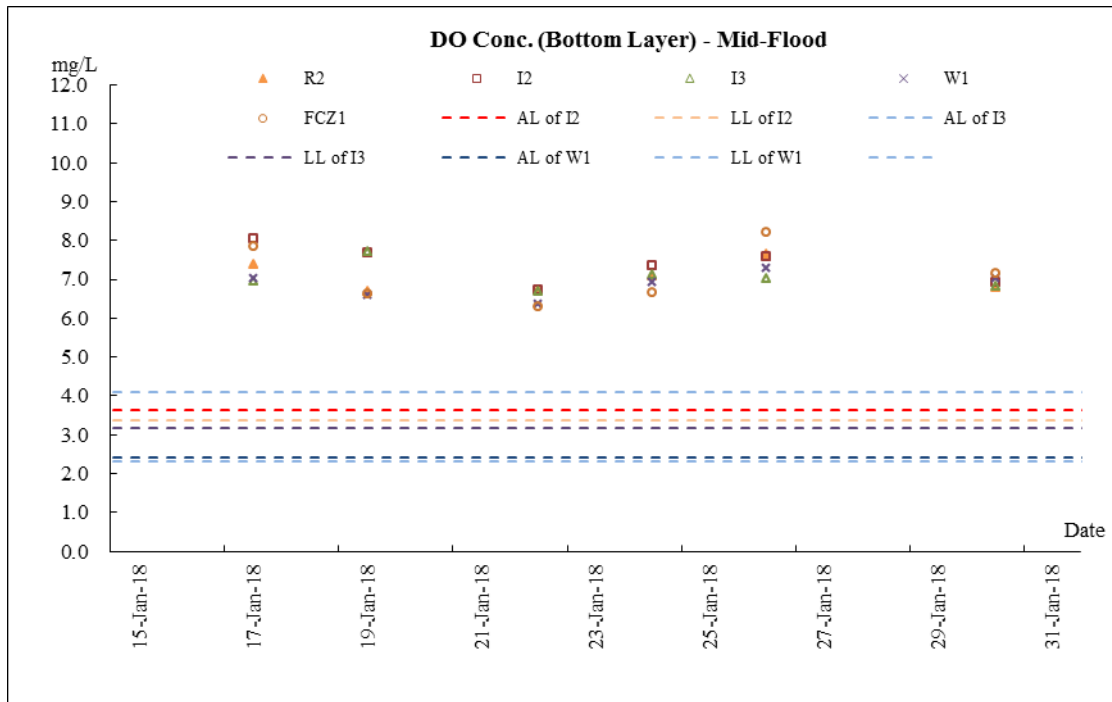
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



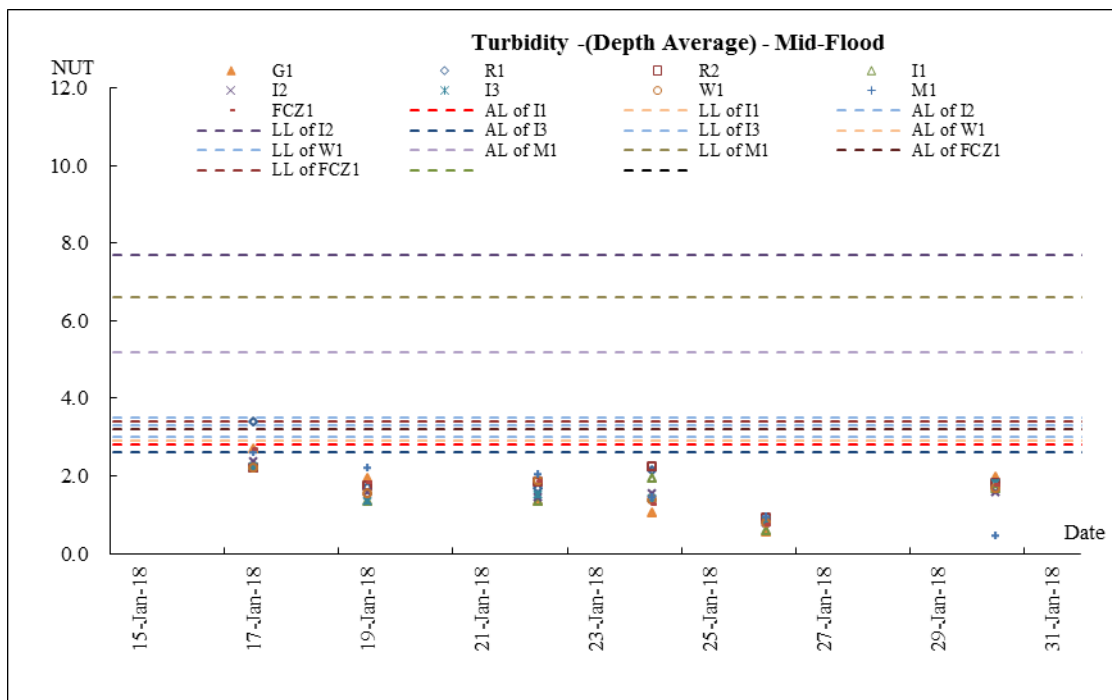
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



