



Lam Environmental Services Limited

Service Contract No: EDO/01/2017
Environmental Team for
Development of Anderson Road Quarry Site
Road Improvement Works
Monthly EM&A Report (November 2018)

SERVICE CONTRACT NO: EDO/01/2017

**ENVIRONMENTAL TEAM FOR
DEVELOPMENT OF
ANDERSON ROAD QUARRY SITE -
ROAD IMPROVEMENT WORKS**

UNDER ENVIRONMENTAL PERMIT NO. EP-513/2016

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

NOVEMBER 2018 -

CLIENTS:

**Civil Engineering and Development
Department**

PREPARED BY:

Lam Environmental Services Limited

11/F Centre Point
181-185 Gloucester Road,
Wanchai, H.K.

Telephone: (852) 2882-3939
Facsimile: (852) 2882-3331
E-mail: info@lamenviro.com
Website: <http://www.lamenviro.com>

CERTIFIED BY:

Derek LO
Environmental Team Leader

DATE:

13 December 2018



Civil Engineering and Development Department
East Development Office
Suite 1213, Chinachem Golden Plaza
77 Mody Road
Tsimshatsui
Kowloon

Your reference:

Our reference: HKCEDD12/50/105419

Date: 13 December 2018

Attention: Mr Leung Siu Kau, Kelvin

BY EMAIL & POST
(email: kelvinleung@cedd.gov.hk)

Dear Sirs

Agreement No. EDO/04/2017
Independent Environmental Checker (IEC) for Development of Anderson Road Quarry Site
– Road Improvement Works
Monthly Environmental Monitoring & Audit Report (November 2018)

We refer to the emails on 5, 10, 11, 12 and 13 December 2018 from Environmental Team, Lam Environmental Services Limited attaching a Monthly Environmental Monitoring and Audit Report (November 2018) for the captioned project.

We have no further comment and hereby verify the abovementioned Monthly Environmental Monitoring and Audit Report (November 2018) in accordance with Clause 3.4 of the Environmental Permit no. EP-513/2016.

Should you have any queries, please do not hesitate to contact the undersigned or our Ms Angie Chan on 2618 2831.

Yours faithfully
ANewR CONSULTING LIMITED



Aqi Lee

Independent Environmental Checker

LYMA/LHHN/CWA/lhmh

cc AECOM – Mr Brad C W Chan (email: c3-srec4@arqaecom.com)
Lam Environmental Services Limited – Mr Derek Lo (email: dereklo@lamenviro.com)



TABLE OF CONTENTS

1 INTRODUCTION..... 5

1.1 Scope of the Report 5

1.2 Structure of the Report 5

2 PROJECT BACKGROUND..... 7

2.1 Background 7

2.2 Scope of the Project and Site Description..... 7

2.3 Project Organization and Contact Personnel..... 7

2.4 Construction Activities 8

3 STATUS OF REGULATORY COMPLIANCE 9

3.1 Status of Environmental Licensing and Permitting under the Project..... 9

3.2 Status of Environmental Licensing and Permitting under the Project..... 10

4 MONITORING REQUIREMENTS 11

4.1 Noise Monitoring..... 11

4.2 Air Monitoring 13

4.3 Water Quality Monitoring..... 16

5. MONITORING RESULTS 20

5.1 Noise Monitoring Results 20

5.2 Air Monitoring Results..... 20

5.3 Water Quality Monitoring Results 20

5.4 Waste Management..... 21

6. COMPLIANCE AUDIT 22

6.1 Noise Monitoring..... 22

6.2 Air Monitoring 22

6.3 Water Quality Monitoring..... 22

6.4 Review of the Reasons for and the Implications of Non-compliance..... 22

6.5 Summary of action taken in the event of and follow-up on non-compliance
22

7. ENVIRONMENTAL SITE AUDIT 23

8. COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION..... 24

9. CONCLUSION..... 25

LIST OF TABLES

Table 2.1	<i>Schedule 2 Designated Projects under this Project</i>
Table 2.2	<i>Contact Details of Key Personnel</i>
Table 3.1	<i>Summary of the current status on licences and/or permits on environmental protection pertinent to the Project</i>
Table 3.2	<i>Summary of submission status under EP-513/2016</i>
Table 4.1	<i>Noise Monitoring Station</i>
Table 4.2	<i>Noise Monitoring Equipment</i>
Table 4.3	<i>Action and Limit Level for Noise Monitoring</i>
Table 4.4	<i>Air Monitoring Station</i>
Table 4.5	<i>Air Quality Monitoring Equipment</i>
Table 4.6	<i>Action and Limit Level for Air Quality Monitoring</i>
Table 4.7	<i>Marine Water Quality Stations for Water Quality Monitoring</i>
Table 4.8	<i>Water Quality Monitoring Equipment</i>
Table 4.9	<i>Action and Limit Level for Water Quality Monitoring</i>
Table 5.1	<i>Summary of Quantities of Inert C&D Materials</i>
Table 5.2	<i>Summary of Quantities of C&D Wastes</i>
Table 8.1	<i>Cumulative Statistics on Complaints</i>
Table 8.2	<i>Cumulative Statistics on Successful Prosecutions</i>
Table 9.1	<i>Construction Activities and Recommended Mitigation Measures in Coming Reporting 2 Months</i>

LIST OF FIGURES

Figure 2.1	Project Layout
Figure 2.2	Project Organization Chart
Figure 4.1	Locations of Noise Monitoring Station (for Road Improvement Work 1 & 2)
Figure 4.2	Locations of Noise Monitoring Station (for Road Improvement Work 3)
Figure 4.3	Locations of Air Quality Monitoring Station (for Road Improvement Work 1 & 2)
Figure 4.4	Locations of Air Quality Monitoring Station (for Road Improvement Work 3)
Figure 4.5	Locations of Water Quality Monitoring Station (for Road Improvement Work 1 & 2)
Figure 4.6	Locations of Water Quality Monitoring Station (for Road Improvement Work 3)

LIST OF APPENDICES

Appendix 3.1	Environmental Mitigation Implementation Schedule
Appendix 4.1	Action and Limit Level
Appendix 4.2	Copies of Calibration Certificates
Appendix 4.3	Wind data extracted from HKO Automatic Weather Station
Appendix 5.1	Monitoring Schedule for Reporting Month
Appendix 5.2	Noise Monitoring Results and Graphical Presentations
Appendix 5.3	Air Quality Monitoring Results and Graphical Presentations
Appendix 5.4	Water Quality Monitoring Results and Graphical Presentations
Appendix 5.5	Monthly Summary Waste Flow Table
Appendix 6.1	Event and Action Plans
Appendix 6.2	Summary for Notification of Exceedance
Appendix 8.1	Complaint Log
Appendix 9.1	Construction Programme of Individual Contracts



EXECUTIVE SUMMARY

- i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – **November 2018** of Development of Anderson Road Quarry Site – Road Improvement Works under Environmental Permit no. EP-513/2016 (Hereafter as “the Project”). The construction works of the Project was commenced on 2 November 2018 and the tentative completion date is end of 2023. This is the **1st** EM&A report presenting the environmental monitoring findings and information recorded during the period of **2 November 2018 to 30 November 2018**. The cut-off date of reporting is at the end of each reporting month.
- ii. In the reporting month, the principal work activities conducted are as follow:
 - **Trees falling work and trees protection works;**
 - **Condition survey;**
 - **UU detection;**
 - **Install monitoring & instrumentation;**
 - **Preparation works of Boulder Treatment Works at road improvement work (RIW) 1;**
 - **Excavate trial pit.**

Air Quality Monitoring

- iii. 1-hour Total Suspended Particulates (TSP) monitoring was conducted at eight monitoring stations. The sampling frequency is 3 times in every 6 days in the reporting month.
- iv. **No action or limit level exceedance was recorded in the reporting period.**

Noise Monitoring

- v. Noise monitoring was conducted at five noise monitoring stations once per week in the reporting month.
- vi. **No action or limit level exceedance was recorded in the reporting period.**

Water Quality Monitoring

- vii. Water monitoring was conducted at four monitoring stations three days per week in the reporting month.
- viii. **Except on 26 November 2018, no water can be collected at Station E as the station was dried out during the monitoring scheduled in the reporting month.**
- ix. **One turbidity limit level exceedance was recorded at Station F on 28 November 2018 in the reporting month. After investigation, the exceedance was concluded as non-project related.**



Site Inspections and Audit

- x. The Environmental Team (ET) conducted weekly site inspections for the Contract on 2, 9, 15, 22 and 29 November. IEC attended the joint site inspection on 9 November 2018. No non-compliance was found during the site inspection.

Complaints, Notifications of Summons and Successful Prosecutions

- xi. No environmental complaint was received in the reporting period.

Reporting Changes

- xii. This is the first monthly environmental and audit report and there are no reporting changes.

Future Key Issues

- xiii. In coming reporting 2 months, the scheduled construction activities and the recommended mitigation measures are listed as follows:

Key Construction Works	Recommended Mitigation Measures
<ul style="list-style-type: none">• Setup Temporary Traffic Arrangement (TTA) on the road;• Erect hoarding and construct haul road;• Excavate trial pit;• Install monitoring;• Utilities mapping on RIW3.	<ul style="list-style-type: none">• Dust control during dust generating works;• Implementation of proper noise pollution control; and• Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system.

1 Introduction

1.1 Scope of the Report

- 1.1.1. Lam Environmental Services Limited (LES) has been appointed to work as the Environmental Team (ET) under Environmental Permit (EP) no. EP-513/2016 to implement the Environmental Monitoring and Audit (EM&A) programme as stipulated in the EM&A Manual of the approved Environmental Impact Assessment (EIA) Report for Development of Anderson Road Quarry site - Road Improvement Works (Register No.: AEIAR-195/2016).
- 1.1.2. In accordance with Clause 3.4 stated in EP-513/2016, four hard copy and one electronic copy of the monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of each reporting month throughout the entire construction period.
- 1.1.3. In accordance with Section 11.3.1 of the Project EM&A Manual, the first Monthly EM&A Report should be prepared and submitted to EPD within a month after the major construction works commences with the subsequently Monthly EM&A Reports due in 10 works day of the end of each reporting month.

1.2 Structure of the Report

Section 1 **Introduction** – details the scope and structure of the report.

Section 2 **Project Background** – summarizes background and scope of the project, site description, project organization and contact details of key personnel during the reporting period.

Section 3 **Status of Regulatory Compliance** – summarizes the status of valid Environmental Permits / Licenses during the reporting period.

Section 4 **Monitoring Requirements** – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency, criteria and respective event and action plan and monitoring programmes.

Section 5 **Monitoring Results** – summarizes the monitoring results obtained in the reporting period.

Section 6 **Compliance Audit** – summarizes the auditing of monitoring results, all exceedances environmental parameters.



- Section 7** **Environmental Site Audit** – summarizes the findings of weekly site inspections undertaken within the reporting period, with a review of any relevant follow-up actions within the reporting period.
- Section 8** ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution
- Section 9** ***Conclusion***

2 Project Background

2.1 Background

- 2.1.1. The Development of Anderson Road Quarry (ARQ) Site is to provide land and the associated infrastructures for the proposed land uses at the existing ARQ site at the north-eastern of East Kowloon.
- 2.1.2. In addition to the site formation and infrastructure works within the ARQ site, a new bus-to-bus interchange (BBI) at the toll plaza of Tseung Kwan O Tunnel and a series of associated off-site road improvement works and pedestrian connectivity facilities are also proposed to mitigate the potential cumulative traffic impact arising from the proposed ARQ development.
- 2.1.3. The Project under Environmental Permit (EP) (EP No. EP-513/2016) is for the three associated of-site road improvement works which comprises: (i) improvement of junction of (J/O) Lin Tak Road / Sau Mau Ping Road (RIW3) (ii) widening and improvement of sections of Clear Water Bay Road and On Sau Road (RIW2); and (iii) widening and improvement of sections of New Clear Water Bay Road and Shun Lee Tsuen Road (RIW1). The location of the Project is shown [Figure 2.1](#).

2.2 Scope of the Project and Site Description

- 2.2.1. The project contains various Schedule 2 Designated Projects (DPs) that, under the EIAO, require EPs to be granted by the DEP before they may be either constructed or operated. **Table 2.1** summarises the DPs under this Project.

Table 2.1 Schedule 2 Designated Projects under this Project

Item	Designated Project	EIAO Reference
DP2	A road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to existing road	Schedule 2, Part I, A.1

2.3 Project Organization and Contact Personnel

- 2.3.1 Civil Engineering and Development Department is the overall project controllers for the Project. For the construction phase of the Project, Project Engineer, Contractor(s), Environmental Team and Independent Environmental Checker are appointed to manage and control environmental issues.

2.3.2 The proposed project organization and lines of communication with respect to environmental protection works are shown in [Figure 2.2](#). Key personnel and contact particulars are summarized in **Table 2.2**:

Table 2.2 Contact Details of Key Personnel

Party	Role	Post	Name	Contact No.	Contact Fax
AECOM	Engineer's Representative	Chief Resident Engineer	Mr. Dennis Leung	2967 6608	2473 3221
Chun Wo – China Metallurgical Group Corporation Joint Venture	Contractor	Site Agent	Mr. Chris Lam	9801 9974	3965 9854
		Environmental Office	Miss Tiffany Tsang	5117 9020	
ANewR Consulting Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Mr. Adi Lee	2618 2836	3007 8648
Lam Environmental Services Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Derek Lo	2882 3939	2882 3331

2.4 Construction Activities

2.4.1 In the reporting month, the principal work activities conducted are as follow.

- Trees falling work and trees protection works;
- Condition survey;
- UU detection;
- Install monitoring & instrumentation;
- Preparation works of Boulder Treatment Works at road improvement work (RIW) 1;
- Excavate trial pit.

2.4.2 In coming reporting 2 months, the scheduled construction activities are listed as follows:

- Setup Temporary Traffic Arrangement (TTA) on the road;
- Erect hoarding and construct haul road;
- Excavate trial pit;
- Install monitoring;
- Utilities mapping on RIW3.

3 Status of Regulatory Compliance

3.1 Status of Environmental Licensing and Permitting under the Project

3.1.1. A summary of the current status on licences and/or permits on environmental protection pertinent to the Project is shown in **Table 3.1**.

Table 3.1 Summary of the current status on licences and/or permits on environmental protection pertinent to the Project

Permits and/or Licences	Permit. No. / Account No.	Valid From	Expiry Date	Status
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	Form NA submitted to EPD on 29 May 2018.			
Environmental Permit	EP-513/2016	20 Jul 2016	N/A	Valid
Construction Noise Permit (CNP)	GW-RE0775-18	16 Nov 2018	15 Feb 2019	Valid
Billing Account for Disposal				
Billing Account for Disposal of Construction Waste	7031075	20 Jul 2018	End of the Project	Valid
Chemical Waste Registration				
Registration as a Waste Producer for Sau Mau Ping Road to Lin Tak Road	5213-294-C4239-04	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for Sau Mau Ping Area between Him Tat House and Sau Mau Ping Salt Water Service Reservoir	5213-293-C4239-05	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for New Clear Water Bay Road (Start from 46 Clear Water Bay Road, End at Shun Lee Tsuen Road and San Lee Street	5213-291-C4239-02	13 Aug 2018	N/A	Valid
Registration as a Waste Producer for South Part of Hiu Ming Street Playground	5213-294-C4239-03	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for Clear Water Bay Road and New Clear Water Bay Road (From the intersection of Fei Ngo Shan Road to Tai Pan Court) and on Sau Road (From the intersection of New Clear Water Bay Road to 9 Anderson Road	5213-831-C4239-08	6 Aug 2018	N/A	Valid
Registration as a Waste Producer for Sau Mau Ping Area Between Anderson Road and On Sau Road, next to Oi Tat House	5213-292-C4239-06	6 Aug 2018	N/A	Valid



3.2 Status of Environmental Licensing and Permitting under the Project

3.2.1. A summary of the current status on submission under EP-513/2016 is shown in **Table 3.2**.

Table 3.2 Summary of submission status under EP-513/2016

EP Condition	Submission	Date of Submission
Condition 1.12	Notification of Commencement Date of Works	24 September 2018
Condition 2.10	Management Organization of Main Construction Companies	27 September 2018
Condition 2.11	Submission of Design Drawing(s) of the Project	28 September 2018
Condition 2.12	Submission of Landscape and Visual Mitigation Plan(s)	28 September 2018
Condition 2.14 (a)	Submission of Detailed Vegetation Survey Report	27 September 2018
Condition 3.3	Submission of Baseline Environmental Monitoring Report	28 September 2018

4 Monitoring Requirements

4.1 Noise Monitoring

NOISE MONITORING STATIONS

4.1.1. The noise monitoring stations for the Project are listed and shown in **Table 4.1** and [Figure 4.1 & 4.2](#).

Table 4.1 Noise Monitoring Station

Monitoring Station ID	Monitoring Location	Measurement Type	Level (in terms of no. of floor)
NMC01	Kei Shun Special School	Façade	G/F
NMC02	Shun Lee Disciplined Services Quarters Block 6	Façade	3/F podium
NMC03	Sienna Garden Block 6	Free-field	G/F
NMC04	Po Tat Estate Tat Kai House	Free-field	3/F podium
NMC05	Hong Wah Court Block B Yee Hong House	Façade	G/F

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

4.1.2. Noise monitoring shall be carried out at all the designated monitoring stations. The monitoring frequency shall depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- One set of measurements between 0700-1900 hours on normal weekdays (six consecutive Leq/5min readings);
- One set of measurements between 1900-2300 hours;
- One set of measurements between 2300-0700 hours of next day; and
- One set of measurements between 0700-2300 hours on holidays (three consecutive Leq/5min readings).

4.1.3. For the latter 3 sets of measurements specified in Section 4.1.2 above, one set of measurements shall at least include 3 consecutive Leq (5min) results.

4.1.4. Supplementary information for data auditing, statistical results such as L10 and L90 shall also be obtained for reference.

4.1.5. If a school exists near the construction activity, noise monitoring shall be carried out at the monitoring stations for the schools during the examination periods. The ET leader shall liaise with the school's personnel and the examination authority to ascertain the exact dates and times of all examination periods during the course of the contract.

MONITORING EQUIPMENT

4.1.6. Noise monitoring was performed using sound level meter at the designated monitoring locations. The sound level meters shall comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator shall be deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 4.2**.

Table 4.2 Noise Monitoring Equipment

Equipment	Brand and Model	Series Number
Integrated Sound Level Meter	Larson Davis LxT	0003737
	B&K2236	2100736
	HONGLIM HLES-01	201692136
Acoustic Calibrator	Larson Davis CAL200	13098 13437

4.1.7. The calibration certificates of the noise monitoring equipment are attached in [Appendix 4.2](#).

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.1.8. Monitoring Procedure

- (a) The monitoring station shall normally be at a point 1m from the exterior of the sensitive receiver's building façade and be at a position 1.2m above the ground.
- (b) Façade measurements were made at the monitoring locations. For free-field measurement, a correction factor of +3 dB (A) would be applied.
- (c) The battery condition was checked to ensure the correct functioning of the meter.
- (d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
- (e) Frequency weighting: A, Time weighting: Fast, Measurement time set: continuous 5 mins
- (f) Prior and after to the noise measurement, the meter was checked using the acoustic calibrator for 94dB (A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than ±1 dB (A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (g) Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

4.1.9. Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The sound level meter and calibrator were calibrated at yearly intervals.

EVENT AND ACTION PLAN

4.1.10. Noise Standards for Daytime Construction Activities are specified under EIAO-TM. The Action and Limit levels for construction noise are defined in **Table 4.3** and [Appendix 4.1](#). Should non-compliance of the criteria occurs, action in accordance with the Event and Action Plan in [Appendix 6.1](#) shall be carried out.

Table 4.3 Action and Limit Level for Noise Monitoring

Monitoring Station	Action Level	Limit Level (dB(A))		
		0700-1900 hrs on normal weekdays	0700-2300 hrs on holidays (including Sundays); and 1900-2300 hrs on all days ²	2300-0700 hrs of all days ²
NMC01	When one documented complaint is received	65 / 70 ¹	60 / 65 / 70 ³	45 / 50 / 55 ³
NMC02		75		
NMC03		75		
NMC04		75		
NMC05		75		

Remark 1: Limit level of NMC01 - Kei Shun Special School reduce to 65 dB (A) during examination periods if any.

Remark 2: Construction noise during restricted hours is under the control of Noise Control Ordinance Limit Level to be selected based on Area Sensitivity Rating.

Remark 3: Limit Level for restricted hour monitoring shall act as reference level only. Investigation would be conducted on CNP compliance if exceedance recorded during restricted hour noise monitoring period.

4.2 Air Monitoring

AIR QUALITY MONITORING STATIONS

4.2.1. The air monitoring stations for the Project are listed and shown in **Table 4.4** and [Figure 4.3 & 4.4](#).

Table 4.4 Air Monitoring Station

Monitoring Station ID	Monitoring Location	Level (in terms of no. of floor)
NCWBR_AMS-1	Shun Lee Fire Station	2/F Roof
NCWBR_AMS-2	Shun Lee Estate Lee Hang House	G/F
NCWBR_AMS-3	Shun Lee Disciplined Services Quarters (Block 6)	4/F podium
NCWBR_AMS-4	Sienna Garden	G/F
NCWBR_AMS-5	Shun Chi Court Shun Fung House	Roof
LTR_AMS-1	St Edward's Catholic Primary School	G/F
LTR_AMS-2	Environmental Protection Department's Restored Landfill Site Office	G/F
LTR_AMS-3	Po Tat Estate Tat Kai House	3/F podium

AIR MONITORING PARAMETERS, FREQUENCY AND DURATION

- 4.2.2. One-hour TSP levels should be measured to indicate the impacts of construction dust on air quality.
- 4.2.3. The sampling frequency of at least three times in every six-days should be undertaken when the highest dust impact occurs.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.2.4. Monitoring Procedures

- (a) Check the calibration period of portable direct reading dust meter prior to monitoring (The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly.)
- (b) Record the site condition near / around the monitoring stations.
- (c) Install the portable direct reading dust meter to the monitoring location.
- (d) Slide the power switch to turn the power on.
- (e) Check of portable direct reading dust meter to ensure the equipment operation in normal condition.
- (f) Select the period of measurement to 60mins.
- (g) Check and set the correct time.
- (h) Select the appropriate unit display for the equipment.
- (i) Slide the power switch to turn the power off when the monitoring period ended (3

- times 1 hour TSP monitoring per day).
- (j) Uninstall the portable direct reading dust meter
- (k) Collected the sampled data for analysis.
- (l) Remark: Procedures (c) to (h) may be different subject to the brands and models of portable direct reading dust meter

4.2.5. Maintenance and Calibration

- (a) The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly to determine the accuracy and validity of the results measured.
- (b) Checking of direct reading dust meter will be carried out in order to determine the conversion factor between the direct reading dust meter and the standard equipment, HVS. The comparison check is to be considered valid based on correlation coefficient checked by HOKLAS laboratory.

4.2.6. The 1-hour TSP air quality monitoring was performed by using portable direct reading dust meters at each designated monitoring station. The brand and model of the equipment are given in **Table 4.5**.

Table 4.5 Air Quality Monitoring Equipment

Equipment	Brand and model	Series Number
Portable direct reading dust meter	Met One BT- 645	R22586 X19295 X19296 X19297 X19298
	Met One AEROCET 831	W14016 W15448 W15449 W16848

4.2.7. The calibration certificates of the air quality monitoring equipment are attached in [Appendix 4.2](#).

WIND DATA

4.2.8. The representative wind data from Tate’s Cairn HKO Automatic Weather Station and Tseung Kwan O HKO Automatic Weather Station were obtained covering the 1-hr TSP monitoring periods. The wind data were extracted and shown in [Appendix 4.3](#).

EVENT AND ACTION PLAN

4.2.9. The Action and Limit levels for construction air quality are defined in **Table 4.6** and [Appendix 4.1](#). Should non-compliance of the air quality criteria occur, action in accordance with the Event and Action Plan in [Appendix 6.1](#) shall be carried out.

Table 4.6 Action and Limit Level for Air Quality Monitoring

Monitoring Locations	1-hour TSP Level in µg/m3	
	Action Level	Limit Level
NCWBR_AMS-1	284.4	500.0
NCWBR_AMS-2	282.4	500.0
NCWBR_AMS-3	287.9	500.0
NCWBR_AMS-4	281.6	500.0
NCWBR_AMS-5	270.0	500.0
LTR_AMS-1	272.1	500.0
LTR_AMS-2	281.1	500.0
LTR_AMS-3	285.1	500.0

4.3 Water Quality Monitoring

WATER QUALITY MONITORING STATIONS

4.3.1. Water quality monitoring was undertaken at 4 monitoring stations in the reporting month. The proposed water quality monitoring stations of the Project are shown in **Table 4.7** and [Figure 4.5 & 4.6](#).

Table 4.7 Marine Water Quality Stations for Water Quality Monitoring

Inland Water	Stations	Description	Easting	Northing
Channelized nullah across the Project site	E	Upstream Control Station	841329	821753
	F	Downstream Impact Station	841469	821635
Ma Yau Tong Stream	H	Upstream Control Station	843008	819880
	I	Downstream Impact Station	842652	819573

WATER QUALITY PARAMETERS, FREQUENCY AND DURATION

- 4.3.2. The levels of dissolved oxygen (DO), turbidity and pH shall be measured in situ while suspended solids (SS) is determined by laboratory analysis at all the designated monitoring stations.
- 4.3.3. In association with the water quality parameters, other relevant data shall also be recorded, such as monitoring location / position, time, water temperature, salinity, DO saturation, weather conditions, and any special phenomena underway near the monitoring station.
- 4.3.4. The sampling frequency of at least three days per week should be undertaken when the highest dust impact occurs. Upon completion of the construction works, the monitoring

exercise at the designated monitoring locations should be continued for four weeks in the same manner as the impact monitoring.

- 4.3.5. The interval between two sets of monitoring should not be less than 36 hours except where there are exceedances of Action and/or Limit Levels, in which case the monitoring frequency will be increased.
- 4.3.6. Replicate in-situ measurements should be carried out in each sampling event.

SAMPLING PROCEDURES AND MONITORING EQUIPMENT

Dissolved Oxygen And Temperature Measuring Equipment

- 4.3.7. The instrument should be a portable, weatherproof dissolved oxygen measuring instrument complete with cable, sensor, comprehensive operation manuals, and use a DC power source. It should be capable of measuring:
- a dissolved oxygen level in the range of 0-20 mg/l and 0-200% saturation
 - a temperature of 0-45 degree Celsius
- 4.3.8. It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary. (e.g. YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).
- 4.3.9. Should salinity compensation not be build-in in the DO equipment, in-situ salinity shall be measured to calibrate the DO equipment prior to each DO measurement.

Turbidity Measurement Instrument

- 4.3.10. The instrument should be a portable, weatherproof turbidity-measuring instrument complete with comprehensive operation manual. The equipment should use a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and be complete with a cable (e.g. Hach model 2100P or an approved similar instrument).

Sampler

- 4.3.11. Due to low water level as mentioned in Section 6.4.3 of the EIA report, bucket sampler (Approximate 1L) will be use instead of water sampler in order to obtain surface water sample without disturb the stream sediment and collect representative results.

Salinity

- 4.3.12. A portable salinometer capable of measuring salinity in the range of 0-70 ppt shall be provided for measuring salinity of the water at each of monitoring location.

MONITORING METHODOLOGY

4.3.13. Monitoring Procedure

- (a) The condition near the monitoring stations shall be observed and recorded on the data log sheet.
- (b) Check of sensors and electrodes with certified standard solutions before each use.
- (c) Wet bulb calibration for a DO meter should be carried out before measurement.
- (d) Sample would be taken using bucket sampler at surface level.
- (e) Transfer the sampled water carefully into cleaned water bottles (2x 500ml) provided by the laboratory at the spot after the collection of the water sample for the subsequent laboratory Suspended Solid testing.
- (f) Transfer the sampled water from the bucket sampler to the rinsed water container for in-situ measurement (In case of the in-situ measurement cannot be carried at spot due to safety and adverse weather condition, sampled water from the bucket sampler will be transfer to cleaned water bottles provided by laboratory. Then, In-situ measurement will be conducted at a safe location which sampled water inside cleaned water bottle will be transfer to the rinsed water container for in-situ measurement) In-situ measurement shall be measured in duplicate.
- (g) Parameters including Water Temperature (°C), pH (units), Salinity (ppt), DO (mg/L), DO saturation (%) will be measured by the Multifunctional Meter and Turbidity (NTU) will be measured by turbid meter. (Water Temperature and Salinity will be measured as reference parameters)
- (h) Record the result on the data log sheet and record any special finding during / after in-situ measurement.
- (i) The water sample bottles will be stored in a cool box (at cooled to 4°C without being frozen), which shall be delivered to HOKLAS laboratory (Pilot Testing Limited) for further testing to determine the level of SS.

4.3.14. Maintenance and Calibration

- (a) The responses of sensors and electrodes of the water quality monitoring equipment were cleaned and checked at regular intervals.
- (b) DO meter (Multifunctional Meter) and turbid meter was certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at three monthly intervals.

4.3.15. Brand and model of the equipment are given in **Table 4.8**.

Table 4.8 Water Quality Monitoring Equipment

Equipment	Brand and model	Series Number
Multifunctional Meter	YSI Professional Plus	14K100322 17F100236
Turbid meter	Xin Rui WGZ-3B	1403009 1309192

4.3.16. The calibration certificates of the water quality monitoring equipment are attached in [Appendix 4.2.](#)

LABORATORY MEASUREMENT / ANALYSIS

4.3.17. Analysis of suspended solids has been carried out in a HOKLAS accredited laboratory, which is Pilot Testing Limited.

EVENT AND ACTION PLAN

4.3.18. The Action and Limit levels for construction water quality are defined in **Table 4.9** and [Appendix 4.1](#). Should the monitoring results of the water quality parameters at any designated monitoring station exceed the water quality criteria, action in accordance with the Event and Action Plan in [Appendix 6.1](#) shall be carried out.

Table 4.9 Action and Limit Level for Water Quality Monitoring

Monitoring Station	Surface pH		Surface DO (mg/L)		Surface Turbidity (NTU)		Surface SS (mg/L)	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
E	-	-	-	-	-	-	-	-
F	Beyond the range of 6.6-8.4	Beyond the range of 6.5-8.5	5.8	5.5	24.4	32.7	17.0	23.8
H	-	-	-	-	-	-	-	-
I	Beyond the range of 6.6-8.4	Beyond the range of 6.5-8.5	5.5	5.4	206.9	214.2	172.8	201.4

*Remarks:

The value of 1.0mg/L was taken as the value for measurement with suspended solid level of <1.0mg/L for Action and Limit level calculation.

It is recommended that upstream monitoring station (monitoring station E and H) would be taken as control reference for exceedance investigation only. Action and limit level would not be establish using the baseline data.

5. Monitoring Results

5.0.1 The environmental monitoring will be implemented based on the division of works areas of each designed projects. Overall layout showing work areas and monitoring stations is shown in [Figure 2.1](#) and Figure 4.1 – 4.6 respectively.

5.0.2 The environment monitoring schedules for reporting month and coming month are presented in [Appendix 5.1](#).

5.1 Noise Monitoring Results

5.1.1 All noise monitoring was conducted as scheduled in the reporting month.

5.1.2 No action or limit level exceedance was recorded in the reporting period.

5.1.3 Noise monitoring results measured in this reporting period are reviewed and summarized. Details of noise monitoring results and graphical presentation can be referred in [Appendix 5.2](#).

5.2 Air Monitoring Results

5.2.1 All 1-hour TSP monitoring was conducted as scheduled in the reporting month.

5.2.2 No action or limit level exceedance was recorded in the reporting period.

5.2.3 Air quality monitoring results measured in this reporting period are reviewed and summarized. Details of air monitoring results and graphical presentation can be referred in [Appendix 5.3](#).

5.3 Water Quality Monitoring Results

5.3.1 All water quality monitoring was conducted as scheduled in the reporting month.

5.3.2 Except on 26 November 2018, no water can be collected at Station E as the station was dried out during the monitoring scheduled in the reporting month.

5.3.3 One turbidity limit level exceedance was recorded at Station F on 28 November 2018 in the reporting month. After investigation, the exceedance was concluded as non-project related.

5.3.4 Water quality monitoring results measured in this reporting period are reviewed and summarized. Details of water quality monitoring results and graphical presentation can be referred in [Appendix 5.4](#).

5.4 Waste Management

5.4.1 The quantities of waste for disposal in the Reporting Period are summarized in **Table 5.1** and **Table 5.2**. The Monthly Summary Waste Flow Table is shown in [Appendix 5.5](#). Whenever possible, materials were reused on-site as far as practicable.

Table 5.1 Summary of Quantities of Inert C&D Materials

Waste Type	Quantity this month	Cumulative Quantity-to-Date	Disposal Location
Hard Rock and Large Broken Concrete (Inert) (in '000m3)	0	0	Nil
Reused in this Contract (Inert) (in '000m3)	0	0	Nil
Reused in other Projects (Inert) (in '000m3)	0	0	Nil
Disposal as Public Fill (Inert) (in '000m3)	0.003	0.003	TKO137 Fill Bank

Table 5.2 Summary of Quantities of C&D Wastes

Waste Type	Quantity this month	Cumulative Quantity-to-Date	Disposal Location
Metals (in '000kg)	0.004	0.012	Nil (waste recycle was arranged)
Paper / Cardboard Packing (in '000kg)	0.088	0.175	Nil (waste recycle was arranged)
Plastics (in '000kg)	0.0025	0.032	Nil (waste recycle was arranged)
Chemical Wastes (in '000kg)	0	0	Nil
General Refuses (in '000m3)	0	0	Nil

6. Compliance Audit

6.0.1. The Event Action Plan for construction noise, air quality and water quality are presented in [Appendix 6.1.](#)

6.0.2. The summary of exceedance is presented in [Appendix 6.2.](#)

6.1 Noise Monitoring

6.1.1 [No action or limit level exceedance was recorded in the reporting period.](#)

6.2 Air Monitoring

6.2.1 [No action or limit level exceedance was recorded in the reporting period.](#)

6.3 Water Quality Monitoring

6.3.1 [One turbidity limit level exceedance was recorded at Station F on 28 November 2018 in the reporting month. After investigation, the exceedance was concluded as non-Project related.](#)

6.4 Review of the Reasons for and the Implications of Non-compliance

6.4.1 [No environmental non-compliance was recorded in the reporting month.](#)

6.5 Summary of action taken in the event of and follow-up on non-compliance

6.5.1 [There was no particular action taken since no non-compliance was recorded in the reporting period.](#)



7. Environmental Site Audit

- 7.0.1. Within this reporting month, weekly environmental site audits were conducted on [2, 9, 15, 22 and 29 November 2018](#). IEC attended the joint site inspection on [9 November 2018](#).
- 7.0.2. No non-compliance was found during the site inspection.