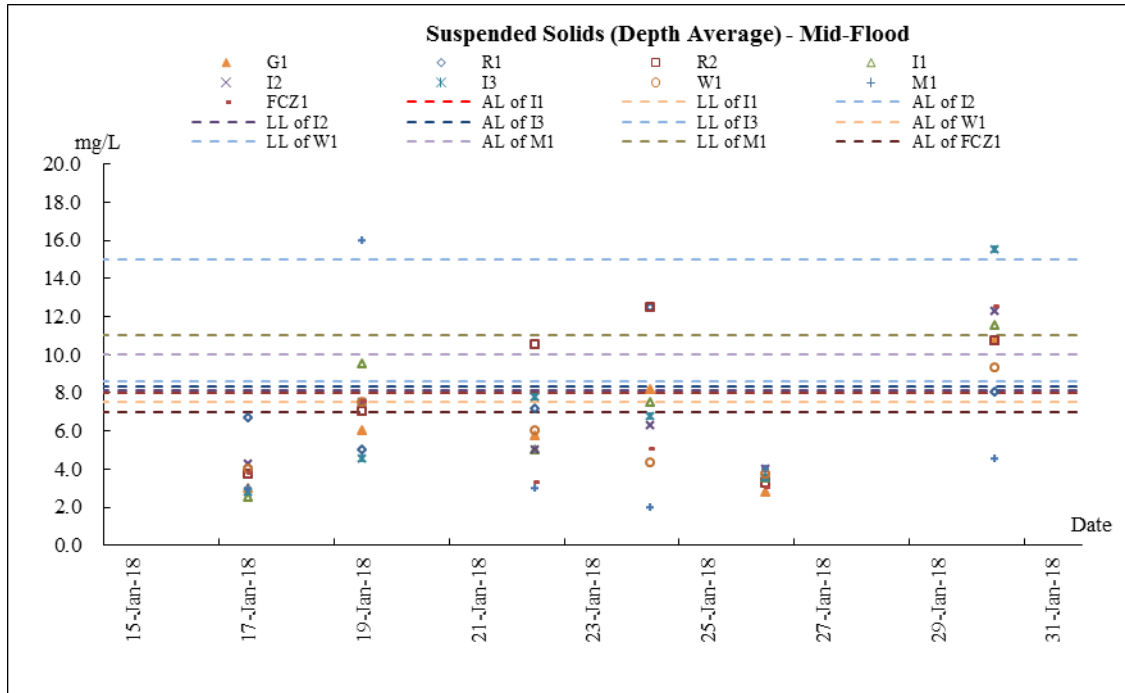
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



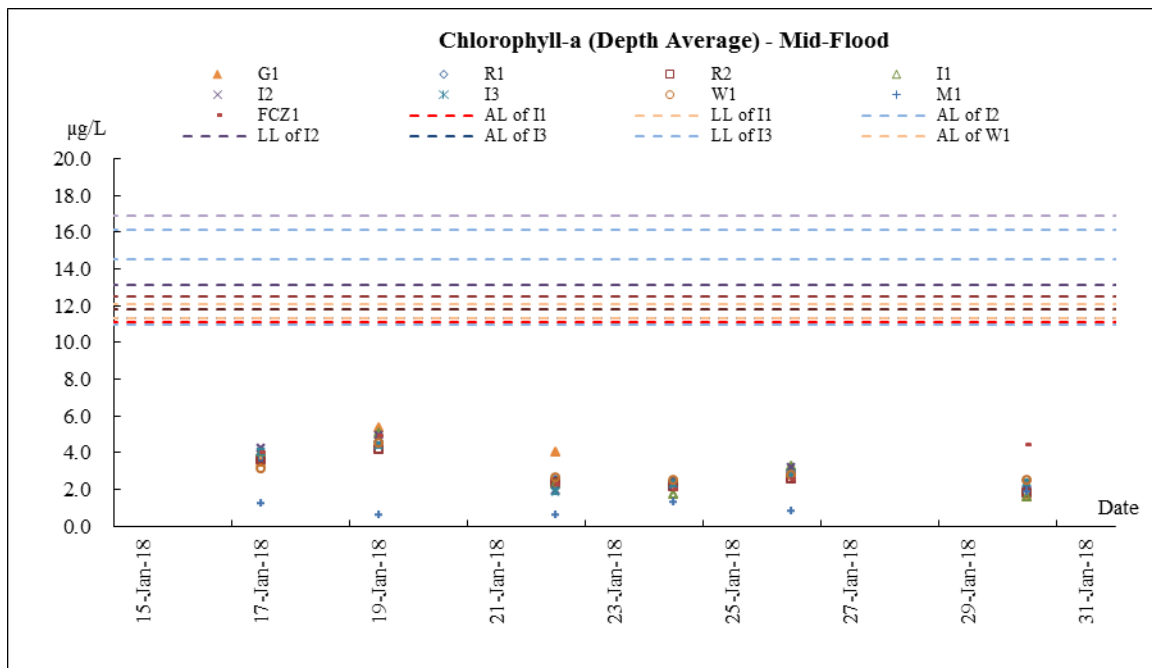
Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only



Remark: Monitoring results on 17th, 19th & 22nd January 2018 are provided for reference only

Appendix J

Meteorological Data

Date		Weather	Total Rainfall (mm)	Tai Po Station		Tai Mei Tuk Station	
				Mean Air Temp. (°C)	Mean Relative Humidity (%)	Wind Speed (km/h)	Wind Direction
1-Jan-18	Mon	Mainly cloudy.	0	17.2	74.5	10.5	E/NE
2-Jan-18	Tue	Moderate east to northeasterly winds	0	17.2	77.5	11.6	E/NE
3-Jan-18	Wed	There will also be one or two light rain patches.	0	19.9	74	16.5	E/NE
4-Jan-18	Thu	Moderate east to northeasterly winds	0.2	19.3	78	15.5	E/NE
5-Jan-18	Fri	Moderate east to northeasterly winds	0.2	19	85	9.7	E/NE
6-Jan-18	Sat	Fresh northerly winds	3.7	16.1	82	10.2	E/NE
7-Jan-18	Sun	Cloudy to overcast with a few rain patches.	16.2	16.6	92	15	E/SE
8-Jan-18	Mon	Cloudy to overcast with a few rain patches.	11.6	13.2	91.3	16.2	N/NE
9-Jan-18	Tue	Cloudy to overcast with a few rain patches.	9.9	8.1	82	19.7	N/NE
10-Jan-18	Wed	Fine and dry.	Trace	12.8	49.5	23.2	NE
11-Jan-18	Thu	Fine and dry.	Trace	13.3	43	21	NE
12-Jan-18	Fri	Moderate to fresh east to northeasterly winds	0	11.6	49	21.7	NE
13-Jan-18	Sat	Fine and dry.	0	11.2	67	10.6	NE
14-Jan-18	Sun	Hazy with sunny periods. Warm during the day. Light winds.	0	13.6	66	9	E
15-Jan-18	Mon	Mainly fine but hazy. Light winds	0	14.6	70.5	9.5	E/SE
16-Jan-18	Tue	Hazy with sunny periods. Warm during the day. Light winds.	0	17.9	67.5	9.4	SE
17-Jan-18	Wed	Mainly fine but hazy. Light winds	0	19.5	58.7	9	S
18-Jan-18	Thu	Fresh easterly winds, strong offshore.	0	18.1	77.5	9.7	E/NE
19-Jan-18	Fri	Moderate to fresh easterly winds	0.8	17.8	76.7	9.7	E/SE
20-Jan-18	Sat	Mainly cloudy	Trace	19.3	80	11	E/SE
21-Jan-18	Sun	Hazy with sunny periods. Warm during the day. Light winds.	0	18.4	81.7	6.5	E
22-Jan-18	Mon	Mainly fine but hazy. Light winds	0	19.3	83.5	8	SE
23-Jan-18	Tue	Mainly fine. Moderate to fresh easterly winds.	0	18.7	83	12.1	E/NE
24-Jan-18	Wed	One or two light rain patches tonight.	0	17.6	77.2	22.5	E
25-Jan-18	Thu	Mainly cloudy	0	17.2	78.7	24.5	E
26-Jan-18	Fri	Mainly fine. Moderate to fresh easterly winds.	Trace	17.1	84.2	11.2	E/NE
27-Jan-18	Sat	One or two light rain patches tonight.	Trace	14.8	87	10	N/NE
28-Jan-18	Sun	Moderate to fresh north to northeasterly winds.	0	13.6	81	14.1	N/NE
29-Jan-18	Mon	Cloudy to overcast and cold with one or two rain patches.	0.1	8.3	81	14.2	N/NE
30-Jan-18	Tue	Mainly cloudy with one or two light rain patches at first.	0.2	6.9	86.5	10.5	N/NE
31-Jan-18	Wed	Mainly fine and dry.	19.3	6.9	93	14.5	N/NE

Appendix K
Waste Flow Table

Year	Mth	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of Import Fill	Actual Quantities of Inert C&D Waste Generated Monthly				
		Total Quantities Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in Other Projects	Disposed in Public Fill		Metal	Paper / Cardboard Packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. General Refuse
		(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
2013	Jun	0	0	0	0	0	0	0	0	0	0	0
	Jul	0	0	0	0	0	0	0	0	0	0	0
	Aug	0	0	0	0	0	0	0	0	0	0	0
	Sep	0	0	0	0	0	0	0	0	0	0	0
	Oct	0	0	0	0	0	0	0	0	0	0	0
	Nov	0	0	0	0	0	0	0	0	0	0	0
	Dec	0	0	0	0	0	0	0	0	0	0	0
2014-2016	Jan	0	0	0	0	0	0	0	0	0	0	0
	:	0	0	0	0	0	0	0	0	0	0	0
	Jun	0	0	0	0	0	0	0	0	0	0	0
	Sub-total:	0	0	0	0	0	0	0	0	0	0	0
	:	0	0	0	0	0	0	0	0	0	0	0
	Oct	0	0	0	0	0	0	0	0	0	0	0
2016	Nov	0	0	0	0	0	0	0	0	0	0	0
	Dec	0	0	0	0	0	0	0	0	0	0	0
	Total:	0	0	0	0	0	0	0	0	0	0	0
2017	Jan	0	0	0	0	0	0	0	0	0	0	0
	Feb	0	0	0	0	0	0	0	0	0	0	0.0024
	Mar	0	0	0	0	0	0	0	0	0	0	0
	Apr	0	0	0	0	0	0	0	0	0	0	0
	May	0	0	0	0	0	0	4.97	0	0	0	0.103644
	Jun	0	0	0	0	0	0	0	0	0	0	0.0064
	Sub-total:	0	0	0	0	0	0	4.97	0	0	0	0.112444
	Jul	0	0	0	0	0	0	0	0	0	0	0.01104
	Aug	0	0	0	0	0	0	0	0	0	0	0
	Sep	0	0	0	0	0	0	0	0	0	0	0.02883
	Oct	0	0	0	0	0	0	0	0	0	0	0
	Nov	0.04875	0	0	0	0.04875	0	0	0	0	0	0.26
	Dec	0	0	0	0	0	0	0	0	0	0	0.0325
	Total:	0.04875	0	0	0	0.04875	0	4.97	0	0	0	0.444814
2018	Jan	0	0	0	0	0	0	0	0	0	0	0.078
	Feb											
	Mar											
	Apr											
	May											
	Jun											
	Sub-total:											
	Jul											
	Aug											
	Sep											
	Oct											
	Nov											
Dec												
	Total:	0.04875	0	0	0	0.04875	0	4.97	0	0	0	0.522814

Appendix L

**Implementation Schedule for
Environmental Mitigation Measures**

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
<i>Air Quality – Construction Phase</i>										
4.5.1	-	<u>Dust Control</u>								
		a Vehicle washing facilities should be provided at the designated vehicle exit point;	To ensure dust emission is controlled and compliance with relevant statutory requirements	Project Site / During construction	Contractor	✓				<i>Air Pollution Control (Construction Dust) Regulations</i>
		b Every vehicle should be washed to remove any dusty materials from its body and wheels immediately before leaving the worksite;								
		c The load carried by the trucks should be covered entirely to ensure no leakage from the vehicles;								
		d Hoarding of not less than 2.4 m high from ground level should be provided along the entire length of that portion of the site boundary adjoining a road or other area accessible to the public except for a site entrance or exit;								
		e The main haul road should be kept clear of dusty materials and should be sprayed with water so as to maintain the entire road surface wet at all the time;								
		f The stockpile of dusty materials should be either covered entirely by								

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
		impervious sheets; place in an area sheltered on the top and three sides; or sprayed with water to maintain the entire surface wet at all the time; g Belt conveyor system should be enclosed on the top and two sides; h The height of the belt conveyor should be kept as low as possible to avoid delivery at height; and i All the exposed area should be kept wet always to minimise dust emission.								
4.5.1	-	<u>Air Quality Control</u>								
		a All dump trucks entering or leaving the Project Site should be provided with mechanical covers in good service condition; and b Ultra-low-sulphur diesel (ULSD) should be used for all construction plant on site.	To ensure air quality standards compliance with relevant statutory requirements	Project Site / During construction	Contractor		✓			ETWB TCW No 19/2005
4.7.1	-	<u>EM&A Requirements</u>								
		Regular site audits (at a frequency of not								