8. Complaints, Notification of Summons and Prosecution

- 8.0.1. No environmental complaint was received in the reporting period.
- 8.0.2. The details of cumulative complaint log and updated summary of complaints are presented in [Appendix 8.1](#).
- 8.0.3. Cumulative statistic on complaints and successful prosecutions are summarized in **Table 8.1** and **Table 8.2** respectively.

Table 8.1 Cumulative Statistics on Complaints

Reporting Period	No. of Complaints
November 2018	0
Total	0

Table 8.2 Cumulative Statistics on Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative No. Project-to-Date
Air	-	0	0
Noise	-	0	0
Water	-	0	0
Waste	-	0	0
Total	-	0	0

9. Conclusion

- 9.0.1. The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed were made in response to changing circumstances.
- 9.0.2. The scheduled construction activities and the recommended mitigation measures for the coming 2 months are listed in **Table 9.1**. The construction programmes of the Project are provided in [Appendix 9.1](#).

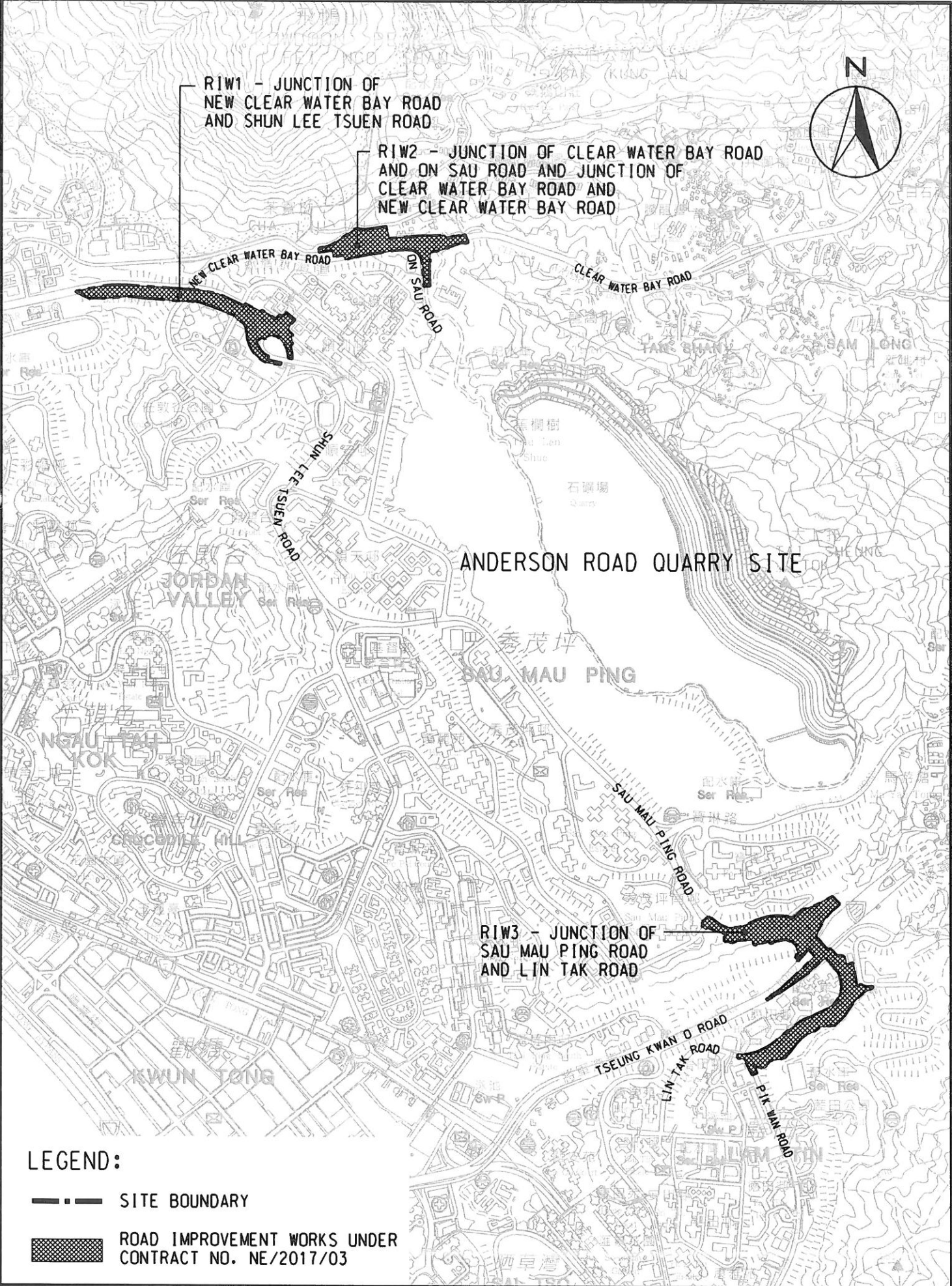
Table 9.1 Construction Activities and Recommended Mitigation Measures in Coming Reporting 2 Months

Key Construction Works	Recommended Mitigation Measures
<ul style="list-style-type: none"> • Setup Temporary Traffic Arrangement (TTA) on the road; • Erect hoarding and construct haul road; • Excavate trial pit; • Install monitoring; • Utilities mapping on RIW3. 	<ul style="list-style-type: none"> • Dust control during dust generating works; • Implementation of proper noise pollution control; and • Provision of protection to ensure no runoff out of site area or direct discharge into public drainage system.



Figure 2.1

Project Layout



LEGEND:

- SITE BOUNDARY
- ▨ ROAD IMPROVEMENT WORKS UNDER CONTRACT NO. NE/2017/03

GENERAL LAYOUT PLAN OF
ROAD IMPROVEMENT WORKS
UNDER CONTRACT NO. NE/2017/03

Figure 2.1
Project Layout



Figure 2.2

Project Organization Chart



Project Organization Chart

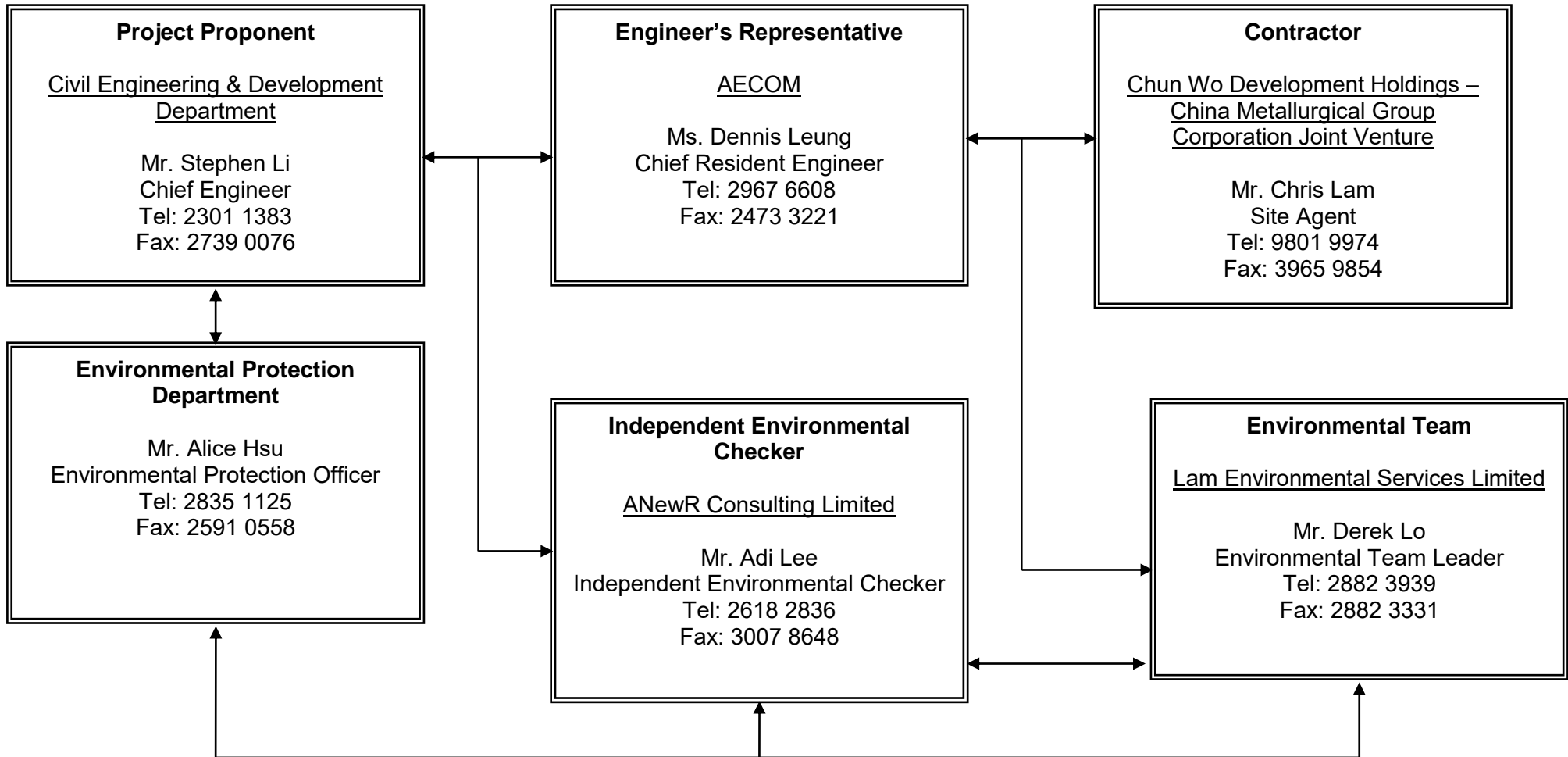
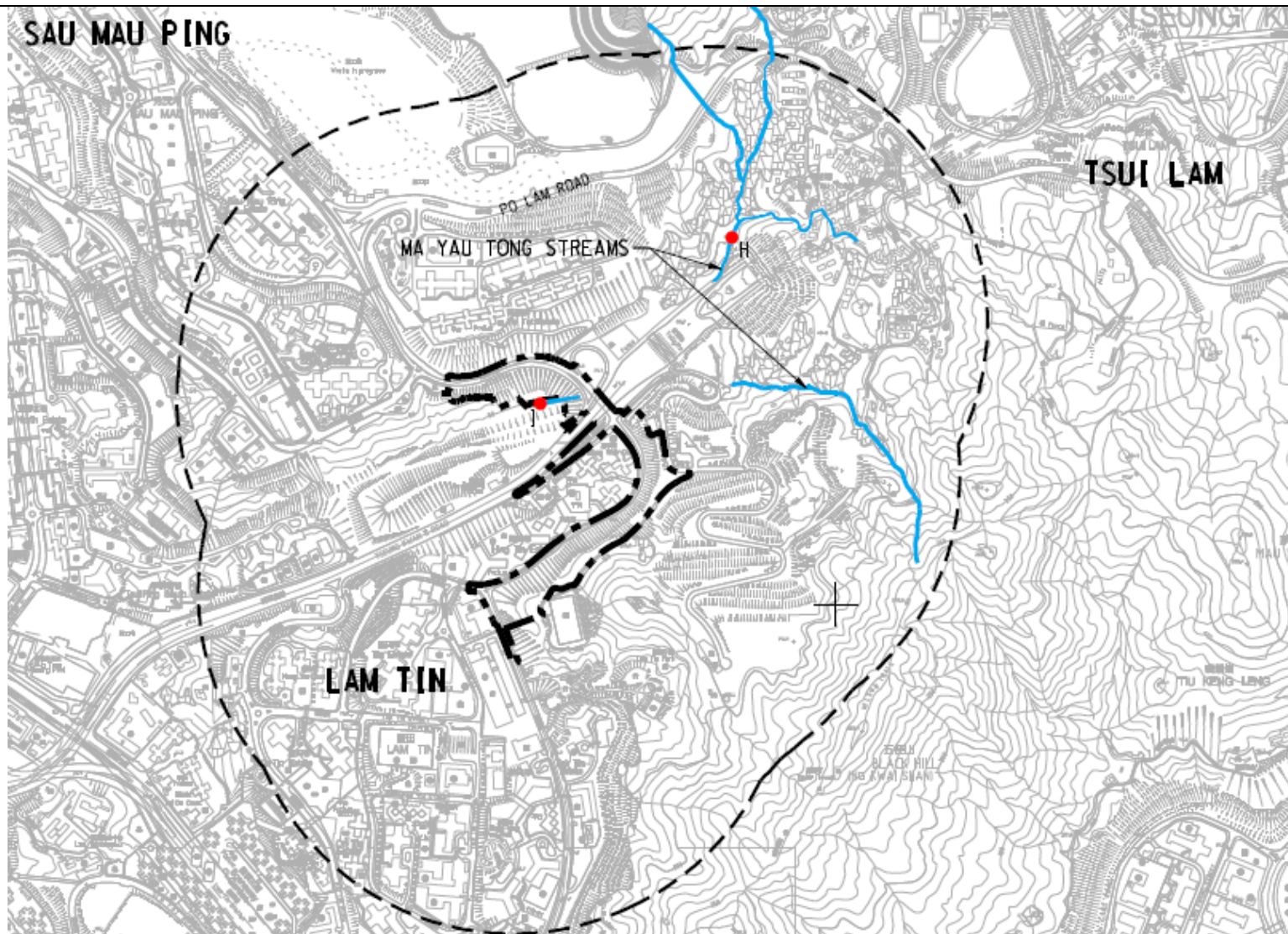


Figure 2.2



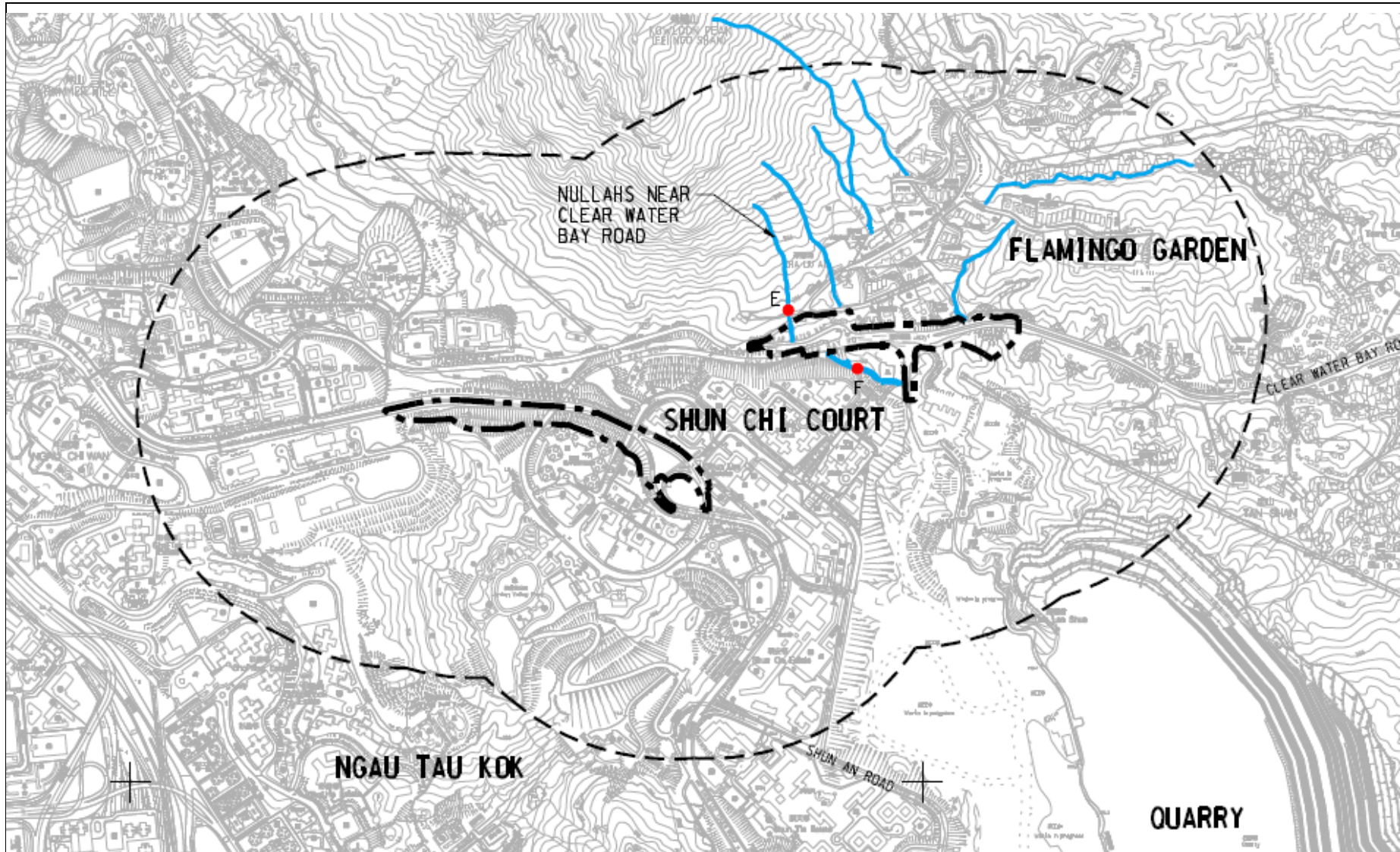
Figure 4.1 to Figure 4.6

Locations of Monitoring Stations



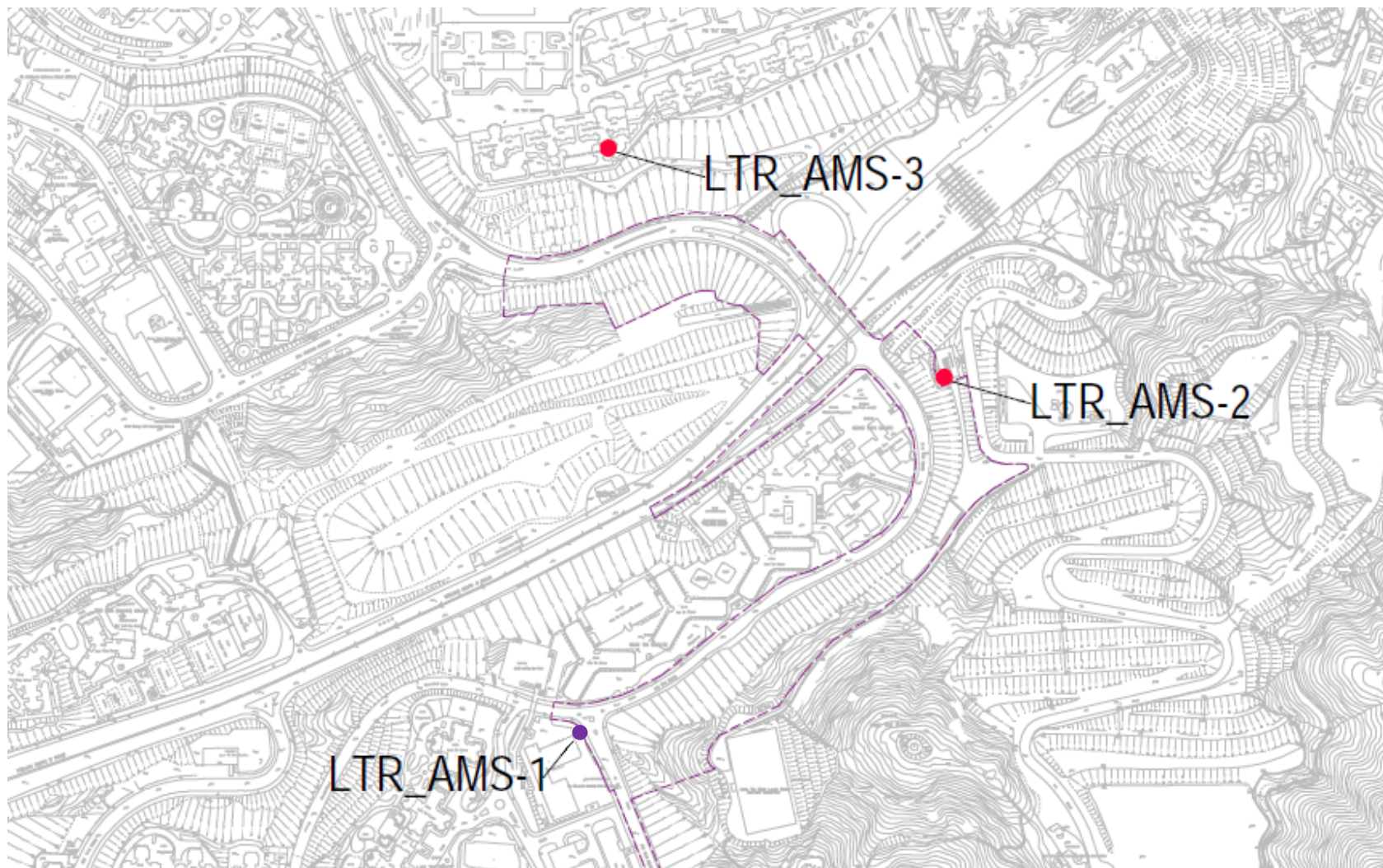
Inland Water	Stations	Description
Ma Yau Tong Stream	H	Upstream Control Station
	I	Downstream Impact Station

Figure 4.6
Location of Water Quality Monitoring Station
(for Road Improvement Work 3)



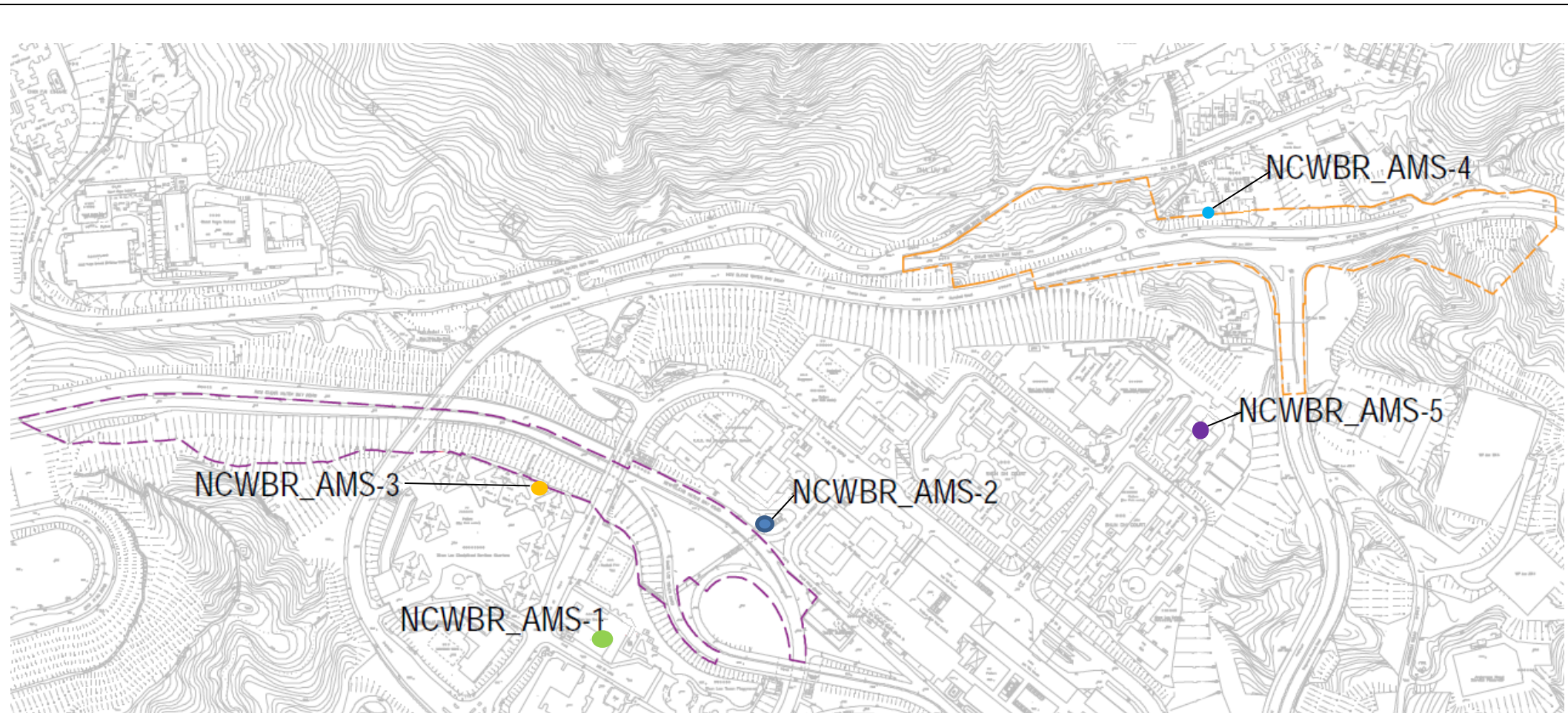
Inland Water	Stations	Description
Channelized nullah across the Project site	E	Upstream Control Station
	F	Downstream Impact Station

Figure 4.5
Location of Water Quality Monitoring Station
(for Road Improvement Work 1 & 2)



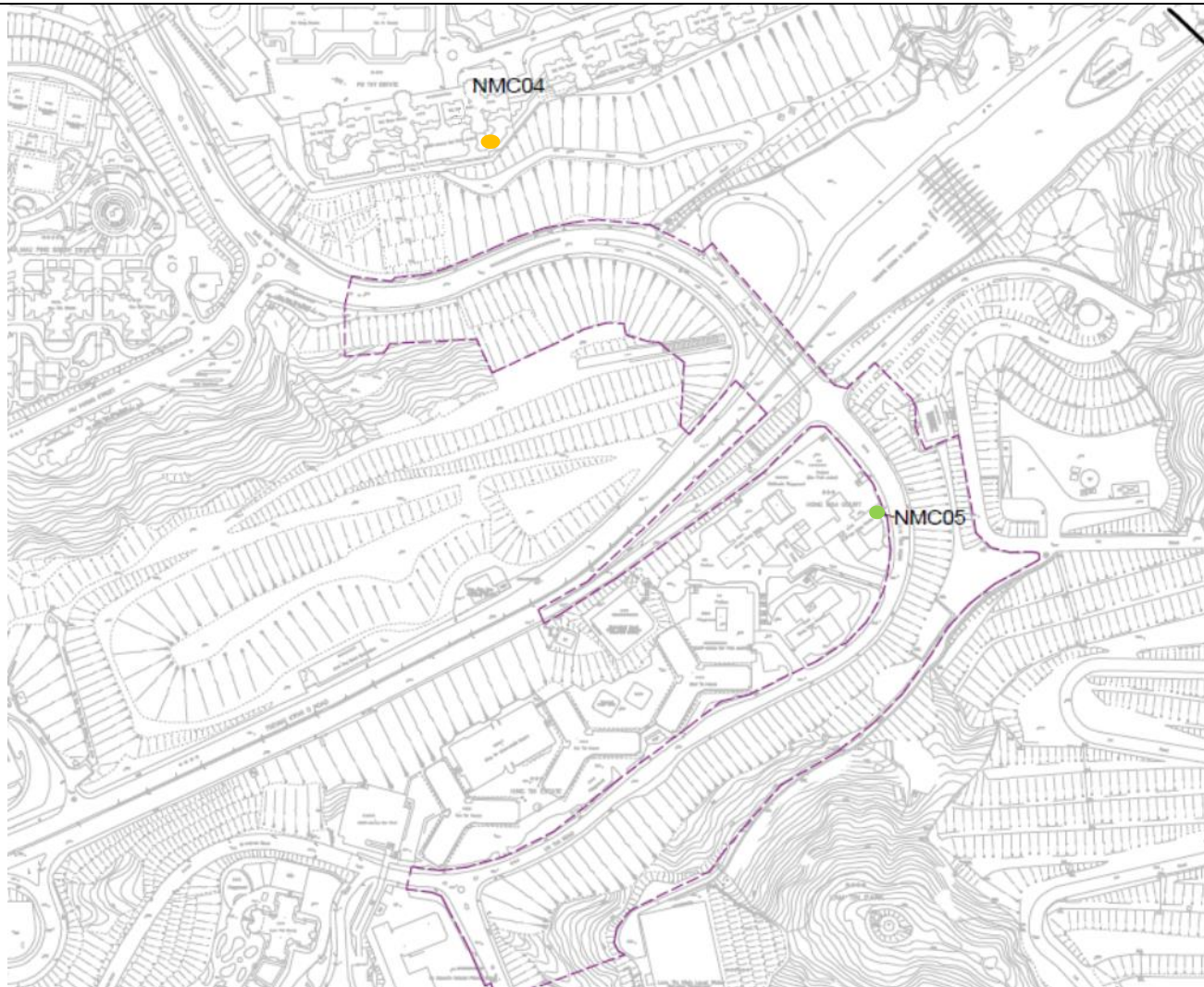
Monitoring Station ID	EIA ID	Location
LTR RIW		
LTR_AMS-1	ASECP-2	St Edward's Catholic Primary School
LTR_AMS-2	AEPD-01	Environmental Protection Department's Restored Landfill Site Office
LTR_AMS-3	APTE-14	Po Tat Estate Tat Kai House

Figure 4.4
Location of Air Quality Monitoring Station
(for Road Improvement Work 3)



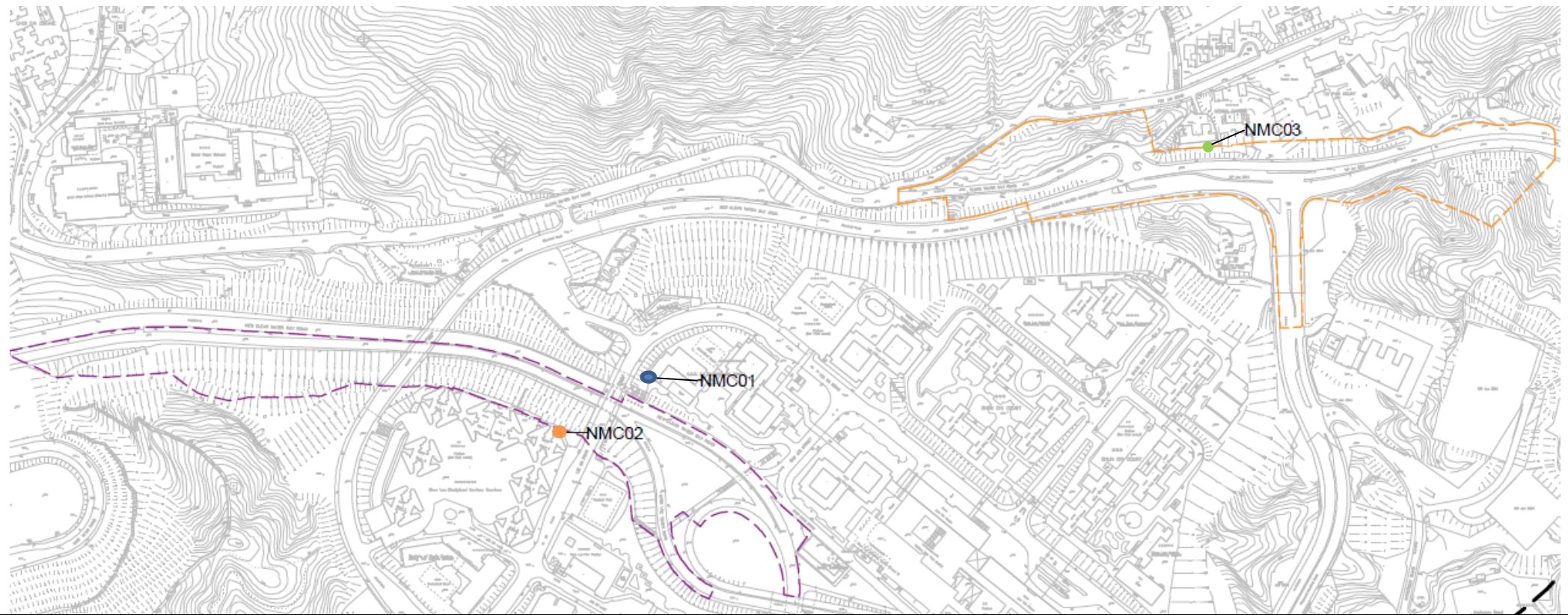
Monitoring Station ID	EIA ID	Location
NCWBR RIW		
NCWBR_AMS-1	ASLF-1	Shun Lee Fire Station
NCWBR_AMS-2	ASLE-21	Shun Lee Estate Lee Hang House
NCWBR_AMS-3	ASLD-10	Shun Lee Disciplined Services Quarters (Block 6)
NCWBR_AMS-4	AFNS-3	Sienna Garden
NCWBR_AMS-5	ASCC-05	Shun Chi Court Shun Fung House

Figure 4.3
Location of Air Quality Monitoring Station
(for Road Improvement Work 1 & 2)



Monitoring Location ID	Description
NMC04	Po Tat Estate Tat Kai House
NMC05	Hong Wah Court Block B Yee Hong House

Figure 4.2
 Location of Noise Monitoring Station
 (Construction Phase)
 (for Road Improvement Work 3)



Monitoring Location ID	Description
<i>Noise Monitoring Station (Construction Phase)</i>	
NMC01	Kei Shun Special School
NMC02	Shun Lee Disciplined Services Quarters Block 6
NMC03	Sienna Garden Block 6

Figure 4.1
 Location of Noise Monitoring Station
 (Construction Phase)
 (for Road Improvement Work 1 & 2)



Appendix 3.1

Environmental Mitigation Implementation Schedule

APPENDIX C - IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

Introduction

This chapter presents the implementation schedule of mitigation measures for the Project. **Table C.1** summarizes the details of the recommended mitigation measures for all works areas. For each recommended mitigation measure, both the location and timing for the mitigation measures have clearly been identified as well as the parties responsible for implementing the mitigation measures and for maintenance (where applicable).