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
		less than once every two weeks) are recommended.	To ensure that appropriate dust control measures are implemented and good site practices are adopted	Project Site / During construction	ET and Contractor		✓			<i>Air Pollution Control (Construction Dust) Regulations</i>
4.7.1	3.0-3.7	Implementation of a construction dust monitoring in every six days	To ensure compliance with the relevant criterion during the construction works.	ASRs A4 (No. 101 Lung Mei Tsuen) and A6 (No. 79 Lo Tsz Tin tsuen) / during construction	ET and Contractor		✓			<i>Air Pollution Control (Construction Dust) Regulations</i>
Noise – Construction Phase										
5.6.1		Site hoardings at the particular work site boundary may be provided for achieving screening effect, provided that the hoardings have no openings or gaps and meet the same specifications for movable noise barriers. The proposed movable noise barriers should be at least 3m high with a surface density of not less than 7 kg m ⁻² , which could provide a minimum of 5 dB(A) attenuation. Skid footing of movable noise barriers should be located at a distance not more than a few metres of stationary plant and mobile plant such that the NSRs would not have direct line of sight to the plant. The length of the barriers should also be at least five times greater than its height.	To reduce the construction noise impact.	Project Site / During construction	ET and Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1	-	The following Quiet Powered Mechanical	To reduce the construction	Project Site / During	Contractor		✓			<i>Noise Control</i>

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
(Table 5.12)		Equipment (PME) should be used during the construction Phase. <ul style="list-style-type: none"> • Mobile Crane, SWL listed in the data base of quality powered mechanical equipment prepared by the Noise Control Authority, 107 dB(A); • Tracked Loader, British Standard 5228 – Table C3, Reference No. 16, 104 dB(A); • Pneumatic breaker, British Standard 5228 – Table C2, Reference No. 10, 110 dB(A); • Concrete Lorry Mixer British Standard 5228 – Table C6, Reference No. 23, 100 dB(A); and • Excavator British Standard 5228 - Table C3, Reference No. 97, 105 dB(A). 	noise impact.	construction phase					<i>Ordinance (NCO) and Annex 5 of the EIAO-TM</i>	
5.7.1 (Table 5.13)	-	<u>Construction Works on Land</u> Movable noise barrier should be provided for excavator and mobile crane; Timber sawing machine should be operated behind site hoarding/ movable noise barrier; and Concrete lorry mixer should be operated behind site hoarding/movable noise barrier.	To reduce the construction noise impact.	Project Site / During the Site Formation, construction of seawall, ramp, staircase, retaining walls, sump tanks for grey water system and superstructure	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
5.7.1 (Table 5.13)	-	Timber sawing machine should be operated behind movable noise barrier; and Movable noise barrier should be provided for excavator and mobile crane.	To reduce the construction noise impact.	Project Site / During the localised road widening works along Ting Kok Road foundation	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Car Park Paving</u> Movable noise barrier should be provided for excavator.	To reduce the construction noise impact.	Project Site / During the car park paving	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Building Works</u> Movable noise barrier should be provided for excavator, mobile crane and earth auger; and Timber sawing machine should be operated behind site hoarding/ movable noise barrier.	To reduce the construction noise impact.	Project Site / During foundation and tanking works	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	Movable noise barrier should be provided for mobile crane; and Timber sawing machine should be operated behind site hoarding/ movable noise barrier.	To reduce the construction noise impact.	Project Site / During superstructure works	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
5.7.1 (Table 5.13)	-	Movable noise barrier should be provided for mobile crane.	To reduce the construction noise impact.	Project Site / During building finishes & internal fitting-out	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Rock filling for the Groynes</u> Movable noise barrier should be provided for excavator and derrick lighter.	To reduce the construction noise impact.	Project Site / During the construction of gabion channel	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Box Culvert Construction</u> Movable noise barrier should be provided for excavator.	To reduce the construction noise impact.	Project Site / During the construction of gabion channel	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	Movable noise barrier should be provided for excavator, mobile crane; and Concrete lorry mixer should be operated behind site hoarding/movable noise barrier.	To reduce the construction noise impact.	Project Site / During the construction of western culvert	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	Concrete lorry mixer should be operated behind site hoarding/movable noise barrier.	To reduce the construction noise impact.	Project Site / During the construction of eastern culvert	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1	-	Site hoarding should be provided for work	To reduce the construction	Project Site / During	Contractor		✓			<i>Noise Control</i>

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(Table 5.13)		site.	noise impact.	the construction of 90m box culvert						<i>Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Sand Filling</u> Movable noise barrier should be provided for excavator.	To reduce the construction noise impact.	Project Site / During the construction of gabion channel	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1	-	<u>Good Site Practice</u> Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; Mobile plant, if any, should be sited as far from NSRs as possible; Machines and plant (such as trucks) 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 should, wherever possible, be	To reduce the construction noise impact.	Project Site / Throughout the construction period	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>

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		orientated so that the noise is directed away from the nearby NSRs; and Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.								
5.9.1	4.1	<u>EM&A Requirements</u> Implementation of weekly construction noise monitoring at the representative NSRs.	To ensure compliance with the relevant criterion during the construction works.	N1, N2/N2a, N3 & N4/ Throughout the construction period	ET and Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
Water Quality – Construction Phase										
6.6.1	-	<u>Dredging and Sandfilling Operations</u> Sandfilling works should be carried out after the completion of groyne construction.	To further minimise the SS level during sandfilling works	Project Site / During sandfilling	Contractor		✓			-
6.6.1 and Figure 6.20	-	A movable cage type / metal frame type silt curtain will be deployed around the dredging area next to the grab dredger prior to commencement of dredging works.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			<i>Annex 6 of the EIAO-TM</i>
6.6.1 and Figure 6.21	-	Standing type silt curtains will be deployed around the proposed sandfilling extent prior to commencement of sandfilling works.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			<i>Annex 6 of the EIAO-TM</i>
6.6.1	-	A hourly dredging rate of a closed grab dredger (with a minimum grab size of 3 m ³) should be less than 31 m ³ hr ⁻¹ , with	To further minimise the SS level during the dredging works	Project Site / During dredging	Contractor		✓			-