Table C.1 Implementation Schedule of Mitigation Measures

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
Air Quality Impact (Construction Phase)								
4.7.1	Hourly watering with intensity of 0.0455 L/m ² (tentatively) on the active construction area so as to achieve a dust removal efficiency of 87.5%.	Active works areas	CEDD/Contractor		✓			EIAO-TM, AQOs
4.7.2	<ul style="list-style-type: none"> • To minimize the dust impact to the surrounding ASRs, dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be incorporated to control dust emission from the site. Major control measures relevant to this Project are listed below, and they are recommended to be included in relevant contract documents. - Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; - Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; - A stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones; - The load of dusty materials on a vehicles leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak form the vehicle; 	All works areas	CEDD/Contractor		✓			Air Pollution Control (Construction Dust) Regulation

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<ul style="list-style-type: none"> - Where practicable, vehicles washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; - When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; - The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; - Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; - Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; - Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; - Any skip hoist for material transport should be totally enclosed by impervious sheeting; - Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the three sides; 							

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<ul style="list-style-type: none"> - Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; and - Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 							
Air Quality Impact (Operational Phase)								
N/A	N/A	N/A	N/A					N/A
Noise Impact (Construction Phase)								
5.8.1 – 5.8.4	<u>Adoption of Quiet PMEs</u> <ul style="list-style-type: none"> • To reduce the noise impacts at the affected NSRs during normal daytime working hours, mitigation measures such as adopting quiet PME and construction noise barriers are recommended. <u>Construction Noise Barriers</u> <ul style="list-style-type: none"> • To alleviate the construction noise impact on the affected NSRs, construction noise barriers or enclosures would be erected to provide screening from the construction plant. 	All works areas	CEDD/Contractor		✓			EIAO-TM
Noise Impact (Operational Phase)								
5.8.5	Direct mitigation measures in the form of Vertical Noise Barriers, Cantilevered Noise Barriers, Semi-Enclosures and Full Enclosures are proposed on the Project Roads such that the noise level would be reduced to fulfil the EIAO requirements for RIW sites at: <ul style="list-style-type: none"> • Sau Mau Ping Road and Lin Tak Road, • J/O Clear Water Bay Road and On Sau Road and • New Clear Water Bay Road and Shun Lee Tsuen Road 	Project roads	CEDD/Contractor			✓		EIAO-TM

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	•							
Water Quality Impact (Construction Phase)								
6.9.1 - 6.9.13	<p><u>Construction Site Run-off and General Construction Activities</u></p> <p><i>Boring and Drilling Water</i></p> <ul style="list-style-type: none"> Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities. <p><i>Wheel Washing Water</i></p> <ul style="list-style-type: none"> All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfill to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. <p><i>Rubbish and Litter</i></p> <ul style="list-style-type: none"> Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis. <p><i>Construction Site Run-off</i></p> <ul style="list-style-type: none"> The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed as far as practicable to minimise surface run-off and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impact. Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities 	All works areas	CEDD/Contractor		✓			<p>ProPECC PN 1/94 Construction Site Drainage</p> <p>TM-DSS</p> <p>Water Pollution Control Ordinance</p>

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>such as sand traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided on site boundaries where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.</p> <ul style="list-style-type: none"> • Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage should comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distance of 100m should be maintained between the discharge points of construction site run-off and the existing saltwater intakes. No effluent will be discharged into typhoon shelter. • Construction works should be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces should be covered e.g. by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. • Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary. • Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater 							

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.</p> <ul style="list-style-type: none"> Construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system. Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis. <p><i>Site Effluent</i></p> <ul style="list-style-type: none"> There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the relevant WPCO licence which is under the ambit of regional office (RO) of EPD. 							
6.9.14 - 6.9.16	<p><u>Accidental Spillage and Potential Contamination of Surface Water and Groundwater</u></p> <ul style="list-style-type: none"> Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations 	All works areas	CEDD/Contractor		✓			<p>Waste Disposal Ordinance</p> <p>Waste Disposal (Chemical Waste)</p>

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for control of chemical wastes.</p> <ul style="list-style-type: none"> Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges. Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul style="list-style-type: none"> Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 							<p>(General) Regulation</p> <p>The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</p>
6.9.17 - 6.9.18	<p><u>Sewage Effluent from Construction Workforce</u></p> <ul style="list-style-type: none"> The construction workforce on site will generate sewage. It is recommended to provide sufficient chemical toilets in the works areas. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment. Regular environmental audit of the construction site will provide an effective control of any malpractices and can encourage continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the project would not cause water 	All works areas	CEDD/Contractor		✓			Water Pollution Control Ordinance

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	pollution problem after undertaking all required measures.							
6.9.19	<p><u>Construction Works in Close Proximity of Inland Waters</u></p> <ul style="list-style-type: none"> The practices outlined in ETWB TC (Works) No. 5/2005 "Protection of natural streams/rivers from adverse impacts arising from construction works" should also be adopted where applicable to minimize the water quality impacts upon any natural streams or surface water systems. Relevant mitigation measures from the ETWB TC (Works) No. 5/2005 are listed below: <ul style="list-style-type: none"> Construction works close to the inland waters should be carried out in dry season as far as practicable where the flow in the surface channel or stream is low. The use of less or smaller construction plants may be specified in areas close to the water courses to reduce the disturbance to the surface water. Temporary storage of materials (e.g. equipment, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works. Stockpiling of construction materials and dusty materials should be covered and located away from any water courses. Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers. Proper shoring may need to be erected in order to prevent soil or mud from slipping into the watercourses. 	All works areas	CEDD/Contractor		✓			Water Pollution Control Ordinance
Water Quality Impact (Operational Phase)								
6.9.20 - 6.9.23	<ul style="list-style-type: none"> Best Management Practices (BMPs) to reduce storm water and non-point source pollution have been proposed for the RIW as follows: <p><i>Design Measures</i></p> <ul style="list-style-type: none"> Exposed surface shall be avoided within the RIW sites to minimize soil erosion. The development site shall be either hard paved or 	All works areas	CEDD/HyD	✓		✓		Water Pollution Control Ordinance

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>covered by landscaping area where appropriate.</p> <ul style="list-style-type: none"> The streams and channelized nullahs near the RIW sites will be retained to maintain the original flow path. The drainage system will be designed to avoid flooding. Green areas / tree / shrub planting etc. will be introduced along roadside amenity strips and central dividers as far as possible, which can help to reduce soil erosion. Evergreen trees species, which in general generate relatively smaller amount of fallen leaves, should be selected where possible. <p><i>Devices/ Facilities to Control Pollution</i></p> <ul style="list-style-type: none"> Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system. Road gullies with standard design and silt traps and oil interceptors should be incorporated during the detailed design to remove particles present in stormwater runoff, where appropriate. <p><i>Administrative Measures</i></p> <ul style="list-style-type: none"> Good management measures such as regular cleaning and sweeping of road surface/ open areas are suggested. The road surface/ open area cleaning should also be carried out prior to occurrence rainstorm. Manholes, as well as stormwater gullies, ditches provided at the Project sites should be regularly inspected and cleaned (e.g. monthly). Additional inspection and cleansing should be carried out before forecast heavy rainfall. 							
Waste Management Implication (Construction Phase)								
7.6.1 – 7.6.3	<p><u>Good Site Practices</u></p> <ul style="list-style-type: none"> Appropriate waste handling, transportation and disposal methods for all waste arising generated during the construction works for the Project should be implemented to ensure that construction wastes do not enter the nearby streams or drainage channel. It is anticipated that adverse impacts would not arise on the 	All works areas	CEDD/Contractor		✓			<p>Waste Disposal Ordinance</p> <p>DEVB TCW No. 6/2010, ETWB TCW No. 19/2005</p>

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>construction site, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> - Nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility. - Training of site personnel in proper waste management and chemical waste handling procedures. - Provision of sufficient waste reception/ disposal points, of a suitable vermin-proof design that minimises windblown litter. - Arrangement for regular collection of waste for transport off-site and final disposal. - Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. - A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed. - A Waste Management Plan should be prepared and should be submitted to the Engineer for approval. One may make reference to <i>ETWB TCW No. 19/2005</i> for details. <ul style="list-style-type: none"> • In order to monitor the disposal of C&D materials at landfills and public filling areas, as appropriate, and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements to be implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. One may take reference to <i>DEVB TCW No.6/2010</i> for details. 							
7.6.4 – 7.6.5	<p><u>Waste Reduction Measures</u></p> <ul style="list-style-type: none"> • Good management and control of construction site activities/ 	All works areas	CEDD/Contractor	✓	✓			Waste Disposal Ordinance

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>processes can minimise the generation of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> - Segregate and store different types of construction related waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. - Provide separate labelled bins to segregate recyclable waste such as aluminium cans from other general refuse generated by the work force, and to encourage collection by individual collectors. - Any unused chemicals or those with remaining functional capacity shall be recycled. - Maximising the use of reusable steel formwork to reduce the amount of C&D materials. - Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill. - Adopt proper storage and site practices to minimise the potential for damage to, or contamination of, construction materials. - Plan the delivery and stock of construction materials carefully to minimise the amount of waste generated. - Minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering. <ul style="list-style-type: none"> • In addition to the above measures, other specific mitigation measures are recommended below to minimise environmental impacts during handling, transportation and disposal of wastes. 							ETWB TCW No. 19/2005
7.6.6 – 7.6.8	<p><u>Construction and Demolition Materials</u></p> <ul style="list-style-type: none"> • The C&D materials generated from site clearance, demolition of existing roads, slope excavation works, and construction of new 	All works areas	CEDD/Contractor		✓			Waste Disposal Ordinance Waste Disposal

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>roads, retaining wall and piling works should be sorted on-site into inert C&D materials (that is, public fill) and C&D waste. To minimise the impact resulting from collection and transportation of C&D materials as far as practicable. C&D waste, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed to landfill. A suitable area should be designated within the site for temporary stockpiling of C&D materials and to facilitate the sorting process. Within the stockpile areas, the following measures should be taken to control potential environmental impacts or nuisance:</p> <ul style="list-style-type: none"> - Waste such as soil should be handled and stored well to ensure secure containment; - Covering material during heavy rainfall; - Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; - Locating stockpiles to minimise potential visual impacts; and - Minimising land intake of stockpile areas as far as possible. <p><u>General Refuse</u></p> <ul style="list-style-type: none"> • General refuse should be stored in enclosed bins or compaction units separate from C&D materials. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D materials. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. <p><u>Chemical Wastes</u></p> <ul style="list-style-type: none"> • If chemical wastes were to be produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer, and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the 						<p>(Chemical Waste) (General) Regulation</p> <p>Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation</p> <p>Land (Miscellaneous Provisions) Ordinance</p> <p>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</p> <p>Packaging, Labelling and Storage of Chemical Wastes</p>	

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	corresponding chemical characteristics of the waste such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport the chemical wastes. The licensed collector shall deliver the waste to the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.							
Waste Management Implication (Operational Phase)								
N/A	N/A	N/A	N/A					
Land Contamination (Construction Phase)								
N/A	N/A	N/A	N/A					
Land Contamination (Operational Phase)								
N/A	N/A	N/A	N/A					
Ecological Impact (Terrestrial) (Construction Phase)								
9.13.2-9.13.5	<p>Measures to Avoid/ Minimize Impacts to Flora Species of Conservation Importance</p> <ul style="list-style-type: none"> • Within the Project Site boundary, two flora species of conservation importance (Incense Tree and Luofushan Joint-fir) would be subject to direct impacts. A detailed vegetation survey should be conducted by a qualified ecologist / botanist within the Project Site boundary. • A Transplantation Proposal should be prepared by a qualified ecologist / botanist with detailed findings of the vegetation survey (i.e. number and locations of the affected individuals, assessment of the suitability and / or practicality of the transplantation) and locations of receptor site(s), transplantation methodology, implementation programme of transplantation, post-transplantation monitoring and maintenance programme. The proposal should be submitted to and approved by AFCD prior to commencement of any works (including ground investigation. The approved transplantation works should be supervised by a qualified botanist / horticulturist / Certified Arborist with relevant experience in transplanting flora species of conservation importance. After transplantation, a 3-year monitoring and maintenance programme 	All works areas	CEDD/Contractor		✓			EIAO-TM

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>of the transplanted species should be conducted to ensure the establishment of the transplanted trees.</p> <ul style="list-style-type: none"> Hoarding or fencing should be erected around the works areas during the construction phase to restrict access, to adjacent habitats supporting flora species of conservation importance, by site workers and to reduce human disturbance. 							
9.13.6-9.13.8	<p>Measures to Avoid/ Minimize Habitat Loss to Woodland and Plantation</p> <ul style="list-style-type: none"> Habitat loss could be avoided in the first instance by retaining existing vegetation wherever possible, particularly mature and semi-mature trees present within the works areas. Any trees retained should be adequately protected during construction phase to promote their health and longevity. Areas which would be temporarily affected by construction activities (i.e. slope works) should be reinstated after completing the construction works. Hoarding or fencing should be erected around the works areas during construction phase to restrict access to natural habitats adjacent to works areas by site workers. 	All works areas	CEDD/Contractor	✓	✓			EIAO-TM
9.13.9-9.13.12	<p>Measures to Minimise Disturbance from Construction Activities</p> <ul style="list-style-type: none"> Construction dust should be suppressed to avoid and minimize the dust covering leaves of plants that would affect their photosynthesis, and thus their health and growth: <ul style="list-style-type: none"> Regular spraying of haul roads. Proper storage of construction materials. Covering trucks or transporting wastes in enclosed containers to minimize windblown litter and dust during transportation of waste. Noise impact during construction phase should be avoided and minimized to reduce the disturbance to the habitats adjacent to the works areas: <ul style="list-style-type: none"> Machines and plant (e.g. trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines and plants known to emit strong directional noise 	All works areas	CEDD/Contractor		✓			EIAO-TM

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>should, wherever possible, be orientated so that the noise is directed away from the nearby habitats.</p> <ul style="list-style-type: none"> - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. - Using Quiet Mechanical Plant (QMP) to limit noise emissions at source. - QMP and other machines and plants (e.g. air compressors, concrete pumps) should be covered by noise enclosure to further reduce noise impact. <ul style="list-style-type: none"> • Through night-time lighting control during construction phase, glare disturbance to wildlife would be controlled. 							
9.13.13	<p>Measures to Minimise Pollution to Watercourses</p> <ul style="list-style-type: none"> • Good site practices should be adopted to avoid any pollution from entering the watercourses. Practices to minimize surface runoff and to reduce suspended solid levels should be undertaken. - Drainage arrangements should include sediment traps to collect and control construction run-off. - All works and storage area should be restricted to the site boundary. - General refuse and construction wastes should be collected and disposed of in a timely and appropriate manner. - Regular check of the construction boundary to avoid unmitigated impacts imposed on nearby watercourse. 	All works areas	CEDD/Contractor		✓			EIAO-TM
Ecological Impact (Terrestrial) (Operational Phase)								
9.13.14	<p>Measures to Minimize Impacts from Noise Barriers</p> <ul style="list-style-type: none"> • During the operational phase, the road networks and associated noise barriers may result in bird collision and mortality. Mitigation measures such as use of tinted materials and superimposing dark patterns or strips on the barrier, as per EPD / Highways Department requirements would be employed to minimise incidents 	All works areas	CEDD/Contractor			✓		EIAO-TM

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	of mortality from collision.							
Landscape and Visual (Construction Phase)								
10.10.4 (Table 10.9)	All existing trees to be retained shall be carefully protected during construction.	All works areas	CEDD/Contractor	✓	✓			DEVB TC (W) No.10/2013
10.10.4 (Table 10.9)	Tree Transplantation Detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWB TCW No. 29/2004, DEVB TC (W) No.7/2015 and “ Guidelines on Tree Transplanting ”, GLTMS of DEVB.	All works areas	CEDD/Contractor	✓	✓			ETWB TCW No. 29/2004 DEVB TC (W) No.7/2015 Guidelines on Tree Transplanting, GLTMS of DEVB
10.10.4 (Table 10.9)	Erection of decorative screen hoarding for reducing visual impacts	All works areas	CEDD/Contractor		✓			EIAO-TM
10.10.4 (Table 10.9)	Measures to avoid / minimize impacts to flora species of conservation importance.	All works areas	CEDD/Contractor	✓	✓			EIAO-TM
Landscape and Visual (Operational Phase)								
10.10.4 (Table 10.10)	Compensatory tree planting for loss of existing trees (Compensation for loss of road side amenity)	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD/LCSD	✓	✓	✓		DEVB TC (W) No.7/2015 GEO publication No. 1/2011
10.10.4 (Table 10.10)	Compensatory woodland planting	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD/ArchSD	✓	✓	✓		DEVB TC (W) No.7/2015 GEO publication No. 1/2011

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
10.10.4 (Table 10.10)	Compensatory shrub mix planting	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD	✓	✓	✓		DEVB TC (W) No.7/2015 GEO publication No. 1/2011
10.10.4 (Table 10.10)	Hydro-seeding planting with shrub seed mix	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD	✓	✓	✓		DEVB TC (W) No.7/2015 GEO publication No. 1/2011
10.10.4 (Table 10.10)	Tall buffer advance screen tree / shrub / climber planting	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD	✓	✓	✓		DEVB TC (W) No.7/2015 GEO publication No. 1/2011
10.10.4 (Table 10.10)	Planting of road verges, central divider and around structures	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD, LCSD	✓	✓	✓		ETWB(W) No. 2/2004 Subject to ACABAS approval
10.10.4 (Table 10.10)	Reinstate modified watercourse	All works areas	Design and Construction Stage - CEDD Operational Stage - DSD	✓	✓	✓		EIAO-TM
10.10.4 (Table 10.10)	Provision of visually pleasing aesthetic treatment on noise barriers (with climbers provided if space available) and enclosures	All works areas	Design and Construction Stage - CEDD Operational Stage - HyD	✓	✓	✓		ETWB(W) No. 2/2004 Subject to ACABAS approval
10.10.4 (Table 10.10)	Hard Landscape Treatment Carriageway, Structures and Roadside Furniture (for example, pleasing aesthetic finishing of retaining wall)	All works areas	Design and Construction Stage - CEDD	✓	✓	✓		ETWB(W) No. 10/2005 Subject to

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
			Operational Stage – HyD/LCSD/ArchSD					ACABAS approval
10.10.4 (Table 10.10)	Planting of toe planters for slope enhancement	All works areas	Design and Construction Stage - CEDD Operational Stage – LCSD	✓	✓	✓		EIAO-TM GEO publication No. 1/2011
10.10.4 (Table 10.10)	Planting of berm planters/ planting strips for slope enhancement	All works areas	Design and Construction Stage - CEDD Operational Stage – HyD	✓	✓	✓		EIAO-TM GEO publication No. 1/2011
Landfill Gas Hazard (Construction Phase)								
11.9.2 - 11.9.4	<ul style="list-style-type: none"> Contractors shall note the possible presence of landfill gas in the ground (even if it is unlikely) and shall take this into account in the design, construction of the proposed works. A Safety Officer or an appropriately qualified person, trained in the use of gas detection equipment, landfill gas related hazards and the appropriate actions to take in the event of adverse circumstances, shall be present on site throughout the works, in particular, when works are undertaken below ground. The contractor shall take cognizance of the presence of surface water and leachate management system and landfill gas management systems near the proposed works area. The contractor shall take all reasonable care to avoid any damage, loss, injury, interruption or impairment of the integrity of the landfill facilities within the works limits, storage area and across road area. The contractor shall also liaise and seek EPD and their landfill contractor – Hong Kong Landfill Restoration Group Limited (HKLRG) agreement on site arrangement before carrying out the proposed work. 	Works areas within landfill consultation zones	CEDD/Contractor		✓	✓		EPD's Landfill Gas Hazard Assessment Guidance Note
11.9.5 - 11.9.11	<u>Safety Measures</u> <ul style="list-style-type: none"> The contractor shall be aware of, and inform all workers accordingly, that methane and carbon dioxide is always likely to be 	Works areas within landfill consultation zones	CEDD/Contractor		✓			EPD's Landfill Gas Hazard Assessment

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<p>present in the soil voids.</p> <ul style="list-style-type: none"> All personnel working on site and all visitors to the site be informed of the nearby landfill site and the possibility of landfill gas in the vicinity of the proposed works area. Safety warning notices shall be posted. No worker shall be allowed to work alone at any time inside the trenches or joint bays or near to any excavation. At least one other worker shall be available to assist in a rescue in an emergency case. Smoking and naked flames shall be strictly prohibited within the site or confined space if any. 'No Smoking' and 'No Naked Flame' notices shall be posted prominently at the site entrance and other conspicuous locations. All electrical equipment, such as motors and extension cords, shall be intrinsically safe. Adequate safety equipment shall be available at all times. This includes but is not limited to fire extinguishing equipment, breathing apparatus and personal protective equipment. In the event of working inside a confined space is required, sufficient approved resuscitation equipment, breathing apparatus and safety torches shall be available. Persons involved in or supervising such work shall be trained and practiced for the use of such equipment. A permit-to-work system for entry into confined space shall be established by an approved qualified person and consistently enforced. All relevant Ordinances, Legislations, Guidelines and Codes of Practice pertaining to work in confined space must be strictly adhered to. 							<p>Guidance Note</p> <p>Labour Department's Code of Practice for Safety and Health at Work in Confined Space</p>
11.9.12-11.9.16	<p><u>Monitoring</u></p> <ul style="list-style-type: none"> The works area shall be monitored periodically during construction for the presence of methane, carbon dioxide and oxygen using gas detection equipment. The gas detection equipment shall be an intrinsically safe portable instrument, appropriately calibrated and capable of measuring the following gases in the ranges indicated below: <p>– Methane 0 – 100% LEL and 0 – 100% v/v;</p>	Works areas within landfill consultation zones	CEDD/Contractor		✓			EPD's Landfill Gas Hazard Assessment Guidance Note

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	<ul style="list-style-type: none"> – Carbon dioxide 0 – 100%; and – Oxygen 0 – 21%. • During construction, monitoring of excavations shall be undertaken as follows: • For excavation deeper than 1 m, measurements shall be made: <ul style="list-style-type: none"> – At the ground surface before excavation commences; – Immediately before any worker enters an excavation; – At the beginning of each working day for the entire period the excavation remains open; and – Periodically through the working day whilst workers are in the excavation. • For excavation between 300 mm and 1 m deep, measurements shall be made: <ul style="list-style-type: none"> – Directly after the excavation has been completed; and – Periodically whilst the excavation remains open. • For excavation less than 300 mm, monitoring may be omitted at the discretion of the Safety Officer or other appropriate qualified person. • The monitoring frequency and area to be monitored shall be set down prior to commencement of ground works either by the Safety Officer or by an appropriately qualified person. • Monitoring should be undertaken by the Safety Officer or by an appropriately qualified person. The monitoring results shall be recorded and kept on site and shall be readily available at all times for inspection by the relevant authority. • Depending upon the results of measurements, actions will vary. Actions shall be set down by the Safety Officer or other appropriately qualified person prior to commencement of occupancy of the proposed works area. 							
Landfill Gas Hazard (Operational Phase)								

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Implementation Stage ⁽¹⁾				Relevant Legislation and Guidelines
				Des	C	O	Dec	
11.10.2 – 11.10.3	<ul style="list-style-type: none"> The presence of landfill gas should be assumed at all times by maintenance workers. All maintenance workers inspecting any manhole should be fully trained in the issue of landfill gas hazard. Any manhole which is large enough to permit to access to personnel should be subject to safe entry procedures. Working in confined spaces is controlled by the Factories and Industrial Undertakings (Confined Spaces) Regulations of the Factories and Industrial Undertakings Ordinance. Following the Code of Practice on Safety and Health at Work in Confined Spaces (Labour Department, Hong Kong) maintains compliance with the above regulations. A strictly regulated “work permit procedure” should be implemented and the relevant safety procedures must be rigidly followed. Adequate communication with maintenance staff should be maintained with respect to landfill gas hazard. Utility companies should undertake a landfill gas surveillance exercise at the utility manholes/inspection chambers. Undertaken using an intrinsically safe portable instrument, appropriately calibrated and capable of measuring the following gases in the ranges indicated: <ul style="list-style-type: none"> – Methane 0 – 100% LEL and 0 – 100% v/v; – Carbon dioxide 0 – 100%; and – Oxygen 0 – 21%. Undertaken for the duration of the site occupancy, or until such time that EPD agrees that surveillance is no longer required. Depending on the results of the measurements, actions required will vary and should be set down by appropriately qualified person. 	Works areas within landfill consultation zones	Maintenance contractor/Utility companies			✓		<p>EPD’s Landfill Gas Hazard Assessment Guidance Note</p> <p>Labour Department’s Code of Practice for Safety and Health at Work in Confined Space</p>

Note:

(1) Des = Design; C = Construction; O = Operation; Dec = Decommissioning



Appendix 4.1

Action and Limit Level

Action and Limit Level

Action and Limit Level for Noise Monitoring

Monitoring Station	Action Level	Limit Level (dB(A))		
		0700-1900 hrs on normal weekdays	0700-2300 hrs on holidays (including Sundays); and 1900-2300 hrs on all days ²	2300-0700 hrs of all days ²
NMC01	When one documented complaint is received	65 / 70 ¹	60 / 65 / 70 ³	45 / 50 / 55 ³
NMC02		75		
NMC03		75		
NMC04		75		
NMC05		75		

Remark 1: Limit level of NMC01 - Kei Shun Special School reduce to 65 dB (A) during examination periods if any.

Remark 2: Construction noise during restricted hours is under the control of Noise Control Ordinance Limit Level to be selected based on Area Sensitivity Rating.

Remark 3: Limit Level for restricted hour monitoring shall act as reference level only. Investigation would be conducted on CNP compliance if exceedance recorded during restricted hour noise monitoring period.

Baseline Level for Noise Monitoring

(For reference and calculation of Construction Noise Levels (CNLs))

Monitoring Station	Action Level	Baseline Level (dB(A))		
		0700-1900 hrs on normal weekdays	0700-2300 hrs on holidays (including Sundays); and 1900-2300 hrs on all days	2300-0700 hrs of all days
NMC01	When one documented complaint is received	69.3	69.0	66.6
NMC02		72.0	66.3	68.6
NMC03		78.2	77.9	73.8
NMC04		66.6	64.0	62.1
NMC05		61.8	59.8	57.9

All the Construction Noise Levels (CNLs) reported in this report were adjusted with the corresponding baseline level (i.e. Measured Leq – Baseline Leq = CNL), in order to facilitate the interpretation of the noise exceedance.

Action and Limit Level for Air Quality Monitoring

Monitoring Locations	1-hour TSP Level inµg/m3	
	Action Level	Limit Level
NCWBR_AMS-1	284.4	500.0
NCWBR_AMS-2	282.4	500.0
NCWBR_AMS-3	287.9	500.0
NCWBR_AMS-4	281.6	500.0
NCWBR_AMS-5	270.0	500.0
LTR_AMS-1	272.1	500.0
LTR_AMS-2	281.1	500.0
LTR_AMS-3	285.1	500.0

Action and Limit Level for Water Monitoring

Monitoring Station	Surface pH		Surface DO (mg/L)		Surface Turbidity (NTU)		Surface SS (mg/L)	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
E	-	-	-	-	-	-	-	-
F	Beyond the range of 6.6-8.4	Beyond the range of 6.5-8.5	5.8	5.5	24.4	32.7	17.0	23.8
H	-	-	-	-	-	-	-	-
I	Beyond the range of 6.6-8.4	Beyond the range of 6.5-8.5	5.5	5.4	206.9	214.2	172.8	201.4

***Remarks:**

The value of 1.0mg/L was taken as the value for measurement with suspended solid level of <1.0mg/L for Action and Limit level calculation.

It is recommended that upstream monitoring station (monitoring station E and H) would be taken as control reference for exceedance investigation only. Action and limit level would not be establish using the baseline data.



Appendix 4.2

Copies of Calibration Certificates





Met One Instruments, Inc.
 1600 NW Washington Blvd, Grants Pass, OR
 TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645
 Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info	Model:	<u>BT-645</u>	81865 Firmware Rev:	<u>1.1.0</u>
	Serial Number:	<u>R22586</u>	81113	<u>0.2.4</u>
	Calibrated By:	<u>Kevin Ricks</u> 	Cal. Date:	<u>12/9/16</u>
	Quality Inspector:		Date:	<u>DEC 14 2016</u>
	Calibration Hz/ $\mu\text{g}/\text{m}^3$:	<u>6.99</u>		

Final Test				
	Flow (2.0 L/M):	Pass	Ambient T (C)	<u>23</u>
			RH, %	<u>41</u>
	Serial Communication:	Pass		
	BT-645 Conc.:	<u>401</u>	Standard Conc.:	<u>400</u>

Calibration Standards				
Standards	Manufacturer	Model	SN	Cal Due
RMS Multimeter	Fluke	289 Multimeter	23740018	4/26/2017
RH & TEMPERATURE	Met One Instruments	083E-1-6	R20313	9/13/2017
Primary Flow Meter	BIOS	Defender-510	133419	3/18/2017
Digital Dust Indicator	SIBATA	LD-3	476795	3/11/2017

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications. The Calibration system complies with MIL-STD-45662A.



1600 Washington Blvd
 Grants Pass, OR 97526
 (541) 471-7111
 (541) 471-7116 (Fax)
 Service@metone.com

**Met One
 Instruments**

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ASTM and JIS.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# Aerocet 831 Instrument Serial# W14016
 Date of Calibration 4/19/2018 Sensor # 16206

Darleen Best *AT7* Calibration Technician AT21 Quality Check

Temperature 23 °C Relative Humidity 31 %

Test Procedure: **Aerocet 831-6100**

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	183039	03/31/2020
0.5	Pass	± 10%	180556	02/28/2020
1.0	Pass	± 10%	169240	5/31/2019
2.5	Pass	± 10%	181944	3/31/2020
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Particle Counter	GT-526	M1762	7/31/2018
Flowmeter	DCL-M	103751	1/29/2019
DMM	289	27720071	6/15/2018
RH/TEMP SENSOR	083E-1-6	R20313	9/18/2018

This calibration certificate shall not be reproduced except in full, without the written approval of Met One Instruments Inc.




1600 Washington Blvd
 Grants Pass, OR 97526
 (541) 471-7111
 (541) 471-7116 (Fax)
 Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# Aerocet 831 Instrument Serial# W15448
 Date of Calibration 6/14/2018 Sensor # 16438
Darleen Best Calibration Technician  Quality Check

Temperature 23.5 °C Relative Humidity 38 %

Test Procedure: Aerocet 831-6100

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	183039	03/31/2020
0.5	Pass	± 10%	180556	02/28/2020
1.0	Pass	± 10%	169240	5/31/2019
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Particle Counter	GT-526	M1762	7/31/2018
Flowmeter	DCL-M	103751	1/29/2019
DMM	289	27720071	6/15/2018
RH/TEMP SENSOR	083E-1-6	R20313	9/18/2018

This calibration certificate shall not be reproduced except in full, without the written approval of Met One Instruments Inc.



1600 Washington Blvd
 Grants Pass, OR 97526
 (541) 471-7111
 (541) 471-7116 (Fax)
 Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# Aerocet 831

Instrument Serial# W15449

Date of Calibration 10/4/2018

Sensor # 16439

Darleen Best *AT7*

AT25

Calibration Technician

Quality Check

Temperature 23 °C

Relative Humidity 36.5 %

Test Procedure: **Aerocet 831-6100**

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	183039	03/31/2020
0.5	Pass	± 10%	180556	02/28/2020
1.0	Pass	± 10%	169240	5/31/2019
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Particle Counter	GT-526	M1760	10/9/2018
Flowmeter	DCL-M	103751	1/29/2019
DMM	289	27720071	6/29/2019
RH/TEMP SENSOR	083E-1-6	R20313	9/18/2019

This calibration certificate shall not be reproduced except in full, without the written approval of Met One Instruments Inc.



1600 Washington Blvd
 Grants Pass, OR 97526
 (541) 471-7111
 (541) 471-7116 (Fax)
 Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# Aerocet 831 Instrument Serial# W16848

Date of Calibration 8/3/2018 Sensor # 16574

Darleen Best AT7

AT₂₅

Calibration Technician

Quality Check

Temperature 23.5 °C

Relative Humidity 41 %

Test Procedure: **Aerocet 831-6100**

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	183039	03/31/2020
0.5	Pass	± 10%	180556	02/28/2020
1.0	Pass	± 10%	169240	5/31/2019
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Particle Counter	GT-526	M1760	10/9/2018
Flowmeter	DCL-M	103751	1/29/2019
DMM	289	32270055	9/21/2018
RH/TEMP SENSOR	083E-1-6	R20313	9/18/2018

This calibration certificate shall not be reproduced except in full, without the written approval of Met One Instruments Inc.



Met One Instruments, Inc.
 1600 NW Washington Blvd, Grants Pass, OR
 TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645
 Particulate Monitor

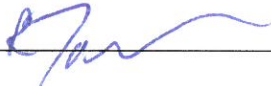
Recommended calibration interval is 24 months from first day of use.

Unit Info

Model: BT-645 81865-1 Firmware Rev: 1.1.0

Serial Number: X19295 1.0.1

Calibrated By: R. von Krohn Cal. Date: 7/27/2018

Quality Inspector:  Date: 7-27-2018

Calibration Hz/μg/m³: 5.9

Final Test

Flow (2.0 L/M): Pass Ambient T (C) 24.8

RH, % 39

Serial Communication: Pass

BT-645 Conc.: 400.12 Standard Conc: 399.67

Calibration Standards

Standards	Manufacturer	Model	SN	Cal Due
DMM Multimeter	Fluke	189 Multimeter	94060816	8/28/2018
RH & TEMPERATURE	Met One Instruments	083E-1-35	R17149	July 28, 2018
BAROMETRIC PRESSURE	Met One Instruments	092	P22757	April 2, 2019
Primary Flow Meter	BIOS	DC-Lite	R537	May 29, 2019
LD-3B	SIBATA	LD-3B	6X7759	Nov 17, 2018

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications. The Calibration system complies with MIL-STD-45662A.



Met One Instruments, Inc.
 1600 NW Washington Blvd, Grants Pass, OR
 TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645
Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info

Model: BT-645 **81865-1** **Firmware Rev:** 1.1.0
Serial Number: X19296 1.0.1
Calibrated By: R. von Krohn **Cal. Date:** 7/27/2018
Quality Inspector: *[Signature]* **Date:** 7-27-2018
Calibration Hz/μg/m³: 6.1

Final Test

Flow (2.0 L/M): Pass **Ambient T (C)** 24.8
RH, % 39
Serial Communication: Pass
BT-645 Conc.: 416.59 **Standard Conc:** 412.22

Calibration Standards

Standards	Manufacturer	Model	SN	Cal Due
DMM Multimeter	Fluke	189 Multimeter	94060816	8/28/2018
RH & TEMPERATURE	Met One Instruments	083E-1-35	R17149	July 28, 2018
BAROMETRIC PRESSURE	Met One Instruments	092	P22757	April 2, 2019
Primary Flow Meter	BIOS	DC-Lite	R537	May 29, 2019
LD-3B	SIBATA	LD-3B	6X7759	Nov 17, 2018

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications. The Calibration system complies with MIL-STD-45662A.




Met One Instruments, Inc.
 1600 NW Washington Blvd, Grants Pass, OR
 TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645
Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info	Model:	<u>BT-645</u>	81865-1	Firmware Rev:	<u>1.1.0</u>
	Serial Number:	<u>X19297</u>			<u>1.0.1</u>
	Calibrated By:	<u>R. von Krohn</u>		Cal. Date:	<u>7/27/2018</u>
	Quality Inspector:	<u></u>		Date:	<u>7-27-2018</u>
	Calibration Hz/μg/m ³ :	<u>5.8</u>			

Final Test			
Flow (2.0 L/M):	Pass	Ambient T (C)	<u>24.8</u>
		RH, %	<u>39</u>
Serial Communication:	Pass		
BT-645 Conc.:	<u>421.14</u>	Standard Conc.:	<u>413.04</u>

Standards	Manufacturer	Model	SN	Cal Due
DMM Multimeter	Fluke	189 Multimeter	94060816	8/28/2018
RH & TEMPERATURE	Met One Instruments	083E-1-35	R17149	July 28, 2018
BAROMETRIC PRESSURE	Met One Instruments	092	P22757	April 2, 2019
Primary Flow Meter	BIOS	DC-Lite	R537	May 29, 2019
LD-3B	SIBATA	LD-3B	6X7759	Nov 17, 2018

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications. The Calibration system complies with MIL-STD-45662A.




Met One Instruments, Inc.
 1600 NW Washington Blvd, Grants Pass, OR
 TEL (541) 471-7111 Fax (541) 471-7116

Certificate of Calibration

BT-645
Particulate Monitor

Recommended calibration interval is 24 months from first day of use.

Unit Info	Model:	<u>BT-645</u>	81865-1	Firmware Rev:	<u>1.1.0</u>
	Serial Number:	<u>X19298</u>			<u>1.0.1</u>
	Calibrated By:	<u>R. von Krohn</u>		Cal. Date:	<u>7/27/2018</u>
	Quality Inspector:			Date:	<u>7-27-2018</u>
	Calibration Hz/ $\mu\text{g}/\text{m}^3$:	<u>7.7</u>			

Final Test			
Flow (2.0 L/M):	Pass	Ambient T (C)	<u>24.8</u>
		RH, %	<u>39</u>
Serial Communication:	Pass		
BT-645 Conc.:	<u>413.48</u>	Standard Conc:	<u>412.22</u>

Calibration Standards

Standards	Manufacturer	Model	SN	Cal Due
DMM Multimeter	Fluke	189 Multimeter	94060816	8/28/2018
RH & TEMPERATURE	Met One Instruments	083E-1-35	R17149	July 28, 2018
BAROMETRIC PRESSURE	Met One Instruments	092	P22757	April 2, 2019
Primary Flow Meter	BIOS	DC-Lite	R537	May 29, 2019
LD-3B	SIBATA	LD-3B	6X7759	Nov 17, 2018

The standards used for this calibration have accuracy equal to or greater than the instrument tested. These standards are on record and traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated, all instruments are calibrated to meet the manufacturer's published specifications. The Calibration system complies with MIL-STD-45662A.


REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 15/5/2018
 REPORT NO. : HK1810475

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : Portable Dust Monitor
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : BT 645
 SERIAL NO. : R22586
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 13/5/2018

STANDARD EQUIPMENT

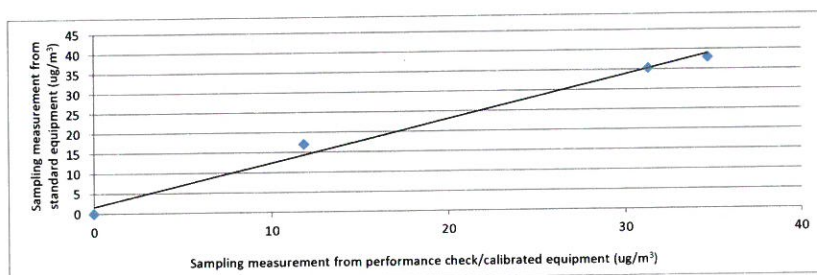
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 27/4/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	13/5/2018,2:00:00 PM	28	1011	0	0
1	13/5/2018,3:36:00 PM	28	1011	38	35
2	13/5/2018,4:42:00 PM	28	1011	35	31
3	13/5/2018,5:35:00 PM	28	1011	17	12

Linear Regression of Y on X

Slope (K- factor) : 1.1000
 Correlation Coefficient : 0.9942
 Validity of Performance Check / Calibration Record : 13/5/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: MA Ching Him, Jackey Signature: Date: 13/5/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 15/5/2018



REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 13/5/2018
 REPORT NO. : HK1810447

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : AEROSOL MASS MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : AEROCET - 831
 SERIAL NO. : W14016
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 11/5/2018

STANDARD EQUIPMENT

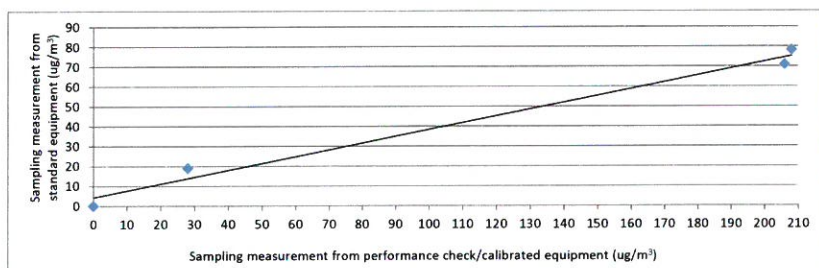
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 27/4/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	11/5/2018, 9:00:00 AM	24	1014	0	0
1	11/5/2018, 10:05:00 AM	24	1014	78	208
2	11/5/2018, 11:29:00 AM	24	1014	71	206
3	11/5/2018, 12:35:00 AM	24	1014	19	28

Linear Regression of Y on X

Slope (K- factor) : 0.3400
 Correlation Coefficient : 0.9925
 Validity of Performance Check / Calibration Record : 11/5/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: MA Ching Him, Jackey Signature: Date: 11/5/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 13/5/2018



REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 27/6/2018
 REPORT NO. : HK1810626

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : AEROSOL MASS MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : AEROCET - 831
 SERIAL NO. : W15448
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 26/6/2018

STANDARD EQUIPMENT

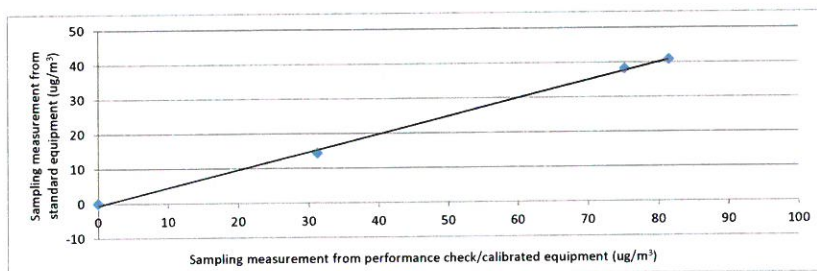
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 27/4/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	26/6/2018, 8:15:00 AM	29.2	1011	0	0
1	26/6/2018, 9:59:00 AM	29.2	1011	38	75
2	26/6/2018, 11:06:00 AM	29.2	1011	41	82
3	26/6/2018, 12:11:00 PM	29.2	1011	14	31

Linear Regression of Y on X

Slope (K- factor) : 0.5100
 Correlation Coefficient : 0.9994
 Validity of Performance Check / Calibration Record : 26/6/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: *Natalie Lau* Date: 26/6/2018

Checked by: Wong Po Yan, Pauline Signature: *Pauline Wong* Date: 27/6/2018



REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 24/10/2018
 REPORT NO. : HK1811054

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : AEROSOL MASS MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : AEROCET - 831
 SERIAL NO. : W15449
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 23/10/2018

STANDARD EQUIPMENT

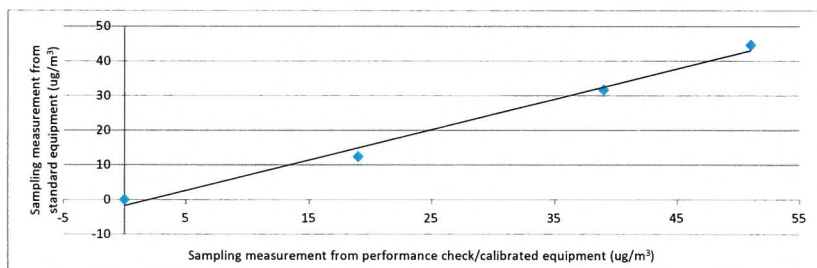
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 25/7/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	23/10/2018,9:05:00 AM	25.3	1017	0	0
1	23/10/2018,10:20:00 AM	25.3	1017	45	51
2	23/10/2018,11:22:00 AM	25.3	1017	32	39
3	23/10/2018,12:29:00 PM	25.3	1017	12	19

Linear Regression of Y on X

Slope (K- factor) : 0.8800
 Correlation Coefficient : 0.9945
 Validity of Performance Check / Calibration Record : 23/10/2019



- Notes :
1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: Date: 23/10/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 24/10/2018

**REPORT OF PERFORMANCE CHECK / CALIBRATION**

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 16/8/2018
 REPORT NO. : HK1810819

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : AEROSOL MASS MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : AEROCET - 831
 SERIAL NO. : W16848
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 15/8/2018

STANDARD EQUIPMENT

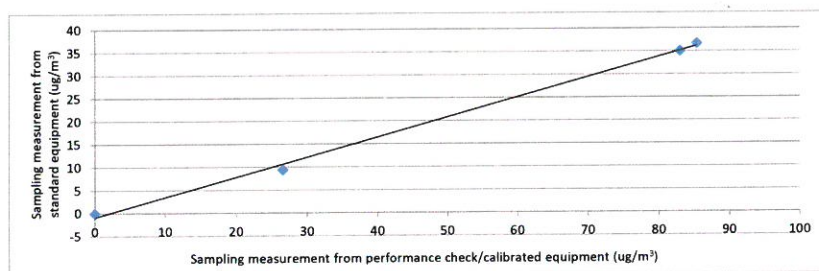
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 25/7/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	15/8/2018,9:05:00 AM	28.2	999	0	0
1	15/8/2018,10:20:00 AM	28.2	999	37	85
2	15/8/2018,11:22:00 AM	28.2	999	35	83
3	15/8/2018,12:29:00 PM	28.2	999	9	27

Linear Regression of Y on X

Slope (K- factor) : 0.4400
 Correlation Coefficient : 0.9988
 Validity of Performance Check / Calibration Record : 15/8/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: *Natalie Lau* Date: 15/8/2018

Checked by: Wong Po Yan, Pauline Signature: *Pauline Wong* Date: 16/8/2018


REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 16/8/2018
 REPORT NO. : HK1810826

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : PARTICULATE MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : BT 645
 SERIAL NO. : X19295
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 16/8/2018

STANDARD EQUIPMENT

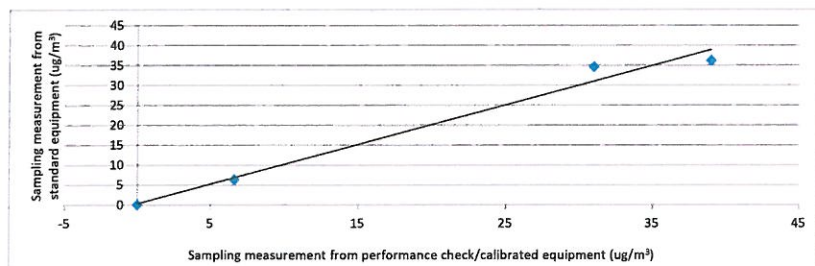
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 25/7/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	16/8/2018, 8:30:00 AM	27.8	1000	0	0
1	16/8/2018, 2:16:00 PM	27.8	1000	36	39
2	16/8/2018, 3:21:00 PM	27.8	1000	35	31
3	16/8/2018, 4:24:00 PM	27.8	1000	6	7

Linear Regression of Y on X

Slope (K- factor) : 1.0000
 Correlation Coefficient : 0.9901
 Validity of Performance Check / Calibration Record : 16/8/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: Date: 16/8/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 16/8/2018


REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 16/8/2018
 REPORT NO. : HK1810827

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : PARTICULATE MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : BT 645
 SERIAL NO. : X19296
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 16/8/2018

STANDARD EQUIPMENT

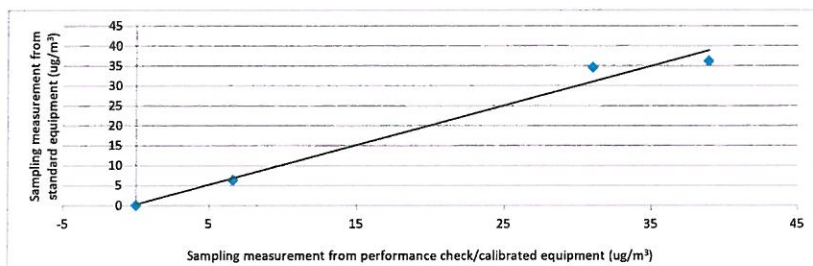
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 25/7/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	16/8/2018,8:30:00 AM	27.8	1000	0	0
1	16/8/2018,2:16:00 PM	27.8	1000	36	39
2	16/8/2018,3:21:00 PM	27.8	1000	35	31
3	16/8/2018,4:24:00 PM	27.8	1000	6	7

Linear Regression of Y on X

Slope (K- factor) : 1.0000
 Correlation Coefficient : 0.9904
 Validity of Performance Check / Calibration Record : 16/8/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: Date: 16/8/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 16/8/2018


REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 22/8/2018
 REPORT NO. : HK1810828

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : PARTICULATE MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : BT 645
 SERIAL NO. : X19297
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 17/8/2018

STANDARD EQUIPMENT

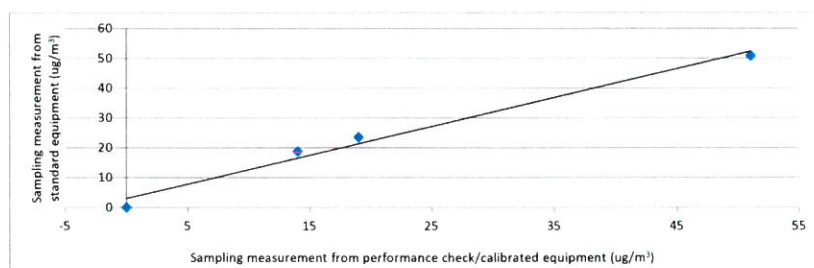
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 25/7/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	17/8/2018, 7:20:00 AM	28	1005	0	0
1	17/8/2018, 8:24:00 PM	28	1005	51	51
2	17/8/2018, 9:26:00 PM	28	1005	24	19
3	17/8/2018, 10:28:00 PM	28	1005	19	14

Linear Regression of Y on X

Slope (K- factor) : 1.0000
 Correlation Coefficient : 0.9921
 Validity of Performance Check / Calibration Record : 17/8/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: Date: 17/8/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 22/8/2018


REPORT OF PERFORMANCE CHECK / CALIBRATION

PROJECT NAME : PERFORMANCE CHECK / CALIBRATION OF DUST METER
 DATE OF ISSUE : 22/8/2018
 REPORT NO. : HK1810829

PERFORMANCE CHECK / CALIBRATED EQUIPMENT

TYPE : PARTICULATE MONITOR
 MANUFACTURER : MET ONE INSTRUMENTS
 MODEL NO. : BT 645
 SERIAL NO. : X19298
 EQUIPMENT NO. : ---
 PERFORMANCE CHECK / CALIBRATION DATE : 17/8/2018

STANDARD EQUIPMENT

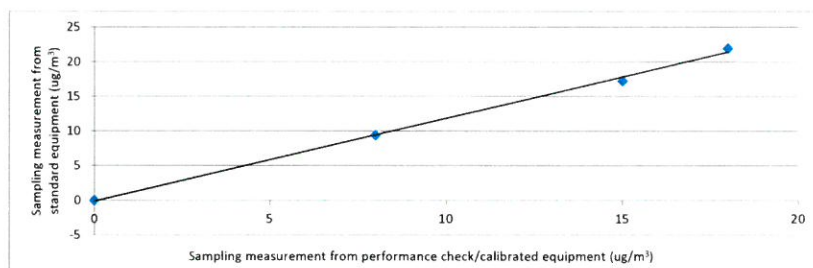
TYPE : HIGH VOLUME AIR SAMPLER
 MANUFACTURER : TISCH
 MODEL NO. : TE-5170
 EQUIPMENT REF NO. : PTL_HV002
 LAST CALIBRATION DATE : 25/7/2018

EQUIPMENT PERFORMANCE CHECK / CALIBRATION RESULTS:

Trial no. in 1-hr period	Time	Mean Temp (C)	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard equipment) (Y - Axis)	Concentration in ug/m ³ (Performance Check / Calibrated equipment) (X - Axis)
Zero Check ¹	17/8/2018,4:50:00 PM	28	1005	0	0
1	17/8/2018,5:52:00 PM	28	1005	22	18
2	17/8/2018,6:58:00 PM	28	1005	17	15
3	17/8/2018,8:00:00 PM	28	1005	9	8

Linear Regression of Y on X

Slope (K- factor) : 1.2000
 Correlation Coefficient : 0.9988
 Validity of Performance Check / Calibration Record : 17/8/2019



- Notes : 1. Zero check conducted as per CAL003 SOP and manufacturer's manual as appropriate.
 2. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 3. Performance Check / Calibration result relates to performance check / calibration item(s) as received.

Operator: Lau, Natalie Signature: Date: 17/8/2018

Checked by: Wong Po Yan, Pauline Signature: Date: 22/8/2018



CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0322 01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	Larson Davis	PCB
Type/Model No.:	LxT1	377B02
Serial/Equipment No.:	0003737	171529
Adaptors used:	-	-

Item submitted by

Customer Name: Lam Geotechnics Ltd.
Address of Customer: -
Request No.: -
Date of receipt: 22-Mar-2018

Date of test: 28-Mar-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 50 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Feng Jun Qi

Date: 06-Apr-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0322 01 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	2.2
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
Linearity range for SPL	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	N/A	N/A	
	R.M.S. accuracy	Crest factor of 3	Pass	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Fung Chi Yip
28-Mar-2018

Checked by:

Lam Tze Wai
06-Apr-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0322 02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	Honglim Co., Ltd.	-
Type/Model No.:	HLES-01	CDM101
Serial/Equipment No.:	201692136	05866
Adaptors used:	-	-

Item submitted by

Customer Name:	Lam Environmental Service Ltd.
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Mar-2018

Date of test: 28-Mar-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

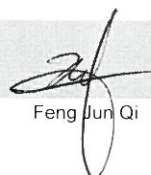
Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:



Feng Jun Qi

Date: 06-Apr-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0322 02 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	2.1
	C	Pass	0.8	
	Lin	N/A	N/A	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	A	Pass	0.3	
	C	Pass	0.3	
Frequency weightings	Lin	N/A	N/A	
	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	Single 100µs rectangular pulse	N/A	N/A	
R.M.S. accuracy	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	N/A	N/A	
	Repeated at frequency of 100 Hz	N/A	N/A	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4	
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Date:

Fung Chi Yip
28-Mar-2018

Checked by:

Date:

Lam Tze Wai
06-Apr-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0309 02

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Larson Davis
Type/Model No.: CAL200
Serial/Equipment No.: 13098
Adaptors used: -

Item submitted by

Customer: Lam Environmental Service Ltd.
Address of Customer: -
Request No.: -
Date of receipt: 09-Mar-2018

Date of test: 12-Mar-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2239857	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature: 21 ± 1 °C
Relative humidity: 50 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

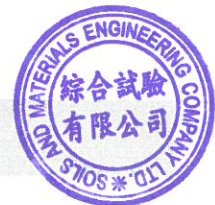
Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:


Feng Jun Qi

Date: 12-Mar-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.



CERTIFICATE OF CALIBRATION

Certificate No.: 18CA1023 02

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Larson Davis
Type/Model No.: CAL200
Serial/Equipment No.: 13437
Adaptors used: -

Item submitted by

Customer: Lam Geotechnics Ltd.
Address of Customer: -
Request No.: -
Date of receipt: 23-Oct-2018

Date of test: 24-Oct-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	20-Apr-2019	SCL
Preamplifier	B&K 2673	2239857	27-Apr-2019	CEPREI
Measuring amplifier	B&K 2610	2346941	08-May-2019	CEPREI
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Digital multi-meter	34401A	US36087050	23-Apr-2019	CEPREI
Audio analyzer	8903B	GB41300350	23-Apr-2019	CEPREI
Universal counter	53132A	MY40003662	24-Apr-2019	CEPREI

Ambient conditions

Temperature: 20 ± 1 °C
Relative humidity: 50 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

Feng Junqi

Date: 24-Oct-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA1023 02

Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 μ Pa)
			Estimated Expanded Uncertainty dB
1000	94.00	93.77	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz **STF = 0.015 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz **Actual Frequency = 1000.2 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor $k = 2.2$

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz **TND = 0.5%**

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date:

Fung Chi Yip
24-Oct-2018

- End -

Checked by:

Date:

Shek Kwong Tat
24-Oct-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 18CA1114 02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2236	,	4188
Serial/Equipment No.:	2100736	,	2288941
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Environmental Service Ltd.
Address of Customer:	-
Request No.:	-
Date of receipt:	14-Nov-2018

Date of test: 15-Nov-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2019	CIGISMEC
Signal generator	DS 360	33873	24-Apr-2019	CEPREI
Signal generator	DS 360	61227	23-Apr-2019	CEPREI

Ambient conditions

Temperature:	20 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure response of the Sound Level Meter.

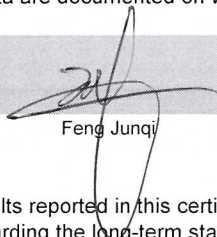
Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:



Feng Junqi

Date: 15-Nov-2018

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA1114 02 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	1.0	2.1
	Lin	Pass	2.0	2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
	Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

- End -

Calibrated by:

Fung Chi Yip

Date:

15-Nov-2018

Checked by:

Shek Kwong Tat

Date:

15-Nov-2018

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION

Information supplied by customer:

CONTACT: MR. SAM LAM **WORK ORDER:** HK1811070
CLIENT: LAM GEOTECHNICS LIMITED
DATE RECEIVED: 24/10/2018
DATE OF ISSUE: 25/10/2018
ADDRESS: 11/F, CENTRE POINT, 181-185, GLOUCESTER ROAD,
WANCHAI, HONG KONG
PROJECT: ---

METHOD OF PERFORMANCE CHECK/ CALIBRATION:

Ref: APHA22nd ed 2130B

COMMENTS

It is certified that the item under performance check/calibration has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1309192
Equipment No.:	---
Date of Calibration:	25/10/2018

Remarks:

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

Approved Signatory: _____
Ms. Wong Po Yan, Pauline
Assistant Laboratory Manager

Issue Date: _____ 25/10/2018

This report may not be reproduced except with prior written approval from Pilot Testing Limited.

**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

WORK ORDER: HK1811070
DATE OF ISSUE: 25/10/2018
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1309192
Equipment No.:	---
Date of Calibration:	25/10/2018
Date of next Calibration:	25/01/2019

Parameters:
Turbidity

Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance
0	0.00	---
4	3.95	-1.3%
10	10.58	5.8%
40	39.06	-2.3%
100	100.50	0.5%
400	397	-0.7%
1000	997	-0.3%
	Tolerance Limit (±)	10%

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

This report may not be reproduced except with prior written approval from Pilot Testing Limited.

**REPORT OF EQUIPMENT PERFORMANCE CHECK / CALIBRATION**

WORK ORDER: HK1810875
DATE OF ISSUE: 31/08/2018
CLIENT: LAM GEOTECHNICS LIMITED

Equipment Type:	Turbidimeter
Brand Name:	Xin Rui
Model No.:	WGZ-3B
Serial No.:	1403009
Equipment No.:	---
Date of Calibration:	30/08/2018
Date of next Calibration:	30/11/2018

Parameters:**Turbidity**Method Ref: APHA 22nd ed. 2130B

Expected Reading (NTU)	Display Reading (NTU)	Tolerance
0	0.00	---
4	3.90	-2.5%
10	10.28	2.8%
40	41.1	2.8%
100	101	1.2%
400	396	-1.0%
1000	1001	0.1%
	Tolerance Limit (±)	10%

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

This report may not be reproduced except with prior written approval from Pilot Testing Limited.



EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

Report No. : HK1811013
Project Name : EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT
Date of Issue : 10/10/2018

Customer : LAM ENVIRONMENTAL SERVICES LIMITED
Address : 11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

Calibration Job No. : HK1811013
Test Item No. : HK1811013-01
Test Item Details
Test Item Description : Sonde
Manufacturer : YSI
Model No. : Professional Plus
Serial No. : 17F100236
Performance Method : Checked according to in-house method CAL005
(References: Temperature (Section 6 of International Accreditation New Zealand Technical G
No. 3 Second edition March 2008: Working Thermometer Calibration Procedure), pH value
(APHA 21e 4500H:B), Salinity (Refer to Conductivity APHA 19e 2510B)
, Dissolved oxygen (APHA 19e 4500-O,C))
Test Item Receipt Date : 8/10/2018
Test Item Calibration Date : 9/10/2018

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 2. Results relate to item(s) as received.
 3. ± indicates the tolerance limit
 4. N/A = Not applicable
 5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
 6. DO, pH, salinity and temperature performance check was conducted by Pilot Testing Limited.
 7. Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

Approved Signatory :

Ms. Wong Po Yan, Pauline
(Assistant Laboratory Manager)

Issue Date: 10/10/2018


REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1811013
DATE OF ISSUE: 10/10/2018
CLIENT: LAM ENVIRONMENTAL SERVICES LIMITED

Equipment Type	Sonde
Manufacturer	YSI
Model No.	Professional Plus
Serial No.	17F100236
Date of Calibration	09-Oct-18
Date of next Calibration	09-Jan-19

Parameters:

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

Reference Reading (°C)	Display Reading (°C)	Deviation (°C)
6.3	6.3	0.0
14.6	14.4	-0.2
25.6	25.5	-0.1
Tolerance Limit		±2.0

pH Value (Method Ref: APHA21e, 4500H:B)

Expected Reading (pH unit)	Reference Reading (pH unit)	Display Reading (pH unit)	Deviation (pH unit)
4.0	3.99	4.01	0.02
7.0	6.97	7.01	0.04
10.0	10.03	10.04	0.01
Tolerance Limit			±0.20

Conductivity (Method Ref: APHA 19e, 2510)

KCl concentration (mol/L)	Reference Reading (ms/cm)	Display Reading (ms/cm)	Deviation (%)
0.0000	0.00	0.00	--
0.1000	12.2	12.1	-0.33
0.2000	24.0	23.9	-0.58
0.5000	57.1	56.9	-0.32
Tolerance Limit			±2.0

Dissolved Oxygen (DO) (Method Ref: APHA 19e, 4500-O, C)

Reference DO reading (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
7.14	7.18	0.04
6.79	6.81	0.02
4.80	4.93	0.13
Tolerance Limit		±0.20

Remarks: (1) Maxium tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.
 (2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
 (3) Because of high sensitivity and ease of measurement, the conductivity method (accordng to APHA 19e 2510) is used to determine salinity.

- End of Report -



EQUIPMENT PERFORMANCE CHECK / CALIBRATION REPORT

Report No. : HK1811019
Project Name : EQUIPMENT PERFORMANCE CHECK/CALIBRATION REPORT
Date of Issue : 11/10/2018

Customer : LAM ENVIRONMENTAL SERVICES LIMITED
Address : 11/F., CENTRE POINT, 181-185 GLOUCESTER ROAD, WAN CHAI, HONG KONG

Calibration Job No. : HK1811019
Test Item No. : HK1811019-01
Test Item Details
Test Item Description : Sonde
Manufacturer : YSI
Model No. : Professional Plus
Serial No. : 14K100322
Performance Method : Checked according to in-house method CAL005
(References: Temperature (Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure), pH value (APHA 21e 4500H:B), Salinity (Refer to Conductivity APHA 19e 2510B)
, Dissolved oxygen (APHA 19e 4500-O,C))
Test Item Receipt Date : 9/10/2018
Test Item Calibration Date : 10/10/2018

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Pilot Testing Limited.
 2. Results relate to item(s) as received.
 3. ± indicates the tolerance limit
 4. N/A = Not applicable
 5. APHA - American Public Health Association, American Water Works Association and Water Environment Federation, Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WEF. USA
 6. DO, pH, salinity and temperature performance check was conducted by Pilot Testing Limited.
 7. Because of high sensitivity and ease of measurement, the conductivity method (according to APHA 19e 2510) is used to determine salinity.

Approved Signatory :

Ms. Wong Po Yan, Pauline
(Assistant Laboratory Manager)

Issue Date:

11/10/2018


REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1811019
DATE OF ISSUE: 11/10/2018
CLIENT: LAM ENVIRONMENTAL SERVICES LIMITED

Equipment Type	Sonde
Manufacturer	YSI
Model No.	Professional Plus
Serial No.	14K100322
Date of Calibration	10-Oct-18
Date of next Calibration	10-Jan-19

Parameters:

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

Reference Reading (°C)	Display Reading (°C)	Deviation (°C)
8.8	8.8	0.0
15.3	15.2	-0.1
25.4	25.3	-0.1
Tolerance Limit		±2.0

pH Value (Method Ref: APHA21e, 4500H:B)

Expected Reading (pH unit)	Reference Reading (pH unit)	Display Reading (pH unit)	Deviation (pH unit)
4.0	4.01	3.98	-0.03
7.0	6.99	7.02	0.03
10.0	10.02	10.03	0.01
Tolerance Limit			±0.20

Conductivity (Method Ref: APHA 19e, 2510)

KCl concentration (mol/L)	Reference Reading (ms/cm)	Display Reading (ms/cm)	Deviation (%)
0.0000	0.00	0.00	--
0.1000	12.3	12.3	-0.16
0.2000	24.0	23.9	-0.33
0.5000	57.1	57.2	0.18
Tolerance Limit			±2.0

Dissolved Oxygen (DO) (Method Ref: APHA 19e, 4500-O, C)

Reference DO reading (mg/L)	DO reading od DO probe (mg/L)	Deviation (mg/L)
7.00	7.01	0.01
6.41	6.43	0.02
4.46	4.41	-0.05
Tolerance Limit		±0.20

- Remarks:
- (1) Maxium tolerance and calibration frequency stated in the report, unless otherwise stated, the internal acceptance criteria of Pilot Testing Limited will be followed.
 - (2) Displayed reading presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.
 - (3) Because of high sensitivity and ease of measurement, the conductivity method (accordng to APHA 19e 2510) is used to determine salinity.