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		reference to the maximum rate for dredging, which was derived in the EIA.								
6.6.1	-	A daily filling rate should be less than 1,000 m ³ day ⁻¹ , which was defined in the EIA.	To further minimise the SS level during the sandfilling works	Project Site / During sandfilling	Contractor		✓			-
6.6.1	-	Mechanical grabs should be designed and maintained to avoid spillage and should seal tightly while being lifted.	To further minimise the SS level during the dredging works	Project Site / During dredging	Contractor		✓			-
6.6.1	-	Barges or hoppers should have tight fitting seals to their bottom openings to prevent leakage of material.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	Loading of barges or hoppers shall be controlled to prevent splashing of dredged material to the surrounding water.	To further minimise the SS level during the dredging works	Project Site / During dredging	Contractor		✓			-
6.6.1	-	Barges or hoppers should not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	Excess material should be cleaned from the decks and exposed fittings of barges or hoppers before the vessel is moved.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	Adequate freeboard should be maintained on barges to reduce the likelihood of decks being washed by wave action.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	All vessels should be sized such that adequate clearance is maintained between vessels and the seabed at all states of the	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-

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		tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.								
6.6.1	-	The works should not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the Project Site.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	<u>Construction Site Runoff</u> The excavation works for the drainage diversions should be carried out to minimise any seawater influx entering the works area and hence to keep the works area dry as much as possible.	To ensure the works area will be kept dry as much as possible and hence avoid construction site runoff	Project Site / During excavation for the drainage diversions	Contractor		✓			-
6.6.1 and Figure 6.21	-	Silt curtains at the inshore waters should be deployed to enclose the works area before the commencement of the excavation works for two drainage diversions until the completion of the diversions.	To avoid any adverse water quality impacts resulting from the site runoff due to heavy rainfall	Project Site / During excavation for the drainage diversions	Contractor		✓			-
6.6.1	-	At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed and internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of efficient silt removal facilities should be based on the guidelines in <i>Appendix A1</i> of <i>ProPECC PN 1/94</i> .	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	All the surface runoff should be collected by	To minimise the	Project Site / During	Contractor		✓			<i>ProPECC PN</i>

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		the on-site drainage system and diverted through the silt traps prior to discharge into storm drain.	construction site runoff	land based construction works						1/94
6.6.1	-	All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks, where practicable. 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 by other means.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94
6.6.1	-	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.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94
6.6.1	-	Measures should be taken to reduce the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they 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	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94

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		facilities.								
6.6.1	-	Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50 m ³ 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.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	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.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	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 summarised in <i>Appendix A2 of ProPECC PN 1/94</i> . Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	Oil interceptors should be provided in the	To minimise the	Project Site / During	Contractor		✓			<i>ProPECC PN</i>

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		drainage system and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	construction site runoff	land based construction works						1/94
6.6.1	-	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment traps should be regularly cleaned and maintained. The temporary diverted drainage should be reinstated to the original condition when the construction work has finished or the temporary diversion is no longer required.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94
6.6.1	-	<u>Sewage Generated by Workforce</u> Sewage from toilets should be collected by a licensed waste collector.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor		✓			Water Pollution Control Ordinance
6.6.1	-	<u>Storage and Handling of Oil, Other Petroleum Products and Chemicals</u> Waste streams classifiable as chemical wastes should be properly stored, collected and treated for compliance with <i>Waste Disposal Ordinance or Disposal (Chemical Waste) (General) Regulation</i> requirements.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor		✓			Waste Disposal Ordinance
6.6.1	-	All fuel tanks and chemical storage areas should be provided with locks and be sited	To prevent contamination to	Project Site / During land based construction	Contractor		✓			Waste Disposal

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		on paved areas.	nearby environment	works						<i>Ordinance</i>	
6.6.1	-	The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor				✓		<i>Waste Disposal Ordinance</i>
6.6.1	-	Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal, in accordance with the <i>Waste Disposal Ordinance</i> . The Contractors should prepare guidelines and procedures for immediate clean-up actions following any spillages of oil, fuel or chemicals.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor				✓		<i>Waste Disposal Ordinance</i>
6.6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should, as far as possible, be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor				✓		<i>Waste Disposal Ordinance</i>
6.9.1 and 11.6.1	5.1	<u>EM&A Requirements</u> Monitoring of marine water quality during the construction phase is considered necessary to evaluate whether any impacts would be posed by these marine works on the surrounding waters during the operation of dredging and filling works.	To ensure the construction works would not arise any impacts to the surrounding waters	Marine water outside the Project Site / During dredging and filling works	ET and Contractor				✓		-

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Water Quality – Post-Construction Phase (After the completion of the construction and before the operation of the beach)

6.9.2 and 11.6.2	5.2	<u>EM&A Requirements</u> <i>E. coli</i> monitoring should be conducted at the outlet of two diverted drains and at EPD's beach water monitoring stations for the identification of pollution loading and to establish relationship between the loading and EPD's beach monitoring programme.	To investigate the pollution loading of <i>E. coli</i> and to establish relationship with EPD's beach monitoring data	Two diverted drains and the Bathing Beach/ Within six weeks after the completion of the construction works	ET				Post-Construction Phase (After the completion of the construction and before the operation of the beach)	-
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Water Quality – Operational Phase

6.6.2	-	<u>Surface Runoff from Project Site</u> A petrol interceptor should be provided in the drainage system and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain. Where appropriate, the design should follow or of similar functions as stated in the <i>ProPECC PN</i>	To prevent contamination to nearby environment	Beach Park area / During operation	Operator	✓	✓		<i>Water Pollution Control Ordinance and ProPECC PN 1/94</i>	
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		1/94.								
6.6.2	-	Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the <i>Waste Disposal Ordinance</i> .	To prevent contamination to nearby environment	Beach Building Facility / During operation	Operator	✓		✓		<i>Waste Disposal Ordinance</i>
Waste Management – Construction Phase										
7.6	-	The Contractor should submit the plan to Project Proponent's Engineer Representative for endorsement prior to the commencement of the construction works. The plan should incorporate site-specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials.	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.6	-	It will be the Contractor's responsibility to ensure that only reputable licensed waste collectors are used and that appropriate measures to reduce adverse impacts, including windblown litter and dust from the transportation of these wastes, are employed.	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.6	-	The Contractor must ensure that all the necessary permits or licences required under the Waste Disposal Ordinance are obtained for the construction phase.	To ensure compliance with relevant statutory requirements	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.6	-	<u>Waste Management Hierarchy</u> <ul style="list-style-type: none"> Nomination of approved personnel to be responsible for good site practices, 	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			<i>Waste Disposal (Charges for Disposal of</i>