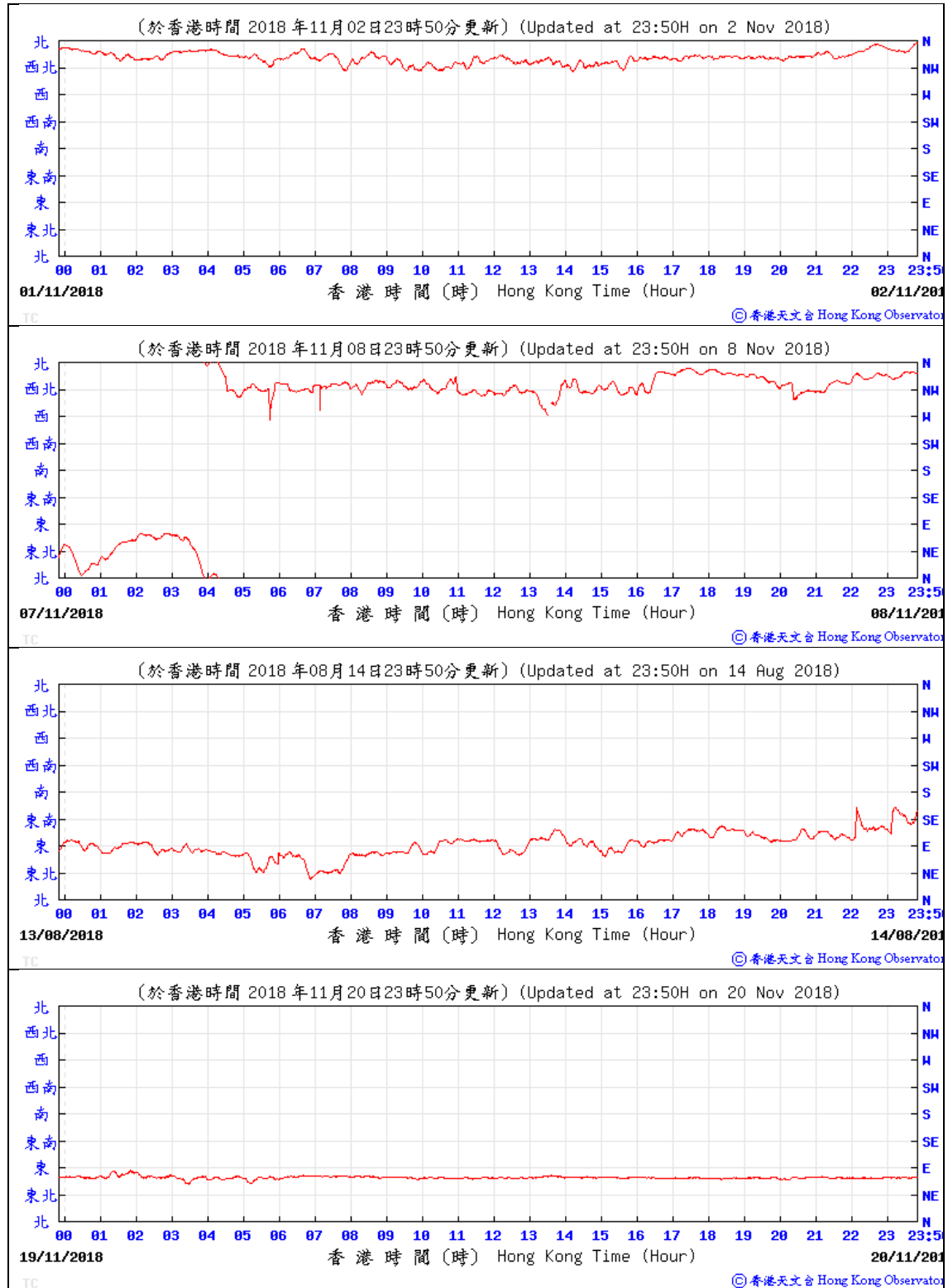
- End of Report -

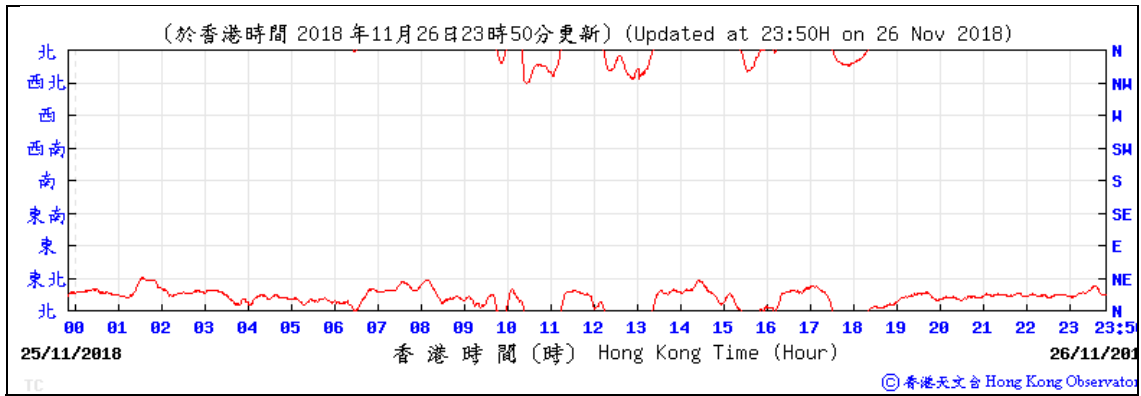


Appendix 4.3

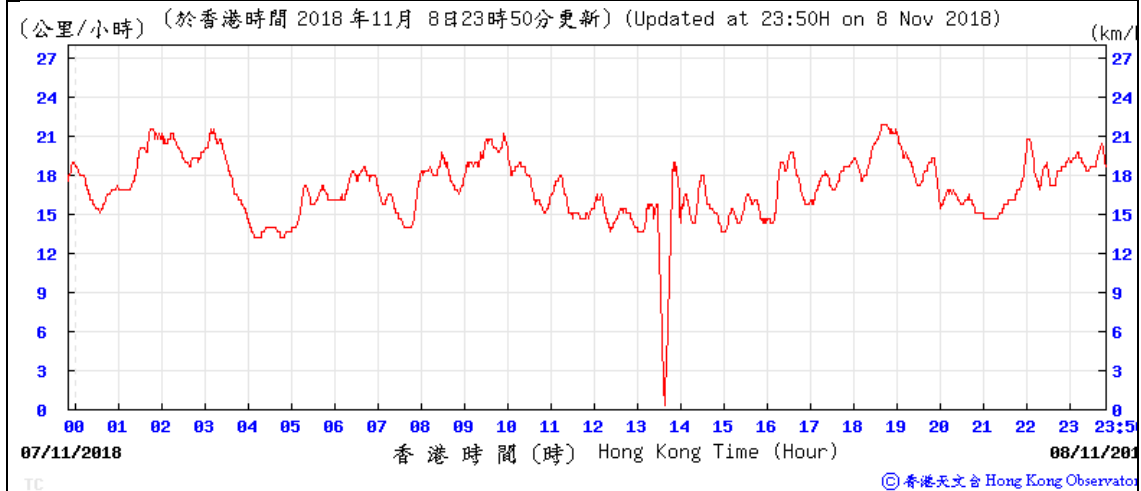
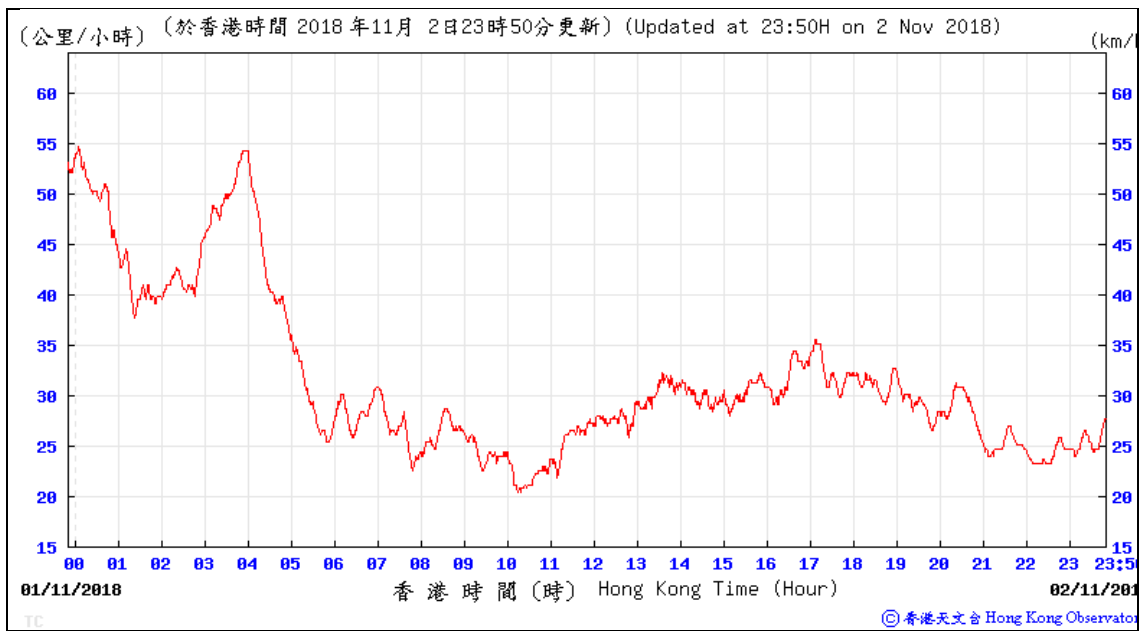
Wind data extracted from HKO Automatic Weather Station

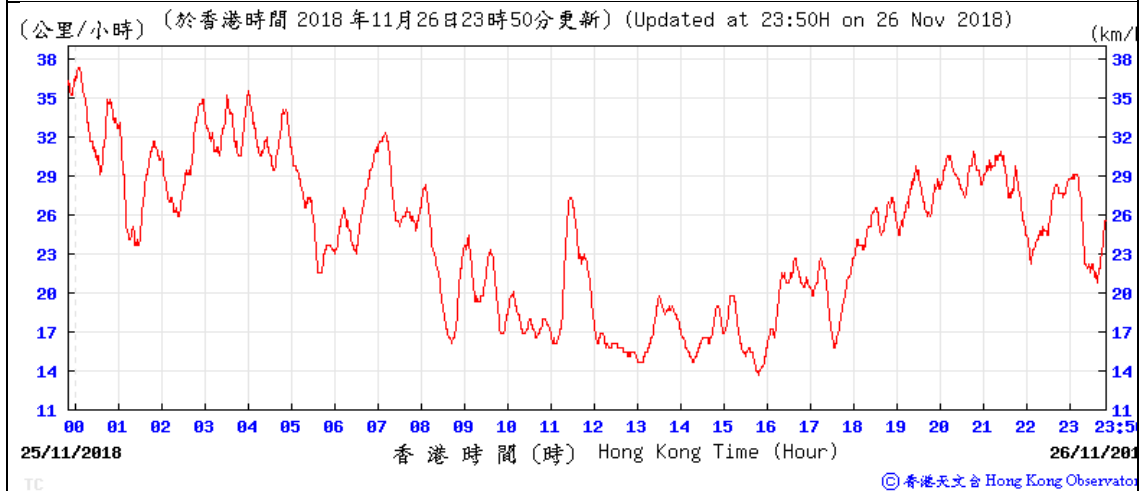
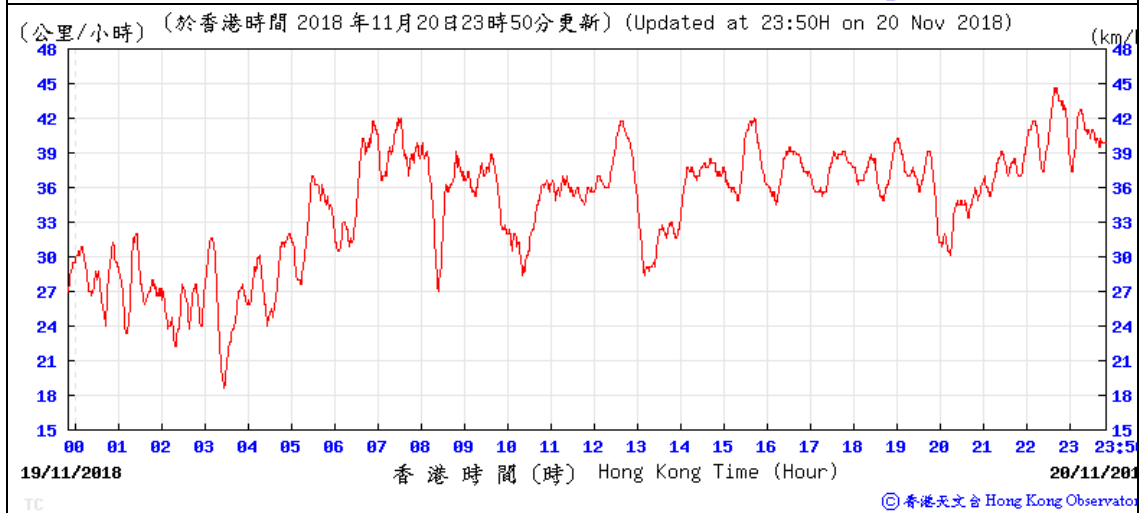
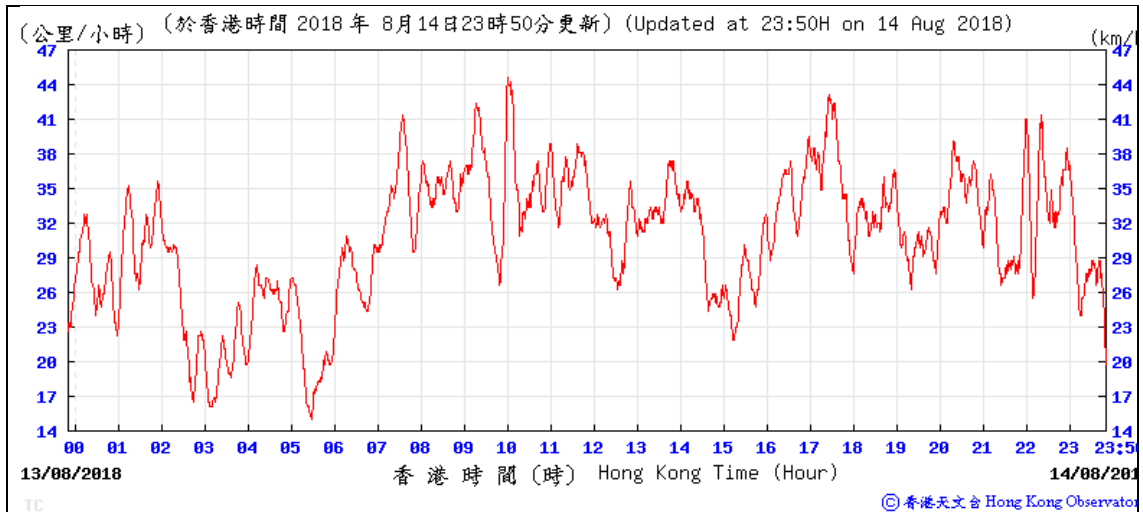
A. Wind Direction extracted from Tate's Cairn HKO Automatic Weather Station



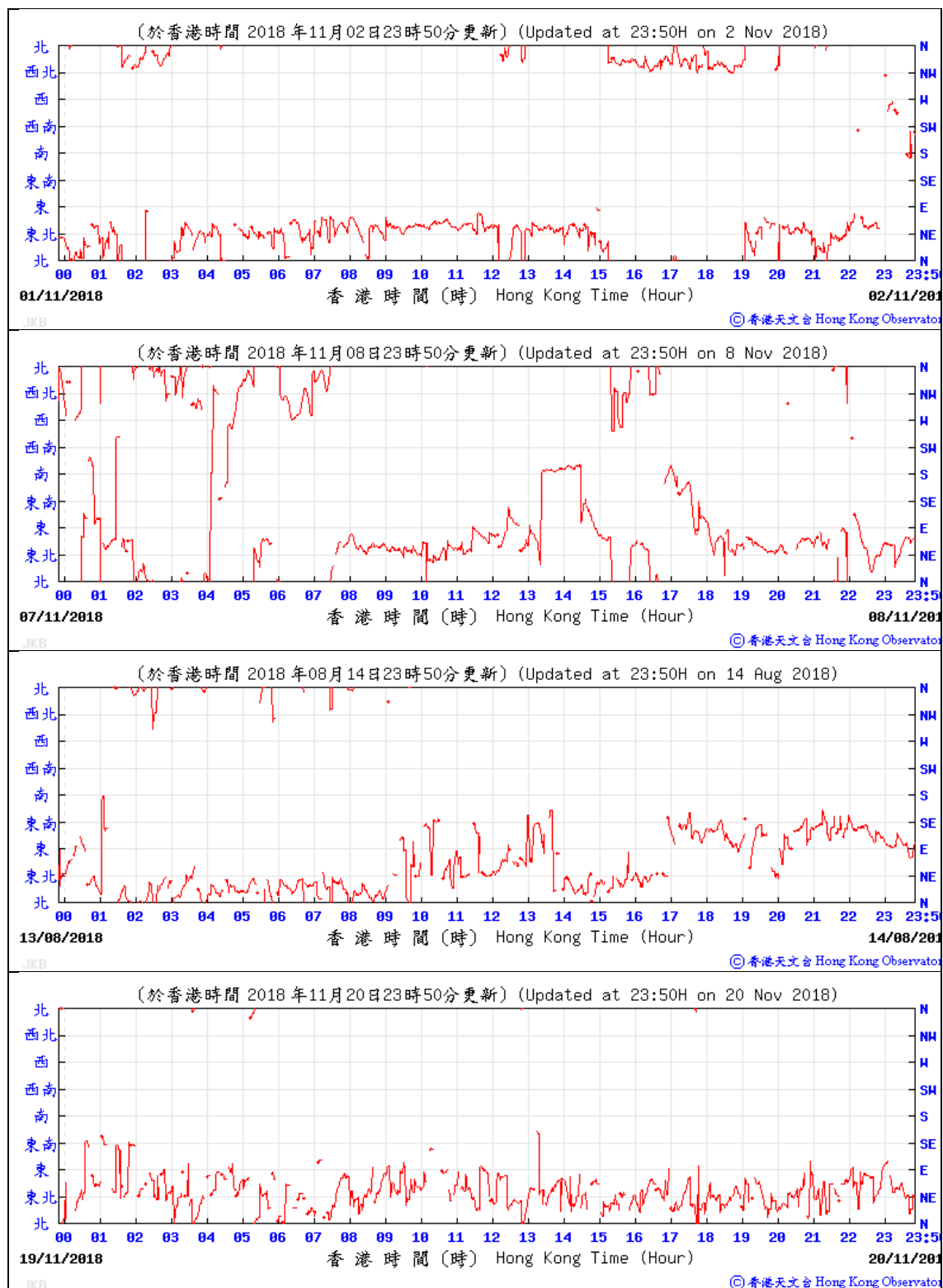


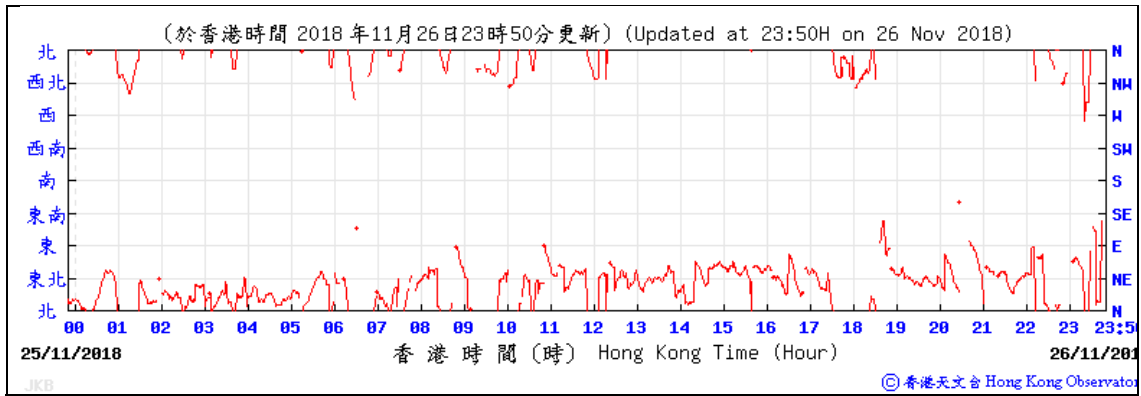
B. Wind Speed extracted from Tate's Cairn HKO Automatic Weather Station



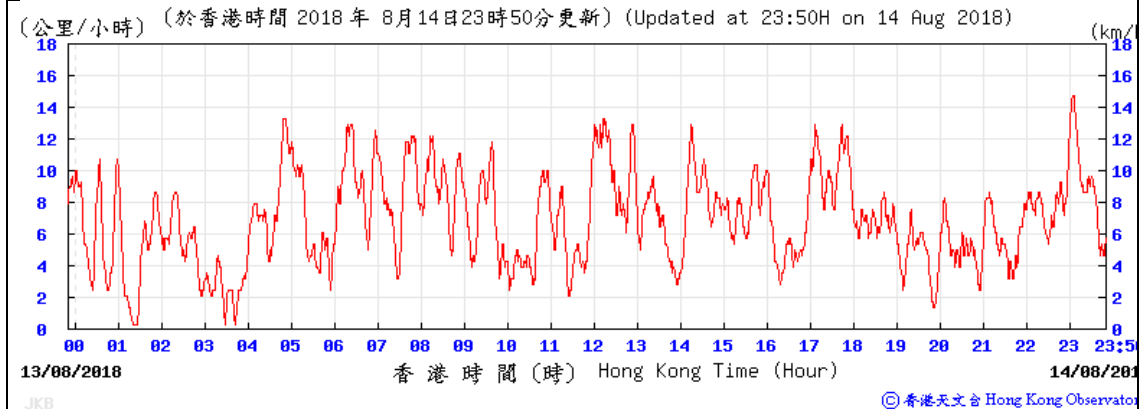
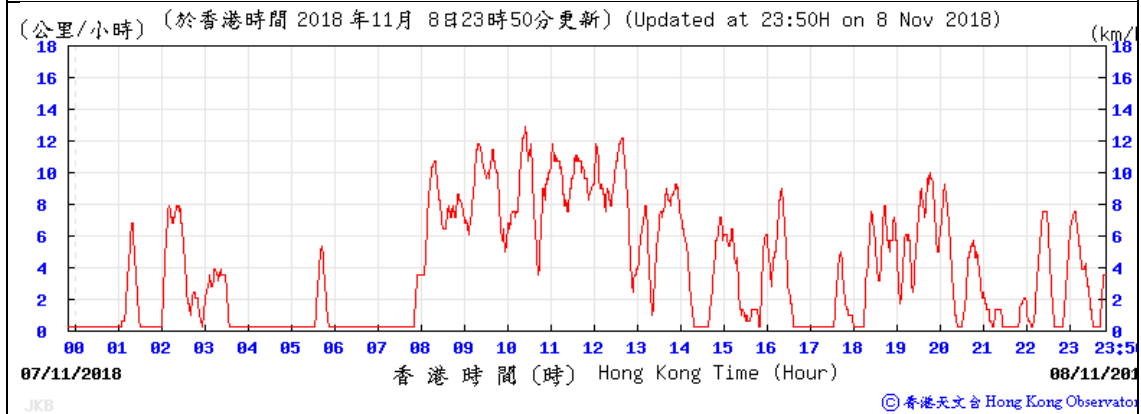
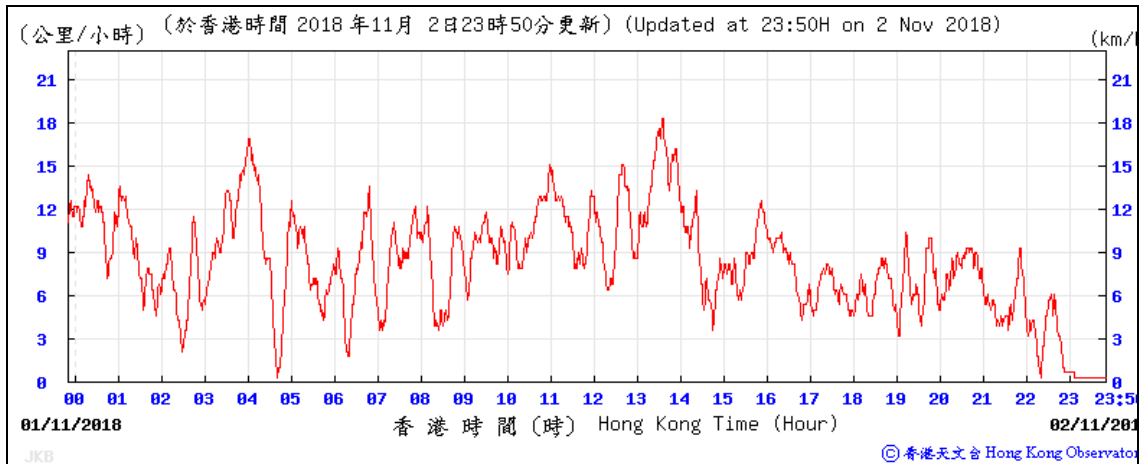


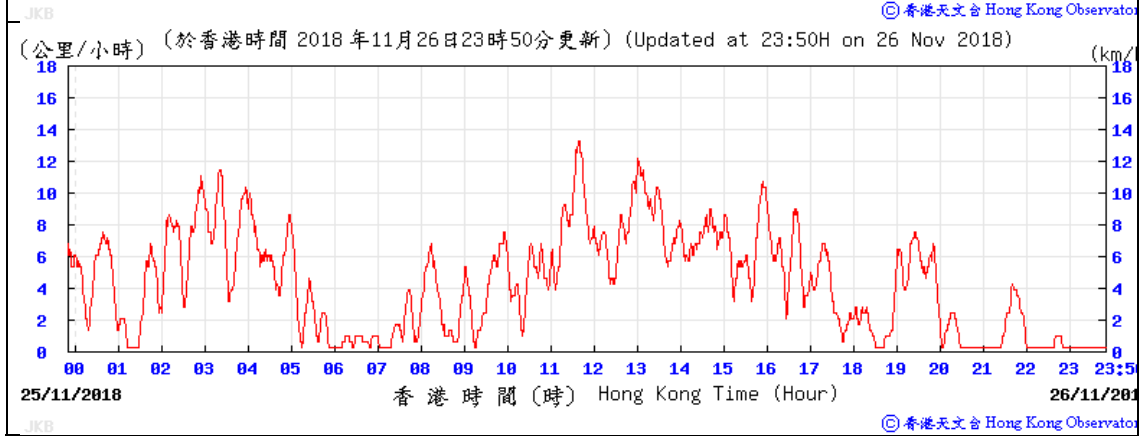
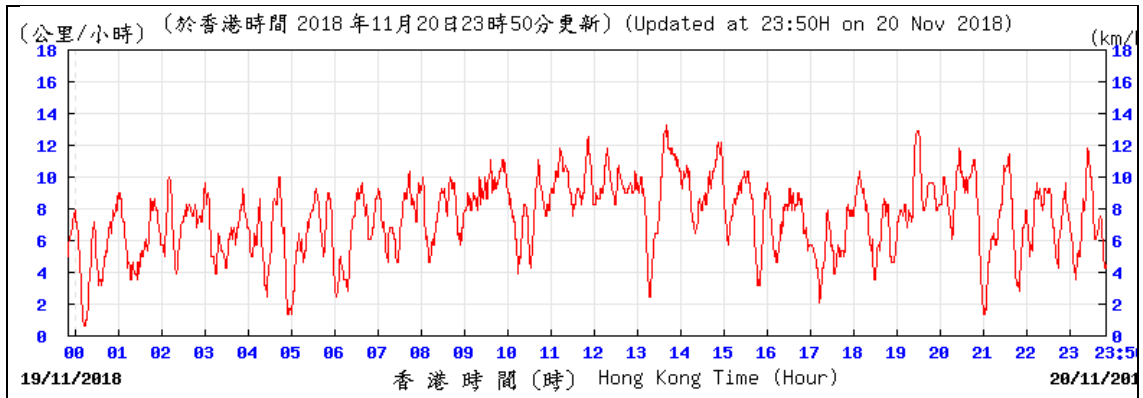
C. Wind Direction extracted from Tseung Kwan O HKO Automatic Weather Station





D. Wind Speed extracted from Tseung Kwan O HKO Automatic Weather Station







Appendix 5.1

Monitoring Schedules for Reporting Month



SERVICE CONTRACT NO. EDO/01/2017
ENVIRONMENTAL TEAM FOR DEVELOPMENT OF
ANDERSON ROAD QUARRY SITE - ROAD IMPROVEMENT WORKS
Tentative Impact Water Quality, Air Quality and Noise Monitoring Schedule
November 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-Nov
					WQM AQM NM	
4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov
	WQM		WQM	AQM NM	WQM	
11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov
	WQM		WQM AQM NM		WQM	
18-Nov	19-Nov	20-Nov	21-Nov	22-Nov	23-Nov	24-Nov
	WQM	AQM NM	WQM		WQM	
25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	1-Dec
	WQM AQM NM		WQM		WQM	

Remark:

1. WQM: Water Quality Monitoring
2. AQM: Air Quality Monitoring
3. NM: Noise Monitoring



Appendix 5.2

Noise Monitoring Results and Graphical Presentations



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: NMC-01 - G/F, Kei Shun Special School

Date	Weather	Time	Measurement Noise Level			Average Noise Level	Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq	Leq
			Unit: dB(A), (5-min)			Unit: dB(A), (30-min)			
2/11/2018	Fine	13:55	67.6	69.4	64.7	67.5	69.3	< Baseline	70
		14:00	67.1	69.8	62.0				
		14:05	67.7	70.0	62.4				
		14:10	67.6	70.0	62.6				
		14:15	67.8	70.4	63.4				
		14:20	67.4	70.0	61.8				
8/11/2018	Fine	14:40	67.7	69.6	64.2	68.6	69.3	< Baseline	70
		14:45	67.2	68.8	63.2				
		14:50	66.8	68.8	63.2				
		14:55	71.7	72.2	64.2				
		15:00	68.1	70.4	62.2				
		15:05	68.1	70.2	64.2				
14/11/2018	Fine	10:30	68.2	70.2	61.8	68.1	69.3	< Baseline	70
		10:35	67.8	70.4	63.6				
		10:40	68.2	70.0	63.2				
		10:45	67.7	70.6	62.4				
		10:50	68.4	70.4	64.6				
		10:55	68.2	70.0	63.8				
20/11/2018	Cloudy	13:23	68.0	69.8	63.6	68.1	69.3	< Baseline	70
		13:28	68.2	71.2	62.4				
		13:33	68.8	72.5	62.5				
		13:38	68.3	70.2	64.8				
		13:43	67.8	69.4	62.7				
		13:48	67.3	70.0	62.0				
26/11/2018	Cloudy	11:19	67.8	70.4	64.1	68.5	69.3	< Baseline	70
		11:24	68.8	71.1	64.5				
		11:29	67.9	70.3	63.6				
		11:34	68.9	71.2	65.9				
		11:39	69.1	71.7	63.9				
		11:44	68.2	70.3	63.9				



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: NMC-02 - 3/F podium, Shun Lee Disciplined Services Quarters Block 6

Date	Weather	Time	Measurement Noise Level			Average Noise Level	Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq	Leq
			Unit: dB(A), (5-min)			Unit: dB(A), (30-min)			
2/11/2018	Fine	10:30	73.6	77.1	60.0	74.3	72.0	70.4	75
		10:35	73.3	76.2	61.5				
		10:40	72.3	77.4	60.6				
		10:45	75.6	79.1	60.0				
		10:50	74.2	78.3	61.1				
		10:55	75.7	79.2	60.8				
8/11/2018	Fine	13:37	69.1	71.4	63.4	70.2	72.0	< Baseline	75
		13:42	70.7	73.2	66.0				
		13:47	70.3	72.8	66.6				
		13:52	69.9	72.4	65.2				
		13:57	70.9	73.4	65.6				
		14:02	69.9	72.0	64.6				
14/11/2018	Fine	10:33	66.8	68.2	65.2	71.3	72.0	< Baseline	75
		10:38	72.1	74.6	67.7				
		10:43	71.7	74.1	66.4				
		10:48	72.2	74.7	67.8				
		10:53	71.5	74.5	67.4				
		10:58	71.8	74.4	67.8				
20/11/2018	Cloudy	9:40	71.7	74.0	68.0	72.5	72.0	62.9	75
		9:45	72.1	74.6	68.0				
		9:50	73.1	74.8	69.4				
		9:55	72.5	74.2	68.6				
		10:00	72.7	75.6	67.4				
		10:05	72.8	75.6	67.6				
26/11/2018	Cloudy	10:35	71.7	74.1	66.5	72.5	72.0	62.7	75
		10:40	72.0	74.8	67.6				
		10:45	72.2	74.4	68.8				
		10:50	73.7	76.1	69.7				
		10:55	72.4	75.2	68.5				
		11:00	72.6	75.1	68.4				



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: NMC-03 - G/F, Sienna Garden Block 6

Date	Weather	Time	Measurement Noise Level			Average Noise Level	Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq	Leq
			Unit: dB(A), (5-min)			Unit: dB(A), (30-min)			
2/11/2018	Fine	13:54	72.9	75.4	68.0	73.4	78.2	< Baseline	75
		13:59	72.5	75.2	67.8				
		14:04	73.8	76.2	69.0				
		14:09	73.4	76.0	66.6				
		14:14	74.1	76.6	69.0				
8/11/2018	Fine	11:30	74.6	78.8	57.8	74.7	78.2	< Baseline	75
		11:35	74.4	77.0	58.6				
		11:40	74.8	76.8	59.8				
		11:45	74.7	75.6	56.6				
		11:50	75.0	75.8	57.4				
14/11/2018	Fine	11:30	75.1	80.8	61.9	77.7	78.2	< Baseline	75
		11:35	77.6	81.2	64.6				
		11:40	76.6	81.2	61.5				
		11:45	77.3	81.3	61.2				
		11:50	79.9	83.5	61.6				
20/11/2018	Cloudy	11:55	78.2	82.0	63.8	77.8	78.2	< Baseline	75
		14:04	77.2	81.2	62.8				
		14:09	77.0	81.0	61.8				
		14:14	77.4	81.7	62.6				
		14:19	79.7	83.2	61.0				
26/11/2018	Cloudy	14:24	77.7	82.4	61.5	78.4	78.2	64.5	75
		14:29	77.1	81.2	62.8				
		14:55	79.3	83.0	63.5				
		15:00	76.9	81.5	63.0				
		15:05	78.0	81.5	63.5				
		15:10	78.9	82.5	66.0				
15:15	78.2	82.0	65.0						
15:20	78.6	82.0	65.5						



Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

Location: NMC-04 - 3/F Podium, Po Tat Estate Tat Kai House

Date	Weather	Time	Measurement Noise Level			Average Noise Level	Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq	Leq
			Unit: dB(A), (5-min)			Unit: dB(A), (30-min)			
2/11/2018	Fine	15:18	65.3	66.2	62.4	64.1	66.6	< Baseline	75
		15:23	63.7	65.2	62.0				
		15:28	63.6	64.8	61.8				
		15:33	64.6	66.4	61.8				
		15:38	63.0	64.0	61.8				
		15:43	63.9	65.4	62.0				
8/11/2018	Fine	10:45	63.7	61.6	59.0	63.9	66.6	< Baseline	75
		10:50	64.0	61.7	59.0				
		10:55	61.6	59.4	57.6				
		11:00	61.4	60.8	57.6				
		11:05	67.5	65.0	57.8				
		11:10	61.9	59.8	57.6				
14/11/2018	Fine	8:58	64.4	65.5	62.7	63.9	66.6	< Baseline	75
		9:03	64.0	65.3	62.3				
		9:08	63.5	64.7	61.9				
		9:13	63.3	64.3	62.3				
		9:18	64.3	65.1	63.1				
		9:23	63.8	65.3	62.2				
20/11/2018	Cloudy	11:14	66.7	68.4	64.2	66.5	66.6	< Baseline	75
		11:19	66.9	68.8	64.5				
		11:24	66.7	68.4	64.2				
		11:29	66.9	68.2	63.8				
		11:34	66.2	67.9	63.5				
		11:39	65.6	68.0	63.6				
26/11/2018	Cloudy	13:14	64.4	65.8	62.9	64.5	66.6	< Baseline	75
		13:19	64.2	65.5	62.9				
		13:24	64.2	65.4	62.5				
		13:29	64.8	66.2	63.5				
		13:34	64.9	66.4	63.4				
		13:39	64.7	65.9	63.2				



Noise Monitoring Result

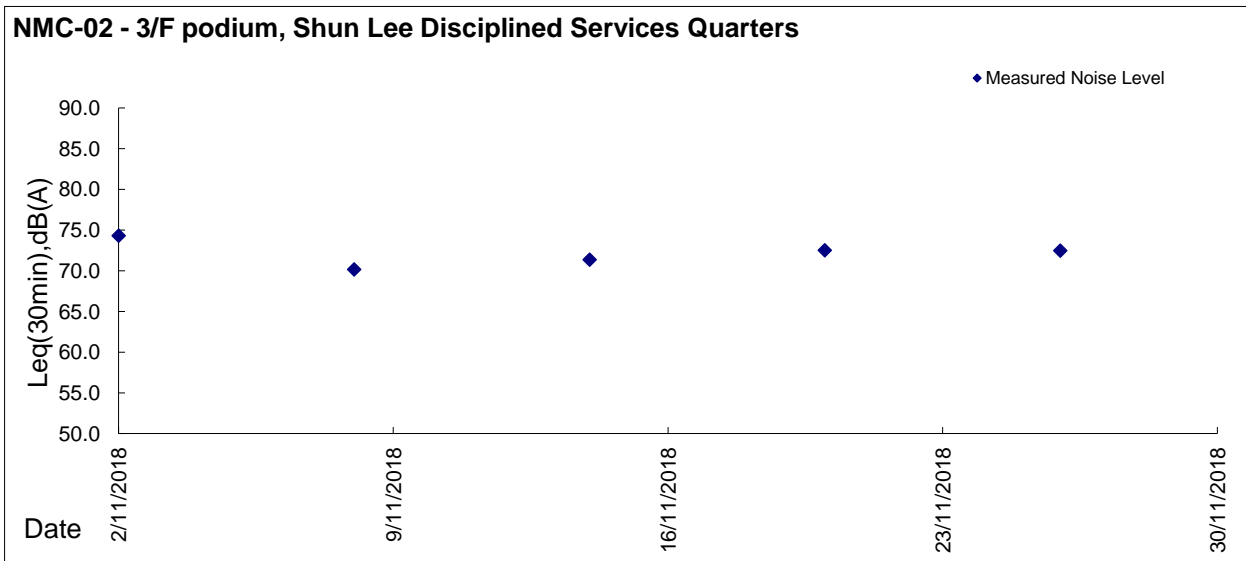
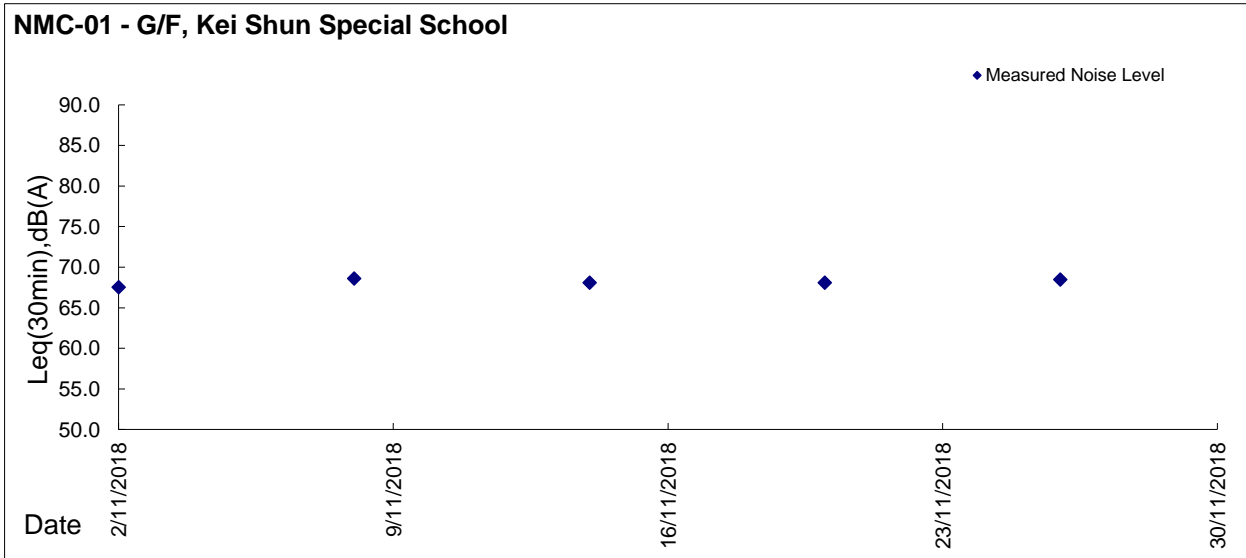
Day Time (0700 - 1900hrs on normal weekdays)

Location: NMC-05 - G/F, Hong Wah Court Block B Yee Hong House

Date	Weather	Time	Measurement Noise Level			Average Noise Level	Baseline Level	Construction Noise Level	Limit Level
			Leq	L10	L90	Leq	Leq	Leq	Leq
			Unit: dB(A), (5-min)			Unit: dB(A), (30-min)			
2/11/2018	Fine	15:35	63.8	67.6	58.0	62.0	61.8	47.4	75
		15:40	59.6	61.0	58.0				
		15:45	60.8	62.4	58.4				
		15:50	59.6	60.8	57.8				
		15:55	63.8	63.9	58.2				
		16:00	62.0	62.2	58.6				
8/11/2018	Fine	10:00	61.6	63.6	59.0	62.3	61.8	52.7	75
		10:05	60.7	62.0	59.0				
		10:10	64.1	66.8	59.8				
		10:15	61.6	63.0	59.6				
		10:20	62.2	63.4	60.0				
		10:25	62.8	64.2	60.6				
14/11/2018	Fine	9:41	62.4	63.5	57.9	60.7	61.8	< Baseline	75
		9:46	59.4	60.9	56.8				
		9:51	58.8	60.0	57.5				
		9:56	60.4	62.3	57.8				
		10:01	60.2	62.0	58.3				
		10:06	61.7	62.9	59.8				
20/11/2018	Cloudy	14:55	60.3	61.6	58.8	61.1	61.8	< Baseline	75
		15:00	60.7	62.0	59.0				
		15:05	60.7	62.0	59.0				
		15:10	61.7	63.2	59.8				
		15:15	61.0	62.4	59.2				
		15:20	62.1	63.4	60.4				
26/11/2018	Cloudy	13:57	61.1	63.0	58.8	60.9	61.8	< Baseline	75
		14:02	61.4	63.0	59.2				
		14:07	61.4	62.6	59.4				
		14:12	60.5	61.9	59.1				
		14:17	60.8	62.4	59.0				
		14:22	60.1	61.3	58.4				



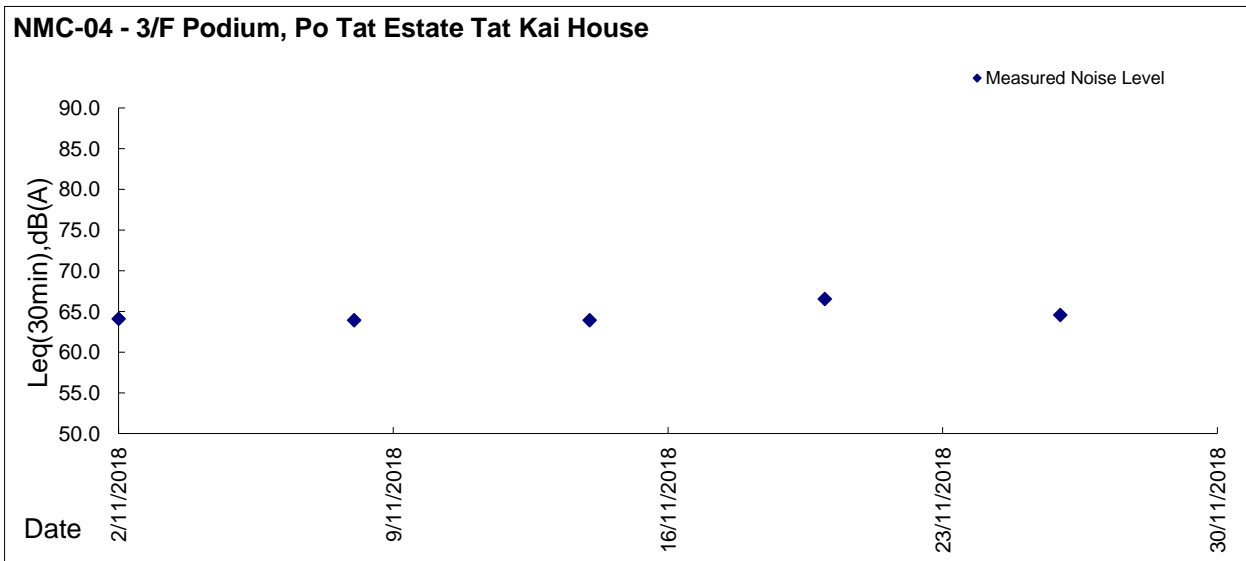
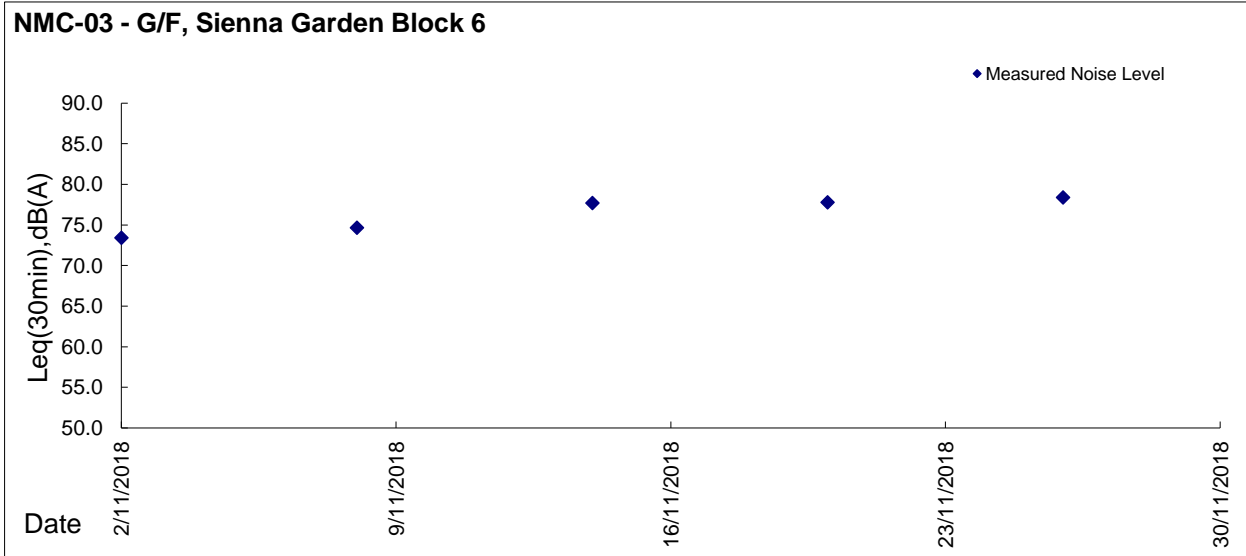
Graphic Presentation of Noise Monitoring Result
Day Time (0700 - 1900hrs on normal weekdays)





Graphic Presentation of Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

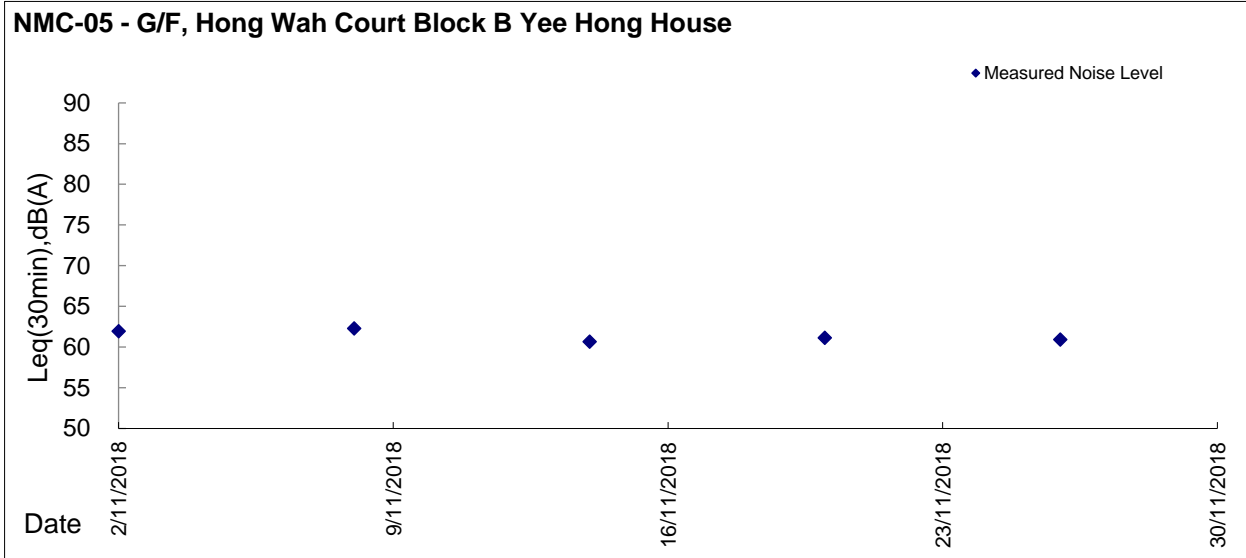




Graphic Presentation of Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

NMC-05 - G/F, Hong Wah Court Block B Yee Hong House





Appendix 5.3

Air Quality Monitoring Results and Graphical Presentations



Report on 1-hour TSP monitoring at NCWBR_AMS-1 - Shun Lee Fire Station

Action Level ($\mu\text{g}/\text{m}^3$) - 284.4
Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:44	21.5
2-Nov-18	Fine	09:45	21.8
2-Nov-18	Fine	10:46	21.2
8-Nov-18	Fine	8:49	49.9
8-Nov-18	Fine	9:50	40.5
8-Nov-18	Fine	10:51	40.6
14-Nov-18	Fine	8:17	28.1
14-Nov-18	Fine	9:18	28.8
14-Nov-18	Fine	10:19	26.5
20-Nov-18	Cloudy	8:54	45.4
20-Nov-18	Cloudy	9:55	41.5
20-Nov-18	Cloudy	10:56	35.9
26-Nov-18	Cloudy	10:33	2.8
26-Nov-18	Cloudy	13:01	3.8
26-Nov-18	Cloudy	14:02	4.5



Report on 1-hour TSP monitoring at NCWBR_AMS-2 - Shun Lee Estate Lee Hang House

Action Level ($\mu\text{g}/\text{m}^3$) - 282.4
Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:39	28.1
2-Nov-18	Fine	09:40	30.6
2-Nov-18	Fine	10:41	29.6
8-Nov-18	Fine	8:20	67.9
8-Nov-18	Fine	9:21	58.4
8-Nov-18	Fine	10:22	55.8
14-Nov-18	Fine	8:00	56.6
14-Nov-18	Fine	9:01	53.9
14-Nov-18	Fine	10:02	51.7
20-Nov-18	Cloudy	8:43	33.0
20-Nov-18	Cloudy	9:44	26.3
20-Nov-18	Cloudy	10:45	23.6
26-Nov-18	Cloudy	10:19	9.1
26-Nov-18	Cloudy	13:04	9.4
26-Nov-18	Cloudy	14:05	10.4



Report on 1-hour TSP monitoring at NCWBR_AMS-3 - Shun Lee Disciplined Services

Quarters (Block 6)

Action Level ($\mu\text{g}/\text{m}^3$) - 287.9

Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:40	19.7
2-Nov-18	Fine	09:41	27.9
2-Nov-18	Fine	10:42	28.3
8-Nov-18	Fine	8:53	59.4
8-Nov-18	Fine	9:54	54.4
8-Nov-18	Fine	10:55	52.2
14-Nov-18	Fine	8:18	45.5
14-Nov-18	Fine	9:19	46.2
14-Nov-18	Fine	10:20	45.2
20-Nov-18	Cloudy	8:37	27.9
20-Nov-18	Cloudy	9:38	23.3
20-Nov-18	Cloudy	10:39	24.4
26-Nov-18	Cloudy	10:32	8.3
26-Nov-18	Cloudy	13:01	8.8
26-Nov-18	Cloudy	14:02	9.6



Report on 1-hour TSP monitoring at NCWBR_AMS-4 - Sienna Garden

Action Level ($\mu\text{g}/\text{m}^3$) - 281.6
Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:47	30.2
2-Nov-18	Fine	09:48	94.4
2-Nov-18	Fine	10:49	49.9
8-Nov-18	Fine	9:06	64.4
8-Nov-18	Fine	10:07	54.8
8-Nov-18	Fine	13:00	80.3
14-Nov-18	Fine	8:30	49.8
14-Nov-18	Fine	9:31	50.3
14-Nov-18	Fine	10:32	44.2
20-Nov-18	Cloudy	10:17	25.8
20-Nov-18	Cloudy	13:00	21.3
20-Nov-18	Cloudy	14:01	18.5
26-Nov-18	Cloudy	10:41	7.4
26-Nov-18	Cloudy	13:01	9.2
26-Nov-18	Cloudy	14:02	9.9



Report on 1-hour TSP monitoring at NCWBR_AMS-5 - Shun Chi Court Shun Fung House

Action Level ($\mu\text{g}/\text{m}^3$) - 270.0
Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:45	47.4
2-Nov-18	Fine	09:46	27.2
2-Nov-18	Fine	10:47	26.3
8-Nov-18	Fine	8:36	37.0
8-Nov-18	Fine	9:37	30.9
8-Nov-18	Fine	10:38	29.5
14-Nov-18	Fine	8:00	44.1
14-Nov-18	Fine	9:01	46.3
14-Nov-18	Fine	10:02	45.3
20-Nov-18	Cloudy	8:58	27.1
20-Nov-18	Cloudy	9:59	24.5
20-Nov-18	Cloudy	11:00	22.3
26-Nov-18	Cloudy	10:18	7.2
26-Nov-18	Cloudy	13:01	6.1
26-Nov-18	Cloudy	14:02	7.8



Report on 1-hour TSP monitoring at LTR_AMS-1 - St Edward's Catholic Primary School

Action Level ($\mu\text{g}/\text{m}^3$) - 272.1
Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:47	35.7
2-Nov-18	Fine	09:48	47.5
2-Nov-18	Fine	10:49	42.0
8-Nov-18	Fine	9:52	24.0
8-Nov-18	Fine	10:53	23.2
8-Nov-18	Fine	13:00	35.3
14-Nov-18	Fine	9:00	48.1
14-Nov-18	Fine	10:01	43.3
14-Nov-18	Fine	13:00	32.3
20-Nov-18	Cloudy	10:51	20.3
20-Nov-18	Cloudy	13:00	16.5
20-Nov-18	Cloudy	14:01	14.9
26-Nov-18	Cloudy	9:47	7.6
26-Nov-18	Cloudy	10:48	8.0
26-Nov-18	Cloudy	13:01	8.2



Report on 1-hour TSP monitoring at LTR_AMS-2 - Environmental Protection

Department's Restored Landfill Site Office

Action Level ($\mu\text{g}/\text{m}^3$) - 281.1

Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	11:00	29.2
2-Nov-18	Fine	13:01	11.9
2-Nov-18	Fine	14:02	15.1
8-Nov-18	Fine	9:42	28.1
8-Nov-18	Fine	10:43	25.6
8-Nov-18	Fine	13:00	36.4
14-Nov-18	Fine	9:00	34.7
14-Nov-18	Fine	10:01	31.3
14-Nov-18	Fine	13:00	24.8
20-Nov-18	Cloudy	10:37	27.4
20-Nov-18	Cloudy	13:00	23.2
20-Nov-18	Cloudy	14:01	20.7
26-Nov-18	Cloudy	9:30	7.4
26-Nov-18	Cloudy	10:31	8.1
26-Nov-18	Cloudy	13:00	11.6



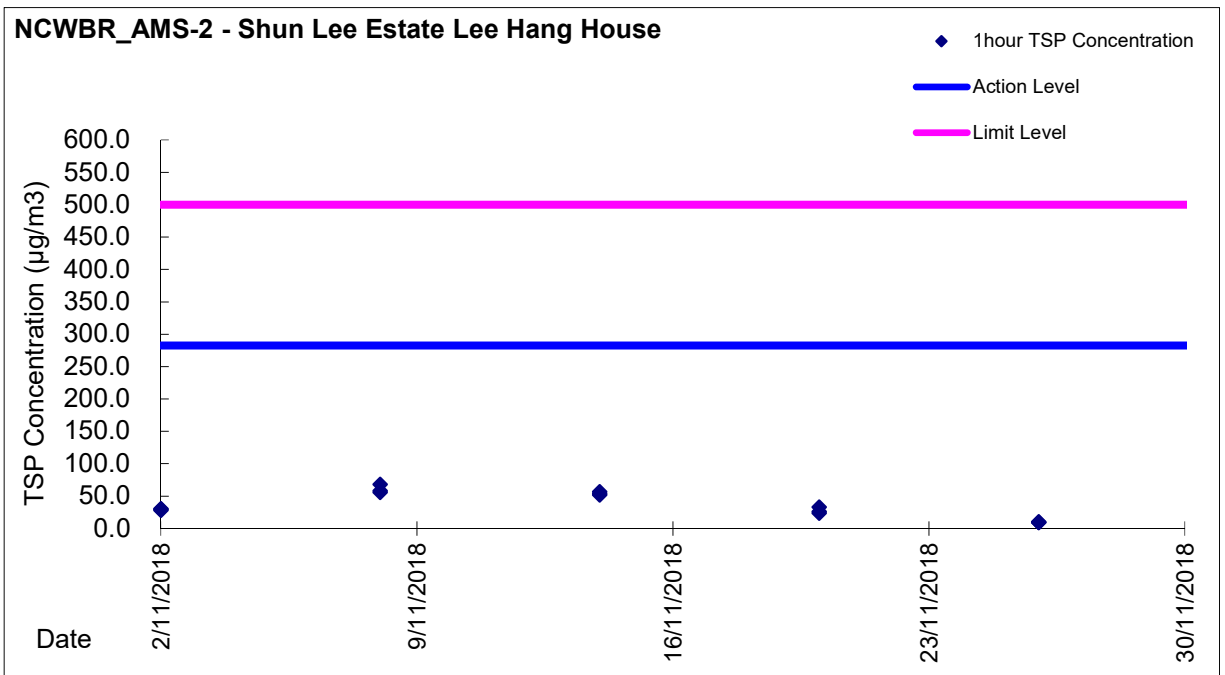
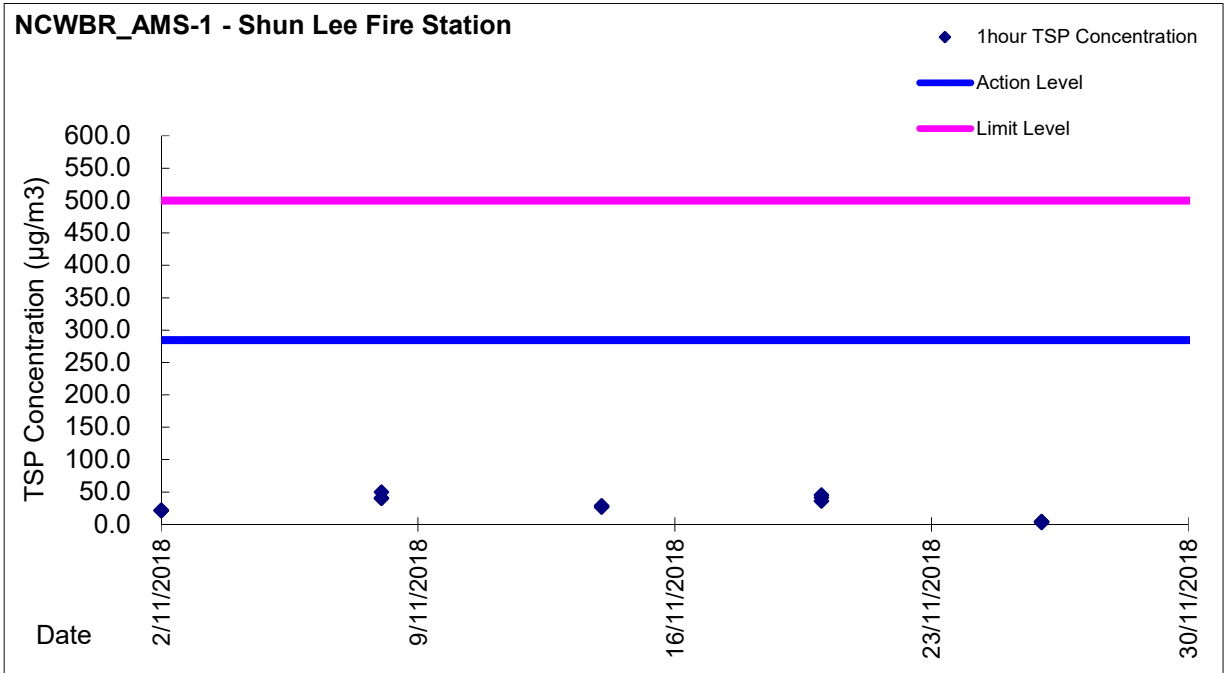
Report on 1-hour TSP monitoring at LTR_AMS-3 - Po Tat Estate Tat Kai House

Action Level ($\mu\text{g}/\text{m}^3$) - 285.1
Limit Level ($\mu\text{g}/\text{m}^3$) - 500.0

Date	Weather Condition	Time	Mass Concentration ($\mu\text{g}/\text{m}^3$)
2-Nov-18	Fine	08:09	15.5
2-Nov-18	Fine	09:10	24.9
2-Nov-18	Fine	10:11	25.4
8-Nov-18	Fine	9:23	78.7
8-Nov-18	Fine	10:24	73.8
8-Nov-18	Fine	13:00	103.6
14-Nov-18	Fine	8:46	49.2
14-Nov-18	Fine	9:47	46.7
14-Nov-18	Fine	10:48	42.5
20-Nov-18	Cloudy	10:57	21.2
20-Nov-18	Cloudy	13:00	19.1
20-Nov-18	Cloudy	14:01	17.1
26-Nov-18	Cloudy	9:51	10.9
26-Nov-18	Cloudy	10:52	9.2
26-Nov-18	Cloudy	13:00	10.6

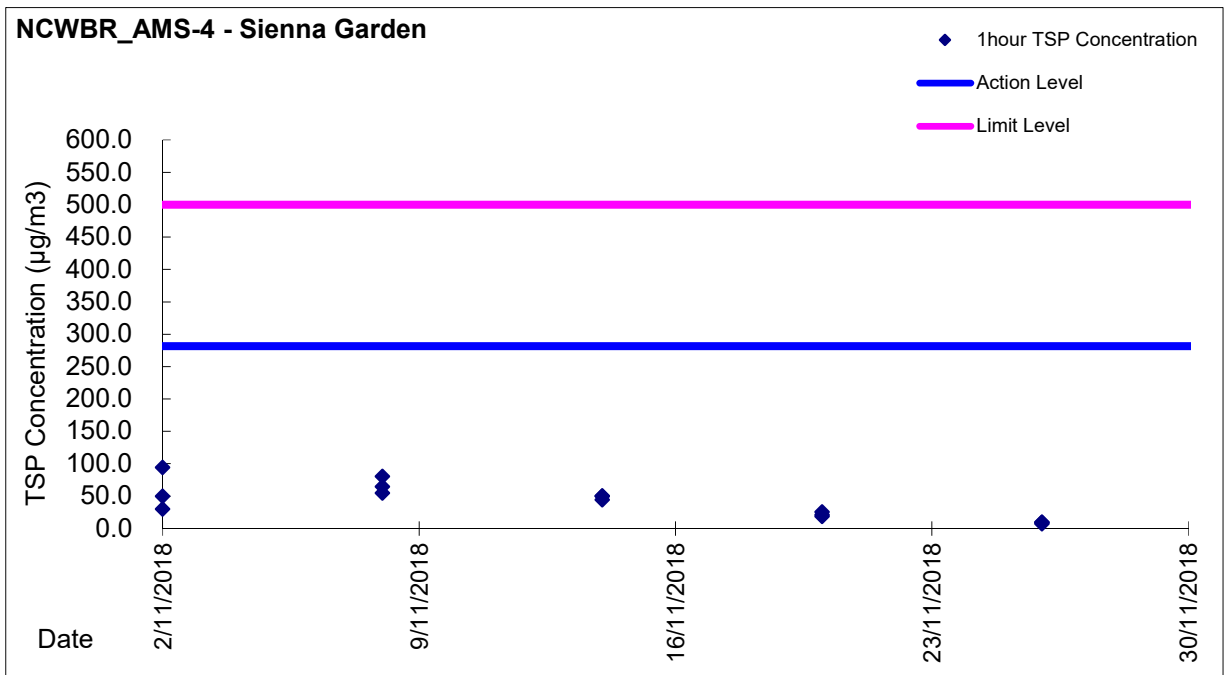
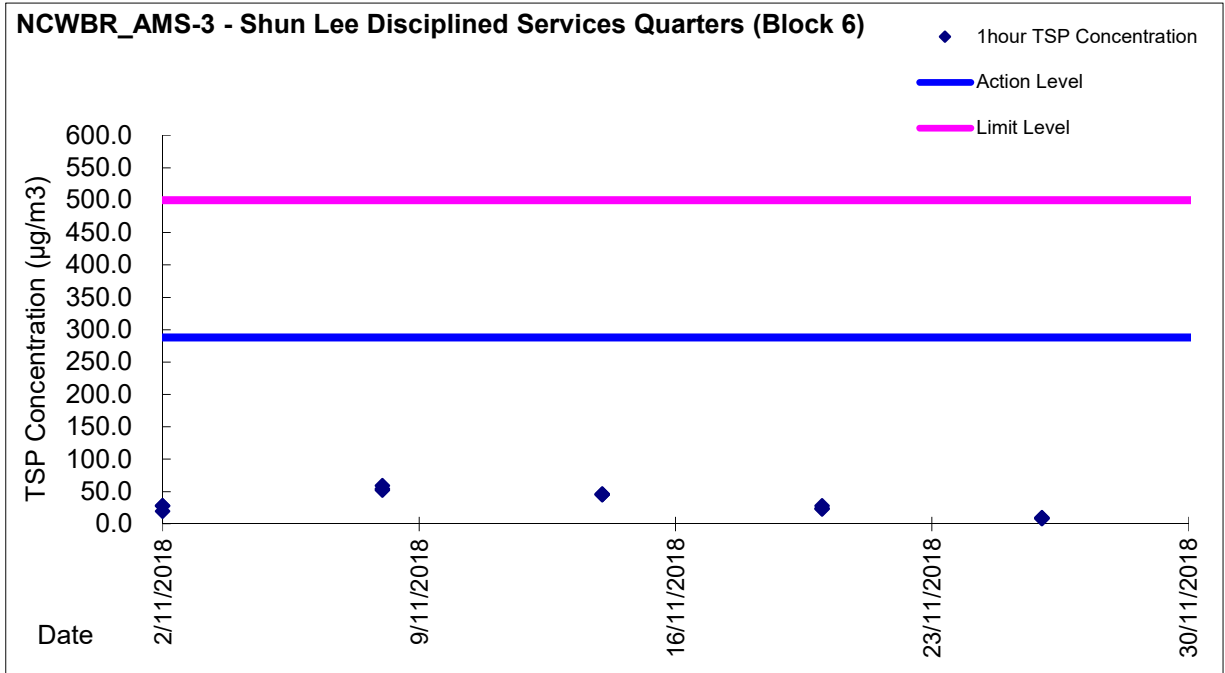


Graphic Presentation of TSP Result



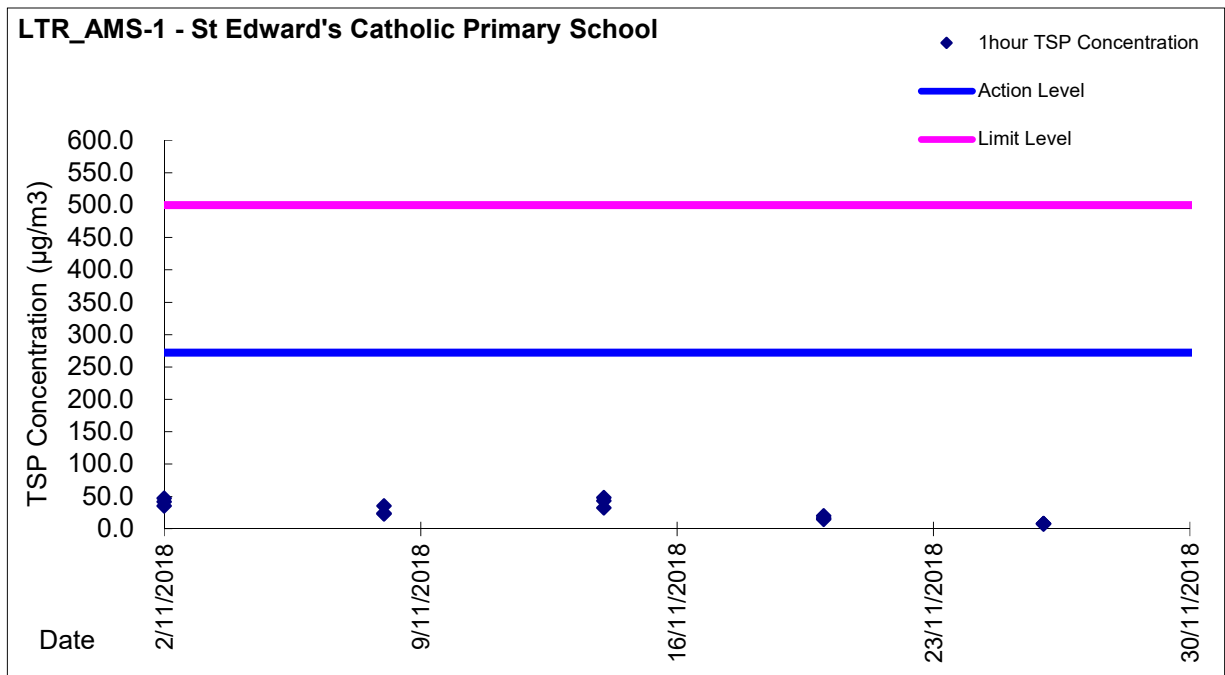
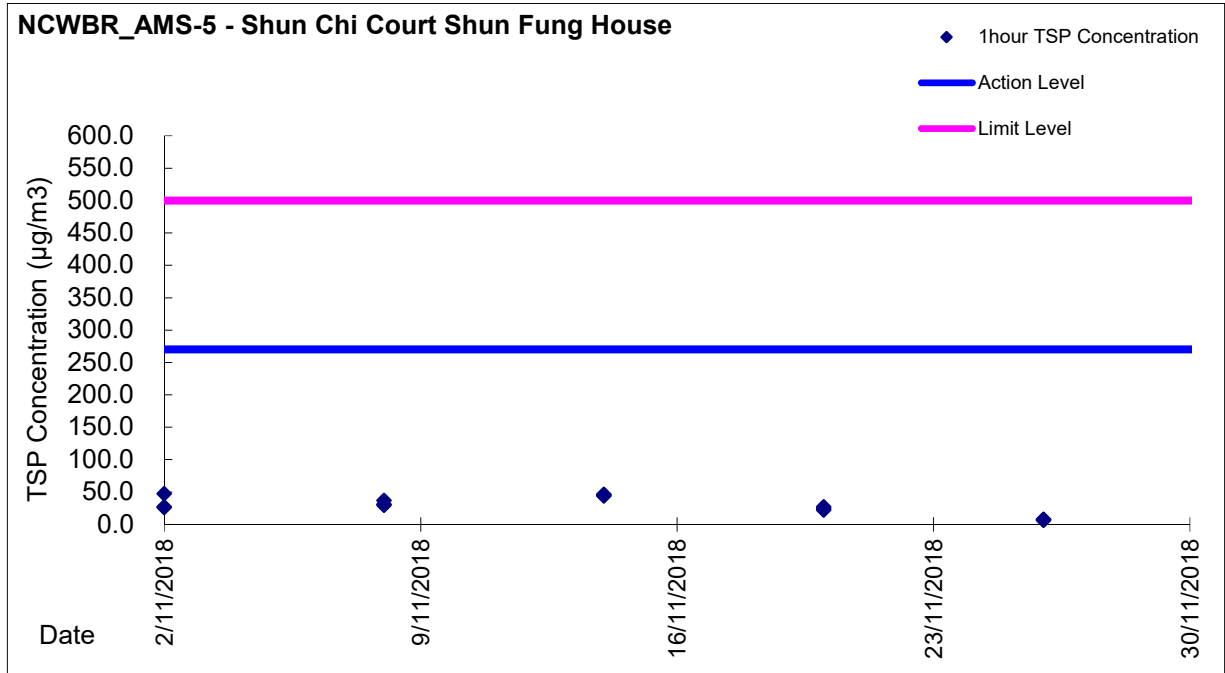