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-		<p>arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site;</p> <ul style="list-style-type: none"> • Training of site personnel in proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection for disposal; • Appropriate measures to reduce windblown litter and dust transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • A recording system for the amount of wastes generated/recycled and disposal sites. <p><u>Waste Reduction Measures</u></p> <ul style="list-style-type: none"> • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse 	To reduce construction waste generation	Project Site / During construction	Contractor	✓				<p><i>Construction Waste) Regulation;</i></p> <p><i>ETWB TCW No.31/2004; and</i></p> <p><i>Appendix C of ETWB TCW No. 19/2005</i></p>

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		or recycling of material and their proper disposal; <ul style="list-style-type: none"> • Encourage collection of aluminium cans and waste paper by individual collectors during construction with separate labelled bins being provided to allow the segregation of these wastes from other general refuse generated by the workforce; • Any unused chemicals and those with remaining functional capacity be recycled as far as possible; • Use of reusable non-timber formwork to reduce the amount of C&D materials; • Prior to disposal of construction waste, wood, steel and other metals should be separated, to the extent practical for re-use and/or recycling to reduce the quantity of waste to be disposed at landfills; • Proper storage and site practices to reduce the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to reduce amount of waste generated and avoid unnecessary generation of waste. 								

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7.6.1	-	<p><u>Dredging Materials</u></p> <p>The final disposal site for the dredged sediments should be determined by the MFC and a dumping licence should be obtained from EPD prior to the commencement of the dredging works. Uncontaminated sediments should be disposed of at open sea disposal sites designated by the MFC. For contaminated sediments requiring Type 2 confined marine disposal, relevant contract documents should specify the allocation conditions of the MFC and EPD.</p>	To ensure adverse environmental impacts are prevented	Dredging area / During construction	Contractor		✓			<i>Dumping at Sea Ordinance</i>
7.6.2	-	<p><u>Excavated Materials and C&D Waste</u></p> <p><i>Management of Waste Disposal</i></p> <p>The contractor should open a billing account with EPD in accordance with the Waste Disposal (Charges for Disposal of Construction Waste) Regulation for the payment of disposal charges. Every waste load transferred to Government waste disposal facilities such as public fill, sorting facilities, or landfills should require a valid “chit” which contains the information of the account holder to facilitate waste transaction recording and billing to the waste producer. A trip-ticket system should be established in accordance with TCW No. 6/2010 to monitor the reuse of surplus excavated materials off-site and disposal of construction waste and general refuse at</p>	To properly handle the excavated materials and C&D waste and thus avoid any adverse impacts	Project Site / During construction	Contractor		✓			<i>Waste Disposal (Charges for Disposal of Construction Waste) Regulation</i>

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		transfer stations/landfills, and to control fly-tipping. The billing “chit” and trip-ticket system should be included as one of the contractual requirements and implemented by the contractor. Regular audits of the waste management measures implemented on-site as described in the Waste Management Plan should be conducted.								
		A recording system (similar to summary table as shown in Annex 4 and Annex 5 of Appendix C of ETWB TWC No. 19/2005) for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established during the construction phase.								
7.6.2	-	<p><i>Reduction of C&D Materials Generation</i></p> <p>Public fill and construction waste should be segregated and stored in different containers or skips to facilitate reuse or recycling of the public fill and proper disposal of the construction waste. Specific areas of the work site should be designated for such segregation and storage if immediate use is not practicable.</p> <p>To reduce the potential dust and water quality impacts of site formation works, C&D materials should be wetted as quickly as possible to the extent practicable after excavation/filling.</p>	To reduce the generation of C&D waste	Project Site / During construction	Contractor		✓			-

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7.6.3	-	<p><u>Chemical Waste</u></p> <p>The Contractor should register as a chemical waste producer with the EPD. Chemical waste, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. Containers used for the storage of chemical wastes should:</p> <ul style="list-style-type: none"> • Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; • Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations. <p>The storage area for chemical wastes will:</p> <ul style="list-style-type: none"> • Be clearly labelled and used solely for the storage of chemical waste; • Be enclosed on at least 3 sides; 	To ensure proper handling of chemical waste	Project Site / During construction	Contractor	✓				<p><i>Code of Practice on the Packaging, Handling and Storage of Chemical Wastes</i></p>

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- Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;
- Have adequate ventilation;
- Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and
- Be arranged so that incompatible materials are appropriately separated.

Chemical waste should be collected by a licensed chemical waste collector to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility.

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7.6.4	-	<p><u>Sewage</u></p> <p>An adequate number of portable toilets should be provided for the on-site construction workforce during construction phase. All portable toilets should be maintained in a state that will not deter the users from using them. Night soil should be regularly collected by a licensed collector for disposal. The sewage generated from the visitors during operation of the Proposed Beach Development should be discharged to the adjacent foul sewer conveying to Tai Po Sewage Treatment Works for treatment.</p>	To ensure proper handling of sewage	Project Site / During construction	Contractor	✓				-
7.6.5	-	<p><u>General Refuse</u></p> <p>General refuse should be stored in enclosed bins or compaction units separately from construction and chemical wastes. A reputable waste collector should be employed to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to reduce odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.</p> <p>Recycling bins should be provided at strategic locations to facilitate recovery of aluminium cans and waste paper from the Project Site. Materials recovered should be sold for recycling.</p>	To ensure proper handling of general refuse	Project Site / During construction	Contractor	✓				-

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7.6.6	-	<p><u>Staff Training</u></p> <p>Training should be provided to workers on the concept of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling at the beginning of the construction works.</p>	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.7	6.1	<p><u>EM&A Requirements</u></p> <p>Joint site audits by the Environmental Team and the Contractor should be undertaken on a weekly basis. Particular attention should be given to the Contractor’s provision of sufficient spaces, adequacy of resources and facilities for on-site sorting and temporary storage of C&D materials. The C&D materials to be disposed of from the Project Site should be visually inspected. The public fill for delivery to the off-site stockpiling area should contain no observable non-inert materials (e.g., general refuse, timber, etc).</p> <p>The waste to be disposed of at refuse transfer stations or landfills should as far as possible contains no observable inert or reusable/recyclable C&D materials (e.g., soil, broken rock, metal, and paper/cardboard packaging, etc). Any irregularities observed during the weekly site audits should be raised promptly to the Contractor for rectification.</p>	To ensure that adverse environmental impacts are prevented	Project Site / During construction	ET and Contractor		✓			-