Graphic Presentation of TSP Result



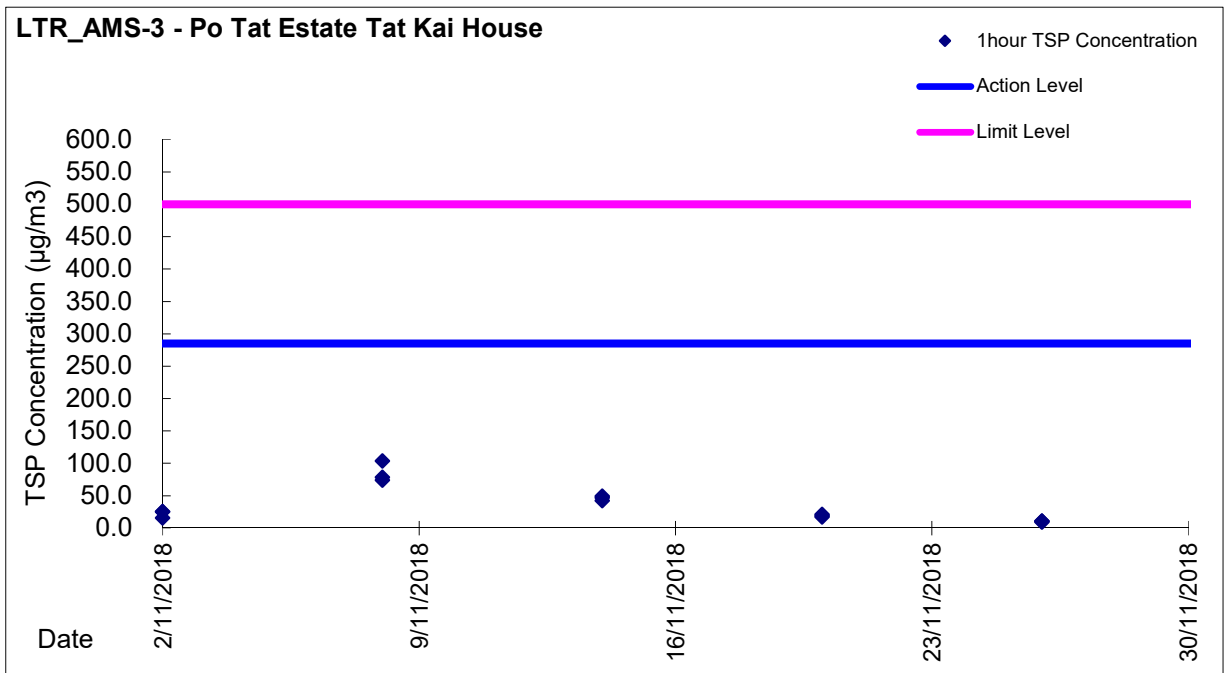
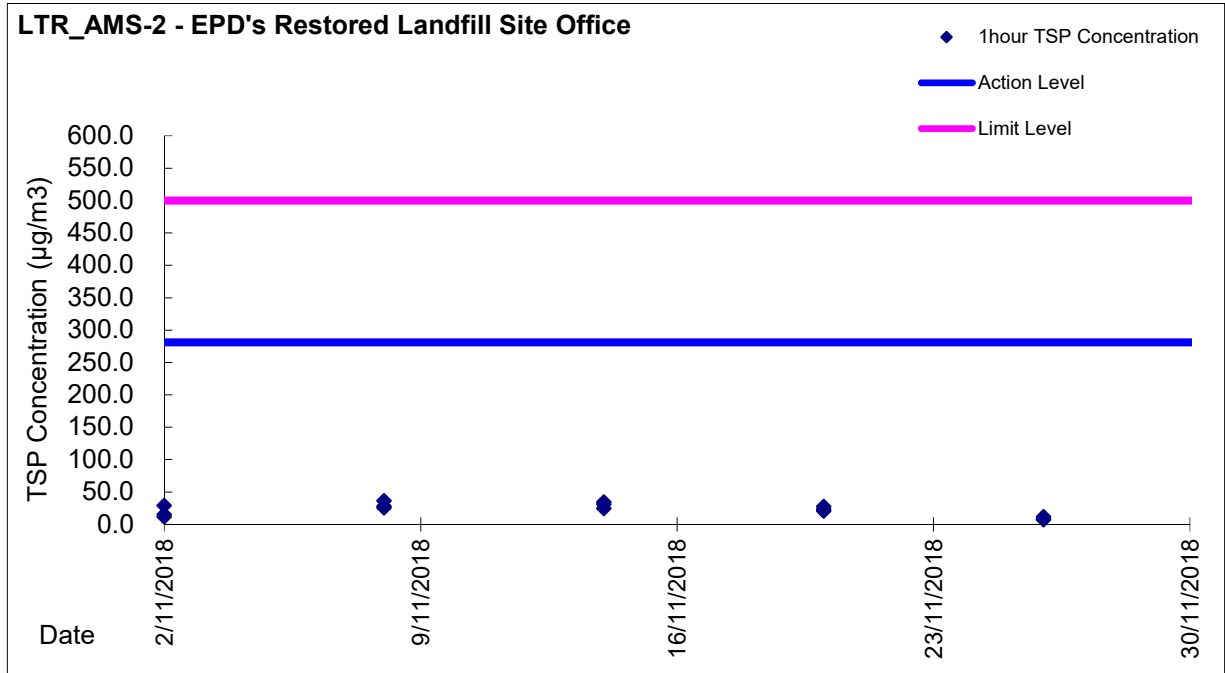


Graphic Presentation of TSP Result





Graphic Presentation of TSP Result





Appendix 5.4

Water Quality Monitoring Results and Graphical Presentations



Water Monitoring Result at Monitoring Station E - Channelized nullah across the Project site (Upstream Control Station)

Date	Time	Weater Condition	Sampling Depth m	Water Temperature °C			pH			Salinity ppt			DO Saturation %			DO mg/L			Turbidity NTU			Suspended Solids mg/L	
				Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value
2/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14/11/2018	-	Cloudy	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16/11/2018	-	Cloudy	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19/11/2018	-	Cloudy	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26/11/2018	11:45	Cloudy	Surface	20.0	20.0	20.0	7.7	7.7	7.7	0.03	0.03	0.03	76.6	77.8	78.0	7.0	7.1	7.1	10.5	10.6	10.6	6.4	5.8
	11:47			20.0	20.0	20.0	7.6	7.6	7.7	0.03	0.03	0.03	78.6	78.8	78.0	7.1	7.2	7.1	10.7	10.6	10.6	5.2	5.8
28/11/2018	-	Cloudy	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30/11/2018	-	Fine	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks:
 Single underline denotes exceedance over Action Level.
 Double underline denotes exceedance over Limit Level.
 Upstream Monitoring Station (Monitoring Station E) would be taken as control reference for exceedance investigation only.
 " - " denotes no water can be collected as the station was dried out.



Water Monitoring Result at Monitoring Station F - Channelized nullah across the Project site (Downstream Impact Station)

Date	Time	Weather Condition	Sampling Depth m	Water Temperature °C			pH			Salinity ppt			DO Saturation %			DO mg/L			Turbidity NTU			Suspended Solids mg/L		
				Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average
2/11/2018	10:45	Fine	Surface	22.3	22.3	22.4	8.2	8.2	8.2	0.08	0.08	0.08	85.8	85.7	85.5	7.5	7.4	7.4	0.5	0.5	0.5	<1.0	<1.0	
	10:47			22.5	22.5		8.2	8.2		0.08	0.08		85.7	84.7		7.4	7.3		0.5	0.5		<1.0	<1.0	
5/11/2018	11:30	Fine	Surface	23.2	23.2	23.3	7.8	7.8	7.8	0.13	0.13	0.13	79.2	81.7	80.8	6.8	7.0	6.9	1.2	1.2	1.2	1.3	1.3	
	11:32			23.4	23.4		7.8	7.8		0.12	0.12		81.7	80.5		7.0	6.9		1.2	1.2		1.3	1.3	
7/11/2018	11:00	Fine	Surface	23.7	23.7	23.8	7.9	7.9	7.9	0.11	0.11	0.11	73.1	76.2	76.8	6.2	6.4	6.5	1.4	1.4	1.4	<1.0	1.2	
	11:02			23.9	23.9		7.9	7.9		0.11	0.11		78.6	79.4		6.6	6.7		1.4	1.4		1.2	1.2	
9/11/2018	12:05	Fine	Surface	23.7	23.7	23.8	8.0	8.0	8.0	0.10	0.10	0.10	80.5	83.9	82.7	6.8	7.1	7.0	1.2	1.2	1.5	1.1	1.1	
	12:07			23.9	23.9		8.0	8.0		0.10	0.10		83.4	82.8		7.1	7.0		1.8	1.8		1.1	1.1	
12/11/2018	14:10	Fine	Surface	24.2	24.2	24.4	8.2	8.2	8.2	0.61	0.61	0.61	75.5	75.5	76.4	6.3	6.3	6.3	8.6	8.6	8.6	2.0	2.0	
	14:12			24.5	24.5		8.2	8.2		0.61	0.61		77.0	77.4		6.4	6.4		8.6	8.6		1.9	1.9	
14/11/2018	11:35	Cloudy	Surface	23.5	23.5	23.6	7.8	7.8	7.7	0.11	0.11	0.11	77.2	77.5	77.6	6.5	6.6	6.6	4.7	4.6	4.6	2.2	2.3	
	11:37			23.6	23.6		7.7	7.7		0.11	0.11		77.9	77.8		6.6	6.6		4.6	4.6		2.3	2.3	
16/11/2018	9:45	Cloudy	Surface	22.6	22.6	22.8	8.3	8.3	8.3	0.22	0.22	0.22	74.7	75.0	74.8	6.4	6.4	6.4	3.4	3.4	3.4	<1.0	<1.0	
	9:47			22.9	22.9		8.3	8.3		0.22	0.22		74.7	74.7		6.4	6.4		3.5	3.5		<1.0	<1.0	
19/11/2018	16:20	Cloudy	Surface	22.6	22.6	22.8	7.9	7.9	7.9	0.21	0.21	0.21	82.5	82.9	82.8	7.1	7.1	7.1	0.6	0.7	0.7	<1.0	<1.0	
	16:22			22.9	22.9		7.9	7.9		0.21	0.21		82.9	82.8		7.1	7.1		0.7	0.7		<1.0	<1.0	
21/11/2018	11:10	Fine	Surface	23.6	23.6	23.8	7.6	7.6	7.6	0.15	0.15	0.15	82.2	82.8	83.6	7.0	7.0	7.1	3.6	3.8	3.8	1.3	1.7	
	11:12			23.9	23.9		7.6	7.6		0.14	0.14		84.7	84.8		7.2	7.2		3.8	3.8		2.0	2.0	
23/11/2018	9:40	Fine	Surface	19.9	19.9	19.9	7.4	7.4	7.4	0.38	0.38	0.39	75.6	76.7	75.9	6.9	7.0	6.9	1.8	1.8	1.8	1.3	1.7	
	9:42			19.9	19.9		7.4	7.5		0.39	0.39		75.8	75.5		6.9	6.9		1.8	1.8		2.1	2.1	
26/11/2018	10:50	Cloudy	Surface	19.8	19.8	19.8	8.0	8.0	7.9	0.14	0.14	0.14	81.3	82.3	82.1	7.4	7.5	7.5	6.0	6.0	6.0	3.0	3.0	
	10:52			19.8	19.8		7.9	7.9		0.14	0.14		82.4	82.4		7.5	7.5		6.0	6.0		2.9	2.9	
28/11/2018	16:25	Cloudy	Surface	20.5	20.5	20.6	7.9	7.9	7.9	0.10	0.10	0.10	80.9	80.5	81.2	7.3	7.2	7.3	71.6	71.7	<u>71.5</u>	8.1	6.9	
	16:27			20.6	20.6		8.0	8.0		0.10	0.10		81.6	81.6		7.2	7.4		71.3	71.3		5.7	5.7	
30/11/2018	11:45	Fine	Surface	21.8	21.8	22.0	7.5	7.5	7.5	0.12	0.12	0.12	83.0	84.4	84.4	7.3	7.4	7.4	3.1	3.1	3.1	<1.0	1.4	
	11:47			22.2	22.2		7.5	7.5		0.12	0.12		85.4	84.6		7.5	7.4		3.1	3.1		1.4	1.4	

Remarks:
 Single underline denotes exceedance over Action Level.
 Double underline denotes exceedance over Limit Level.



Water Monitoring Result at Monitoring Station H - Ma Yau Tong Stream (Upstream Control Station)

Date	Time	Weather Condition	Sampling Depth m	Water Temperature °C		pH		Salinity ppt		DO Saturation %		DO mg/L		Turbidity NTU		Suspended Solids mg/L							
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average						
2/11/2018	11:25	Fine	Surface	23.7	23.7	23.8	7.8	7.8	7.8	0.94	0.94	0.94	88.5	88.1	88.3	7.4	7.4	7.4	0.2	0.2	0.2	<1.0	<1.0
	11:27			23.8	23.8		7.9	7.8		0.94	0.94		88.5	88.2		7.4	7.4		0.2	0.2			
5/11/2018	11:55	Fine	Surface	24.6	24.6	24.7	7.7	7.7	7.7	0.85	0.85	0.85	86.7	85.7	86.5	6.8	7.0	6.9	2.5	2.2	2.2	2.9	3.8
	11:57			24.8	24.8		7.7	7.7		0.85	0.85		86.4	87.0		7.0	6.9		2.1	2.1		4.7	
7/11/2018	11:16	Fine	Surface	24.7	24.7	24.9	8.3	8.3	8.3	0.31	0.31	0.31	82.9	82.5	82.6	6.9	6.8	6.8	0.2	0.3	0.2	<1.0	<1.0
	11:18			25.1	25.1		8.3	8.3		0.31	0.31		82.2	82.9		6.8	6.8		0.1	0.1		<1.0	
9/11/2018	12:30	Fine	Surface	24.7	24.7	24.8	7.8	7.8	7.8	0.36	0.36	0.36	88.0	87.3	87.2	7.3	7.2	7.2	1.0	1.0	1.0	23.6	17.9
	12:32			24.8	24.8		7.8	7.8		0.36	0.36		86.7	86.7		7.2	7.2		1.0	1.0		12.2	
12/11/2018	14:30	Fine	Surface	24.7	24.7	24.8	8.0	8.0	7.9	0.59	0.59	0.61	83.8	84.6	83.9	6.9	7.0	6.9	5.7	5.6	5.5	1.2	2.7
	14:32			24.9	24.9		7.8	7.8		0.62	0.62		83.5	83.7		6.9	6.9		5.4	5.5		4.1	
14/11/2018	14:10	Cloudy	Surface	23.8	23.8	23.9	7.5	7.5	7.5	0.74	0.74	0.74	78.4	77.8	77.9	6.6	6.6	6.6	5.9	5.8	5.8	6.0	5.1
	14:12			23.9	23.9		7.5	7.5		0.74	0.74		77.7	77.8		6.5	6.6		5.7	5.8		4.2	
16/11/2018	10:10	Cloudy	Surface	22.9	22.9	23.0	7.8	7.8	7.8	1.07	1.07	1.08	74.3	74.5	74.5	6.3	6.4	6.4	2.8	2.9	2.9	<1.0	<1.0
	10:12			23.0	23.0		7.7	7.7		1.08	1.08		74.6	74.7		6.4	6.4		2.9	2.9		<1.0	
19/11/2018	15:40	Cloudy	Surface	23.8	23.8	23.8	8.0	8.0	8.0	0.99	0.99	0.99	79.0	79.1	79.1	6.6	6.6	6.6	0.9	0.9	0.9	<1.0	<1.0
	15:42			23.8	23.8		8.0	8.0		0.99	0.99		79.1	79.2		6.6	6.6		0.9	0.9		<1.0	
21/11/2018	12:45	Fine	Surface	25.8	25.8	26.1	7.4	7.4	7.5	0.23	0.23	0.23	85.7	83.9	84.4	6.9	6.8	6.8	1.7	1.7	1.7	1.9	1.8
	12:47			26.3	26.3		7.5	7.5		0.23	0.23		83.8	84.1		6.8	6.8		1.7	1.7		1.6	
23/11/2018	10:47	Fine	Surface	21.7	21.7	21.8	7.9	7.9	7.8	0.69	0.69	0.69	58.0	57.4	57.0	5.1	5.0	5.0	5.6	5.6	5.6	1.1	1.2
	10:49			21.9	21.9		7.7	7.7		0.69	0.69		57.1	55.4		5.0	4.8		5.6	5.6		1.3	
26/11/2018	12:15	Cloudy	Surface	19.4	19.4	19.5	7.9	7.9	7.9	0.16	0.16	0.16	77.1	77.5	78.0	7.1	7.1	7.2	42.8	42.8	42.8	370.4	359.8
	12:17			19.5	19.5		7.9	7.9		0.16	0.16		78.6	78.6		7.2	7.2		42.8	42.8		349.2	
28/11/2018	15:45	Cloudy	Surface	20.9	20.9	20.9	8.8	8.8	8.7	0.35	0.35	0.35	80.8	81.4	80.9	7.3	7.3	7.2	7.9	7.9	7.9	9.8	9.2
	15:47			20.9	20.9		8.7	8.7		0.35	0.35		80.5	80.8		7.2	7.2		7.9	7.9		8.6	
30/11/2018	12:20	Fine	Surface	22.5	22.5	22.7	7.5	7.5	7.5	0.45	0.45	0.45	85.8	83.5	83.8	7.4	7.2	7.2	16.0	16.0	15.8	20.4	21.1
	12:22			22.9	22.9		7.5	7.5		0.45	0.45		81.7	84.0		7.0	7.0		15.8	15.6		21.8	

Remarks:

Single underline denotes exceedance over Action Level.

Double underline denotes exceedance over Limit Level.

Upstream Monitoring Station (Monitoring Station H) would be taken as control reference for exceedance investigation only.



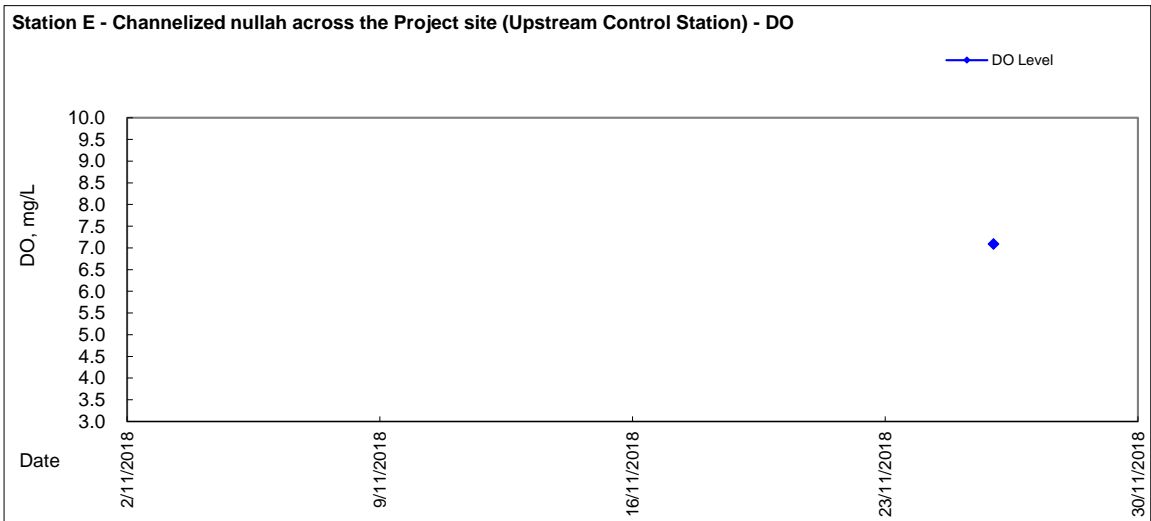
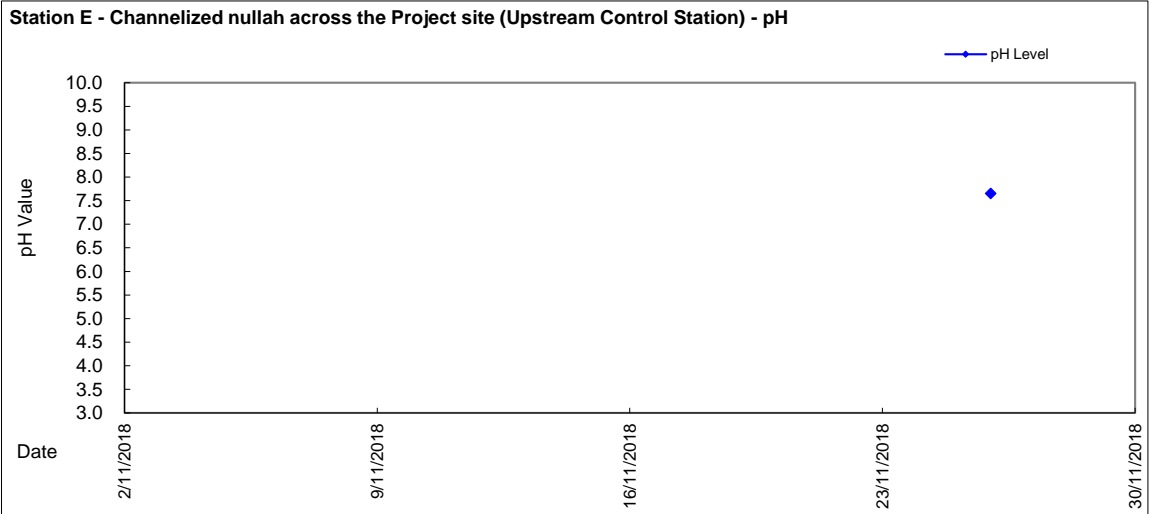
Water Monitoring Result at Monitoring Station I - Ma Yau Tong Stream (Downstream Impact Station)

Date	Time	Weather Condition	Sampling Depth m	Water Temperature °C			pH			Salinity ppt			DO Saturation %		DO mg/L		Turbidity NTU		Suspended Solids mg/L				
				Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average	Value	Value	Average		
2/11/2018	11:50	Fine	Surface	24.3	24.3	24.3	8.0	8.0	8.0	0.31	0.31	0.31	78.2	78.1	78.0	6.5	6.5	6.5	1.4	1.4	1.4	2.2	3.7
	11:52			24.3	24.4		8.0	8.0		0.31	0.31		78.1	77.7		6.5	6.5		1.4	1.4		5.2	
5/11/2018	12:30	Fine	Surface	24.9	24.9	24.9	7.8	7.8	7.8	0.38	0.38	0.38	78.8	78.2	78.5	6.5	6.5	6.5	0.5	0.6	0.5	1.4	1.4
	12:32			24.9	24.9		7.8	7.8		0.38	0.38		78.7	78.4		6.5	6.5		0.5	0.5		<1.0	
7/11/2018	11:42	Fine	Surface	25.5	25.5	25.6	8.0	8.0	8.0	0.25	0.25	0.25	69.5	68.8	67.9	5.7	5.6	5.5	0.3	0.3	0.3	1.8	1.5
	11:44			25.6	25.6		8.0	8.0		0.25	0.25		66.8	66.6		5.5	5.4		0.3	0.3		1.2	
9/11/2018	12:50	Fine	Surface	24.4	24.4	24.5	7.8	7.8	7.8	0.26	0.26	0.26	83.1	82.2	82.6	6.9	6.8	6.9	0.8	0.8	0.8	1.5	1.4
	12:52			24.6	24.6		7.8	7.8		0.26	0.26		82.1	83.0		6.8	6.9		0.8	0.8		1.3	
12/11/2018	15:00	Fine	Surface	24.5	24.5	24.5	7.8	7.8	7.8	0.30	0.30	0.29	80.9	81.1	80.7	6.7	6.8	6.7	2.9	2.9	2.9	6.2	4.0
	15:02			24.5	24.5		7.7	7.7		0.28	0.28		80.5	80.2		6.7	6.7		2.9	2.9		1.7	
14/11/2018	9:50	Cloudy	Surface	23.5	23.5	23.6	8.0	8.0	7.9	0.29	0.29	0.29	79.0	78.7	78.2	6.7	6.7	6.6	5.2	5.2	5.1	4.8	4.5
	9:52			23.7	23.7		7.9	7.9		0.29	0.29		77.4	77.5		6.5	6.6		5.1	5.1		4.1	
16/11/2018	10:40	Cloudy	Surface	23.7	23.7	23.8	7.9	7.9	7.8	0.38	0.38	0.38	82.9	83.4	83.2	7.0	7.0	7.0	2.0	2.1	2.1	<1.0	<1.0
	10:42			23.8	23.8		7.8	7.8		0.38	0.38		83.1	83.3		7.0	7.0		2.1	2.1		<1.0	
19/11/2018	15:08	Cloudy	Surface	24.1	24.1	24.2	8.4	8.5	8.4	0.65	0.65	0.66	86.7	86.8	86.1	7.3	7.3	7.2	1.1	1.1	1.1	2.6	2.2
	15:10			24.2	24.2		8.4	8.4		0.66	0.66		85.4	85.4		7.1	7.1		1.1	1.1		1.8	
21/11/2018	13:00	Fine	Surface	25.6	25.6	25.9	7.3	7.3	7.4	0.54	0.54	0.54	82.2	83.5	82.4	6.7	6.8	6.7	3.3	3.2	3.2	1.1	1.2
	13:02			26.1	26.1		7.4	7.4		0.54	0.54		82.4	81.3		6.7	6.6		3.2	3.2		1.3	
23/11/2018	10:53	Fine	Surface	21.8	21.8	21.9	7.7	7.7	7.7	0.56	0.56	0.56	76.7	75.9	75.8	6.7	6.6	6.6	22.7	22.7	22.7	28.1	28.8
	10:55			21.9	21.9		7.7	7.7		0.56	0.56		74.9	73.4		6.5	6.4		22.7	22.8		29.5	
26/11/2018	9:20	Cloudy	Surface	19.8	19.8	19.8	8.0	8.0	8.0	1.07	1.07	1.08	81.0	81.6	81.9	7.4	7.1	7.4	30.8	30.7	30.8	23.8	22.5
	9:22			19.8	19.8		8.0	8.0		1.08	1.08		82.3	82.5		7.5	7.5		30.9	30.9		21.2	
28/11/2018	15:25	Cloudy	Surface	21.8	21.8	21.7	8.1	8.1	8.0	1.43	1.43	1.45	84.4	83.3	84.2	7.4	7.3	7.4	53.5	53.9	53.6	32.7	35.2
	15:27			21.6	21.6		8.0	8.0		1.46	1.46		84.5	84.7		7.4	7.4		53.5	53.5		37.7	
30/11/2018	12:45	Fine	Surface	22.4	22.4	22.5	7.5	7.5	7.5	0.72	0.72	0.72	81.5	85.5	83.6	7.5	7.4	7.3	4.8	4.7	4.7	5.8	5.6
	12:47			22.6	22.6		7.5	7.5		0.71	0.71		83.3	84.2		7.2	7.3		4.6	4.6		5.3	

Remarks:
 Single underline denotes exceedance over Action Level.
 Double underline denotes exceedance over Limit Level.

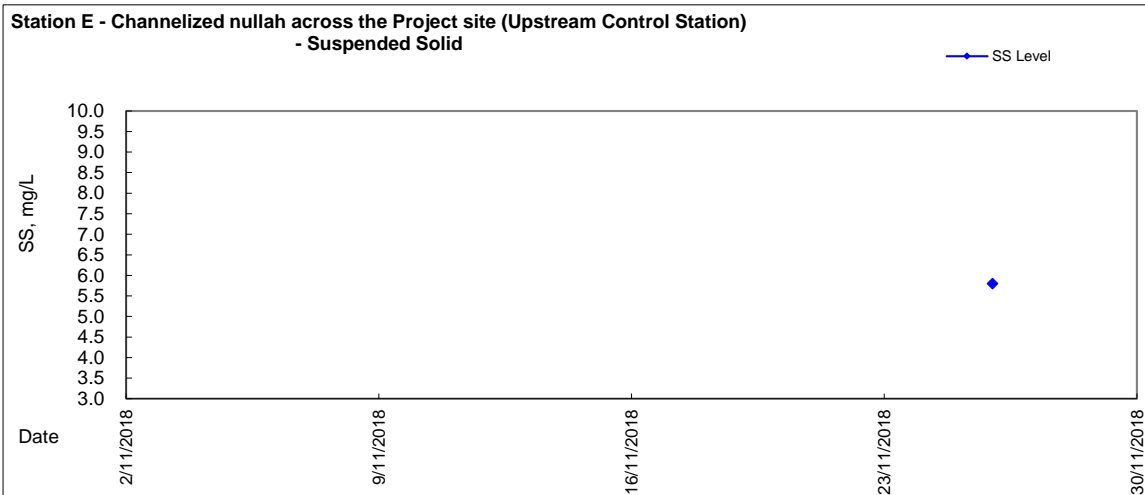
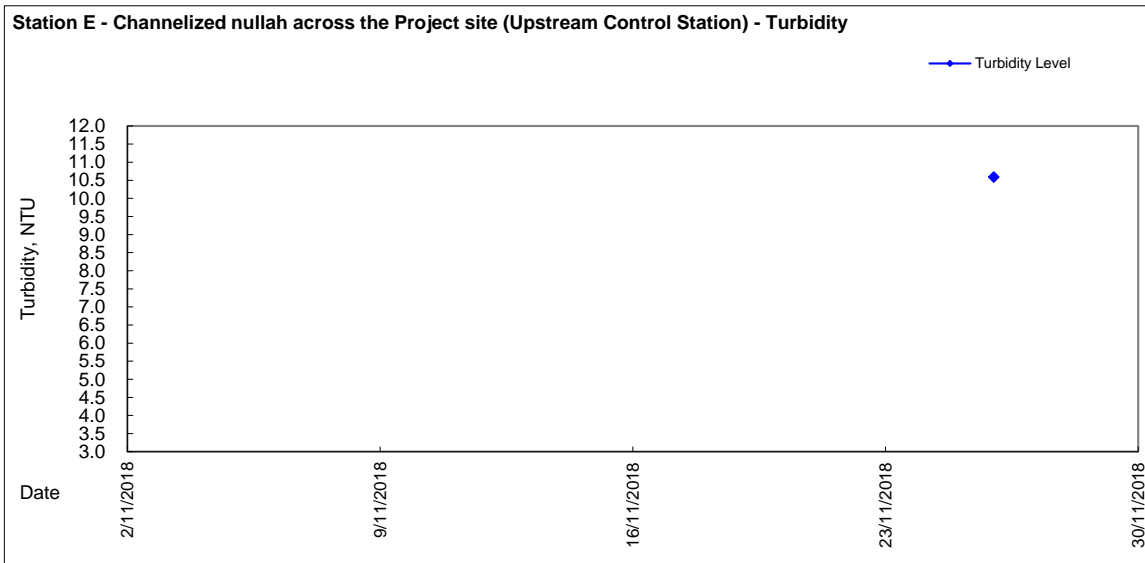


Graphic Presentation of WQM Result



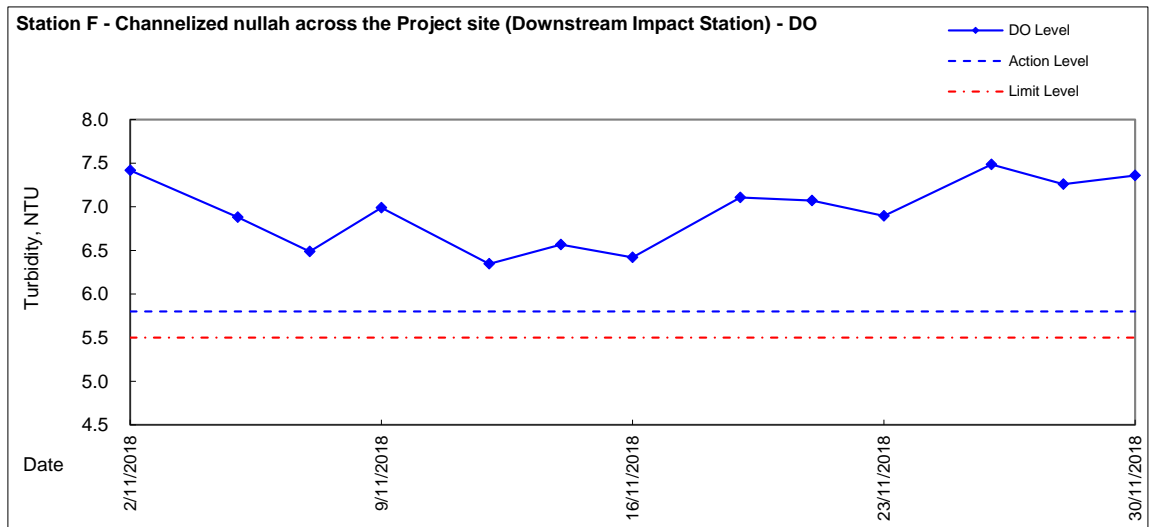
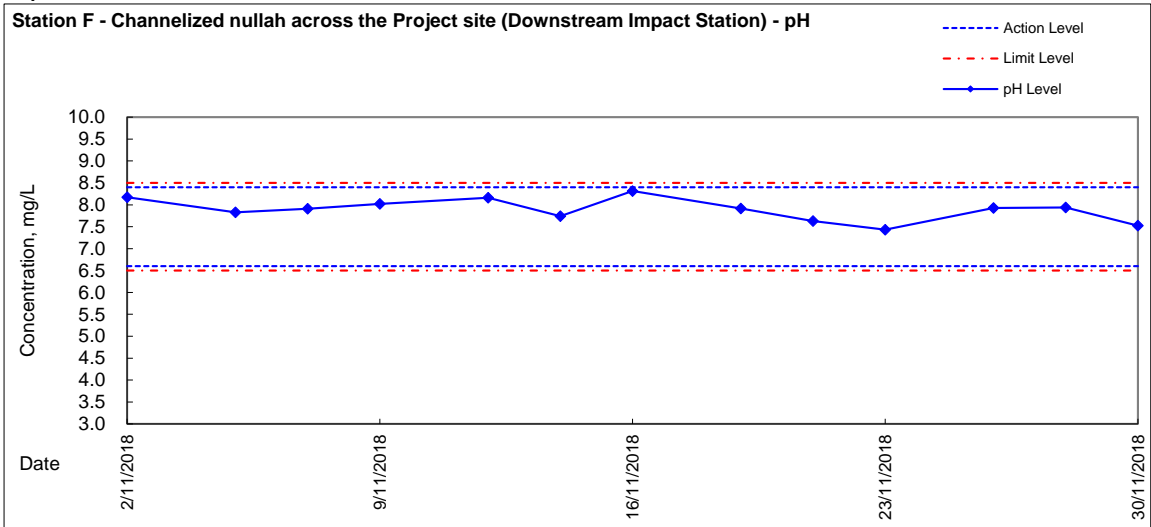


Graphic Presentation of WQM Result



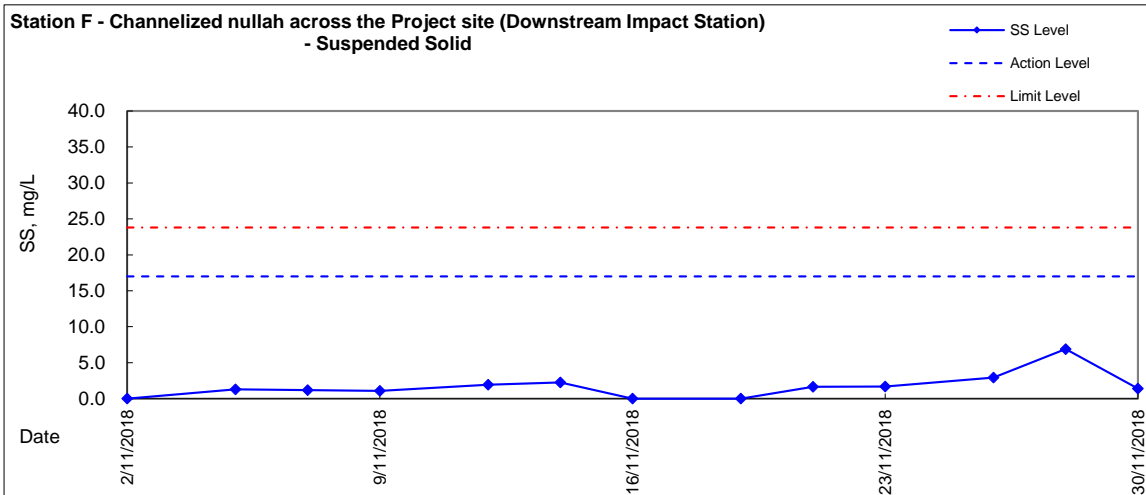
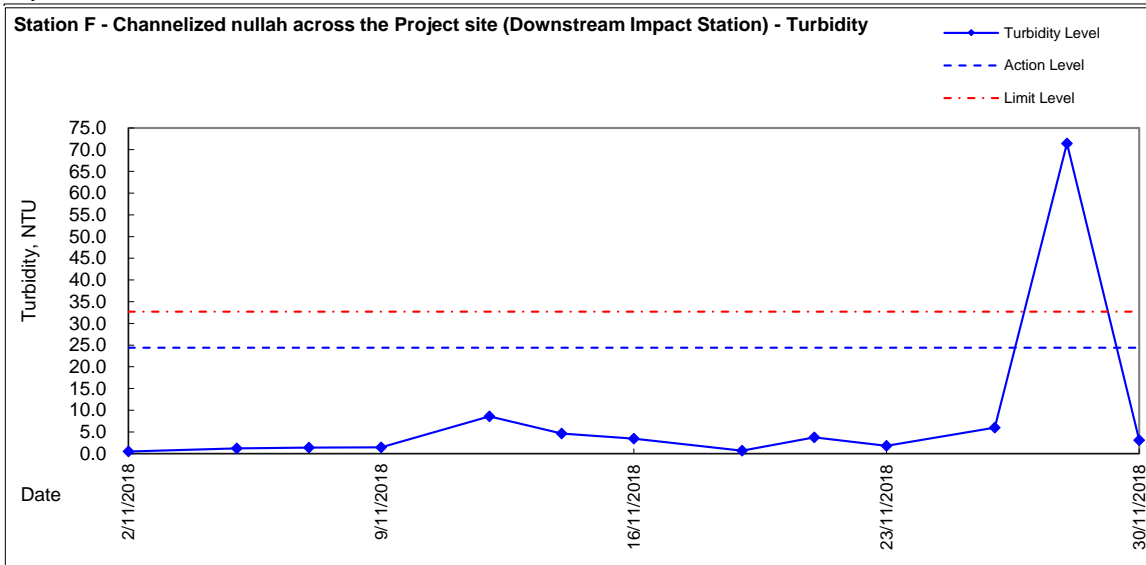


Graphic Presentation of WQM Result



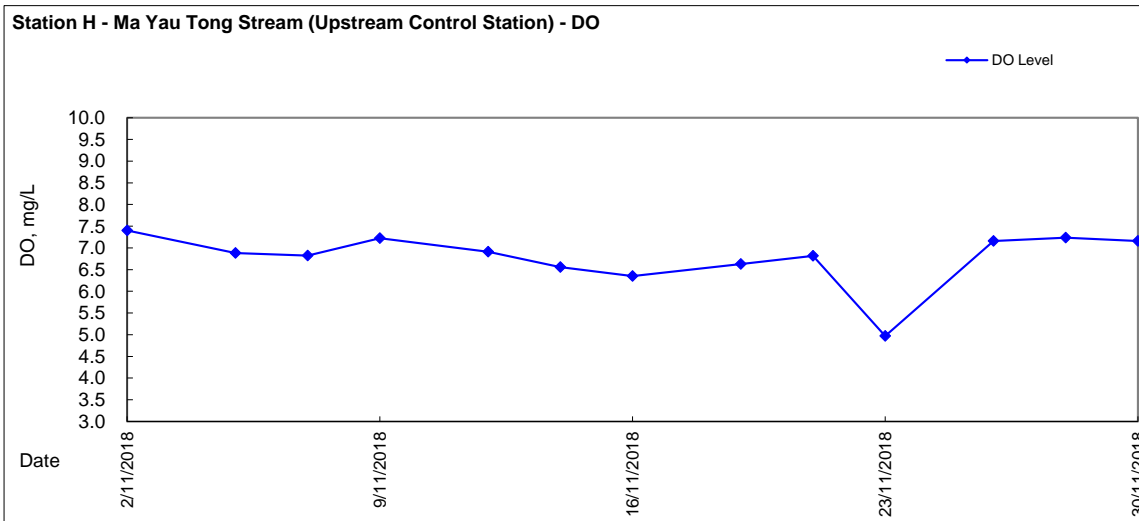
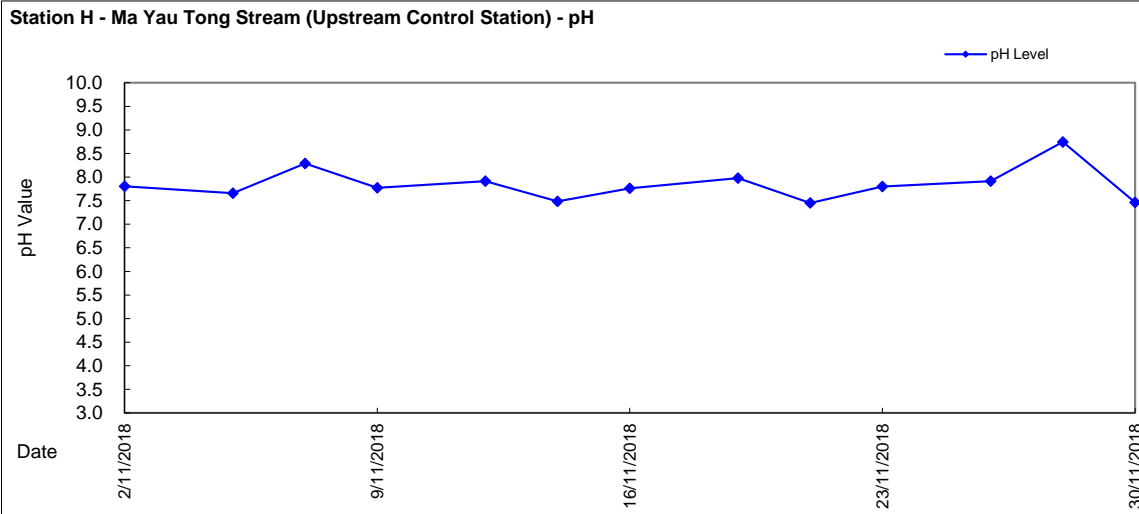


Graphic Presentation of WQM Result



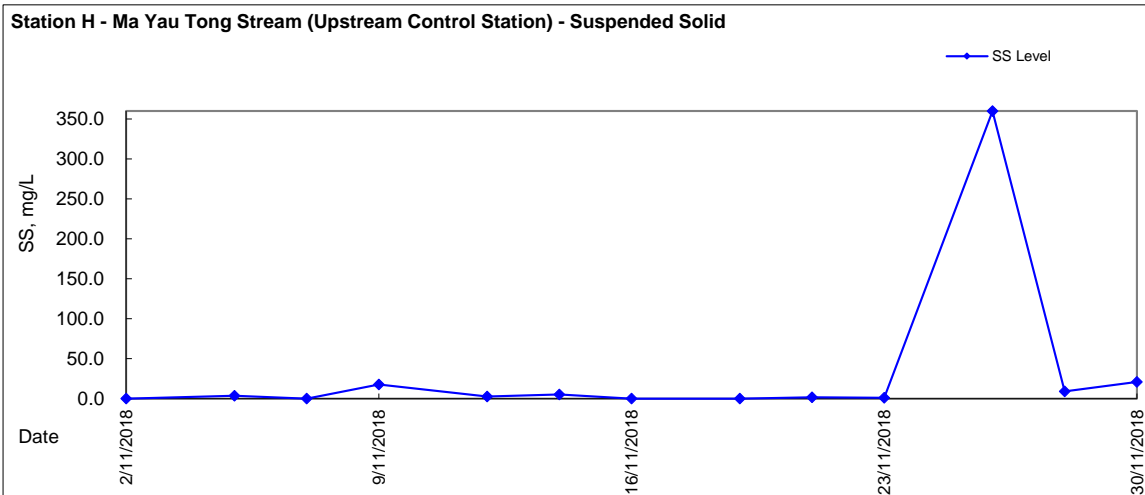
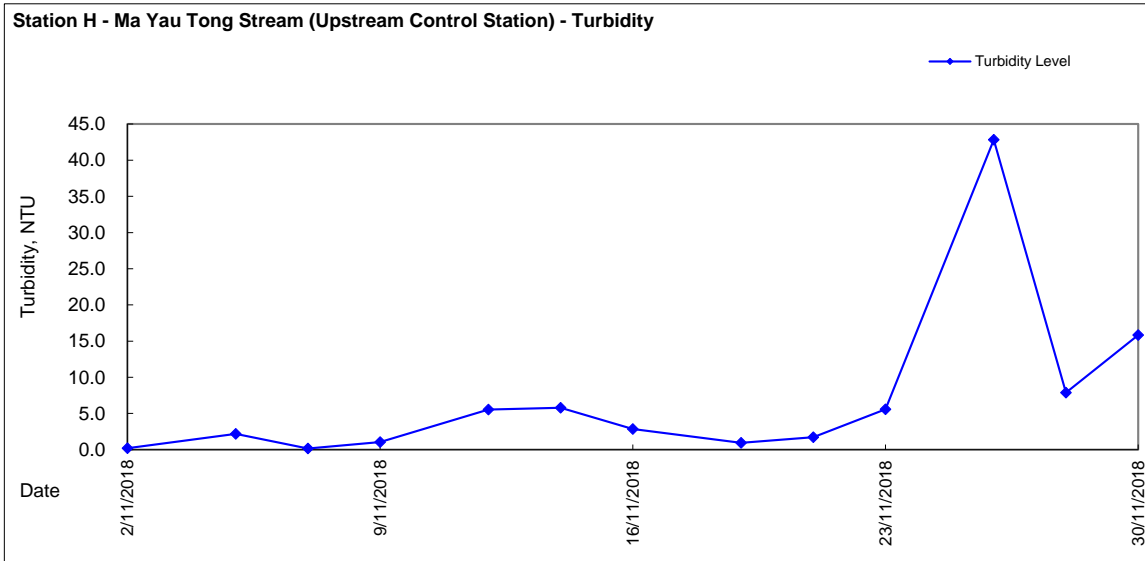


Graphic Presentation of WQM Result



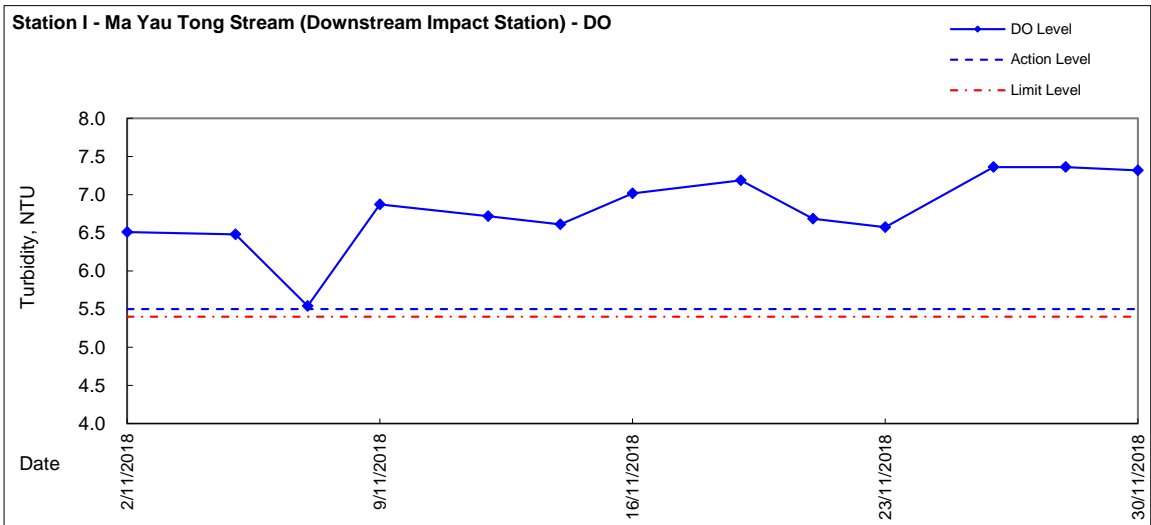
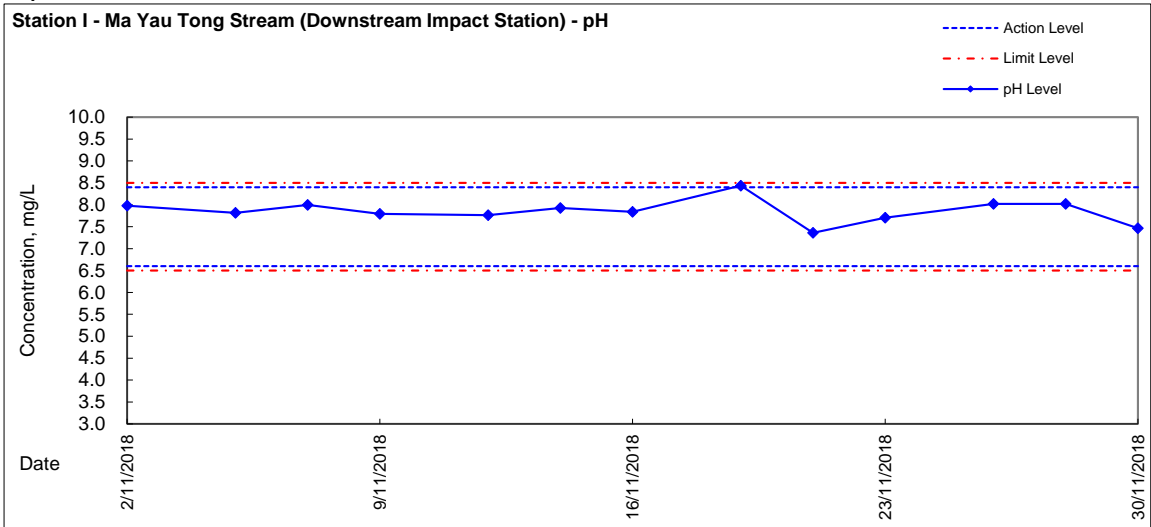


Graphic Presentation of WQM Result



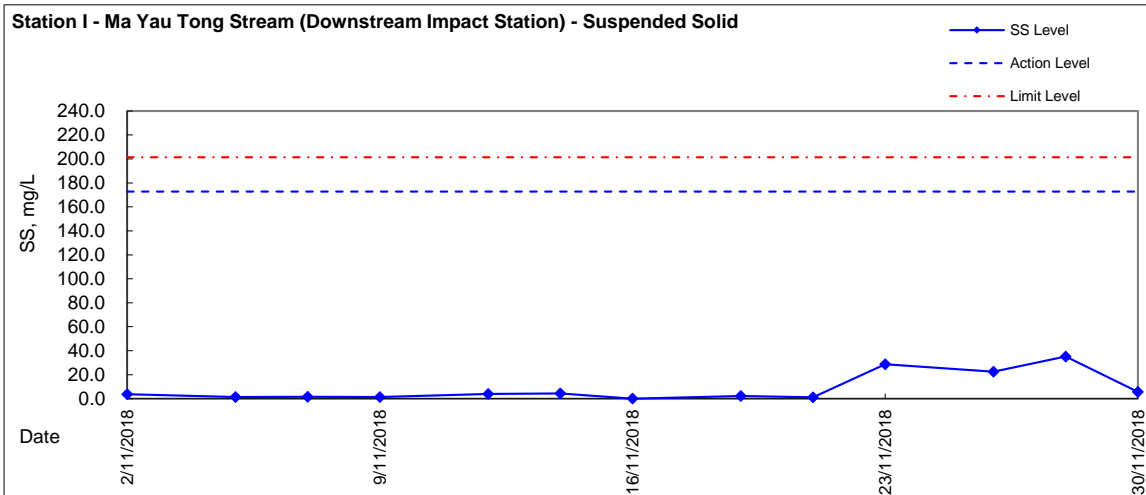
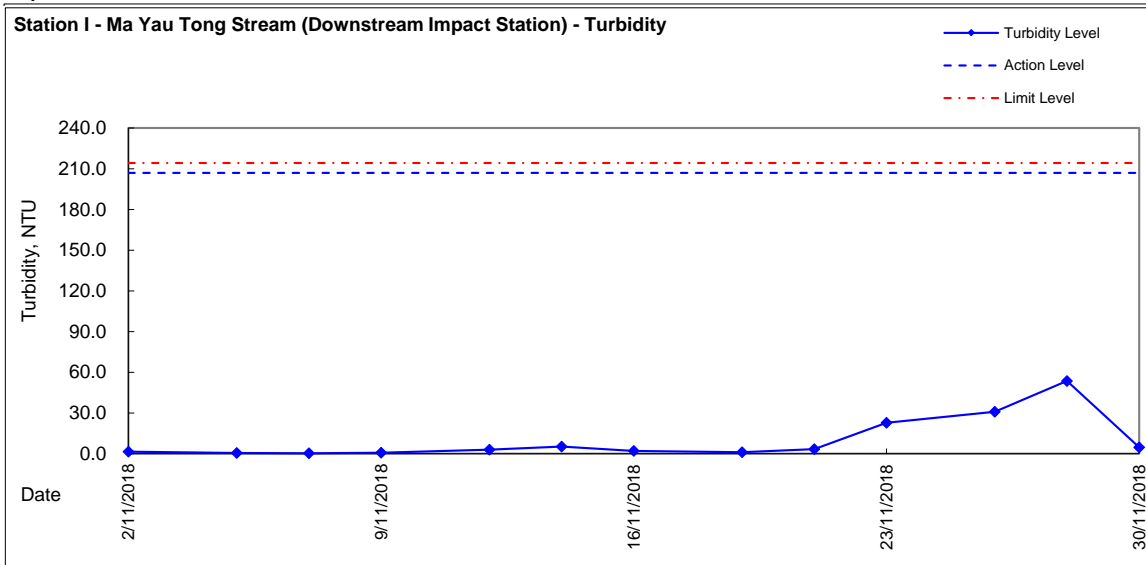


Graphic Presentation of WQM Result





Graphic Presentation of WQM Result





Appendix 5.5

Monthly Summary Waste Flow Table

Contract No.: NE/2017/03

Development of Anderson Road Quarry Site – Road Improvement Works and Pedestrian Connectivity Facilities Works Phase 2A

Monthly Summary Waste Flow Table for 2018(year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan	--	--	--	--	--	--	--	--	--	--	--
Feb	--	--	--	--	--	--	--	--	--	--	--
Mar	--	--	--	--	--	--	--	--	--	--	--
Apr	--	--	--	--	--	--	--	--	--	--	--
May	--	--	--	--	--	--	--	--	--	--	--
Jun	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jul	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.006	0.004	0.000	0.000
Oct	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.081	0.003	0.000	0.000
Nov	0.003	0.000	0.000	0.000	0.003	0.000	0.004	0.088	0.0025	0.000	0.000
Dec											
Total	0.003	0.000	0.000	0.000	0.003	0.000	0.012	0.175	0.032	0.000	0.000

Contract No.: NE/2017/03

Development of Anderson Road Quarry Site – Road Improvement Works and Pedestrian Connectivity Facilities Works Phase 2A

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
7.000	0	0	0	7.000	0	100.000	2.000	0.300	1.000	3.500

- Notes:
- (1) The performance targets are given in PS Clause 6.14.
 - (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and waste will be collected by recycler for recycling
 - (4) Use the conversion factor, density of general refuse (1 t/m³) and inert C&D materials (2 t/m³).
 - (5) Use the conversion factor for chemical waste (0.88kg/L)



Appendix 6.1

Event Action Plans



Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed 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 analyzed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to ET Leader / ER; 2. Implement noise mitigation proposals.
Limit Level being exceeded	<ol style="list-style-type: none"> 1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance 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 and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.



Event and Action Plan for Construction Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform Contractor, IEC and ER; Repeat measurement to confirm finding; Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; and Review and advise the ET and ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> Notify Contractor. 	<ol style="list-style-type: none"> Identify source(s), investigate the causes of exceedance and propose remedial measures; Implement remedial measures; and Amend working methods agreed with the ER as appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Identify source; Inform Contractor, IEC and ER; Advise the Contractor and ER on the effectiveness of the proposed remedial measures; Repeat measurements to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with Contractor, IEC and ER; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET, ER and Contractor on possible remedial measures; Advise the ET and ER on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 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"> Identify source and investigate the causes of exceedance; Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; Implement the agreed proposals; and Amend proposal as appropriate.



Event and Action Plan for Construction Air Quality (Con't)

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform Contractor, IEC, ER, and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ER on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> Identify source(s) and investigate the causes of exceedance; Take immediate action to avoid further exceedance; Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; Implement the agreed proposals; and Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> Notify IEC, ER, Contractor and EPD; Identify source; Repeat measurement to confirm findings; Increase monitoring frequency to daily; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IEC and ER to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Check monitoring data submitted by the ET; Discuss amongst ER, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; Supervise the implementation of remedial measures; and 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"> Identify source(s) and investigate the causes of exceedance; Take immediate action to avoid further exceedance; Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; Implement the agreed proposals; Revise and resubmit proposals if problem still not under control; and Stop the relevant portion of works as determined by the ER until the exceedance is abated.



Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in situ measurement to confirm findings; Identify reasons for noncompliance and source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> Discuss with ET, ER and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with ET, IEC and Contractor on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, ER and IEC and propose mitigation measures to IEC and ER; Implement the agreed mitigation measures.
Action level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> Repeat in situ measurement to confirm findings; Identify reasons for noncompliance and source(s) of impact; Inform IEC and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Prepare to increase the monitoring frequency to daily; Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> Discuss with ET, ER and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with ET, IEC and Contractor on the proposed mitigation measures; Make agreement on the mitigation measures to be implemented; Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, ER and IEC and propose mitigation measures to IEC and ER within three working days; Implement the agreed mitigation measures.



Event and Action Plan for Water Quality (cont'd)

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> Repeat in situ measurement to confirm findings; Identify reasons for noncompliance and source(s) of impact; Inform IEC Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level. 	<ol style="list-style-type: none"> Discuss with ET, ER and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within three working days; Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	<ol style="list-style-type: none"> Repeat in situ measurement to confirm findings; Identify reasons for noncompliance and source(s) of impact; Inform IEC Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	<ol style="list-style-type: none"> Discuss with ET, ER and Contractor on the mitigation measures; Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Supervise the implementation of remedial measures; Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level. 	<ol style="list-style-type: none"> Inform the ER and confirm notification of the noncompliance in writing; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within three working days; Implement the agreed mitigation measures; As directed by the ER, to slow down or to stop all or part of the construction activities.



Event and Action Plan for Landscape and Visual

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
Nonconformity on one occasion	<ol style="list-style-type: none"> 1. Identify source(s); 2. Inform the Contractor, IEC and ER; 3. Discuss remedial actions with IEC, ER and Contractor; 4. Monitor remedial actions until rectification has been completed 	<ol style="list-style-type: none"> 1. Check inspection report; 2. Check contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Advise ER on effectiveness of proposed remedial measures; 5. Check implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of non-conformity in writing 2. Review and agree on the remedial measures proposed by the Contractor; 3. Supervise implementation of remedial 	<ol style="list-style-type: none"> 1. Identify source and investigate the non- conformity 2. Implement remedial measures 3. Amend working methods agreed with ER as appropriate 4. Rectify damage and undertake any necessary replacement
Repeated Nonconformity	<ol style="list-style-type: none"> 1. Identify source(s) 2. Inform the Contractor, IEC and ER; 3. Discuss inspection frequency 4. Discuss remedial actions with IEC, ER and Contractor 5. Monitor remedial actions until rectification has been completed; 6. If non- conformity stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Check inspection report 2. Check Contractor's working method 3. Discuss with ET, ER and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures 5. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Notify the Contractor 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 3. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Identify source and investigate the non- conformity 2. Implement remedial measures 3. Amend working methods agreed with ER as appropriate 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by ER until the non- conformity is abated.



Appendix 6.2

Summary for Notification of Exceedance



Summary for Notification of Exceedance

Ref No.	Date	Location	Parameters (Unit)	Measured	Action Level	Limit Level	Follow-up Action
X_18RIW2_001	28-Nov-18	F	Turbidity	71.5 mg/L	24.4 mg/L	32.7 mg/L	<p>Possible reason: Natural variation or changes of water quality in the vicinity of water abstraction location for the water quality monitoring station.</p> <p>Action taken/ to be taken: A repeated in-situ measurement (71.9 mg/L) had been conducted to confirm the exceedances. Checked with contractor works and reviewed previous monitoring data. Increased the monitoring frequency to daily and no exceedance of action and limit level was recorded on 29 Nov 2018 (1.0 mg/L).</p> <p>Remarks/ Other Observations: No construction activities was conducted (only placing water barrier) at construction site area on the monitoring date, no surface run-off on Clear Water Bay Road was observed. In view of no construction activity was conducted and no exceedance was recorded on the next day monitoring, it was considered that the exceedance was non-Project related.</p>



Appendix 8.1

Complaint Log



Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
--	--	--	--	--	--	--



Appendix 9.1

Construction Programme of Individual Contracts

Activity ID	Activity Name	Duration	Start	Finish	2018		2019	
					Nov 11	Dec 12	Jan 13	Feb 14
NE2017/03 - ARQ PHASE 2A - Monthly Programme Update (201810)-3i								
Road Improvement Works Location 1 (RIW1)								
Construction Works								
Preliminary Works								
CON10030	Trees survey at portion A	42	22-Oct-18 A	03-Dec-18				
CON11060	Pre-condition survey (RIW1)	30	22-Oct-18 A	25-Oct-18 A				
CON10040	Trees protection for trees transplant at portion A	89	12-Nov-18 A	01-Mar-19				
CON10110	Trees protection / trees felling works at portion A	60	04-Dec-18	18-Feb-19				
CON10010	Install monitoring & instrumentation at portion A	33	08-Dec-18	18-Jan-19				
Works in Subway KS27								
CON11130	Pre-drill works (RIW1)	120	13-Nov-18 A	16-Mar-19				
CON10060	Erect hoarding (KS27)	36	24-Nov-18	08-Jan-19				
Portion All Boulder Treatment Works								
CON10020	Boulder Treatment Works (Portion All)	75	21-Nov-18	22-Feb-19				
Road Improvement Works Location 2 (RIW2)								
Construction Works in Slope C3 (Portion B)								
Preliminary Works								
Site Set-up Works								
CON20010	Trees survey at portion B	30	22-Oct-18 A	24-Nov-18				
CON20040	Trees protection / trees felling works at portion B	42	26-Nov-18	16-Jan-19				
CON20080	Install monitoring & instrumentation at portion B	48	10-Dec-18	09-Feb-19				
CON20060	Erect hoarding at portion B	48	13-Dec-18	13-Feb-19				
Construction Noise Semi-Enclosure SE2 (Portion C)								
Preliminary Works								
Site Set-up Works								
CON20020	Trees survey at portion C	24	22-Oct-18 A	17-Nov-18 A				
CON21020	Pre-condition survey (RIW2, portion C)	30	22-Oct-18 A	24-Nov-18				
CON20050	Trees protection / trees felling works at portion C	48	19-Nov-18 A	16-Jan-19				
CON20090	Install monitoring & instrumentation at portion C	48	04-Dec-18	31-Jan-19				
CON20070	Erect hoarding at portion C	48	13-Dec-18	13-Feb-19				
Construction Works								
Road Works								
CON20030	Notification of district welcome sign board relocation	35	03-Oct-18 A	19-Nov-18 A				
CON20100	Relocation of district welcome sign board	18	19-Nov-18 A	10-Dec-18				
Road Improvement Works Location 3 (RIW3)								
Construction Works								
Works in Slope D1								
Preparation Works								
CON30860	Pre-condition survey (RIW3)	30	10-Oct-18 A	14-Nov-18 A				
Road Works (Slope D1)								
CON30890	Utilities mapping at Section 3	72	01-Dec-18	01-Mar-19				
Works in Slope D2								
Construction of Retaining Wall RWD2								
CON30020	Trees felling	60	21-Nov-18	01-Feb-19				
Works in Slope D3								
Slope Works (Slope D3)								
CON30030	Install safety fencing, from haul road & hoarding	65	18-Dec-18	09-Mar-19				
Noise Barrier Works								
Site Set-up Works								
CON30040	Traffic diversion	12	04-Dec-18	17-Dec-18				
CON30960	Road works at existing Sau Mau Ping Rd / Lin Tak Road cross junction	30	18-Dec-18	24-Jan-19				
Pedestrian Connectivity Facility (PC-E8)								
Construction Works								
Preparation Works								
CON41170	Pre-condition survey (PC-E8)	30	22-Oct-18 A	24-Nov-18				
Trees Works								
CON40060	Trees survey to Portion G	6	22-Oct-18 A	27-Oct-18 A				
CON40080	Trees felling works & trees protection works	52	22-Oct-18 A	20-Dec-18				
Hoarding Works & Site Set-up								

- Summary
- Actual Work
- Remaining Work
- Critical Remainin...
- Milestone

Activity ID	Activity Name	Duration	Start	Finish	2018		2019	
					Nov 11	Dec 12	Jan 13	Feb 14
CON40020	Announcement to public works to be commenced	52	22-Oct-18 A	20-Dec-18				
CON40090	Erect temporary staircase along E8-ABT & diversion	48	11-Dec-18	11-Feb-19				
CON40070	Erect hoarding (along Hiu Ming Street)	12	11-Dec-18	24-Dec-18				
Earth Works		70	06-Nov-18 A	29-Jan-19				
CON40040	Install monitoring & instrumentation	18	06-Nov-18 A	04-Dec-18				
CON40050	Initial reading for monitoring & instrumentation point	38	06-Nov-18 A	29-Dec-18				
CON40140	Construct soldier pile wall to E8-ABT	52	27-Nov-18	29-Jan-19				
Pedestrian Connectivity Facility (PC-E11)		921	22-Oct-18 A	27-Nov-21				
Construction Works		921	22-Oct-18 A	27-Nov-21				
Preliminary Works		921	22-Oct-18 A	27-Nov-21				
CON40650	Trees survey	16	22-Oct-18 A	08-Nov-18 A				
CON41180	Pre-condition survey (PC-E11)	24	22-Oct-18 A	17-Nov-18 A				
CON40720	Prepare & submit trees survey report	6	09-Nov-18 A	15-Nov-18 A				
CON40731	Trees preservation duration works period at portion E	893	23-Nov-18	27-Nov-21				
CON40660	Install ground settlement marker at Portion E	24	04-Dec-18	03-Jan-19				
CON40670	Install tiltmeter marker at Portion E	6	04-Dec-18	10-Dec-18				
CON40680	Install building settlement marker at Portion E	6	04-Dec-18	10-Dec-18				
CON40690	Initial reading taking	6	04-Dec-18	10-Dec-18				
CON40700	Prepare & submit initial reading for monitoring & instrumentation	7	11-Dec-18	18-Dec-18				
Sub-structure Works		96	30-Nov-18	28-Mar-19				
CON40760	Construct U/G utilities	96	30-Nov-18	28-Mar-19				
Pedestrian Connectivity Facility System A (SYA)		89	17-Sep-18 A	17-Jan-19				
Construction Works		89	17-Sep-18 A	17-Jan-19				
Preliminary Works		68	17-Sep-18 A	10-Dec-18				
CON50010	UU detection	8	17-Sep-18 A	29-Sep-18 A				
CON50160	Pre-condition survey (SYA)	30	24-Sep-18 A	10-Nov-18 A				
CON50020	Excavation for trial pit	42	08-Oct-18 A	01-Nov-18 A				
CON50030	Erect hoarding	52	16-Oct-18 A	10-Dec-18				
Sub-structure Works		30	11-Dec-18	17-Jan-19				
CON500410	Install sheet pile at SYA-F1 (62m L, 2m/d, 1 team)	30	11-Dec-18	17-Jan-19				
Pedestrian Connectivity Facility System B (SYB)		67	22-Oct-18 A	10-Jan-19				
Construction Works		67	22-Oct-18 A	10-Jan-19				
Preliminary Works		67	22-Oct-18 A	10-Jan-19				
CON50170	Pre-condition survey (SYB)	35	22-Oct-18 A	26-Nov-18				
CON50180	UU detection	36	27-Nov-18	10-Jan-19				

- Summary
- Critical Remainin...
- Actual Work
- Remaining Work
- Milestone