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<i>Ecology – Construction Phase</i>										
8.10.2	7.1	<p><u>Measures for Common Rat Snake</u></p> <p>To undertake a search of the Common Rat Snake within the land based Project Site just before the commencement of the construction works. Due to the small size of the Project Site and given that there are no optimal habitats for Common Rat Snake, one day-time search is considered sufficient. The surveyor(s) should actively search the areas within the Project Site and pay special attention to the leaf litters and rocks. All recorded Common Rat Snake should be caught by hand and translocated to the shrubland at the north of the Study Area, immediately after the search. The Common Rat Snake search and translocation works should be undertaken by a qualified ecologist with relevant experience in faunal translocation works.</p>	To ensure that adverse impacts arising from the Project to Common Rat Snake are prevented	Project Site (land based) / prior to commencement of construction works	ET / Qualified Ecologist	✓				-
-	7.2	<p><u>Measures for marine ecology</u></p> <p>(1) To translocate target marine fauna, including fishes, starfish, sea urchins and sea cucumbers, from the intertidal area of the Site at Lung Mei to the intertidal area at the reception site of Ting Kok East before commencement of sand filling works or any other works that may cause disturbances to the</p>	To ensure that adverse impacts arising from the Project to marine ecology	Project Site (marine based) / prior to commencement of marine works	ET / Qualified Ecologist	✓				

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		<p>existing marine ecology. The translocation works shall cover capturing, handling, holding transporting and releasing of the captured target marine fauna.</p> <p>(2) Translocation of seahorses, including identifying, capturing, handling, protecting, transporting and placing the target seahorse species from Site at Lung Mei to the reception site of Ting Kok East, as well as pre- and post-translocation monitoring and post-construction monitoring shall be conducted. Seahorse translocation shall be undertaken before the commencement of marine construction works. The identifying, capturing, handling, protecting, transporting and placing of seahorses shall be led and supervised by the Fish Specialist.</p>								
8.10.2	-	<p><u>Dredging and Sand Filling Operations</u></p> <p>It is predicted that the sediment plume and the sediment deposition will not be large in extent and no unacceptable water impacts including DO depletion, release of contaminants and nutrients are expected. Although no unacceptable water quality impacts would result, the following good construction site practice and proactive precautionary measures are recommended to</p>	To minimise ecological impacts arising from dredging and sand filling works	Project Site / During dredging and sand filling works	Contractor		✓			-

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		<p>ensure dredging and sandfilling operations would be undertaken in such a manner as to avoid any uncontrolled or unexpected incidents during the marine works:</p> <ul style="list-style-type: none"> • A movable cage type / metal frame type silt curtain should be deployed around the dredging area next to the grab dredger prior to commencement of dredging works; • Standing type silt curtains should be deployed around the proposed sandfilling extent prior to commencement of sandfilling works; and <p>Proper equipment, dredging rate, filling rate and good construction practices should be implemented, details refer to <i>Section 6.6.1</i>.</p>								
8.10.2	-	<p><u>Measures for Controlling Construction Runoff</u></p> <ul style="list-style-type: none"> • Storm water run-off from the construction site should be directed into existing drainage channel via adequately designed sand/silt removal facilities such as sand/silt traps and oil interceptors. Channels, earth bunds or sand bag 	To minimise ecological impacts of construction runoff	Project Site / During dredging and filling works	Contractor		✓			-

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		barriers should be provided on site to properly direct storm water to such silt removal facilities.								
8.10.2	-	<u>Planting along the Western Drainage Diversion</u> <ul style="list-style-type: none"> Provide tree/ shrub/ climber planting along the gabion wall of the new drainage channel. Regular monitoring and removal of the weed plant <i>Mikania micrantha</i> during the establishment and maintenance period. 	To provide an ecological habitat	Along gabion wall of the new western drainage channel/ After completion of the gabion	Contractor		✓	✓		-
8.10.2	-	<u>Good Construction Practices</u> <ul style="list-style-type: none"> Erect fences along the boundary of the Extension Site before the commencement of works to prevent vehicle movements, and encroachment of personnel, onto adjacent areas; and Regularly check the work site boundaries to ensure that they are not breached and that damage does not occur to surrounding areas. 	To avoid any adverse ecological impacts	Project Site / During construction works	Contractor		✓			-
<i>Fisheries – Construction Phase</i>										
9.10.1	-	<u>EM&A Requirements</u> EM&A is not required during the	To ensure that no water quality deterioration in the	Details refer to Section 12.6 of the EM&A	ET and Contractor		✓			<i>Environmental Impact</i>

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		construction phase of the Project. However, water quality monitoring will be conducted at the Yim Tin Tsai Fish Culture Zone. Details should be referred to the Water Quality Section.	Fish Culture Zone as a result of the dredging and sandfilling works	Manual.						<i>Assessment Ordinance, Annex 21 of the EIAO-TM</i>
<i>Landscape and Visual Impact – Construction Phase</i>										
10.5.1	-	<u>Landscape Mitigation</u> A Landscape Plan will be submitted before the commencement of Works.	To provide landscaping work.	Before commencement of construction phase	ET and Contractor	✓				-
10.6.10	-	<i>Cultivation of areas impacted during construction.</i> Areas impacted during the construction phase that are not required during the operation phase, are to be cultivated to a depth of 300mm in accordance with accepted Hong Kong practice and guidelines. The cultivation shall involve ripping of compacted soil by mechanical means and the addition gypsum and/or organic fertiliser if required.	To improve the soil allowing plants to thrive	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Car Park Tree Planting.</i> Advanced trees are to be planted in the car park.	To provide shade to the carpark areas and to reduce the mass of the paved areas	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Tree and shrub planting.</i> All planting of trees and shrubs is to be carried out in accordance with the relevant best practice guidelines. Plant densities are to be provided in future detailed design documents and are to be selected so as to achieve a finished landscape that matches	To improve the appearance of the development	Project Site / During construction	Contractor			✓		-

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		the surrounding, undisturbed, equivalent landscape types. Regular monitoring and removal of the weed plant <i>Mikania micrantha</i> during the establishment and maintenance period.								
10.6.10	-	<i>Roof Terrace Planting.</i> Trees, shrubs and climbers shall be established in planters on the roof terraces of the new structures where possible.	To improve the appearance of the development by softening the building element	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Natural Rock Groynes</i> New rock groynes are needed to contain the sand of the new beach. Natural stones will be used for construction of the Groynes.	To improve the appearance of the development to make the man-made feature be more compatible with the surroundings	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Inter-Tidal Re-generation.</i> It is likely that a build up of sediment and sand will occur at the outer edges of the rock groyne. This is a natural process and the development proponent has no control over the implementation of this mitigation measure.	To improve the appearance of the development	Adjacent areas	Nil			✓		-
10.6.10	-	<i>Mangrove Re-generation.</i> Mangroves of similar species to existing to be manually established by planting of droppings.	To improve the ecological value of the project	Project Site / During post-construction	Contractor		✓			-
10.6.10	-	<i>Buffer Planting.</i> Trees and shrubs are to be planted along Ting Kok road to screen the development from the nearby Village/Developed Areas.	To improve the appearance of the development	Project Site / During post-construction	Contractor		✓			-

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10.6.10	-	<i>Early Planting Works</i> Where technically feasible, new plantings are to be installed during the construction works to reduce landscape impacts.	To improve the appearance of the development	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Tree Protection/Transplantation.</i> Where technically feasible, existing trees in the Trees/Backshore Vegetation LR are to be retained. Those trees that cannot be retained that are of value are to be transplanted.	To improve the appearance of the development	Project Site / Before commencement of construction	Contractor		✓			-
10.7.9	-	<u>Visual Mitigation</u> <i>Design of Structures.</i> The structure shown in the photomontages are to illustrate the mass of the structures only. During the design phase of the development, features such as the location of doors, windows, eaves etc. will be detailed. All of these elements will greatly improve the appearance of the structures. Where possible, built structures will utilise appropriate designs to complement the surrounding landscape. Materials and finishes will also be considered during detailed design.	To reduce visual impacts and improve the appearance of the development	Project Site / During construction	Architect		✓			-
10.7.9	-	<i>Colour Scheme.</i> Colours for the structures can be used to complement the surrounding area. Lighter colours such as shades of light grey, off-white and light brown may be utilised where technically feasible to reduce the visibility of the structures.	To reduce visual impacts and improve the appearance of the development	Project Site / During construction	Architect		✓			-
10.7.9	-	<i>Plantings.</i> In addition to the landscape	To help integrate the new	Project Site / During	Contractor		✓			-

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		mitigation plantings proposed in Section 10.5.9 of the EIA report, appropriate new plantings will be installed as appropriate to help integrate the new structures into the surrounding landscape.	structures into the surrounding landscape	post-construction						
10.7.9	-	<i>Colour of Site Hoardings.</i> In order to mitigate the visual impact of these temporary hoardings, it is recommended that the hoardings be erected at a uniform height, with a uniform colour that complements the existing surrounding landscape.	To mitigate the visual impact of temporary hoardings	Project Site / During construction	Contractor		✓			-
-	9.2	<u>EM&A Requirements</u> A specialist Landscape Sub-Contractor should be employed for the implementation of landscape construction works and subsequent maintenance operations during a 12-month establishment period. A Registered Landscape Architect should be employed to supervise the specialist Landscape Sub-contractor for the implementation of landscape works, both hard and soft, involved. Measures undertaken by both the Contractor(s) and the specialist Landscape Sub-Contractor during the construction phase and first year post-construction will be audited by the Registered Landscape Architect of the ET. Site inspections should be undertaken at	To check the implementation and maintenance of landscape mitigation measures and ensure that they are fully realised and that potential conflicts between the proposed landscape measures and any other project works and operational requirements are resolved at the earliest practical date and without compromise to the intention of the mitigation measures	Project Site / During construction and post-construction phase	Specialist Landscape Sub-contractor, Registered Landscape Architect and ET		✓			-

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		least once every two weeks throughout the landscaping plants establishment period when planting works are being undertaken.								
		<p>A tree survey should be prepared, for DLO submission, and for the purpose of existing trees protection. Removal of existing trees to be minimized. The Contractor should consider to employ a certified arborist when sizable and valuable existing tree(s) protection of transplant is required.</p> <p>Post-construction phase auditing will be restricted to the 12-month establishment works of the landscaping proposals.</p> <p>Advance planting- monitoring of implementation and maintenance of planting, and against potential incursion, physical damage, fire, pollution, surface erosion, etc.</p> <p>Protection of trees to be retained-identification and demarcation of trees / vegetation to be retained, erection of physical protection (e.g. fencing), monitoring against potential incursion, physical damage, fire, pollution, surface erosion, etc.</p> <p>Clearance of existing vegetation-identification and demarcation of trees / vegetation to be cleared, checking of</p>								

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		<p>extent of works to reduce damage, monitoring of adjacent areas against potential incursion, physical damage, fire, pollution, surface erosion, etc.</p> <p>Transplanting of trees-identification and demarcation of trees / vegetation to be transplanted, monitoring of extent of pruning / lifting works to reduce damage, timing of operations, implementation of the stages of preparatory and translocation works, and maintenance of transplanted vegetation, etc.</p> <p>Plant supply-monitoring of operations relating to the supply of specialist plant material (including the collecting, germination and growth of plants from seed) to ensure that plants will be available in time to be used within the construction works.</p> <p>Soiling, planting, etc-monitoring of implementation and maintenance of soiling and planting works and against potential incursion, physical damage, fire, pollution, surface erosion, etc.</p> <p>Architectural design and treatment of all structures (where practicable), retaining walls, elevated road structures and other engineering works-implementation and maintenance of mitigation measures, to ensure conformity with agreed designs.</p> <p>Erection of Site Hoardings/Fences-</p>								

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		Erection of site hoardings/fences during the construction phase to reduce visual impacts.								
		Establishment Works- monitoring of implementation of maintenance operations during Establishment Period.								

Remark: Des – Design; C – Construction; O – Operation; Dec – Decommissioning